TIP: U-3334A

CONTRACT: C201300

STRUCTURE

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

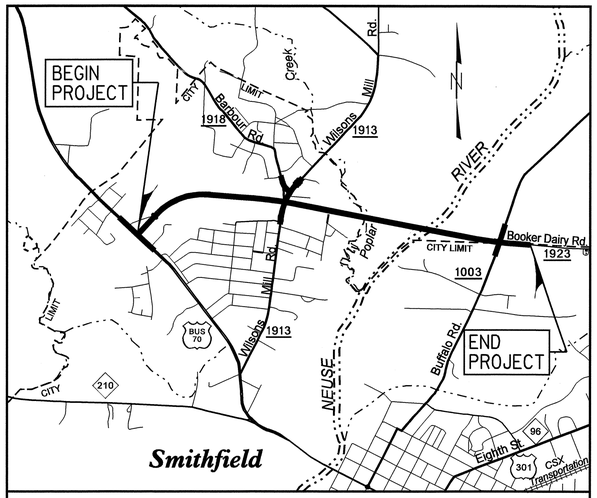
JOHNSTON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3334A		

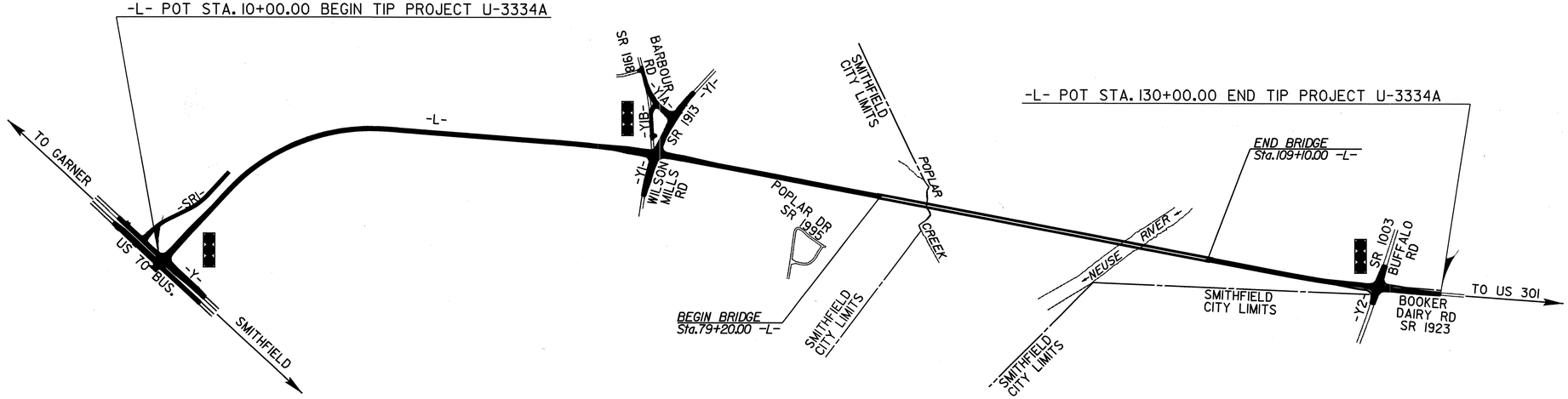
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34929.1.1	STP-1923(2)	P.E.
34929.2.4	STP-1923(3)	ROW, UTIL.
34929.3.2	STP-1923(6)	CONSTR.

LOCATION: SR 1923 EXTENSION (BOOKER DAIRY RD) FROM US 70 BUSINESS WEST TO SR 1003 (BUFFALO RD)

TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES, AND SIGNALS



VICINITY MAP



STRUCTURE DESIGN UNIT

DESIGN DATA

ADT 2005 = 6,000
ADT 2025 = 9,500
DHV = 10 %
D = 55 %
* T = 10 %
V = 50 MPH

*(TTST 4 % + DUAL 6 %)

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT U-3334A = 1.707 miles
LENGTH OF STRUCTURE TIP PROJECT U-3334A = 0.566 miles
TOTAL LENGTH TIP PROJECT U-3334A = 2.273 miles

Prepared In The Office of:

DIVISION OF HIGHWAYS

1000 Birch Ridge Dr., Raleigh, NC 27610

2006 STANDARD SPECIFICATIONS

LETTING DATE:
April 21, 2009

ROY GIROLAMI, P.E.
PROJECT ENGINEER

DAVID ANDERSON, P.E.
PROJECT DESIGN ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE DESIGN ENGINEER

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED
DIVISION ADMINISTRATOR ***DATE***

ARCHIVE.DGN
Plotted: 11/25/08 11:23
Time: 9:19AM

06-OCT-2008 10:52
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danderson

F.A. PROJECT NO.: STP-1923(6)

79+00 80+00 81+00 82+00 83+00 84+00 85+00 86+00 87+00

FILL FACE @ E.B.1
STA. 79+20.00 -L-
GRADE POINT EL.138.760

EXP. SPAN A SPAN B SPAN C SPAN D SPAN E

APPROX. NATURAL GROUND

1'-0" MIN. EARTH BERM

TOP OF BERM EL. 129.699

1½:1 SLOPE (NORMAL TO CAP)

160 150 140 130 120 110 100

EL. 130.0±

1'-6"

EL. 120.0±

EL. 119.0±

℄ HP 12 X 53 STEEL PILES

FIX FIX

EL. 116.0±

EXP. EXP.

FOR TOP OF DRILLED PIER ELEVATIONS, SEE INTERIOR BENT SHEETS

FIX FIX

EL. 110.0±

EL. 107.5±

EXP. EXP.

POPLAR CREEK

MATCH LINE 1

FIX FIX

EL. 111.0±

END BENT 1 BENT 1 BENT 2 BENT 3 BENT 4 BENT 5

ELEVATION

(SECTIONS AT BENTS AND END BENTS ARE SHOWN AT RIGHT ANGLES)

GRADE DATA

0.5059% -0.5612%

PI = 94+50.00
EL = 146.500
VC = 200'

HYDRAULIC DATA

DESIGN DISCHARGE	20,500 c.f.s.
FREQUENCY OF DESIGN FLOOD	50 yr.
DESIGN HIGH WATER ELEVATION	127.700
DRAINAGE AREA	1,185 sq. MI.
BASIC DISCHARGE(Q100)	25,100 c.f.s.
BASIC HIGH WATER ELEVATION	129.500

OVERTOPPING FLOOD DATA

OVERTOPPING DISCHARGE	60,000 c.f.s.
FREQUENCY OF OVERTOPPING FLOOD	500 yr. +
OVERTOPPING FLOOD ELEVATION	137.500

MATCH LINE 1

SS EASEMENT

BEGIN APPR. SLAB STA. 78+96.04 -L-

1'-0" MIN. EARTH BERM NORMAL TO CAP

SR 1913

CLASS II RIP-RAP

75°-00'-00"

TOP OF BERM EL. 129.699 (LEVEL)

WORK POINT #1
STA. 79+20.00 -L-
FILL FACE @ E.BT.#1

WORK POINT #2 STA. 80+32.00 -L-

WORK POINT #3 STA. 81+64.50 -L-

WORK POINT #4 STA. 82+97.00 -L-

WORK POINT #5 STA. 84+29.50 -L-

WORK POINT #6 STA. 85+62.00 -L-

75°-00'-00" (TYP. END BENT #1 AND BENT#1 THRU BENT #5)

WORK BRIDGE

BENT 1 CONTROL LINE

BENT 2 CONTROL LINE

BENT 3 CONTROL LINE

POPLAR CREEK

BENT 4 CONTROL LINE

BENT 5 CONTROL LINE

30'-0" (TYP.)

20'-0" (TYP.)

55'-0" (TYP.)

30'-0" (TYP.)

-L-

9'-0"

RIGHT LANE CONTROL LINE

SR 1003

112'-0" SPAN A | 132'-6" SPAN B | 132'-6" SPAN C | 132'-6" SPAN D | 132'-6" SPAN E | SPANS F THRU X

2990'-0"
TOTAL LENGTH OF BRIDGE, WP #1 TO WP #25

MATCH LINE 1

PLAN

NORTH CAROLINA PROFESSIONAL SEAL 9804 ENGINEER KEVIN K. KIRKLAND
10-27-08

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 1 OF 8 BRIDGE #608

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1923 OVER NEUSE RIVER BETWEEN SR 1913 AND SR 1003

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-1
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : N. Q. TRAN DATE : 12-3-02
CHECKED BY : W. K. FISCHER DATE : 6-23-04

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danderson

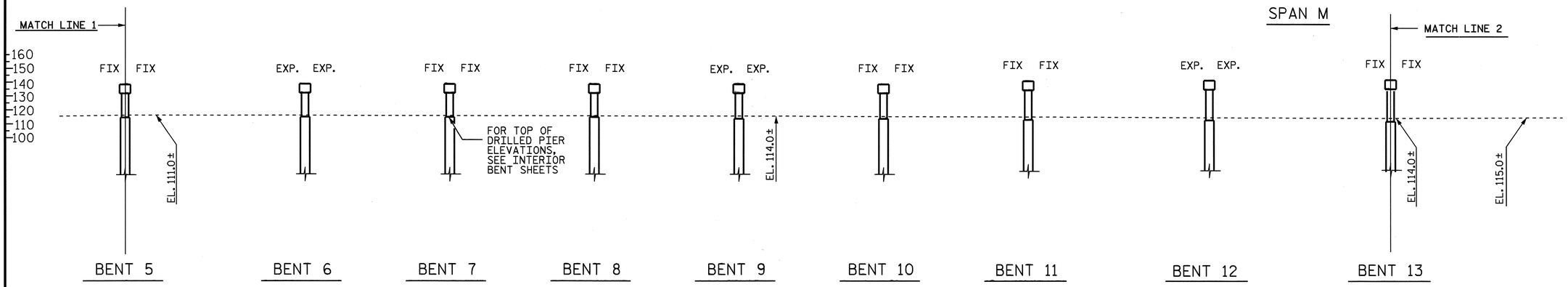
86+00 87+00 88+00 89+00 90+00 91+00 92+00 93+00 94+00 95+00

GRADE DATA

0.5059% -0.5612%

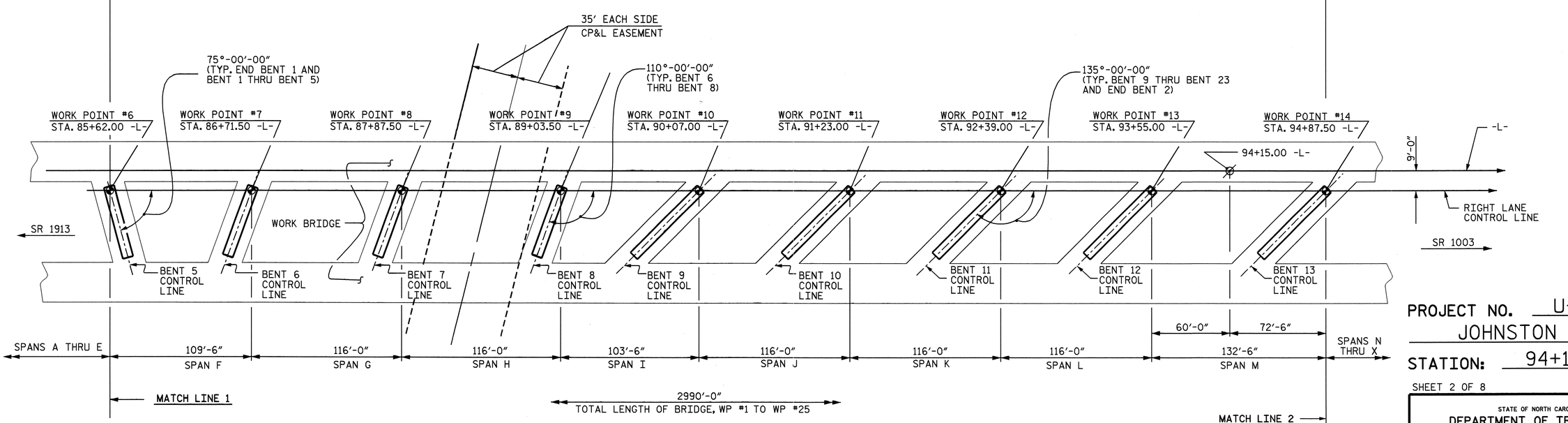
PI = 94+50.00
EL = 146.500
VC = 200'

SPAN F SPAN G SPAN H SPAN I SPAN J SPAN K SPAN L SPAN M



ELEVATION

(SECTIONS AT BENTS AND END BENTS ARE SHOWN AT RIGHT ANGLES)



PLAN

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1923 OVER NEUSE RIVER BETWEEN SR 1913 AND SR 1003

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-2
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : N. Q. TRAN DATE : 12-3-02
CHECKED BY : W. K. FISCHER DATE : 6-23-04

06-OCT-2008 10:52
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danderson

95+00 96+00 97+00 98+00 99+00 100+00 101+00 102+00 103+00 104+00

GRADE DATA

0.5059% -0.5612%

PI = 94+50.00
EL = 146.500
VC = 200'

SPAN N SPAN O SPAN P SPAN Q SPAN R SPAN S

160 150 140 130 120 110 100

MATCH LINE 2

FIX FIX | FIX FIX | EXP. EXP. | FIX FIX | FIX FIX | EXP. EXP. | FIX FIX

NEUSE RIVER

EL. 129.5 (100 YR.)

NORMAL WATER SURFACE EL. 105.6 (9/02)

MATCH LINE 3

EL. 114.0± EL. 118.0± EL. 120.0± EL. 121.0± EL. 117.0± EL. 115.0± EL. 106.0± EL. 103.0± EL. 104.0± EL. 105.0± EL. 116.5± EL. 121.0± EL. 122.0±

FOR TOP OF DRILLED PIER ELEVATIONS, SEE INTERIOR BENT SHEETS

BENT 13 BENT 14 BENT 15 BENT 16 BENT 17 BENT 18 BENT 19

ELEVATION

(SECTIONS AT BENTS AND END BENTS ARE SHOWN AT RIGHT ANGLES)

MATCH LINE 2

MATCH LINE 3

135°-00'-00" (TYP. BENT 9 THRU BENT 23 AND END BENT 2)

WORK POINT #14 STA. 94+87.50 -L-
WORK POINT #15 STA. 96+20.00 -L-
WORK POINT #16 STA. 97+52.50 -L-
WORK POINT #17 STA. 98+85.00 -L-
WORK POINT #18 STA. 100+17.50 -L-
WORK POINT #19 STA. 101+50.00 -L-
WORK POINT #20 STA. 102+82.50 -L-

SR 1913

WORK BRIDGE

BENT 13 CONTROL LINE
BENT 14 CONTROL LINE
BENT 15 CONTROL LINE
BENT 16 CONTROL LINE
BENT 17 CONTROL LINE
BENT 18 CONTROL LINE
BENT 19 CONTROL LINE

EDGE OF WATER
NEUSE RIVER
EDGE OF WATER

9'-0"
-L-
RIGHT LANE CONTROL LINE
SR 1003

SPANS A THRU M | 132'-6" SPAN N | 132'-6" SPAN O | 132'-6" SPAN P | 132'-6" SPAN Q | 132'-6" SPAN R | 132'-6" SPAN S | SPANS T THRU X

MATCH LINE 2

2990'-0"
TOTAL LENGTH OF BRIDGE, WP #1 TO WP #25

MATCH LINE 3

PLAN

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID B. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 3 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1923 OVER NEUSE RIVER BETWEEN SR 1913 AND SR 1003

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-3
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : N. Q. TRAN DATE : 12-3-02
CHECKED BY : W. K. FISCHER DATE : 6-23-04

06-OCT-2008 10:53
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06-OCT-2008 10:53
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danderson

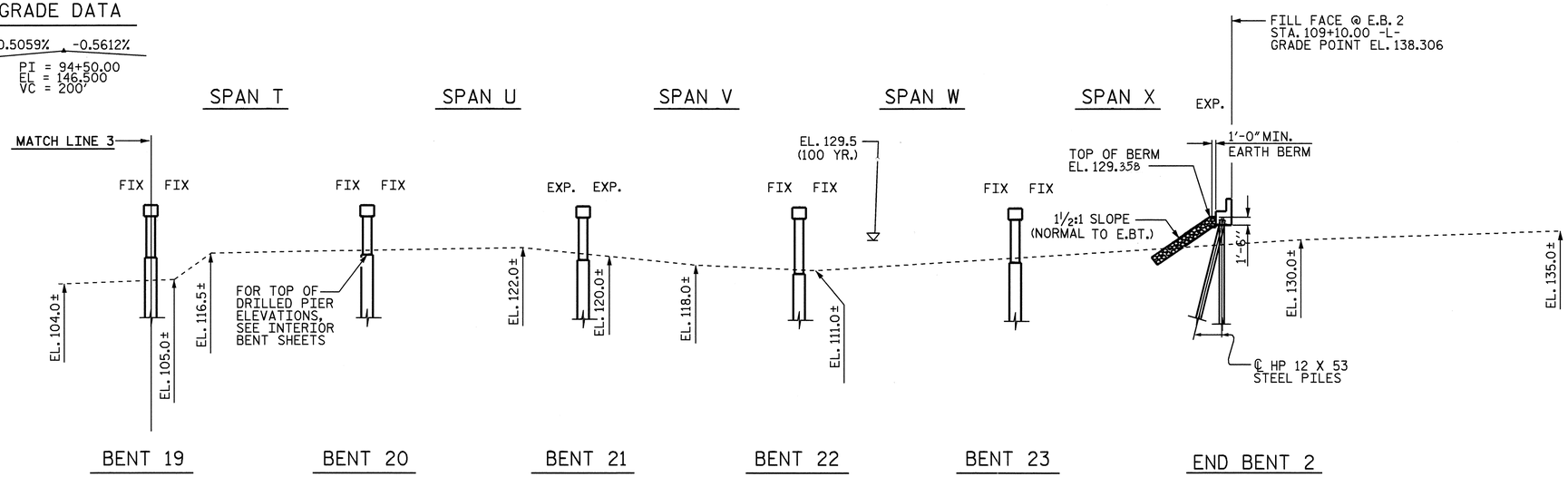
103+00 104+00 105+00 106+00 107+00 108+00 109+00 110+00 111+00

GRADE DATA

0.5059% ▲ -0.5612%

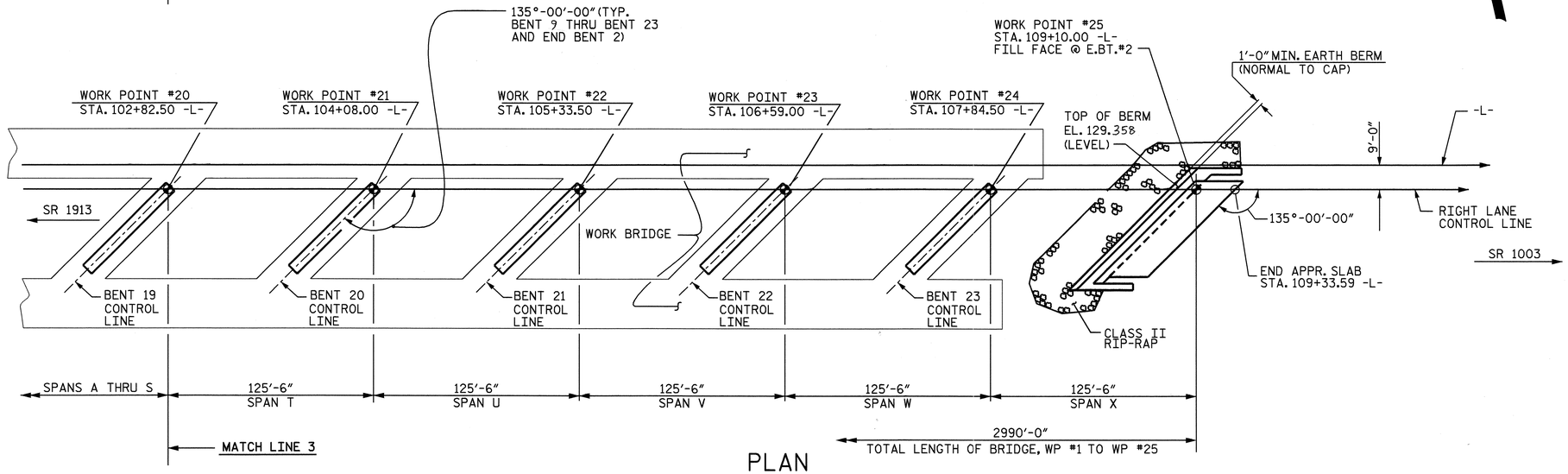
PI = 94+50.00
EL = 146.500
VC = 200'

SPAN T SPAN U SPAN V SPAN W SPAN X



ELEVATION

(SECTIONS AT BENTS AND END BENTS ARE SHOWNS AT RIGHT ANGLES)



PLAN

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 4 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1923 OVER NEUSE RIVER BETWEEN SR 1913 AND SR 1003

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-4
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : N. Q. TRAN DATE : 12-3-02
CHECKED BY : W. K. FISCHER DATE : 6-23-04

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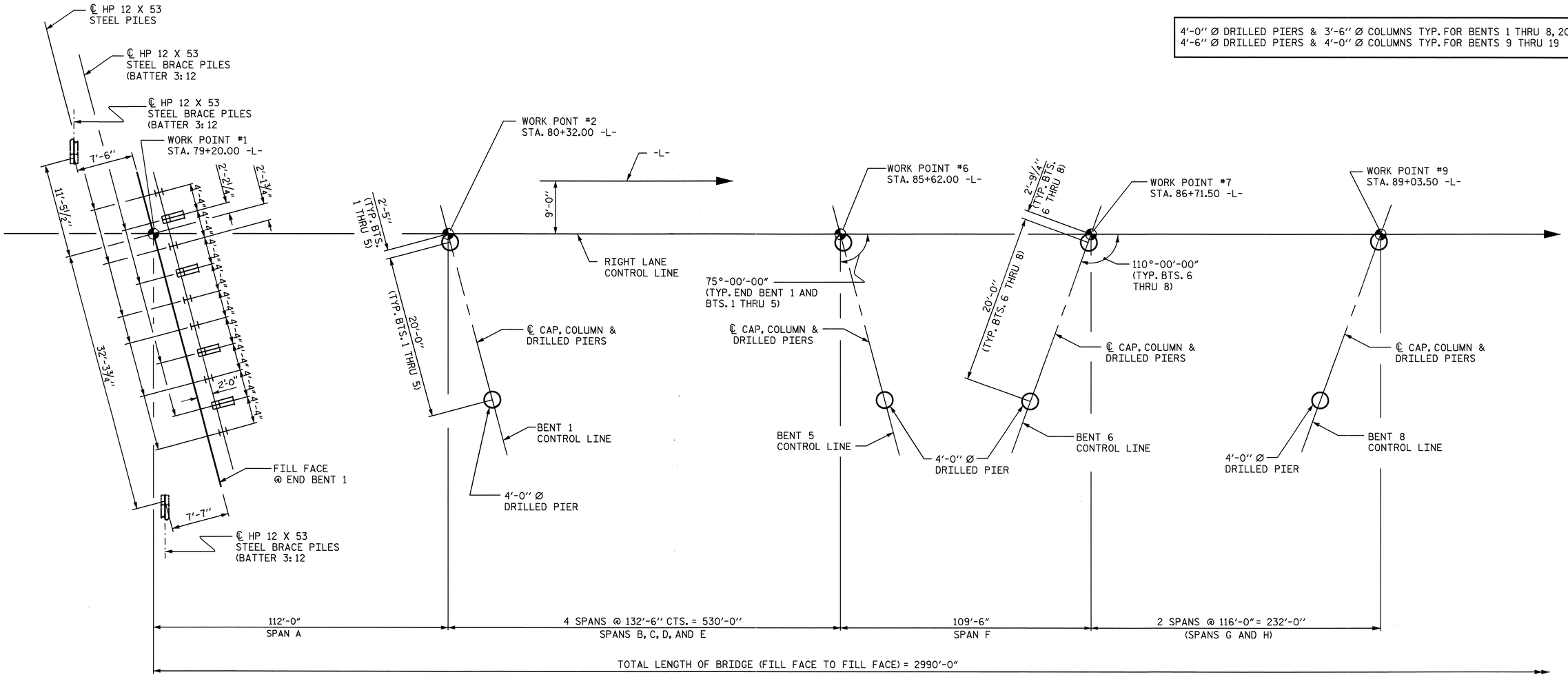
srashidi

4'-0'' Ø DRILLED PIERS & 3'-6'' Ø COLUMNS TYP. FOR BENTS 1 THRU 8, 20 THRU 23
4'-6'' Ø DRILLED PIERS & 4'-0'' Ø COLUMNS TYP. FOR BENTS 9 THRU 19



FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE)

WORK POINT #1 STA. 79+20.00 -L- FILL FACE @ E.BT.1	WORK POINT #5 STA. 84+29.50 -L- BENT 4	WORK POINT #9 STA. 89+03.50 -L- BENT 8	WORK POINT #13 STA. 93+55.00 -L- BENT 12	WORK POINT #17 STA. 98+85.00 -L- BENT 16	WORK POINT #21 STA. 104+08.00 -L- BENT 20	WORK POINT #25 STA. 109+10.00 -L- FILL FACE @ E. BT. 2
WORK POINT #2 STA. 80+32.00 -L- BENT 1	WORK POINT #6 STA. 85+62.00 -L- BENT 5	WORK POINT #10 STA. 90+07.00 -L- BENT 9	WORK POINT #14 STA. 94+87.50 -L- BENT 13	WORK POINT #18 STA. 100+17.50 -L- BENT 17	WORK POINT #22 STA. 105+33.50 -L- BENT 21	
WORK POINT #3 STA. 81+64.50 -L- BENT 2	WORK POINT #7 STA. 86+71.50 -L- BENT 6	WORK POINT #11 STA. 91+23.00 -L- BENT 10	WORK POINT #15 STA. 96+20.00 -L- BENT 14	WORK POINT #19 STA. 101+50.00 -L- BENT 18	WORK POINT #23 STA. 106+59.00 -L- BENT 22	
WORK POINT #4 STA. 82+97.00 -L- BENT 3	WORK POINT #8 STA. 87+87.50 -L- BENT 7	WORK POINT #12 STA. 92+39.00 -L- BENT 11	WORK POINT #16 STA. 97+52.50 -L- BENT 15	WORK POINT #20 STA. 102+82.50 -L- BENT 19	WORK POINT #24 STA. 107+84.50 -L- BENT 23	

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

DRAWN BY : S. M. RASHIDI DATE : 3/15/05
CHECKED BY : D. R. ANDERSON DATE : 8/21/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 5 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON SR 1923 OVER NEUSE RIVER BETWEEN SR 1913 AND SR 1003

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-5
1			3			TOTAL SHEETS
2			4			115

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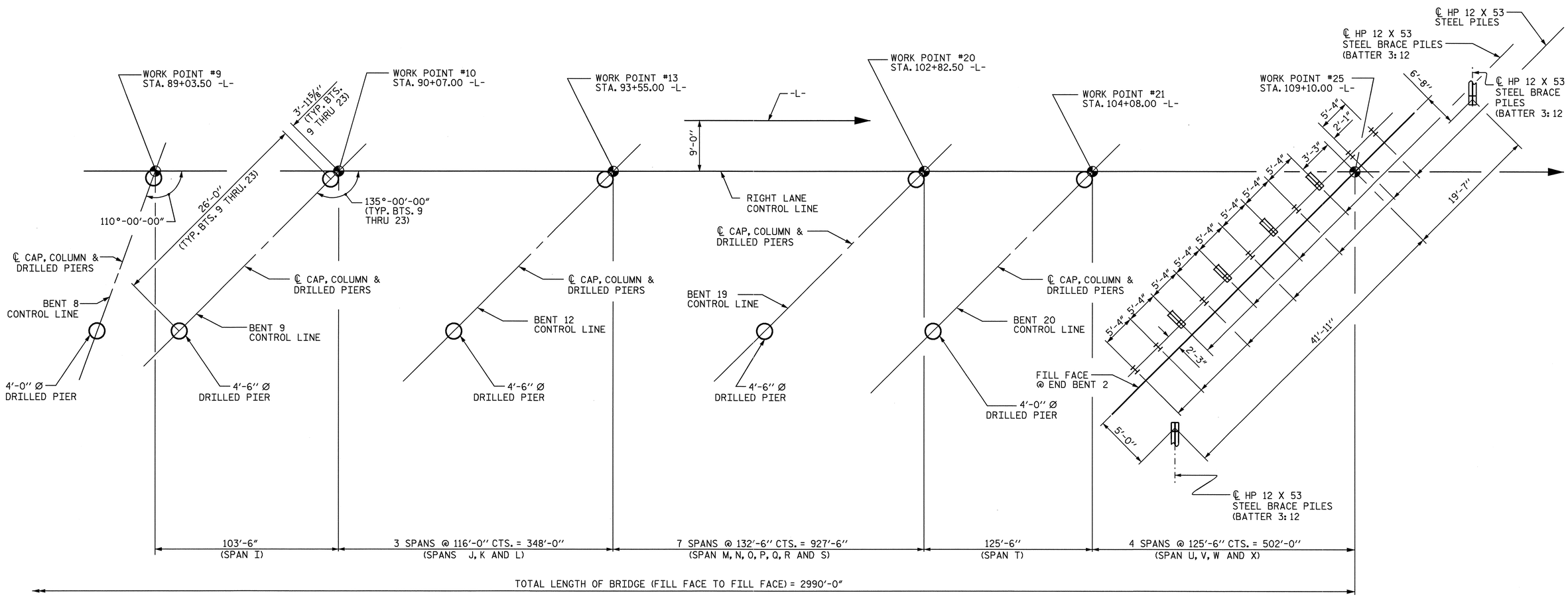
jtillman

4'-0'' Ø DRILLED PIERS & 3'-6'' Ø COLUMNS TYP. FOR BENTS 1 THRU 8, 20 THRU 23
4'-6'' Ø DRILLED PIERS & 4'-0'' Ø COLUMNS TYP. FOR BENTS 9 THRU 19



FOUNDATION LAYOUT

(DIMENSIONS LOCATING PILES ARE SHOWN TO THE PILE CENTERLINE)

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 6 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

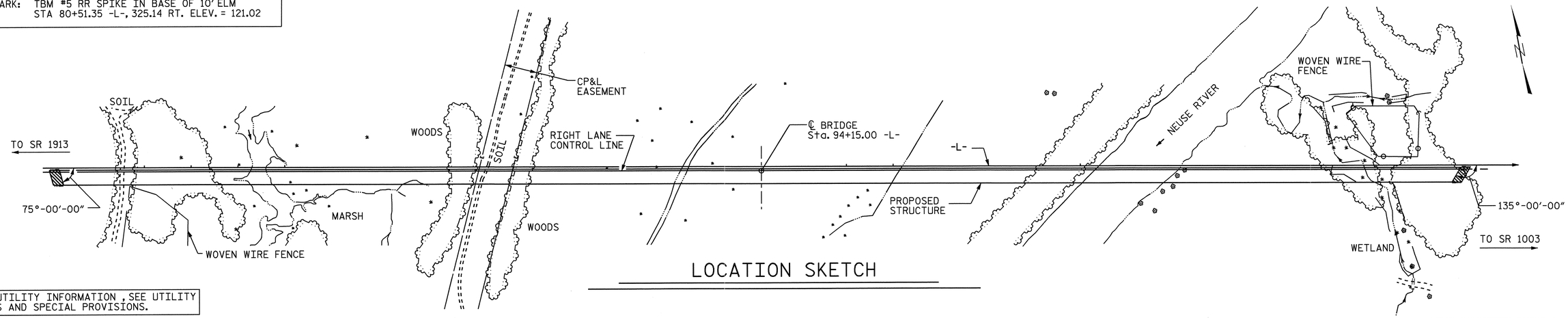
GENERAL DRAWING
BRIDGE ON SR 1923 OVER
NEUSE RIVER BETWEEN
SR 1913 AND SR 1003

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-6
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

DRAWN BY : S. M. RASHIDI DATE : 3/15/05
CHECKED BY : D. R. ANDERSON DATE : 8/21/08

BENCH MARK: TBM #5 RR SPIKE IN BASE OF 10" ELM
STA 80+51.35 -L-, 325.14 RT. ELEV. = 121.02



LOCATION SKETCH

FOR UTILITY INFORMATION , SEE UTILITY PLANS AND SPECIAL PROVISIONS.

NOTES:

ASSUMED LIVE LOAD = HS 20 OR ALTERNATE LOADING, EXCEPT THAT GIRDERS HAVE BEEN DESIGNED FOR HS 25.

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

THIS BRIDGE HAS BEEN DESIGNED BY THE STRENGTH DESIGN METHOD AS SPECIFIED IN AASHTO STANDARD SPECIFICATIONS.

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

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES", MAY, 2001.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

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.

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

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

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

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

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT, MAINTAIN AND AFTERWARDS REMOVE A TEMPORARY ACCESS AT STATION 94+15.00 -L- FOR USE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE. FOR CONSTRUCTION, MAINTENANCE AND REMOVAL OF TEMPORARY ACCESS, SEE SPECIAL PROVISIONS.

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

DRILLED PIERS AT BENT NO. 1 THROUGH BENT NO. 23 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 65 TSF.

DRILLED PIERS AT BENT NO. 1 THROUGH BENT NO. 5 ARE DESIGNED FOR AN APPLIED LOAD OF 465 TONS EACH AT THE TOP OF THE COLUMN.

DRILLED PIERS FOR BENT NO. 6 THROUGH BENT NO. 8 ARE DESIGNED FOR AN APPLIED LOAD OF 436 TONS EACH AT THE TOP OF THE COLUMN.

DRILLED PIERS FOR BENT NO. 9 THROUGH BENT NO. 11 ARE DESIGNED FOR AN APPLIED LOAD OF 444 TONS EACH AT THE TOP OF THE COLUMN.

DRILLED PIERS FOR BENT NO. 12 THROUGH BENT NO. 19 ARE DESIGNED FOR AN APPLIED LOAD OF 482 TONS EACH AT THE TOP OF THE COLUMN.

DRILLED PIERS FOR BENT NO. 20 THROUGH BENT NO. 23 ARE DESIGNED FOR AN APPROVAL LOAD OF 464 TONS EACH AT THE TOP OF THE COLUMN.

INSTALL DRILLED PIERS AT BENT NO. 1, NO. 3 THROUGH NO. 6 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 98.5', 88.5', 88.5', 88.0', & 89.0', RESPECTIVELY, SATISFY THE REQUIRED END BEARING CAPACITY, AND HAVE A MINIMUM PENETRATION OF 4 FEET INTO ROCK AS DEFINED BY THE DRILLED PIERS PROVISIONS.

INSTALL DRILLED PIERS AT BENT NO. 2 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 93.5' (LEFT) AND 96.0' (RIGHT), SATISFY THE REQUIRED END BEARING CAPACITY, AND HAVE A MINIMUM PENETRATION OF 4 FEET INTO ROCK AS DEFINED BY THE DRILLED PIERS PROVISION.

INSTALL DRILLED PIERS AT BENT NO. 7 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 86.0' (LEFT) AND 89.0' (RIGHT), SATISFY THE REQUIRED END BEARING CAPACITY, AND HAVE A MINIMUM PENETRATION OF 4.5 FEET INTO ROCK AS DEFINED BY THE DRILLED PIERS PROVISION.

INSTALL DRILLED PIERS AT BENT NO. 8 THROUGH NO. 13 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 88.0', 87.0', 85.5', 86.5', 85.0', & 85.0', RESPECTIVELY, SATISFY THE REQUIRED TIP BEARING CAPACITY, AND HAVE A MINIMUM PENETRATION OF 5.0 FEET INTO ROCK AS DEFINED BY THE DRILLED PIERS PROVISION.

INSTALL DRILLED PIERS AT BENT NO. 14 THROUGH NO. 18 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 85.0', 84.5', 84.5', 80.0', & 83.0', RESPECTIVELY, SATISFY THE REQUIRED TIP BEARING CAPACITY, AND HAVE A MINIMUM PENETRATION OF 5.0 FEET INTO ROCK AS DEFINED BY THE DRILLED PIERS PROVISION.

INSTALL DRILLED PIERS AT BENT NO. 19 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 83.5' (LEFT) AND 86.0' (RIGHT), RESPECTIVELY, SATISFY THE REQUIRED END BEARING CAPACITY, AND HAVE A MINIMUM PENETRATION OF 5.0 FEET INTO ROCK AS DEFINED BY THE DRILLED PIERS PROVISION

INSTALL DRILLED PIERS AT BENT NO. 20 THROUGH NO. 23 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 93.0', 93.5', 92.5', 97.5', RESPECTIVELY, SATISFY THE REQUIRED TIP BEARING CAPACITY, AND HAVE A MINIMUM PENETRATION OF 4.0 FEET INTO ROCK AS DEFINED BY THE DRILLED PIERS PROVISION.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 THROUGH BENT NO. 23 ARE ELEVATIONS 110.0', 105.0', 98.0', 99.0', 98.0', 98.0', 98.0', 98.0', 95.0', 95.0', 95.0', 95.0', 95.0', 95.0', 95.0', 95.0', 94.0', 94.0', 95.0', 97.0', 101.0', 104.0', 104.0', & 104.0'. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT NO. 1 THROUGH BENT NO. 23.

SID INSPECTINS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CROSSHOLE SONIC LOGGING, SEE SPECIAL PROVISIONS.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1 THROUGH NO. 6. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 110.0', 105.0', 98.0', 97.5', 98.0', & 98.0', RESPECTIVELY, WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 7. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 95.0' (LEFT) & 98.0' (RIGHT), WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 8 THROUGH NO. 15. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 95.0', WITHOUT THE ENGINEER'S PERMISSION. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 18 AND BENT NO. 19. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 94.0' & 96.0', WITHOUT THE ENGINEER'S PERMISSION. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

PERMANENT STEEL CASING MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 22 AND BENT NO. 23. IF REQUIRED, DO NOT EXTEND CASING BELOW ELEVATION 95.0', WITHOUT THE ENGINEER'S PERMISSION. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT STEEL CASING.

INSTALL PERMANENT STEEL CASING AT BENT NO. 18 AND BENT NO. 19 BY VIBRATING, SCREWING, OR DRIVING THE CASING BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 98.0'.

INSTALL PERMANENT STEEL CASING, IF REQUIRED, AT BENT NO. 1 THROUGH BENT NO. 6 BY VIBRATING, SCREWING, OR DRIVING THE CASING BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 115.5', 110.5', 108.0', 108.0', 108.0', 108.0', RESPECTIVELY.

INSTALL PERMANENT STEEL CASING, IF REQUIRED, AT BENT NO. 7 THROUGH BENT NO. 15 BY VIBRATING, SCREWING, OR DRIVING THE CASING BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 111.0'.

INSTALL PERMANENT STEEL CASING, IF REQUIRED, AT BENT NO. 22 AND BENT NO. 23 BY VIBRATING, SCREWING, OR DRIVING THE CASING BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATION 108.0'.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED BEARING CAPACITY OF 60 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF TWO.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT END BENT NO. 1 AND END BENT NO. 2 IS 60 TONS PER PILE.

FOR BRIDGE DECK RIDEABILITY AND GROOVING, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 7 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1923 OVER NEUSE RIVER BETWEEN SR 1913 AND SR 1003

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-7
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : J.A. TILLMAN DATE : 9/18/09
CHECKED BY : A.S. CALLAWAY DATE : 9/18/09

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TOTAL BILL OF MATERIAL

	CONSTRUCTION, MAINTENANCE & REMOVAL OF TEMP. ACCESS	4'-6"Ø DRILLED PIERS IN SOIL	4'-0"Ø DRILLED PIERS IN SOIL	4'-6"Ø DRILLED PIERS NOT IN SOIL	4'-0"Ø DRILLED PIERS NOT IN SOIL	PERMANENT STEEL CASING FOR 4'-6"Ø DRILLED PIERS	PERMANENT STEEL CASING FOR 4'-0"Ø DRILLED PIERS	SID INSPECTION	CROSSHOLE SONIC LOGGING	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS	REINFORCING STEEL	SPIRIAL COLUMN REINFORCING STEEL	MODIFIED 72" PRESTRESSED CONCRETE GIRDERS		HP 12 X 53 STEEL PILES		2-BAR METAL RAIL	1'-2" x 2'-6" CONCRETE PARAPET	RIP RAP CLASS II (2'-0" THICK)	FILTER FABRIC FOR DRAINAGE	ELASTOMERIC BEARINGS	EVAZOTE JOINT SEALS	STRUCTURE DRAINAGE SYSTEM
	LUMP SUM	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	LIN. FT.	EACH	EACH	SQ. FT.	SQ. FT.	CU. YDS.	LUMP SUM	LBS.	LBS.	NO.	LIN. FT.	NO.	LIN. FT.	LIN. FT.	LIN. FT.	TONS	SQ. YDS.	LUMP SUM	LUMP SUM	LUMP SUM
SUPERSTRUCTURE										102,790	87,154					96	11,819.1			5,927.8	5,944.5					
END BENT 1												35.1		4,691				12	180			105	100			
BENT 1			20.5		18.0		15.5					27.8		12,240	1,498											
BENT 2			19.5		16.0		15.0					32.0		13,179	1,719											
BENT 3			27.0		16.0		24.0					34.2		14,649	2,072											
BENT 4			24.0		16.0		24.0					35.0		14,790	2,118											
BENT 5			25.7		18.0		23.7					35.3		15,039	2,172											
BENT 6			24.4		18.0		24.9					35.4		14,886	2,164											
BENT 7			29.5		18.0		29.4					35.0		15,329	2,251											
BENT 8			32.4		18.0		36.3					34.1		15,346	2,243											
BENT 9		34.8		18.0		36.8						50.9		17,828	2,658											
BENT 10		37.0		18.0		36.0						51.8		18,315	2,790											
BENT 11		34.7		18.0		35.7						52.5		18,217	2,765											
BENT 12		37.7		18.0		35.7						53.1		19,361	2,890											
BENT 13		37.8		18.0		35.9						53.3		19,438	2,906											
BENT 14		37.5		19.0		36.5						52.5		19,321	2,884											
BENT 15		38.7		19.0		36.6						51.7		19,263	2,861											
BENT 16		44.0		18.0								49.0		19,088	2,798											
BENT 17		35.3		18.0								56.5		19,964	3,048											
BENT 18		27.3		20.0		25.3						55.8		19,088	2,836											
BENT 19		23.8		20.0		21.3						55.1		18,504	2,672											
BENT 20			36.2		18.0							38.1		15,409	1,834											
BENT 21			34.7		18.0							37.7		15,143	1,767											
BENT 22			18.2		18.0		31.1					43.9		15,215	1,804											
BENT 23			17.2		18.0		40.0					40.2		14,010	1,522											
END BENT 2												51.1		6,366				13	260			240	230			
TOTAL	LUMP SUM	388.6	309.3	204.0	210.0	299.8	263.9	4	4	102,790	87,154	1,097.1	LUMP SUM	394,679	54,272	96	11,819.1	25	440	5,927.8	5,944.5	345	330	LUMP SUM	LUMP SUM	LUMP SUM

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 8 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

BRIDGE ON SR 1923 OVER
NEUSE RIVER BETWEEN
SR 1913 AND SR 1003

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-8
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : J.A. TILLMAN DATE : 9/18/09
CHECKED BY : A. S. CALLAWAY DATE : 9/18/09

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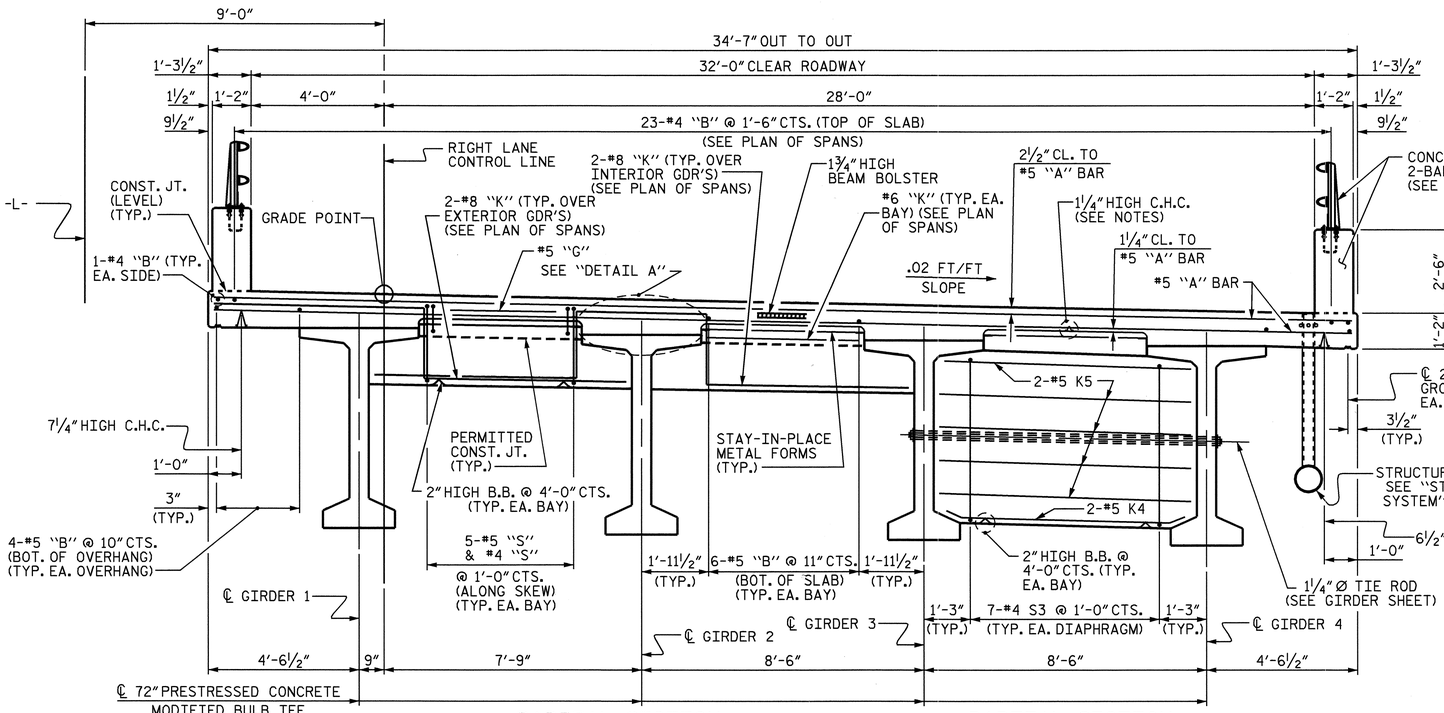
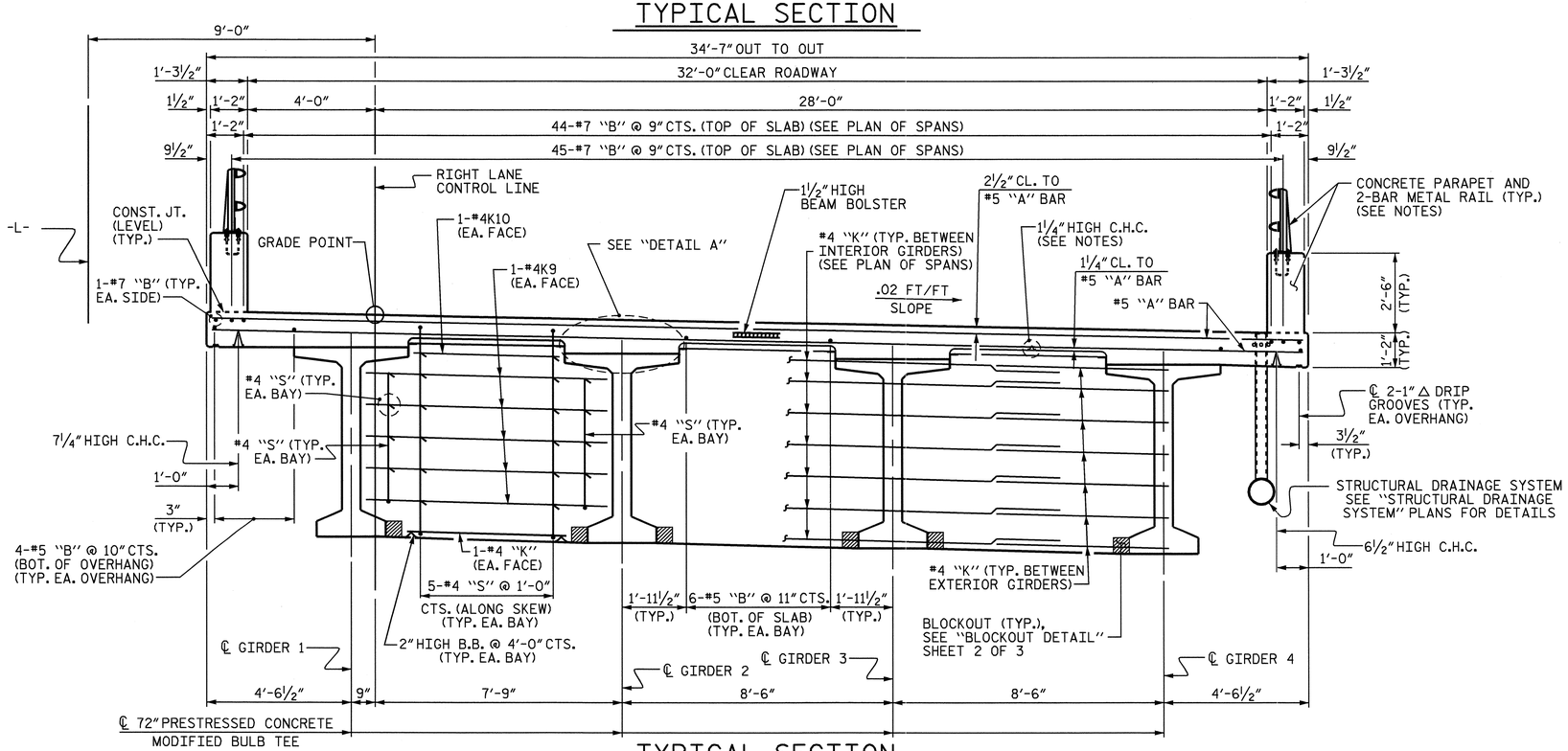


PARTIAL SECTION
@ END BENTS AND BENTS 2, 4, 6, 9, 12, 15, 18, & 21

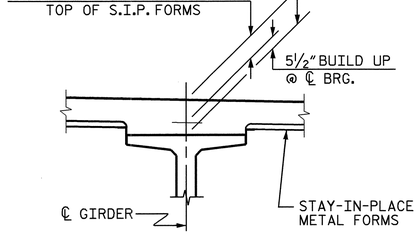
PARTIAL SECTION
@ INTERMEDIATE DIAPHRAGMS

TYPICAL SECTION



TYPICAL SECTION

FOR BENTS 1, 3, 5, 7, 8, 10, 11, 13, 14, 16, 17, 19, 20, 22, & 23



DETAIL A

NOTES

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

LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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

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

CONCRETE IN INTERMEDIATE DIAPHRAGMS MAY BE CLASS A IN LIEU OF CLASS AA. PAYMENT SHALL BE MADE UNDER THE UNIT CONTRACT PRICE FOR REINFORCED CONCRETE DECK SLAB.

#5 "G" BARS MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE DIAPHRAGMS AND THE 1¼" DIA. TIE RODS SHALL BE TIGHTENED BEFORE THE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RE-TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.

FOR CONCRETE PARAPET REINFORCING STEEL AND DETAILS, SEE "SUPERSTRUCTURE 1'-2" x 2'-6" CONCRETE PARAPET" SHEETS.

FOR 2 BAR METAL RAIL DETAILS, SEE 2 BAR METAL RAIL SHEETS.

EXCLUDER PLATES SHALL BE USED SO THAT CONCRETE IS EXCLUDED FROM THE METAL STAY-IN-PLACE FORM VALLEYS FOR SPANS B, C, D, E, M, N O, P, Q, R, & S.

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SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-9
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : N.Q. TRAN DATE : 7/13/08
CHECKED BY : W.F. PARKER DATE : 9/04/08

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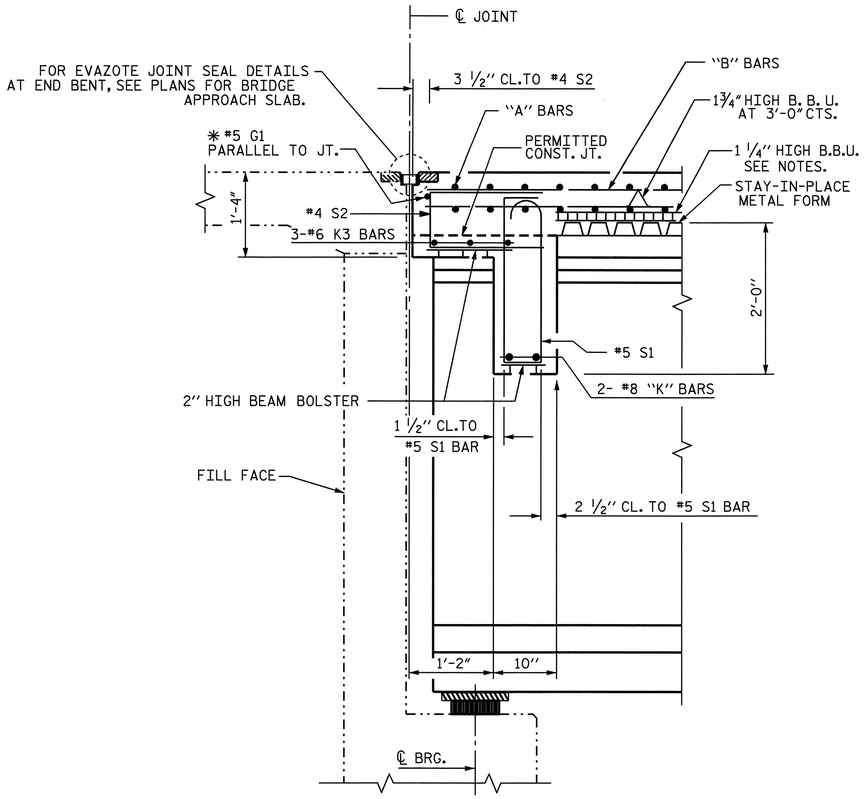
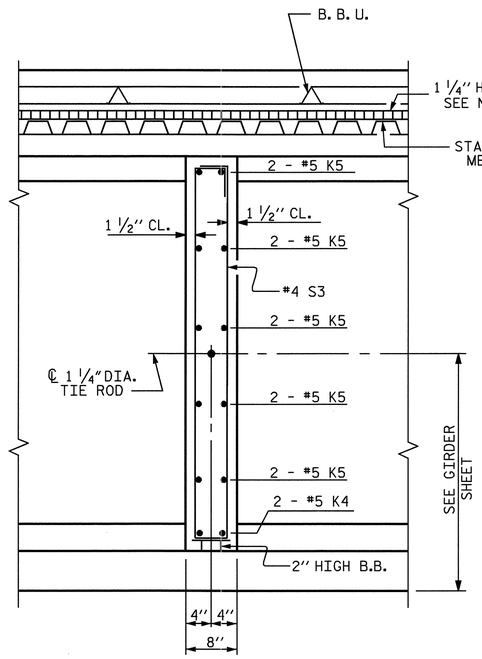
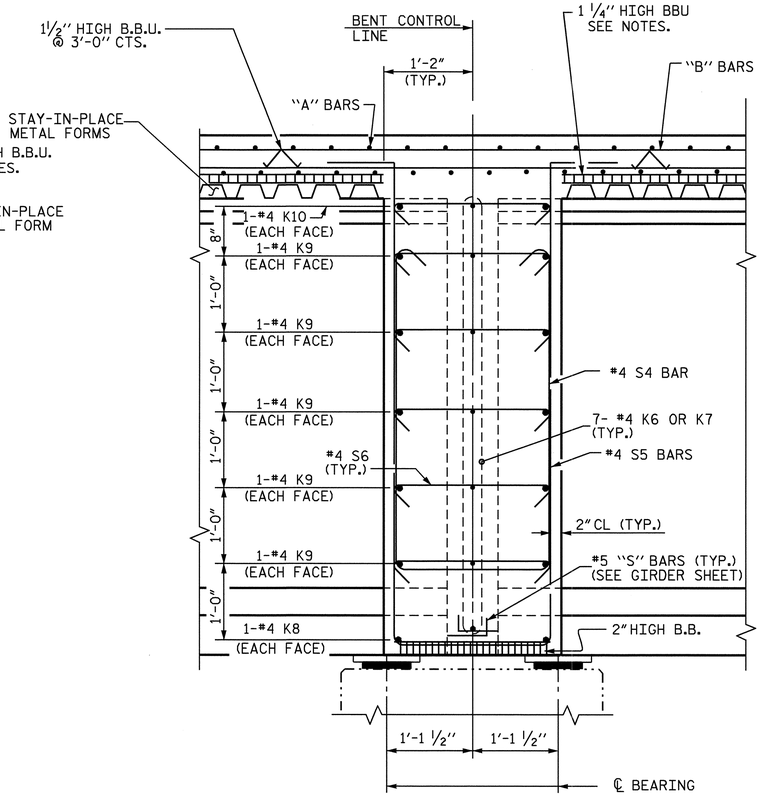


SECTION A-A

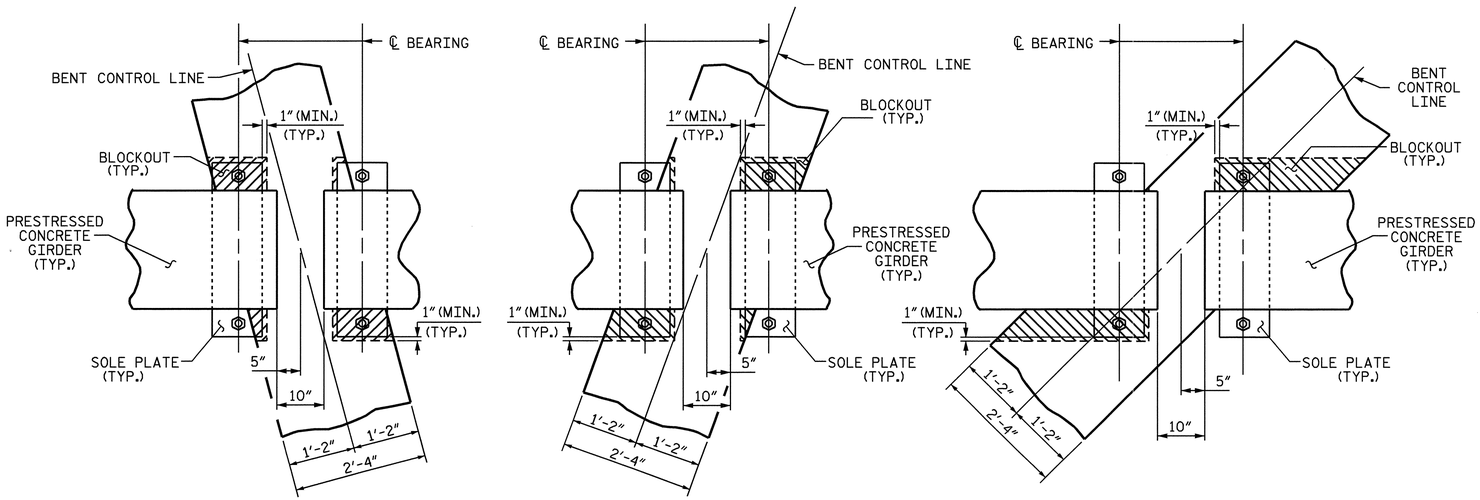
✳#5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



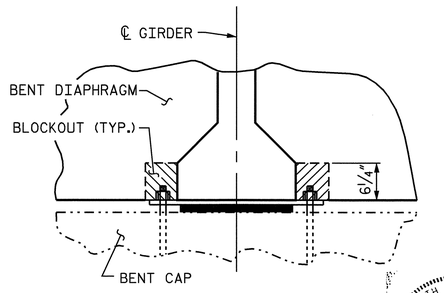
SECTION B-B



SECTION C-C



BENT DIAPHRAGM BLOCK-OUT DETAIL



SECTION

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-10
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : N.Q. TRAN DATE : 7/13/08
CHECKED BY : W.F. PARKER DATE : 9/4/08

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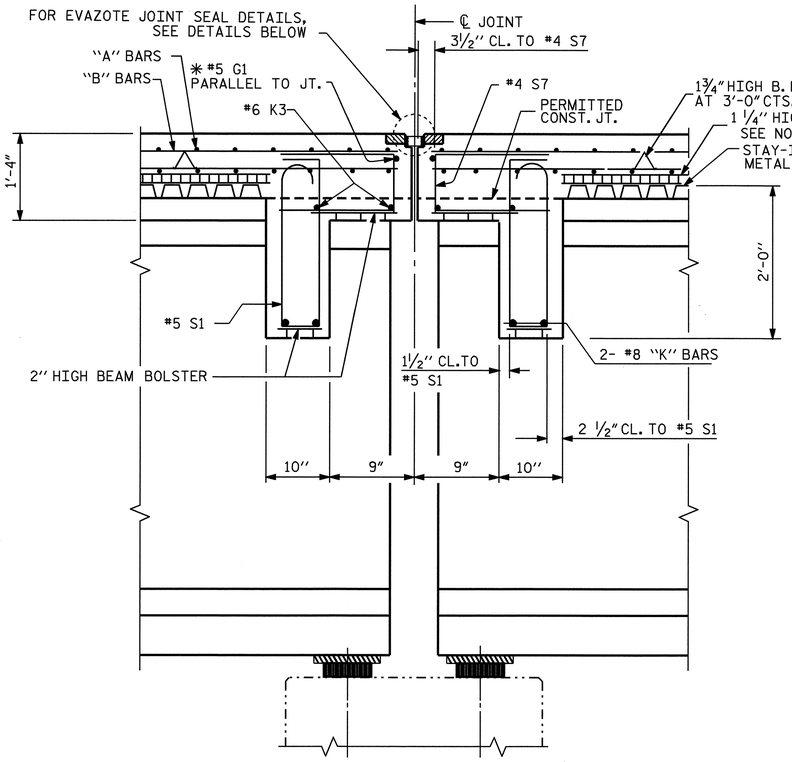
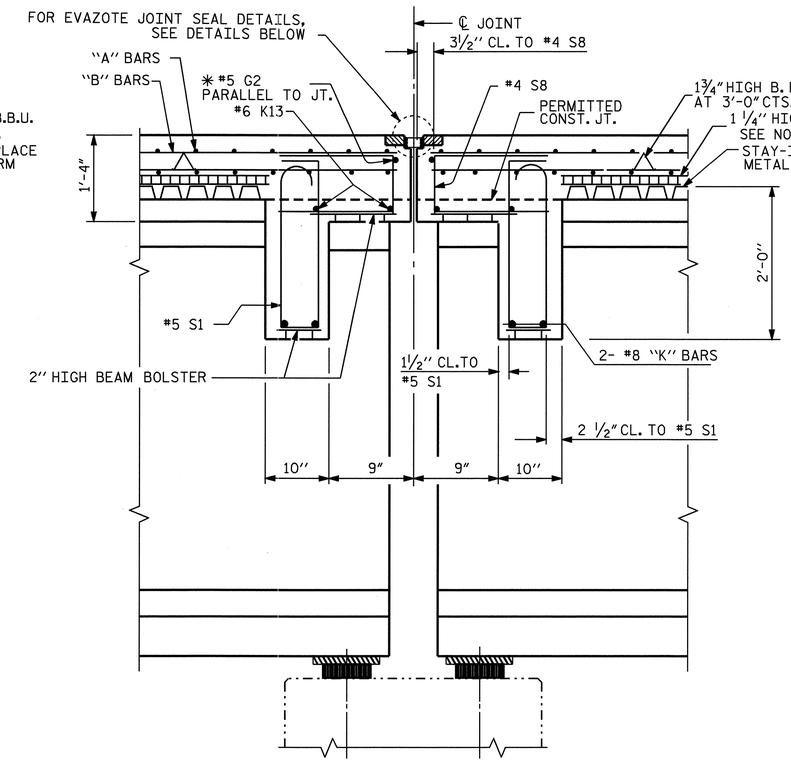


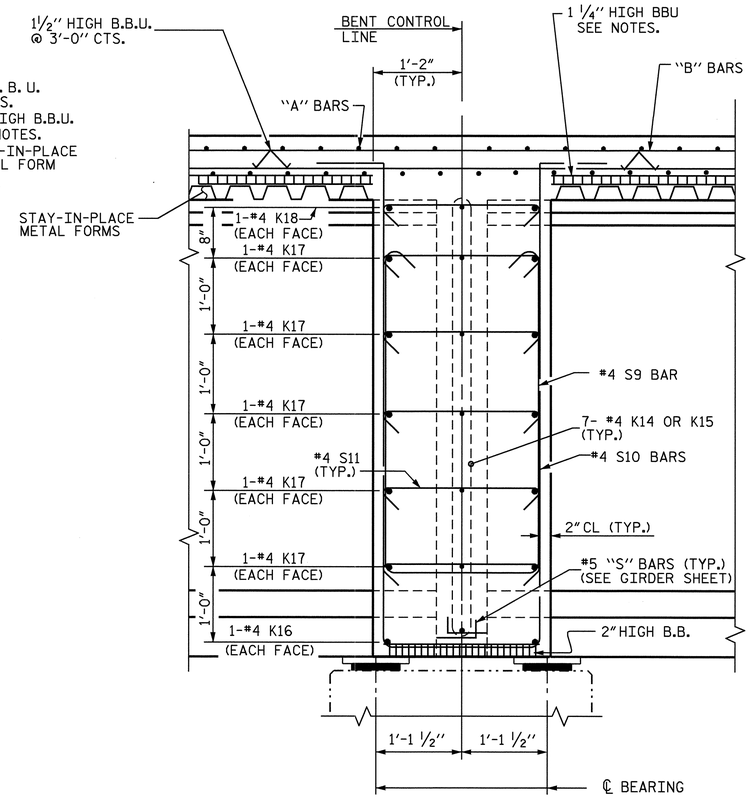
SECTION D-D

✱#5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

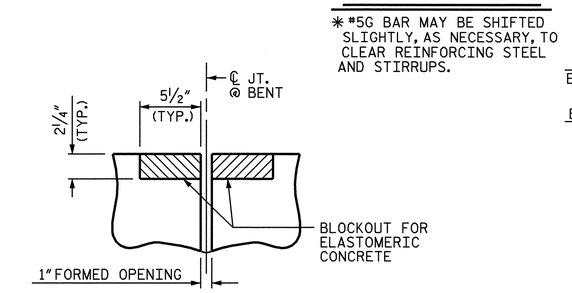


SECTION E-E

✱#5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.

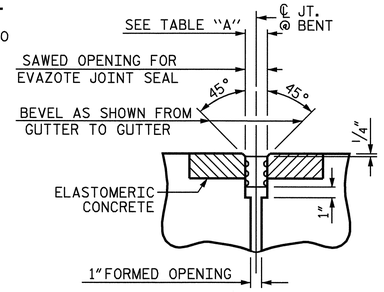


SECTION F-F



SECTION C-C

EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)



SECTION C-C

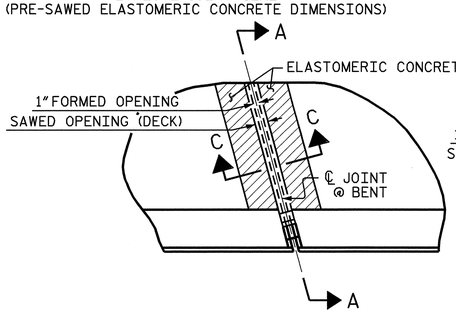
EVAZOTE JOINT SEAL
(EXPANSION)

	BENT 2	BENT 4	BENT 6	BENT 9	BENT 12	BENT 15	BENT 18	BENT 21
@ 45° F.	2 15/16"	3"	2 15/16"	3"	2 15/16"	2 15/16"	2 15/16"	2 15/16"
@ 60° F.	2 11/16"	2 3/4"	2 5/8"	2 3/4"	2 5/8"	2 5/8"	2 5/8"	2 5/8"
@ 90° F.	2 3/16"	2 1/4"	2 1/16"	2 1/4"	2 1/16"	2"	2 1/16"	2 1/16"

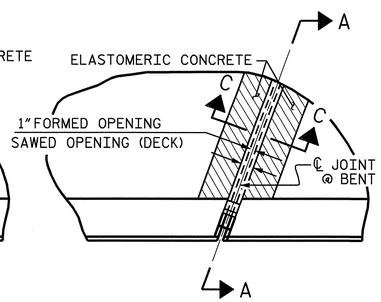
TABLE "A"

ELASTOMERIC CONCRETE	
BENT	ELASTOMERIC CONCRETE ★ (CU. FT.)
2	5.2
4	5.2
6	5.5
9	9.6
12	9.6
15	9.6
18	9.6
21	9.6
TOTAL	63.9

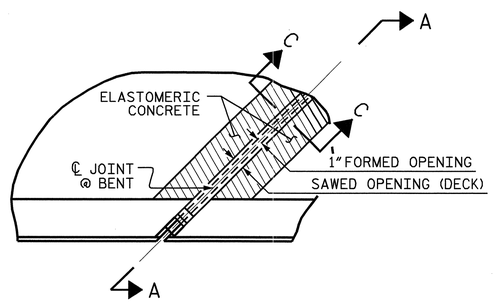
★ BASED ON MINIMUM BLOCKOUT SHOWN.



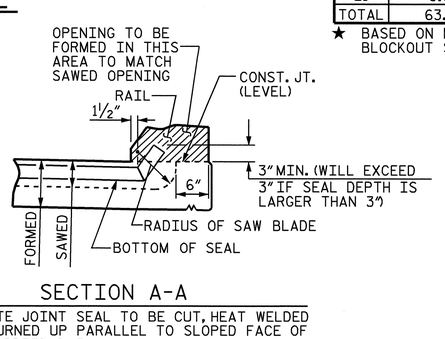
PLAN @ 75°



PLAN @ 110°



PLAN 135°



SECTION A-A

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
11/25/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-11
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : N.Q. TRAN DATE : 7/13/08
CHECKED BY : W.F. PARKER DATE : 9/4/08

EVAZOTE JOINT SEAL DETAILS @ BENT 2, 4, 6, 9, 12, 15, 18, & 21

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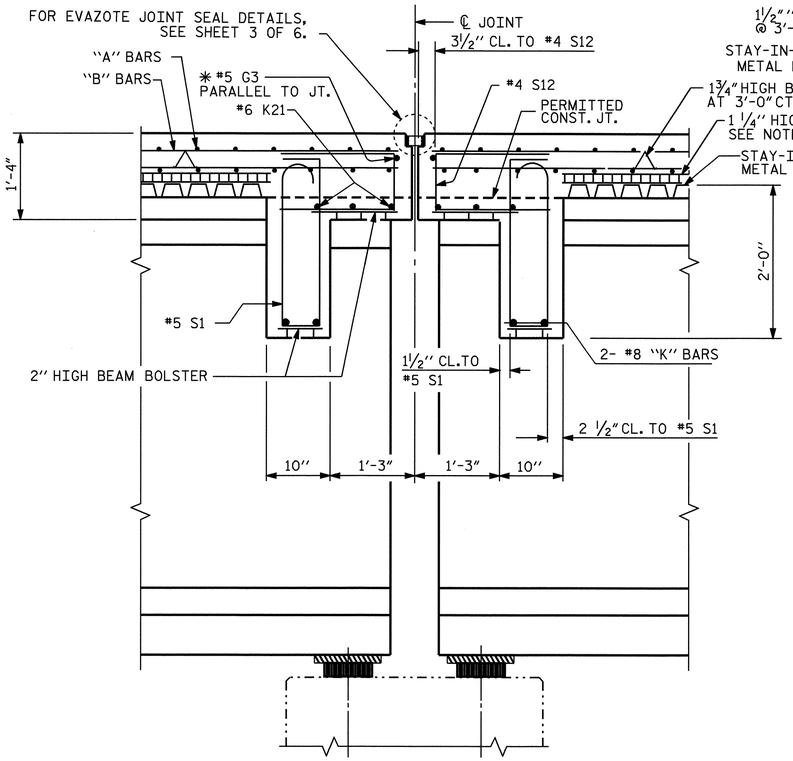
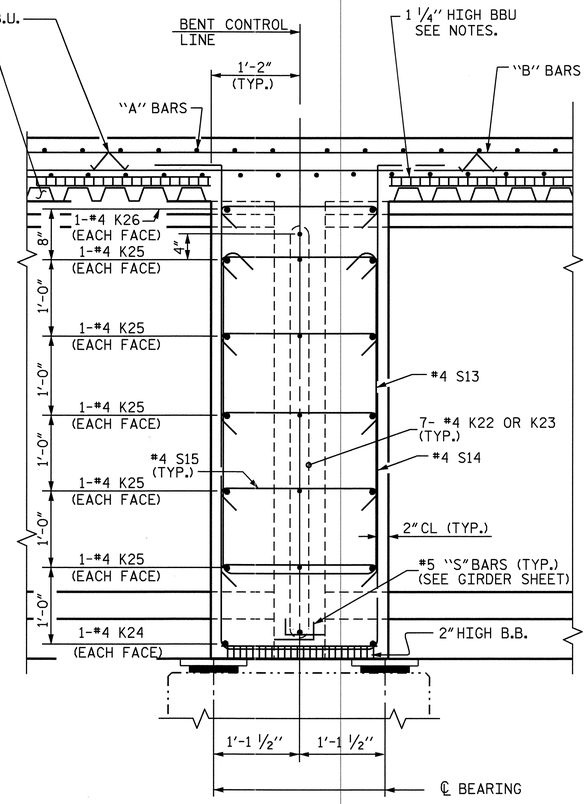
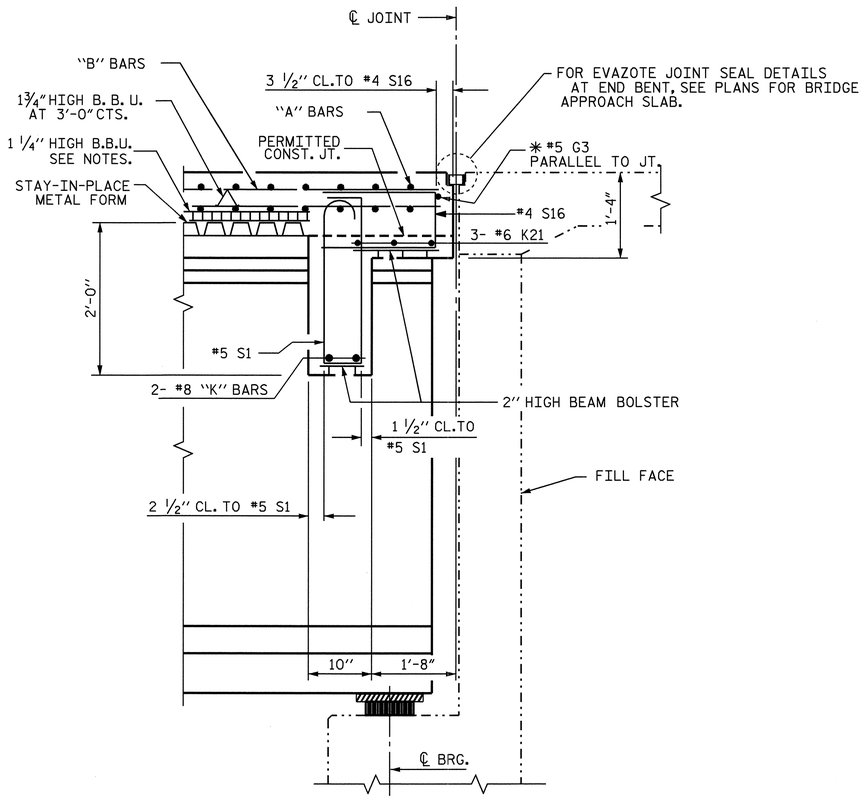


SECTION G-G

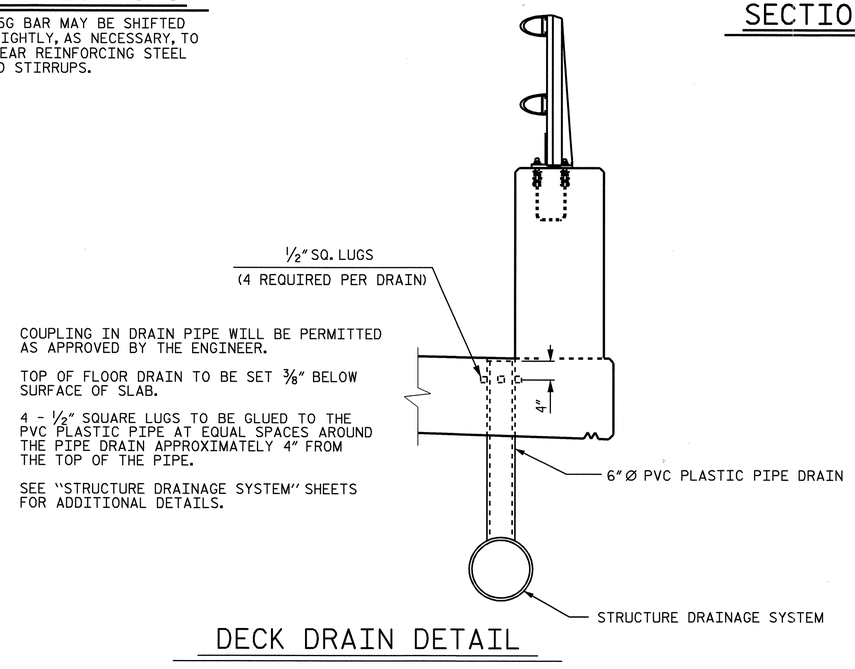
✳ #5G BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR REINFORCING STEEL AND STIRRUPS.



SECTION H-H



SECTION I-I



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

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

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

SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS FOR ADDITIONAL DETAILS.

