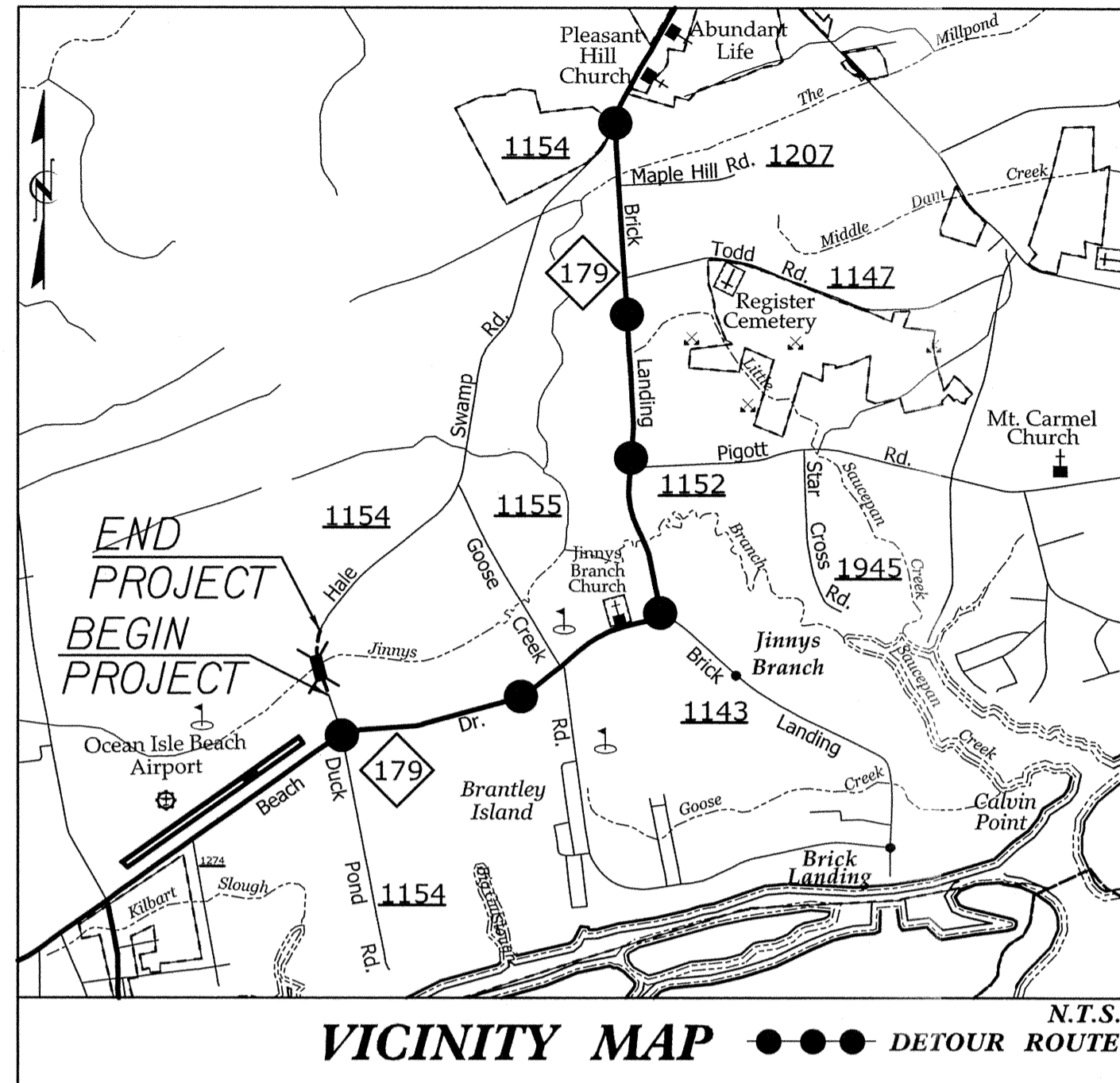


**TIP PROJECT: BD-5103R**

**CONTRACT:**

See Sheet 1-A For Index of Sheets

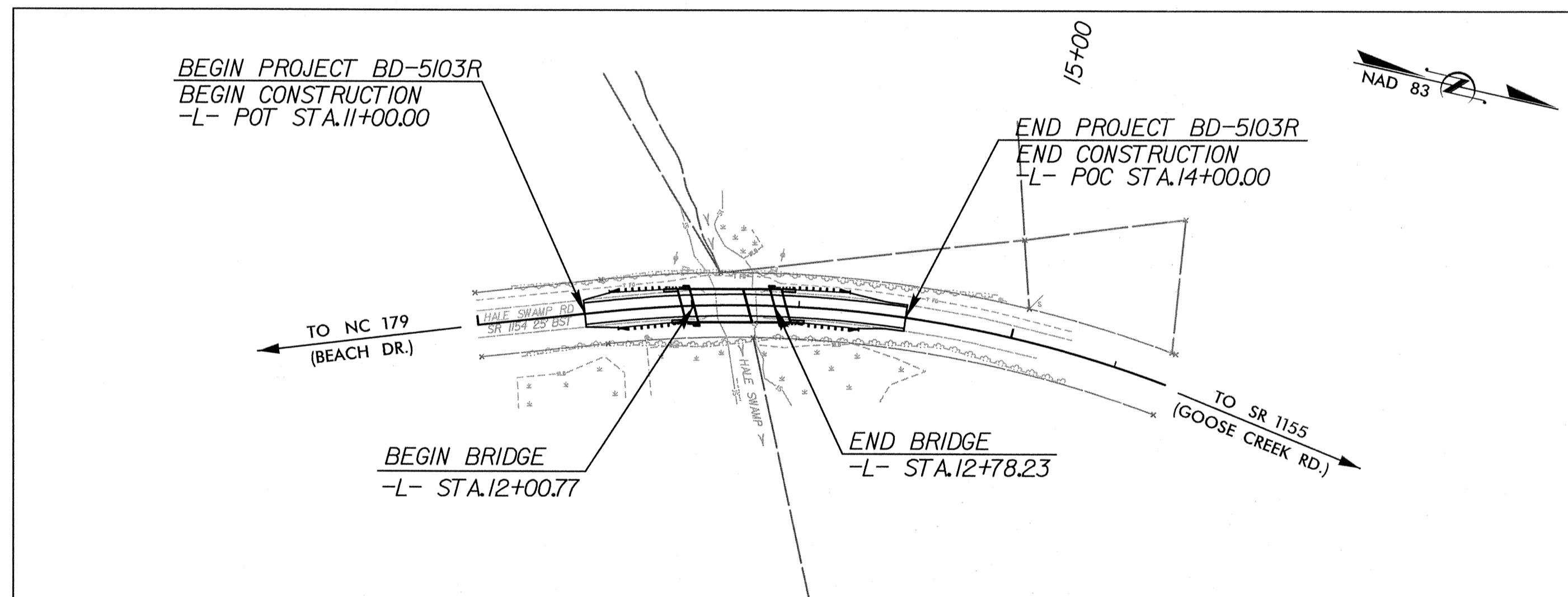


STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**BRUNSWICK COUNTY**

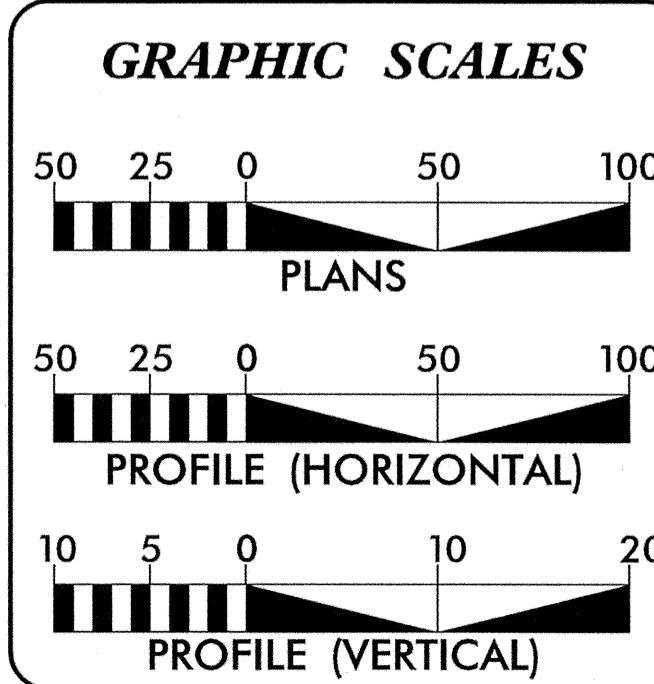
**LOCATION: BRIDGE NO. 064 OVER HALE SWAMP  
ON SR 1154 (HALE SWAMP RD.)**

**TYPE OF WORK: LOW IMPACT BRIDGE REPLACEMENT**

| STATE           | PROJECT REFERENCE NO. | SHEET NO.       | TOTAL SHEETS |
|-----------------|-----------------------|-----------------|--------------|
| NC              | BD-5103R              | 1               | X            |
| STATE PROJ. NO. | F.A. PROJ. NO.        | DESCRIPTION     |              |
| 45349.3.18      | BRZ-1154(5)           | LIB REPLACEMENT |              |
|                 |                       |                 |              |
|                 |                       |                 |              |
|                 |                       |                 |              |
|                 |                       |                 |              |



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.



**DESIGN DATA**

|                   |
|-------------------|
| ADT 2007 = 2400   |
| ADT 2035 = 4800   |
| DHV = 10%         |
| D = 60%           |
| T = 6% *          |
| V = 45 MPH        |
| * TTST 2% DUAL 4% |

**PROJECT LENGTH**

|  |          |
|--|----------|
| LENGTH OF ROADWAY TIP PROJECT BD-5103R =   | 0.05 MI. |
| LENGTH OF STRUCTURE TIP PROJECT BD-5103R = | 0.01 MI. |
| TOTAL LENGTH OF TIP PROJECT BD-5103R =     | 0.06 MI. |

Prepared in the Office of:

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

2012 STANDARD SPECIFICATIONS

**RIGHT OF WAY DATE:**  
APRIL 27, 2012

**LETTING DATE:**  
AUGUST 16, 2012

**ENRICO A. ROQUE, P.E.**  
PROJECT ENGINEER

**ANTHONY THOMPSON, P.E.**  
PROJECT DESIGNER

**AMANDA GLYNN, P.E.**  
NCDOT CONTACT

**HYDRAULICS ENGINEER**

**ROADWAY DESIGN ENGINEER**

James A. Byrd, P.E. 7-16-12

Seal: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 15764

Seal: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19824

**DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA**

STATE HIGHWAY DESIGN ENGINEER

7/13/2012 10:04:04 AM ...\\p-r-j\BD5103R\_Ldy\_1.sh.dgn

















**Note: Not to Scale**

\*S.U.E. = *Subsurface Utility Engineering*












STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# CONVENTIONAL PLAN SHEET SYMBOLS

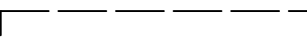









**BOUNDARIES AND PROPERTY:**

|                                     |   |
|-------------------------------------|---|
| State Line                          | _____   |
| County Line                         | _____   |
| Township Line                       | _____   |
| City Line                           | _____   |
| Reservation Line                    | _____   |
| Property Line                       | _____   |
| Existing Iron Pin                   | _____    |
| Property Corner                     | _____   |
| Property Monument                   | _____    |
| Parcel/Sequence Number              | _____    |
| Existing Fence Line                 | _____   |
| Proposed Woven Wire Fence           | _____    |
| Proposed Chain Link Fence           | _____    |
| Proposed Barbed Wire Fence          | _____    |
| Existing Wetland Boundary           | _____    |
| Proposed Wetland Boundary           | _____    |
| Existing Endangered Animal Boundary | _____  |
| Existing Endangered Plant Boundary  | _____  |

**BUILDINGS AND OTHER CULTURE:**

|                               |   |
|-------------------------------|---|
| Gas Pump Vent or U/G Tank Cap | _____  |
| Sign                          | _____  |
| Well                          | _____  |
| Small Mine                    | _____  |
| Foundation                    | _____  |
| Area Outline                  | _____  |
| Cemetery                      | _____  |
| Building                      | _____  |
| School                        | _____  |
| Church                        | _____  |
| Dam                           | _____  |














**HYDROLOGY:**

|                                    |  |
|------------------------------------|--|
| Stream or Body of Water            | _____  |
| Hydro, Pool or Reservoir           | _____  |
| Jurisdictional Stream              | _____   |
| Buffer Zone 1                      | _____   |
| Buffer Zone 2                      | _____   |
| Flow Arrow                         | _____   |
| Disappearing Stream                | _____   |
| Spring                             | _____   |
| Wetland                            | _____   |
| Proposed Lateral, Tail, Head Ditch | _____  |
| False Sump                         | _____   |

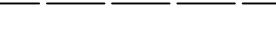






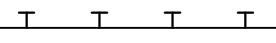
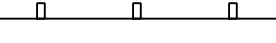
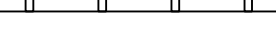



**RAILROADS:**

|                    |   |
|--------------------|---|
| Standard Gauge     | _____  |
| RR Signal Milepost | _____  |
| Switch             | _____  |
| RR Abandoned       | _____  |
| RR Dismantled      | _____  |

**RIGHT OF WAY:**

|  |   |
|--|---|
| Baseline Control Point                                     | _____    |
| Existing Right of Way Marker                               | _____    |
| Existing Right of Way Line                                 | _____    |
| Proposed Right of Way Line                                 | _____    |
| Proposed Right of Way Line with Iron Pin and Cap Marker    | _____    |
| Proposed Right of Way Line with Concrete or Granite Marker | _____    |
| Existing Control of Access                                 | _____    |
| Proposed Control of Access                                 | _____    |
| Existing Easement Line                                     | _____    |
| Proposed Temporary Construction Easement                   | _____   |
| Proposed Temporary Drainage Easement                       | _____  |
| Proposed Permanent Drainage Easement                       | _____  |
| Proposed Permanent Utility Easement                        | _____  |

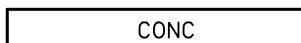
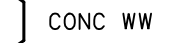

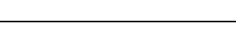
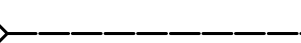
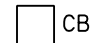
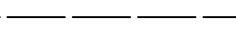

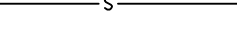
**ROADS AND RELATED FEATURES:**

|                                      |   |
|--------------------------------------|---|
| Existing Edge of Pavement            | _____  |
| Existing Curb                        | _____  |
| Proposed Slope Stakes Cut            | _____  |
| Proposed Slope Stakes Fill           | _____  |
| Proposed Wheel Chair Ramp            | _____  |
| Proposed Wheel Chair Ramp Curb Cut   | _____  |
| Curb Cut for Future Wheel Chair Ramp | _____  |
| Existing Metal Guardrail             | _____  |
| Proposed Guardrail                   | _____  |
| Existing Cable Guiderail             | _____  |
| Proposed Cable Guiderail             | _____  |
| Equality Symbol                      | _____  |
| Pavement Removal                     | _____  |












**VEGETATION:**

|              |   |
|--------------|---|
| Single Tree  | _____  |
| Single Shrub | _____  |
| Hedge        | _____  |
| Woods Line   | _____  |
| Orchard      | _____  |
| Vineyard     | _____  |








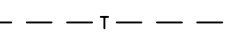
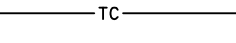
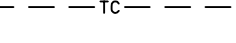
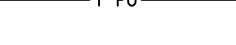


**EXISTING STRUCTURES:**

|  |   |
|--|---|
| MAJOR:                                   |   |
| Bridge, Tunnel or Box Culvert            | _____  |
| Bridge Wing Wall, Head Wall and End Wall | _____  |
| MINOR:                                   |   |
| Head and End Wall                        | _____  |
| Pipe Culvert                             | _____  |
| Footbridge                               | _____  |
| Drainage Box: Catch Basin, DI or JB      | _____  |
| Paved Ditch Gutter                       | _____  |
| Storm Sewer Manhole                      | _____  |
| Storm Sewer                              | _____  |








**UTILITIES:**

|                                     |   |
|-------------------------------------|---|
| POWER:                              |   |
| Existing Power Pole                 | _____   |
| Proposed Power Pole                 | _____  |
| Existing Joint Use Pole             | _____  |
| Proposed Joint Use Pole             | _____  |
| Power Manhole                       | _____  |
| Power Line Tower                    | _____  |
| Power Transformer                   | _____  |
| U/G Power Cable Hand Hole           | _____  |
| H-Frame Pole                        | _____  |
| Recorded U/G Power Line             | _____  |
| Designated U/G Power Line (S.U.E.*) | _____  |









**TELEPHONE:**

|   |   |
|---|---|
| Existing Telephone Pole                     | _____  |
| Proposed Telephone Pole                     | _____  |
| Telephone Manhole                           | _____  |
| Telephone Booth                             | _____  |
| Telephone Pedestal                          | _____  |
| Telephone Cell Tower                        | _____  |
| U/G Telephone Cable Hand Hole               | _____  |
| Recorded U/G Telephone Cable                | _____  |
| Designated U/G Telephone Cable (S.U.E.*)    | _____  |
| Recorded U/G Telephone Conduit              | _____  |
| Designated U/G Telephone Conduit (S.U.E.*)  | _____  |
| Recorded U/G Fiber Optics Cable             | _____  |
| Designated U/G Fiber Optics Cable (S.U.E.*) | _____  |






**WATER:**

|                                     |   |
|-------------------------------------|---|
| Water Manhole                       | _____  |
| Water Meter                         | _____  |
| Water Valve                         | _____  |
| Water Hydrant                       | _____  |
| Recorded U/G Water Line             | _____  |
| Designated U/G Water Line (S.U.E.*) | _____  |
| Above Ground Water Line             | _____  |







**TV:**

|  |   |
|--|---|
| TV Satellite Dish                          | _____  |
| TV Pedestal                                | _____  |
| TV Tower                                   | _____  |
| U/G TV Cable Hand Hole                     | _____  |
| Recorded U/G TV Cable                      | _____  |
| Designated U/G TV Cable (S.U.E.*)          | _____  |
| Recorded U/G Fiber Optic Cable             | _____  |
| Designated U/G Fiber Optic Cable (S.U.E.*) | _____  |











**GAS:**

|                                   |   |
|-----------------------------------|---|
| Gas Valve                         | _____  |
| Gas Meter                         | _____  |
| Recorded U/G Gas Line             | _____  |
| Designated U/G Gas Line (S.U.E.*) | _____  |
| Above Ground Gas Line             | _____  |

**SANITARY SEWER:**

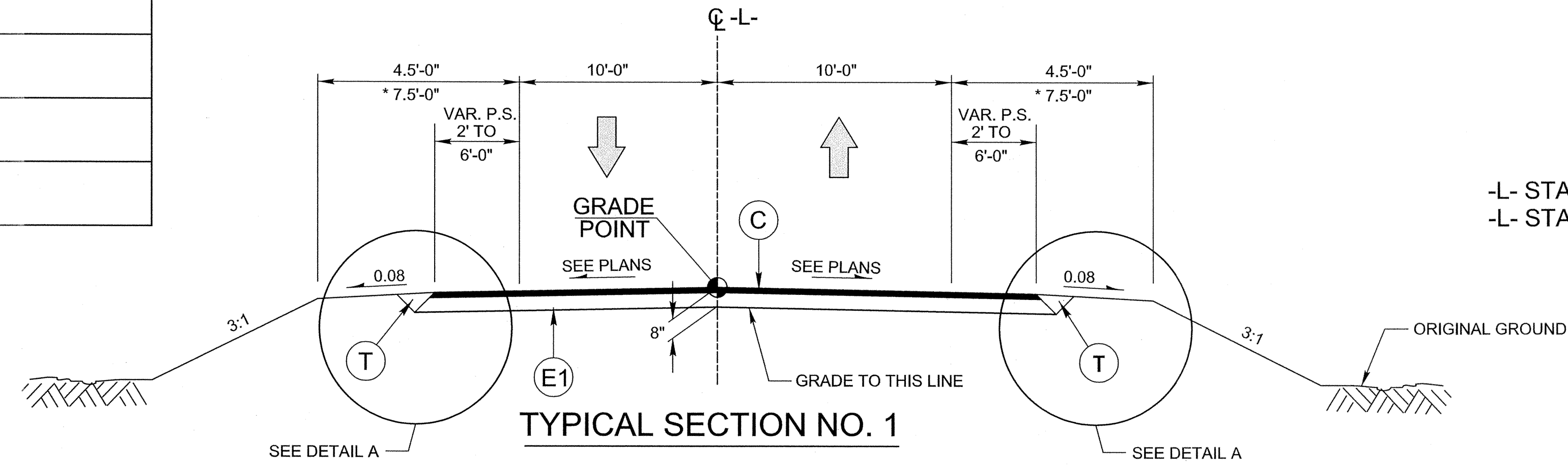
|  |   |
|--|---|
| Sanitary Sewer Manhole                   | _____  |
| Sanitary Sewer Cleanout                  | _____  |
| U/G Sanitary Sewer Line                  | _____  |
| Above Ground Sanitary Sewer              | _____  |
| Recorded SS Forced Main Line             | _____  |
| Designated SS Forced Main Line (S.U.E.*) | _____  |

**MISCELLANEOUS:**

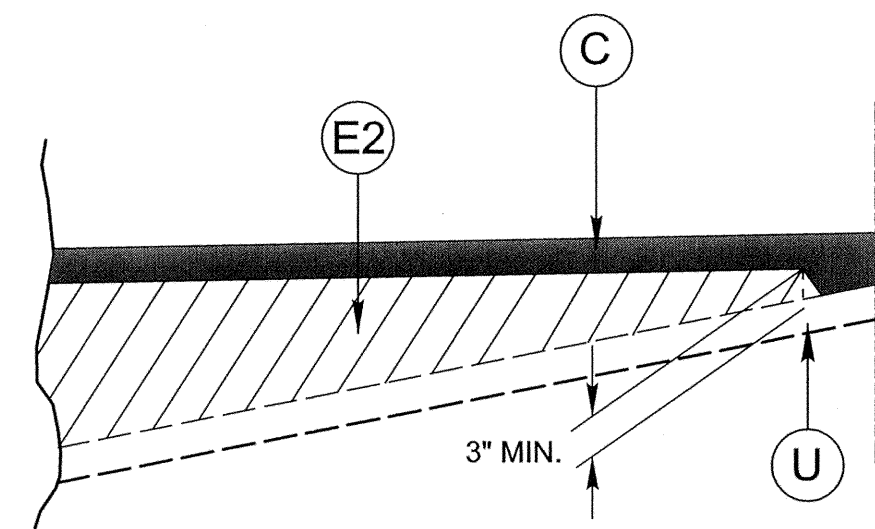
|  |   |
|--|---|
| Utility Pole                           | _____  |
| Utility Pole with Base                 | _____  |
| Utility Located Object                 | _____  |
| Utility Traffic Signal Box             | _____  |
| Utility Unknown U/G Line               | _____  |
| U/G Tank; Water, Gas, Oil              | _____  |
| A/G Tank; Water, Gas, Oil              | _____  |
| U/G Test Hole (S.U.E.*)                | _____  |
| Abandoned According to Utility Records | _____  |
| End of Information                     | _____  |

| PAVEMENT SCHEDULE |  |
|-------------------|--|
| C                 | PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YARD IN EACH OF TWO LAYERS.  |
| E1                | PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YARD.   |
| E2                | PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B AT AN AVERAGE RATE OF 114 LBS. PER SQ. YARD PER INCH. DEPTH TO BE PLACED IN LAYERS NOT GREATER THAN 5.5" IN DEPTH OR LESS THAN 3" IN DEPTH. |
| R                 | SHOULDER BERM GUTTER   |
| T                 | EARTH MATERIAL   |
| U                 | EXISTING PAVEMENT  |
| W                 | WEDGING (SEE DETAIL)   |

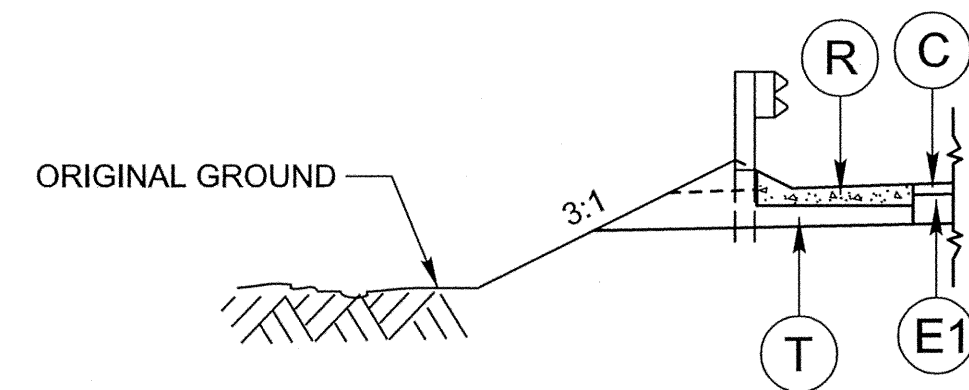
ALL PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



USE TYPICAL SECTION NO. 1 FROM:  
 -L- STA. 11+00.00 TO -L- STA. 12+00.77 (BEGIN BRIDGE)  
 -L- STA. 12+78.23 (END BRIDGE) TO -L- STA. 14+00.00



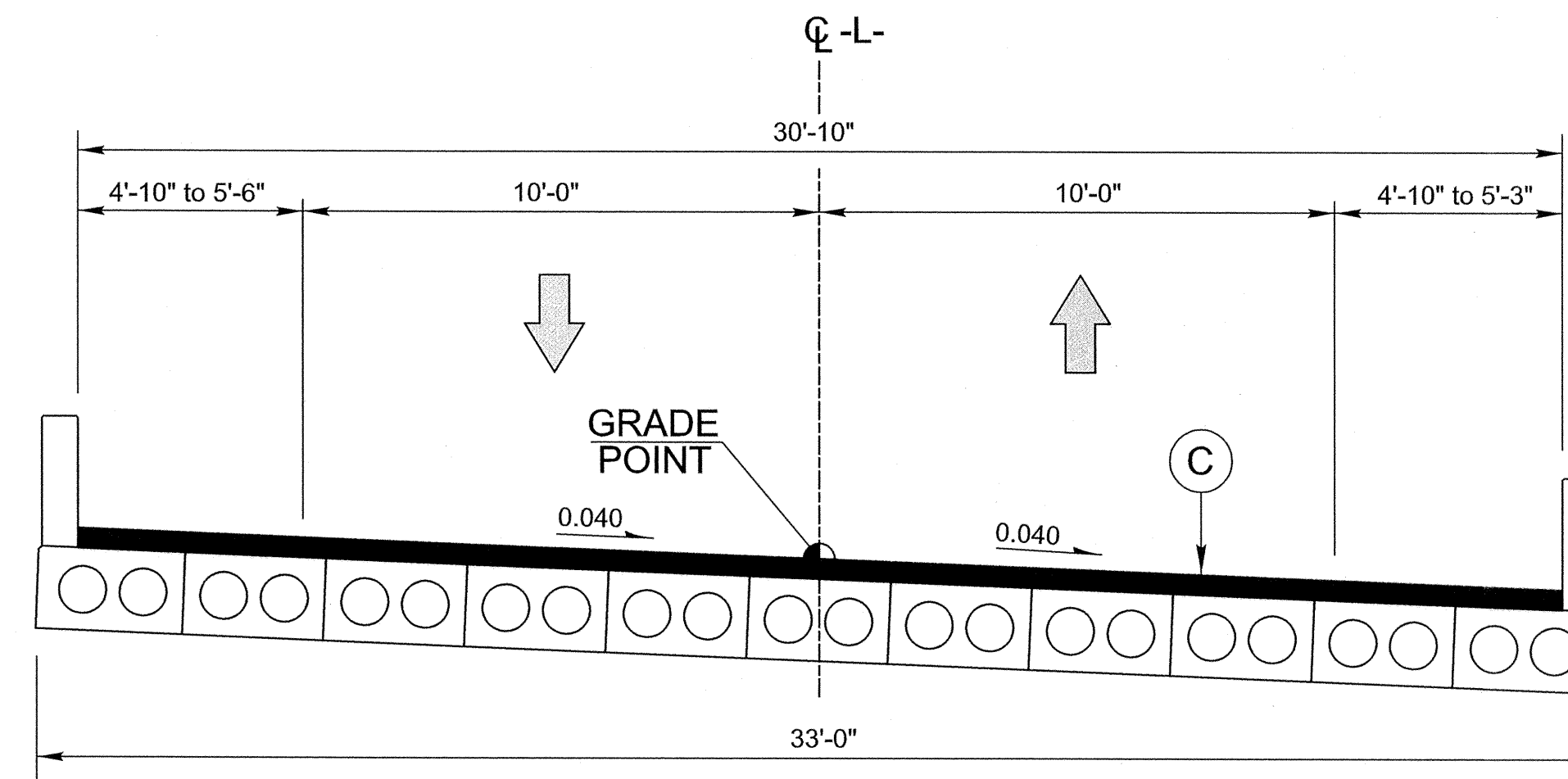
**DETAIL SHOWING METHOD OF WEDGING**  
 SEE TYPICAL SECTIONS



**DETAIL A**

**SHOULDER BERM GUTTER LOCATIONS**

- L- STA. 11+73.7 TO -L- STA. 11+86.0 LT
- L- STA. 12+85.1 TO -L- STA. 12+97.4 LT
- L- STA. 11+79.7 TO -L- STA. 11+92.4 RT
- L- STA. 12+93.9 TO -L- STA. 13+06.6 RT



USE TYPICAL SECTION NO. 2 FROM:  
 -L- STA. 12+00.77 (BEGIN BRIDGE) TO -L- STA. 12+78.23 (END BRIDGE)

**TYPICAL SECTION NO. 2**  
 CORED SLAB BRIDGE OVERLAY

NOTES: \* SHOULDER WIDTH INCREASED 3' WITH THE USE OF GUARDRAIL

REVISIONS





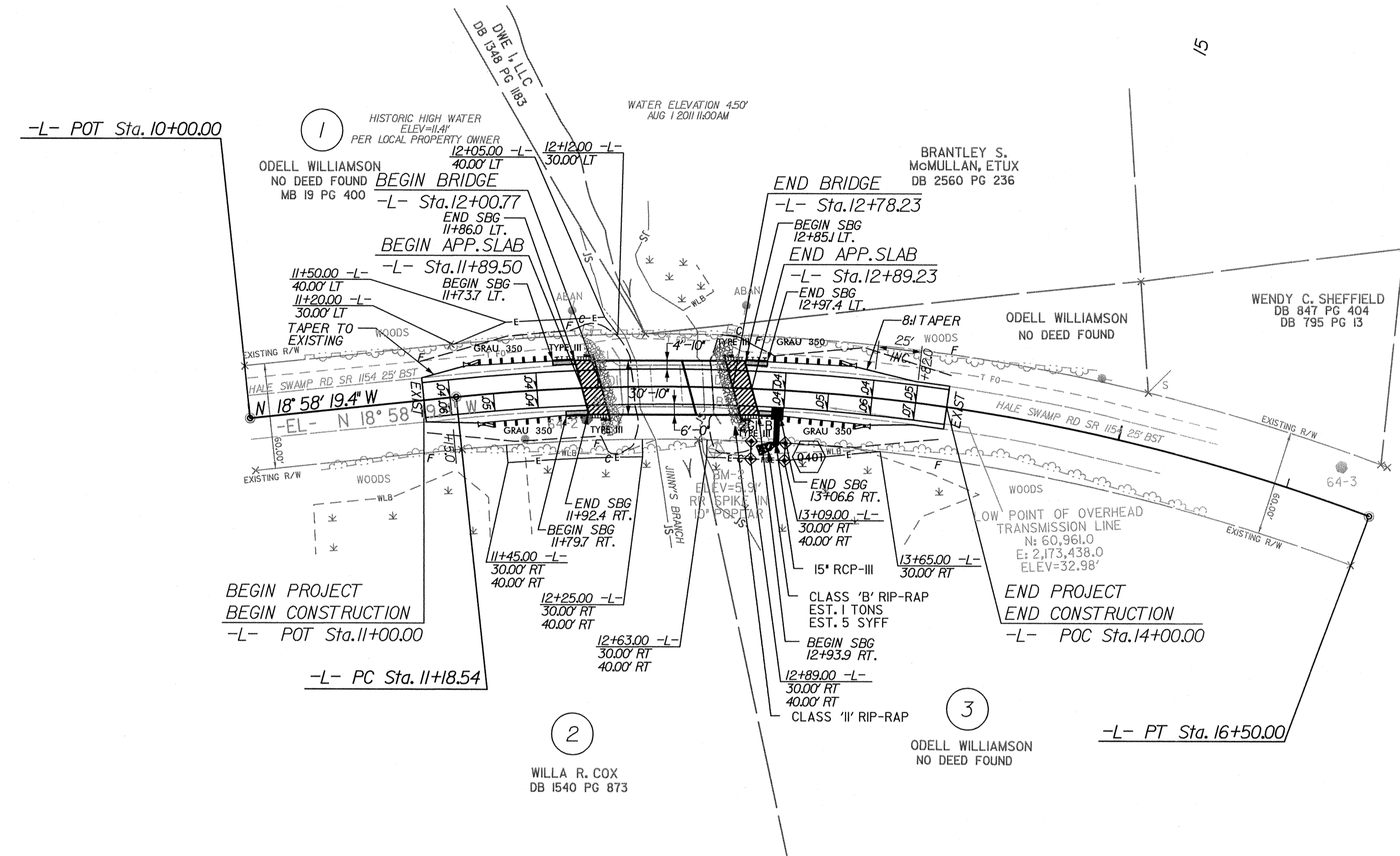
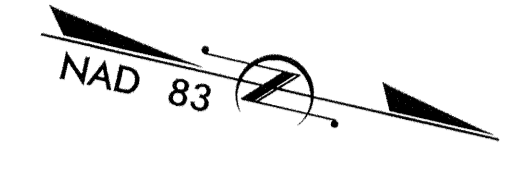


# PLAN

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

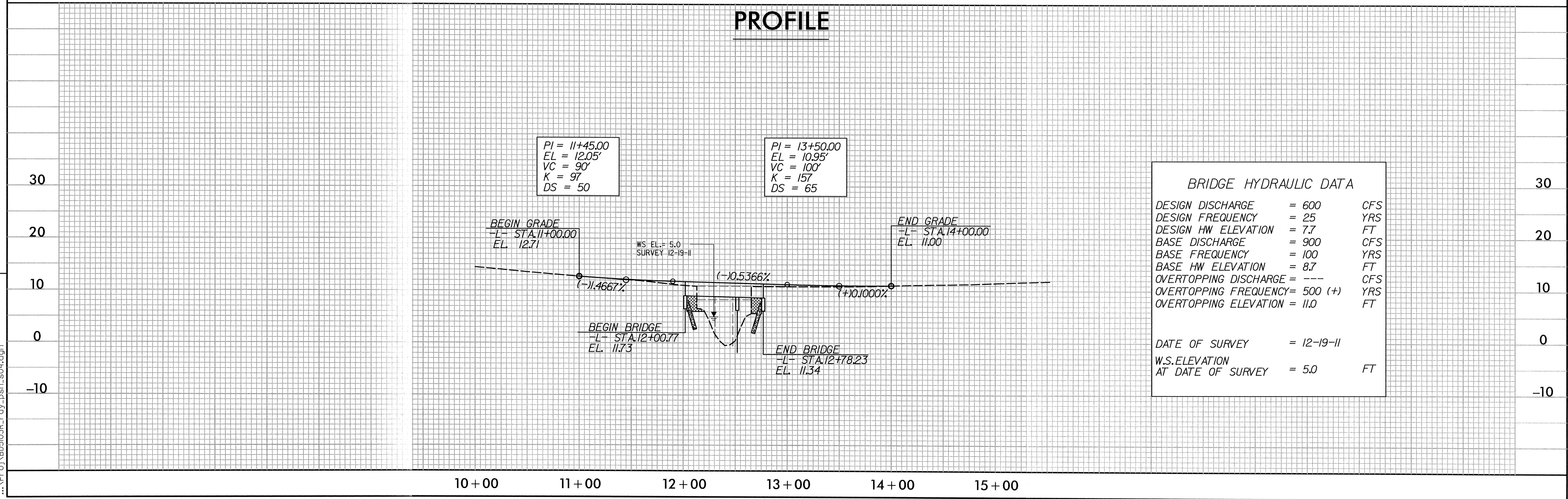
|  |                       |
|--|-----------------------|
| PROJECT REFERENCE NO.<br><b>BD-5103R</b> | SHEET NO.<br><b>4</b> |
| ROADWAY DESIGN ENGINEER                  | HYDRAULICS ENGINEER   |
|  |                       |

-L-  
PI Sta. 13+89.17  
 $\Delta = 26^{\circ} 39' 51.6''$  (RT)  
D = 5' 0" 01.7"  
L = 531.46'  
T = 270.63'  
R = 1,142.00'



**DATUM DESCRIPTION**  
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "64-3" WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF NORTHING: 61253.186(±) EASTING: 2173404.312(±) ELEVATION: 12.77 (±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 1.000146575 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "64-3" TO -L- STATION 10+00 IS N10 31' 51.21"W 625.06' ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

# PROFILE



**BRIDGE HYDRAULIC DATA**

|                                  |            |     |
|----------------------------------|------------|-----|
| DESIGN DISCHARGE                 | = 600      | CFS |
| DESIGN FREQUENCY                 | = 25       | YRS |
| DESIGN HW ELEVATION              | = 7.7      | FT  |
| BASE DISCHARGE                   | = 900      | CFS |
| BASE FREQUENCY                   | = 100      | YRS |
| BASE HW ELEVATION                | = 8.7      | FT  |
| OVERTOPPING DISCHARGE            | = ---      | CFS |
| OVERTOPPING FREQUENCY            | = 500 (+)  | YRS |
| OVERTOPPING ELEVATION            | = 11.0     | FT  |
| DATE OF SURVEY                   | = 12-19-11 |     |
| W.S. ELEVATION AT DATE OF SURVEY | = 5.0      | FT  |

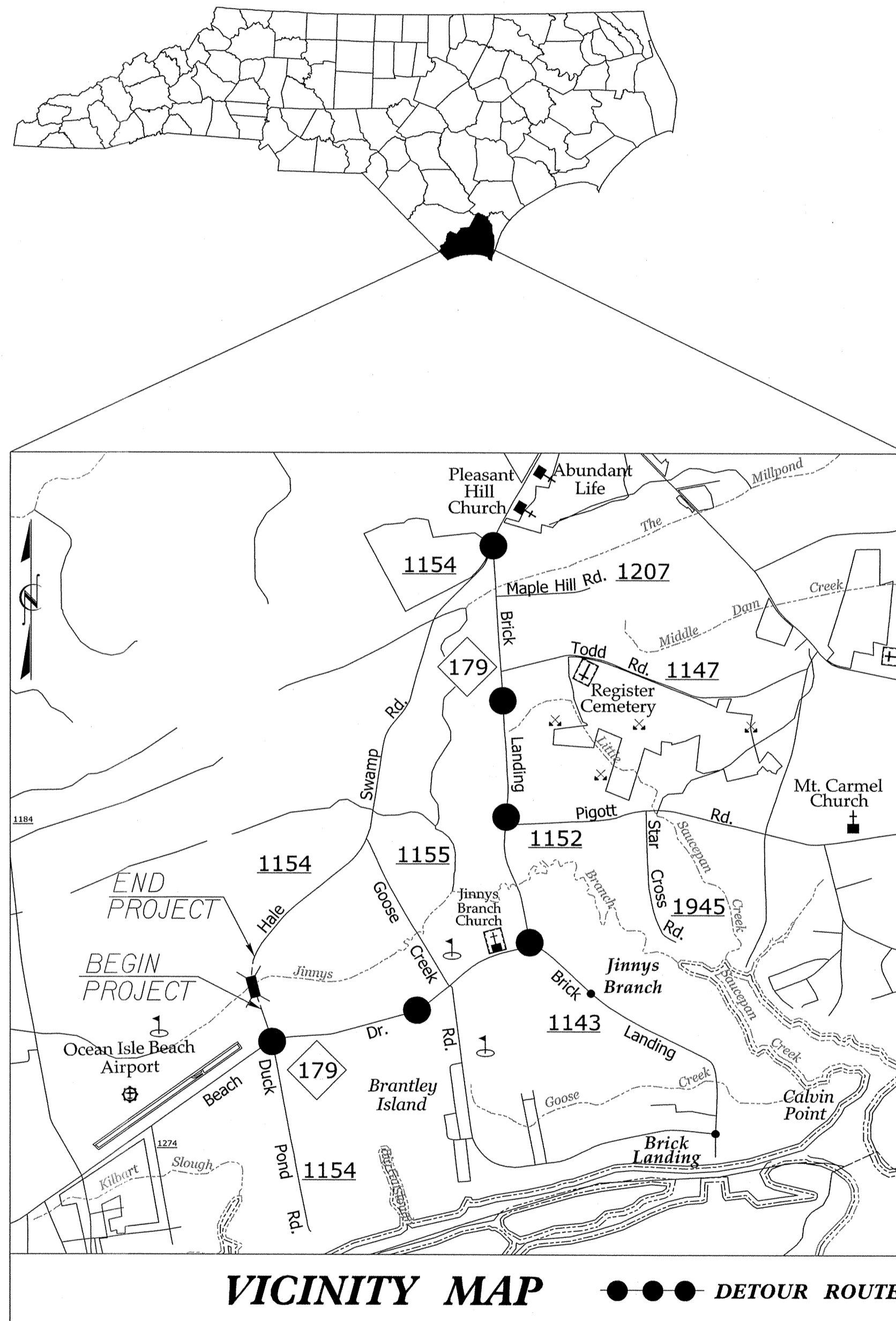
7/12/2012 4:01:16 PM  
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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**TRANSPORTATION MANAGEMENT PLAN**

**BRUNSWICK COUNTY**



**INDEX OF SHEETS**

| SHEET NO. | TITLE   |
|-----------|---|
| TMP-1     | TITLE SHEET, INDEX OF SHEETS AND LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS |
| TMP-1A    | PHASING, GENERAL NOTES AND LOCAL NOTES  |
| TMP-2     | DETOUR SIGNING  |

**ROADWAY STANDARD DRAWINGS**

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C. DATED JAN 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

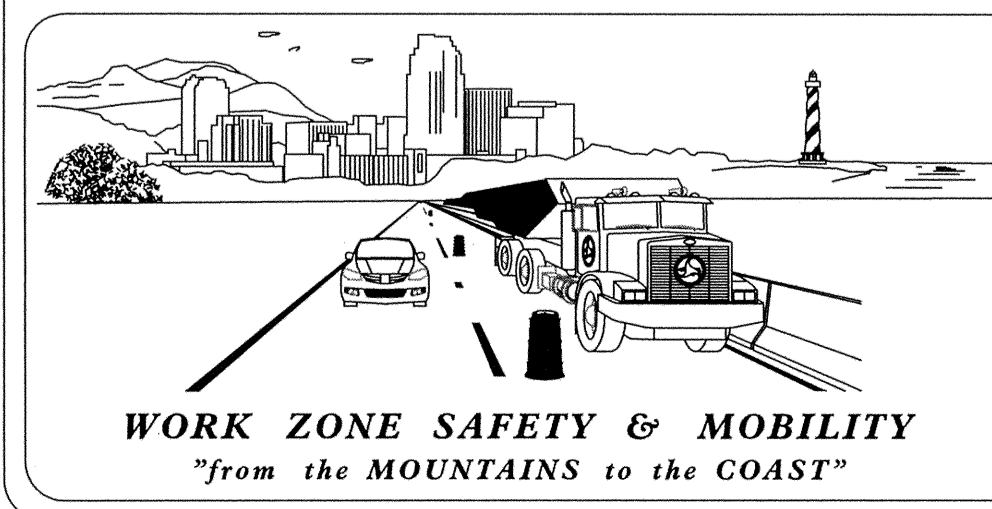
| STD. NO. | TITLE   |
|----------|---|
| 1101.03  | TEMPORARY ROAD CLOSURES                           |
| 1101.11  | TRAFFIC CONTROL DESIGN TABLES                     |
| 1110.01  | STATIONARY WORK ZONE SIGNS                        |
| 1145.01  | BARRICADES  |
| 1205.01  | PAVEMENT MARKINGS - LINE TYPES & OFFSETS          |
| 1205.02  | PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS   |
| 1205.12  | PAVEMENT MARKINGS - BRIDGES                       |
| 1250.01  | PAVEMENT MARKER SPACING                           |
| 1251.01  | RAISED PAVEMENT MARKERS - PERMANENT AND TEMPORARY |
| 1261.01  | GUARDRAIL AND BARRIER DELINEATOR SPACING          |
| 1261.02  | GUARDRAIL AND BARRIER DELINEATOR TYPE             |
| 1262.01  | GUARDRAIL END DELINEATION                         |

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

R. B. EARLY, PE TRAFFIC CONTROL PROJECT ENGINEER  
J. A. PHILLIPS TRAFFIC CONTROL DESIGN ENGINEER

APPROVED: *[Signature]*  
DATE: 6.13.12

SEAL



N.C.D.O.T. WORK ZONE TRAFFIC CONTROL  
1561 MAIL SERVICE CENTER (MSC) RALEIGH, NC 27699-1561  
750 N. GREENFIELD PARKWAY, GARNER, NC 27529 (DELIVERY)  
PHONE: (919) 773-2800 FAX: (919) 771-2745

KATHERINE HITE, PE DIVISION TRAFFIC ENGINEER



\$\$\$\$\$SYTIME\$\$\$\$\$  
\$\$\$\$\$SDGN\$\$\$\$\$  
\$\$\$\$\$USERNAME\$\$\$\$\$

SHEET NO.  
TMP-1

**BD-5103R**

**TIP PROJECT:**



**PHASING**

PHASE I

PRIOR TO ANY CONSTRUCTION OPERATIONS, PLACE AND COVER OFF-SITE DETOUR SIGNS AS SHOWN ON TCP-2 AND IN ACCORDANCE WITH RSD 1101.03 (SHEET 1 OF 9). PLACE CMS AND ACTIVATE ON EACH SIDE OF THE BRIDGE TO BE CLOSED.

