09/08/99

TIP PROJECT: W-5516

CONTRACT: C203652

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

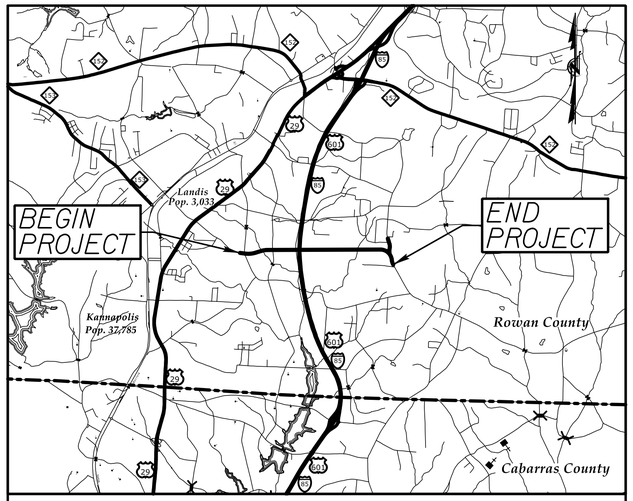
# ROWAN COUNTY

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | W-5516 | | |

| STATE PROJ. NO. | F. A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 44105.1.FD | HSIP-1221(18) | PE |
| 44105.3.FD1 | HSIP-1221(18) | CONST |

***LOCATION:*** *OLD BEATTY FORD ROAD FROM WEST OF BOSTIAN ROAD INTERSECTION TO LENTZ ROAD*

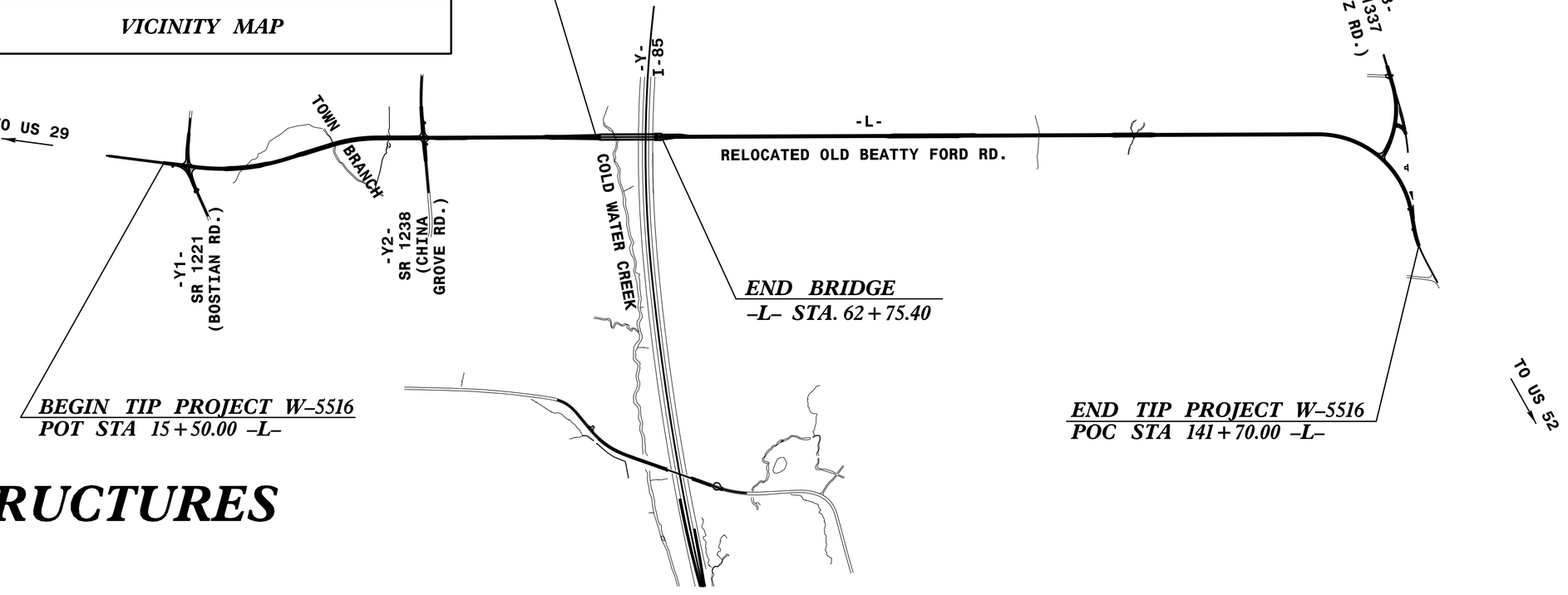
***TYPE OF WORK:*** *GRADING, DRAINAGE, PAVING, INTERSECTION IMPROVEMENTS, STRUCTURES & CULVERTS.*




*VICINITY MAP*

NAD 83/
NSRS 2007

*BEGIN BRIDGE*
*-L- STA. 57+45.40*




*END BRIDGE*
*-L- STA. 62+75.40*

*BEGIN TIP PROJECT W-5516*
*POT STA 15+50.00 -L-*

*END TIP PROJECT W-5516*
*POC STA 141+70.00 -L-*

# STRUCTURES

***DESIGN DATA***

ADT (2015) = 2000
ADT (2035) = 3300
DHV = 10 %
D = 65 %
T = 8 % *
V = 50 MPH
* TTST = 3% DUAL = 5%

FUNC CLASS = COLLECTOR
REGIONAL TIER

***PROJECT LENGTH***

*LENGTH ROADWAY TIP PROJECT W-5516 = 2.290 MILE*

*LENGTH STRUCTURE TIP PROJECT W-5516 = 0.100 MILE*

*TOTAL LENGTH TIP PROJECT W-5516 = 2.390 MILE*

*Prepared for the North Carolina Department of Transportation In the office of:*

ICA Engineering
5121 Kingdom Way, Suite 100
Raleigh, NC 27607
NC License No: P0258

*2012 STANDARD SPECIFICATIONS*

*LETTING DATE:*
SEPTEMBER 15, 2015

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by:
Thomas E. Tallman
E9B789620EE24D5...
7/7/2015

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·

5/28/2015
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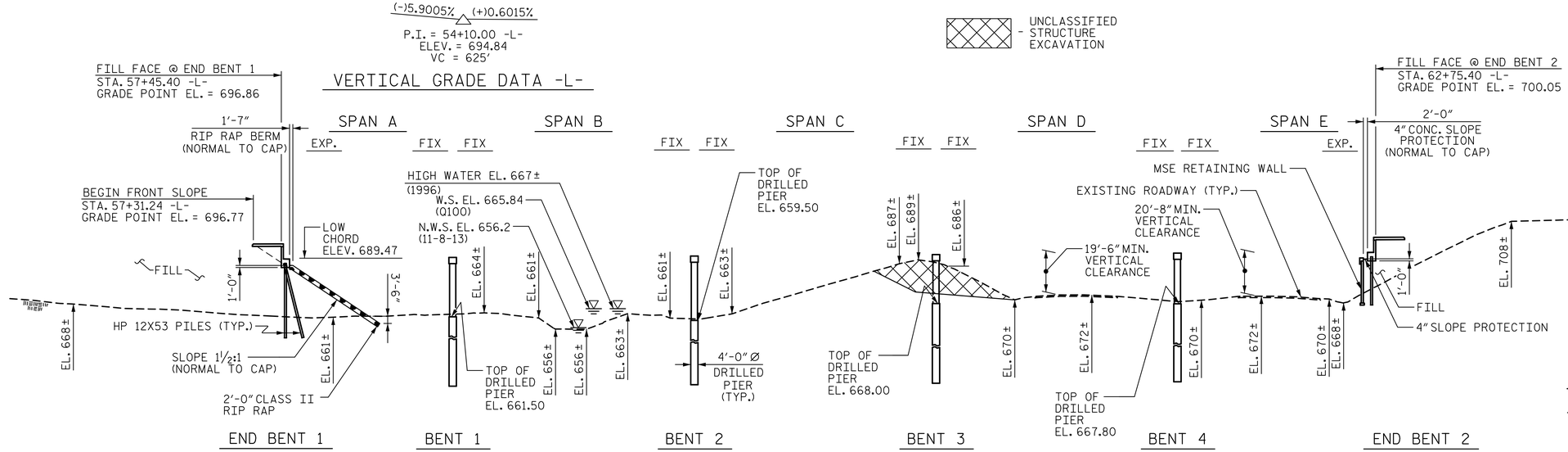
ICA Engineering

F.A. PROJECT NO. : HSIP-1221(18)

## VERTICAL GRADE DATA -L-

(-)5.9005% (+)0.6015%
P.I. = 54+10.00 -L-
ELEV. = 694.84
VC = 625'




## SECTION ALONG -L-

SECTIONS AT BENT AND END BENTS ARE AT RIGHT ANGLES

## HORIZONTAL CURVE DATA -Y-

P.I. = 44+63.14 -Y-
△ = 12°28'03.6" (LT)
D = 0°29'15.8"
L = 2,556.26'
T = 1,283.20'
R = 11,747.41'

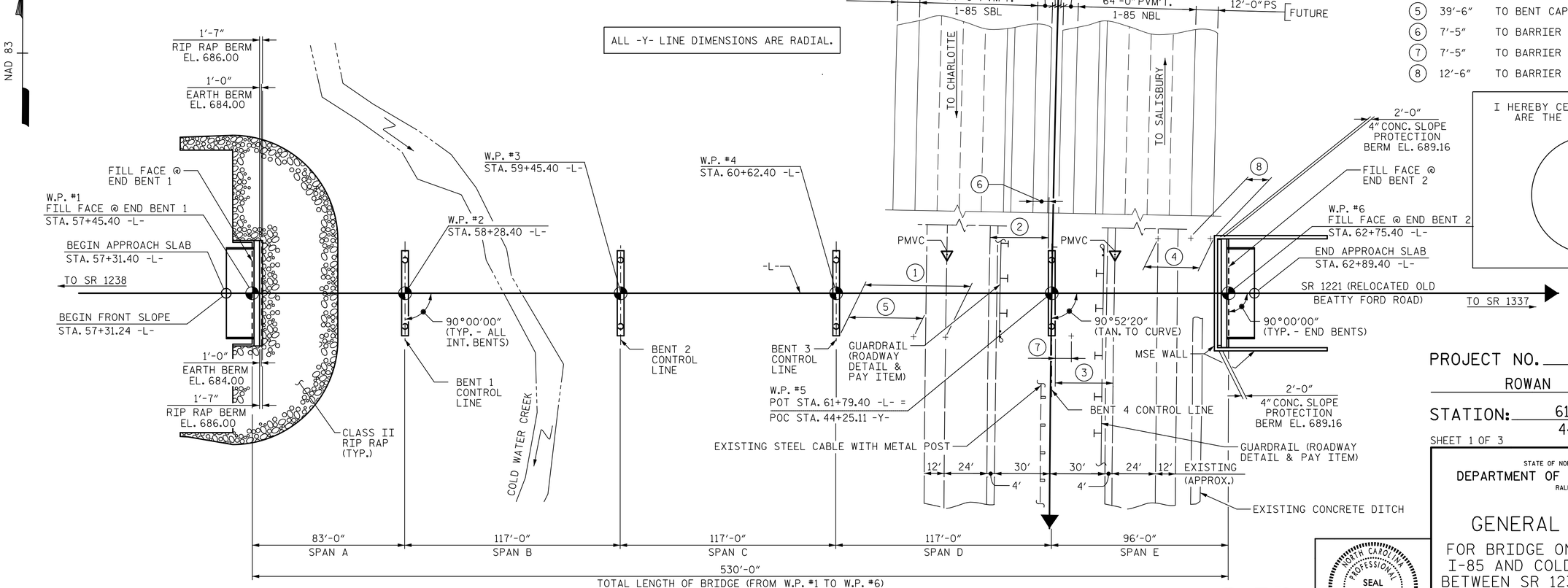
## MIN. HORIZ. CLEARANCE

### PROPOSED

| | | |
|---|---|---|
| 1 | 57'-3" | TO BENT CAP |
| 2 | 31'-6" | TO BENT CAP |
| 3 | 31'-5" | TO BENT CAP |
| 4 | 31'-10" | TO FACE OF MSE WALL |

### FUTURE

| | | |
|---|---|---|
| 5 | 39'-6" | TO BENT CAP |
| 6 | 7'-5" | TO BARRIER RAIL |
| 7 | 7'-5" | TO BARRIER RAIL |
| 8 | 12'-6" | TO BARRIER RAIL |




## PLAN

PILES NOT SHOWN FOR CLARITY

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. W-5516
ROWAN COUNTY
STATION: 61+79.40 -L-
44+25.11 -Y-
SHEET 1 OF 3 BRIDGE NO. 467

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

FOR BRIDGE ON SR 1221 OVER I-85 AND COLD WATER CREEK BETWEEN SR 1238 AND SR 1337

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

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

ICA Engineering
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: P-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN
DocuSigned by: Thomas E. Tallman 7/7/2015
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5/29/2015
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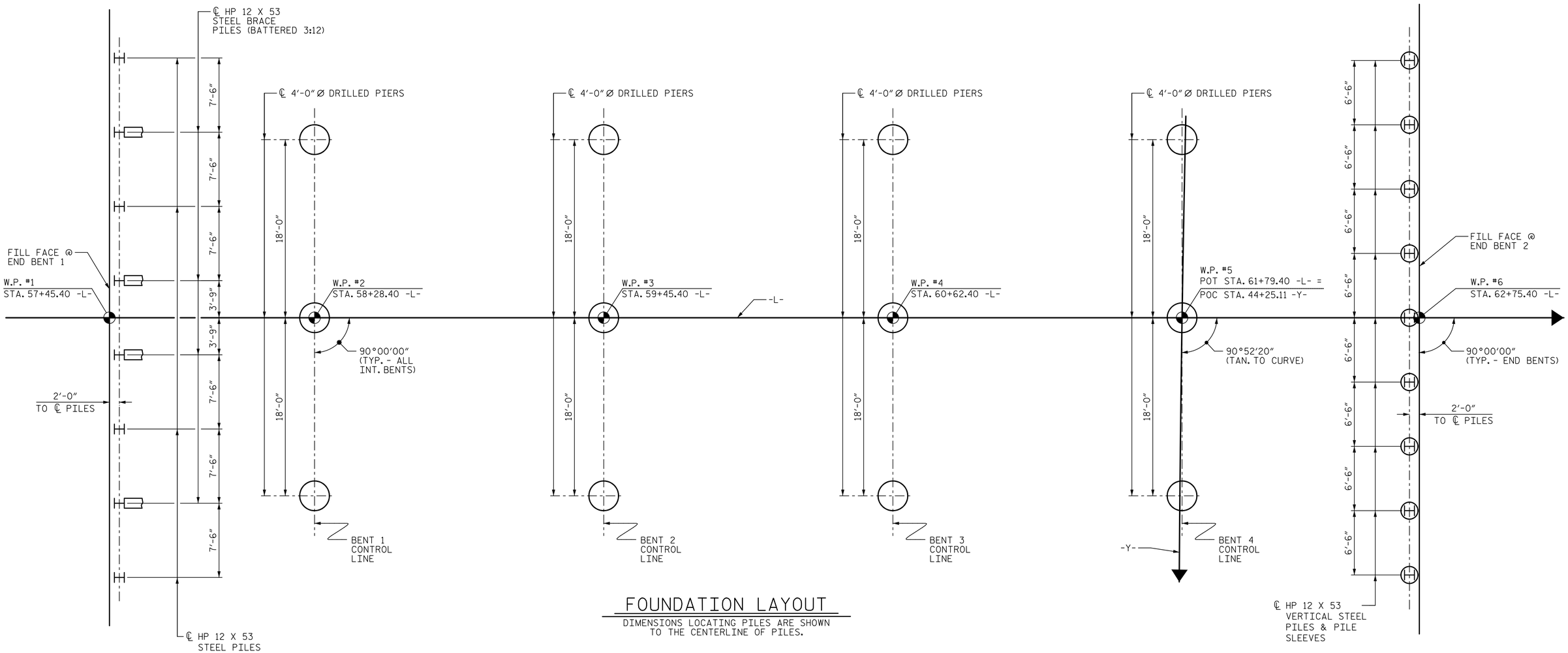
ICA Engineering




# FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES.

## NOTES

FOR PILES, SEE SECTION 450 OF STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE. DRIVE VERTICAL PILES TO A REQUIRED DRIVING RESISTANCE OF 150 TONS PER PILE.

PILES AT END BENT NO. 2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE. DRIVE PILES AT BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY OF 43,420 FT-LBS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NOS. 1 AND 2. THIS ESTIMATED ENERGY DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH THE PILES PROVISION.

STEEL H-PILE POINTS ARE REQUIRED FOR STEEL H-PILES AT END BENT NO. 1 AND END BENT NO. 2. FOR STEEL PILE POINTS, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

OBSERVE A 1 MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT TO THE BOTTOM OF CAP ELEVATION BEFORE BEGINNING END BENT CONSTRUCTION AT END BENT NO. 1.

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

DRILLED PIERS AT BENT NOS. 1, 2, 3 & 4 ARE DESIGNED FOR A FACTORED RESISTANCES OF 679, 721, 702, & 655 TONS PER PIER, RESPECTIVELY.

DRILLED PIERS AT BENT NOS. 1, 2, 3 & 4 ARE DESIGNED FOR A FACTORED RESISTANCES OF 679, 721, 702, & 655 TONS PER PIER, RESPECTIVELY.

DRILLED PIERS AT BENT NOS. 1 THROUGH 4 ARE DESIGNED FOR SIDE RESISTANCE ONLY.

INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 635.9 FT AND A PENETRATION OF AT LEAST 12.0 FT INTO COMPETENT ROCK, AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 1. IF REQUIRED, DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 647.9 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

IF REQUIRED, INSTALL PERMANENT STEEL CASING AT BENT NO. 1 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATON 660.2 FT.

INSTALL DRILLED PIERS AT BENT NO. 2 TO A TIP ELEVATION NO HIGHER THAN 635.9 FT AND A PENETRATION OF AT LEAST 12.0 FT INTO COMPETENT ROCK, AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

PERMANENT STEEL CASINGS MAY BE REQUIRED FOR DRILLED PIERS AT BENT NO. 2. IF REQUIRED, DO NOT EXTEND PERMANENT CASING BELOW ELEVATION 649.6 FT WITHOUT PRIOR APPROVAL FROM THE ENGINEER. THE ENGINEER WILL DETERMINE THE NEED FOR PERMANENT CASINGS.

IF REQUIRED, INSTALL PERMANENT STEEL CASING AT BENT NO. 2 BY VIBRATING, SCREWING OR DRIVING PERMANENT CASINGS BEFORE EXCAVATING OR DISTURBING ANY MATERIAL BELOW ELEVATON 657.4 FT.

INSTALL DRILLED PIERS AT BENT NO. 3 TO A TIP ELEVATION NO HIGHER THAN 640.3 FT AND A PENETRATION OF AT LEAST 12.0 FT INTO COMPETENT ROCK, AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIERS AT BENT NO. 4 TO A TIP ELEVATION NO HIGHER THAN 637.2 FT AND A PENETRATION OF AT LEAST 12.0 FT INTO COMPETENT ROCK, AS DEFINED BY ARTICLE 411-1 OF THE STANDARD SPECIFICATIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO. 1 IS ELEVATION 660.2 FT AND FOR BENT NO. 2 IS ELEVATION 657.4 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

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

PILES AT END BENT 2 ARE TO BE SLEEVED IN MSE REINFORCED BACKFILL ZONE. SEE MSE RETAINING WALL PLANS. NO SEPARATE PAYMENT WILL BE MADE FOR PIPE SLEEVES AND ARE CONSIDERED INCIDENTAL TO OTHER CONTRACT UNITS.

LOOSE SAND TO FILL VOID BETWEEN PILE AND PILE SLEEVE SHALL NOT BE ADDED UNTIL THE MSE WALL FILL IS TO GRADE FOR END BENT CONSTRUCTION.

WHEN DRIVING PILES AT END BENT NO. 1 AND END BENT NO. 2, FUEL SETTING ADJUSTMENT WILL BE REQUIRED TO AVOID OVERSTRESSING THE PILES AT THE END OF DRIVING.

PILES AT END BENT NO. 2 WILL REQUIRE PILE SLEEVES TO REDUCE DOWNDRAG LOADS.

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

ICA Engineering
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN
DocuSigned by: Thomas E. Tallman 7/7/2015
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PROJECT NO. W-5516
ROWAN COUNTY
STATION: 61+79.40 -L-
SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
FOR BRIDGE ON SR 1221 OVER I-85 AND COLD WATER CREEK BETWEEN SR 1238 AND SR 1337

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

5/28/2015
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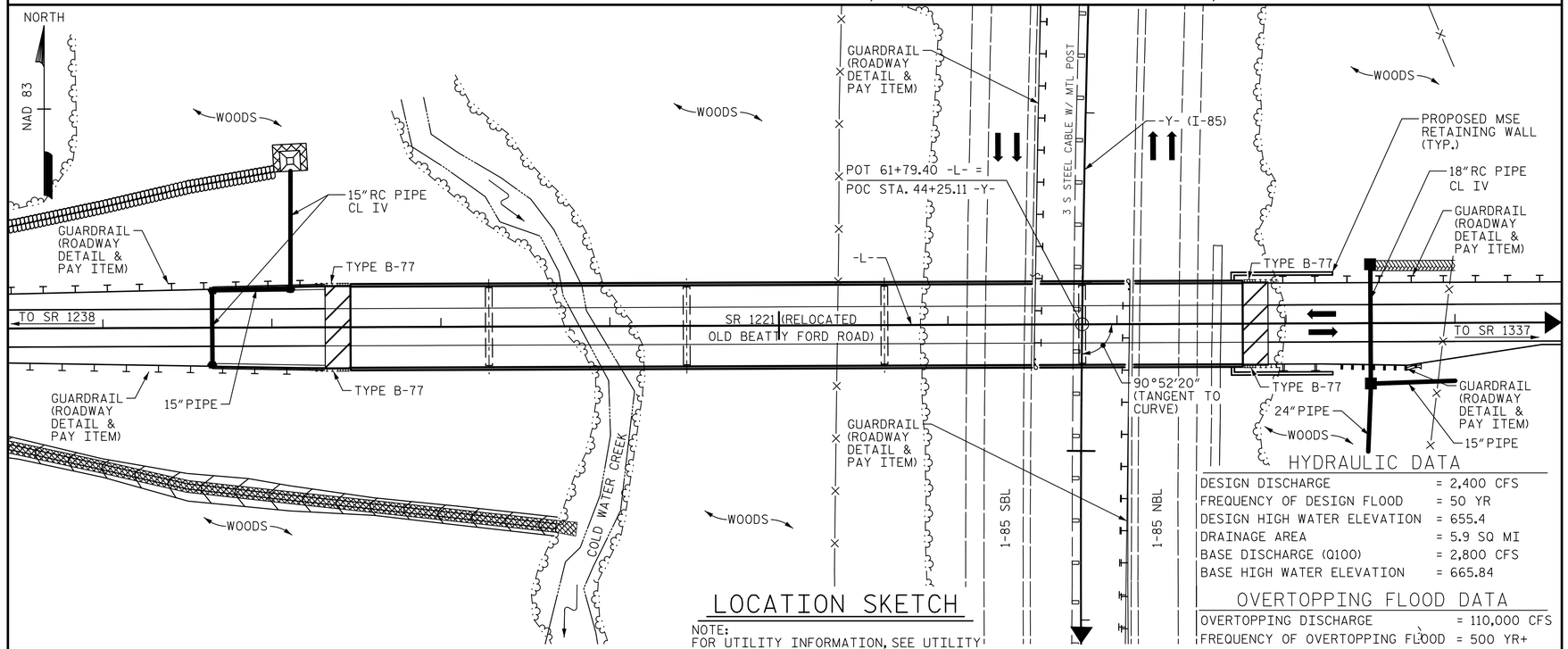
ICA Engineering

BENCH MARK # BM-2: RR SPIKE IN NW ROOT OF 6" OAK TREE, 995.31' RT. OF STA 71+90.63 -L-, EL. 732.72




## LOCATION SKETCH

NOTE:
FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

### HYDRAULIC DATA

| | |
|---|---|
| DESIGN DISCHARGE | = 2,400 CFS |
| FREQUENCY OF DESIGN FLOOD | = 50 YR |
| DESIGN HIGH WATER ELEVATION | = 655.4 |
| DRAINAGE AREA | = 5.9 SQ MI |
| BASE DISCHARGE (Q100) | = 2,800 CFS |
| BASE HIGH WATER ELEVATION | = 665.84 |

### OVERTOPPING FLOOD DATA

| | |
|---|---|
| OVERTOPPING DISCHARGE | = 110,000 CFS |
| FREQUENCY OF OVERTOPPING FLOOD | = 500 YR+ |
| OVERTOPPING FLOOD ELEVATION | = 696.6 |

## NOTES:

ASSUMED LIVE LOAD= HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA ON SHEET S-1 SHALL BE EXCAVATED FOR A DISTANCE OF 60.0 FT. AT BENT 3 ON EACH SIDE OF THE CENTERLINE OF ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION, SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

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

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

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

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

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINTS OF MINIMUM VERTICAL CLEARANCE ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING BRIDGE CONSTRUCTION, VERIFY THE ELEVATIONS ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE. REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

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

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

## TOTAL BILL OF MATERIAL

| | 4'-0" DIA DRILLED PIERS IN SOIL | 4'-0" DIA DRILLED PIERS NOT IN SOIL | PERMANENT STEEL CASING FOR 4'-0" DIA. DRILLED PIER | CSL TESTING | UNCLASSIFIED STRUCTURE EXCAVATION | REINFORCED CONCRETE DECK SLAB | GROOVING BRIDGE FLOORS | CLASS A CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | SPIRAL COLUMN REINFORCING STEEL | MODIFIED 72" PRESTRESSED CONCRETE GIRDERS | | HP 12 X 53 STEEL PILES | | STEEL PILE POINTS | CONCRETE BARRIER RAIL | 4" SLOPE PROTECTION | RIP RAP CLASS II | GEOTEXTILE FOR DRAINAGE | ELASTOMERIC BEARINGS | FOAM JOINT SEALS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | LIN. FT. | LIN. FT. | LIN. FT. | EA. | LUMP SUM | SQ. FT. | SQ. FT. | CU. YDS. | LUMP SUM | LBS. | LBS. | NO. | LIN. FT. | NO. | LIN. FT. | EA. | LIN. FT. | SQ.YDS. | TONS | SQ. YDS. | LUMP SUM | LUMP SUM |
| SUPERSTRUCTURE | | | | | | 27,053 | 24,963 | | | | | 25 | 2,619.17 | | | | 1,055.42 | | | | | |
| END BENT 1 | | | | | | | | 58.8 | | 7,781 | | | | 8 | 280 | 8 | | | 885 | 983 | | |
| BENT 1 | 40.80 | 36.00 | 44.72 | 1 | | | | 61.4 | | 17,250 | 3,775 | | | | | | | | | | | |
| BENT 2 | 34.80 | 36.00 | 33.29 | 1 | | | | 64.3 | | 17,393 | 3,841 | | | | | | | | | | | |
| BENT 3 | 47.10 | 36.00 | | 1 | | | | 55.9 | | 16,676 | 3,524 | | | | | | | | | | | |
| BENT 4 | 55.80 | 36.00 | | 1 | | | | 56.9 | | 17,409 | 3,813 | | | | | | | | | | | |
| END BENT 2 | | | | | | | | 49.9 | | 6,521 | | | | 9 | 315 | 9 | | 13 | | | | |
| TOTAL | 178.50 | 144.00 | 78.01 | 4 | LUMP SUM | 27,053 | 24,963 | 347.2 | LUMP SUM | 83,030 | 14,953 | 25 | 2,619.17 | 17 | 595 | 17 | 1,055.42 | 13 | 885 | 983 | LUMP SUM | LUMP SUM |

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# GENERAL DRAWING

FOR BRIDGE ON SR 1221 OVER I-85 AND COLD WATER CREEK BETWEEN SR 1238 AND SR 1337

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

DRAWN BY : D. H. CARTER DATE : JUN 2015
CHECKED BY : M. T. NEITHEISEL DATE : JUN 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : JUN 2015

ICA Engineering
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
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NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
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7/7/2015
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ICA Engineering

# LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

| LEVEL | | VEHICLE | WEIGHT (W) (TONS) | ⟨#⟩ CONTROLLING LOAD RATING | MINIMUM RATING FACTORS (RF) | TONS = W × RF | STRENGTH I LIMIT STATE | | | | | | | | | | SERVICE III LIMIT STATE | | | | | | COMMENT NUMBER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | MOMENT | | | | | SHEAR | | | | | MOMENT | | | | | | |
| | | | | | | | LIVE-LOAD FACTORS ($\gamma_{LL}$) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | LIVE-LOAD FACTORS ($\gamma_{LL}$) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | |
| DESIGN LOAD RATING | | HL-93 (INVENTORY) | N/A | ⟨1⟩ | **1.13** | -- | 1.75 | 0.971 | **1.13** | E | EL/ER | **46.375** | 0.971 | 1.21 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.23 | E | EL/ER | 46.375 | |
| | | HL-93 (OPERATING) | N/A | | 1.46 | -- | 1.35 | 0.971 | 1.46 | E | EL/ER | 46.375 | 0.971 | 1.61 | B-D | EL/ER | 10.908 | N/A | -- | -- | -- | -- | -- | |
| | | HS-20 (INVENTORY) | 36.000 | ⟨2⟩ | **1.54** | 55.440 | 1.75 | 0.971 | **1.54** | E | EL/ER | **46.375** | 0.971 | 1.72 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.68 | E | EL/ER | 46.375 | |
| | | HS-20 (OPERATING) | 36.000 | | 2.00 | 72.000 | 1.35 | 0.971 | 2.00 | E | EL/ER | 46.375 | 0.971 | 2.26 | B-D | EL/ER | 10.908 | N/A | -- | -- | -- | -- | -- | |
| LEGAL LOAD RATING | SINGLE VEHICLE (SV) | SNSH | 13.500 | | 3.96 | 53.460 | 1.40 | 0.971 | 4.54 | E | EL/ER | 46.375 | 0.971 | 5.62 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 3.96 | E | EL/ER | 46.375 | |
| | | SNGARBS2 | 20.000 | | 2.88 | 57.600 | 1.40 | 0.971 | 3.30 | E | EL/ER | 46.375 | 0.971 | 3.88 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 2.88 | E | EL/ER | 46.375 | |
| | | SNAGRIS2 | 22.000 | | 2.70 | 59.400 | 1.40 | 0.971 | 3.10 | E | EL/ER | 46.375 | 0.971 | 3.56 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 2.70 | E | EL/ER | 46.375 | |
| | | SNCOTTS3 | 27.250 | | 1.97 | 53.683 | 1.40 | 0.971 | 2.26 | E | EL/ER | 46.375 | 0.971 | 2.73 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.97 | E | EL/ER | 46.375 | |
| | | SNAGGRS4 | 34.925 | | 1.62 | 56.579 | 1.40 | 0.971 | 1.86 | E | EL/ER | 46.375 | 0.971 | 2.19 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.62 | E | EL/ER | 46.375 | |
| | | SNS5A | 35.550 | | 1.58 | 56.169 | 1.40 | 0.971 | 1.82 | E | EL/ER | 46.375 | 0.971 | 2.18 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.58 | E | EL/ER | 46.375 | |
| | | SNS6A | 39.950 | | 1.44 | 57.528 | 1.40 | 0.971 | 1.65 | E | EL/ER | 46.375 | 0.971 | 1.95 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.44 | E | EL/ER | 46.375 | |
| | | SNS7B | 42.000 | | 1.37 | 57.540 | 1.40 | 0.971 | 1.57 | E | EL/ER | 46.375 | 0.971 | 1.89 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.37 | E | EL/ER | 46.375 | |
| | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33.000 | | 1.76 | 58.080 | 1.40 | 0.971 | 2.01 | E | EL/ER | 46.375 | 0.971 | 2.38 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.76 | E | EL/ER | 46.375 | |
| | | TNT4A | 33.075 | | 1.76 | 58.212 | 1.40 | 0.971 | 2.02 | E | EL/ER | 46.375 | 0.971 | 2.34 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.76 | E | EL/ER | 46.375 | |
| | | TNT6A | 41.600 | | 1.43 | 59.488 | 1.40 | 0.971 | 1.64 | E | EL/ER | 46.375 | 0.971 | 1.98 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.43 | E | EL/ER | 46.375 | |
| | | TNT7A | 42.000 | | 1.43 | 60.060 | 1.40 | 0.971 | 1.64 | E | EL/ER | 46.375 | 0.971 | 1.95 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.43 | E | EL/ER | 46.375 | |
| | | TNT7B | 42.000 | | 1.47 | 61.740 | 1.40 | 0.971 | 1.68 | E | EL/ER | 46.375 | 0.971 | 1.86 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.47 | E | EL/ER | 46.375 | |
| | | TNAGRIT4 | 43.000 | | 1.41 | 60.630 | 1.40 | 0.971 | 1.61 | E | EL/ER | 46.375 | 0.971 | 1.82 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.41 | E | EL/ER | 46.375 | |
| | | TNAGT5A | 45.000 | | 1.33 | 59.850 | 1.40 | 0.971 | 1.53 | E | EL/ER | 46.375 | 0.971 | 1.77 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | 1.33 | E | EL/ER | 46.375 | |
| | | TNAGT5B | 45.000 | ⟨3⟩ | **1.32** | 59.400 | 1.40 | 0.971 | 1.51 | E | EL/ER | 46.375 | 0.971 | 1.72 | B-D | EL/ER | 10.908 | 0.80 | 0.971 | **1.32** | E | EL/ER | **46.375** | |

## LOAD FACTORS:

| DESIGN LOAD RATING FACTORS | LIMIT STATE | $\gamma_{DC}$ | $\gamma_{DW}$ |
|---|---|---|---|
| | STRENGTH I | 1.25 | 1.50 |
| | SERVICE III | 1.00 | 1.00 |

## NOTES:

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

ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

## COMMENTS:

1.
2.
3.
4.