DECK DRAIN DETAIL

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/21/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-12
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : N.Q. TRAN DATE : 7/13/08
CHECKED BY : W.F. PARKER DATE : 9/4/08

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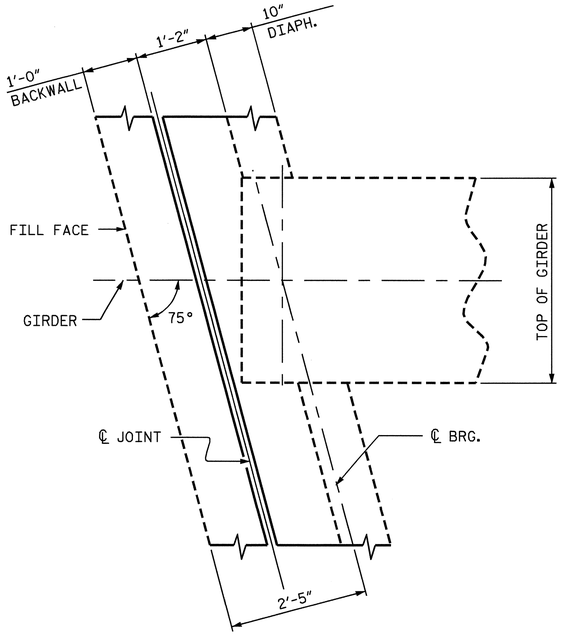

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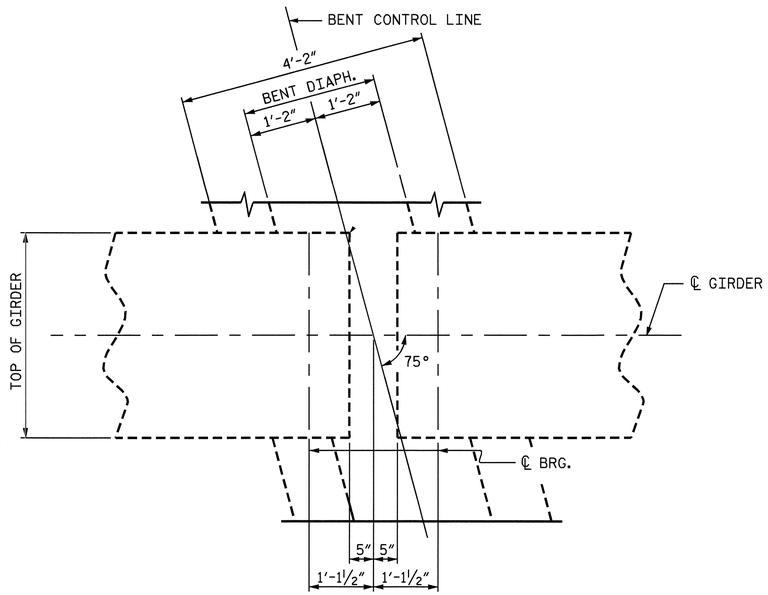

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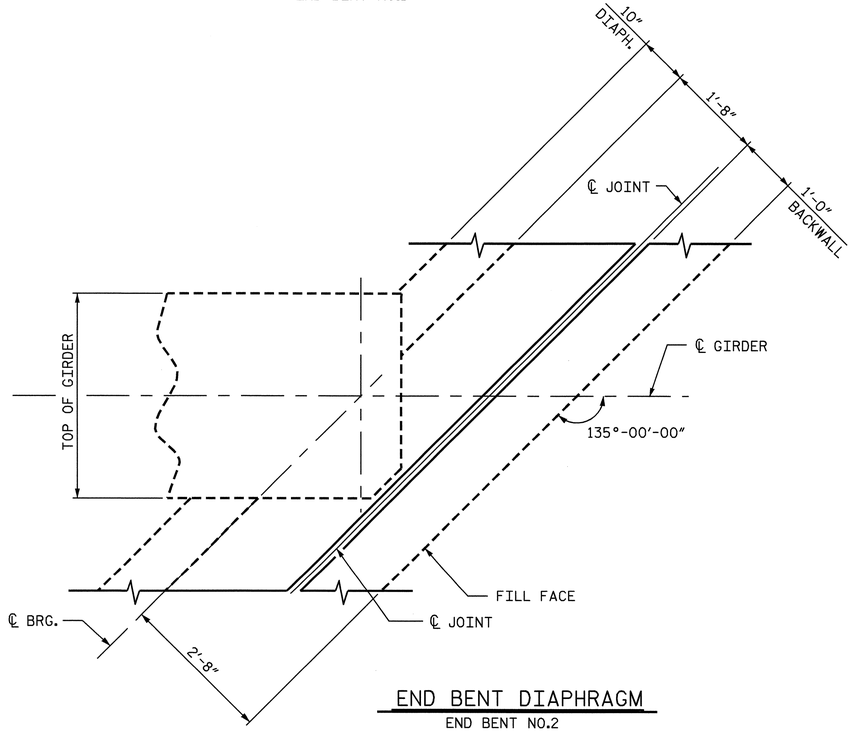

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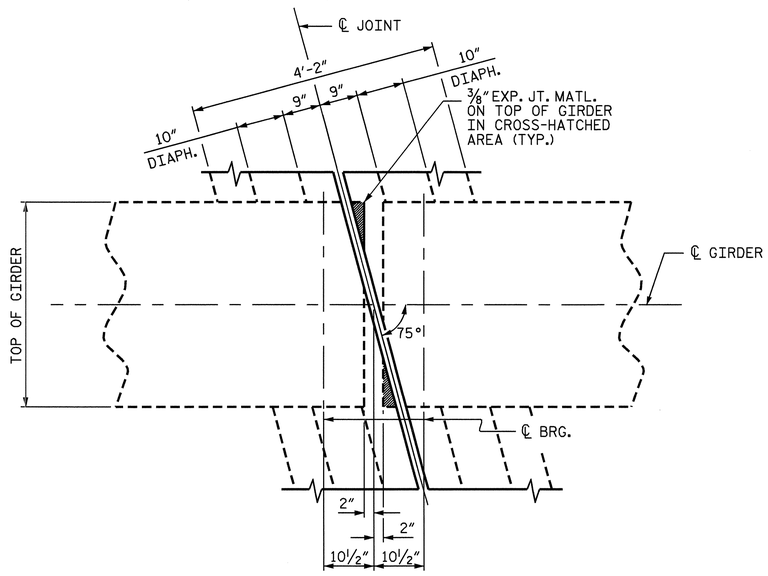

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PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-13
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

DRAWN BY : J.A. TILLMAN DATE : 9/12/08
CHECKED BY : W.F. PARKER DATE : 9/12/08

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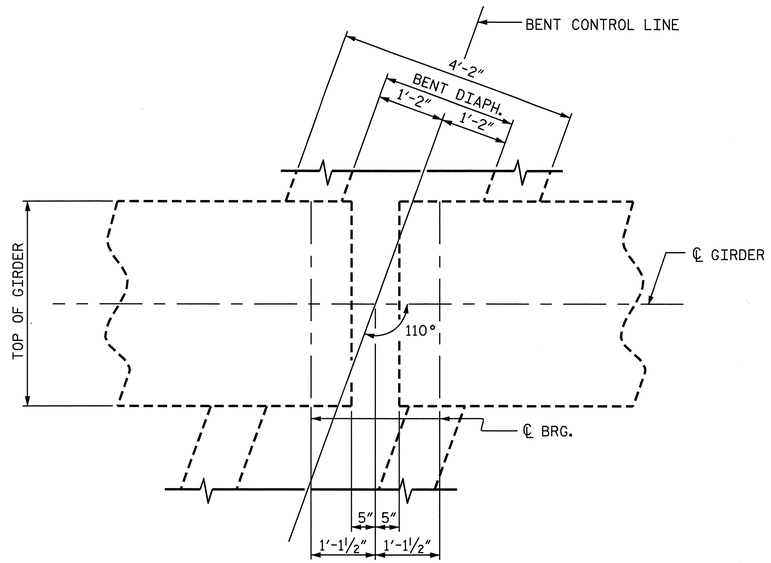

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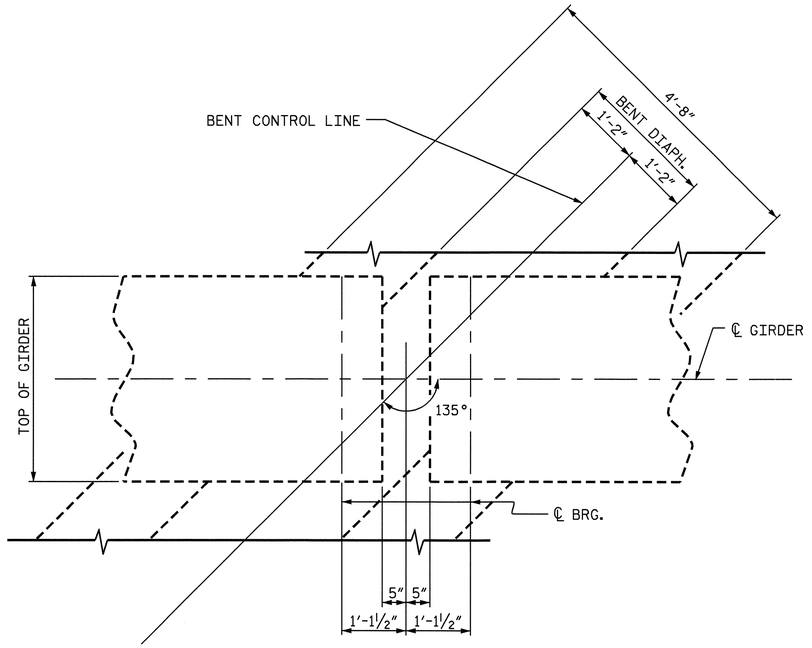

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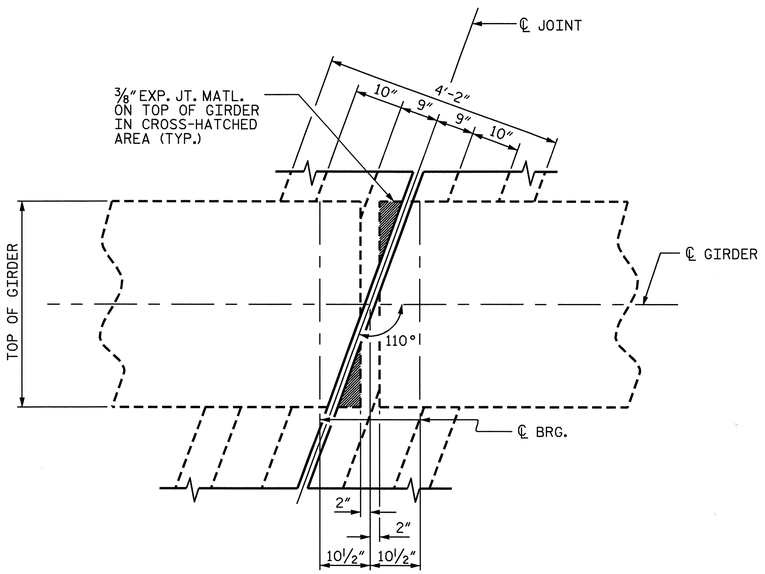

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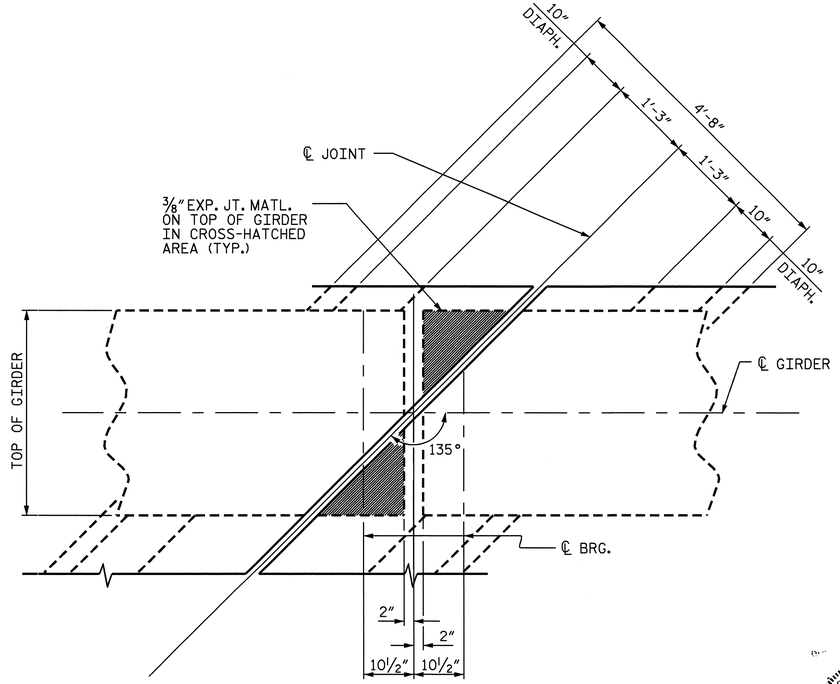

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PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTIONS

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-14
1			3			TOTAL SHEETS
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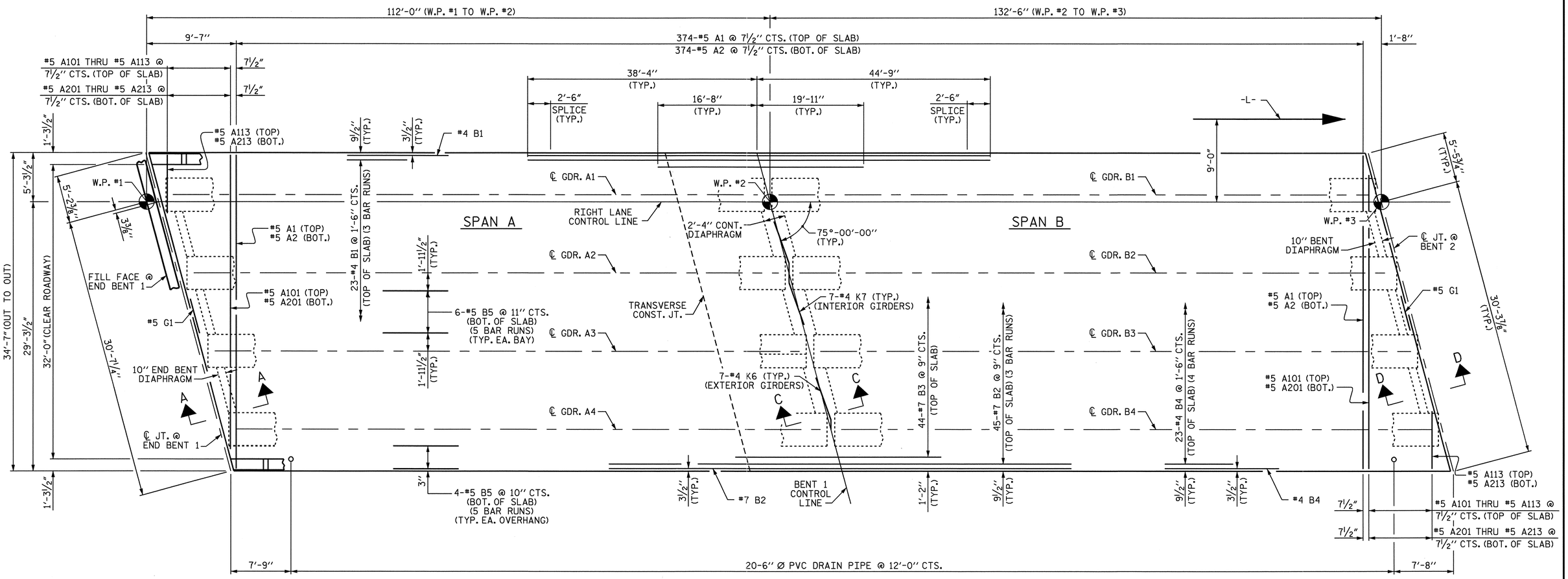

PLAN OF SPAN A-B

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

FOR DRAIN DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

"B" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR DECK DRAINS.

FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 1 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN A-B

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-15
1			3			TOTAL SHEETS
2			4			115

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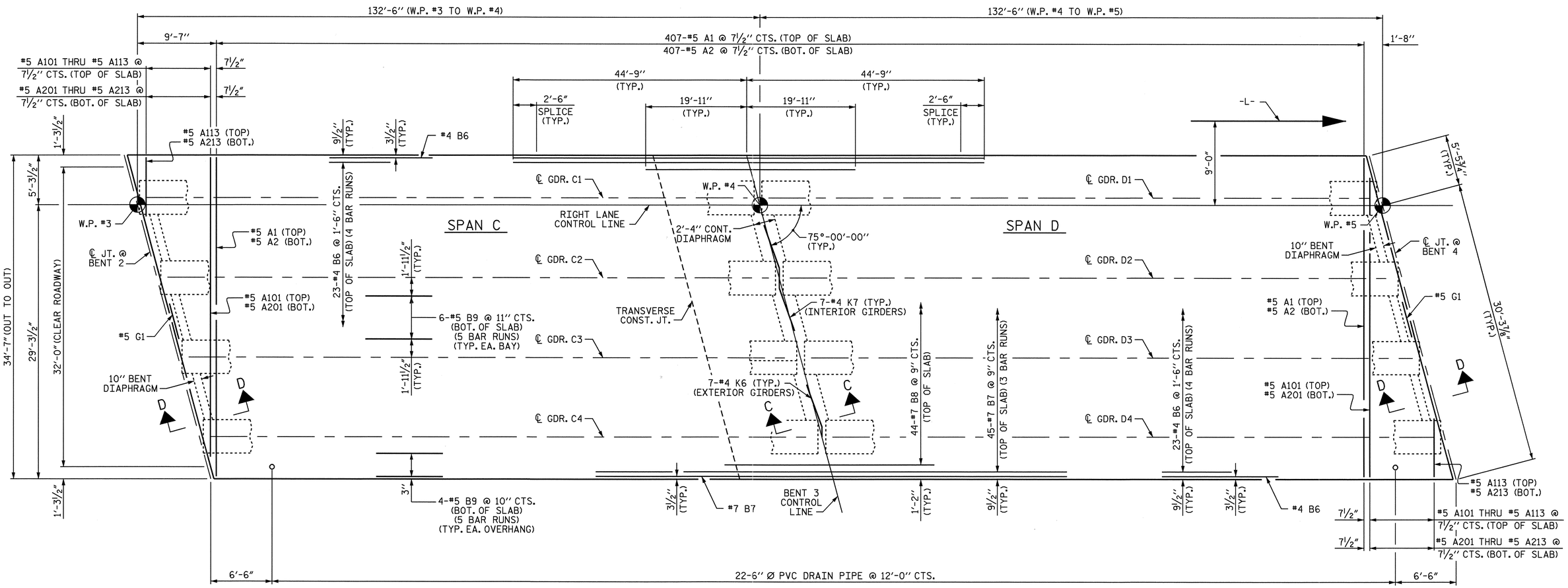

PLAN OF SPAN C-D

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

FOR DRAIN DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

"B" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR DECK DRAINS.

FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 2 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN C-D

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-16
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 9/4/08
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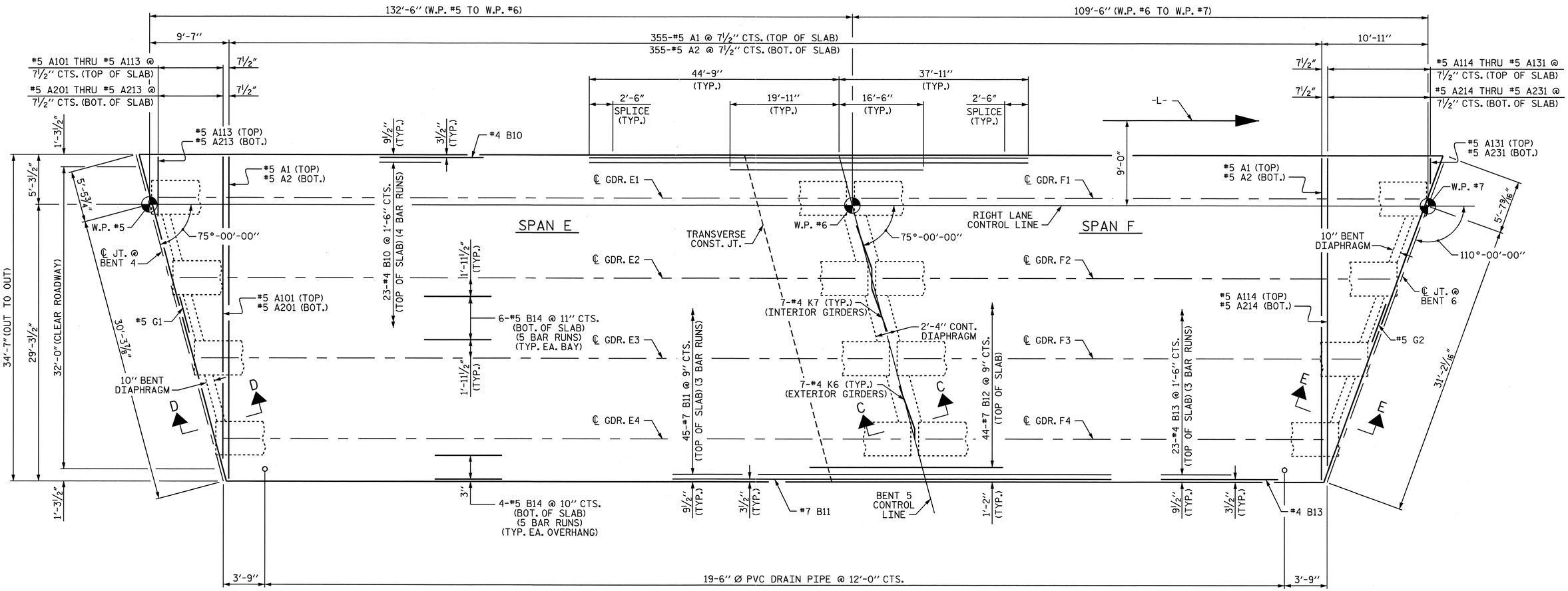

PLAN OF SPAN E-F

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

FOR DRAIN DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

"B" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR DECK DRAINS.

FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/22/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 3 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN E-F

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-17
1			3			TOTAL SHEETS
2			4			115

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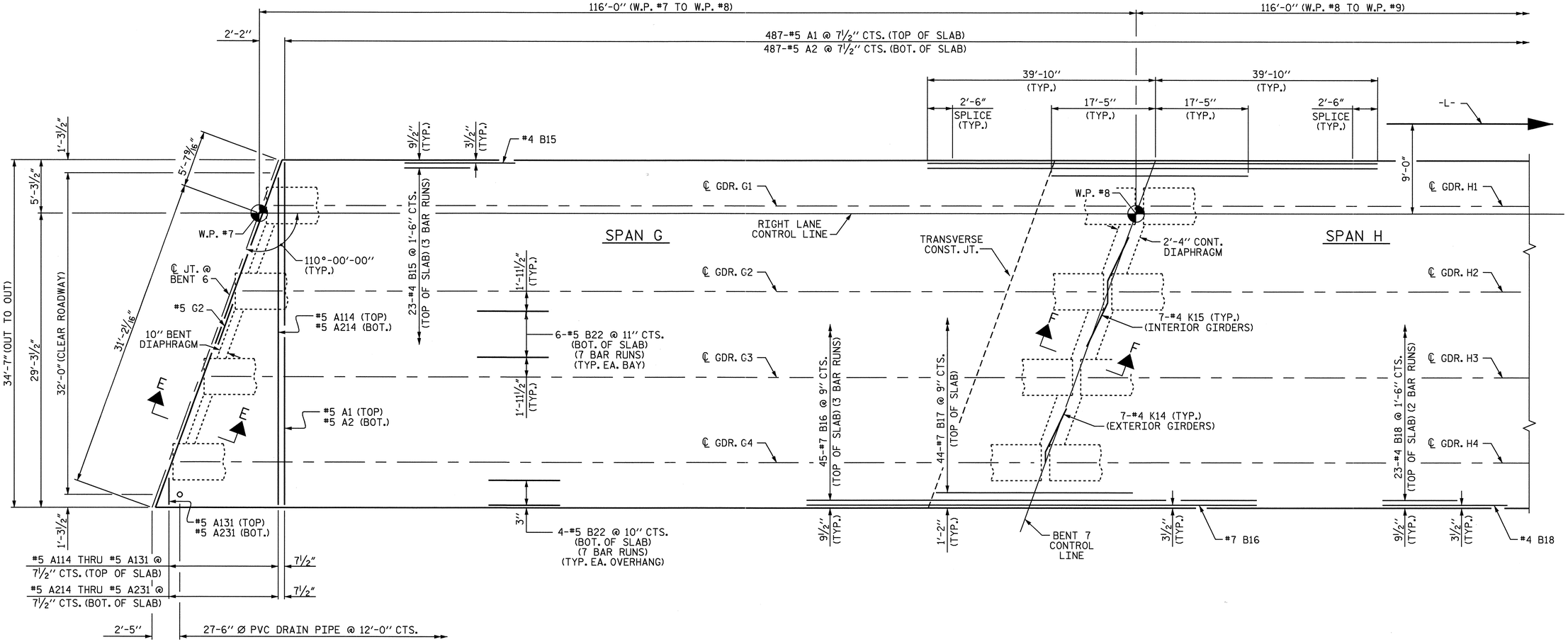

PLAN OF SPAN G-H-I

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

FOR DRAIN DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

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FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON

10/27/08

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 4 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN G-H-I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-18
1			3			TOTAL SHEETS
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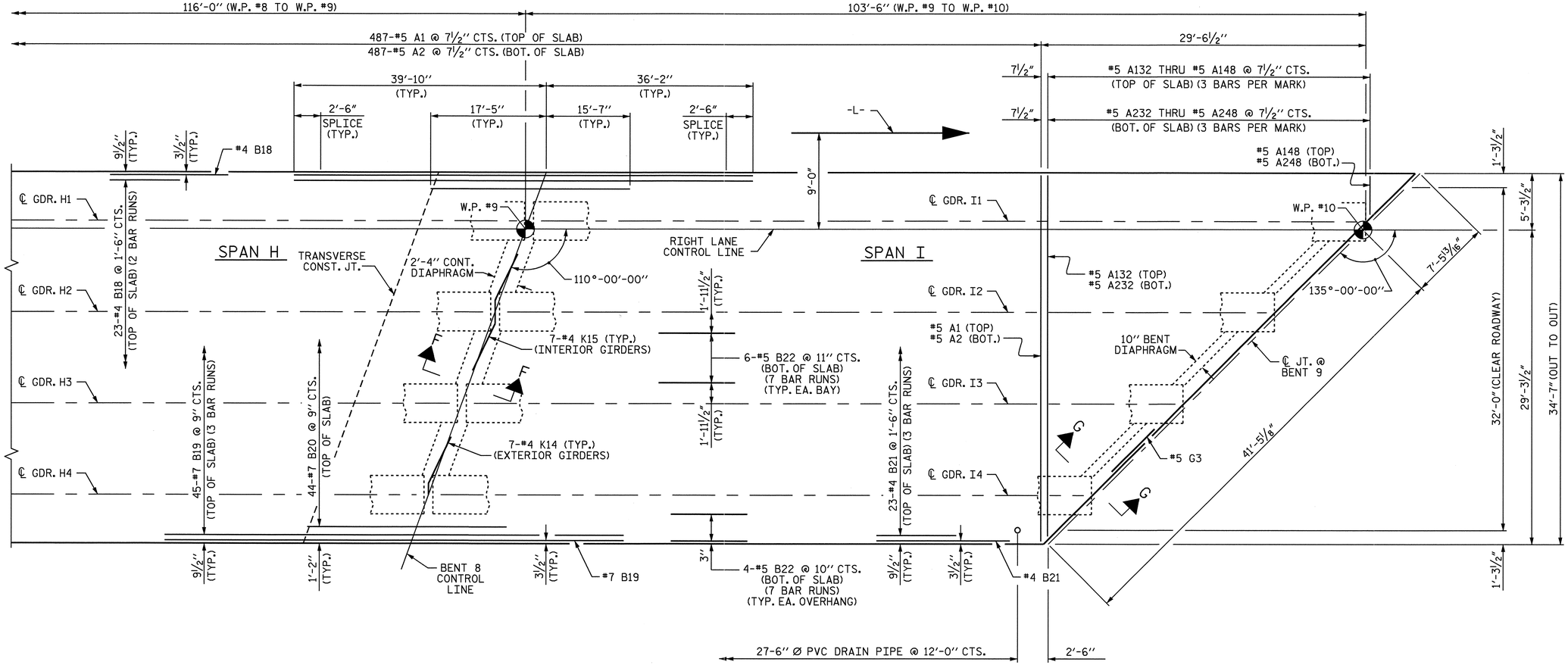

PLAN OF SPAN G-H-I

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

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FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 5 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN G-H-I

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-19
1			3			TOTAL SHEETS
2			4			115

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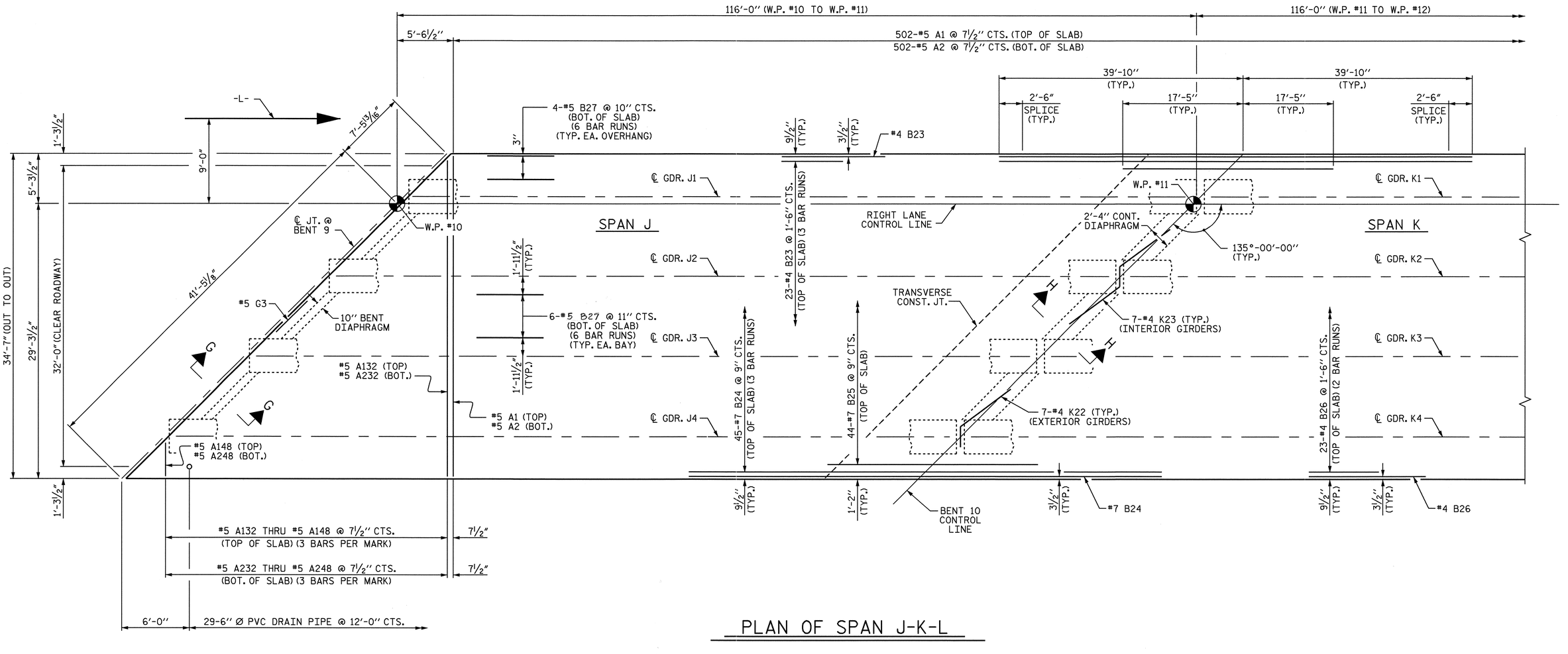

PLAN OF SPAN J-K-L

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

FOR DRAIN DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

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FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 6 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN J-K-L

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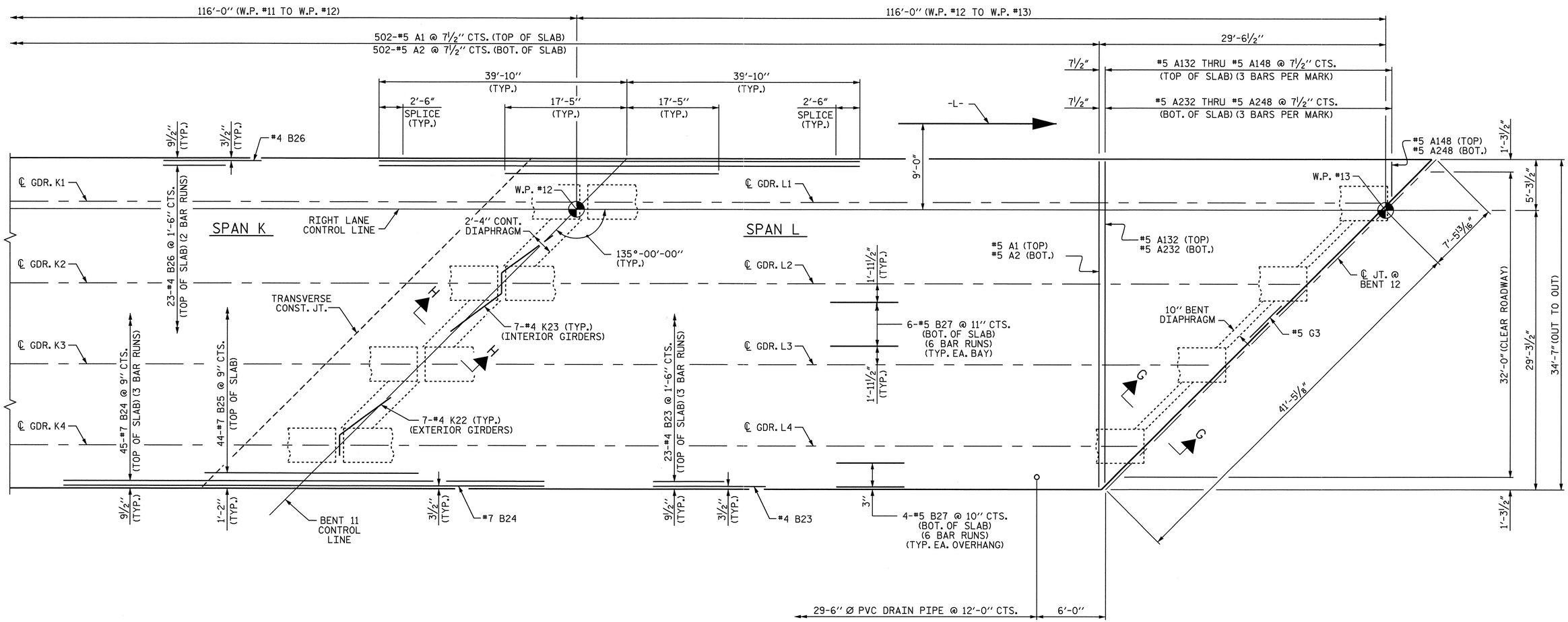

PLAN OF SPAN J-K-L

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

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FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 7 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN J-K-L

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-21
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 9/4/08
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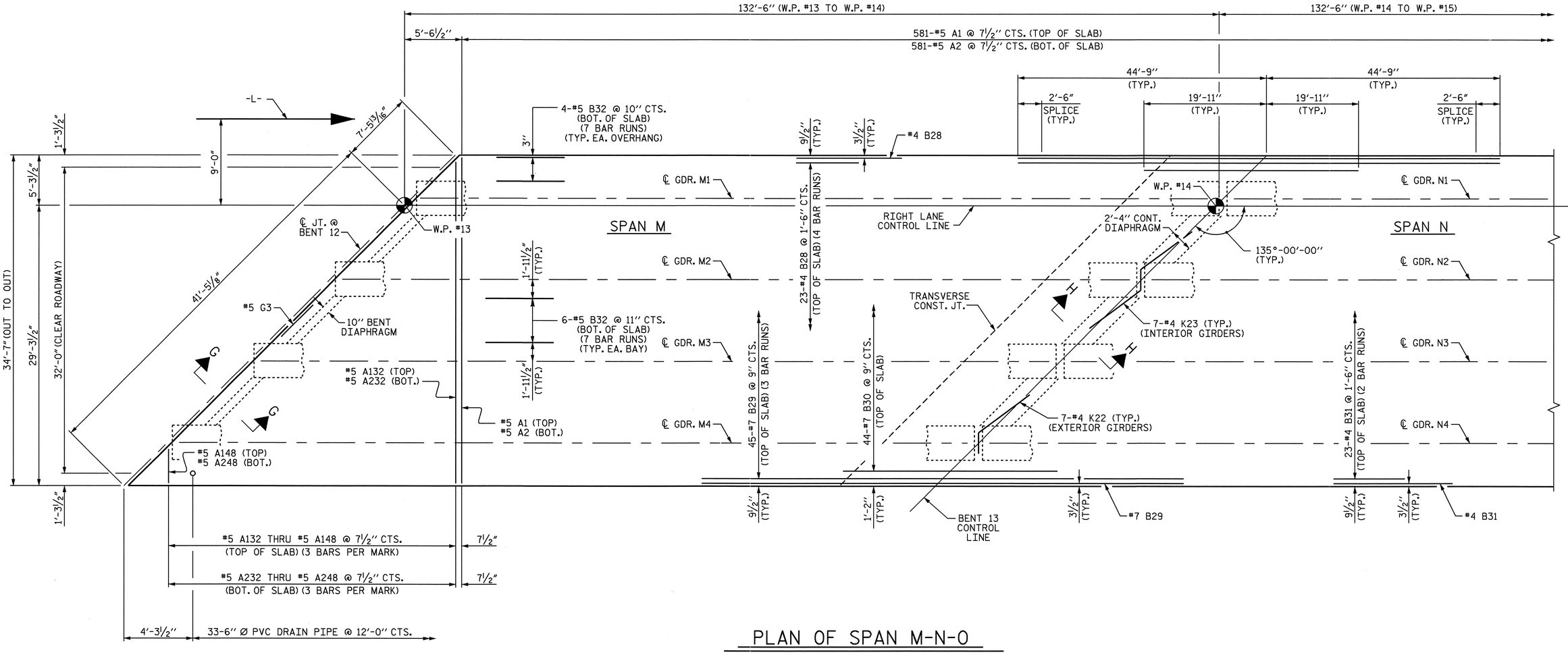

PLAN OF SPAN M-N-O

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

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FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 8 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN M-N-O

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-22
1			3			TOTAL SHEETS
2			4			115

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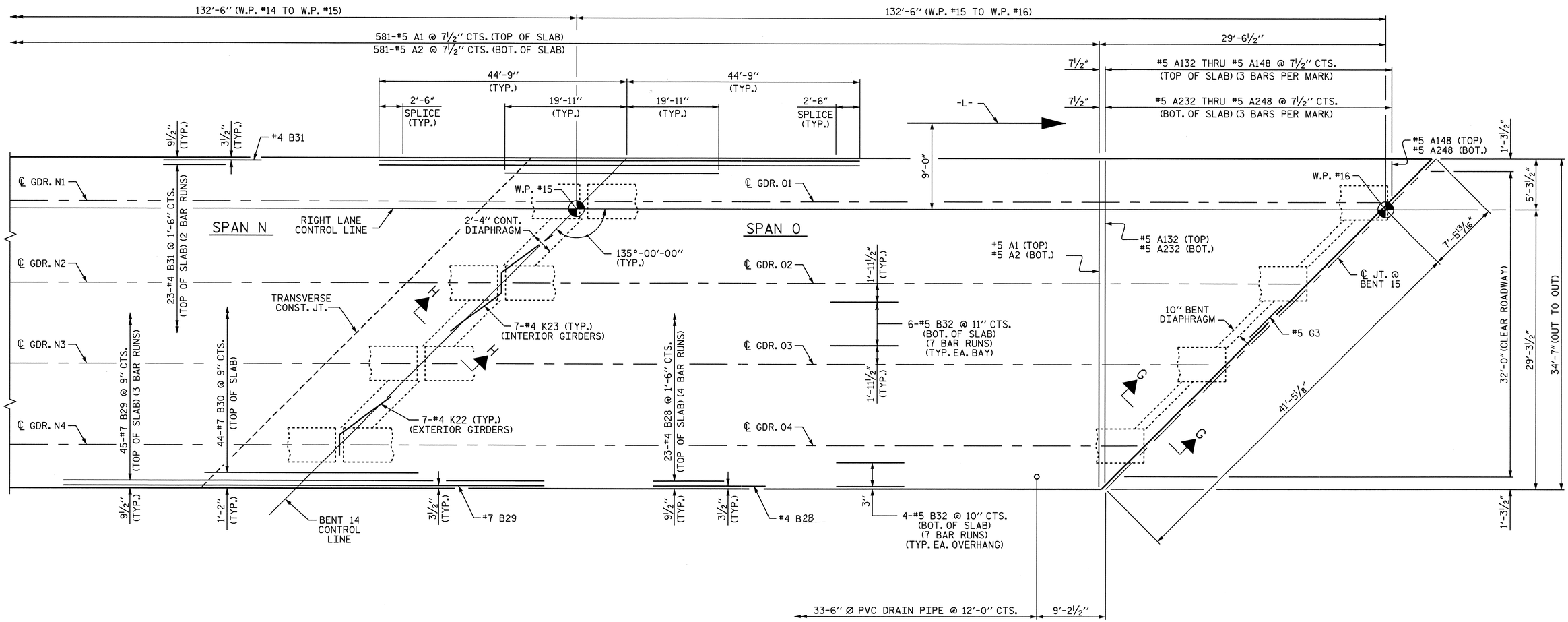

PLAN OF SPAN M-N-O

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

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FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11259 DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 9 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN M-N-O

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-23
1			3			TOTAL SHEETS
2			4			115

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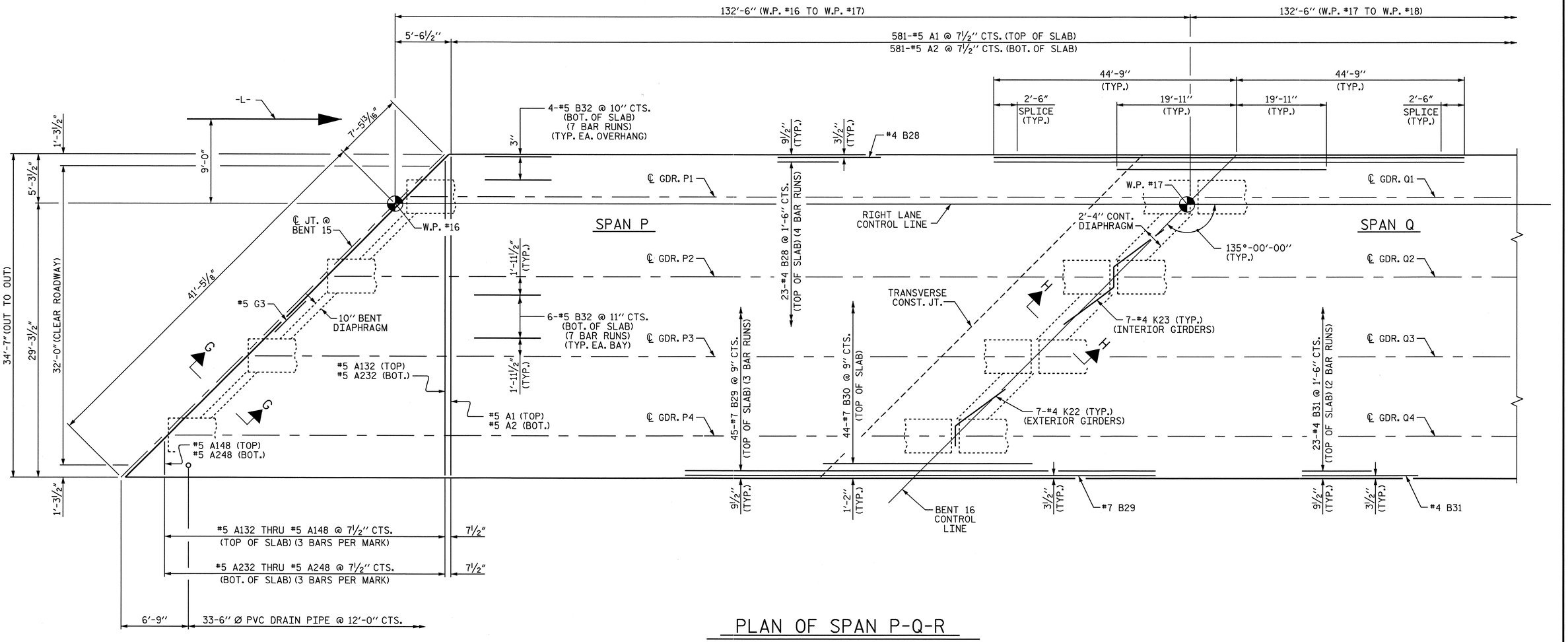

PLAN OF SPAN P-Q-R

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

FOR DRAIN DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

"B" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR DECK DRAINS.

FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11259 DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 10 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN P-Q-R

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-24
1			3			TOTAL SHEETS
2			4			115

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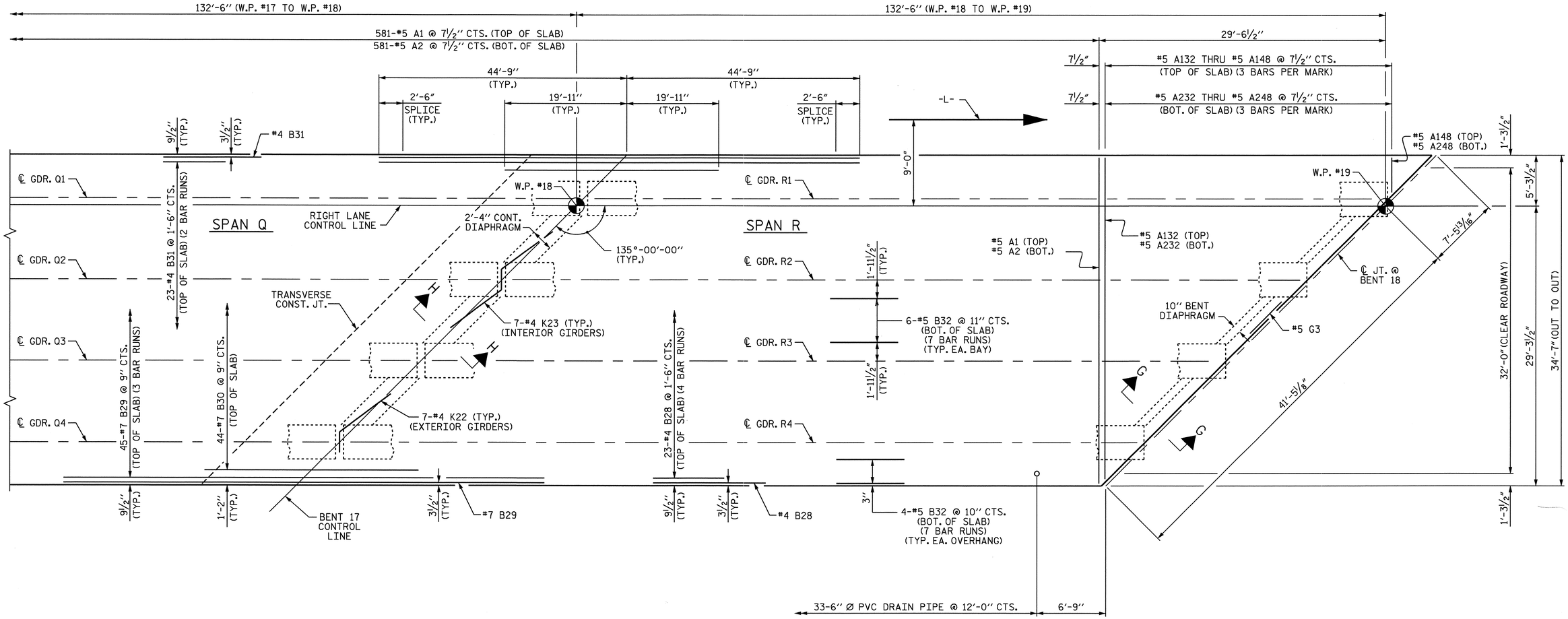

PLAN OF SPAN P-Q-R

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

FOR DRAIN DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

"B" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR DECK DRAINS.

FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 11 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN P-Q-R

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-25
1			3			TOTAL SHEETS
2			4			115

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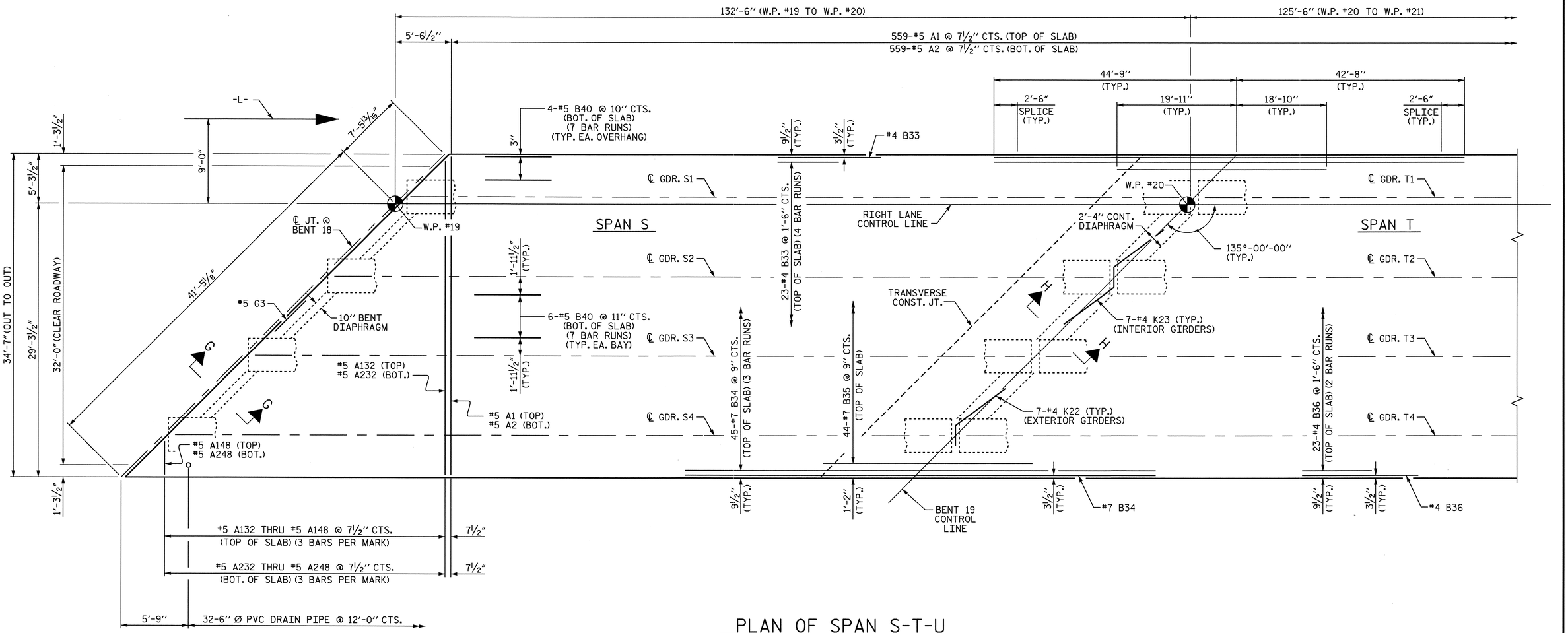

PLAN OF SPAN S-T-U

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

FOR DRAIN DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

"B" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR DECK DRAINS.

FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. LINDEMUTH
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 12 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN S-T-U

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-26
1			3			TOTAL SHEETS
2			4			115

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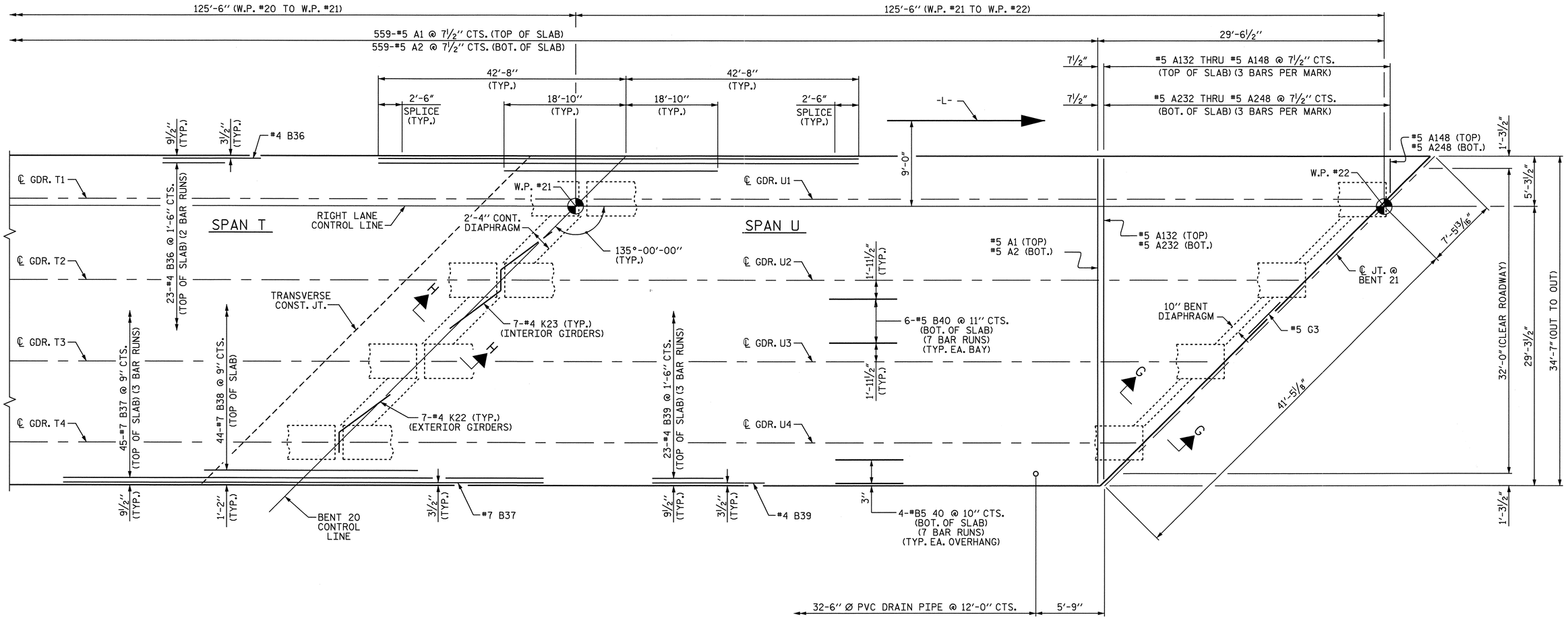

PLAN OF SPAN S-T-U

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

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FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 13 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN S-T-U

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-27
1			3			TOTAL SHEETS
2			4			115

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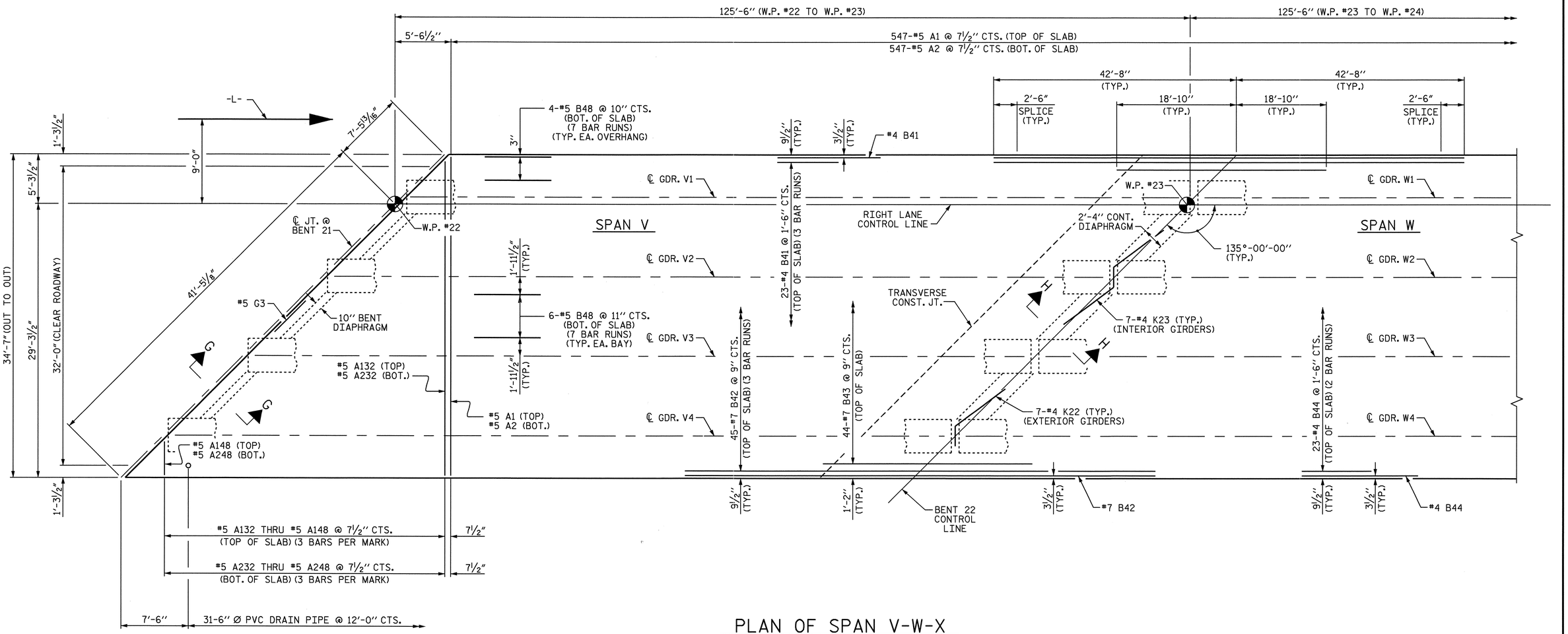

PLAN OF SPAN V-W-X

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

FOR DRAIN DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

"B" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO CLEAR DECK DRAINS.

FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 14 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN V-W-X

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-28
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 9/4/08
CHECKED BY : W.F. PARKER DATE : 9/12/08

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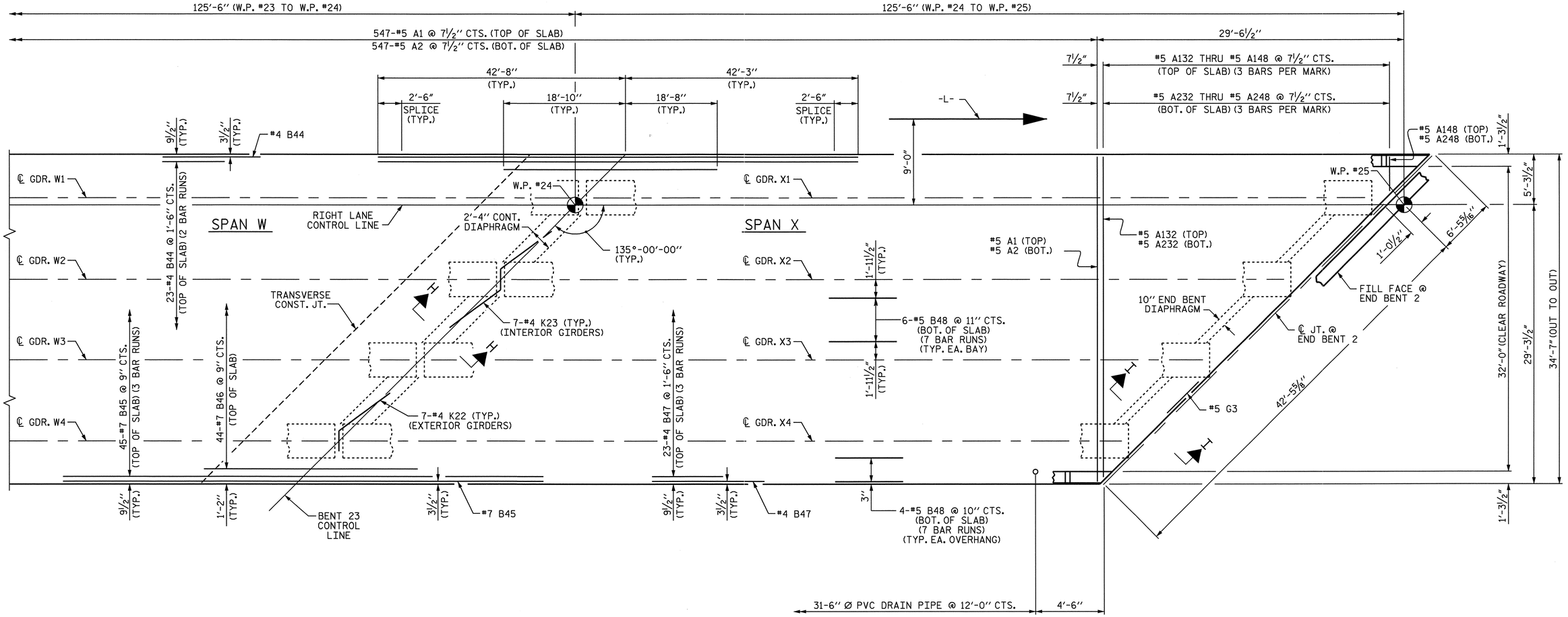

PLAN OF SPAN V-W-X

NOTES:

PARAPET NOT SHOWN FOR CLARITY. FOR PARAPET DETAILS AND REINFORCING STEEL SEE "1'-2" X 2'-6" CONCRETE PARAPET" SHEETS.

INTERMEDIATE DIAPHRAGMS NOT SHOWN FOR CLARITY. FOR LOCATION OF DIAPHRAGMS, SEE "GIRDER LAYOUT" SHEETS.

FOR DRAIN DETAILS, SEE "STRUCTURE DRAINAGE SYSTEM" SHEETS.

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FOR TRANSVERSE CONSTRUCTION JOINT LOCATION, SEE "POURING SEQUENCE" SHEETS.

FOR SECTIONS, SEE "TYPICAL SECTION" SHEETS.

FOR ADDITIONAL DIAPHRAGM REINFORCING STEEL, SEE SHEETS 16 OF 17 AND 17 OF 17.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/29/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 15 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

SPAN V-W-X

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-29
1			3			TOTAL SHEETS
2			4			115

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CHECKED BY : W.F. PARKER DATE : 9/12/08

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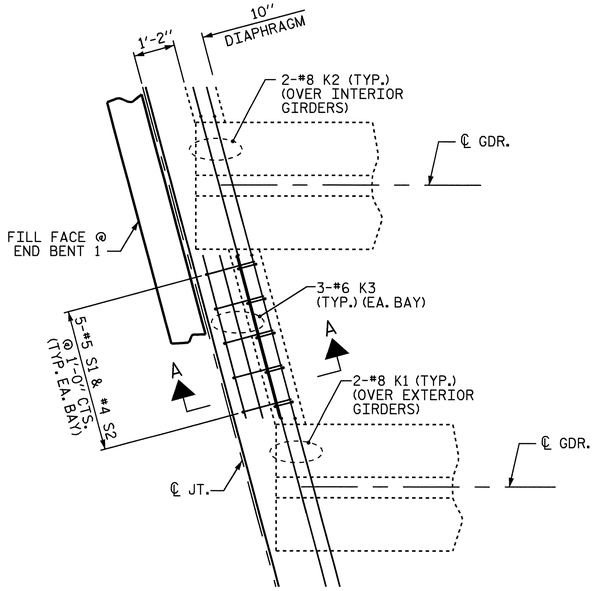
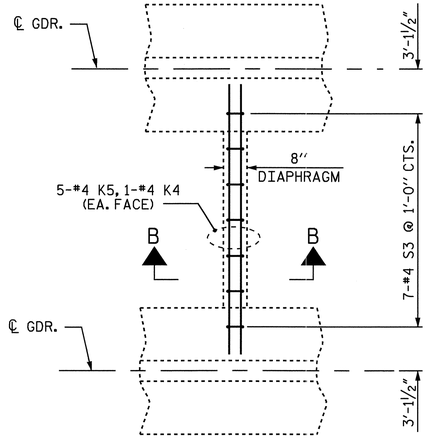


END BENT DIAPHRAGM

(END BENT 1)



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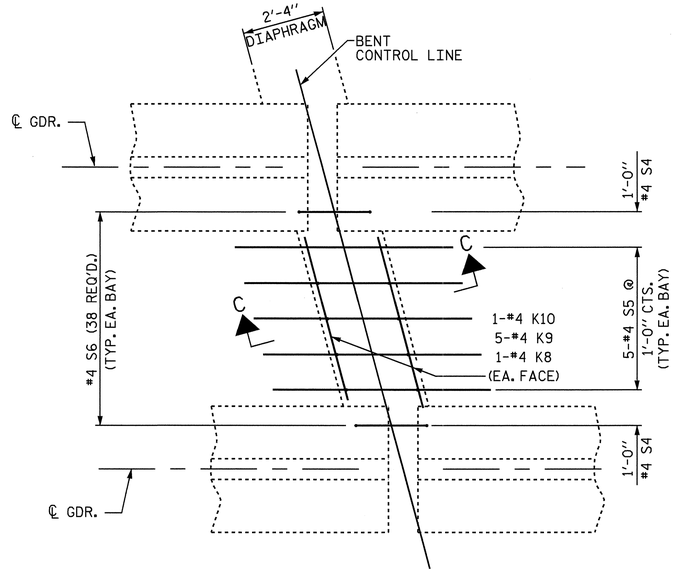
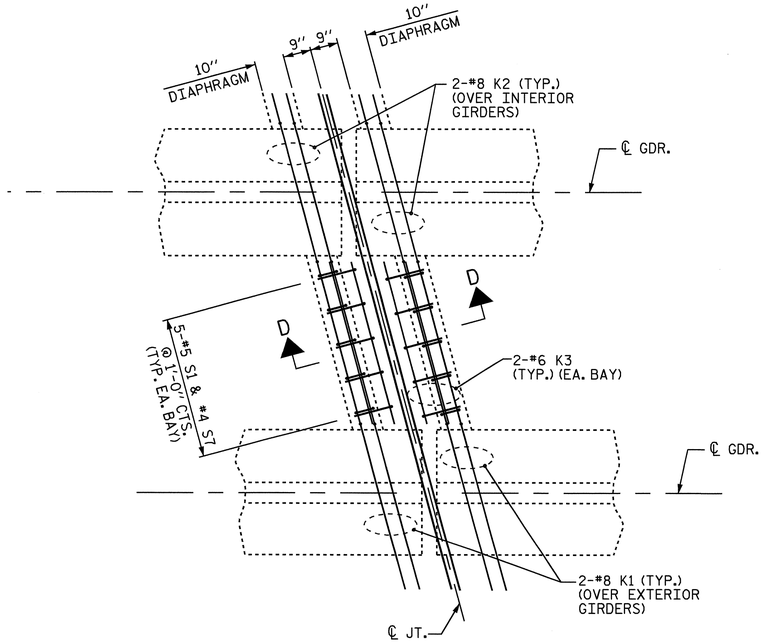


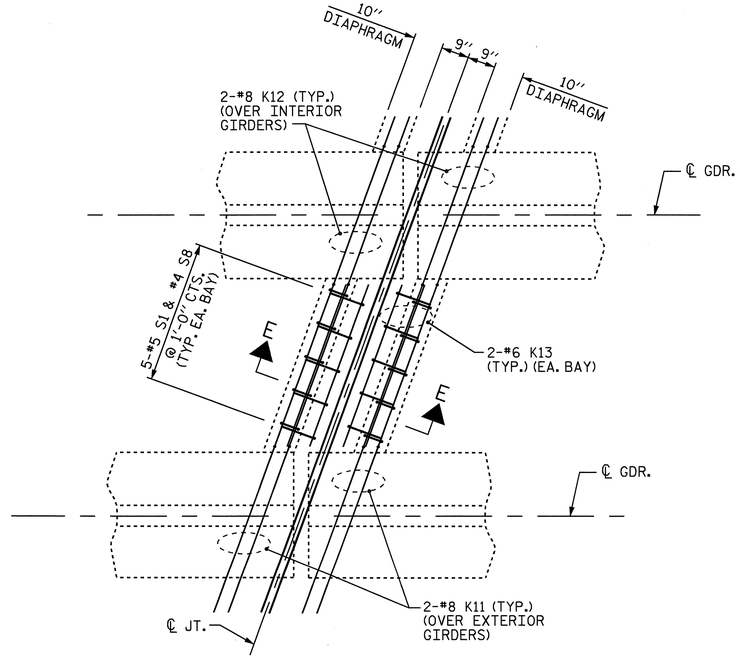
CONTINUOUS DIAPHRAGM

(BENTS 1, 3 & 5)



BENT DIAPHRAGM

(BENTS 2 & 4)



BENT DIAPHRAGM

(BENT 6)

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 16 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

DIAPHRAGM DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-30
1			3			TOTAL SHEETS
2			4			115

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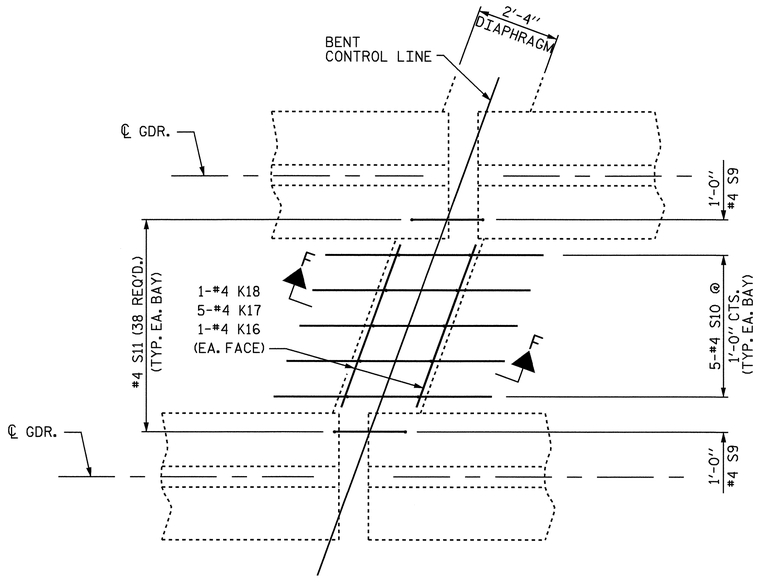
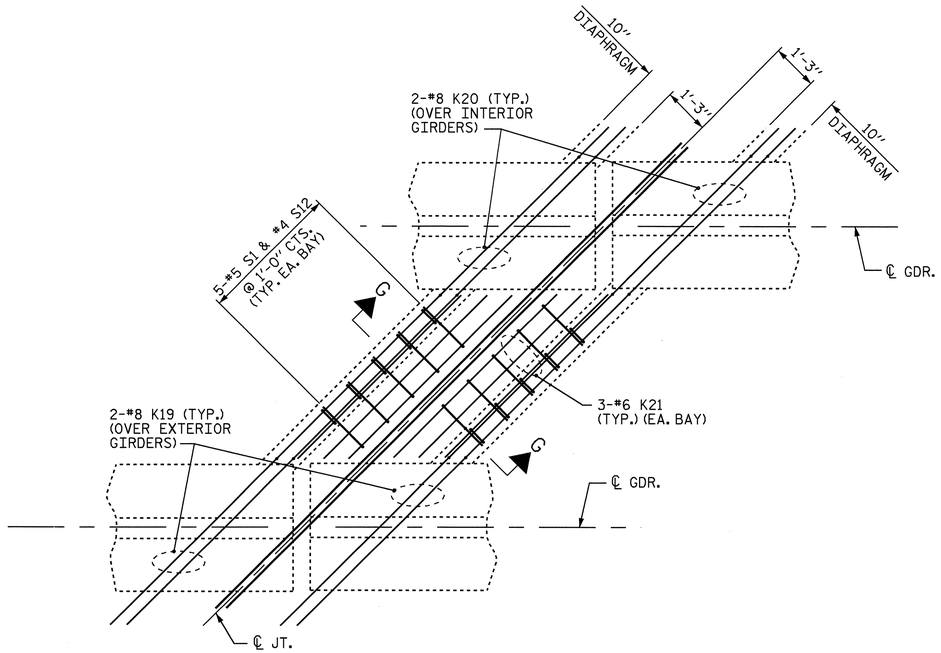


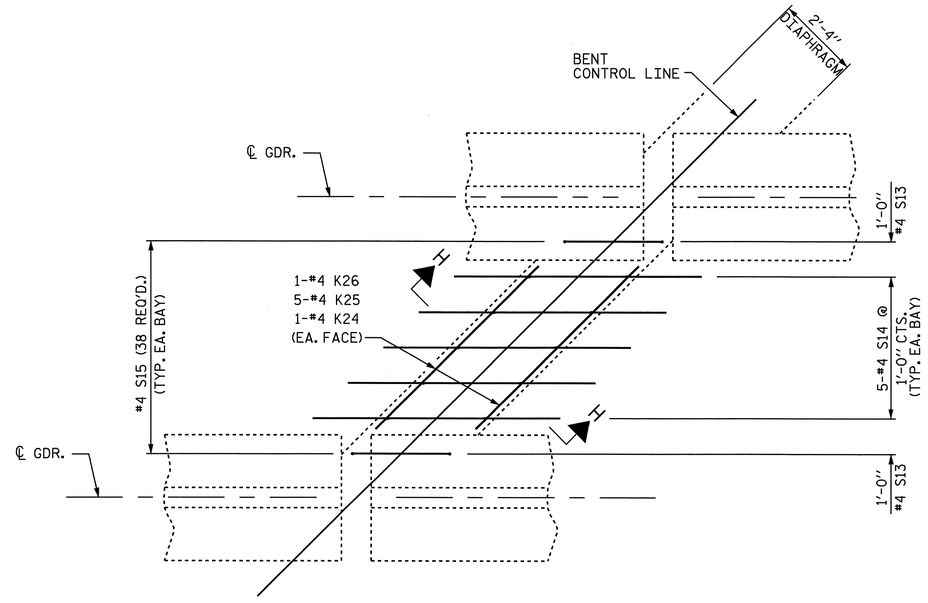
CONTINUOUS DIAPHRAGM

(BENTS 7 & 8)



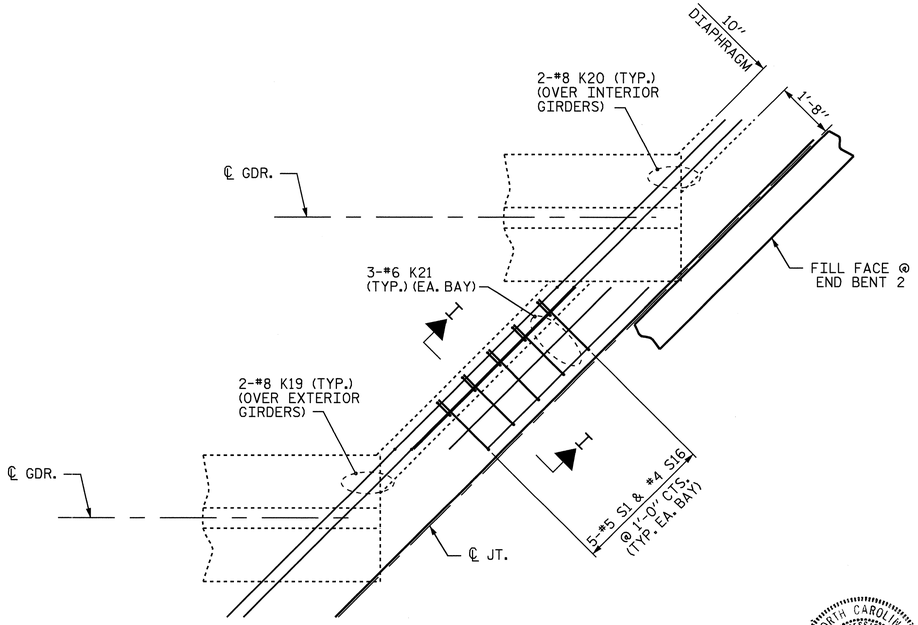
BENT DIAPHRAGM

(BENTS 9, 12, 15, 18 & 21)



CONTINUOUS DIAPHRAGM

(BENTS 10, 11, 13, 14, 16, 17, 19, 20, 22 & 23)



END BENT DIAPHRAGM

(END BENT 2)

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/21/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 17 OF 17

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPANS

DIAPHRAGM DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-31
1			3			TOTAL SHEETS
2			4			115

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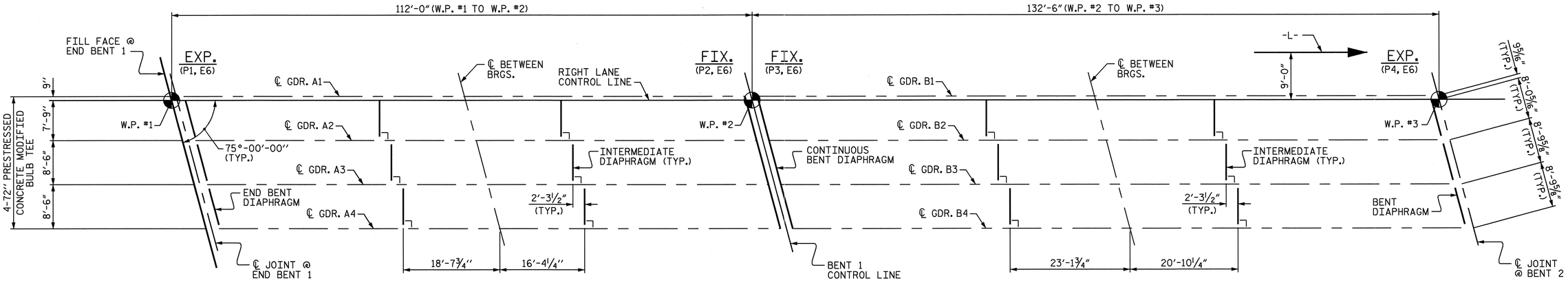
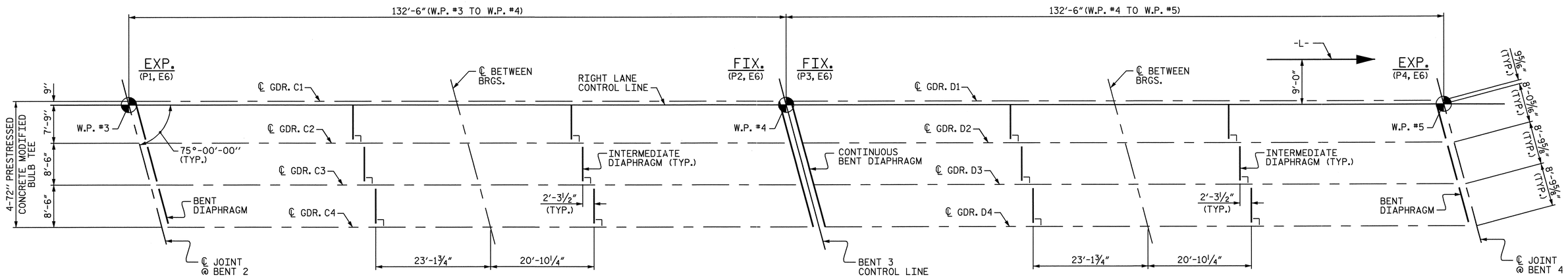


SPAN "A"

SPAN "B"



SPAN "C"

SPAN "D"

GIRDER LAYOUT SPANS A, B, C & D

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-32
1			3			TOTAL SHEETS
2			4			115

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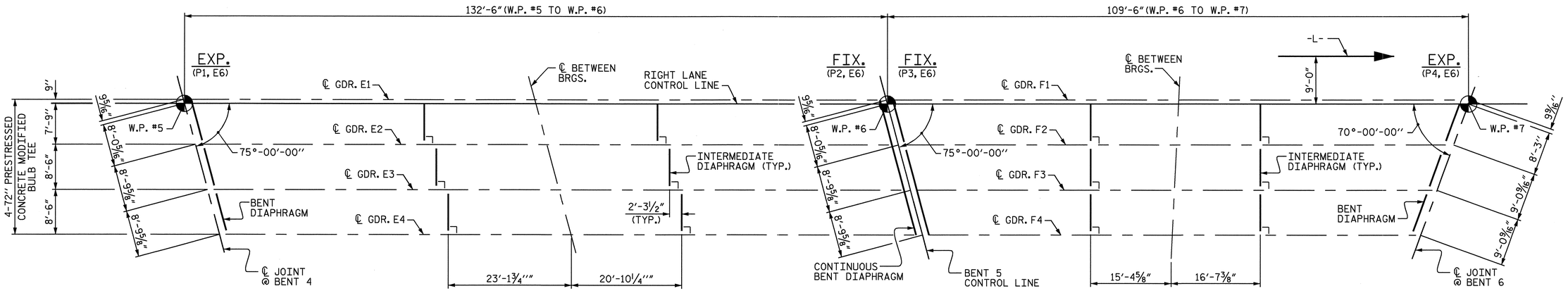
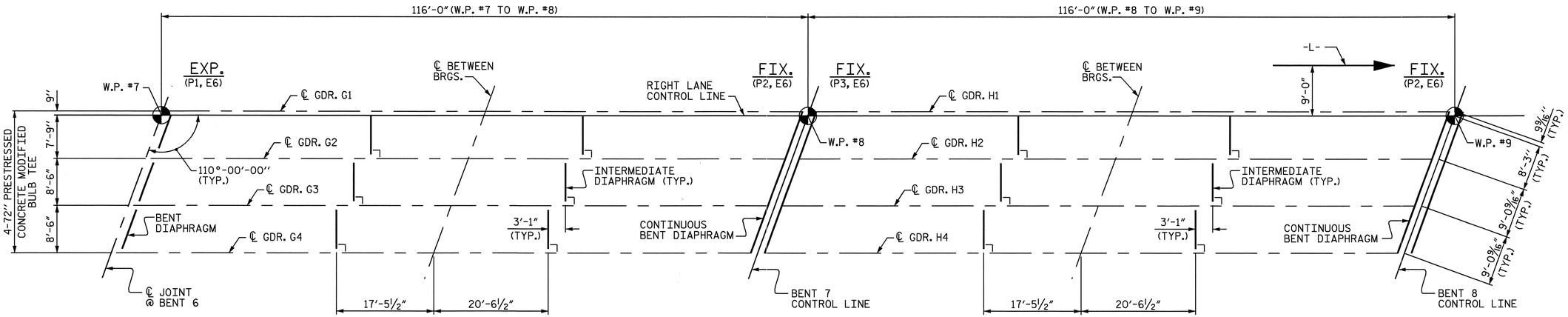


SPAN "E"

SPAN "F"



SPAN "G"

SPAN "H"

GIRDER LAYOUT SPANS E, F, G & H

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-33
1			3			TOTAL SHEETS
2			4			115

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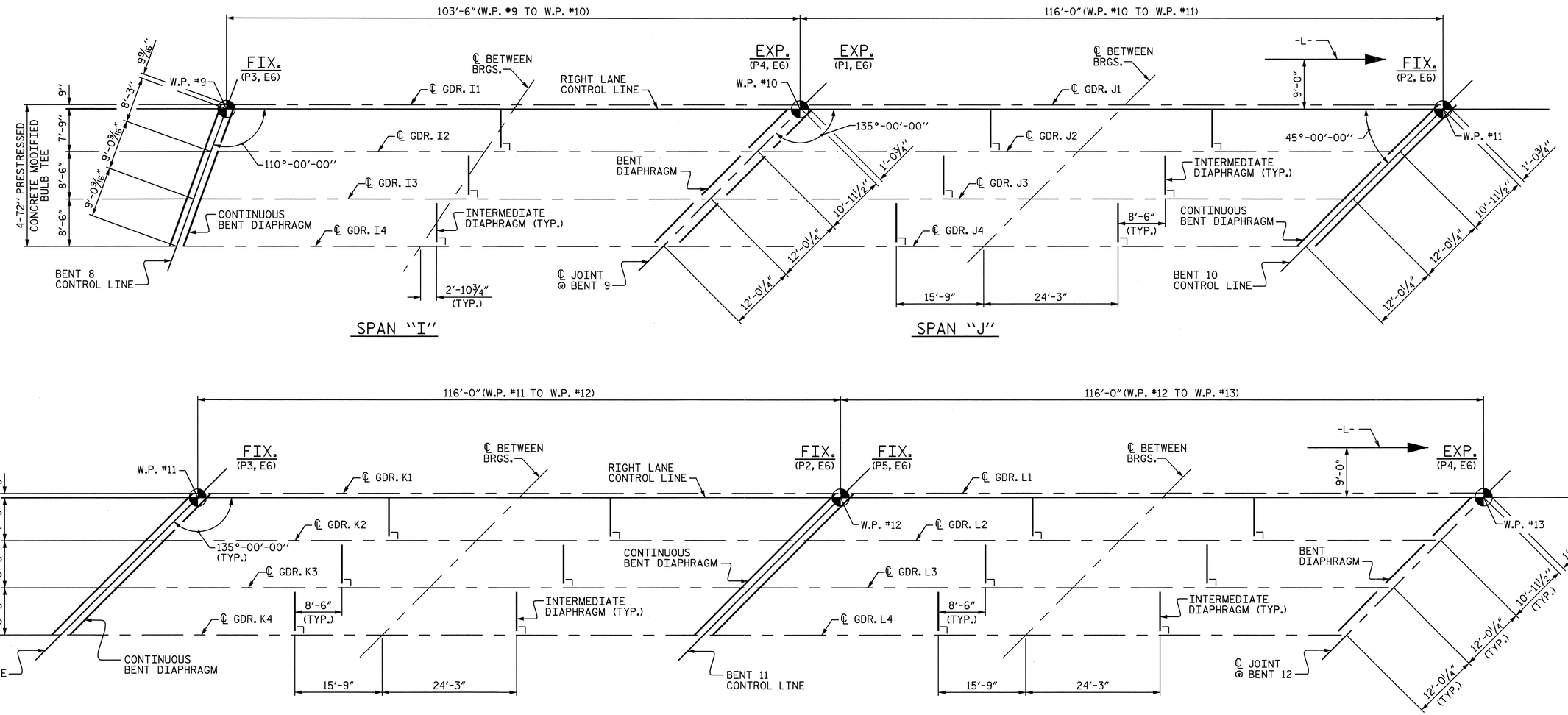

GIRDER LAYOUT SPANS I, J, K & L

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-34
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/1/08
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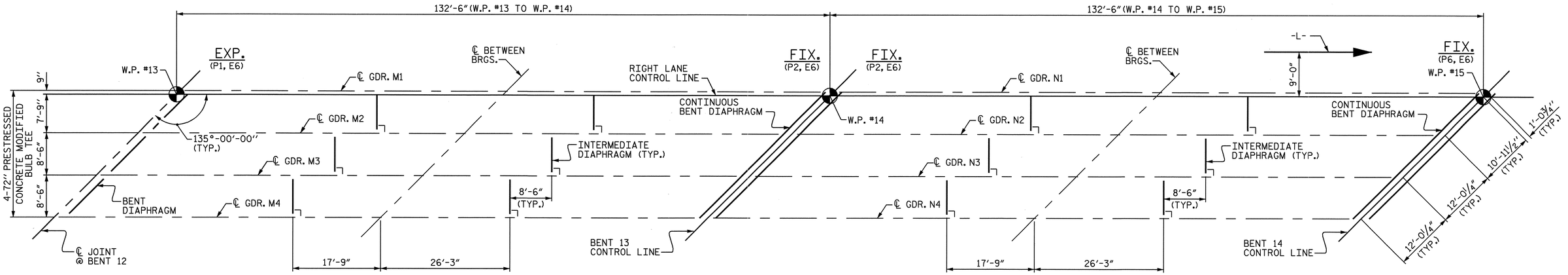

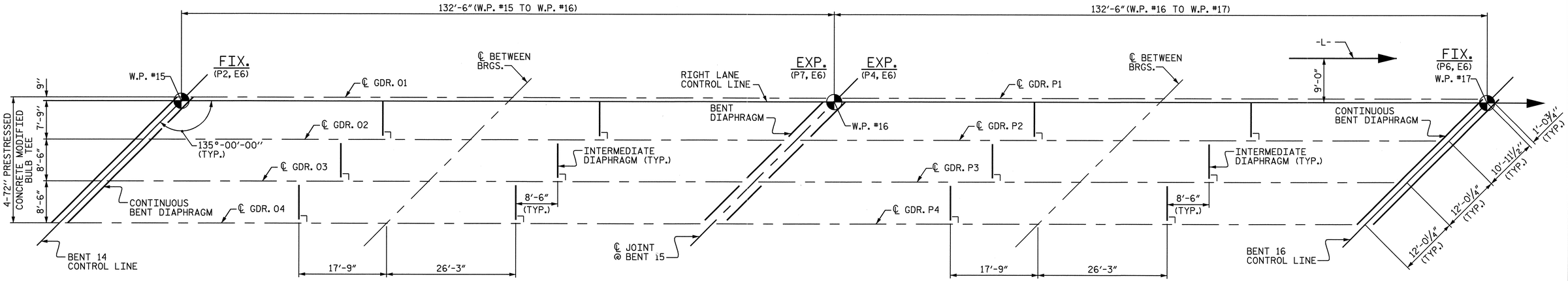

GIRDER LAYOUT SPANS M, N, O & P

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON

10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-35
1			3			TOTAL SHEETS
2			4			115

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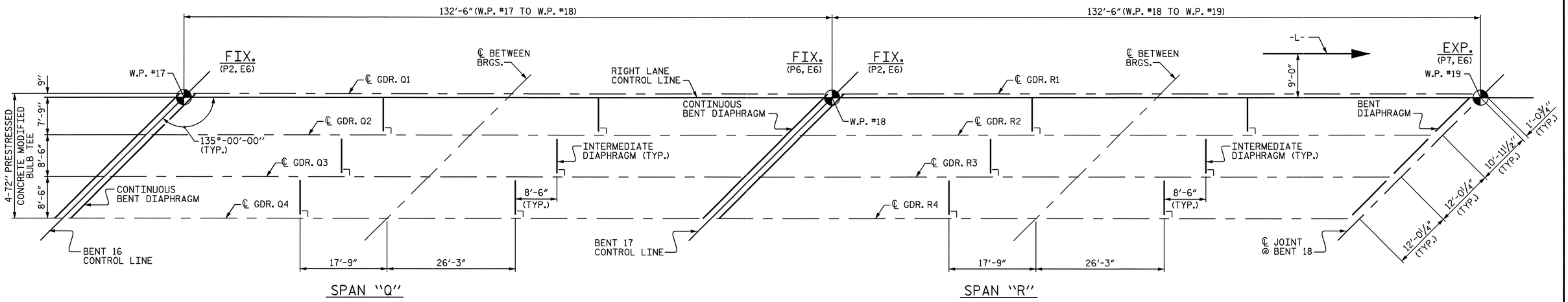
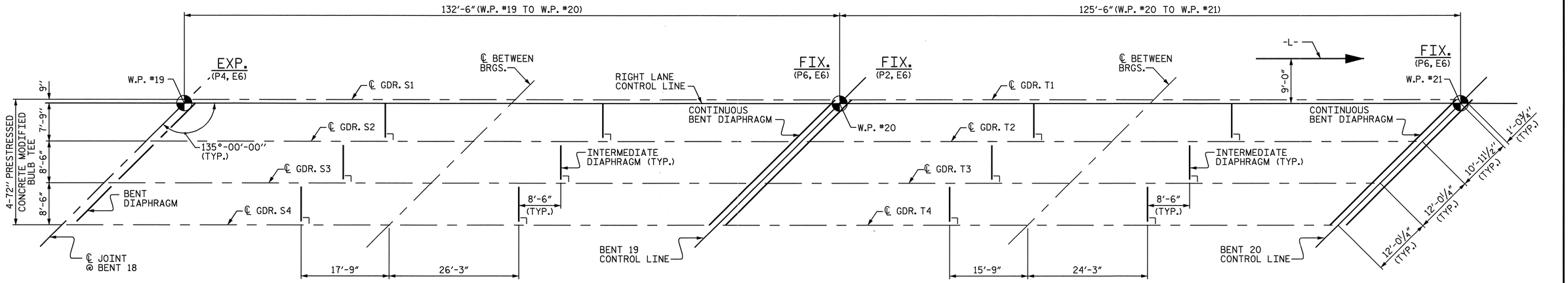


SPAN "Q"

SPAN "R"



SPAN "S"

SPAN "T"

GIRDER LAYOUT SPANS Q, R, S & T

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11259 DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-36
1			3			TOTAL SHEETS
2			4			115

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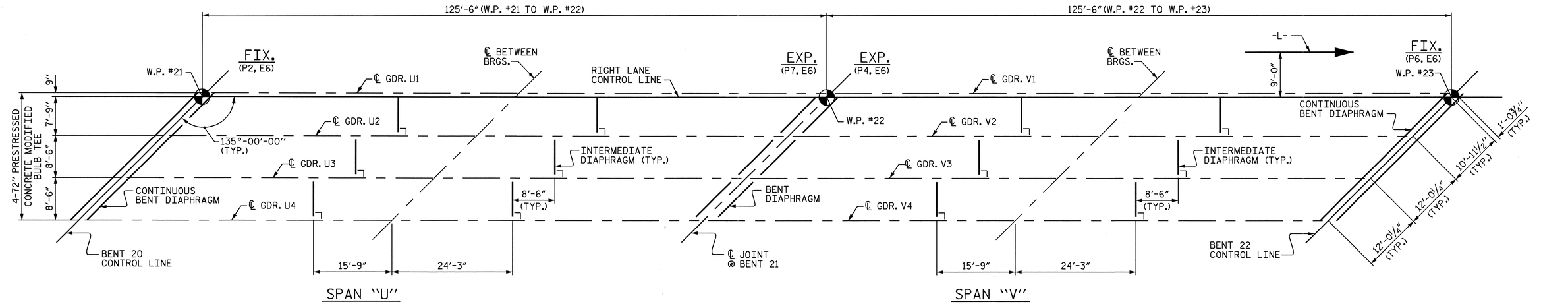

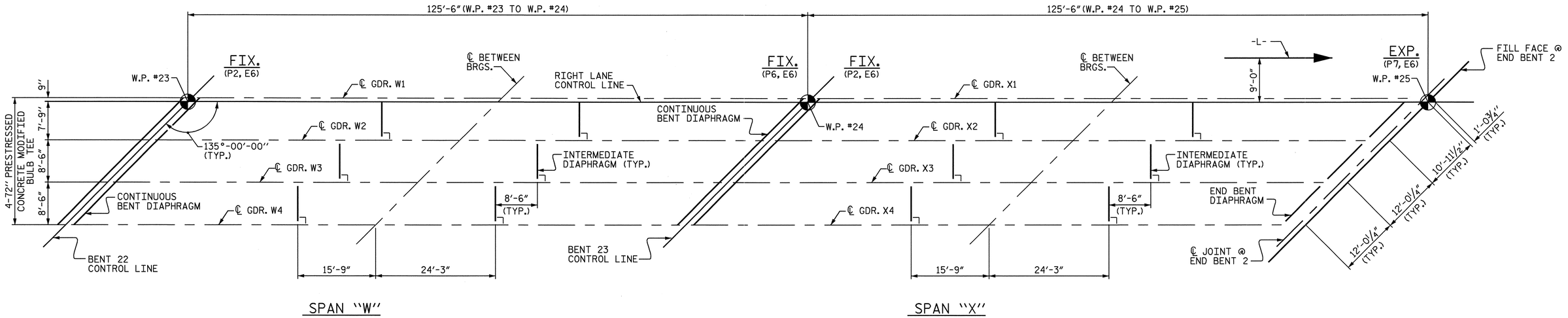

GIRDER LAYOUT SPANS U, V, W & X

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

GIRDER LAYOUT

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-37
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/1/08
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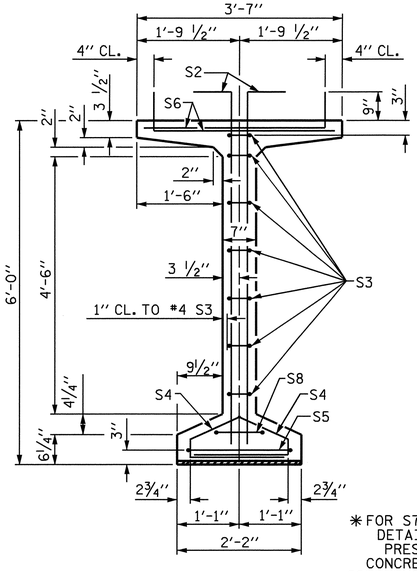
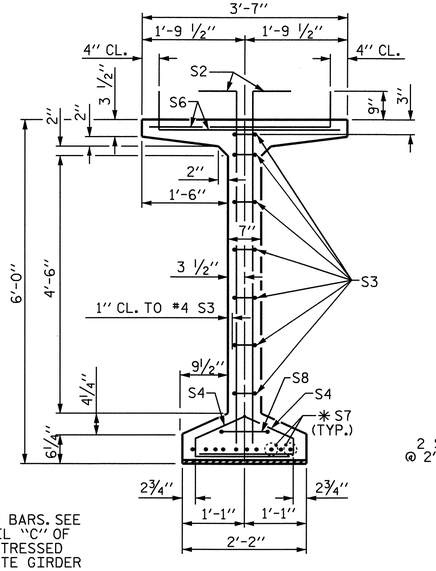
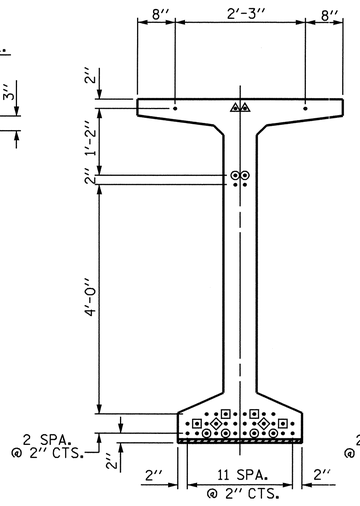


SECTION A-A

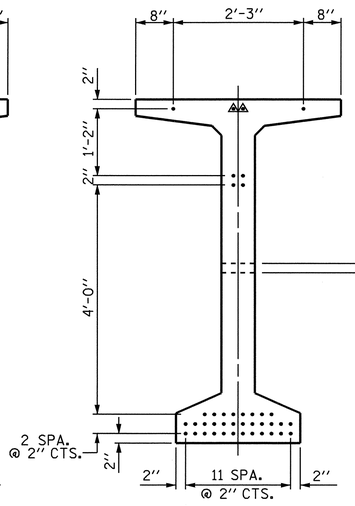


SECTION B-B

* FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



AT END OF GIRDER



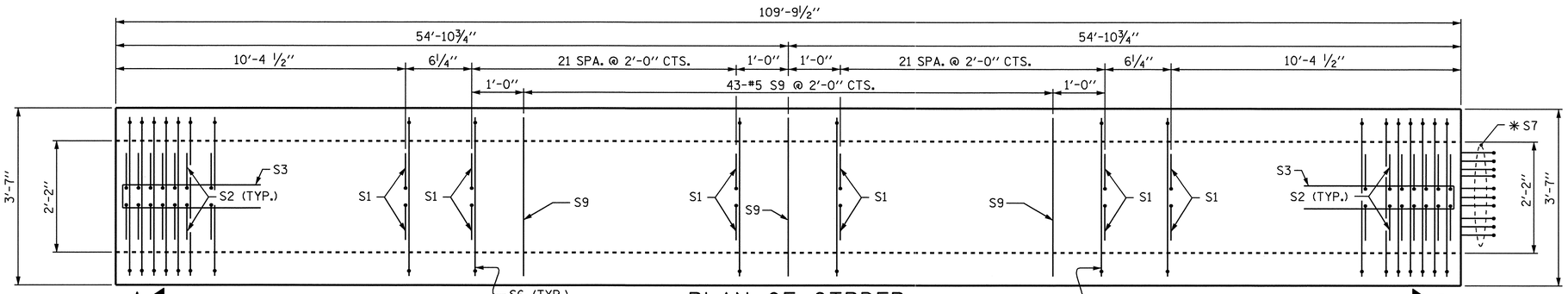
AT ℄ OF GIRDER

0.6"Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◈ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- △ OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.