PHASE II

USING OFF-SITE DETOUR, UNCOVER DETOUR SIGNS, RELOCATE CMS BOARDS AS SHOWN ON TMP-2 AND CLOSE -L- (SR 1154 / HALE SWAMP RD. SW) TO TRAFFIC AND CONSTRUCT BRIDGE, APPROACHES AND ROADWAY UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE.

PHASE III

UPON COMPLETION OF BRIDGE, APPROACHES AND ROADWAY, PLACE FINAL PAVEMENT MARKINGS AND MARKERS IN ACCORDANCE WITH ROADWAY STANDARD DRAWINGS. REMOVE BARRICADES AND DETOUR SIGNS AND OPEN -L- (SR 1154 / HALE SWAMP RD. SW) TO TRAFFIC.

**GENERAL NOTES**

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
- B) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADWAY STANDARD DRAWING NO. 1101.04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

TRAFFIC PATTERN ALTERATIONS

- C) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

- D) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- E) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.  
  
PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN ON SHEET TMP-2.
- F) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.  
  
COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.
- G) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

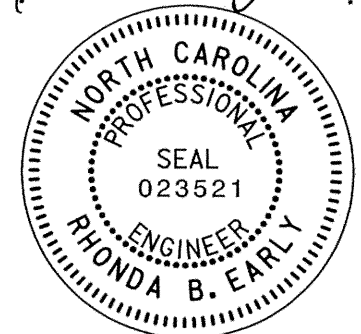
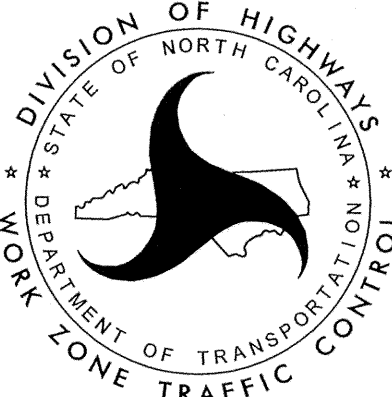
- H) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.
- I) INSTALL AND ACTIVATE CMS BOARDS 2 WEEKS PRIOR TO ROAD CLOSURE.

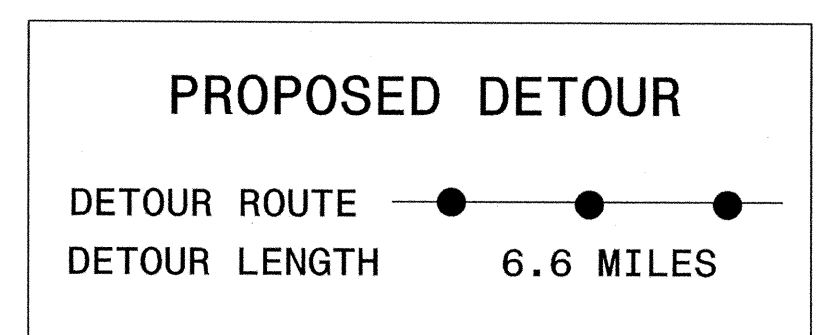
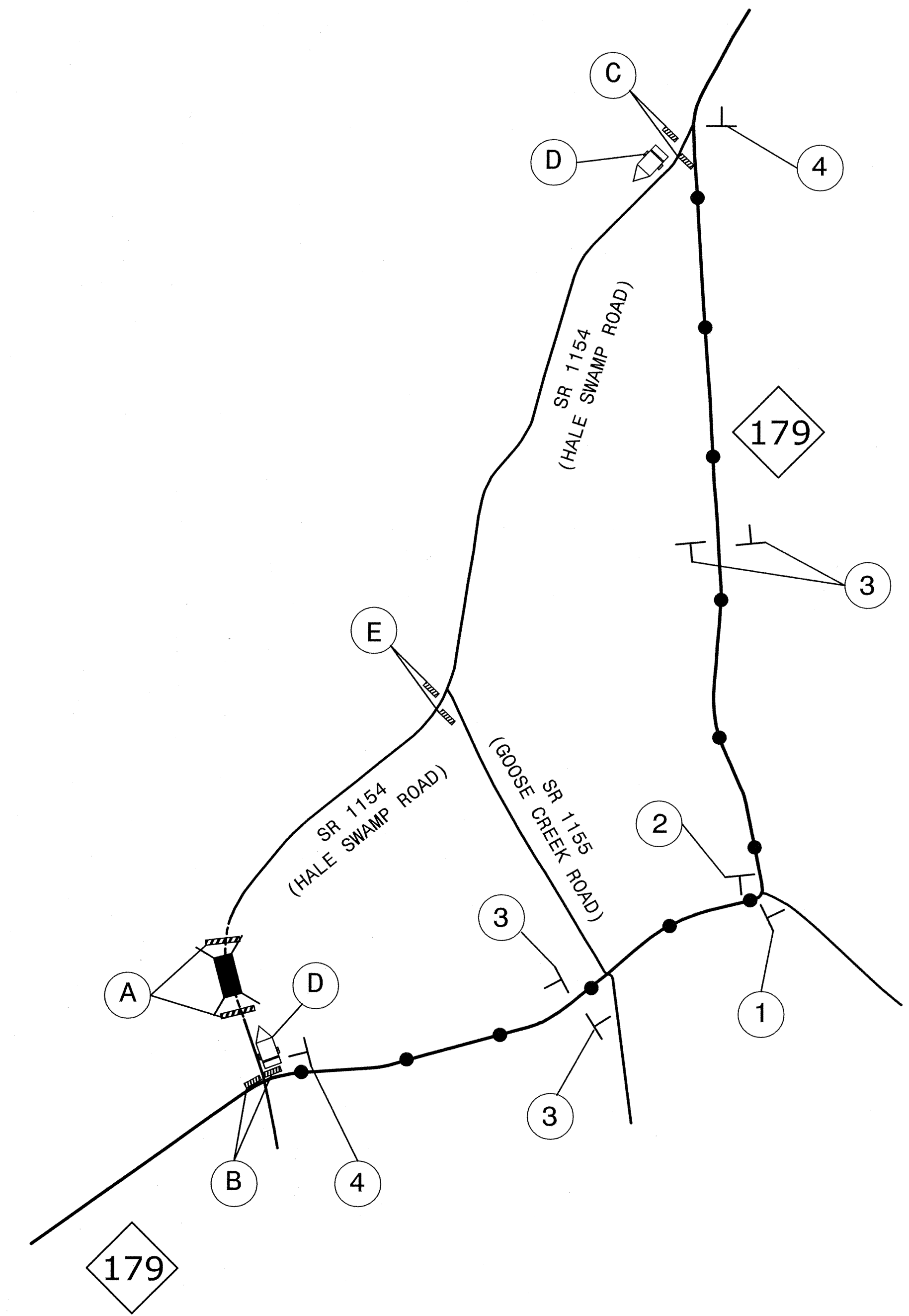
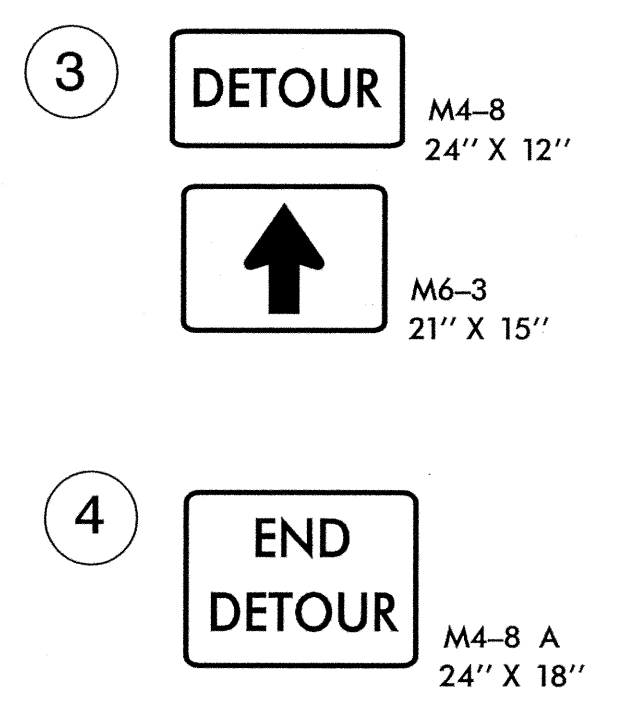
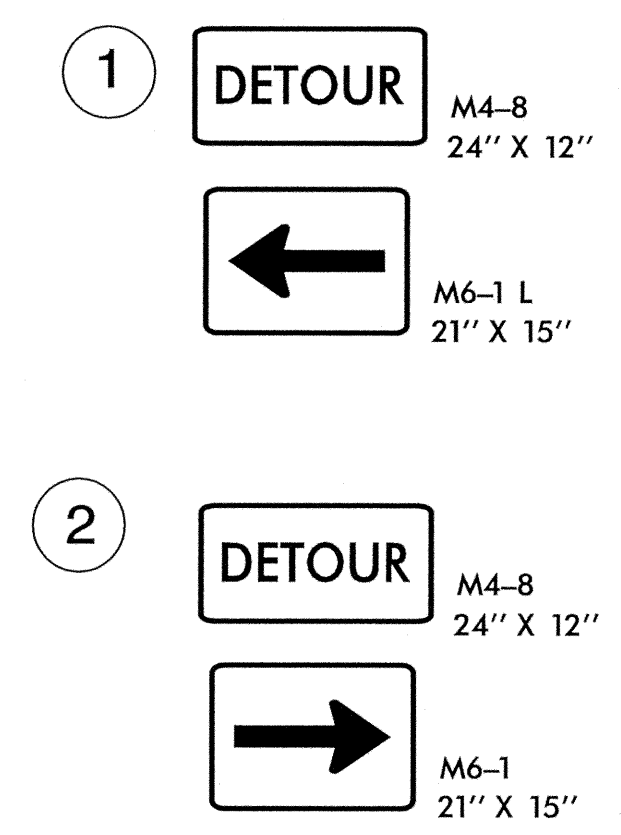
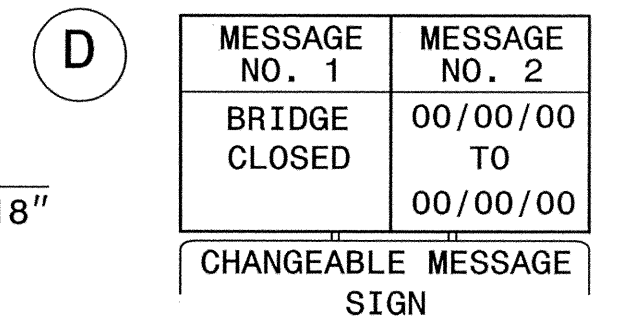
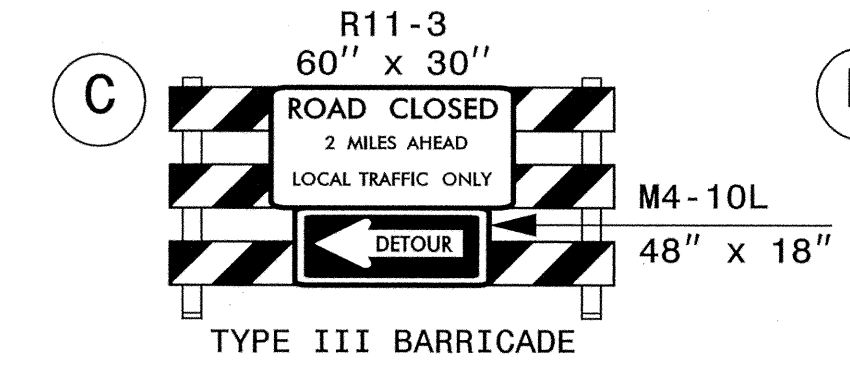
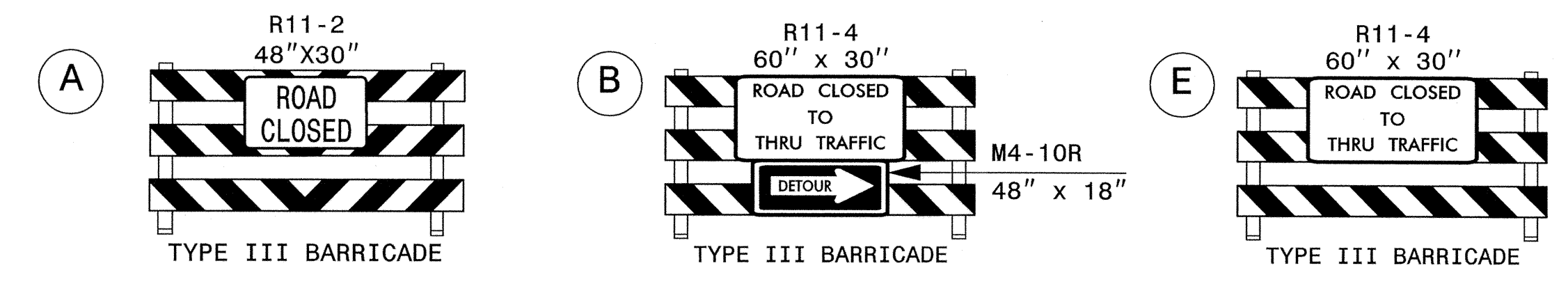
PAVEMENT MARKINGS AND MARKERS

- J) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE AS FOLLOWS:
 

| ROAD NAME               | MARKING | MARKERS |
|-------------------------|---------|---------|
| SR 1554 (HALE SWAMP RD) | PAINT   | RAISED  |
- K) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- L) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS.
- M) PASSING ZONE WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

\$\$\$ SYSTEMS \$\$\$  
 \$\$\$ USER NAME \$\$\$  
 \$\$\$ DATE \$\$\$

|   |   |  |
|---|---|--|
| APPROVED: <i>[Signature]</i> DATE: 6-13-12<br> |  | <h2 style="margin: 0;">TRANSPORTATION<br/>OPERATIONS<br/>PLAN</h2> |
|---|---|--|



| APPROVED: <i>Rhonda B. Earl</i> DATE: 6-13-12 | <b>DETOUR SIGNING</b> |  |           |  |  |  |  |  |  |  |
|---|-----------------------|--|-----------|--|--|--|--|--|--|--|
|   | SCALE: NONE           | <table border="1"> <tr> <th colspan="2">REVISIONS</th> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table> | REVISIONS |  |  |  |  |  |  |  |
|   | REVISIONS             |  |           |  |  |  |  |  |  |  |
|   |                       |  |           |  |  |  |  |  |  |  |
|   |                       |  |           |  |  |  |  |  |  |  |
|   |                       |  |           |  |  |  |  |  |  |  |
| DATE: 06/13/12                                |                       |  |           |  |  |  |  |  |  |  |
| DESIGN BY: JAP                                |                       |  |           |  |  |  |  |  |  |  |
| REVIEWED BY: RBE                              |                       |  |           |  |  |  |  |  |  |  |
| CADD FILE                                     |                       |  |           |  |  |  |  |  |  |  |

SYSTEMTIME: 06/13/12 10:00:00 AM  
 USER: JAP  
 USERNAME: JAP

|                 |                             |             |              |
|-----------------|-----------------------------|-------------|--------------|
| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.   | TOTAL SHEETS |
| N.C.            | BD-5103R                    | EC-1        | 5            |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION |              |
|                 |                             |             |              |
|                 |                             |             |              |
|                 |                             |             |              |

**TIP PROJECT: BD-5103R**

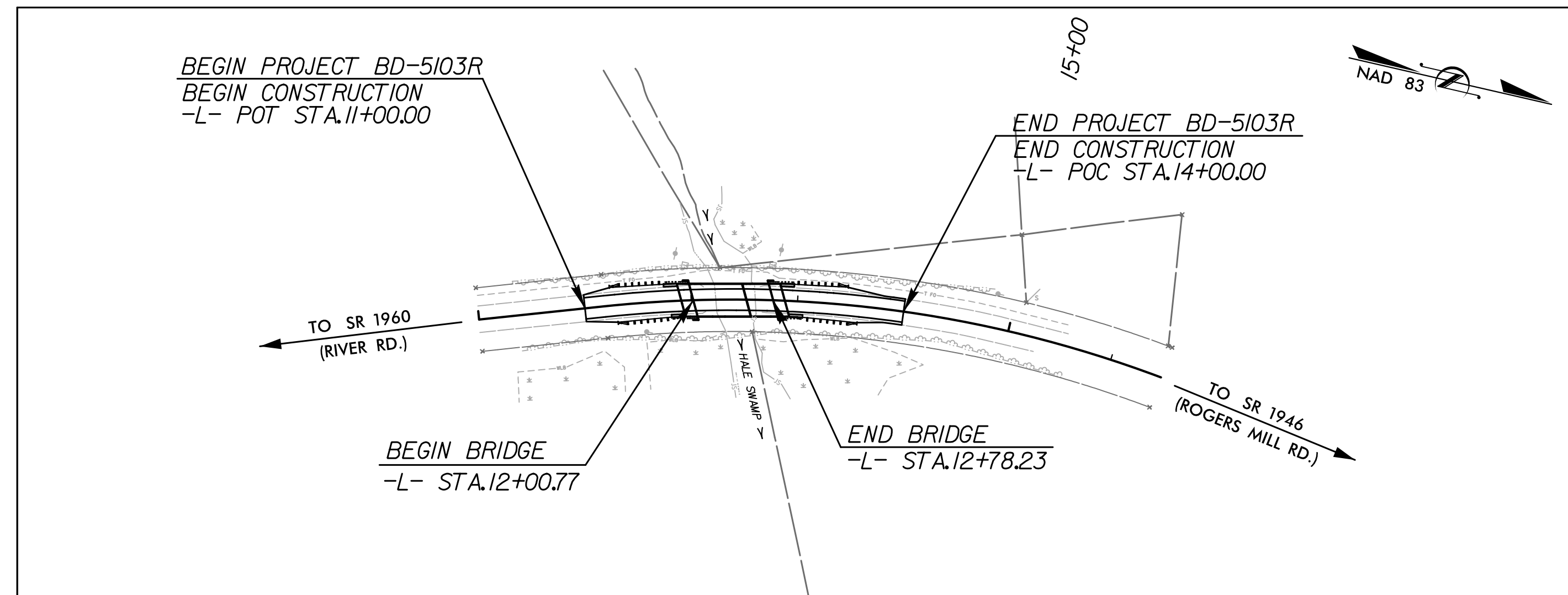
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS  
**PLAN FOR PROPOSED  
HIGHWAY EROSION CONTROL**

**LOCATION: BRUNSWICK COUNTY BRIDGE NO. 064 OVER  
HALE SWAMP ON SR 1154 (HALE SWAMP RD.)**

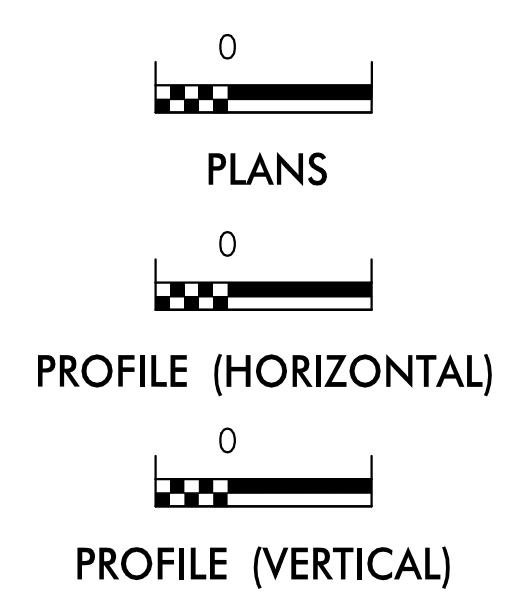
**TYPE OF WORK: LOW IMPACT BRIDGE REPLACEMENT**

**EROSION AND SEDIMENT CONTROL MEASURES**

| Std. #  | Description  | Symbol |
|---------|--|--------|
| 1630.03 | Temporary Silt Ditch   | TD     |
| 1630.05 | Temporary Diversion  | TD     |
| 1605.01 | Temporary Silt Fence   |        |
| 1606.01 | Special Sediment Control Fence   | △△△    |
| 1622.01 | Temporary Berms and Slope Drains                                       | →      |
|         | Silt Basin Type B  | ▨      |
| 1633.01 | Temporary Rock Silt Check Type-A                                       | ⊗      |
|         | Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM) | ⊗      |
|         | Temporary Rock Silt Check Type-B                                       | →      |
|         | Wattle/Coir Fiber Wattle   | ⌒      |
|         | Wattle/Coir Fiber Wattle with Polyacrylamide (PAM)                     | ⌒      |
| 1634.01 | Temporary Rock Sediment Dam Type-A                                     | ▨      |
| 1634.02 | Temporary Rock Sediment Dam Type-B                                     | ▨      |
| 1635.01 | Rock Pipe Inlet Sediment Trap Type-A                                   | ⊓      |
| 1635.02 | Rock Pipe Inlet Sediment Trap Type-B                                   | ⊓      |
| 1630.04 | Stilling Basin   | ▭      |
| 1630.06 | Special Stilling Basin   | ▭      |
|         | Rock Inlet Sediment Trap:  |        |
| 1632.01 | Type A   | A      |
| 1632.02 | Type B   | B      |
| 1632.03 | Type C   | C      |
|         | Skimmer Basin  | ▭      |
|         | Tiered Skimmer Basin   | ▭      |
|         | Infiltration Basin   | ▭      |



**GRAPHIC SCALE**



ROADSIDE ENVIRONMENTAL UNIT  
DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE AUGUST 3, 2011 ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES DIVISION OF WATER QUALITY.

Prepared in the Office of:

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

**2012 STANDARD SPECIFICATIONS**

PHILLIP E. ROGERS, P.E.  
EROSION CONTROL  
LEVEL III-A  
CERTIFICATION #330

Roadway Standard Drawings

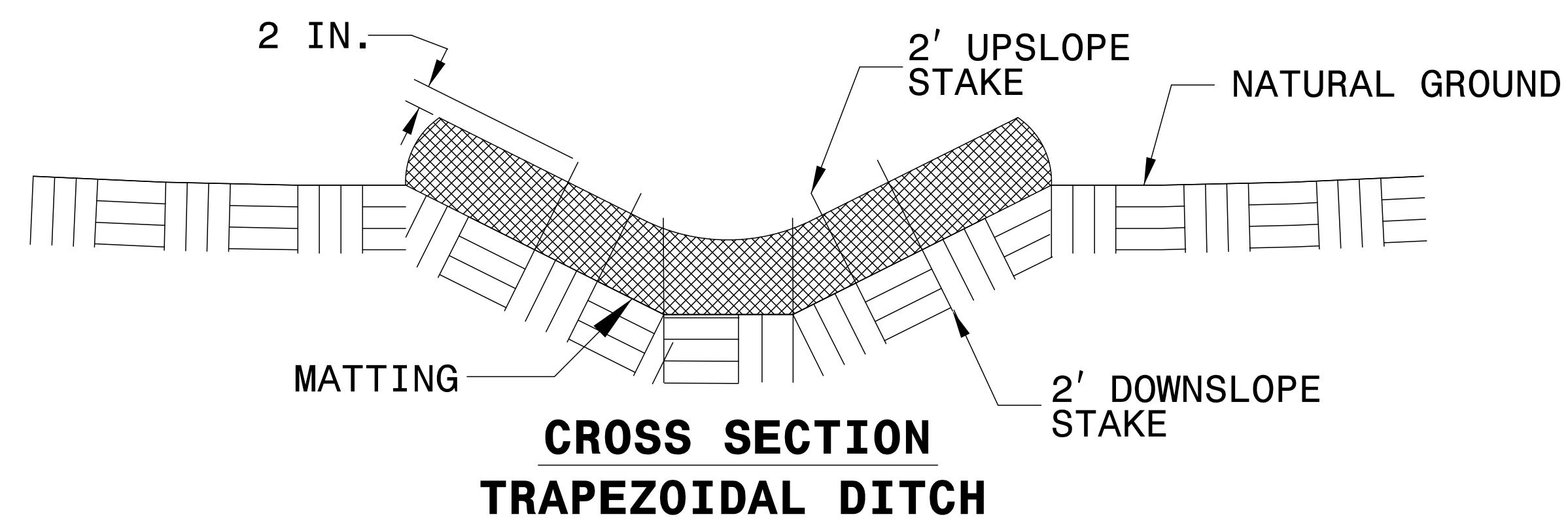
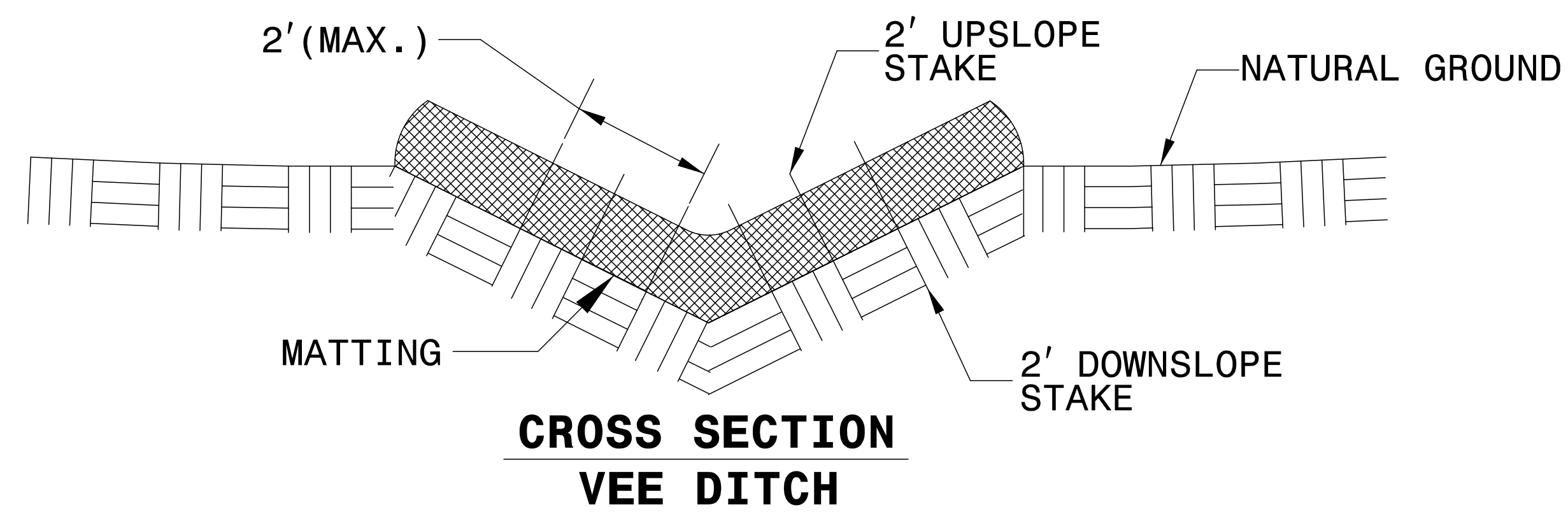
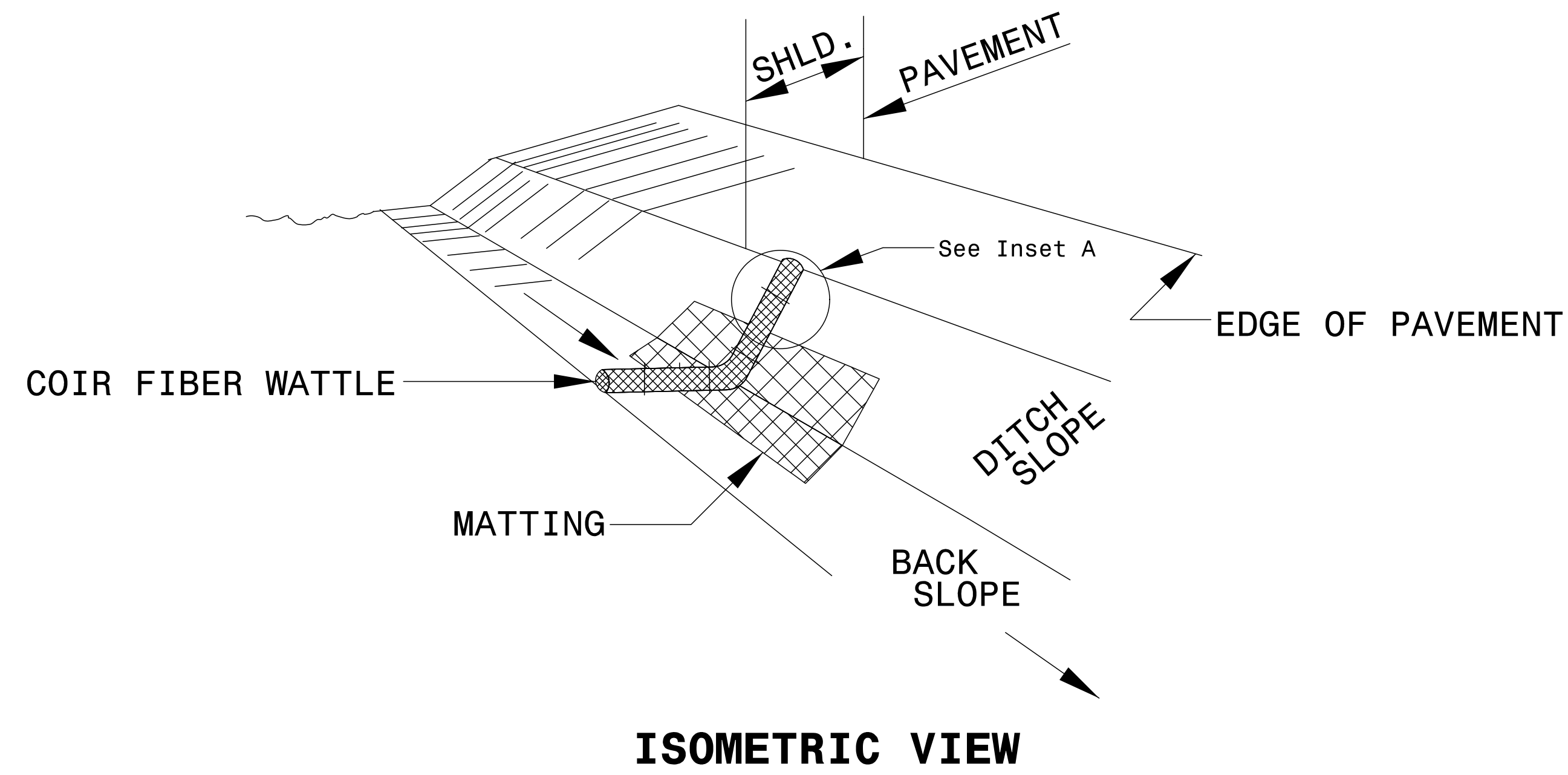
The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2012 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

|  |  |
|--|--|
| 1604.01 Railroad Erosion Control Detail  | 1632.01 Rock Inlet Sediment Trap Type A      |
| 1605.01 Temporary Silt Fence             | 1632.02 Rock Inlet Sediment Trap Type B      |
| 1606.01 Special Sediment Control Fence   | 1632.03 Rock Inlet Sediment Trap Type C      |
| 1607.01 Gravel Construction Entrance     | 1633.01 Temporary Rock Silt Check Type A     |
| 1622.01 Temporary Berms and Slope Drains | 1633.02 Temporary Rock Silt Check Type B     |
| 1630.01 Riser Basin                      | 1634.01 Temporary Rock Sediment Dam Type A   |
| 1630.02 Silt Basin Type B                | 1634.02 Temporary Rock Sediment Dam Type B   |
| 1630.03 Temporary Silt Ditch             | 1635.01 Rock Pipe Inlet Sediment Trap Type A |
| 1630.04 Stilling Basin                   | 1635.02 Rock Pipe Inlet Sediment Trap Type B |
| 1630.05 Temporary Diversion              | 1640.01 Coir Fiber Baffle                    |
| 1630.06 Special Stilling Basin           | 1645.01 Temporary Stream Crossing            |
| 1631.01 Matting Installation             |  |

12:32:03 PM 12/10/09 ec\_sah.dgn  
###USERNAME###



# COIR FIBER WATTLE DETAIL



**NOTES:**

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

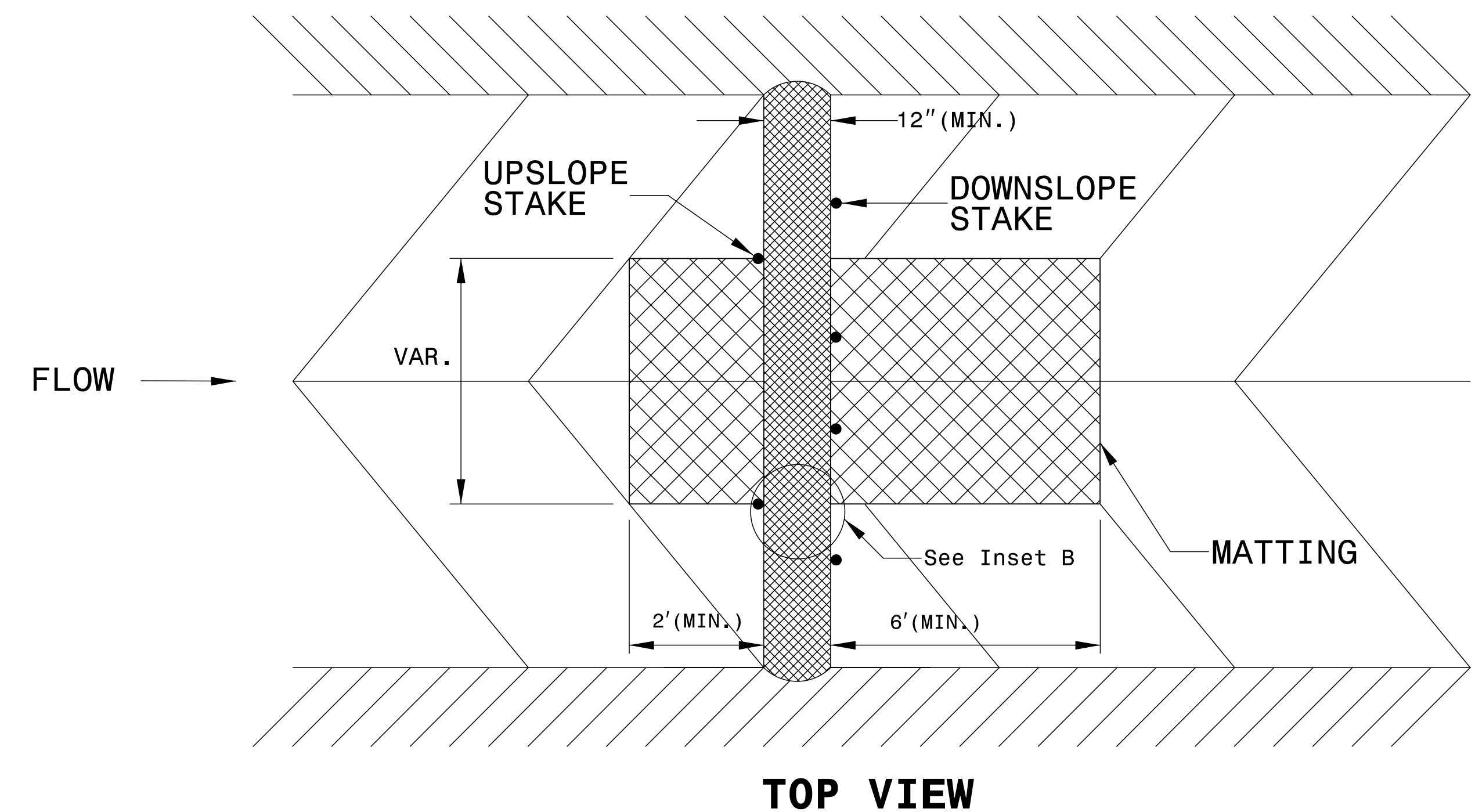
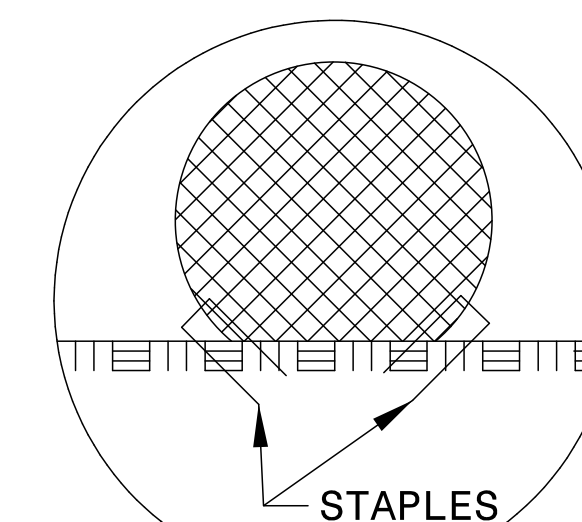
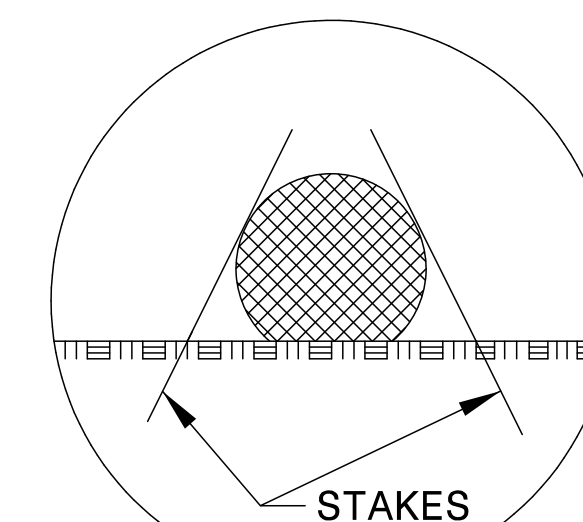
ONLY INSTALL WATTLE(S) TO A HEIGHT IN DITCH SO FLOW WILL NOT WASH AROUND WATTLE AND SCOUR DITCH SLOPES AND AS DIRECTED.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO BOTTOM OF DITCH.