⟨#⟩ CONTROLLING LOAD RATING

⟨1⟩ DESIGN LOAD RATING (HL-93)

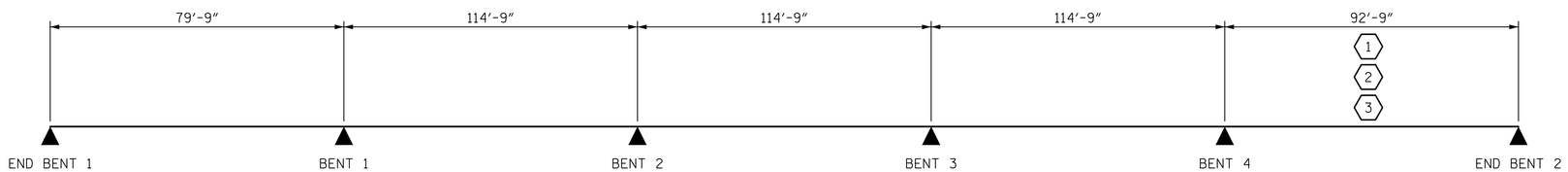
⟨2⟩ DESIGN LOAD RATING (HS-20)

⟨3⟩ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

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




## LRFR SUMMARY

(DIMENSIONS SHOWN ARE ℄ BEARING TO ℄ BEARING)

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

LRFR SUMMARY FOR PRESTRESSED CONCRETE GIRDERS
(NON-INTERSTATE TRAFFIC)

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

ASSEMBLED BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015

DRAWN BY : MAA 1/08
CHECKED BY : GM/DI 2/08

REV. 11/12/08RR MAA/GM
REV. 10/1/11 MAA/GM

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NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
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5/28/2015 R:\Structures\Plans\s4_w-5516_sd_lr.dgn
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STD. NO. LRFR1

## 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.

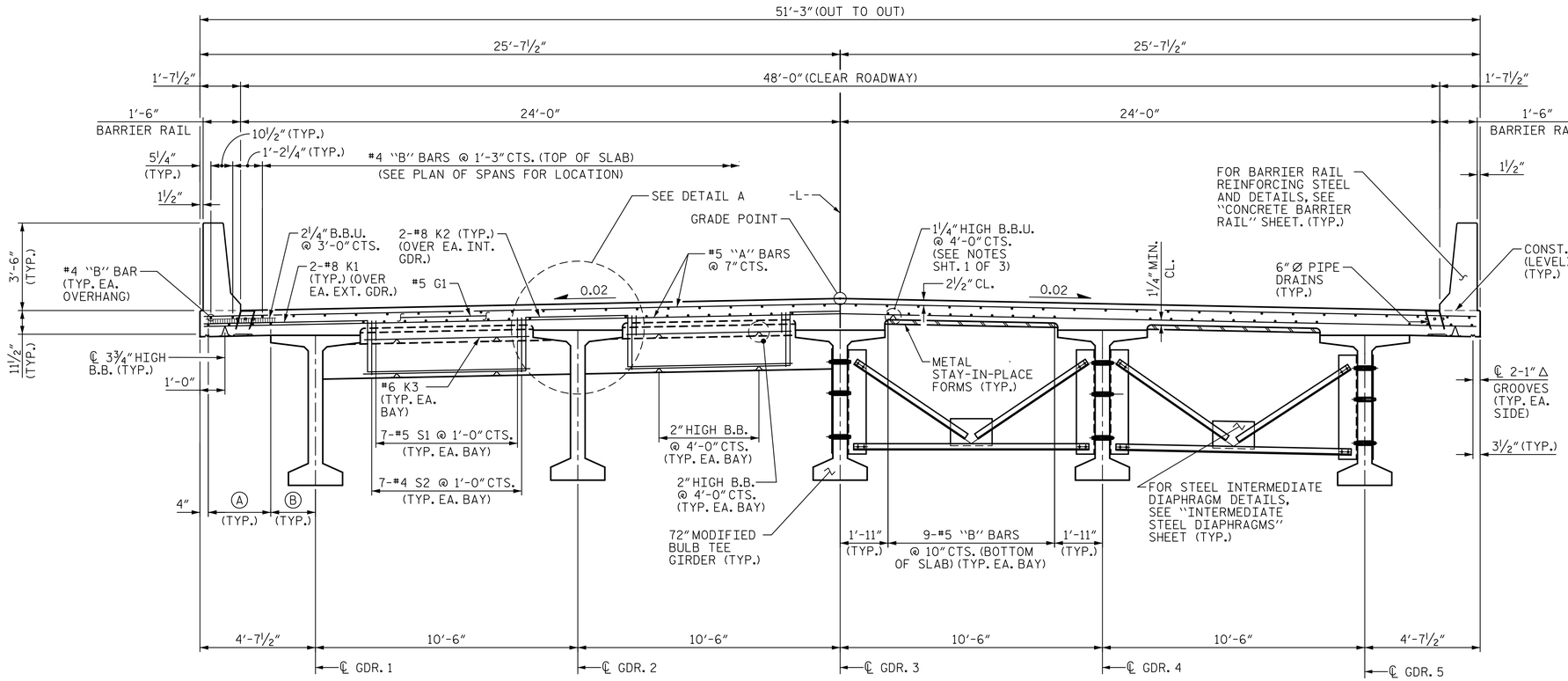
LONGITUDINAL STEEL MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO AVOID INTERFERENCE WITH STIRRUPS IN PRESTRESSED CONCRETE GIRDERS.

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.

CONCRETE BARRIER RAIL IN EACH 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.

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

FOR 6"Ø PIPE DRAIN DETAILS, SEE SHT. 2 OF 3.



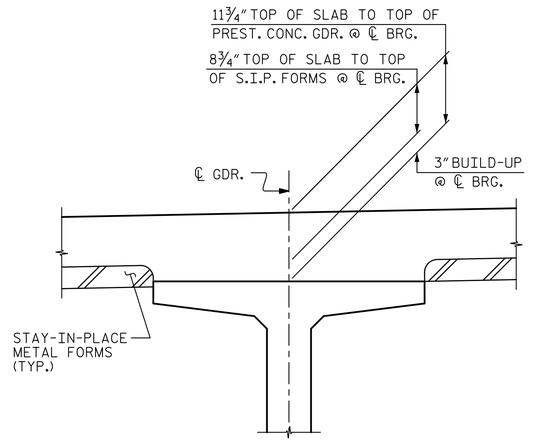

HALF SECTION - END BENT DIAPHRAGM

HALF SECTION - INTERMEDIATE DIAPHRAGM

Ⓐ 4-#5 "B" BARS @ 10" SPA.

Ⓑ 1'-9½"

## TYPICAL SECTION




## DETAIL "A"

(TYPICAL EACH GIRDER @ EACH BENT)

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-5 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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5/28/2015
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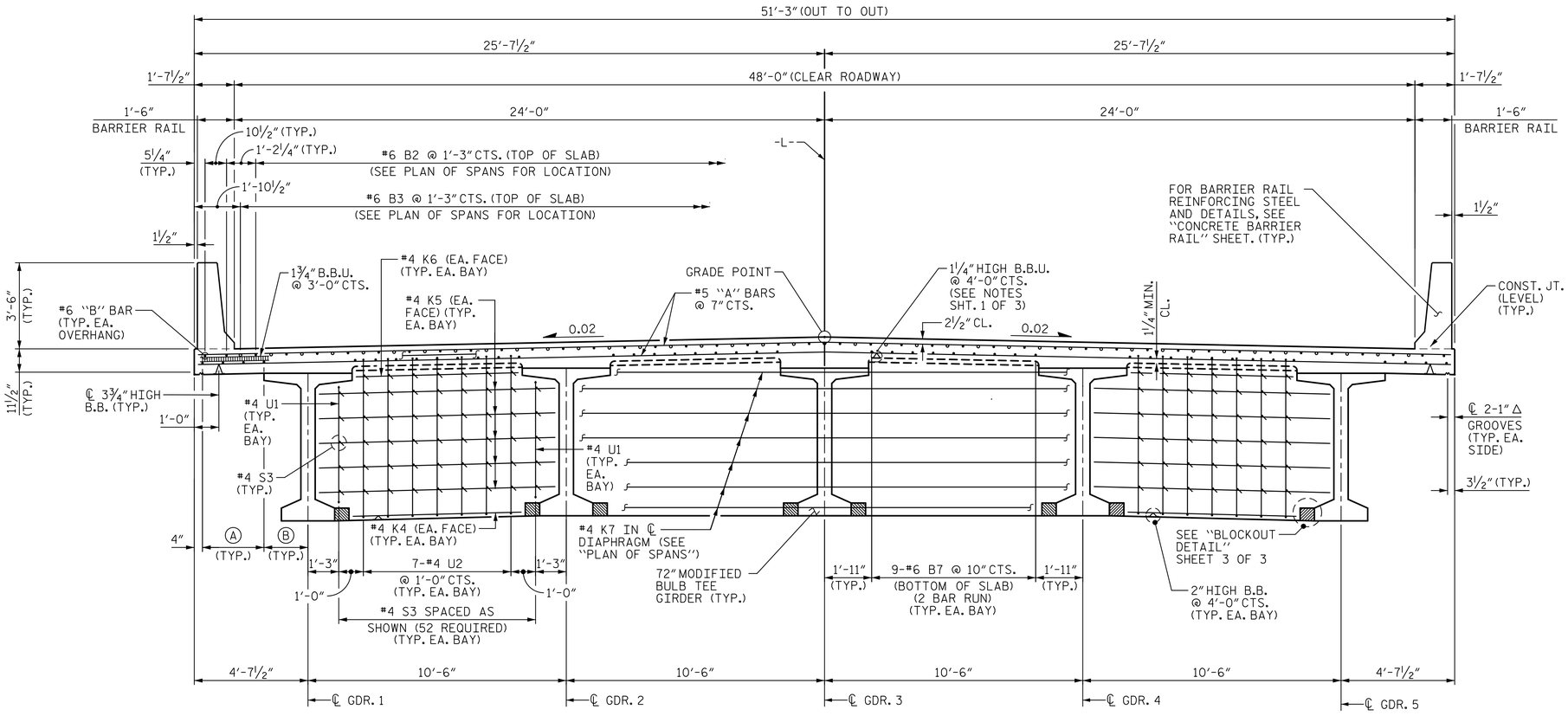
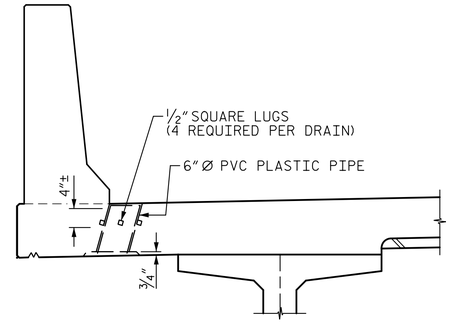



BENT DIAPHRAGM

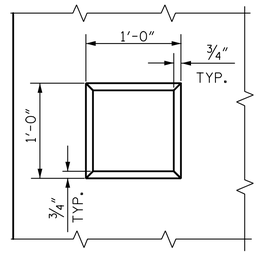
# TYPICAL SECTION

Ⓐ 4-#6 B7 @ 10" SPA.

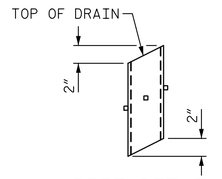
Ⓑ 1'-9½"




ELEVATION




PLAN OF RECESS




PIPE DETAIL
(34 DRAINS REQUIRED)

# DRAIN DETAILS

FOR DRAIN SPACING, SEE "PLAN OF SPANS" SHEETS.

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.

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

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-6 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEITHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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NC License No: F-0258

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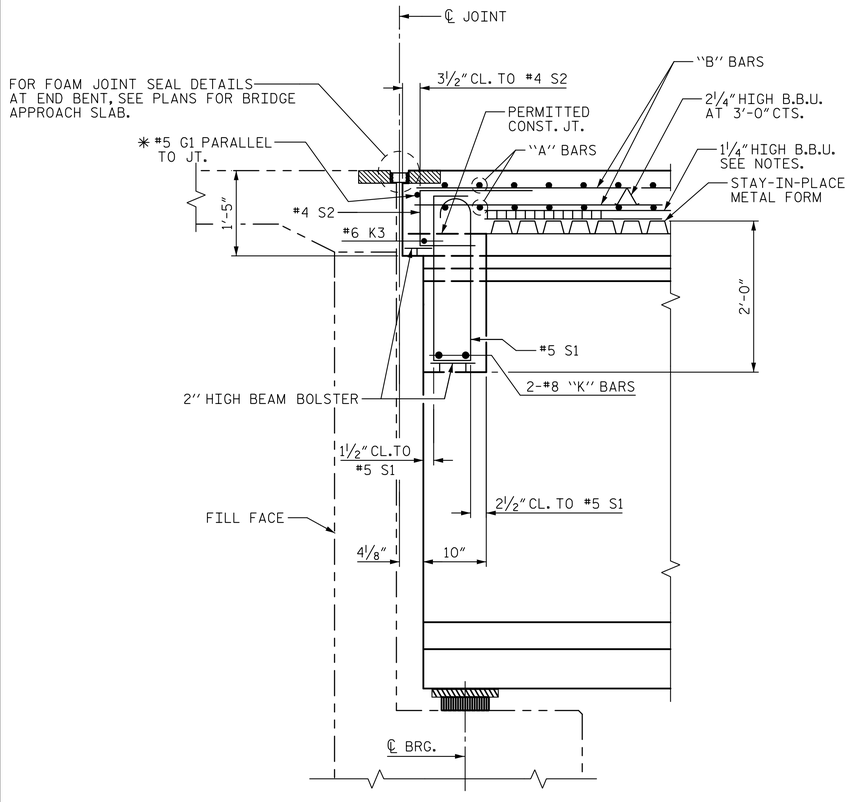
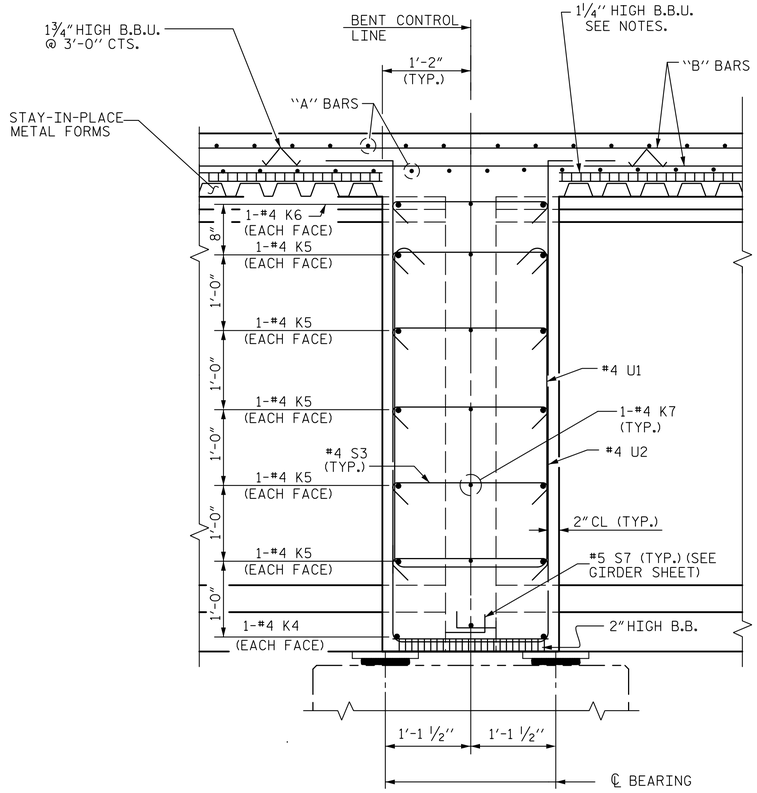
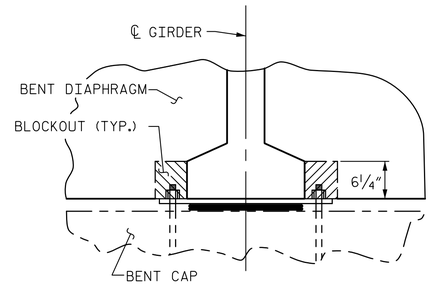



## SECTION THRU END BENT DIAPHRAGM

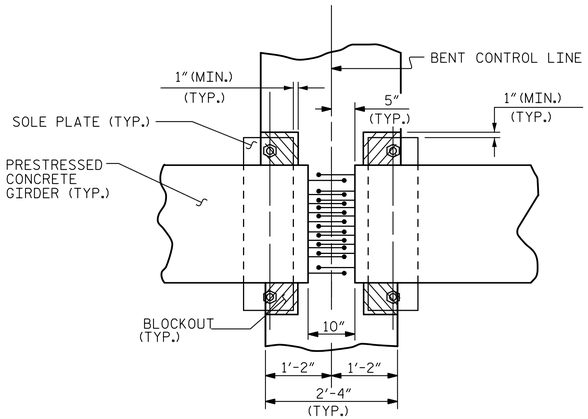
✳ #5 G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR STEEL REINFORCING AND STIRRUPS.




## SECTION THRU BENT DIAPHRAGM

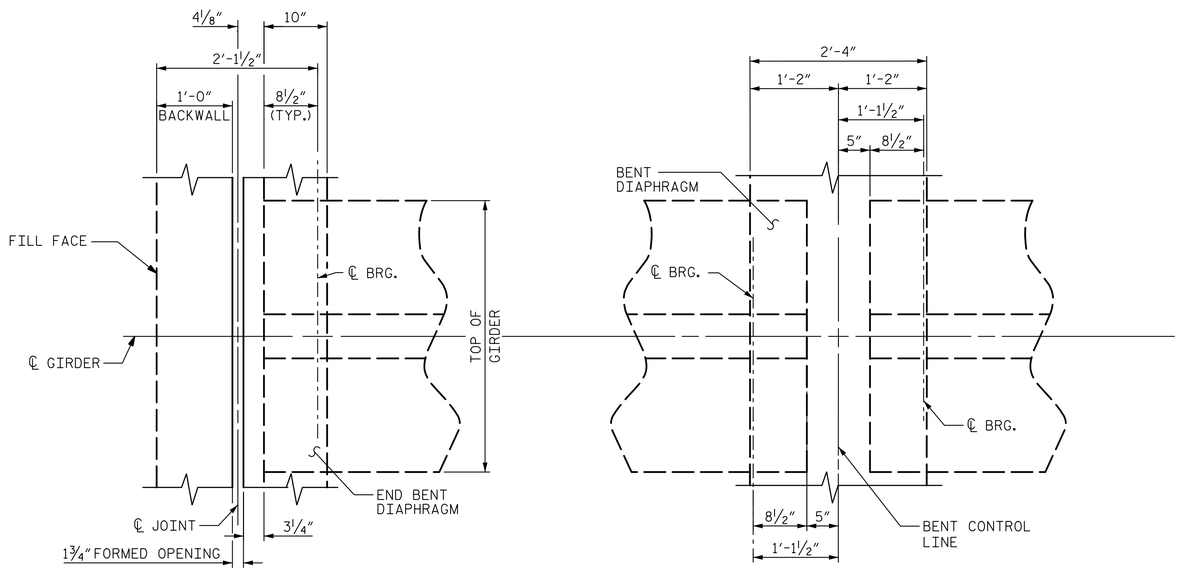



## SECTION




## PLAN

## BENT DIAPHRAGM BLOCK-OUT DETAIL




## END BENT DIAPHRAGM

## BENT DIAPHRAGM

## PLAN

| | | | |
|---|---|---|---|
| DRAWN BY : | D. H. CARTER | DATE : | MAY 2015 |
| CHECKED BY : | M. T. NEITHEISEL | DATE : | MAY 2015 |
| DESIGN ENGINEER OF RECORD: | T. E. TALLMAN | DATE : | MAY 2015 |

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

# TYPICAL SECTION DETAILS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-7 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

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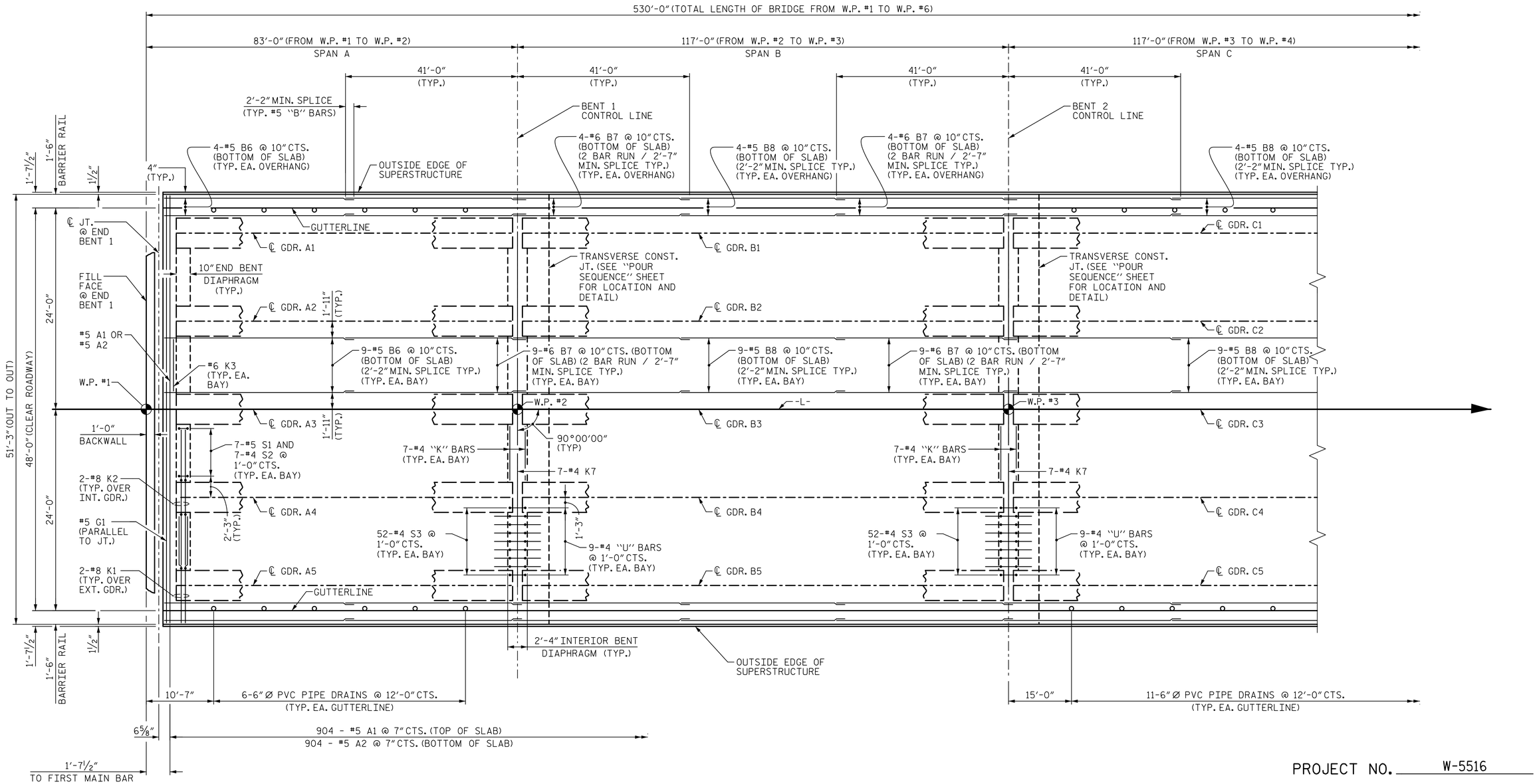


## PARTIAL PLAN OF SPANS "A", "B" AND "C"

FOR REINFORCING STEEL IN END BENT AND INTERIOR BENT DIAPHRAGMS, SEE "TYPICAL SECTION" SHEETS.
FOR LONGITUDINAL BARS IN TOP OF SLAB, SEE SHT. 3 OF 4.

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PARTIAL PLAN OF SPANS "A", "B" AND "C"

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-8 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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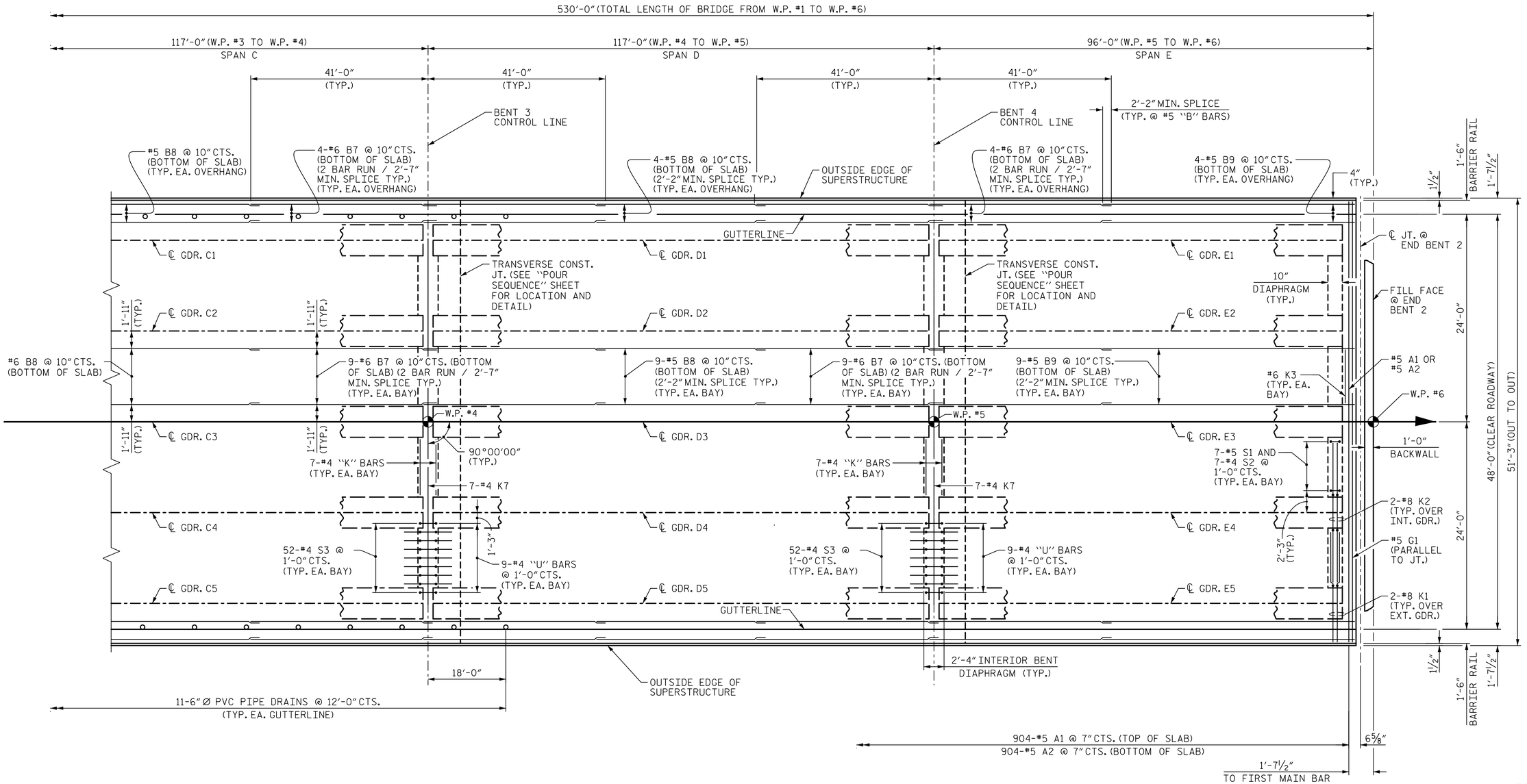


# PARTIAL PLAN OF SPANS "C", "D" AND "E"

FOR REINFORCING STEEL IN END BENT AND INTERIOR BENT DIAPHRAGMS, SEE "TYPICAL SECTION" SHEETS.
FOR LONGITUDINAL BARS IN TOP OF SLAB, SEE SHT. 4 OF 4.

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PARTIAL PLAN OF SPANS "C", "D" AND "E"

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-9 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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5/28/2015
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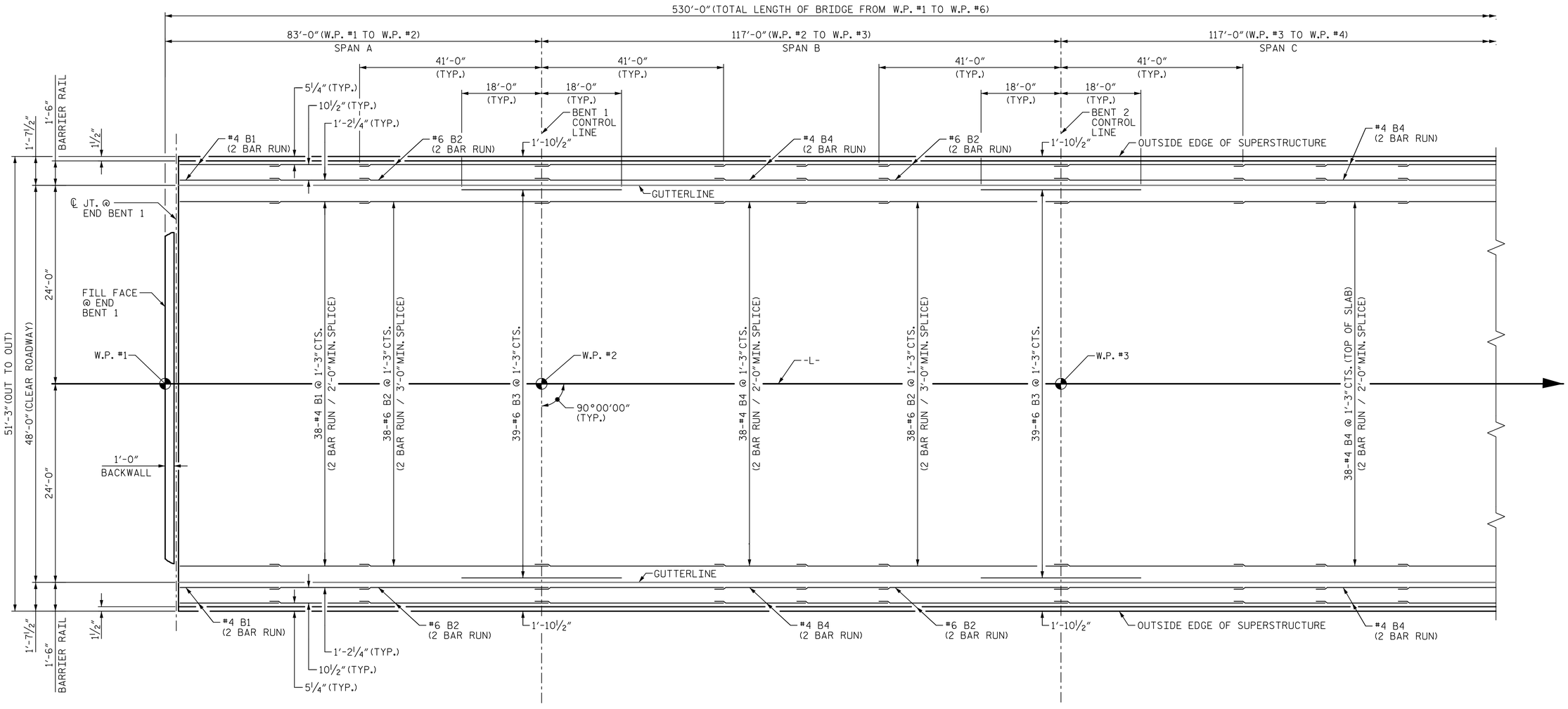


# PLAN OF TOP OF SLAB "B" BAR LAYOUT

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TOP "B" BAR LAYOUT
SPANS "A", "B"
AND "C"

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-10 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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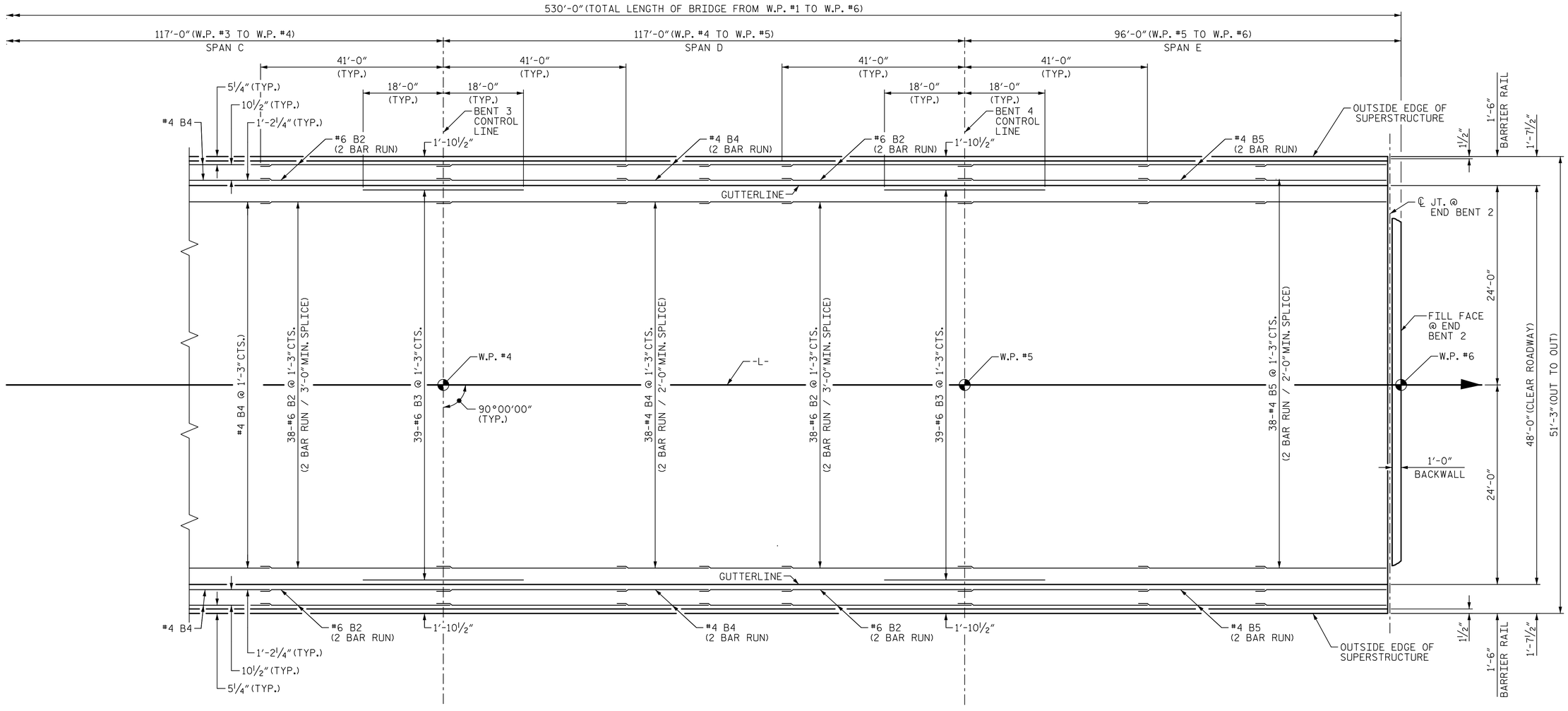


## PLAN OF TOP OF SLAB "B" BAR LAYOUT

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TOP "B" BAR LAYOUT
SPANS "C", "D"
AND "E"

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-11 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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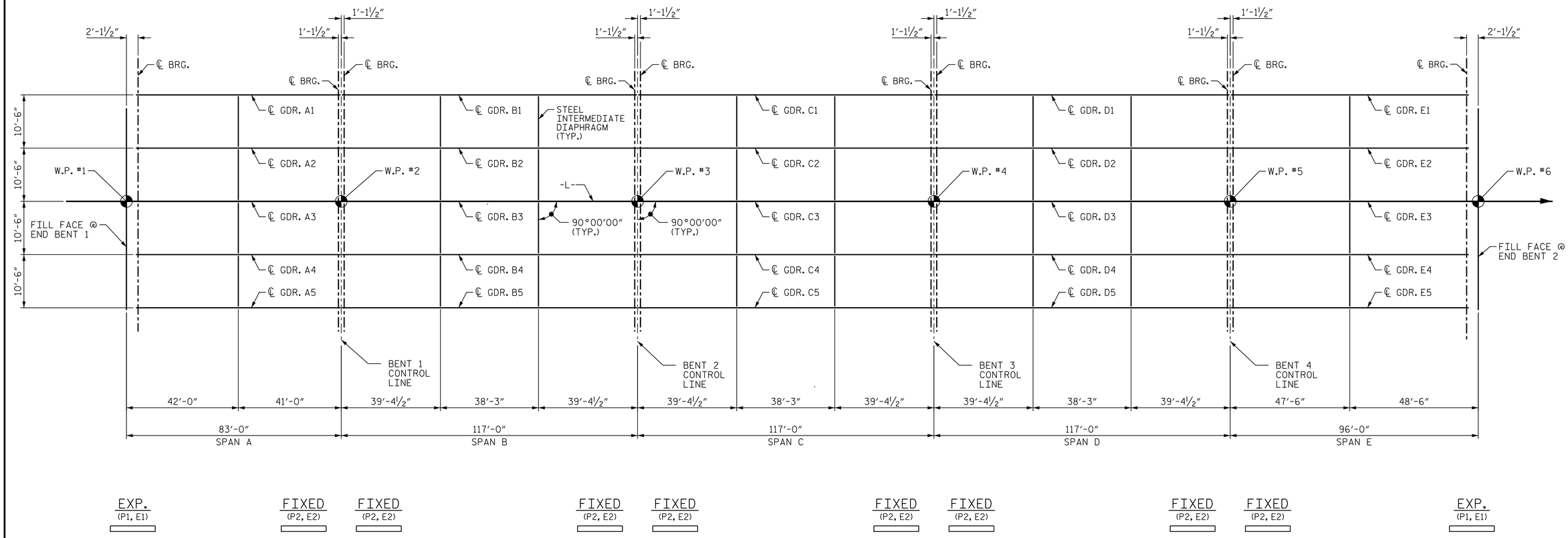


