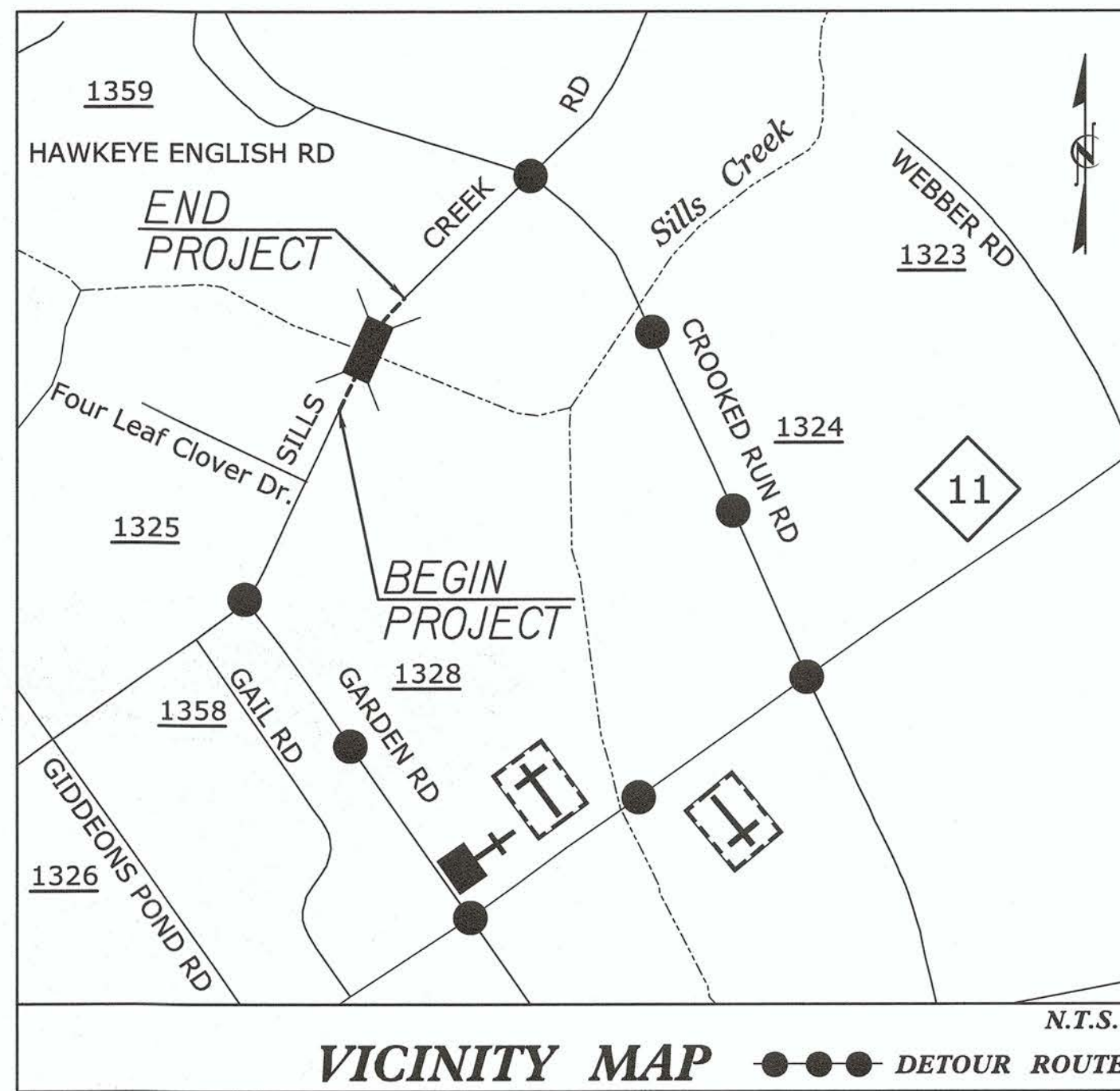


4/29/2015 1:36:03 PM  
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CONTRACT: DC00111

TIP PROJECT: BD-5103X

See Sheet 1-A For Index of Sheets



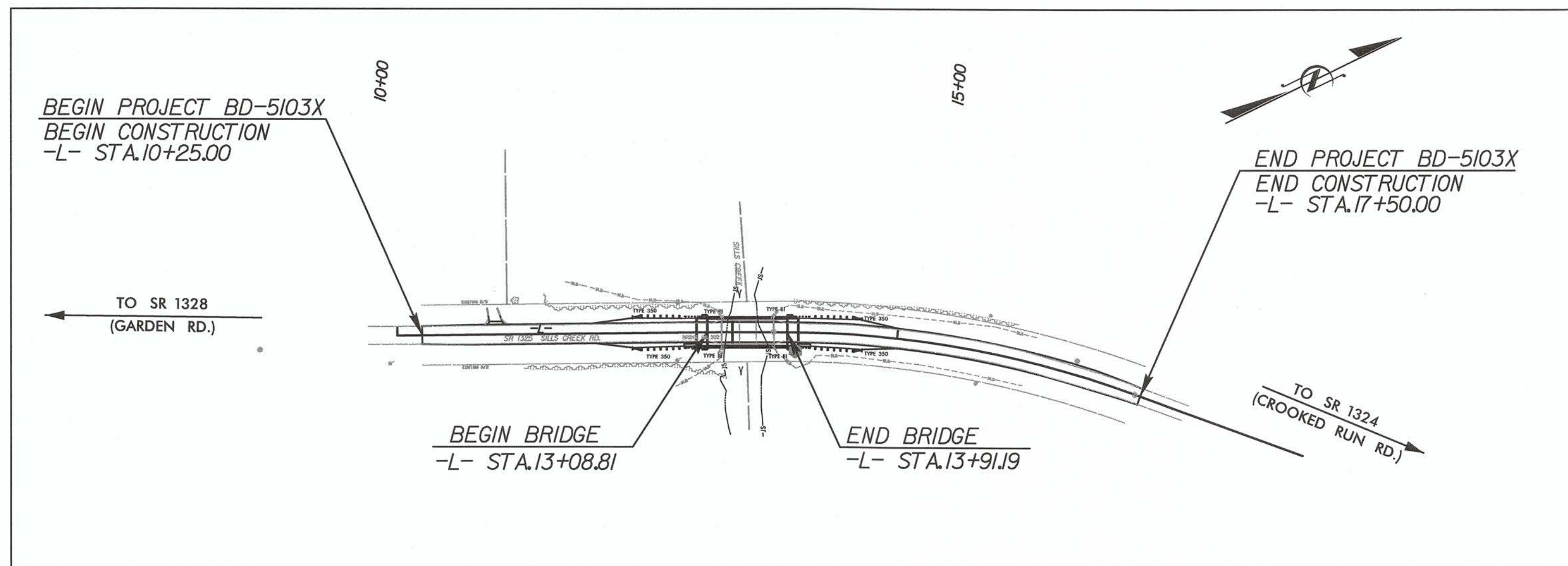
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**PENDER COUNTY**

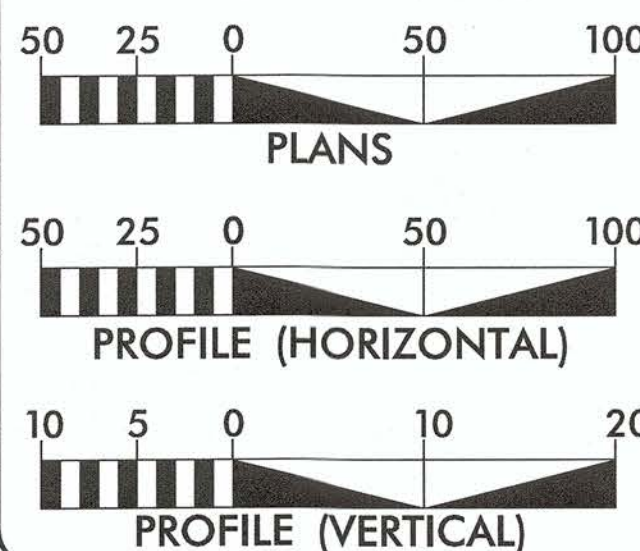
LOCATION: **BRIDGE NO. 202 OVER BRANCH OF SILL'S CREEK  
ON SR 1325 (SILLS CREEK RD.)**

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

| STATE           | PROJECT REFERENCE NO. | SHEET NO.       | TOTAL SHEETS |
|-----------------|-----------------------|-----------------|--------------|
| NC              | BD-5103X              | 1               | 43           |
| STATE PROJ. NO. | F.A. PROJ. NO.        | DESCRIPTION     |              |
| 45349.3.FD24    | BRZ-1325(6)           | LIB REPLACEMENT |              |
|                 |                       |                 |              |
|                 |                       |                 |              |
|                 |                       |                 |              |
|                 |                       |                 |              |
|                 |                       |                 |              |



GRAPHIC SCALES



DESIGN DATA

ADT 2008 = 90  
ADT 2035 = <400  
DHV = 10%  
D = 60%  
T = 6% \*  
V = 50 MPH  
\* TTST 2% DUAL 4%  
SUB REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT BD-5103X = 0.121 MI.  
LENGTH OF STRUCTURE TIP PROJECT BD-5103X = 0.016 MI.  
TOTAL LENGTH OF TIP PROJECT BD-5103X = 0.137 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:  
DECEMBER 12, 2013

LETTING DATE:  
MAY 28, 2015

ENRICO A. ROQUE, P.E.  
PROJECT ENGINEER

MONICA J. DUVAL  
SR. ROADWAY DESIGNER

AMANDA GLYNN, P.E.  
NCDOT CONTACT

HYDRAULICS  
ENGINEER

James C. Byrd  
SIGNATURE: 4/29/15

ROADWAY  
DESIGN  
ENGINEER

Guin A. R. R. P.E.  
SIGNATURE: 4/29/15

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA



STATE HIGHWAY DESIGN ENGINEER P.E.



INDEX OF SHEETS

| SHEET NUMBER          | SHEET                                                                                 |
|-----------------------|---------------------------------------------------------------------------------------|
| I                     | TITLE SHEET                                                                           |
| I-A                   | INDEX OF SHEETS, GENERAL NOTES & LIST OF STANDARDS                                    |
| I-B                   | SYMBOLGY SHEET                                                                        |
| I-C                   | SURVEY CONTROL SHEETS                                                                 |
| 2                     | TYPICAL SECTION SHEET                                                                 |
| 3                     | EARTHWORK, PAVEMENT REMOVAL, GUARDRAIL SUMMARY, ROW SUMMARY, & DRAINAGE SUMMARY SHEET |
| 4                     | PLAN & PROFILE SHEET                                                                  |
| TMP-I, TMP-IA & TMP-2 | TRANSPORTATION MANAGEMENT PLANS                                                       |
| EC-I THRU EC-6        | EROSION CONTROL PLANS                                                                 |
| X-I THRU X-5          | -L- CROSS SECTION SHEETS                                                              |
| S-I THRU S-22         | STRUCTURE PLANS                                                                       |

GENERAL NOTES: 2012 SPECIFICATIONS  
EFFECTIVE: 01-17-12  
REVISED: 11/01/11

GRADE LINE:  
GRADING AND SURFACING:  
THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

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

SUPERELEVATION:  
ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:  
ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01.

DRIVEWAYS:  
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3' RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

GUARDRAIL:  
THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

END BENTS:  
THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:  
UTILITY OWNERS ON THIS PROJECT ARE:  
Power - DUKE ENERGY PROGRESS  
NO UTILITY RELOCATIONS ARE REQUIRED FOR THIS PROJECT.

RIGHT-OF-WAY MARKERS:  
ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

2012 ROADWAY ENGLISH STANDARD DRAWINGS

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

| STD.NO.                                    | TITLE                                                                         |
|--------------------------------------------|-------------------------------------------------------------------------------|
| DIVISION 2 - EARTHWORK                     |                                                                               |
| 200.02                                     | Method of Clearing - Method II                                                |
| 225.02                                     | Guide for Grading Subgrade - Secondary and Local                              |
| 225.04                                     | Method of Obtaining Superelevation - Two Lane Pavement                        |
| DIVISION 3 - PIPE CULVERTS                 |                                                                               |
| 300.01                                     | Method of Pipe Installation                                                   |
| DIVISION 4 - MAJOR STRUCTURES              |                                                                               |
| 422.10                                     | Reinforced Bridge Approach Fills                                              |
| DIVISION 5 - SUBGRADE, BASES AND SHOULDERS |                                                                               |
| 560.01                                     | Method of Shoulder Construction - High Side of Superelevated Curve - Method I |
| DIVISION 8 - INCIDENTALS                   |                                                                               |
| 806.01                                     | Concrete Right-of-Way Marker                                                  |
| 840.00                                     | Concrete Base Pad for Drainage Structures                                     |
| 840.29                                     | Frames and Narrow Slot Flat Grates                                            |
| 840.35                                     | Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates     |
| 840.66                                     | Drainage Structure Steps                                                      |
| 846.01                                     | Concrete Curb, Gutter and Curb & Gutter                                       |
| 846.04                                     | Drop Inlet Installation in Shoulder Berm Gutter                               |
| 848.02                                     | Driveway Turnout - Radius Type                                                |
| 862.01                                     | Guardrail Placement                                                           |
| 862.02                                     | Guardrail Installation                                                        |
| 862.03                                     | Structure Anchor Units                                                        |
| 876.01                                     | Rip Rap in Channels                                                           |
| 876.02                                     | Guide for Rip Rap at Pipe Outlets                                             |

CENTERLINE COORDINATE LIST

| POINT | STATION  | NORTHING     | EASTING        |
|-------|----------|--------------|----------------|
| POT   | 10+00.00 | 336,394.0311 | 2,286,173.6701 |
| BEG   | 10+25.00 | 336,416.6440 | 2,286,184.3310 |
| END   | 17+50.00 | 337,036.2072 | 2,286,551.1208 |
| POT   | 19+23.00 | 337,156.6780 | 2,286,675.2760 |
|       |          |              |                |
|       |          |              |                |
|       |          |              |                |
|       |          |              |                |
|       |          |              |                |
|       |          |              |                |
|       |          |              |                |
|       |          |              |                |
|       |          |              |                |
|       |          |              |                |
|       |          |              |                |

NOTE: SEE SHEET NO. 1-C FOR DATUM DESCRIPTION

REVISIONS



*Note: Not to Scale*

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

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

| PROJECT REFERENCE NO. | SHEET NO. |
|-----------------------|-----------|
| BD-5103X              | 1-B       |

**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.*) |  |

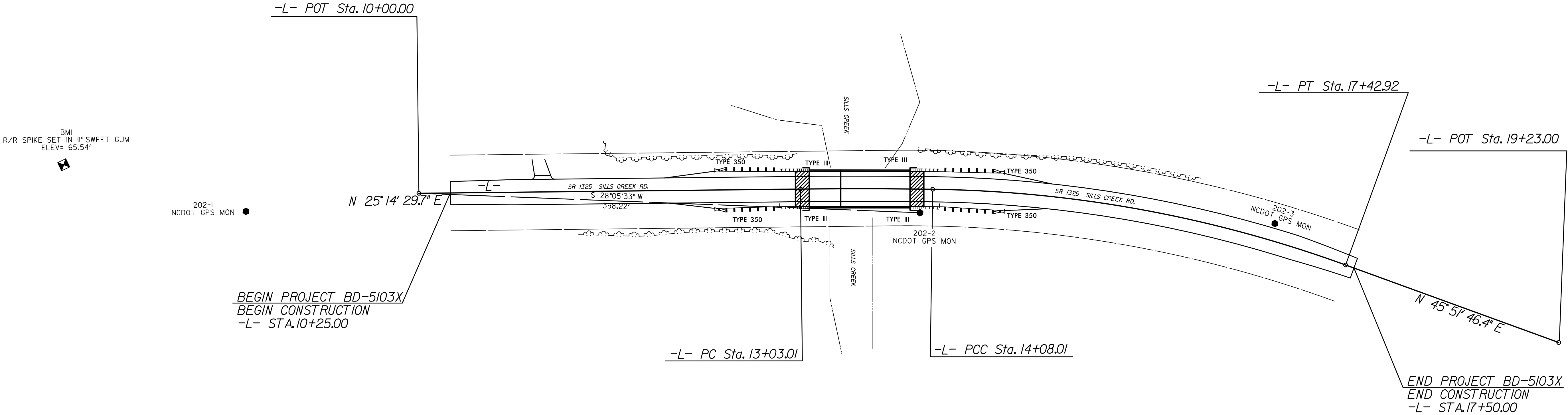
**MISCELLANEOUS:**

|                                        |               |
|----------------------------------------|---------------|
| 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 | <b>AATUR</b>  |
| End of Information                     | <b>E.O.I.</b> |



SURVEY CONTROL SHEET BD-5103X-202

|                       |           |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| WBS# 45349.1.24       | 1C        |
| Location and Surveys  |           |



| BL   | POINT           | DESC. | NORTH       | EAST         | ELEVATION | L STATION              | OFFSET   |
|------|-----------------|-------|-------------|--------------|-----------|------------------------|----------|
| 2021 | GPS REBAR & CAP |       | 336264.2200 | 2286126.6530 | 59.36     | OUTSIDE PROJECT LIMITS |          |
| 2022 | GPS REBAR & CAP |       | 336745.3360 | 2286361.1910 | 47.67     | 13+98.16               | 18.73 RT |
| 2023 | GPS REBAR & CAP |       | 336995.1120 | 2286491.8970 | 47.78     | 16+79.71               | 13.77 LT |

.....  
KC353 ELEVATION = 65.54  
N 336016 E 2285965  
L STATION 19+23.00  
S 31°54'8.93" W DIST 1343.95  
R/R SPIKE SET IN 11" SWEET GUM  
.....