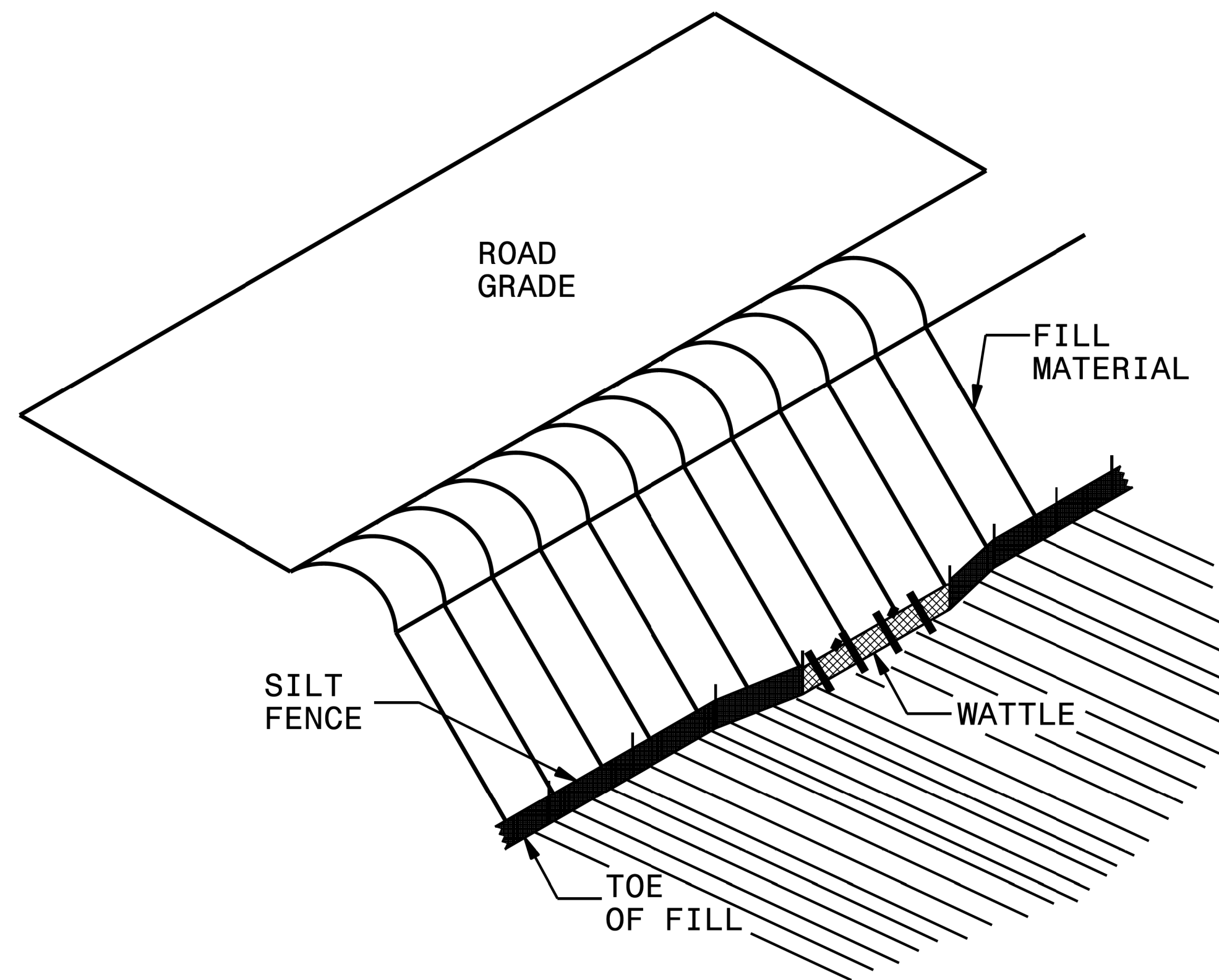
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

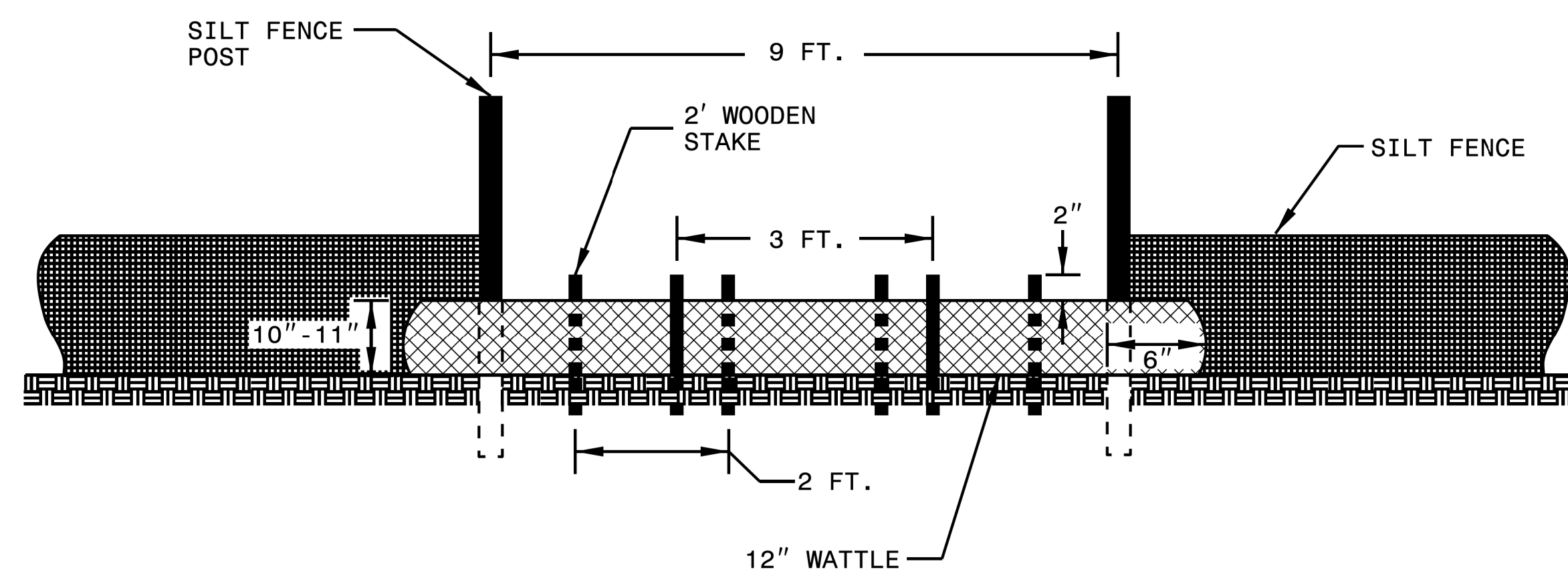
INSTALL MATTING IN ACCORDANCE WITH SECTION 1631 OF THE STANDARD SPECIFICATIONS.



# SILT FENCE COIR FIBER WATTLE BREAK DETAIL



**ISOMETRIC VIEW**



**VIEW FROM SLOPE**

**NOTES:**

USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.

EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.

DO NOT PLACE WATTLE ON TOE OF SLOPE.

USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.

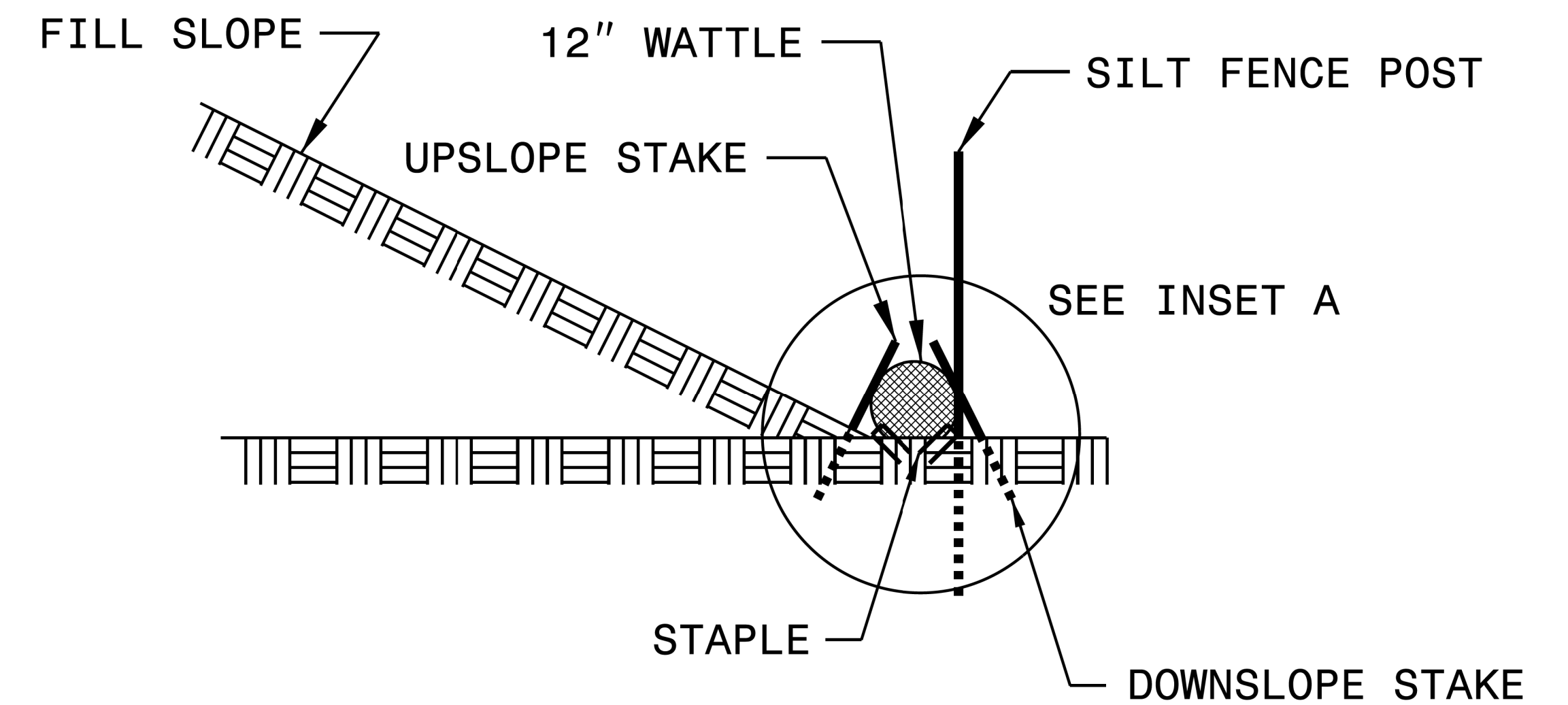
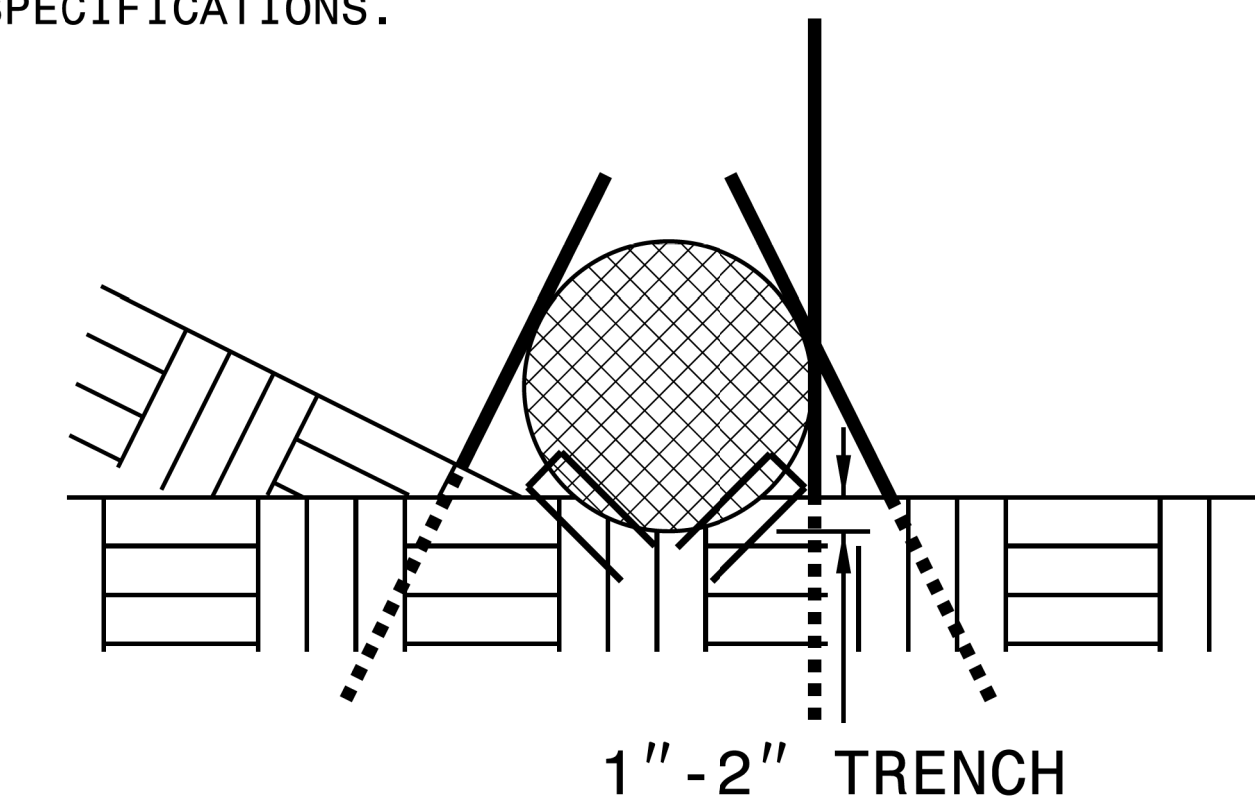
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.

WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.

INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

**INSET A**



**SIDE VIEW**

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

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## ***SOIL STABILIZATION TIMEFRAMES***

| <i>SITE DESCRIPTION</i>                      | <i>STABILIZATION TIME</i> | <i>TIMEFRAME EXCEPTIONS</i>  |
|--|---------------------------|--|
| PERIMETER DIKES, SWALES, DITCHES AND SLOPES  | 7 DAYS                    | NONE   |
| HIGH QUALITY WATER (HQW) ZONES               | 7 DAYS                    | NONE   |
| SLOPES STEEPER THAN 3:1                      | 7 DAYS                    | IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED. |
| SLOPES 3:1 OR FLATTER                        | 14 DAYS                   | 7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH.  |
| ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1 | 14 DAYS                   | NONE, EXCEPT FOR PERIMETERS AND HQW ZONES.   |

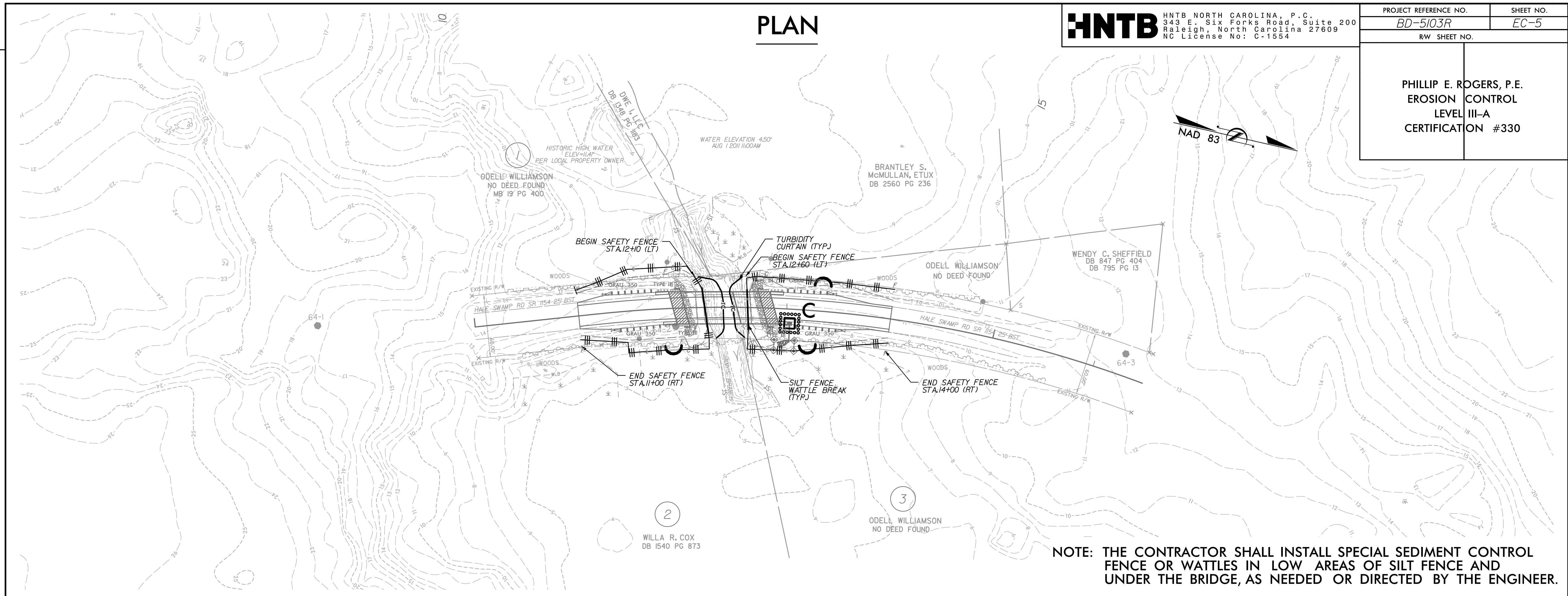


# PLAN

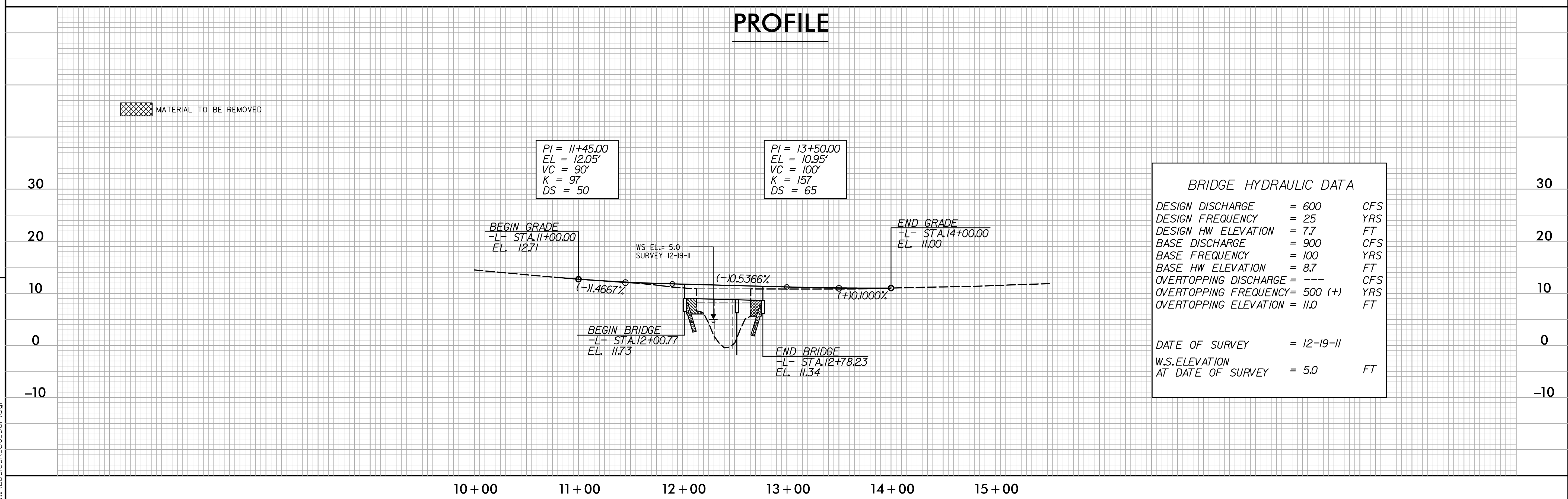
**HNTB** HNTB NORTH CAROLINA, P.C.  
343 E. Six Forks Road, Suite 200  
Raleigh, North Carolina 27609  
NC License No: C-1554

PROJECT REFERENCE NO. **BD-5103R** SHEET NO. **EC-5**  
RW SHEET NO.

PHILLIP E. ROGERS, P.E.  
EROSION CONTROL  
LEVEL III-A  
CERTIFICATION #330



# PROFILE

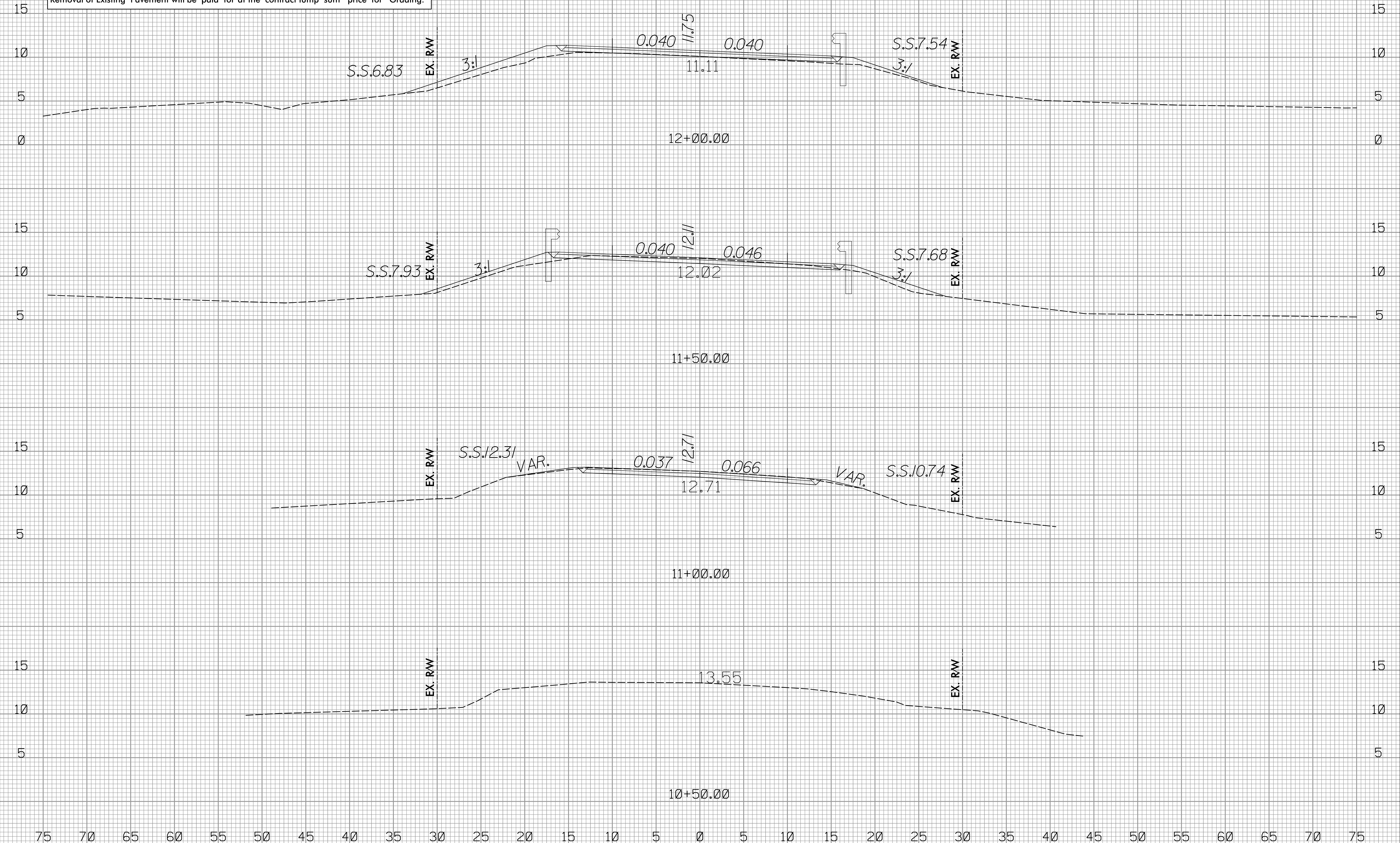


REVISIONS

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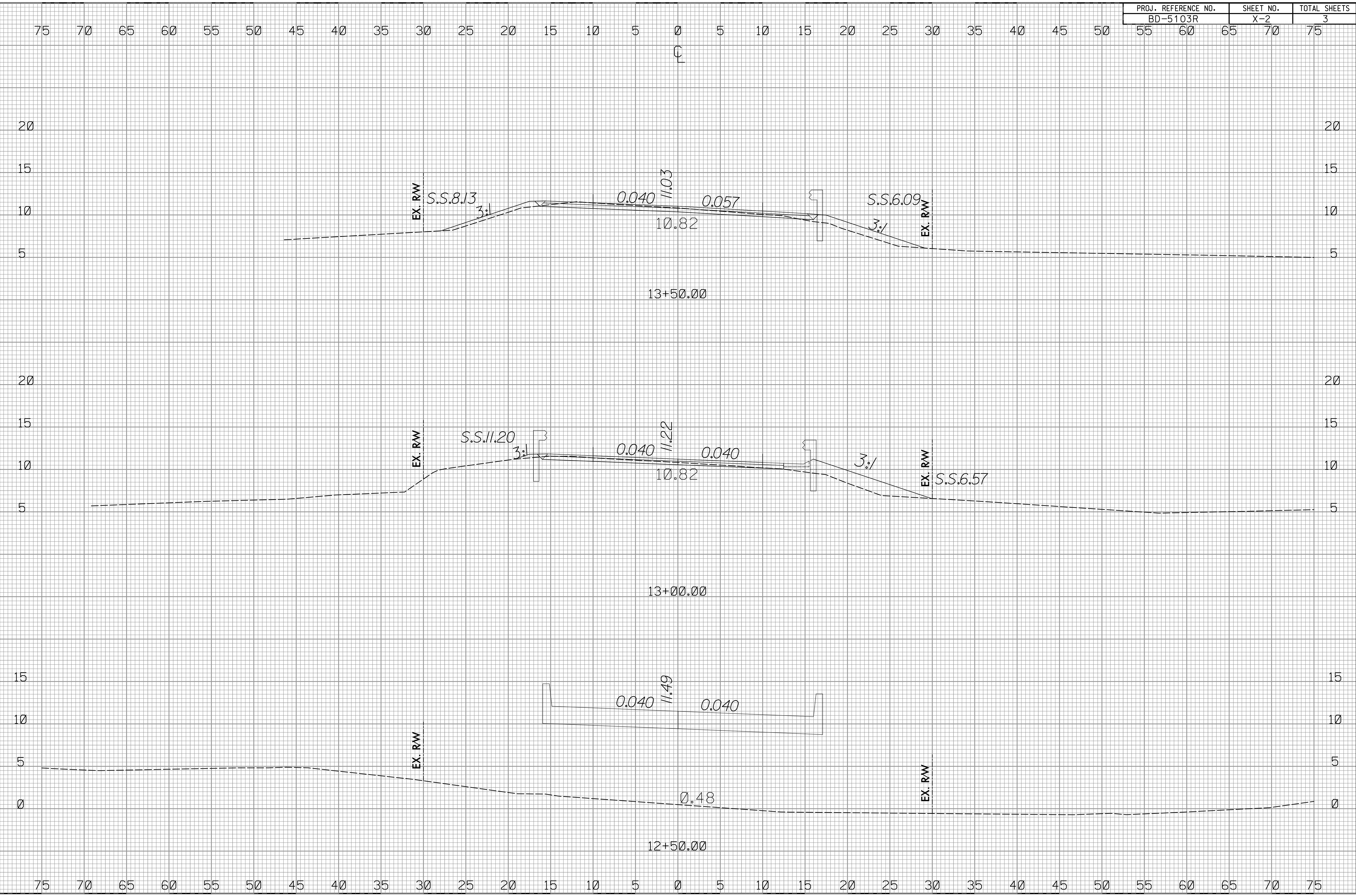
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Shoulder Borrow, Fine Grading, Clearing and Grubbing, Breaking of Existing Pavement, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."



02/03/98

|                     |           |              |
|---------------------|-----------|--------------|
| PROJ. REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
| BD-5103R            | X-2       | 3            |



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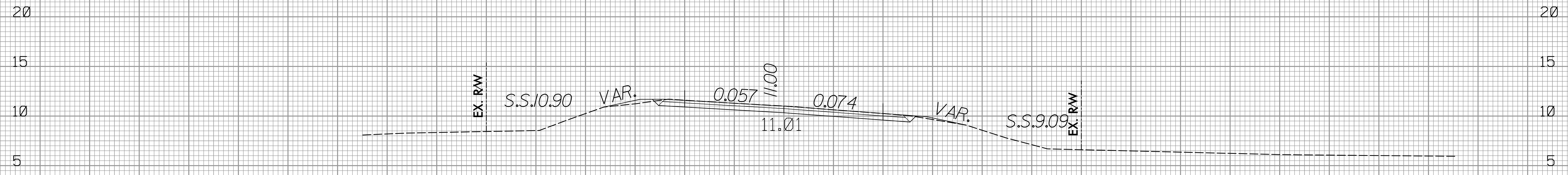
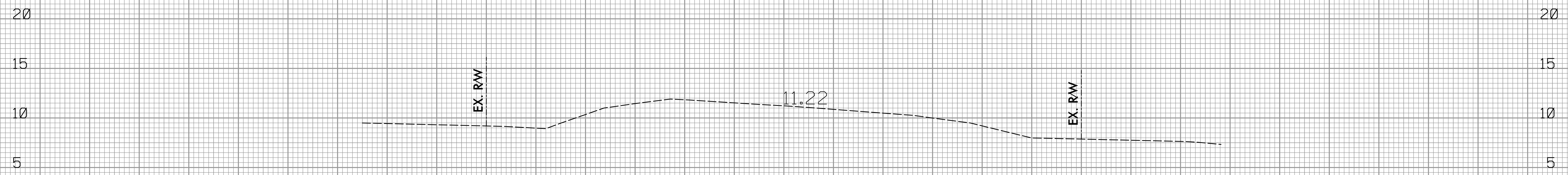
02/03/98

| PROJ. REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---------------------|-----------|--------------|
| BD-5103R            | X-3       | 3            |

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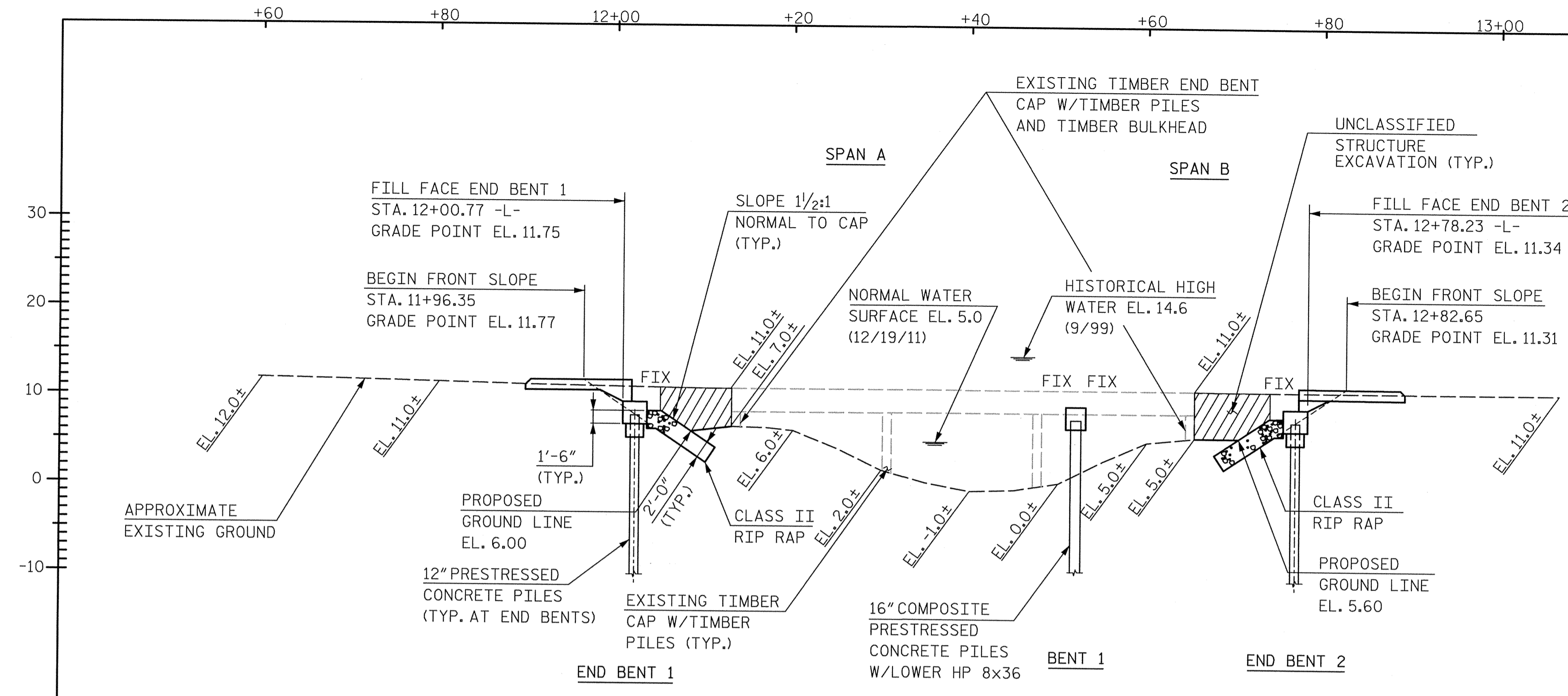


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55 60 65 70 75

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FOR GENERAL NOTES, SEE SHEET 2.



**BRIDGE HYDRAULIC DATA**

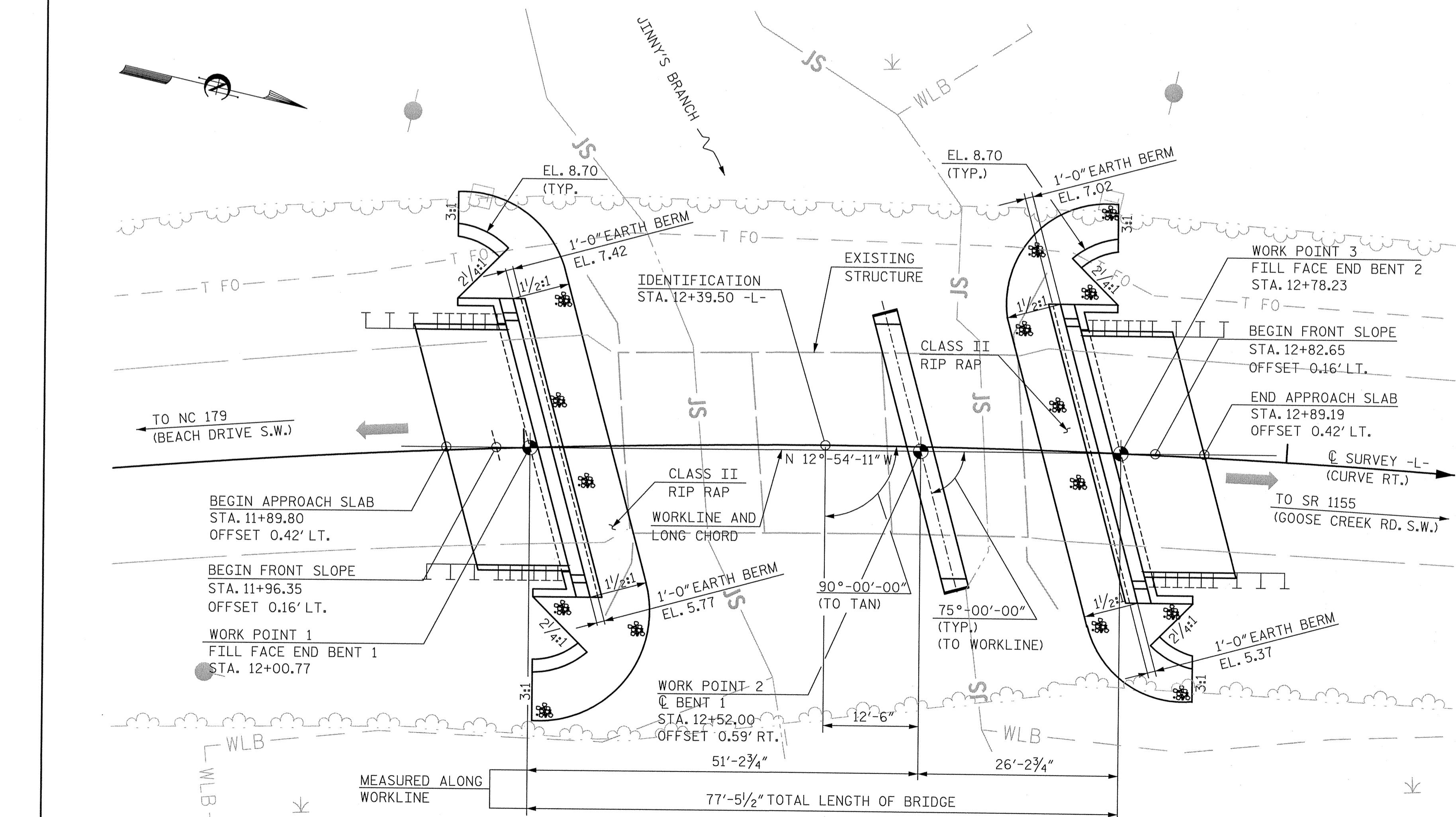
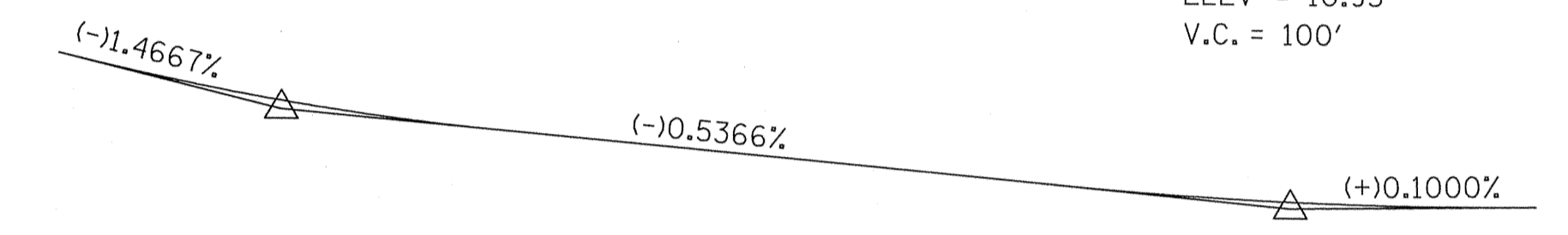
|                             |   |             |
|-----------------------------|---|-------------|
| DESIGN DISCHARGE            | = | 600 CFS     |
| FREQUENCY OF DESIGN FLOOD   | = | 25 YR       |
| DESIGN HIGH WATER ELEVATION | = | 7.7 FT.     |
| DRAINAGE AREA               | = | 4.2 SQ. MI. |
| BASIC DISCHARGE (Q100)      | = | 900 CFS     |
| BASIC HIGH WATER ELEVATION  | = | 8.7 FT.     |

**OVERTOPPING FLOOD DATA**

|                                |   |            |
|--------------------------------|---|------------|
| OVERTOPPING DISCHARGE          | = | - CFS      |
| FREQUENCY OF OVERTOPPING FLOOD | = | 500 YR (+) |
| OVERTOPPING FLOOD ELEVATION    | = | 11.0 FT.   |

PI STA. = 11+45.00  
ELEV = 12.05  
V.C. = 90'

PI STA. = 13+50.00  
ELEV = 10.95  
V.C. = 100'



NOTES: ALL SUBSTRUCTURE UNITS ARE PARALLEL.  
PILES NOT SHOWN FOR CLARITY.  
WORKLINE FOR BRIDGE SHALL BE THE ROADWAY LONG CHORD BETWEEN FILL FACES AND ITS EXTENSION.

**CURVE DATA -L-**

PI STA. = 13+89.17  
Δ = 26°39'51.6" (RT)  
D = 5°01'01.7"  
L = 531.46'  
T = 270.63'  
R = 1,142.00'

I HEREBY CERTIFY THESE PLANS ARE AS-BUILT PLANS

PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
STATION: 12+39.50 -L-

SHEET 1 OF 2 REPLACES BRIDGE NO. 64



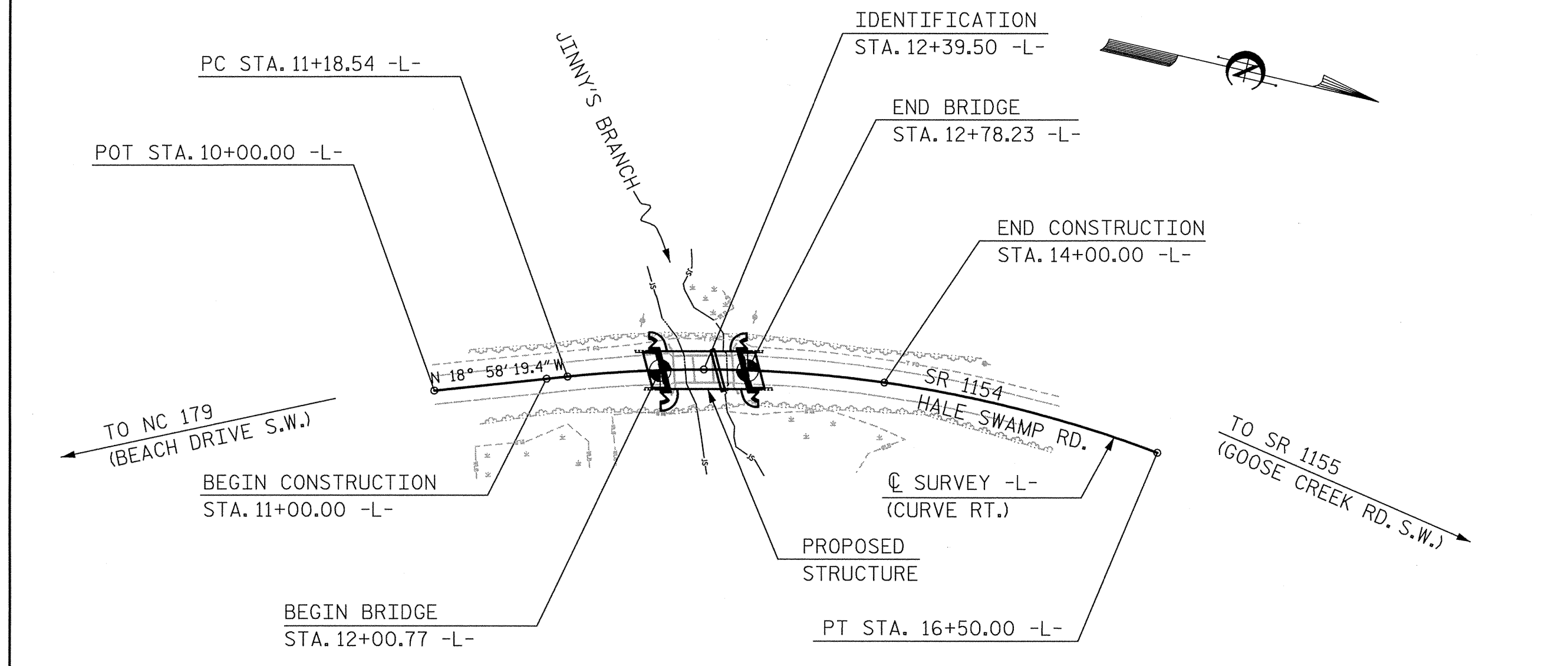
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
GENERAL DRAWING  
FOR BRIDGE ON SR 1154  
OVER JINNY'S BRANCH  
BETWEEN SR 1155  
AND NC 179

|             |          |  |      |
|-------------|----------|--|------|
| <b>HNTB</b> |          | HNTB NORTH CAROLINA, P.C.<br>NC License No. C-1554<br>343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 |      |
| DRAWN BY    | J. BAYNE | DATE   | 3/12 |
| CHECKED BY  | D. RAGAN | DATE   | 3/12 |
| DWG. NO. 1  |          |  |      |

| REVISIONS              |    |      |     |    |      |
|------------------------|----|------|-----|----|------|
| NO.                    | BY | DATE | NO. | BY | DATE |
| 1                      |    |      | 3   |    |      |
| 2                      |    |      | 4   |    |      |
| SHEET NO. <b>S-1</b>   |    |      |     |    |      |
| TOTAL SHEETS <b>19</b> |    |      |     |    |      |



BM - BASELINE CAP 'BL-3', STA. 16+25.74 -L- (LT.), ELEV 12.77



**FOUNDATION NOTES**

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED DRIVING RESISTANCE OF 70 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 120 TONS PER PILE.

PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 90 TONS PER PILE.

DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 220 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAG OR SCOUR.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 50 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 85 TONS PER PILE.