# FRAMING PLAN

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-12 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

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CHECKED BY : M. T. NEITHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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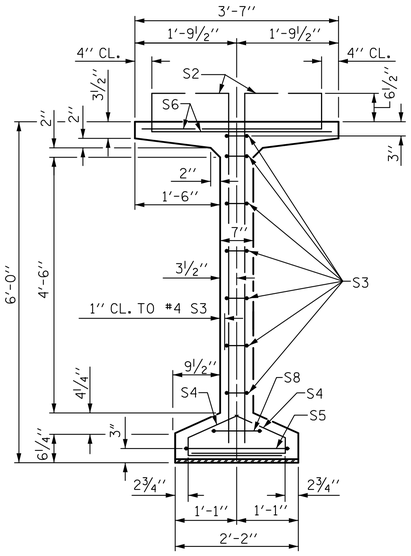
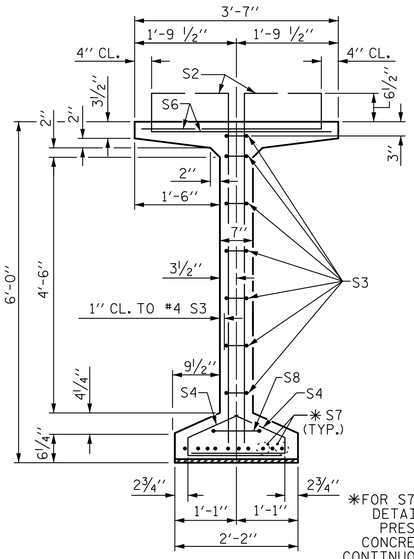
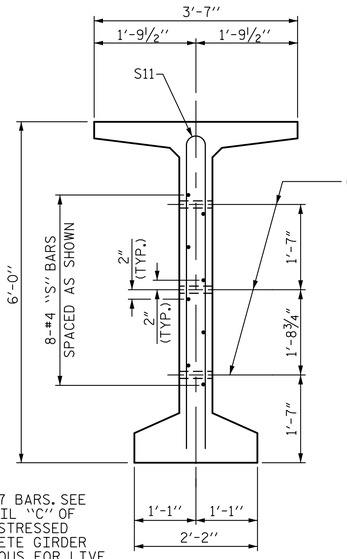



SECTION A-A



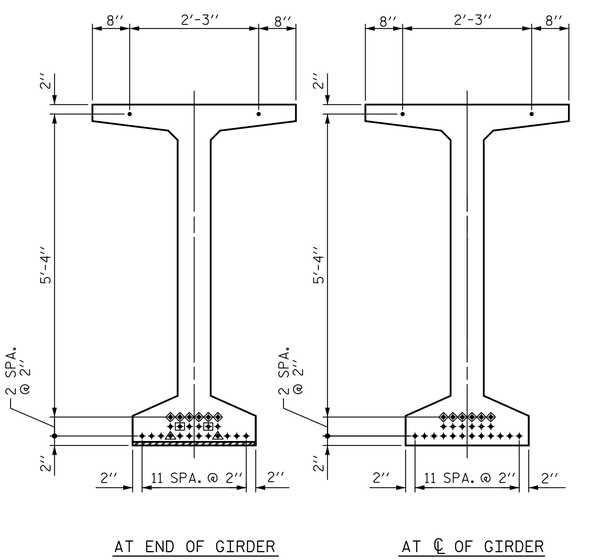

SECTION B-B




SECTION C-C

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

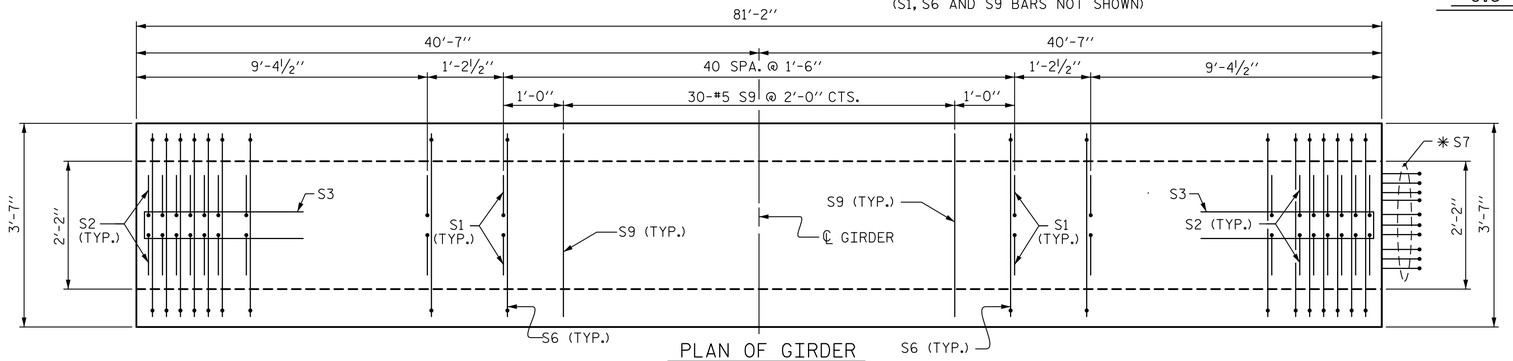
(S1, S6 AND S9 BARS NOT SHOWN)



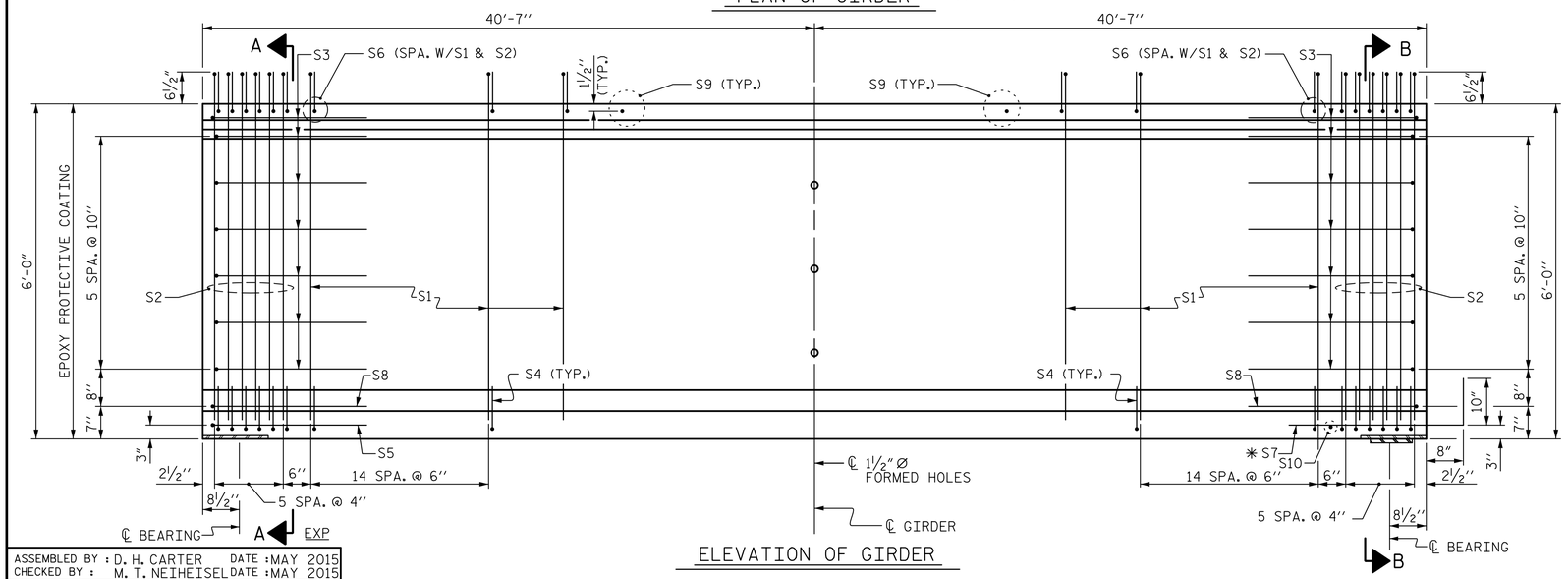

AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



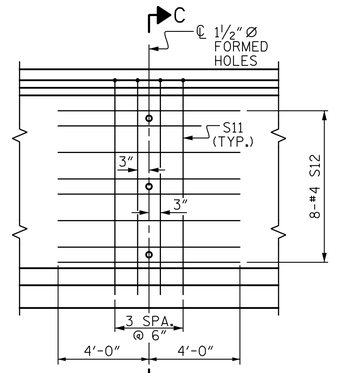

PLAN OF GIRDER




ELEVATION OF GIRDER

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◬ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- ◈ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO USE THESE STRANDS IN THE GIRDER, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE GIRDER AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.




PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL)

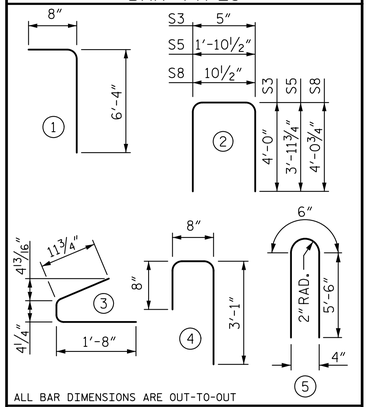
| 0.6" Ø L. R. GRADE 270 STRANDS | | |
|---|---|---|
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
| 0.217 | 58,600 | 43,950 |

REINFORCING STEEL FOR ONE GDR

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 142 | #4 | 1 | 7'-0" | 664 |
| S2 | 24 | #5 | 1 | 6'-11" | 173 |
| S3 | 14 | #4 | 2 | 8'-5" | 79 |
| S4 | 84 | #4 | 3 | 3'-0" | 168 |
| S5 | 1 | #5 | 2 | 9'-10" | 10 |
| S6 | 166 | #5 | 4 | 4'-5" | 765 |
| ✱S7 | 10 | #5 | STR | 3'-8" | 38 |
| S8 | 2 | #5 | 2 | 9'-0" | 19 |
| S9 | 30 | #5 | STR | 3'-3" | 102 |
| S10 | 1 | #3 | STR | 1'-10" | 1 |
| S11 | 4 | #5 | 5 | 11'-6" | 48 |
| S12 | 8 | #4 | STR | 8'-0" | 43 |

✱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

| | REINFORCING STEEL | 7,000 PSI CONCRETE | 0.6" Ø L.R. STRANDS |
|---|---|---|---|
| | LB. | C.Y. | No. |
| | 2,110 | 17.39 | 20 |

GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|---|---|---|
| 5 | 81'-2" | 405'-10" |

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (SPAN "A")

| ASSEMBLED BY : D. H. CARTER | DATE : MAY 2015 |
|---|---|
| CHECKED BY : M. T. NEIHEISEL | DATE : MAY 2015 |
| DRAWN BY : EEM 2/6/97 | REV. 5/1/06R TLA/GM |
| CHECKED BY : VAP 2/6/97 | REV. 10/1/11 MAA/GM |
| | REV. 6/13 MAA/GM |

ICA Engineering
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

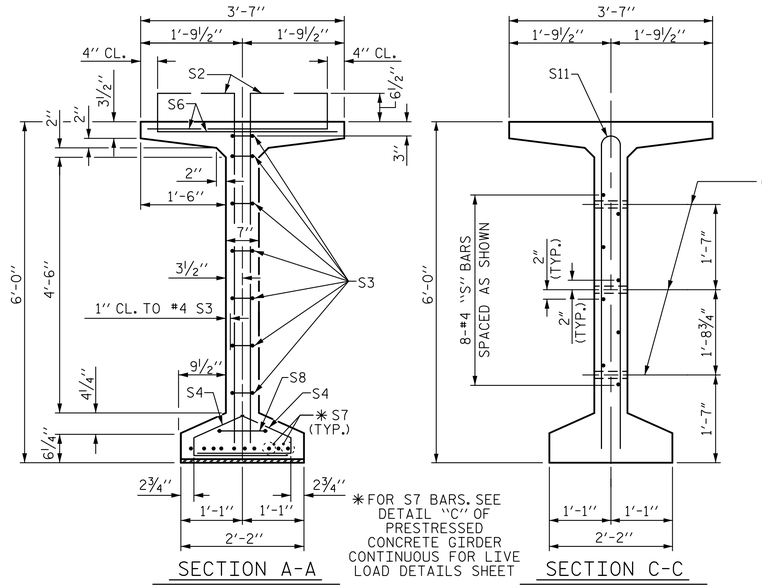
NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
E9B7B9620EE24D5...

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-13 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

5/28/2015
ICA Engineering
R:\Structures\Plans\s13_w-5516_sd_cg_01.dgn

STD. NO. PCG8 (Sht. 1)

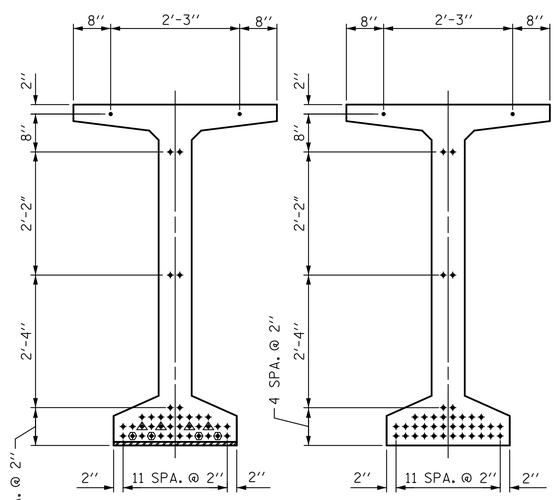



✳FOR S7 BARS, SEE DETAIL "C" OF PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS SHEET

SECTION A-A

SECTION C-C

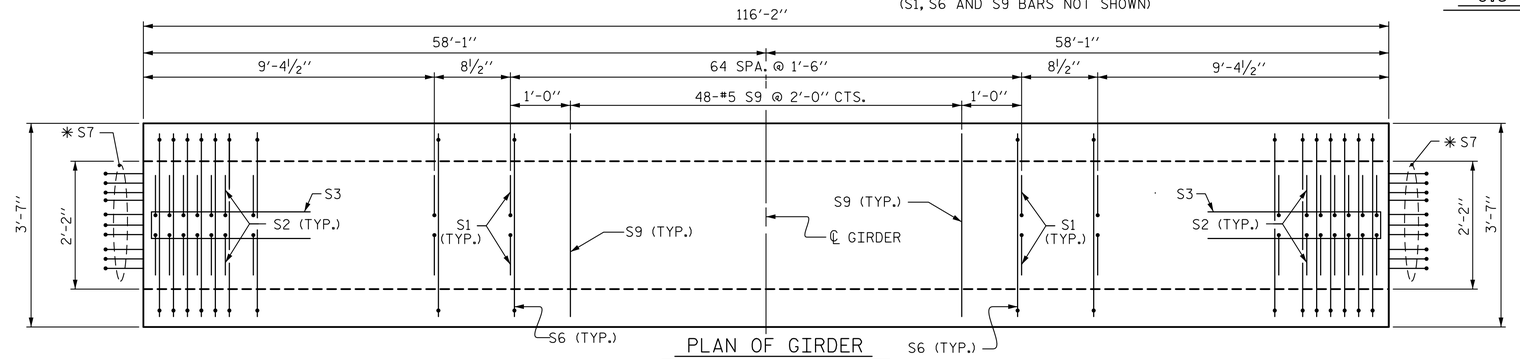
(S1, S6 AND S9 BARS NOT SHOWN)



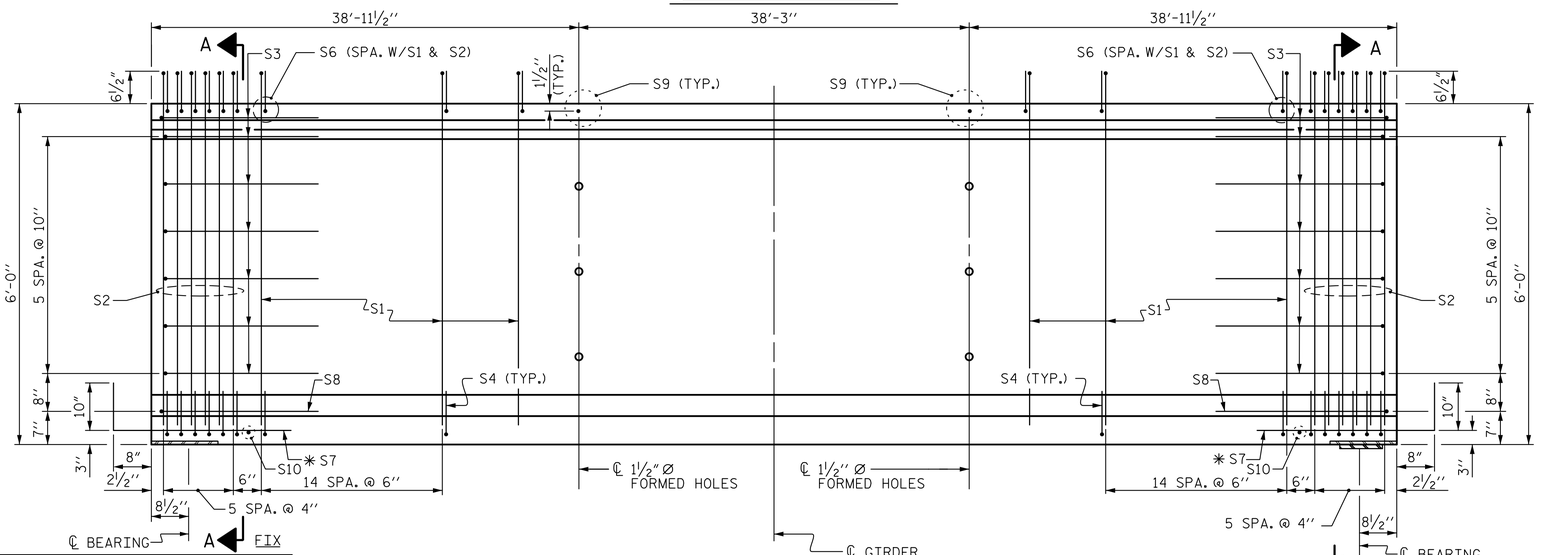

AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



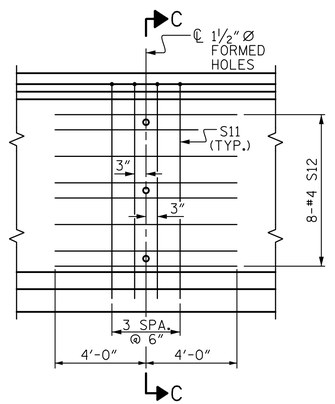

PLAN OF GIRDER




ELEVATION OF GIRDER

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ◬ STRANDS DEBONDED FOR 6'-0" FROM END OF GIRDER
- ⬡ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER




PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL)

## 0.6" Ø L. R. GRADE 270 STRANDS

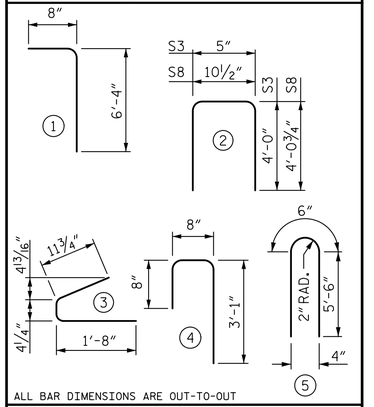
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
|---|---|---|
| 0.217 | 58,600 | 43,950 |

## REINFORCING STEEL FOR ONE GDR

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 190 | #4 | 1 | 7'-0" | 888 |
| S2 | 24 | #5 | 1 | 6'-11" | 173 |
| S3 | 14 | #4 | 2 | 8'-5" | 79 |
| S4 | 84 | #4 | 3 | 3'-0" | 168 |
| | | | | | |
| S6 | 214 | #5 | 4 | 4'-5" | 986 |
| ✳S7 | 20 | #5 | STR | 3'-8" | 76 |
| S8 | 2 | #5 | 2 | 9'-0" | 19 |
| S9 | 48 | #5 | STR | 3'-3" | 163 |
| S10 | 2 | #3 | STR | 1'-10" | 1 |
| S11 | 8 | #5 | 5 | 11'-6" | 96 |
| S12 | 16 | #4 | STR | 8'-0" | 85 |

✳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

| | REINFORCING STEEL | 8,000 PSI CONCRETE | 0.6" Ø L.R. STRANDS |
|---|---|---|---|
| | LB. | C.Y. | No. |
| | 2,734 | 24.89 | 40 |

## GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|---|---|---|
| 15 | 116'-2" | 1,742'-6" |

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (SPANS "B", "C" & "D")

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-14 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

| | | |
|---|---|---|
| ASSEMBLED BY : D. H. CARTER | DATE : MAY 2015 | |
| CHECKED BY : M. T. NEITHEISEL | DATE : MAY 2015 | |
| DRAWN BY : EEM 2/6/97 | REV. 5/1/06R | TLA/GM |
| CHECKED BY : VAP 2/6/97 | REV. 10/1/11 | MAA/GM |
| | REV. 6/13 | MAA/GM |

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NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
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5/28/2015
ICA Engineering

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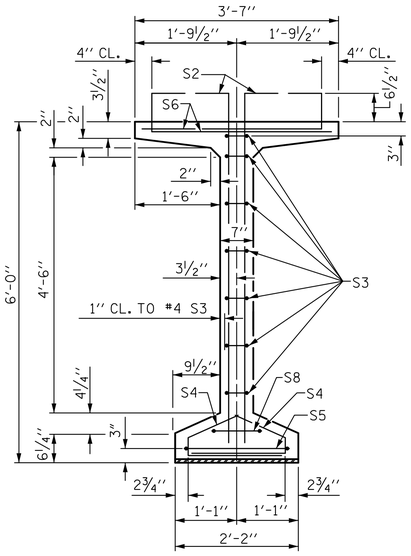
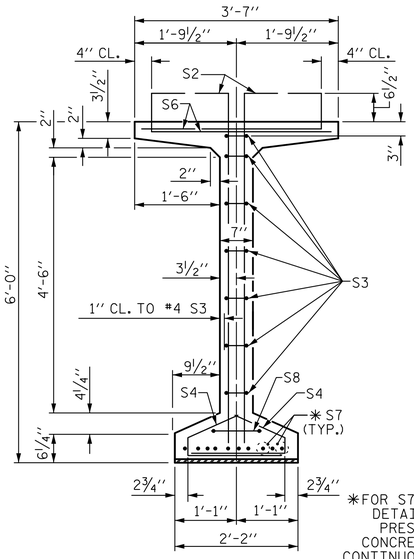
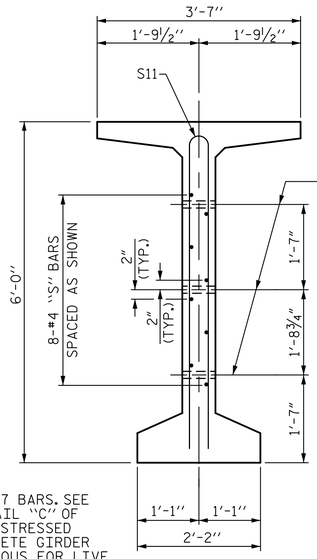
STD. NO. PCG8 (Sht. 1)




SECTION A-A



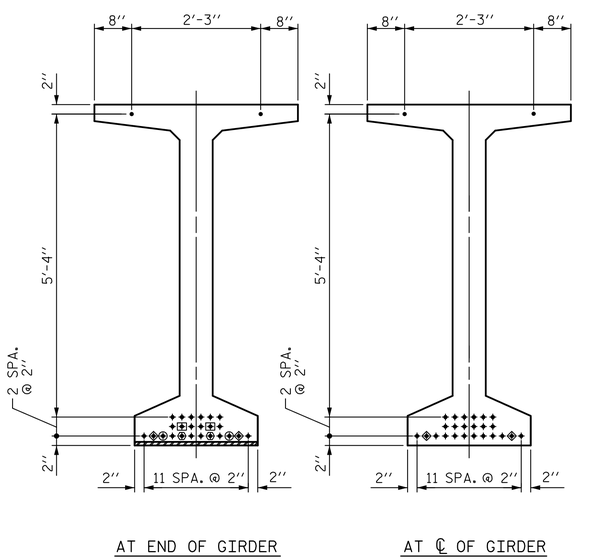

SECTION B-B




SECTION C-C

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

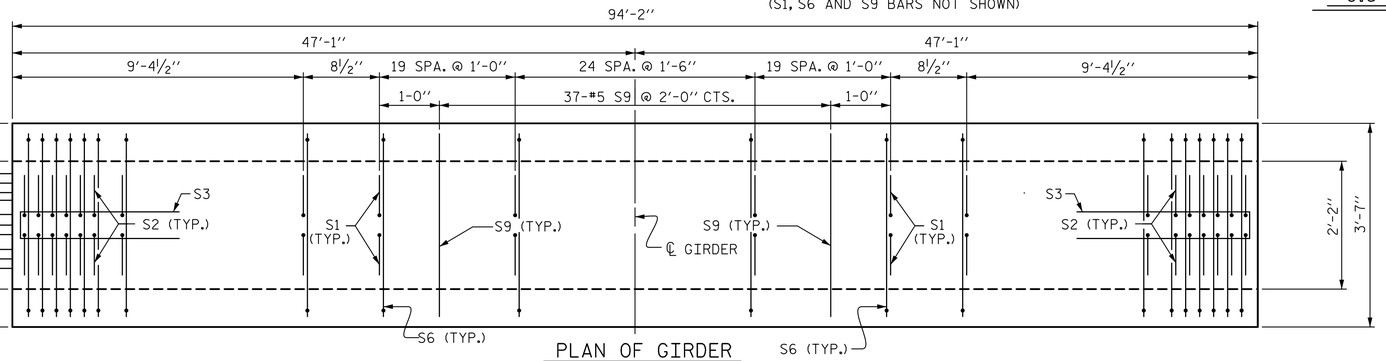
(S1, S6 AND S9 BARS NOT SHOWN)



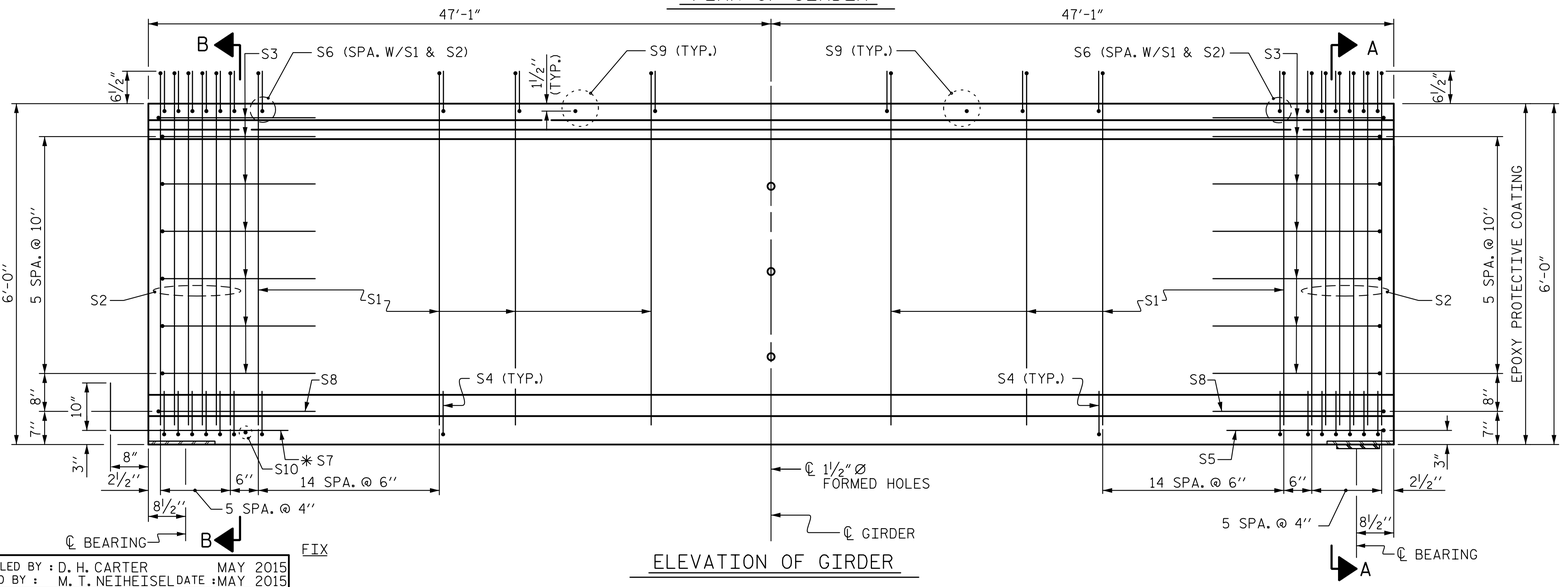

AT END OF GIRDER

AT ℄ OF GIRDER

0.6" Ø LOW RELAXATION STRAND LAYOUT



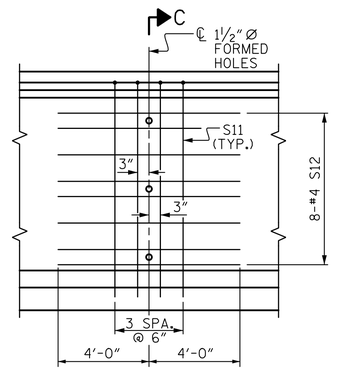

PLAN OF GIRDER




ELEVATION OF GIRDER

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER
- ◉ STRANDS DEBONDED FOR 8'-0" FROM END OF GIRDER
- ⬢ STRANDS DEBONDED FOR 12'-0" FROM END OF GIRDER
- ◈ OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO USE THESE STRANDS IN THE GIRDER, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE GIRDER AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.




PARTIAL ELEVATION

SHOWING INTERMEDIATE STEEL DIAPHRAGM REINFORCING STEEL)

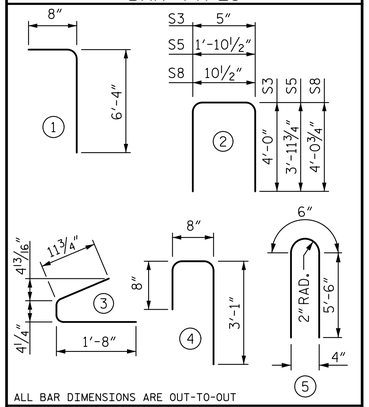
| 0.6" Ø L. R. GRADE 270 STRANDS | | |
|---|---|---|
| AREA (SQUARE INCHES) | ULTIMATE STRENGTH (LBS. PER STRAND) | APPLIED PRESTRESS (LBS. PER STRAND) |
| 0.217 | 58,600 | 43,950 |

REINFORCING STEEL FOR ONE GDR

| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| S1 | 186 | #4 | 1 | 7'-0" | 870 |
| S2 | 24 | #5 | 1 | 6'-11" | 173 |
| S3 | 14 | #4 | 2 | 8'-5" | 79 |
| S4 | 84 | #4 | 3 | 3'-0" | 168 |
| S5 | 1 | #5 | 2 | 9'-10" | 10 |
| S6 | 210 | #5 | 4 | 4'-5" | 967 |
| ✱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 |
| S11 | 4 | #5 | 5 | 11'-6" | 48 |
| S12 | 8 | #4 | STR | 8'-0" | 43 |

✱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

| | REINFORCING STEEL | 7,000 PSI CONCRETE | 0.6" Ø L.R. STRANDS |
|---|---|---|---|
| | LB. | C.Y. | No. |
| | 2,541 | 20.18 | 24 |

GIRDERS REQUIRED

| NUMBER | LENGTH | TOTAL LENGTH |
|---|---|---|
| 5 | 94'-2" | 470'-10" |

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
72" PRESTRESSED CONCRETE MODIFIED BULB TEE CONTINUOUS FOR LIVE LOAD (SPAN "E")

| ASSEMBLED BY : D. H. CARTER | | MAY 2015 |
|---|---|---|
| CHECKED BY : M. T. NEIHEISEL | DATE : | MAY 2015 |
| DRAWN BY : EEM 2/6/97 | REV. 5/1/06R | TLA/GM |
| CHECKED BY : VAP 2/6/97 | REV. 10/1/11 | MAA/GM |
| | REV. 6/13 | MAA/GM |

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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN
DocuSigned by: Thomas E. Tallman 7/7/2015
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REVISIONS

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

SHEET NO. S-15

TOTAL SHEETS 41

5/28/2015
ICA Engineering

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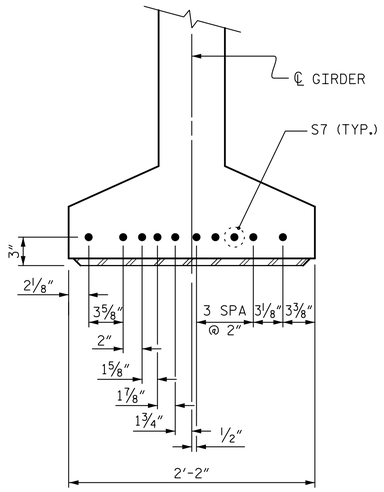
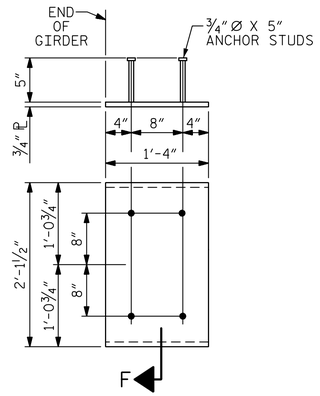
STD. NO. PCG8 (Sht. 1)

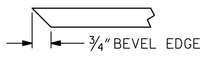



DETAIL "C"




EMBEDDED PLATE "B-1" DETAILS

(2 REQ'D PER GIRDER)




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.

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.

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 5000 PSI FOR SPAN A, 6400 PSI FOR SPANS B, C, AND D, AND 5500 PSI FOR SPAN E.

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".

A 2" x 2" CHAMFER IS ALLOWED AT THE INTERSECTION OF THE WEB AND THE BOTTOM FLANGE OF THE 63" AND 72" MODIFIED BULB TEES ONLY.

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 4500 lbs.