**DATUM DESCRIPTION**  
THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "202-2"  
WITH NAD 83/NSRS 2007 STATE PLANE GRID COORDINATES OF  
NORTHING: 336745.336(±) EASTING: 2286361.191(±)  
ELEVATION: 47.666(±)  
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999926737  
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "202-2" TO -L- STATION 10+00.00 IS  
S 28° 05' 33" W 398.22'  
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
VERTICAL DATUM USED IS NAVD 88

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:  
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)

THE FILES TO BE FOUND ARE AS FOLLOWS:  
TIP####\_LS\_CONTROL\_DATE.HTML

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

Ⓢ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.  
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.  
NETWORK ESTABLISHED FROM EXISTING HARN MONUMENTATION  
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

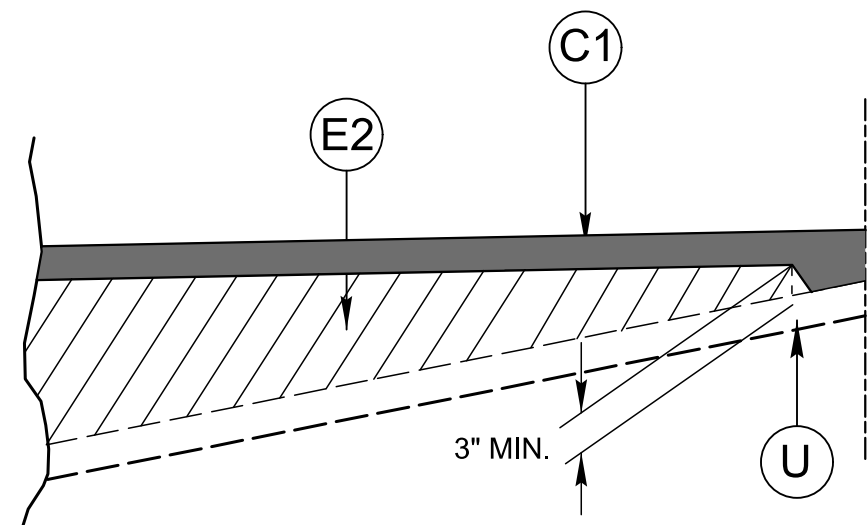


REVISIONS

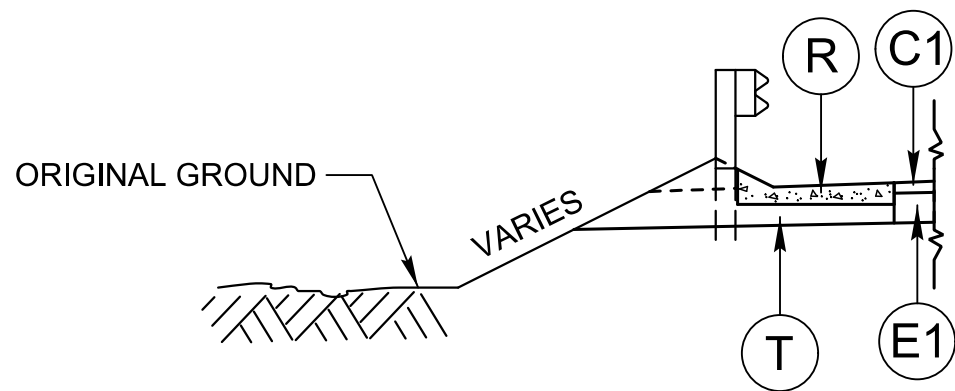
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| PAVEMENT SCHEDULE |                                                                                                                                                                                                             |
|-------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| C1                | 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.                                                                           |
| C2                | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110.00 LBS. PER SQ. YARD PER 1" DEPTH TO BE PLACED IN LAYERS NOT TO EXCEED 3".                                         |
| 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 LESS THAN 3" IN DEPTH OR GREATER THAN 5.5" 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



DETAIL SHOWING METHOD OF WEDGING  
SEE TYPICAL SECTIONS



DETAIL A

SHOULDER BERM GUTTER LOCATIONS

-L- STA. 12+85.3 TO -L- STA. 12+97.6 RT

-L- STA. 14+02.39 TO -L- STA. 14+14.69 RT

**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-5103X

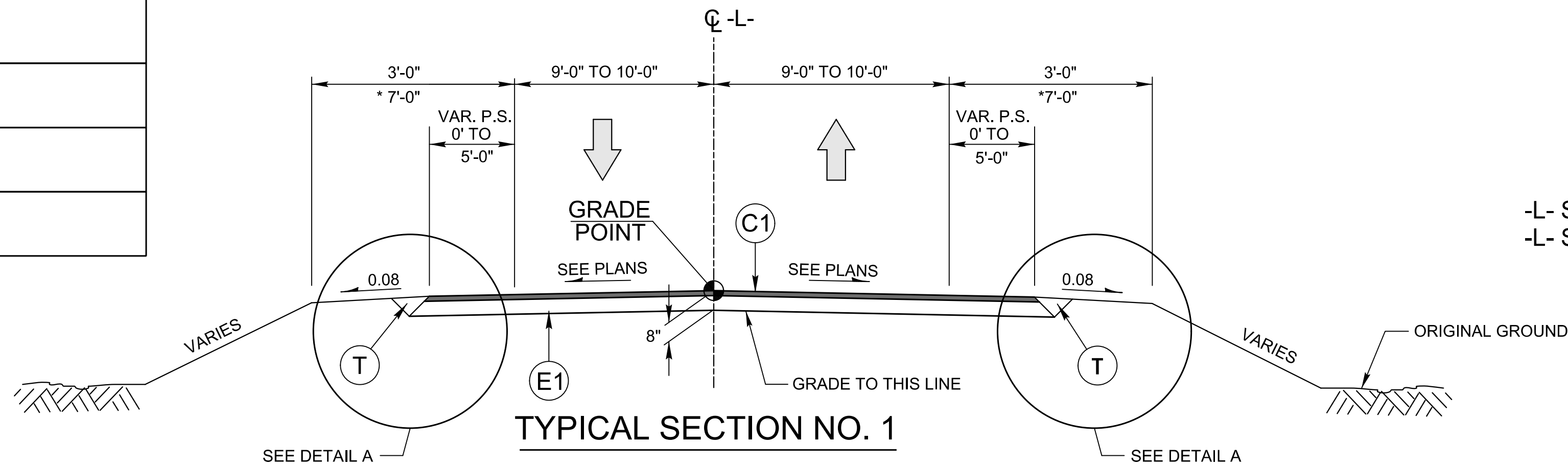
SHEET NO.

2

RW SHEET NO.

ROADWAY DESIGN  
ENGINEER

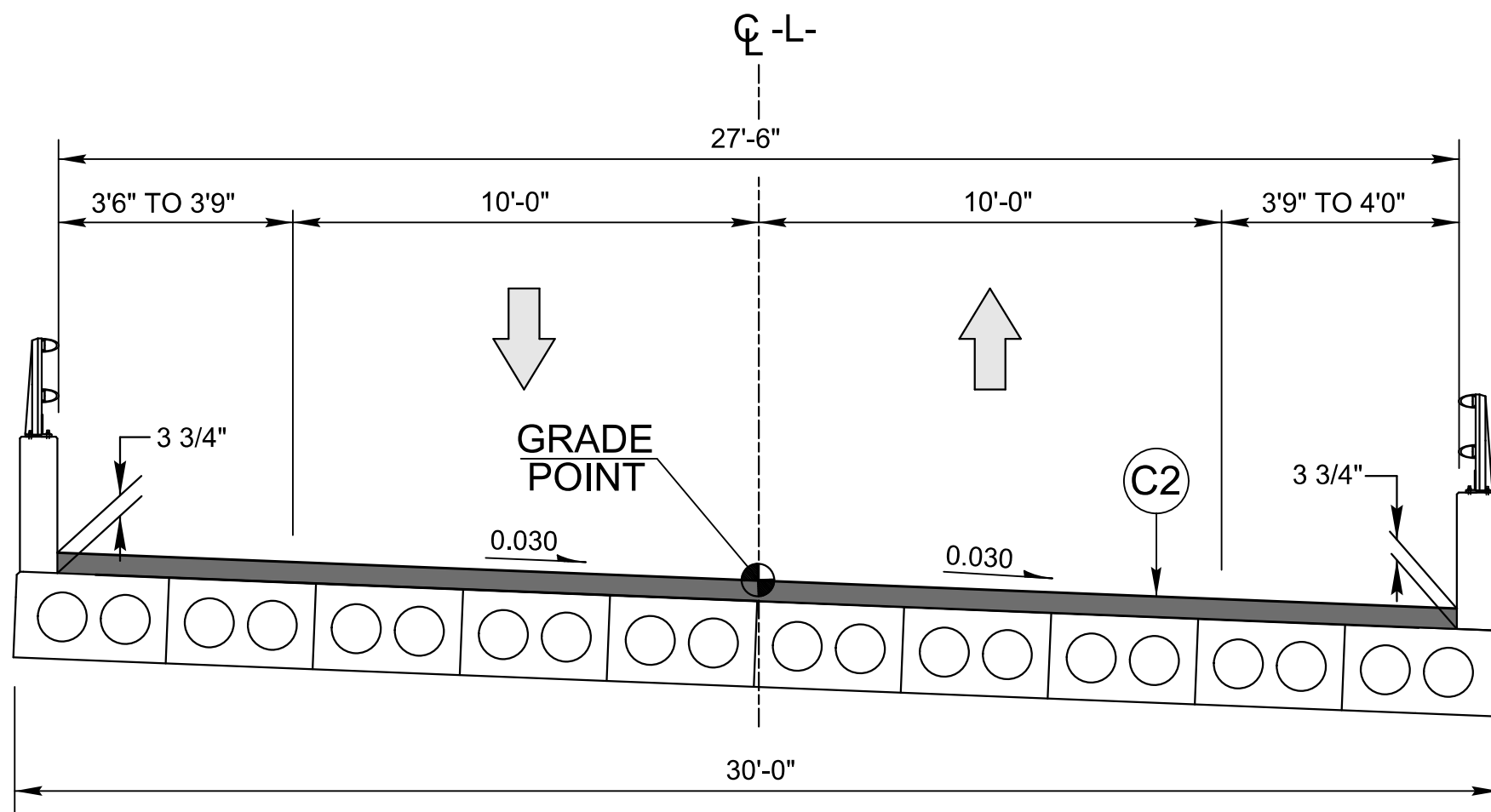
PAVEMENT DESIGN  
ENGINEER



USE TYPICAL SECTION NO. 1 FROM:

-L- STA. 10+25.00 TO -L- STA. 13+08.81 (BEGIN BRIDGE)

-L- STA. 13+91.19 (END BRIDGE) TO -L- STA. 17+50.00



TYPICAL SECTION NO. 2  
CORED SLAB BRIDGE OVERLAY

USE TYPICAL SECTION NO. 2 FROM:

-L- STA. 13+08.81 +/- TO -L- STA. 13+91.19 +/-

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



REVISIONS

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| ROW AREA DATA SUMMARY |                       |               |                   |                    |                    |              |                    |                    |
|-----------------------|-----------------------|---------------|-------------------|--------------------|--------------------|--------------|--------------------|--------------------|
| PARCEL NO.            | PROPERTY OWNERS NAMES | TOTAL ACREAGE | AREA TAKEN (SQFT) | AREA REMAINING RT. | AREA REMAINING LT. | CONST. EASE. | PERM. DRAIN. EASE. | TEMP. DRAIN. EASE. |
| 4                     | JIMMIE MINTZ, ET ALL  | -             |                   |                    |                    |              | 307.7 SF           |                    |
|                       |                       | -             |                   |                    |                    |              |                    |                    |
|                       |                       | -             |                   |                    |                    |              |                    |                    |
|                       |                       |               |                   |                    |                    |              |                    |                    |
|                       |                       |               |                   |                    |                    |              |                    |                    |
|                       |                       |               |                   |                    |                    |              |                    |                    |
|                       |                       |               |                   |                    |                    |              |                    |                    |
|                       |                       |               |                   |                    |                    |              |                    |                    |
|                       |                       |               |                   |                    |                    |              |                    |                    |
|                       |                       |               |                   |                    |                    |              |                    |                    |

| STATION            | LOCATION (LT,RT, OR CL) | STRUCTURE NO. |     | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) |     |     | QUANTITIES FOR DRAINAGE STRUCTURES<br>TOTAL L.F. FOR PAY QUANTITY SHALL BE COL.'A' + (1.3 X COL. 'B') |                   |                   | SIDE DRAIN PIPE |     |     | GRADED T.B.D.I., TYPE 'B' STD. 840.35 | T.B.D.I. (NS) FRAME AND GRATE STD. 840.29 |  | ABBREVIATIONS |
|--------------------|-------------------------|---------------|-----|---------------|------------------|------------------|----------------|----------------------------------------------|-----|-----|-------------------------------------------------------------------------------------------------------|-------------------|-------------------|-----------------|-----|-----|---------------------------------------|-------------------------------------------|--|---------------|
|                    |                         |               |     |               |                  |                  |                |                                              |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
|                    |                         |               |     |               |                  |                  |                | 15"                                          | 18" | 24" |                                                                                                       |                   |                   | 15"             | 18" | 24" |                                       |                                           |  |               |
|                    |                         |               |     |               |                  |                  |                |                                              |     |     | PER EACH (0 THRU 5.0')                                                                                | A 5.0' THRU 10.0' | B 10.0' AND ABOVE |                 |     |     |                                       |                                           |  |               |
| SIZE               | FROM                    | TO            |     |               |                  |                  |                |                                              |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
| THICKNESS OR GAUGE |                         |               |     |               |                  |                  |                |                                              |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
|                    |                         |               |     |               |                  |                  |                |                                              |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
| -L- 14 + 09.45     | RT                      | 0401          |     | 50.51         |                  |                  |                |                                              |     |     | 1                                                                                                     |                   |                   |                 |     |     | 1                                     | 1                                         |  |               |
| -L- 14 + 09.54     | RT                      | 0401          | OUT |               | 46.01            | 45.51            |                | 20                                           |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
|                    |                         |               |     |               |                  |                  |                |                                              |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
|                    |                         |               |     |               |                  |                  |                |                                              |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
|                    |                         |               |     |               |                  |                  |                |                                              |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
|                    |                         |               |     |               |                  |                  |                |                                              |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
|                    |                         |               |     |               |                  |                  |                |                                              |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
|                    |                         |               |     |               |                  |                  |                |                                              |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
|                    |                         |               |     |               |                  |                  |                |                                              |     |     |                                                                                                       |                   |                   |                 |     |     |                                       |                                           |  |               |
| TOTAL              |                         |               |     |               |                  |                  |                | 20                                           |     |     | 1                                                                                                     |                   |                   |                 |     |     | 1                                     | 1                                         |  |               |