INSTALL PILES AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN -11.5 FT. FOR UPPER SQUARE CONCRETE PILE SECTIONS AND TO A TIP ELEVATION NO HIGHER THAN -23.5 FT. FOR LOWER HP STEEL PILE SECTIONS.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION -9.5 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40 TO 55 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO.1 AND BENT NO.1. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 30 TO 40 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO.2. THIS ESTIMATED ENERGY RANGE DOES NOT RELEASE THE CONTRACTOR FROM PROVIDING DRIVING EQUIPMENT IN ACCORDANCE WITH SUBARTICLE 450-3(D)(2) OF THE STANDARD SPECIFICATIONS.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED AT BENT NO.1. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

**TOTAL BILL OF MATERIAL**

|                | REMOVAL OF EXISTING STRUCTURE AT STATION 12+39.50 -L- | PDA TESTING | UNCLASSIFIED STRUCTURE EXCAVATION AT STATION 12+39.50 -L- | CLASS AA CONCRETE | BRIDGE APPROACH SLABS AT STATION 12+39.50 -L- | EPOXY COATED REINFORCING STEEL | 12" PRESTRESSED CONCRETE PILES |          | 16" PRESTRESSED CONCRETE PILES |          | HP 8x36 STEEL PILES | PILE REDRIVES | VERTICAL CONCRETE BARRIER RAIL | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE | ELASTOMERIC BEARINGS | 3'-0"x1'-9" PRESTRESSED CONCRETE CORED SLABS |          |     |          |
|----------------|---|-------------|---|-------------------|---|--------------------------------|--------------------------------|----------|--------------------------------|----------|---------------------|---------------|--------------------------------|--------------------------------|-------------------------|----------------------|--|----------|-----|----------|
|                |   |             |   |                   |   |                                | NO.                            | LIN. FT. | NO.                            | LIN. FT. |                     |               |                                |                                |                         |                      | NO.  | LIN. FT. | NO. | LIN. FT. |
| SUPERSTRUCTURE | LUMP SUM  | EACH        | LUMP SUM  | CU. YDS.          | LUMP SUM                                      | LBS.                           |                                |          |                                |          |                     |               |                                |                                |                         |                      |  |          |     |          |
| END BENT NO. 1 |   |             | LUMP SUM  | 13.2              |   | 2,149                          | 7                              | 280      |                                |          |                     | 4             |                                |                                | 70                      | 80                   |  | LUMP SUM | 22  | 825      |
| BENT NO. 1     |   | 1           |   | 11.1              |   | 2,208                          |                                |          | 7                              | 175      | 7                   | 140           | 4                              |                                |                         |                      |  |          |     |          |
| END BENT NO. 2 |   |             | LUMP SUM  | 13.2              |   | 2,149                          | 7                              | 175      |                                |          |                     | 4             |                                | 70                             | 80                      |                      |  |          |     |          |
| TOTAL          | LUMP SUM  | 1           | LUMP SUM  | 37.5              | LUMP SUM                                      | 6,506                          | 14                             | 455      | 7                              | 175      | 7                   | 140           | 12                             | 150.50                         | 140                     | 160                  | LUMP SUM                                     | 22       | 825 |          |

**GENERAL NOTES**

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

THE EXISTING 3 SPAN STRUCTURE WITH SPAN LENGTHS OF 17'-8", 17'-1" AND 17'-10" WITH 19 TIMBER JOISTS AT VARYING CENTERS SUPPORTING REINFORCED CONCRETE DECK WITH A 23'-11" CLEAR ROADWAY WIDTH ON TIMBER CAP AND TIMBER PILES SHALL BE REMOVED. IN ADDITION, ANY PILES REMAINING FROM PREVIOUS BRIDGE CONSTRUCTION OR MAINTENANCE OPERATIONS SHALL BE REMOVED AND INCLUDED IN THE LUMP SUM PAY ITEM FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 12+39.50 -L-".

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 19.5 FT EACH SIDE OF CENTERLINE 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.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITY ON ROADWAY PLANS.

THIS STRUCTURE CONTAINS THE NECESSARY CORROSION PROTECTION REQUIRED FOR A CORROSIVE SITE.

CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE COLUMNS, BENT CAPS, PILE CAPS, AND FOOTINGS, AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

ALL BAR SUPPORTS USED IN THE PARAPET, BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS

THE CONCRETE IN THE BENT CAPS, AND PILES IN END BENT NO.1, BENT NO.1 AND END BENT NO.2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS ITEMS.

ALL METALIZED SURFACES SHALL RECEIVE A SEAL COATING AS SPECIFIED IN THE SPECIAL PROVISION FOR THERMAL SPRAYED COATINGS (METALIZATION).

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

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.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR THERMAL SPRAYED COATINGS (METALIZATION) SEE SPECIAL PROVISIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 2.

**PROJECT NO.** BD-5103R  
**BRUNSWICK COUNTY**  
**STATION:** 12+39.50 -L-

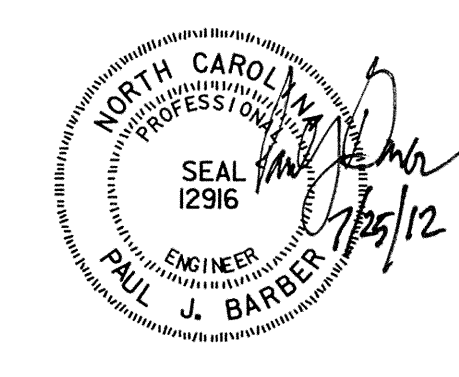
SHEET 2 OF 2

STATE OF NORTH CAROLINA  
**DEPARTMENT OF TRANSPORTATION**  
 RALEIGH  
**GENERAL DRAWING**  
**FOR BRIDGE ON SR 1154**  
**OVER JINNY'S BRANCH**  
**BETWEEN SR 1155**  
**AND NC 179**

REVISIONS

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

SHEET NO. **S-2**  
 TOTAL SHEETS **19**



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

DRAWN BY J. BAYNE DATE 3/12  
 CHECKED BY D. RAGAN DATE 3/12

DWG. NO. 2



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

LOAD FACTORS:

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

| LEVEL                    | VEHICLE    | WEIGHT (W)<br>(TONS) | CONTROLLING<br>LOAD RATING | MINIMUM<br>RATING FACTORS<br>(RF) | TONS = W X RF | STRENGTH I LIMIT STATE |                              |               |      |                 |   |                              |               |      |                 | SERVICE III LIMIT STATE                   |                     |                              |               |      | COMMENT NUMBER |                 |   |  |
|--------------------------|------------|----------------------|----------------------------|-----------------------------------|---------------|------------------------|------------------------------|---------------|------|-----------------|---|------------------------------|---------------|------|-----------------|---|---------------------|------------------------------|---------------|------|----------------|-----------------|---|--|
|                          |            |                      |                            |                                   |               | LIVELOAD<br>FACTORS    | MOMENT                       |               |      |                 |   | SHEAR                        |               |      |                 |   | LIVELOAD<br>FACTORS | MOMENT                       |               |      |                |                 |   |  |
|                          |            |                      |                            |                                   |               |                        | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) |                     | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN |                | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) |  |
| DESIGN<br>LOAD<br>RATING | HL-93(Inv) | N/A                  | 1                          | 1.233                             | --            | 1.75                   | 0.279                        | 2.57          | 25'  | EL              | 11.982                                    | 0.637                        | <b>1.23</b>   | 25'  | EL              | <b>1.198</b>                              | 0.80                | 0.279                        | 2.37          | 25'  | EL             | 11.982          |   |  |
|                          | HL-93(Opr) | N/A                  | --                         | 1.598                             | --            | 1.35                   | 0.279                        | 3.34          | 25'  | EL              | 11.982                                    | 0.637                        | 1.6           | 25'  | EL              | 1.198                                     | N/A                 | --                           | --            | --   | --             | --              |   |  |
|                          | HS-20(Inv) | 36.000               | 2                          | 1.428                             | 51.406        | 1.75                   | 0.279                        | 3.82          | 25'  | EL              | 11.982                                    | 0.637                        | <b>1.43</b>   | 25'  | EL              | <b>1.198</b>                              | 0.80                | 0.279                        | 3.52          | 25'  | EL             | 11.982          |   |  |
|                          | HS-20(Opr) | 36.000               | --                         | 1.851                             | 66.637        | 1.35                   | 0.279                        | 4.95          | 25'  | EL              | 11.982                                    | 0.637                        | 1.85          | 25'  | EL              | 1.198                                     | N/A                 | --                           | --            | --   | --             | --              |   |  |
| LEGAL<br>LOAD<br>RATING  | SV         | SNSH                 | 13.500                     | --                                | 3.307         | 44.639                 | 1.4                          | 0.279         | 6.95 | 25'             | EL  | 11.982                       | 0.637         | 3.31 | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 5.11 | 25'            | EL              | 11.982                                    |  |
|                          |            | SNGARBS2             | 20.000                     | --                                | 2.65          | 53                     | 1.4                          | 0.279         | 6.5  | 25'             | EL  | 11.982                       | 0.637         | 2.65 | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 4.79 | 25'            | EL              | 11.982                                    |  |
|                          |            | SNAGRIS2             | 22.000                     | --                                | 2.596         | 57.117                 | 1.4                          | 0.279         | 6.95 | 25'             | EL  | 11.982                       | 0.637         | 2.6  | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 5.11 | 25'            | EL              | 11.982                                    |  |
|                          |            | SNCOTTS3             | 27.250                     | --                                | 1.678         | 45.729                 | 1.4                          | 0.279         | 3.64 | 25'             | EL  | 11.982                       | 0.637         | 1.68 | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 2.68 | 25'            | EL              | 11.982                                    |  |
|                          |            | SNAGGRS4             | 34.925                     | --                                | 1.615         | 56.393                 | 1.4                          | 0.279         | 3.62 | 25'             | EL  | 11.982                       | 0.637         | 1.61 | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 2.66 | 25'            | EL              | 11.982                                    |  |
|                          |            | SNS5A                | 35.550                     | --                                | 1.687         | 59.981                 | 1.4                          | 0.279         | 3.51 | 25'             | EL  | 11.982                       | 0.637         | 1.69 | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 2.58 | 25'            | EL              | 11.982                                    |  |
|                          |            | SNS6A                | 39.950                     | --                                | 1.618         | 64.639                 | 1.4                          | 0.279         | 3.29 | 25'             | EL  | 11.982                       | 0.637         | 1.62 | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 2.42 | 25'            | EL              | 11.982                                    |  |
|                          | SNS7B      | 42.000               | --                         | 1.63                              | 68.445        | 1.4                    | 0.279                        | 3.29          | 25'  | EL              | 11.982                                    | 0.637                        | 1.63          | 25'  | EL              | 1.198                                     | 0.80                | 0.279                        | 2.41          | 25'  | EL             | 11.982          |   |  |
|                          | TTST       | TNAGRIT3             | 33.000                     | --                                | 1.982         | 65.415                 | 1.4                          | 0.279         | 4.64 | 25'             | EL  | 11.982                       | 0.637         | 1.98 | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 3.41 | 25'            | EL              | 11.982                                    |  |
|                          |            | TNT4A                | 33.075                     | --                                | 1.798         | 59.466                 | 1.4                          | 0.279         | 4.02 | 25'             | EL  | 11.982                       | 0.637         | 1.8  | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 2.96 | 25'            | EL              | 11.982                                    |  |
|                          |            | TNT6A                | 41.600                     | --                                | 1.694         | 70.481                 | 1.4                          | 0.279         | 3.78 | 25'             | EL  | 11.982                       | 0.637         | 1.69 | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 2.78 | 25'            | EL              | 11.982                                    |  |
|                          |            | TNT7A                | 42.000                     | --                                | 1.687         | 70.851                 | 1.4                          | 0.279         | 3.9  | 25'             | EL  | 11.982                       | 0.637         | 1.69 | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 2.87 | 25'            | EL              | 11.982                                    |  |
|                          |            | TNT7B                | 42.000                     | --                                | 1.628         | 68.365                 | 1.4                          | 0.279         | 3.52 | 25'             | EL  | 11.982                       | 0.637         | 1.63 | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 2.59 | 25'            | EL              | 11.982                                    |  |
|                          |            | TNAGRIT4             | 43.000                     | --                                | 1.625         | 69.855                 | 1.4                          | 0.279         | 3.78 | 25'             | EL  | 11.982                       | 0.637         | 1.62 | 25'             | EL  | 1.198               | 0.80                         | 0.279         | 2.77 | 25'            | EL              | 11.982                                    |  |
| TNACT5A                  |            | 45.000               | --                         | 1.657                             | 74.558        | 1.4                    | 0.279                        | 3.78          | 25'  | EL              | 11.982                                    | 0.637                        | 1.66          | 25'  | EL              | 1.198                                     | 0.80                | 0.279                        | 2.77          | 25'  | EL             | 11.982          |   |  |
| TNACT5B                  | 45.000     | 3                    | 1.503                      | 67.632                            | 1.4           | 0.279                  | 3.72                         | 25'           | EL   | 9.586           | 0.637                                     | <b>1.5</b>                   | 25'           | EL   | <b>1.198</b>    | 0.80                                      | 0.279               | 2.75                         | 25'           | EL   | 9.586          |                 |   |  |

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)

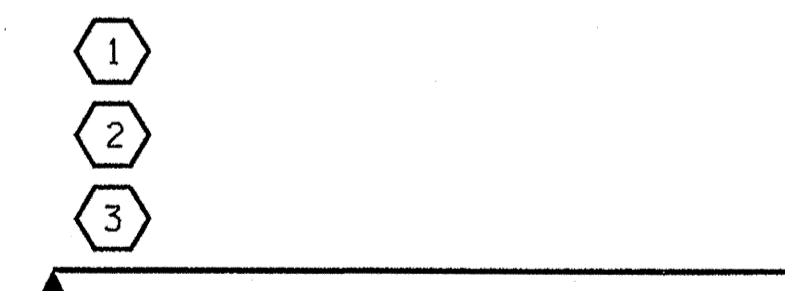
3 LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

---

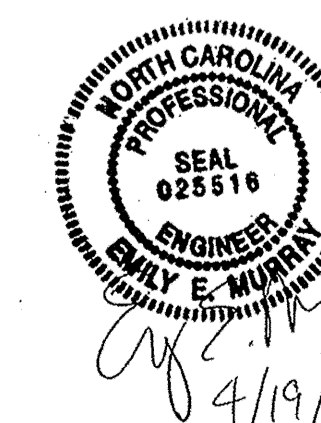
GIRDER LOCATION

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



LRFR SUMMARY  
FOR SPAN 25'

PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-



STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 LRFR SUMMARY FOR  
 25' CORED SLAB UNIT  
 75° SKEW & 105° SKEW  
 (NON-INTERSTATE TRAFFIC)

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

ASSEMBLED BY : E. E. MURRAY DATE : 4/12/12  
 CHECKED BY : B. L. GREEN DATE : 4/12/12  
 DRAWN BY : CVC 6/10  
 CHECKED BY : DNS 6/10



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

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:

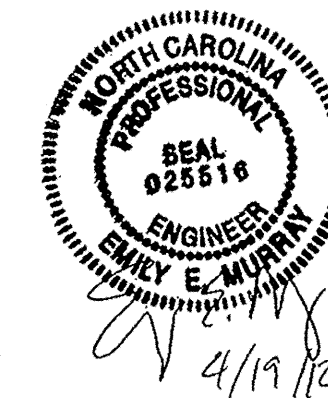
MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.

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

COMMENTS:

- 1.
- 2.
- 3.
- 4.

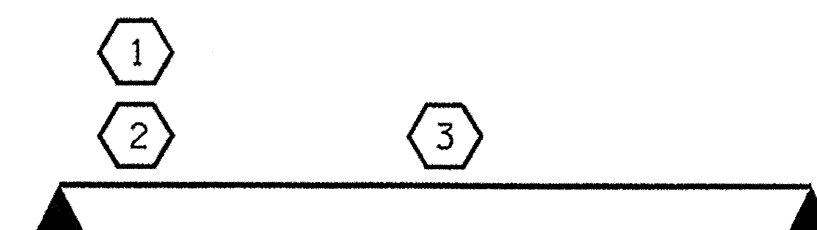
|  |                            |
|--|----------------------------|
| #  | CONTROLLING LOAD RATING    |
| 1  | DESIGN LOAD RATING (HL-93) |
| 2  | DESIGN LOAD RATING (HS-20) |
| 3  | LEGAL LOAD RATING **       |
| ** SEE CHART FOR VEHICLE TYPE  |                            |
| GIRDER LOCATION  |                            |
| I - INTERIOR GIRDER<br>EL - EXTERIOR LEFT GIRDER<br>ER - EXTERIOR RIGHT GIRDER |                            |



PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-

|   |     |       |     |     |       |
|---|-----|-------|-----|-----|-------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH                                      |     |       |     |     |       |
| STANDARD<br>LRFR SUMMARY FOR<br>50' CORED SLAB UNIT<br>75° SKEW & 105° SKEW<br>(NON-INTERSTATE TRAFFIC) |     |       |     |     |       |
| REVISIONS   |     |       |     |     |       |
| NO.   | BY: | DATE: | NO. | BY: | DATE: |
| 1   |     |       | 3   |     |       |
| 2   |     |       | 4   |     |       |
| SHEET NO.   |     |       |     |     | 3-4   |
| TOTAL SHEETS  |     |       |     |     | 4     |

| LEVEL                    | VEHICLE    | WEIGHT (W)<br>(TONS) | CONTROLLING<br>LOAD RATING | MINIMUM<br>RATING FACTORS<br>(RF) | TONS = W X RF | STRENGTH I LIMIT STATE |                              |               |      |                 |   |                              |               |      |                 | SERVICE III LIMIT STATE                   |                     |                              |               |      | COMMENT NUMBER |                 |   |  |
|--------------------------|------------|----------------------|----------------------------|-----------------------------------|---------------|------------------------|------------------------------|---------------|------|-----------------|---|------------------------------|---------------|------|-----------------|---|---------------------|------------------------------|---------------|------|----------------|-----------------|---|--|
|                          |            |                      |                            |                                   |               | MOMENT                 |                              |               |      |                 | SHEAR                                     |                              |               |      |                 | MOMENT                                    |                     |                              |               |      |                |                 |   |  |
|                          |            |                      |                            |                                   |               | LIVELOAD<br>FACTORS    | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) | LIVELOAD<br>FACTORS | DISTRIBUTION<br>FACTORS (DF) | RATING FACTOR | SPAN |                | GIRDER LOCATION | DISTANCE FROM<br>LEFT END OF<br>SPAN (ft) |  |
| DESIGN<br>LOAD<br>RATING | HL-93(Inv) | N/A                  | 1                          | 1.205                             | --            | 1.75                   | 0.271                        | 1.59          | 50'  | EL              | 24.482                                    | 0.616                        | 1.2           | 50'  | EL              | 4.896                                     | 0.80                | 0.271                        | 1.46          | 50'  | EL             | 24.482          |   |  |
|                          | HL-93(0pr) | N/A                  | --                         | 1.562                             | --            | 1.35                   | 0.271                        | 2.06          | 50'  | EL              | 24.482                                    | 0.616                        | 1.56          | 50'  | EL              | 4.896                                     | N/A                 | --                           | --            | --   | --             | --              |   |  |
|                          | HS-20(Inv) | 36.000               | 2                          | 1.434                             | 51.614        | 1.75                   | 0.271                        | 1.97          | 50'  | EL              | 24.482                                    | 0.616                        | 1.43          | 50'  | EL              | 4.896                                     | 0.80                | 0.271                        | 1.81          | 50'  | EL             | 24.482          |   |  |
|                          | HS-20(0pr) | 36.000               | --                         | 1.859                             | 66.906        | 1.35                   | 0.271                        | 2.56          | 50'  | EL              | 24.482                                    | 0.616                        | 1.86          | 50'  | EL              | 4.896                                     | N/A                 | --                           | --            | --   | --             | --              |   |  |
| LEGAL<br>LOAD<br>RATING  | SV         | SNSH                 | 13.500                     | --                                | 3.678         | 49.655                 | 1.4                          | 0.271         | 5.02 | 50'             | EL  | 24.482                       | 0.616         | 4    | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 3.68 | 50'            | EL              | 24.482                                    |  |
|                          |            | SNGARBS2             | 20.000                     | --                                | 2.905         | 58.101                 | 1.4                          | 0.271         | 3.97 | 50'             | EL  | 24.482                       | 0.616         | 2.93 | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 2.91 | 50'            | EL              | 24.482                                    |  |
|                          |            | SNAGRIS2             | 22.000                     | --                                | 2.748         | 60.456                 | 1.4                          | 0.271         | 3.83 | 50'             | EL  | 19.586                       | 0.616         | 2.75 | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 2.81 | 50'            | EL              | 24.482                                    |  |
|                          |            | SNCOTTS3             | 27.250                     | --                                | 1.835         | 49.998                 | 1.4                          | 0.271         | 2.5  | 50'             | EL  | 24.482                       | 0.616         | 2.01 | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 1.83 | 50'            | EL              | 24.482                                    |  |
|                          |            | SNAGGRS4             | 34.925                     | --                                | 1.595         | 55.714                 | 1.4                          | 0.271         | 2.18 | 50'             | EL  | 24.482                       | 0.616         | 1.72 | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 1.60 | 50'            | EL              | 24.482                                    |  |
|                          |            | SNS5A                | 35.550                     | --                                | 1.556         | 55.303                 | 1.4                          | 0.271         | 2.12 | 50'             | EL  | 24.482                       | 0.616         | 1.77 | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 1.56 | 50'            | EL              | 24.482                                    |  |
|                          |            | SNS6A                | 39.950                     | --                                | 1.455         | 58.112                 | 1.4                          | 0.271         | 1.99 | 50'             | EL  | 24.482                       | 0.616         | 1.64 | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 1.45 | 50'            | EL              | 24.482                                    |  |
|                          | SNS7B      | 42.000               | --                         | 1.386                             | 58.224        | 1.4                    | 0.271                        | 1.89          | 50'  | EL              | 24.482                                    | 0.616                        | 1.65          | 50'  | EL              | 4.896                                     | 0.80                | 0.271                        | 1.39          | 50'  | EL             | 24.482          |   |  |
|                          | TTST       | TNAGRIT3             | 33.000                     | --                                | 1.782         | 58.809                 | 1.4                          | 0.271         | 2.43 | 50'             | EL  | 24.482                       | 0.616         | 1.94 | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 1.78 | 50'            | EL              | 24.482                                    |  |
|                          |            | TNT4A                | 33.075                     | --                                | 1.798         | 59.458                 | 1.4                          | 0.271         | 2.45 | 50'             | EL  | 24.482                       | 0.616         | 1.86 | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 1.80 | 50'            | EL              | 24.482                                    |  |
|                          |            | TNT6A                | 41.600                     | --                                | 1.497         | 62.293                 | 1.4                          | 0.271         | 2.04 | 50'             | EL  | 24.482                       | 0.616         | 1.8  | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 1.50 | 50'            | EL              | 24.482                                    |  |
|                          |            | TNT7A                | 42.000                     | --                                | 1.52          | 63.842                 | 1.4                          | 0.271         | 2.08 | 50'             | EL  | 24.482                       | 0.616         | 1.67 | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 1.52 | 50'            | EL              | 24.482                                    |  |
|                          |            | TNT7B                | 42.000                     | --                                | 1.585         | 66.559                 | 1.4                          | 0.271         | 2.16 | 50'             | EL  | 24.482                       | 0.616         | 1.59 | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 1.58 | 50'            | EL              | 24.482                                    |  |
|                          |            | TNAGRIT4             | 43.000                     | --                                | 1.504         | 64.667                 | 1.4                          | 0.271         | 2.05 | 50'             | EL  | 24.482                       | 0.616         | 1.53 | 50'             | EL  | 4.896               | 0.80                         | 0.271         | 1.50 | 50'            | EL              | 24.482                                    |  |
| TNAGT5A                  |            | 45.000               | --                         | 1.405                             | 63.217        | 1.4                    | 0.271                        | 1.92          | 50'  | EL              | 24.482                                    | 0.616                        | 1.56          | 50'  | EL              | 4.896                                     | 0.80                | 0.271                        | 1.40          | 50'  | EL             | 24.482          |   |  |
| TNAGT5B                  | 45.000     | 3                    | 1.376                      | 61.936                            | 1.4           | 0.271                  | 1.88                         | 50'           | EL   | 24.482          | 0.616                                     | 1.45                         | 50'           | EL   | 4.896           | 0.80                                      | 0.271               | 1.38                         | 50'           | EL   | 24.482         |                 |   |  |



LRFR SUMMARY

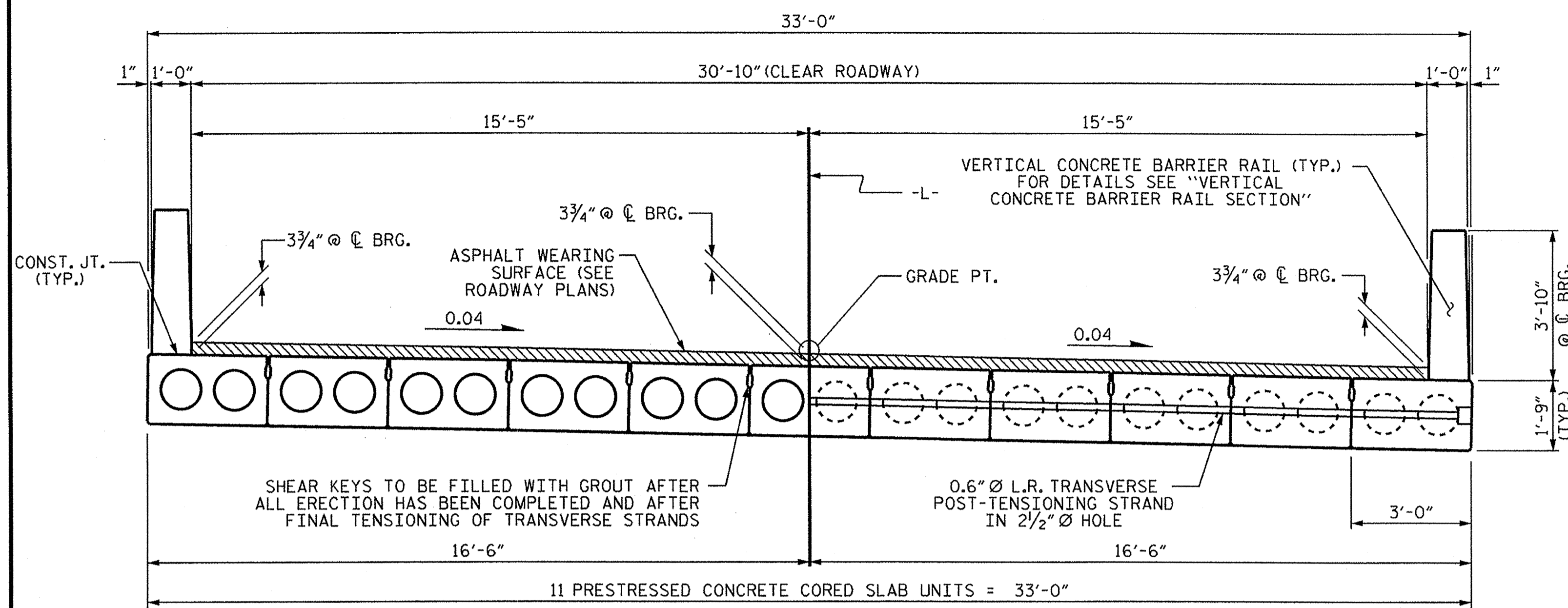
FOR SPAN 50'

ASSEMBLED BY : E. E. MURRAY DATE : 4/12/12  
 CHECKED BY : B. L. GREEN DATE : 4/12/12  
 DRAWN BY : CVC 6/10  
 CHECKED BY : DNS 6/10

19-APR-2012 15:02  
 S:\DPT\Emily\BDR\Projects\BD-5103R\BD5103R.SD.CS.dgn  
 emurray

STD. NO. 21LRFR1-75&105S-50L





HALF SECTION AT INTERMEDIATE DIAPHRAGMS  
 HALF SECTION THROUGH VOIDS

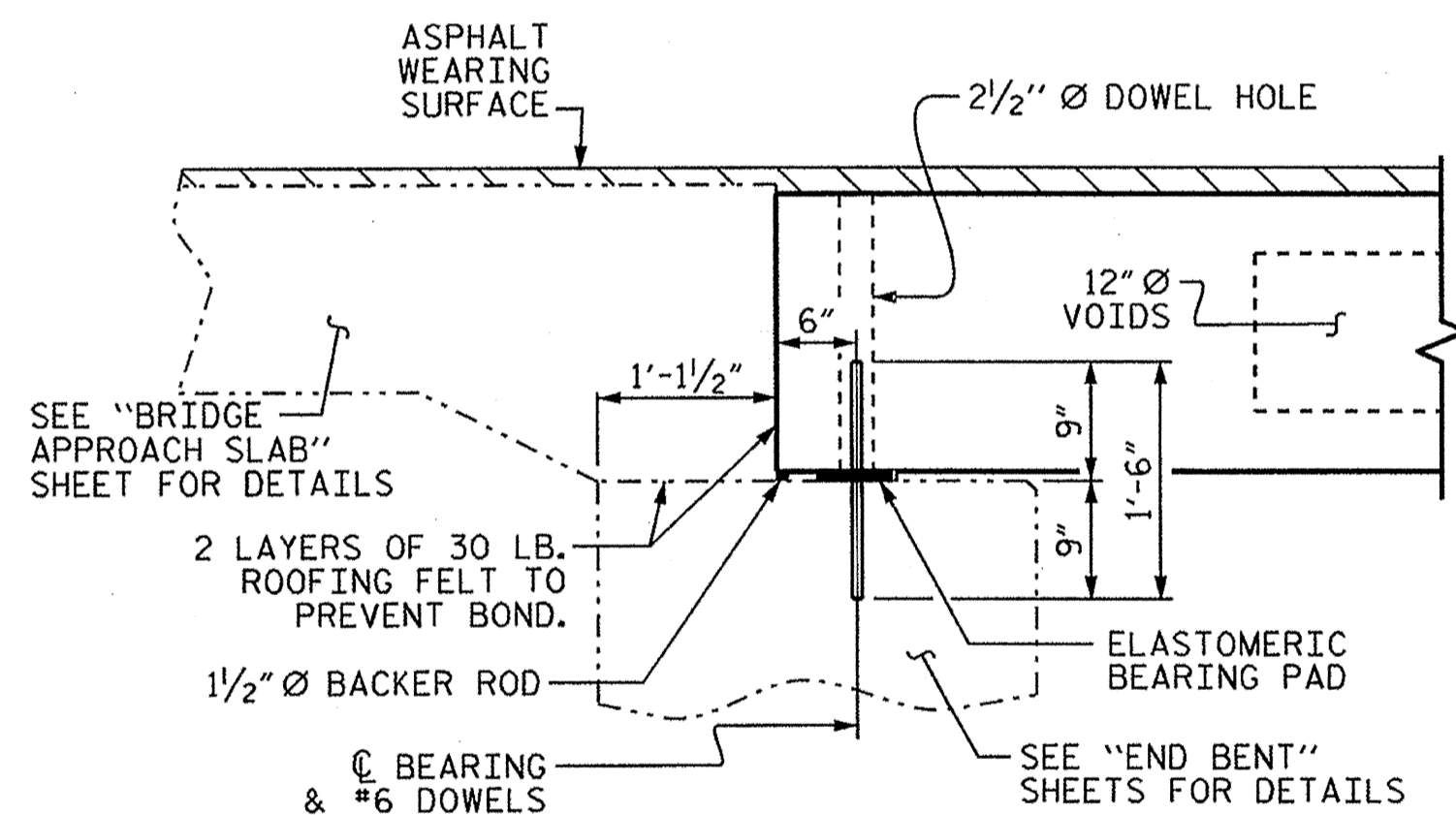
**TYPICAL SECTION**

\* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

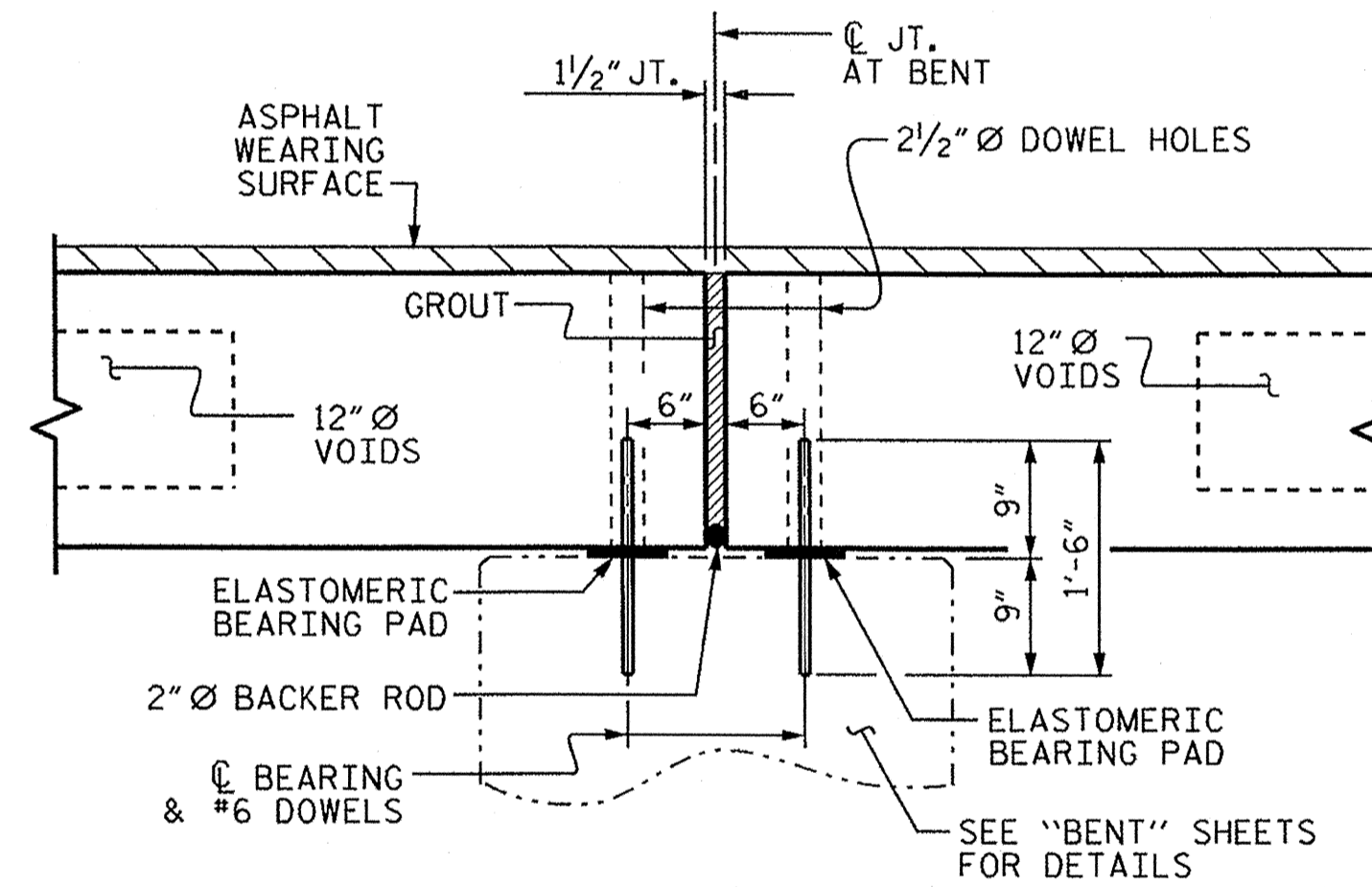
FIXED END

FIXED END

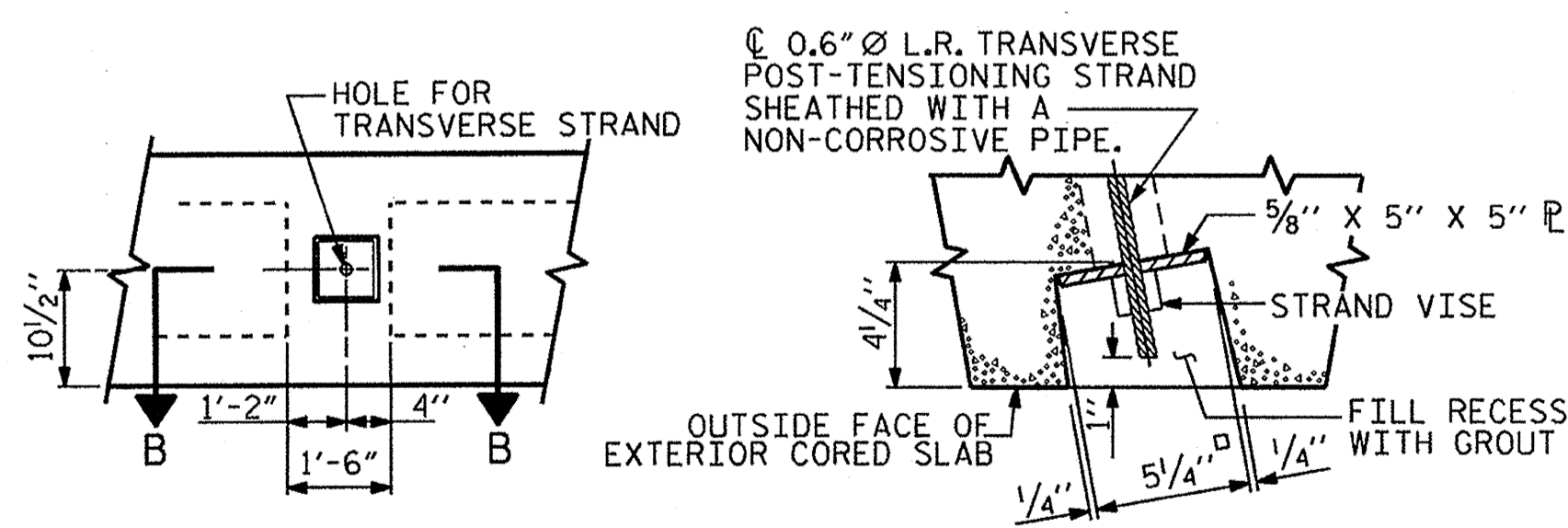
FIXED END



**SECTION AT END BENT**



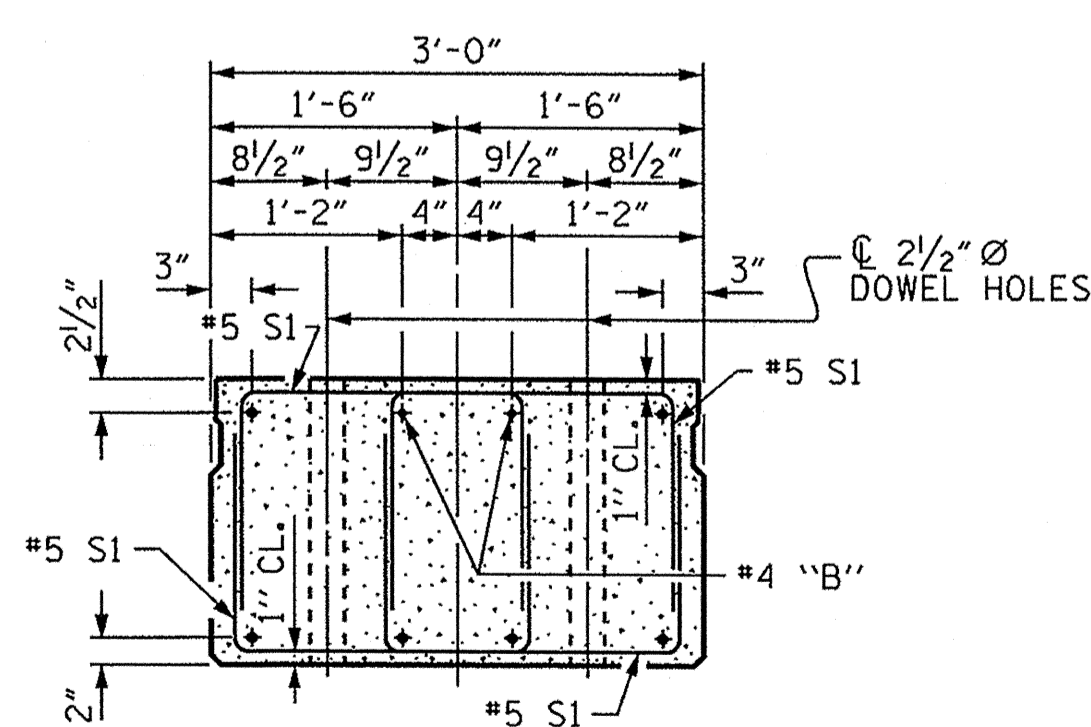
**SECTION AT BENT**



ELEVATION VIEW

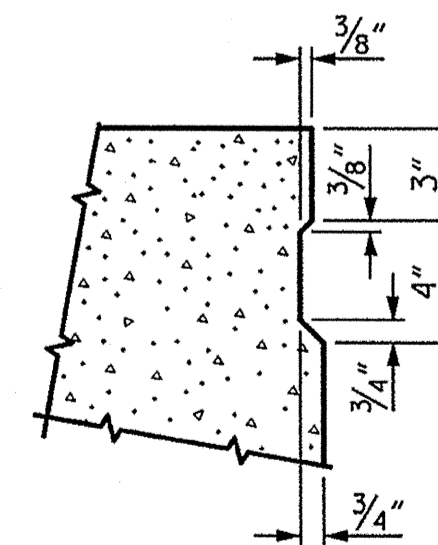
SECTION B-B

**GRAUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS**



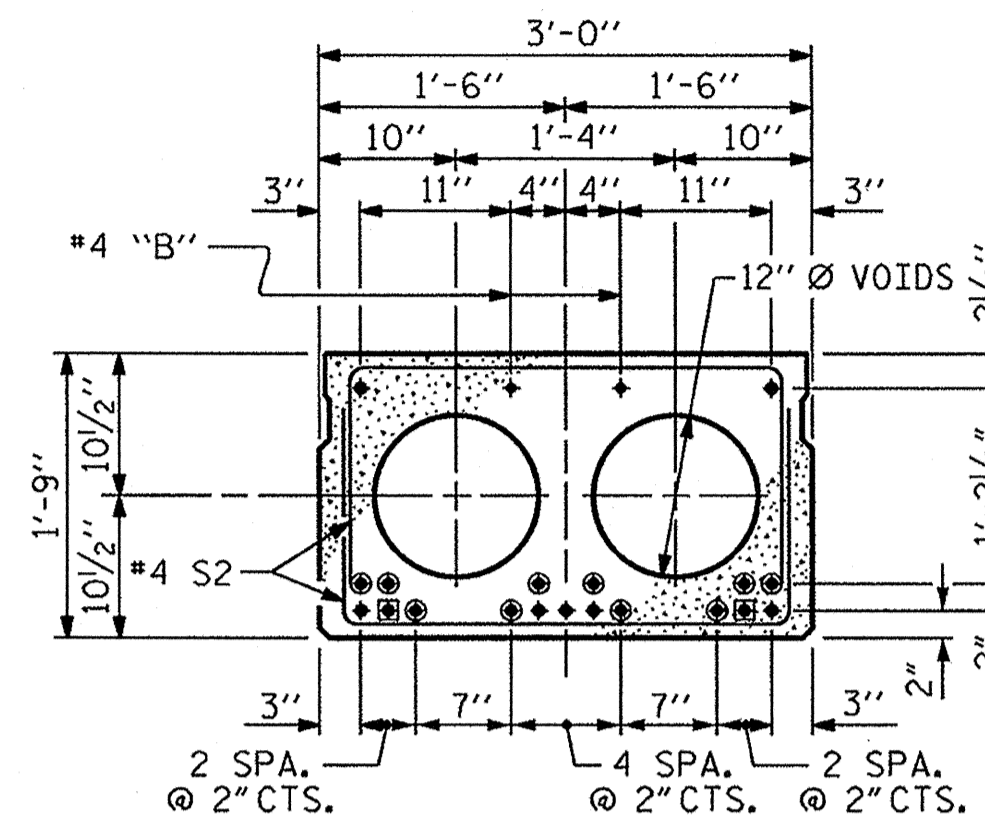
**END ELEVATION**

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN). INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.