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

PRESTRESSED CONCRETE GIRDER CONTINUOUS FOR LIVE LOAD DETAILS

| | |
|---|---|
| ASSEMBLED BY : | D. H. CARTER DATE : JUN 2015 |
| CHECKED BY : | M. T. NEIHEISEL DATE : JUN 2015 |
| DRAWN BY : | ELR 11/91 |
| CHECKED BY : | GRP 11/91 |

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-16 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
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6/25/2015
ICA Engineering
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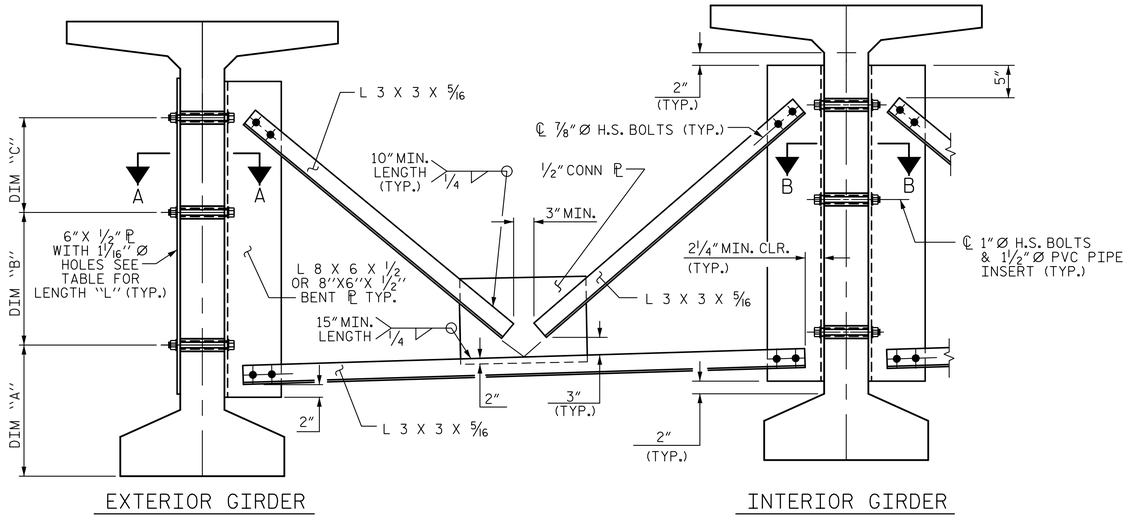
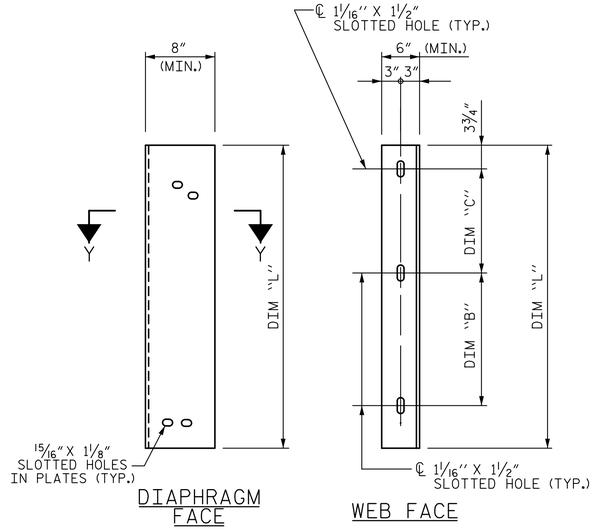
STD. NO. PCG9 (Sht. 4)




EXTERIOR GIRDER

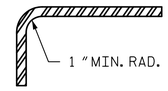
INTERIOR GIRDER

## PART SECTION AT INTERMEDIATE DIAPHRAGM




DIAPHRAGM FACE

WEB FACE




SECTION Y-Y

## CONNECTOR PLATE DETAIL

## STRUCTURAL STEEL NOTES

ALL INTERMEDIATE DIAPHRAGM STEEL AND CONNECTOR PLATES SHALL BE AASHTO M270 GRADE 50 OR APPROVED EQUAL.

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

TENSION ON THE ASTM A449 BOLTS THROUGH THE GIRDER WEB SHALL BE SNUG TIGHTENED FOLLOWED BY AN ADDITIONAL 1/4 TURN.

THE PLATES, BENT PLATES, AND ANGLES SHALL BE GALVANIZED OR METALLIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

FOR METALLIZATION, APPLY AN 8 MIL THICK 99.99 PERCENT ZINC (W-Zn-1) THERMAL SPRAYED COATING WITH A 0.5 MIL THICK SEAL COAT TO ALL STEEL DIAPHRAGM SURFACES IN ACCORDANCE WITH THE THERMAL SPRAYED COATINGS SPECIAL PROVISION AND SECTION 442 OF THE STANDARD SPECIFICATIONS.

GALVANIZE THE HIGH STRENGTH BOLTS, NUTS, WASHERS AND DIRECT TENSION INDICATORS IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

USE AN ASTM F436 HARDENED WASHER WITH STANDARD AND SLOTTED HOLES UNDER EACH BOLT HEAD AND NUT.

FOR BOLTS THROUGH THE GIRDER WEB, PROVIDE SUFFICIENT LENGTH OF THREADS ON ALL BOLTS TO ACCOMMODATE WASHERS AND THE THICKNESS OF CONNECTING MEMBER PLUS AT LEAST 1/4" PROJECTION BEYOND THE NUT.

INTERMEDIATE DIAPHRAGM ASSEMBLY SHALL COMPLY WITH SECTION 1072 OF THE STANDARD SPECIFICATIONS.

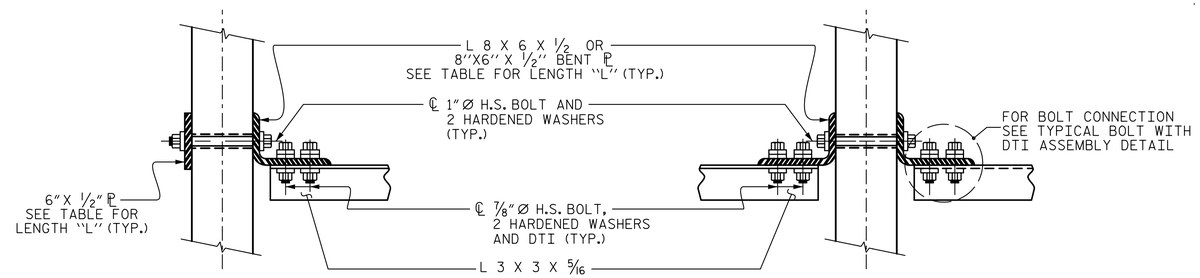
SUBMIT TWO SETS OF WORKING DRAWINGS FOR THE INTERMEDIATE DIAPHRAGM ASSEMBLY FOR REVIEW, COMMENTS AND ACCEPTANCE. AFTER REVIEW, COMMENTS, AND ACCEPTANCE, SUBMIT SEVEN SETS FOR DISTRIBUTION.

IN THE EXTERIOR BAYS, PLACE TEMPORARY STRUTS BETWEEN PRESTRESSED GIRDERS ADJACENT TO THE STEEL DIAPHRAGMS. STRUTS SHALL REMAIN IN PLACE 3 DAYS AFTER CONCRETE IS PLACED.

THE COST OF THE STEEL DIAPHRAGMS AND ASSEMBLIES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE GIRDERS.

## TABLE

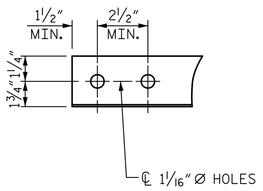
| GIRDER TYPE | DIM "A" | DIM "B" | DIM "C" | DIM "L" |
|---|---|---|---|---|
| 72" BULB TEE | 1'-7" | 1'-8 3/4" | 1'-7" | 4'-2" |




SECTION A-A

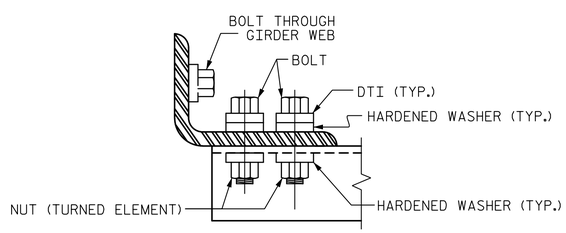
SECTION B-B

## CONNECTION DETAILS




## ANGLE END

(L 3 X 3 X 5/16)




## BOLT WITH DTI ASSEMBLY DETAIL

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# INTERMEDIATE STEEL DIAPHRAGMS FOR 72" MODIFIED BULB TEE PRESTRESSED CONCRETE GIRDERS

| ASSEMBLED BY : D. H. CARTER | DATE : MAY 2015 |
|---|---|
| CHECKED BY : M. T. NEIHEISEL | DATE : MAY 2015 |
| DRAWN BY : RWW 11/09 | ADDED 11/23/09R |
| CHECKED BY : GM 11/09 | REV. 10/1/11 MAA/GM |

ICA Engineering
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
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| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-17 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

STD. NO. PCG11

5/28/2015
ICA Engineering
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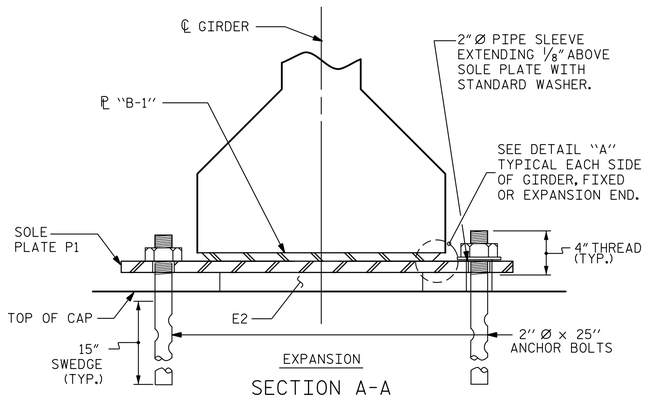
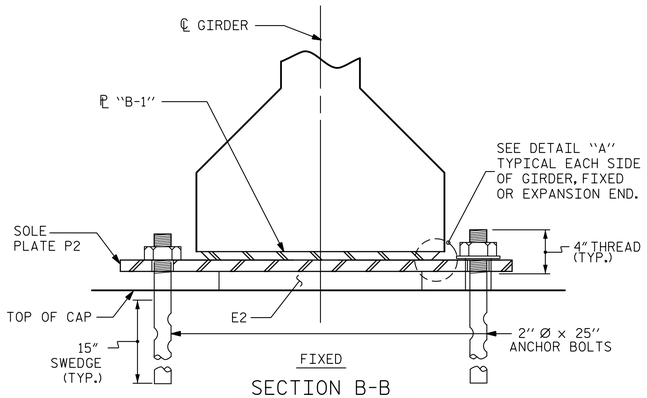
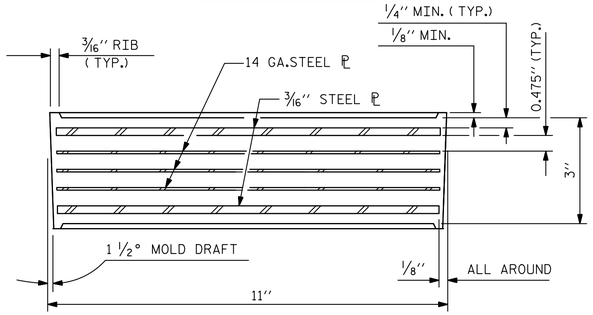


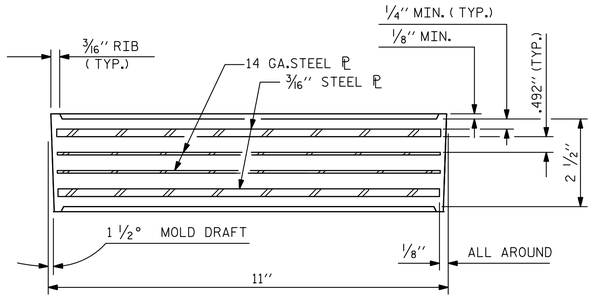

SECTION A-A



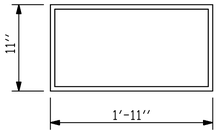

SECTION B-B




TYPICAL SECTION OF ELASTOMERIC BEARINGS



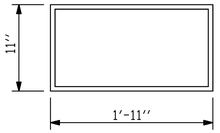

TYPICAL SECTION OF ELASTOMERIC BEARINGS




E1 (10 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

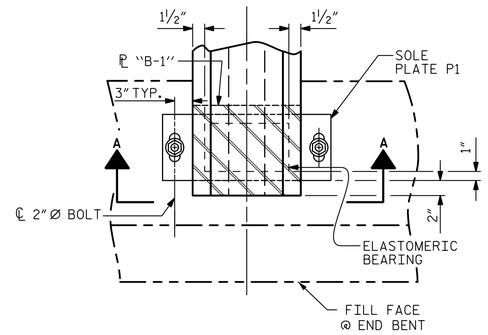
TYPE VI-MODIFIED



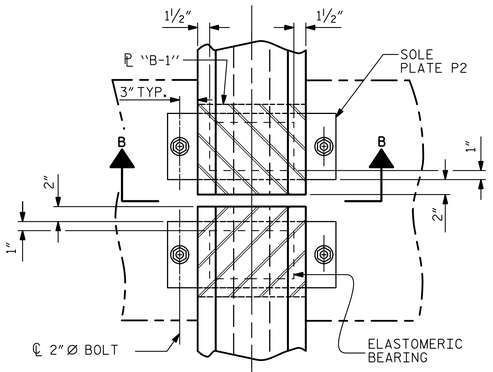

E2 (40 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

TYPE VI




PLAN AT END BENT




PLAN VIEW AT 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.

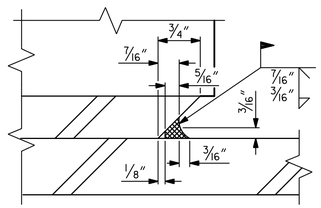
ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. NO SHOP DRAWINGS ARE REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

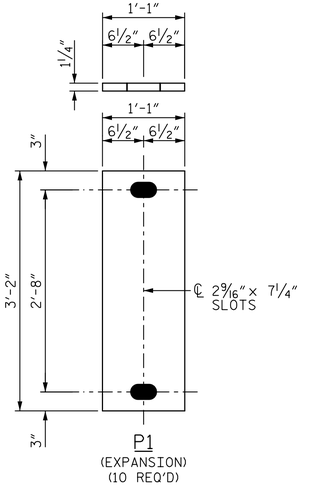
THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 36.




DETAIL "A"




SOLE PLATE DETAILS ("P")

| — LOAD RATING — | |
|---|---|
| | MAX. D.L.+ L.L. |
| TYPE VI | 420 K |
| TYPE VI-MODIFIED | 470 K |

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

# ELASTOMERIC BEARING DETAILS

PRESTRESSED CONCRETE GIRDER SUPERSTRUCTURE

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-18 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

| | | |
|---|---|---|
| ASSEMBLED BY : D. H. CARTER | DATE : MAY 2015 | |
| CHECKED BY : M. T. NEIHEISEL | DATE : MAY 2015 | |
| DRAWN BY : EEM 2/97 | REV. 10/1/11 | MAA/GM |
| CHECKED BY : VAP 2/97 | REV. 6/13 | AAC/MAA |
| | REV. 1/15 | MAA/GM |

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NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMON

DocuSigned by: Thomas E. Tallmon 7/7/2015
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5/28/2015
ICA Engineering
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STD. NO. EB4

## DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| 0.6"Ø LOW RELAXATION | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SPAN A | | | | | | | | | | | |
| | GIRDERS A1 AND A5 | | | | | | | | | | | |
| TENTH POINTS | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | 0 |
| CAMBER ( GIRDER ALONE IN PLACE ) ↑ | 0.000 | 0.029 | 0.054 | 0.075 | 0.087 | 0.092 | 0.087 | 0.075 | 0.054 | 0.029 | 0.000 |
| ✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.012 | 0.024 | 0.034 | 0.040 | 0.042 | 0.040 | 0.034 | 0.024 | 0.012 | 0.000 |
| FINAL CAMBER ↑ | 0.000 | 3/16" | 3/8" | 1/2" | 9/16" | 5/8" | 9/16" | 1/2" | 3/8" | 3/16" | 0.000 |
| | GIRDERS A2, A3 AND A4 | | | | | | | | | | |
| TENTH POINTS | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | 0 |
| CAMBER ( GIRDER ALONE IN PLACE ) ↑ | 0.000 | 0.029 | 0.054 | 0.075 | 0.087 | 0.092 | 0.087 | 0.075 | 0.054 | 0.029 | 0.000 |
| ✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.013 | 0.025 | 0.034 | 0.040 | 0.043 | 0.040 | 0.034 | 0.025 | 0.013 | 0.000 |
| FINAL CAMBER ↑ | 0.000 | 3/16" | 3/8" | 1/2" | 9/16" | 9/16" | 9/16" | 1/2" | 3/8" | 3/16" | 0.000 |

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

## DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| 0.6"Ø LOW RELAXATION | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | SPANS B, C AND D | | | | | | | | | | | | | | | | | | | | | |
| | GIRDERS B1, C1, D1, B5, C5 AND D5 | | | | | | | | | | | | | | | | | | | | | |
| TWENTIETH POINTS | 0 | .05 | .10 | .15 | .20 | .25 | .30 | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 0 |
| CAMBER ( GIRDER ALONE IN PLACE ) ↑ | 0.000 | 0.040 | 0.079 | 0.116 | 0.149 | 0.179 | 0.205 | 0.225 | 0.240 | 0.249 | 0.252 | 0.249 | 0.240 | 0.225 | 0.205 | 0.179 | 0.149 | 0.116 | 0.079 | 0.040 | 0.000 |
| ✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.025 | 0.050 | 0.074 | 0.098 | 0.116 | 0.135 | 0.147 | 0.159 | 0.163 | 0.167 | 0.163 | 0.159 | 0.147 | 0.135 | 0.116 | 0.098 | 0.074 | 0.050 | 0.025 | 0.000 |
| FINAL CAMBER ↑ | 0.000 | 3/16" | 3/8" | 1/2" | 5/8" | 3/4" | 13/16" | 15/16" | 15/16" | 1" | 1" | 1" | 15/16" | 15/16" | 13/16" | 3/4" | 5/8" | 1/2" | 3/8" | 3/16" | 0.000 |
| | GIRDERS B2, B3, B4, C2, C3, C4, D2, D3 AND D4 | | | | | | | | | | | | | | | | | | | | | |
| TWENTIETH POINTS | 0 | .05 | .10 | .15 | .20 | .25 | .30 | .35 | .40 | .45 | .50 | .55 | .60 | .65 | .70 | .75 | .80 | .85 | .90 | .95 | 0 |
| CAMBER ( GIRDER ALONE IN PLACE ) ↑ | 0.000 | 0.040 | 0.079 | 0.116 | 0.149 | 0.179 | 0.205 | 0.225 | 0.240 | 0.249 | 0.252 | 0.249 | 0.240 | 0.225 | 0.205 | 0.179 | 0.149 | 0.116 | 0.079 | 0.040 | 0.000 |
| ✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.025 | 0.051 | 0.075 | 0.100 | 0.119 | 0.138 | 0.150 | 0.162 | 0.166 | 0.170 | 0.166 | 0.162 | 0.150 | 0.138 | 0.119 | 0.100 | 0.075 | 0.051 | 0.025 | 0.000 |
| FINAL CAMBER ↑ | 0.000 | 3/16" | 5/16" | 1/2" | 5/8" | 3/4" | 13/16" | 7/8" | 15/16" | 1" | 1" | 1" | 15/16" | 7/8" | 13/16" | 3/4" | 5/8" | 1/2" | 5/16" | 3/16" | 0.000 |

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

## DEAD LOAD DEFLECTION TABLE FOR GIRDERS

| 0.6"Ø LOW RELAXATION | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | SPAN E | | | | | | | | | | |
| | GIRDERS E1 AND E5 | | | | | | | | | | |
| TENTH POINTS | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | 0 |
| CAMBER ( GIRDER ALONE IN PLACE ) ↑ | 0.000 | 0.040 | 0.075 | 0.103 | 0.120 | 0.127 | 0.120 | 0.103 | 0.075 | 0.040 | 0.000 |
| ✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.023 | 0.045 | 0.062 | 0.073 | 0.076 | 0.073 | 0.062 | 0.045 | 0.023 | 0.000 |
| FINAL CAMBER ↑ | 0.000 | 3/16" | 3/8" | 1/2" | 9/16" | 5/8" | 9/16" | 1/2" | 3/8" | 3/16" | 0.000 |
| | GIRDERS E2, E3 AND E4 | | | | | | | | | | |
| TENTH POINTS | 0 | .1 | .2 | .3 | .4 | .5 | .6 | .7 | .8 | .9 | 0 |
| CAMBER ( GIRDER ALONE IN PLACE ) ↑ | 0.000 | 0.040 | 0.075 | 0.103 | 0.120 | 0.127 | 0.120 | 0.103 | 0.075 | 0.040 | 0.000 |
| ✳ DEFLECTION DUE TO SUPERIMPOSED D.L. ↓ | 0.000 | 0.023 | 0.045 | 0.063 | 0.074 | 0.078 | 0.074 | 0.063 | 0.045 | 0.023 | 0.000 |
| FINAL CAMBER ↑ | 0.000 | 3/16" | 3/8" | 1/2" | 9/16" | 9/16" | 9/16" | 1/2" | 3/8" | 3/16" | 0.000 |

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

PROJECT NO. W-5516
ROWAN COUNTY
STATION: 61+79.40 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

GIRDER DEAD LOAD AND DEFLECTION

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

SHEET NO. S-19
TOTAL SHEETS 41

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

ICA Engineering
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN
DocuSigned by: Thomas E. Tallman
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5/29/2015
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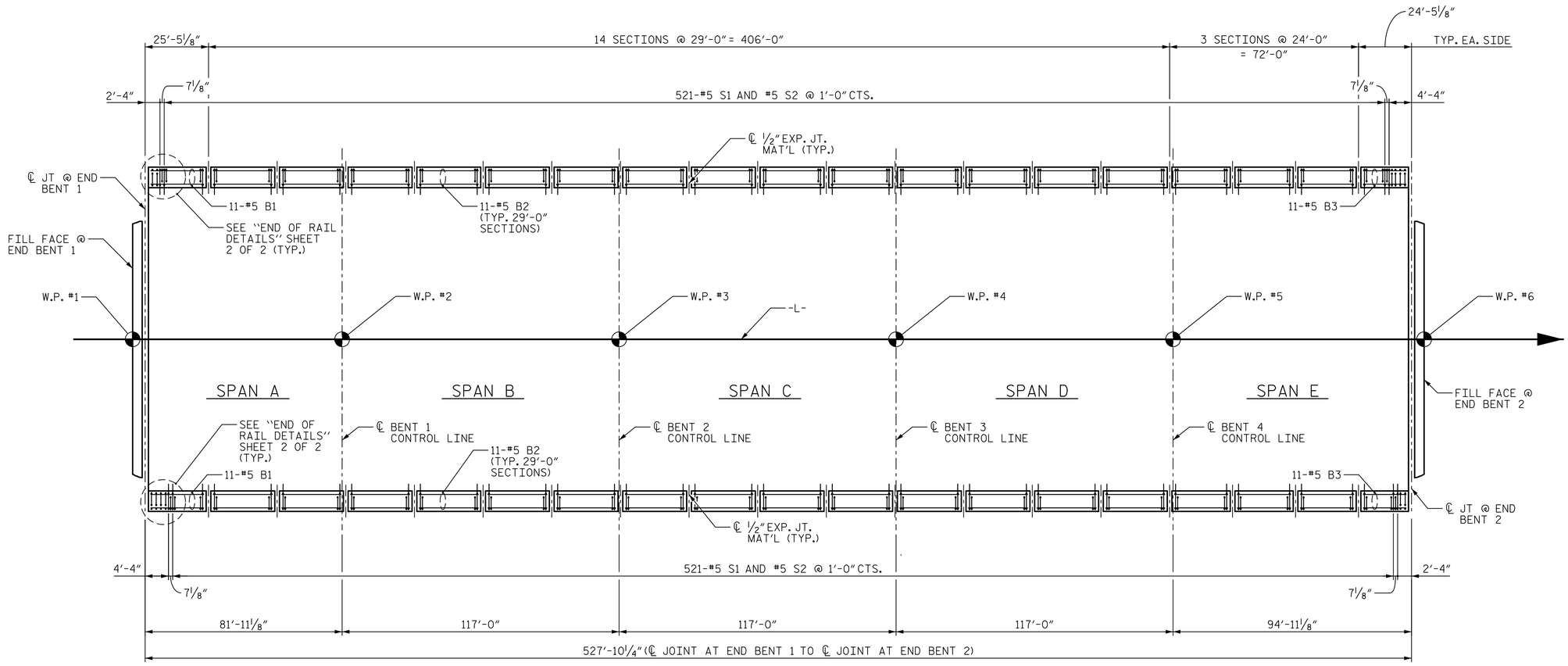
ICA Engineering




# PLAN

DIMENSIONS ARE ALONG OUTSIDE FACE OF BARRIER RAIL.
FOR NOTES, DETAILS, & BILL OF MATERIALS SEE SHEET 2 OF 2.

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

CONCRETE BARRIER RAIL

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-20 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
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5/28/2015
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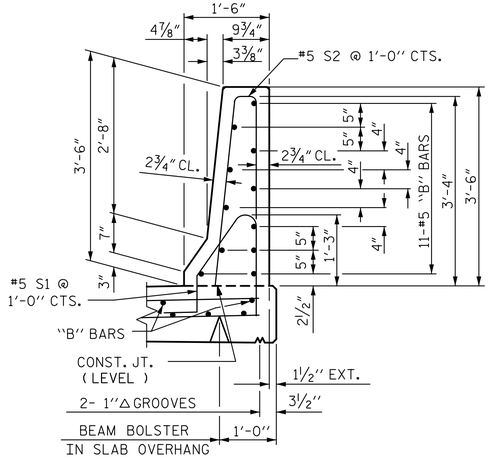
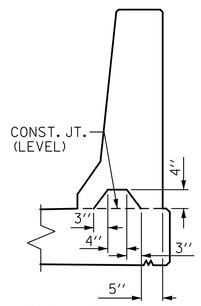
ICA Engineering

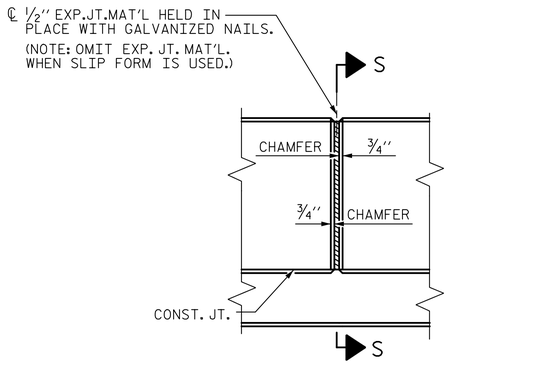



SECTION THRU RAIL



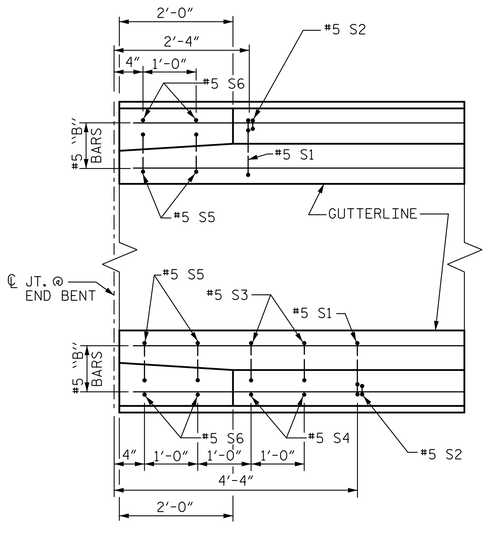

SECTION S-S

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

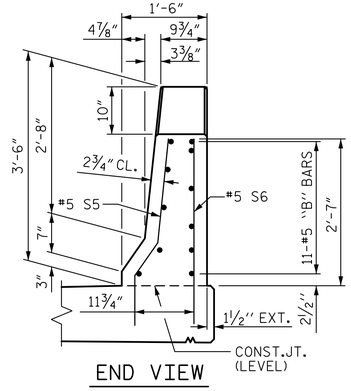



ELEVATION AT EXPANSION JOINTS

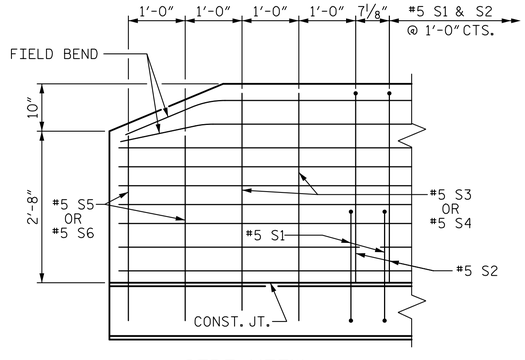
# BARRIER RAIL DETAILS




PLAN




END VIEW




SIDE VIEW

RIGHT BARRIER SHOWN, LEFT BARRIER SIMILAR

# END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

## NOTES

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

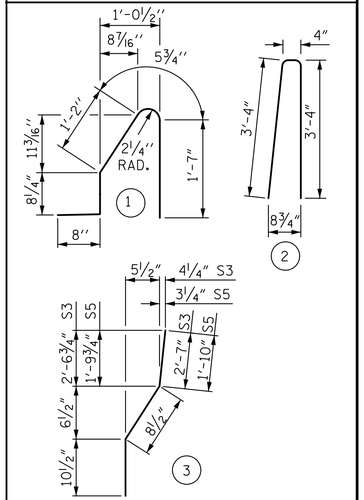
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

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

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| * B1 | 22 | #5 | STR | 25'-0" | 574 |
| * B2 | 374 | #5 | STR | 28'-8" | 11,182 |
| * B3 | 22 | #5 | STR | 9'-0" | 207 |
| * S1 | 1,046 | #5 | 1 | 4'-7" | 5,000 |
| * S2 | 1,046 | #5 | 2 | 7'-0" | 7,637 |
| * S3 | 4 | #5 | 3 | 4'-2" | 17 |
| * S4 | 4 | #5 | STR | 4'-0" | 17 |
| * S5 | 8 | #5 | 3 | 3'-5" | 29 |
| * S6 | 8 | #5 | STR | 3'-3" | 27 |

| | |
|---|---|
| * EPOXY COATED REINFORCING STEEL | 24,690 LBS. |
| CLASS AA CONCRETE | 143.4 CU. YDS. |
| CONCRETE BARRIER RAIL | 1055.42 LIN. FT. |

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# CONCRETE BARRIER RAIL

| ASSEMBLED BY : D. H. CARTER | DATE : MAY 2015 |
|---|---|
| CHECKED BY : M. T. NETHEISEL | DATE : MAY 2015 |
| DRAWN BY : ARB 5/87 | REV. 10/1/11 MAA/GM |
| CHECKED BY : SJD 9/87 | REV. 7/12 MAA/GM |
| | REV. 6/13 MAA/GM |

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NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN
DocuSigned by: Thomas E. Tallman 7/7/2015
E9D789620EE24D5...

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-21 |
| 1 | | | 3 | | | TOTAL SHEETS |
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STD. NO. CBR1 (SHT 1)

5/28/2015
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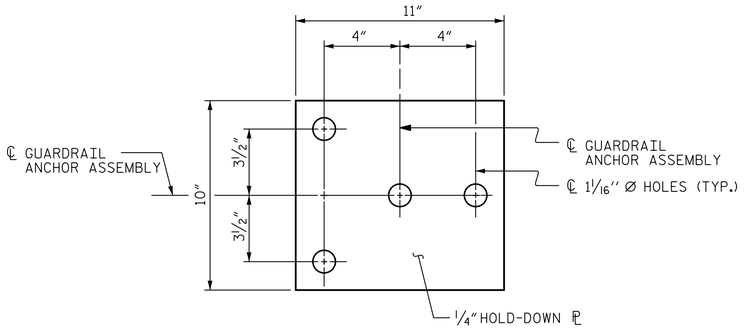
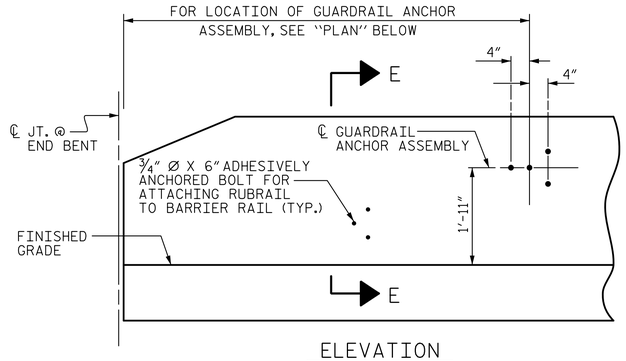
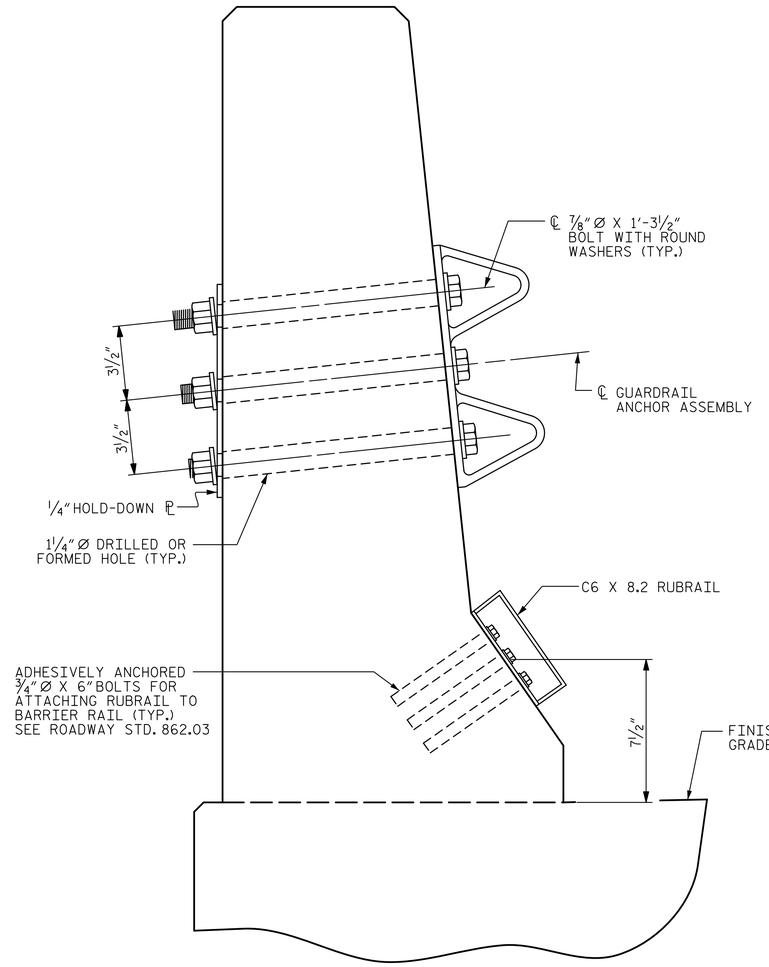
SHEET 1 AT 90




PLAN

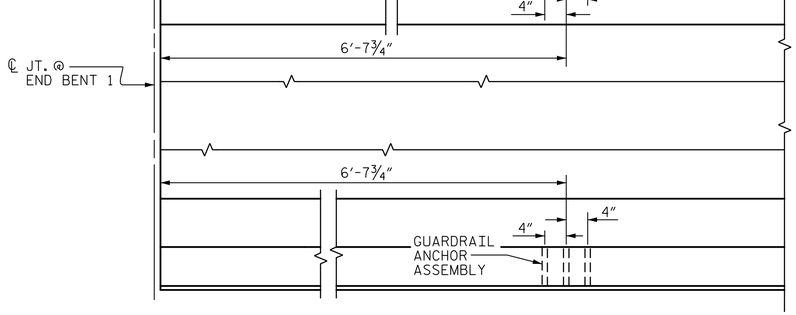



ELEVATION




SECTION E-E

## GUARDRAIL ANCHOR ASSEMBLY DETAILS




PLAN

## LOCATION OF ANCHORS FOR GUARDRAIL

END BENT 1 SHOWN, END BENT 2 SIMILAR.

## NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼″ HOLD-DOWN PLATE AND 4 - ⅞″ Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

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

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞″ Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

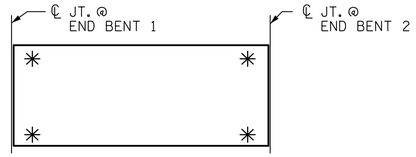
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

THE 1 ¼″ Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE ¾″ Ø X 6″ BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE ¾″ Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.




SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# GUARDRAIL ANCHORAGE FOR BARRIER RAIL

| ASSEMBLED BY : D. H. CARTER | DATE : MAY 2015 |
|---|---|
| CHECKED BY : M. T. NEIHEISEL | DATE : MAY 2015 |

| | | |
|---|---|---|
| DRAWN BY : TLA 5/06 | REV. 10/1/11 | MAA/GM |
| CHECKED BY : GM 5/06 | REV. 7/12 | MAA/GM |
| | REV. 6/13 | MAA/GM |

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NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN
DocuSigned by: Thomas E. Tallman 7/7/2015 E9B7B9620EE24D5...

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-22 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

(SHT 1) STD. NO. GRA2

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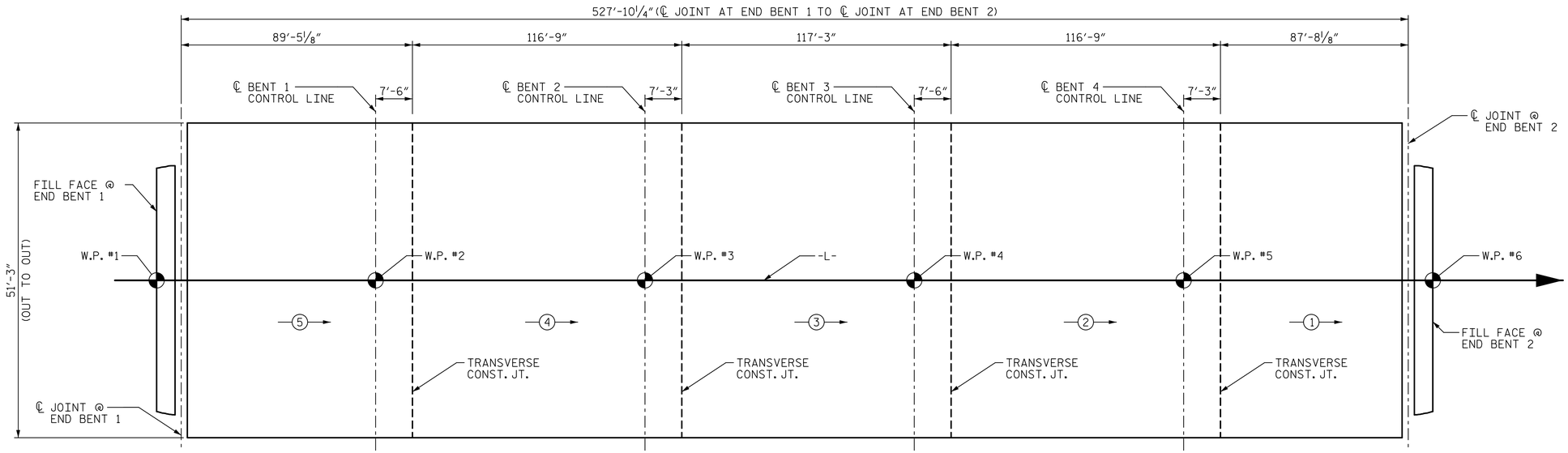
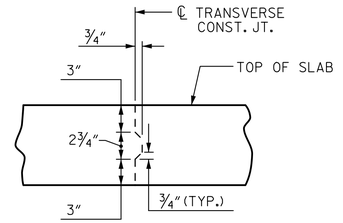


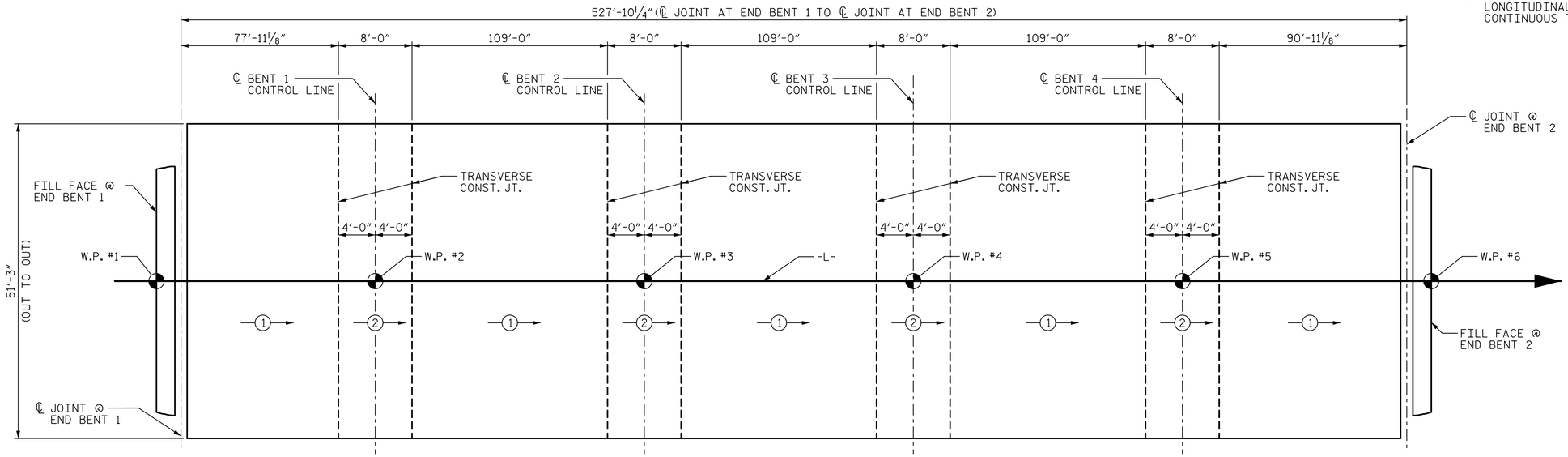

## POURING SEQUENCE

(#) → DENOTES POUR NUMBER AND DIRECTION




## TRANSVERSE CONSTRUCTION JOINT DETAIL

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




## OPTIONAL POURING SEQUENCE

(#) → DENOTES POUR NUMBER AND DIRECTION

POUR ② CANNOT BE STARTED UNTIL BOTH ADJACENT ① POURS REACH A MINIMUM OF 3000 PSI.

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

POUR SEQUENCE

| | |
|---|---|
| ASSEMBLED BY : | D. H. CARTER |
| DATE | MAY 2015 |
| CHECKED BY : | M. T. NEITHEISEL |
| DATE | MAY 2015 |
| DRAWN BY : | JMB 5/87 |
| CHECKED BY : | SJD 9/87 |

| | | |
|---|---|---|
| REV. | 8/16/99 | RWW/LES |
| REV. | 5/1/06 | TLA/GM |
| REV. | 10/1/11 | MAA/GM |

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| REVISIONS | | | | | | SHEET NO. |
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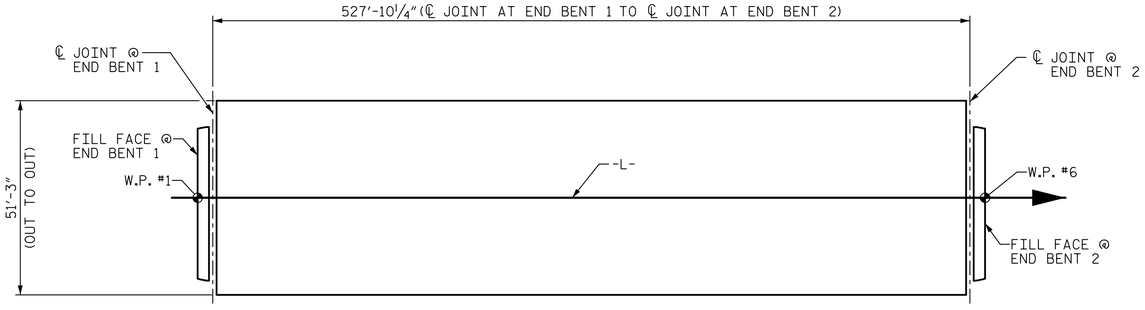
| SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS | | | | | |
|---|---|---|---|---|---|
| BAR SIZE | SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL | | APPROACH SLABS | | PARAPET AND BARRIER RAIL |
| | EPOXY COATED | UNCOATED | EPOXY COATED | 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″ | | | |

## SUPERSTRUCTURE BILL OF MATERIAL

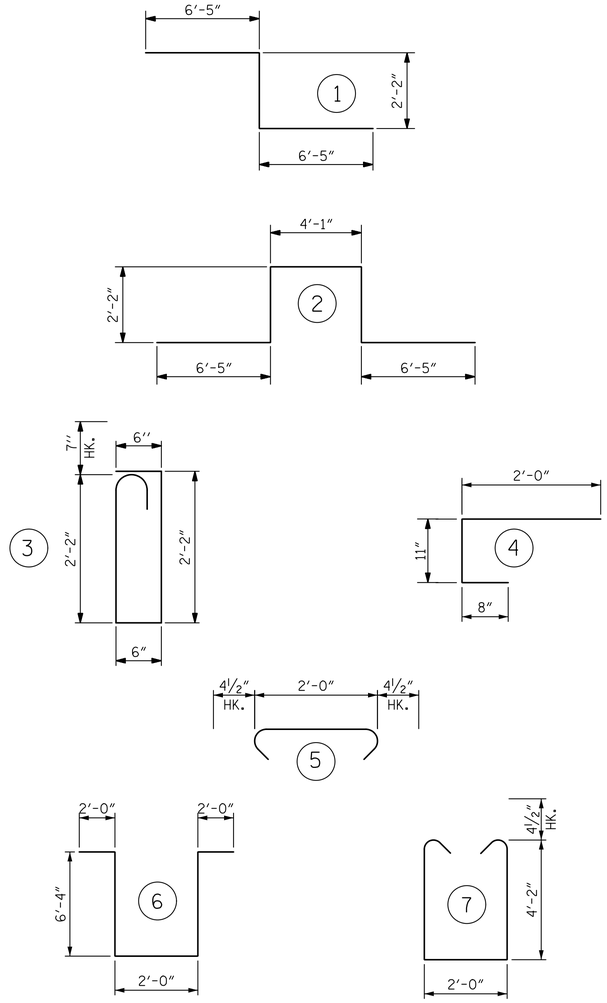
| | CLASS AA CONCRETE (CU. YDS.) | | | | | | REINFORCING STEEL (LBS.) | EPOXY COATED REINFORCING STEEL (LBS.) |
|---|---|---|---|---|---|---|---|---|
| POUR NO. | #1 | #2 | #3 | #4 | #5 | TOTAL | | |
| DECK | 147.7 | 214.6 | 215.4 | 214.6 | 171.6 | 963.9 | 85,592 | 85,880 |
| | | | | | | | | |
| | | | | | | | | |
| TOTALS** | | | | | | 963.9 | 85,592 | 85,880 |

**QUANTITIES FOR CONCRETE BARRIER RAIL ARE NOT INCLUDED




## LAYOUT FOR COMPUTING AREA REINFORCED CONCRETE DECK SLAB (SQ. FT. = 27,053)

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT

## BILL OF MATERIAL

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| ✳A1 | 904 | #5 | STR | 50′-11″ | 48,008 |
| A2 | 904 | #5 | STR | 50′-11″ | 48,008 |
| | | | | | |
| ✳B1 | 84 | #4 | STR | 22′-4″ | 1,253 |
| ✳B2 | 336 | #6 | STR | 42′-6″ | 21,449 |
| ✳B3 | 156 | #6 | STR | 36′-0″ | 8,435 |
| ✳B4 | 252 | #4 | STR | 20′-6″ | 3,451 |
| ✳B5 | 84 | #4 | STR | 28′-10″ | 1,618 |
| B6 | 44 | #5 | STR | 42′-10″ | 1,966 |
| B7 | 352 | #6 | STR | 42′-4″ | 22,382 |
| B8 | 132 | #5 | STR | 39′-4″ | 5,415 |
| B9 | 44 | #5 | STR | 55′-10″ | 2,562 |
| | | | | | |
| ✳G1 | 2 | #5 | STR | 50′-11″ | 106 |
| | | | | | |
| ✳K1 | 8 | #8 | 1 | 15′-0″ | 320 |
| ✳K2 | 12 | #8 | 2 | 21′-3″ | 681 |
| ✳K3 | 8 | #6 | STR | 6′-7″ | 79 |
| K4 | 32 | #4 | STR | 6′-10″ | 146 |
| K5 | 160 | #4 | STR | 9′-7″ | 1,024 |
| K6 | 32 | #4 | STR | 6′-7″ | 141 |
| K7 | 28 | #4 | STR | 42′-0″ | 786 |
| | | | | | |
| ✳S1 | 56 | #5 | 3 | 5′-11″ | 346 |
| ✳S2 | 56 | #4 | 4 | 3′-7″ | 134 |
| S3 | 832 | #4 | 5 | 2′-9″ | 1,528 |
| | | | | | |
| U1 | 32 | #4 | 7 | 11′-1″ | 237 |
| U2 | 112 | #4 | 6 | 18′-8″ | 1,397 |

| | | |
|---|---|---|
| REINFORCING STEEL | LBS. | 85,592 |
| ✳EPOXY COATED REINFORCING STEEL | LBS. | 85,880 |

| GROOVING BRIDGE FLOORS | |
|---|---|
| APPROACH SLABS | 1,234 SQ.FT. |
| BRIDGE DECK | 23,729 SQ.FT. |
| TOTAL | 24,963 SQ.FT. |

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# SUPERSTRUCTURE BILL OF MATERIAL

| ASSEMBLED BY : D. H. CARTER | DATE MAY 2015 |
|---|---|
| CHECKED BY : M. T. NEIHEISEL | DATE MAY 2015 |
| DRAWN BY : JMB 5/87 | REV. 8/16/99 RWW/LES |
| CHECKED BY : SJD 9/87 | REV. 5/1/06 TLA/GM |
| | REV. 10/1/11 MAA/GM |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| NO. | BY: | DATE: | NO. | BY: | DATE: | S-24 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

## NOTES

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

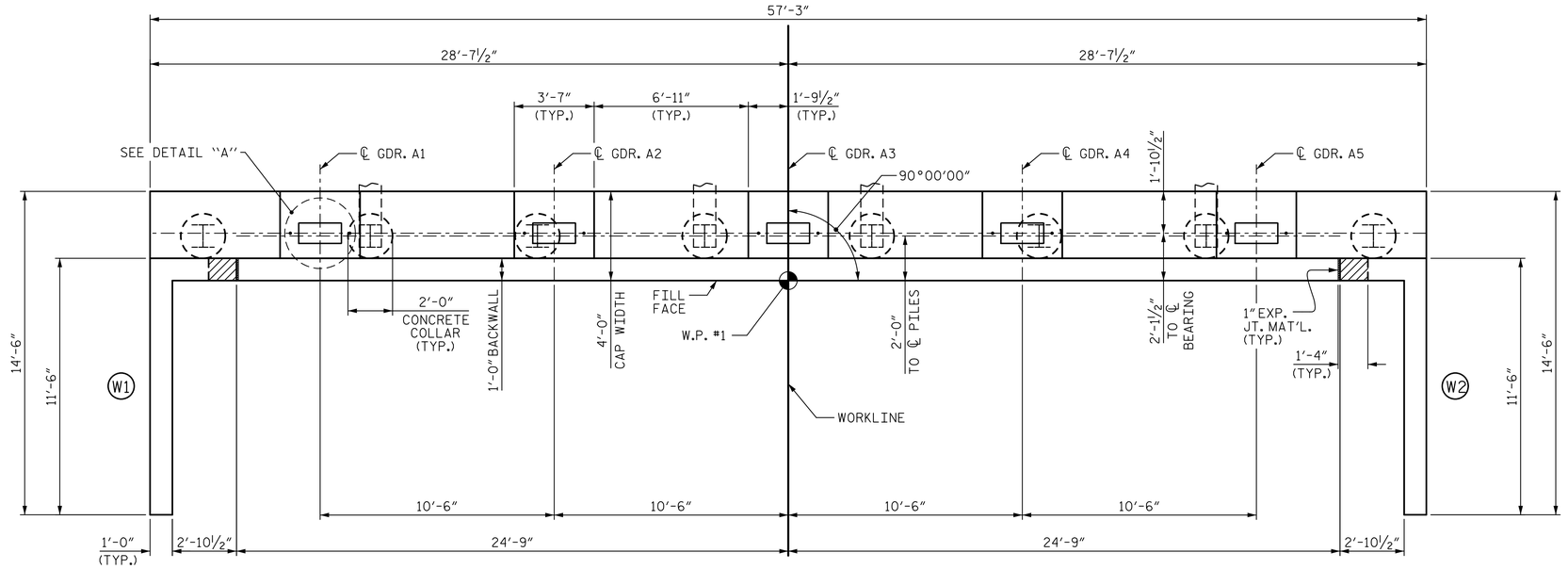
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

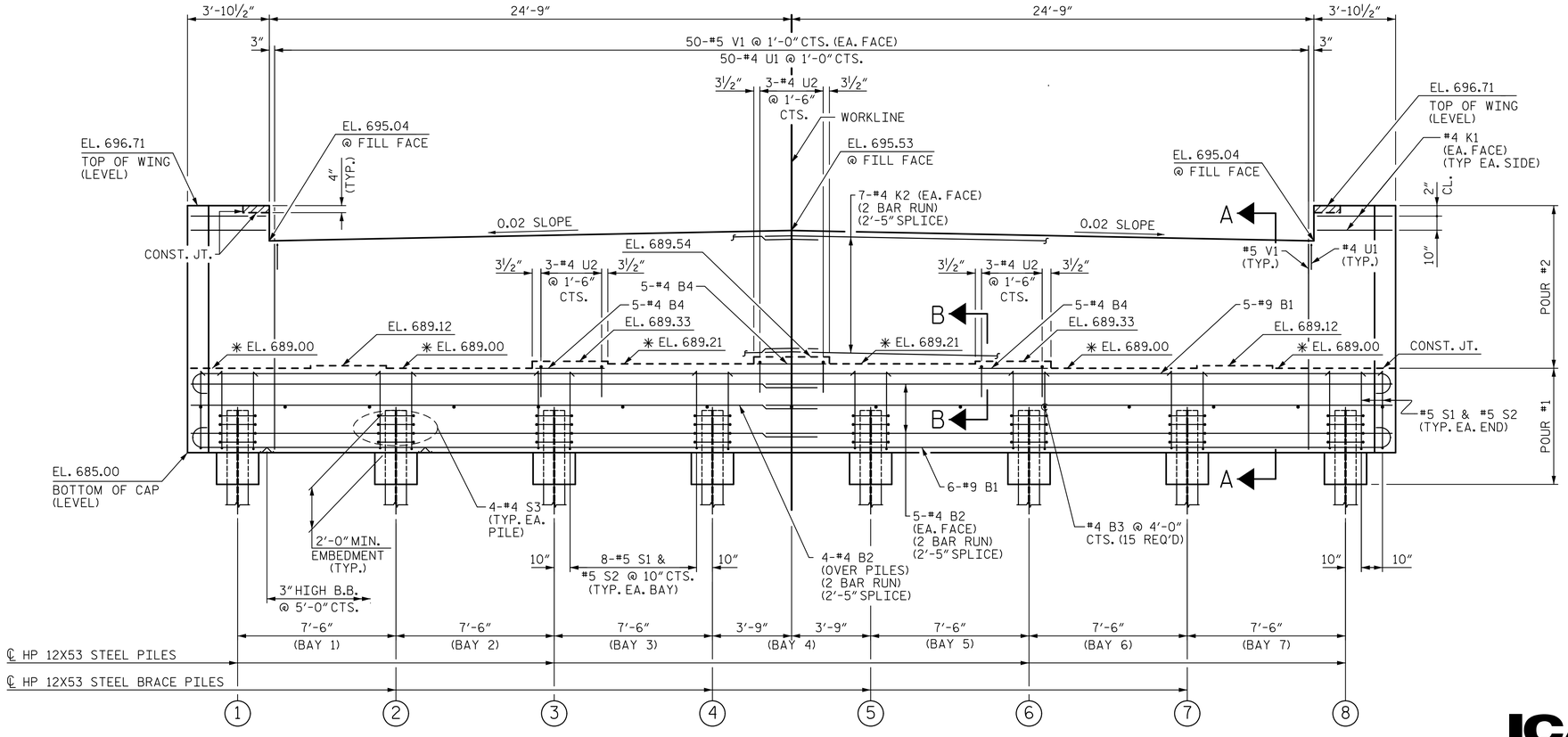
THE TOP SURFACE OF THE END BENT CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERSELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%.

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

FOR SECTION A-A AND B-B, SEE SHT. 3 OF 3.

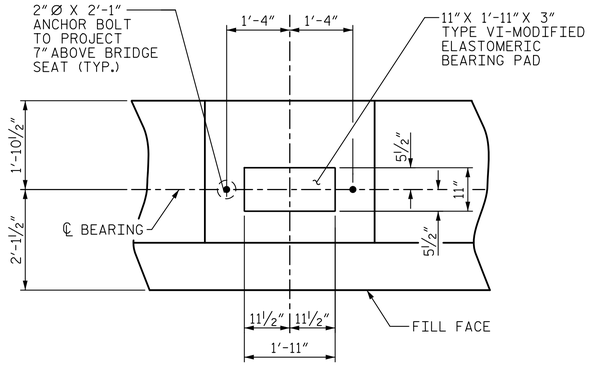



## PLAN




## ELEVATION

✳ SEE SHEET 3 OF 3 FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS.




## DETAIL "A"

(TYP. EA. GDR.)

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-25 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEITHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
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5/28/2015
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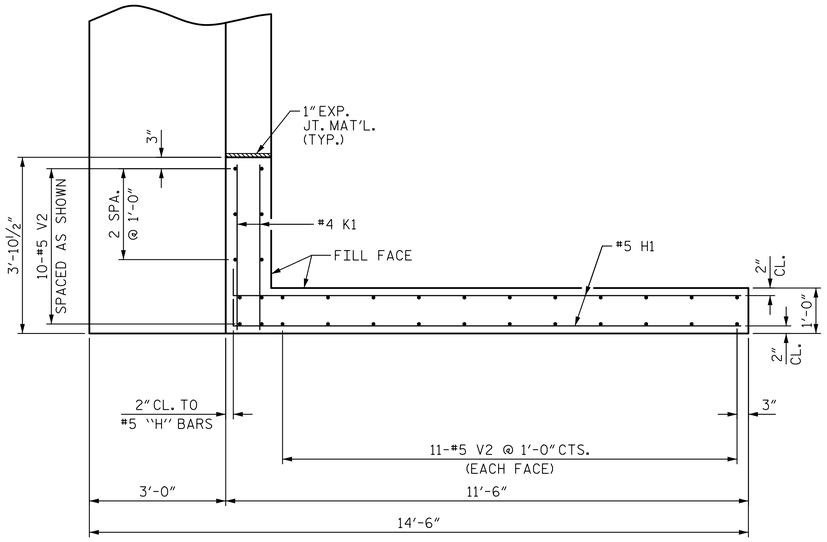
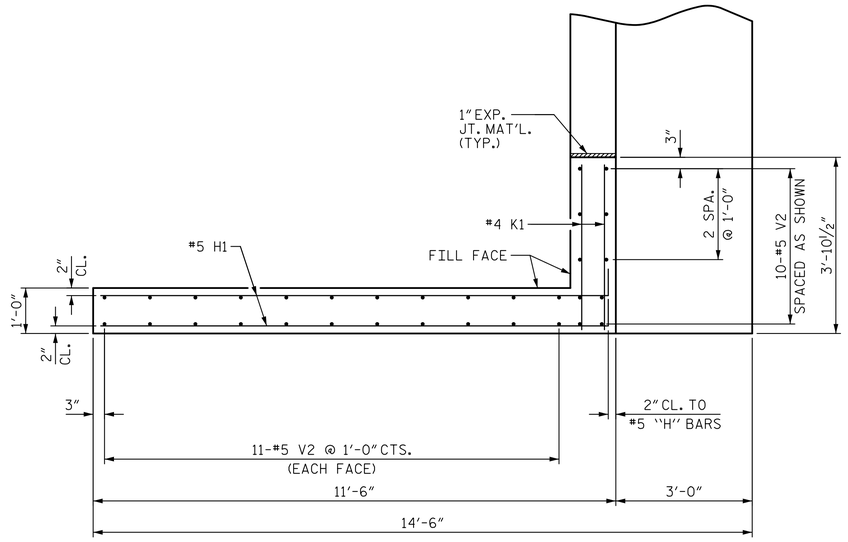
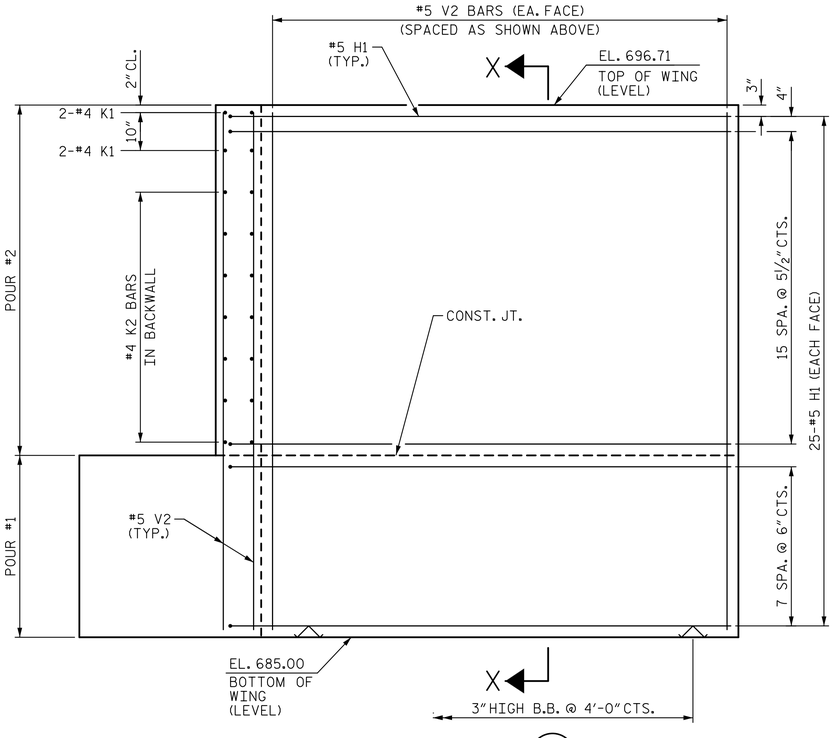


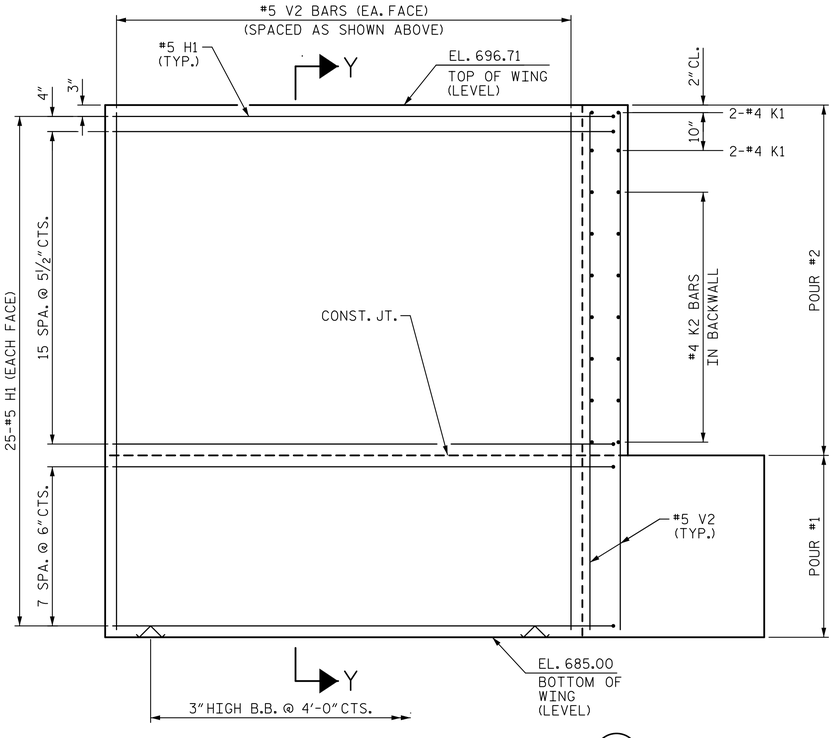

## PLAN OF WING (W1)



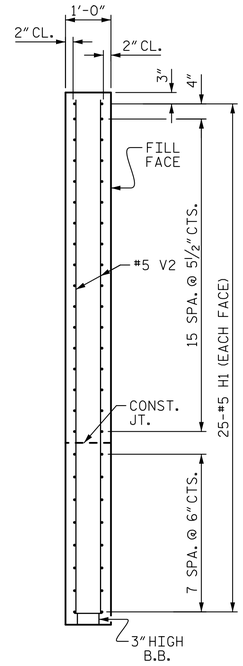

## PLAN OF WING (W2)



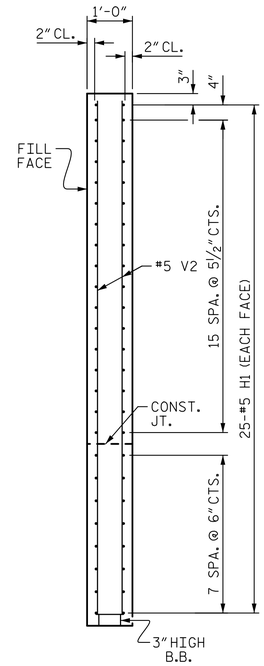

## ELEVATION OF WING (W1)




## ELEVATION OF WING (W2)




## SECTION X-X




## SECTION Y-Y

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -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-26 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

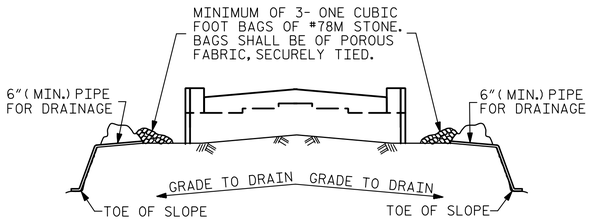
DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

ICA Engineering
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
E9B7B9620EE24D5...

5/28/2015
R:\Structures\Plans\s26_ w-5516_sd_e1_02.dgn
ICA Engineering

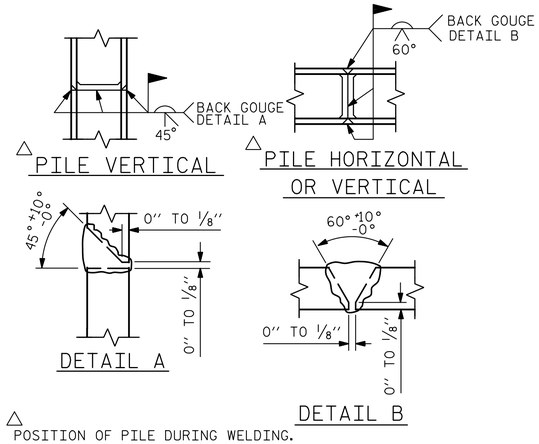



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

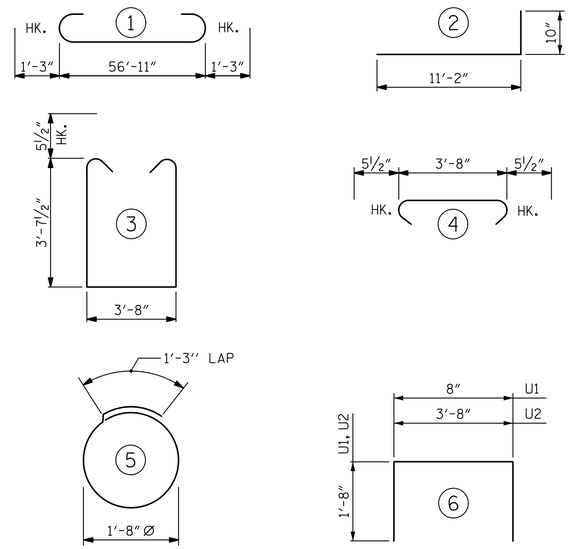
## TEMPORARY DRAINAGE AT END BENT




△ POSITION OF PILE DURING WELDING.

## PILE SPLICE DETAILS

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

HP 12 X 53 STEEL PILES
NO: 8 LIN. FT.= 280

## BILL OF MATERIAL

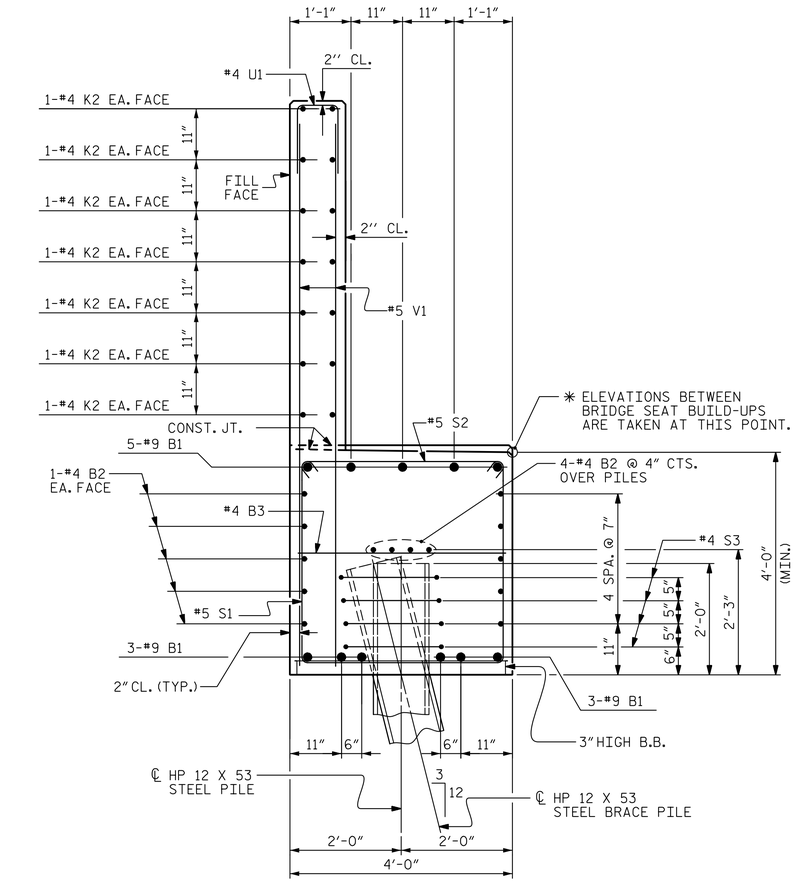
### END BENT 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 11 | #9 | 1 | 59'-5" | 2,222 |
| B2 | 28 | #4 | STR | 29'-8" | 555 |
| B3 | 15 | #4 | STR | 3'-8" | 37 |
| B4 | 15 | #4 | STR | 3'-3" | 33 |
| | | | | | |
| H1 | 100 | #5 | 2 | 12'-0" | 1,252 |
| | | | | | |
| K1 | 8 | #4 | STR | 3'-6" | 19 |
| K2 | 28 | #4 | STR | 29'-8" | 555 |
| | | | | | |
| S1 | 60 | #5 | 3 | 11'-10" | 741 |
| S2 | 60 | #5 | 4 | 4'-7" | 287 |
| S3 | 32 | #4 | 5 | 6'-6" | 139 |
| | | | | | |
| U1 | 50 | #4 | 6 | 4'-0" | 134 |
| U2 | 9 | #4 | 6 | 7'-0" | 42 |
| | | | | | |
| V1 | 100 | #5 | STR | 9'-8" | 1,008 |
| V2 | 64 | #5 | STR | 11'-4" | 757 |

REINFORCING STEEL 7,781 LBS.