| SURVEY LINE | BEG. STA.                     | END STA.   | LOCATION | LENGTH   |                |                 | WARRANT POINT   |                 | "N"<br>DIST.<br>FROM<br>E.O.L. | TOTAL<br>SHOULDER<br>WIDTH | FLARE LENGTH    |                 | W               |                 | ANCHORS   |    |             |                    |      |       |     |     |      |    | IMPACT<br>ATTENUATOR<br>TYPE 350 |    |  | SINGLE<br>FACED<br>GUARDRAIL | REMOVE<br>EXISTING<br>GUARDRAIL | REMOVE<br>AND<br>STOCKPILE<br>EXISTING<br>GUARDRAIL | REMARKS |
|-------------|-------------------------------|------------|----------|----------|----------------|-----------------|-----------------|-----------------|--------------------------------|----------------------------|-----------------|-----------------|-----------------|-----------------|-----------|----|-------------|--------------------|------|-------|-----|-----|------|----|----------------------------------|----|--|------------------------------|---------------------------------|-----------------------------------------------------|---------|
|             |                               |            |          | STRAIGHT | SHOP<br>CURVED | DOUBLE<br>FACED | APPROACH<br>END | TRAILING<br>END |                                |                            | APPROACH<br>END | TRAILING<br>END | APPROACH<br>END | TRAILING<br>END | XI<br>MOD | XI | GRAU<br>350 | TYPE 350<br>(TL-3) | XIII | CAT-1 | III | BIC | AT-1 | EA | G                                | NG |  |                              |                                 |                                                     |         |
|             |                               |            |          |          |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
| -L-         | 12 + 35.16                    | 13 + 10.16 | LT       | 75       |                |                 |                 |                 | 4                              | 7                          |                 | 50              |                 | 1               |           |    | 1           |                    |      |       |     | 1   |      |    |                                  |    |  |                              |                                 |                                                     |         |
| -L-         | 13 + 89.87                    | 14 + 64.87 | LT       | 75       |                |                 |                 |                 | 4                              | 7                          | 50              |                 | 1               |                 |           |    | 1           |                    |      |       | 1   |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
| -L-         | 12 + 34.85                    | 13 + 09.85 | RT       | 75       |                |                 |                 |                 | 4                              | 7                          | 50              |                 | 1               |                 |           |    | 1           |                    |      |       | 1   |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
| -L-         | 13 + 90.13                    | 14 + 65.13 | RT       | 75       |                |                 |                 |                 | 4                              | 7                          |                 | 50              |                 | 1               |           |    | 1           |                    |      |       | 1   |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             |                               |            |          |          |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             | LESS ANCHOR DEDUCTIONS        |            |          |          |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             |                               |            |          |          |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             |                               |            |          |          |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             | GRAU-350                      | 4 @ 50.00' | =        | 200.00   |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             | TYPE III                      | 4 @ 18.75' | =        | 75.00    |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             |                               |            |          |          |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             |                               |            | TOTAL    | 275.0    |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    | 4           |                    |      |       | 4   |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             |                               |            |          |          |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             |                               |            | SAY      | 25.0     |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             | (5 ADDITIONAL GUARDRAIL POST) |            |          |          |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |
|             |                               |            |          |          |                |                 |                 |                 |                                |                            |                 |                 |                 |                 |           |    |             |                    |      |       |     |     |      |    |                                  |    |  |                              |                                 |                                                     |         |

| PAVEMENT REMOVAL SUMMARY<br>IN SQUARE YARDS |                             |                              |
|---------------------------------------------|-----------------------------|------------------------------|
| LOCATION                                    | REMOVAL OF ASPHALT PAVEMENT | BREAKING OF ASPHALT PAVEMENT |
| -L- STA. 10+25 TO 13+25                     | 600 sy                      |                              |
| -L- STA. 13+76 TO 17+50                     | 750 sy                      |                              |
|                                             |                             |                              |
|                                             |                             |                              |
| GRAND TOTAL                                 | 1350 sy                     |                              |
| SAY                                         | 1400 sy                     |                              |

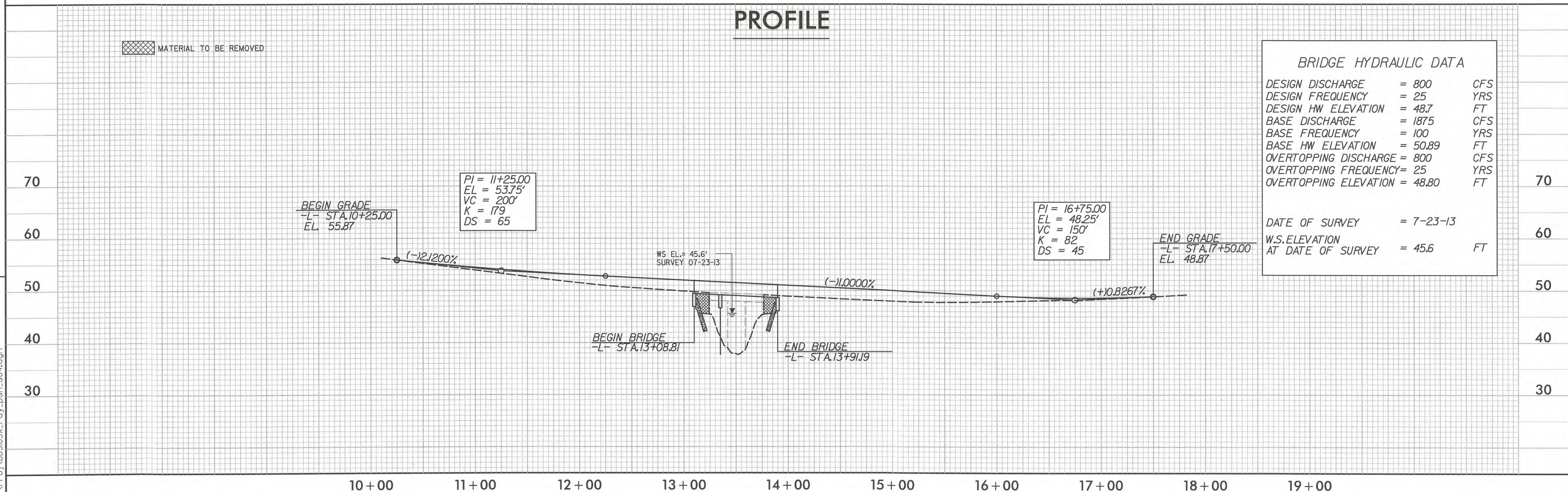
| SUMMARY OF EARTHWORK<br>IN CUBIC YARDS |                                    |                         |             |        |       |
|----------------------------------------|------------------------------------|-------------------------|-------------|--------|-------|
| STATION                                | STATION                            | UNCLASSIFIED EXCAVATION | EMBANK. + % | BORROW | WASTE |
| -L- STA. 10 + 25.00                    | -L- STA. 13 + 08.81 (BEGIN BRIDGE) | 24                      | 503         | 479    |       |
| -L- STA. 13 + 91.19 (END BRIDGE)       | -L- STA. 17 + 50                   | 23                      | 714         | 691    |       |
|                                        |                                    |                         |             |        |       |
| PROJECT SUBTOTAL                       |                                    | 47                      | 1217        | 1170   |       |
| 5% TO REPLACE BORROW                   |                                    |                         |             | 59     |       |
|                                        |                                    |                         |             |        |       |
| PROJECT TOTAL                          |                                    | 47                      |             | 1229   |       |
| GRAND TOTALS:                          |                                    | 47                      |             | 1229   |       |
| SAY:                                   |                                    | 50                      |             | 1250   |       |
|                                        |                                    |                         |             |        |       |
|                                        |                                    |                         |             |        |       |

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



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Raleigh, North Carolina 27609  
NC License No: C-1554

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



BRIDGE HYDRAULIC DATA

|                       |   |       |     |
|-----------------------|---|-------|-----|
| DESIGN DISCHARGE      | = | 800   | CFS |
| DESIGN FREQUENCY      | = | 25    | YRS |
| DESIGN HW ELEVATION   | = | 48.7  | FT  |
| BASE DISCHARGE        | = | 1875  | CFS |
| BASE FREQUENCY        | = | 100   | YRS |
| BASE HW ELEVATION     | = | 50.89 | FT  |
| OVERTOPPING DISCHARGE | = | 800   | CFS |
| OVERTOPPING FREQUENCY | = | 25    | YRS |
| OVERTOPPING ELEVATION | = | 48.80 | FT  |

DATE OF SURVEY = 7-23-13

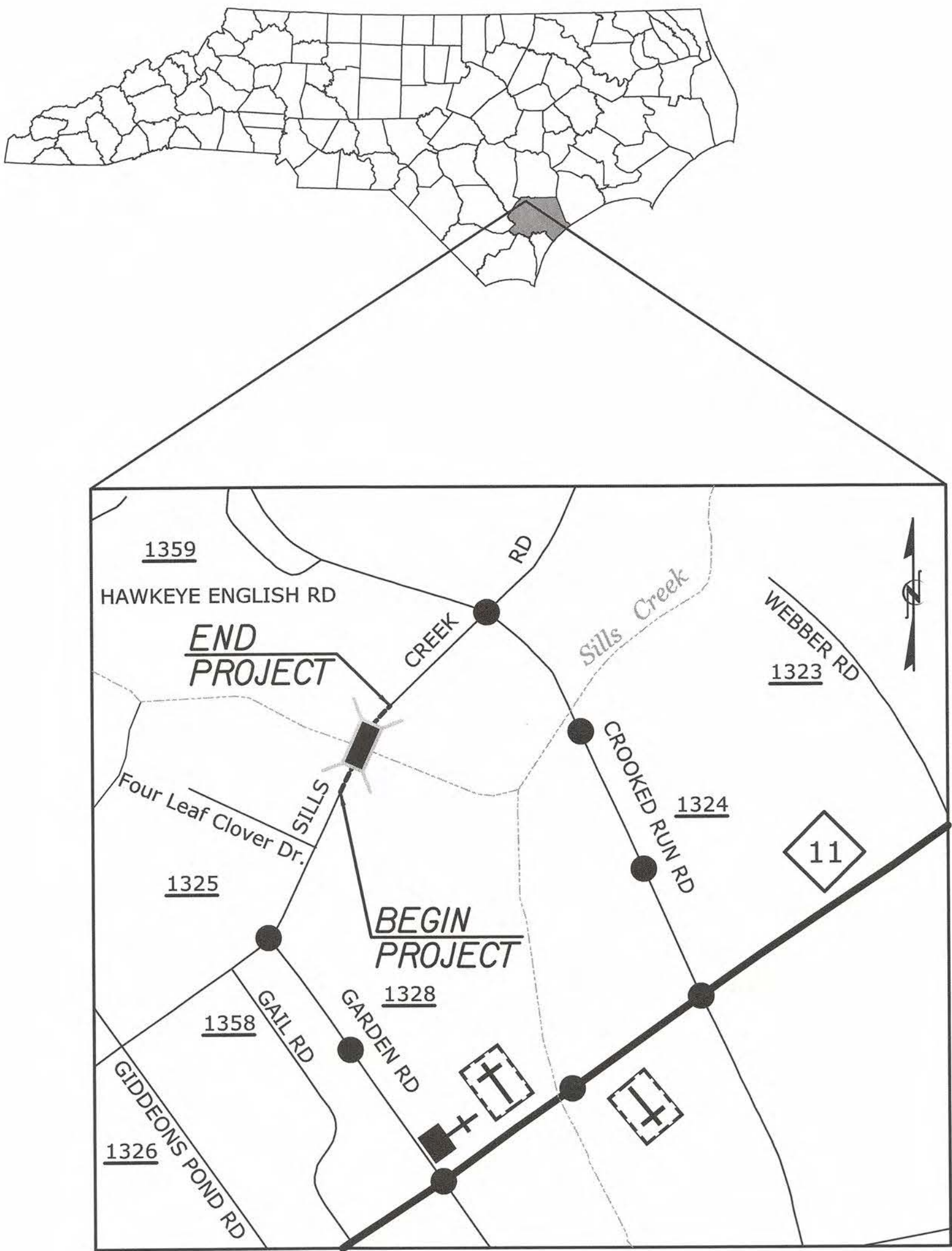
W.S.ELEVATION  
AT DATE OF SURVEY = 45.6 FT

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STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN  
PENDER COUNTY



INDEX OF SHEETS

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

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:

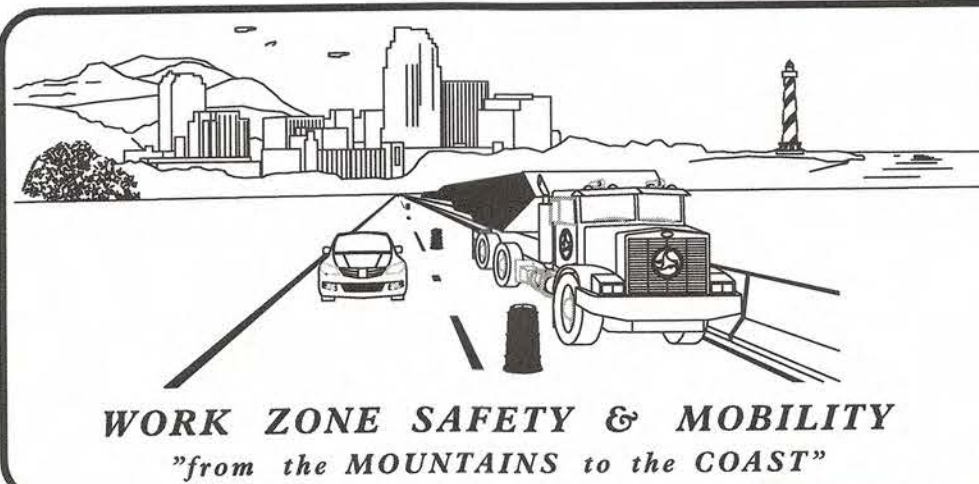
| STD. NO. | TITLE                                             |
|----------|---------------------------------------------------|
| 1101.01  | WORK ZONE ADVANCE WARNING SIGNS                   |
| 1101.03  | TEMPORARY ROAD CLOSURES                           |
| 1101.11  | TRAFFIC CONTROL DESIGN TABLES                     |
| 1110.01  | STATIONARY WORK ZONE SIGNS                        |
| 1145.01  | BARRICADES                                        |
| 1205.01  | PAVEMENT MARKINGS - LINE TYPES & OFFSETS          |
| 1205.02  | PAVEMENT MARKINGS - 2 LANE & MULTILANE ROADWAYS   |
| 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                         |

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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: 6-26-14

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



BD-5103X

TIP PROJECT:



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\$\$\$\$\$USER\$NAME\$\$\$\$

QA/QC STAGE:

REVIEW:  
CONCUR:  
REVISE:  
VERIFY:

REVISIONS

8/17/99

|                     |           |
|---------------------|-----------|
| PROJ. REFERENCE NO. | SHEET NO. |
| BD-5103X            | TMP-1A    |

## 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 UNDESIREED 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 IN THE TRAFFIC CONTROL PLANS.