PLAN OF GIRDER

ELEVATION OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

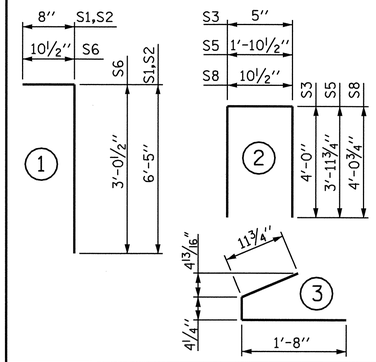
REINF. STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	156	#4	1	7'-1"	738
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	92	#4	3	3'-0"	184
S5	1	#5	2	9'-10"	10
S6	180	#5	1	3'-11"	735
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	43	#5	STR	3'-3"	146
S10	1	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR ONE GIRDER

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	2127	23.5	38

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
A	4	109'-9 1/2"	439'-2"

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)

SPAN A

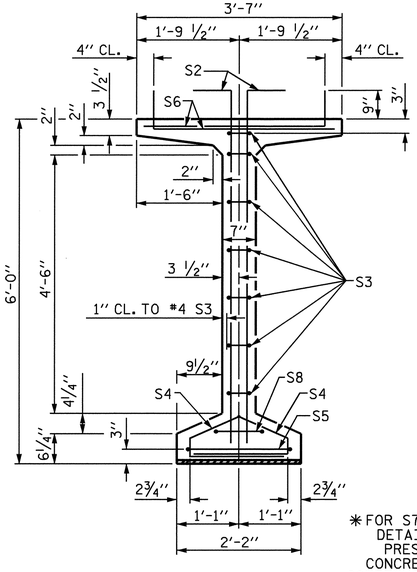
NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-38
1			3			TOTAL SHEETS
2			4			115

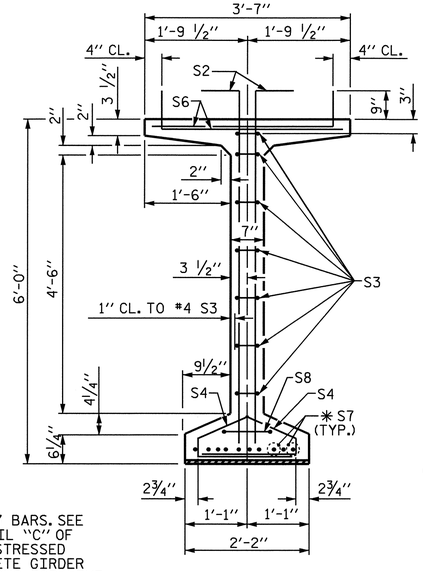
ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

24-NOV-2008 08:43
r:\structures\callaway\u3334a_sd_g*_01.dgn
jrtillman

STD. NO. PCGD10

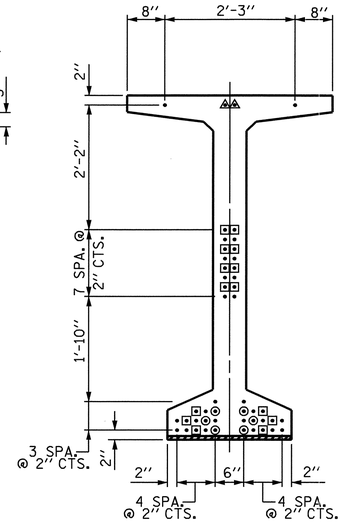


SECTION A-A

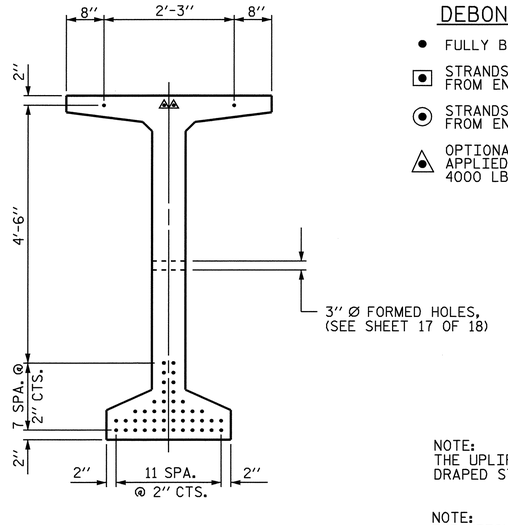


SECTION B-B

* FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



AT END OF GIRDER



AT ℄ OF GIRDER

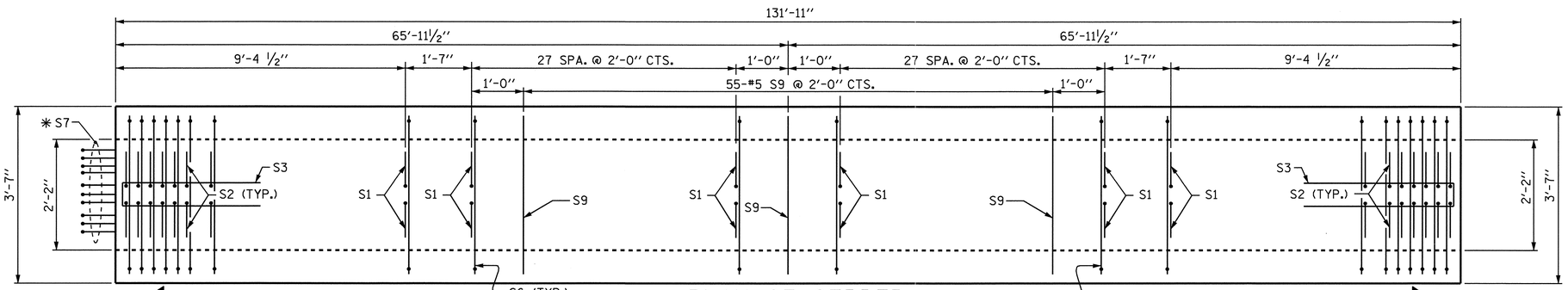
0.6"Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

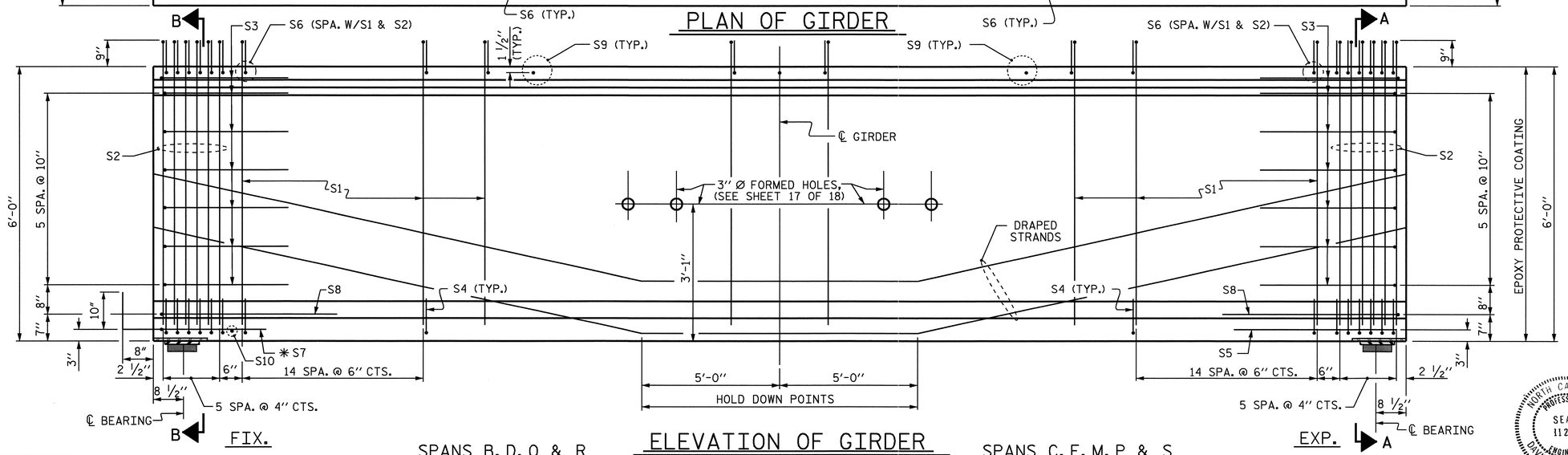
- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- △ OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 26.892 KIPS.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.



PLAN OF GIRDER



SPANS B, D, O & R UP-STATION

ELEVATION OF GIRDER

SPANS C, E, M, P & S UP-STATION

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

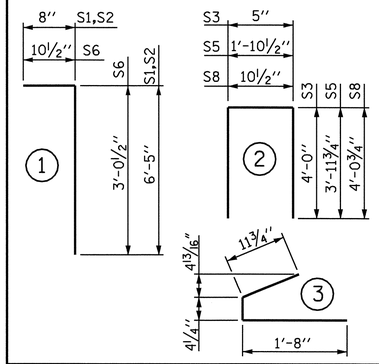
REINF. STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	172	#4	1	7'-1"	814
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	196	#5	1	3'-11"	801
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	55	#5	STR	3'-3"	186
S10	1	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR ONE GIRDER

	REINF. STEEL	10000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	2293	28.3	46

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
B	4	131'-11"	527'-8"
C	4	131'-11"	527'-8"
D	4	131'-11"	527'-8"
E	4	131'-11"	527'-8"
M	4	131'-11"	527'-8"
O	4	131'-11"	527'-8"
P	4	131'-11"	527'-8"
R	4	131'-11"	527'-8"
S	4	131'-11"	527'-8"

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)

SPANS B, C, D, E, M, O, P, R & S

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-39
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11259 DAVID R. ANDERSON
11/25/08

ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

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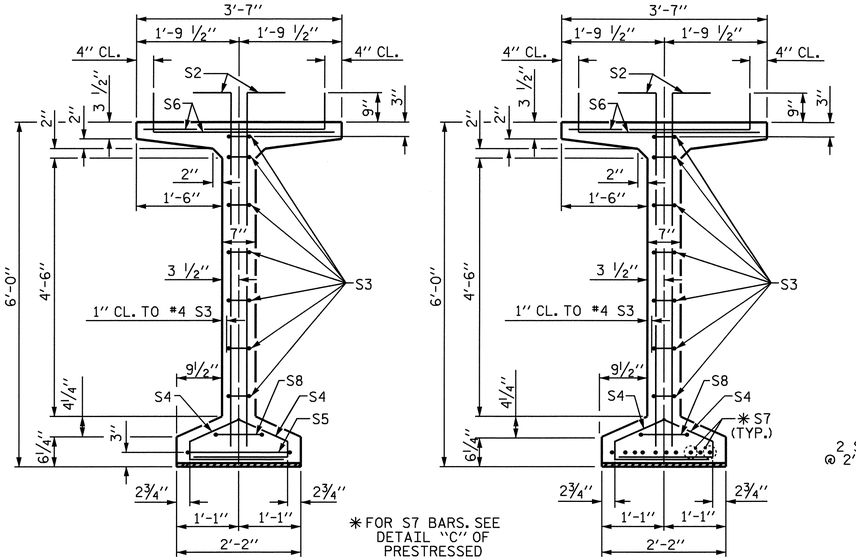
jtillman

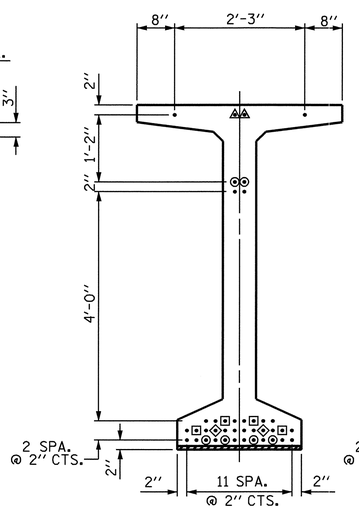
STD. NO. PCGD10



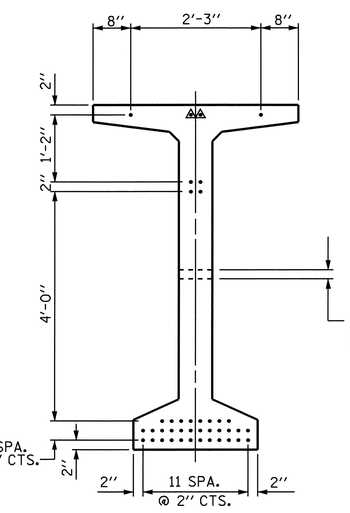
SECTION A-A

SECTION B-B

* FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



AT END OF GIRDER



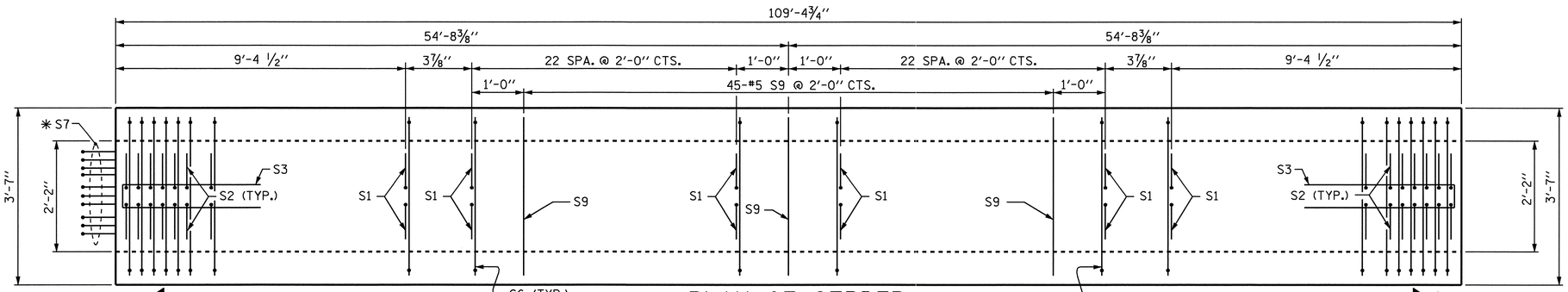
AT ℄ OF GIRDER

DEBONDING LEGEND

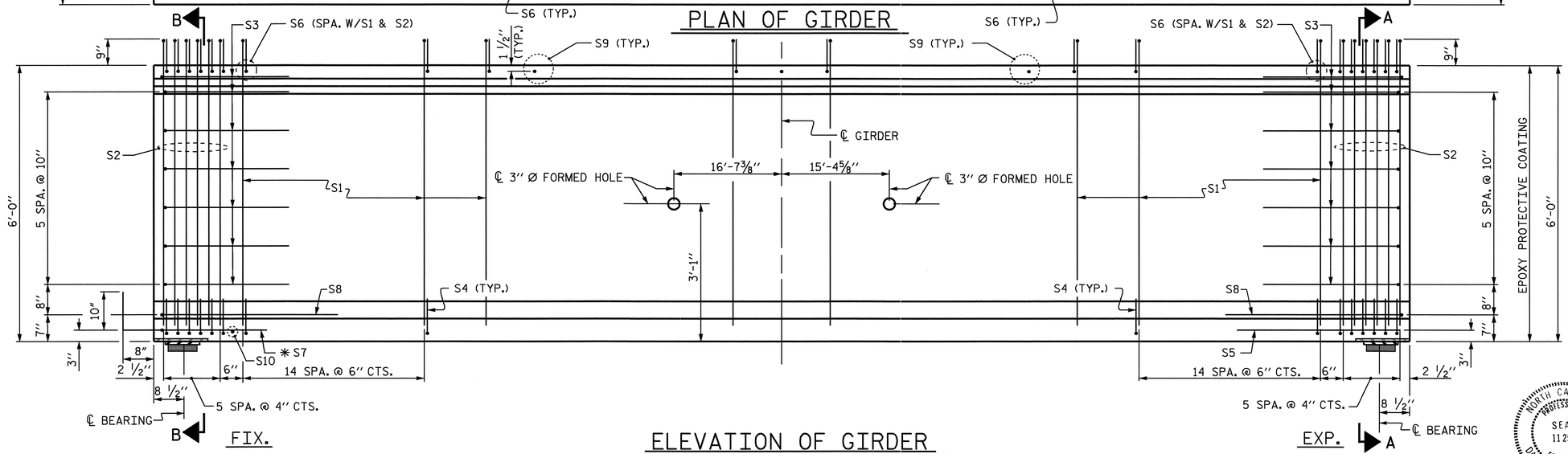
- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◈ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- △ OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08		
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08		
DRAWN BY : RWW 9/19/02	ADDED 9/19/02		
CHECKED BY : GM 9/19/02	REV. 5/1/06	TLA/GM	

24-NOV-2008 08:44
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jtillman

0.6" Ø L.R. GRADE 270 STRANDS

AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

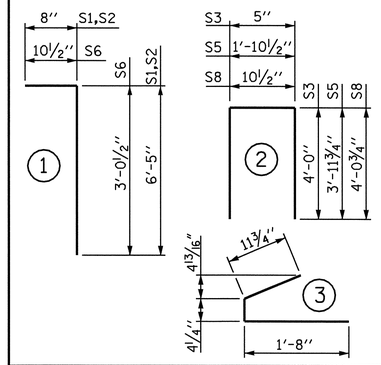
REINF. STEEL FOR GIRDER #1

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	152	#4	1	7'-1"	719
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	176	#5	1	3'-11"	719
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	45	#5	STR	3'-3"	153
S10	1	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR GIRDER #1

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	2083	23.4	38

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 3 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

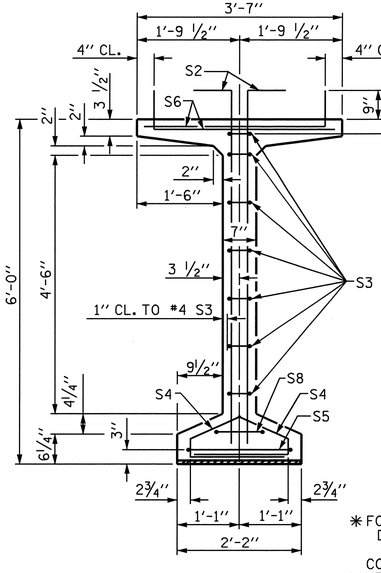
72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)

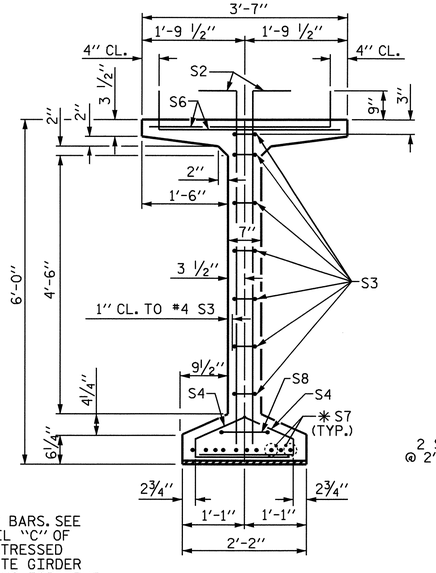
SPAN F / GDR. #1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-40
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

STD. NO. PCGD10

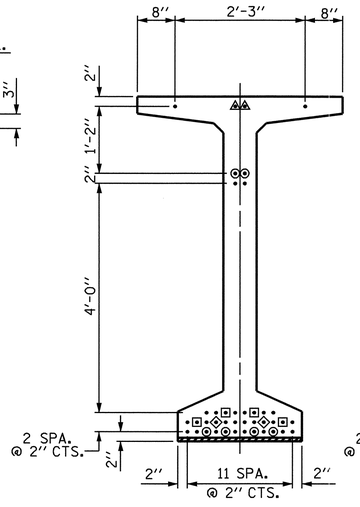




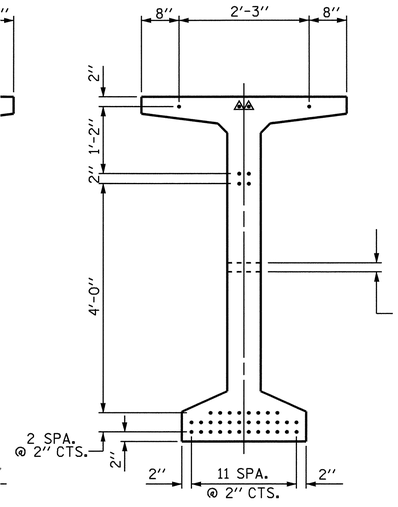
* FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION A-A

SECTION B-B



AT END OF GIRDER



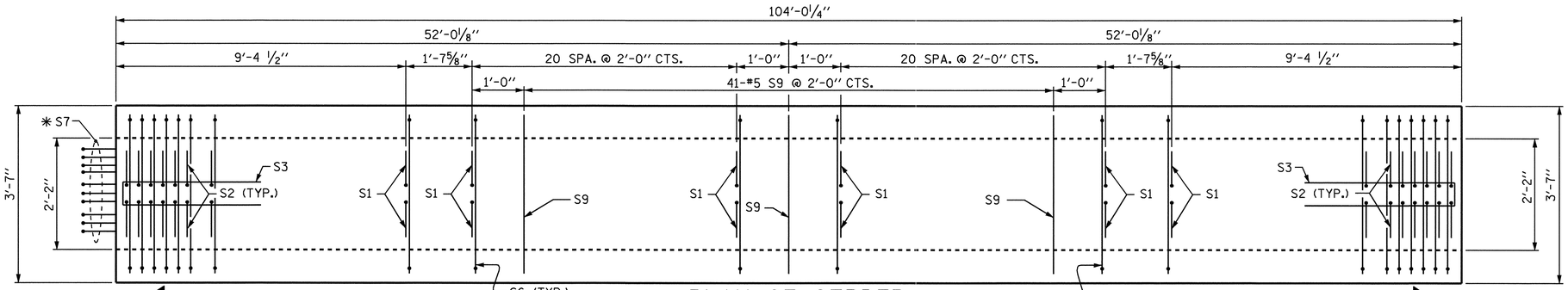
AT ℄ OF GIRDER

DEBONDING LEGEND

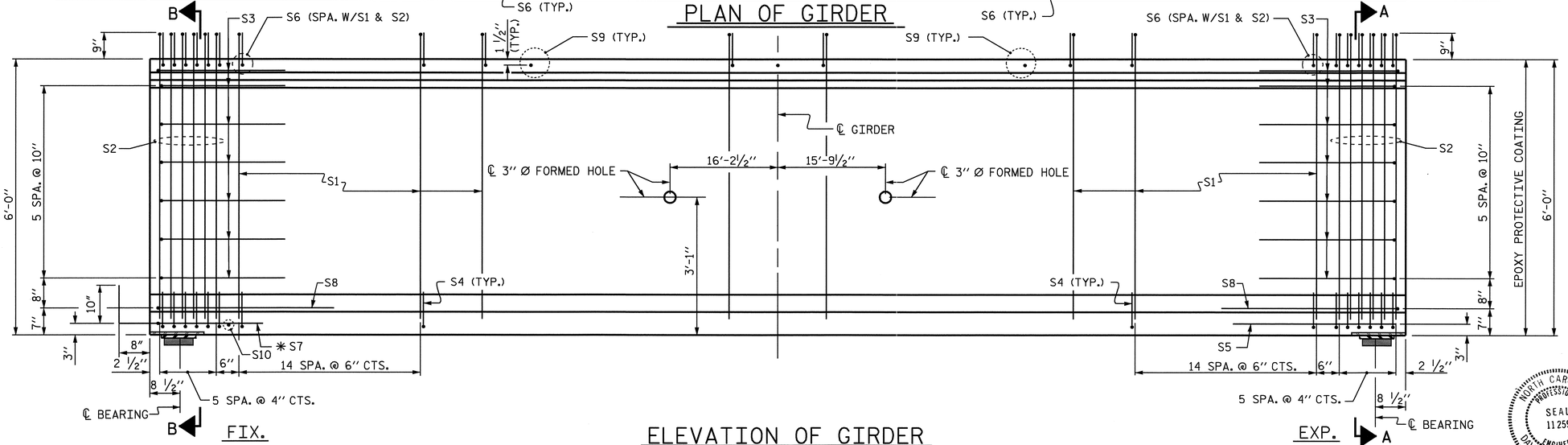
- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

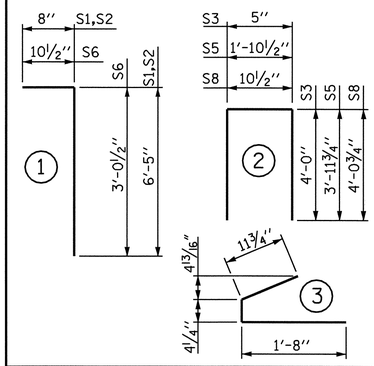
REINF. STEEL FOR GIRDER #2

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	144	#4	1	7'-1"	681
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	168	#5	1	3'-11"	686
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	41	#5	STR	3'-3"	139
S10	1	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR GIRDER #2

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	1998	22.3	38

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 4 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)
SPAN F / GDR. #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-41
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

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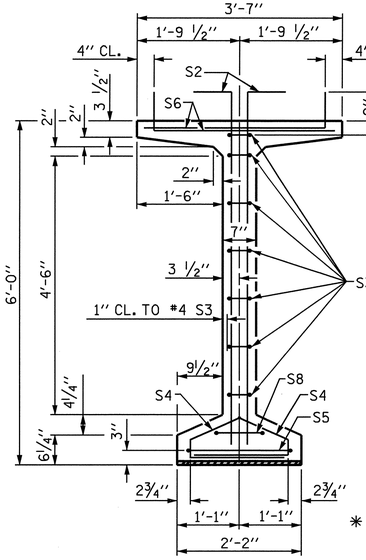
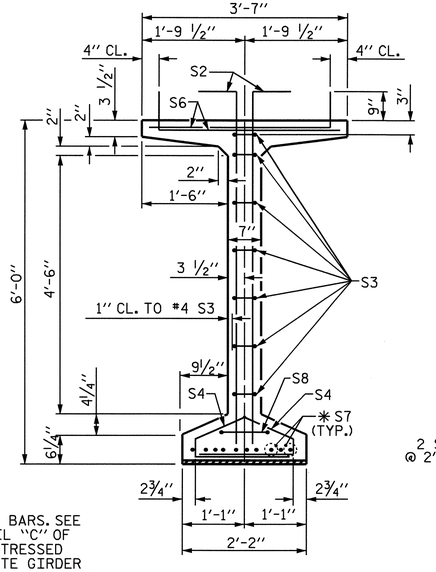
jtillman

STD. NO. PCGD10

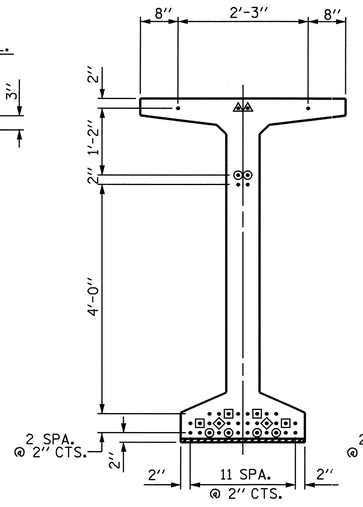


SECTION A-A

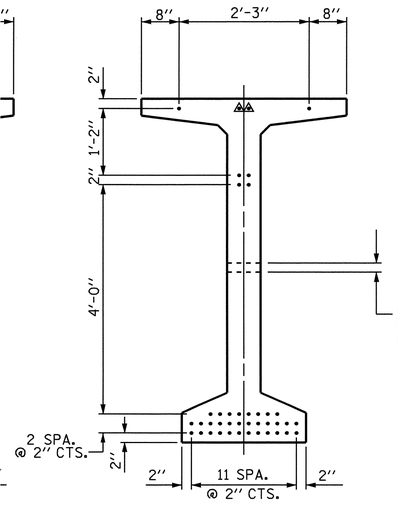


SECTION B-B

* FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



AT END OF GIRDER



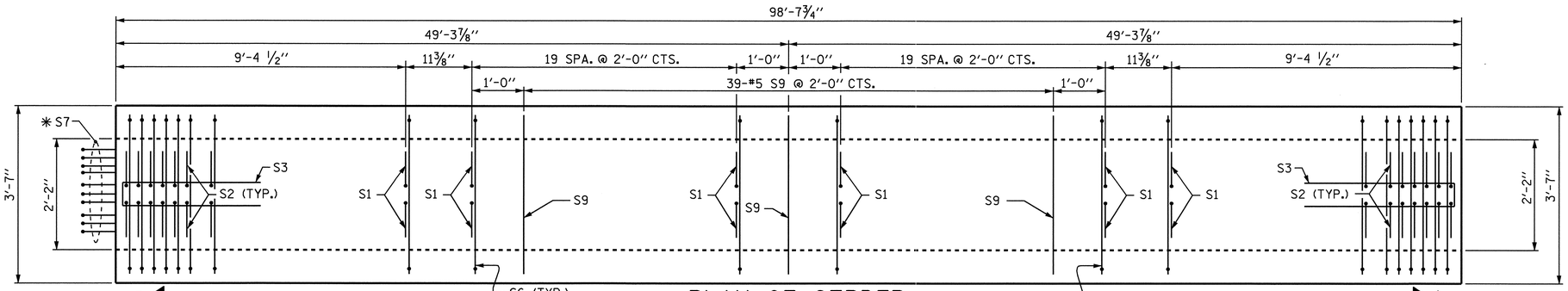
AT ℄ OF GIRDER

DEBONDING LEGEND

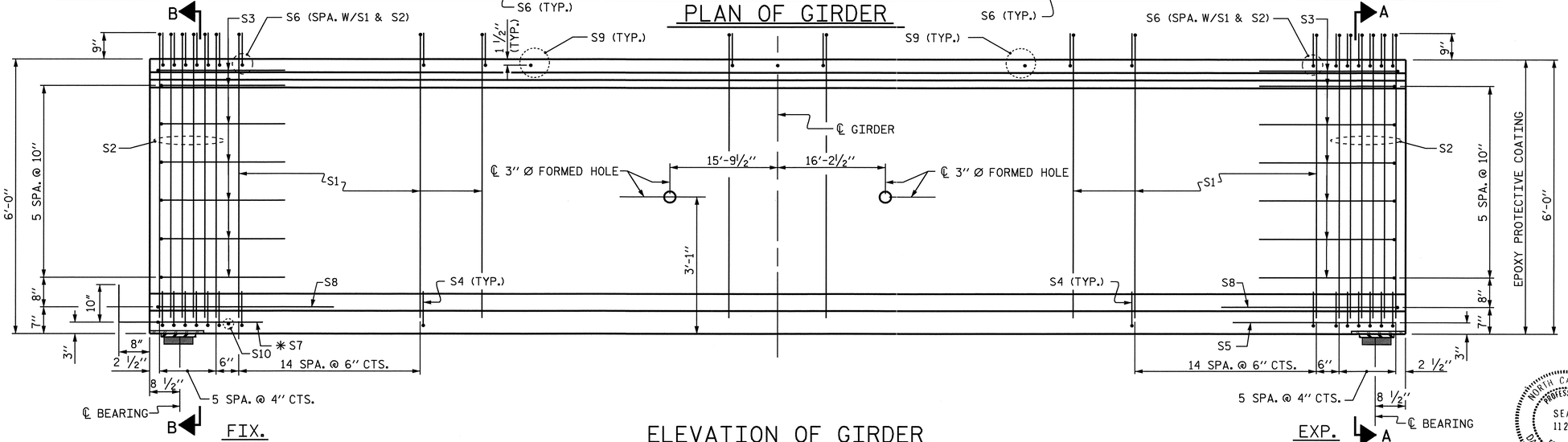
- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

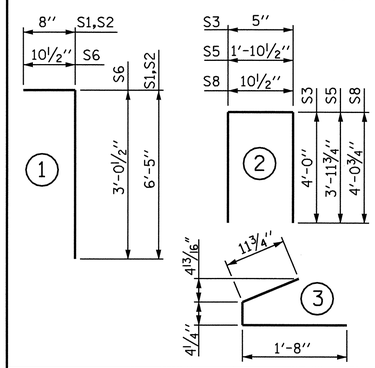
REINF. STEEL FOR GIRDER #3

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	140	#4	1	7'-1"	662
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	164	#5	1	3'-11"	670
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	39	#5	STR	3'-3"	132
S10	1	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR GIRDER #3

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	1956	21.1	38

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 5 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)
SPAN F / GDR. #3

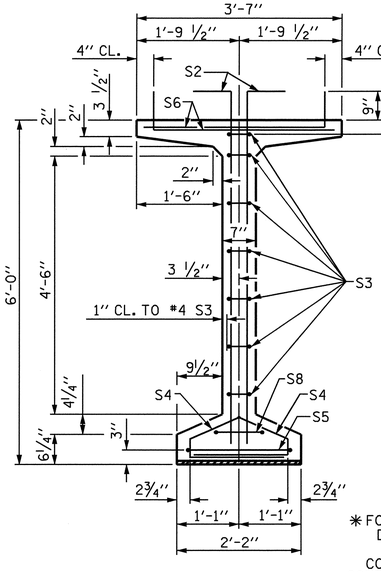
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-42
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
11/25/08

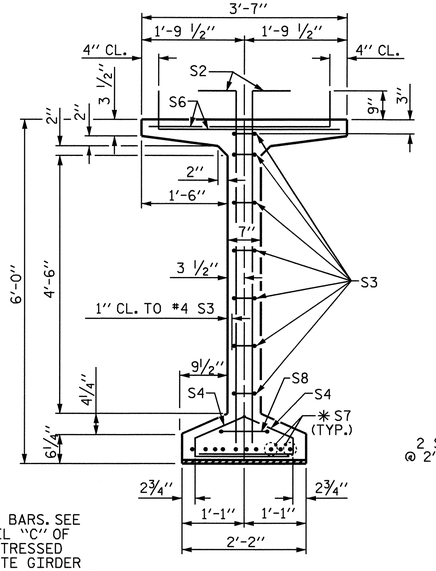
ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

24-NOV-2008 08:45
r:\structures\callaway\u3334a_sd_g*_01.dgn
jtillman

STD. NO. PCGD10

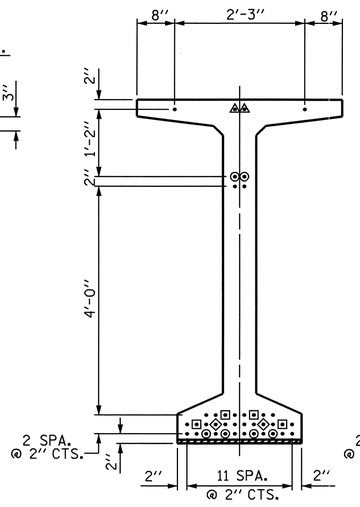


SECTION A-A

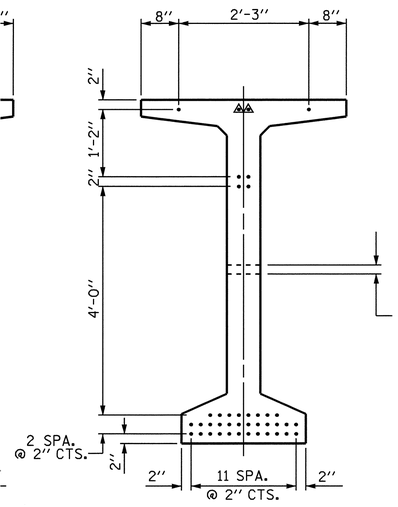


SECTION B-B

* FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



AT END OF GIRDER



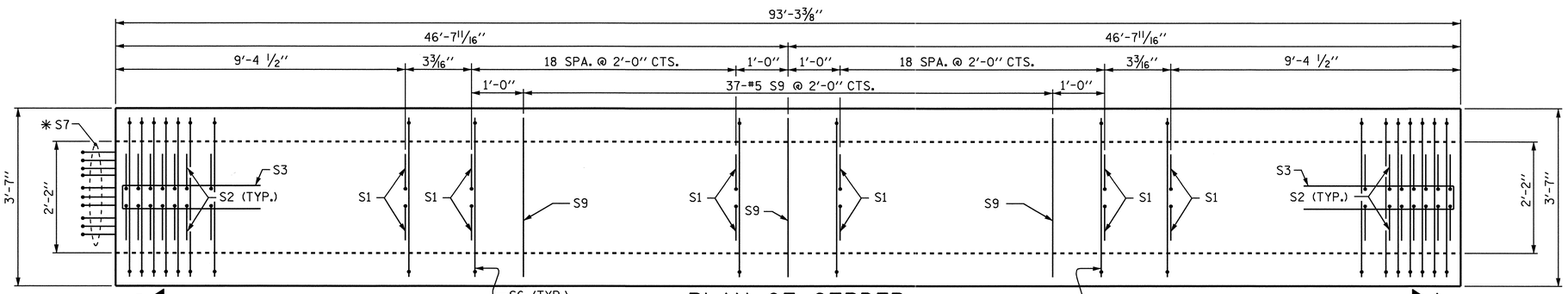
AT ℄ OF GIRDER

DEBONDING LEGEND

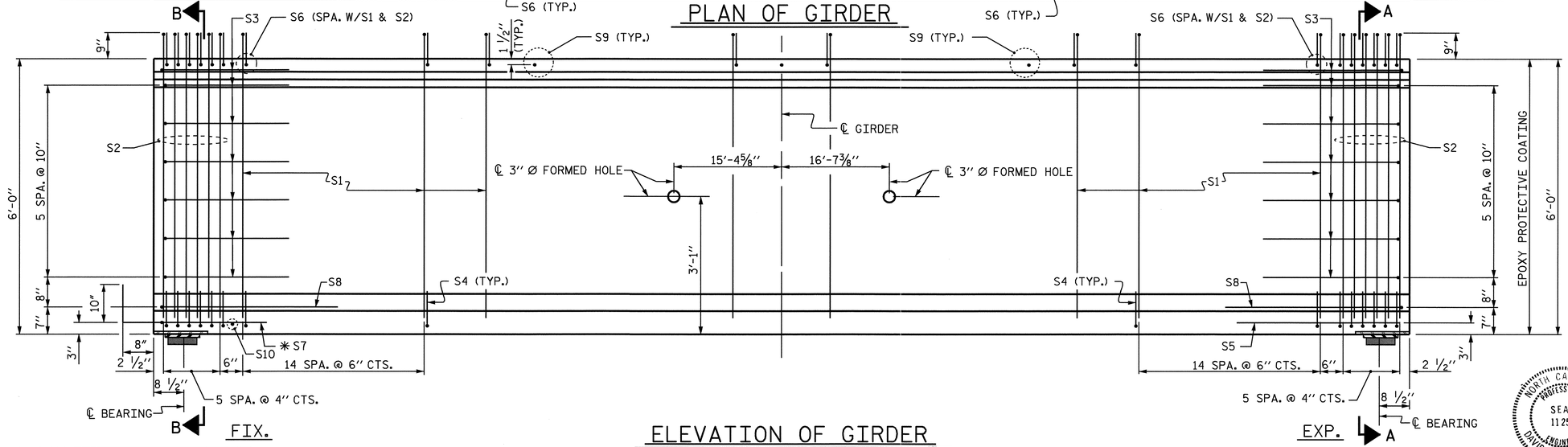
- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◈ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- △ OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

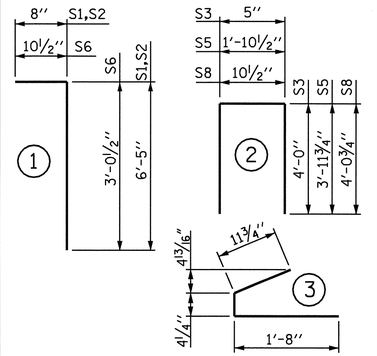
REINF. STEEL FOR GIRDER #4

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	136	#4	1	7'-1"	644
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	160	#5	1	3'-11"	654
*S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	37	#5	STR	3'-3"	125
S10	1	#3	STR	1'-10"	1

*NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR GIRDER #4

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	1915	20.0	38

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 6 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)

SPAN F / GDR. #4

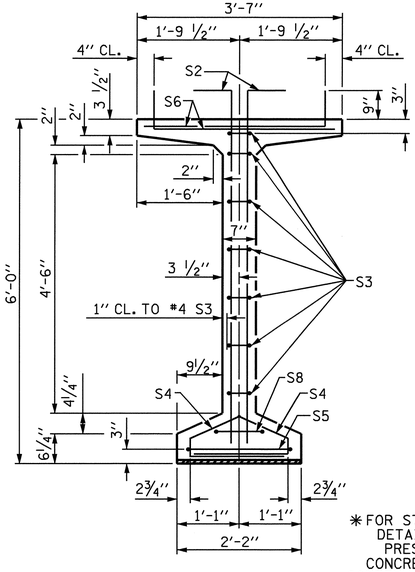
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-43
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
11/25/08

ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

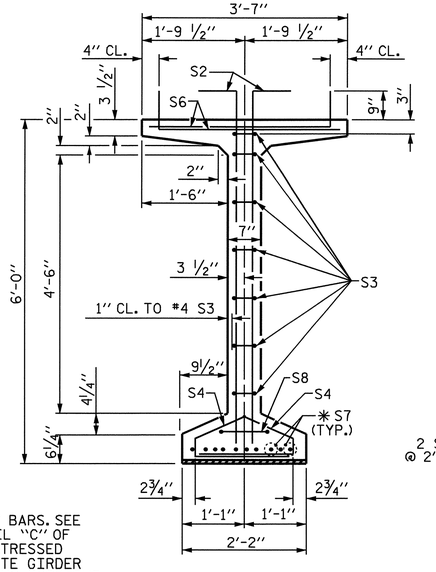
24-NOV-2008 08:45
r:\structures\callaway\u3334a_sd_g*_01.dgn
jtillman

STD. NO. PCGD10

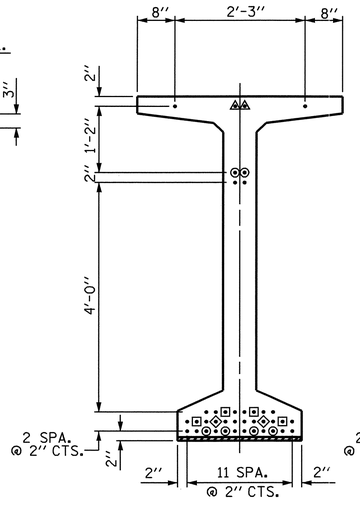


✳ FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

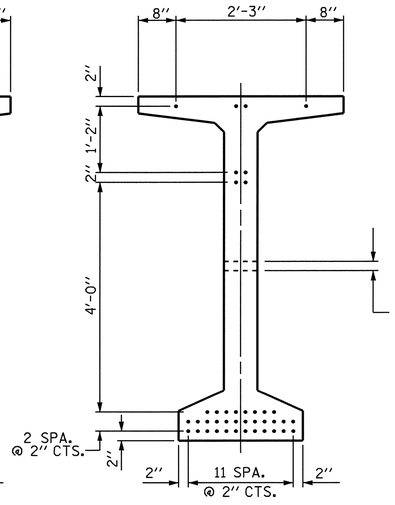
SECTION A-A



SECTION B-B



AT END OF GIRDER



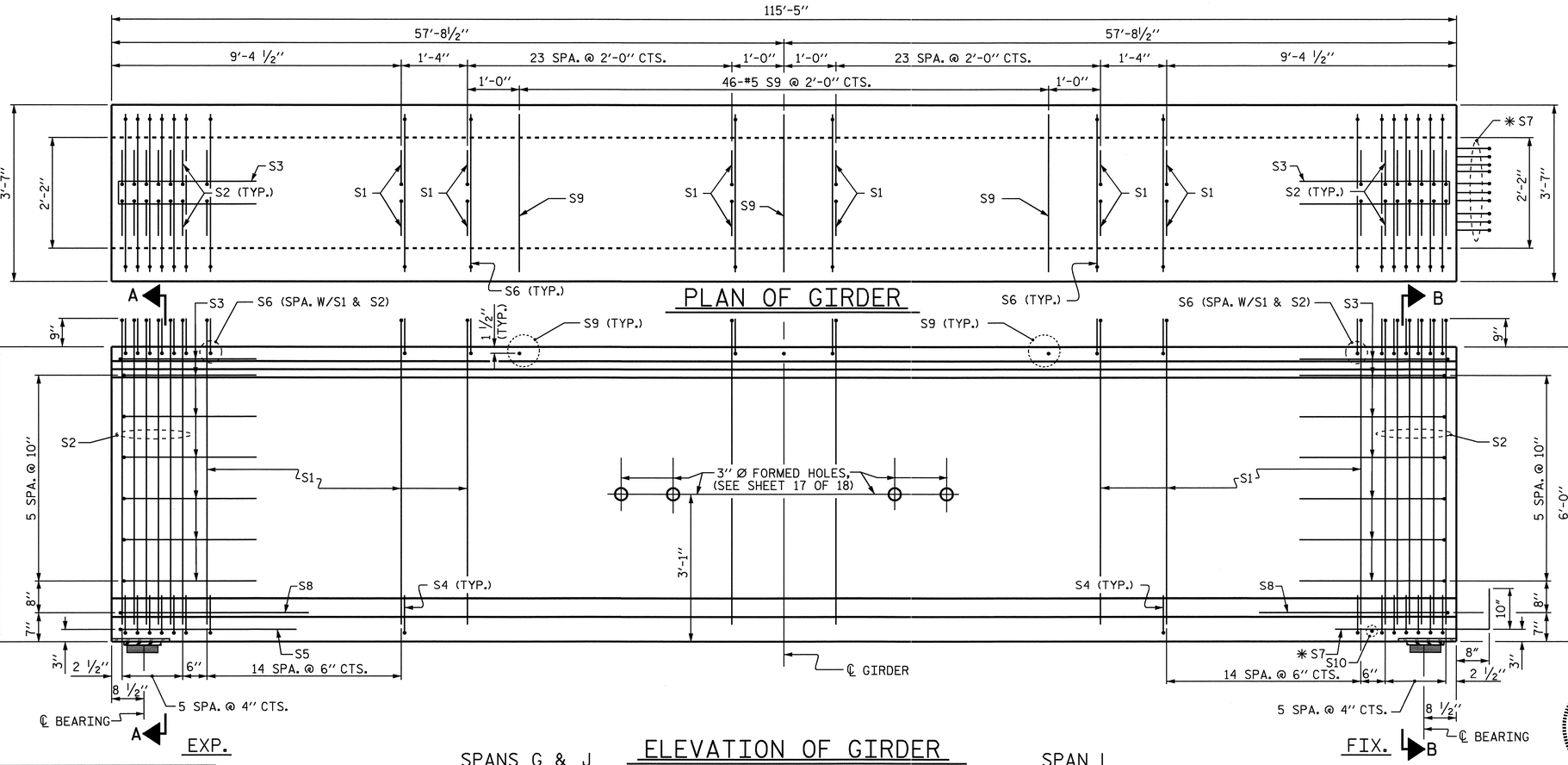
AT ℄ OF GIRDER

DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



SPANS G & J UP-STATION ← ELEVATION OF GIRDER → SPAN L UP-STATION

PLAN OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

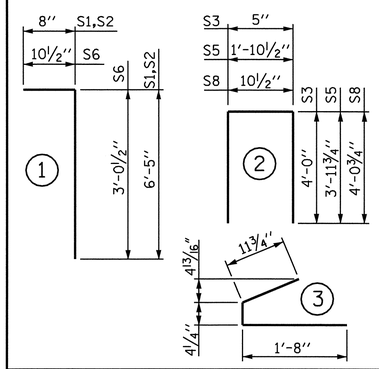
REINF. STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	156	#4	1	7'-1"	738
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	180	#5	1	3'-11"	735
✳ S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	46	#5	STR	3'-3"	156
S10	1	#3	STR	1'-10"	1

✳ NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR ONE GIRDER

	REINF. STEEL	8000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	2121	24.7	38

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
G	4	115'-5"	461'-8"
J	4	115'-5"	461'-8"
L	4	115'-5"	461'-8"

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 7 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)

SPANS G, J & L

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-44
1			3			TOTAL SHEETS
2			4			115

STD. NO. PCGD10

ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

24-NOV-2008 09:21
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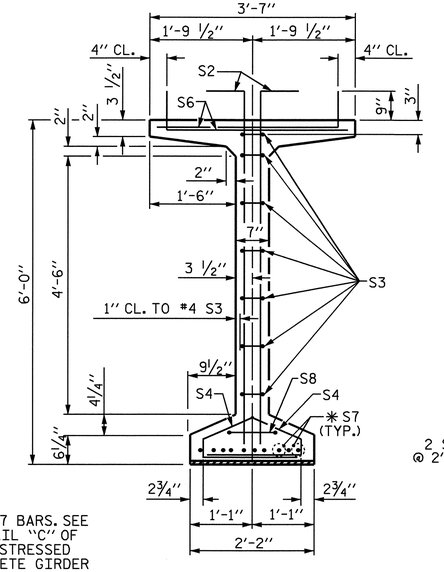
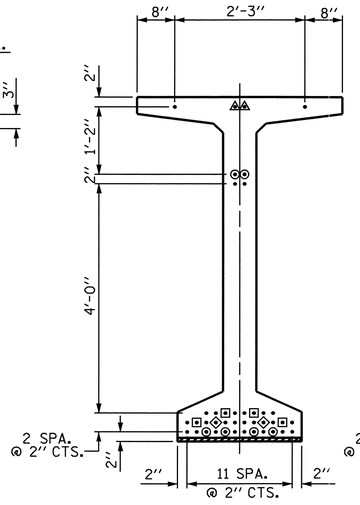
jtillman

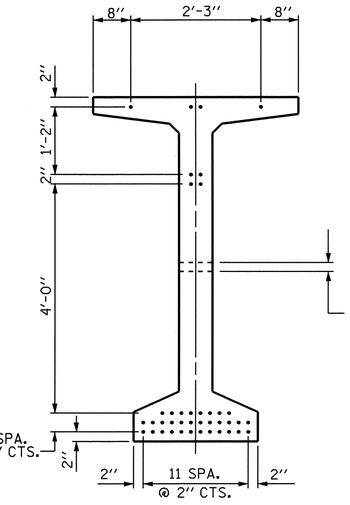


* FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION B-B



AT END OF GIRDER



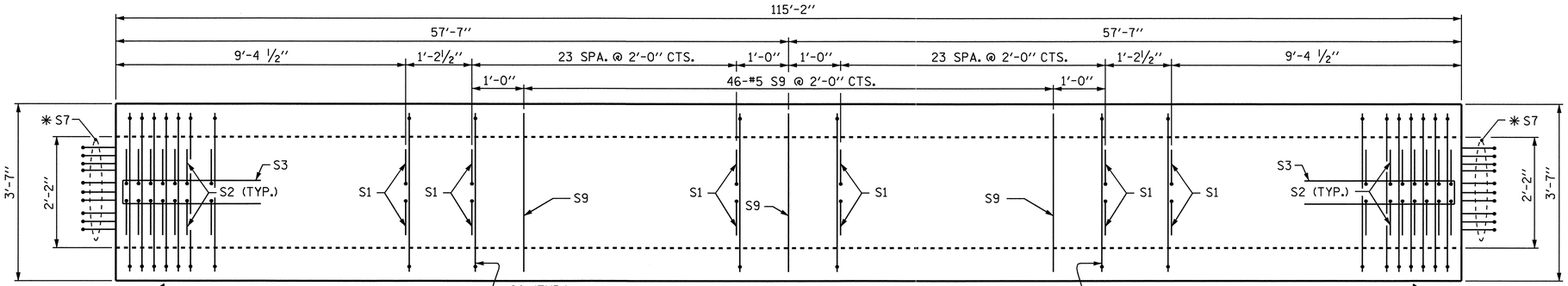
AT ℄ OF GIRDER

DEBONDING LEGEND

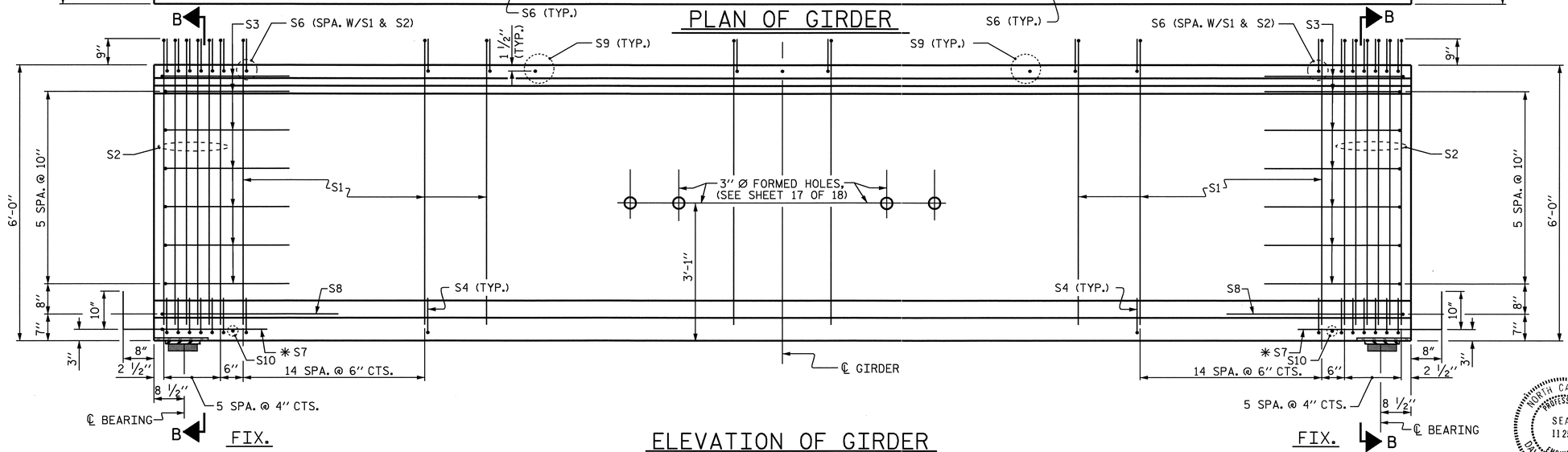
- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◈ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- ◬ OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS

AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

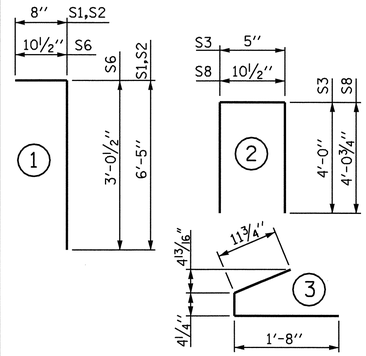
REINF. STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	156	#4	1	7'-1"	738
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S6	180	#5	1	3'-11"	735
* S7	20	#5	STR	3'-8"	76
S8	2	#5	2	9'-0"	19
S9	46	#5	STR	3'-3"	156
S10	2	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR ONE GIRDER

	REINF. STEEL	8000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	2149	24.7	38

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
H	4	115'-2"	460'-8"
K	4	115'-2"	460'-8"

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 8 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)
SPANS H & K

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-45
1			3			TOTAL SHEETS
2			4			115

ASSEMBLED BY : A.S. CALLAWAY DATE : 7/22/08
CHECKED BY : J.A. TILLMAN DATE : 8/19/08

DRAWN BY : RWW 9/19/02
CHECKED BY : GM 9/19/02

ADDED 9/19/02
REV. 5/1/06 TLA/GM

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
11/25/08

24-NOV-2008 09:21
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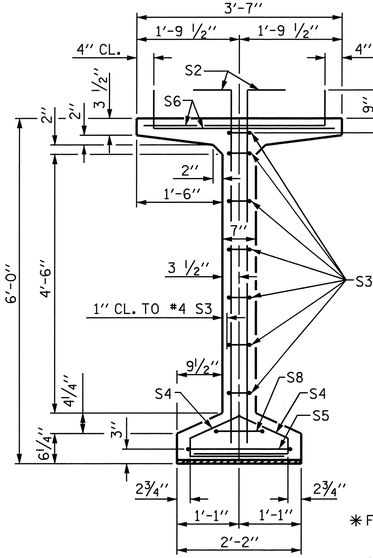
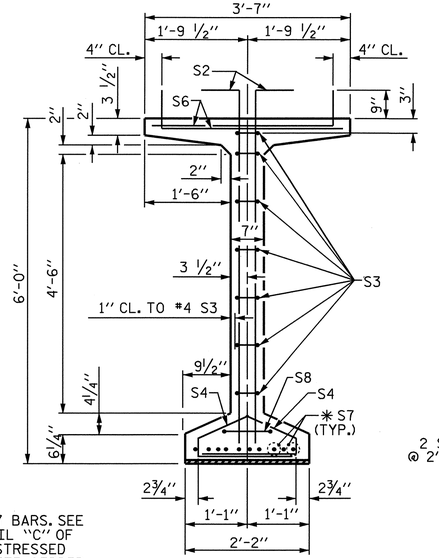
jtillman

STD. NO. PCGD10

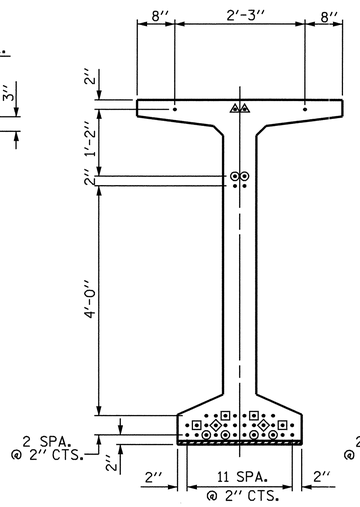


SECTION A-A

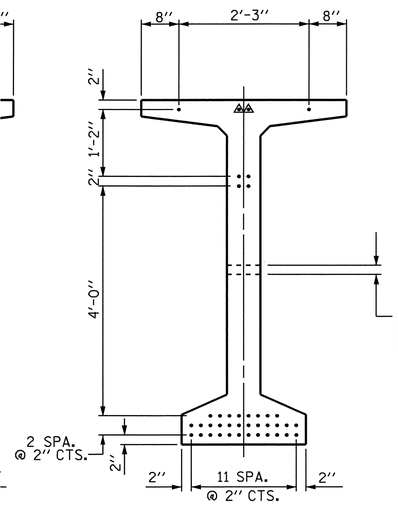


SECTION B-B

* FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



AT END OF GIRDER



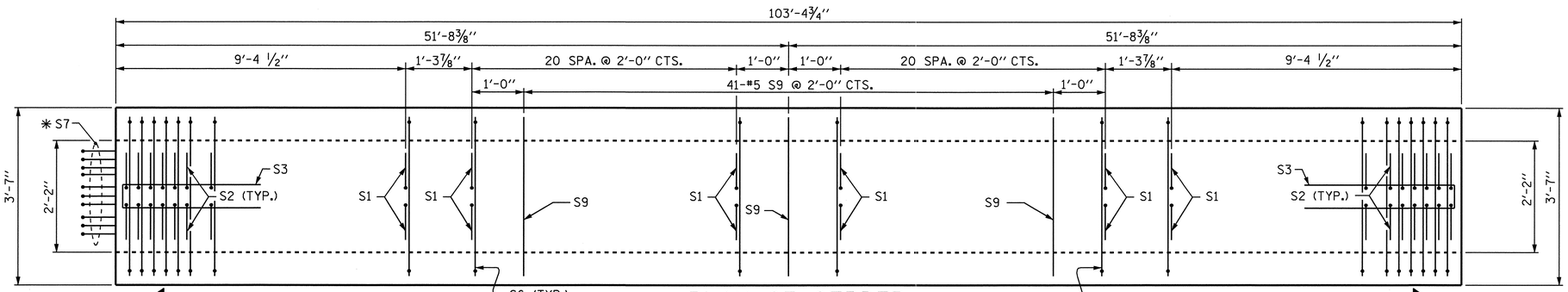
AT ℄ OF GIRDER

DEBONDING LEGEND

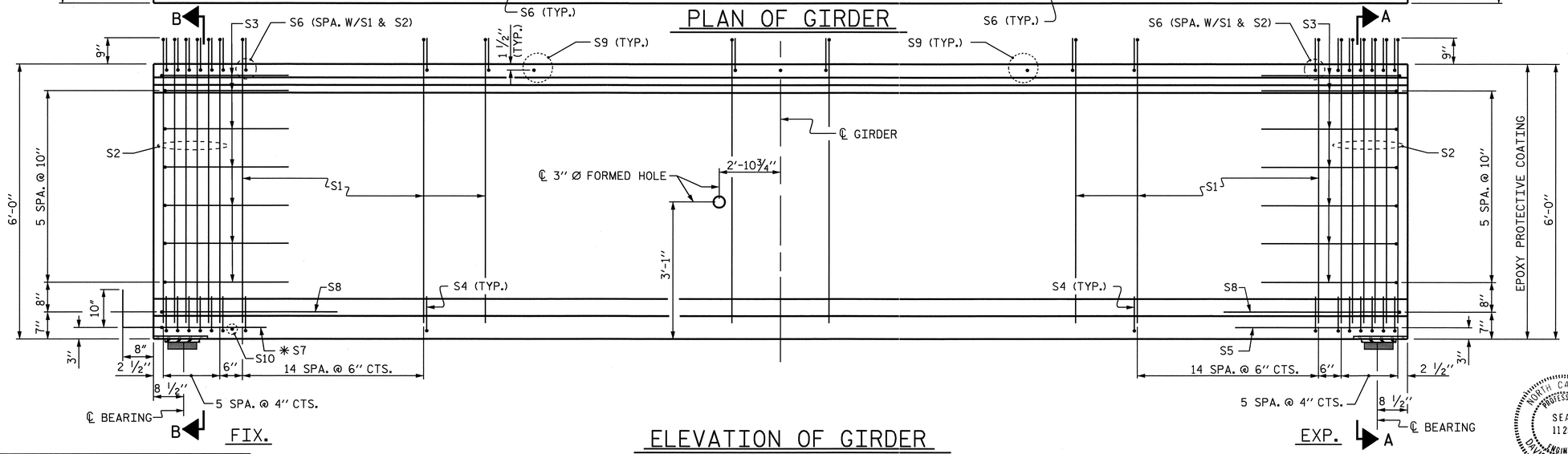
- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

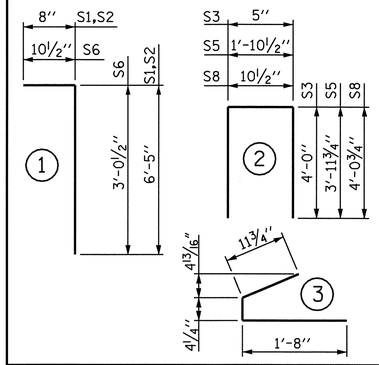
REINF. STEEL FOR GIRDER #1

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	144	#4	1	7'-1"	681
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	168	#5	1	3'-11"	686
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	41	#5	STR	3'-3"	139
S10	1	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR GIRDER #1

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	1998	22.2	38

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 9 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)
SPAN I / GDR. #1

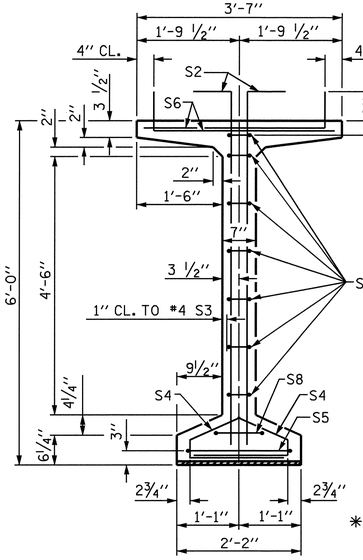
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-46
1			3			TOTAL SHEETS
2			4			115

STD. NO. PCGD10

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

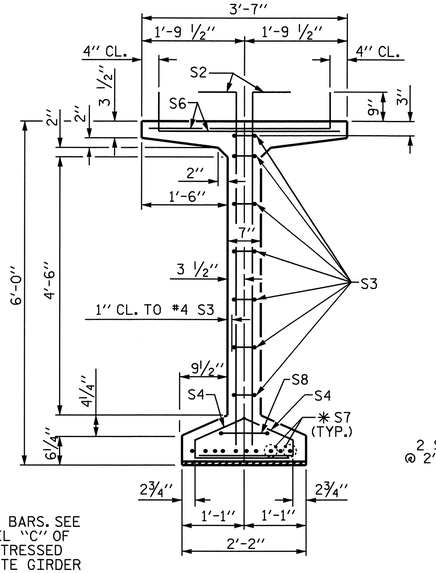
ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

24-NOV-2008 09:20
r:\structures\callaway\u3334a_sd_g*_01.dgn
jtillman

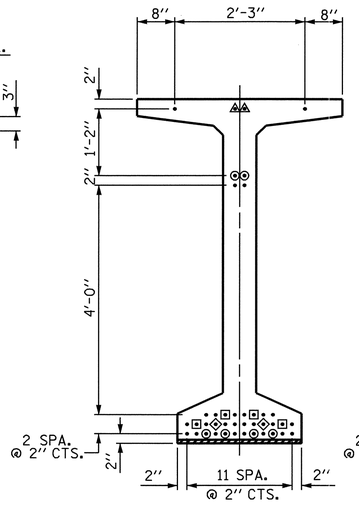


✱ FOR S7 BARS, SEE DETAIL 'C' OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

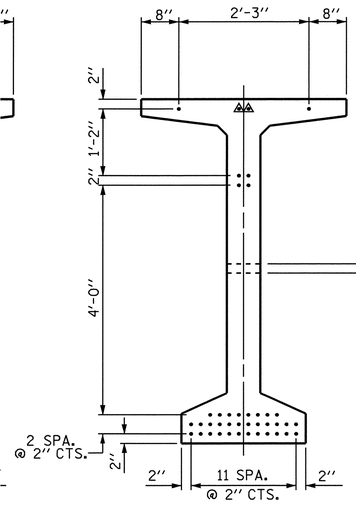
SECTION A-A



SECTION B-B



AT END OF GIRDER



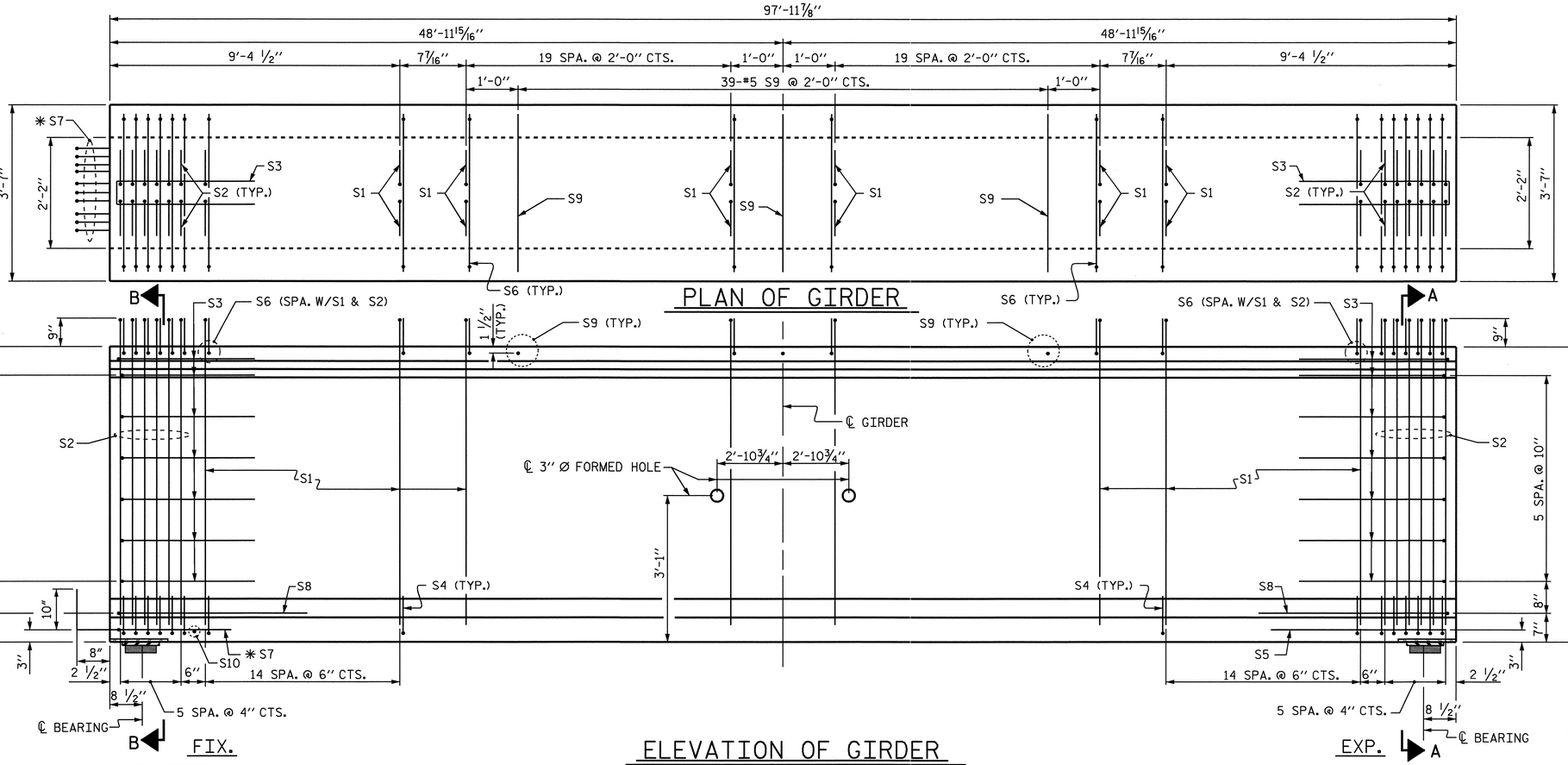
AT ℄ OF GIRDER

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◈ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- △ OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER

ELEVATION OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

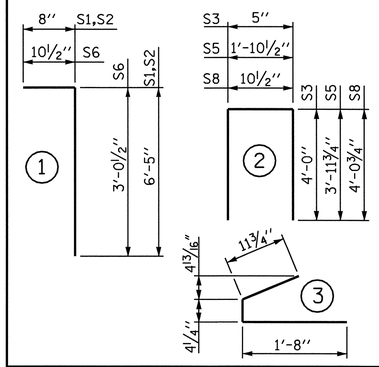
REINF. STEEL FOR GIRDER #2

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	140	#4	1	7'-1"	662
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	164	#5	1	3'-11"	670
✱ S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	39	#5	STR	3'-3"	132
S10	1	#3	STR	1'-10"	1

✱ NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR GIRDER #2

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	1956	21.0	38

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 10 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)
SPAN I / GDR. #2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-47
1			3			TOTAL SHEETS
2			4			115

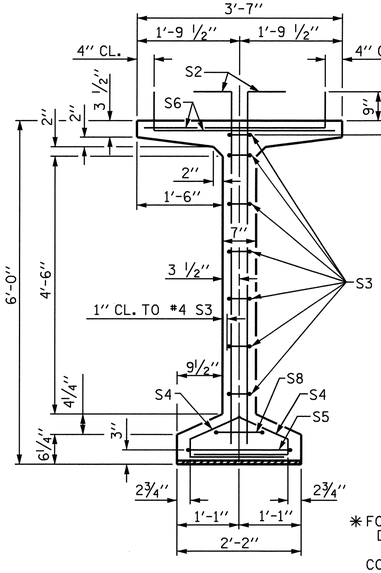
NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

ASSEMBLED BY : A.S. CALLAWAY DATE : 7/22/08
CHECKED BY : J.A. TILLMAN DATE : 8/19/08

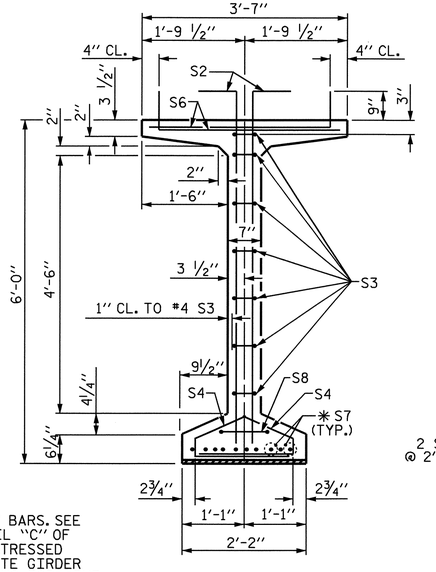
DRAWN BY : RWW 9/19/02 ADDED 9/19/02
CHECKED BY : GM 9/19/02 REV. 5/1/06 TLA/GM