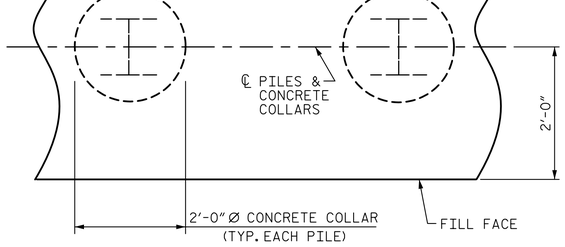
CLASS A CONCRETE BREAKDOWN

| | | |
|---|---|---|
| POUR #1 | CAP, LOWER PART OF WINGS & COLLARS | 39.6 C.Y. |
| POUR #2 | BACKWALL AND UPPER PART OF WINGS | 19.2 C.Y. |
| TOTAL CLASS A CONCRETE | | 58.8 C.Y. |

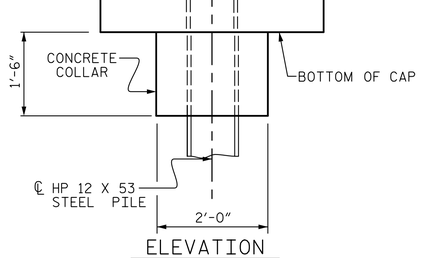



## SECTION A-A

(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

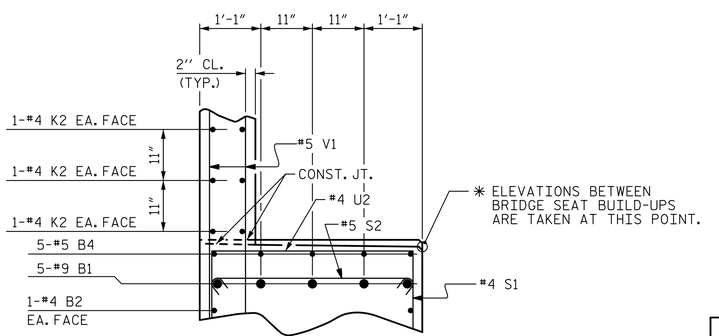



PLAN




ELEVATION

## CORROSION PROTECTION FOR STEEL PILES DETAIL




## PARTIAL SECTION B-B

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

# END BENT 1 DETAILS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-27 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

ICA Engineering
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
E9B7B9620EE24D5...

5/28/2015
R:\Structures\Plans\s27_w-5516_sd_e1_03.dgn
ICA Engineering

## NOTES

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

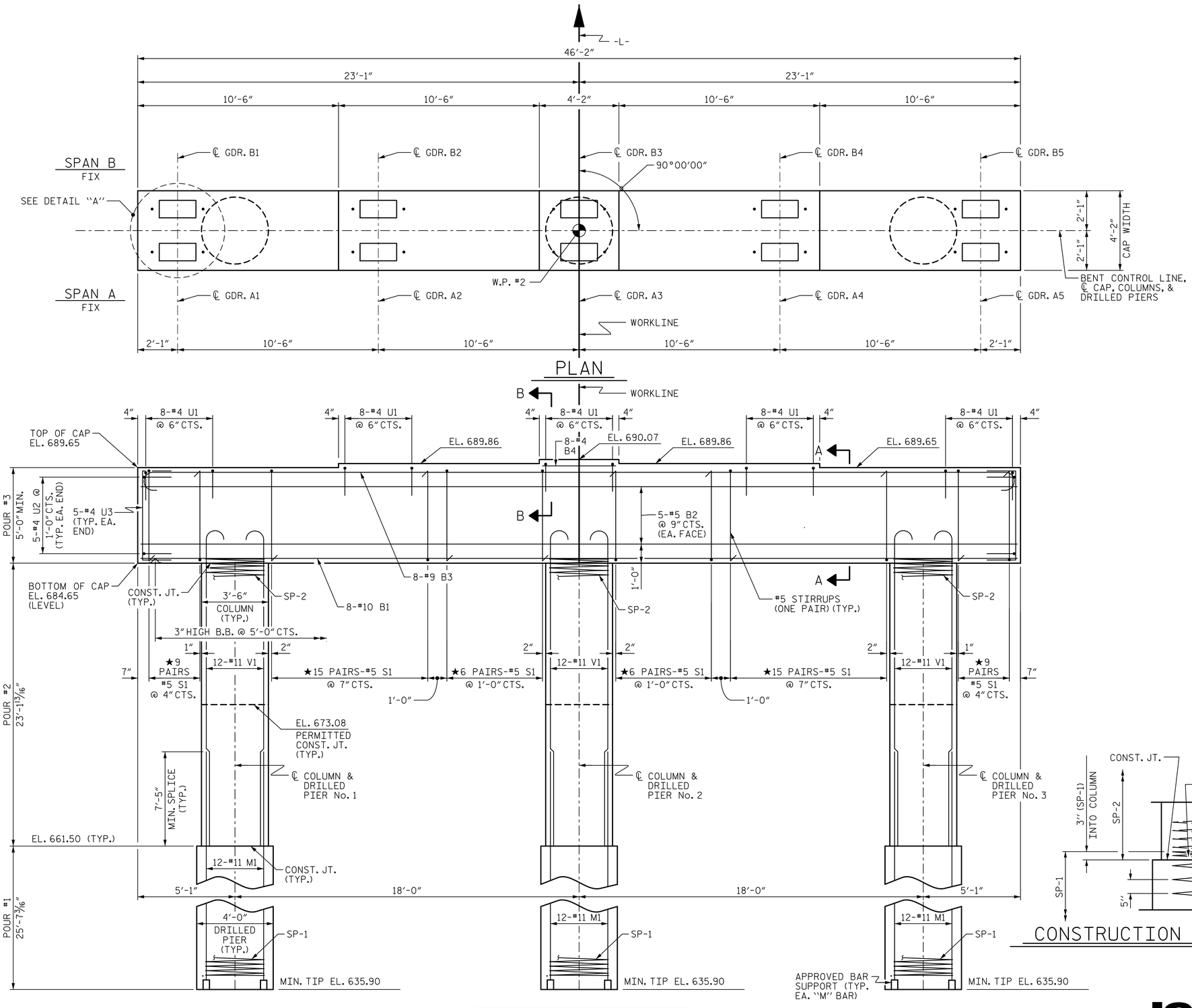
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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 ONE FOOT BELOW THE GROUND LINE.

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

FOR SECTION A-A, B-B, AND REINFORCING BILL OF MATERIAL, SEE SHEET 2 OF 2.

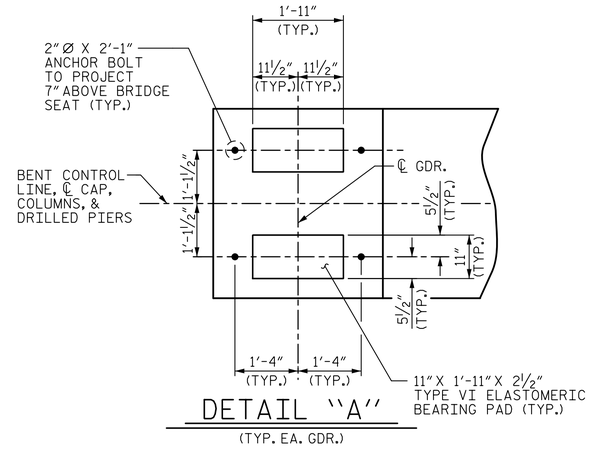



## PLAN



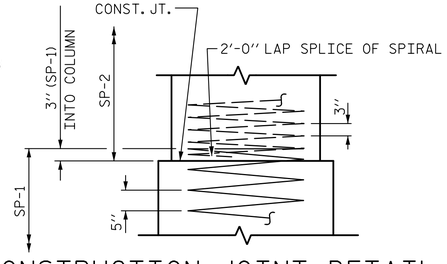

★ INVERT ALTERNATE STIRRUP PAIRS.

## ELEVATION




## DETAIL "A"

(TYP. EA. GDR.)




## CONSTRUCTION JOINT DETAIL

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-28 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

ICA Engineering
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
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5/28/2015
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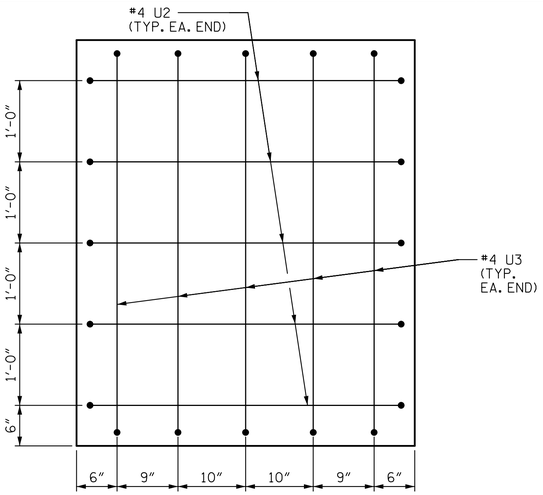
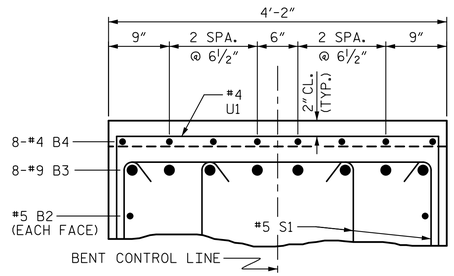
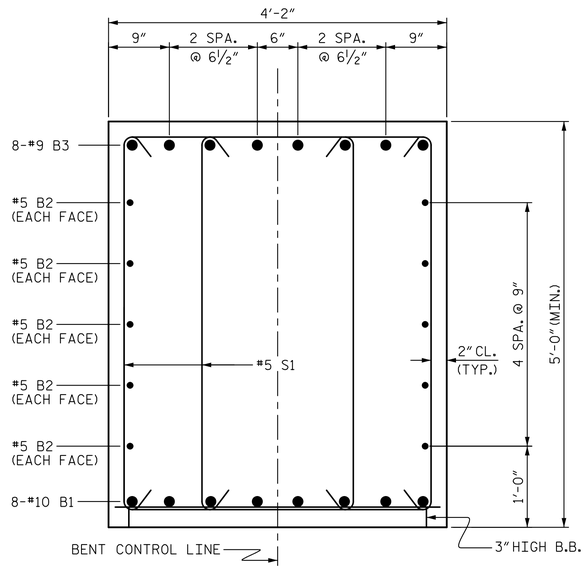
ICA Engineering



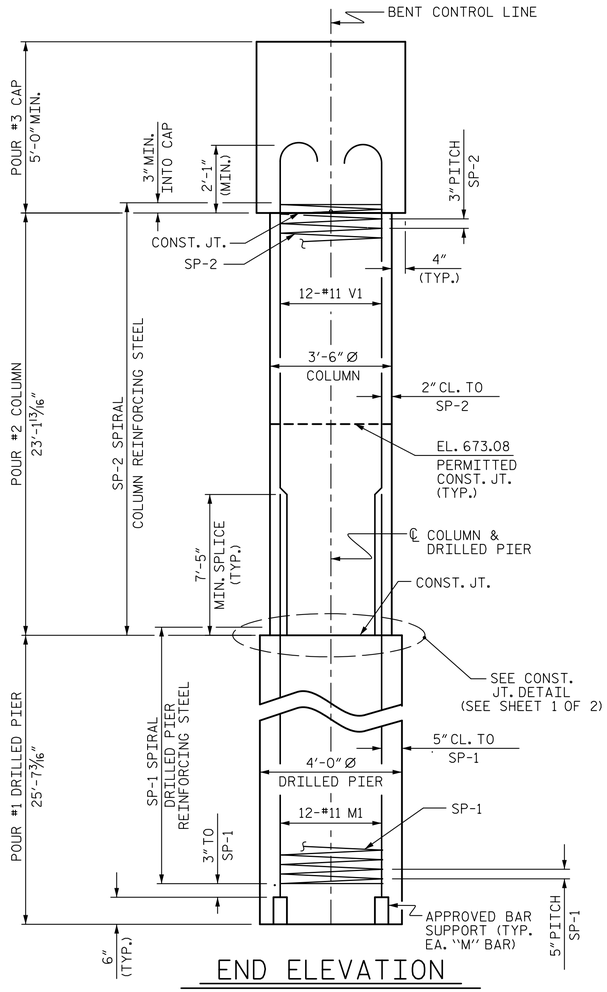

END OF CAP DETAIL (TYP.)



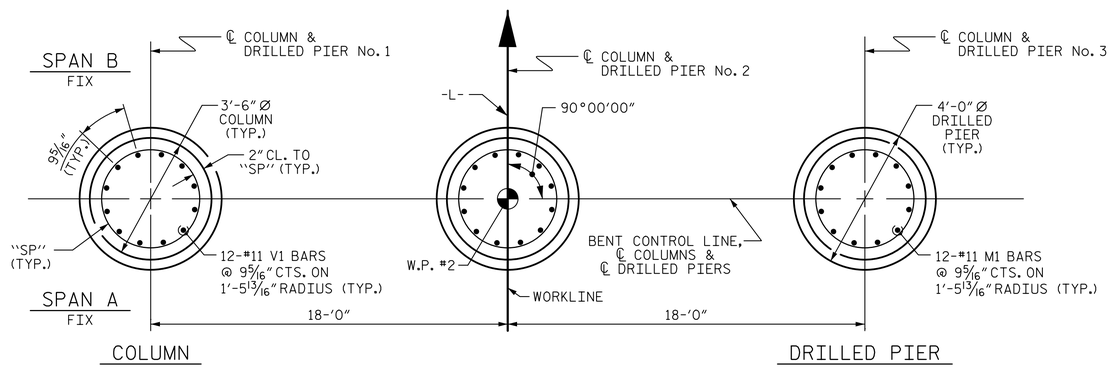

SECTION B-B




SECTION A-A



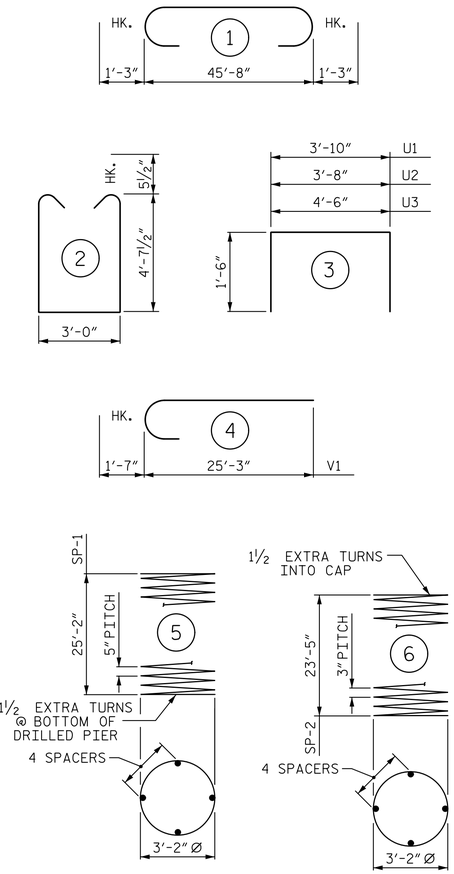

END ELEVATION




PLAN OF DRILLED PIERS & COLUMNS

(DETAILS ARE TYPICAL EACH DRILLED PIER & COLUMN)

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

## BILL OF MATERIAL

### BENT 1

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 8 | #10 | STR | 45'-10" | 1,578 |
| B2 | 10 | #5 | STR | 45'-10" | 478 |
| B3 | 8 | #9 | 1 | 48'-2" | 1,310 |
| B4 | 8 | #4 | STR | 3'-10" | 20 |
| | | | | | |
| M1 | 36 | #11 | STR | 35'-7" | 6,806 |
| | | | | | |
| S1 | 120 | #5 | 2 | 13'-2" | 1,648 |
| | | | | | |
| U1 | 40 | #4 | 3 | 6'-10" | 183 |
| U2 | 10 | #4 | 3 | 6'-8" | 45 |
| U3 | 10 | #4 | 3 | 7'-6" | 50 |
| | | | | | |
| V1 | 36 | #11 | 4 | 26'-10" | 5,132 |

REINFORCING STEEL 17,250 LBS.

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| SP-1 | 3 | ✳ | 5 | 607'-3" | 1,900 |
| SP-2 | 3 | ✳✳ | 6 | 935'-6" | 1,875 |

SPIRAL COLUMN REINFORCING STEEL 3,775 LBS.

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

✳✳THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

| | |
|---|---|
| POUR #2 (COLUMNS) | 24.8 C.Y. |
| POUR #3 (CAP) | 36.6 C.Y. |
| TOTAL CLASS A CONCRETE | 61.4 C.Y. |

DRILLED PIERS:

DRILLED PIER CONCRETE
POUR #1 (DRILLED PIERS) 35.8 C.Y.

4'-0" Ø DRILLED PIERS NOT IN SOIL 36.00 LIN. FT.

4'-0" Ø DRILLED PIERS IN SOIL 40.80 LIN. FT.

PERMANENT STEEL CASING FOR
4'-0" Ø DRILLED PIER 44.72 LIN. FT.

CSL TUBES 325.2 LIN. FT.

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-29 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

ICA Engineering
5121 Kingston Way, Suite 100 Raleigh, NC 27607
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NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
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5/28/2015
R:\Structures\Plans\s29_ w-5516_sd_b1_02.dgn
ICA Engineering

## NOTES

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

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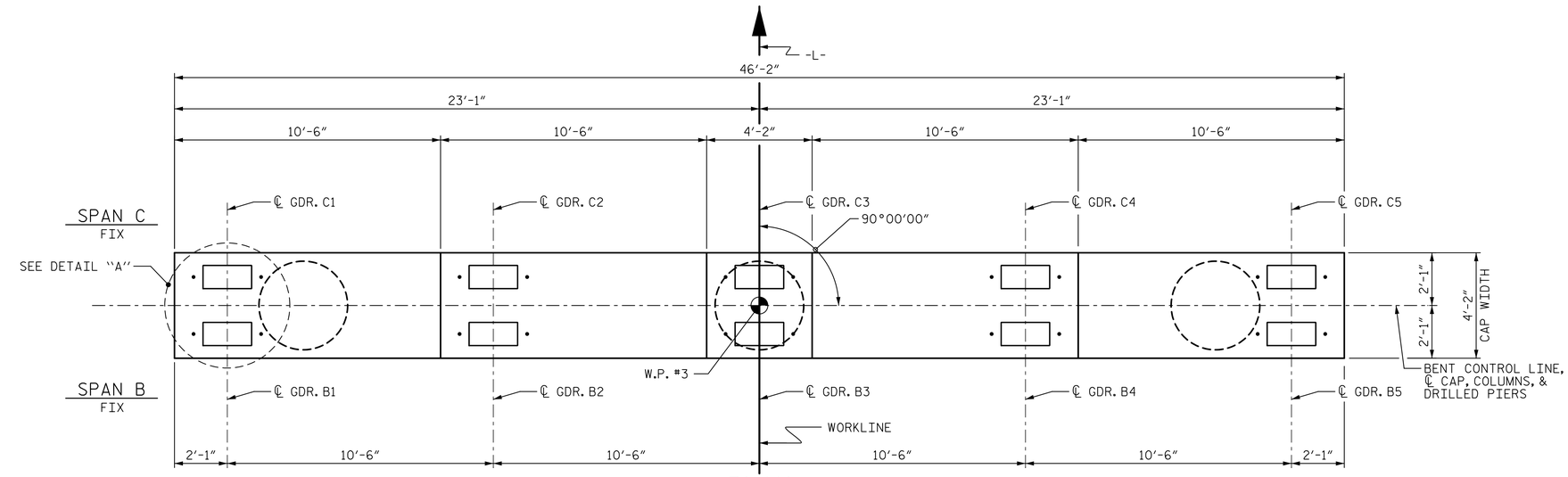
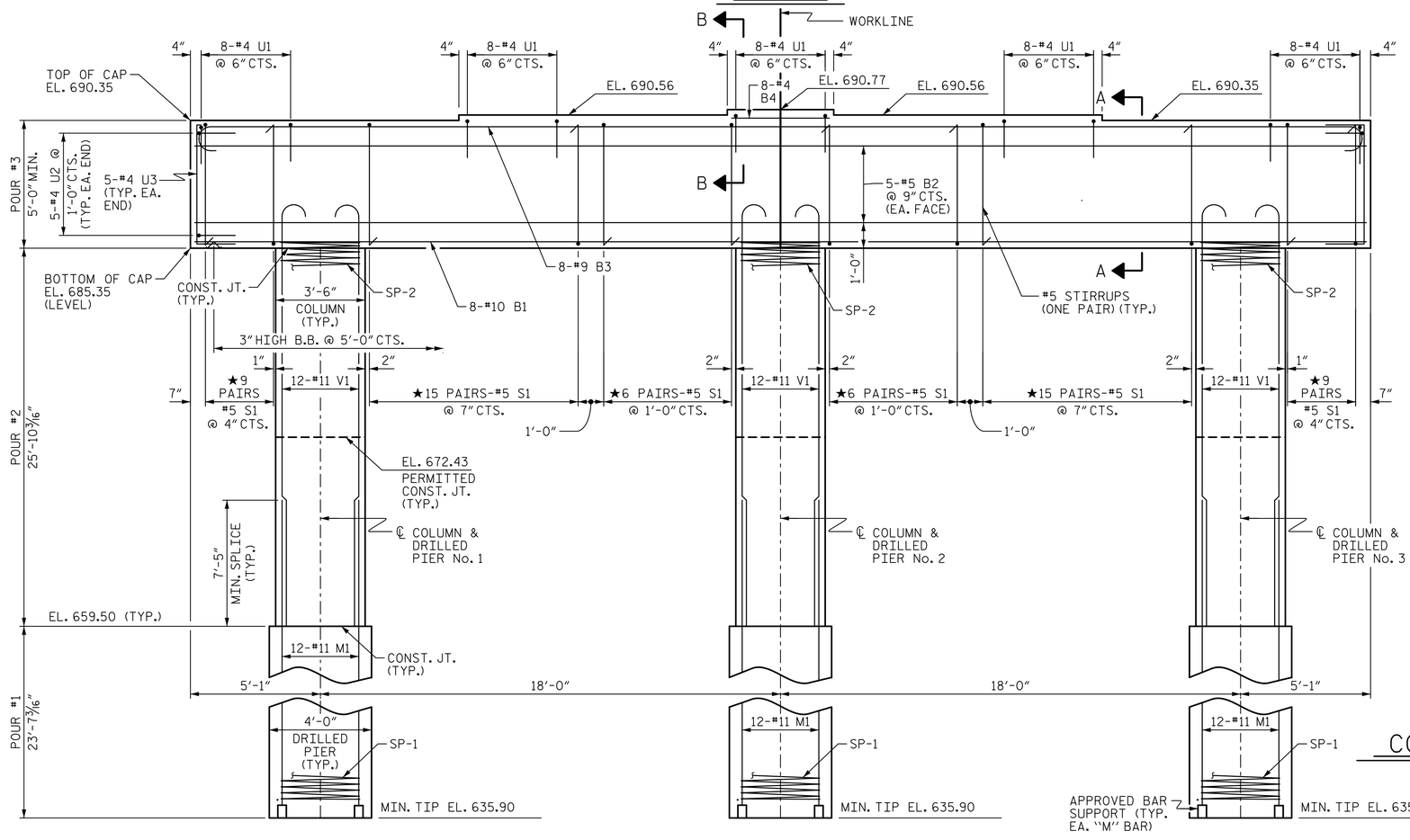
THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

FOR SECTION A-A, B-B, AND REINFORCING BILL OF MATERIAL, SEE SHEET 2 OF 2.

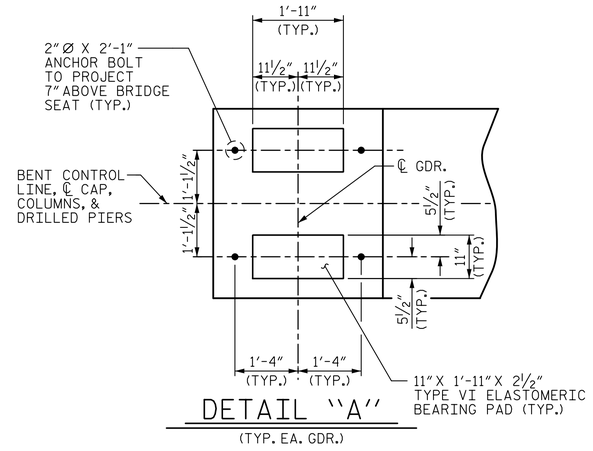



## PLAN



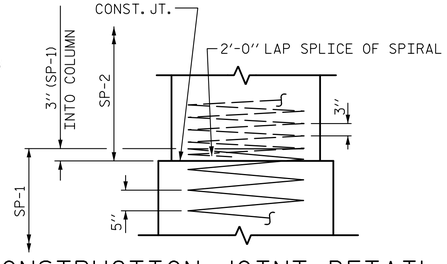

★ INVERT ALTERNATE STIRRUP PAIRS.

## ELEVATION




## DETAIL "A"

(TYP. EA. GDR.)




## CONSTRUCTION JOINT DETAIL

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-30 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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5/28/2015
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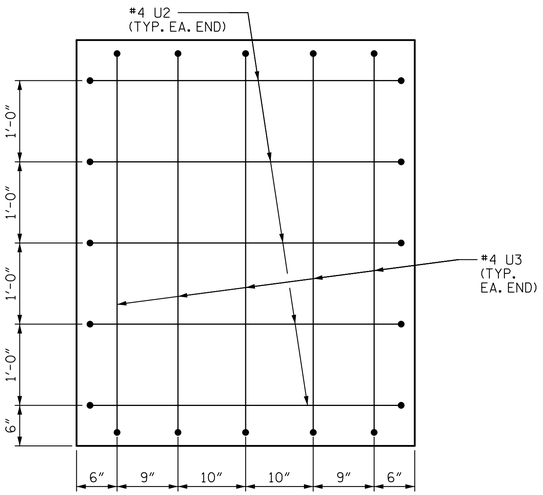
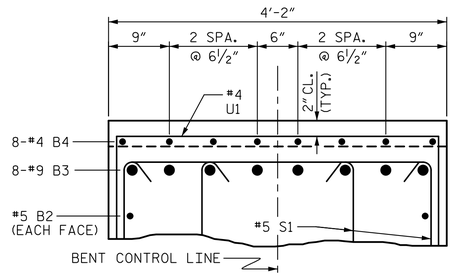
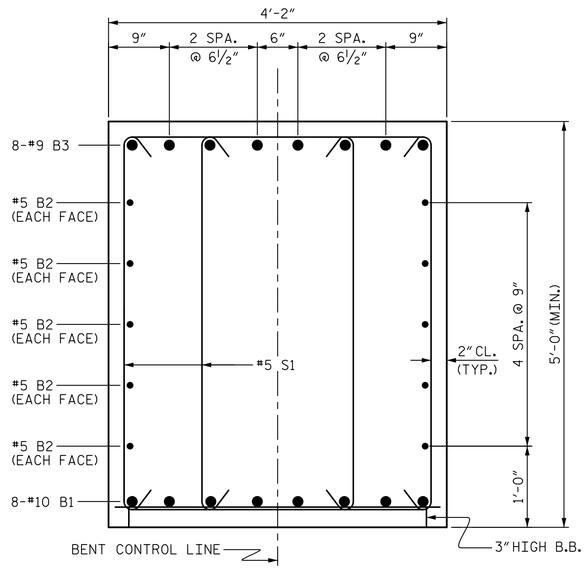
ICA Engineering



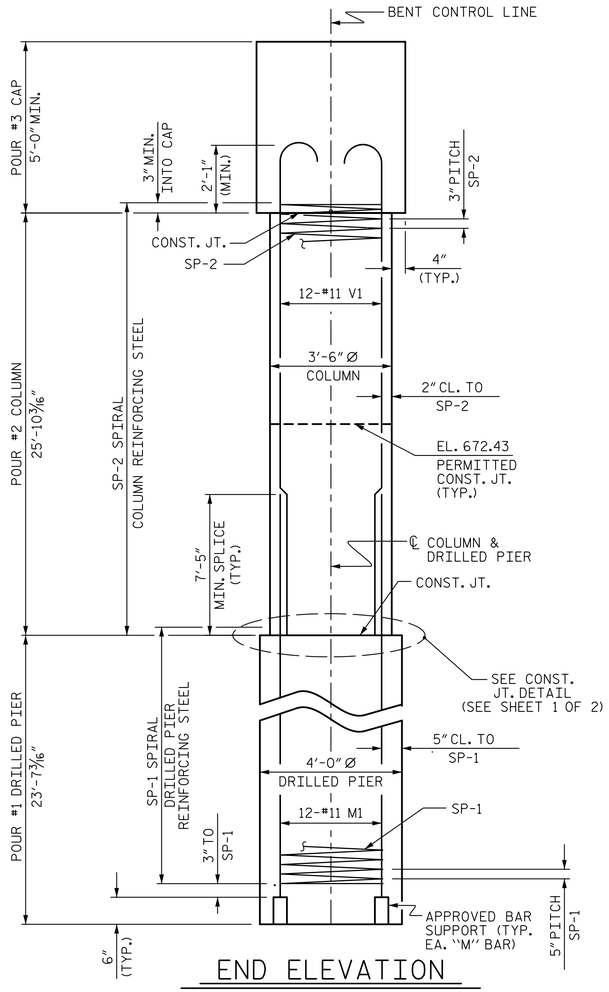

END OF CAP DETAIL (TYP.)



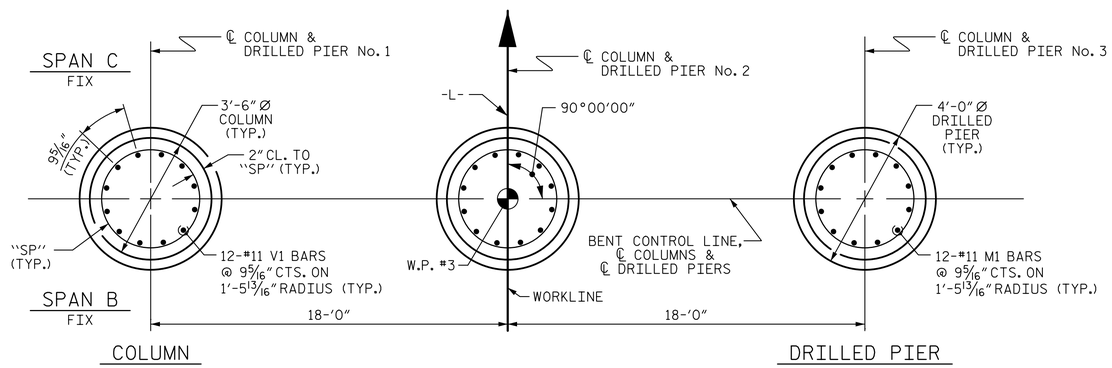

SECTION B-B




SECTION A-A



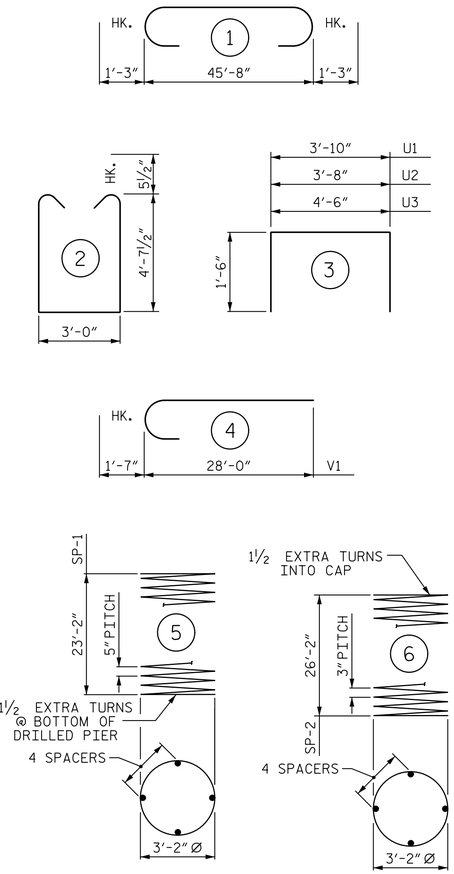

END ELEVATION




PLAN OF DRILLED PIERS & COLUMNS

(DETAILS ARE TYPICAL EACH DRILLED PIER & COLUMN)

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

## BILL OF MATERIAL

### BENT 2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 8 | #10 | STR | 45'-10" | 1,578 |
| B2 | 10 | #5 | STR | 45'-10" | 478 |
| B3 | 8 | #9 | 1 | 48'-2" | 1,310 |
| B4 | 8 | #4 | STR | 3'-10" | 20 |
| | | | | | |
| M1 | 36 | #11 | STR | 33'-7" | 6,423 |
| | | | | | |
| S1 | 120 | #5 | 2 | 13'-2" | 1,648 |
| | | | | | |
| U1 | 40 | #4 | 3 | 6'-10" | 183 |
| U2 | 10 | #4 | 3 | 6'-8" | 45 |
| U3 | 10 | #4 | 3 | 7'-6" | 50 |
| | | | | | |
| V1 | 36 | #11 | 4 | 29'-7" | 5,658 |

REINFORCING STEEL 17,393 LBS.

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| SP-1 | 3 | ✳ | 5 | 560'-9" | 1,755 |
| SP-2 | 3 | ✳✳ | 6 | 1,041'-0" | 2,086 |

SPIRAL COLUMN REINFORCING STEEL 3,841 LBS.

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

✳✳THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

| | |
|---|---|
| POUR #2 (COLUMNS) | 27.7 C.Y. |
| POUR #3 (CAP) | 36.6 C.Y. |
| TOTAL CLASS A CONCRETE | 64.3 C.Y. |

DRILLED PIERS:

DRILLED PIER CONCRETE
POUR #1 (DRILLED PIERS) 33.0 C.Y.

4'-0" Ø DRILLED PIERS NOT IN SOIL 36.00 LIN. FT.

4'-0" Ø DRILLED PIERS IN SOIL 34.80 LIN. FT.

PERMANENT STEEL CASING FOR
4'-0" Ø DRILLED PIER 33.29 LIN. FT.

CSL TUBES 301.2 LIN. FT.

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

ICA Engineering
5121 Kingston Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN
DocuSigned by: Thomas E. Tallman 7/7/2015
E9878962OEE24D5...