- 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.

### PAVEMENT MARKINGS AND MARKERS

- I) INSTALL TEMPORARY PAVEMENT MARKINGS AND TEMPORARY PAVEMENT MARKERS ON INTERIM LAYERS OF PAVEMENT AS FOLLOWS:

| ROAD NAME                   | MARKING | MARKER |
|-----------------------------|---------|--------|
| SR 1325<br>(SILLS CREEK RD) | PAINT   | NONE   |

- J) PLACE ONE APPLICATION OF PAINT FOR TEMPORARY TRAFFIC PATTERNS. PLACE A SECOND APPLICATION OF PAINT SIX (6) MONTHS AFTER THE INITIAL APPLICATION AND EVERY SIX MONTHS AS DIRECTED BY THE ENGINEER.
- K) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- L) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS BY THE END OF EACH DAY'S OPERATION.

## PHASING

### PHASE I Step 1

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).

### STEP 2

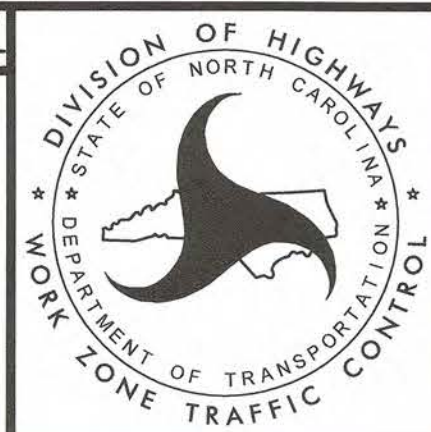
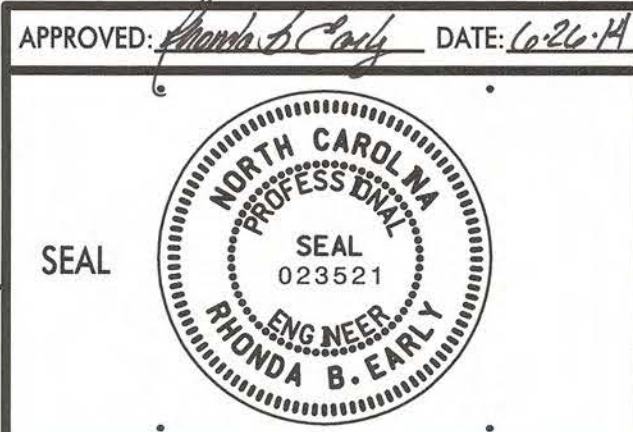
USING OFF-SITE DETOUR, UNCOVER DETOUR SIGNS AND CLOSE -L- (SR 1325 / SILLS CREEK RD.) TO TRAFFIC AND CONSTRUCT BRIDGE, APPROACHES AND ROADWAY UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE.

### STEP 3

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 1325 / SILLS CREEK RD.) TO TRAFFIC.

**HNTB**

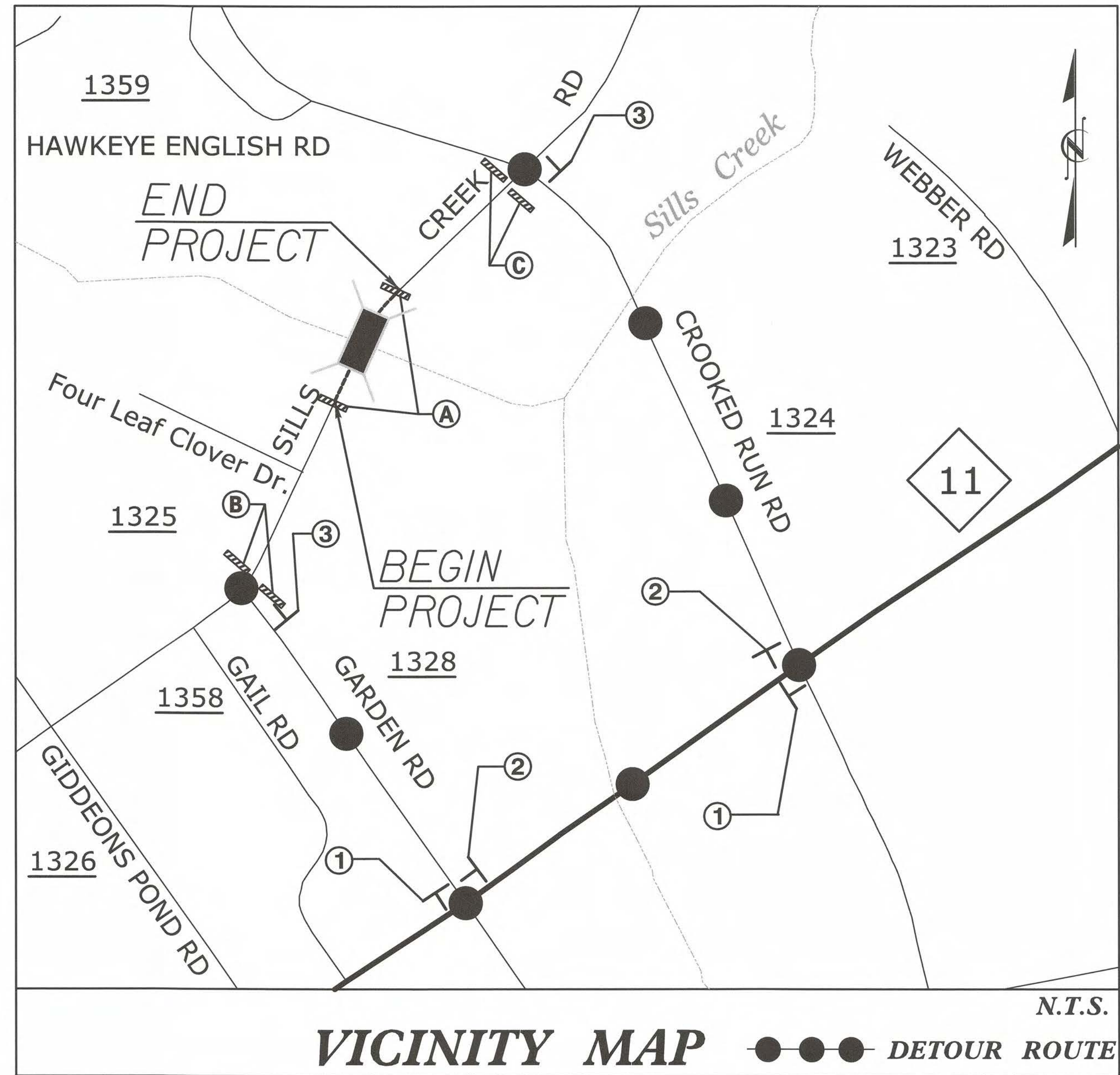
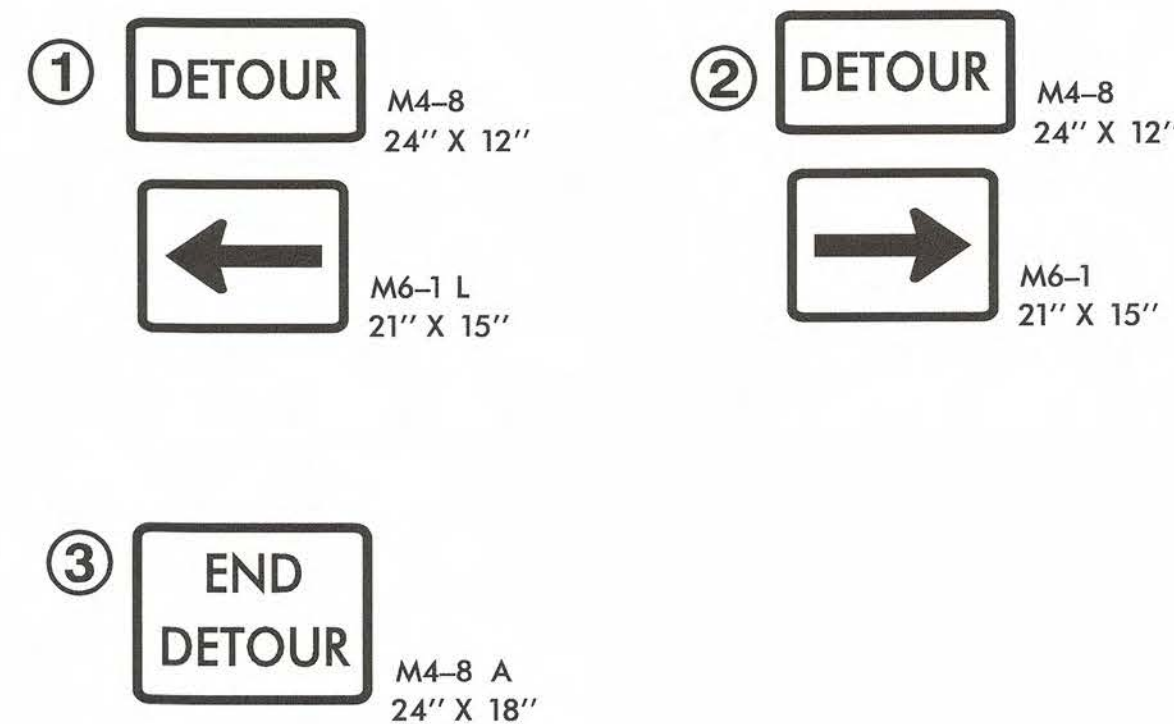
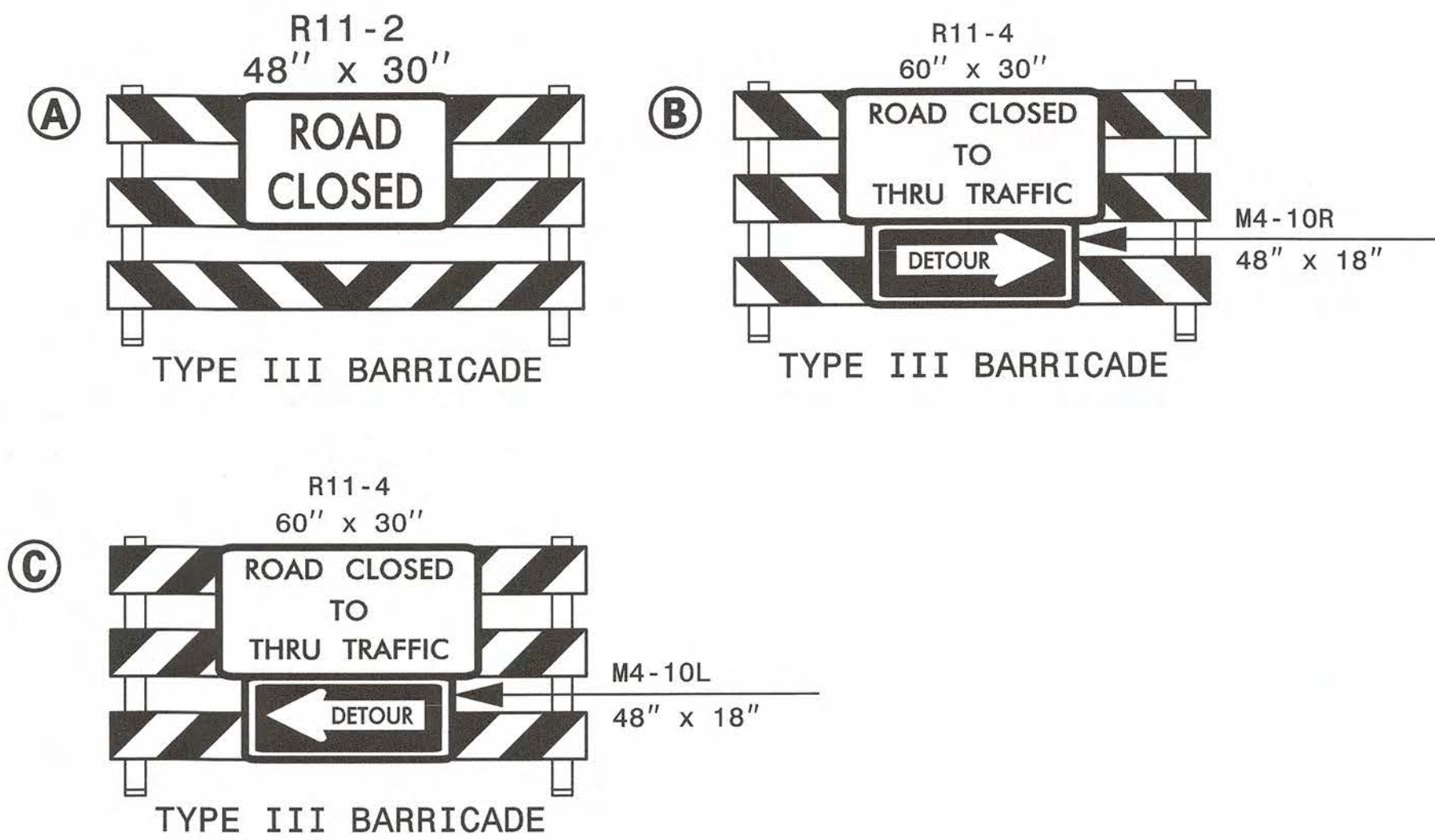
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Raleigh, North Carolina 27609  
NC License No: C-1554



TRANSPORTATION  
MANAGEMENT PLAN

GENERAL NOTES  
& PHASING





**PROPOSED DETOUR**

DETOUR ROUTE ●—●—●

DETOUR LENGTH 1.7 MILES

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Raleigh, North Carolina 27609  
NC License No: C-1554

APPROVED: *Mark D. Early* DATE: 6-26-14

SEAL  
NORTH CAROLINA  
PROFESSIONAL  
ENGINEER  
SEAL  
023521  
RICHARD B. EARLY

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
WORK ZONE TRAFFIC CONTROL

TRANSPORTATION  
MANAGEMENT PLAN

DETOUR DETAIL



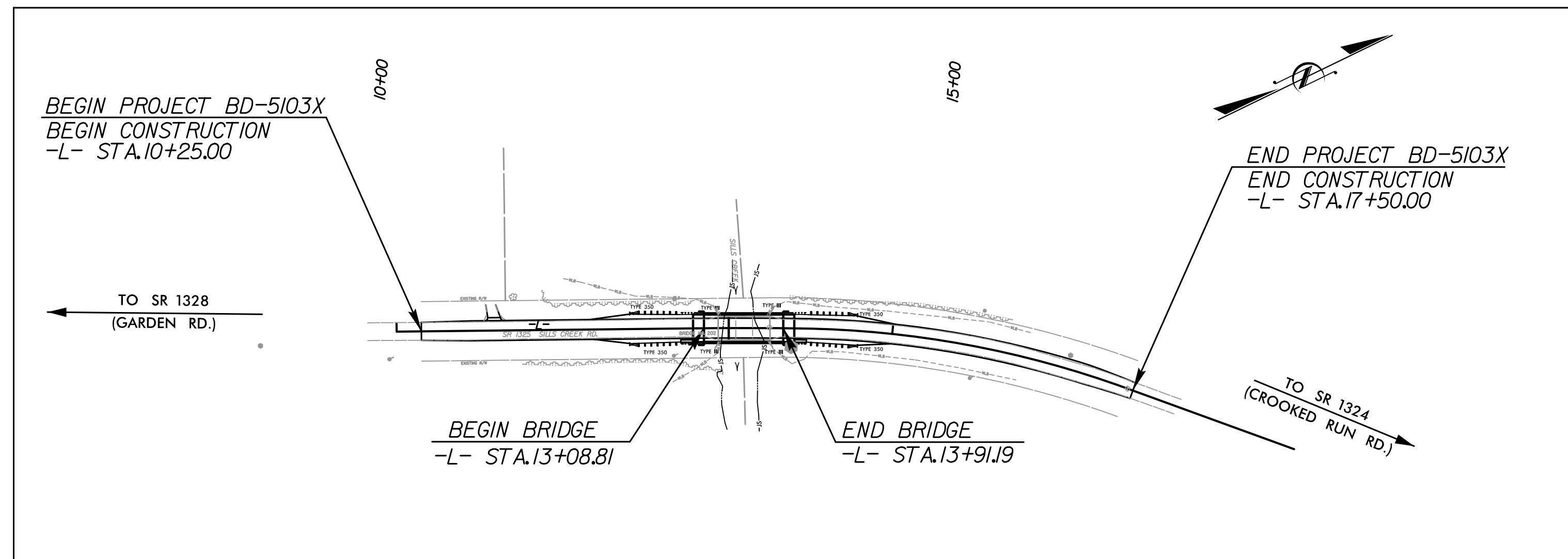
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TIP PROJECT: BD-5103X

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

LOCATION: BRIDGE NO. 202 OVER BRANCH OF SILL'S CREEK  
ON SR 1325 (SILLS CREEK RD.)