24-NOV-2008 09:20
r:\structures\callaway\u3334a_sd_g*_01.dgn
jtillman

STD. NO. PCGD10

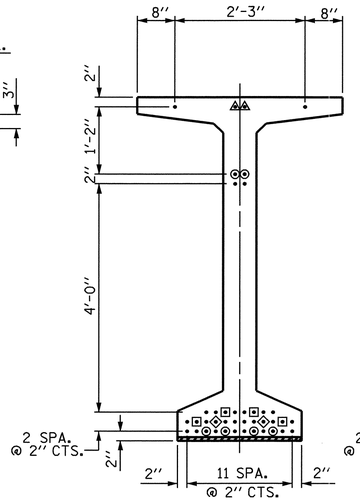


SECTION A-A

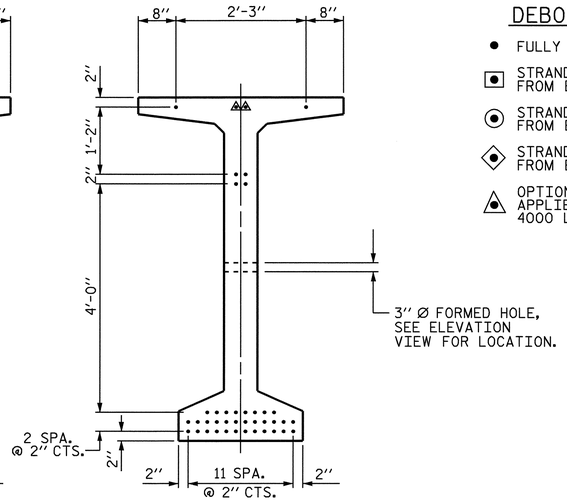


* FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION B-B



AT END OF GIRDER



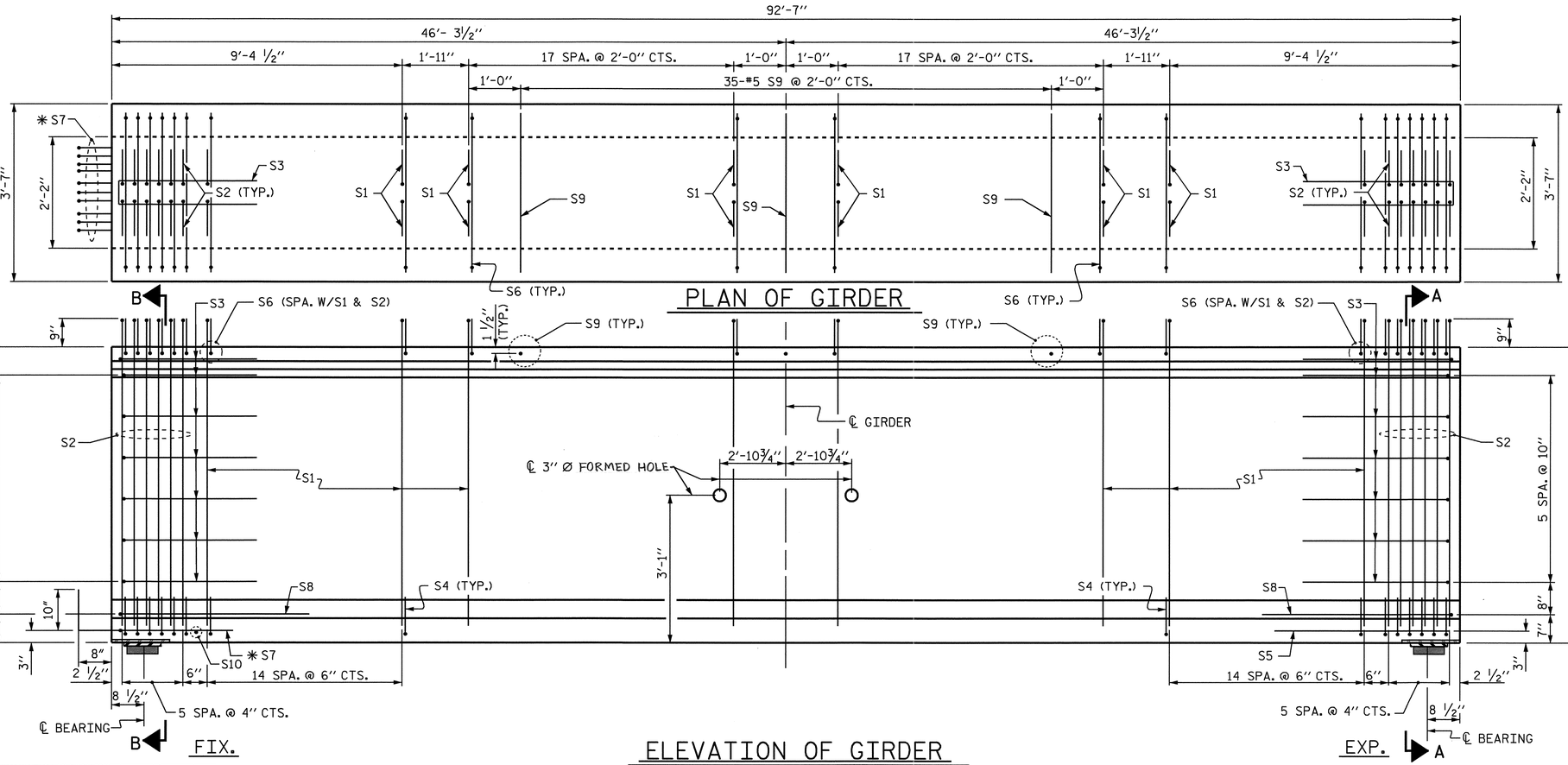
AT ℄ OF GIRDER

DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER

ELEVATION OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

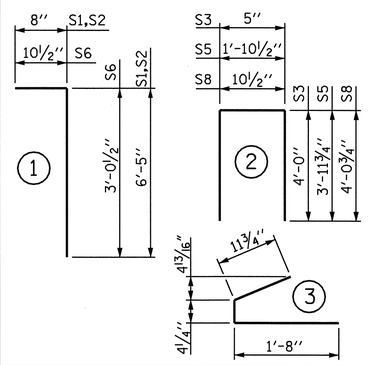
REINF. STEEL FOR GIRDER #3

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	132	#4	1	7'-1"	625
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	156	#5	1	3'-11"	637
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	35	#5	STR	3'-3"	119
S10	1	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR GIRDER #3

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	1873	19.8	38

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 11 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)
SPAN I / GDR. #3

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-48
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

24-NOV-2008 09:20
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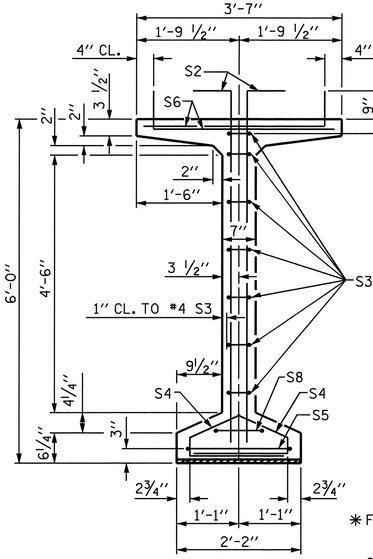
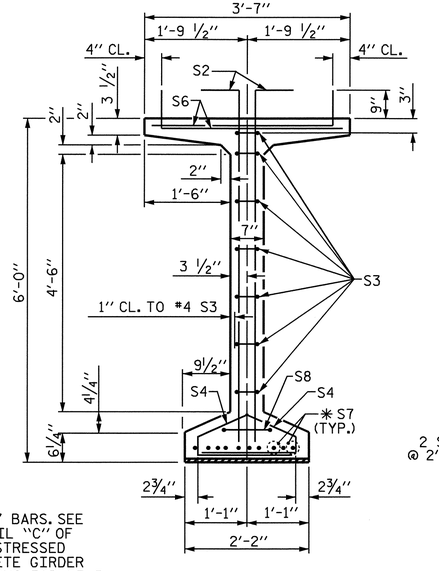
jtillman

STD. NO. PCGD10

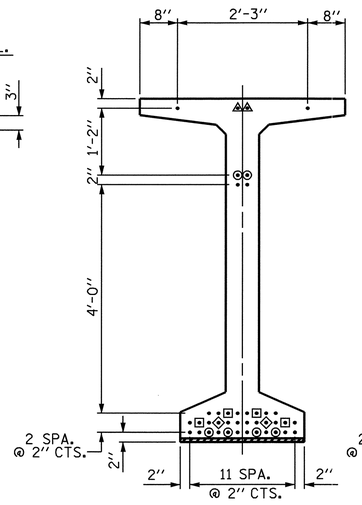


SECTION A-A

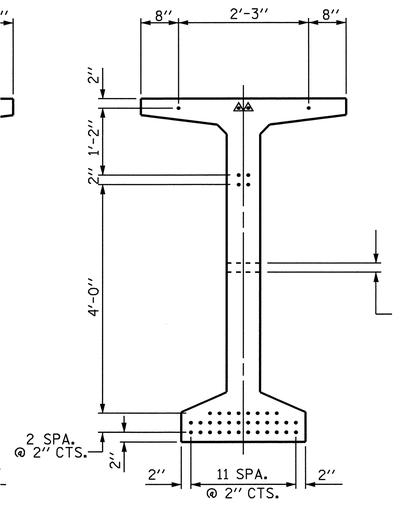


SECTION B-B

* FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



AT END OF GIRDER



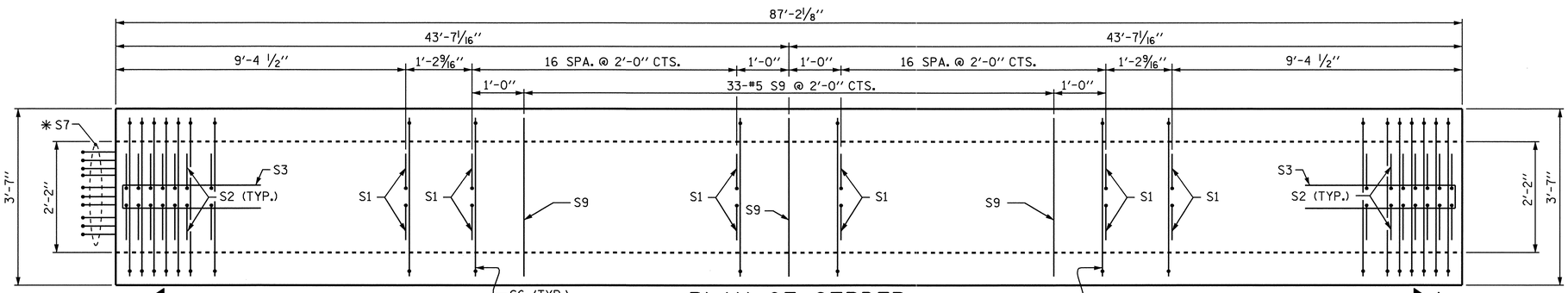
AT ℄ OF GIRDER

DEBONDING LEGEND

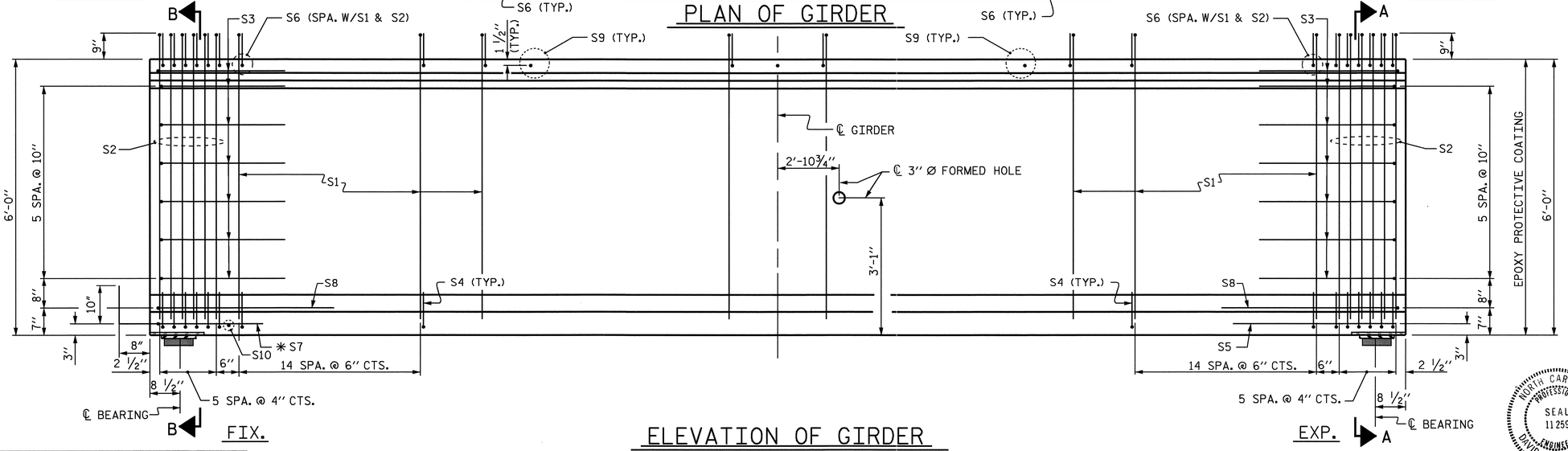
- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

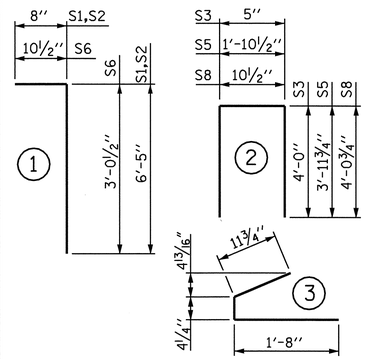
REINF. STEEL FOR GIRDER #4

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	128	#4	1	7'-1"	606
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S5	1	#5	2	9'-10"	10
S6	152	#5	1	3'-11"	621
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	33	#5	STR	3'-3"	112
S10	1	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR GIRDER #4

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	1831	18.7	38

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 12 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)
SPAN I / GDR. #4

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-49
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID B. ANDERSON
11/25/08

ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

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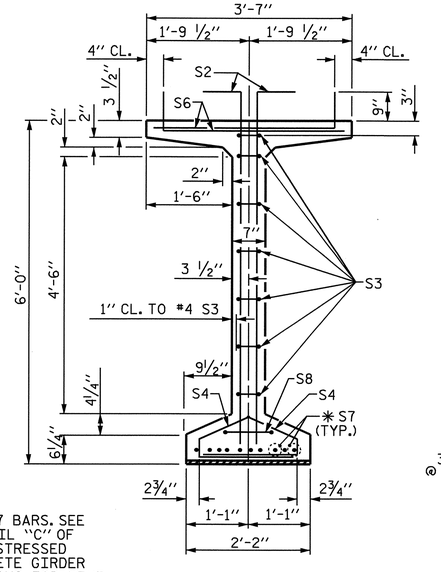
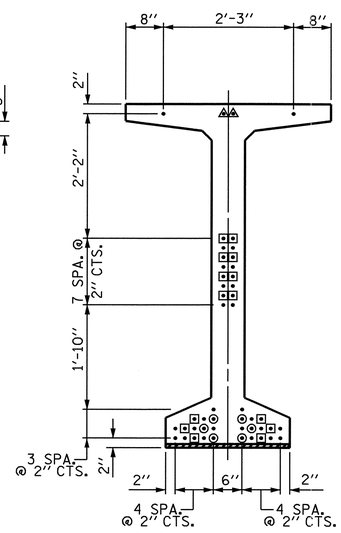
jtillman

STD. NO. PCGD10

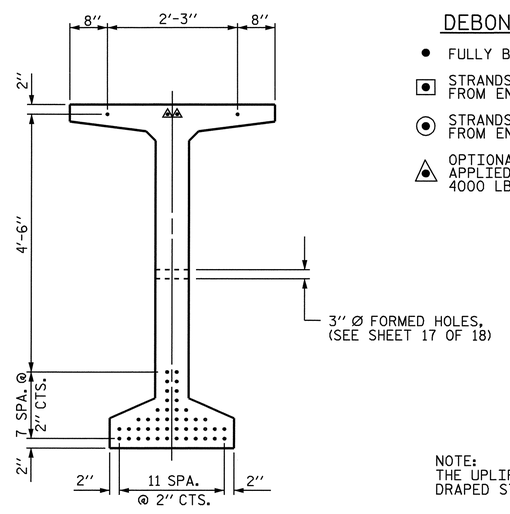


* FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION B-B



AT END OF GIRDER



AT ℄ OF GIRDER

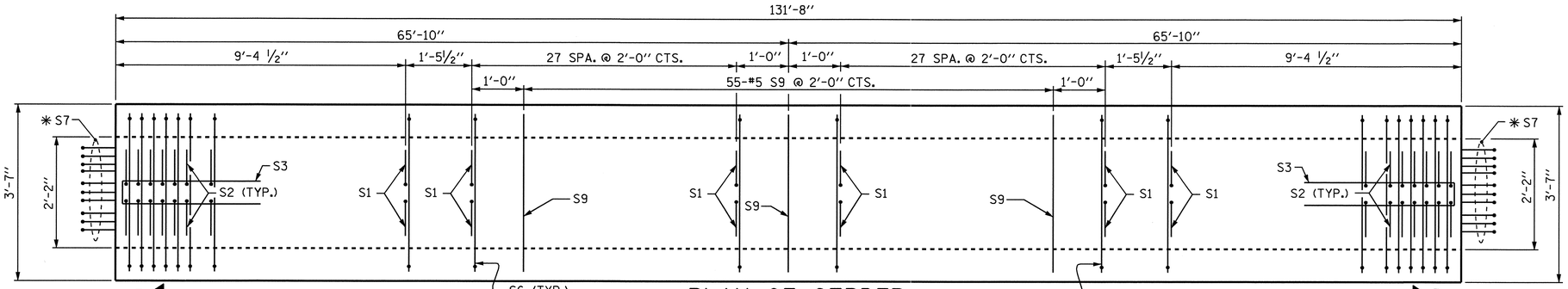
DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

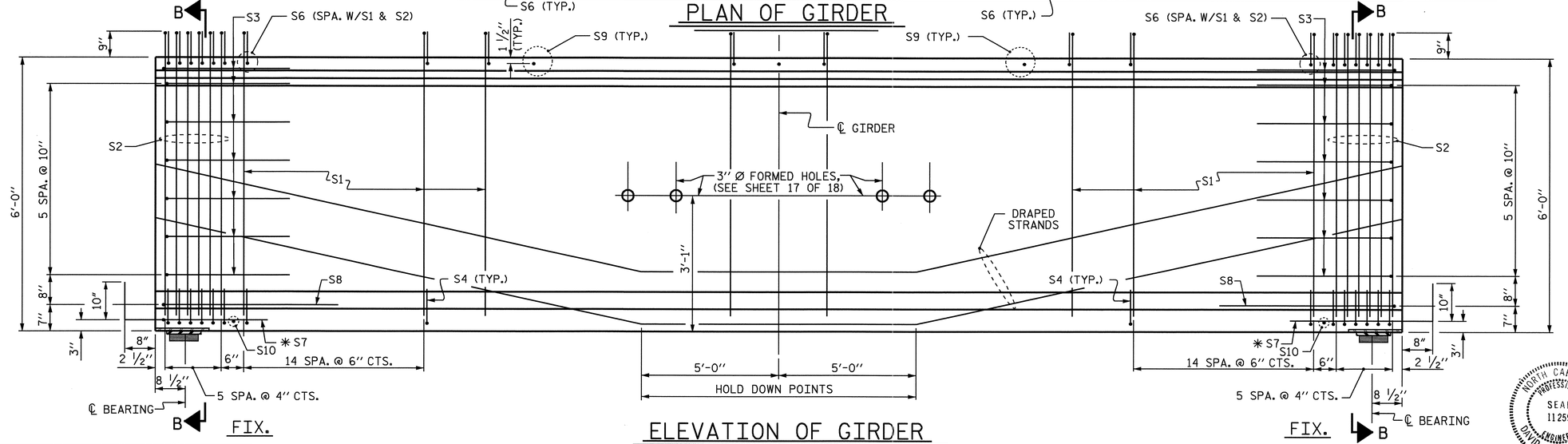
NOTE:
THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 20.416 KIPS.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄ .

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08		
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08		
DRAWN BY : RWW 9/19/02	ADDED 9/19/02		
CHECKED BY : GM 9/19/02	REV. 5/1/06	TLA/GM	

24-NOV-2008 08:45
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jtillman

0.6" Ø L.R. GRADE 270 STRANDS

AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

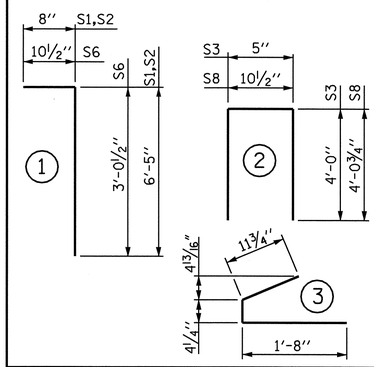
REINF. STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	172	#4	1	7'-1"	814
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	84	#4	3	3'-0"	168
S6	196	#5	1	3'-11"	801
* S7	20	#5	STR	3'-8"	76
S8	2	#5	2	9'-0"	19
S9	55	#5	STR	3'-3"	186
S10	2	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR ONE GIRDER

	REINF. STEEL	10000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	2321	28.2	46

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
N	4	131'-8"	526'-8"
Q	4	131'-8"	526'-8"

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 13 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

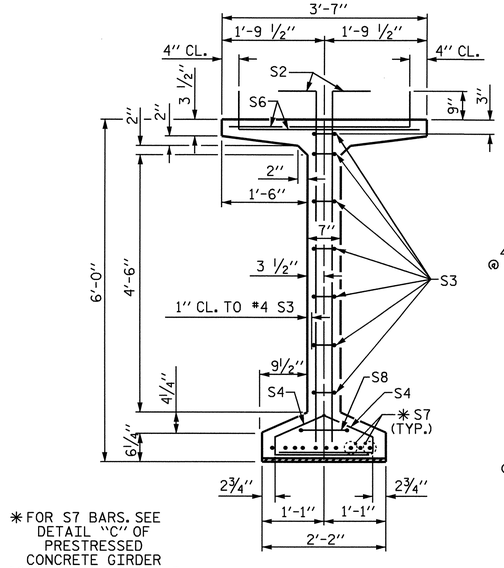
72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)

SPANS N & Q

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
11/25/08

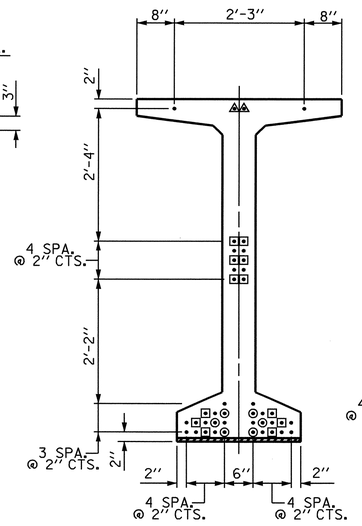
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-50
1			3			TOTAL SHEETS
2			4			115

STD. NO. PCGD10

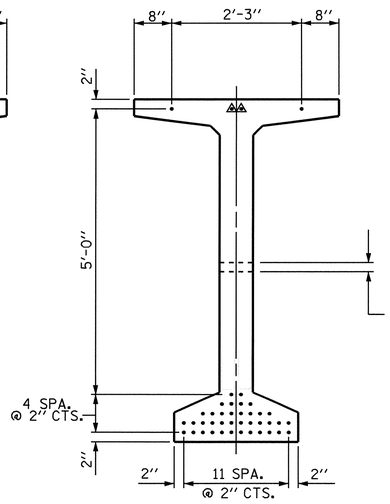


* FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION B-B



AT END OF GIRDER



AT ℄ OF GIRDER

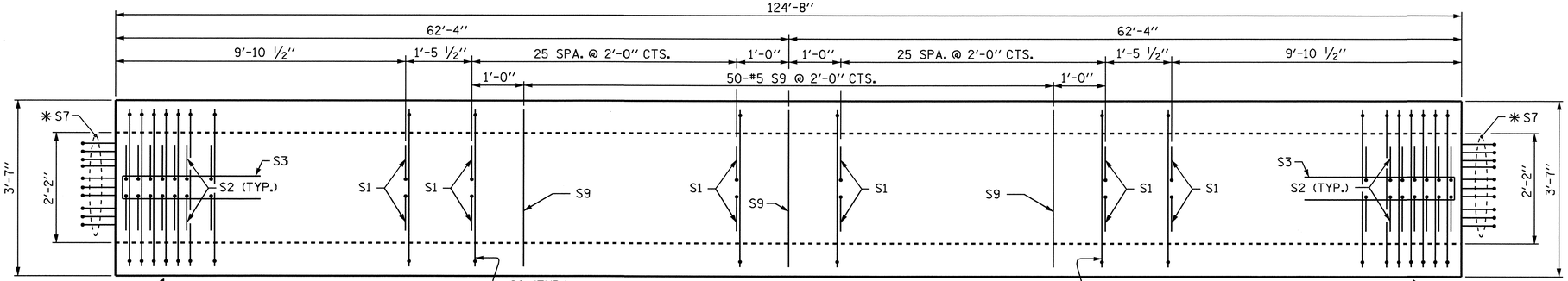
0.6"Ø LOW RELAXATION STRAND LAYOUT

DEBONDING LEGEND

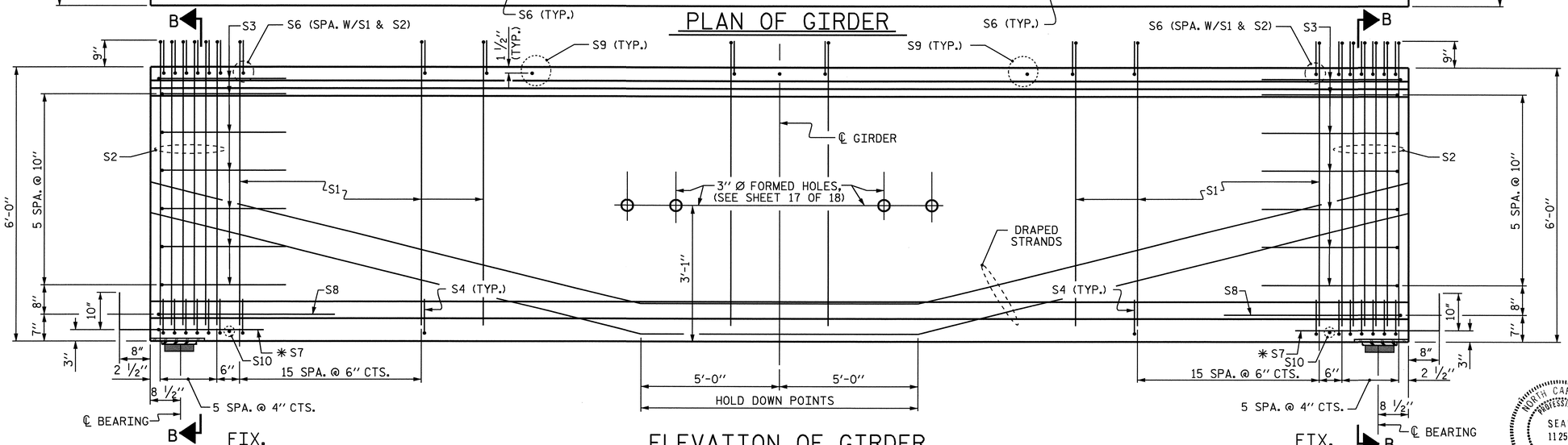
- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- △ OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

NOTE:
THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 20.416 KIPS.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.



PLAN OF GIRDER



ELEVATION OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

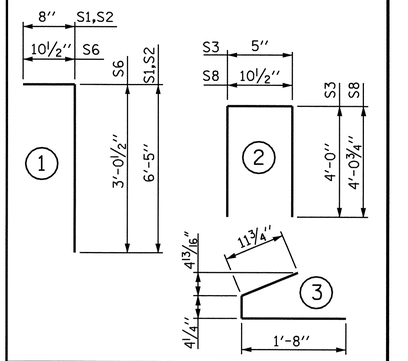
REINF. STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	168	#4	1	7'-1"	795
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	88	#4	3	3'-0"	176
S6	192	#5	1	3'-11"	784
* S7	20	#5	STR	3'-8"	76
S8	2	#5	2	9'-0"	19
S9	50	#5	STR	3'-3"	169
S10	2	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR ONE GIRDER

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	2277	26.7	40

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
T	4	124'-8"	498'-8"
W	4	124'-8"	498'-8"

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 14 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)
SPANS T & W

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-51
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

24-NOV-2008 08:45
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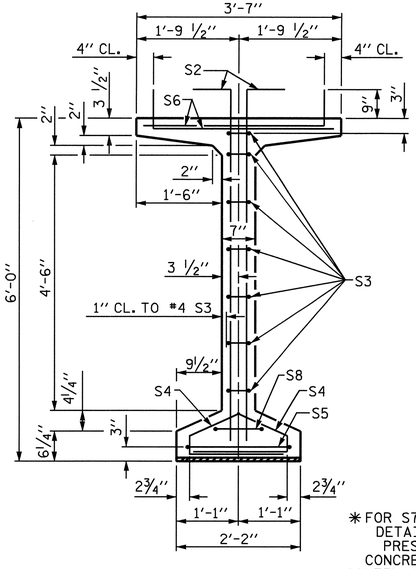
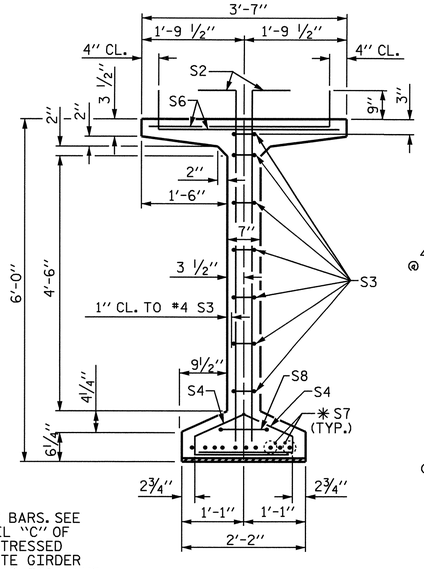
jtillman

STD. NO. PCGD10

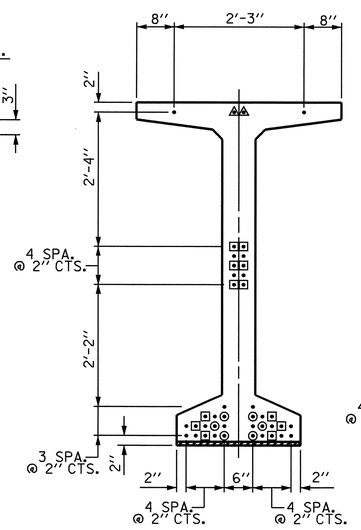


SECTION A-A

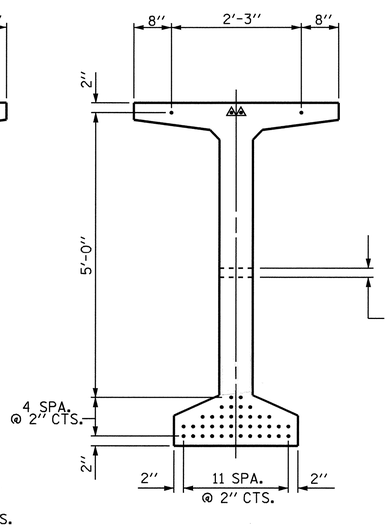


* FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION B-B



AT END OF GIRDER



AT ℄ OF GIRDER

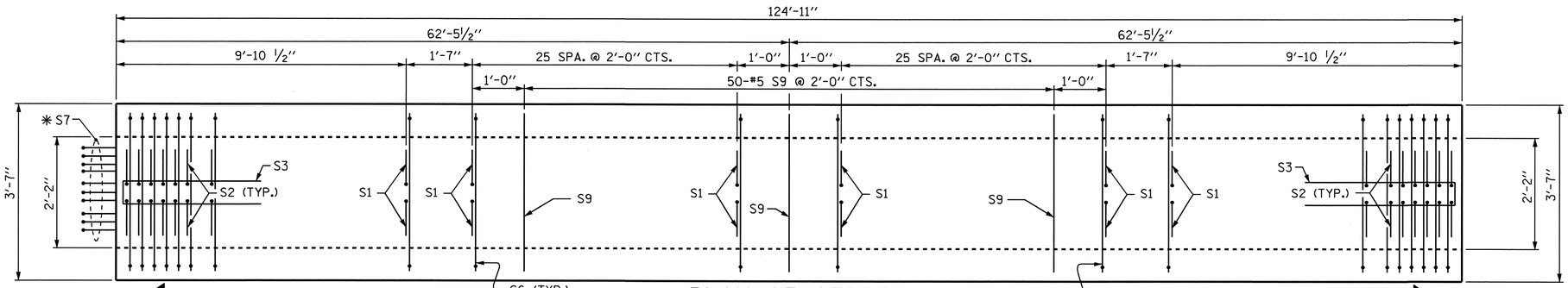
DEBONDING LEGEND

- FULLY BONDED STRANDS
- STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

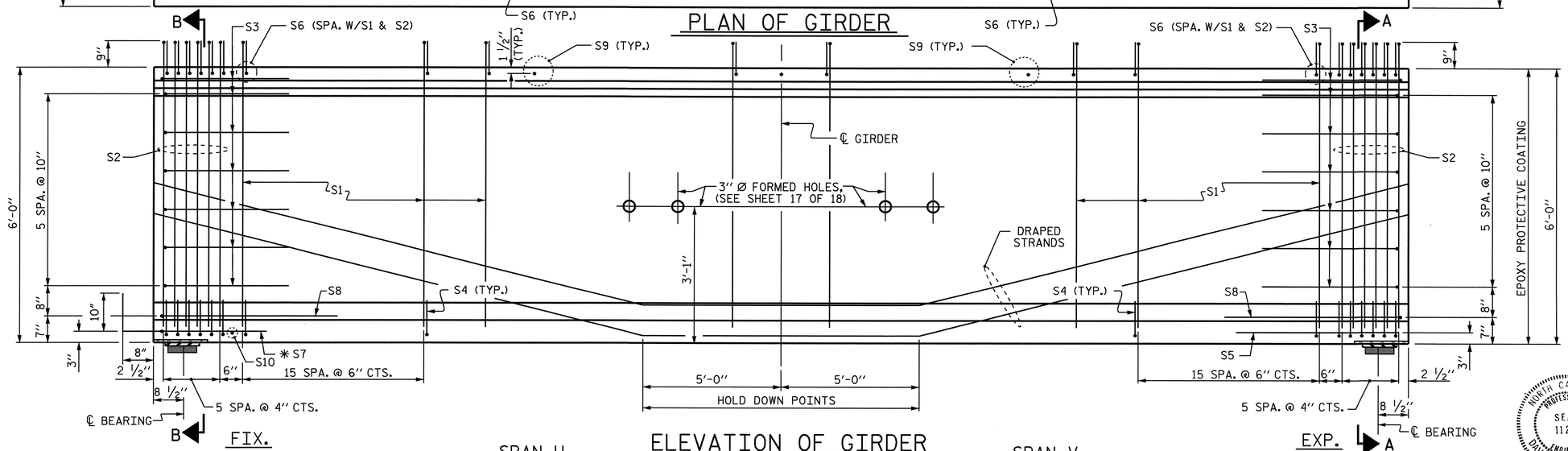
NOTE:
THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 20.416 KIPS.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

SPAN U UP-STATION

SPAN V UP-STATION

0.6" Ø L.R. GRADE 270 STRANDS

AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

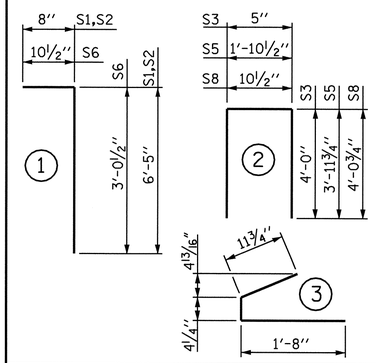
REINF. STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	168	#4	1	7'-1"	795
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	88	#4	3	3'-0"	176
S5	1	#5	2	9'-10"	10
S6	190	#5	1	3'-11"	776
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	50	#5	STR	3'-3"	169
S10	1	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR ONE GIRDER

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	2240	26.8	40

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
U	4	124'-11"	499'-8"
V	4	124'-11"	499'-8"

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 15 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)

SPAN U & V

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-52
1			3			TOTAL SHEETS
2			4			115

ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

24-NOV-2008 08:46
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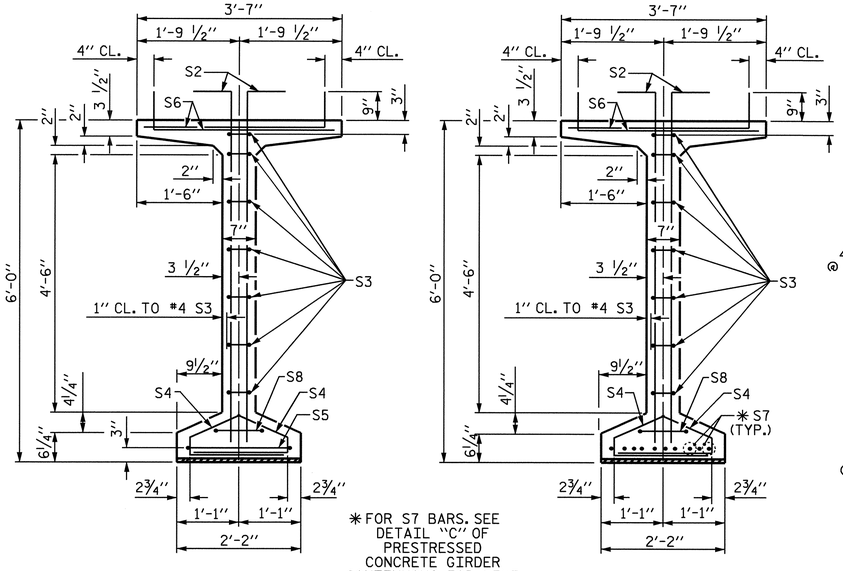
jtillman

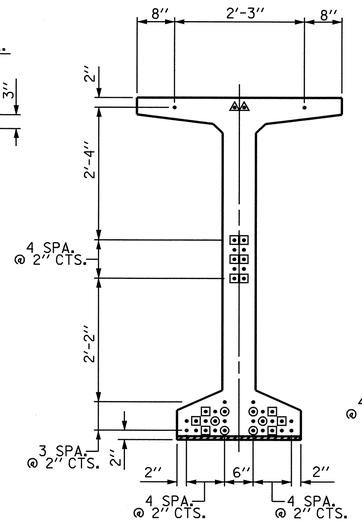
STD. NO. PCGD10



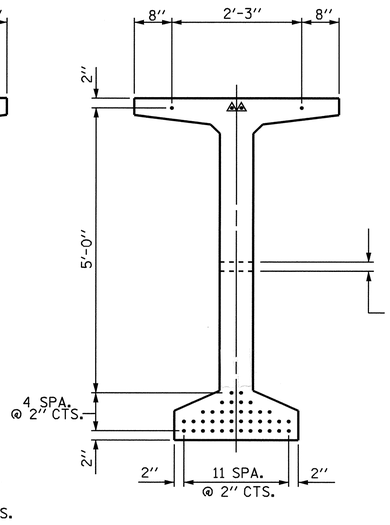
SECTION A-A

SECTION B-B

* FOR S7 BARS. SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET



AT END OF GIRDER



AT ℄ OF GIRDER

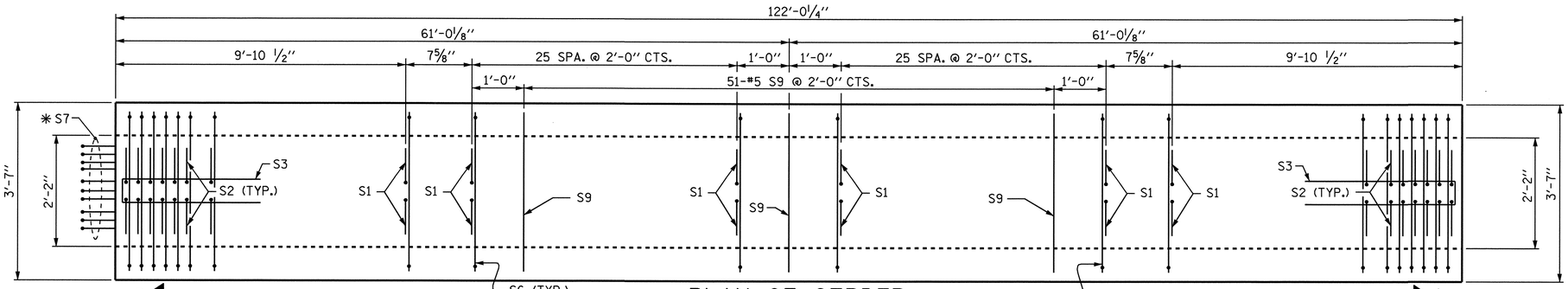
DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 2'-0" FROM END OF GIRDER
- ⊙ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- △ OPTIONAL SLACK STRAND WITH APPLIED PRESTRESS OF 4000 LBS. PER STRAND.

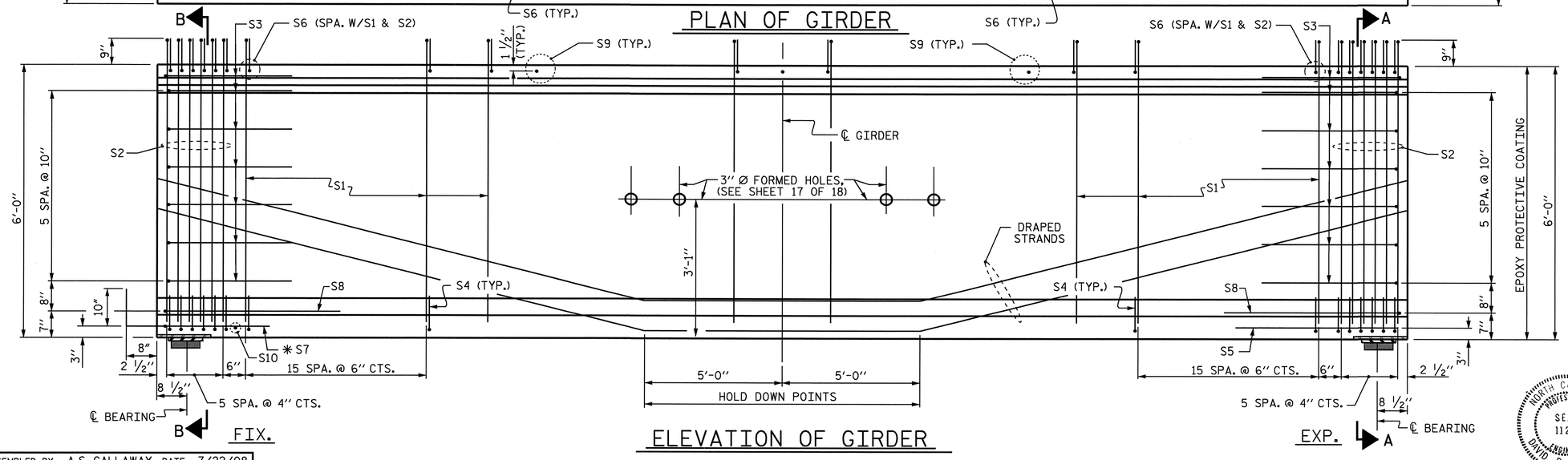
NOTE:
THE UPLIFT FORCE DUE TO DRAPED STRANDS IS 20.416 KIPS.

NOTE:
THE HEIGHT THAT THE S1 AND S2 BARS EXTEND ABOVE THE TOP OF GIRDER VARIES FROM 9" AT END OF GIRDER TO 6" AT GIRDER ℄.

0.6"Ø LOW RELAXATION STRAND LAYOUT



PLAN OF GIRDER



ELEVATION OF GIRDER

0.6" Ø L.R. GRADE 270 STRANDS		
AREA	ULTIMATE STRENGTH	APPLIED PRESTRESS
0.217 (SQ. INCHES)	58,600 (LBS. / STRAND)	43,950 (LBS. / STRAND)

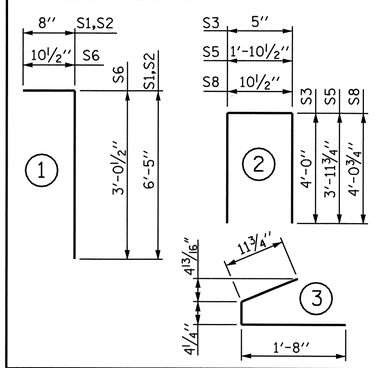
REINF. STEEL FOR ONE GIRDER

BAR	NUMBER	SIZE	TYPE	LENGTH	WEIGHT
S1	168	#4	1	7'-1"	795
S2	24	#5	1	7'-1"	177
S3	14	#4	2	8'-5"	79
S4	88	#4	3	3'-0"	176
S5	1	#5	2	9'-10"	10
S6	192	#5	1	3'-11"	784
* S7	10	#5	STR	3'-8"	38
S8	2	#5	2	9'-0"	19
S9	51	#5	STR	3'-3"	173
S10	1	#3	STR	1'-10"	1

* NOTE: S7 BARS SHALL BE BENT BEFORE SHIPMENT. HEAT BENDING SHALL NOT BE ALLOWED.

BAR TYPES

ALL BAR DIMENSIONS ARE OUT TO OUT.



QUANTITIES FOR ONE GIRDER

	REINF. STEEL	9000 PSI CONCRETE	0.6" Ø L.R. STRANDS
	LB.	C.Y.	NO.
	2252	26.1	40

GIRDERS REQUIRED

SPAN	NUMBER	LENGTH	TOTAL LENGTH
X	4	122'-0 1/4"	488'-1"

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 16 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (WITH 0.6" Ø PARTIALLY DEBONDED STRANDS)

SPAN X

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-53
1			3			TOTAL SHEETS
2			4			115

ASSEMBLED BY : A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : RWW 9/19/02	ADDED 9/19/02
CHECKED BY : GM 9/19/02	REV. 5/1/06 TLA/GM

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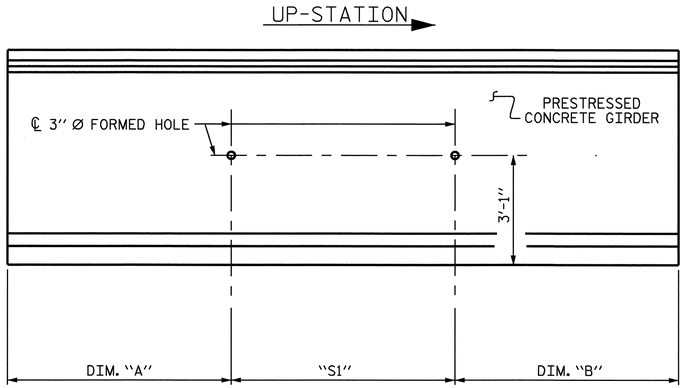
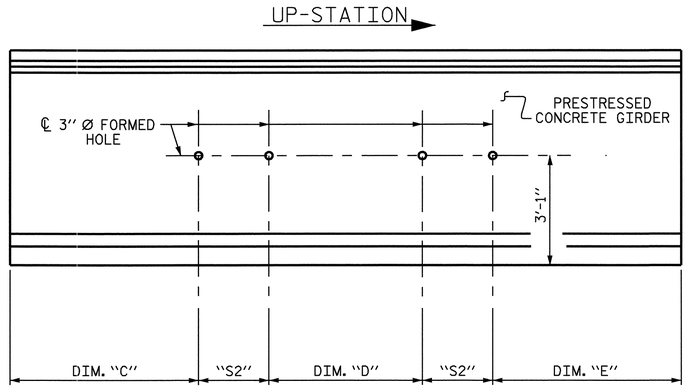
jtillman

STD. NO. PCGD10



ELEVATION
GIRDERS #1 & #4



ELEVATION
GIRDERS #2 & #3

TIE ROD PLACEMENT DETAILS

SPAN A							
GIRDER	DIM. "A"	"S1"	DIM. "B"	DIM. "C"	"S2"	DIM. "D"	DIM. "E"
#1	38'-6½''	35'-0''	36'-3''				
#2 & #3				36'-3''	2'-3½''	32'-8½''	36'-3''
#4	36'-3''	35'-0''	38'-6½''				
SPANS B, C, D & E							
#1	45'-1¼''	44'-0''	42'-9¾''				
#2 & #3				42'-9¾''	2'-3½''	41'-8½''	42'-9¾''
#4	42'-9¾''	44'-0''	45'-1¼''				
SPAN G							
#1	37'-2''	38'-0''	40'-3''				
#2 & #3				37'-2''	3'-1''	34'-11''	37'-2''
#4	40'-3''	38'-0''	37'-2''				
SPAN H							
#1	37'-0½''	38'-0''	40'-1½''				
#2 & #3				37'-0½''	3'-1''	34'-11''	37'-0½''
#4	40'-1½''	38'-0''	37'-0½''				
SPANS J & L							
#1	33'-5½''	40'-0''	41'-11½''				
#2 & #3				33'-5½''	8'-6''	31'-6''	33'-5½''
#4	41'-11½''	40'-0''	33'-5½''				
SPAN K							
#1	33'-4''	40'-0''	41'-10''				
#2 & #3				33'-4''	8'-6''	31'-6''	33'-4''
#4	41'-10''	40'-0''	33'-4''				

SPANS M, O, P, R & S							
GIRDER	DIM. "A"	"S1"	DIM. "B"	DIM. "C"	"S2"	DIM. "D"	DIM. "E"
#1	39'-8½''	44'-0''	48'-2½''				
#2 & #3				39'-8½''	8'-6''	35'-6''	39'-8½''
#4	48'-2½''	44'-0''	39'-8½''				
SPANS N & Q							
#1	39'-7''	44'-0''	48'-1''				
#2 & #3				39'-7''	8'-6''	35'-6''	39'-7''
#4	48'-1''	44'-0''	39'-7''				
SPANS T & W							
#1	38'-1''	40'-0''	46'-7''				
#2 & #3				38'-1''	8'-6''	31'-6''	38'-1''
#4	46'-7''	40'-0''	38'-1''				
SPANS U & V							
#1	38'-2½''	40'-0''	46'-8½''				
#2 & #3				38'-2½''	8'-6''	31'-6''	38'-2½''
#4	46'-8½''	40'-0''	38'-2½''				
SPAN X							
#1	36'-9⅛''	40'-0''	45'-3⅛''				
#2 & #3				36'-9⅛''	8'-6''	31'-6''	36'-9⅛''
#4	45'-3⅛''	40'-0''	36'-9⅛''				

NOTE: SPANS F & I TIE ROD LOCATIONS ARE SHOWN ON THE GIRDER SHEETS FOR THAT SPAN.

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 17 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/25/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-54
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 7/22/08
CHECKED BY : J.A. TILLMAN DATE : 8/19/08

24-NOV-2008 08:47
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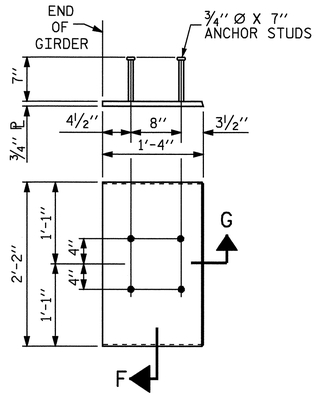
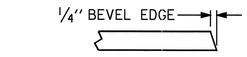
jtillman

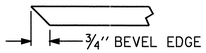


EMBEDDED PLATE "B-1" DETAILS
72" MODIFIED BULB TEE

(2 REQ'D PER GIRDER)



SECTION "G"



SECTION "F"

(SEE NOTES)

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

TIE ROD ASSEMBLY SHALL BE AASHTO M270 GRADE 36 STRUCTURAL STEEL.

ALL REINFORCING STEEL SHALL BE GRADE 60.

APPLY EPOXY PROTECTIVE COATING TO END OF GIRDER SURFACES INDICATED IN ELEVATION VIEW.

EMBEDDED PLATE "B-1" SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. BEVEL EDGES OF PLATE "B-1" TO GIVE CLOSE FIT BUT NOT TIGHT FIT TO STEEL CASTING FORM.

ANCHOR STUDS SHALL CONFORM TO AASHTO M169 GRADES 1010 THROUGH 1020 OR APPROVED EQUAL, AND SHALL MEET THE TYPE "B" REQUIREMENTS OF SUBSECTION 7.3 OF THE ANSI/AASHTO/AWS D1.5 BRIDGE WELDING CODE.

AT ENDS OF GIRDERS TO BE EMBEDDED IN CONCRETE DIAPHRAGMS OR END WALLS, PRESTRESSING STRANDS MAY EXTEND A MAXIMUM OF 2" BEYOND THE GIRDER ENDS. OTHERWISE, PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE GIRDER ENDS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE GIRDER SHALL BE DONE WHEN CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN (6700 PSI FOR SPANS A, F & I) (7200 PSI FOR SPANS B, C, D, E, M, N, O, P, Q, R & S) (6400 PSI FOR SPANS G, H, J, K & L) AND (6800 PSI FOR SPANS T, U, V, W & X).

DEPENDING ON THE TYPE OF SYSTEM USED TO SUPPORT THE DECK SLAB FORMS, PRESET ANCHORS MAY BE NECESSARY IN THE PRESTRESSED CONCRETE GIRDER.

THE TOP SURFACE OF THE GIRDER, EXCLUDING THE OUTSIDE 4", SHALL BE RAKED TO A DEPTH OF ¼".

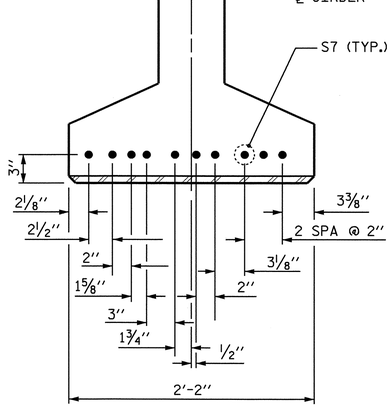
WHEN DRAPED STRANDS ARE DETAILED, THE LONGITUDINAL LOCATION OF THE HOLD DOWN DEVICES SHALL BE WITHIN 6" OF THE LOCATION SHOWN AND THE CENTER OF GRAVITY OF THE GROUP OF DRAPED STRANDS SHALL BE LOCATED WITHIN ½" OF THE THEORETICAL LOCATION SHOWN.

A 2" × 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE.

THE CONTRACTOR HAS THE OPTION TO PROVIDE, AT NO ADDITIONAL COST TO THE DEPARTMENT, 2 ADDITIONAL STRANDS AT THE TOP OF THE GIRDER TO FACILITATE TYING OF THE REINFORCING STEEL. THESE STRANDS SHALL BE PULLED TO A LOAD OF 4000 lbs.

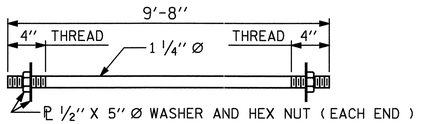
FOR CRACK REPAIR OF PRESTRESSED CONCRETE GIRDERS, SEE SPECIAL PROVISIONS.

TEMPORARY STRUTS SHALL BE PLACED BETWEEN PRESTRESSED GIRDERS ADJACENT TO DIAPHRAGMS AND THE NUTS ON THE 1¼" Ø TIE RODS SHALL BE FULLY TIGHTENED BEFORE DIAPHRAGMS ARE CAST. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED. THE TIE RODS SHALL BE RE-TIGHTENED AFTER THE STRUTS HAVE BEEN REMOVED.



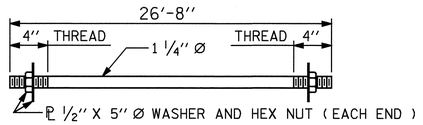
DETAIL "C"

(72" MODIFIED BULB TEE)



1¼" Ø TIE ROD ASSEMBLY

(TR1 - 135 COMPLETE ASSEMBLIES REQUIRED)



1¼" Ø TIE ROD ASSEMBLY

(TR2 - 2 COMPLETE ASSEMBLIES REQUIRED)

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 18 OF 18

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON

10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-55
1			3			TOTAL SHEETS
2			4			115

STD. NO. PCG11

ASSEMBLED BY A.S. CALLAWAY	DATE : 7/22/08
CHECKED BY : J.A. TILLMAN	DATE : 8/19/08
DRAWN BY : ELR 11/91	REV. 10/17/00 RWW/LES
CHECKED BY : GRP 11/91	REV. 7/10/01RR LES/RDR
	REV. 5/1/06 TLA/GM

12-SEP-2008 08:03
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scallaway

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN A

GIRDER 1

0.6" LOW RELAXATION											
TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.114	0.217	0.297	0.347	0.365	0.347	0.297	0.217	0.114	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.041	0.078	0.107	0.125	0.132	0.125	0.107	0.078	0.041	0
FINAL CAMBER ↑	0	7/8"	1 5/8"	2 1/4"	2 11/16"	2 13/16"	2 11/16"	2 1/4"	1 5/8"	7/8"	0

GIRDERS 2 & 3

0.6" LOW RELAXATION											
TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.114	0.217	0.297	0.347	0.365	0.347	0.297	0.217	0.114	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.039	0.075	0.102	0.120	0.126	0.120	0.102	0.075	0.039	0
FINAL CAMBER ↑	0	7/8"	1 11/16"	2 5/16"	2 3/4"	2 7/8"	2 3/4"	2 5/16"	1 11/16"	7/8"	0

GIRDER 4

0.6" LOW RELAXATION											
TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.114	0.217	0.297	0.347	0.365	0.347	0.297	0.217	0.114	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.041	0.078	0.107	0.125	0.131	0.125	0.107	0.078	0.041	0
FINAL CAMBER ↑	0	7/8"	1 5/8"	2 1/4"	2 11/16"	2 13/16"	2 11/16"	2 1/4"	1 5/8"	7/8"	0

SPANS B, C, D, E, M, N, O. P, Q, R & S

GIRDER 1

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.182	0.344	0.470	0.551	0.578	0.551	0.470	0.344	0.182	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.076	0.143	0.196	0.230	0.241	0.230	0.196	0.143	0.076	0
FINAL CAMBER ↑	0	1 1/4"	2 3/8"	3 5/16"	3 7/8"	4 1/16"	3 7/8"	3 5/16"	2 3/8"	1 1/4"	0

GIRDERS 2 & 3

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.182	0.344	0.470	0.551	0.578	0.551	0.470	0.344	0.182	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.072	0.136	0.186	0.217	0.228	0.217	0.186	0.136	0.072	0
FINAL CAMBER ↑	0	1 5/16"	2 1/2"	3 7/16"	4"	4 3/16"	4"	3 7/16"	2 1/2"	1 5/16"	0

GIRDER 4

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.182	0.344	0.470	0.551	0.578	0.551	0.470	0.344	0.182	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.076	0.144	0.197	0.231	0.242	0.231	0.197	0.144	0.076	0
FINAL CAMBER ↑	0	1 1/4"	2 3/8"	3 5/16"	3 7/8"	4 1/16"	3 7/8"	3 5/16"	2 3/8"	1 1/4"	0

SPAN F

GIRDER 1

0.6" LOW RELAXATION											
TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.114	0.216	0.295	0.346	0.363	0.346	0.295	0.216	0.114	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.041	0.077	0.105	0.123	0.130	0.123	0.105	0.077	0.041	0
FINAL CAMBER ↑	0	7/8"	1 11/16"	2 1/4"	2 11/16"	2 13/16"	2 11/16"	2 1/4"	1 11/16"	7/8"	0

GIRDER 2

0.6" LOW RELAXATION											
TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.108	0.205	0.280	0.328	0.345	0.328	0.280	0.205	0.108	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.032	0.060	0.082	0.096	0.101	0.096	0.082	0.060	0.032	0
FINAL CAMBER ↑	0	15/16"	1 3/4"	2 3/8"	2 13/16"	2 15/16"	2 13/16"	2 3/8"	1 3/4"	15/16"	0

GIRDER 3

0.6" LOW RELAXATION											
TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.101	0.192	0.263	0.308	0.323	0.308	0.263	0.192	0.101	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.026	0.048	0.066	0.078	0.082	0.078	0.066	0.048	0.026	0
FINAL CAMBER ↑	0	15/16"	1 11/16"	2 3/8"	2 3/4"	2 7/8"	2 3/4"	2 3/8"	1 11/16"	15/16"	0

GIRDER 4

0.6" LOW RELAXATION											
TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.094	0.178	0.244	0.286	0.300	0.286	0.244	0.178	0.094	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.021	0.040	0.055	0.065	0.068	0.065	0.055	0.040	0.021	0
FINAL CAMBER ↑	0	7/8"	1 11/16"	2 1/4"	2 5/8"	2 13/16"	2 5/8"	2 1/4"	1 11/16"	7/8"	0

SPANS G, H, J, K & L

GIRDER 1

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.119	0.225	0.308	0.361	0.379	0.361	0.308	0.225	0.119	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.053	0.101	0.138	0.162	0.170	0.162	0.138	0.101	0.053	0
FINAL CAMBER ↑	0	3/4"	1 1/2"	2"	2 3/8"	2 1/2"	2 3/8"	2"	1 1/2"	3/4"	0

GIRDERS 2 & 3

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.119	0.225	0.308	0.361	0.379	0.361	0.308	0.225	0.119	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.051	0.096	0.132	0.155	0.162	0.155	0.132	0.096	0.051	0
FINAL CAMBER ↑	0	13/16"	1 9/16"	2 1/8"	2 1/2"	2 9/16"	2 1/2"	2 1/8"	1 9/16"	13/16"	0

GIRDER 4

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.119	0.225	0.308	0.361	0.379	0.361	0.308	0.225	0.119	0
✳DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.053	0.101	0.138	0.162	0.170	0.162	0.138	0.101	0.053	0
FINAL CAMBER ↑	0	3/4"	1 1/2"	2"	2 3/8"	2 1/2"	2 3/8"	2"	1 1/2"	3/4"	0

✳INCLUDES FUTURE WEARING SURFACE

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION TABLES

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON

10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-56
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/5/08
CHECKED BY : S. WANCE DATE : 9/8/08

17-SEP-2008 09:32
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DEAD LOAD DEFLECTION TABLE FOR GIRDERS

SPAN I

0.6" LOW RELAXATION — GIRDER 1

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.107	0.203	0.278	0.326	0.342	0.326	0.278	0.203	0.107	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.032	0.061	0.084	0.098	0.103	0.098	0.084	0.061	0.032	0
FINAL CAMBER ↑	0	7/8"	1 11/16"	2 5/16"	2 3/4"	2 7/8"	2 3/4"	2 5/16"	1 11/16"	7/8"	0

0.6" LOW RELAXATION — GIRDER 2

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.101	0.190	0.261	0.305	0.320	0.305	0.261	0.190	0.101	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.025	0.047	0.065	0.076	0.079	0.076	0.065	0.047	0.025	0
FINAL CAMBER ↑	0	15/16"	1 11/16"	2 3/8"	2 3/4"	2 7/8"	2 3/4"	2 3/8"	1 11/16"	15/16"	0

0.6" LOW RELAXATION — GIRDER 3

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.093	0.176	0.242	0.283	0.297	0.283	0.242	0.176	0.093	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.020	0.038	0.051	0.060	0.063	0.060	0.051	0.038	0.020	0
FINAL CAMBER ↑	0	7/8"	1 11/16"	2 1/4"	2 11/16"	2 13/16"	2 11/16"	2 1/4"	1 11/16"	7/8"	0

0.6" LOW RELAXATION — GIRDER 4

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.086	0.162	0.222	0.260	0.273	0.260	0.222	0.162	0.086	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.016	0.031	0.042	0.049	0.052	0.049	0.042	0.031	0.016	0
FINAL CAMBER ↑	0	13/16"	1 9/16"	2 3/16"	2 1/2"	2 5/8"	2 1/2"	2 3/16"	1 9/16"	13/16"	0

SPANS T, U, V & W

0.6" LOW RELAXATION — GIRDER 1

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.157	0.297	0.407	0.477	0.501	0.477	0.407	0.297	0.157	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.065	0.123	0.168	0.197	0.207	0.197	0.168	0.123	0.065	0
FINAL CAMBER ↑	0	1 1/8"	2 1/8"	2 7/8"	3 3/8"	3 1/2"	3 3/8"	2 7/8"	2 1/8"	1 1/8"	0

0.6" LOW RELAXATION — GIRDERS 2 & 3

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.157	0.297	0.407	0.477	0.501	0.477	0.407	0.297	0.157	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.064	0.120	0.165	0.193	0.202	0.193	0.165	0.120	0.064	0
FINAL CAMBER ↑	0	1 1/8"	2 1/8"	2 15/16"	3 3/8"	3 9/16"	3 3/8"	2 15/16"	2 1/8"	1 1/8"	0

0.6" LOW RELAXATION — GIRDER 4

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.157	0.297	0.407	0.477	0.501	0.477	0.407	0.297	0.157	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.065	0.123	0.169	0.198	0.207	0.198	0.169	0.123	0.065	0
FINAL CAMBER ↑	0	1 1/8"	2 1/16"	2 7/8"	3 3/8"	3 1/2"	3 3/8"	2 7/8"	2 1/16"	1 1/8"	0

SPAN X

0.6" LOW RELAXATION — GIRDER 1

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.154	0.291	0.399	0.467	0.491	0.467	0.399	0.291	0.154	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.059	0.111	0.152	0.178	0.187	0.178	0.152	0.111	0.059	0
FINAL CAMBER ↑	0	1 1/8"	2 3/16"	2 15/16"	3 7/16"	3 5/8"	3 7/16"	2 15/16"	2 3/16"	1 1/8"	0

0.6" LOW RELAXATION — GIRDERS 2 & 3

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.154	0.291	0.399	0.467	0.491	0.467	0.399	0.291	0.154	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.057	0.109	0.149	0.174	0.183	0.174	0.149	0.109	0.057	0
FINAL CAMBER ↑	0	1 3/16"	2 3/16"	3"	3 1/2"	3 11/16"	3 1/2"	3"	2 3/16"	1 3/16"	0

0.6" LOW RELAXATION — GIRDER 4

TENTH POINTS	BRG.	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	BRG.
CAMBER (GIRDER ALONE IN PLACE) ↑	0	0.154	0.291	0.399	0.467	0.491	0.467	0.399	0.291	0.154	0
✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓	0	0.059	0.111	0.152	0.178	0.187	0.178	0.152	0.111	0.059	0
FINAL CAMBER ↑	0	1 1/8"	2 3/16"	2 15/16"	3 7/16"	3 5/8"	3 7/16"	2 15/16"	2 3/16"	1 1/8"	0

✳ INCLUDES FUTURE WEARING SURFACE

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT " FINAL CAMBER ", WHICH IS GIVEN IN INCHES (FRACTION FORM).

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON

10/27/08

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION TABLES

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-57
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/5/08

CHECKED BY : S. WANCE DATE : 9/8/08

17-SEP-2008 07:56
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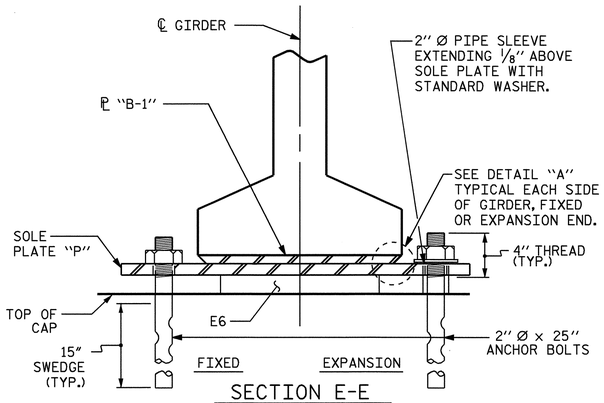
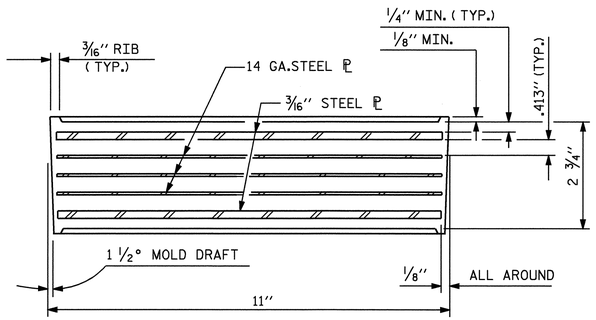
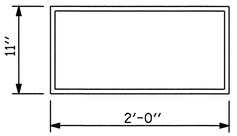


SECTION E-E



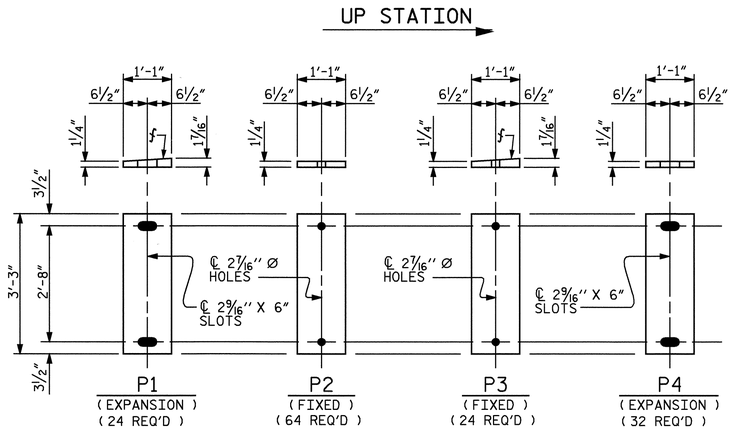
TYPICAL SECTION OF ELASTOMERIC BEARINGS

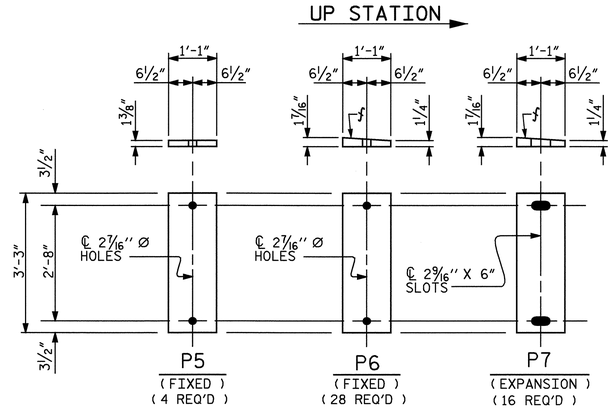


E6 (192 REQ'D)

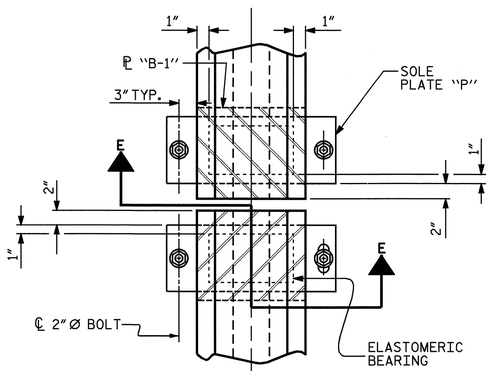
PLAN VIEW OF ELASTOMERIC BEARING

TYPE VII





SOLE PLATE DETAILS ("P")



TYPICAL HALF-PLAN (SHOWING CONTINUOUS BENT)

TYPICAL HALF-PLAN (SHOWING SIMPLE SPAN BENT)

NOTES

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

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

STEEL SOLE PLATES, ANCHOR BOLTS, NUTS, AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

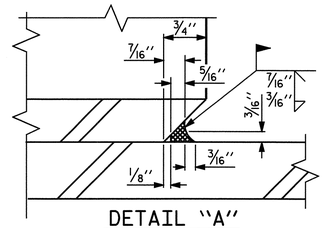
PRIOR TO WELDING, GRIND THE GALVANIZED SURFACE OF THE PORTION OF THE EMBEDDED PLATE AND SOLE PLATE THAT ARE TO BE WELDED. AFTER WELDING, DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

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

SOLE PLATE "P", BOLTS, NUTS, WASHERS, AND PIPE SLEEVE SHALL BE INCLUDED IN THE PAY ITEM FOR PRESTRESSED CONCRETE GIRDERS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.