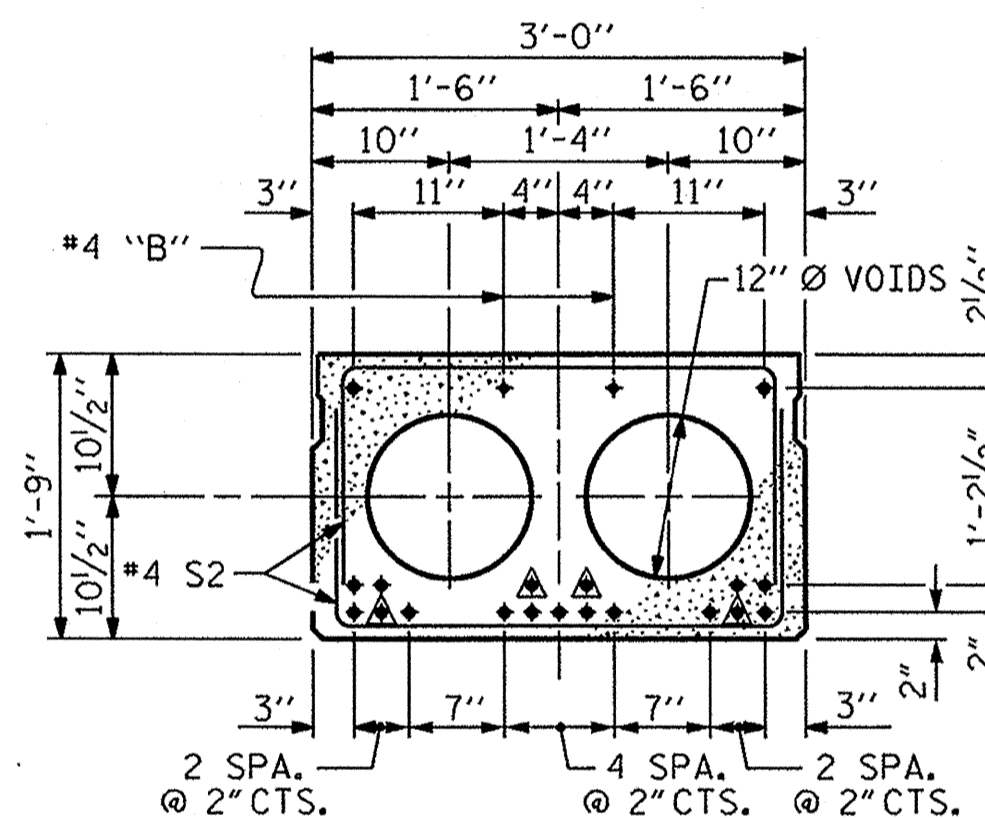


**SHEAR KEY DETAIL**

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

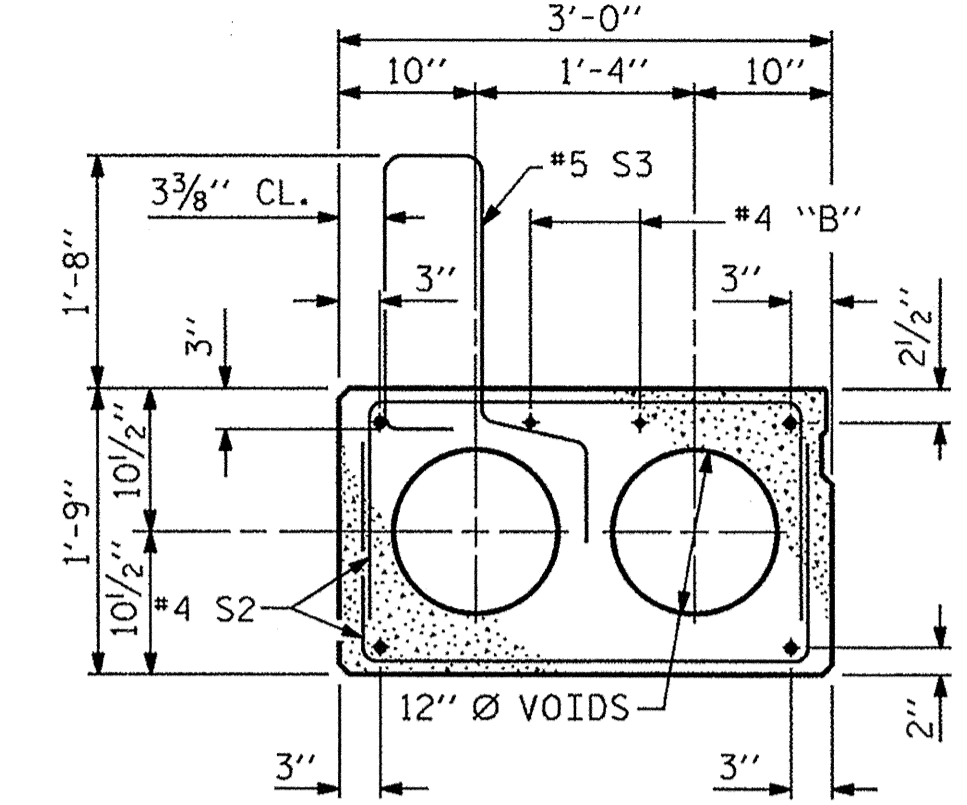


**INTERIOR SLAB SECTION (25' UNIT)**  
(9 STRANDS REQUIRED)



**INTERIOR SLAB SECTION (50' UNIT)**  
(19 STRANDS REQUIRED)

**0.6" Ø LOW RELAXATION STRAND LAYOUT**



**EXT. SLAB SECTION**

(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

■ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

● OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED, IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

**DEBONDING LEGEND**

PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-

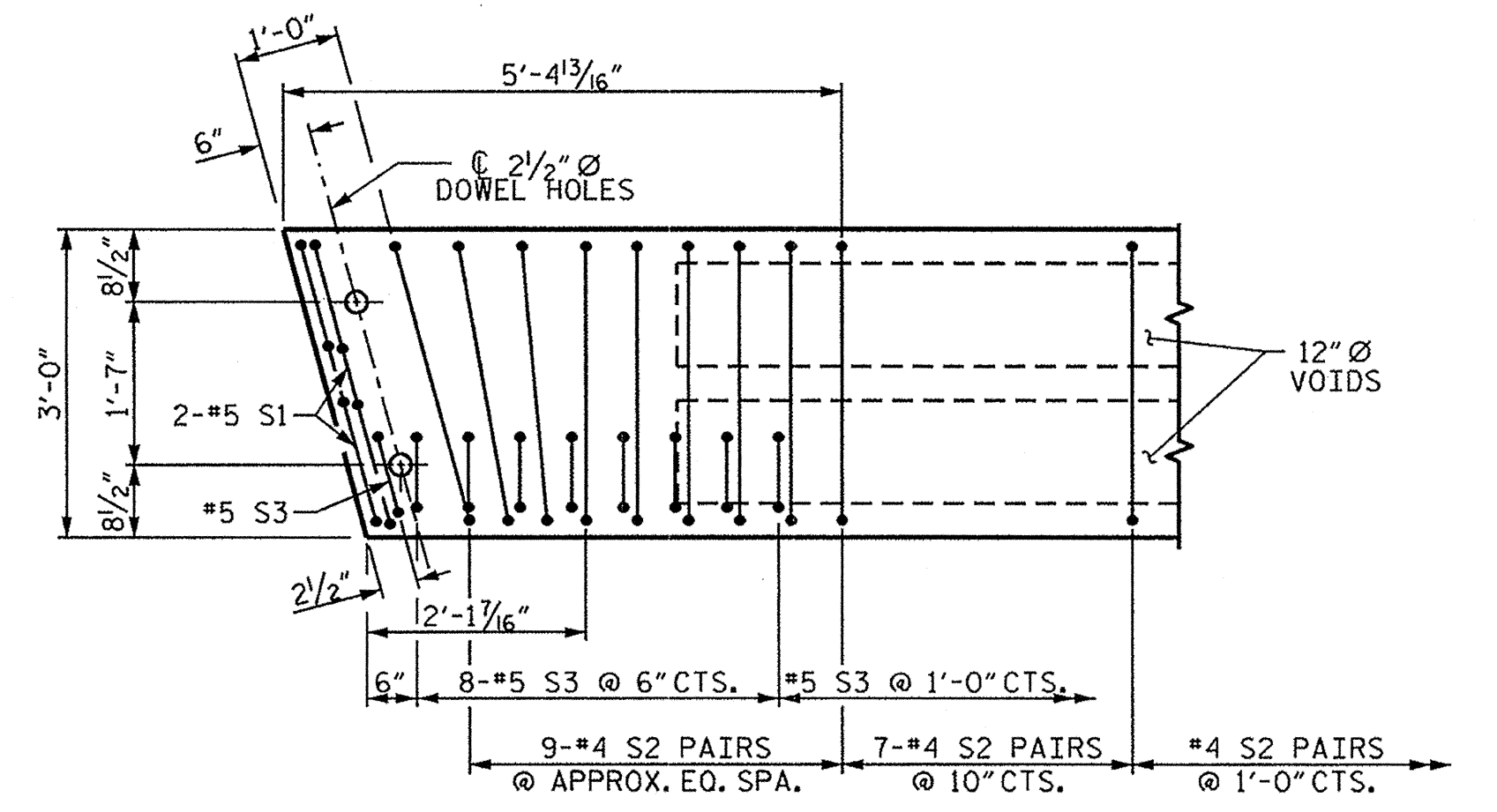
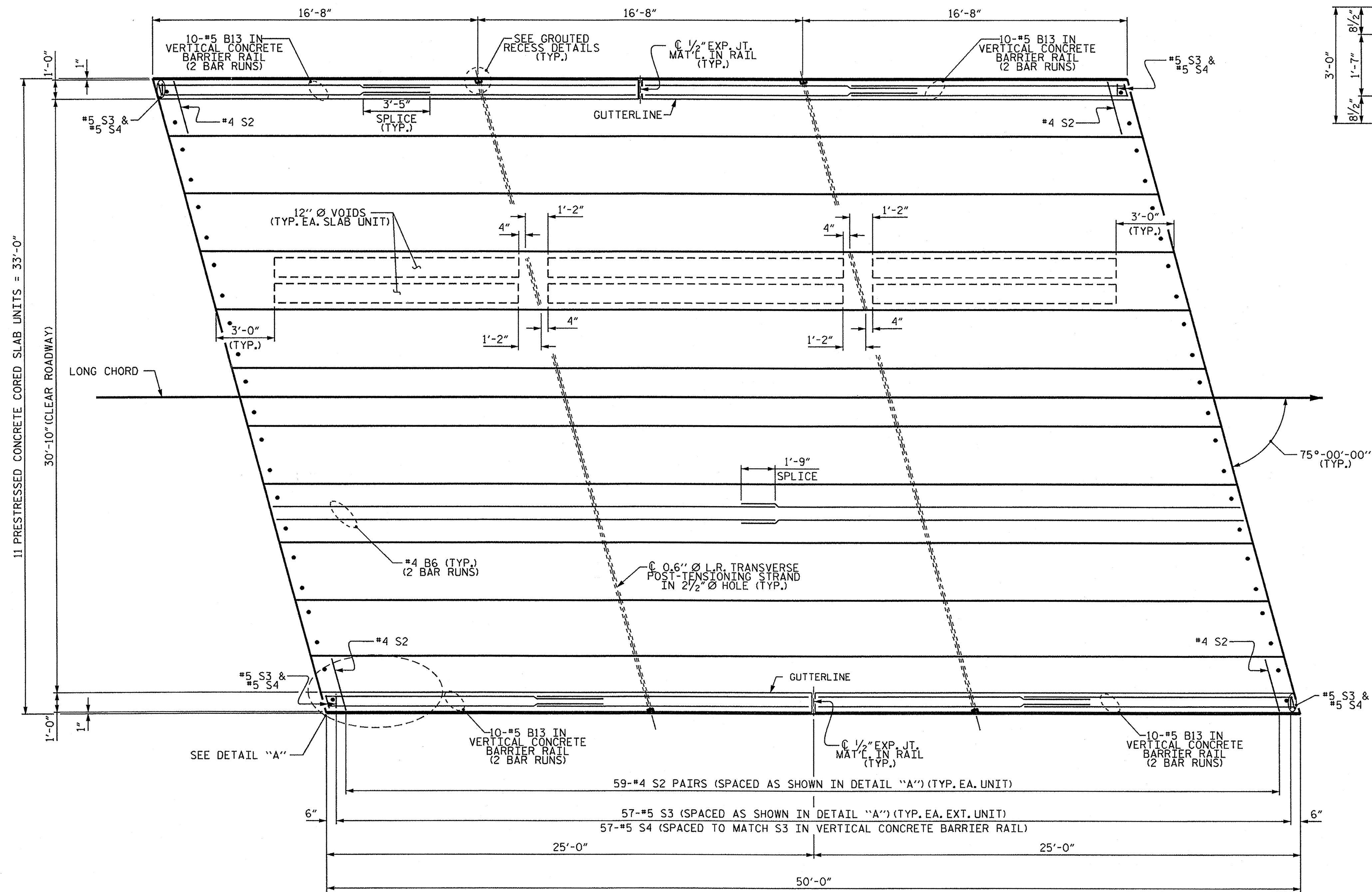
SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 3'-0" X 1'-9"  
 PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 75° SKEW

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



|                          |                |
|--------------------------|----------------|
| ASSEMBLED BY : A.M. LEE  | DATE : 7/23/12 |
| CHECKED BY : E.E. MURRAY | DATE : 7/24/12 |
| DRAWN BY : DGE 5/09      | REV. 12/11     |
| CHECKED BY : BCH 6/09    | MAA/AAC        |



DETAIL "A"  
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

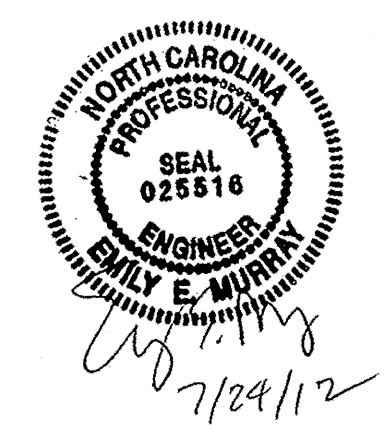
PLAN OF UNIT

PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PLAN OF 50' UNIT  
 30'-10" CLEAR ROADWAY  
 75° SKEW

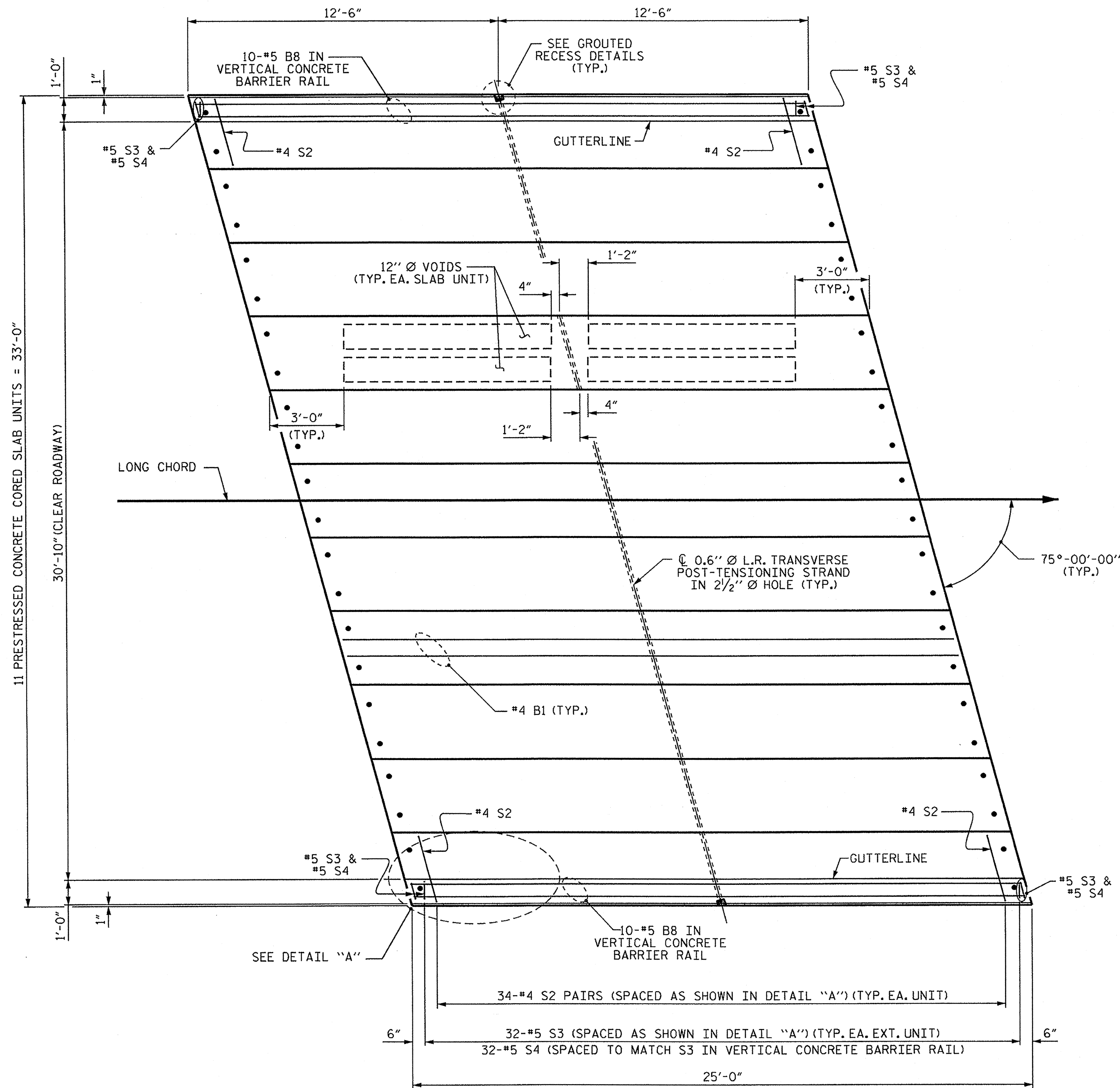


|                |             |        |              |
|----------------|-------------|--------|--------------|
| ASSEMBLED BY : | A.M. LEE    | DATE : | 7/23/12      |
| CHECKED BY :   | E.E. MURRAY | DATE : | 7/24/12      |
| DRAWN BY :     | DGE         | 5/09   | REV. 12/5/11 |
| CHECKED BY :   | BCH         | 6/09   | MAA/AAC      |

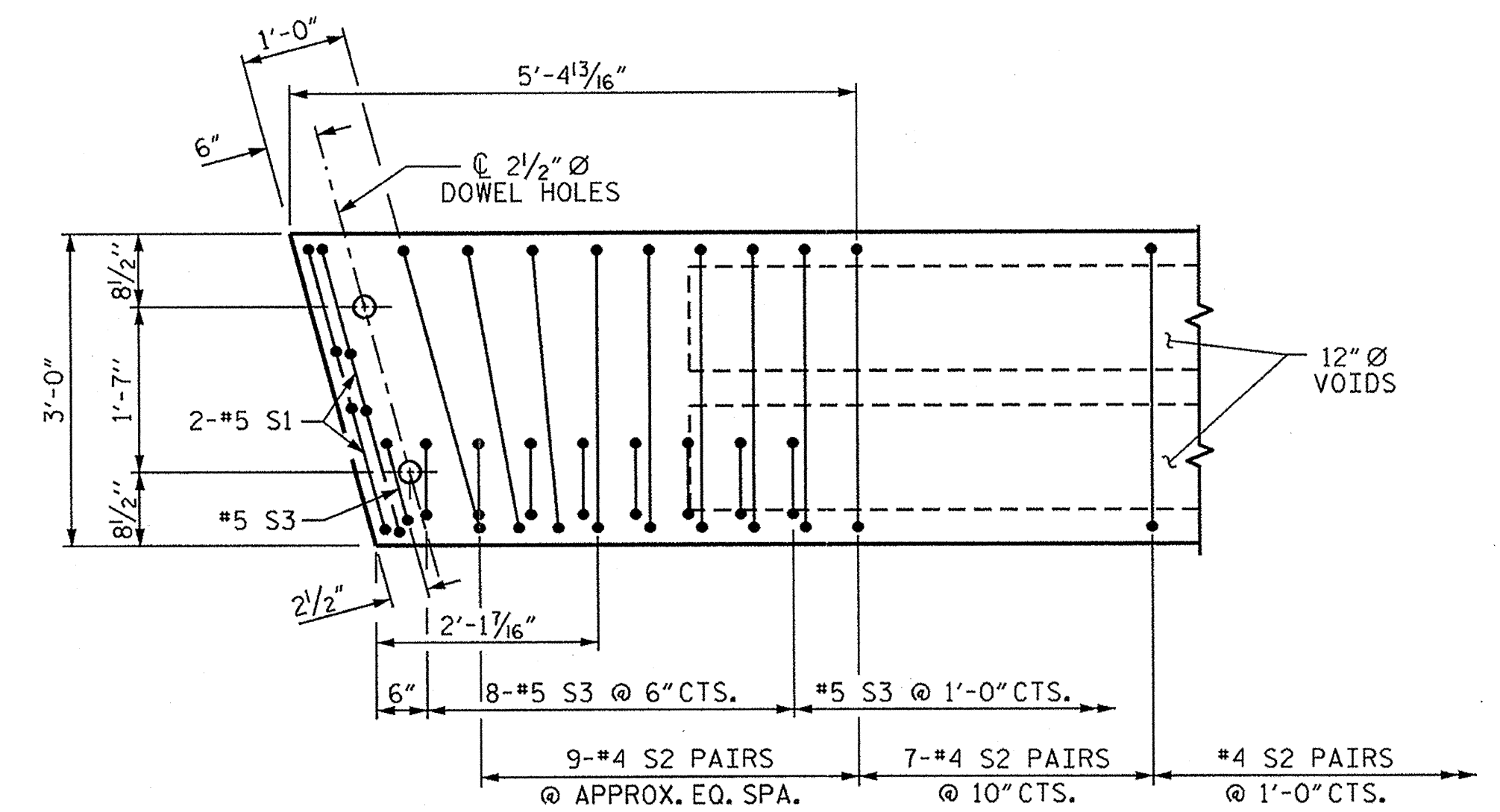
| REVISIONS |     |       |     |     |       | SHEET NO.    |   |
|-----------|-----|-------|-----|-----|-------|--------------|---|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |   |
| 1         |     |       | 3   |     |       | 5            | 6 |
| 2         |     |       | 4   |     |       | 19           |   |

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 emlee





PLAN OF UNIT



DETAIL "A"

NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PLAN OF 25' UNIT  
 30'-10" CLEAR ROADWAY  
 75° SKEW



|                          |                      |
|--------------------------|----------------------|
| ASSEMBLED BY : A.M. LEE  | DATE : 7/23/12       |
| CHECKED BY : E.M. MURRAY | DATE : 7/24/12       |
| DRAWN BY : DGE 3/09      | REV. 12/5/11 MAA/AAC |
| CHECKED BY : BCH 3/09    |                      |

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |
| 1         |     |       | 3   |     |       | 5-7          |
| 2         |     |       | 4   |     |       | 19           |

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| CORED SLABS REQUIRED |        |        |              |
|----------------------|--------|--------|--------------|
| 25' UNIT             | NUMBER | LENGTH | TOTAL LENGTH |
| EXTERIOR C.S.        | 2      | 25'-0" | 50'-0"       |
| INTERIOR C.S.        | 9      | 25'-0" | 225'-0"      |
| TOTAL                | 11     |        | 275'-0"      |

| CORED SLABS REQUIRED |        |        |              |
|----------------------|--------|--------|--------------|
| 50' UNIT             | NUMBER | LENGTH | TOTAL LENGTH |
| EXTERIOR C.S.        | 2      | 50'-0" | 100'-0"      |
| INTERIOR C.S.        | 9      | 50'-0" | 450'-0"      |
| TOTAL                | 11     |        | 550'-0"      |

| BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL |                                 |           |      |      |         |        |
|---|---------------------------------|-----------|------|------|---------|--------|
| BAR   | BARS PER PAIR OF EXTERIOR UNITS | TOTAL NO. | SIZE | TYPE | LENGTH  | WEIGHT |
| 25' UNIT  |                                 |           |      |      |         |        |
| * B8  | 20                              | 20        | #5   | STR  | 24'-6"  | 511    |
| * S4  | 68                              | 68        | #5   | 2    | 7'-2"   | 508    |
| * EPOXY COATED REINFORCING STEEL                    |                                 |           |      |      | LBS.    | 1019   |
| CLASS AA CONCRETE                                   |                                 |           |      |      | CU.YDS. | 6.6    |
| TOTAL VERTICAL CONCRETE BARRIER RAIL                |                                 |           |      |      | LN. FT. | 50.25  |

| BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL |                                 |           |      |      |         |        |
|---|---------------------------------|-----------|------|------|---------|--------|
| BAR   | BARS PER PAIR OF EXTERIOR UNITS | TOTAL NO. | SIZE | TYPE | LENGTH  | WEIGHT |
| 50' UNIT  |                                 |           |      |      |         |        |
| * B13   | 80                              | 80        | #5   | STR  | 14'-2"  | 1182   |
| * S4  | 118                             | 118       | #5   | 2    | 7'-2"   | 882    |
| * EPOXY COATED REINFORCING STEEL                    |                                 |           |      |      | LBS.    | 2064   |
| CLASS AA CONCRETE                                   |                                 |           |      |      | CU.YDS. | 13.1   |
| TOTAL VERTICAL CONCRETE BARRIER RAIL                |                                 |           |      |      | LN. FT. | 100.25 |

| BILL OF MATERIAL FOR ONE 25' CORED SLAB UNIT |        |      |      |                      |                      |                      |                      |
|--|--------|------|------|----------------------|----------------------|----------------------|----------------------|
| BAR  | NUMBER | SIZE | TYPE | EXTERIOR UNIT LENGTH | EXTERIOR UNIT WEIGHT | INTERIOR UNIT LENGTH | INTERIOR UNIT WEIGHT |
| B1   | 2      | #4   | STR  | 24'-7"               | 33                   | 24'-7"               | 33                   |
| S1   | 8      | #5   | 3    | 4'-3"                | 35                   | 4'-3"                | 35                   |
| S2   | 68     | #4   | 3    | 5'-4"                | 242                  | 5'-4"                | 242                  |
| * S3   | 34     | #5   | 1    | 6'-2"                | 219                  |                      |                      |
| REINFORCING STEEL                            |        |      |      | LBS.                 | 310                  |                      | 310                  |
| * EPOXY COATED REINFORCING STEEL             |        |      |      | LBS.                 | 219                  |                      |                      |
| 5000 P.S.I. CONCRETE                         |        |      |      | CU. YDS.             | 3.8                  |                      | 3.8                  |
| 0.6" Ø L.R. STRANDS                          |        |      |      | No.                  | 9                    |                      | 9                    |

| BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT |        |      |      |                      |                      |                      |                      |
|--|--------|------|------|----------------------|----------------------|----------------------|----------------------|
| BAR  | NUMBER | SIZE | TYPE | EXTERIOR UNIT LENGTH | EXTERIOR UNIT WEIGHT | INTERIOR UNIT LENGTH | INTERIOR UNIT WEIGHT |
| B6   | 4      | #4   | STR  | 25'-9"               | 69                   | 25'-9"               | 69                   |
| S1   | 8      | #5   | 3    | 4'-3"                | 35                   | 4'-3"                | 35                   |
| S2   | 118    | #4   | 3    | 5'-4"                | 420                  | 5'-4"                | 420                  |
| * S3   | 59     | #5   | 1    | 6'-2"                | 379                  |                      |                      |
| REINFORCING STEEL                            |        |      |      | LBS.                 | 524                  |                      | 524                  |
| * EPOXY COATED REINFORCING STEEL             |        |      |      | LBS.                 | 379                  |                      |                      |
| 6500 P.S.I. CONCRETE                         |        |      |      | CU. YDS.             | 7.3                  |                      | 7.3                  |
| 0.6" Ø L.R. STRANDS                          |        |      |      | No.                  | 19                   |                      | 19                   |

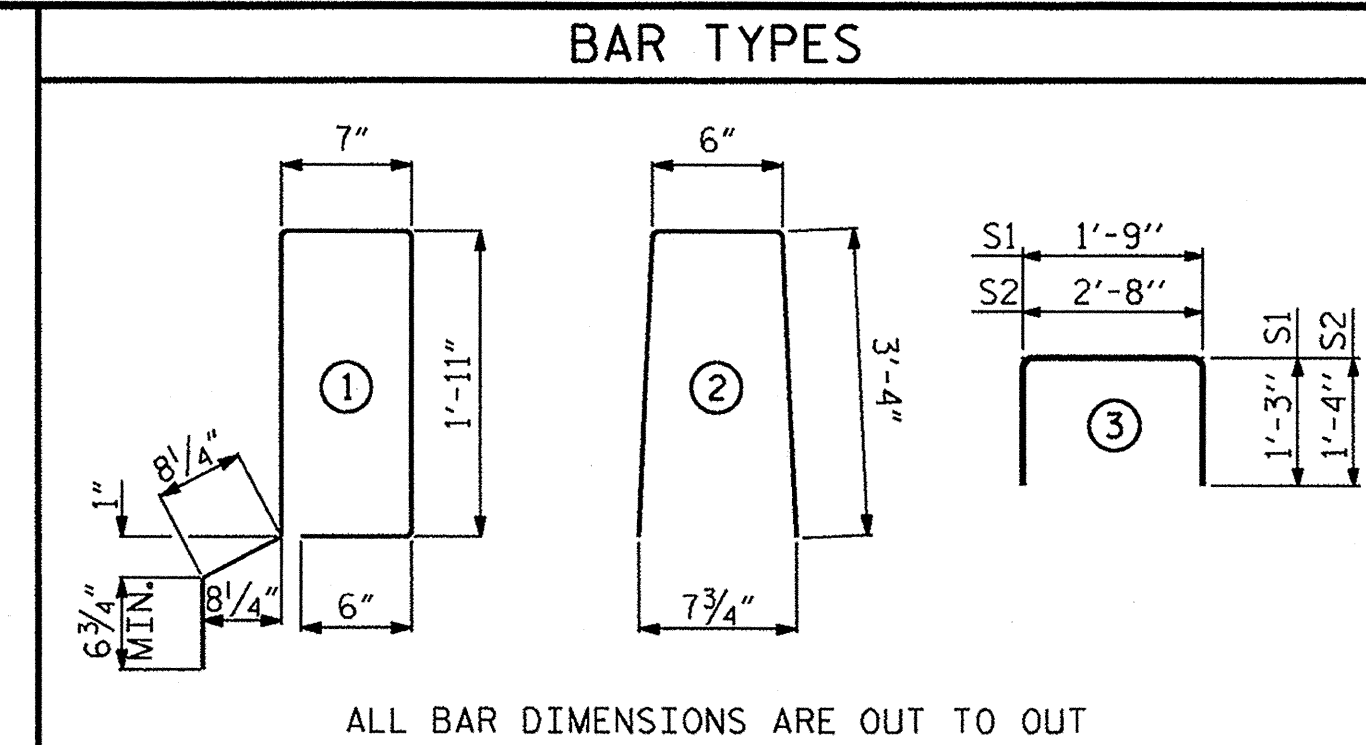
| CONCRETE RELEASE STRENGTH |      |
|---------------------------|------|
| UNIT                      | PSI  |
| 25' UNITS                 | 4000 |
| 50' UNITS                 | 4900 |

ASSEMBLED BY : A.M. LEE DATE : 7/23/12  
 CHECKED BY : E.E. MURRAY DATE : 7/24/12  
 DRAWN BY : DGE 5/09 REV. 12/11 MAA/AAC  
 CHECKED BY : BCH 6/09

| DEAD LOAD DEFLECTION AND CAMBER            |                                  |
|--|----------------------------------|
| 25' CORED SLAB UNIT                        | 3'-0" x 1'-9" 0.6" Ø L.R. STRAND |
| CAMBER (SLAB ALONE IN PLACE)               | 1/2" ↑                           |
| DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD** | 1/8" ↓                           |
| FINAL CAMBER                               | 3/8" ↑                           |

| DEAD LOAD DEFLECTION AND CAMBER            |                                  |
|--|----------------------------------|
| 50' CORED SLAB UNIT                        | 3'-0" x 1'-9" 0.6" Ø L.R. STRAND |
| CAMBER (SLAB ALONE IN PLACE)               | 2 1/2" ↑                         |
| DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD** | 1/4" ↓                           |
| FINAL CAMBER                               | 2 1/4" ↑                         |

| GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT |                           |             |
|--|---------------------------|-------------|
| 30'-10" CLEAR ROADWAY                      | ASPHALT OVERLAY THICKNESS | RAIL HEIGHT |
|  | @ MID-SPAN                | @ MID-SPAN  |
|  | SUPERED SECTION           |             |
| 25' UNITS                                  | 3 3/8"                    | 3'-9 5/8"   |
| 50' UNITS                                  | 1 1/2"                    | 3'-7 3/4"   |



**GRADE 270 STRANDS**

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

**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 CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM, IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

ALL REINFORCING STEEL IN THE VERTICAL CONCRETE BARRIER RAIL SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

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. A 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.

TRANSVERSE POST TENSIONING OF THE CORED SLAB UNITS SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

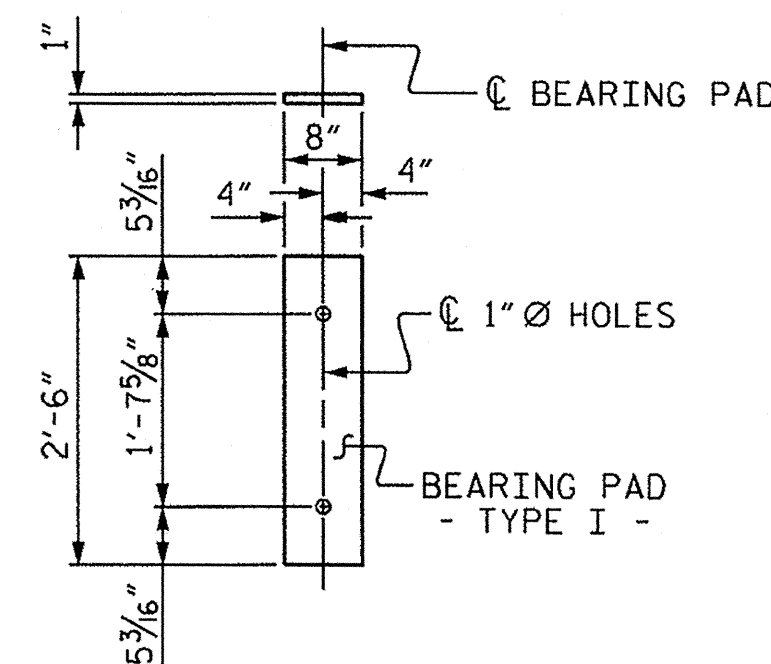
THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

ALL BAR SUPPORTS USED IN THE VERTICAL CONCRETE BARRIER RAIL AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

PRESTRESSED CORED SLAB UNITS ARE DESIGNED FOR 0 PSI TENSION IN THE PRECOMPRESSED TENSILE ZONE UNDER ALL LOADING CONDITIONS.

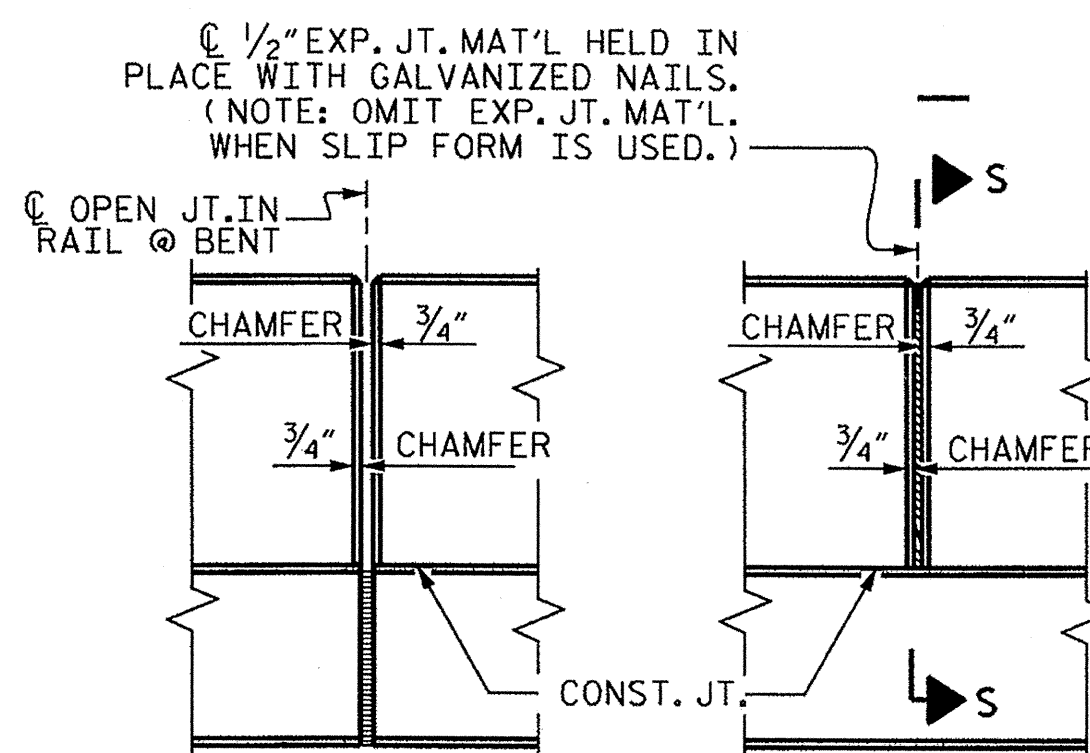
PRESTRESSED CONCRETE CORED SLAB UNITS SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.



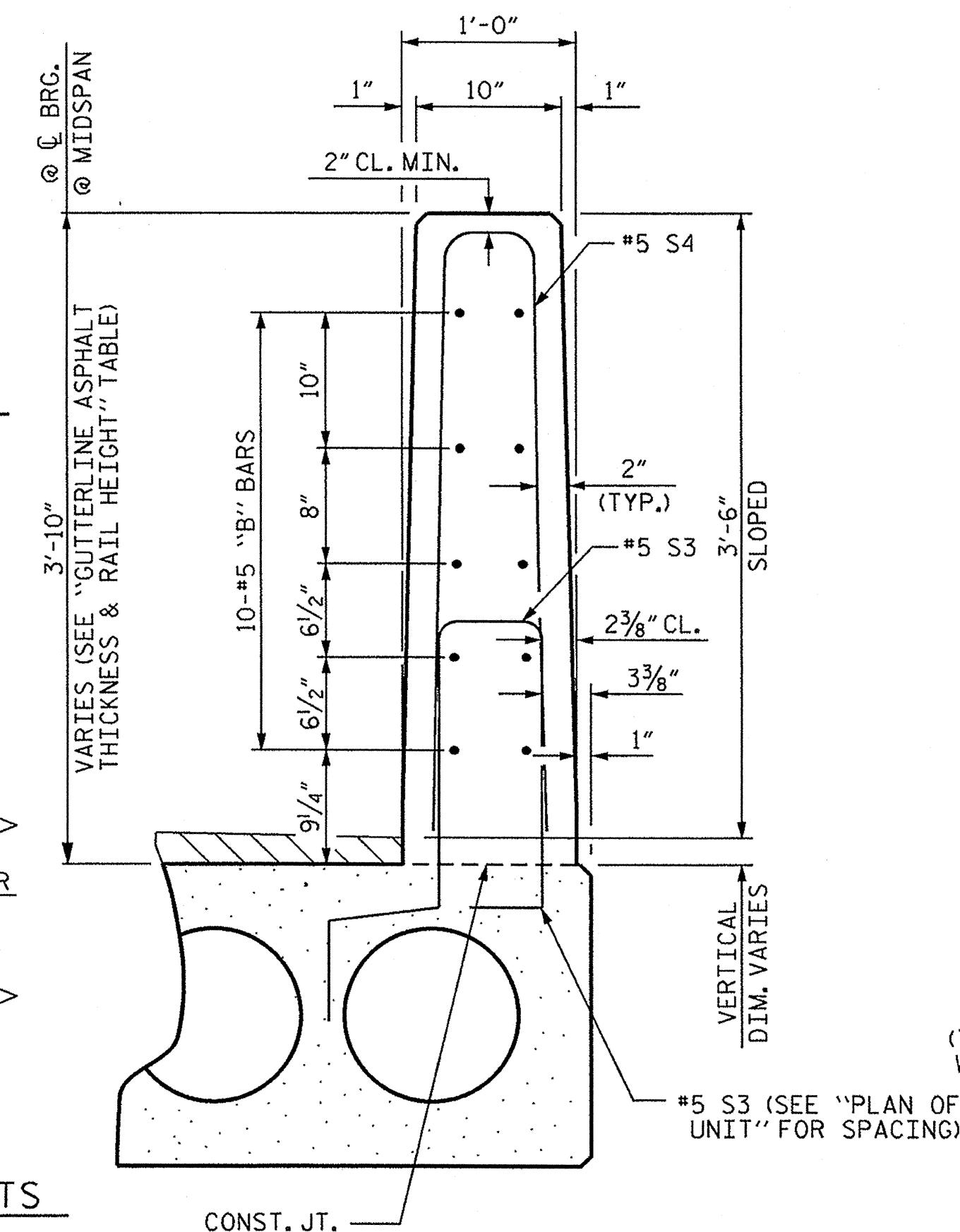
FIXED END (TYPE I - 44 REQ'D)

**ELASTOMERIC BEARING DETAILS**

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.