TYPE OF WORK: GRADING, PAVING, RESURFACING, GUARDRAIL,  
DRAINAGE & STRUCTURE.

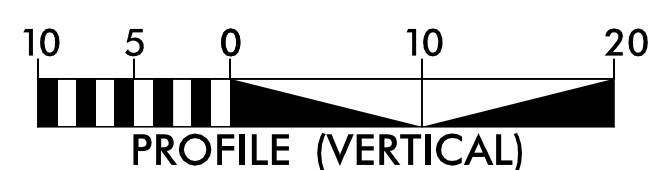
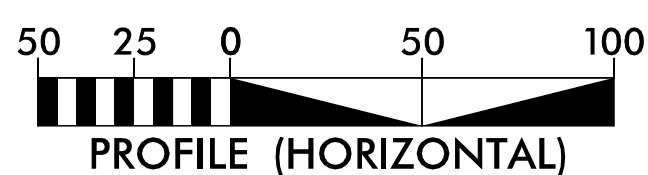
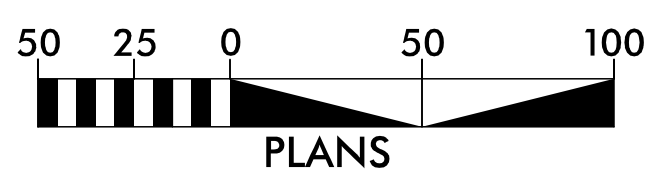


| STATE          | STATE PROJECT REFERENCE NO. | SHEET NO.   | TOTAL SHEETS |
|----------------|-----------------------------|-------------|--------------|
| N.C.           | BD-5103X                    | EC-1        | 6            |
| STATE PROJ.NO. | F.A.PROJ.NO.                | DESCRIPTION |              |
|                |                             |             |              |
|                |                             |             |              |
|                |                             |             |              |
|                |                             |             |              |

EROSION AND SEDIMENT CONTROL MEASURES

| Std. #  | Description                                                                 | Symbol |
|---------|-----------------------------------------------------------------------------|--------|
| 1630.03 | Temporary Silt Ditch.....                                                   |        |
| 1630.05 | Temporary Diversion.....                                                    |        |
| 1605.01 | Temporary Silt Fence.....                                                   |        |
| 1606.01 | Special Sediment Control Fence.....                                         |        |
| 1622.01 | Temporary Berms and Slope Drains.....                                       |        |
| 1630.01 | 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.....                                                                 |        |
| 1632.02 | Type B.....                                                                 |        |
| 1632.03 | Type C.....                                                                 |        |
|         | Skimmer Basin.....                                                          |        |
|         | Tiered Skimmer Basin.....                                                   |        |
|         | Infiltration Basin.....                                                     |        |

GRAPHIC SCALES



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

BENTON R. CARROLL, E.I.  
EROSION CONTROL  
LEVEL III  
CERTIFICATION #3180

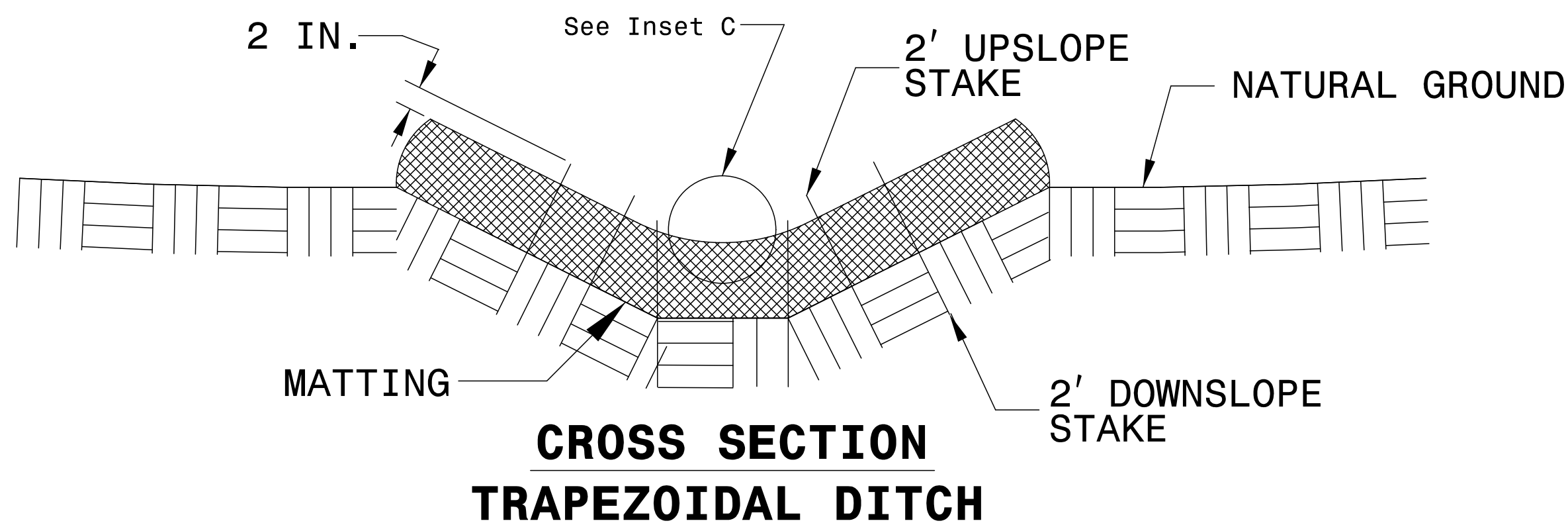
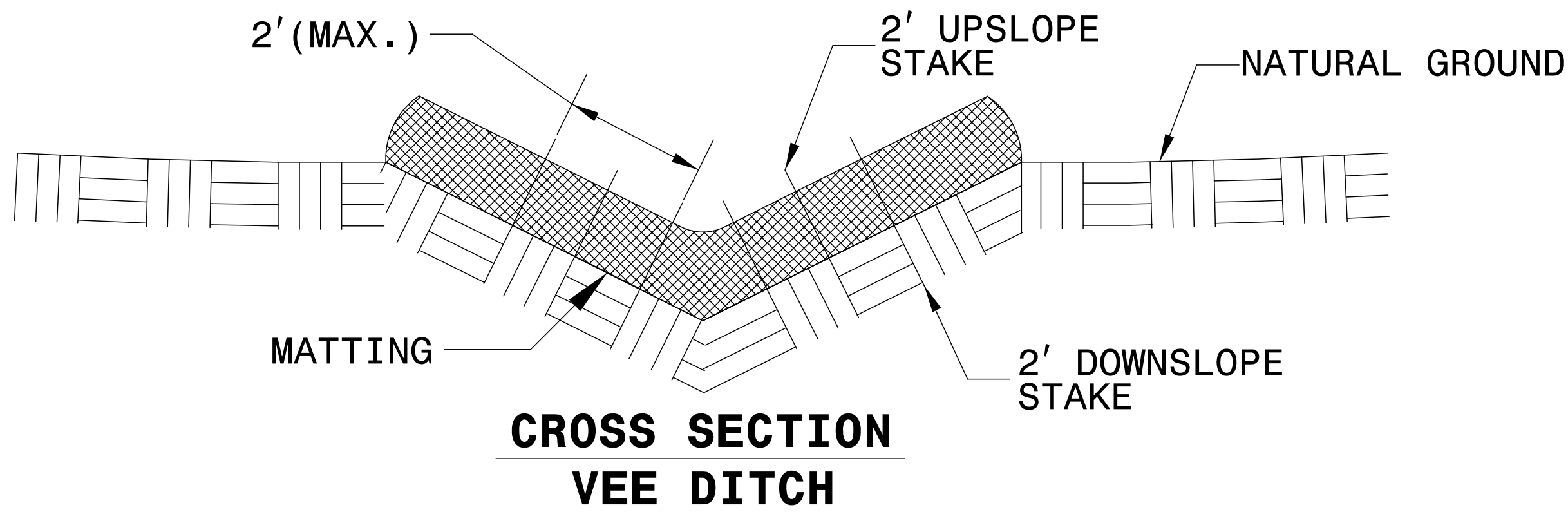
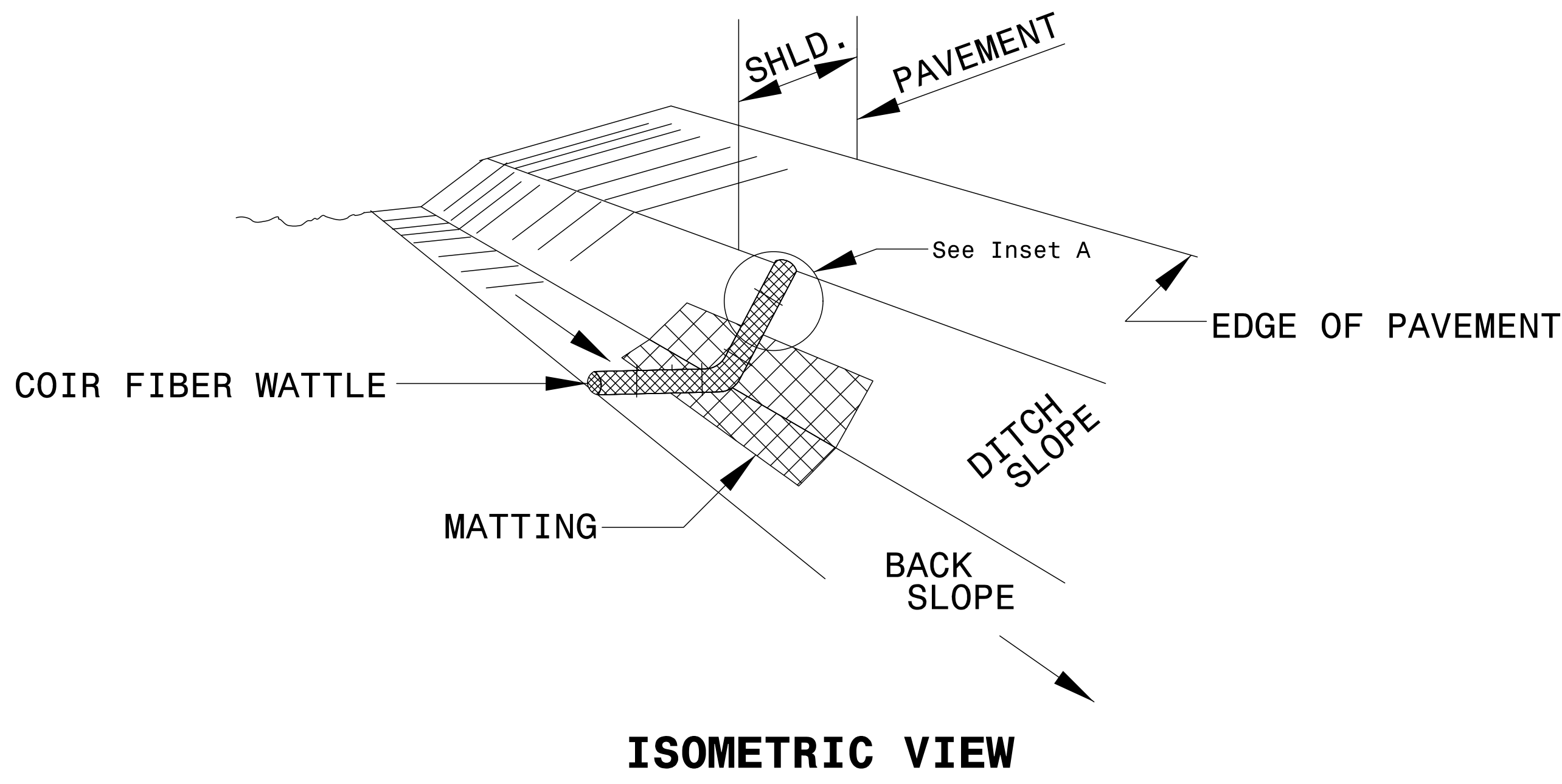
Roadway Standard Drawings

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             |         |                                      |