DETAIL "A"

— LOAD RATINGS —	
	MAX.D.L.+ L.L.
TYPE VII	264 K

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-58
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : N. Q. TRAN	DATE : 08/15/08	
CHECKED BY : A. S. CALLAWAY	DATE : 08-21-08	
DRAWN BY : EEM 2/97	REV. 8/16/99	RWW/LES
CHECKED BY : VAP 2/97	REV. 10/17/00	RWW/LES
	REV. 5/1/06	TLA/GM

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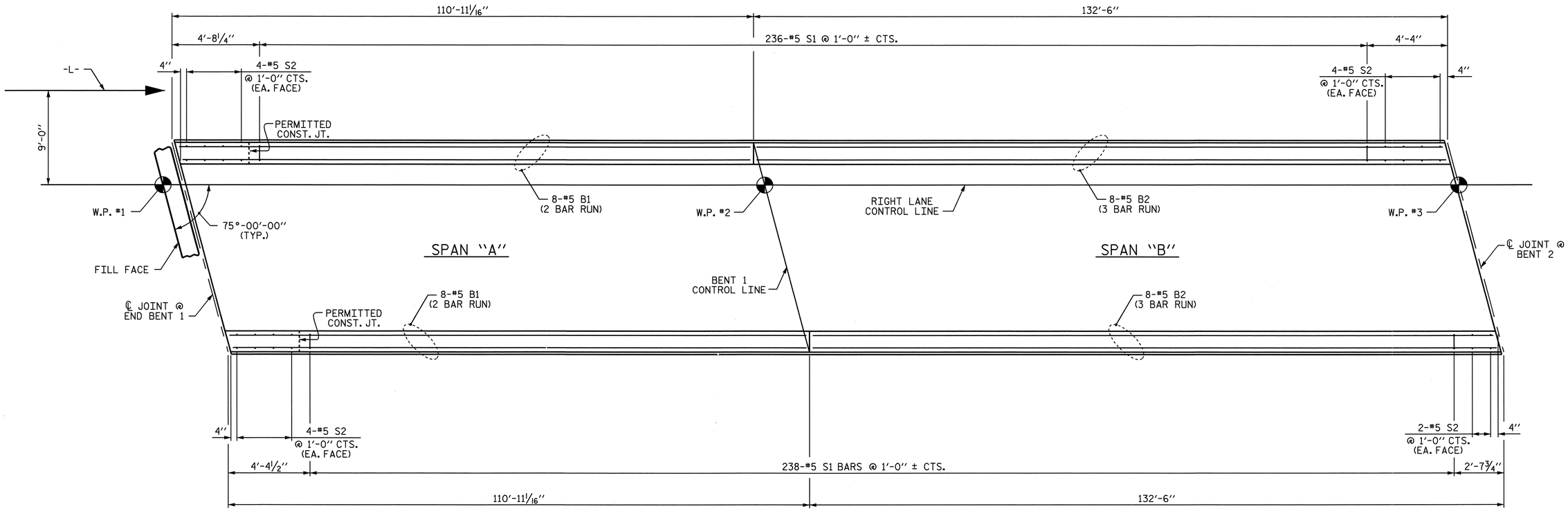
ntran

STD. NO. EB4



PLAN OF PARAPET SPANS A & B

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

1'-2" X 2'-6"
CONCRETE PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-59
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/11/08
CHECKED BY : J.A. TILLMAN DATE : 8/21/08

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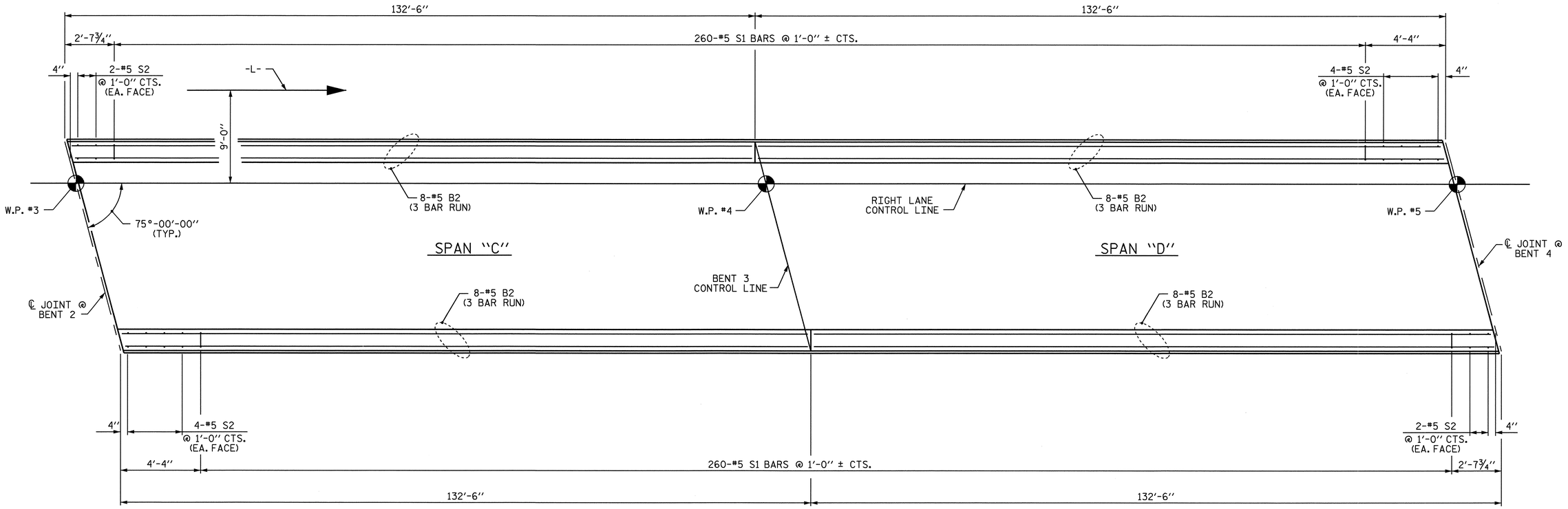

PLAN OF PARAPET SPANS C & D

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

1'-2" X 2'-6"
CONCRETE PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-60
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/11/08
CHECKED BY : J.A. TILLMAN DATE : 8/21/08

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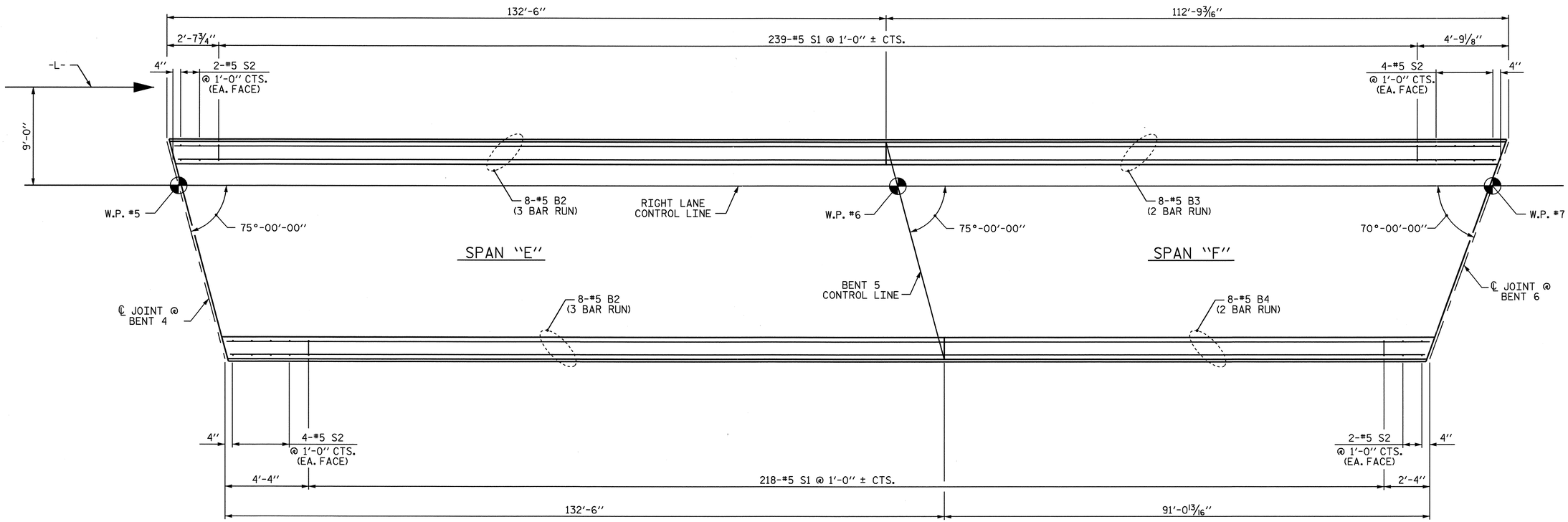

PLAN OF PARAPET SPANS E & F

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 3 OF 9

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON

10/27/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

1'-2" X 2'-6"
CONCRETE PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-61
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/11/08
CHECKED BY : J.A. TILLMAN DATE : 8/21/08

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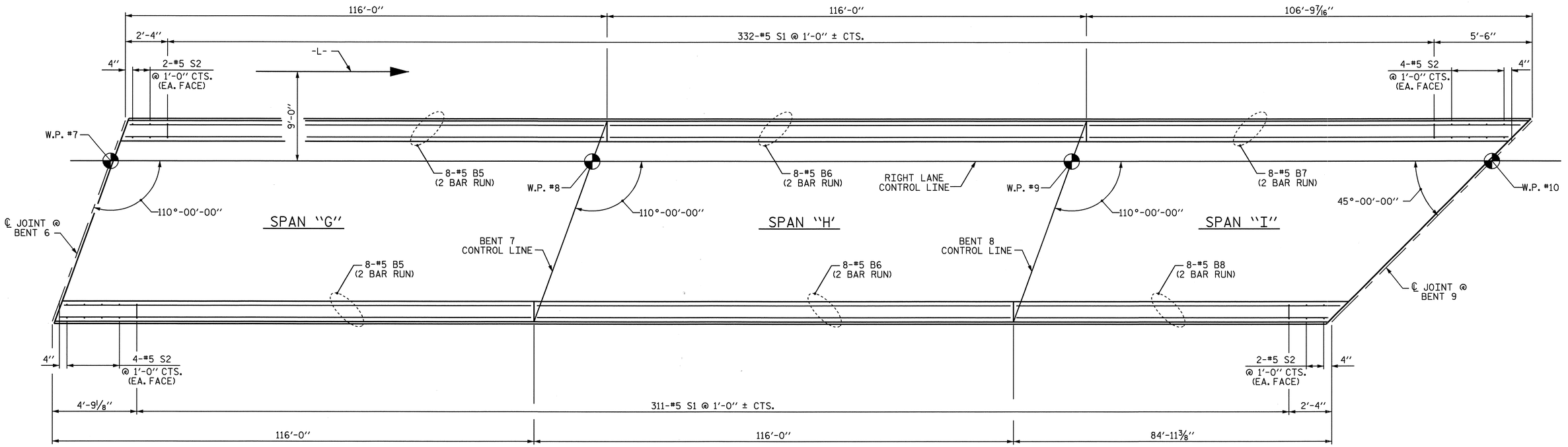

PLAN OF PARAPET SPANS G, H & I

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 4 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

1'-2" X 2'-6"
CONCRETE PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-62
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/11/08
CHECKED BY : J.A. TILLMAN DATE : 8/21/08

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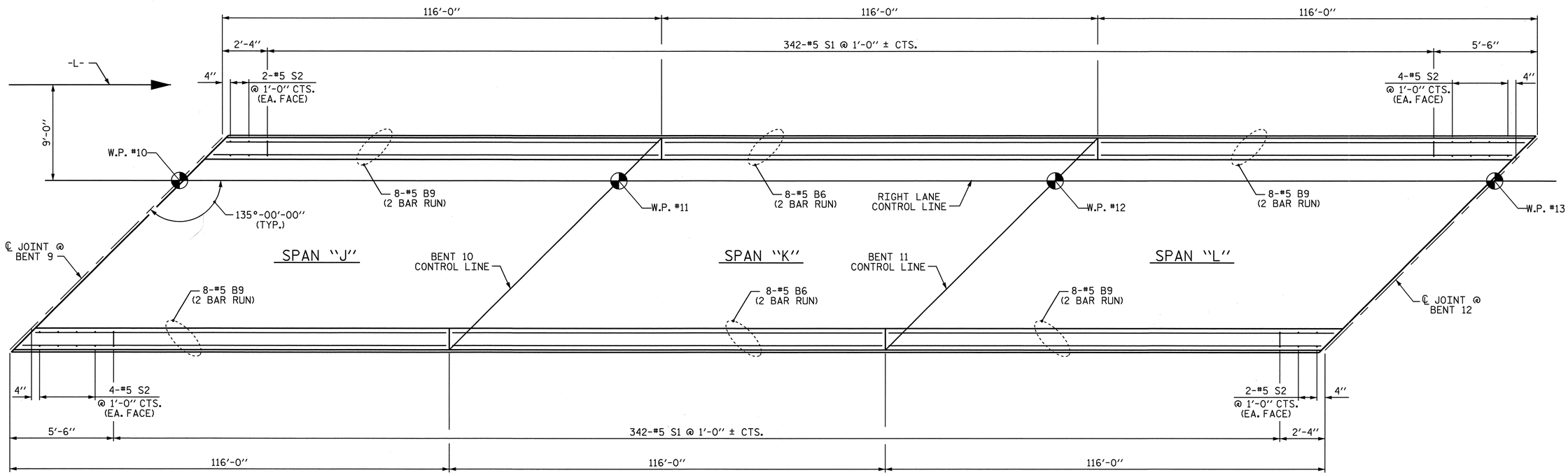

PLAN OF PARAPET SPANS J, K & L

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 5 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

1'-2" X 2'-6"
CONCRETE PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON

10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-63
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/11/08
CHECKED BY : J.A. TILLMAN DATE : 8/21/08

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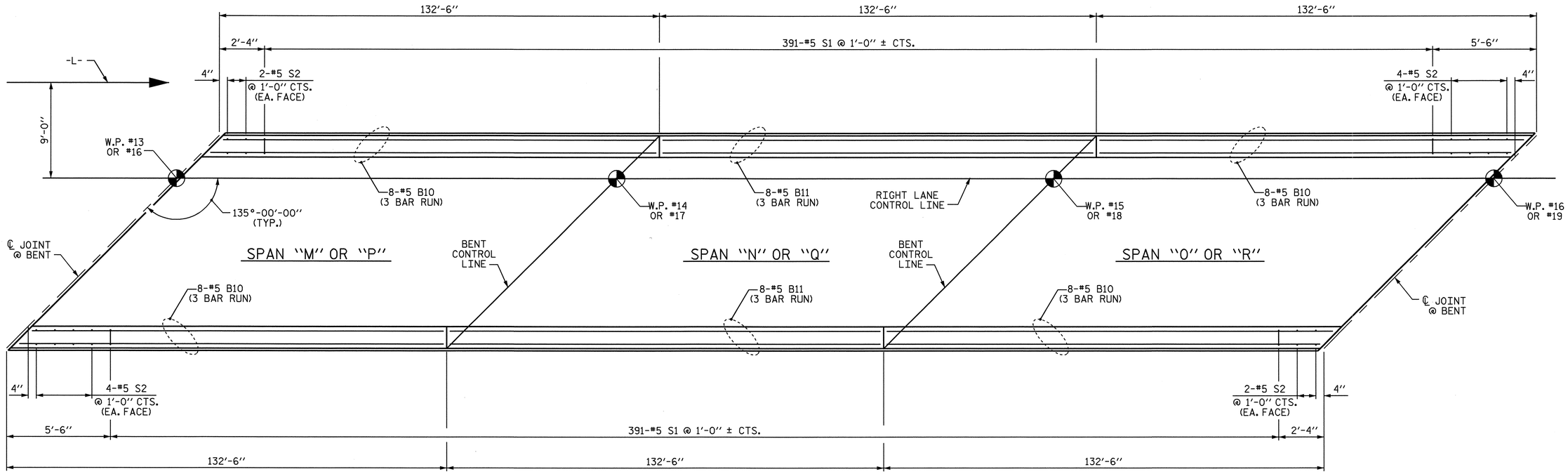

PLAN OF PARAPET SPANS M, N, O, P, Q & R

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 6 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

1'-2" X 2'-6"
CONCRETE PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-64
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/11/08
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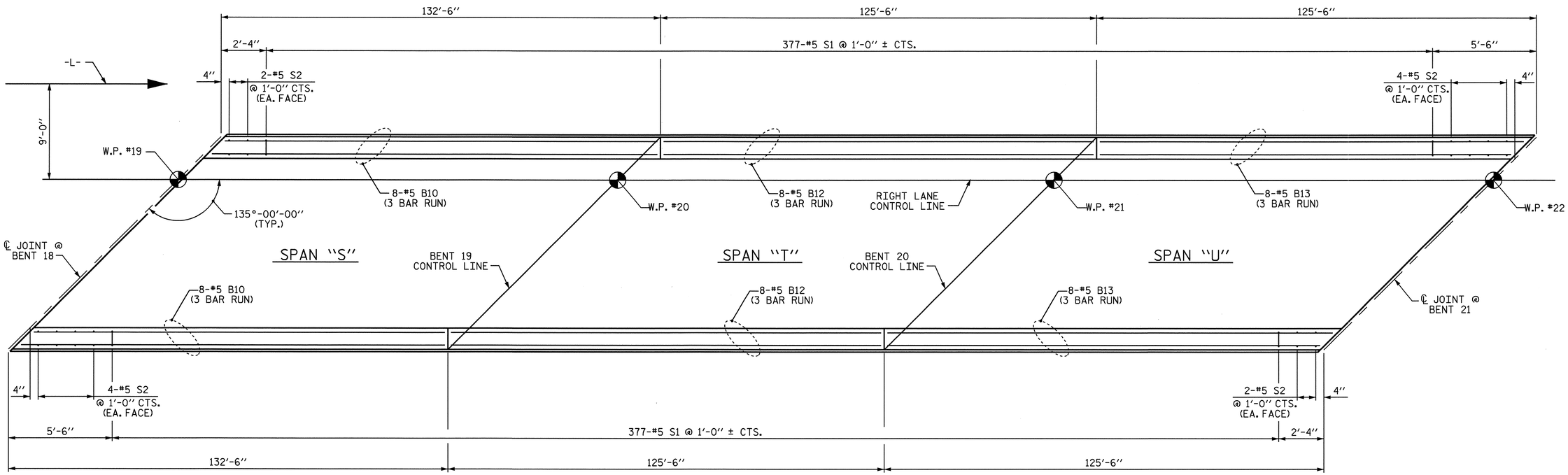

PLAN OF PARAPET SPANS S, T & U

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 7 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

1'-2" X 2'-6"
CONCRETE PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON

10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-65
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/11/08
CHECKED BY : J.A. TILLMAN DATE : 8/21/08

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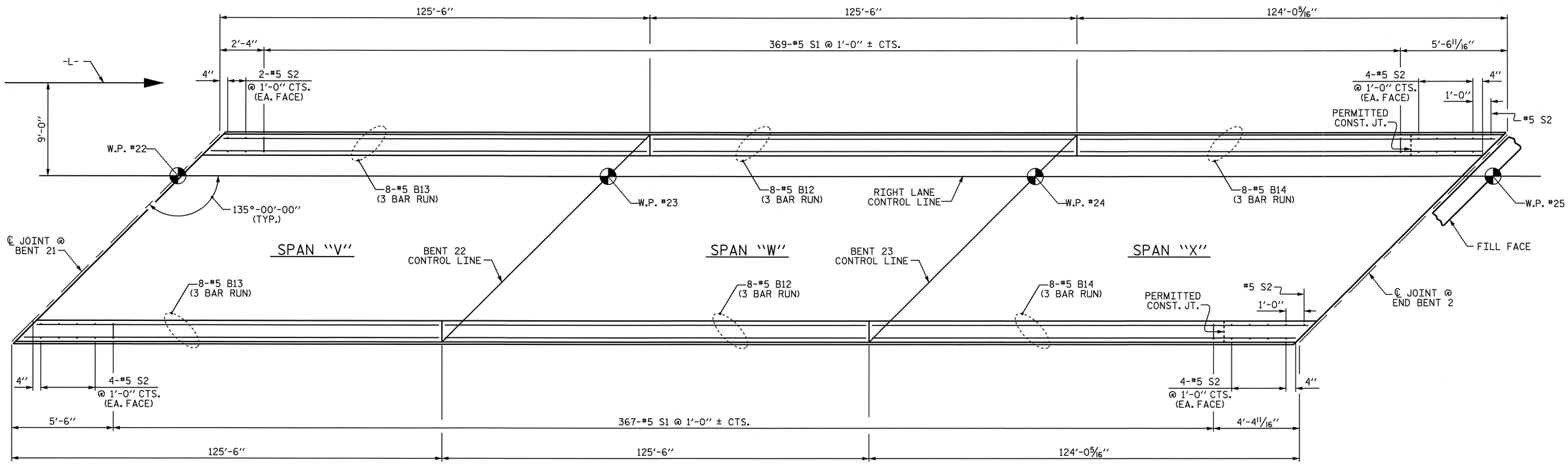

PLAN OF PARAPET SPANS V, W & X

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 8 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

1'-2" X 2'-6"
CONCRETE PARAPET

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON

10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-66
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/11/08
CHECKED BY : J.A. TILLMAN DATE : 8/21/08

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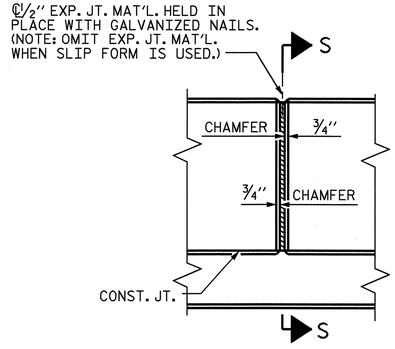
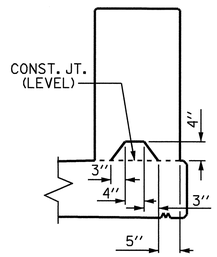


ELEVATION AT EXPANSION JOINTS



SECTION S-S

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

NOTES

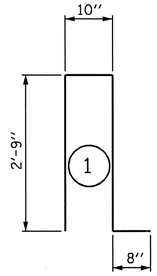
THE CONCRETE PARAPET IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

EVAZOTE JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF THE CONCRETE PARAPET.

ALL REINFORCING STEEL IN CONCRETE PARAPET SHALL BE EPOXY COATED.

THE #5 S2 BARS SHALL BE INSTALLED USING AN ADHESIVE ANCHORING SYSTEM AFTER SAWING THE JOINT. LEVEL TWO FIELD TESTING IS REQUIRED, AND THE YIELD LOAD FOR THE #5 S2 BAR IS 18.6 KIPS.

BAR TYPE



ALL BAR DIMEMSIONS ARE OUT TO OUT.

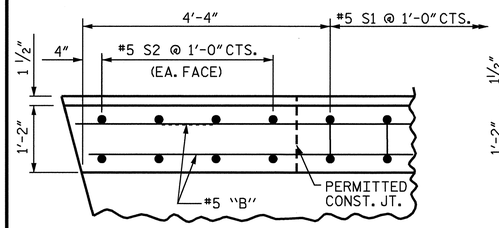
BILL OF MATERIAL

PARAPET & FOUR END POSTS

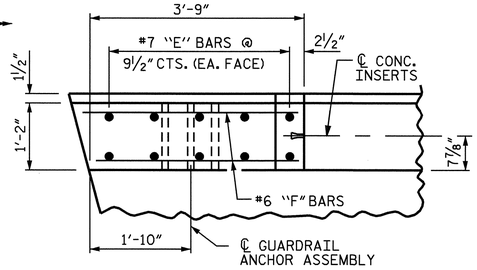
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳B1	32	#5	STR	57'-1"	1905
✳B2	192	#5	STR	46'-5"	9295
✳B3	16	#5	STR	57'-10"	965
✳B4	16	#5	STR	47'-2"	787
✳B5	32	#5	STR	59'-8"	1991
✳B6	64	#5	STR	59'-6"	3972
✳B7	16	#5	STR	54'-9"	914
✳B8	16	#5	STR	44'-4"	740
✳B9	64	#5	STR	59'-11"	4000
✳B10	240	#5	STR	46'-7"	11661
✳B11	96	#5	STR	46'-4"	4639
✳B12	96	#5	STR	44'-0"	4406
✳B13	96	#5	STR	44'-3"	4431
✳B14	48	#5	STR	43'-9"	2190
✳E1	4	#7	STR	2'-7"	21
✳E2	4	#7	STR	3'-1"	25
✳E3	4	#7	STR	3'-6"	29
✳E4	4	#7	STR	4'-0"	33
✳E5	8	#7	STR	4'-4"	71
✳E6	4	#7	STR	2'-11"	24
✳E7	4	#7	STR	3'-4"	27
✳E8	4	#7	STR	3'-8"	30
✳E9	4	#7	STR	4'-1"	33
✳F1	4	#6	STR	2'-0"	12
✳F2	2	#6	STR	3'-8"	11
✳F3	2	#6	STR	3'-11"	12
✳F4	2	#6	STR	3'-3"	10
✳F5	2	#6	STR	3'-9"	11
✳F6	4	#6	STR	2'-5"	15
✳F7	2	#6	STR	4'-3"	13
✳F8	2	#6	STR	4'-6"	14
✳F9	2	#6	STR	3'-6"	11
✳F10	2	#6	STR	3'-8"	11
✳S1	5832	#5	1	7'-0"	42579
✳S2	224	#5	STR	3'-0"	701

✳EPOXY COATED REINFORCING STEEL	LBS. 95589
1'-2" X 2'-6" CONCRETE PARAPET	LIN. FT. 5944.5
CLASS AA CONCRETE	CU. YDS. 643.2

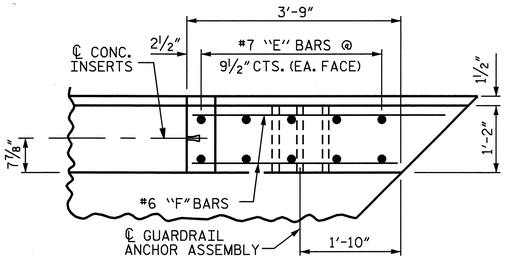
PARAPET DETAILS



PLAN OF PARAPET



PLAN OF END POST



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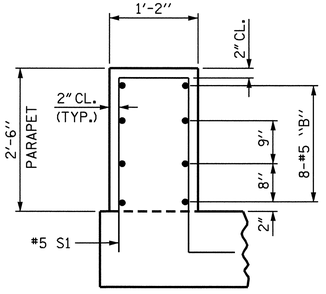
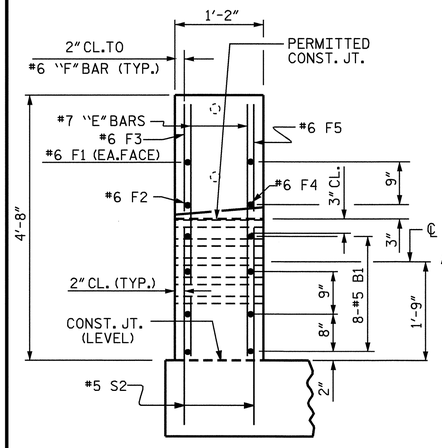
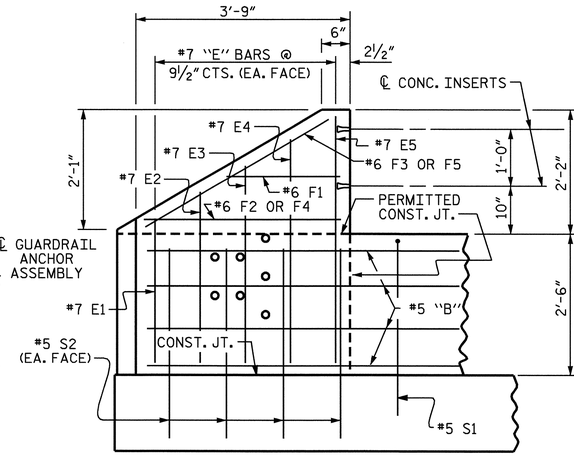


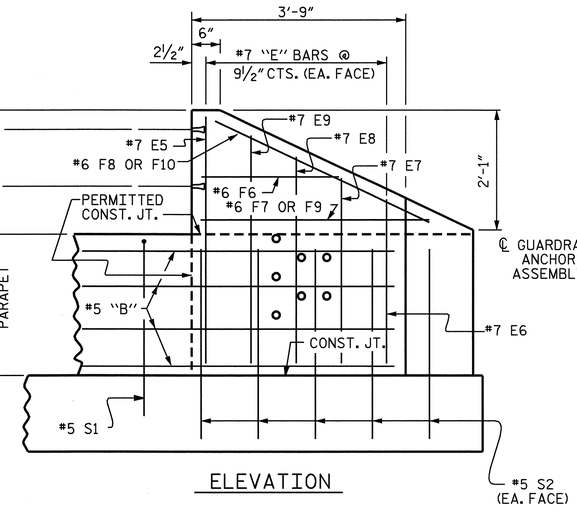
SECTION THRU PARAPET



END VIEW



ELEVATION



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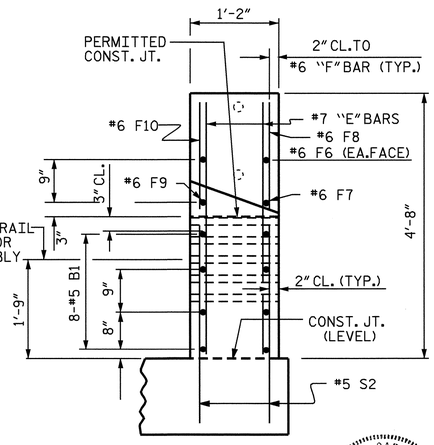

END VIEW

PARAPET AND END POST FOR TWO BAR RAIL

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 9 OF 9

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
1'-2" X 2'-6" CONCRETE PARAPET

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-67
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11259 DAVID R. ANDERSON
10/27/08

DRAWN BY : A.S. CALLAWAY DATE : 8/11/08
CHECKED BY : J.A. TILLMAN DATE : 8/28/08

12-SEP-2008 07:30
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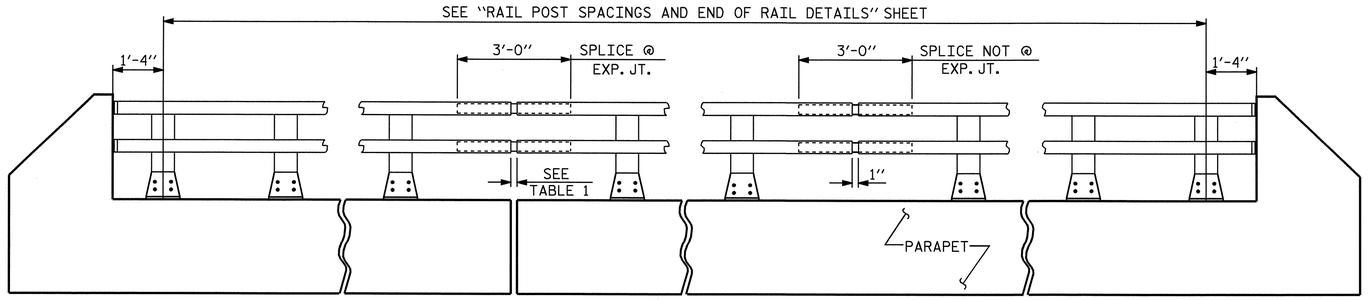
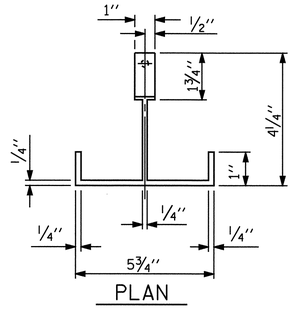


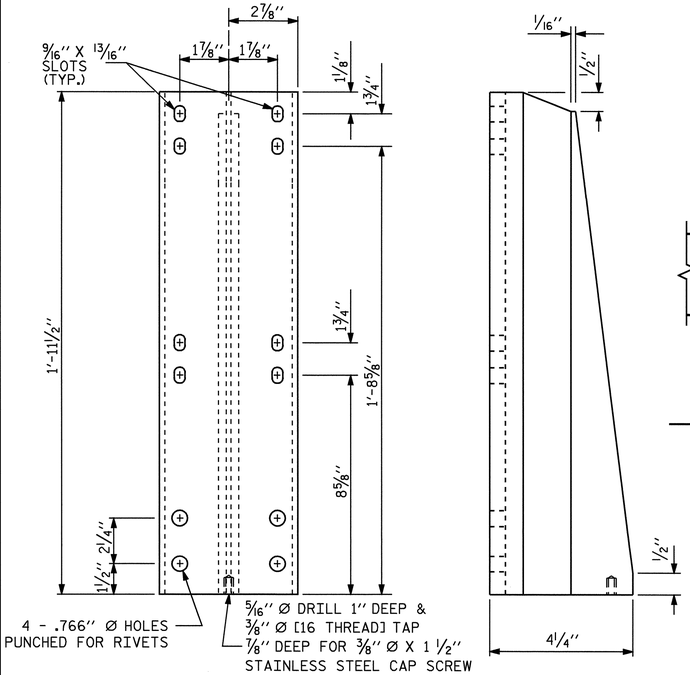
ELEVATION

NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.

TABLE 1	
℄ EXP. JT. @	RAIL OPENING
BENT No. 2	1 9/16"
BENT No. 4	1 1/2"
BENT No. 6	1 11/16"
BENT No. 9	1 1/2"
BENT No. 12	1 11/16"
BENT No. 15	1 11/16"
BENT No. 18	1 11/16"
BENT No. 21	1 11/16"

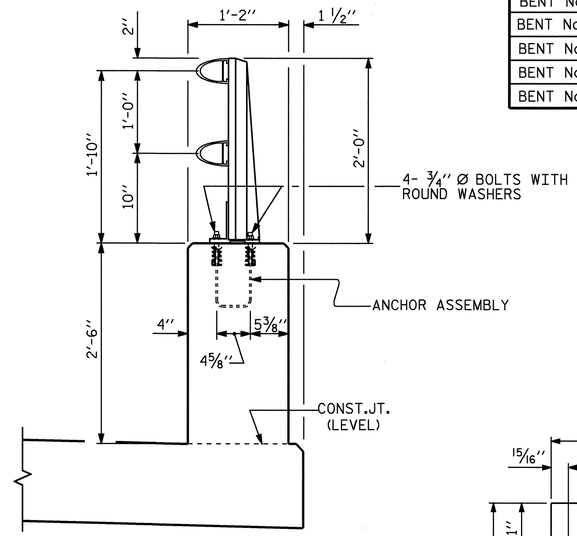


PLAN

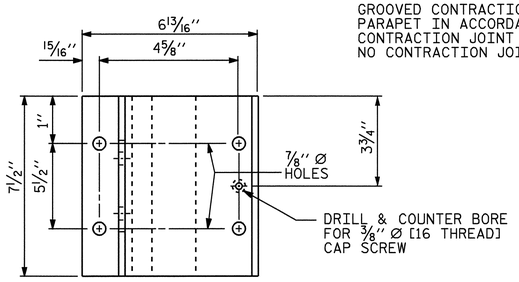


FRONT ELEVATION — SIDE ELEVATION

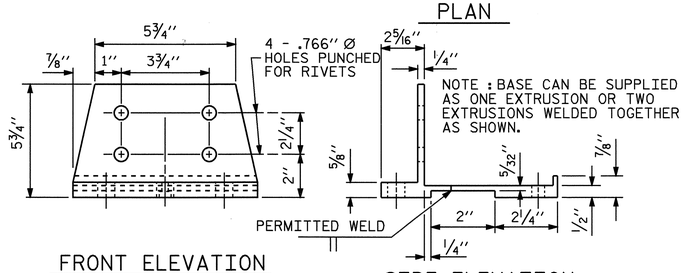
DETAILS OF POST



SECTION THRU PARAPET AND RAIL

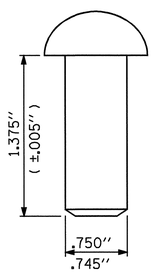


PLAN



FRONT ELEVATION — SIDE ELEVATION

POST BASE DETAILS



RIVET DETAIL

NOTES

AT THE CONTRACTOR'S OPTION, METAL RAIL MAY BE EITHER ALUMINUM OR GALVANIZED STEEL IN ACCORDANCE WITH THE REQUIREMENTS OF THE GENERAL NOTES AND THE FOLLOWING SPECIFICATIONS FOR THE ALTERNATE MATERIALS; HOWEVER, THE CONTRACTOR WILL BE REQUIRED TO USE THE SAME RAIL MATERIAL ON ALL STRUCTURES ON THE PROJECT FOR WHICH METAL RAIL IS DESIGNATED.

ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6.

MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

THE BASE OF RAIL POSTS, OR ANY OTHER ALUMINUM SURFACE IN CONTACT WITH CONCRETE SHALL BE THOROUGHLY COATED WITH AN ALUMINUM IMPREGNATED CAULKING COMPOUND OF APPROVED QUALITY.

MATERIAL FOR SHIMS TO BE ASTM B209 ALLOY 6061-T6.

GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

POST, POST BASES, RAILS, EXPANSION BARS AND CLAMP BARS: AASHTO M270 GRADE 36 STRUCTURAL STEEL - GALVANIZED TO AASHTO M111.

RIVETS: RIVETS SHALL MEET THE REQUIREMENTS OF ASTM A502 FOR GRADE 1 RIVETS.

THE CUT ENDS OF GALVANIZED STEEL RAILING, AFTER GRINDING SMOOTH SHALL BE GIVEN TWO COATS OF ZINC RICH PAINT MEETING THE REQUIREMENTS OF FEDERAL SPECIFICATION MIL-P-26915 USAF TYPE 1, OR OF FEDERAL SPECIFICATIONS TT-P-641.

SHIMS: SHIMS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

RAIL CAPS: RAIL CAPS SHALL MEET THE REQUIREMENTS OF ASTM A570 FOR GRADE 33 OR A611 FOR GRADE C AND SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M111.

GENERAL NOTES

RAILING SHALL BE CONTINUOUS FROM END POST TO END POST OF BRIDGE. EACH JOINT IN RAIL LENGTH SHALL BE SPLICED AS DETAILED. PANEL LENGTHS OF RAIL SHALL BE ATTACHED TO A MINIMUM OF THREE POSTS.

FOR END OF RAIL TO CLEAR FACE OF CONCRETE END POST DIMENSION, SEE STANDARD NO. BMR2.

CAP SCREWS SHALL BE ASTM F593 ALLOY 305 STAINLESS STEEL. WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY SHALL BE MADE FROM ALLOY 304 STAINLESS STEEL.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAILS AND POSTS. SHOP INSPECTION IS NOT REQUIRED.

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

METHOD OF MEASUREMENT FOR METAL RAILS: FOR LENGTH OF METAL RAILS TO BE PAID FOR, SEE THE STANDARD SPECIFICATIONS.

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

TO INSURE FUTURE IDENTIFICATION OF THE FABRICATOR, A PERMANENT IDENTIFYING MARK SHALL BE PLACED ON EACH POST. THE METHOD OF MARKING AND LOCATION SHALL BE SUCH THAT IT DOES NOT DETRACT FROM THE APPEARANCE OF THE POST, BUT REMAINS VISIBLE AFTER RAIL PLACEMENT.

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

ALLOY 6351-T5 MAY BE SUBSTITUTED FOR ALLOY 6061-T6 WHERE APPLICABLE.

MINOR VARIATIONS IN DETAILS OF METAL RAIL WILL BE CONSIDERED. DETAILS OF SUCH VARIATIONS, IF DESIRED, SHALL BE SUBMITTED FOR APPROVAL.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT A SPACING OF 8FT. TO 10FT. BETWEEN EXPANSION JOINTS. NO CONTRACTION JOINTS WILL BE REQUIRED FOR SEGMENTS LESS THAN 10 FEET IN LENGTH.

PAY LENGTH = 5927.8 LIN. FT.

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-68
1			3			TOTAL SHEETS
2			4			115

ASSEMBLED BY : A.S. CALLAWAY	DATE : 8/5/08	
CHECKED BY : J.A. TILLMAN	DATE : 8/25/08	
DRAWN BY : EEM 6/94	REV. 10/17/00	LES/RDR
CHECKED BY : RGW 6/94	REV. 5/7/03R	RWW/JTE
	REV. 5/1/06	TLA/GM

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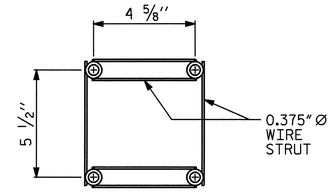
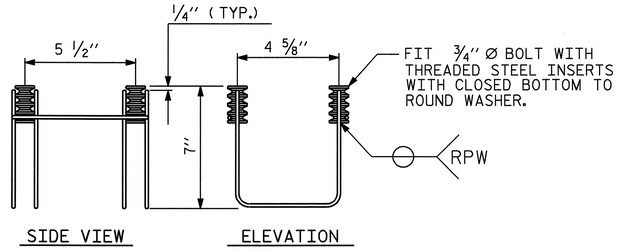
STD. NO. BMR3



PLAN



SIDE VIEW ELEVATION

MINIMUM LENGTH OF THREADS IN INSERT (FERRULE): 1 3/4''

4-BOLT METAL RAIL ANCHOR ASSEMBLY

(942 ASSEMBLIES REQUIRED)

NOTES

STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2'' FOR 3/4'' FERRULES.

B. 4 - 3/4'' Ø X 2 1/2'' BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4'' Ø X 2 1/2'' GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.

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

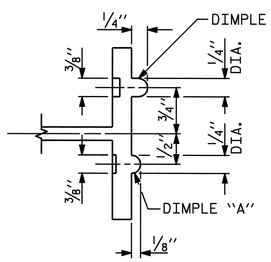
D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.

E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.

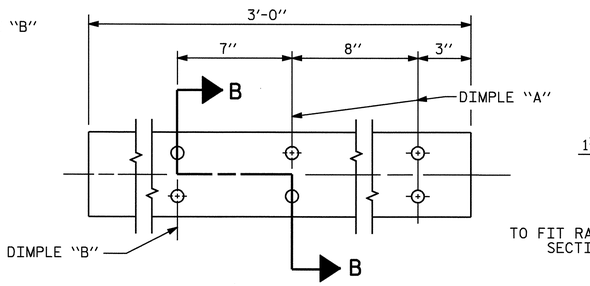
F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

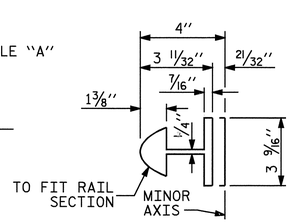
WHEN ADHESIVELY ANCHORED ANCHOR BOLTS ARE USED, BOLTS SHALL MEET THE REQUIREMENTS OF ASTM F593 ALLOY 304 STAINLESS STEEL WITH MINIMUM 75,000 PSI ULTIMATE STRENGTH. NUTS SHALL MEET THE REQUIREMENTS OF ASTM F594 ALLOY 304 STAINLESS STEEL AND WASHERS SHALL MEET THE REQUIREMENTS OF ASTM F844 EXCEPT THEY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



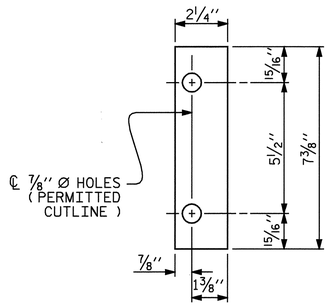
SECTION B - B



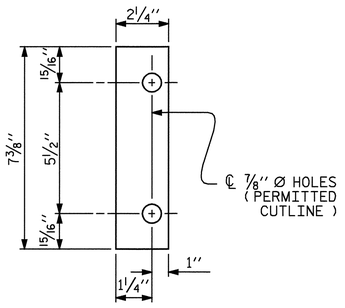
EXPANSION BAR DETAILS



BAR SECTION



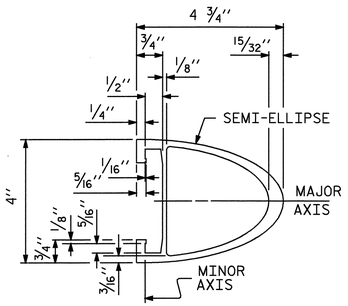
FRONT PLATE



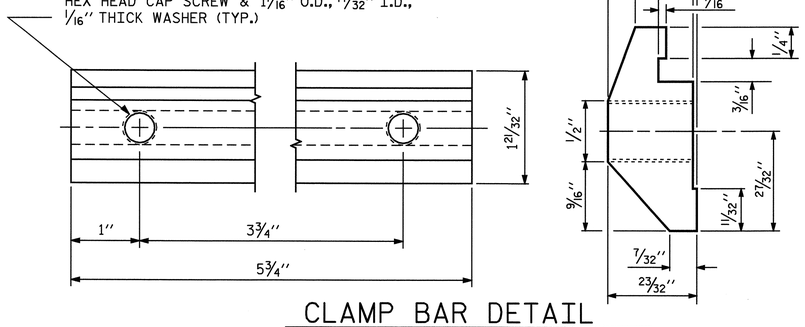
REAR PLATE

SHIM DETAILS

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

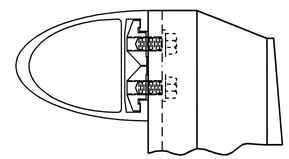


RAIL SECTION

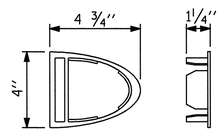


CLAMP BAR DETAIL

(4 REQUIRED PER POST)



CLAMP ASSEMBLY



RAIL CAP

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

2 BAR METAL RAIL

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

ASSEMBLED BY : A.S. CALLAWAY	DATE : 8/5/08
CHECKED BY : J.A. TILLMAN	DATE : 8/25/08

DRAWN BY : EEM 6/94	REV. 2/6/97 EEM/RGW
CHECKED BY : RGW 6/94	REV. 8/16/99 MAB/LES
	REV. 5/1/06R KMM/GM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-69
1			3			TOTAL SHEETS
2			4			115

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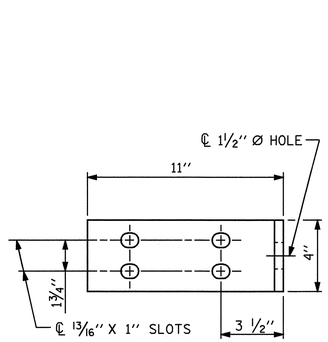
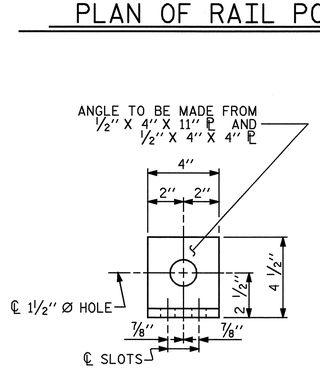
STD. NO. BMR4

FOR RAIL POST SPACING, SEE "2 BAR METAL RAIL POST SPACING" SHEETS.

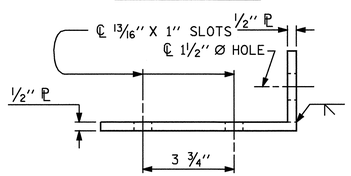
PLAN OF RAIL POST SPACINGS



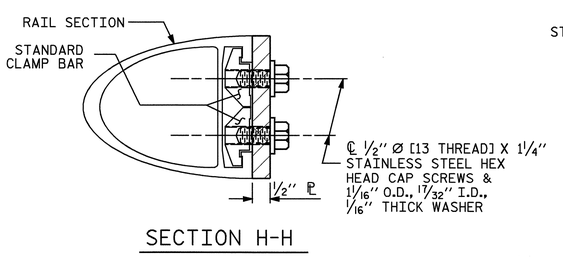
ELEVATION



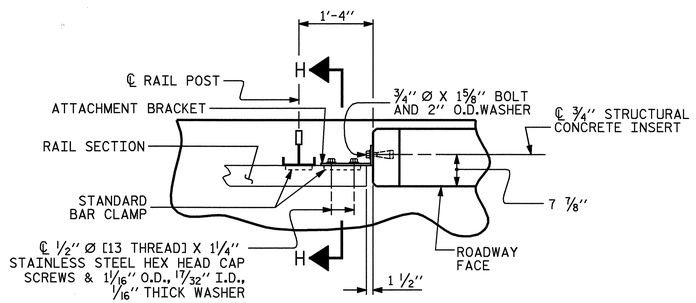
END VIEW



TOP VIEW



SECTION H-H



PLAN - RAIL AND END POST

FIXED

DETAILS FOR ATTACHING METAL RAIL TO END POST

NOTES

STRUCTURAL CONCRETE INSERT

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

A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1½".

B. 1 - ¾" Ø X 1⅝" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE ¾" Ø X 1⅝" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

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

NOTES

METAL RAIL TO END POST CONNECTION

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

A. ½" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.

B. ¾" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A ¾"Ø X 1⅝" BOLT WITH 2" O.D. WASHER IN PLACE. THE ¾"Ø X 1⅝" BOLT SHALL HAVE N. C. THREADS.

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

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

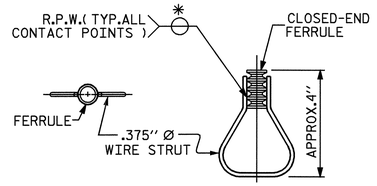
E. ½" Ø PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

THE ¾" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE ¾" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE ½" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE ¾" Ø X 1⅝" BOLT WITH WASHER SHALL BE REPLACED WITH A ¾"Ø X 6½" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE ¾" Ø X 1⅝" BOLT SHALL APPLY TO THE ¾"Ø X 6 ½" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.



PLAN ELEVATION

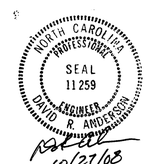
STRUCTURAL CONCRETE INSERT

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

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

RAIL POST SPACINGS AND END OF RAIL DETAILS

TWO BAR METAL RAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-70
1			3			TOTAL SHEETS
2			4			115

ASSEMBLED BY : A.S. CALLAWAY	DATE : 8/5/08	
CHECKED BY : J.A. TILLMAN	DATE : 8/25/08	
DRAWN BY : FCJ 1/88	REV. 10/17/00	LES/RDR
CHECKED BY : CRK 3/89	REV. 5/7/03	RWW/JTE
	REV. 5/1/06	TLA/GM

12-SEP-2008 07:21
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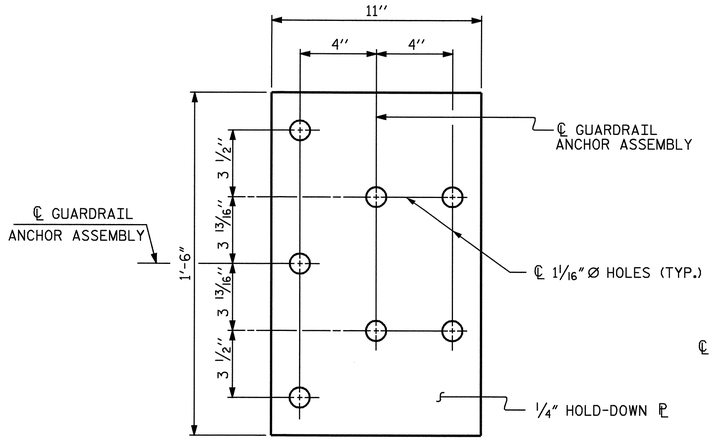
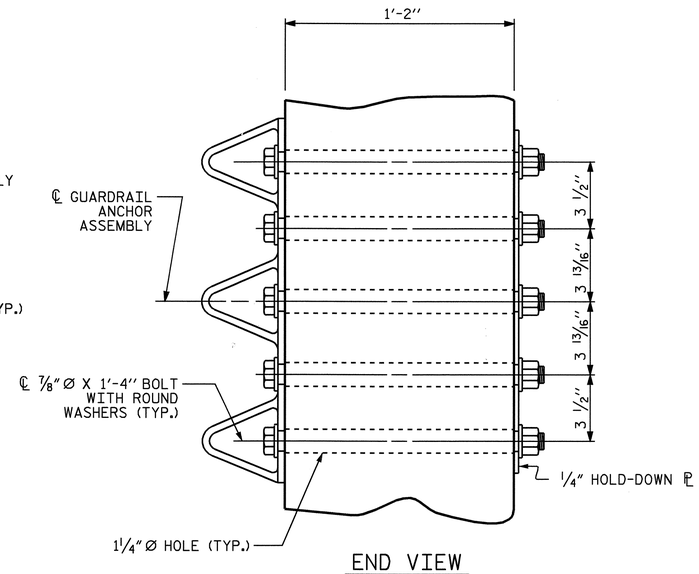
STD. NO. BMR2



PLAN



END VIEW

GUARDRAIL ANCHOR ASSEMBLY DETAILS

NOTES

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

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

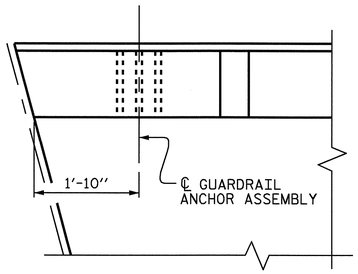
BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8'' Ø GALVANIZED BOLTS, NUTS AND WASHERS.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

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

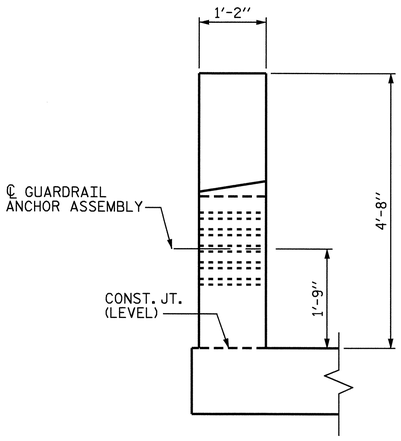
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLIES WITH BOLTS, NUTS AND WASHERS COMPLETE IN PLACE, SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

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

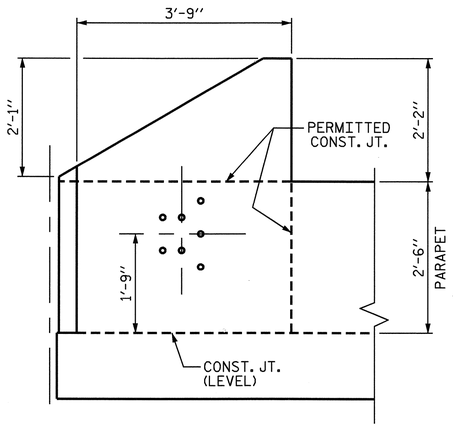
THE 1 1/4'' Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



PLAN



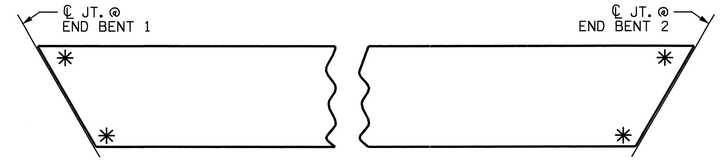
END VIEW



ELEVATION

LOCATION OF GUARDRAIL ANCHOR AT END POST

(END BENT 1 SHOWN, END BENT 2 SIMILAR)



SKETCH SHOWING POINTS OF ATTACHMENT

✳LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

GUARDRAIL ANCHORAGE DETAILS FOR METAL RAILS

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-71
1			3			TOTAL SHEETS
2			4			115

ASSEMBLED BY : A.S. CALLAWAY DATE : 8/5/08
CHECKED BY : J.A. TILLMAN DATE : 8/25/08

DRAWN BY : EEM 6/94
CHECKED BY : RGW 6/94

REV. 10/17/00 RWW/LES
REV. 5/7/03 RWW/JTE
REV. 5/1/06 TLA/GM

12-SEP-2008 07:21
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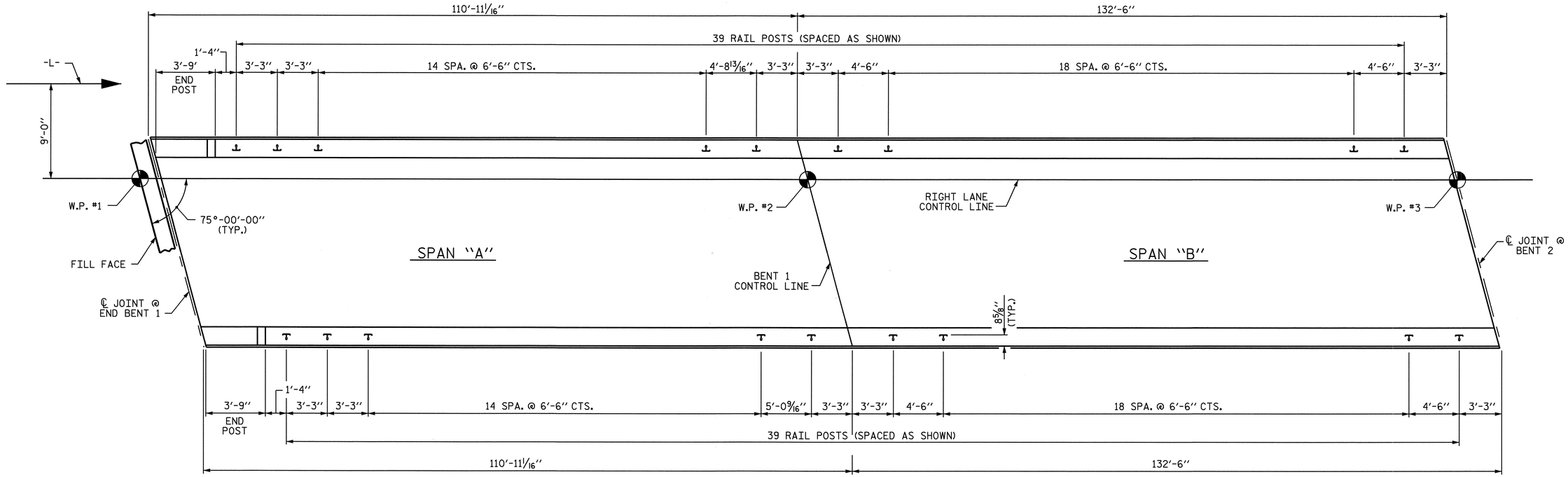
STD. NO. BMR8



PLAN OF RAIL POST SPACING SPANS A & B

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

2 BAR METAL RAIL POST SPACING

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID P ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-72
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/9/08
CHECKED BY : J.A. TILLMAN DATE : 8/25/08

15-SEP-2008 11:51
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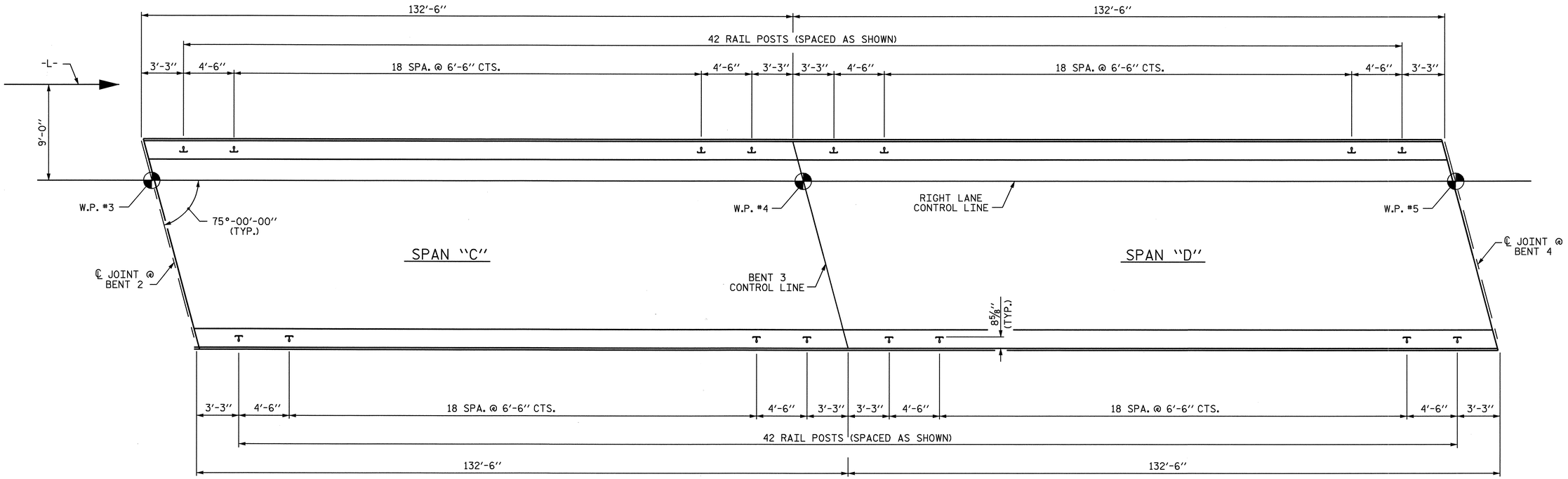

PLAN OF RAIL POST SPACING SPANS C & D

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON

10/27/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

2 BAR METAL RAIL POST SPACING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-73
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/9/08
CHECKED BY : J.A. TILLMAN DATE : 8/25/08

15-SEP-2008 11:51
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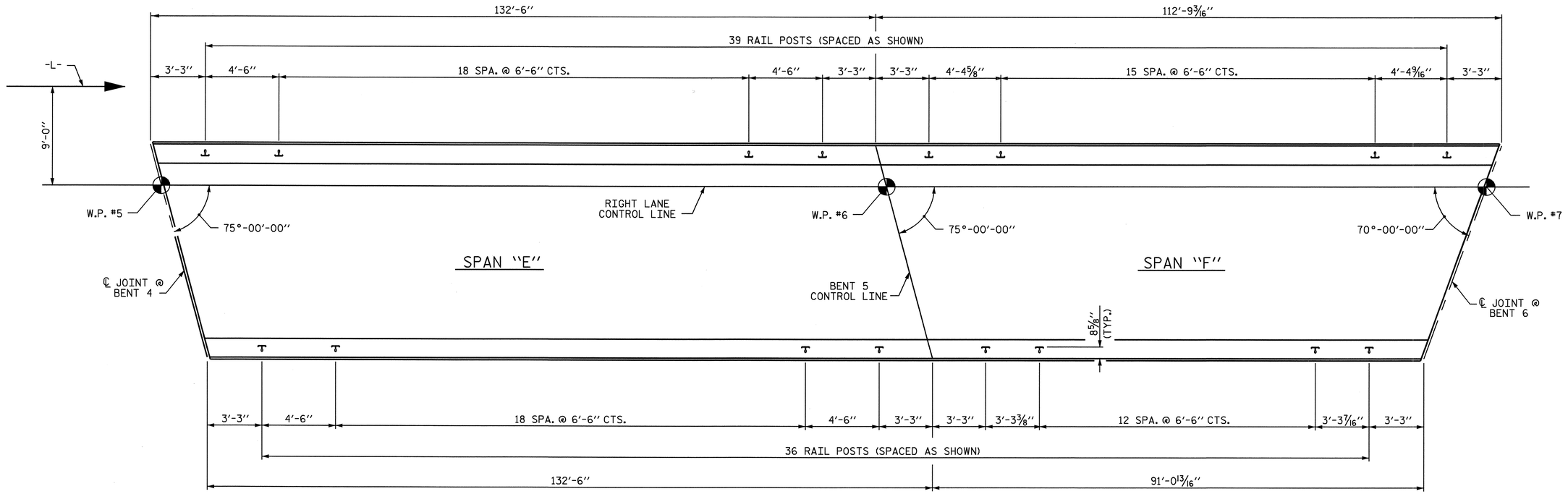

PLAN OF RAIL POST SPACING SPANS E & F

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 3 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

2 BAR METAL RAIL POST SPACING

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/21/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-74
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/9/08
CHECKED BY : J.A. TILLMAN DATE : 8/25/08

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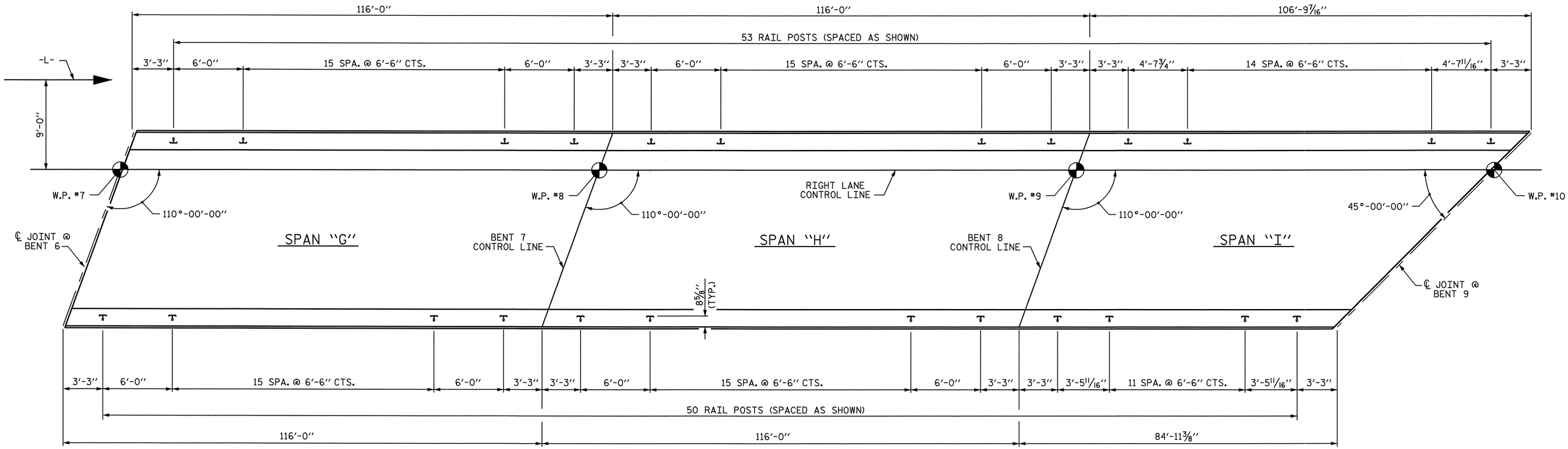

PLAN OF RAIL POST SPACING SPANS G, H & I

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 4 OF 8

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON

10/27/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

2 BAR METAL RAIL POST SPACING

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-75
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/9/08
CHECKED BY : J.A. TILLMAN DATE : 8/25/08

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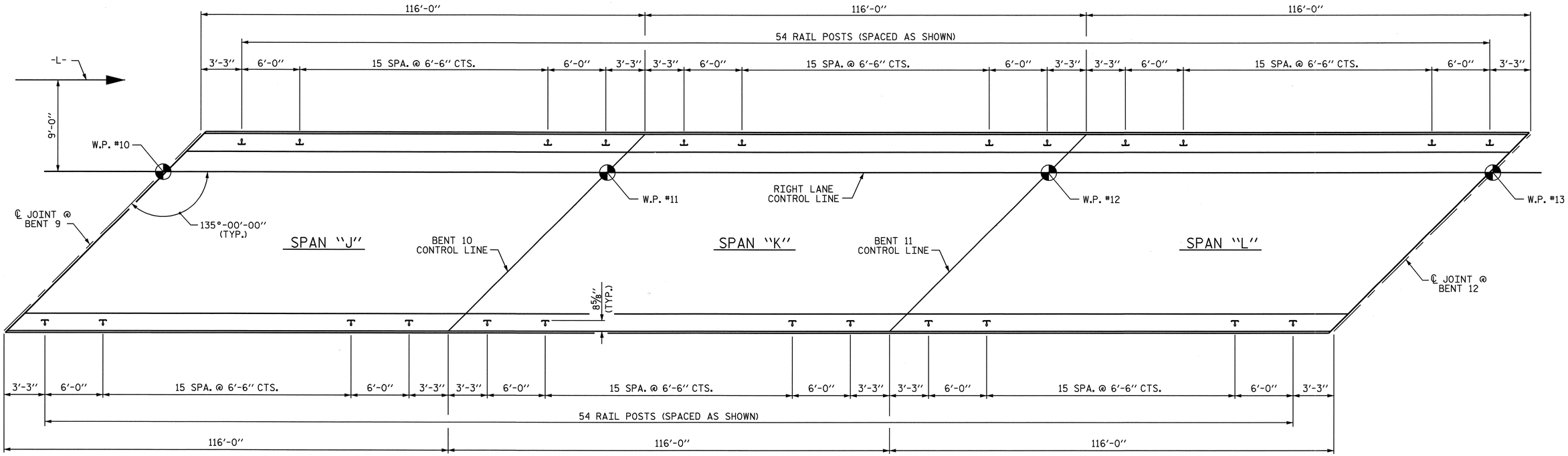

PLAN OF RAIL POST SPACING SPANS J, K & L

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 5 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

2 BAR METAL RAIL POST SPACING

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-76
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/9/08
CHECKED BY : J.A. TILLMAN DATE : 8/25/08

15-SEP-2008 11:50
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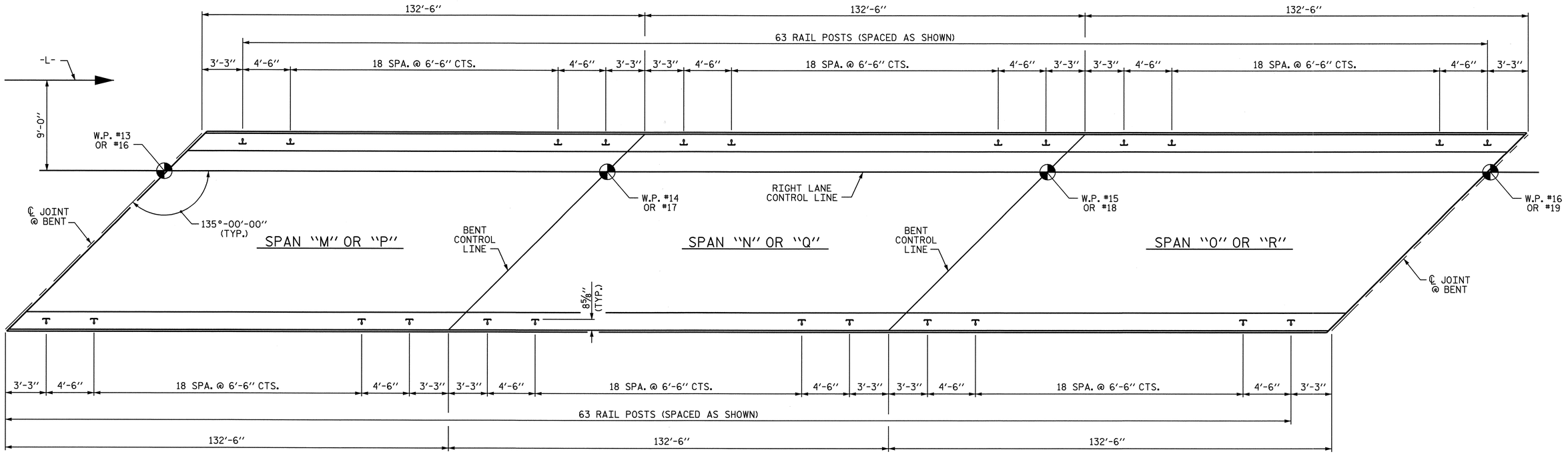

PLAN OF RAIL POST SPACING SPANS M, N, O, P, Q & R

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 6 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

2 BAR METAL RAIL POST SPACING

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-77
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/9/08
CHECKED BY : J.A. TILLMAN DATE : 8/25/08

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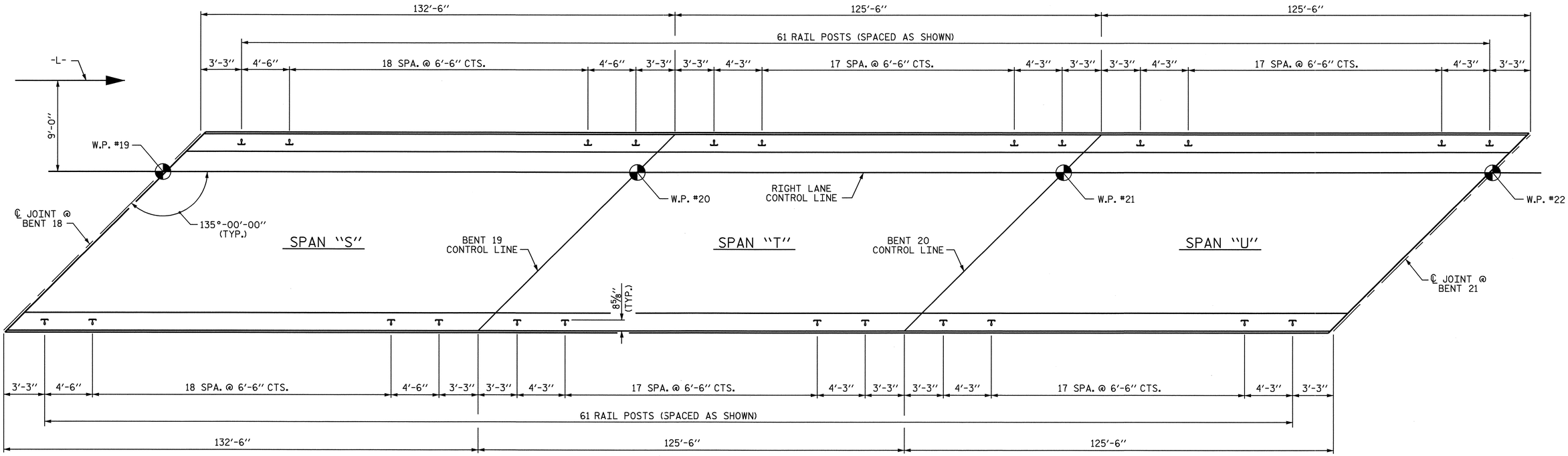

PLAN OF RAIL POST SPACING SPANS S, T & U

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 7 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

2 BAR METAL RAIL POST SPACING

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-7B
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/9/08
CHECKED BY : J.A. TILLMAN DATE : 8/25/08

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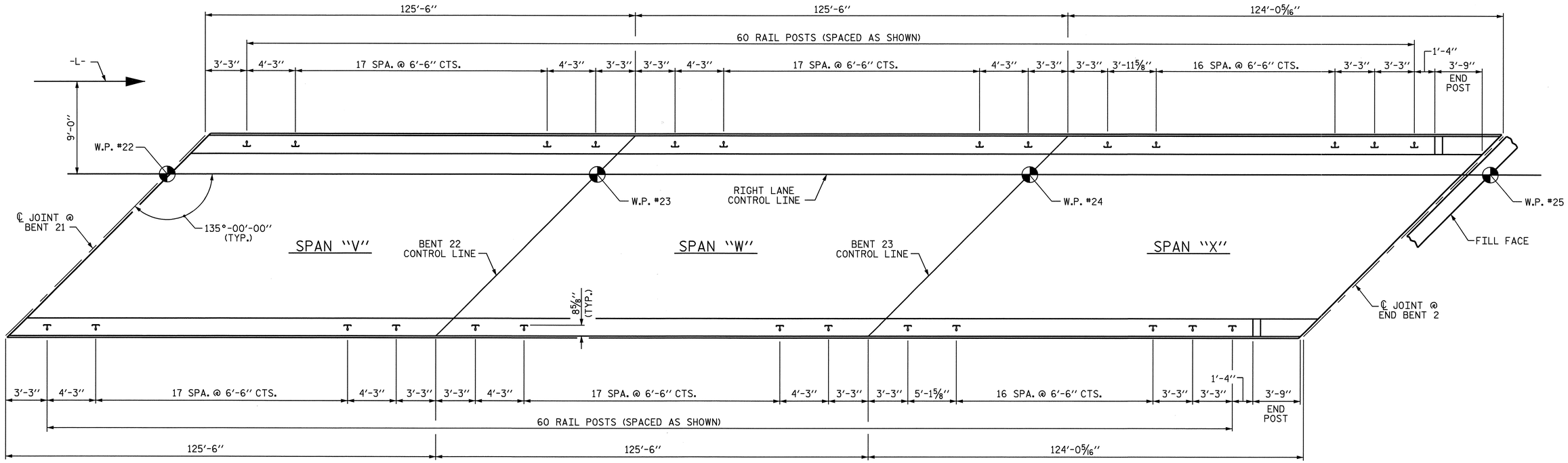

PLAN OF RAIL POST SPACING SPANS V, W & X

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 8 OF 8

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

2 BAR METAL RAIL POST SPACING

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-79
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/9/08
CHECKED BY : J.A. TILLMAN DATE : 8/25/08

15-SEP-2008 11:49
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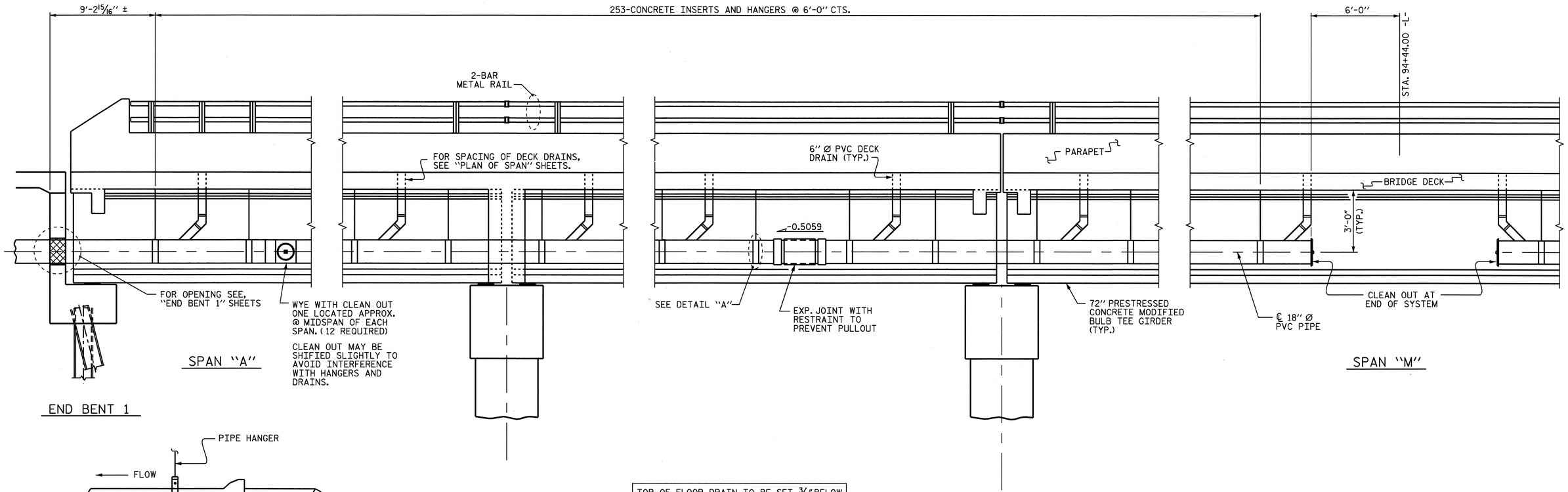
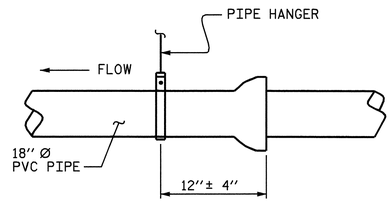
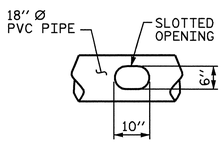


TOP OF FLOOR DRAIN TO BE SET 3/8" BELOW SURFACE OF SLAB.

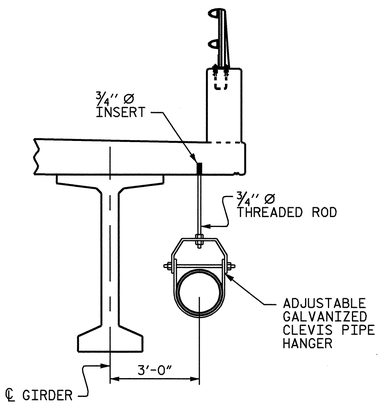
4 -1/2" SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.



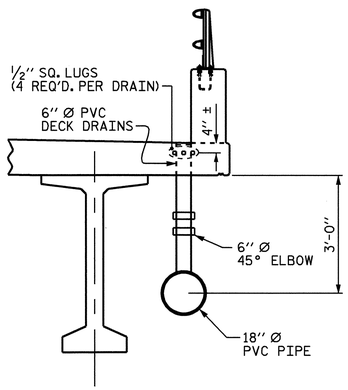
DETAIL "A"



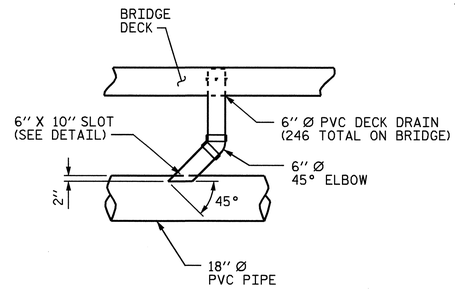
SLOT DETAIL



SECTION THRU DRAINAGE SYSTEM AT TYPICAL HANGER



SECTION THRU DRAINAGE SYSTEM AT 6" Ø DECK DRAINS



ELEVATION VIEW OF DECK DRAIN AND DRAIN LINE INTERSECTION

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURE DRAINAGE SYSTEM

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-80
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

DRAWN BY : A.S. CALLAWAY DATE : 8/15/08
CHECKED BY : S. WANCE DATE : 9/10/08

06-OCT-2008 08:32
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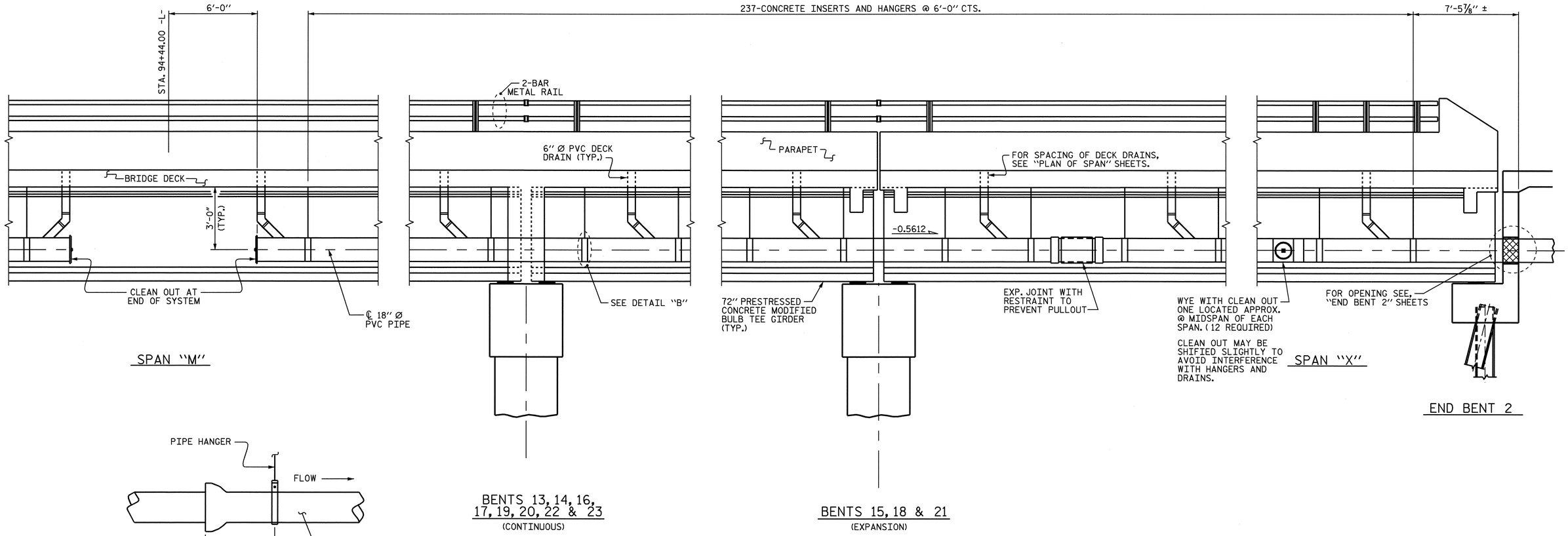
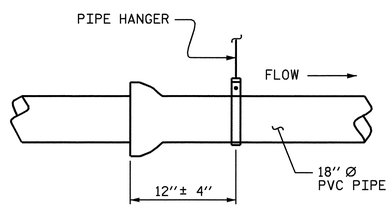
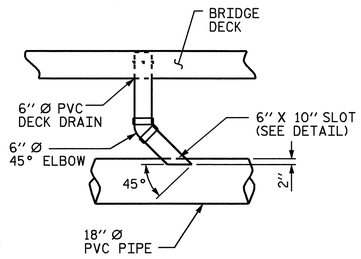
srashidi





DETAIL "B"



ELEVATION VIEW OF DECK DRAIN AND DRAIN LINE INTERSECTION

TOP OF FLOOR DRAIN TO BE SET 3/8" BELOW SURFACE OF SLAB.

4 - 1/2" SQUARE LUGS TO BE GLUED TO THE PVC PLASTIC PIPE AT EQUAL SPACES AROUND THE PIPE DRAIN APPROXIMATELY 4" FROM THE TOP OF THE PIPE.

NOTES

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

THE CONTRACTOR SHALL SUBMIT A PLAN FOR THE DRAINAGE SYSTEM, INCLUDING, BUT NOT LIMITED TO, ATTACHMENTS TO THE BRIDGE, PIPE ALIGNMENT AND PIPE LENGTHS, AND ALL NECESSARY FITTINGS, ELBOWS, WYES, ADAPTERS, GUIDES AND JOINTS.

SEE "PLAN OF SPANS" SHEETS FOR LOCATION OF 6" Ø PVC PIPE DRAINS.

THE DRAINAGE SYSTEM DETAILS ARE SCHEMATIC DRAWINGS ONLY.

DRAINAGE SYSTEM WILL BE PAID FOR UNDER THE PAY ITEM "STRUCTURE DRAINAGE SYSTEM".

BOLTS, NUTS, AND WASHERS SHALL BE HIGH STRENGTH AND GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

CONCRETE INSERTS SHALL BE OF AN APPROVED GALVANIZED TYPE HAVING A MINIMUM WORKING LOAD TENSION CAPACITY OF 11.1 kN.

THE CONTRACTOR MAY USE ADHESIVELY ANCHORED RODS IN PLACE OF CASTING INSERTS INTO THE DECK. LEVEL 2 FIELD TESTING IS REQUIRED. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SPECIAL PROVISIONS.

PIPE AND FITTINGS SHALL BE PVC, SDR 35, ASTM D 3034.

FITTING JOINTS SHALL BE SOLVENT CEMENT TYPE.