ELEVATION AT EXPANSION JOINTS



**VERTICAL CONCRETE BARRIER RAIL SECTION**

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



PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-

SHEET 4 OF 4

| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH         |     |       |           |     |       |
|--|-----|-------|-----------|-----|-------|
| STANDARD 3'-0" X 1'-9" PRESTRESSED CONCRETE CORED SLAB UNIT 75° SKEW |     |       |           |     |       |
| REVISIONS  |     |       | SHEET NO. |     |       |
| NO.  | BY: | DATE: | NO.       | BY: | DATE: |
| 1  |     |       | 3         |     |       |
| 2  |     |       | 4         |     |       |

STD. NO. 21" PCS3\_33\_75S



NOTES

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

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

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

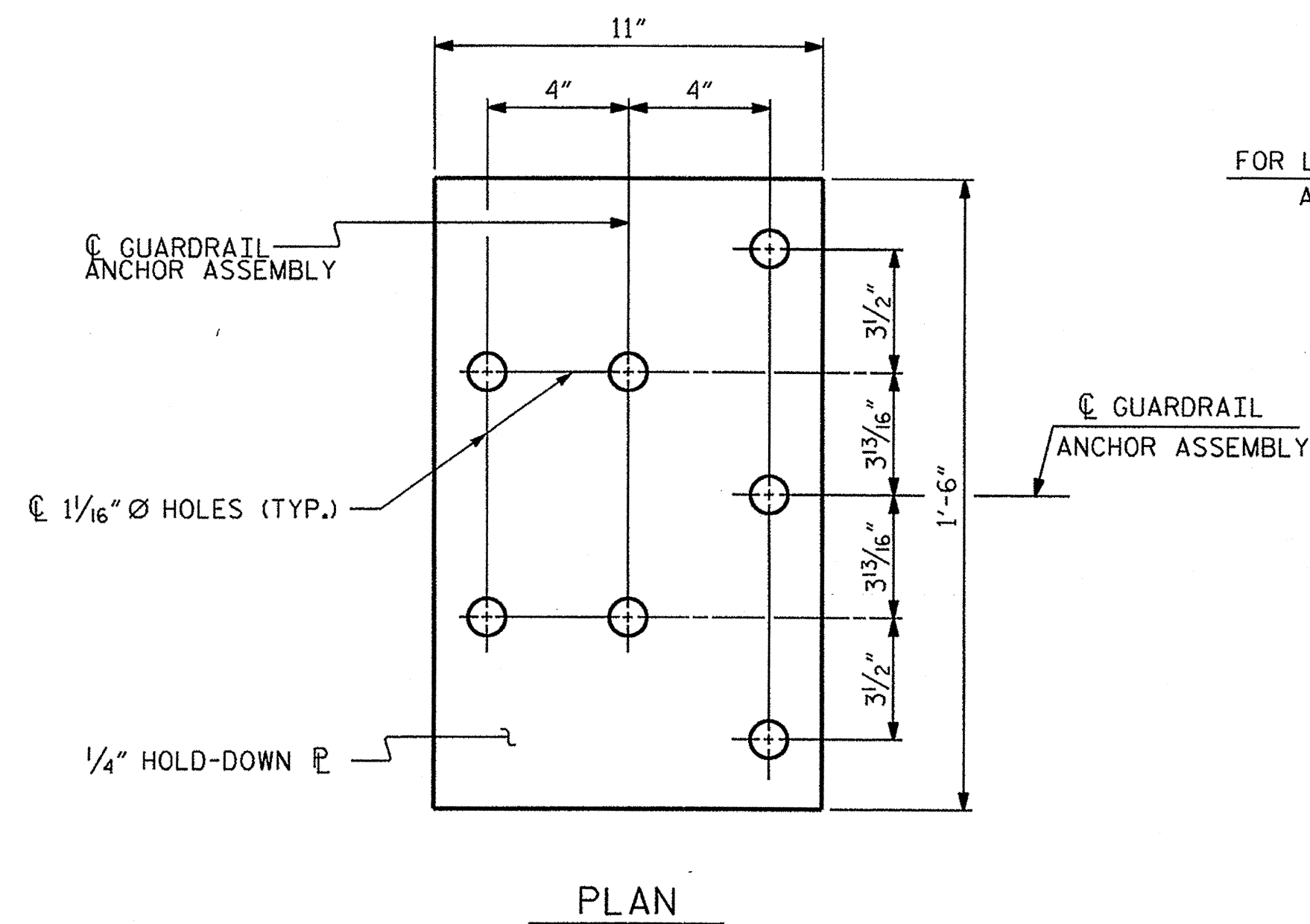
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

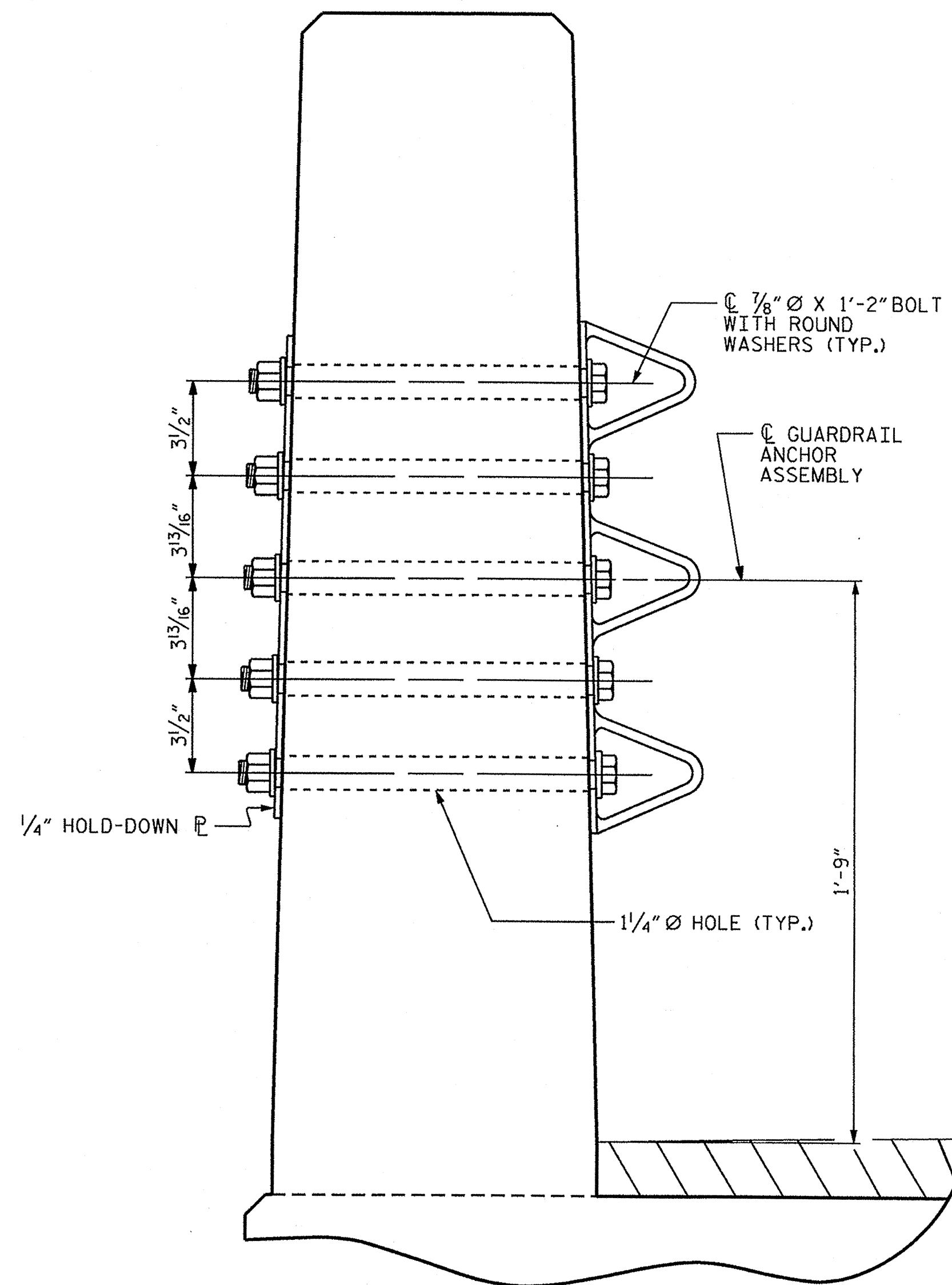
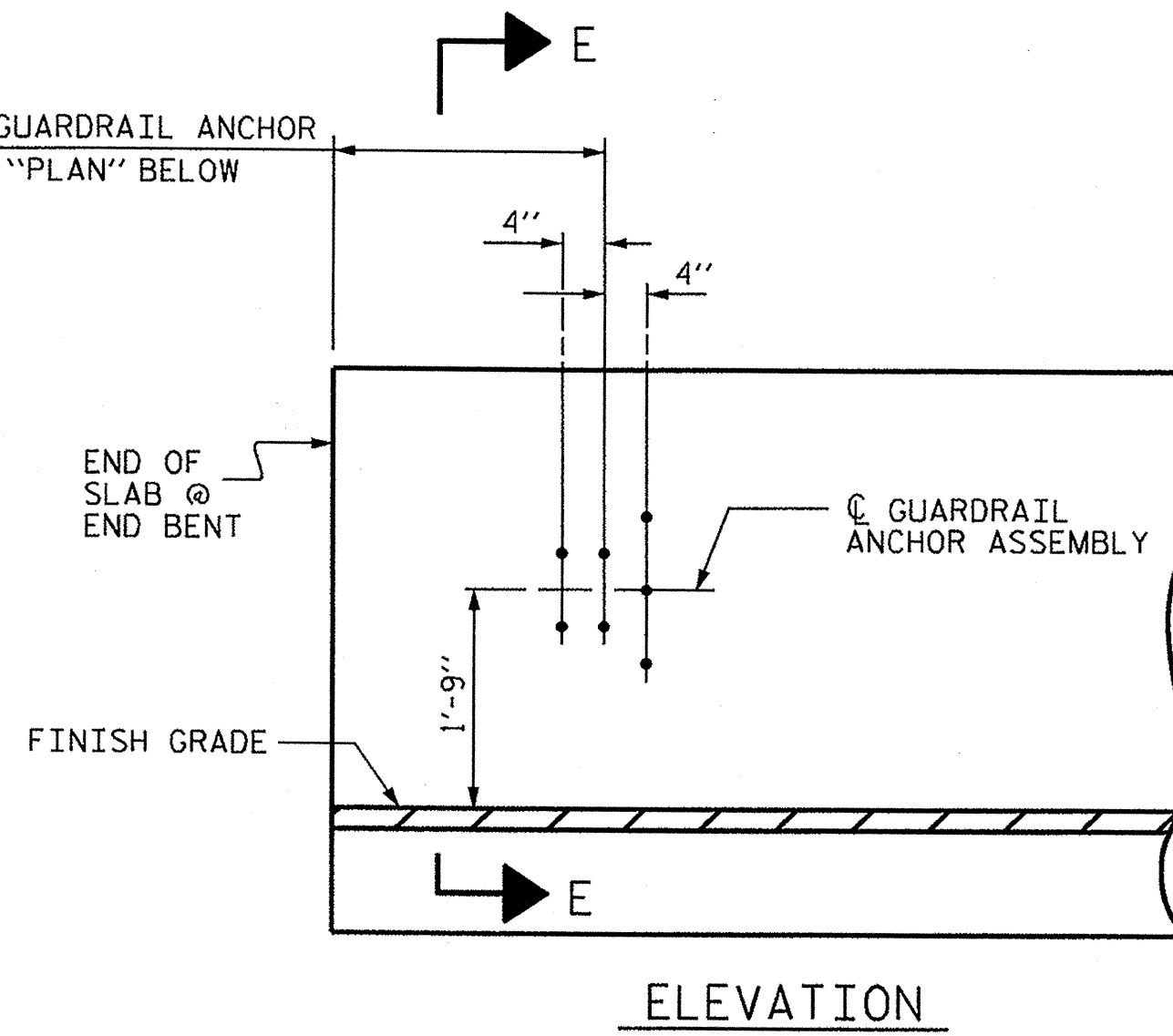
THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.

THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.

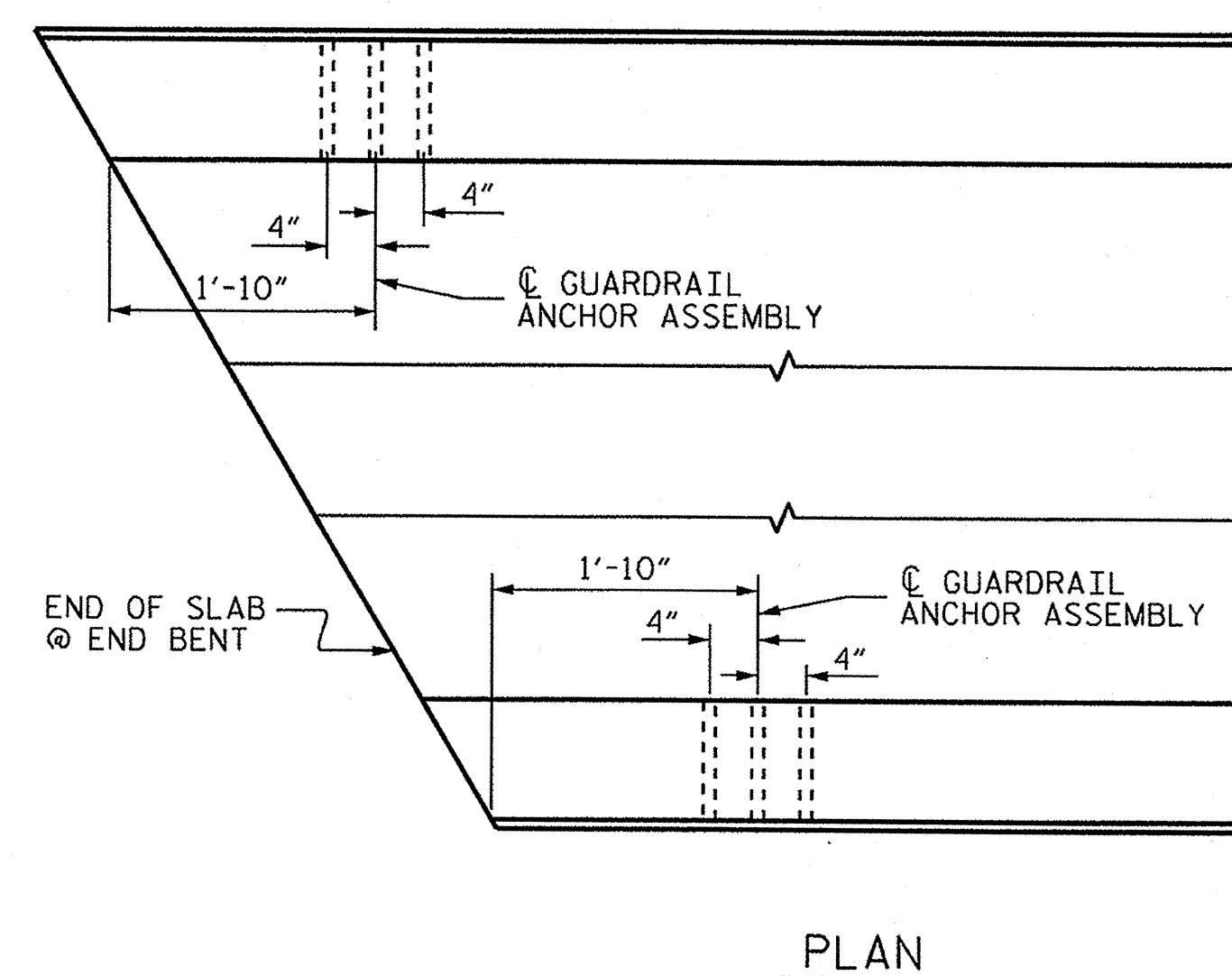
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW

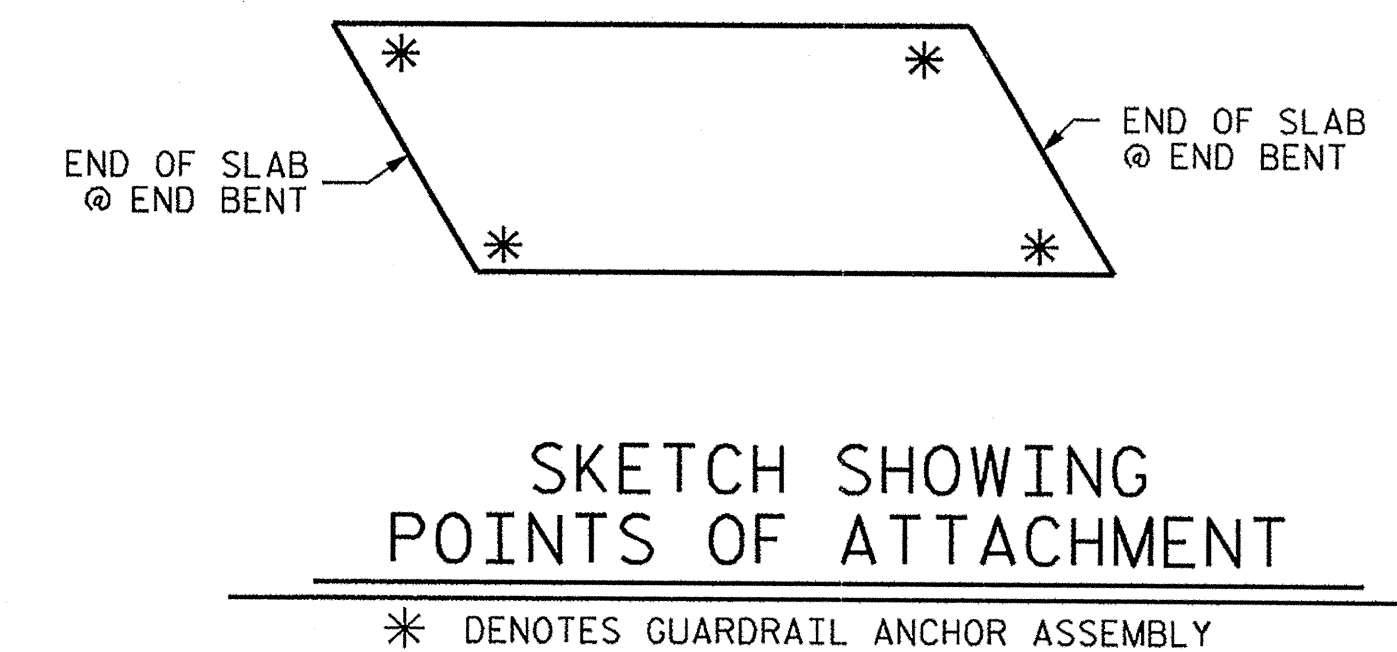


SECTION E-E  
GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENT

\* DENOTES GUARDRAIL ANCHOR ASSEMBLY

PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-



|  |     |       |     |     |           |
|--|-----|-------|-----|-----|-----------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH       |     |       |     |     |           |
| STANDARD<br>GUARDRAIL ANCHORAGE<br>FOR VERTICAL CONCRETE<br>BARRIER RAIL |     |       |     |     |           |
| REVISIONS  |     |       |     |     | SHEET NO. |
| NO.  | BY: | DATE: | NO. | BY: | DATE:     |
| 1  |     |       | 3   |     |           |
| 2  |     |       | 4   |     |           |
| TOTAL SHEETS   |     |       |     |     | 5-9       |
|  |     |       |     |     | 19        |

|                          |                     |
|--------------------------|---------------------|
| ASSEMBLED BY : A.M. LEE  | DATE : 7/23/12      |
| CHECKED BY : E.M. MURRAY | DATE : 7/24/12      |
| DRAWN BY : MAA 5/10      | ADDED 5/6/10        |
| CHECKED BY : GM 5/10     | REV. 10/1/11 MAA/GM |
|                          | REV. 12/5/11 MAA/GM |

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NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

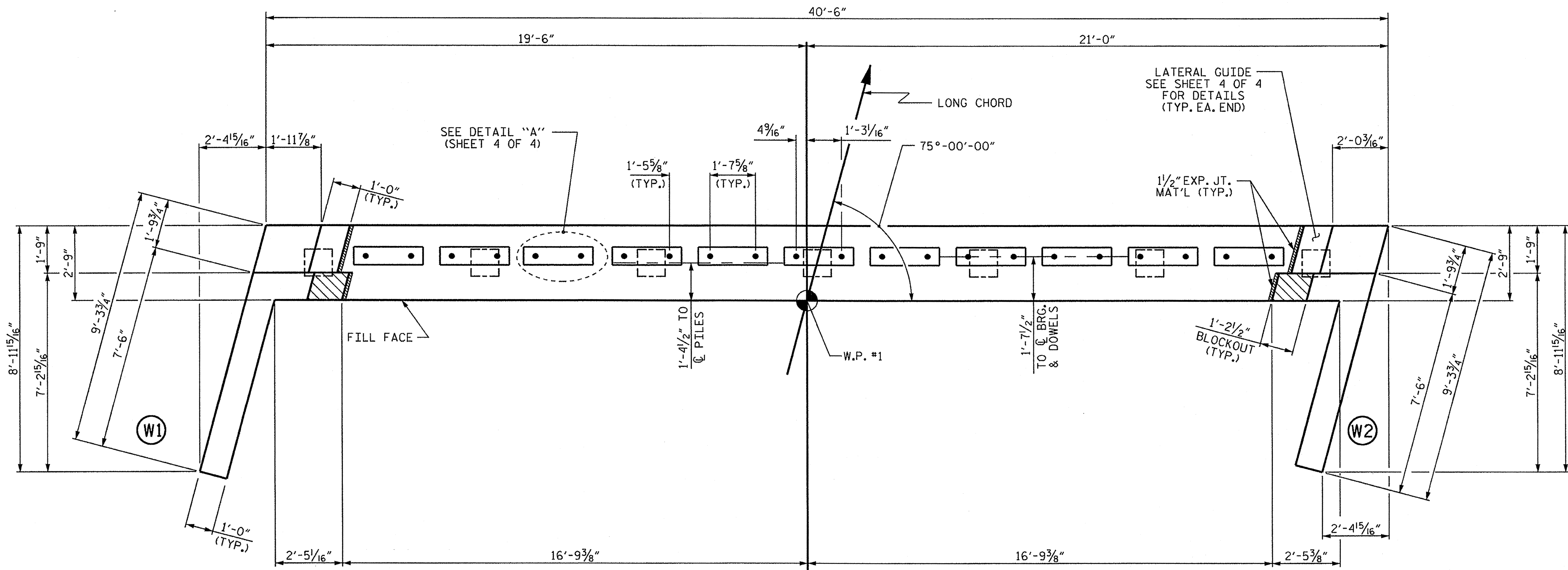
CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

ALL BAR SUPPORTS USED IN THE BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

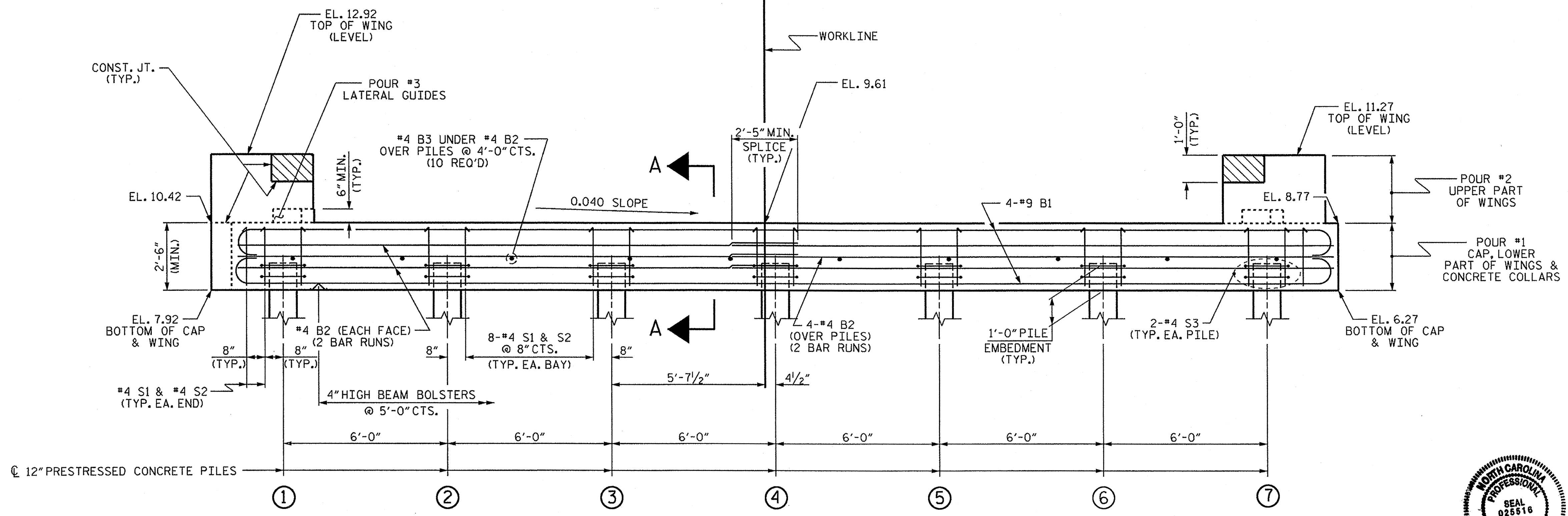
THE CONCRETE IN END BENT NO. 1 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN



ELEVATION

TOP OF PILE ELEVATIONS

|   |      |
|---|------|
| ① | 8.87 |
| ② | 8.63 |
| ③ | 8.39 |
| ④ | 8.15 |
| ⑤ | 7.91 |
| ⑥ | 7.67 |
| ⑦ | 7.43 |

PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-

SHEET 1 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 1

| REVISIONS |     |       |     |     |       | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |           |
| 1         |     |       | 3   |     |       | 5-10      |
| 2         |     |       | 4   |     |       | 9         |



ASSEMBLED BY : B. L. GREEN DATE : 3/16/12  
 CHECKED BY : E. E. MURRAY DATE : 4/19/12  
 DRAWN BY : DGE 03/10  
 CHECKED BY : MKT 03/10

WINGS NOT SHOWN FOR CLARITY.  
 FOR SECTION A-A, SEE SHEET 4 OF 4.  
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.



NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

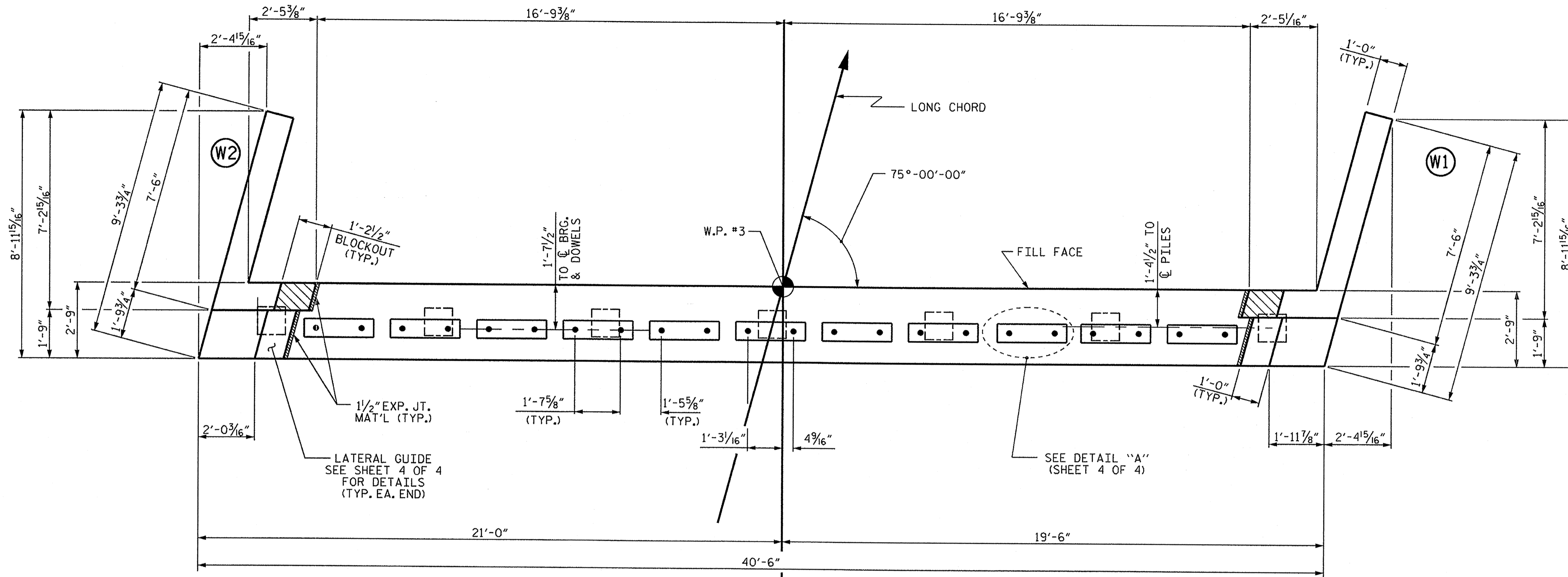
CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

ALL BAR SUPPORTS USED IN THE BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

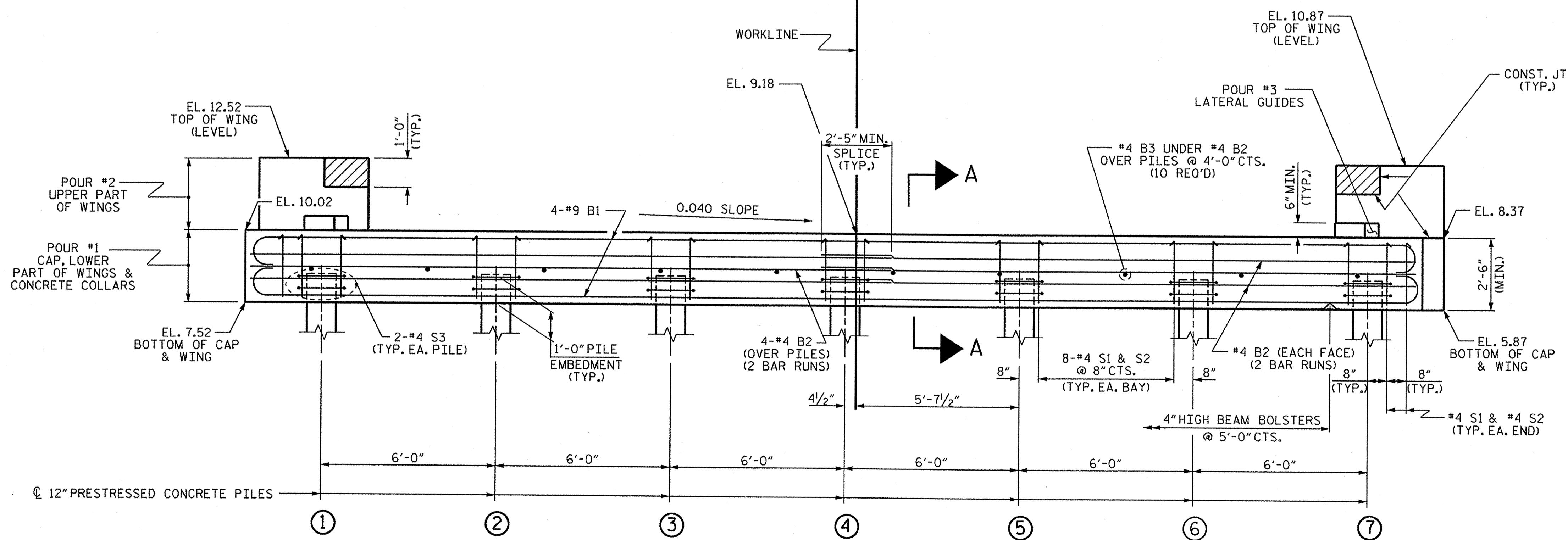
THE CONCRETE IN END BENT NO. 2 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

FOR WING DETAILS, SEE SHEET 3 OF 4.

INSTALL THE 4" DIA. DRAIN PIPE THROUGH THE WING WALL AS REQUIRED FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.



PLAN



ELEVATION

TOP OF PILE ELEVATIONS

|   |      |
|---|------|
| ① | 8.47 |
| ② | 8.23 |
| ③ | 7.99 |
| ④ | 7.75 |
| ⑤ | 7.51 |
| ⑥ | 7.27 |
| ⑦ | 7.03 |

PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-

SHEET 2 OF 4

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 END BENT No. 2

| REVISIONS |     |       |     |     |       | SHEET NO.    |  |
|-----------|-----|-------|-----|-----|-------|--------------|--|
| NO.       | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |  |
| 1         |     |       | 3   |     |       | 5-11         |  |
| 2         |     |       | 4   |     |       | 19           |  |

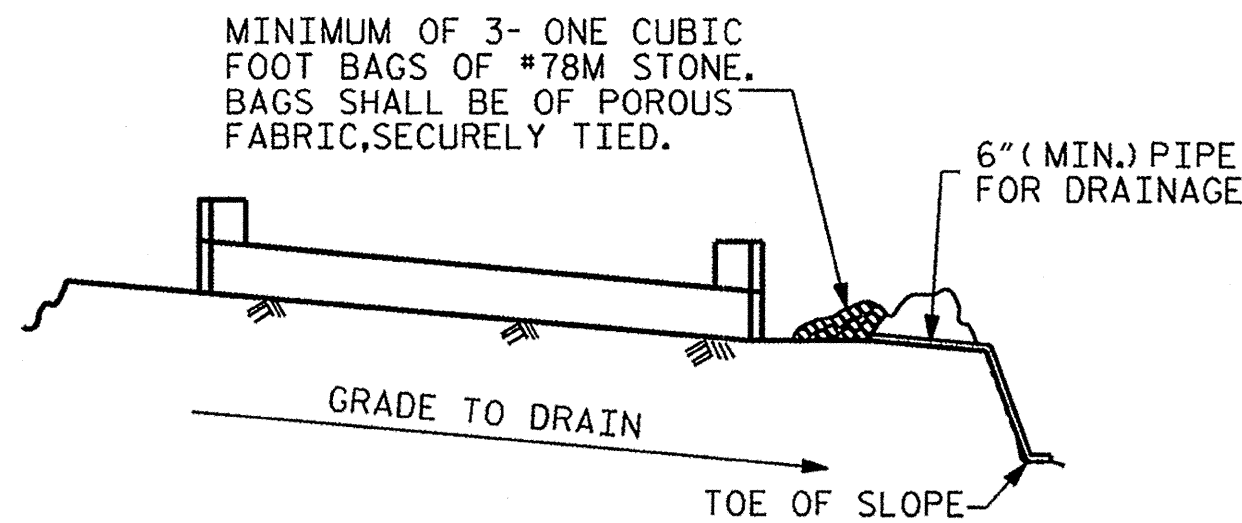


ASSEMBLED BY : B. L. GREEN DATE : 3/16/12  
 CHECKED BY : E. E. MURRAY DATE : 4/19/12  
 DRAWN BY : DGE 03/10  
 CHECKED BY : MKT 03/10

WINGS NOT SHOWN FOR CLARITY.  
 FOR SECTION A-A, SEE SHEET 4 OF 4.  
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.  
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.





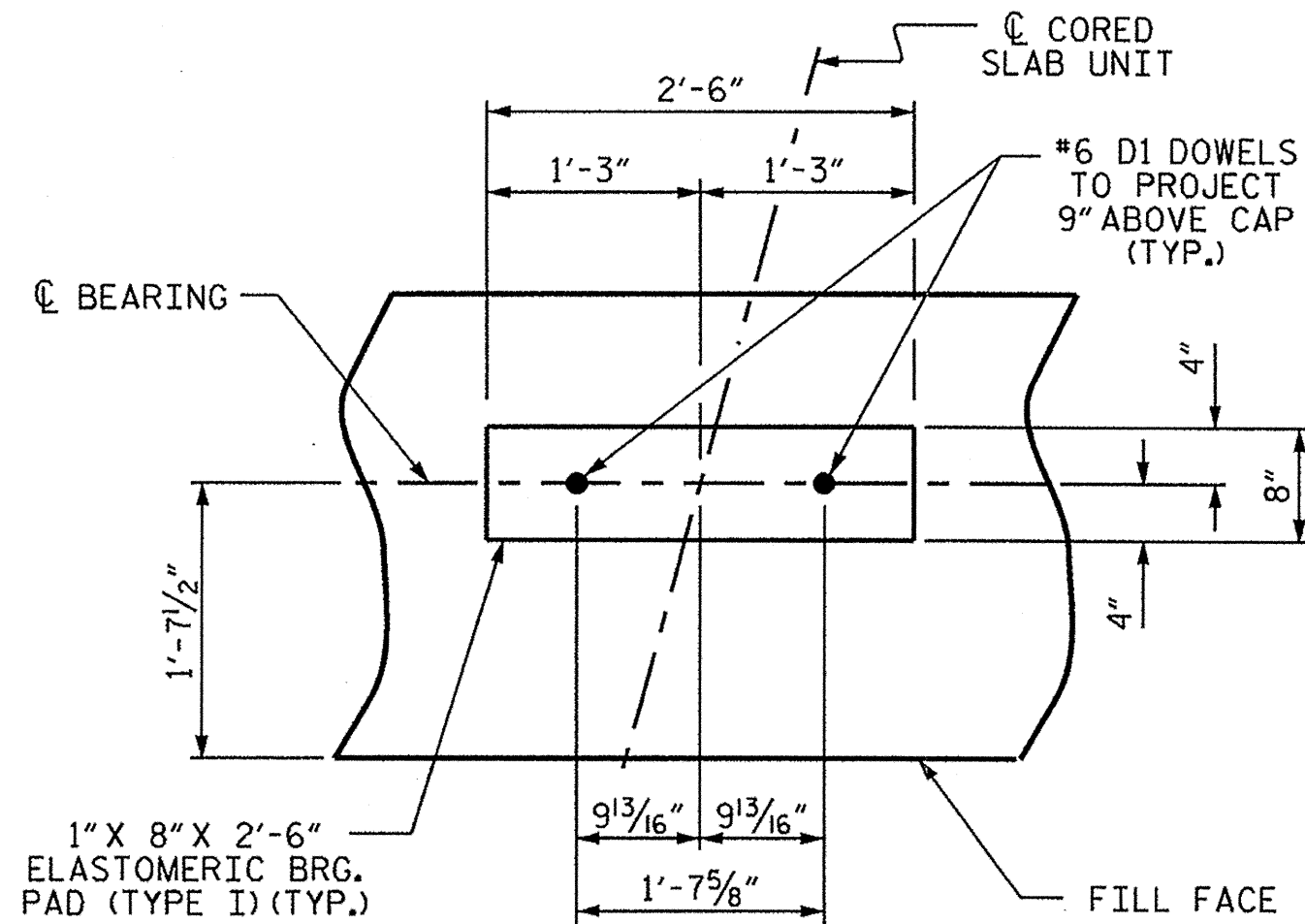


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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.

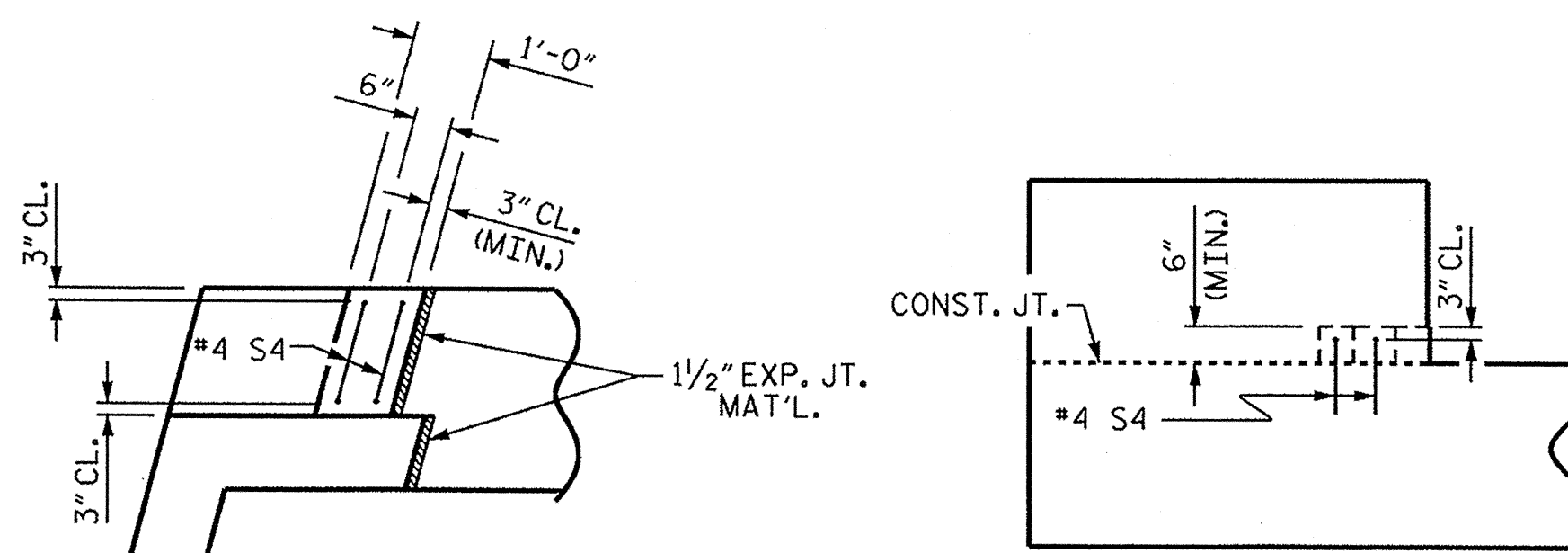
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

### TEMPORARY DRAINAGE AT END BENT



DETAIL "A"

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



### LATERAL GUIDE DETAILS

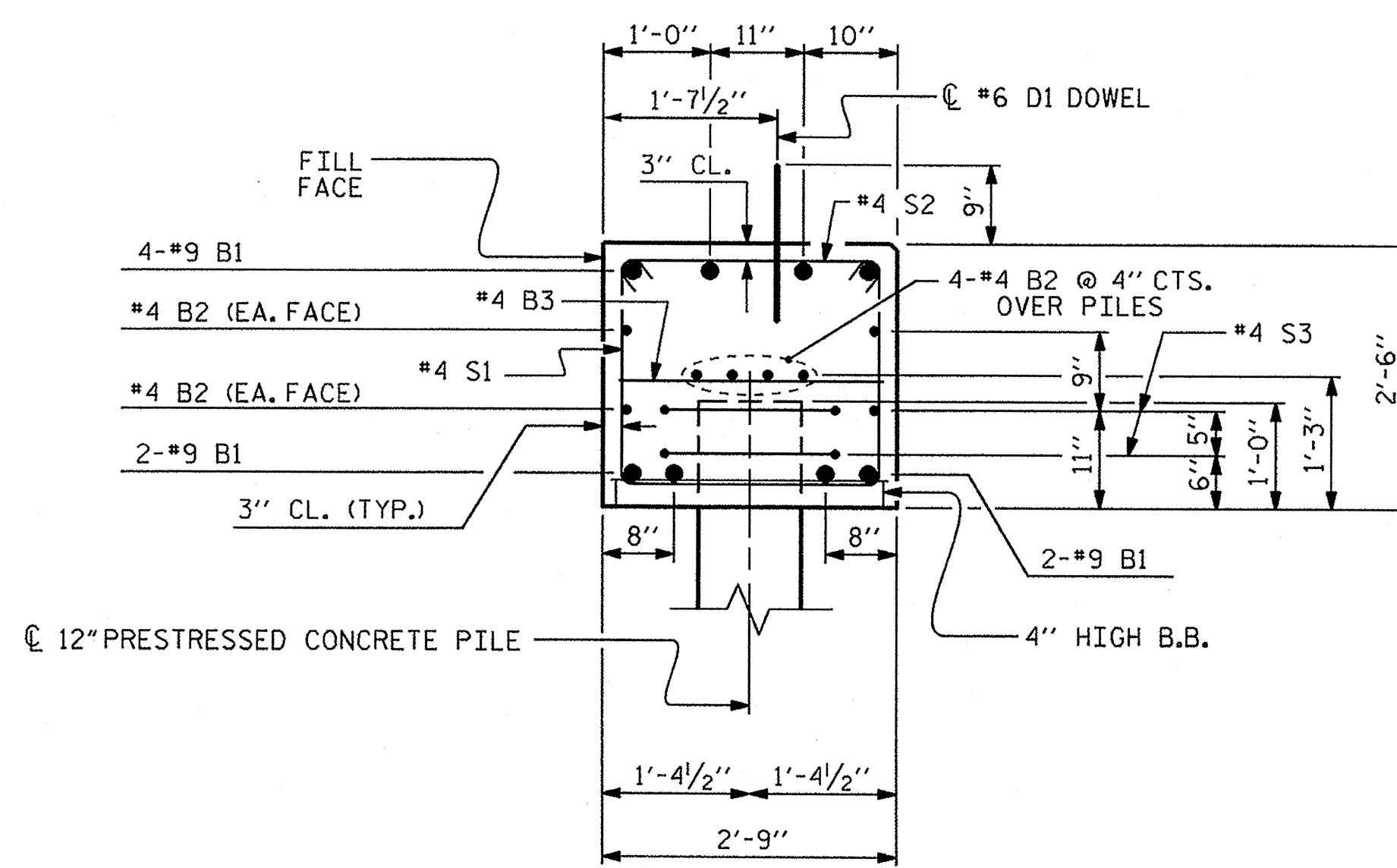
(END BENT No. 1, LEFT LATERAL GUIDE SHOWN, RIGHT END SIMILAR)  
(END BENT No. 2 SIMILAR BY ROTATION)

| BAR TYPES   |      |      |        |             |  | BILL OF MATERIAL FOR ONE END BENT |  |  |  |  |  |
|---|------|------|--------|-------------|--|-----------------------------------|--|--|--|--|--|
| BAR NO.   | SIZE | TYPE | LENGTH | WEIGHT      |  |                                   |  |  |  |  |  |
| *B1   | #8   |      | 42'-4" | 1151        |  |                                   |  |  |  |  |  |
| *B2   | #4   | STR  | 21'-3" | 227         |  |                                   |  |  |  |  |  |
| *B3   | #4   | STR  | 2'-3"  | 15          |  |                                   |  |  |  |  |  |
| *D1   | #6   | STR  | 1'-6"  | 50          |  |                                   |  |  |  |  |  |
| *H1   | #4   | 2    | 7'-5"  | 30          |  |                                   |  |  |  |  |  |
| *H2   | #4   | 2    | 7'-7"  | 30          |  |                                   |  |  |  |  |  |
| *H3   | #4   | 3    | 7'-10" | 31          |  |                                   |  |  |  |  |  |
| *H4   | #4   | 3    | 7'-8"  | 31          |  |                                   |  |  |  |  |  |
| *K1   | #4   | STR  | 2'-11" | 23          |  |                                   |  |  |  |  |  |
| *S1   | #4   | 4    | 6'-11" | 240         |  |                                   |  |  |  |  |  |
| *S2   | #4   | 5    | 3'-0"  | 104         |  |                                   |  |  |  |  |  |
| *S3   | #4   | 6    | 6'-6"  | 61          |  |                                   |  |  |  |  |  |
| *S4   | #4   | 7    | 4'-3"  | 11          |  |                                   |  |  |  |  |  |
| *V1   | #4   | STR  | 4'-5"  | 145         |  |                                   |  |  |  |  |  |
| * EPOXY COATED REINFORCING STEEL (FOR ONE END BENT) 2149 LBS. |      |      |        |             |  |                                   |  |  |  |  |  |
| CLASS AA CONCRETE BREAKDOWN (FOR ONE END BENT)                |      |      |        |             |  |                                   |  |  |  |  |  |
| POUR #1 CAP, LOWER PART OF WINGS                              |      |      |        | ▲ 11.3 C.Y. |  |                                   |  |  |  |  |  |
| POUR #2 UPPER PART OF WINGS                                   |      |      |        | 1.8 C.Y.    |  |                                   |  |  |  |  |  |
| POUR #3 LATERAL GUIDES  |      |      |        | 0.1 C.Y.    |  |                                   |  |  |  |  |  |
| TOTAL CLASS AA CONCRETE                                       |      |      |        | 13.2 C.Y.   |  |                                   |  |  |  |  |  |

| END BENT No. 1                 |                | END BENT No. 2                 |                |
|--------------------------------|----------------|--------------------------------|----------------|
| 12" PRESTRESSED CONCRETE PILES | NO: 7          | 12" PRESTRESSED CONCRETE PILES | NO: 7          |
| PILE REDRIVES                  | EA. 4          | PILE REDRIVES                  | EA. 4          |
|                                | LIN. FT. = 280 |                                | LIN. FT. = 175 |

ALL BAR DIMENSIONS ARE OUT TO OUT.