# COIR FIBER WATTLE WITH POLYACRYLAMIDE (PAM) 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.

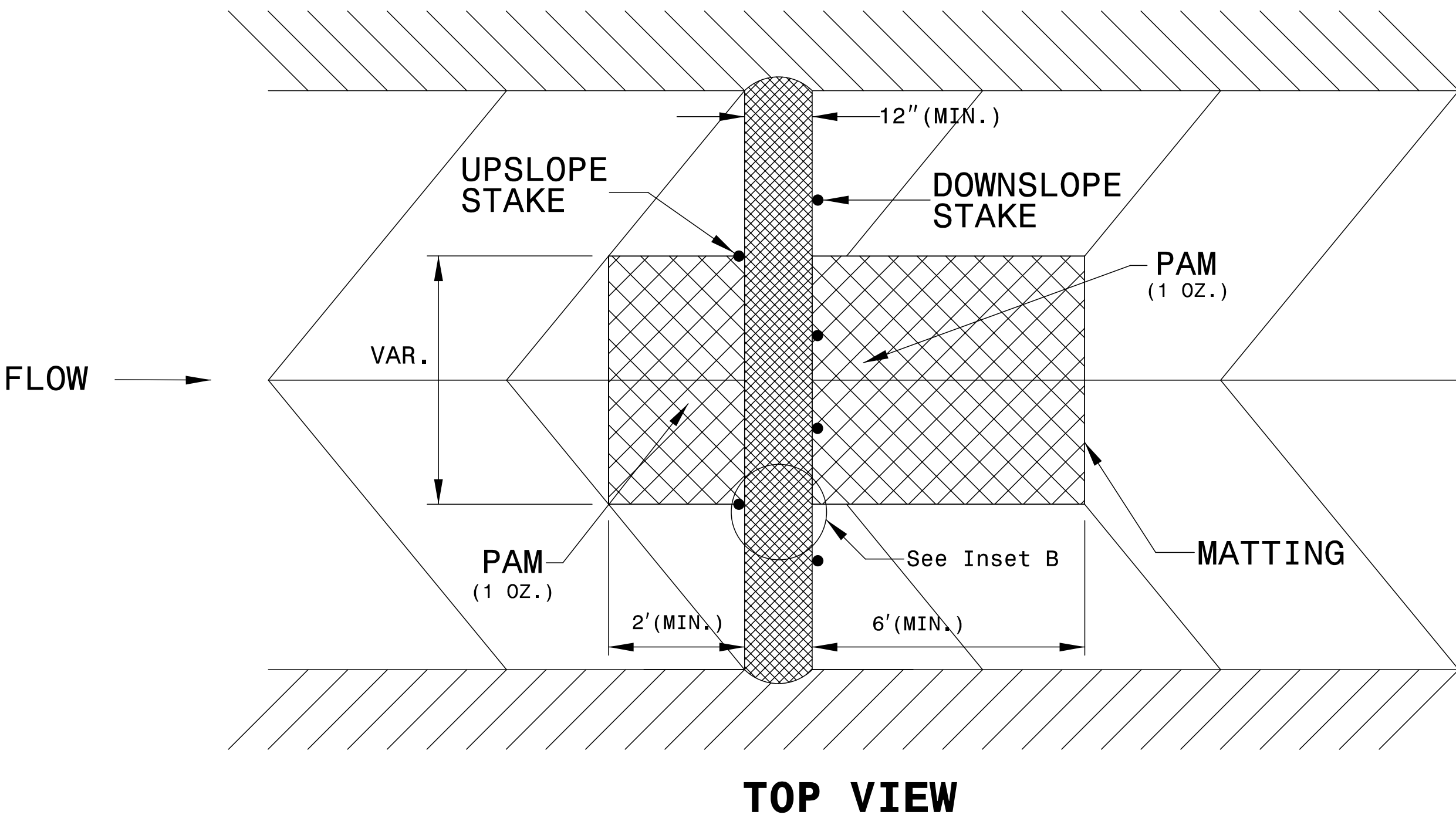
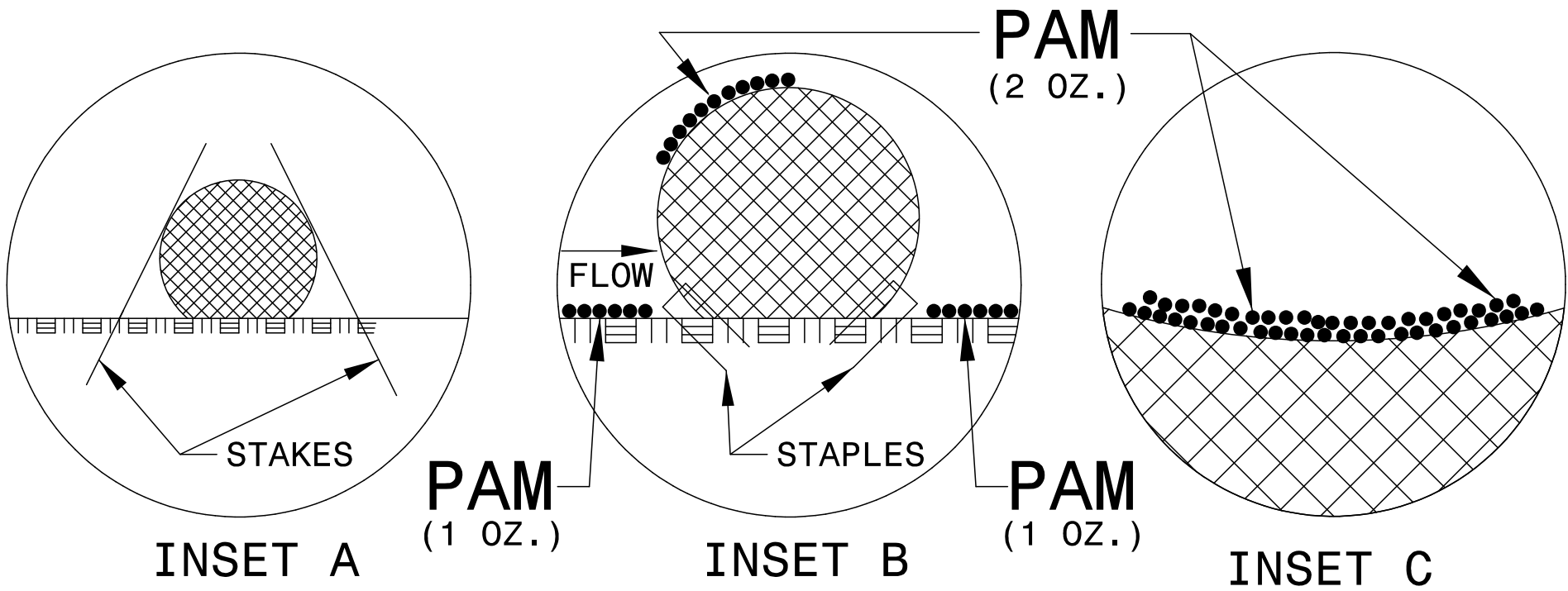
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

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.

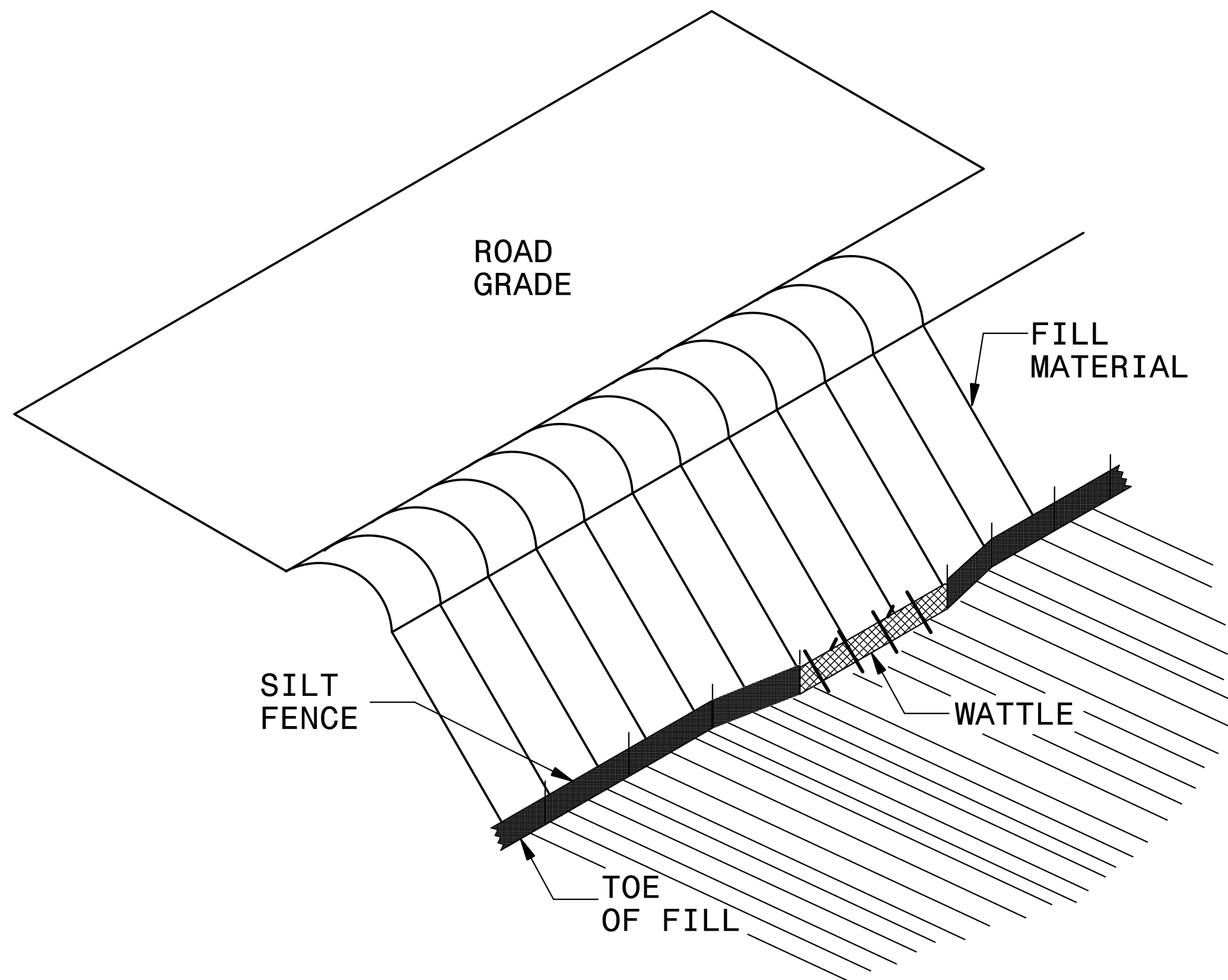
PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH WATTLE.

INITIALLY APPLY 2 OUNCES OF ANIONIC OR NEUTRALLY CHARGED PAM OVER WATTLE WHERE WATER WILL FLOW AND 1 OUNCE OF PAM ON MATTING ON EACH SIDE OF WATTLE. REAPPLY PAM AFTER EVERY RAINFALL EVENT THAT IS EQUAL TO OR EXCEEDS 0.50 IN.

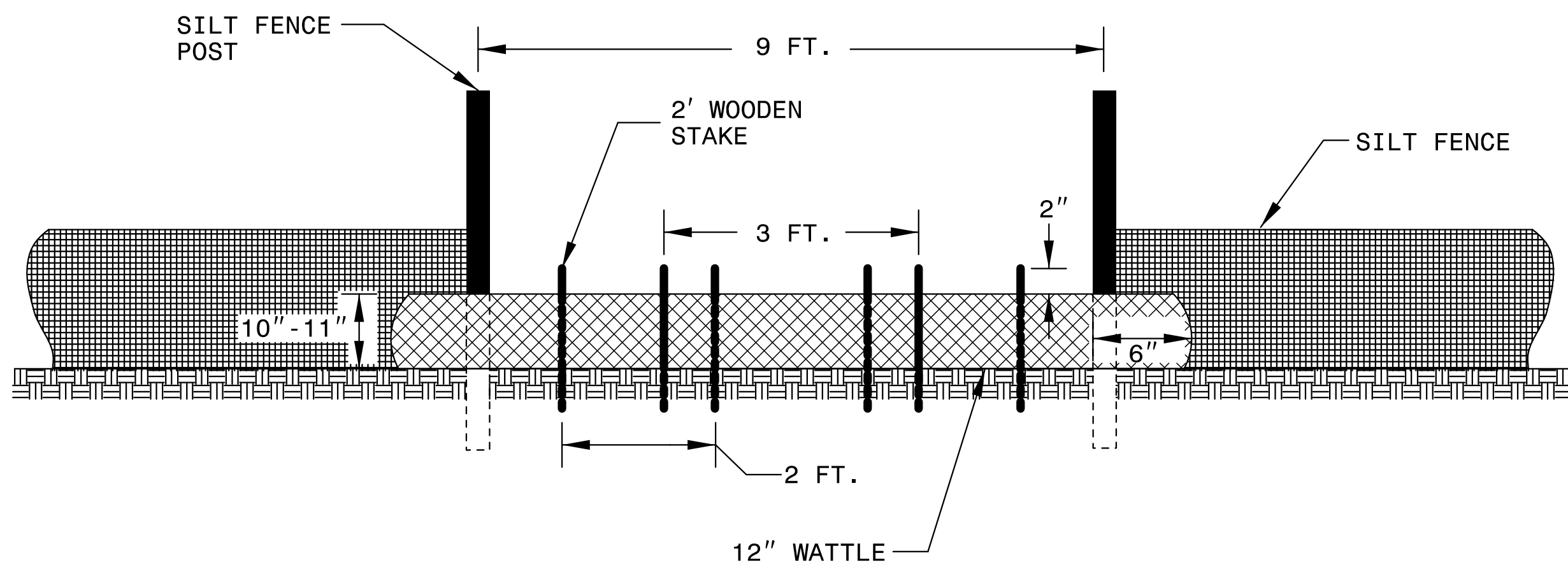




# SILT FENCE COIR FIBER WATTLE BREAK DETAIL



**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.

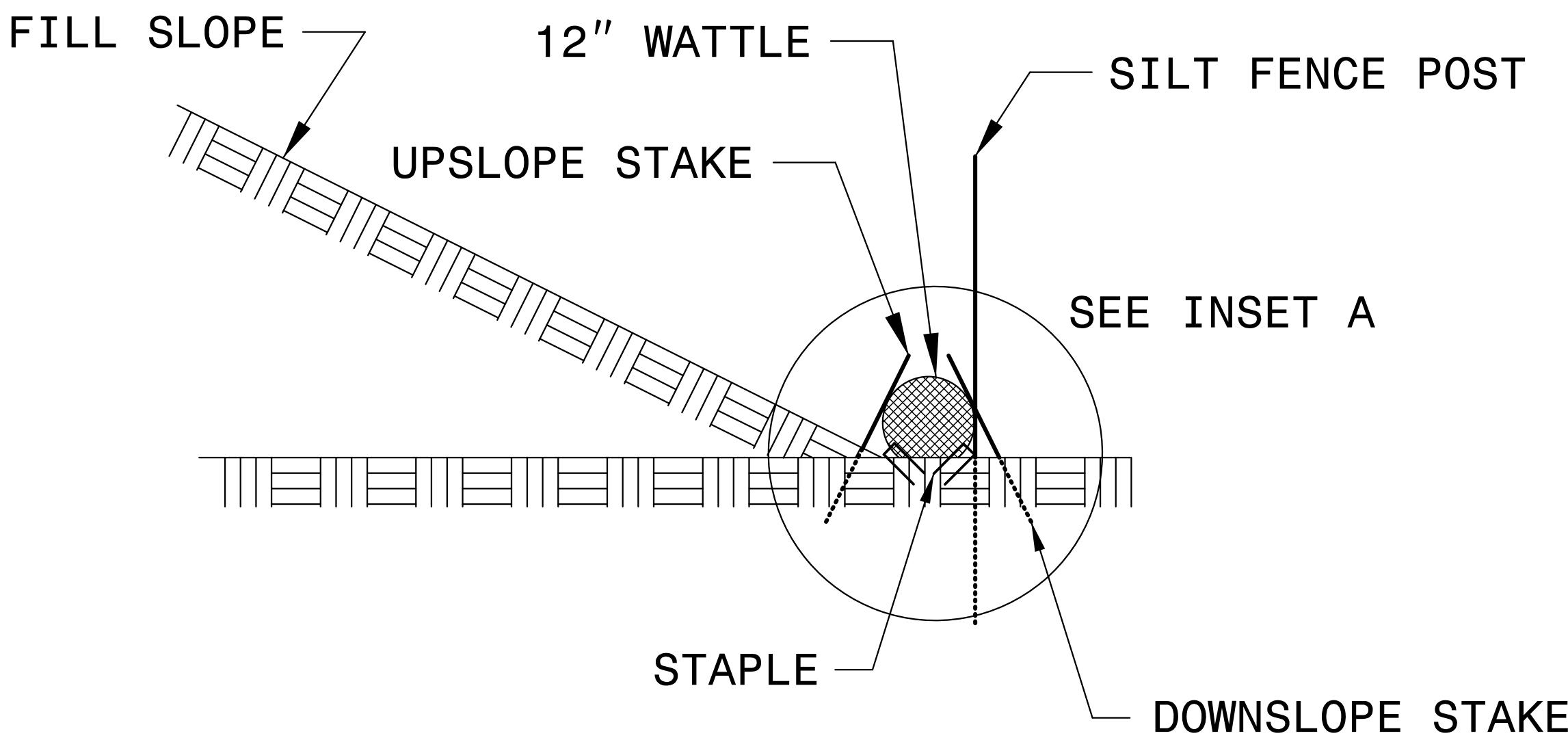
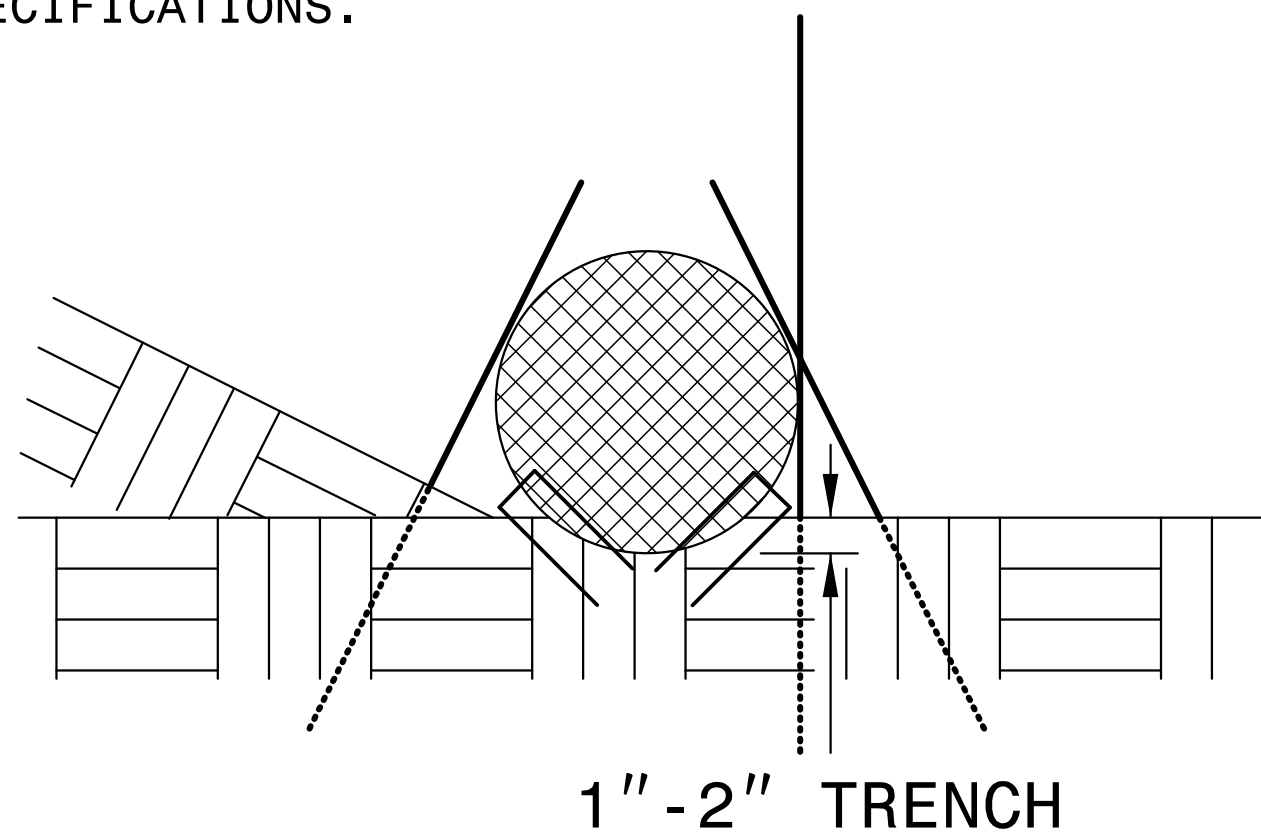
PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.