PROJECT NO. W-5516
ROWAN COUNTY
STATION: 61+79.40 -L-
SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 2

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-31 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

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ICA Engineering

## NOTES

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

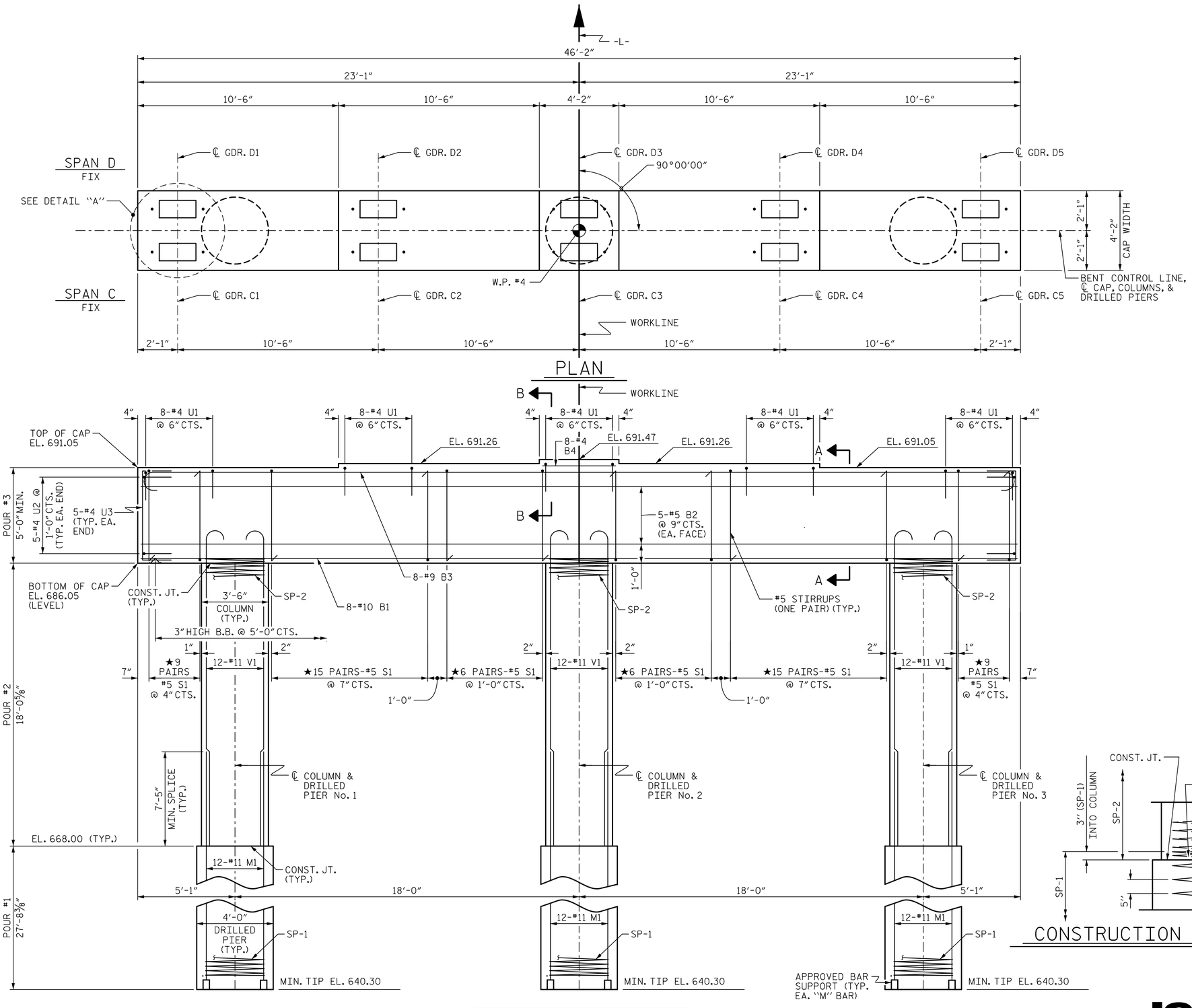
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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 ONE FOOT BELOW THE GROUND LINE.

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

FOR SECTION A-A, B-B, AND REINFORCING BILL OF MATERIAL, SEE SHEET 2 OF 2.

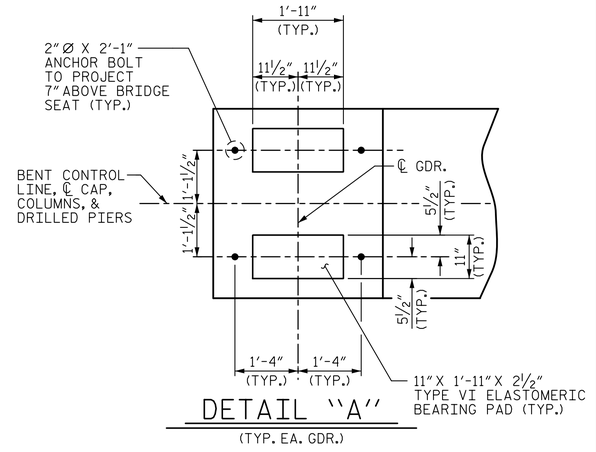



## PLAN



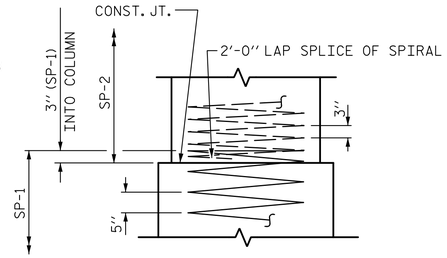

★ INVERT ALTERNATE STIRRUP PAIRS.

## ELEVATION




## DETAIL "A"

(TYP. EA. GDR.)




## CONSTRUCTION JOINT DETAIL

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 3

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-32 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

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5/28/2015
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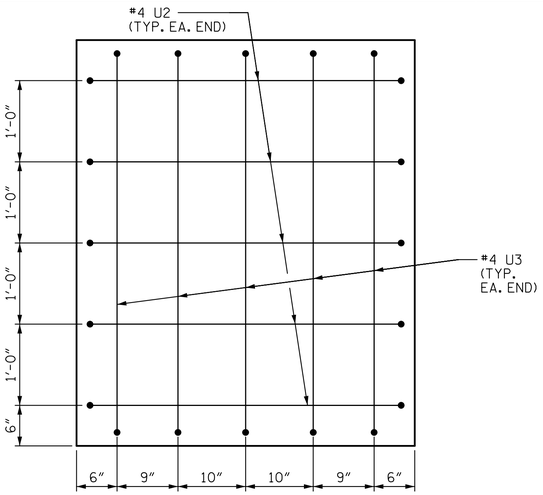
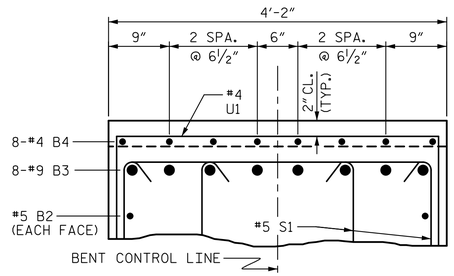
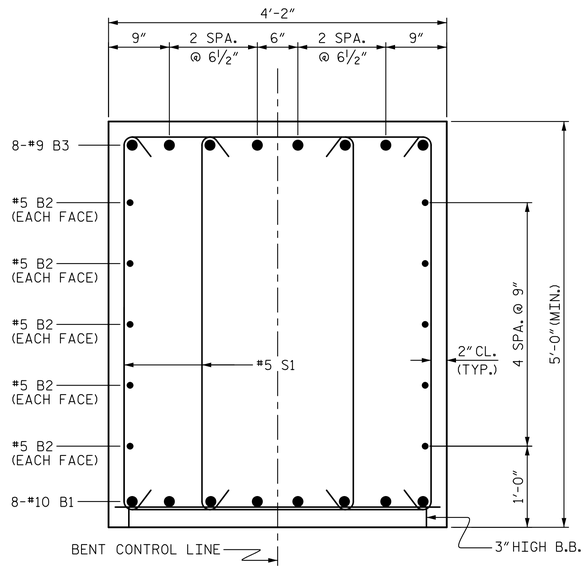
ICA Engineering



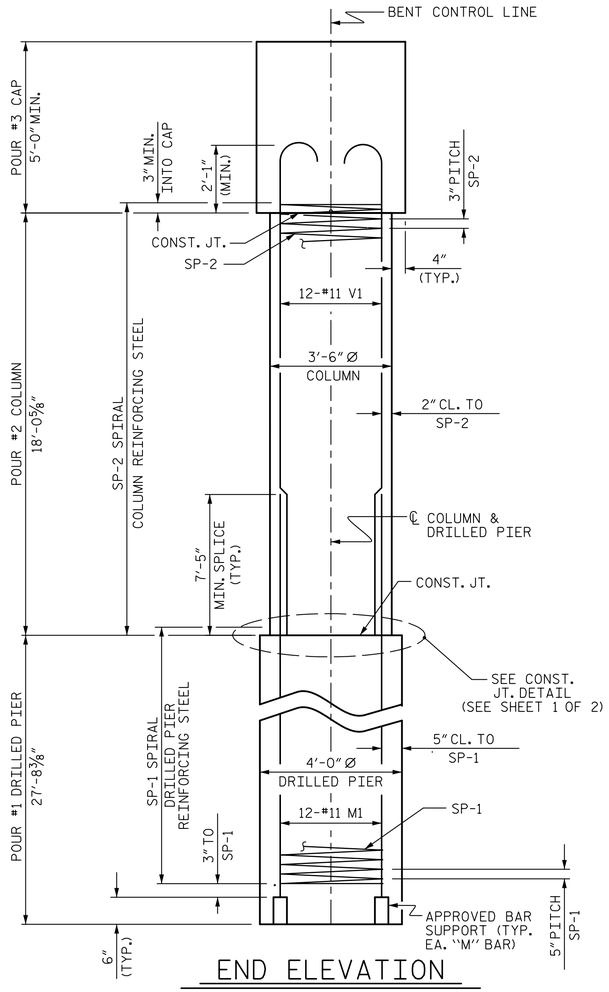

END OF CAP DETAIL (TYP.)



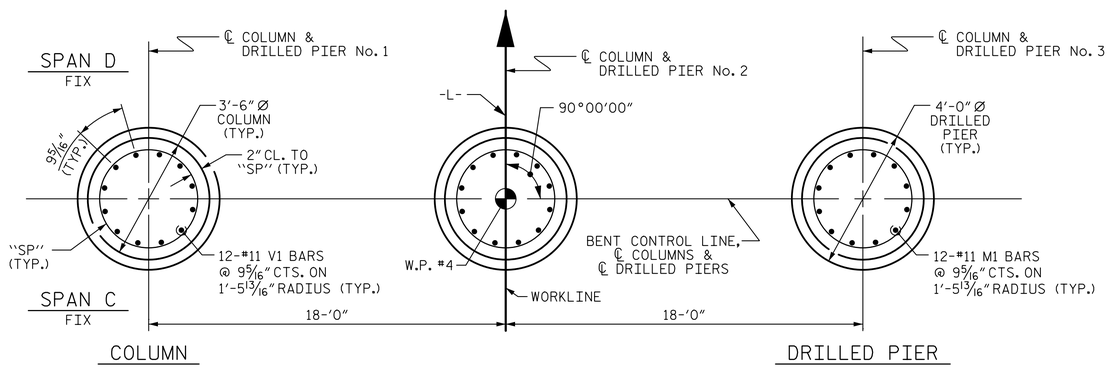

SECTION B-B




SECTION A-A



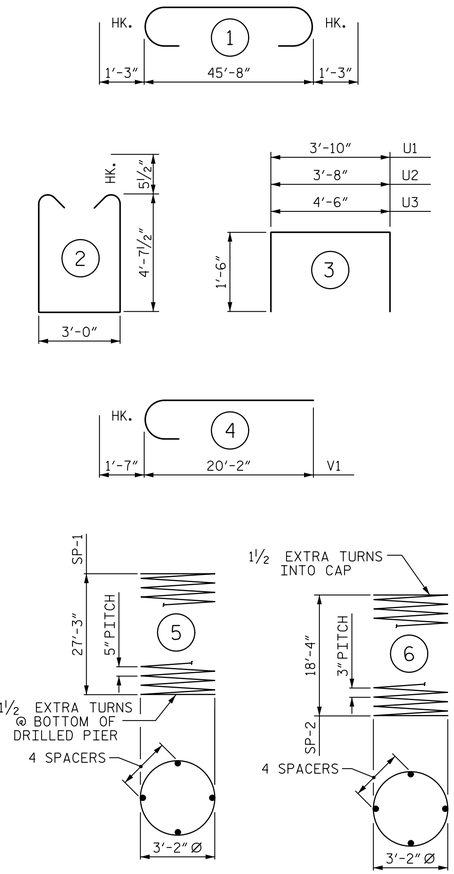

END ELEVATION




PLAN OF DRILLED PIERS & COLUMNS

(DETAILS ARE TYPICAL EACH DRILLED PIER & COLUMN)

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

## BILL OF MATERIAL

### BENT 3

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 8 | #10 | STR | 45'-10" | 1,578 |
| B2 | 10 | #5 | STR | 45'-10" | 478 |
| B3 | 8 | #9 | 1 | 48'-2" | 1,310 |
| B4 | 8 | #4 | STR | 3'-10" | 20 |
| | | | | | |
| M1 | 36 | #11 | STR | 37'-8" | 7,204 |
| | | | | | |
| S1 | 120 | #5 | 2 | 13'-2" | 1,648 |
| | | | | | |
| U1 | 40 | #4 | 3 | 6'-10" | 183 |
| U2 | 10 | #4 | 3 | 6'-8" | 45 |
| U3 | 10 | #4 | 3 | 7'-6" | 50 |
| | | | | | |
| V1 | 36 | #11 | 4 | 21'-9" | 4,160 |

REINFORCING STEEL 16,676 LBS.

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| SP-1 | 3 | ✳ | 5 | 656'-3" | 2,053 |
| SP-2 | 3 | ✳✳ | 6 | 734'-2" | 1,471 |

SPIRAL COLUMN REINFORCING STEEL 3,524 LBS.

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

✳✳THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

| | |
|---|---|
| POUR #2 (COLUMNS) | 19.3 C.Y. |
| POUR #3 (CAP) | 36.6 C.Y. |
| TOTAL CLASS A CONCRETE | 55.9 C.Y. |

DRILLED PIERS:

DRILLED PIER CONCRETE
POUR #1 (DRILLED PIERS) 38.7 C.Y.

4'-0" Ø DRILLED PIERS NOT IN SOIL 36.00 LIN. FT.

4'-0" Ø DRILLED PIERS IN SOIL 47.10 LIN. FT.

CSL TUBES 350.4 LIN. FT.

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 3

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-33 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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5121 Kingston Way, Suite 100 Raleigh, NC 27607
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NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

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## NOTES

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

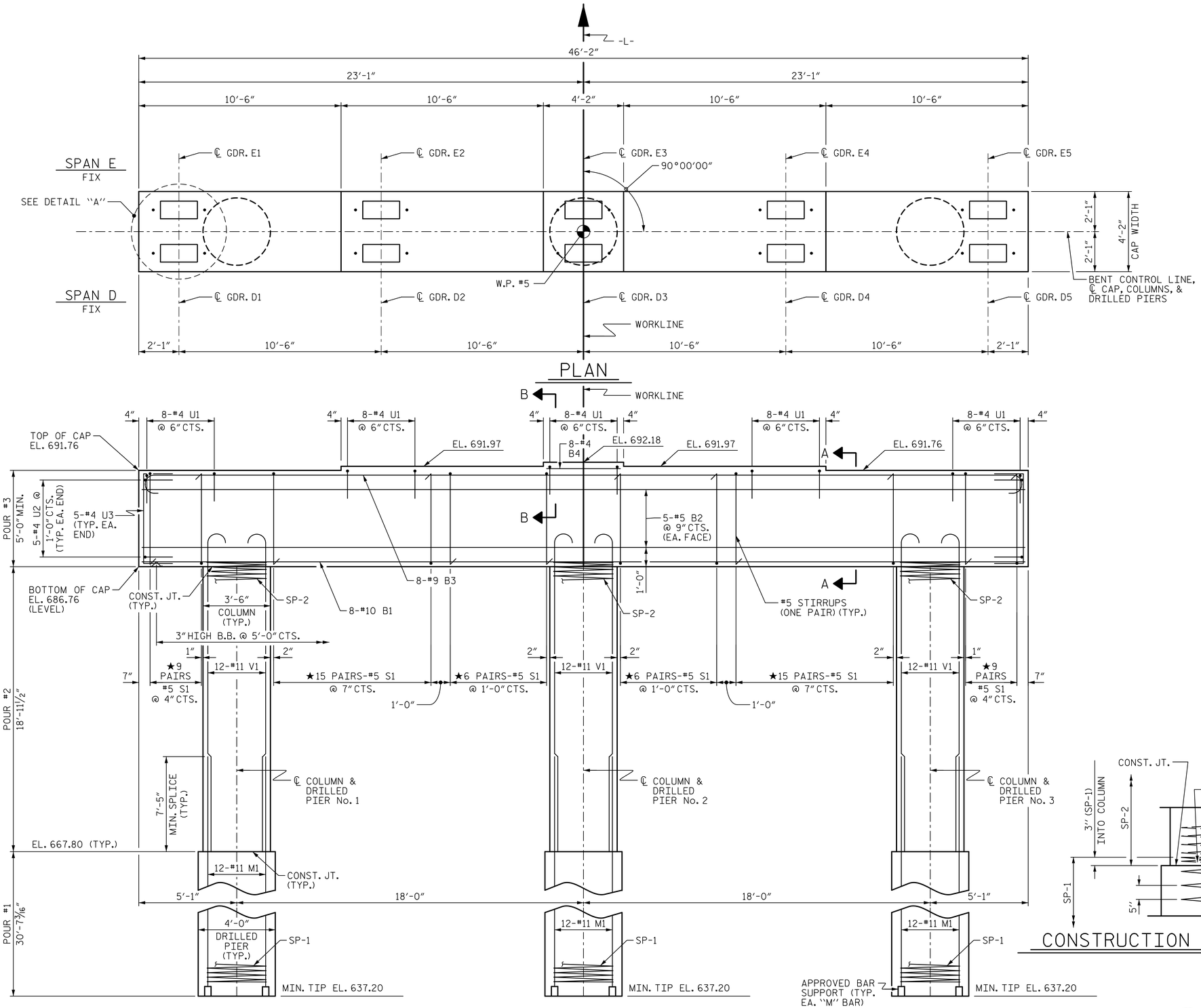
ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL."

STIRRUPS AND "U" BARS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

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 ONE FOOT BELOW THE GROUND LINE.

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

FOR SECTION A-A, B-B, AND REINFORCING BILL OF MATERIAL, SEE SHEET 2 OF 2.

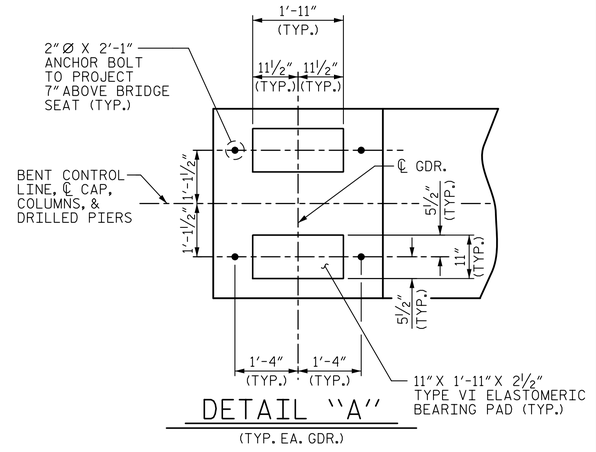



## PLAN



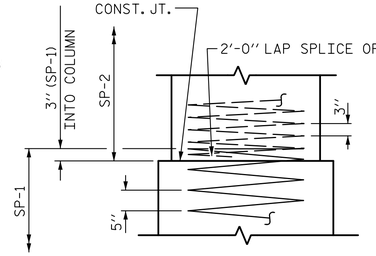

★ INVERT ALTERNATE STIRRUP PAIRS.

## ELEVATION




## DETAIL "A"

(TYP. EA. GDR.)




## CONSTRUCTION JOINT DETAIL

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 4

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-34 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEIHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

ICA Engineering
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

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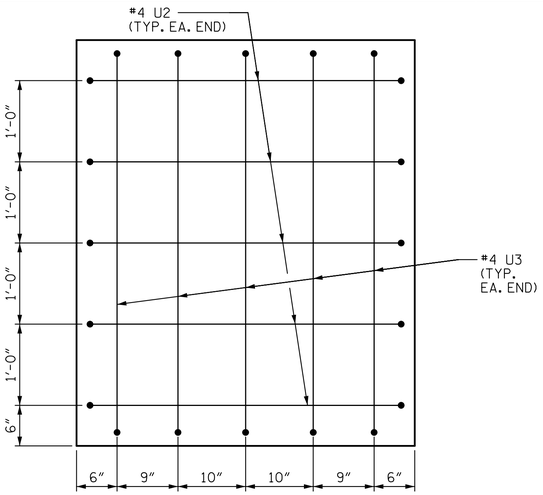
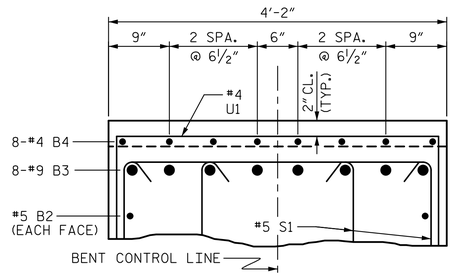
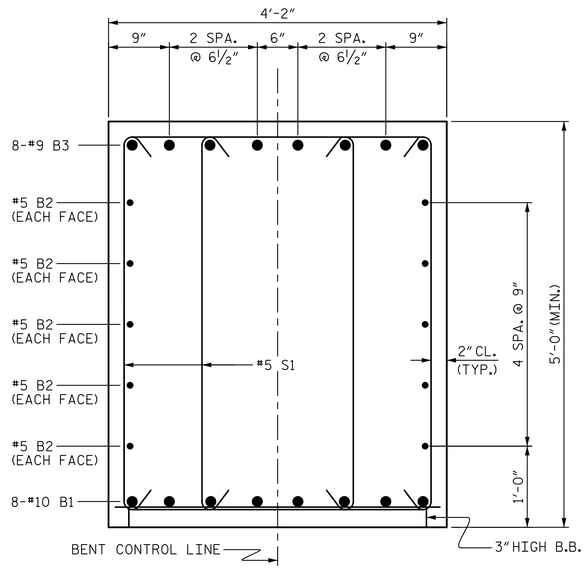


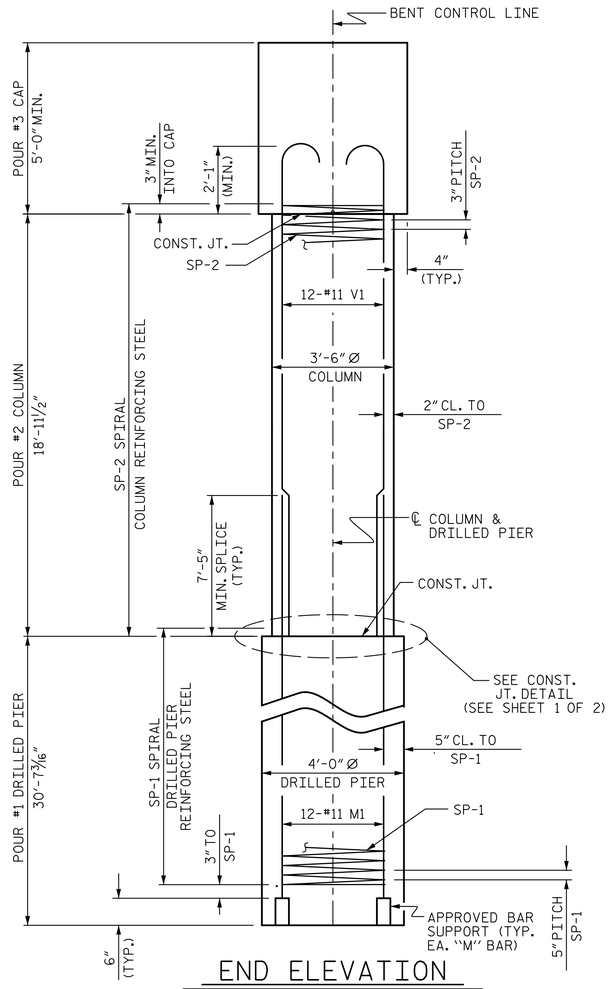

END OF CAP DETAIL (TYP.)



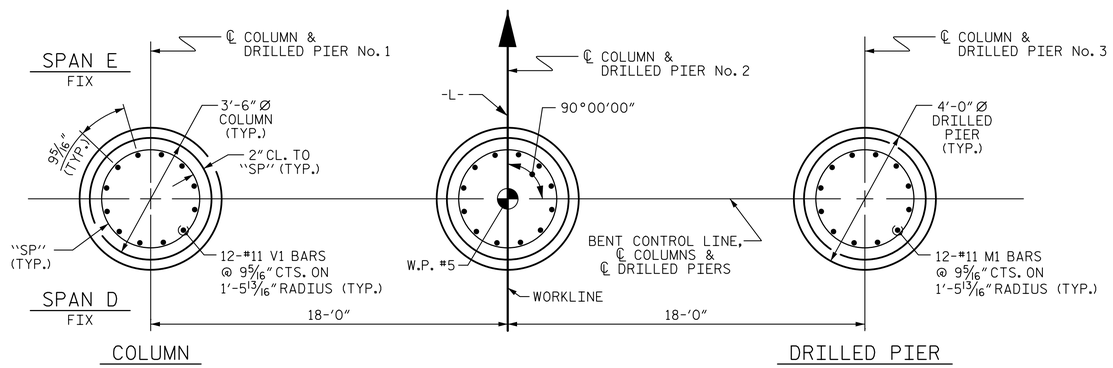

SECTION B-B




SECTION A-A



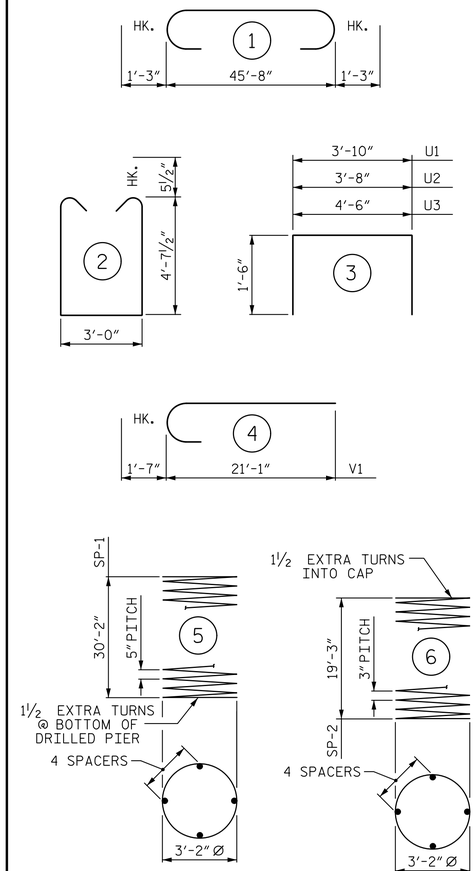

END ELEVATION




PLAN OF DRILLED PIERS & COLUMNS

(DETAILS ARE TYPICAL EACH DRILLED PIER & COLUMN)

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

## BILL OF MATERIAL

### BENT 4

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 8 | #10 | STR | 45'-10" | 1,578 |
| B2 | 10 | #5 | STR | 45'-10" | 478 |
| B3 | 8 | #9 | 1 | 48'-2" | 1,310 |
| B4 | 8 | #4 | STR | 3'-10" | 20 |
| | | | | | |
| M1 | 36 | #11 | STR | 40'-7" | 7,762 |
| | | | | | |
| S1 | 120 | #5 | 2 | 13'-2" | 1,648 |
| | | | | | |
| U1 | 40 | #4 | 3 | 6'-10" | 183 |
| U2 | 10 | #4 | 3 | 6'-8" | 45 |
| U3 | 10 | #4 | 3 | 7'-6" | 50 |
| | | | | | |
| V1 | 36 | #11 | 4 | 22'-8" | 4,335 |

REINFORCING STEEL 17,409 LBS.

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| SP-1 | 3 | ✳ | 5 | 724'-9" | 2,268 |
| SP-2 | 3 | ✳✳ | 6 | 771'-0" | 1,545 |

SPIRAL COLUMN REINFORCING STEEL 3,813 LBS.

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

✳✳THE SP-2 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR

CLASS A CONCRETE BREAKDOWN

| | |
|---|---|
| POUR #2 (COLUMNS) | 20.3 C.Y. |
| POUR #3 (CAP) | 36.6 C.Y. |
| TOTAL CLASS A CONCRETE | 56.9 C.Y. |

DRILLED PIERS:

DRILLED PIER CONCRETE
POUR #1 (DRILLED PIERS) 42.8 C.Y.

4'-0" Ø DRILLED PIERS NOT IN SOIL 36.00 LIN. FT.

4'-0" Ø DRILLED PIERS IN SOIL 55.80 LIN. FT.

CSL TUBES 385.2 LIN. FT.

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 4

| DRAWN BY : | D. H. CARTER | DATE : | MAY 2015 |
|---|---|---|---|
| CHECKED BY : | M. T. NEIHEISEL | DATE : | MAY 2015 |
| DESIGN ENGINEER OF RECORD: | T. E. TALLMAN | DATE : | MAY 2015 |

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5121 Kingston Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

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DocuSigned by: Thomas E. Tallman 7/7/2015
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| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-35 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

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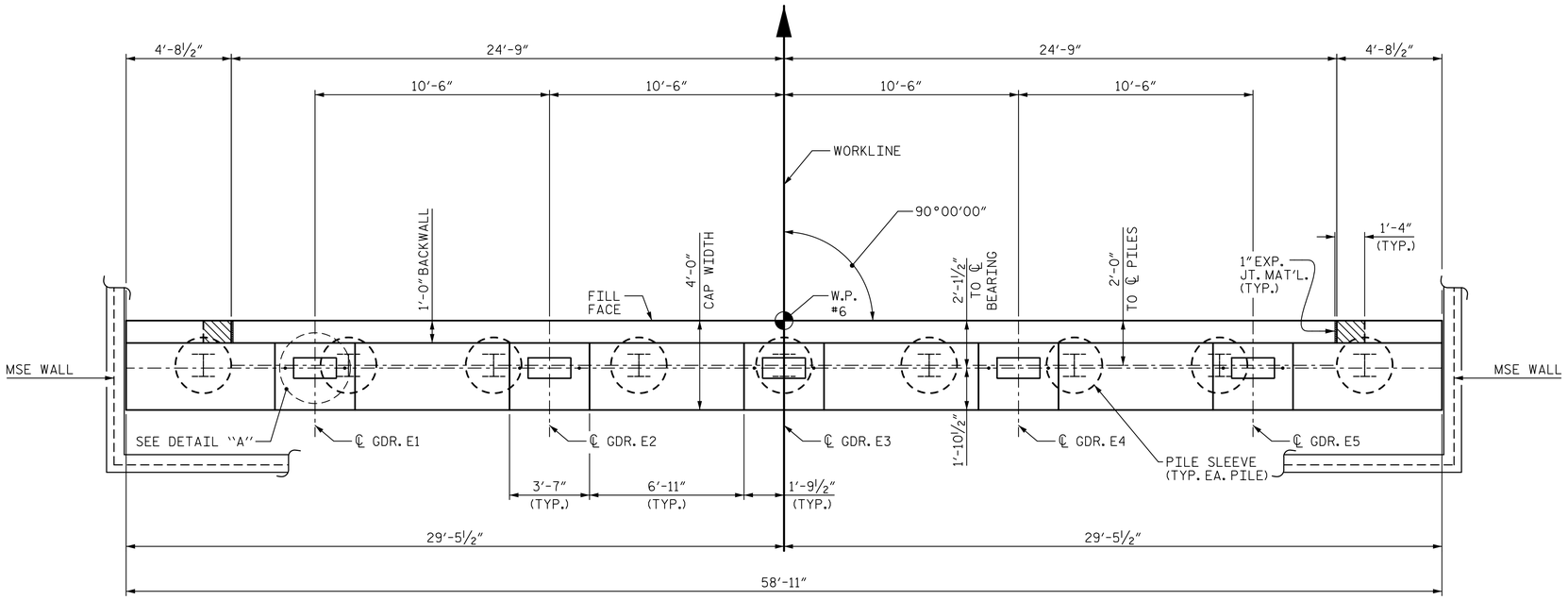
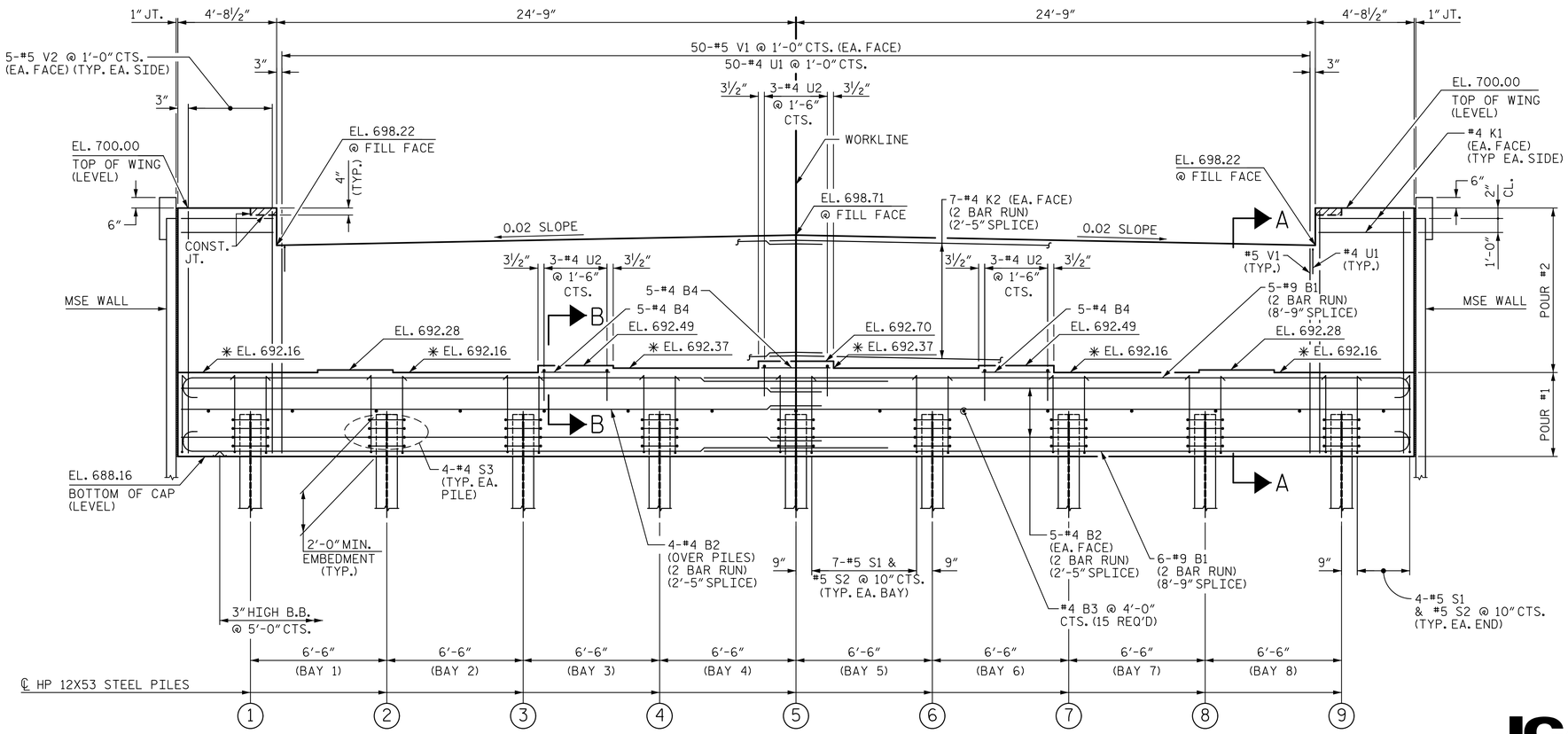



## PLAN




## ELEVATION

✳ SEE SHEET 2 OF 2 FOR LOCATION OF ELEVATIONS BETWEEN BRIDGE SEAT BUILD-UPS.