▲ CONCRETE DISPLACED BY THE 12" PRESTRESSED CONCRETE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.



### SECTION A-A

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

PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
STATION: 12+39.50 -L-

SHEET 4 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE

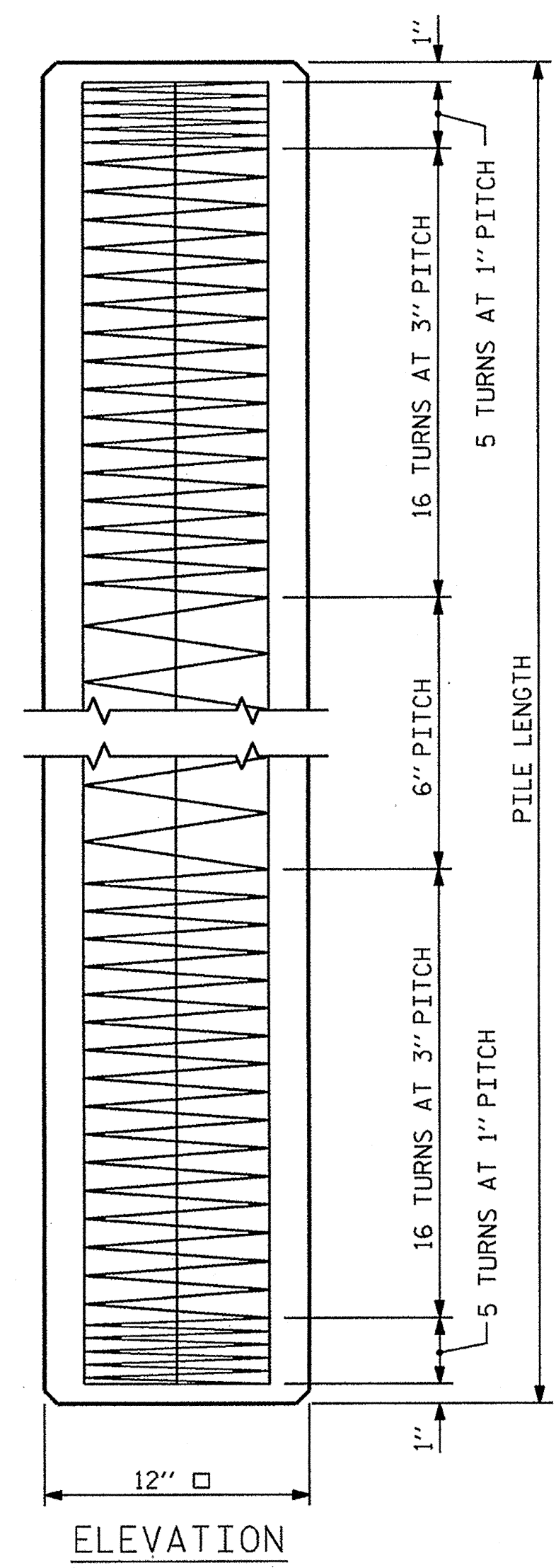
END BENT No. 1 & 2  
DETAILS



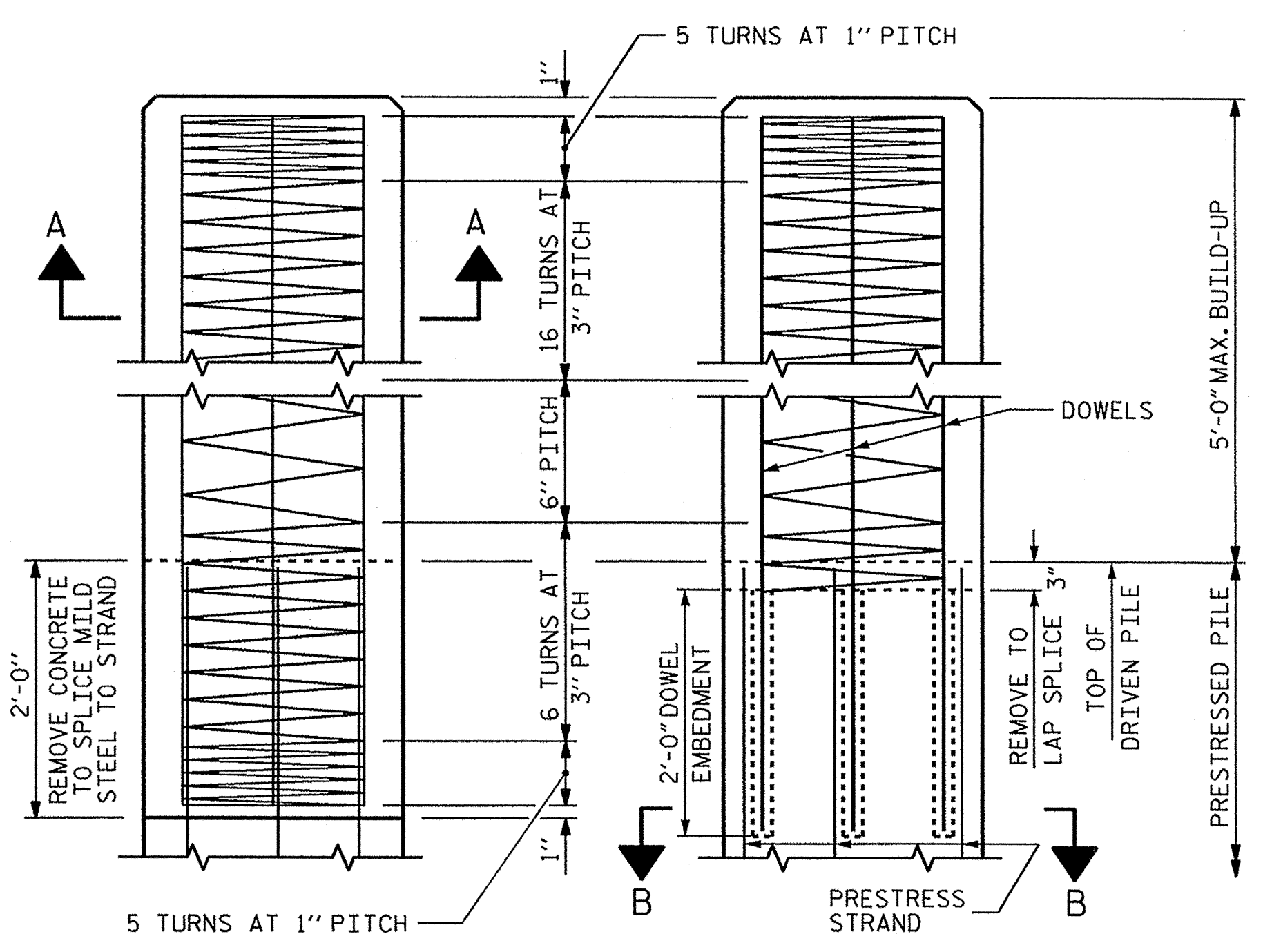
|                           |               |
|---------------------------|---------------|
| ASSEMBLED BY: B. L. GREEN | DATE: 3/16/12 |
| CHECKED BY: E. E. MURRAY  | DATE: 4/19/12 |
| DRAWN BY: DGE             | 03/10         |
| CHECKED BY: MKT           | 03/10         |

| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | 5-13            |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 19 |



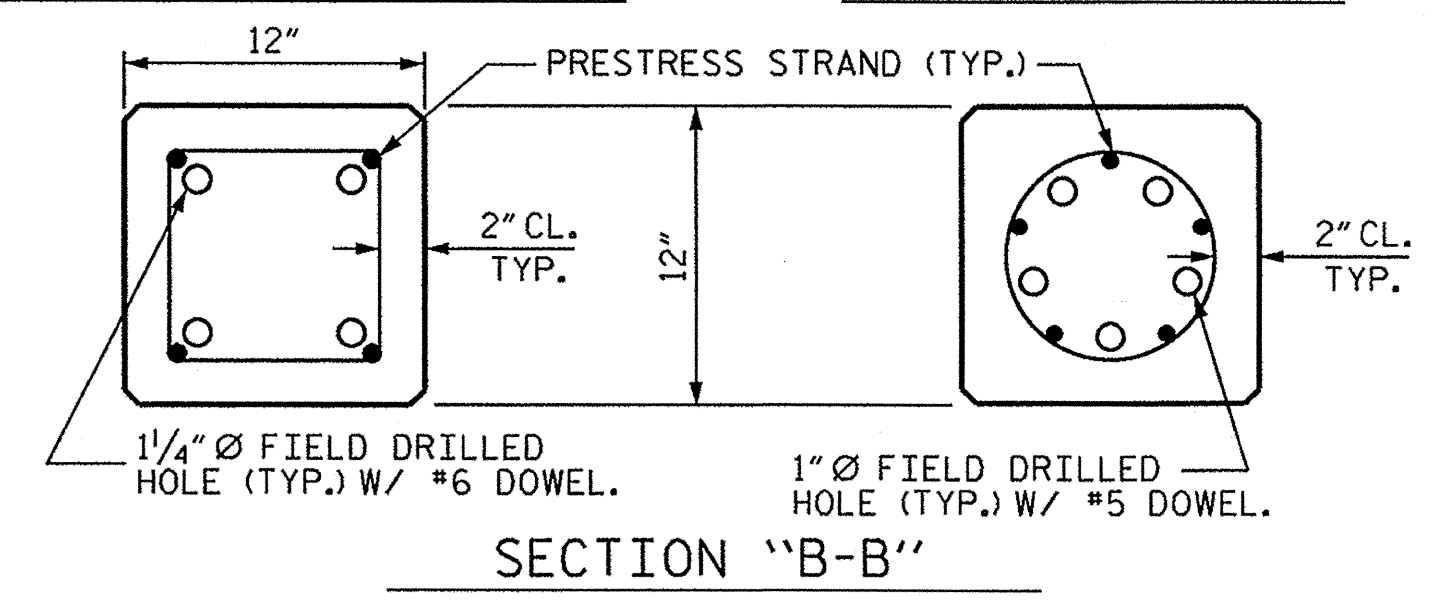


ELEVATION



BUILD-UP AND SPIRAL REINFORCING

OPTIONAL BUILD-UP WITH DOWELS



SECTION "B-B"

(AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)

DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

GROUT COMPRESSION STRENGTH:  $f'_c = 5,000$  PSI

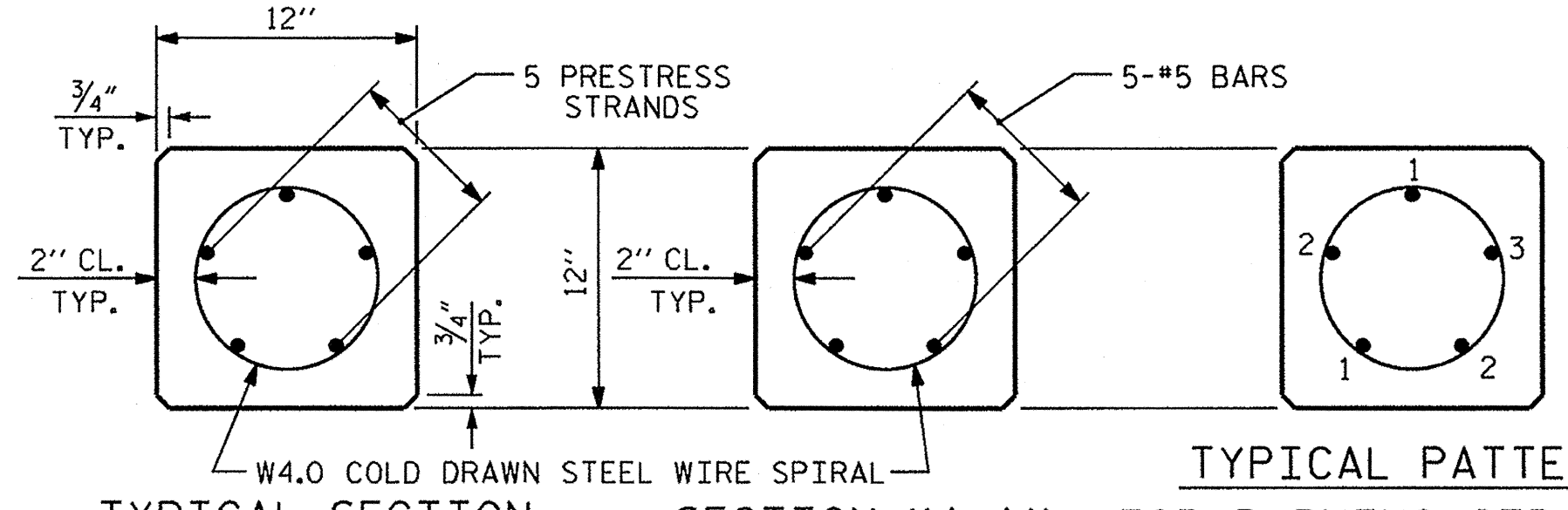
BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN 1/2" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

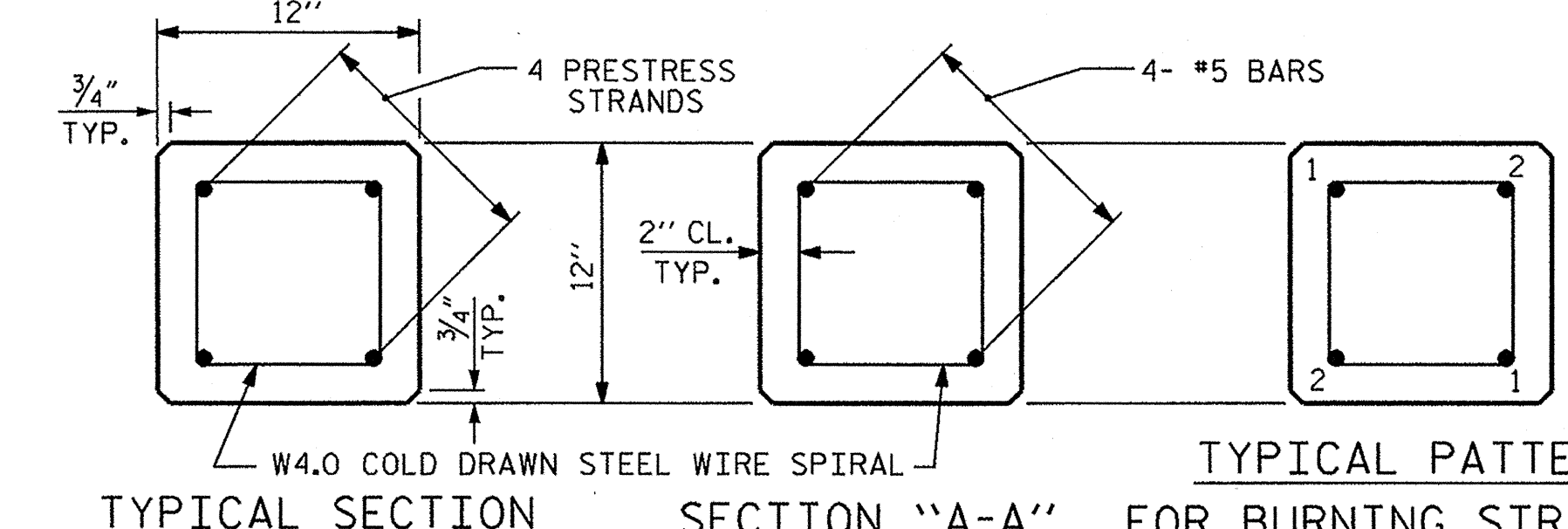
FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

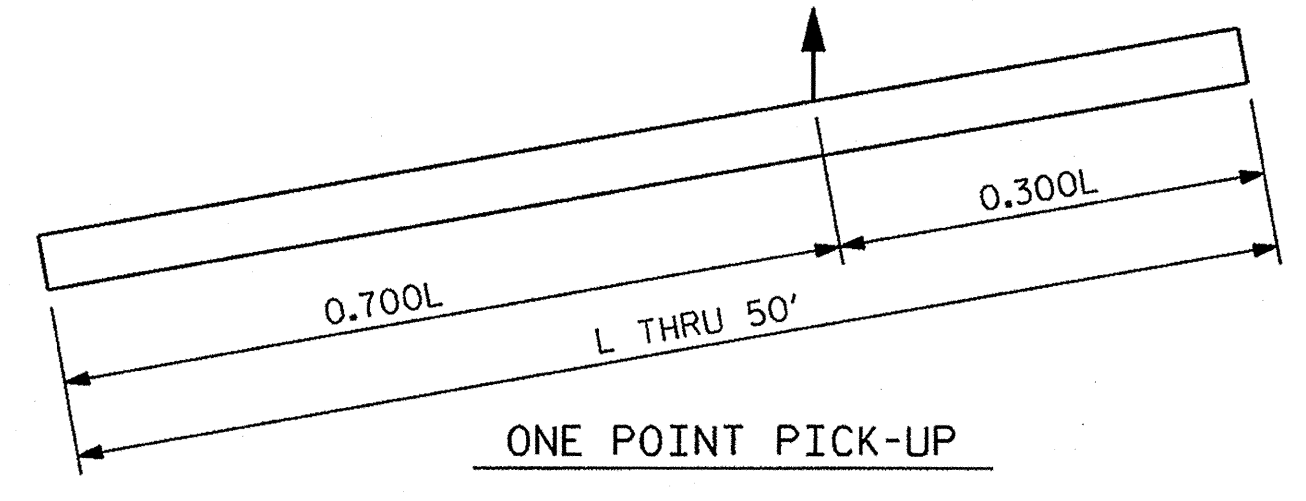
THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPLICED BY OVERLAPPING A MIN. OF ONE TURN.



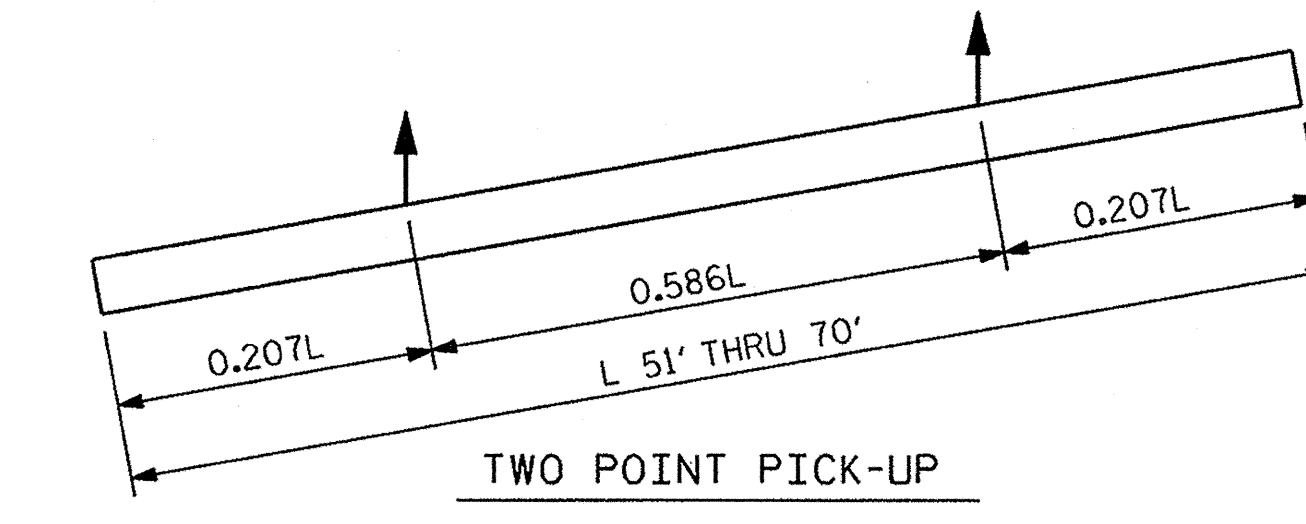
TYPICAL PATTERN SECTION "A-A" FOR BURNING STRANDS  
1/2" OR 0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS



TYPICAL PATTERN SECTION "A-A" FOR BURNING STRANDS  
1/2" OR 0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS



ONE POINT PICK-UP



TWO POINT PICK-UP

PICK-UP POINTS

| QUANTITIES FOR ONE 12" PRESTRESSED PILE |                   |               |                   |        |                   |        |
|---|-------------------|---------------|-------------------|--------|-------------------|--------|
| LENGTH                                  | CONCRETE CU. YDS. | PILE WT. TONS | ONE POINT PICK-UP |        | TWO POINT PICK-UP |        |
|   |                   |               | 0.300L            | 0.700L | 0.207L            | 0.586L |
| 25'-0"                                  | 0.91              | 1.85          | 7'-6"             | 17'-6" |                   |        |
| 30'-0"                                  | 1.10              | 2.22          | 9'-0"             | 21'-0" |                   |        |
| 35'-0"                                  | 1.28              | 2.59          | 10'-6"            | 24'-6" |                   |        |
| 40'-0"                                  | 1.46              | 2.96          | 12'-0"            | 28'-0" |                   |        |
| 45'-0"                                  | 1.64              | 3.33          | 13'-6"            | 31'-6" |                   |        |
| 50'-0"                                  | 1.83              | 3.72          | 15'-0"            | 35'-0" |                   |        |
| 55'-0"                                  | 2.01              | 4.09          |                   |        | 11'-4 1/2"        | 32'-3" |
| 60'-0"                                  | 2.19              | 4.46          |                   |        | 12'-5"            | 35'-2" |
| 65'-0"                                  | 2.38              | 4.81          |                   |        | 13'-5 1/2"        | 38'-1" |
| 70'-0"                                  | 2.57              | 5.18          |                   |        | 14'-6"            | 41'-0" |

NOTES

PRESTRESSED CONCRETE STRENGTH :  $f'_c = 7,500$  PSI  
 BUILD-UP CONCRETE STRENGTH :  $f'_c = 7,500$  PSI

STRAND DATA:

| SIZE | GRADE    | AREA  | ULTIMATE STRENGTH  | APPLIED PRESTRESS FORCE |
|------|----------|-------|--------------------|-------------------------|
| 1/2" | 270 L.R. | 0.153 | 41,300* PER STRAND | 30,980* PER STRAND      |
| 0.6" | 270 L.R. | 0.217 | 58,600* PER STRAND | 43,940* PER STRAND      |

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

AT THE CONTRACTOR'S OPTION, 1/2" OR 0.6" STRANDS MAY BE USED IN EITHER THE 4 OR 5 STRAND CONFIGURATION SHOWN IN THE TYPICAL SECTION DETAIL. MIXING OF STRAND SIZE IS NOT ALLOWED.

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN PAIRS, EXCEPT WHERE 5 STRANDS ARE USED, THE LAST STRAND MAY BE BURNED SINGLY ACCORDING TO BURNING PATTERNS SHOWN. NOT MORE THAN 4 STRANDS MAY BE BURNED AT ANY ONE SECTION BEFORE THE SAME STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2" WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

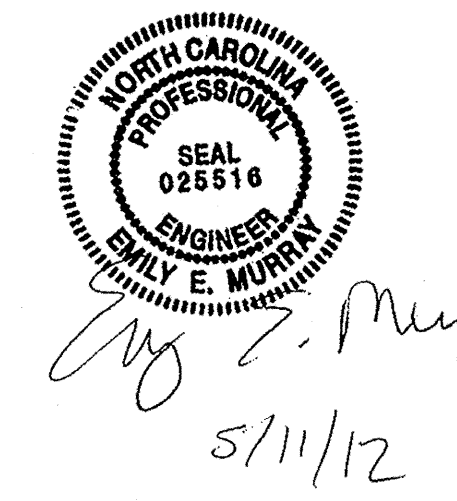
DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

THE CONCRETE IN THE PRECAST SECTIONS AND BUILT-UP SECTIONS OF THE PILE SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB OF CEMENT. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.

CONCRETE IN THE PRECAST SECTIONS AND BUILT-UP SECTIONS OF THE PILES SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE WATER CEMENT RATIO FOR CONCRETE PILES SHALL NOT EXCEED 0.40.

PROJECT NO. BD-5103R  
 BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-



| REVISIONS |     |       |     |     |       | SHEET NO.<br>5-14  |
|-----------|-----|-------|-----|-----|-------|--------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                    |
| 1         |     |       | 3   |     |       | TOTAL SHEETS<br>19 |
| 2         |     |       | 4   |     |       |                    |

|                            |                      |
|----------------------------|----------------------|
| ASSEMBLED BY : B. L. GREEN | DATE : 3/16/12       |
| CHECKED BY : E. E. MURRAY  | DATE : 4/19/12       |
| DRAWN BY : FCJ 7/88        | REV. 5/1/06R TLA/GM  |
| CHECKED BY : CRK 3/89      | REV. 11/30/10 WMC/GM |
|                            | REV. 10/1/11 MAA/GM  |



NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.

★ INVERT ALTERNATE STIRRUPS.

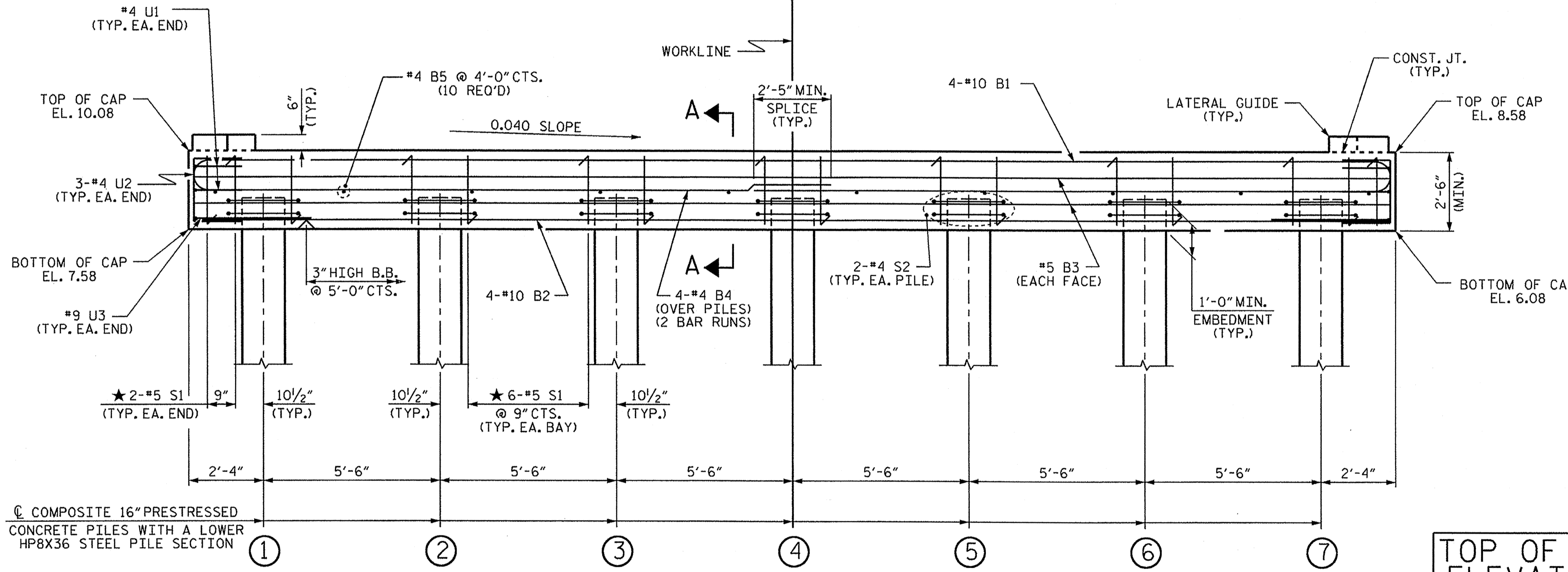
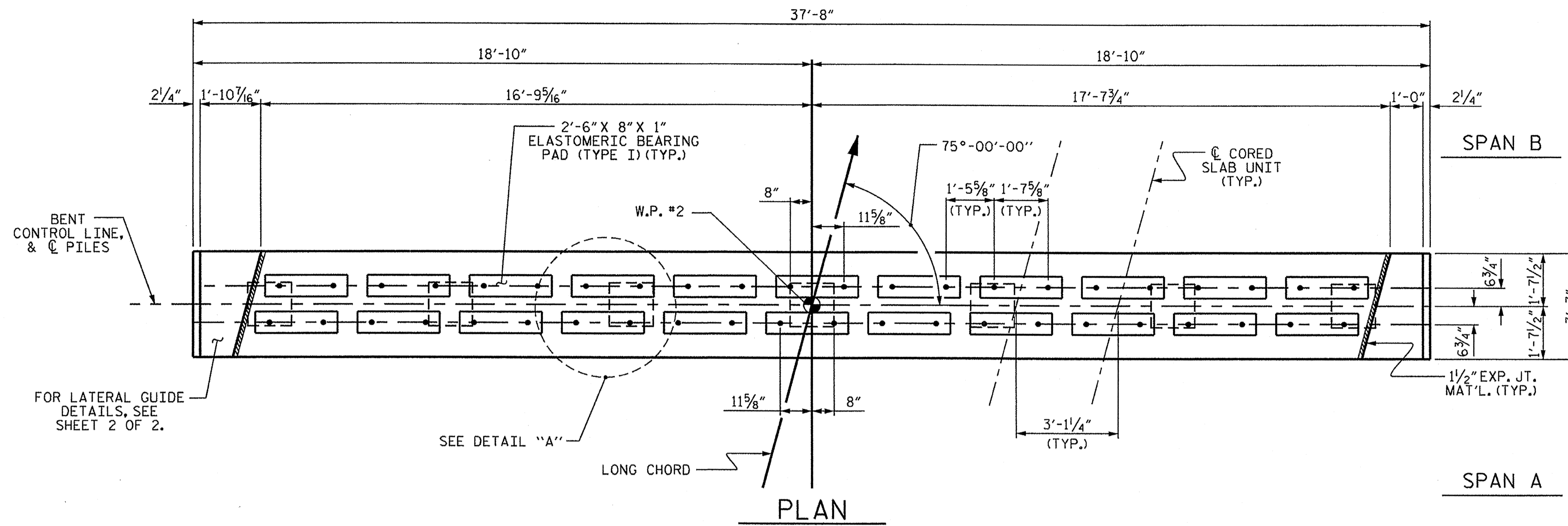
METALIZE THE FULL LENGTH OF THE STEEL PORTION OF EACH COMPOSITE PILE. FOR THERMAL SPRAYED COATINGS (METALLIZATION) SEE SPECIAL PROVISIONS.

THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.

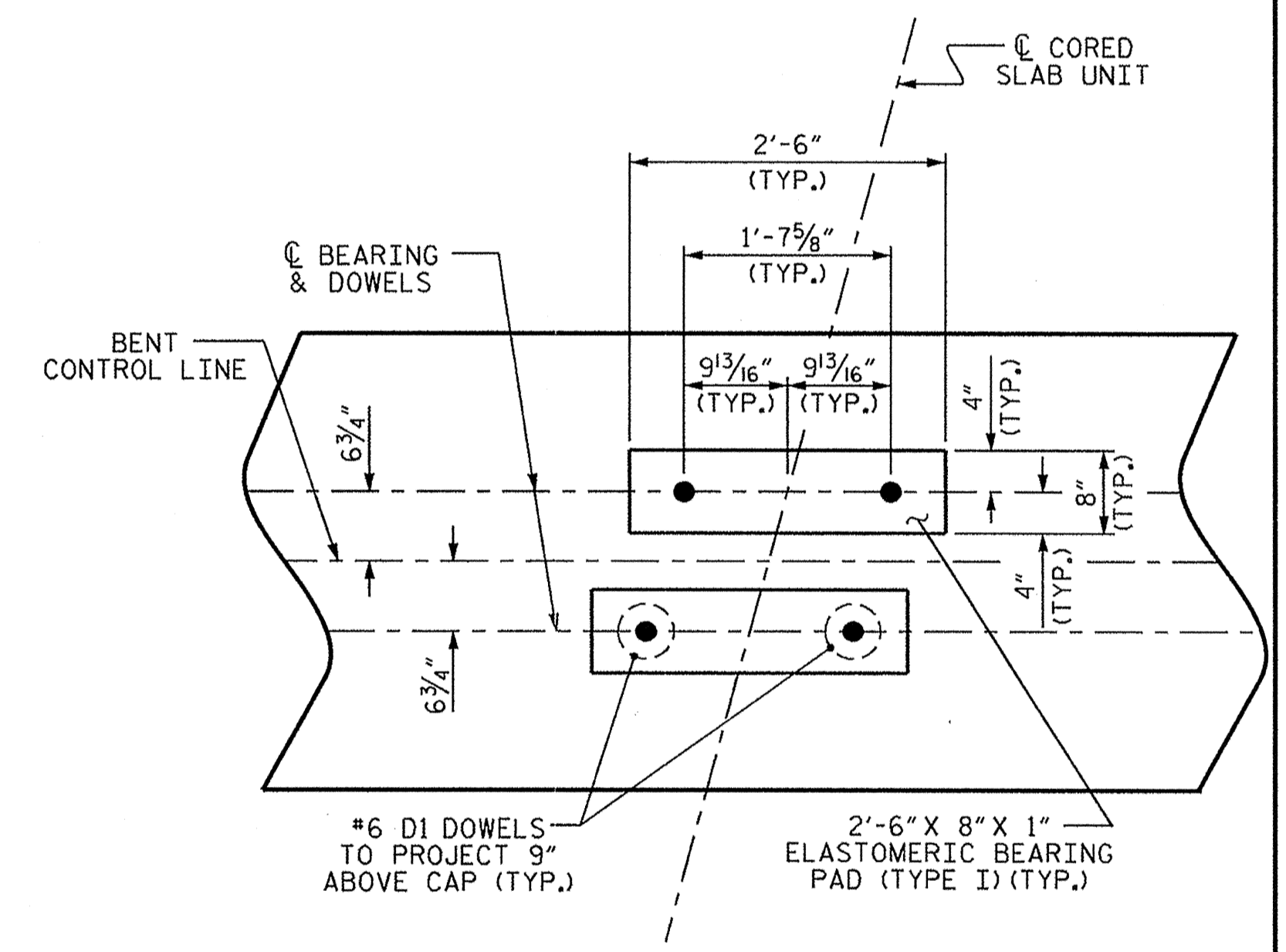
CLASS AA CONCRETE SHALL BE USED IN ALL CAST-IN-PLACE BENT CAPS AND SHALL CONTAIN CALCIUM NITRITE CORROSION INHIBITOR.

ALL BAR SUPPORTS USED IN THE BENT CAPS AND ALL INCIDENTAL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

THE CONCRETE IN THE BENT CAPS OF BENT NO. 1 SHALL CONTAIN SILICA FUME. SILICA FUME SHALL BE SUBSTITUTED FOR 5% OF THE PORTLAND CEMENT BY WEIGHT. IF THE OPTION OF ARTICLE 1024-1 OF THE STANDARD SPECIFICATIONS TO PARTIALLY SUBSTITUTE CLASS F FLY ASH FOR PORTLAND CEMENT IS EXERCISED, THEN THE RATE OF FLY ASH SUBSTITUTION SHALL BE REDUCED TO 1.0 LB OF FLY ASH PER 1.0 LB. NO PAYMENT WILL BE MADE FOR THIS SUBSTITUTION AS IT IS CONSIDERED INCIDENTAL TO THE VARIOUS PAY ITEMS.



| TOP OF PILE ELEVATIONS |      |
|------------------------|------|
| ①                      | 8.51 |
| ②                      | 8.29 |
| ③                      | 8.07 |
| ④                      | 7.85 |
| ⑤                      | 7.63 |
| ⑥                      | 7.41 |
| ⑦                      | 7.19 |



PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-

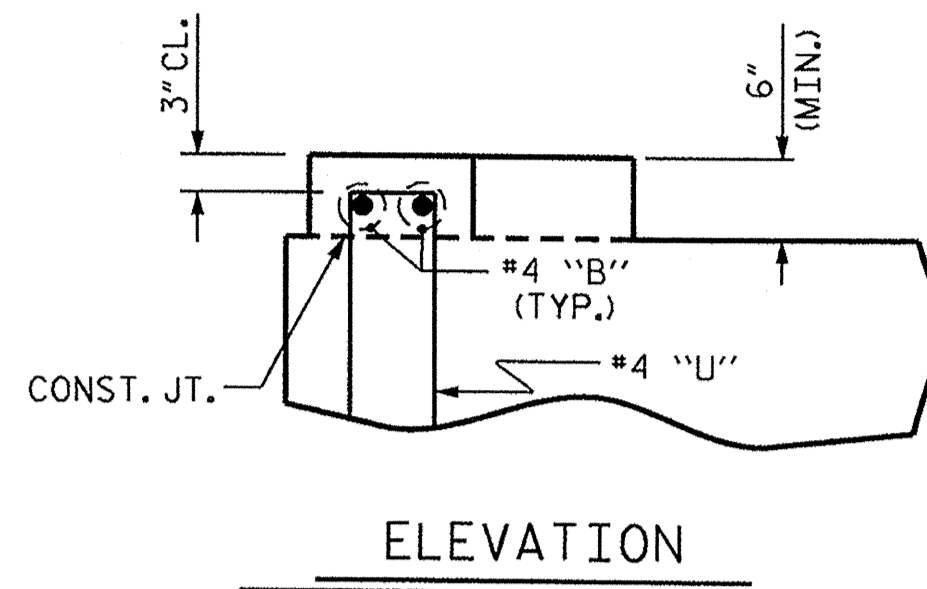
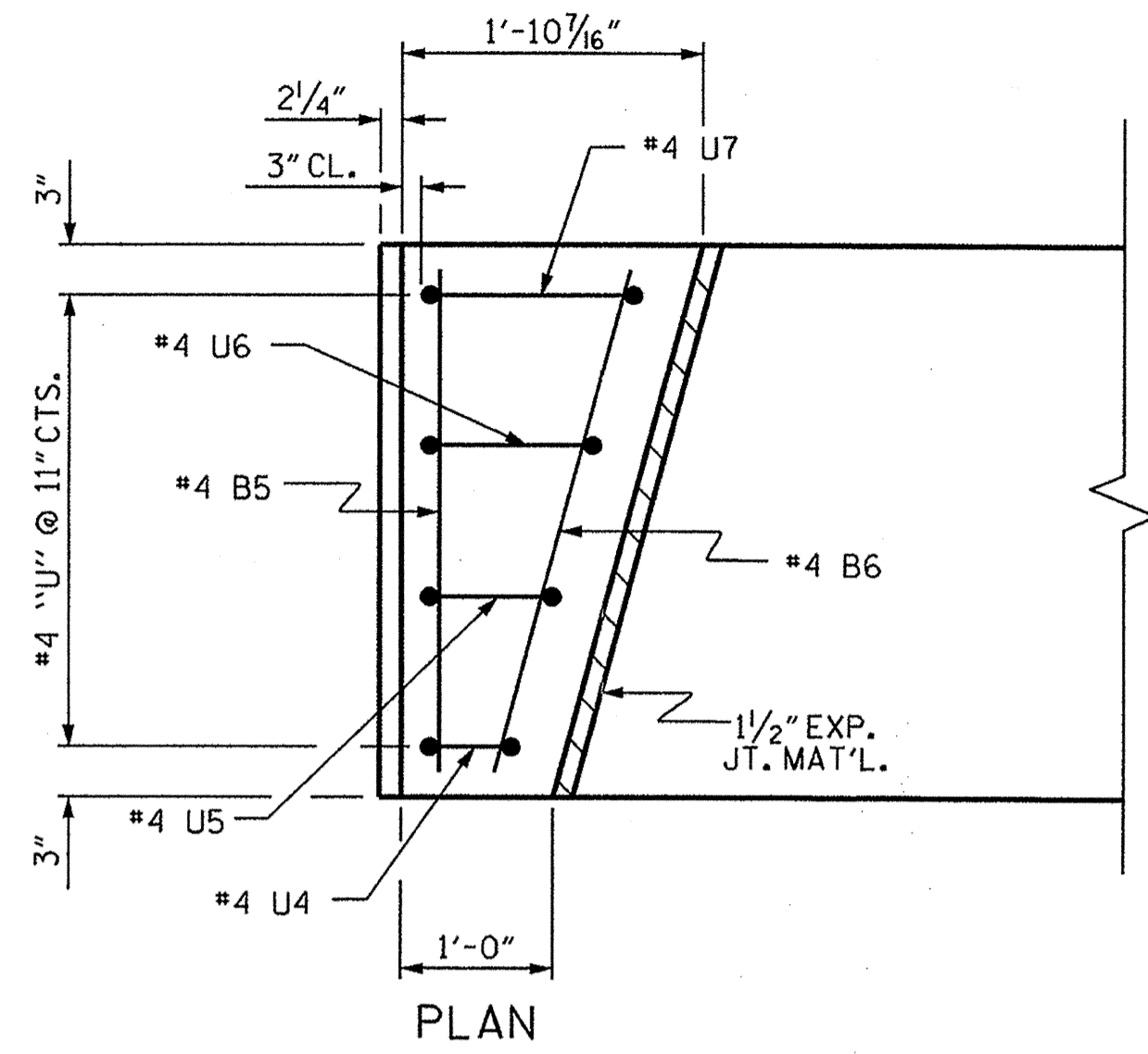
SHEET 1 OF 2  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

SUBSTRUCTURE  
 BENT No. 1



| REVISIONS |     |       |     |     |       | SHEET NO.<br>5-15  |
|-----------|-----|-------|-----|-----|-------|--------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                    |
| 1         |     |       | 3   |     |       | TOTAL SHEETS<br>19 |
| 2         |     |       | 4   |     |       |                    |

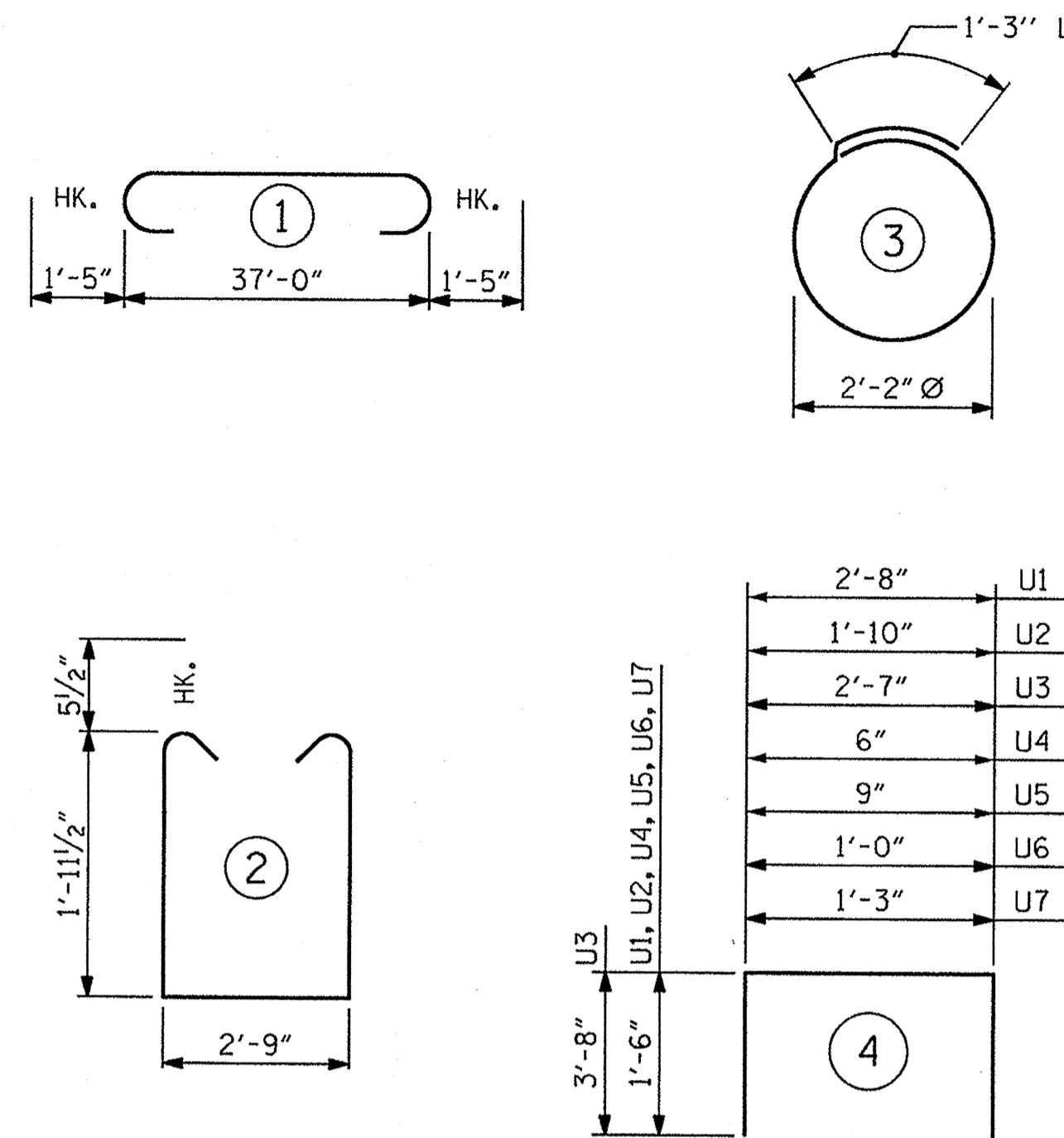
ASSEMBLED BY : B. L. GREEN DATE : 3/16/12  
 CHECKED BY : E. E. MURRAY DATE 4/19/12  
 DRAWN BY : DGE 6/10  
 CHECKED BY : MKT 6/10



**LATERAL GUIDE DETAILS**

(LEFT LATERAL GUIDE SHOWN, RIGHT SIDE SIMILAR)

**BAR TYPES**



ALL BAR DIMENSIONS ARE OUT TO OUT.