PIPE JOINTS SHALL BE ELASTOMERIC TYPE.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER R. ANDERSON DAVID
11/26/08

DRAWN BY : A.S. CALLAWAY DATE : 8/15/08
CHECKED BY : S. WANCE DATE : 9/10/08

20-NOV-2008 13:47
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jtillman

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

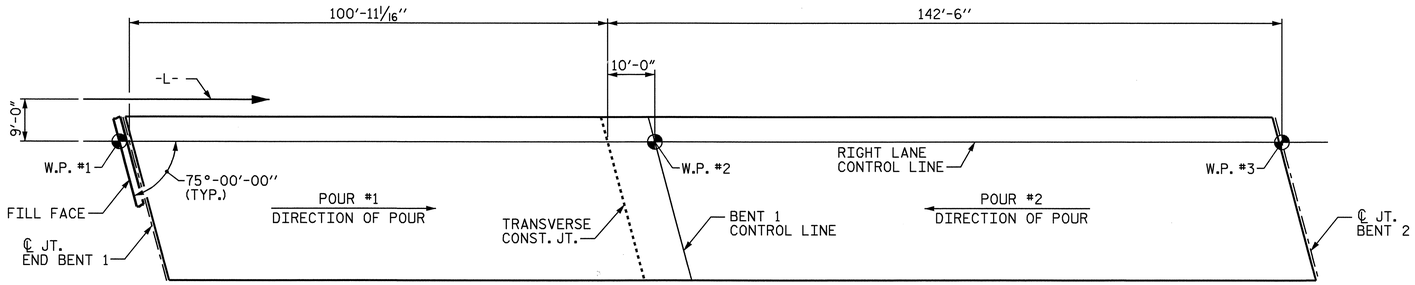
SHEET 2 OF 2

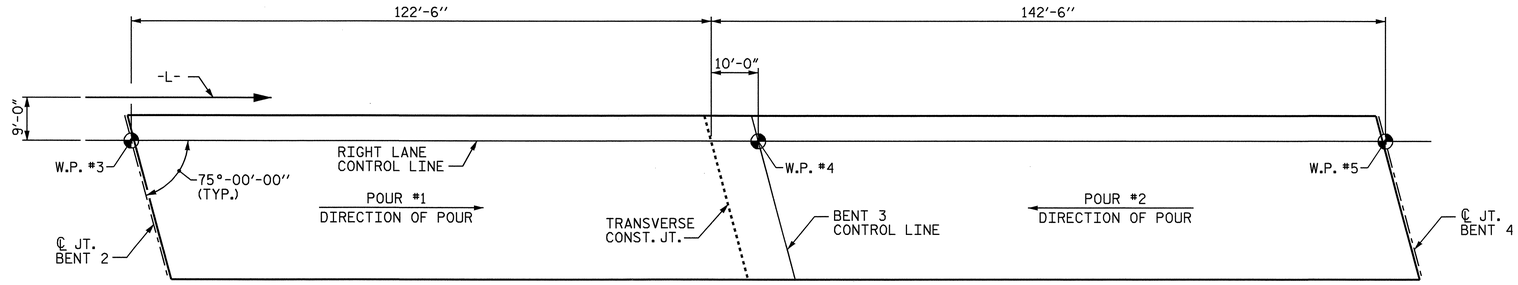
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

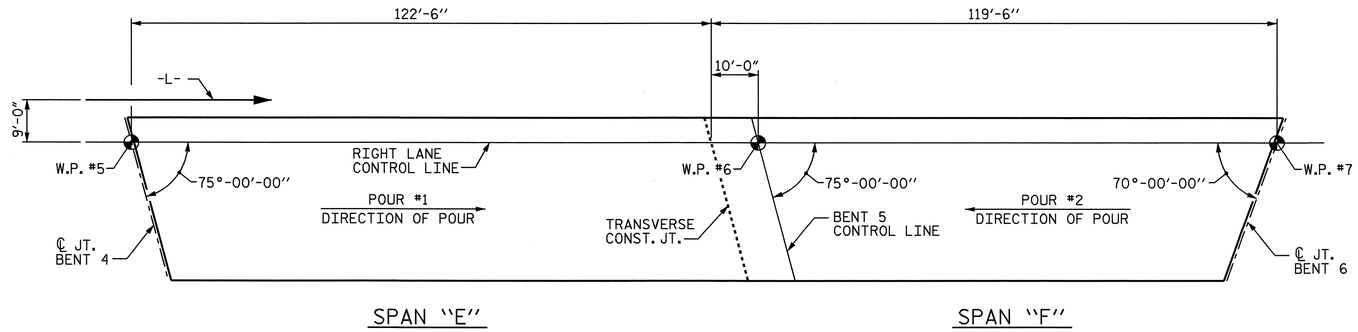
SUPERSTRUCTURE

STRUCTURE DRAINAGE SYSTEM

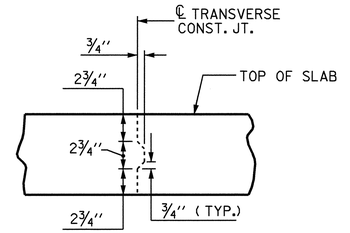
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-81
1			3			TOTAL SHEETS
2			4			115







POURING SEQUENCE SPANS A THROUGH F



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

POURING SEQUENCE

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-82
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/18/08
CHECKED BY : S. WANCE DATE : 9/10/08

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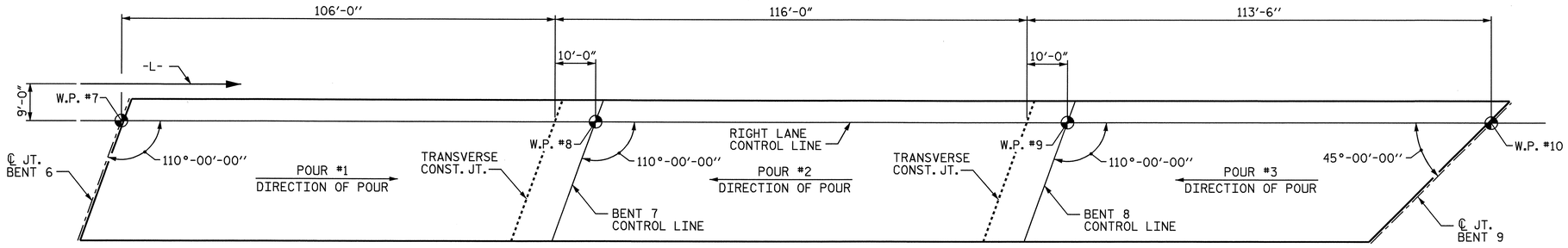
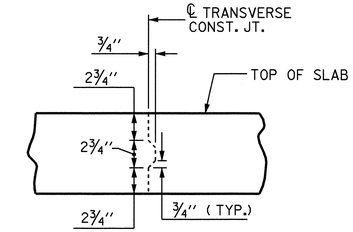
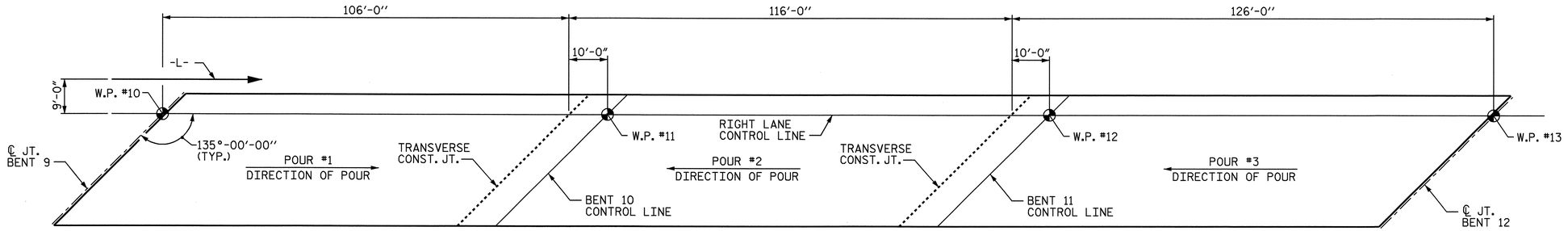


SPAN "G" SPAN "H" SPAN "I"

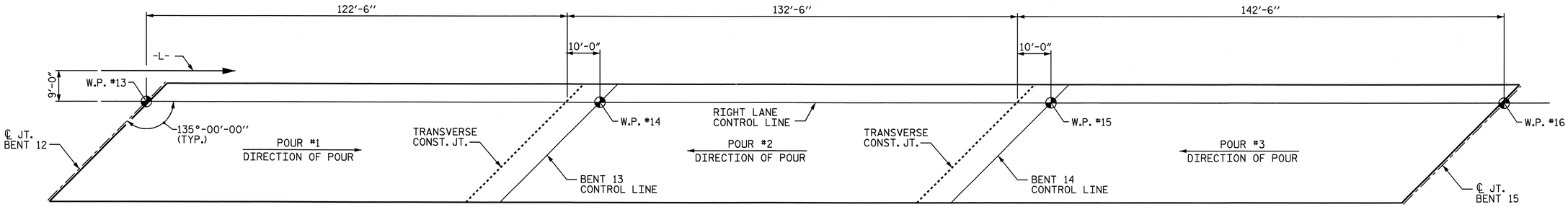


TRANSVERSE CONSTRUCTION JOINT DETAIL

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



SPAN "J" SPAN "K" SPAN "L"



SPAN "M" SPAN "N" SPAN "O"

POURING SEQUENCE SPANS G THROUGH O

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

POURING SEQUENCE

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-83
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/18/08
CHECKED BY : S. WANCE DATE : 9/10/08

11-SEP-2008 11:40
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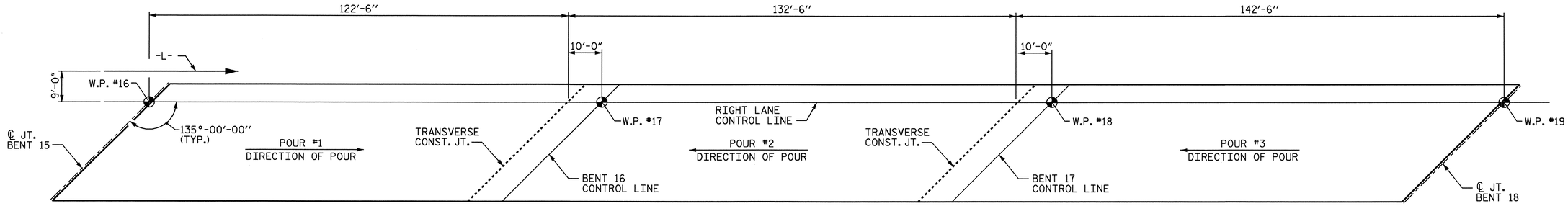
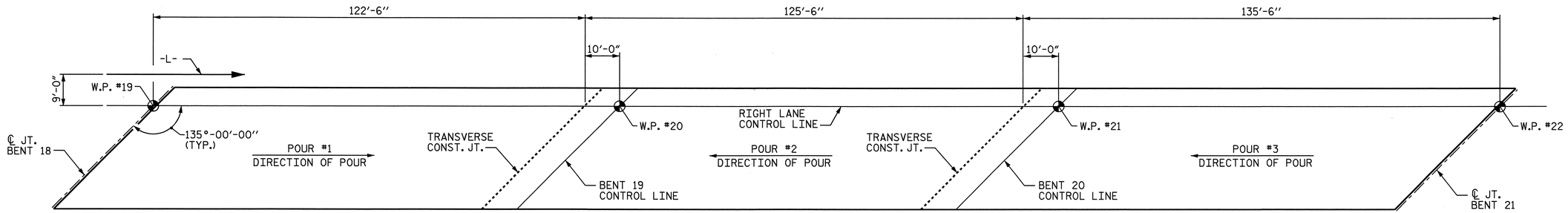
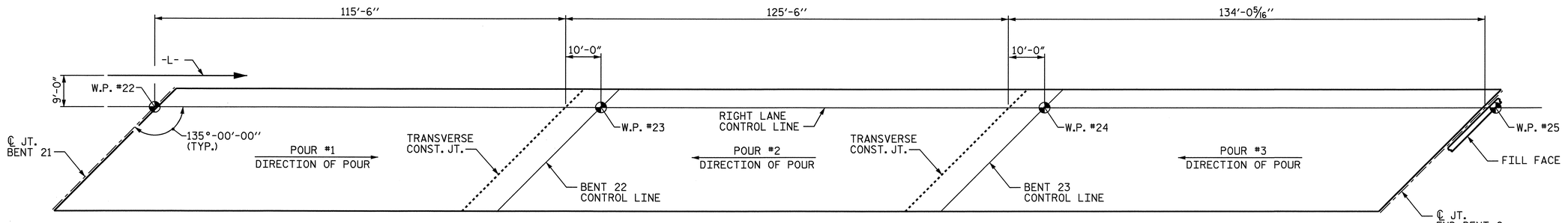
scallaway



SPAN "P" SPAN "Q" SPAN "R"

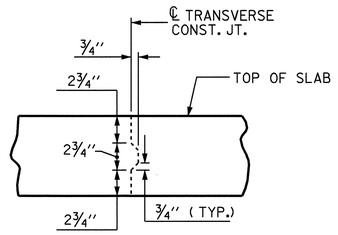


SPAN "S" SPAN "T" SPAN "U"



SPAN "V" SPAN "W" SPAN "X"

POURING SEQUENCE SPANS P THROUGH X



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 3 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

POURING SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-84
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/18/08
CHECKED BY : S. WANCE DATE : 9/10/08

11-SEP-2008 11:41
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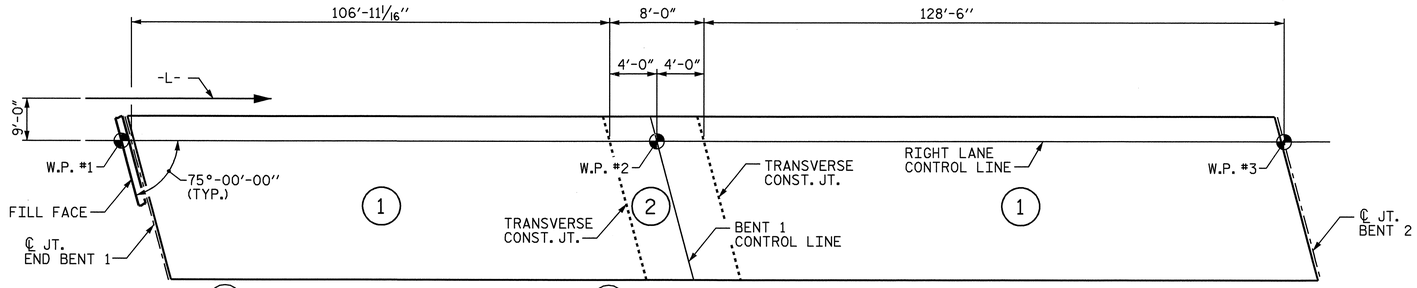
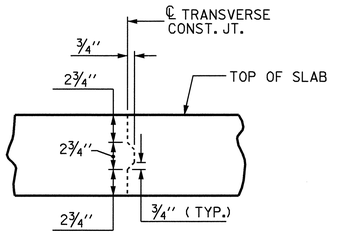
scallaway



POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

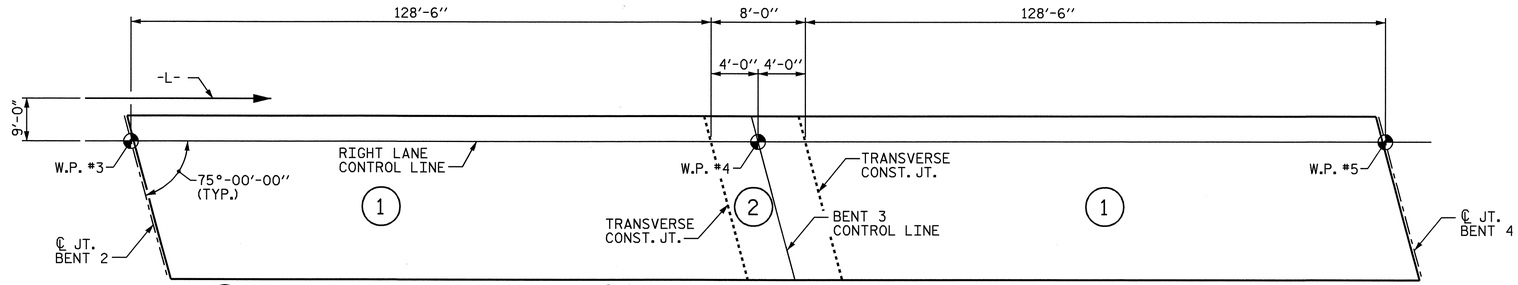
SPAN "A"

SPAN "B"



TRANSVERSE CONSTRUCTION JOINT DETAIL

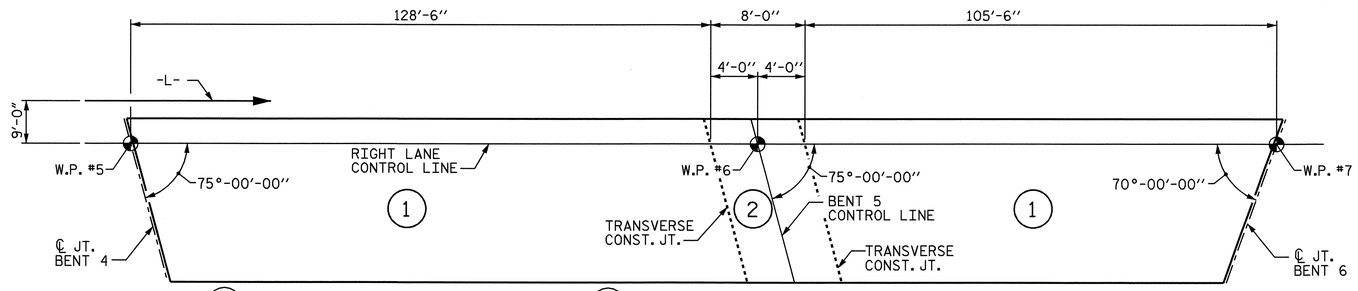
NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT



POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

SPAN "C"

SPAN "D"



POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

SPAN "E"

SPAN "F"

OPTIONAL POURING SEQUENCE SPANS A THROUGH F

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 4 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

OPTIONAL POURING SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-85
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

DRAWN BY : A.S. CALLAWAY DATE : 8/18/08
CHECKED BY : S. WANCE DATE : 9/10/08

11-SEP-2008 11:47
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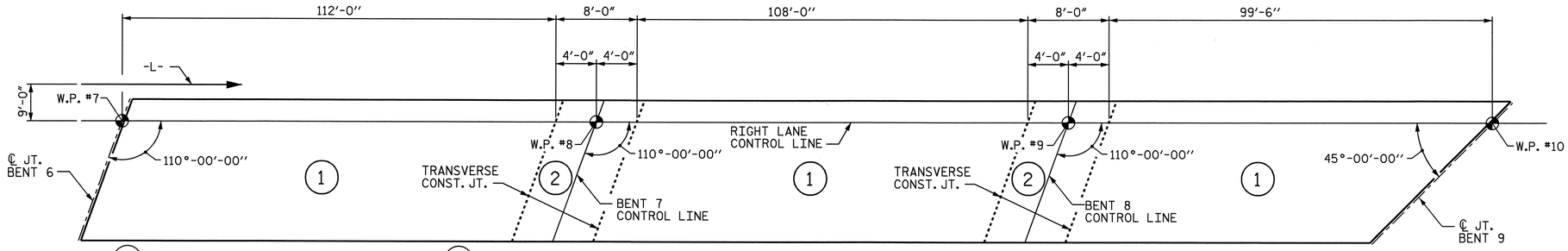
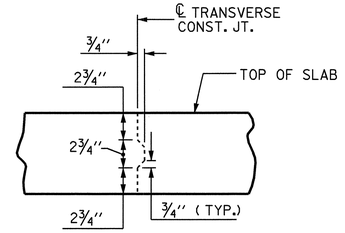
scallaway



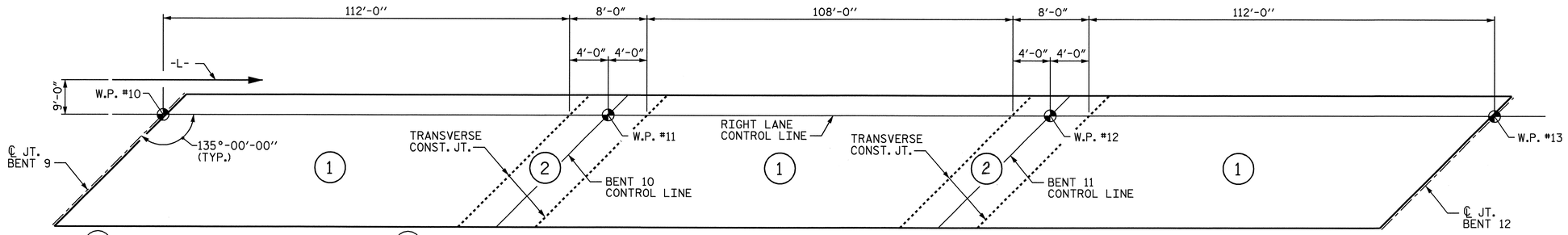
POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

SPAN "G" SPAN "H" SPAN "I"



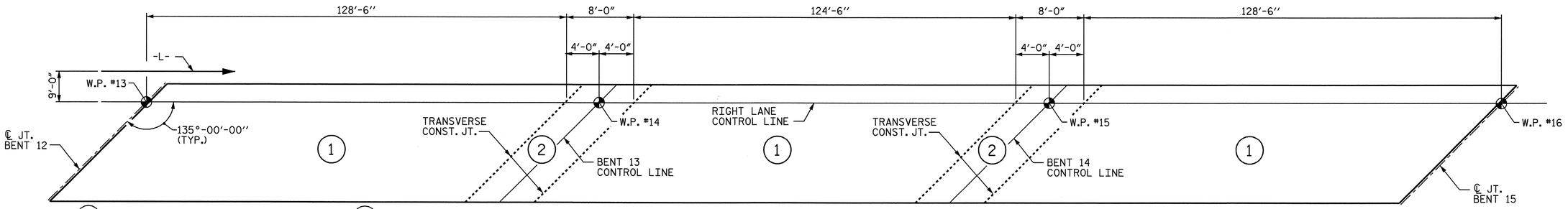
TRANSVERSE CONSTRUCTION JOINT DETAIL

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



POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

SPAN "J" SPAN "K" SPAN "L"



POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

SPAN "M" SPAN "N" SPAN "O"

OPTIONAL POURING SEQUENCE SPANS G THROUGH O

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 5 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

OPTIONAL POURING SEQUENCE

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-86
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/18/08
CHECKED BY : S. WANCE DATE : 9/10/08

11-SEP-2008 11:47
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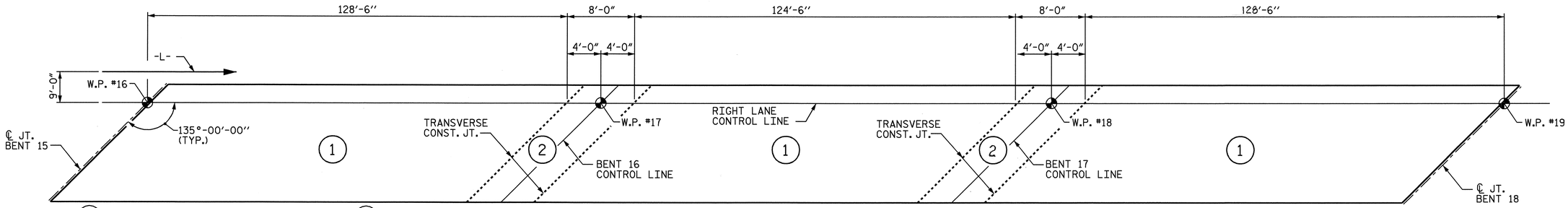
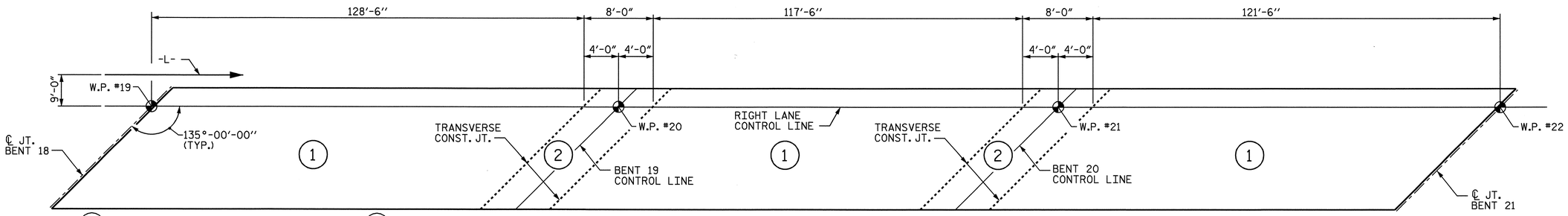
scallaway



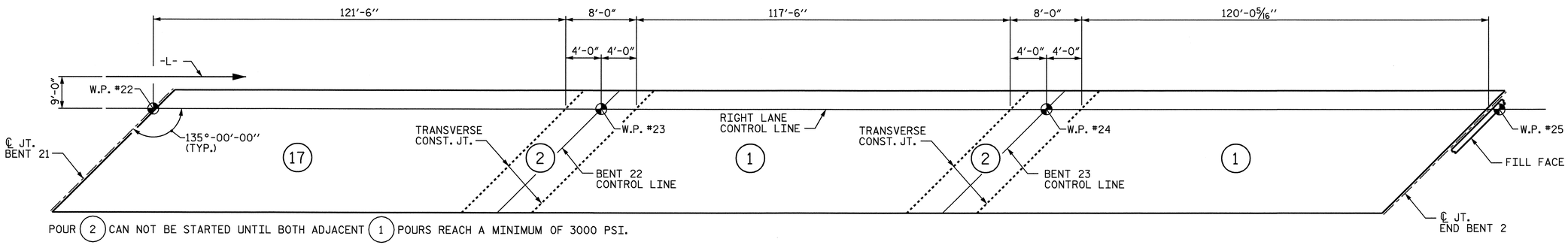
POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

SPAN "P" SPAN "Q" SPAN "R"



POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

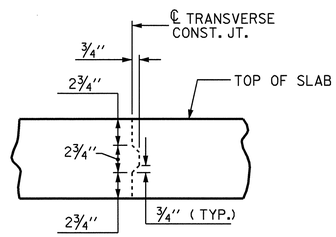
SPAN "S" SPAN "T" SPAN "U"



POUR (2) CAN NOT BE STARTED UNTIL BOTH ADJACENT (1) POURS REACH A MINIMUM OF 3000 PSI.

SPAN "V" SPAN "W" SPAN "X"

OPTIONAL POURING SEQUENCE SPANS P THROUGH X



TRANSVERSE CONSTRUCTION JOINT DETAIL

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

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 6 OF 6

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
OPTIONAL POURING SEQUENCE

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-87
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : A.S. CALLAWAY DATE : 8/18/08
CHECKED BY : S. WANCE DATE : 9/10/08

11-SEP-2008 11:47
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scallaway

BILL OF MATERIAL
SPAN A-B

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	374	#5	STR	34′- 3″	13360
A2	374	#5	STR	34′- 3″	13360
✳A101	2	#5	STR	32′- 0″	67
✳A102	2	#5	STR	29′- 8″	62
✳A103	2	#5	STR	27′- 4″	57
✳A104	2	#5	STR	25′- 0″	52
✳A105	2	#5	STR	22′- 8″	47
✳A106	2	#5	STR	20′- 4″	42
✳A107	2	#5	STR	18′ 0″	38
✳A108	2	#5	STR	15′- 8 ′	33
✳A109	2	#5	STR	13′- 4″	28
✳A110	2	#5	STR	11′- 0″	23
✳A111	2	#5	STR	8′- 8″	18
✳A112	2	#5	STR	6′- 4″	13
✳A113	2	#5	STR	4′- 0″	8
A201	2	#5	STR	32′ -0″	67
A202	2	#5	STR	29′- 8″	62
A203	2	#5	STR	27′- 4″	57
A204	2	#5	STR	25′- 0″	52
A205	2	#5	STR	22′- 8″	47
A206	2	#5	STR	20′- 4″	42
A207	2	#5	STR	18′- 0″	38
A208	2	#5	STR	15′ - 8′	33
A209	2	#5	STR	13′- 4″	28
A210	2	#5	STR	11′- 0″	23
A211	2	#5	STR	8′- 8″	18
A212	2	#5	STR	6′- 4″	13
A213	2	#5	STR	4′- 0″	8
✳B1	75	#4	STR	26′ -4″	1319
✳B2	141	#7	STR	31′- 6″	9078
✳B3	44	#7	STR	36′- 7″	3290
✳B4	100	#4	STR	24′- 0″	1603
B5	130	#5	STR	50′- 4″	6825
✳G1	2	#5	STR	35′- 4″	74
✳K1	8	#8	1	14′-11″	319
✳K2	8	#8	2	21′- 0″	449
✳K3	15	#6	STR	4′- 9″	107
K4	24	#5	5	7′- 7″	190
K5	120	#5	STR	7′- 7″	949
K6	14	#4	9	5′-11″	55
K7	14	#4	10	11′-10″	111
K8	6	#4	STR	6′- 2″	25
K9	30	#4	STR	7′-10″	157
K10	6	#4	STR	4′- 9″	19
✳S1	30	#5	3	6′- 1″	190
✳S2	15	#4	6	3′- 8″	37
S3	84	#4	4	10′-11″	613
S4	6	#4	7	11′- 0″	44
✳S5	15	#4	2	10′- 6″	105
S6	114	#4	8	2′- 9″	209
✳S7	15	#4	6	3′- 0″	30
REINFORCING STEEL = 23045 LBS					
EPOXY COATED REINF. STEEL = 30449 LBS					

BILL OF MATERIAL
SPAN C-D

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	407	#5	STR	34′- 3″	14539
A2	407	#5	STR	34′- 3″	14539
✳A101	2	#5	STR	32′- 0″	67
✳A102	2	#5	STR	29′- 8″	62
✳A103	2	#5	STR	27′- 4″	57
✳A104	2	#5	STR	25′- 0″	52
✳A105	2	#5	STR	22′- 8″	47
✳A106	2	#5	STR	20′- 4″	42
✳A107	2	#5	STR	18′ 0″	38
✳A108	2	#5	STR	15′- 8 ′	33
✳A109	2	#5	STR	13′- 4″	28
✳A110	2	#5	STR	11′- 0″	23
✳A111	2	#5	STR	8′- 8″	18
✳A112	2	#5	STR	6′- 4″	13
✳A113	2	#5	STR	4′- 0″	8
A201	2	#5	STR	32′ -0″	67
A202	2	#5	STR	29′- 8″	62
A203	2	#5	STR	27′- 4″	57
A204	2	#5	STR	25′- 0″	52
A205	2	#5	STR	22′- 8″	47
A206	2	#5	STR	20′- 4″	42
A207	2	#5	STR	18′- 0″	38
A208	2	#5	STR	15′ - 8′	33
A209	2	#5	STR	13′- 4″	28
A210	2	#5	STR	11′- 0″	23
A211	2	#5	STR	8′- 8″	18
A212	2	#5	STR	6′- 4″	13
A213	2	#5	STR	4′- 0″	8
✳B6	200	#4	STR	24′- 0″	3206
✳B7	141	#7	STR	33′- 4″	9607
✳B8	44	#7	STR	39′-10″	3582
B9	130	#5	STR	54′- 9″	7424
✳G1	2	#5	STR	35′- 4″	74
✳K1	8	#8	1	14′-11″	319
✳K2	8	#8	2	21′- 0″	449
✳K3	12	#6	STR	4′- 9″	86
K4	24	#5	5	7′- 7″	190
K5	120	#5	STR	7′- 7″	949
K6	14	#4	9	5′-11″	55
K7	14	#4	10	11′-10″	111
K8	6	#4	STR	6′- 2″	25
K9	30	#4	STR	7′-10″	157
K10	6	#4	STR	4′- 9″	19
✳S1	30	#5	3	6′- 1″	190
S3	84	#4	4	10′-11″	613
S4	6	#4	7	11′- 0″	44
✳S5	15	#4	2	10′- 6″	105
S6	114	#4	8	2′- 9″	209
✳S7	30	#4	6	3′- 0″	60
REINFORCING STEEL = 24823 LBS					
EPOXY COATED REINF. STEEL = 32705 LBS					

BILL OF MATERIAL
SPAN E-F

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	355	#5	STR	34′- 3″	12682	A216	1	#5	STR	29′- 2″	30
A2	355	#5	STR	34′- 3″	12682	A217	1	#5	STR	27′- 6″	29
						A218	1	#5	STR	25′- 9″	27
✳A101	1	#5	STR	32′- 0″	33	A219	1	#5	STR	24′- 0″	25
✳A102	1	#5	STR	29′- 8″	31	A220	1	#5	STR	22′- 4″	23
✳A103	1	#5	STR	27′- 4″	29	A221	1	#5	STR	20′- 7″	21
✳A104	1	#5	STR	25′- 0″	26	A222	1	#5	STR	18′-11″	20
✳A105	1	#5	STR	22′- 8″	24	A223	1	#5	STR	17′- 2″	18
✳A106	1	#5	STR	20′- 4″	21	A224	1	#5	STR	15′- 5″	16
✳A107	1	#5	STR	18′ 0″	19	A225	1	#5	STR	13′- 9″	14
✳A108	1	#5	STR	15′- 8 ′	16	A226	1	#5	STR	12′- 0″	13
✳A109	1	#5	STR	13′- 4″	14	A227	1	#5	STR	10′- 4″	11
✳A110	1	#5	STR	11′- 0″	11	A228	1	#5	STR	8′- 7″	9
✳A111	1	#5	STR	8′- 8″	9	A229	1	#5	STR	6′-10″	7
✳A112	1	#5	STR	6′- 4″	7	A230	1	#5	STR	5′- 2″	5
✳A113	1	#5	STR	4′- 0″	4	A231	1	#5	STR	3′- 5″	4
✳A114	1	#5	STR	32′- 7″	34						
✳A115	1	#5	STR	30′-11″	32	✳B10	100	#4	STR	24′ -8″	1648
✳A116	1	#5	STR	29′- 2″	30	✳B11	141	#7	STR	31′- 1″	8958
✳A117	1	#5	STR	27′- 6″	29	✳B12	44	#7	STR	36′- 5″	3275
✳A118	1	#5	STR	25′- 9″	27	✳B13	75	#4	STR	23′- 3″	1165
✳A119	1	#5	STR	24′- 0″	25	B14	130	#5	STR	46′-11″	6361
✳A120	1	#5	STR	22′- 4″	23						
✳A121	1	#5	STR	20′- 7″	21	✳G1	1	#5	STR	35′- 4″	37
✳A122	1	#5	STR	18′-11″	20	✳G2	1	#5	STR	36′- 4″	38
✳A123	1	#5	STR	17′- 2″	18						
✳A124	1	#5	STR	15′- 5″	16	✳K1	4	#8	1	14′-11″	159
✳A125	1	#5	STR	13′- 9″	14	✳K2	4	#8	2	21′- 0″	224
✳A126	1	#5	STR	12′- 0″	13	✳K3	6	#6	STR	4′- 9″	43
✳A127	1	#5	STR	10′- 4″	11	K4	24	#5	5	7′- 7″	190
✳A128	1	#5	STR	8′- 7″	9	K5	120	#5	STR	7′- 7″	949
✳A129	1	#5	STR	6′-10″	7	K6	14	#4	9	5′-11″	55
✳A130	1	#5	STR	5′- 2″	5	K7	14	#4	10	11′-10″	111
✳A131	1	#5	STR	3′- 5″	4	K8	6	#4	STR	6′- 2″	25
						K9	30	#4	STR	7′-10″	157
A201	1	#5	STR	32′ -0″	33	K10	6	#4	STR	4′- 9″	19
A202	1	#5	STR	29′- 8″	31	✳K11	4	#8	1	15′- 3″	163
A203	1	#5	STR	27′- 4″	29	✳K12	4	#8	2	21′- 6″	230
A204	1	#5	STR	25′- 0″	26	K13	6	#6	STR	4′-10″	44
A205	1	#5	STR	22′- 8″	24						
A206	1	#5	STR	20′- 4″	21	✳S1	30	#5	3	6′- 1″	190
A207	1	#5	STR	18′- 0″	19	S3	84	#4	4	10′-11″	613
A208	1	#5	STR	15′ - 8′	16	S4	6	#4	7	11′- 0″	44
A209	1	#5	STR	13′- 4″	14	✳S5	15	#4	2	10′- 6″	105
A210	1	#5	STR	11′- 0″	11	S6	114	#4	8	2′- 9″	209
A211	1	#5	STR	8′- 8″	9	✳S7	15	#4	6	3′- 0″	30
A212	1	#5	STR	6′- 4″	7	✳S8	15	#4	6	2′-10″	28
A213	1	#5	STR	4′- 0″	4						
A214	1	#5	STR	32′- 7″	34	REINFORCING STEEL = 22041 LBS					
A215	1	#5	STR	30′-11″	32	EPOXY COATED REINF. STEEL = 29557 LBS					

✳DENOTES EPOXY COATED REINFORCING STEEL.

BILL OF MATERIAL
SPAN G-H-I

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	487	#5	STR	34′- 3″	17397	A232	3	#5	STR	32′- 5″	101
A2	487	#5	STR	34′- 3″	17397	A233	3	#5	STR	30′- 6″	95
						A234	3	#5	STR	28′- 8″	90
✳A114	1	#5	STR	32′- 7″	34	A235	3	#5	STR	26′- 9″	84
✳A115	1	#5	STR	30′-11″	32	A236	3	#5	STR	24′-11″	78
✳A116	1	#5	STR	29′- 2″	30	A237	3	#5	STR	23′- 0″	72
✳A117	1	#5	STR	27′- 6″	29	A238	3	#5	STR	21′- 2″	66
✳A118	1	#5	STR	25′- 9″	27	A239	3	#5	STR	19′- 3″	60
✳A119	1	#5	STR	24′- 0″	25	A240	3	#5	STR	17′- 5″	54
✳A119	1	#5	STR	24′- 0″	25	A241	3	#5	STR	16′- 6″	52
✳A119	1	#5	STR	24′- 0″	25	A242	3	#5	STR	13′- 8″	43
✳A120	1	#5	STR	22′- 4″	23	A243	3	#5	STR	11′- 9″	37
✳A121	1	#5	STR	20′- 7″	21	A244	3	#5	STR	9′-11″	31
✳A122	1	#5	STR	18′-11″	20	A245	3	#5	STR	8′- 0″	25
✳A123	1	#5	STR	17′- 2″	18	A246	3	#5	STR	6′- 2″	19
✳A124	1	#5	STR	15′- 5″	16	A247	3	#5	STR	4′- 3″	13
✳A125	1	#5	STR	13′- 9″	14	A248	3	#5	STR	2′- 5″	8
✳A126	1	#5	STR	12′- 0″	13						
✳A127	1	#5	STR	10′- 4″	11	✳B15	75	#4	STR	27′ -6″	1378
✳A128	1	#5	STR	8′- 7″	9	✳B16	141	#7	STR	30′- 1″	8670
✳A129	1	#5	STR	6′-10″	7	✳B17	44	#7	STR	34′-10″	3133
✳A130	1	#5	STR	5′- 2″	5	✳B18	50	#4	STR	22′- 8″	757
✳A131	1	#5	STR	3′- 5″	4	✳B19	141	#7	STR	28′-10″	8310
✳A132	3	#5	STR	32′- 5″	101	✳B20	44	#7	STR	33′- 0″	2968
✳A133	3	#5	STR	30′- 6″	95	✳B21	75	#4	STR	24′- 3″	1215
✳A134	3	#5	STR	28′- 8″	90	B22	182	#5	STR	51′-10″	9839
✳A135	3	#5	STR	26′- 9″	84						
✳A136	3	#5	STR	24′-11″	78	✳G2	1	#5	STR	36′- 4″	38
✳A137	3	#5	STR	23′- 0″	72	✳G3	1	#5	STR	48′- 3″	50
✳A138	3	#5	STR	21′- 2″	66						
✳A139	3	#5	STR	19′- 3″	60	K4	30	#5	5	7′- 7″	237
✳A140	3	#5	STR	17′- 5″	54	K5	150	#5	STR	7′- 7″	1186
✳A141	3	#5	STR	16′- 6″	52	✳K11	4	#8	1	15′- 3″	163
✳A142	3	#5	STR	13′- 8″	43	✳K12	4	#8	2	21′- 6″	230
✳A143	3	#5	STR	11′- 9″	37	✳K13	6	#6	STR	4′-10″	44
✳A144	3	#5	STR	9′-11″	31	K14	28	#4	9	5′-11″	111
✳A145	3	#5	STR	8′- 0″	25	K15	28	#4	10	11′-10″	221
✳A146	3	#5	STR	6′- 2″	19	K16	12	#4	STR	6′- 4″	51
✳A147	3	#5	STR	4′- 3″	13	K17	60	#4	STR	8′- 0″	321
✳A148	3	#5	STR	2′- 5″	8	K18	12	#4	STR	4′-10″	39
						✳K19	4	#8	1	19′- 8″	210
A214	1	#5	STR	32′- 7″	34	✳K20	4	#8	2	27′- 2″	290
A215	1	#5	STR	30′-11″	32	✳K21	9	#6	STR	6′- 5″	87
A216	1	#5	STR	29′- 2″	30						
A217	1	#5	STR	27′- 6″	29	✳S1	30	#5	3	6′- 1″	190
A218	1	#5	STR	25′- 9″	27	S3	105	#4	4	10′-11″	766
A219	1	#5	STR	24′- 0″	25	✳S8	15	#4	6	2′-10″	28
A220	1	#5	STR	22′- 4″	23	S9	12	#4	7	11′- 1″	89
A221	1	#5	STR	20′- 7″	21	S10	30	#4	2	10′- 7″	212
A222	1	#5	STR	18′-11″	20	S11	228	#4	8	2′-10″	432
A223	1	#5	STR	17′- 2″	18	✳S12	15	#4	6	4′- 0″	40
A224	1	#5	STR	15′- 5″	16						
A225	1	#5	STR	13′- 9″	14	REINFORCING STEEL = 32167 LBS					
A226	1	#5	STR	12′- 0″	13	EPOXY COATED REINF. STEEL = 46514 LBS					
A227	1	#5	STR	10′- 4″	11						
A228	1	#5	STR	8′- 7″	9						
A229	1	#5	STR	6′-10″	7						
A230	1	#5	STR	5′- 2″	5						
A231	1	#5	STR	3′- 5″	4						

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON

10/27/08

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TOTAL
BILL OF MATERIAL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-88
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : William T. Parker DATE : 09/10/08
CHECKED BY : A.S. CALLAWAY DATE : 9/15/08

19-SEP-2008 14:33
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BILL OF MATERIAL
SPAN J-K-L

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	502	#5	STR	34′- 3″	17933
A2	502	#5	STR	34′- 3″	17933
✳A132	6	#5	STR	32′- 5″	203
✳A133	6	#5	STR	30′- 6″	191
✳A134	6	#5	STR	28′- 8″	179
✳A135	6	#5	STR	26′- 9″	167
✳A136	6	#5	STR	24′-11″	156
✳A137	6	#5	STR	23′- 0″	144
✳A138	6	#5	STR	21′- 2″	132
✳A139	6	#5	STR	19′- 3″	120
✳A140	6	#5	STR	17′- 5″	109
✳A141	6	#5	STR	16′- 6″	103
✳A142	6	#5	STR	13′- 8″	86
✳A143	6	#5	STR	11′- 9″	74
✳A144	6	#5	STR	9′-11″	62
✳A145	6	#5	STR	8′- 0″	50
✳A146	6	#5	STR	6′- 2″	39
✳A147	6	#5	STR	4′- 3″	27
✳A148	6	#5	STR	2′- 5″	15
A232	6	#5	STR	32′- 5″	203
A233	6	#5	STR	30′- 6″	191
A234	6	#5	STR	28′- 8″	179
A235	6	#5	STR	26′- 9″	167
A236	6	#5	STR	24′-11″	156
A237	6	#5	STR	23′- 0″	144
A238	6	#5	STR	21′- 2″	132
A239	6	#5	STR	19′- 3″	120
A240	6	#5	STR	17′- 5″	109
A241	6	#5	STR	16′- 6″	103
A242	6	#5	STR	13′- 8″	86
A243	6	#5	STR	11′- 9″	74
A244	6	#5	STR	9′-11″	62
A245	6	#5	STR	8′- 0″	50
A246	6	#5	STR	6′- 2″	39
A247	6	#5	STR	4′- 3″	27
A248	6	#5	STR	2′- 5″	15
✳B23	150	#4	STR	27′ -5″	2747
✳B24	282	#7	STR	30′- 1″	17340
✳B25	88	#7	STR	34′-10″	6266
✳B26	50	#4	STR	21′- 8″	724
B27	156	#5	STR	59′- 8″	9708
✳G3	2	#5	STR	48′- 3″	101
K4	36	#5	5	7′- 7″	285
K5	180	#5	STR	7′- 7″	1424
✳K19	8	#8	1	19′- 8″	420
✳K20	8	#8	2	27′- 2″	580
✳K21	18	#6	STR	6′- 5″	173
K22	28	#4	9	7′- 9″	145
K23	28	#4	10	15′- 6″	290
K24	12	#4	STR	8′- 5″	67
K25	60	#4	STR	10′- 8″	428
K26	12	#4	STR	6′- 5″	51
✳S1	30	#5	3	6′- 1″	190
S3	126	#4	4	10′-11″	919
✳S12	30	#4	6	4′- 0″	80
S13	12	#4	7	11′-10″	95
S14	30	#4	2	11′- 4″	227
S15	228	#4	8	3′- 7″	546
REINFORCING STEEL = 33975 LBS					
EPOXY COATED REINF. STEEL = 48411 LBS					

BILL OF MATERIAL
SPAN M-N-O

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	581	#5	STR	34′- 3″	20755
A2	581	#5	STR	34′- 3″	20755
✳A132	6	#5	STR	32′- 5″	203
✳A133	6	#5	STR	30′- 6″	191
✳A134	6	#5	STR	28′- 8″	179
✳A135	6	#5	STR	26′- 9″	167
✳A136	6	#5	STR	24′-11″	156
✳A137	6	#5	STR	23′- 0″	144
✳A138	6	#5	STR	21′- 2″	132
✳A139	6	#5	STR	19′- 3″	120
✳A140	6	#5	STR	17′- 5″	109
✳A141	6	#5	STR	16′- 6″	103
✳A142	6	#5	STR	13′- 8″	86
✳A143	6	#5	STR	11′- 9″	74
✳A144	6	#5	STR	9′-11″	62
✳A145	6	#5	STR	8′- 0″	50
✳A146	6	#5	STR	6′- 2″	39
✳A147	6	#5	STR	4′- 3″	27
✳A148	6	#5	STR	2′- 5″	15
A232	6	#5	STR	32′- 5″	203
A233	6	#5	STR	30′- 6″	191
A234	6	#5	STR	28′- 8″	179
A235	6	#5	STR	26′- 9″	167
A236	6	#5	STR	24′-11″	156
A237	6	#5	STR	23′- 0″	144
A238	6	#5	STR	21′- 2″	132
A239	6	#5	STR	19′- 3″	120
A240	6	#5	STR	17′- 5″	109
A241	6	#5	STR	16′- 6″	103
A242	6	#5	STR	13′- 8″	86
A243	6	#5	STR	11′- 9″	74
A244	6	#5	STR	9′-11″	62
A245	6	#5	STR	8′- 0″	50
A246	6	#5	STR	6′- 2″	39
A247	6	#5	STR	4′- 3″	27
A248	6	#5	STR	2′- 5″	15
✳B28	200	#4	STR	24′- 0″	3206
✳B29	282	#7	STR	33′- 4″	19214
✳B30	88	#7	STR	39′-10″	7165
✳B31	50	#4	STR	25′- 0″	835
B32	182	#5	STR	58′- 7″	11121
✳G3	2	#5	STR	48′- 3″	101
K4	36	#5	5	7′- 7″	285
K5	180	#5	STR	7′- 7″	1424
✳K19	8	#8	1	19′- 8″	420
✳K20	8	#8	2	27′- 2″	580
✳K21	18	#6	STR	6′- 5″	173
K22	28	#4	9	7′- 9″	145
K23	28	#4	10	15′- 6″	290
K24	12	#4	STR	8′- 5″	67
K25	60	#4	STR	10′- 8″	428
K26	12	#4	STR	6′- 5″	51
✳S1	30	#5	3	6′- 1″	190
S3	126	#4	4	10′-11″	919
✳S12	30	#4	6	4′- 0″	80
S13	12	#4	7	11′-10″	95
S14	30	#4	2	11′- 4″	227
S15	228	#4	8	3′- 7″	546
REINFORCING STEEL = 38210 LBS					
EPOXY COATED REINF. STEEL = 54576 LBS					

BILL OF MATERIAL
SPAN P-Q-R

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	581	#5	STR	34′- 3″	20755
A2	581	#5	STR	34′- 3″	20755
✳A132	6	#5	STR	32′- 5″	203
✳A133	6	#5	STR	30′- 6″	191
✳A134	6	#5	STR	28′- 8″	179
✳A135	6	#5	STR	26′- 9″	167
✳A136	6	#5	STR	24′-11″	156
✳A137	6	#5	STR	23′- 0″	144
✳A138	6	#5	STR	21′- 2″	132
✳A139	6	#5	STR	19′- 3″	120
✳A140	6	#5	STR	17′- 5″	109
✳A141	6	#5	STR	16′- 6″	103
✳A142	6	#5	STR	13′- 8″	86
✳A143	6	#5	STR	11′- 9″	74
✳A144	6	#5	STR	9′-11″	62
✳A145	6	#5	STR	8′- 0″	50
✳A146	6	#5	STR	6′- 2″	39
✳A147	6	#5	STR	4′- 3″	27
✳A148	6	#5	STR	2′- 5″	15
A232	6	#5	STR	32′- 5″	203
A233	6	#5	STR	30′- 6″	191
A234	6	#5	STR	28′- 8″	179
A235	6	#5	STR	26′- 9″	167
A236	6	#5	STR	24′-11″	156
A237	6	#5	STR	23′- 0″	144
A238	6	#5	STR	21′- 2″	132
A239	6	#5	STR	19′- 3″	120
A240	6	#5	STR	17′- 5″	109
A241	6	#5	STR	16′- 6″	103
A242	6	#5	STR	13′- 8″	86
A243	6	#5	STR	11′- 9″	74
A244	6	#5	STR	9′-11″	62
A245	6	#5	STR	8′- 0″	50
A246	6	#5	STR	6′- 2″	39
A247	6	#5	STR	4′- 3″	27
A248	6	#5	STR	2′- 5″	15
✳B28	200	#4	STR	24′- 0″	3206
✳B29	282	#7	STR	33′- 4″	19214
✳B30	88	#7	STR	39′-10″	7165
✳B31	50	#4	STR	25′- 0″	835
B32	182	#5	STR	58′- 7″	11121
✳G3	2	#5	STR	48′- 3″	101
K4	36	#5	5	7′- 7″	285
K5	180	#5	STR	7′- 7″	1424
✳K19	8	#8	1	19′- 8″	420
✳K20	8	#8	2	27′- 2″	580
✳K21	18	#6	STR	6′- 5″	173
K22	28	#4	9	7′- 9″	145
K23	28	#4	10	15′- 6″	290
K24	12	#4	STR	8′- 5″	67
K25	60	#4	STR	10′- 8″	428
K26	12	#4	STR	6′- 5″	51
✳S1	30	#5	3	6′- 1″	190
S3	126	#4	4	10′-11″	919
✳S12	30	#4	6	4′- 0″	80
S13	12	#4	7	11′-10″	95
S14	30	#4	2	11′- 4″	227
S15	228	#4	8	3′- 7″	546
REINFORCING STEEL = 38210 LBS					
EPOXY COATED REINF. STEEL = 54576 LBS					

BILL OF MATERIAL
SPAN S-T-U

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	559	#5	STR	34′- 3″	19969
A2	559	#5	STR	34′- 3″	19969
✳A132	6	#5	STR	32′- 5″	203
✳A133	6	#5	STR	30′- 6″	191
✳A134	6	#5	STR	28′- 8″	179
✳A135	6	#5	STR	26′- 9″	167
✳A136	6	#5	STR	24′-11″	156
✳A137	6	#5	STR	23′- 0″	144
✳A138	6	#5	STR	21′- 2″	132
✳A139	6	#5	STR	19′- 3″	120
✳A140	6	#5	STR	17′- 5″	109
✳A141	6	#5	STR	16′- 6″	103
✳A142	6	#5	STR	13′- 8″	86
✳A143	6	#5	STR	11′- 9″	74
✳A144	6	#5	STR	9′-11″	62
✳A145	6	#5	STR	8′- 0″	50
✳A146	6	#5	STR	6′- 2″	39
✳A147	6	#5	STR	4′- 3″	27
✳A148	6	#5	STR	2′- 5″	15
A232	6	#5	STR	32′- 5″	203
A233	6	#5	STR	30′- 6″	191
A234	6	#5	STR	28′- 8″	179
A235	6	#5	STR	26′- 9″	167
A236	6	#5	STR	24′-11″	156
A237	6	#5	STR	23′- 0″	144
A238	6	#5	STR	21′- 2″	132
A239	6	#5	STR	19′- 3″	120
A240	6	#5	STR	17′- 5″	109
A241	6	#5	STR	16′- 6″	103
A242	6	#5	STR	13′- 8″	86
A243	6	#5	STR	11′- 9″	74
A244	6	#5	STR	9′-11″	62
A245	6	#5	STR	8′- 0″	50
A246	6	#5	STR	6′- 2″	39
A247	6	#5	STR	4′- 3″	27
A248	6	#5	STR	2′- 5″	15
✳B33	100	#4	STR	24′- 0″	1603
✳B34	141	#7	STR	32′- 7″	9391
✳B35	44	#7	STR	38′- 9″	3485
✳B36	50	#4	STR	23′- 7″	788
✳B37	141	#7	STR	32′- 0″	9223
✳B38	44	#7	STR	37′- 8″	3388
✳ B39	75	#4	STR	29′- 8″	1486
B40	182	#5	STR	56′- 7″	10741
✳G3	2	#5	STR	48′- 3″	101
K4	36	#5	5	7′- 7″	285
K5	180	#5	STR	7′- 7″	1424
✳K19	8	#8	1	19′- 8″	420
✳K20	8	#8	2	27′- 2″	580
✳K21	18	#6	STR	6′- 5″	173
K22	28	#4	9	7′- 9″	145
K23	28	#4	10	15′- 6″	290
K24	12	#4	STR	8′- 5″	67
K25	60	#4	STR	10′- 8″	428
K26	12	#4	STR	6′- 5″	51
✳S1	30	#5	3	6′- 1″	190
S3	126	#4	4	10′-11″	919
✳S12	30	#4	6	4′- 0″	80
S13	12	#4	7	11′-10″	95
S14	30	#4	2	11′- 4″	227
S15	228	#4	8	3′- 7″	546
REINFORCING STEEL = 37044 LBS					
EPOXY COATED REINF. STEEL = 52734 LBS					

BILL OF MATERIAL
SPAN V-W-X

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	547	#5	STR	34′- 3″	19540
A2	547	#5	STR	34′- 3″	19540
✳A132	6	#5	STR	32′- 5″	203
✳A133	6	#5	STR	30′- 6″	191
✳A134	6	#5	STR	28′- 8″	179
✳A135	6	#5	STR	26′- 9″	167
✳A136	6	#5	STR	24′-11″	156
✳A137	6	#5	STR	23′- 0″	144
✳A138	6	#5	STR	21′- 2″	132
✳A139	6	#5	STR	19′- 3″	120
✳A140	6	#5	STR	17′- 5″	109
✳A141	6	#5	STR	16′- 6″	103
✳A142	6	#5	STR	13′- 8″	86
✳A143	6	#5	STR	11′- 9″	74
✳A144	6	#5	STR	9′-11″	62
✳A145	6	#5	STR	8′- 0″	50
✳A146	6	#5	STR	6′- 2″	39
✳A147	6	#5	STR	4′- 3″	27
✳A148	6	#5	STR	2′- 5″	15
A232	6	#5	STR	32′- 5″	203
A233	6	#5	STR	30′- 6″	191
A234	6	#5	STR	28′- 8″	179
A235	6	#5	STR	26′- 9″	167
A236	6	#5	STR	24′-11″	156
A237	6	#5	STR	23′- 0″	144
A238	6	#5	STR	21′- 2″	132
A239	6	#5	STR	19′- 3″	120
A240	6	#5	STR	17′- 5″	109
A241	6	#5	STR	16′- 6″	103
A242	6	#5	STR	13′- 8″	86
A243	6	#5	STR	11′- 9″	74
A244	6	#5	STR	9′-11″	62
A245	6	#5	STR	8′- 0″	50
A246	6	#5	STR	6′- 2″	39
A247	6	#5	STR	4′- 3″	27
A248	6	#5	STR	2′- 5″	15
✳B41	75	#4	STR	29′- 8″	1486
✳B42	141	#7	STR	32′- 0″	9223
✳B43	44	#7	STR	37′- 8″	3388
✳B44	50	#4	STR	23′- 7″	788
✳B45	141	#7	STR	32′-10″	9174
✳B46	44	#7	STR	37′- 6″	3373
✳ B47	75	#4	STR	29′- 5″	1474
B48	182	#5	STR	54′-11″	10425
✳G3	2	#5	STR	48′- 3″	101
K4	36	#5	5	7′- 7″	285
K5	180	#5	STR	7′- 7″	1424
✳K19	8	#8	1	19′- 8″	420
✳K20	8	#8	2	27′- 2″	580
✳K21	18	#6	STR	6′- 5″	173
K22	28	#4	9	7′- 9″	145
K23	28	#4	10	15′- 6″	290
K24	12	#4	STR	8′- 5″	67
K25	60	#4	STR	10′- 8″	428
K26	12	#4	STR	6′- 5″	51
✳S1	30	#5	3	6′- 1″	190
S3	126	#4	4	10′-11″	919
✳S12	15	#4	6	4′- 0″	40
S13	12	#4	7	11′-10″	95
S14	30	#4	2	11′- 4″	227
S15	228	#4	8	3′- 7″	546
S16	15	#4	6	4′-10″	48
REINFORCING STEEL = 36347 LBS					
EPOXY COATED REINF. STEEL = 52096 LBS					

✳DENOTES EPOXY COATED REINFORCING STEEL.

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TOTAL
BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-89
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : William T. Parker DATE : 09/10/08
CHECKED BY : A.S. CALLAWAY DATE : 9/15/08

19-SEP-2008 14:33
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danderson

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

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

GROOVING BRIDGE FLOORS

APPROACH SLABS	1391	SQ.FT.
BRIDGE DECK	85,763	SQ.FT.
TOTAL	87,154	SQ.FT.

SUPERSTRUCTURE BILL OF MATERIAL

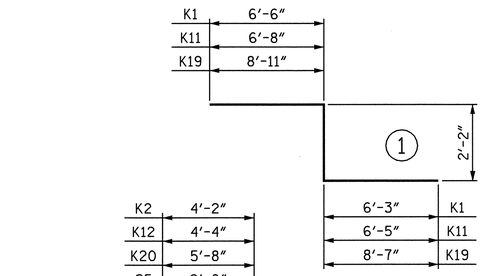
	CLASS AA CONCRETE POUR #1	CLASS AA CONCRETE POUR #2	CLASS AA CONCRETE POUR #3	CLASS AA CONCRETE TOTAL	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU. YDS.)	(CU. YDS.)	(CU. YDS.)	(CU. YDS.)	(LBS.)	(LBS.)
SPAN A-B	142.7	195.8	———	338.5	23045	30449
SPAN C-D	158.4	194.9	———	353.3	24823	32705
SPAN E-F	158.4	175.4	———	333.8	22041	29557
SPAN G-H-I	149.4	173.1	158.9	481.4	32167	46514
SPAN J-K-L	105.1	177.0	192.7	474.8	33975	48411
SPAN M-N-O	159.4	185.3	200.1	544.8	37904	54576
SPAN P-Q-R	159.4	185.3	200.1	544.8	38210	54576
SPAN S-T-U	159.4	195.0	205.4	559.8	37044	52734
SPAN V-W-X	162.8	189.7	203.6	556.1	36347	52096
TOTALS**	———	———	———	4187.3	285556	401618

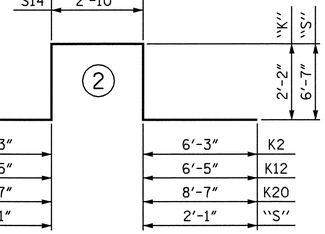
**QUANTITIES FOR PARAPET ARE NOT INCLUDED

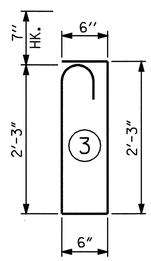
FOR LOCATION OF POURS, SEE "POURING SEQUENCE" SHEETS.

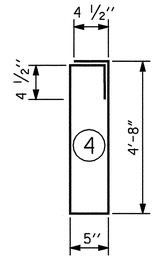
BAR TYPES

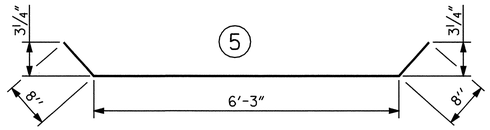
ALL BAR DIMENSIONS ARE OUT TO OUT

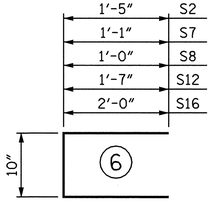


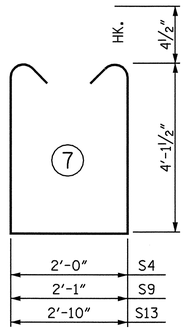


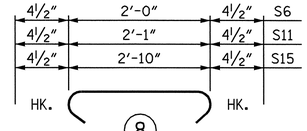


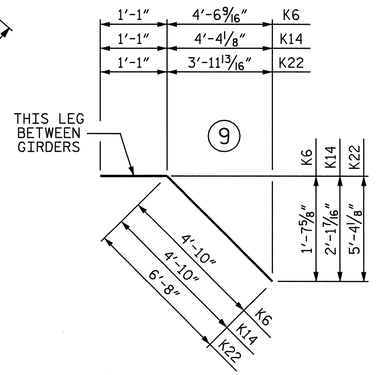


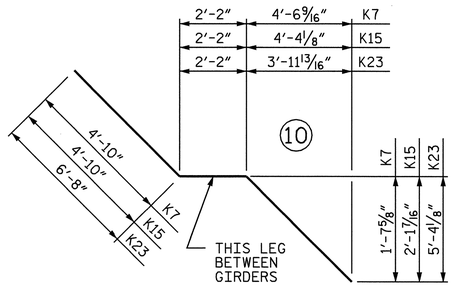


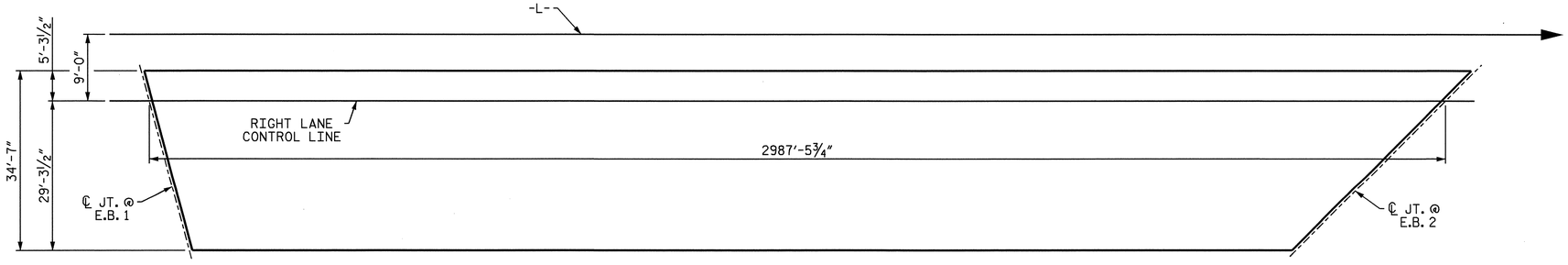












LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 102,790)

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE
TOTAL
BILL OF MATERIAL

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/22/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-90
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : William F. Parker DATE : 09/10/08
CHECKED BY : A.S. CALLAWAY DATE : 9/15/08

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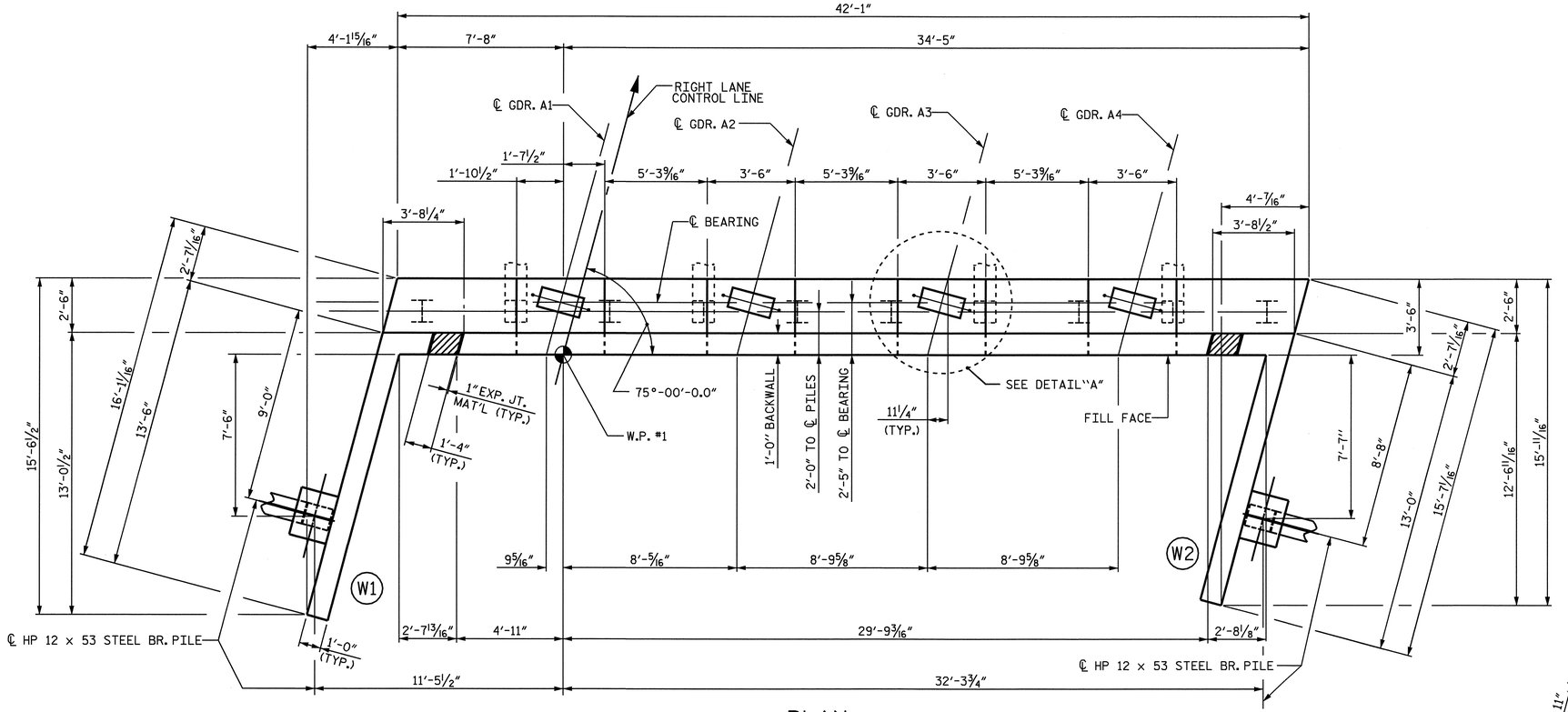
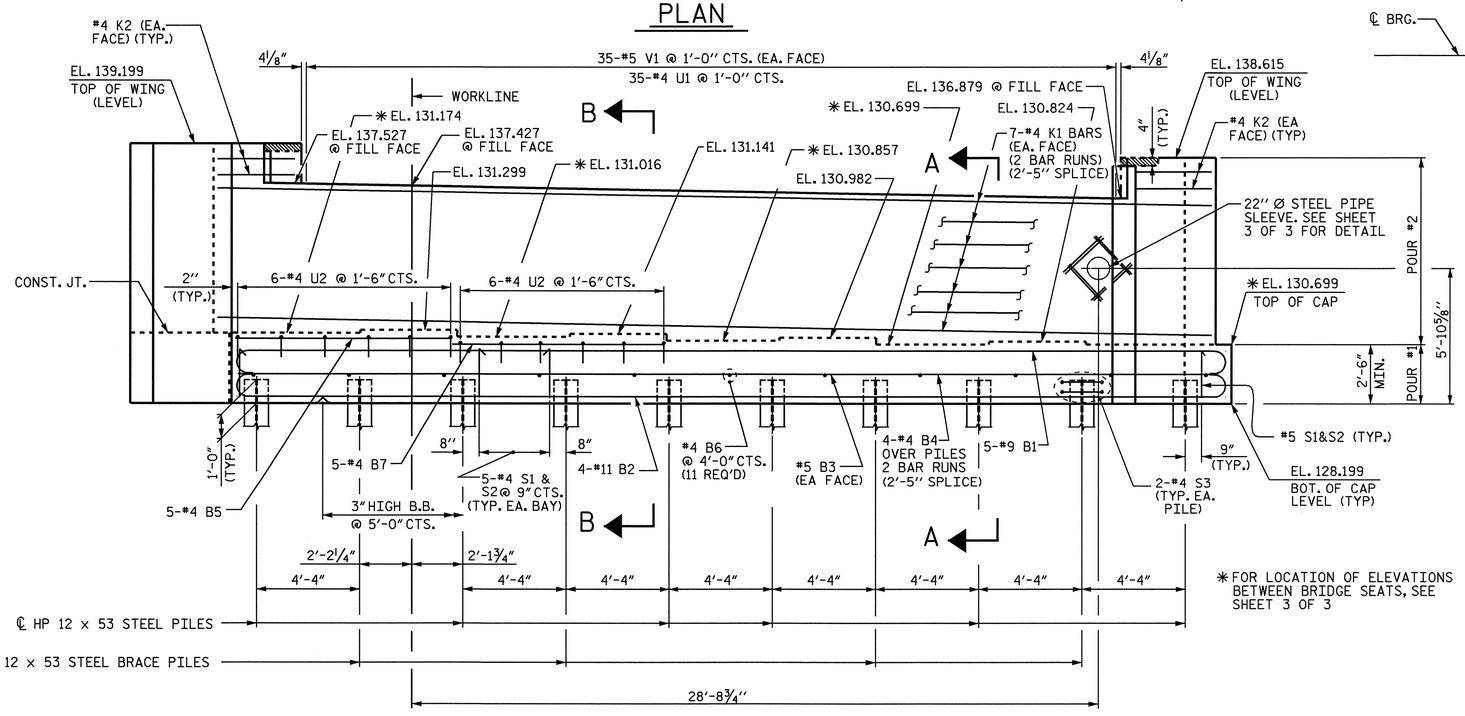
jtillman

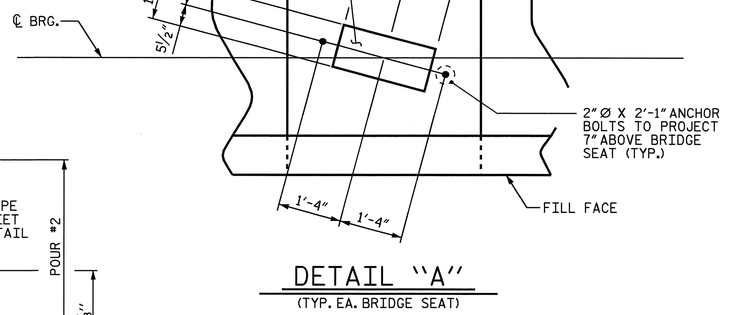


PLAN



ELEVATION

NOTE:
22" Ø STEEL PIPE SLEEVE BACKWALL INSERT IS TO BE FLUSH WITH BOTH SIDES OF BACKWALL AND IS TO BE PLACED SO THAT THE OPENING IS PARALLEL TO THE BEAMS.



DETAIL "A"
(TYP. EA. BRIDGE SEAT)

NOTES

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 1/4" PER FOOT.

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

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAILS ARE CAST IF SLIP FORMING IS USED.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

THE DIMENSION AND DETAILS SHOWN FOR THE STEEL PIPE SLEEVE ARE FOR CONTRACTOR'S BENEFIT IN PLACING THE SLEEVE AND SHOULD NOT BE CONSTRUED TO BE AN APPROVAL FOR THE ATTACHMENT OF THE UTILITY TO THE STRUCTURE.

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/26/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-91
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : S. M. RASHIDI DATE : 6/30/08
CHECKED BY : J. A. TILLMAN DATE : 7/17/08

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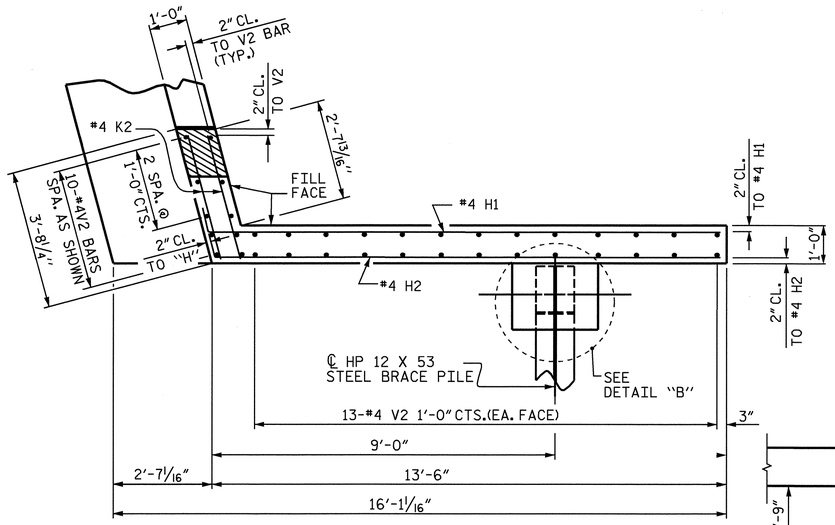
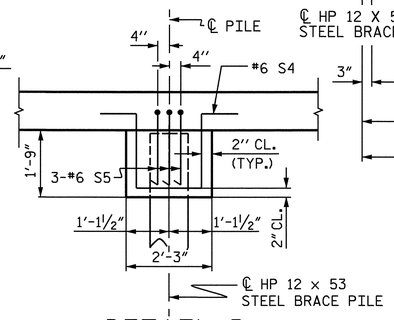
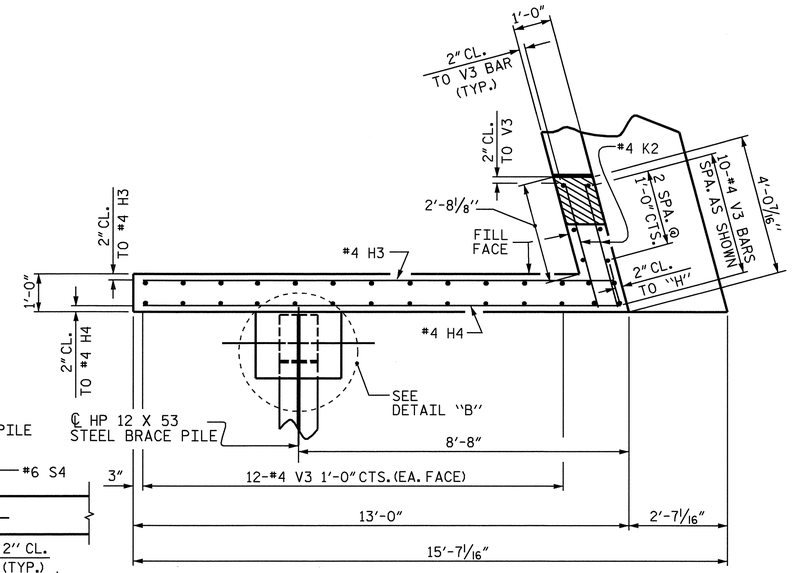


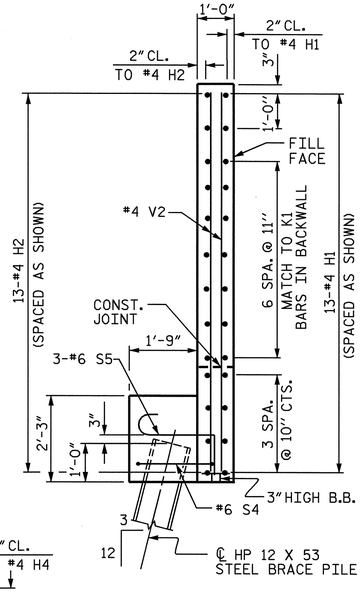
PLAN OF WING W1



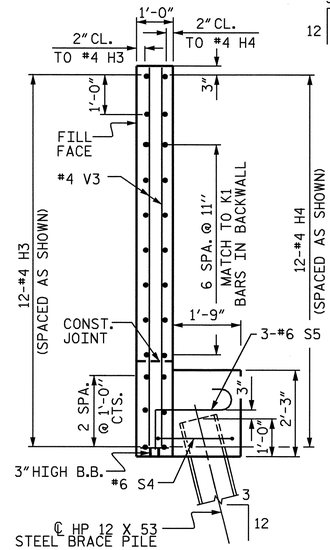
DETAIL B



PLAN OF WING W2



SECTION X-X



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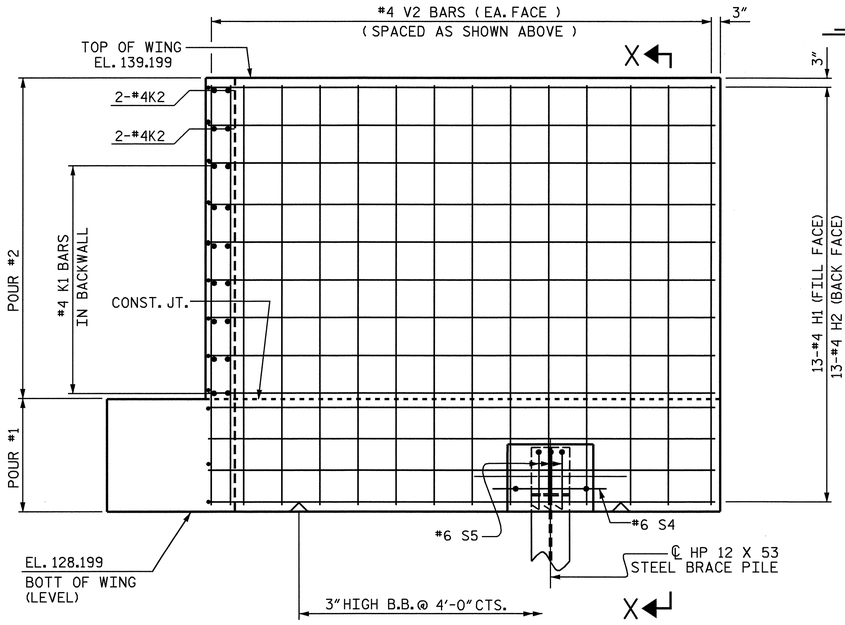
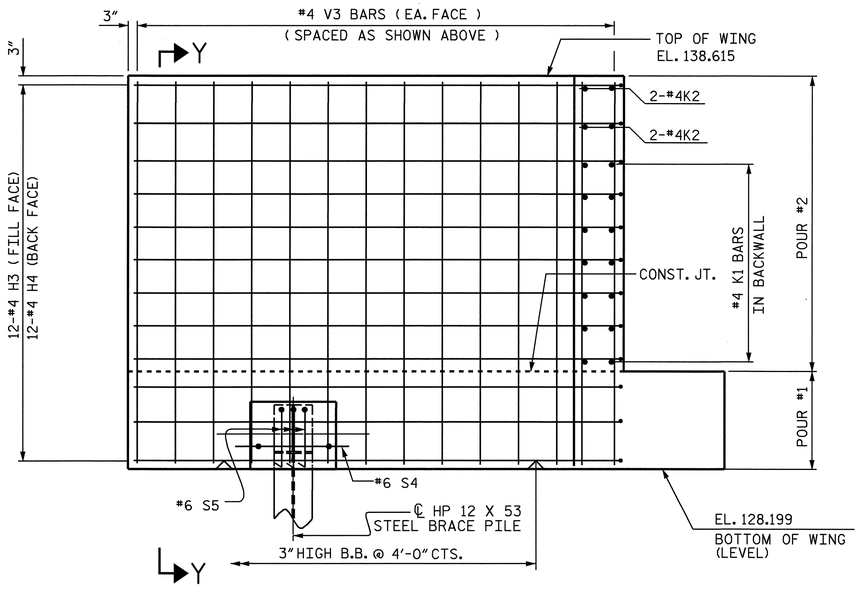


ELEVATION OF WING W1



ELEVATION OF WING W2

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-92
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/26/08

DRAWN BY : S. M. RASHIDI DATE : 6/30/08
CHECKED BY : J. A. TILLMAN DATE : 7/17/08

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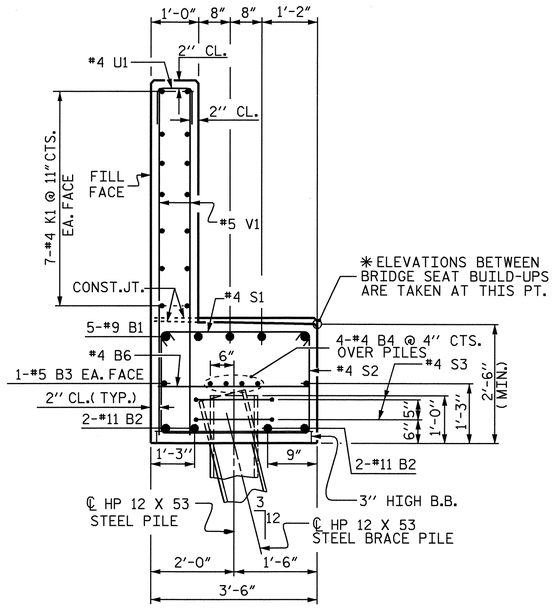
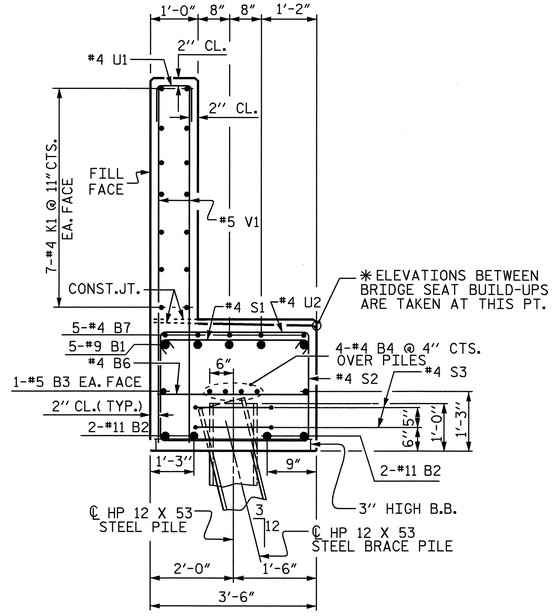
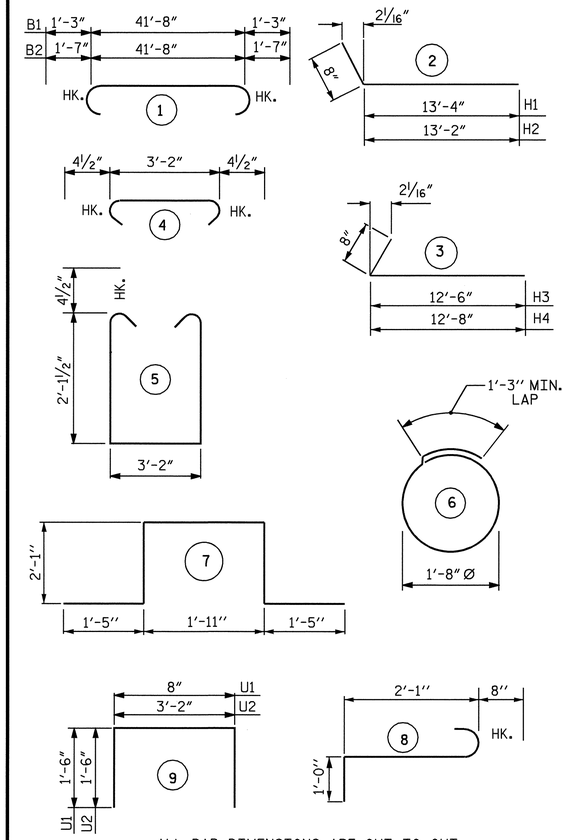


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	5	9	1	44'-2"	751
B2	4	11	1	44'-10"	953
B3	2	5	STR	41'-8"	87
B4	8	4	STR	22'-1"	118
B5	5	4	STR	9'-0"	30
B6	11	4	STR	3'-2"	24
B7	5	4	STR	8'-6"	28
H1	13	4	2	14'-0"	122
H2	13	4	2	13'-10"	120
H3	12	4	3	13'-2"	106
H4	12	4	3	13'-4"	107
K1	28	4	STR	22'-1"	413
K2	8	4	STR	3'-5"	18
P1	16	4	STR	3'-10"	41
S1	47	4	4	3'-11"	123
S2	47	4	5	8'-2"	256
S3	20	4	6	6'-6"	87
S4	2	6	7	8'-11"	27
S5	6	6	8	3'-9"	34
U1	35	4	9	3'-8"	86
U2	12	4	9	9'-6"	76
V1	70	5	STR	8'-3"	602
V2	36	4	STR	10'-7"	255
V3	34	4	STR	10'-0"	227

REINFORCING STEEL TOTAL LBS. 4691

CLASS A CONCRETE

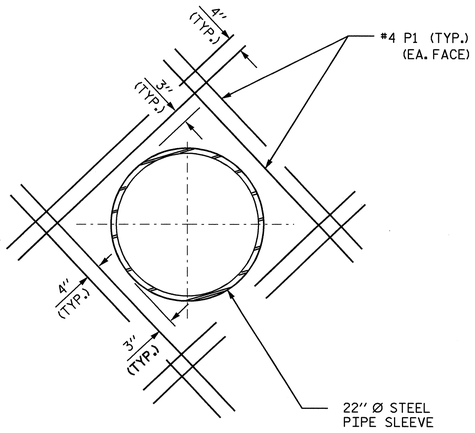
POUR #1 CAP & LOWER PORTION OF WINGS 17.6 CU. YD.

POUR #2 BACKWALL & UPPER PORTION OF WINGS 17.5 CU. YD.

TOTAL CLASS A CONCRETE 35.1 CU. YD.

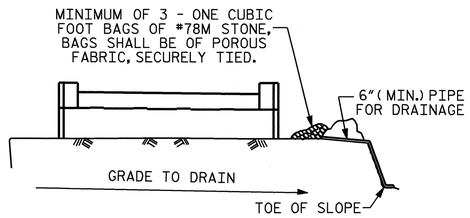
HP 12 X 53 STEEL PILES

NO. 12 LIN. FEET 180



22" Ø STEEL PIPE SLEEVE DETAIL

THE REINFORCING STEEL IN BACKWALL WILL BE CUT AND FIELD BENT AS NECESSARY TO CLEAR STEEL PIPE SLEEVE.