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.

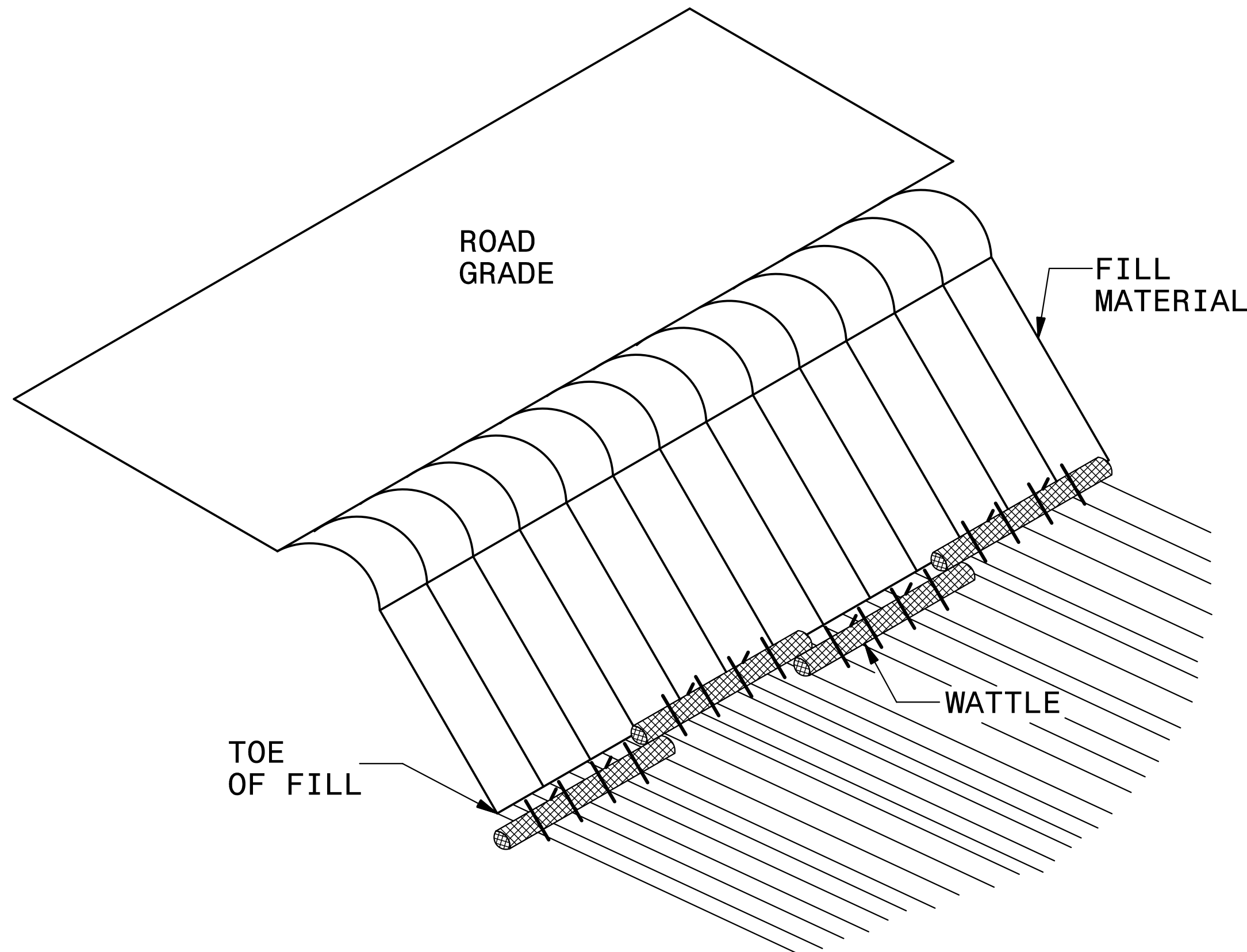
**INSET A**



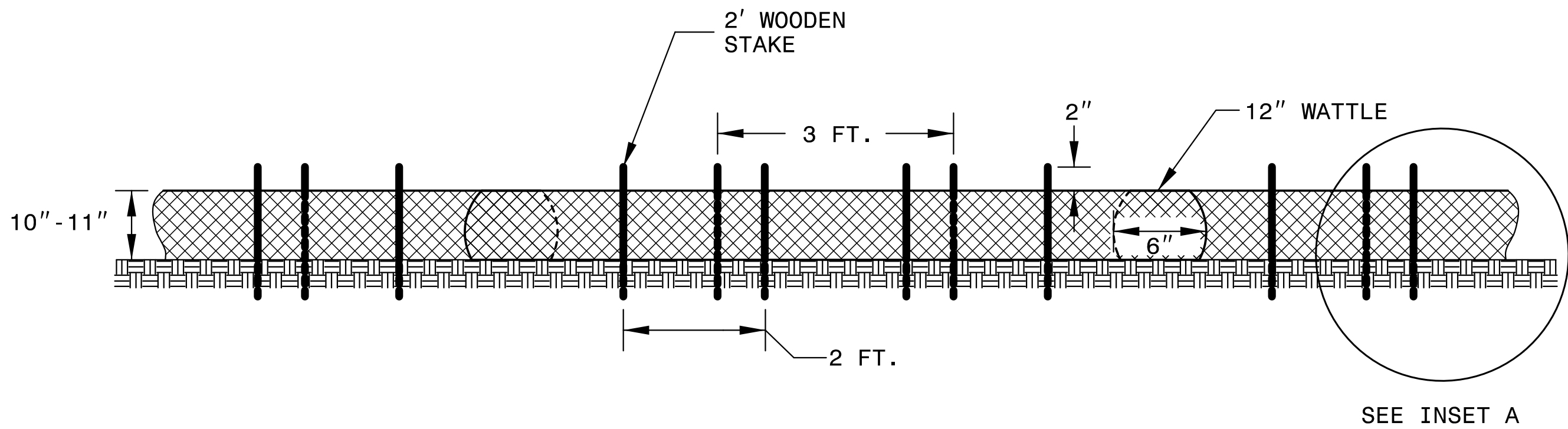
**SIDE VIEW**



# COIR FIBER WATTLE BARRIER DETAIL



**ISOMETRIC VIEW**



**FRONT VIEW**

**NOTES:**

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

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

DO NOT PLACE WATTLES ON TOE OF SLOPE.

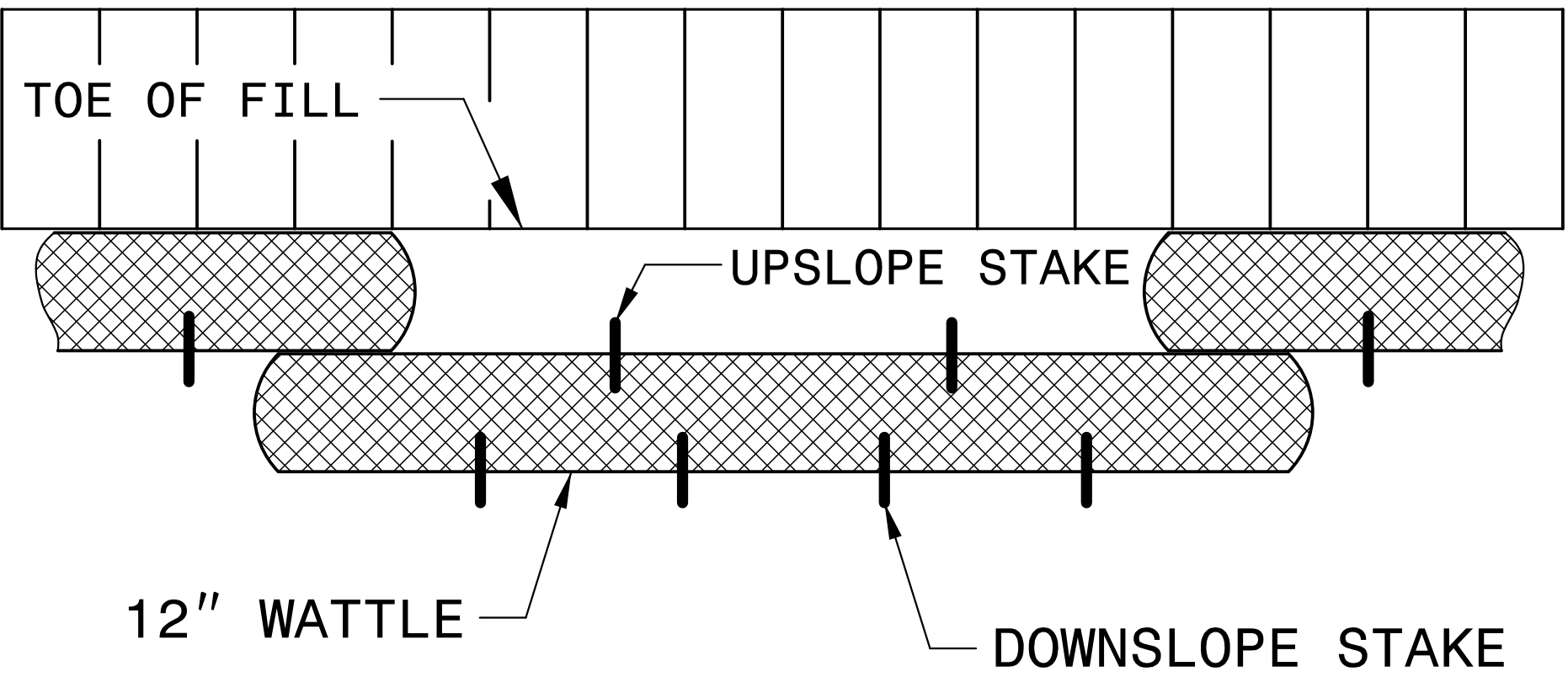
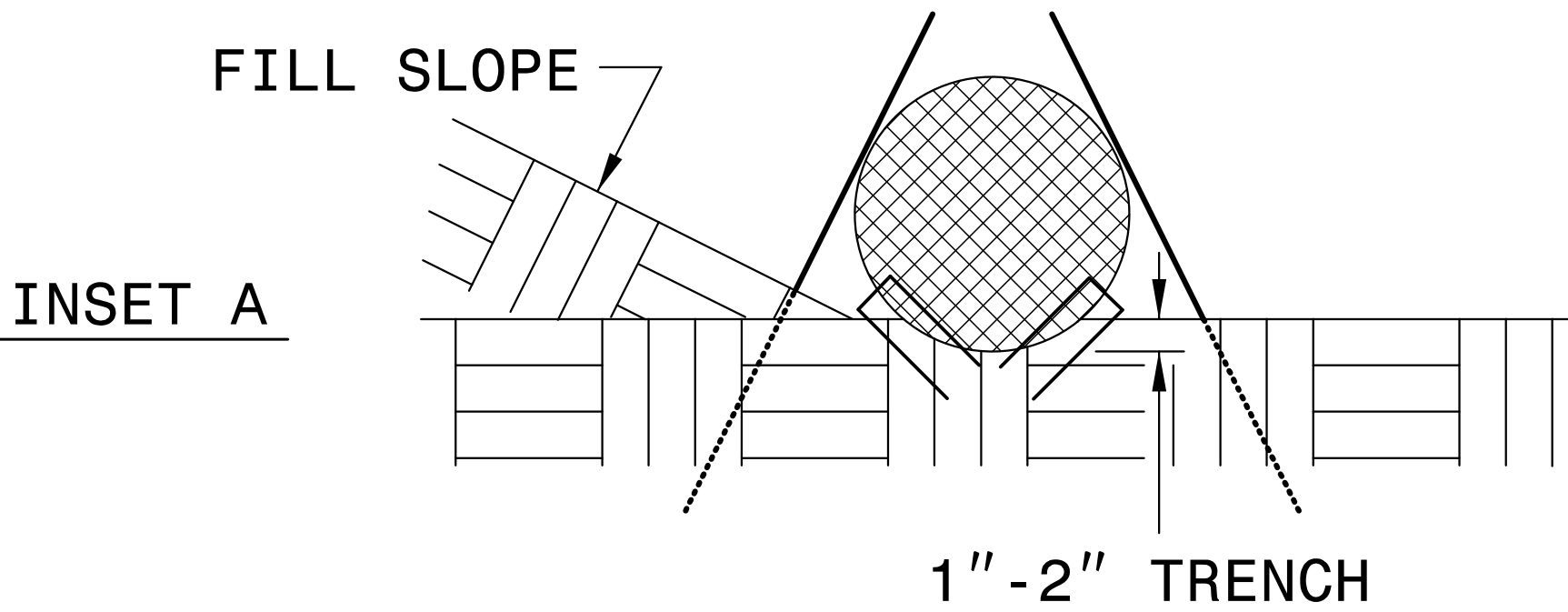
USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.