## NOTES

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

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND APPROACH SLAB HAS BEEN SAWED AND THE CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

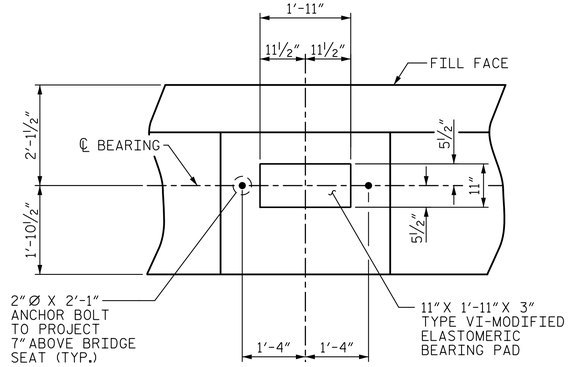
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

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

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

FOR PILE SLEEVE NOTES, SEE ″GENERAL DRAWING″ SHT. 2 OF 3.

FOR SECTIONS A-A AND B-B, SEE SHT. 2 OF 2.




## DETAIL ″A″

(TYP. EA. GDR.)

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-36 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEITHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

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NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

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5/28/2015
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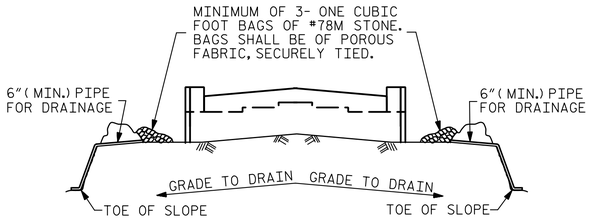
ICA Engineering

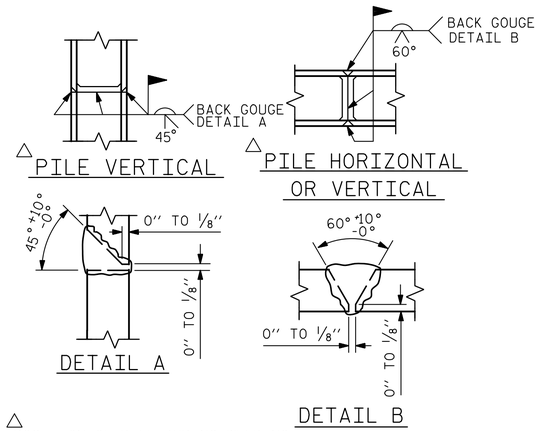



BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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

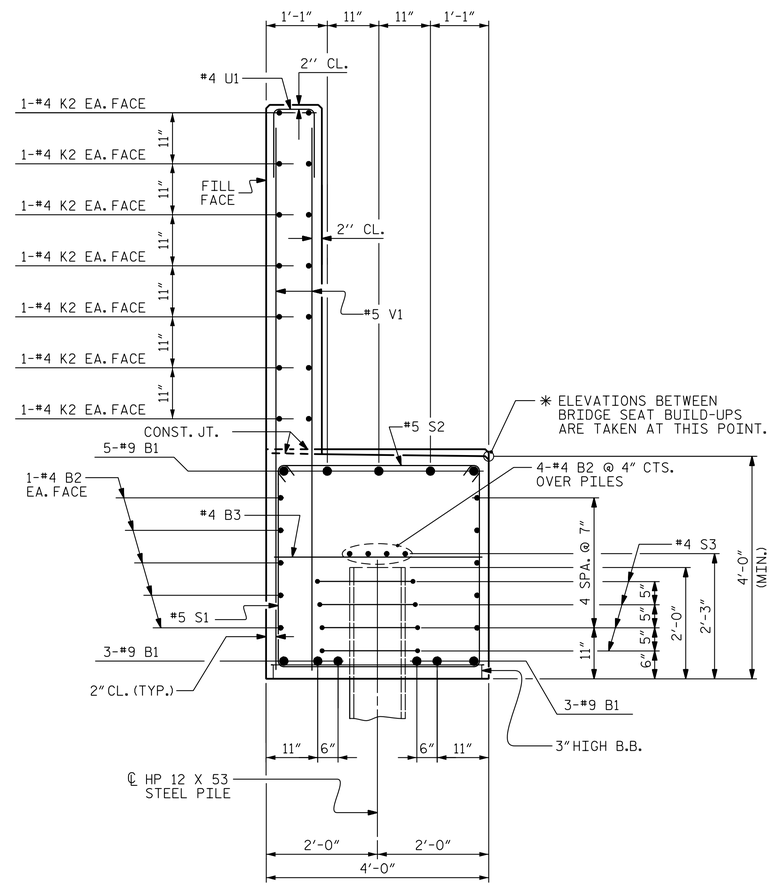
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

## TEMPORARY DRAINAGE AT END BENT

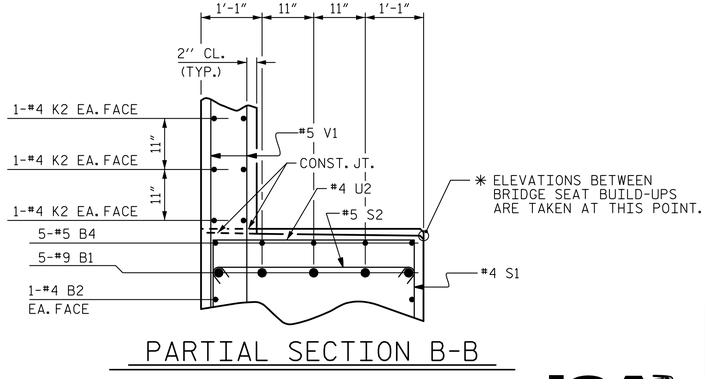



△ POSITION OF PILE DURING WELDING.

## PILE SPLICE DETAILS

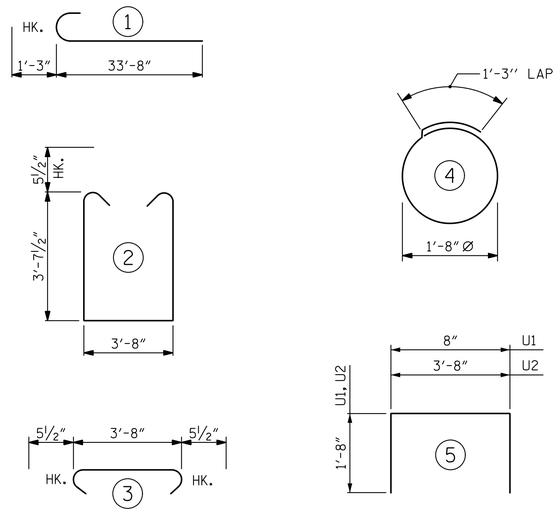



## SECTION A-A




## PARTIAL SECTION B-B

## BAR TYPES




ALL BAR DIMENSIONS ARE OUT TO OUT.

HP 12 X 53 STEEL PILES
NO: 9 LIN. FT.= 315

## BILL OF MATERIAL

### END BENT 2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| B1 | 22 | #9 | 1 | 34'-11" | 2,612 |
| B2 | 28 | #4 | STR | 30'-6" | 570 |
| B3 | 15 | #4 | STR | 3'-8" | 37 |
| B4 | 15 | #4 | STR | 3'-3" | 33 |
| | | | | | |
| K1 | 8 | #4 | STR | 4'-4" | 23 |
| K2 | 28 | #4 | STR | 30'-6" | 570 |
| | | | | | |
| S1 | 64 | #5 | 2 | 11'-10" | 790 |
| S2 | 64 | #5 | 3 | 4'-7" | 306 |
| S3 | 36 | #4 | 4 | 6'-6" | 156 |
| | | | | | |
| U1 | 50 | #4 | 5 | 4'-0" | 134 |
| U2 | 9 | #4 | 5 | 7'-0" | 42 |
| | | | | | |
| V1 | 100 | #5 | STR | 9'-8" | 1,008 |
| V2 | 20 | #5 | STR | 11'-6" | 240 |

REINFORCING STEEL 6,521 LBS.

CLASS A CONCRETE BREAKDOWN

POUR #1 CAP 36.1 C.Y.

POUR #2 BACKWALL 13.8 C.Y.

TOTAL CLASS A CONCRETE 49.9 C.Y.

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-37 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

DRAWN BY : D. H. CARTER DATE : MAY 2015
CHECKED BY : M. T. NEITHEISEL DATE : MAY 2015
DESIGN ENGINEER OF RECORD: T. E. TALLMAN DATE : MAY 2015

ICA Engineering
5121 Kingdom Way, Suite 100 Raleigh, NC 27607
NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
E9B7B9620EE2405...

5/28/2015
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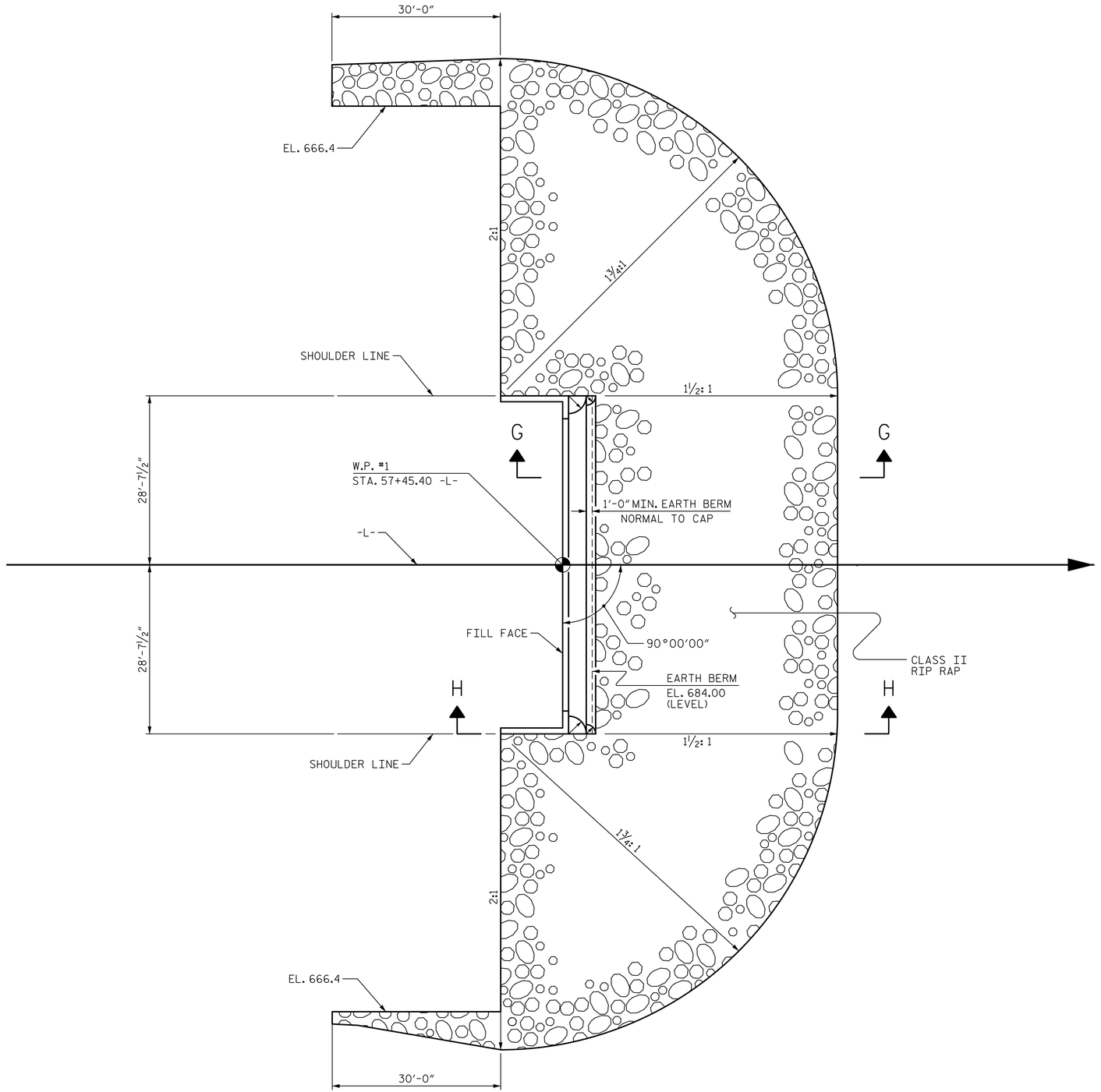
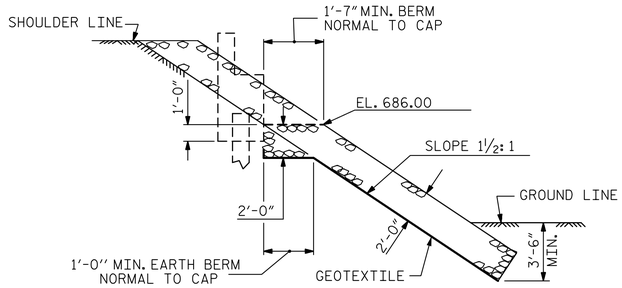
ICA Engineering

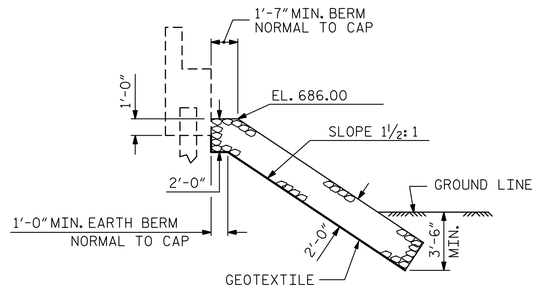



PLAN OF RIP RAP @ END BENT 1

| ESTIMATED QUANTITIES | | |
|---|---|---|
| BRIDGE @ STA. 61+79.40 -L- | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE |
| | TONS | SQUARE YARDS |
| END BENT 1 | 885 | 983 |




SECTION H-H




SECTION G-G
BERM RIP RAPPED

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# RIP RAP DETAILS

| ASSEMBLED BY : D. H. CARTER DATE : MAY 2015 | |
|---|---|
| CHECKED BY : M. T. NEITHEISEL DATE : MAY 2015 | |
| DRAWN BY : REK 1/84 | REV. 5/1/06R TLA/GM |
| CHECKED BY : RDU 1/84 | REV. 10/1/11 MAA/GM |
| | REV. 12/21/11 MAA/GM |

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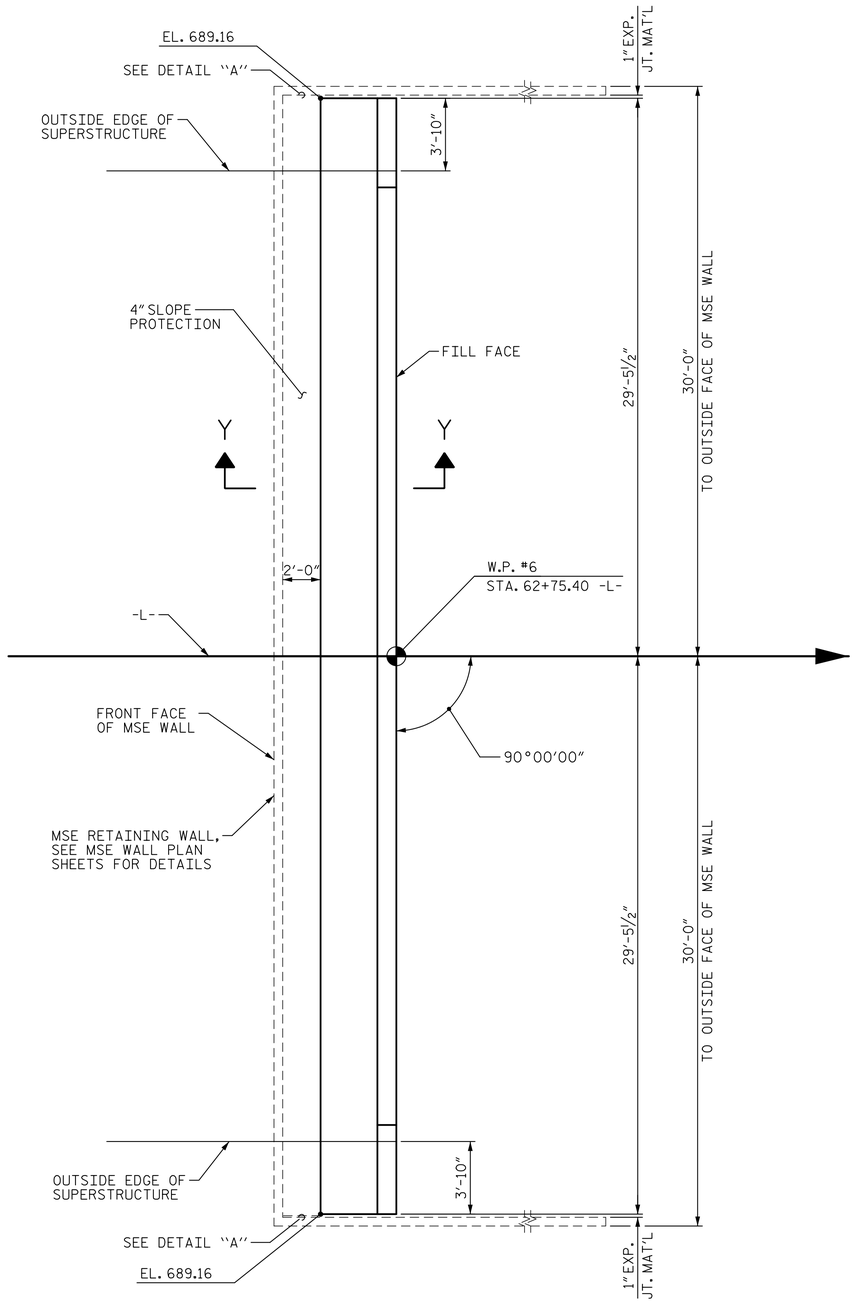
NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E TALLMAN
DocuSigned by: Thomas E. Tallman 7/7/2015
E9B789620EE24D5...

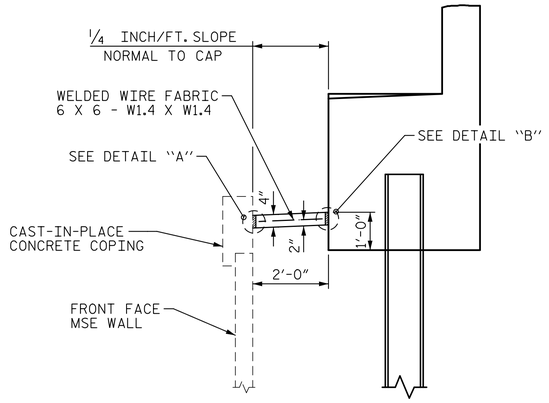
| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-38 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 41 |

5/28/2015 R:\Structures\Plans\s38_w-5516_sd_rr.dgn
ICA Engineering

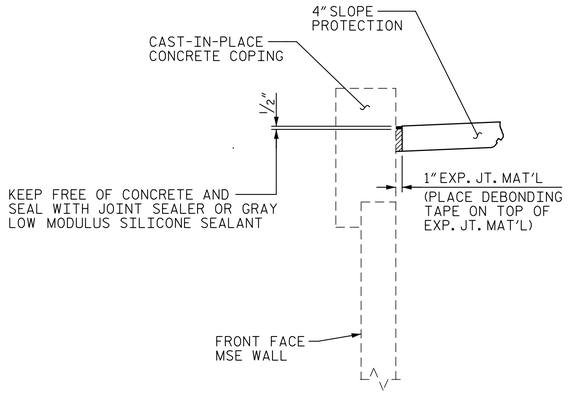
STD. NO. RR1 (Sht 2)



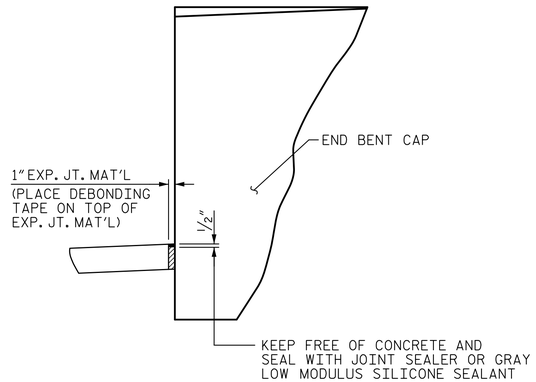

PLAN AT END BENT 2



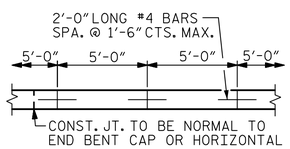

SECTION Y-Y



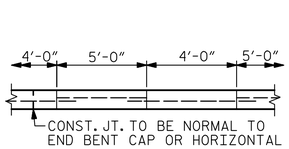

DETAIL "A"




DETAIL "B"




POURING DETAIL




POUR A 4'-0" STRIP FIRST.

OPTIONAL POURING DETAIL

## GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED AT END BENT #2 OF THE BRIDGE AS SHOWN IN THE DETAILS. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS.

## SLOPE PROTECTION

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.

| BRIDGE @ STA. 61+79.40 -L- | 4" INCH SLOPE PROTECTION | * WELDED WIRE FABRIC 60 INCHES WIDE |
|---|---|---|
| | SQUARE YARDS | APPROX. L.F. |
| END BENT 2 | 13 | 24 |

* QUANTITY SHOWN IS BASED ON 5' POURS.

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

# SLOPE PROTECTION DETAILS

| ASSEMBLED BY : D. H. CARTER | MAY 2015 |
|---|---|
| CHECKED BY : M. T. NEITHEISEL | DATE : MAY 2015 |

| DRAWN BY : ELR 5/92 | REV. 5/1/06 | TLA/GM |
|---|---|---|
| CHECKED BY : GRP 6/92 | REV. 10/1/11 | MAA/GM |
| | REV. 12/21/11 | MAA/GM |

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NC License No: F-0258

NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
E9078962OEE24D5...

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-39 |
| 1 | | | 3 | | | TOTAL SHEETS |
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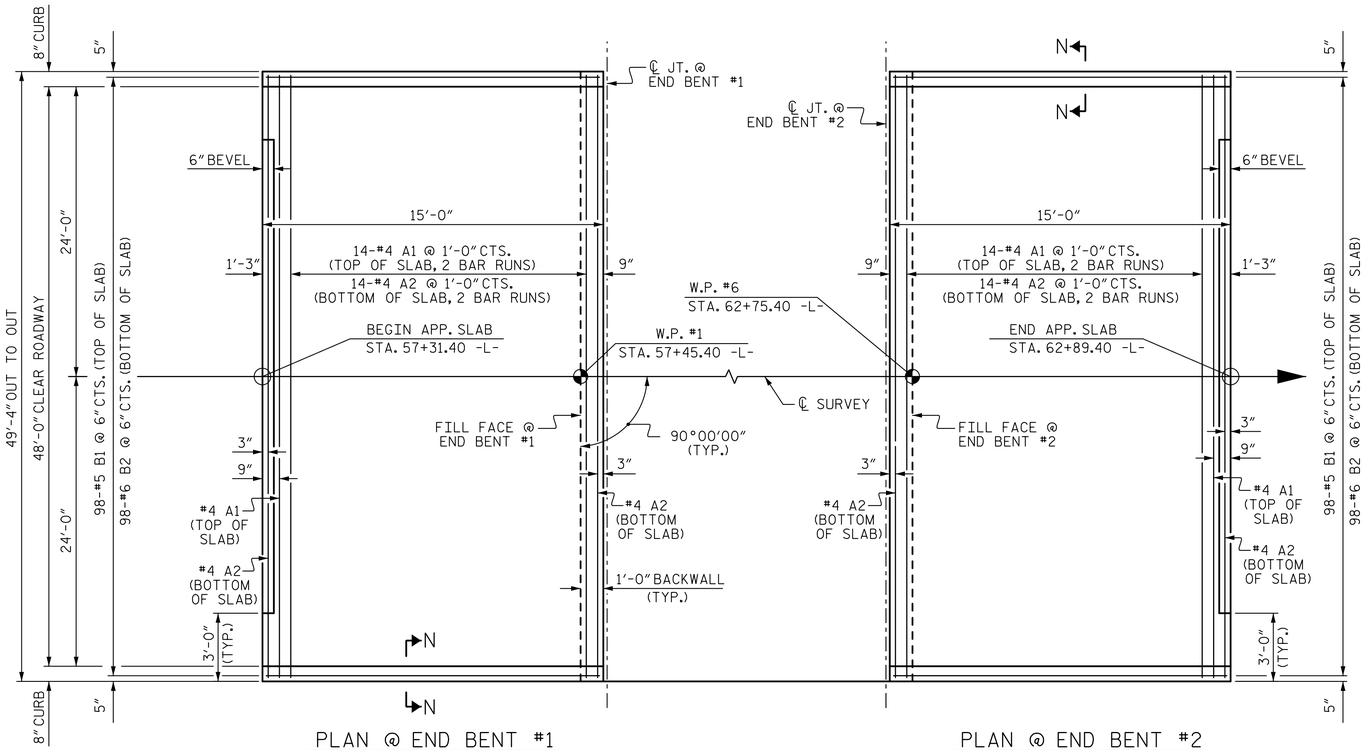
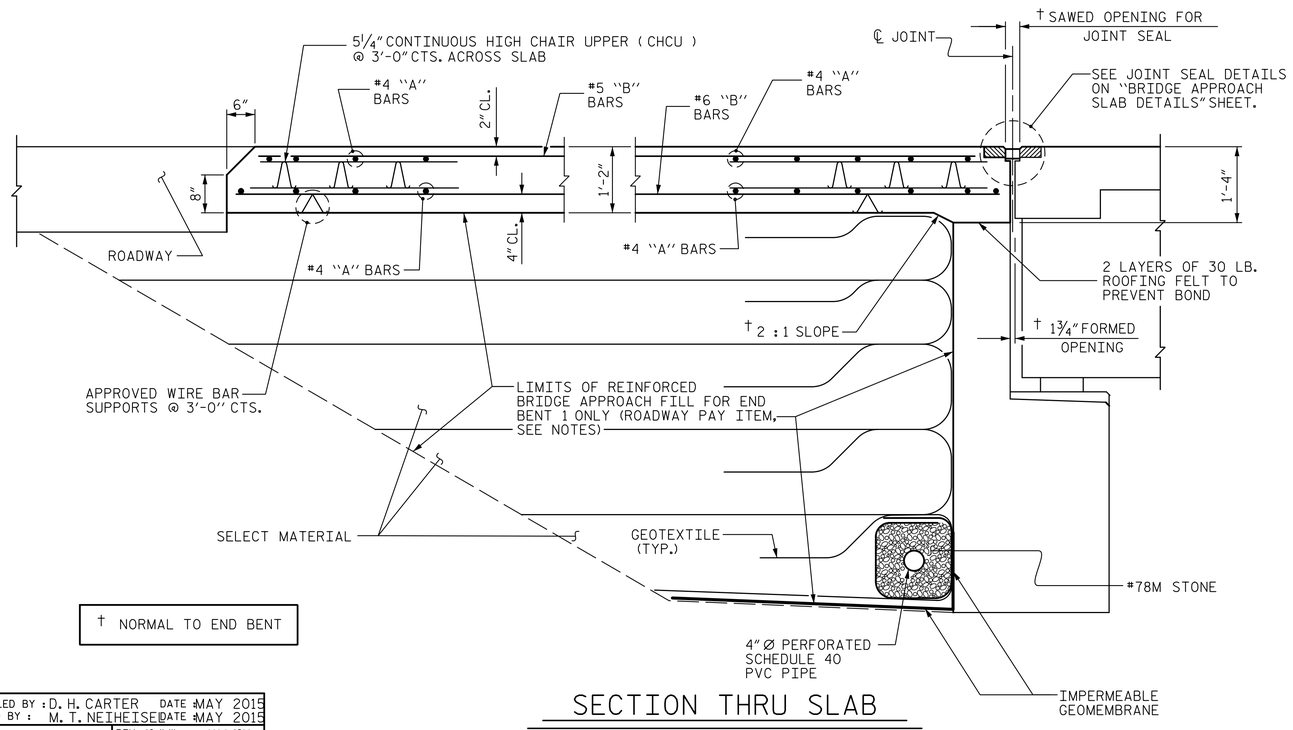
STD. NO. SP1

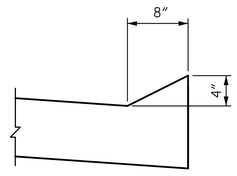



DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS




† NORMAL TO END BENT

SECTION THRU SLAB




SECTION N-N

CURB DETAILS

## NOTES

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

FOR REINFORCED BRIDGE APPROACH FILL AT END BENT 1 INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS. FOR BACKFILL AT END BENT 2, SEE MSE WALL 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 JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 3½".

FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

## BILL OF MATERIAL

FOR ONE APPROACH SLAB (2 REQ'D)

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|---|---|---|---|---|---|
| ✳ A1 | 30 | #4 | STR | 25'-6" | 511 |
| A2 | 32 | #4 | STR | 25'-5" | 543 |
| | | | | | |
| ✳ B1 | 98 | #5 | STR | 13'-8" | 1,397 |
| B2 | 98 | #6 | STR | 14'-8" | 2,159 |
| | | | | | |
| REINFORCING STEEL | | | | LBS. | 2,702 |
| ✳ EPOXY COATED REINFORCING STEEL | | | | LBS. | 1,908 |
| | | | | | |
| CLASS AA CONCRETE | | | | C. Y. | 32.2 |

## SPLICE LENGTHS

| BAR SIZE | EPOXY COATED | UNCOATED |
|---|---|---|
| #4 | 2'-0" | 1'-9" |
| #5 | 2'-6" | 2'-2" |
| #6 | 3'-10" | 2'-7" |

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR RIGID PAVEMENT

| ASSEMBLED BY : D. H. CARTER | DATE : MAY 2015 |
|---|---|
| CHECKED BY : M. T. NEITHEISER | DATE : MAY 2015 |
| DRAWN BY : EEM 3/95 | REV. 10/1/11 MAA/GM |
| CHECKED BY : VAP 3/95 | REV. 12/21/11 MAA/GM |
| | REV. 6/13 MAA/GM |

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NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
E9078962OEE24D5...

| REVISIONS | | | | | | SHEET NO. |
|---|---|---|---|---|---|---|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-40 |
| 1 | | | 3 | | | TOTAL SHEETS |
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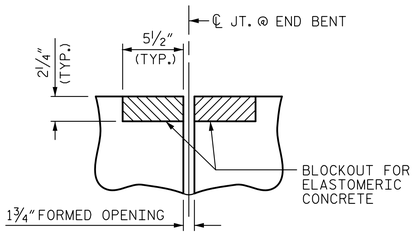
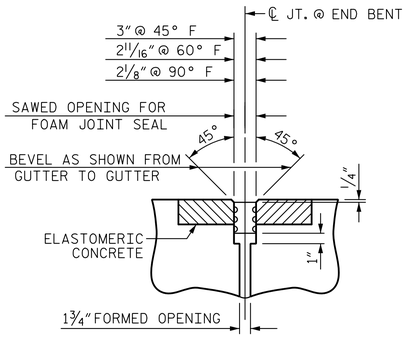
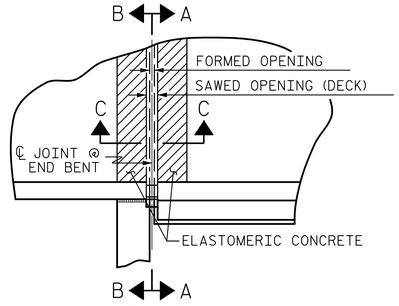
STD. NO. BAS2 (SHT 1)



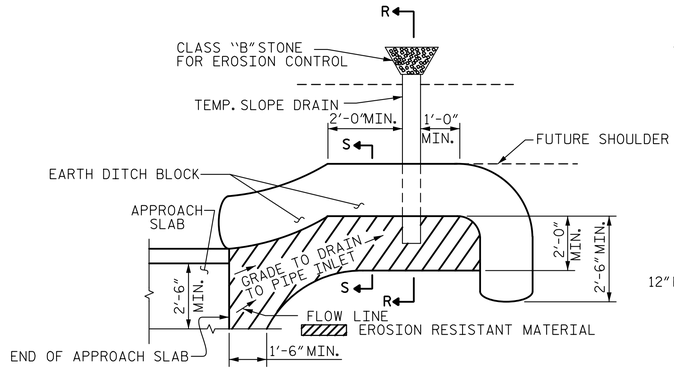

SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)




SECTION C-C
FOAM JOINT SEAL
( EXPANSION )

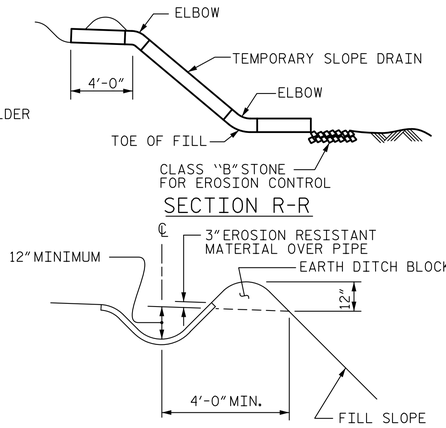



PLAN




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.

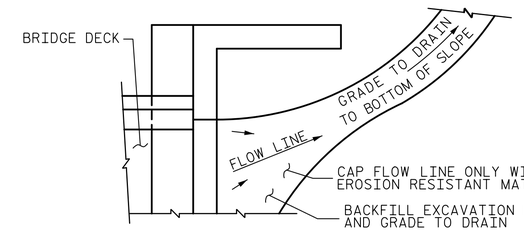
PLAN VIEW




SECTION S-S

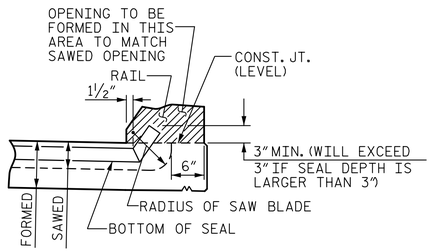
# TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

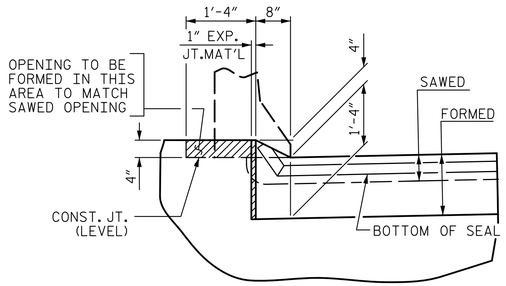



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL




SECTION A-A




SECTION B-B

# JOINT SEAL DETAILS @ END BENT

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

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL.

| ELASTOMERIC CONCRETE | |
|---|---|
| END BENT NO. | ELASTOMERIC CONCRETE * (CU. FT.) |
| 1 | 8.3 |
| 2 | 8.3 |
| TOTAL | 16.6 |

* BASED ON THE MINIMUM BLOCKOUT SHOWN.

PROJECT NO. W-5516

ROWAN COUNTY

STATION: 61+79.40 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH
SLAB DETAILS

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

| | | |
|---|---|---|
| ASSEMBLED BY : D. H. CARTER | DATE : MAY 2015 | |
| CHECKED BY : M. T. NEITHEISEL | DATE : MAY 2015 | |
| DRAWN BY : FCJ 11/88 | REV. 10/1/11 | MAA/GM |
| CHECKED BY : ARB 11/88 | REV. 7/12 | MAA/GM |
| | REV. 6/13 | MAA/GM |

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NORTH CAROLINA PROFESSIONAL SEAL 14408 ENGINEER THOMAS E. TALLMAN

DocuSigned by: Thomas E. Tallman 7/7/2015
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5/28/2015
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STD. NO. BAS4 (SHT 1)