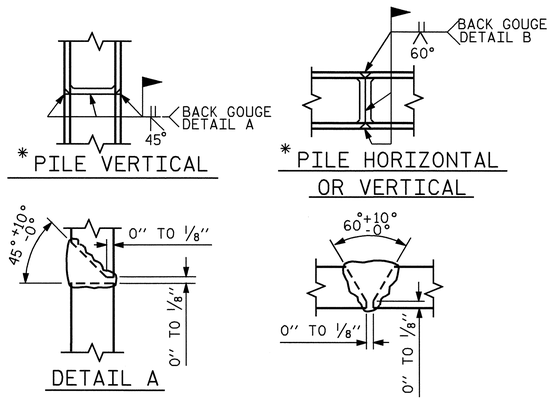


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



✱POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11259 DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

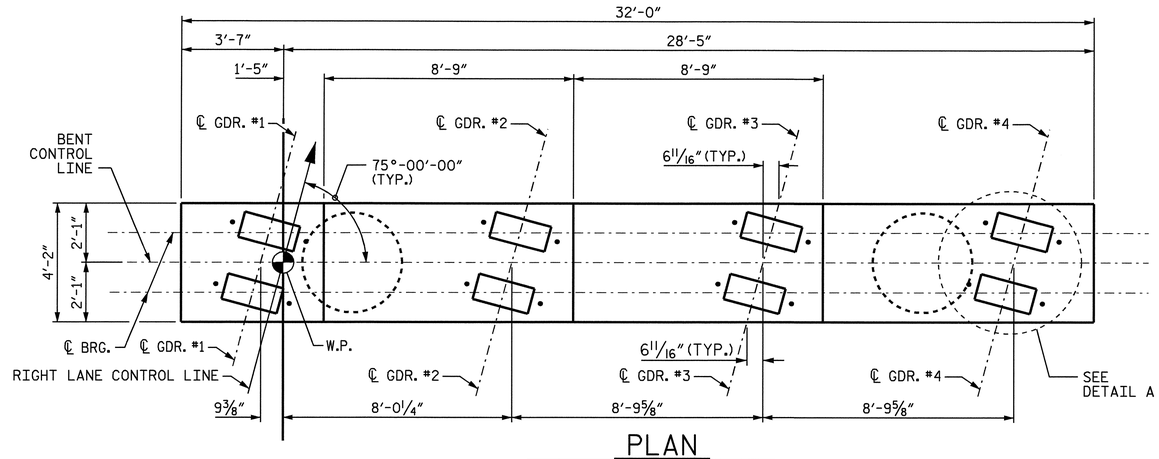
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 1

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-93
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : S. M. RASHIDI DATE : 6/30/08
CHECKED BY : J. A. TILLMAN DATE : 7/17/08

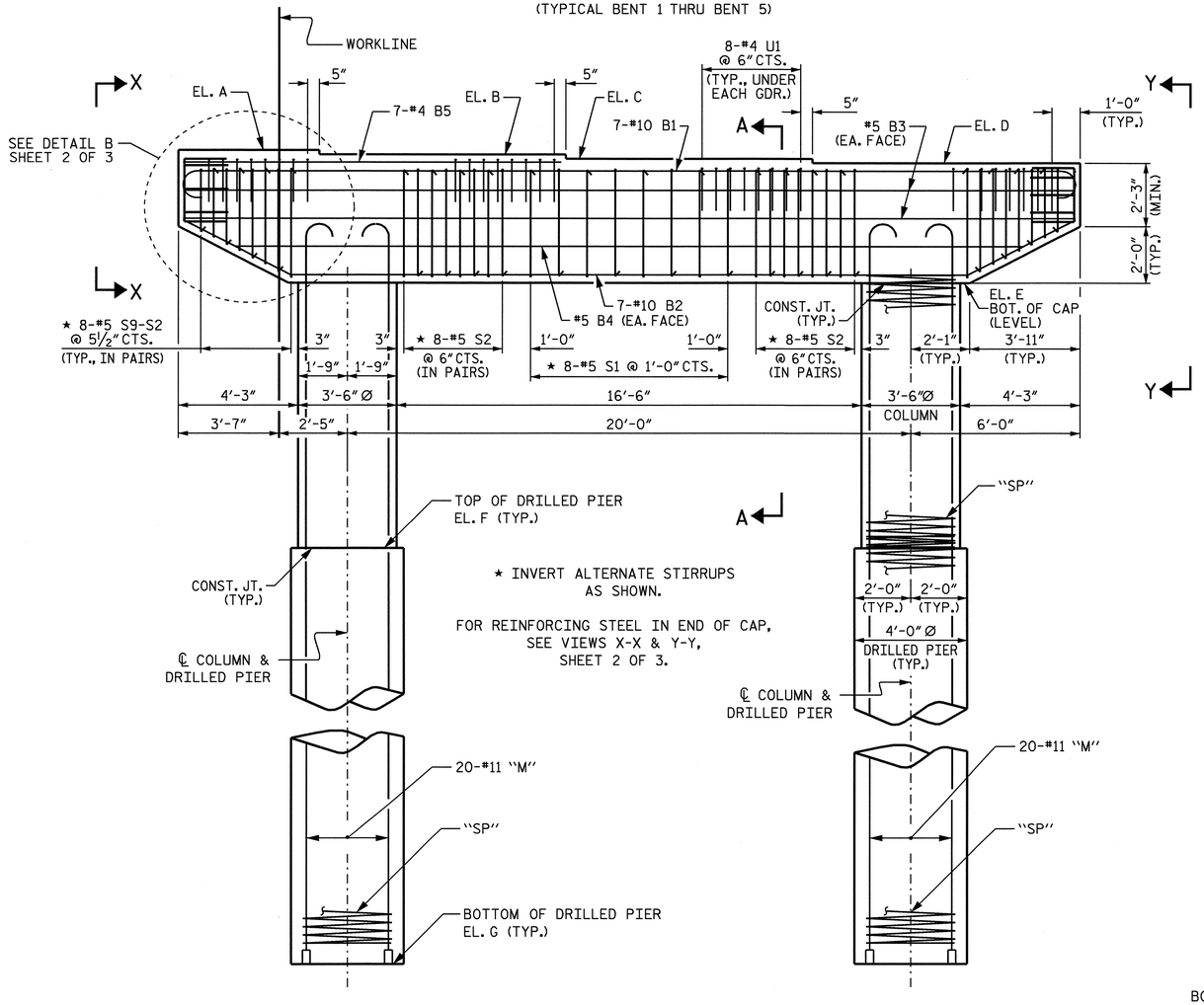


SPANS B THRU F

SPANS A THRU E

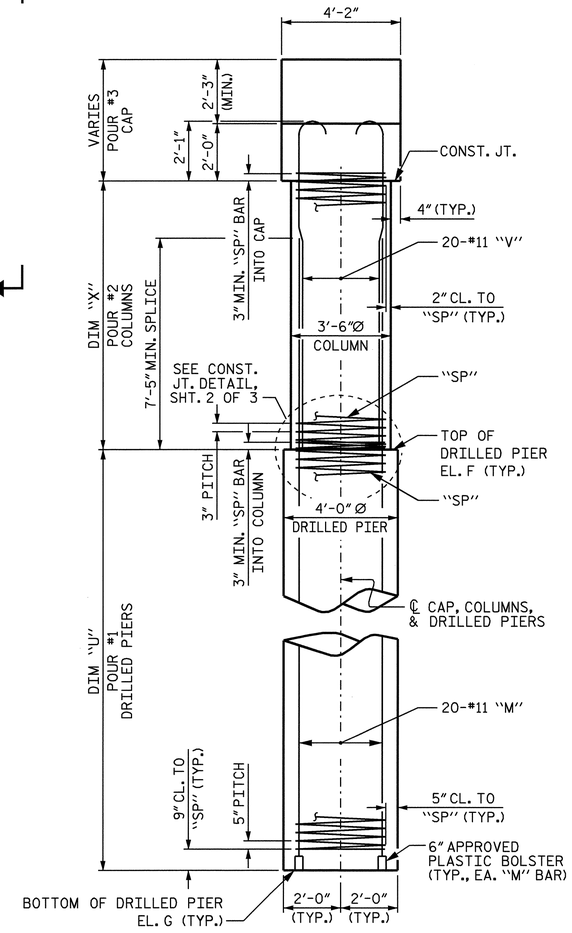
PLAN

(TYPICAL BENT 1 THRU BENT 5)



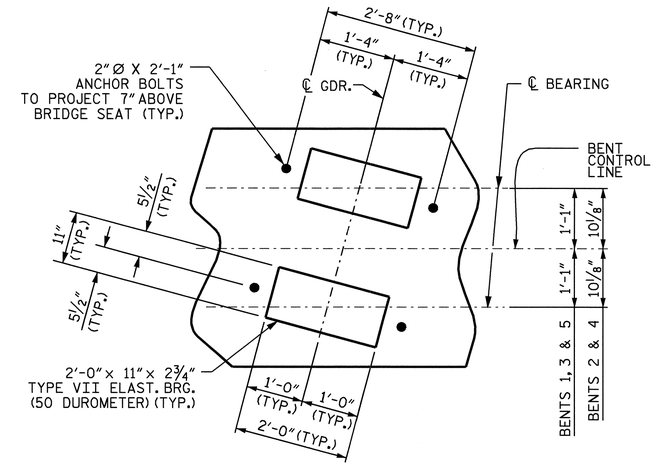
ELEVATION

(TYPICAL BENT 1 THRU BENT 5)



END ELEVATION

(TYPICAL BENT 1 THRU BENT 5)



DETAIL A

(TYP. EA. GDR.)

		BENT 1	BENT 2	BENT 3	BENT 4	BENT 5
BRIDGE SEAT & BOTTOM OF CAP ELEVATIONS	EL. A	131.856	132.527	133.196	133.868	134.537
	EL. B	131.697	132.369	133.038	133.709	134.378
	EL. C	131.539	132.210	132.879	133.551	134.220
	EL. D	131.380	132.052	132.721	133.392	134.061
	EL. E	127.130	127.802	128.471	129.142	129.811
COLUMN & DRILLED PIER ELEVATIONS	EL. F	117.713	112.469	109.971	109.475	109.811
	EL. G	98.463	93.469 (L) 95.969 (R)	88.471	88.475	87.978

	BENT 1	BENT 2	BENT 3	BENT 4	BENT 5
DIMENSION "X" (IN FT.)	9.417	15.333	18.500	19.667	20.000
DIMENSION "U" (IN FT.)	19.250	19.000 (L) 16.500 (R)	21.500	21.000	21.833

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1 THRU BENT 5

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/26/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-94
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : TRAN/WITHROW DATE : 9/11/08
CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

20-NOV-2008 14:42
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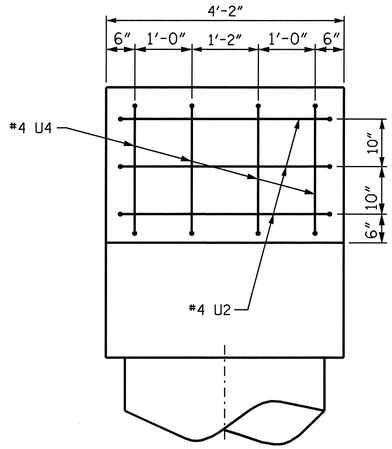
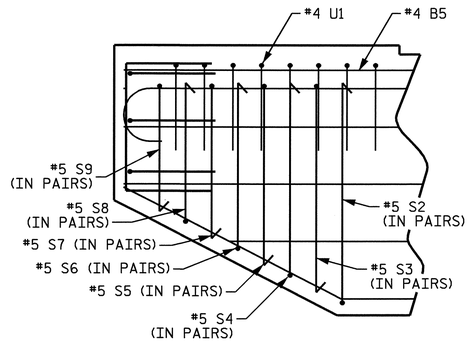
NCDOT



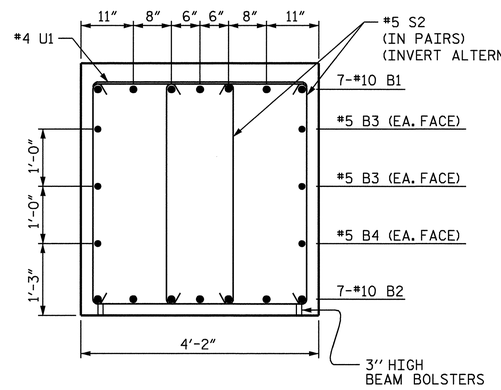
VIEW X-X

(TYPICAL BENT 1 THRU BENT 5)



DETAIL B

(TYPICAL EACH END)
(TYPICAL BENT 1 THRU BENT 5)



SECTION A-A

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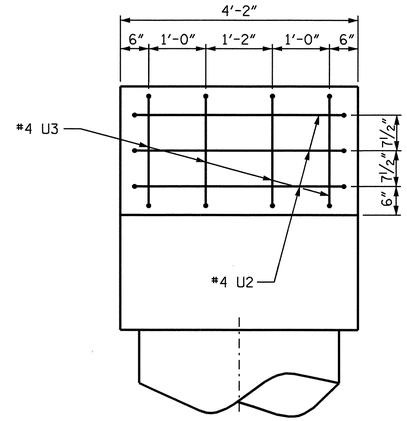

VIEW Y-Y

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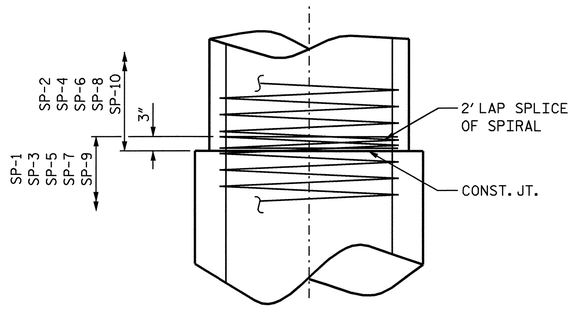

CONSTRUCTION JOINT DETAIL

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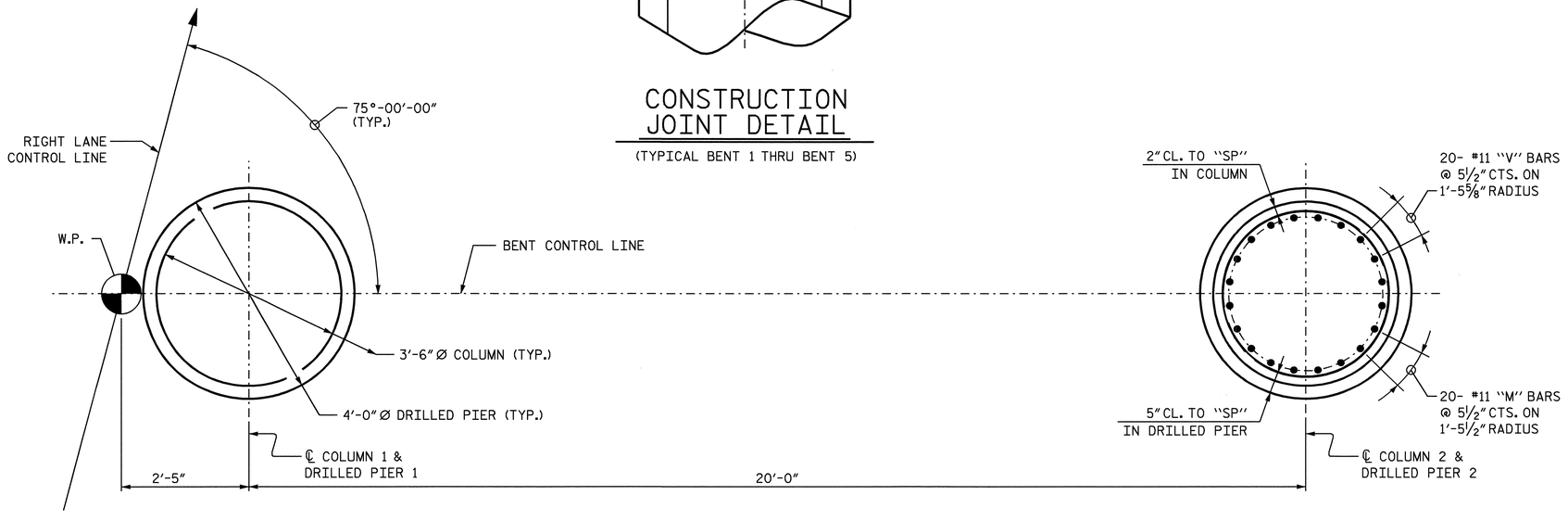

PLAN OF DRILLED PIERS & COLUMNS

(ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL, BENT 1 THRU BENT 5)

NOTES

STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONTRACTOR SHALL ALIGN THE "V" & "M" BARS AS SHOWN IN THE PLAN OF DRILLED PIERS AND COLUMNS.

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

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3'-0" OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/26/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1 THRU BENT 5

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-95
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : TRAN/WITHROW DATE : 9/11/08
CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

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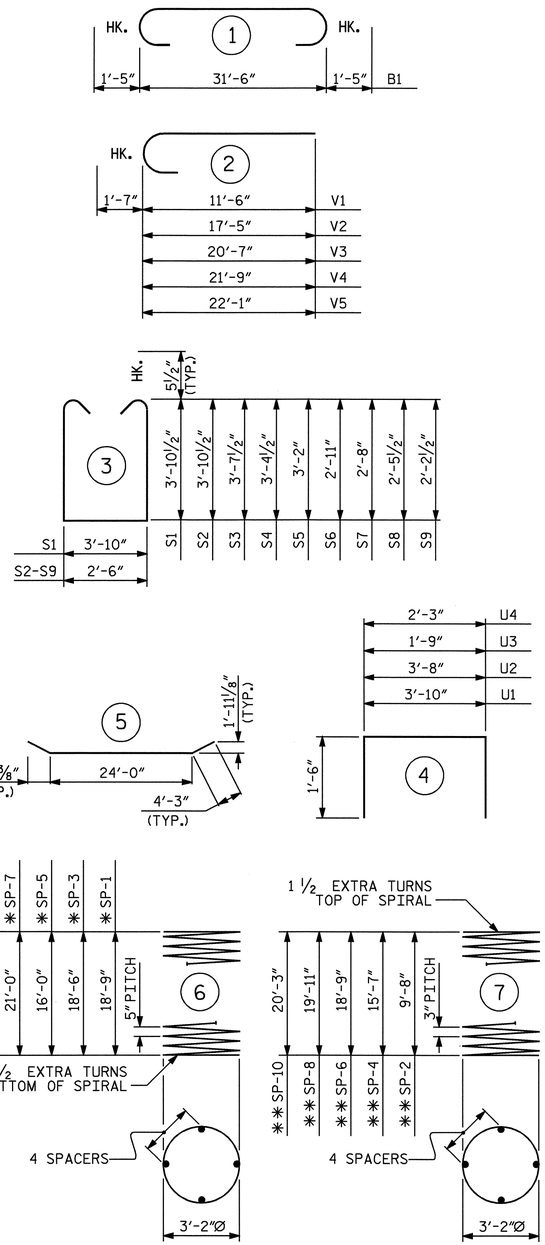
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL — BENT 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	34'-4"	1034
B2	7	#10	5	32'-6"	979
B3	4	#5	STR	31'-8"	132
B4	2	#5	STR	28'-0"	58
B5	7	#4	STR	13'-5"	63
M1	40	#11	STR	29'-2"	6199
S1	8	#5	3	12'-6"	104
S2	36	#5	3	11'-2"	419
S3	4	#5	3	10'-8"	45
S4	4	#5	3	10'-2"	42
S5	4	#5	3	9'-9"	41
S6	4	#5	3	9'-3"	39
S7	4	#5	3	8'-9"	37
S8	4	#5	3	8'-4"	35
S9	4	#5	3	7'-10"	33
U1	32	#4	4	6'-10"	146
U2	6	#4	4	6'-8"	27
U3	4	#4	4	4'-9"	13
U4	4	#4	4	5'-3"	14
V1	40	#11	2	13'-1"	2780

REINFORCING STEEL = 12240 LBS

SP-1	2	*	6	460'-4"	960
SP-2	2	**	7	402'-8"	538

SPIRAL COLUMN
REINFORCING STEEL = 1498 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 6.8
POUR #3 (CAP) = C. Y. 21.0
TOTAL = C. Y. 27.8

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 18.0
4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 20.5
4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 15.5
CSL TUBES LIN. FT. 154.0

BILL OF MATERIAL — BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	34'-4"	1034
B2	7	#10	5	32'-6"	979
B3	4	#5	STR	31'-8"	132
B4	2	#5	STR	28'-0"	58
B5	7	#4	STR	13'-5"	63
M2 (L)	20	#11	STR	28'-11"	3073
M3 (R)	20	#11	STR	26'-5"	2807
S1	8	#5	3	12'-6"	104
S2	36	#5	3	11'-2"	419
S3	4	#5	3	10'-8"	45
S4	4	#5	3	10'-2"	42
S5	4	#5	3	9'-9"	41
S6	4	#5	3	9'-3"	39
S7	4	#5	3	8'-9"	37
S8	4	#5	3	8'-4"	35
S9	4	#5	3	7'-10"	33
U1	32	#4	4	6'-10"	146
U2	6	#4	4	6'-8"	27
U3	4	#4	4	4'-9"	13
U4	4	#4	4	5'-3"	14
V2	40	#11	2	19'-0"	4038

REINFORCING STEEL = 13179 LBS

SP-3	1	*	6	450'-7"	470
SP-4	2	**	7	628'-7"	840
SP-5	1	*	6	391'-9"	409

SPIRAL COLUMN
REINFORCING STEEL = 1719 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 11.0
POUR #3 (CAP) = C. Y. 21.0
TOTAL = C. Y. 32.0

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 16.5
4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 19.5
4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 16.0
PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 15.0
CSL TUBES LIN. FT. 142.0

BILL OF MATERIAL — BENT 3

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	34'-4"	1034
B2	7	#10	5	32'-6"	979
B3	4	#5	STR	31'-8"	132
B4	2	#5	STR	28'-0"	58
B5	7	#4	STR	13'-5"	63
M4	40	#11	STR	31'-5"	6677
S1	8	#5	3	12'-6"	104
S2	36	#5	3	11'-2"	419
S3	4	#5	3	10'-8"	45
S4	4	#5	3	10'-2"	42
S5	4	#5	3	9'-9"	41
S6	4	#5	3	9'-3"	39
S7	4	#5	3	8'-9"	37
S8	4	#5	3	8'-4"	35
S9	4	#5	3	7'-10"	33
U1	32	#4	4	6'-10"	146
U2	6	#4	4	6'-8"	27
U3	4	#4	4	4'-9"	13
U4	4	#4	4	5'-3"	14
V3	40	#11	2	22'-2"	4711

REINFORCING STEEL = 14649 LBS

SP-6	2	**	7	756'-3"	1010
SP-7	2	*	6	509'-4"	1062

SPIRAL COLUMN
REINFORCING STEEL = 2072 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 13.2
POUR #3 (CAP) = C. Y. 21.0
TOTAL = C. Y. 34.2

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 21.0
4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 27.0
4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 16.0
PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 24.0
CSL TUBES LIN. FT. 172.0

BILL OF MATERIAL — BENT 4

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	34'-4"	1034
B2	7	#10	5	32'-6"	979
B3	4	#5	STR	31'-8"	132
B4	2	#5	STR	28'-0"	58
B5	7	#4	STR	13'-5"	63
M2	40	#11	STR	30'-11"	6570
S1	8	#5	3	12'-6"	104
S2	36	#5	3	11'-2"	419
S3	4	#5	3	10'-8"	45
S4	4	#5	3	10'-2"	42
S5	4	#5	3	9'-9"	41
S6	4	#5	3	9'-3"	39
S7	4	#5	3	8'-9"	37
S8	4	#5	3	8'-4"	35
S9	4	#5	3	7'-10"	33
U1	32	#4	4	6'-10"	146
U2	6	#4	4	6'-8"	27
U3	4	#4	4	4'-9"	13
U4	4	#4	4	5'-3"	14
V4	40	#11	2	23'-4"	4959

REINFORCING STEEL = 14790 LBS

SP-8	2	**	7	805'-4"	1076
SP-9	2	*	6	499'-6"	1042

SPIRAL COLUMN
REINFORCING STEEL = 2118 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 14.0
POUR #3 (CAP) = C. Y. 21.0
TOTAL = C. Y. 35.0

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 19.6
4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 24.0
4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 24.0
CSL TUBES LIN. FT. 168.0

BILL OF MATERIAL — BENT 5

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	34'-4"	1034
B2	7	#10	5	32'-6"	979
B3	4	#5	STR	31'-8"	132
B4	2	#5	STR	28'-0"	58
B5	7	#4	STR	13'-5"	63
M5	40	#11	STR	31'-9"	6748
S1	8	#5	3	12'-6"	104
S2	36	#5	3	11'-2"	419
S3	4	#5	3	10'-8"	45
S4	4	#5	3	10'-2"	42
S5	4	#5	3	9'-9"	41
S6	4	#5	3	9'-3"	39
S7	4	#5	3	8'-9"	37
S8	4	#5	3	8'-4"	35
S9	4	#5	3	7'-10"	33
U1	32	#4	4	6'-10"	146
U2	6	#4	4	6'-8"	27
U3	4	#4	4	4'-9"	13
U4	4	#4	4	5'-3"	14
V5	40	#11	2	23'-8"	5030

REINFORCING STEEL = 15039 LBS

SP-10	2	**	7	815'-2"	1089
SP-11	2	*	6	519'-1"	1083

SPIRAL COLUMN
REINFORCING STEEL = 2172 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 14.3
POUR #3 (CAP) = C. Y. 21.0
TOTAL = C. Y. 35.3

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 20.3
4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 25.7
4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 23.7
CSL TUBES LIN. FT. 174.7

* THE SP-1, SP-3, SP-5, SP-7, SP-9 & SP-11 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2, SP-4, SP-6, SP-8 & SP-10 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 1 THRU BENT 5

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-96
1			3			TOTAL SHEETS
2			4			115

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CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

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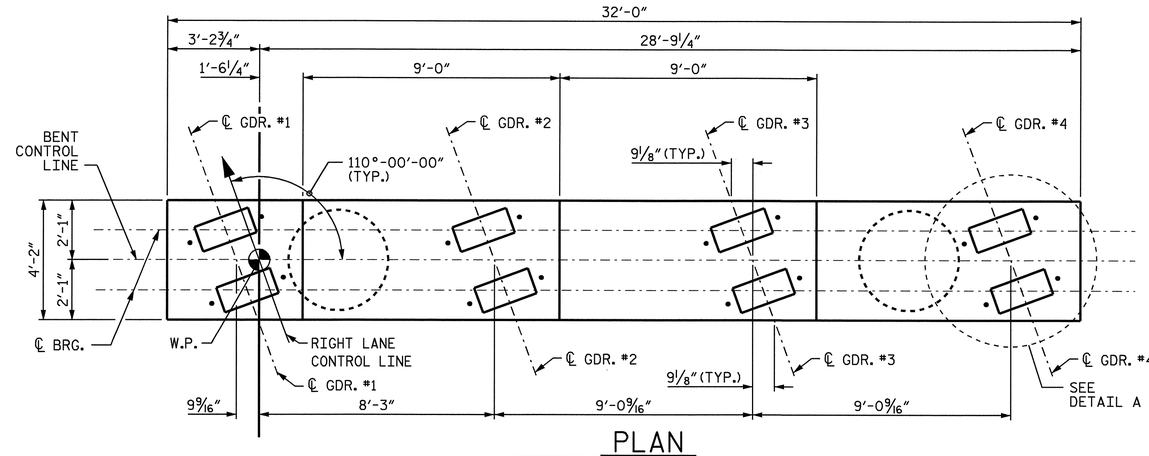
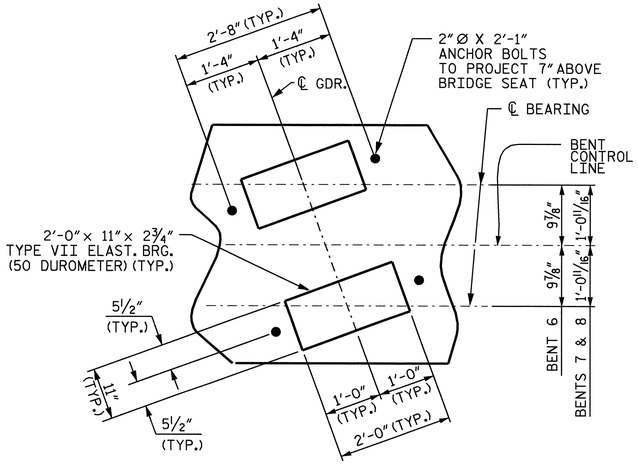


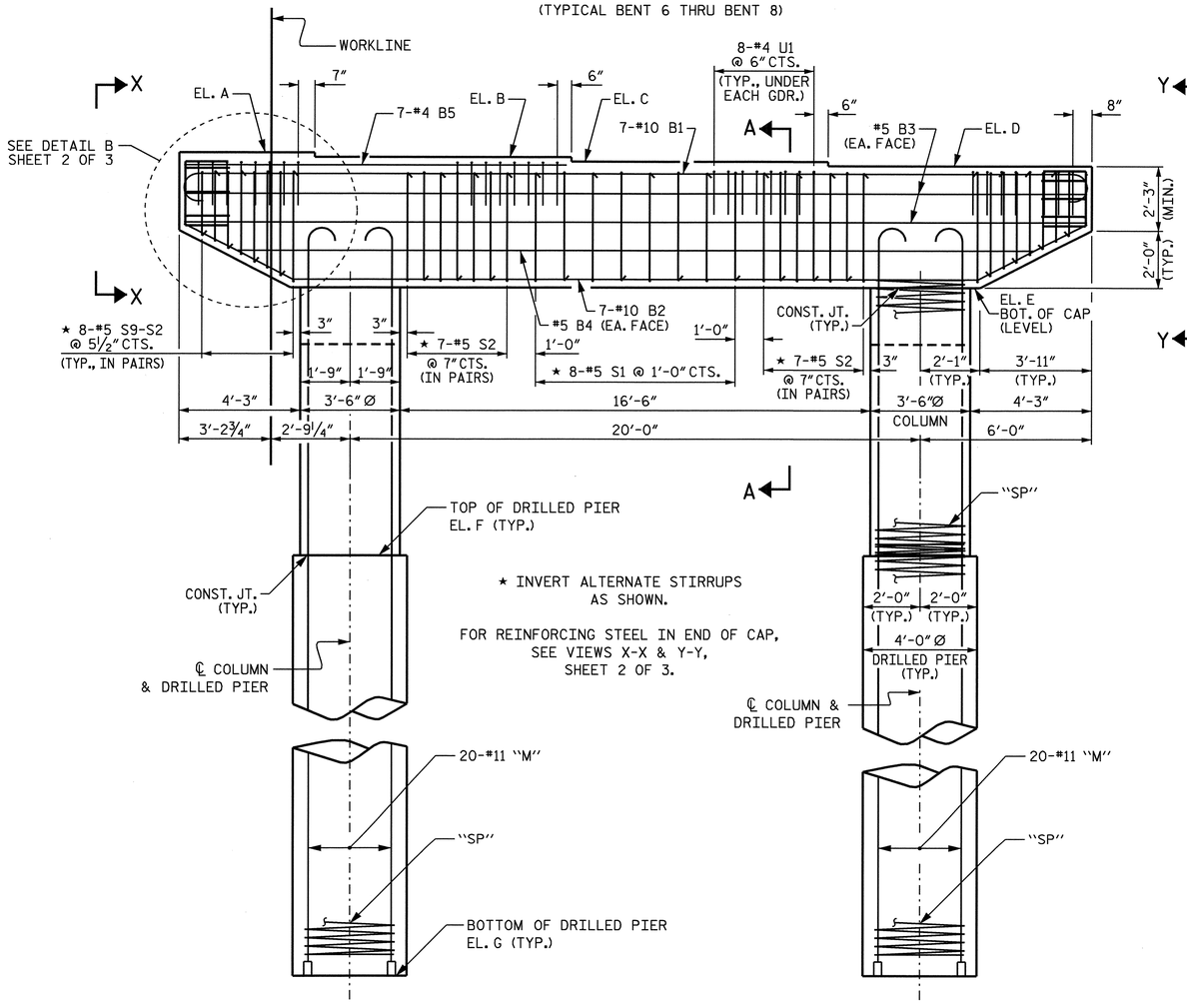
PLAN

(TYPICAL BENT 6 THRU BENT 8)



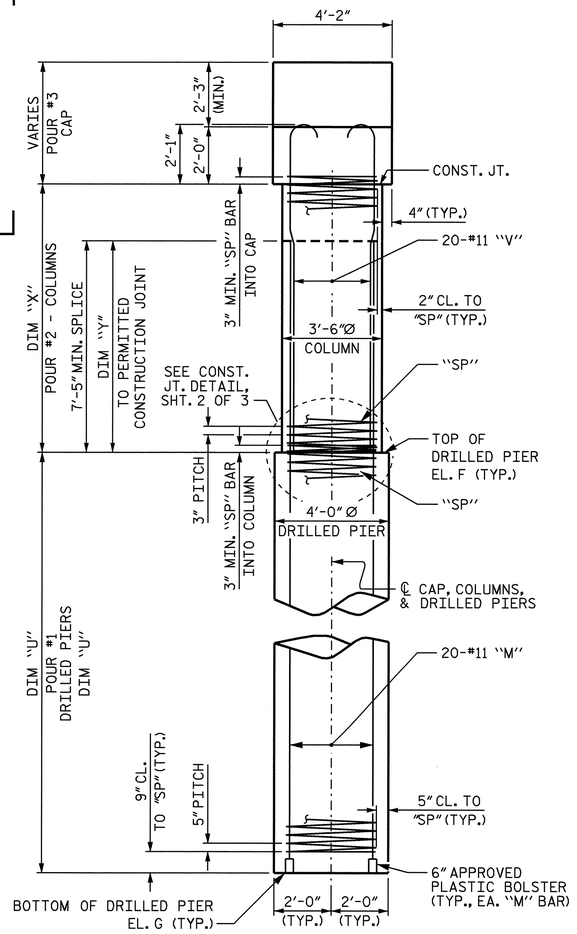
DETAIL A

(TYP. EA. GDR.)



ELEVATION

(TYPICAL BENT 6 THRU BENT 8)



END ELEVATION

(TYPICAL BENT 6 THRU BENT 8)

		BENT 6	BENT 7	BENT 8
BRIDGE SEAT & BOTTOM OF CAP ELEVATIONS	EL. A	135.095	135.680	136.267
	EL. B	134.909	135.494	136.081
	EL. C	134.723	135.309	135.896
	EL. D	134.538	135.123	135.710
	EL. E	130.288	130.873	131.460
COLUMN & DRILLED PIER ELEVATIONS	EL. F	110.121	111.206	113.127
	EL. G	88.954	85.956 (L) 88.956 (R)	87.960

	BENT 6	BENT 7	BENT 8
DIMENSION "X" (IN FT.)	20.167	19.667	18.333
DIMENSION "Y" (IN FT.)	10.000	-	-
DIMENSION "U" (IN FT.)	21.167	25.250 (L) 22.250 (R)	25.167

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 6 THRU BENT 8

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON

11/26/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-97
1			3			TOTAL SHEETS
2			4			115

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CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

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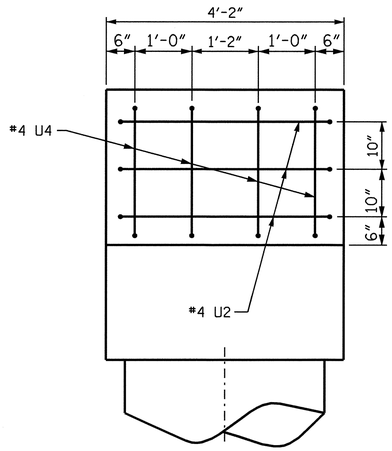
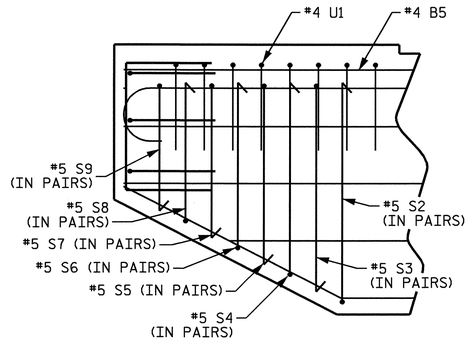
jtillman

NCDOT



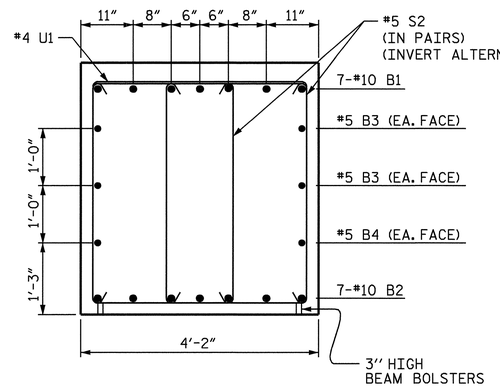
VIEW X-X

(TYPICAL BENT 6 THRU BENT 8)



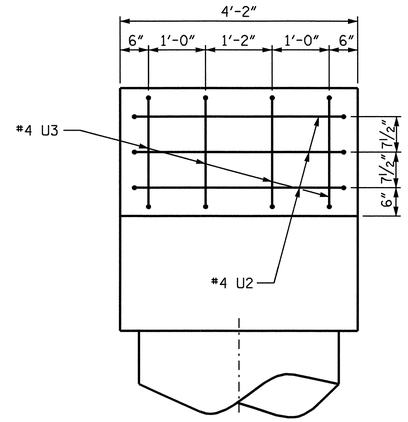
DETAIL B

(TYPICAL EACH END)
(TYPICAL BENT 6 THRU BENT 8)



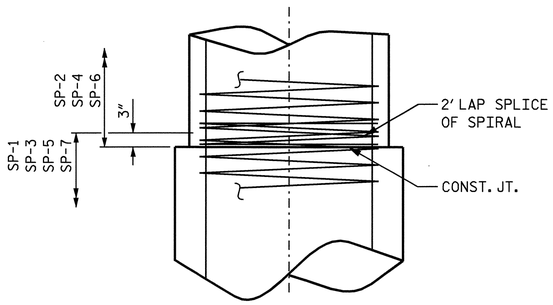
SECTION A-A

(TYPICAL BENT 6 THRU BENT 8)



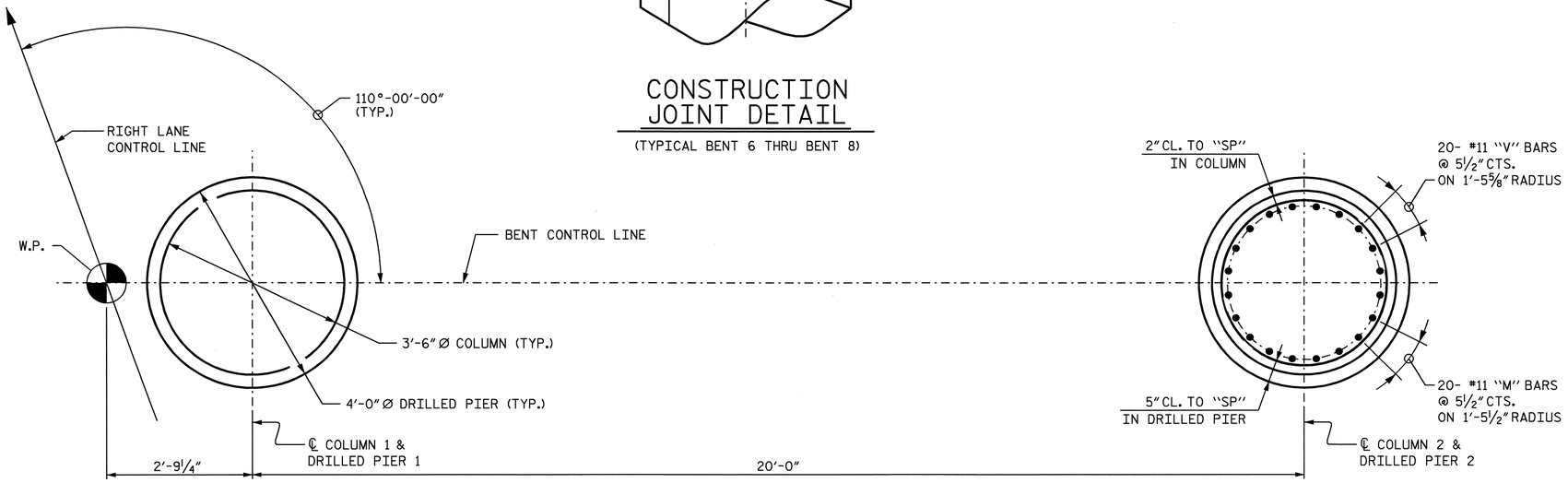
VIEW Y-Y

(TYPICAL BENT 6 THRU BENT 8)



CONSTRUCTION
JOINT DETAIL

(TYPICAL BENT 6 THRU BENT 8)



PLAN OF DRILLED PIERS & COLUMNS

(ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL, BENT 6 THRU BENT 8)

NOTES

STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3'-0" OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 6 THRU BENT 8

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON

11/26/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	5-98
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : TRAN/WITHROW DATE : 9/11/08
CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

20-NOV-2008 14:47
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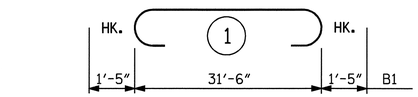
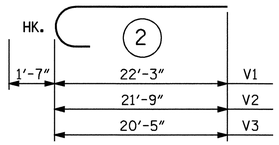
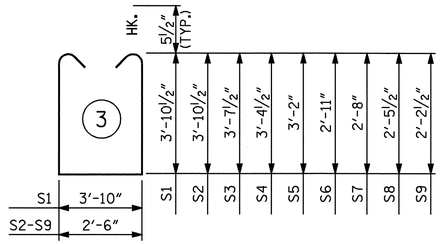
jtillman

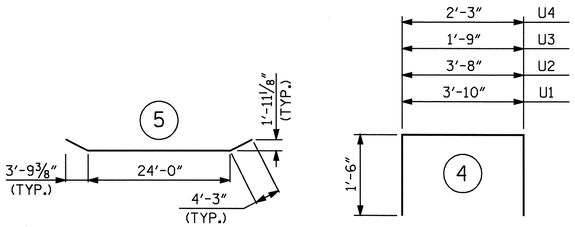
NCDOT

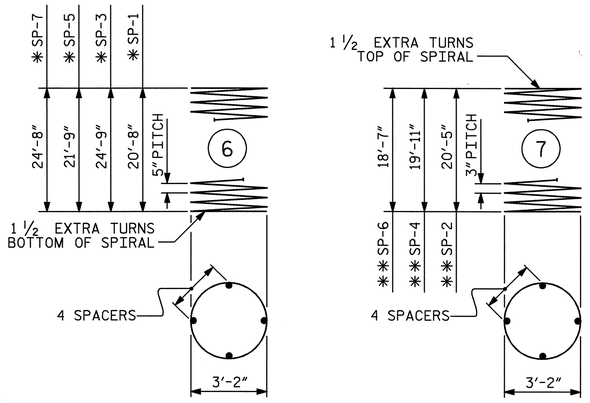
BAR TYPES











ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL — BENT 6

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	34'-4"	1034
B2	7	#10	5	32'-6"	979
B3	4	#5	STR	31'-8"	132
B4	2	#5	STR	28'-0"	58
B5	7	#4	STR	13'-5"	63
M1	40	#11	STR	31'-1"	6606
S1	8	#5	3	12'-6"	104
S2	32	#5	3	11'-2"	373
S3	4	#5	3	10'-8"	45
S4	4	#5	3	10'-2"	42
S5	4	#5	3	9'-9"	41
S6	4	#5	3	9'-3"	39
S7	4	#5	3	8'-9"	37
S8	4	#5	3	8'-4"	35
S9	4	#5	3	7'-10"	33
U1	32	#4	4	6'-10"	146
U2	6	#4	4	6'-8"	27
U3	4	#4	4	4'-9"	13
U4	4	#4	4	5'-3"	14
V1	40	#11	2	23'-10"	5065

REINFORCING STEEL = 14886 LBS

SP-1	2	*	6	509'-4"	1062
SP-2	2	**	7	825'-0"	1102

SPIRAL COLUMN
REINFORCING STEEL = 2164 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 14.4
POUR #3 (CAP) = C. Y. 21.0
TOTAL = C. Y. 35.4

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 19.7
4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 24.4
4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 24.9
CSL TUBES LIN. FT. 169.4

BILL OF MATERIAL — BENT 7

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	34'-4"	1034
B2	7	#10	5	32'-6"	979
B3	4	#5	STR	31'-8"	132
B4	2	#5	STR	28'-0"	58
B5	7	#4	STR	13'-5"	63
M2 (L)	20	#11	STR	35'-2"	3737
M3 (R)	20	#11	STR	32'-2"	3418
S1	8	#5	3	12'-6"	104
S2	32	#5	3	11'-2"	373
S3	4	#5	3	10'-8"	45
S4	4	#5	3	10'-2"	42
S5	4	#5	3	9'-9"	41
S6	4	#5	3	9'-3"	39
S7	4	#5	3	8'-9"	37
S8	4	#5	3	8'-4"	35
S9	4	#5	3	7'-10"	33
U1	32	#4	4	6'-10"	146
U2	6	#4	4	6'-8"	27
U3	4	#4	4	4'-9"	13
U4	4	#4	4	5'-3"	14
V2	40	#11	2	23'-4"	4959

REINFORCING STEEL = 15329 LBS

SP-3	1	*	6	597'-5"	623
SP-4	2	**	7	805'-4"	1076
SP-5	1	*	6	528'-11"	552

SPIRAL COLUMN
REINFORCING STEEL = 2251 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 14.0
POUR #3 (CAP) = C. Y. 21.0
TOTAL = C. Y. 35.0

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 22.2
4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 29.5
4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 29.4
CSL TUBES LIN. FT. 190.0

BILL OF MATERIAL — BENT 8

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	34'-4"	1034
B2	7	#10	5	32'-6"	979
B3	4	#5	STR	31'-8"	132
B4	2	#5	STR	28'-0"	58
B5	7	#4	STR	13'-5"	63
M4	40	#11	STR	35'-1"	7456
S1	8	#5	3	12'-6"	104
S2	32	#5	3	11'-2"	373
S3	4	#5	3	10'-8"	45
S4	4	#5	3	10'-2"	42
S5	4	#5	3	9'-9"	41
S6	4	#5	3	9'-3"	39
S7	4	#5	3	8'-9"	37
S8	4	#5	3	8'-4"	35
S9	4	#5	3	7'-10"	33
U1	32	#4	4	6'-10"	146
U2	6	#4	4	6'-8"	27
U3	4	#4	4	4'-9"	13
U4	4	#4	4	5'-3"	14
V3	40	#11	2	22'-0"	4675

REINFORCING STEEL = 15346 LBS

SP-6	2	**	7	746'-5"	997
SP-7	2	*	6	597'-5"	1246

SPIRAL COLUMN
REINFORCING STEEL = 2243 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 13.1
POUR #3 (CAP) = C. Y. 21.0
TOTAL = C. Y. 34.1

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 23.4
4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 32.4
4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 36.3
CSL TUBES LIN. FT. 201.4

* THE SP-1, SP-3, SP-5 & SP-7 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2, SP-4 & SP-6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 6 THRU BENT 8

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-99
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : TRAN/WITHROW DATE : 9/11/08
CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

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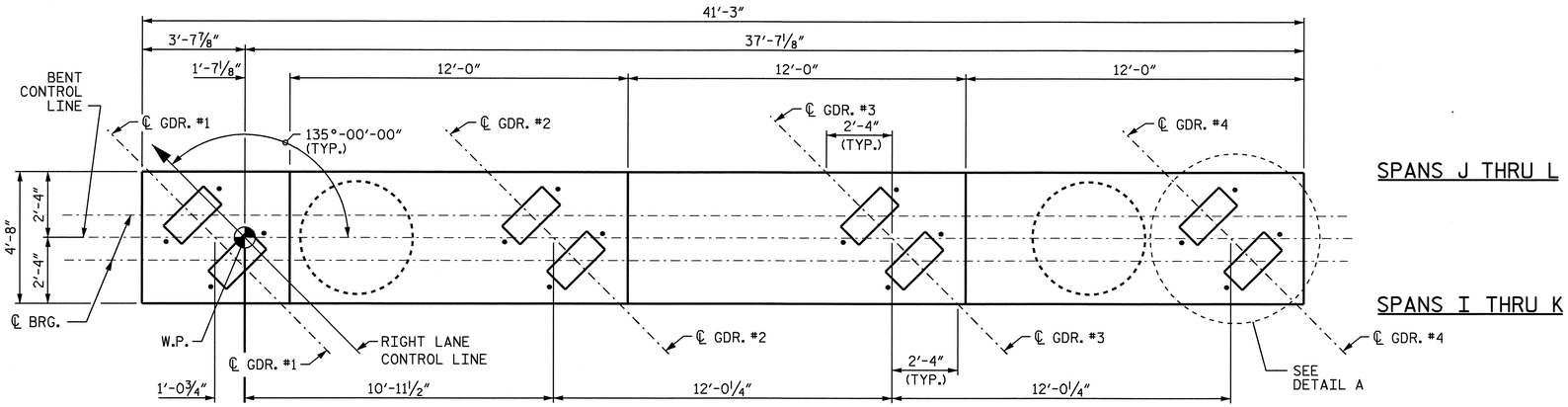
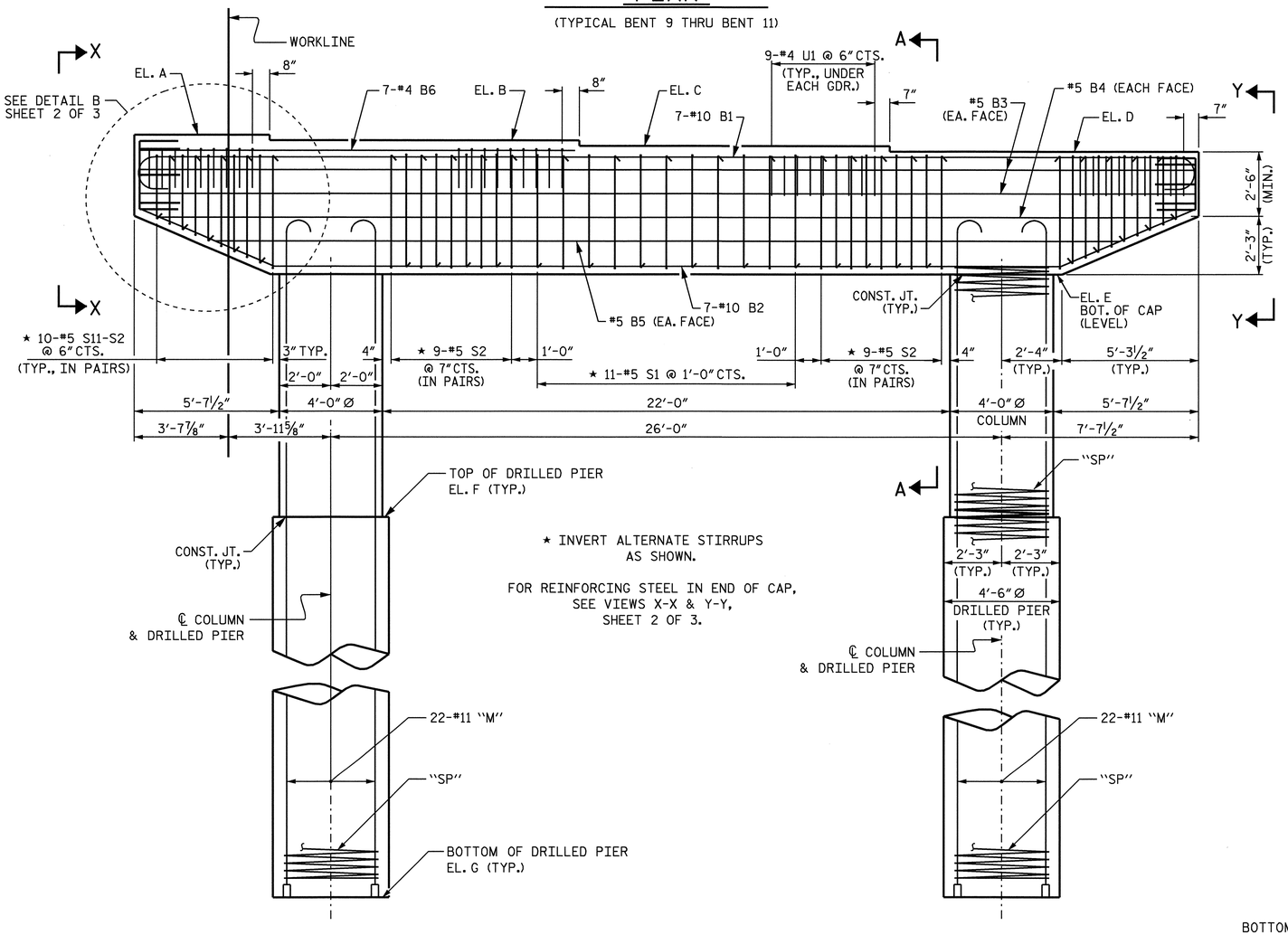


SPANS J THRU L

SPANS I THRU K

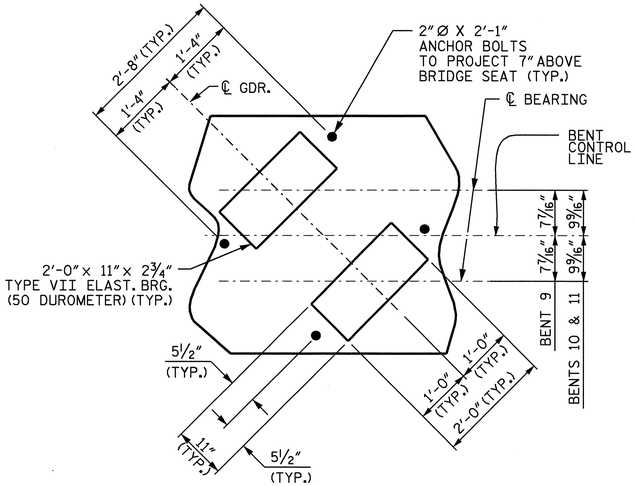
PLAN

(TYPICAL BENT 9 THRU BENT 11)



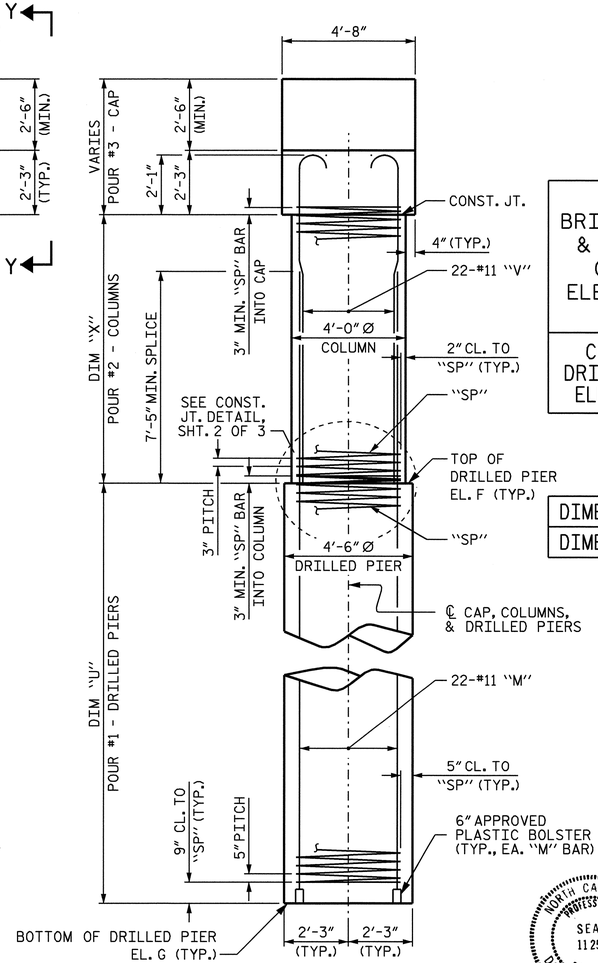
ELEVATION

(TYPICAL BENT 9 THRU BENT 11)



DETAIL A

(TYP. EA. GDR.)



END ELEVATION

(TYPICAL BENT 9 THRU BENT 11)

		BENT 9	BENT 10	BENT 11
BRIDGE SEAT & BOTTOM OF CAP ELEVATIONS	EL. A	136.794	137.380	137.967
	EL. B	136.581	137.167	137.754
	EL. C	136.368	136.954	137.541
	EL. D	136.155	136.741	137.328
	EL. E	131.405	131.991	132.578
COLUMN & DRILLED PIER ELEVATIONS	EL. F	113.405	112.991	112.828
	EL. G	86.988	85.491	86.495

	BENT 9	BENT 10	BENT 11
DIMENSION "X" (IN FT.)	18.000	19.000	19.750
DIMENSION "U" (IN FT.)	26.417	27.500	26.333

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 9 THRU BENT 11

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON

11/26/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-100
1			3			TOTAL SHEETS
2			4			115

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CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

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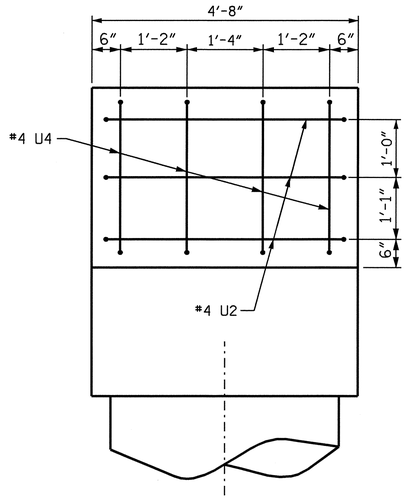
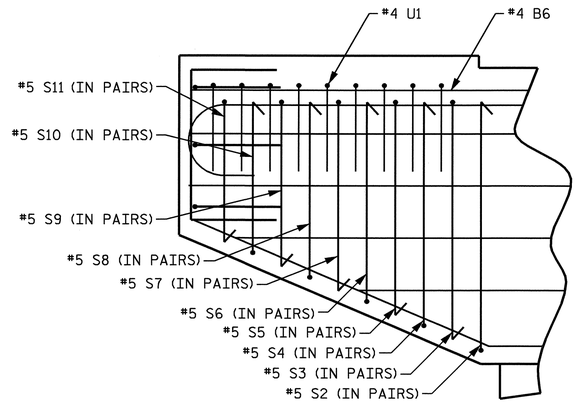


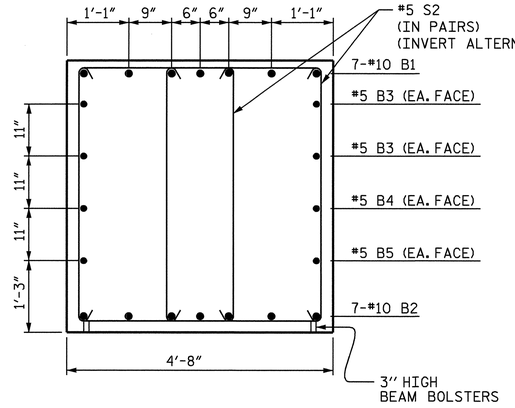
VIEW X-X

(TYPICAL BENT 9 THRU BENT 11)



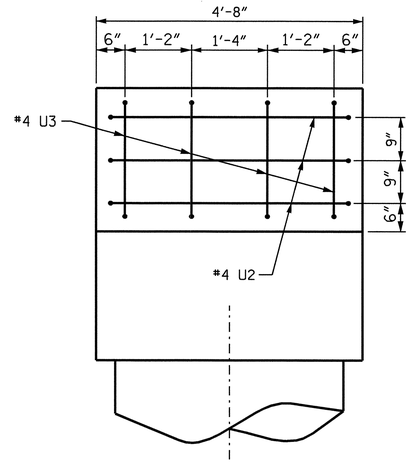
DETAIL B

(TYPICAL EACH END)
(TYPICAL BENT 9 THRU BENT 11)



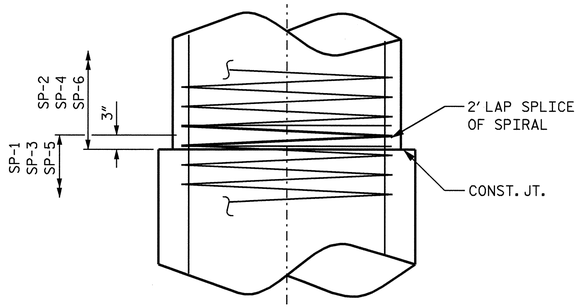
SECTION A-A

(TYPICAL BENT 9 THRU BENT 11)



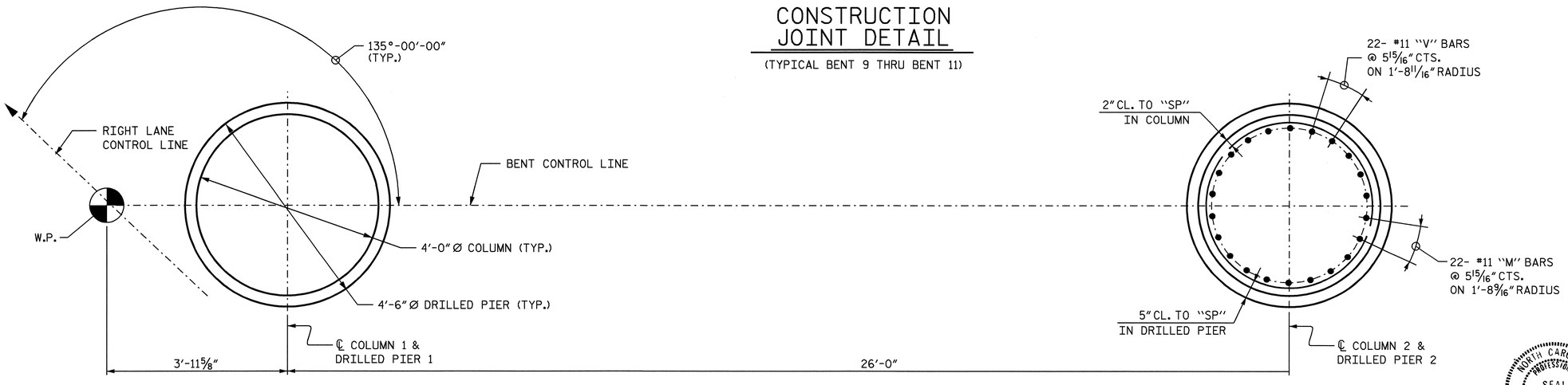
VIEW Y-Y

(TYPICAL BENT 9 THRU BENT 11)



CONSTRUCTION JOINT DETAIL

(TYPICAL BENT 9 THRU BENT 11)



PLAN OF DRILLED PIERS & COLUMNS

(ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL, BENT 9 THRU BENT 11)

NOTES

STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONTRACTOR SHALL ALIGN THE "V" & "M" BARS AS SHOWN IN THE PLAN OF DRILLED PIERS AND COLUMNS.

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

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3'-0" OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 11259 DAVID R. DALLAWAY
11/26/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 9 THRU BENT 11

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-101
1			3			TOTAL SHEETS
2			4			115

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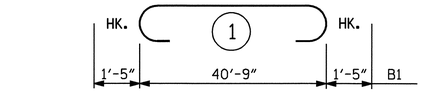
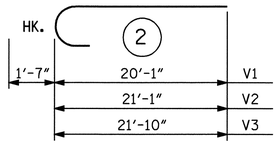
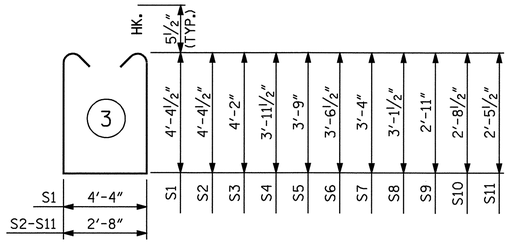
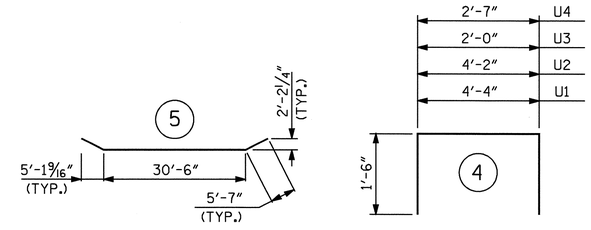
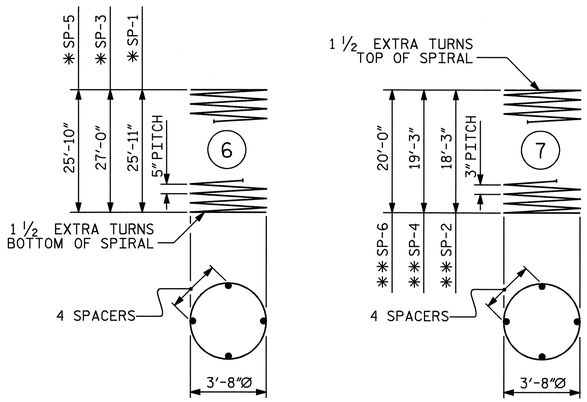
BAR TYPES











ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL — BENT 9

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	43'-7"	1313
B2	7	#10	5	41'-8"	1255
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M1	44	#11	STR	36'-4"	8494
S1	11	#5	3	14'-0"	161
S2	40	#5	3	12'-4"	515
S3	4	#5	3	11'-11"	50
S4	4	#5	3	11'-6"	48
S5	4	#5	3	11'-1"	46
S6	4	#5	3	10'-8"	45
S7	4	#5	3	10'-3"	43
S8	4	#5	3	9'-10"	41
S9	4	#5	3	9'-5"	39
S10	4	#5	3	9'-0"	38
S11	4	#5	3	8'-6"	35
U1	36	#4	4	7'-4"	176
U2	6	#4	4	7'-2"	29
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-7"	15
V1	44	#11	2	21'-8"	5065
REINFORCING STEEL = 17828 LBS					
SP-1	2	*	6	727'-3"	1517
SP-2	2	**	7	854'-4"	1141

SPIRAL COLUMN
REINFORCING STEEL = 2658 LBS

CLASS A CONCRETE (C. Y.)
- POUR #2 (COLUMNS) = C. Y. 16.8
- POUR #3 (CAP) = C. Y. 34.1

TOTAL = C. Y. 50.9

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
- POUR #1 (DRILLED PIERS) = C. Y. 31.1
- 4'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 34.8
- 4'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
- PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIERS LIN. FT. 36.8
- CSL TUBES LIN. FT. 211.4

BILL OF MATERIAL — BENT 10

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	43'-7"	1313
B2	7	#10	5	41'-8"	1255
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M2	44	#11	STR	37'-5"	8747
S1	11	#5	3	14'-0"	161
S2	40	#5	3	12'-4"	515
S3	4	#5	3	11'-11"	50
S4	4	#5	3	11'-6"	48
S5	4	#5	3	11'-1"	46
S6	4	#5	3	10'-8"	45
S7	4	#5	3	10'-3"	43
S8	4	#5	3	9'-10"	41
S9	4	#5	3	9'-5"	39
S10	4	#5	3	9'-0"	38
S11	4	#5	3	8'-6"	35
U1	36	#4	4	7'-4"	176
U2	6	#4	4	7'-2"	29
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-7"	15
V2	44	#11	2	22'-8"	5299
REINFORCING STEEL = 18315 LBS					
SP-3	2	*	6	761'-5"	1588
SP-4	2	**	7	899'-11"	1202

SPIRAL COLUMN
REINFORCING STEEL = 2790 LBS

CLASS A CONCRETE (C. Y.)
- POUR #2 (COLUMNS) = C. Y. 17.7
- POUR #3 (CAP) = C. Y. 34.1

TOTAL = C. Y. 51.8

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
- POUR #1 (DRILLED PIERS) = C. Y. 32.4
- 4'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 37.0
- 4'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
- PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIERS LIN. FT. 36.0
- CSL TUBES LIN. FT. 220.0

BILL OF MATERIAL — BENT 11

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#10	1	43'-7"	1313
B2	7	#10	5	41'-8"	1255
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M3	44	#11	STR	36'-3"	8474
S1	11	#5	3	14'-0"	161
S2	40	#5	3	12'-4"	515
S3	4	#5	3	11'-11"	50
S4	4	#5	3	11'-6"	48
S5	4	#5	3	11'-1"	46
S6	4	#5	3	10'-8"	45
S7	4	#5	3	10'-3"	43
S8	4	#5	3	9'-10"	41
S9	4	#5	3	9'-5"	39
S10	4	#5	3	9'-0"	38
S11	4	#5	3	8'-6"	35
U1	36	#4	4	7'-4"	176
U2	6	#4	4	7'-2"	29
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-7"	15
V3	44	#11	2	23'-5"	5474
REINFORCING STEEL = 18217 LBS					
SP-5	2	*	6	727'-3"	1517
SP-6	2	**	7	934'-1"	1248

SPIRAL COLUMN
REINFORCING STEEL = 2765 LBS

CLASS A CONCRETE (C. Y.)
- POUR #2 (COLUMNS) = C. Y. 18.4
- POUR #3 (CAP) = C. Y. 34.1

TOTAL = C. Y. 52.5

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
- POUR #1 (DRILLED PIERS) = C. Y. 31.0
- 4'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 34.7
- 4'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
- PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIERS LIN. FT. 35.7
- CSL TUBES LIN. FT. 210.7

* THE SP-1, SP-3 & SP-5 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2, SP-4 & SP-6 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 9 THRU BENT 11

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-102
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : TRAN/WITHROW DATE : 9/12/08
CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

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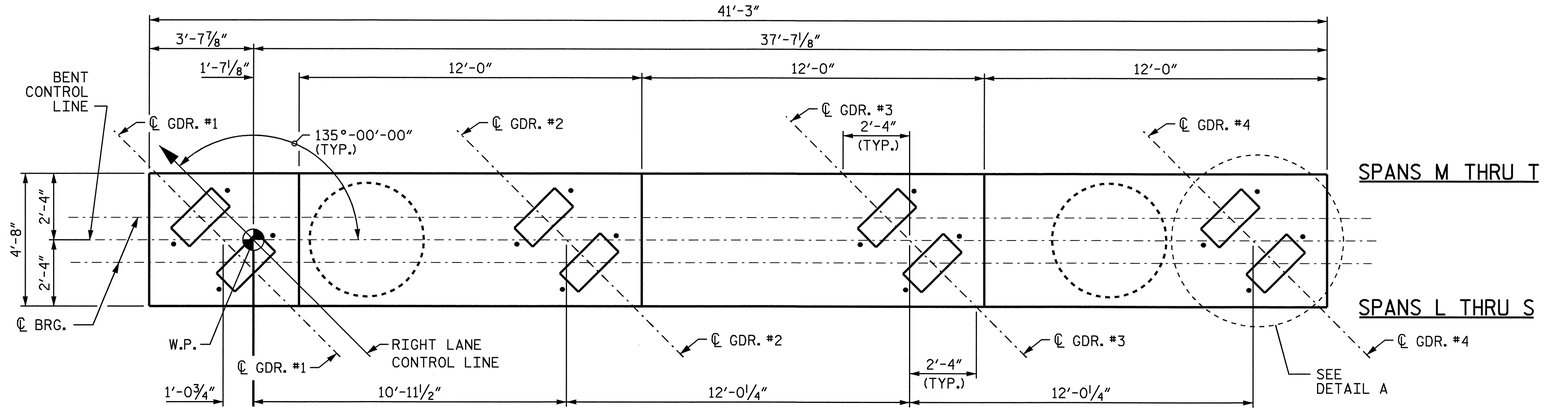
NCDOT

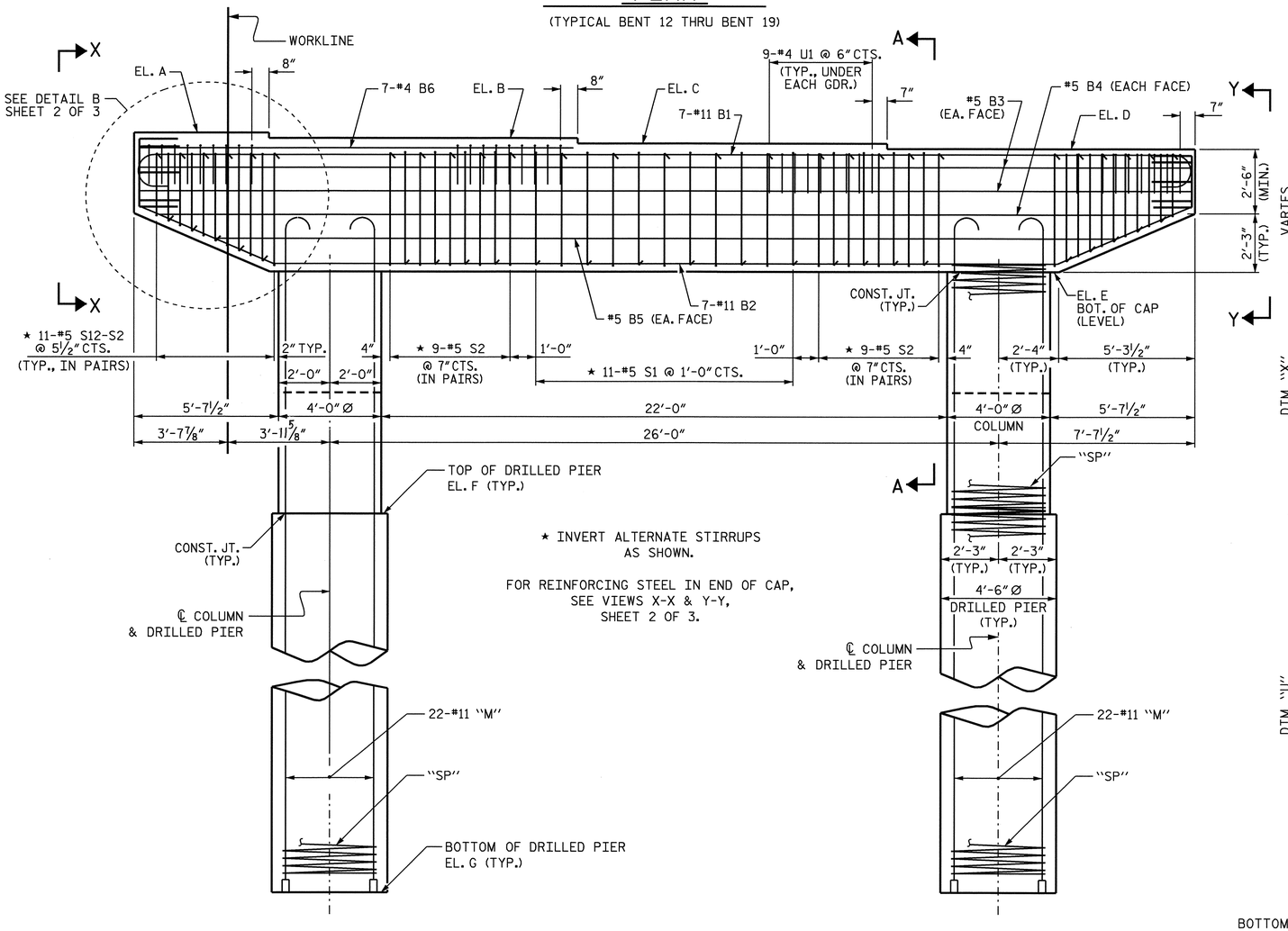


PLAN

(TYPICAL BENT 12 THRU BENT 19)

		BENT 12	BENT 13	BENT 14	BENT 15	BENT 16	BENT 17	BENT 18	BENT 19
BRIDGE SEAT & BOTTOM OF CAP ELEVATIONS	EL. A	138.554	138.717	138.071	137.329	136.584	135.841	135.098	134.353
	EL. B	138.342	138.565	137.949	137.207	136.462	135.718	134.976	134.231
	EL. C	138.129	138.410	137.827	137.085	136.340	135.596	134.854	134.109
	EL. D	137.916	138.250	137.705	136.962	136.217	135.474	134.732	133.987
	EL. E	133.166	133.500	132.955	132.212	131.467	130.724	129.982	129.237
COLUMN & DRILLED PIER ELEVATIONS	EL. F	112.833	112.911	113.205	113.295	115.467	106.641	106.648	106.653
	EL. G	84.999	84.994	84.955	84.462	84.467	79.974	82.981	83.486 (L) 85.986 (R)

	BENT 12	BENT 13	BENT 14	BENT 15	BENT 16	BENT 17	BENT 18	BENT 19
DIMENSION "X" (IN FT.)	20.333	20.589	19.750	18.917	16.000	24.083	23.334	22.584
DIMENSION "Y" (IN FT.)	11.000	11.000	-	-	-	12.000	12.000	12.000
DIMENSION "U" (IN FT.)	27.834	27.917	28.250	28.833	31.000	26.667	23.667	23.167 (L) 20.667 (R)

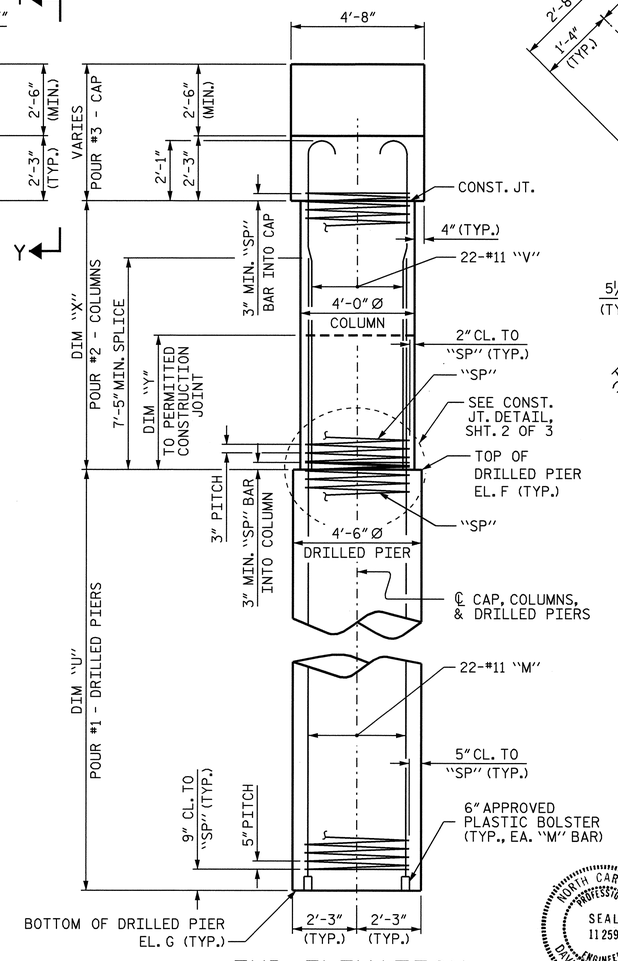


★ INVERT ALTERNATE STIRRUPS AS SHOWN.

FOR REINFORCING STEEL IN END OF CAP, SEE VIEWS X-X & Y-Y, SHEET 2 OF 3.

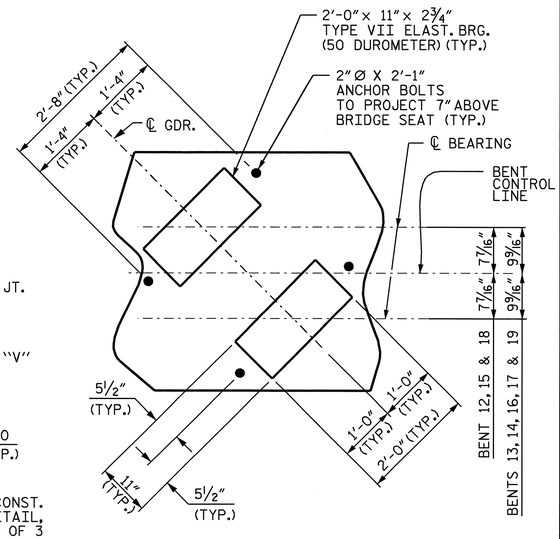
ELEVATION

(TYPICAL BENT 12 THRU BENT 19)



END ELEVATION

(TYPICAL BENT 12 THRU BENT 19)



DETAIL A

(TYP. EA. GDR.)

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 12 THRU BENT 19

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
11/26/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-103
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : TRAN/WITHROW DATE : 9/15/08
CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

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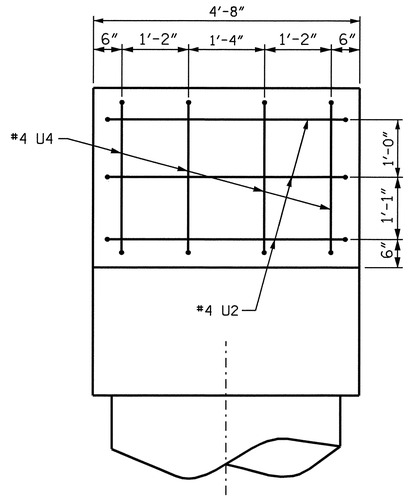
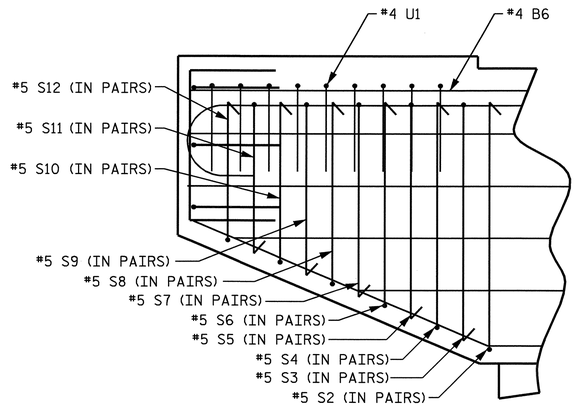
NCBDS



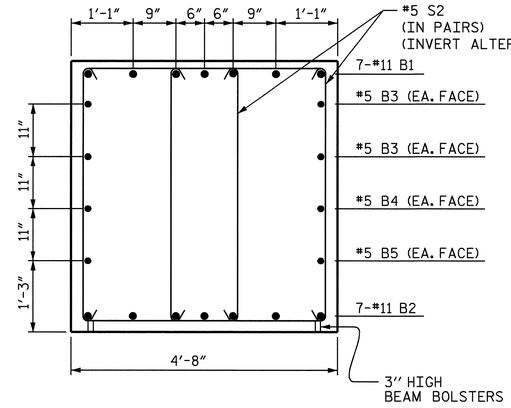
VIEW X-X

(TYPICAL BENT 12 THRU BENT 19)



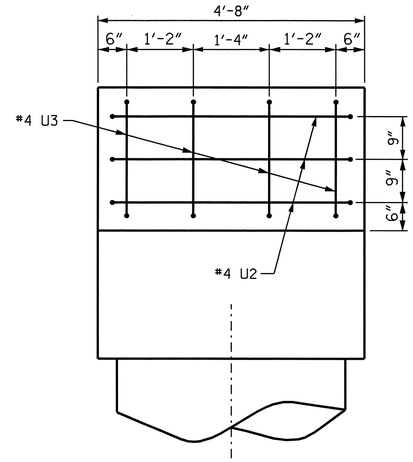
DETAIL B

(TYPICAL EACH END)
(TYPICAL BENT 12 THRU BENT 19)



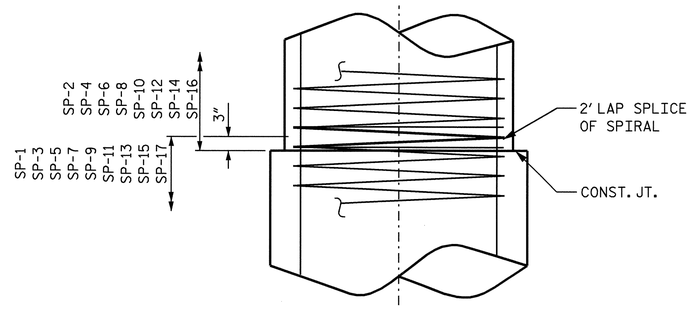
SECTION A-A

(TYPICAL BENT 12 THRU BENT 19)



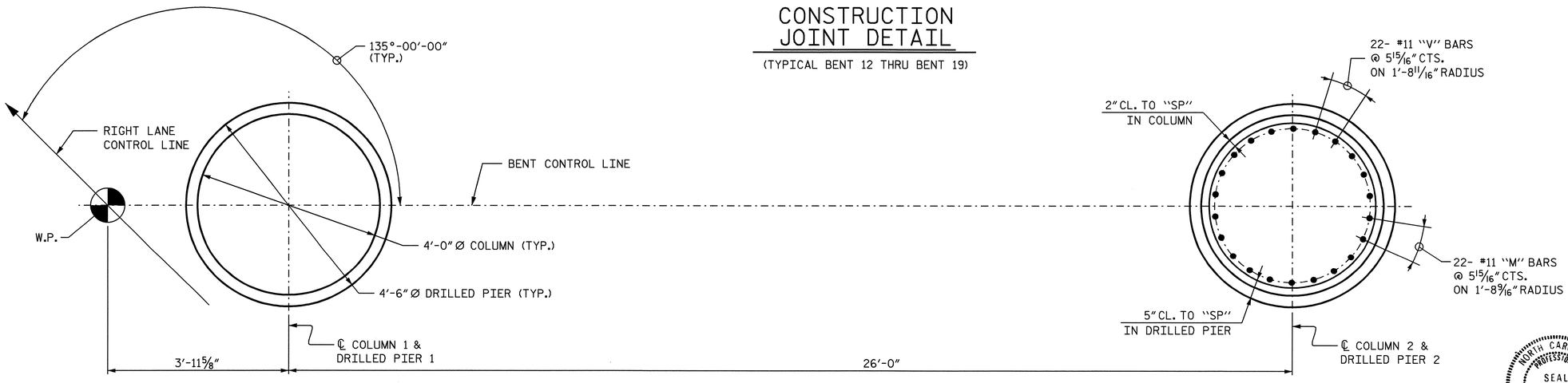
VIEW Y-Y

(TYPICAL BENT 12 THRU BENT 19)



CONSTRUCTION JOINT DETAIL

(TYPICAL BENT 12 THRU BENT 19)



PLAN OF DRILLED PIERS & COLUMNS

(ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL, BENT 12 THRU BENT 19)

NOTES

STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONTRACTOR SHALL ALIGN THE "V" & "M" BARS AS SHOWN IN THE PLAN OF DRILLED PIERS AND COLUMNS.