**BILL OF MATERIAL**

**FOR ONE BENT**

| BAR | NO. | SIZE | TYPE | LENGTH  | WEIGHT |
|-----|-----|------|------|---------|--------|
| *B1 | 4   | #10  | 1    | 38'-10" | 668    |
| *B2 | 4   | #10  | STR  | 37'-2"  | 640    |
| *B3 | 4   | #5   | STR  | 37'-2"  | 155    |
| *B4 | 8   | #4   | STR  | 19'-10" | 106    |
| *B5 | 12  | #4   | STR  | 2'-9"   | 22     |
| *B6 | 2   | #4   | STR  | 2'-10"  | 4      |
| *D1 | 44  | #6   | STR  | 1'-6"   | 99     |
| *S1 | 40  | #5   | 2    | 7'-7"   | 316    |
| *S2 | 14  | #4   | 3    | 8'-1"   | 76     |
| *U1 | 4   | #4   | 4    | 5'-8"   | 15     |
| *U2 | 6   | #4   | 4    | 4'-10"  | 19     |
| *U3 | 2   | #9   | 4    | 9'-11"  | 67     |
| *U4 | 2   | #4   | 4    | 3'-6"   | 5      |
| *U5 | 2   | #4   | 4    | 3'-9"   | 5      |
| *U6 | 2   | #4   | 4    | 4'-0"   | 5      |
| *U7 | 2   | #4   | 4    | 4'-3"   | 6      |

\*EPOXY COATED REINFORCING STEEL 2208 LBS (FOR ONE BENT)

CLASS AA CONCRETE BREAKDOWN (FOR ONE BENT)

POUR #1 (CAP) ▲ 10.9 C.Y.  
POUR #2 (LATERAL GUIDES) 0.2 C.Y.

TOTAL CLASS AA CONCRETE 11.1 C.Y.

16" PRESTRESSED CONCRETE PILES (FOR ONE BENT)

No. 7 LIN. FT. 175

HP 8 X 36 STEEL PILES (FOR ONE BENT)

No. 7 LIN. FT. 140

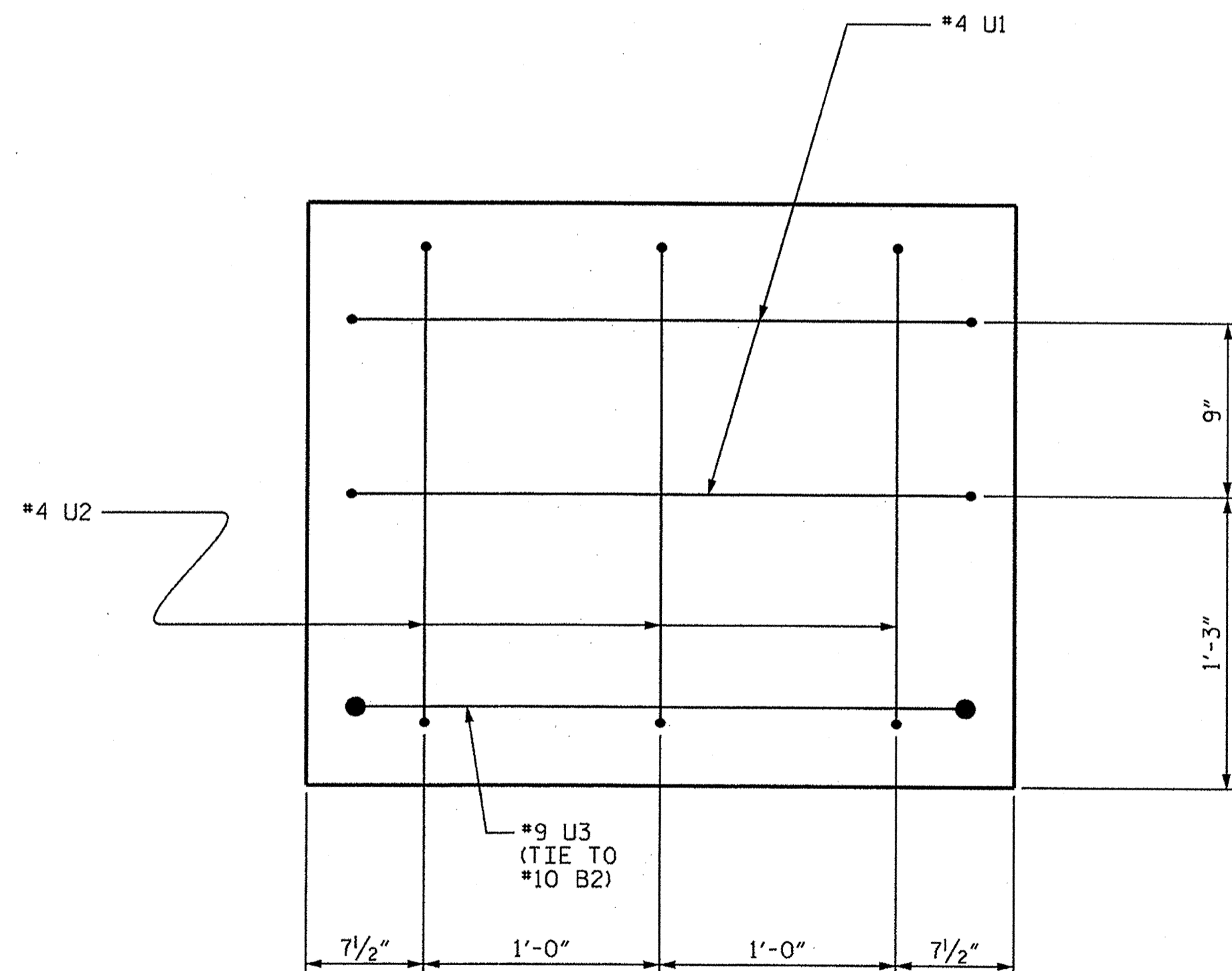
PILE REDRIVES (FOR ONE BENT)

EA. 4

PDA TESTING

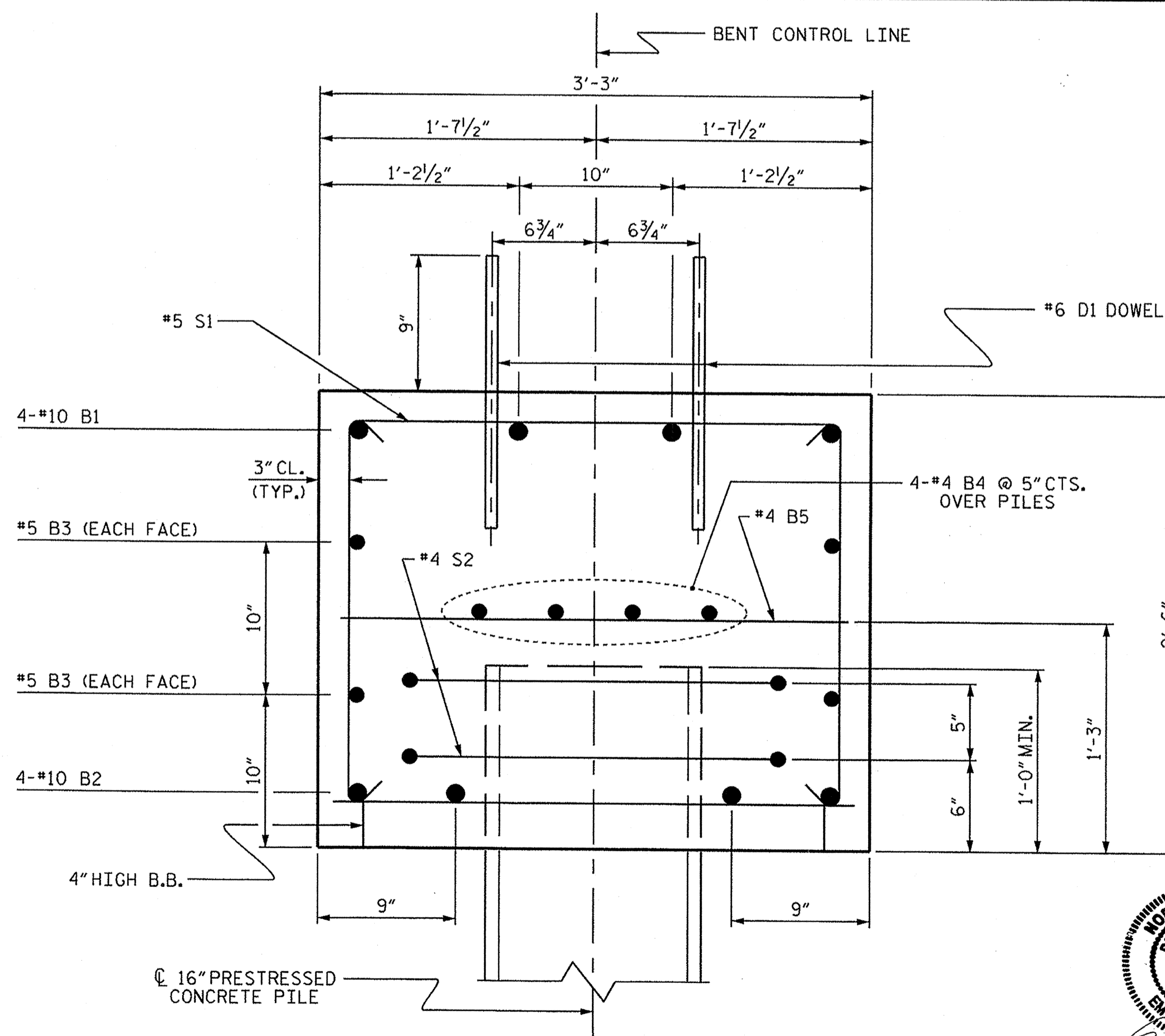
EA. 1

▲ CONCRETE DISPLACED BY THE 16" PRESTRESSED CONCRETE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY.



**END OF CAP VIEW**

(TYPICAL BOTH ENDS)



**SECTION A-A**



PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
STATION: 12+39.50 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENT No. 1

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

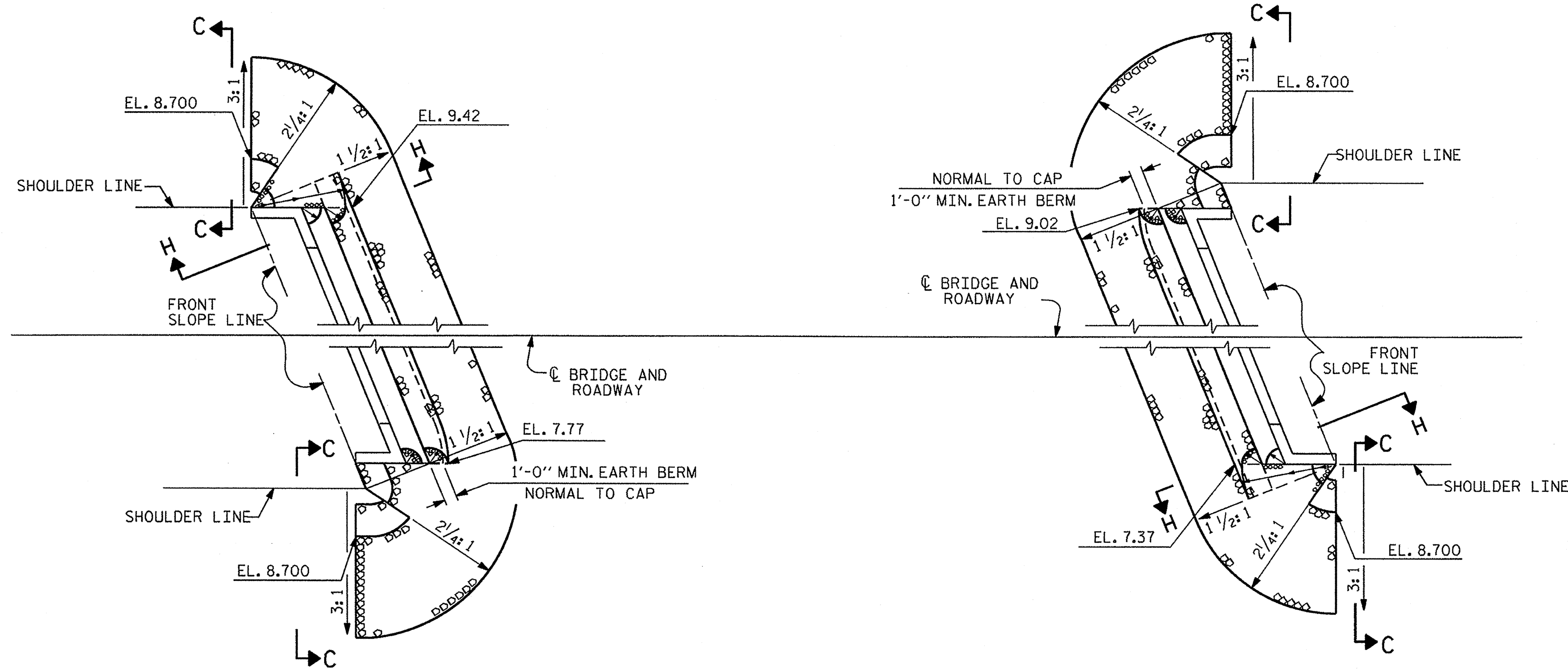
STD.NO. 16" PS.BT.33.75S.<60'

DRAWN BY: B. L. GREEN DATE: 3/16/12  
CHECKED BY: E. E. MURRAY DATE: 4/19/12  
DRAWN BY: DGE 06/10  
CHECKED BY: MKT 06/10



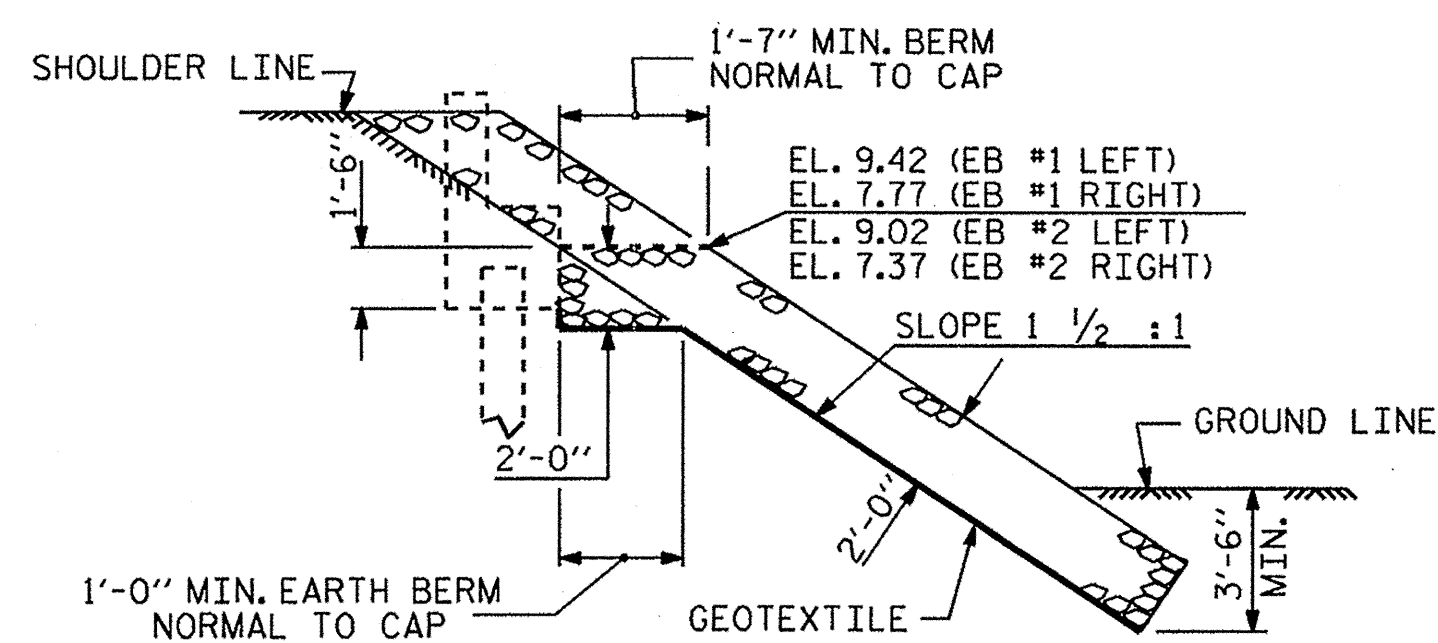


NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.

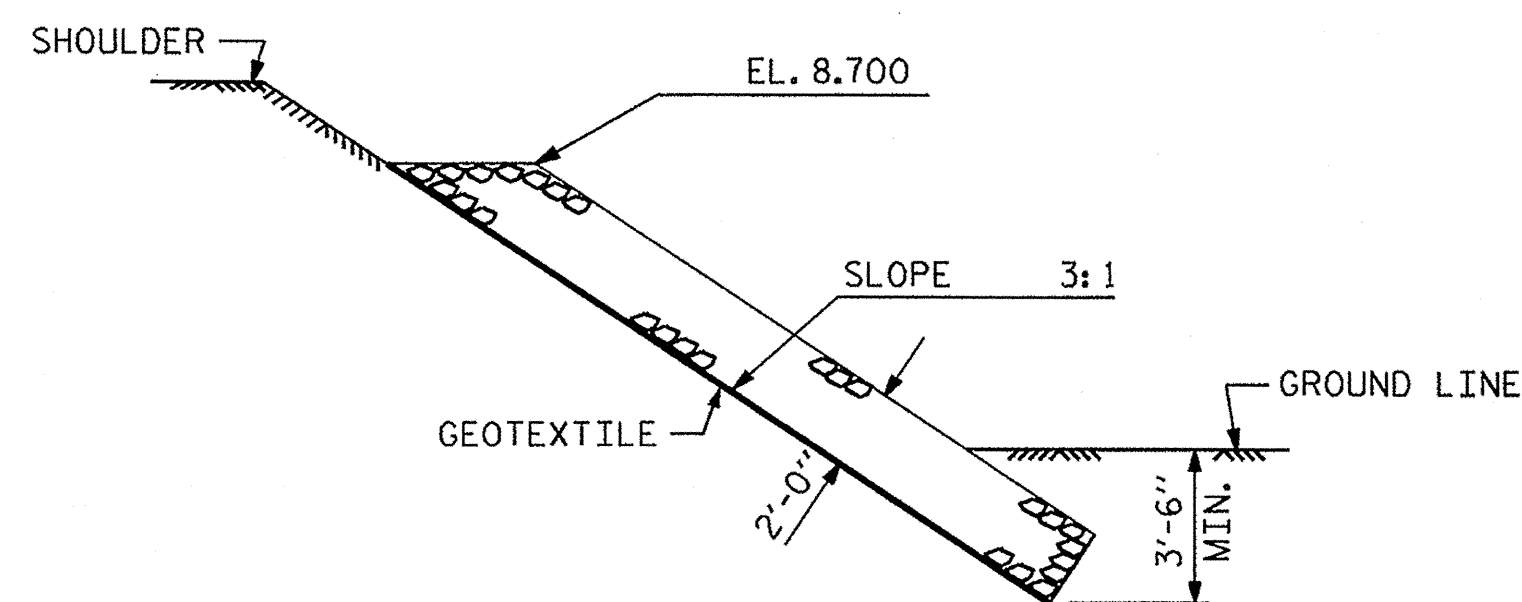


PLAN

| ESTIMATED QUANTITIES |                                |                         |
|----------------------|--------------------------------|-------------------------|
| BRIDGE @ STA.        | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE |
|                      | TONS                           | SQUARE YARDS            |
| END BENT 1           | 70                             | 80                      |
| END BENT 2           | 70                             | 80                      |

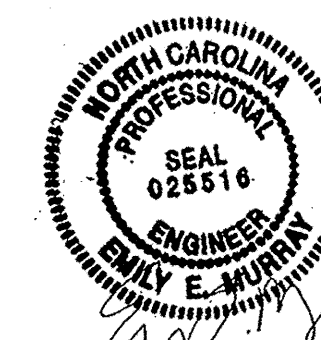


SECTION H-H



SECTION C-C

PROJECT NO. BD-5103R  
BRUNSWICK COUNTY  
STATION: 12+39.50 -L-

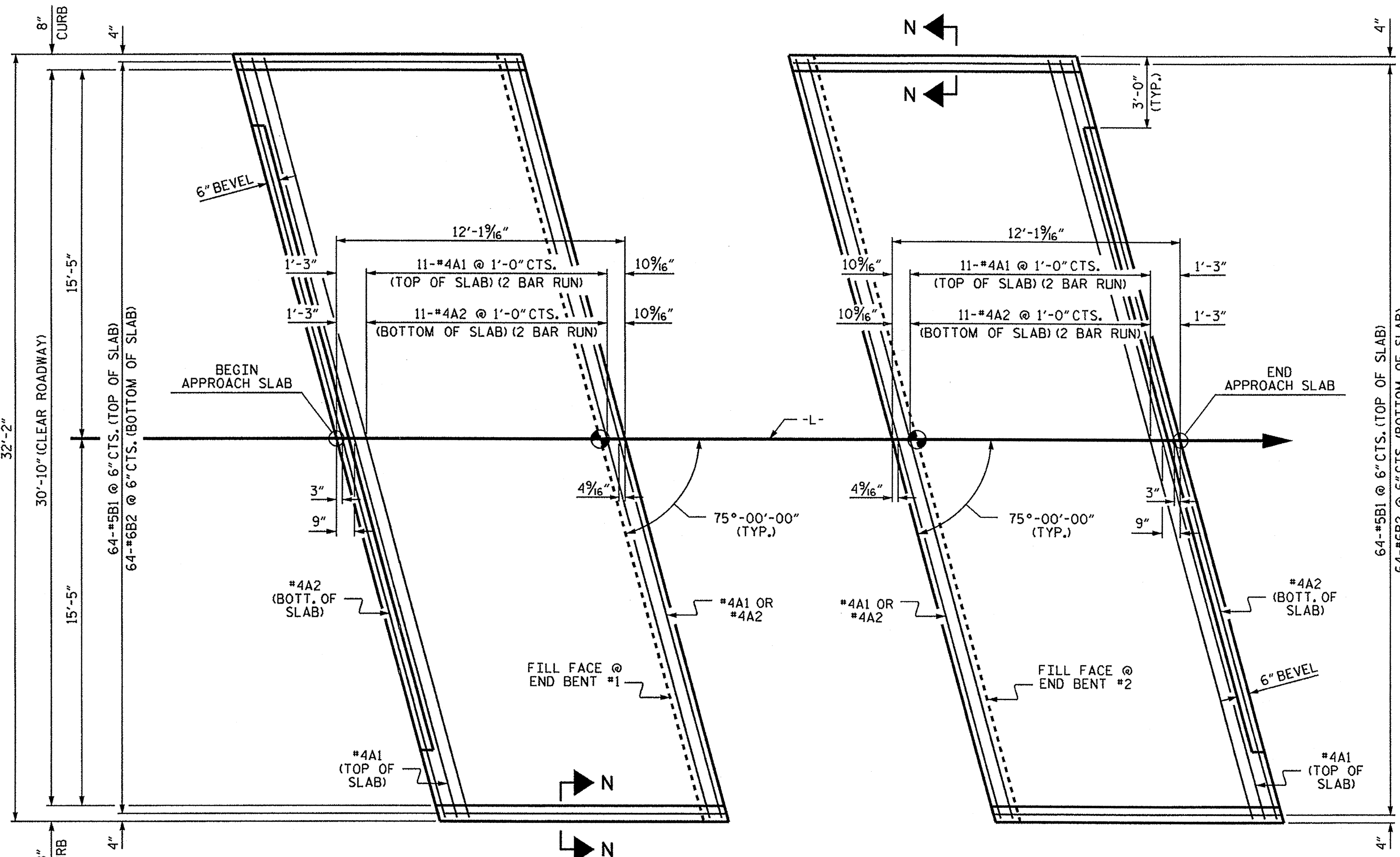


|  |     |       |     |     |       |                           |
|--|-----|-------|-----|-----|-------|---------------------------|
| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |       | SHEET NO.<br><b>5-18</b>  |
| STANDARD<br>= RIP RAP DETAILS =                                    |     |       |     |     |       |                           |
| REVISIONS  |     |       |     |     |       | TOTAL SHEETS<br><b>19</b> |
| NO.  | BY: | DATE: | NO. | BY: | DATE: |                           |
| 1  |     |       | 3   |     |       |                           |
| 2  |     |       | 4   |     |       |                           |

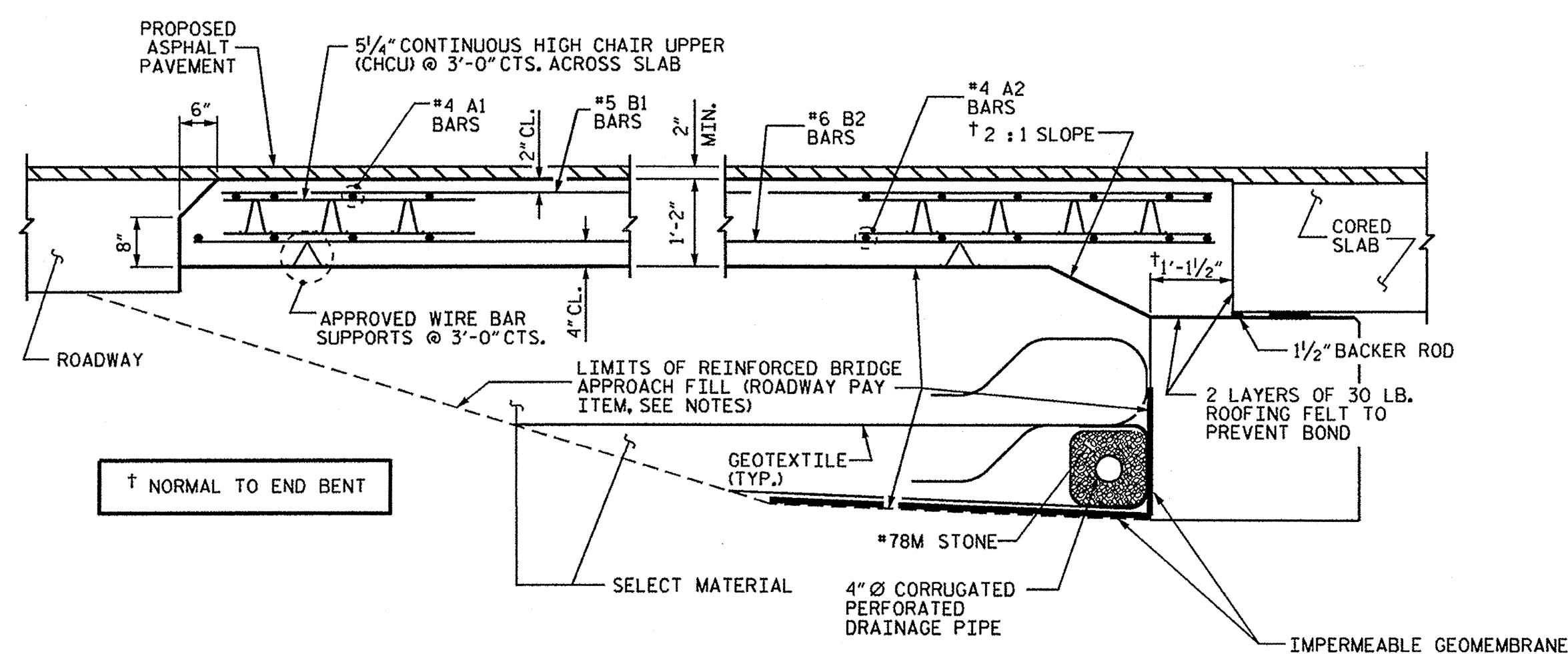
ASSEMBLED BY : B. L. GREEN DATE : 3/16/12  
CHECKED BY : E. E. MURRAY DATE : 4/19/12  
DRAWN BY : REK 1/84 REV. 5/1/06R TLA/GM  
CHECKED BY : RDU 1/84 REV. 10/1/11 MAA/GM  
REV. 12/21/11 MAA/GM

19-APR-2012 16:45  
S:\DPG\Emily\BOP\Projects\BD-5103R\BD-5103R\_SD.RR.dgn  
emurray





PLAN @ END BENT #1 PLAN @ END BENT #2  
DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



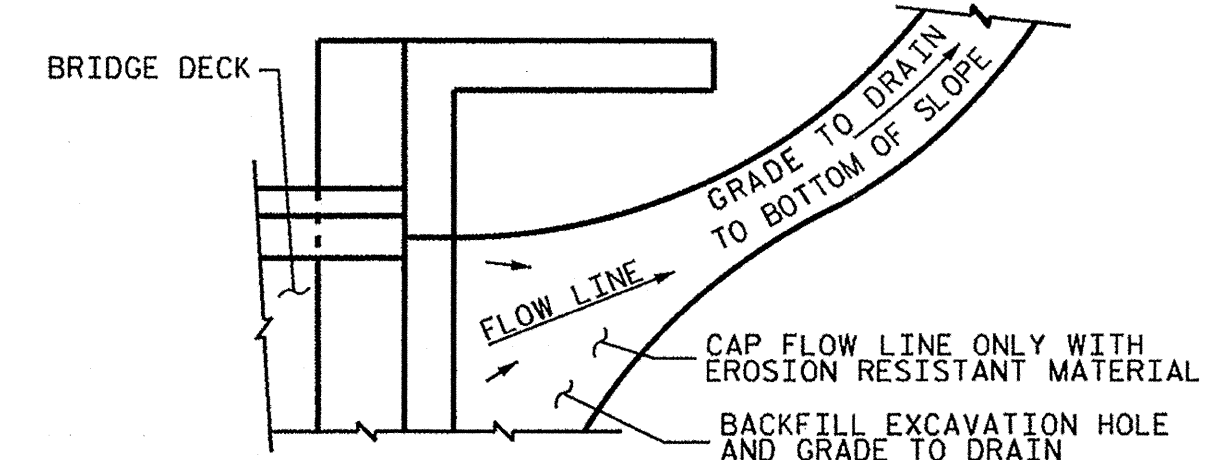
SECTION THRU SLAB

ASSEMBLED BY : B. L. GREEN DATE : 3/16/12  
 CHECKED BY : E. E. MURRAY DATE : 4/19/12  
 DRAWN BY : SHS/MAA 5-09 REV. 12-11 MAA/AAC  
 CHECKED BY : BCH 5-09

19-APR-2012 16:56  
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 emurray

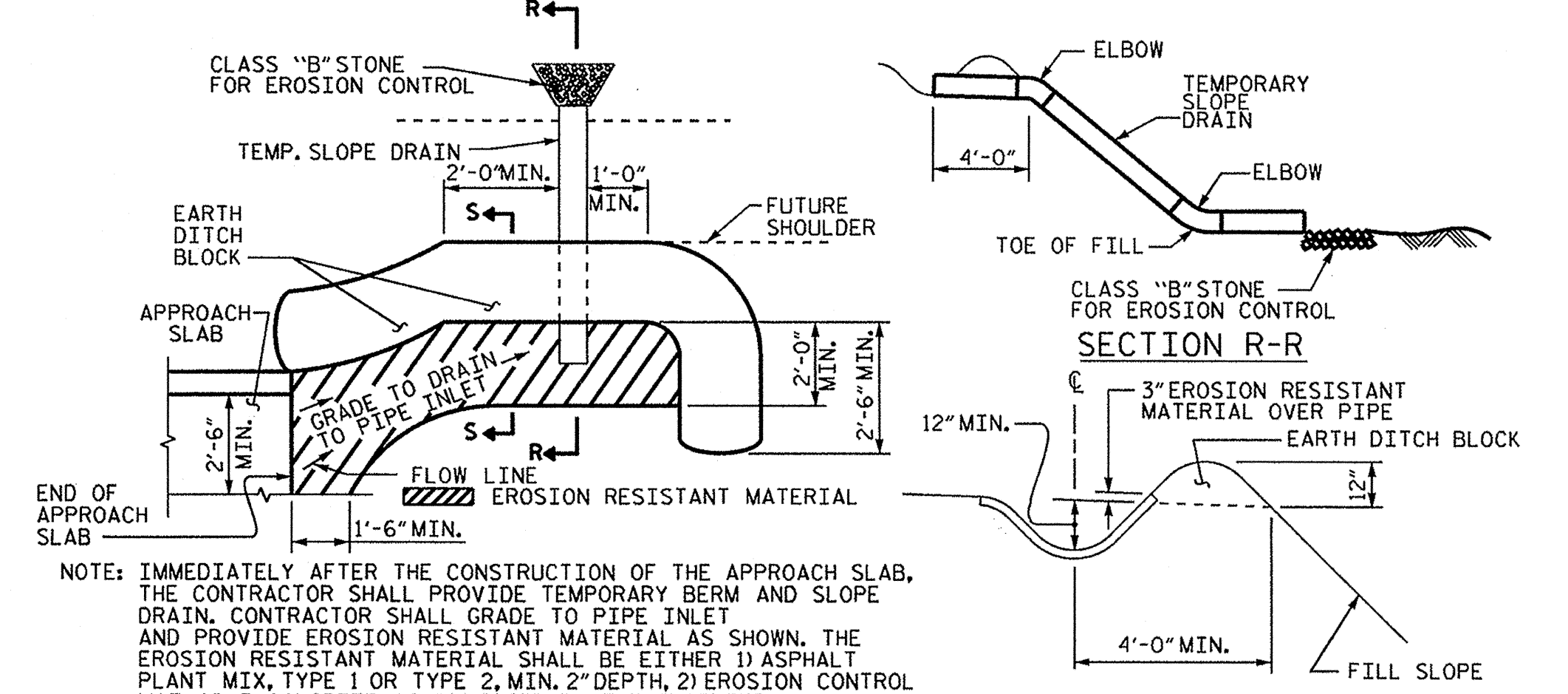
NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.  
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.  
 APPROACH SLAB GROOVING IS NOT REQUIRED.

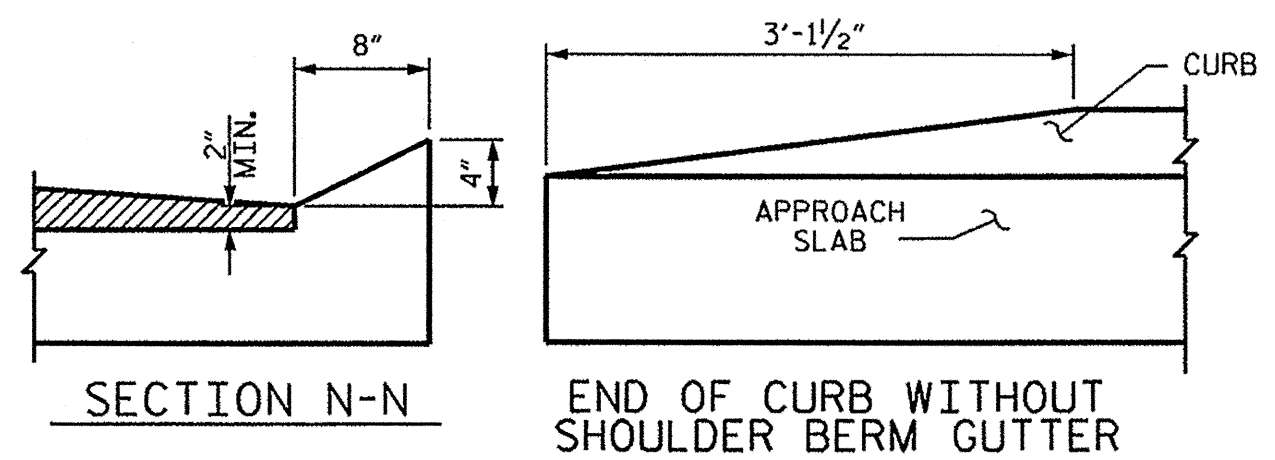


NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT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

TEMPORARY DRAINAGE DETAIL

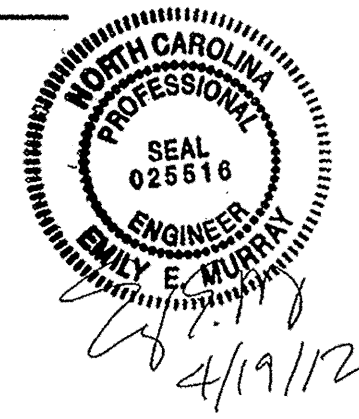


TEMPORARY BERM AND SLOPE DRAIN DETAILS  
(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)



CURB DETAILS

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



| BILL OF MATERIAL                 |     |      |      |        |            |
|----------------------------------|-----|------|------|--------|------------|
| APPROACH SLAB AT EB #1           |     |      |      |        |            |
| BAR                              | NO. | SIZE | TYPE | LENGTH | WEIGHT     |
| *A1                              | 26  | #4   | STR  | 17'-6" | 304        |
| *A2                              | 26  | #4   | STR  | 17'-5" | 302        |
| *B1                              | 64  | #5   | STR  | 11'-1" | 740        |
| *B2                              | 64  | #6   | STR  | 11'-7" | 1113       |
| * EPOXY COATED REINFORCING STEEL |     |      |      |        | LBS. 2459  |
| CLASS AA CONCRETE                |     |      |      |        | C. Y. 18.7 |
| APPROACH SLAB AT EB #2           |     |      |      |        |            |
| BAR                              | NO. | SIZE | TYPE | LENGTH | WEIGHT     |
| *A1                              | 26  | #4   | STR  | 17'-6" | 304        |
| *A2                              | 26  | #4   | STR  | 17'-5" | 302        |
| *B1                              | 64  | #5   | STR  | 11'-1" | 740        |
| *B2                              | 64  | #6   | STR  | 11'-7" | 1113       |
| * EPOXY COATED REINFORCING STEEL |     |      |      |        | LBS. 2459  |
| CLASS AA CONCRETE                |     |      |      |        | C. Y. 18.7 |

PROJECT NO. BD-5103R  
 BRUNSWICK COUNTY  
 STATION: 12+39.50 -L-

| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH              |     |       |     |     |                    |
|---|-----|-------|-----|-----|--------------------|
| STANDARD<br>BRIDGE APPROACH SLAB<br>FOR PRESTRESSED CONCRETE<br>CORED SLAB UNIT |     |       |     |     |                    |
| 75° SKEW  |     |       |     |     |                    |
| REVISIONS   |     |       |     |     | SHEET NO.          |
| NO.   | BY: | DATE: | NO. | BY: | DATE:              |
| 1   |     |       | 3   |     |                    |
| 2   |     |       | 4   |     |                    |
|   |     |       |     |     | TOTAL SHEETS<br>19 |



## STANDARD NOTES

### DESIGN DATA:

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

### MATERIAL AND WORKMANSHIP:

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

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

### CONCRETE:

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

### CONCRETE CHAMFERS:

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

### DOWELS:

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

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

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

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

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

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

### REINFORCING STEEL:

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

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

### STRUCTURAL STEEL:

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

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

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

### HANDRAILS AND POSTS:

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

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

### SPECIAL NOTES:

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

# ENGLISH

JANUARY, 1990