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

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3'-0" OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/26/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 12 THRU BENT 19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-104
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : TRAN/WITHROW DATE : 9/15/08
CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

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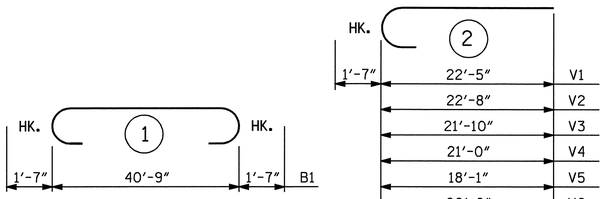
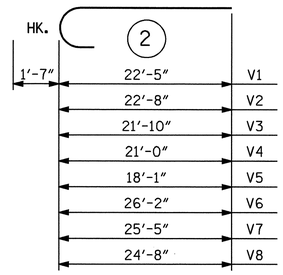
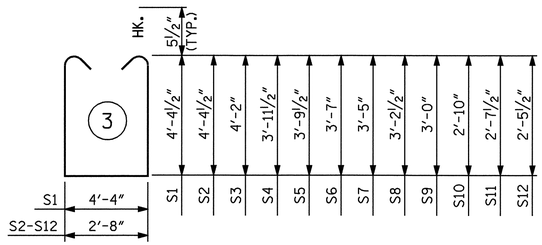
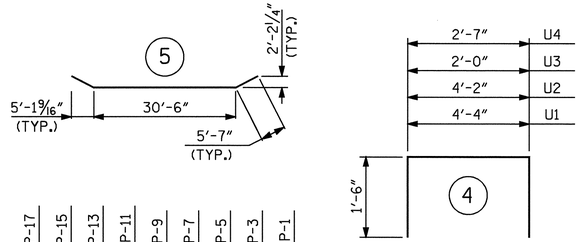
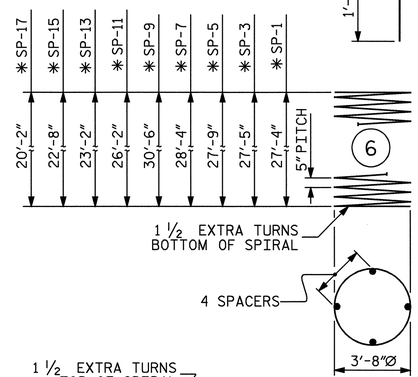
BAR TYPES

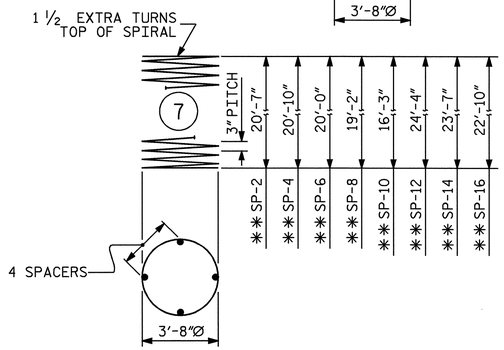












ALL BAR DIMENSIONS ARE OUT TO OUT.

DRAWN BY : TRAN/WITHROW DATE : 9/15/08
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BILL OF MATERIAL — BENT 12

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M1	44	#11	STR	37'-9"	8825
S1	11	#5	3	14'-0"	161
S2	40	#5	3	12'-4"	515
S3	4	#5	3	11'-11"	50
S4	4	#5	3	11'-6"	48
S5	4	#5	3	11'-2"	47
S6	4	#5	3	10'-9"	45
S7	4	#5	3	10'-5"	43
S8	4	#5	3	10'-0"	42
S9	4	#5	3	9'-7"	40
S10	4	#5	3	9'-3"	39
S11	4	#5	3	8'-10"	37
S12	4	#5	3	8'-6"	35
U1	36	#4	4	7'-4"	176
U2	6	#4	4	7'-2"	29
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-7"	15
V1	44	#11	2	24'-0"	5611
REINFORCING STEEL = 19361 LBS					
SP-1	2	*	6	772'-9"	1612
SP-2	2	**	7	956'-11"	1278

SPIRAL COLUMN
REINFORCING STEEL = 2890 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 19.0
POUR #3 (CAP) = C. Y. 34.1
TOTAL = C. Y. 53.1

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 32.8
4'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 37.7
4'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIERS LIN. FT. 35.7
CSL TUBES LIN. FT. 222.7

BILL OF MATERIAL — BENT 13

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M2	44	#11	STR	37'-10"	8844
S1	11	#5	3	14'-0"	161
S2	40	#5	3	12'-4"	515
S3	4	#5	3	11'-11"	50
S4	4	#5	3	11'-6"	48
S5	4	#5	3	11'-2"	47
S6	4	#5	3	10'-9"	45
S7	4	#5	3	10'-5"	43
S8	4	#5	3	10'-0"	42
S9	4	#5	3	9'-7"	40
S10	4	#5	3	9'-3"	39
S11	4	#5	3	8'-10"	37
S12	4	#5	3	8'-6"	35
U1	36	#4	4	7'-4"	176
U2	6	#4	4	7'-2"	29
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-7"	15
V2	44	#11	2	24'-3"	5669
REINFORCING STEEL = 19438 LBS					
SP-3	2	*	6	772'-9"	1612
SP-4	2	**	7	968'-3"	1294

SPIRAL COLUMN
REINFORCING STEEL = 2906 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 19.2
POUR #3 (CAP) = C. Y. 34.1
TOTAL = C. Y. 53.3

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 32.9
4'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 37.8
4'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIERS LIN. FT. 35.9
CSL TUBES LIN. FT. 223.4

BILL OF MATERIAL — BENT 14

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M3	44	#11	STR	38'-2"	8922
S1	11	#5	3	14'-0"	161
S2	40	#5	3	12'-4"	515
S3	4	#5	3	11'-11"	50
S4	4	#5	3	11'-6"	48
S5	4	#5	3	11'-2"	47
S6	4	#5	3	10'-9"	45
S7	4	#5	3	10'-5"	43
S8	4	#5	3	10'-0"	42
S9	4	#5	3	9'-7"	40
S10	4	#5	3	9'-3"	39
S11	4	#5	3	8'-10"	37
S12	4	#5	3	8'-6"	35
U1	36	#4	4	7'-4"	176
U2	6	#4	4	7'-2"	29
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-7"	15
V3	44	#11	2	23'-5"	5474
REINFORCING STEEL = 19321 LBS					
SP-5	2	*	6	784'-1"	1636
SP-6	2	**	7	934'-1"	1248

SPIRAL COLUMN
REINFORCING STEEL = 2884 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 18.4
POUR #3 (CAP) = C. Y. 34.1
TOTAL = C. Y. 52.5

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 33.3
4'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 37.5
4'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 19.0
PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIERS LIN. FT. 36.5
CSL TUBES LIN. FT. 226.0

BILL OF MATERIAL — BENT 15

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M4	44	#11	STR	38'-9"	9059
S1	11	#5	3	14'-0"	161
S2	40	#5	3	12'-4"	515
S3	4	#5	3	11'-11"	50
S4	4	#5	3	11'-6"	48
S5	4	#5	3	11'-2"	47
S6	4	#5	3	10'-9"	45
S7	4	#5	3	10'-5"	43
S8	4	#5	3	10'-0"	42
S9	4	#5	3	9'-7"	40
S10	4	#5	3	9'-3"	39
S11	4	#5	3	8'-10"	37
S12	4	#5	3	8'-6"	35
U1	36	#4	4	7'-4"	176
U2	6	#4	4	7'-2"	29
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-7"	15
V4	44	#11	2	22'-7"	5279
REINFORCING STEEL = 19263 LBS					
SP-7	2	*	6	795'-6"	1659
SP-8	2	**	7	899'-11"	1202

SPIRAL COLUMN
REINFORCING STEEL = 2861 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 17.6
POUR #3 (CAP) = C. Y. 34.1
TOTAL = C. Y. 51.7

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 34.0
4'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 38.7
4'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 19.0
PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIERS LIN. FT. 36.6
CSL TUBES LIN. FT. 230.7

BILL OF MATERIAL — BENT 16

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M5	44	#11	STR	40'-11"	9565
S1	11	#5	3	14'-0"	161
S2	40	#5	3	12'-4"	515
S3	4	#5	3	11'-11"	50
S4	4	#5	3	11'-6"	48
S5	4	#5	3	11'-2"	47
S6	4	#5	3	10'-9"	45
S7	4	#5	3	10'-5"	43
S8	4	#5	3	10'-0"	42
S9	4	#5	3	9'-7"	40
S10	4	#5	3	9'-3"	39
S11	4	#5	3	8'-10"	37
S12	4	#5	3	8'-6"	35
U1	36	#4	4	7'-4"	176
U2	6	#4	4	7'-2"	29
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-7"	15
V5	44	#11	2	19'-8"	4598
REINFORCING STEEL = 19088 LBS					
SP-9	2	*	6	852'-3"	1778
SP-10	2	**	7	763'-3"	1020

SPIRAL COLUMN
REINFORCING STEEL = 2798 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 14.9
POUR #3 (CAP) = C. Y. 34.1
TOTAL = C. Y. 49.0

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 36.5
4'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 44.0
4'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIERS LIN. FT. 0.0
CSL TUBES LIN. FT. 248.0

* THE SP-1, SP-3, SP-5, SP-7, SP-9, SP-11, SP-13, SP-15 & SP-17 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2, SP-4, SP-6, SP-8, SP-10, SP-12, SP-14 & SP-16 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

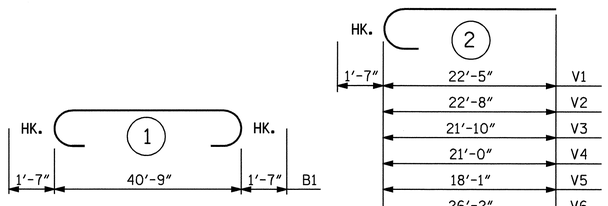
BENT 12 THRU BENT 19

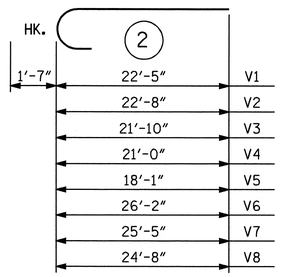
NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

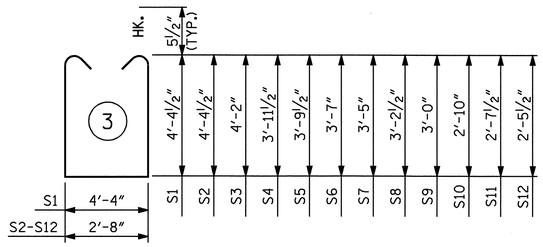
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-105
1			3			TOTAL SHEETS
2			4			115

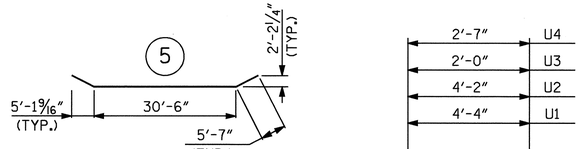
NCDOT

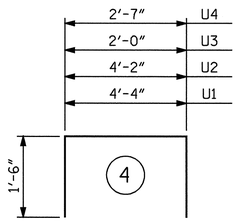
BAR TYPES

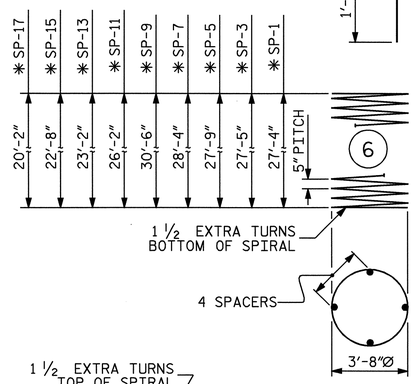


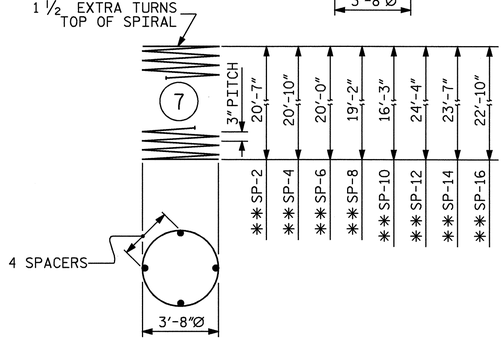












ALL BAR DIMENSIONS ARE OUT TO OUT.

DRAWN BY : TRAN/WITHROW DATE : 9/15/08
CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

27-OCT-2008 15:12
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jtillman

BILL OF MATERIAL — BENT 17

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M6	44	#11	STR	36'-7"	8552
S1	11	#5	3	14'-0"	161
S2	40	#5	3	12'-4"	515
S3	4	#5	3	11'-11"	50
S4	4	#5	3	11'-6"	48
S5	4	#5	3	11'-2"	47
S6	4	#5	3	10'-9"	45
S7	4	#5	3	10'-5"	43
S8	4	#5	3	10'-0"	42
S9	4	#5	3	9'-7"	40
S10	4	#5	3	9'-3"	39
S11	4	#5	3	8'-10"	37
S12	4	#5	3	8'-6"	35
U1	36	#4	4	7'-4"	176
U2	6	#4	4	7'-2"	29
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-7"	15
V6	44	#11	2	27'-9"	6487

REINFORCING STEEL = 19964 LBS

SP-11	2	*	6	738'-8"	1541
SP-12	2	**	7	1127'-9"	1507

SPIRAL COLUMN
REINFORCING STEEL = 3048 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 22.4
POUR #3 (CAP) = C. Y. 34.1
TOTAL = C. Y. 56.5

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 31.4
4'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 35.3
4'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIERS LIN. FT. 0.0
CSL TUBES LIN. FT. 213.4

BILL OF MATERIAL — BENT 18

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M7	44	#11	STR	33'-7"	7851
S1	11	#5	3	14'-0"	161
S2	40	#5	3	12'-4"	515
S3	4	#5	3	11'-11"	50
S4	4	#5	3	11'-6"	48
S5	4	#5	3	11'-2"	47
S6	4	#5	3	10'-9"	45
S7	4	#5	3	10'-5"	43
S8	4	#5	3	10'-0"	42
S9	4	#5	3	9'-7"	40
S10	4	#5	3	9'-3"	39
S11	4	#5	3	8'-10"	37
S12	4	#5	3	8'-6"	35
U1	36	#4	4	7'-4"	176
U2	6	#4	4	7'-2"	29
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-7"	15
V7	44	#11	2	27'-0"	6312

REINFORCING STEEL = 19088 LBS

SP-13	2	*	6	659'-1"	1375
SP-14	2	**	7	1093'-7"	1461

SPIRAL COLUMN
REINFORCING STEEL = 2836 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 21.7
POUR #3 (CAP) = C. Y. 34.1
TOTAL = C. Y. 55.8

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 27.9
4'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 27.3
4'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 20.0
PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIERS LIN. FT. 25.3
CSL TUBES LIN. FT. 189.4

BILL OF MATERIAL — BENT 19

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M8	22	#11	STR	33'-1"	3867
M9	22	#11	STR	30'-7"	3575
S1	11	#5	3	14'-0"	161
S2	40	#5	3	12'-4"	515
S3	4	#5	3	11'-11"	50
S4	4	#5	3	11'-6"	48
S5	4	#5	3	11'-2"	47
S6	4	#5	3	10'-9"	45
S7	4	#5	3	10'-5"	43
S8	4	#5	3	10'-0"	42
S9	4	#5	3	9'-7"	40
S10	4	#5	3	9'-3"	39
S11	4	#5	3	8'-10"	37
S12	4	#5	3	8'-6"	35
U1	36	#4	4	7'-4"	176
U2	6	#4	4	7'-2"	29
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-7"	15
V8	44	#11	2	26'-3"	6137

REINFORCING STEEL = 18504 LBS

SP-15	1	*	6	636'-5"	664
SP-16	1	**	7	1059'-5"	1415
SP-17	1	*	6	568'-2"	593

SPIRAL COLUMN
REINFORCING STEEL = 2672 LBS

CLASS A CONCRETE (C. Y.)
POUR #2 (COLUMNS) = C. Y. 21.0
POUR #3 (CAP) = C. Y. 34.1
TOTAL = C. Y. 55.1

DRILLED PIERS:
DRILLED PIER CONCRETE (C. Y.)
POUR #1 (DRILLED PIERS) = C. Y. 25.8
4'-6" DIA. DRILLED PIERS IN SOIL LIN. FT. 23.8
4'-6" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 20.0
PERMANENT STEEL CASING FOR 4'-6" DIA. DRILLED PIERS LIN. FT. 21.3
CSL TUBES LIN. FT. 175.4

* THE SP-1, SP-3, SP-5, SP-7, SP-9, SP-11, SP-13, SP-15 & SP-17 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2, SP-4, SP-6, SP-8, SP-10, SP-12, SP-14 & SP-16 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

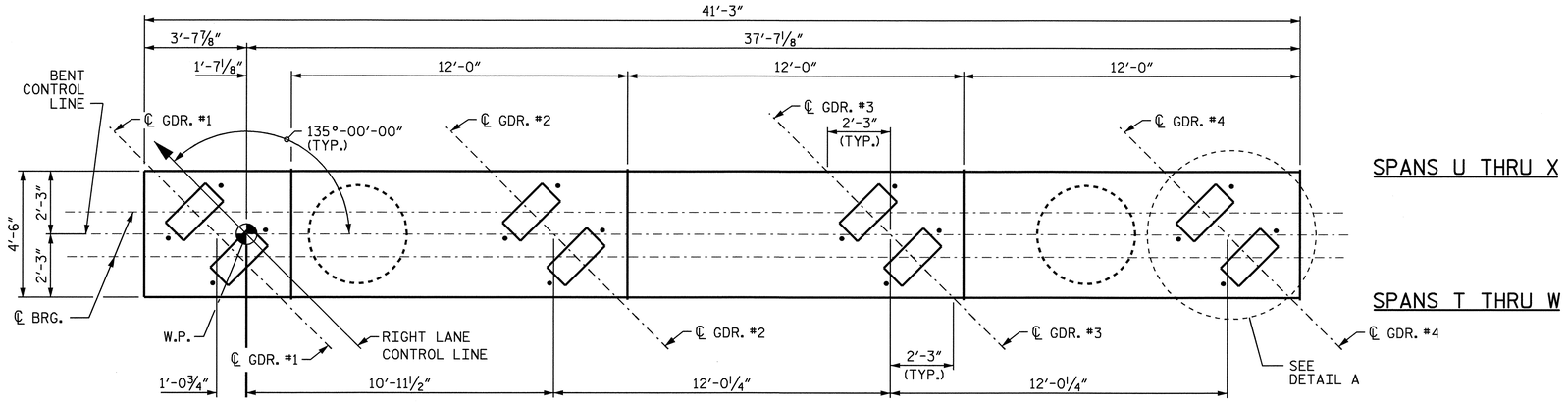
SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 12 THRU BENT 19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-106
1			3			TOTAL SHEETS
2			4			115

NCDOT



SPANS U THRU X

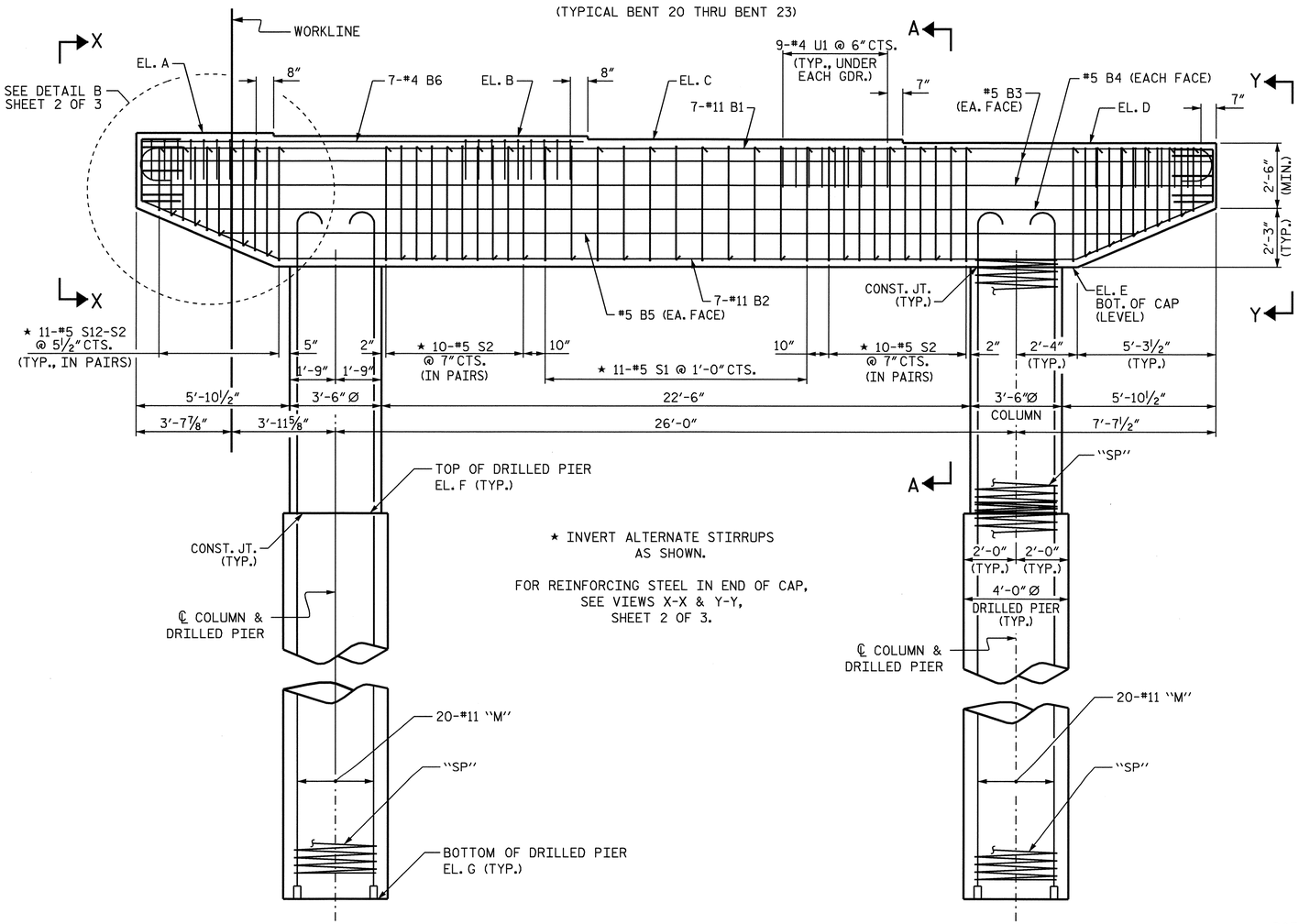
SPANS T THRU W

PLAN

(TYPICAL BENT 20 THRU BENT 23)

		BENT 20	BENT 21	BENT 22	BENT 23
BRIDGE SEAT & BOTTOM OF CAP ELEVATIONS	EL. A	133.649	132.946	132.241	131.536
	EL. B	133.527	132.824	132.118	131.414
	EL. C	133.405	132.702	131.996	131.292
	EL. D	133.282	132.579	131.874	131.169
	EL. E	128.532	127.829	127.124	126.419
COLUMN & DRILLED PIER ELEVATIONS	EL. F	120.032	119.829	110.541	115.002
	EL. G	92.949	93.496	92.457	97.419

	BENT 20	BENT 21	BENT 22	BENT 23
DIMENSION "X" (IN FT.)	8.500	8.000	16.583	11.417
DIMENSION "U" (IN FT.)	27.083	26.333	18.083	17.583

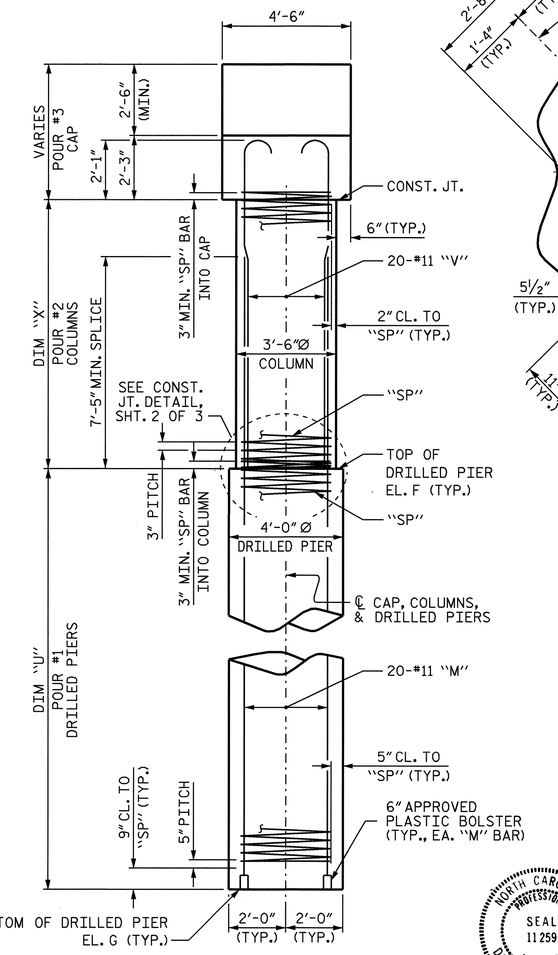


★ INVERT ALTERNATE STIRRUPS AS SHOWN.

FOR REINFORCING STEEL IN END OF CAP, SEE VIEWS X-X & Y-Y, SHEET 2 OF 3.

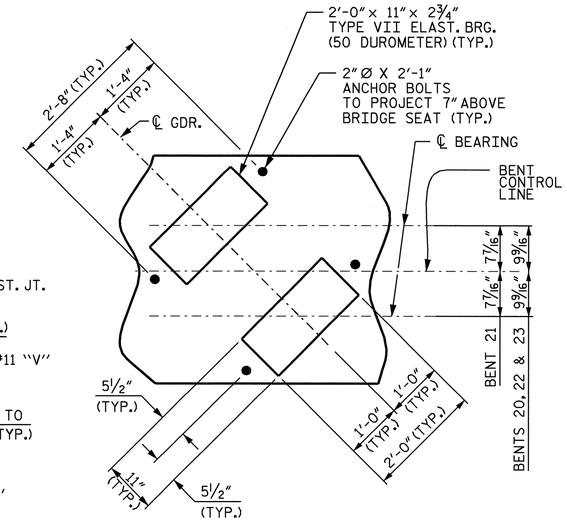
ELEVATION

(TYPICAL BENT 20 THRU BENT 23)



END ELEVATION

(TYPICAL BENT 20 THRU BENT 23)



DETAIL A

(TYP. EA. GDR.)

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 20 THRU BENT 23

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-107
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON

11/26/08

DRAWN BY : TRAN/WITHROW DATE : 9/15/08
CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

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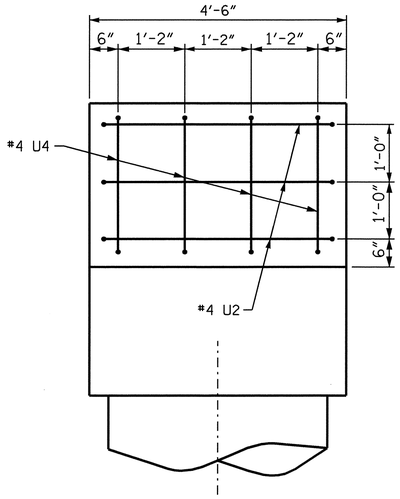
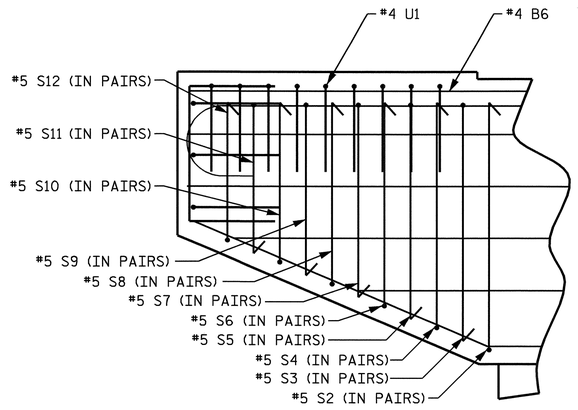
NCDOT



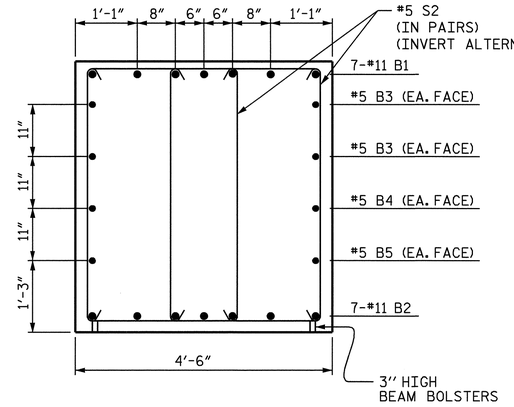
VIEW X-X

(TYPICAL BENT 20 THRU BENT 23)



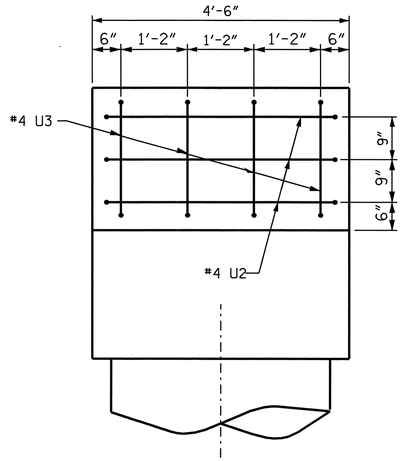
DETAIL B

(TYPICAL EACH END)
(TYPICAL BENT 20 THRU BENT 23)



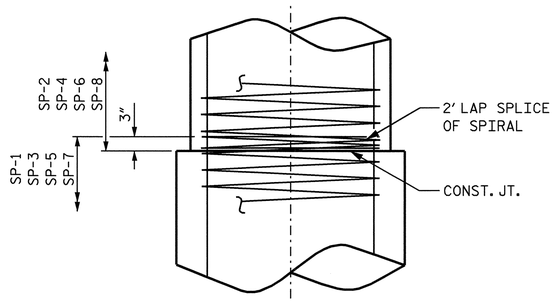
SECTION A-A

(TYPICAL BENT 20 THRU BENT 23)



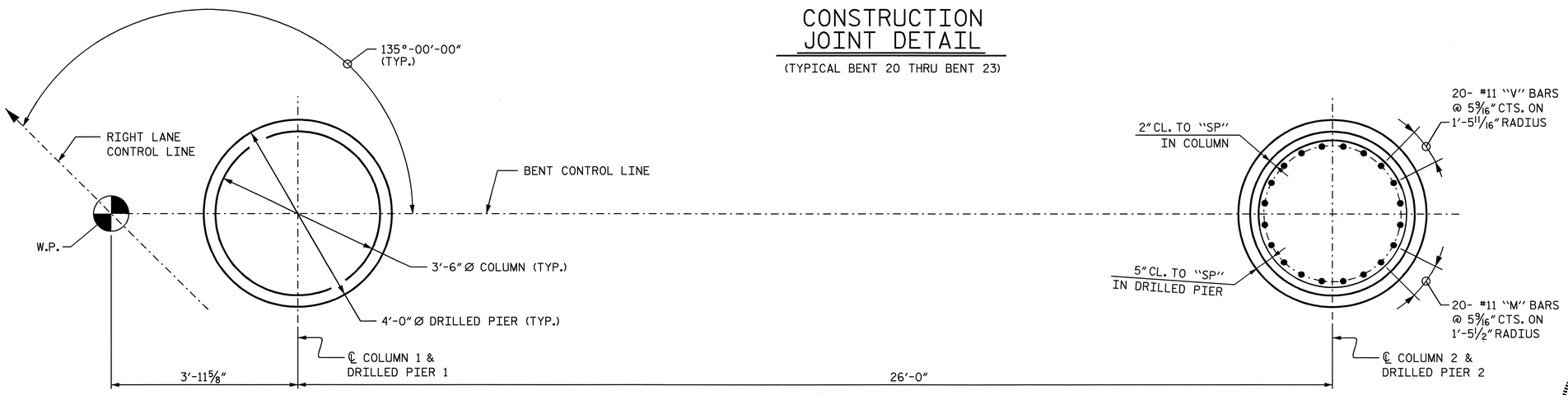
VIEW Y-Y

(TYPICAL BENT 20 THRU BENT 23)



CONSTRUCTION JOINT DETAIL

(TYPICAL BENT 20 THRU BENT 23)



PLAN OF DRILLED PIERS & COLUMNS

(ALL DIMENSIONS AND REINFORCING STEEL ARE TYPICAL, BENT 20 THRU BENT 23)

NOTES

STIRRUPS AND U1 BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

THE CONTRACTOR SHALL ALIGN THE "V" & "M" BARS AS SHOWN IN THE PLAN OF DRILLED PIERS AND COLUMNS.

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

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

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3'-0" OF EXTRA LENGTH.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/26/08

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
BENT 20 THRU BENT 23

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-108
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : TRAN/WITHROW DATE : 9/15/08
CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

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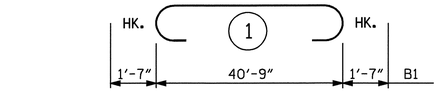
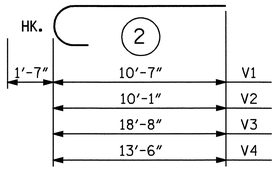
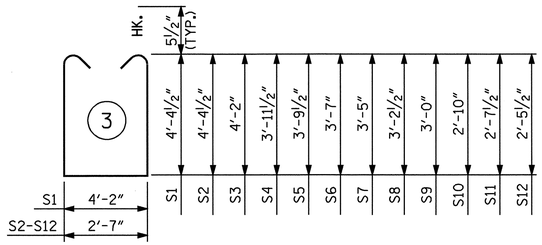
jtillman

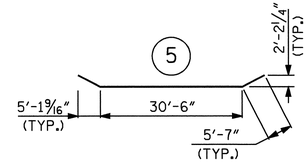
NCBDS

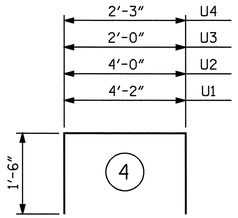
BAR TYPES

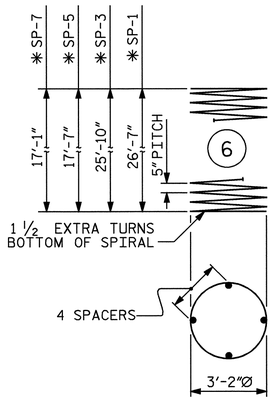


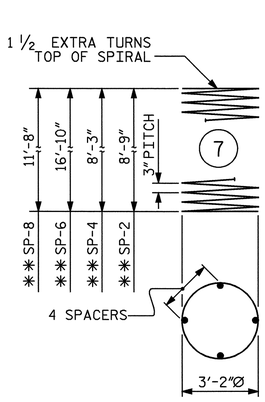












ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL — BENT 20

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M1	40	#11	STR	37'-0"	7863
S1	11	#5	3	13'-10"	159
S2	44	#5	3	12'-3"	562
S3	4	#5	3	11'-10"	49
S4	4	#5	3	11'-5"	48
S5	4	#5	3	11'-1"	46
S6	4	#5	3	10'-8"	45
S7	4	#5	3	10'-4"	43
S8	4	#5	3	9'-11"	41
S9	4	#5	3	9'-6"	40
S10	4	#5	3	9'-2"	38
S11	4	#5	3	8'-9"	37
S12	4	#5	3	8'-5"	35
U1	36	#4	4	7'-2"	172
U2	6	#4	4	7'-0"	28
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-3"	14
V1	40	#11	2	12'-2"	2586

REINFORCING STEEL = 15409 LBS

SP-1	2	*	6	646'-5"	1348
SP-2	2	**	7	363'-5"	486

SPIRAL COLUMN REINFORCING STEEL = 1834 LBS

CLASS A CONCRETE (C. Y.)
- POUR #2 (COLUMNS) = C. Y. 6.1
- POUR #3 (CAP) = C. Y. 32.0

TOTAL = C. Y. 38.1

DRILLED PIERS:

DRILLED PIER CONCRETE (C. Y.)
- POUR #1 (DRILLED PIERS) = C. Y. 25.3
- 4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 36.2
- 4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
- PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 0.0
- CSL TUBES LIN. FT. 216.7

BILL OF MATERIAL — BENT 21

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M2	40	#11	STR	36'-3"	7704
S1	11	#5	3	13'-10"	159
S2	44	#5	3	12'-3"	562
S3	4	#5	3	11'-10"	49
S4	4	#5	3	11'-5"	48
S5	4	#5	3	11'-1"	46
S6	4	#5	3	10'-8"	45
S7	4	#5	3	10'-4"	43
S8	4	#5	3	9'-11"	41
S9	4	#5	3	9'-6"	40
S10	4	#5	3	9'-2"	38
S11	4	#5	3	8'-9"	37
S12	4	#5	3	8'-5"	35
U1	36	#4	4	7'-2"	172
U2	6	#4	4	7'-0"	28
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-3"	14
V2	40	#11	2	11'-8"	2479

REINFORCING STEEL = 15143 LBS

SP-3	2	*	6	626'-10"	1308
SP-4	2	**	7	343'-9"	459

SPIRAL COLUMN REINFORCING STEEL = 1767 LBS

CLASS A CONCRETE (C. Y.)
- POUR #2 (COLUMNS) = C. Y. 5.7
- POUR #3 (CAP) = C. Y. 32.0

TOTAL = C. Y. 37.7

DRILLED PIERS:

DRILLED PIER CONCRETE (C. Y.)
- POUR #1 (DRILLED PIERS) = C. Y. 24.6
- 4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 34.7
- 4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
- PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 0.0
- CSL TUBES LIN. FT. 210.7

BILL OF MATERIAL — BENT 22

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M3	40	#11	STR	28'-0"	5951
S1	11	#5	3	13'-10"	159
S2	44	#5	3	12'-3"	562
S3	4	#5	3	11'-10"	49
S4	4	#5	3	11'-5"	48
S5	4	#5	3	11'-1"	46
S6	4	#5	3	10'-8"	45
S7	4	#5	3	10'-4"	43
S8	4	#5	3	9'-11"	41
S9	4	#5	3	9'-6"	40
S10	4	#5	3	9'-2"	38
S11	4	#5	3	8'-9"	37
S12	4	#5	3	8'-5"	35
U1	36	#4	4	7'-2"	172
U2	6	#4	4	7'-0"	28
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-3"	14
V3	40	#11	2	20'-3"	4304

REINFORCING STEEL = 15215 LBS

SP-5	2	*	6	431'-0"	899
SP-6	2	**	7	677'-8"	905

SPIRAL COLUMN REINFORCING STEEL = 1804 LBS

CLASS A CONCRETE (C. Y.)
- POUR #2 (COLUMNS) = C. Y. 11.9
- POUR #3 (CAP) = C. Y. 32.0

TOTAL = C. Y. 43.9

DRILLED PIERS:

DRILLED PIER CONCRETE (C. Y.)
- POUR #1 (DRILLED PIERS) = C. Y. 16.9
- 4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 18.2
- 4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
- PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 31.1
- CSL TUBES LIN. FT. 144.7

BILL OF MATERIAL — BENT 23

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	7	#11	1	43'-11"	1633
B2	7	#11	5	41'-8"	1550
B3	4	#5	STR	40'-11"	171
B4	2	#5	STR	39'-7"	83
B5	2	#5	STR	35'-3"	74
B6	7	#4	STR	16'-11"	79
M4	40	#11	STR	27'-6"	5844
S1	11	#5	3	13'-10"	159
S2	44	#5	3	12'-3"	562
S3	4	#5	3	11'-10"	49
S4	4	#5	3	11'-5"	48
S5	4	#5	3	11'-1"	46
S6	4	#5	3	10'-8"	45
S7	4	#5	3	10'-4"	43
S8	4	#5	3	9'-11"	41
S9	4	#5	3	9'-6"	40
S10	4	#5	3	9'-2"	38
S11	4	#5	3	8'-9"	37
S12	4	#5	3	8'-5"	35
U1	36	#4	4	7'-2"	172
U2	6	#4	4	7'-0"	28
U3	4	#4	4	5'-0"	13
U4	4	#4	4	5'-3"	14
V4	40	#11	2	15'-1"	3206

REINFORCING STEEL = 14010 LBS

SP-7	2	*	6	421'-2"	879
SP-8	2	**	7	481'-3"	643

SPIRAL COLUMN REINFORCING STEEL = 1522 LBS

CLASS A CONCRETE (C. Y.)
- POUR #2 (COLUMNS) = C. Y. 8.2
- POUR #3 (CAP) = C. Y. 32.0

TOTAL = C. Y. 40.2

DRILLED PIERS:

DRILLED PIER CONCRETE (C. Y.)
- POUR #1 (DRILLED PIERS) = C. Y. 16.4
- 4'-0" DIA. DRILLED PIERS IN SOIL LIN. FT. 17.2
- 4'-0" DIA. DRILLED PIERS NOT IN SOIL LIN. FT. 18.0
- PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIERS LIN. FT. 40.0
- CSL TUBES LIN. FT. 140.7

* THE SP-1, SP-3, SP-5 & SP-7 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

** THE SP-2, SP-4, SP-6 & SP-8 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 20 THRU BENT 23

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-109
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : TRAN/WITHROW DATE : 9/15/08
CHECKED BY : A.S. CALLAWAY DATE : 10/07/08

27-OCT-2008 15:17
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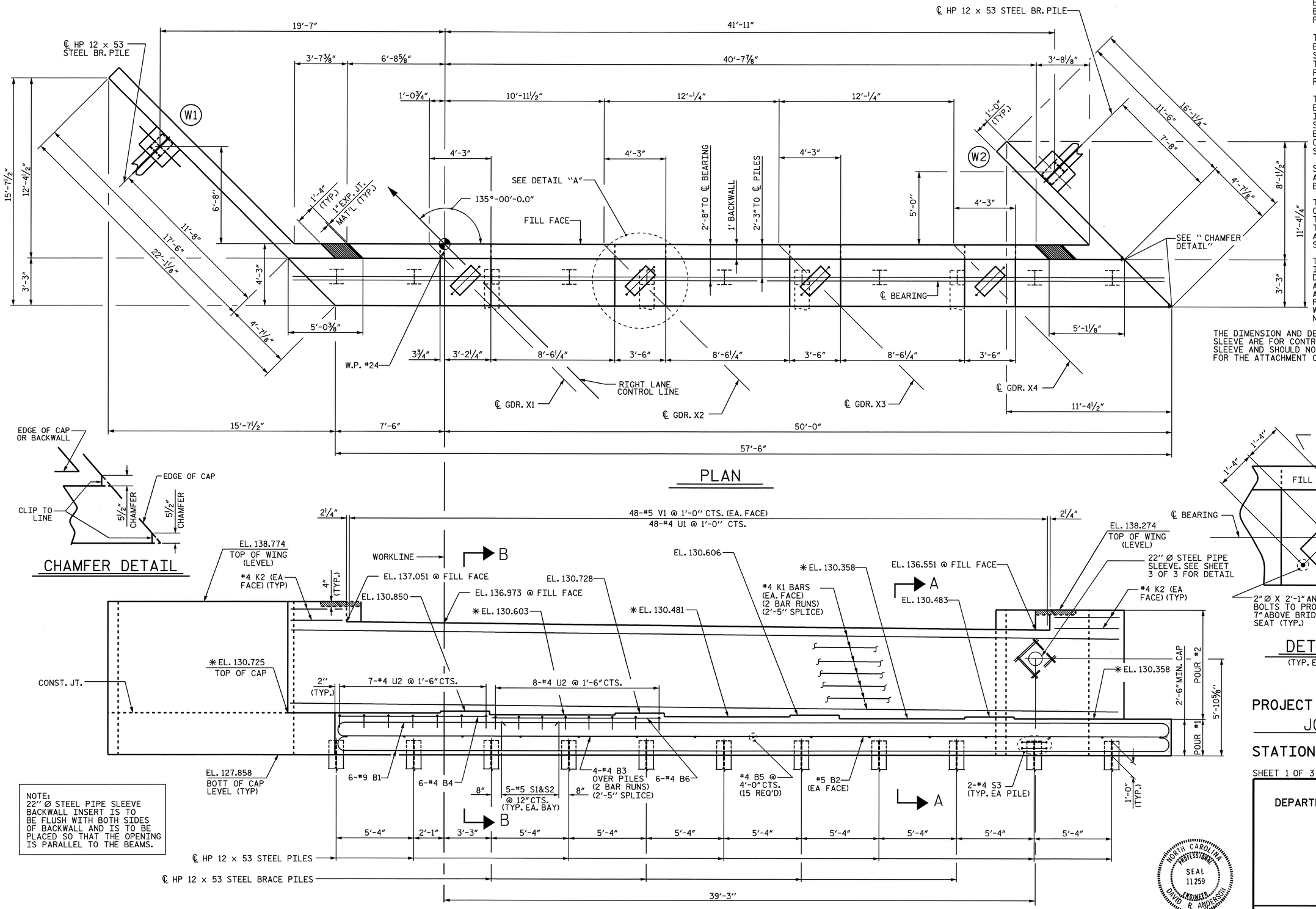
jtillman

NCDOT



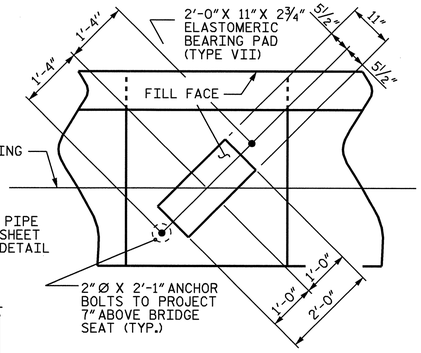
PLAN

CHAMFER DETAIL

ELEVATION

✱FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEATS, SEE SHEET 3 OF 3

NOTE:
22" Ø STEEL PIPE SLEEVE BACKWALL INSERT IS TO BE FLUSH WITH BOTH SIDES OF BACKWALL AND IS TO BE PLACED SO THAT THE OPENING IS PARALLEL TO THE BEAMS.



DETAIL "A"

(TYP. EA. BRIDGE SEAT)

NOTES

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF ¼" PER FOOT.

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

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL ARE CAST IF SLIP FORMING IS USED.

THE CONTRACTOR SHALL PROVIDE FOR INSTALLATION OF THE 4" DIAMETER DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS. SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

THE DIMENSION AND DETAILS SHOWN FOR THE STEEL PIPE SLEEVE ARE FOR CONTRACTOR'S BENEFIT IN PLACING THE SLEEVE AND SHOULD NOT BE CONSTRUED TO BE AN APPROVAL FOR THE ATTACHMENT OF THE UTILITY TO THE STRUCTURE.

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-110
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
11/26/08

DRAWN BY : S. M. RASHIDI DATE : 6/30/08
CHECKED BY : J. A. TILLMAN DATE : 7/17/08

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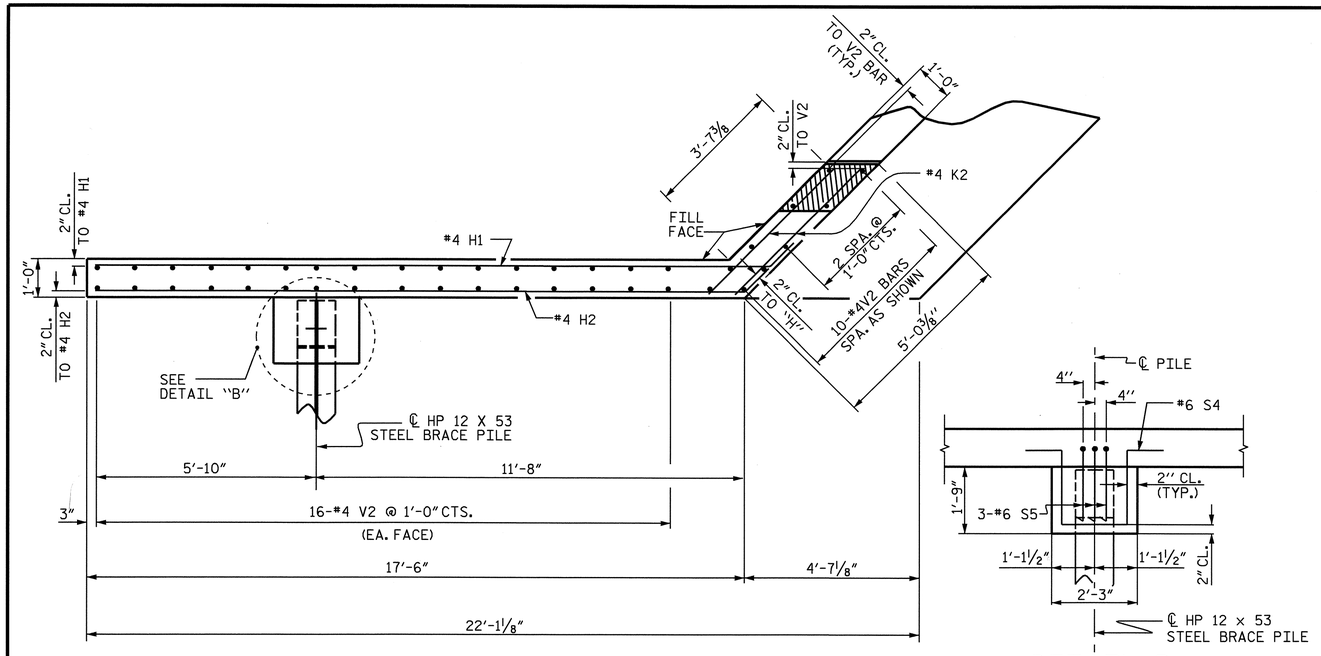
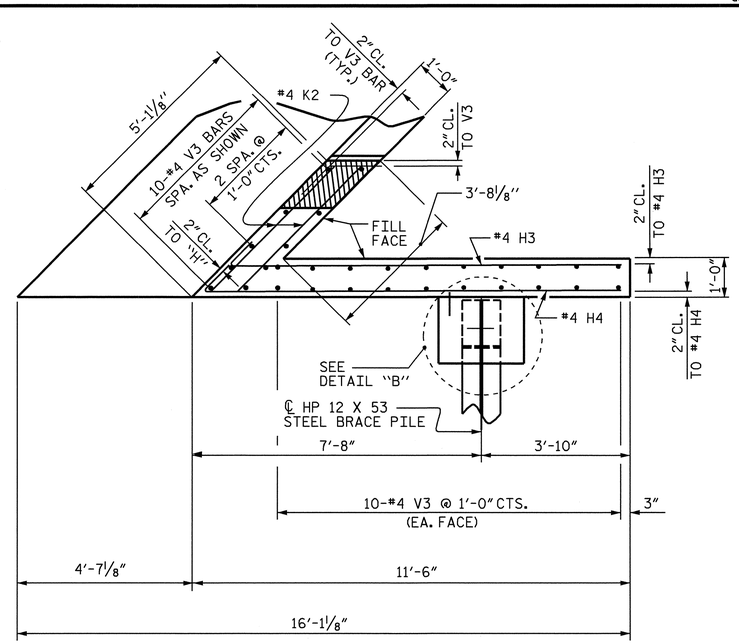
jtillman

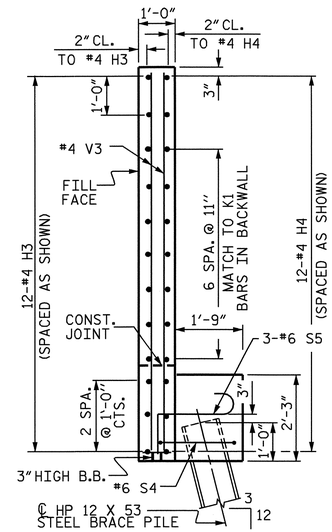


PLAN OF WING W1

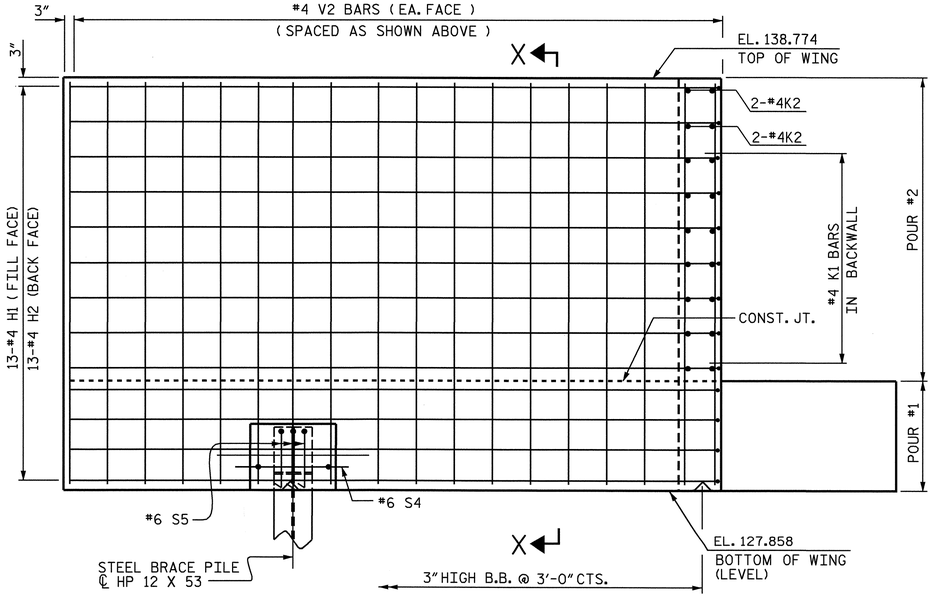
DETAIL B



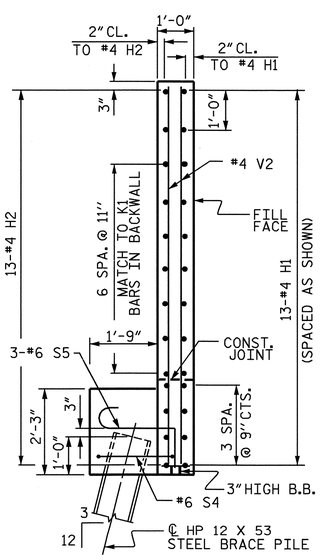
PLAN OF WING W2



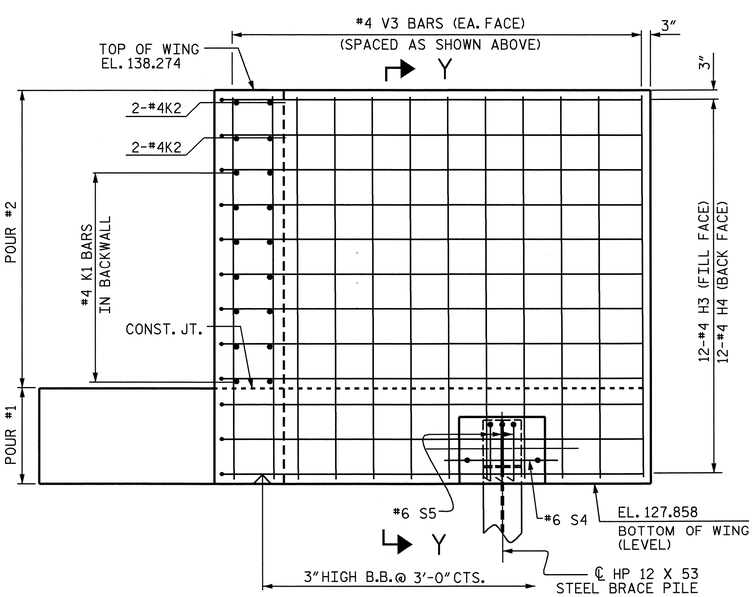
SECTION Y-Y



ELEVATION OF WING W1



SECTION X-X



ELEVATION OF WING W2

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-111
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : S. M. RASHIDI DATE : 6/30/08
CHECKED BY : J. A. TILLMAN DATE : 7/17/08

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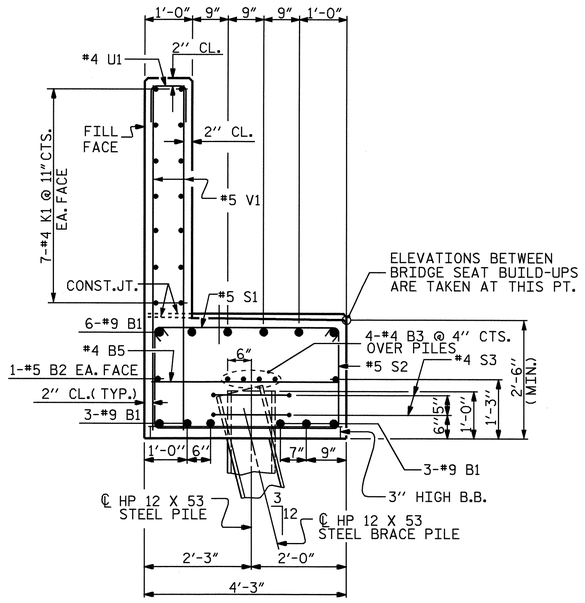
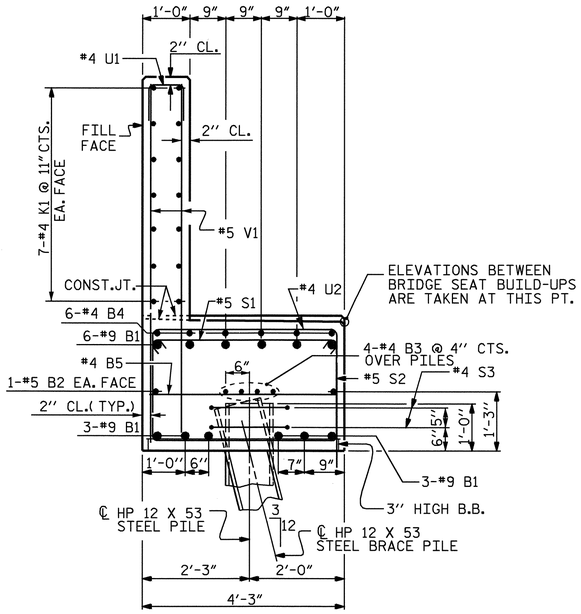
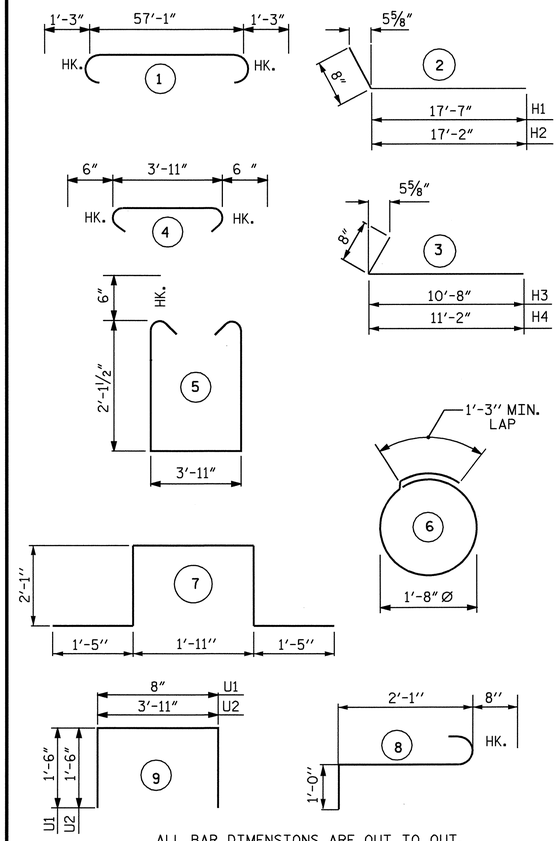


SECTION A-A



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	12	9	1	59'-7"	2431
B2	2	5	STR	57'-1"	119
B3	8	4	STR	29'-9"	159
B4	6	4	STR	10'-4"	41
B5	15	4	STR	3'-11"	39
B6	6	4	STR	11'-8"	47
H1	13	4	2	18'-3"	158
H2	13	4	2	17'-10"	155
H3	12	4	3	11'-4"	91
H4	12	4	3	11'-10"	95
K1	28	4	STR	29'-10"	558
K2	8	4	STR	4'-9"	25
P1	16	4	STR	4'-7"	49
S1	50	5	4	4'-11"	256
S2	50	5	5	9'-2"	478
S3	22	4	6	6'-6"	96
S4	2	6	7	8'-11"	27
S5	6	6	8	3'-9"	34
U1	48	4	9	3'-8"	118
U2	15	4	9	6'-11"	69
V1	96	5	STR	8'-3"	826
V2	42	4	STR	10'-6"	295
V3	30	4	STR	10'-0"	200

REINFORCING STEEL TOTAL LBS. 6366

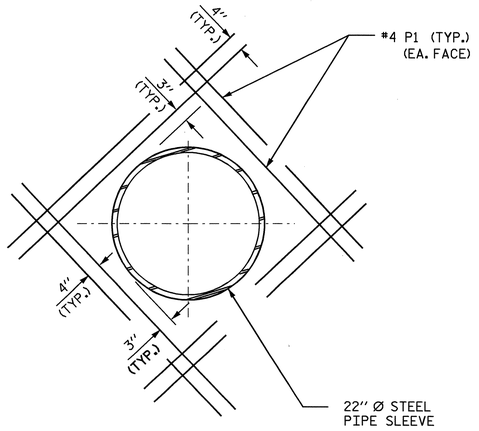
CLASS A CONCRETE

POUR #1 CAP & LOWER
PORTION OF WINGS 29.4 CU. YD.

POUR #2 BACKWALL & UPPER
PORTION OF WINGS 21.7 CU. YD.

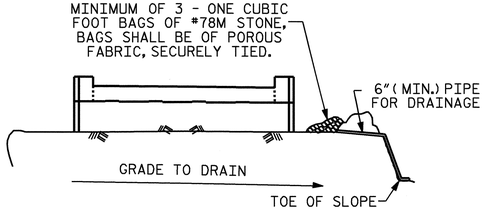
TOTAL CLASS A CONCRETE 51.1 CU. YD.

HP 12 X 53 STEEL PILES
NO. 13 LIN. FEET 260



22" Ø STEEL PIPE SLEEVE DETAIL

THE REINFORCING STEEL IN BACKWALL WILL BE CUT AND FIELD BENT AS NECESSARY TO CLEAR STEEL PIPE SLEEVE..

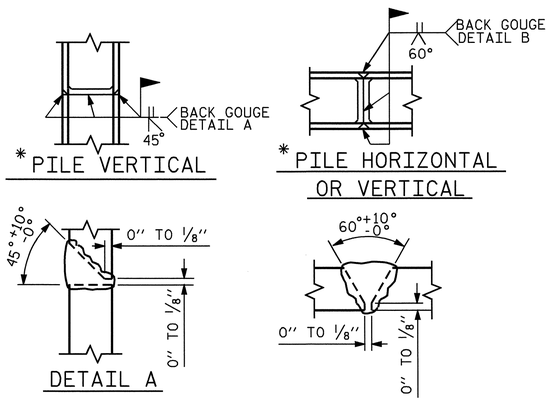


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

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

TEMPORARY DRAINAGE AT END BENT



POSITION OF PILE DURING WELDING.

PILE SPLICE DETAILS

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

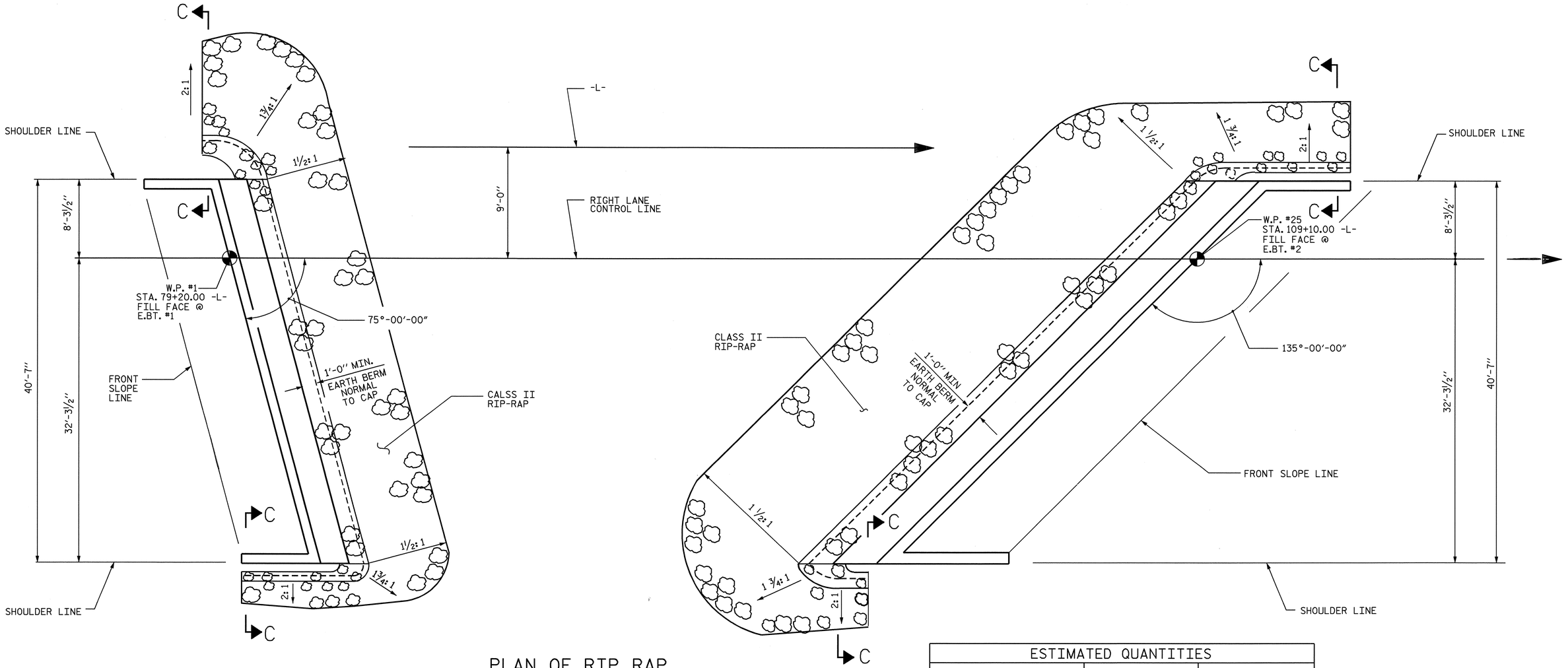
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE
END BENT 2

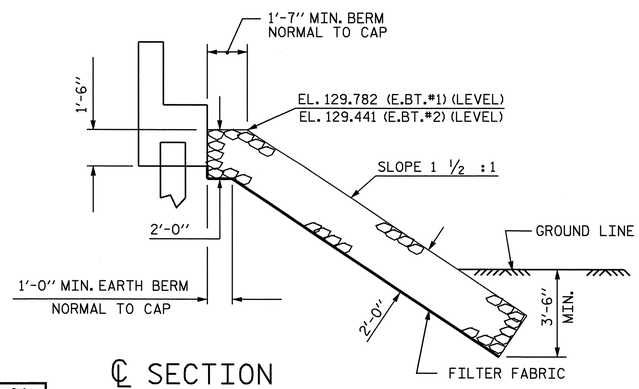
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-112
1			3			TOTAL SHEETS
2			4			115

DRAWN BY : S. M. RASHIDI DATE : 6/30/08
CHECKED BY : J. A. TILLMAN DATE : 7/17/08

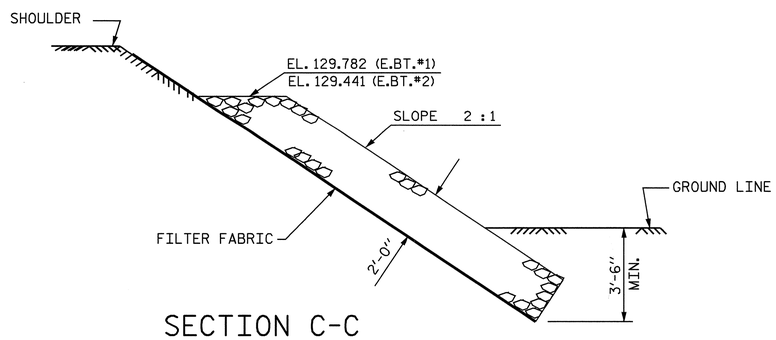


PLAN OF RIP RAP

ESTIMATED QUANTITIES		
BRIDGE @ STA. 94+15.00 -L-	RIP RAP CLASS II	FILTER FABRIC FOR DRAINAGE
	TONS	SQUARE YARDS
END BENT 1	105	100
END BENT 2	240	230



℄ SECTION



SECTION C-C

BERM RIP RAPPED

PROJECT NO. U-3334A
JOHNSTON COUNTY
STATION: 94+15.00 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

RIP RAP DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-113
1			3			TOTAL SHEETS
2			4			115

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON
10/27/08

ASSEMBLED BY N. Q. TRAN	DATE : 8-2-04	
CHECKED BY : S. M. RASHIDI	DATE : 10-22-04	
DRAWN BY : FCJ 2/88	REV. 7/17/98	REK/RWW
CHECKED BY : ARB 8/88	REV. 8/16/99	RWW/LES
	REV. 10/17/00	RWW/LES

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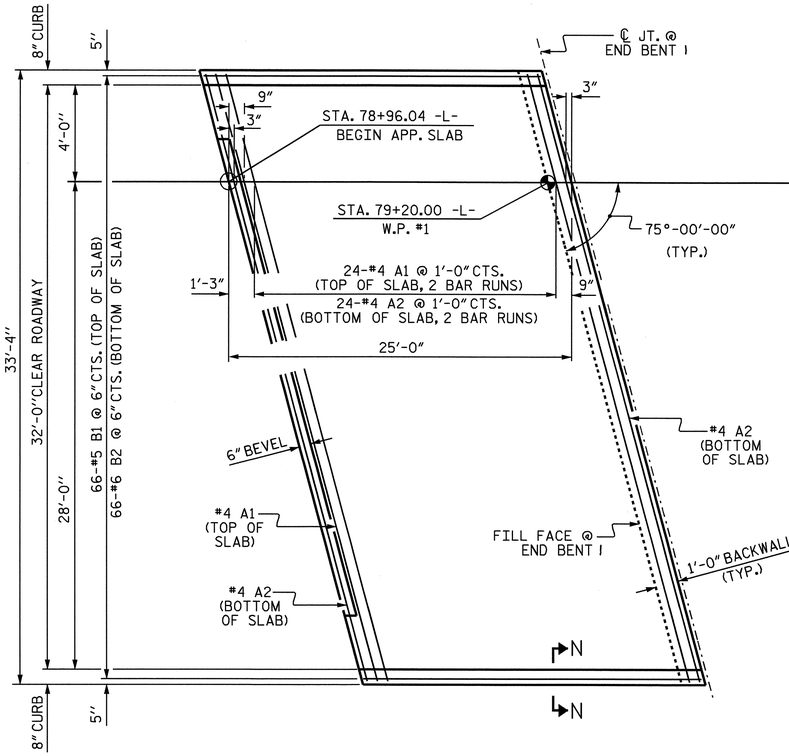
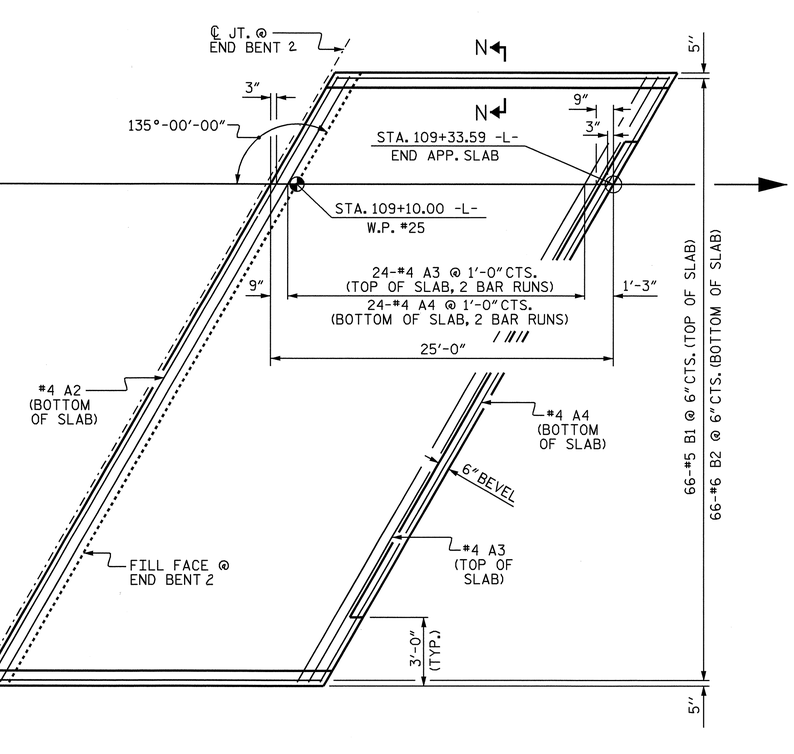
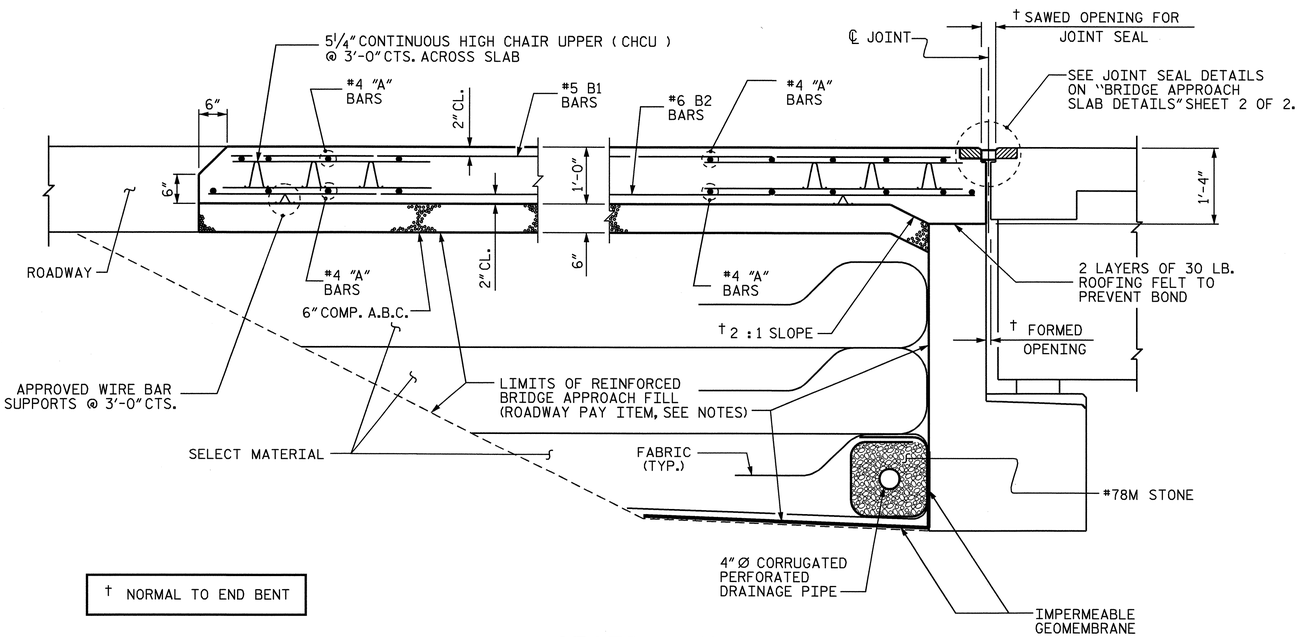


PLAN @ END BENT 1



PLAN @ END BENT 2

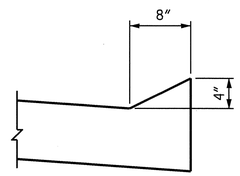
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



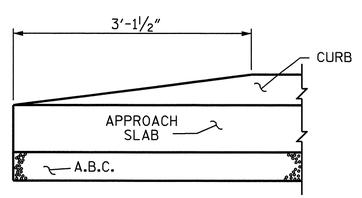
† NORMAL TO END BENT

SECTION THRU SLAB

(AT END BENT 1 - END BENT 2 SIMILAR)



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

BILL OF MATERIAL

APPROACH SLAB AT EB 1						APPROACH SLAB AT EB 2					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳A1	50	#4	STR	18'-1"	604	✳A3	50	#4	STR	24'-4"	813
A2	52	#4	STR	18-'0"	625	A4	52	#4	STR	24-'3"	842
✳B1	66	#5	STR	23'-8"	1629	✳B1	66	#5	STR	23'-8"	1629
B2	66	#6	STR	24-'8"	2445	B2	66	#6	STR	24-'8"	2445
REINFORCING STEEL				LBS.	3070	REINFORCING STEEL				LBS.	3287
✳EPOXY COATED REINFORCING STEEL				LBS.	2233	✳EPOXY COATED REINFORCING STEEL				LBS.	2442
CLASS AA CONCRETE				C. Y.	31.0	CLASS AA CONCRETE				C. Y.	31.0

NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

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

THE 6" COMP. A.B.C. SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB AND SHALL EXTEND 1'-0" OUTSIDE EACH EDGE OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL BE FLUSH WITH THE ROADWAY END OF THE APPROACH SLAB, AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE PARAPET.

WITH EVAZOTE JOINT SEAL

FOR EVAZOTE JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE EVAZOTE JOINT SEAL SHALL BE 2½".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R ANDERSON

11/26/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-114
1			3			TOTAL SHEETS
2			4			115

STD. NO. BAS4

ASSEMBLED BY : S. M. RASHIDI	DATE : 7/30/08	
CHECKED BY : J.A. TILLMAN	DATE : 8/69/08	
DRAWN BY : EEM 3/95	REV. 7/10/01	LES/RDR
CHECKED BY : VAP 3/95	REV. 5/7/03R	RWW/JTE
	REV. 5/1/06R	KMM/GM

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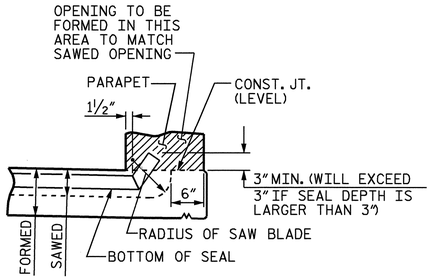
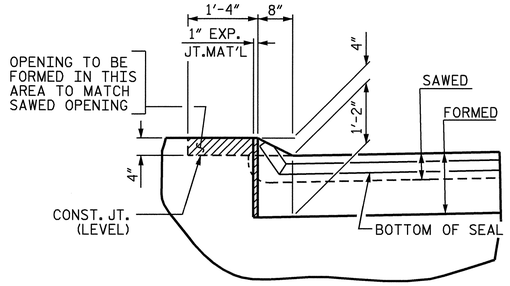
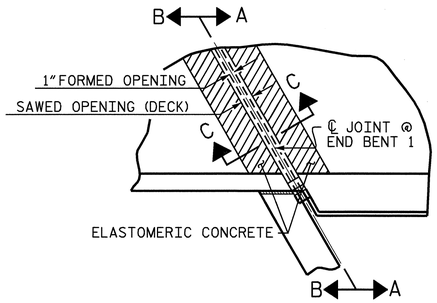


SECTION A-A

EVAZOTE JOINT SEAL TO BE CUT, HEAT WELDED AND TURNED UP PARALLEL TO SLOPED FACE OF THE BARRIER RAIL.

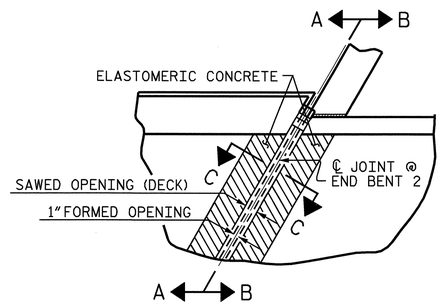


SECTION B-B



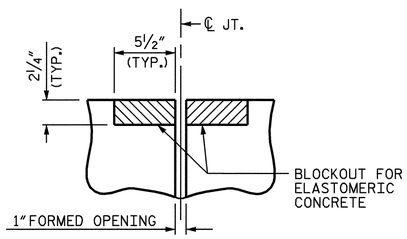
PLAN

(AT END BENT 1)



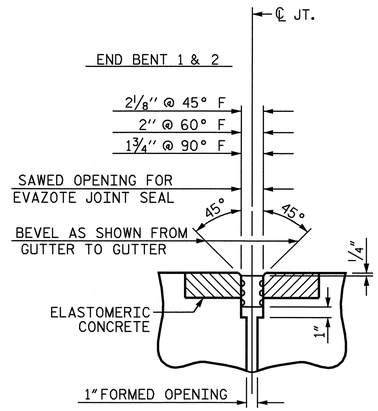
PLAN

(AT END BENT 2)



SECTION C-C

EVAZOTE JOINT SEAL
(PRE-SAWED ELASTOMERIC CONCRETE DIMENSIONS)

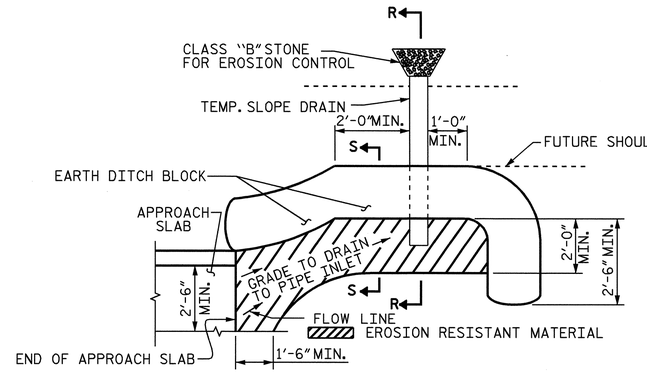


SECTION C-C

EVAZOTE JOINT SEAL
(EXPANSION)

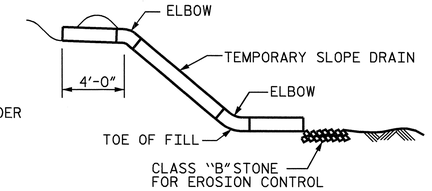
JOINT SEAL DETAILS

(SHOWING PARTIAL DEPTH BLOCKOUT)
END BENT 1 & 2

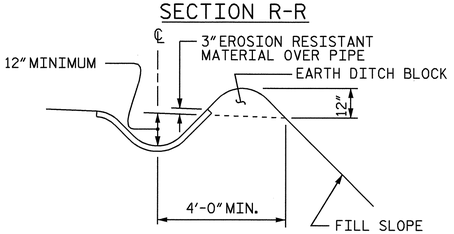


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN.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

PLAN VIEW



SECTION R-R



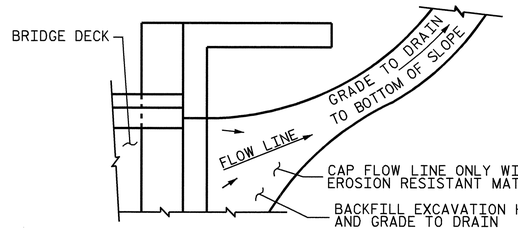
SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

ELASTOMERIC CONCRETE	
END BENT	ELASTOMERIC CONCRETE * (CU. FT.)
1	5.7
2	7.8
TOTAL	13.5

* BASED ON THE MINIMUM BLOCKOUT SHOWN.



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

TEMPORARY DRAINAGE DETAIL

PROJECT NO. U-3334A

JOHNSTON COUNTY

STATION: 94+15.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

NORTH CAROLINA PROFESSIONAL SEAL 11259 ENGINEER DAVID R. ANDERSON
11/26/08

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S-115
1			3			TOTAL SHEETS
2			4			115

STD. NO. BAS10

ASSEMBLED BY : S. M. RASHIDI	DATE : 7/30/08		
CHECKED BY : J.A. TILLMAN	DATE : 8/69/08		
DRAWN BY : FCJ 11/88	REV. 10/17/00	RWW/LES	
CHECKED BY : ARB 11/88	REV. 5/7/03	RWW/JTE	
	REV. 5/1/06R	MAA/KMM	

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STANDARD NOTES

DESIGN DATA:

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

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2006 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

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

CONCRETE:

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

CONCRETE CHAMFERS:

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

DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

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

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

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

REINFORCING STEEL:

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

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

STRUCTURAL STEEL:

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

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

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (c) RGW REV. 5-7-03 RWW (c) JTE
REV. 8-16-99 RWW (c) LES REV. 5-1-06 TLA (c) GM

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