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.

FOR BREAKS ALONG LARGE SLOPES, USE MAXIMUM SPACING OF 20 FT.



**TOP VIEW**



DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

SOIL STABILIZATION TIMEFRAMES

| SITE DESCRIPTION                             | STABILIZATION TIME | TIMEFRAME EXCEPTIONS                                                                   |
|----------------------------------------------|--------------------|----------------------------------------------------------------------------------------|
| 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.  
3443 E. Six Forks Road, Suite 200  
Raleigh, North Carolina 27609  
NC License No: C-1554

PROJECT REFERENCE NO.

BD-5103X

SHEET NO.

EC-6

RW SHEET NO.

BENTON R. CARROLL E.I.

EROSION CONTROL

LEVEL III

CERTIFICATION #3180

The plan view shows a bridge structure crossing a creek. Key features include: stationing from 10+00 to 19+00; safety fences at STA.13+35 (LT), STA.13+00 (RT), STA.16+50 (LT), and STA.16+40 (RT); a clean-out ditch and turbidity curtain; a 15' RCP-III pipe; and various property owners (Racheal Ann Young, Jimmie D. Mintz, Iris Ann Cottle, Jimmie Mintz). A north arrow points towards the top right. A note at the bottom right states: "NOTE: THE CONTRACTOR SHALL INSTALL SPECIAL SEDIMENT CONTROL FENCE OR WATTLES IN LOW AREAS OF SILT FENCE AND UNDER THE BRIDGE, AS NEEDED OR DIRECTED BY THE ENGINEER."

PROFILE

The profile view shows the bridge structure and the ground profile. Key features include: stationing from 10+00 to 19+00; elevation from 30 to 70 feet; a vertical curve with PI = 11+25.00, EL = 53.75', VC = 200', K = 179, DS = 65; a second vertical curve with PI = 16+75.00, EL = 48.25', VC = 150', K = 82, DS = 45; and a third vertical curve with PI = 17+50.00, EL = 48.87', VC = 150', K = 82, DS = 45. A note at the bottom right states: "NOTE: THE CONTRACTOR SHALL INSTALL SPECIAL SEDIMENT CONTROL FENCE OR WATTLES IN LOW AREAS OF SILT FENCE AND UNDER THE BRIDGE, AS NEEDED OR DIRECTED BY THE ENGINEER."

| BRIDGE HYDRAULIC DATA            |           |     |
|----------------------------------|-----------|-----|
| DESIGN DISCHARGE                 | = 800     | CFS |
| DESIGN FREQUENCY                 | = 25      | YRS |
| DESIGN HW ELEVATION              | = 48.8    | FT  |
| BASE DISCHARGE                   | = 1875    | CFS |
| BASE FREQUENCY                   | = 100     | YRS |
| BASE HW ELEVATION                | = 50.90   | FT  |
| OVERTOPPING DISCHARGE            | = 800     | CFS |
| OVERTOPPING FREQUENCY            | = 25      | YRS |
| OVERTOPPING ELEVATION            | = 48.80   | FT  |
| DATE OF SURVEY                   | = 7-23-13 |     |
| W.S. ELEVATION AT DATE OF SURVEY | = 45.6    | FT  |

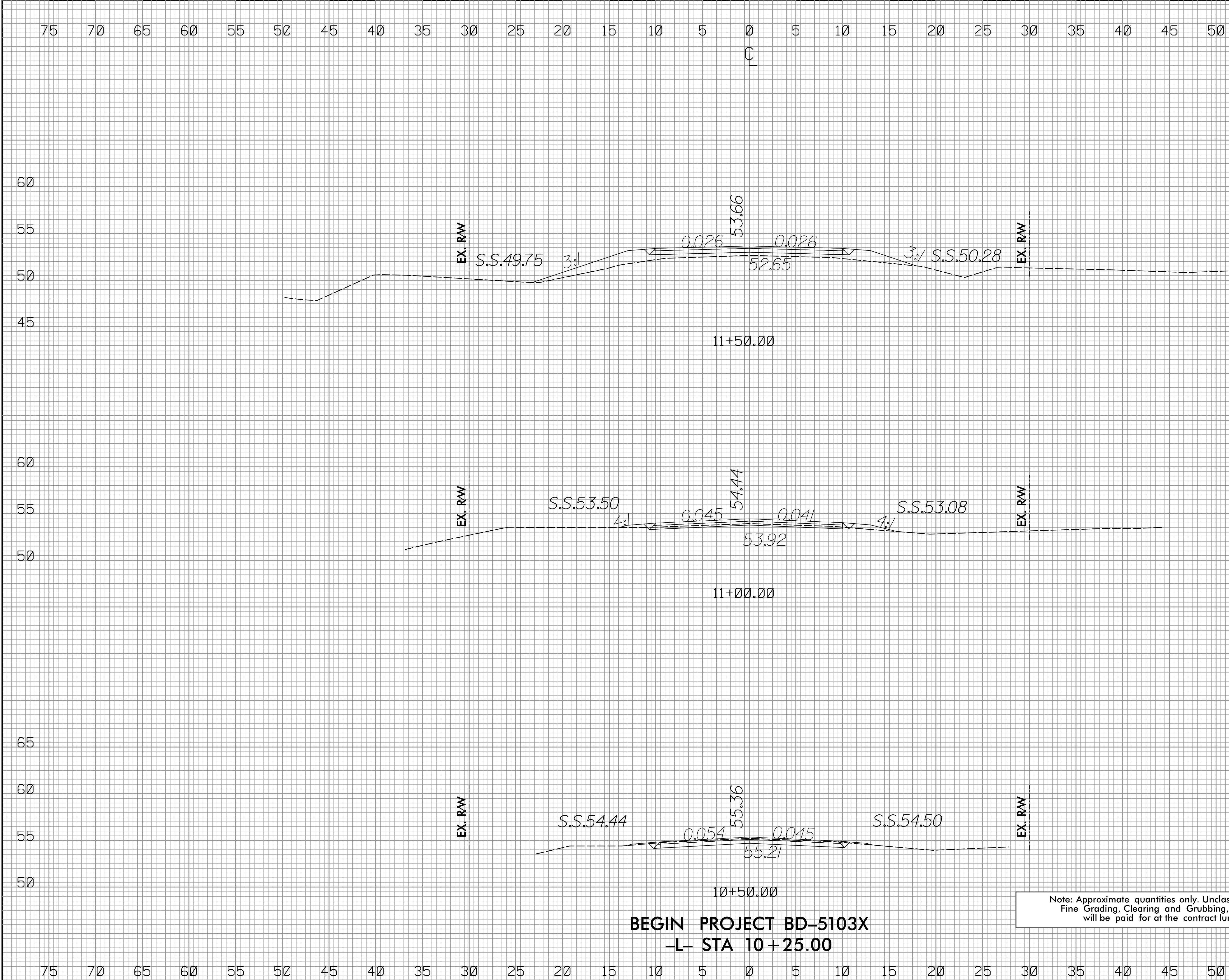
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02/03/98

9452-28-AM-05103X-rdy-xpl.dgn  
\$\$\$\$\$USFEMVCE\$\$\$\$

| PROJ. REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---------------------|-----------|--------------|
| BD-5103X            | X-1       | 5            |



**BEGIN PROJECT BD-5103X**  
**-L- STA 10+25.00**

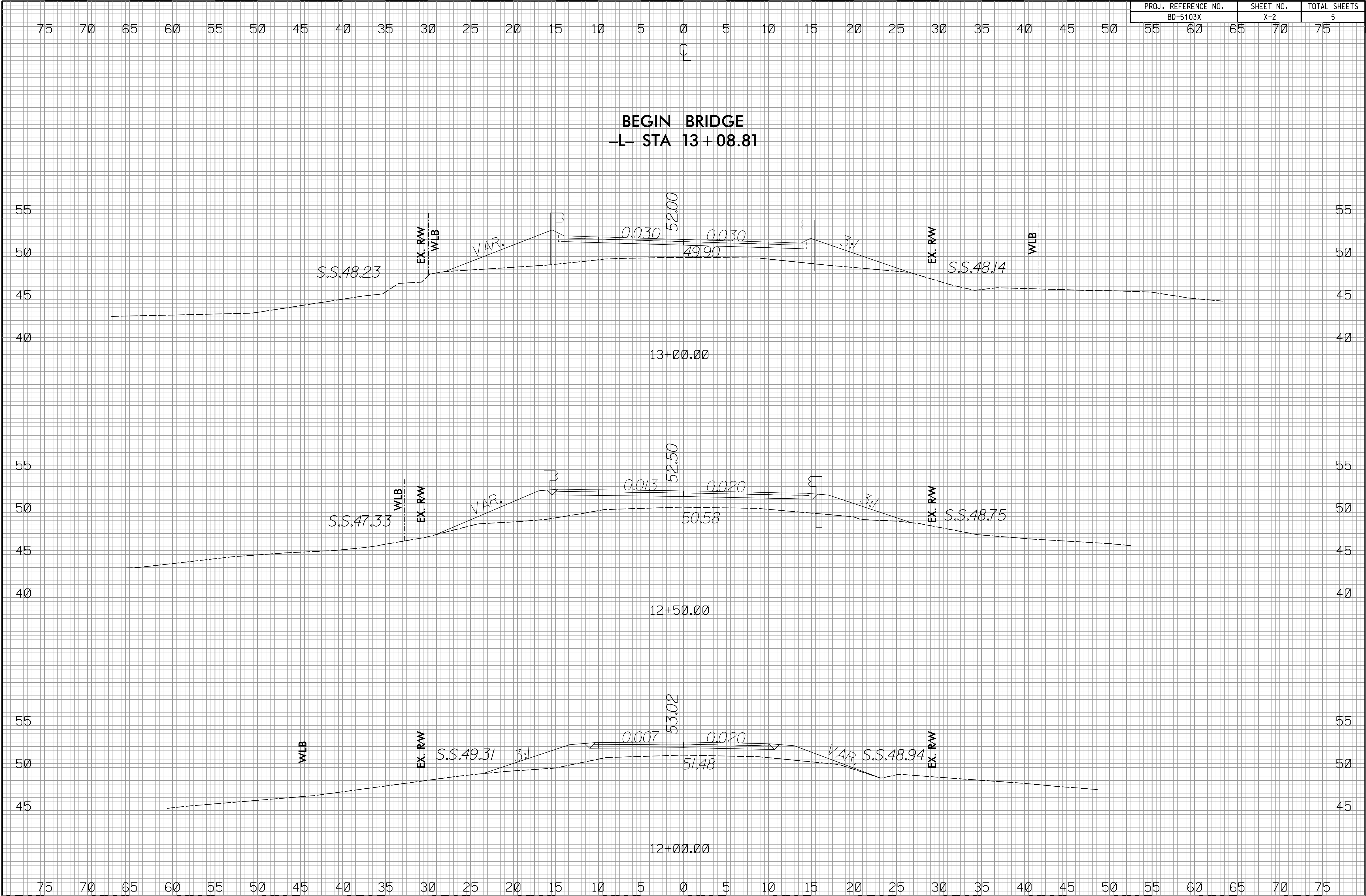
Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."



02/03/98

| PROJ. REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---------------------|-----------|--------------|
| BD-5103X            | X-2       | 5            |

BEGIN BRIDGE  
-L- STA 13+08.81



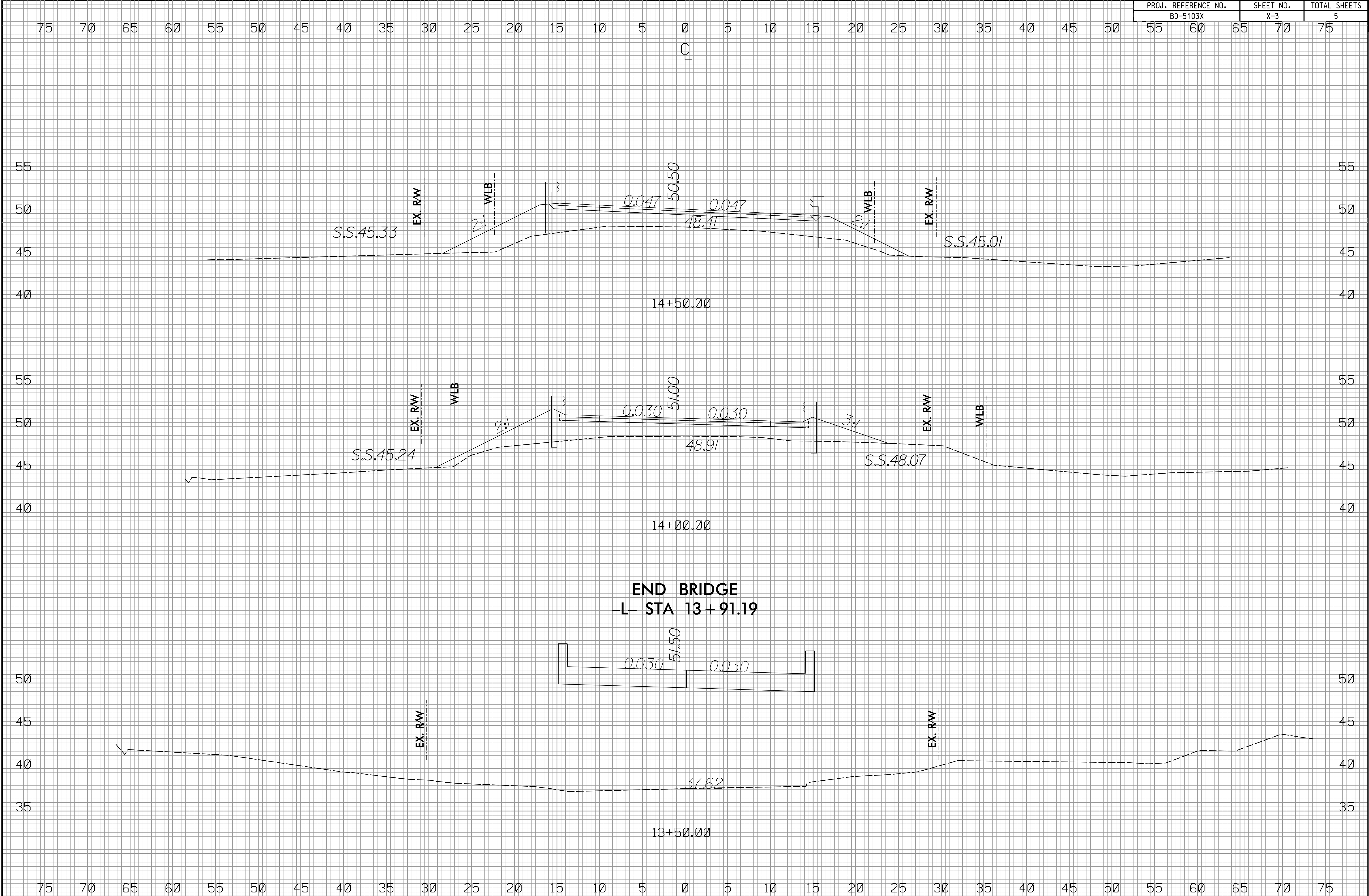
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02/03/98

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\$\$\$\$\$

| PROJ. REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---------------------|-----------|--------------|
| BD-5103X            | X-3       | 5            |

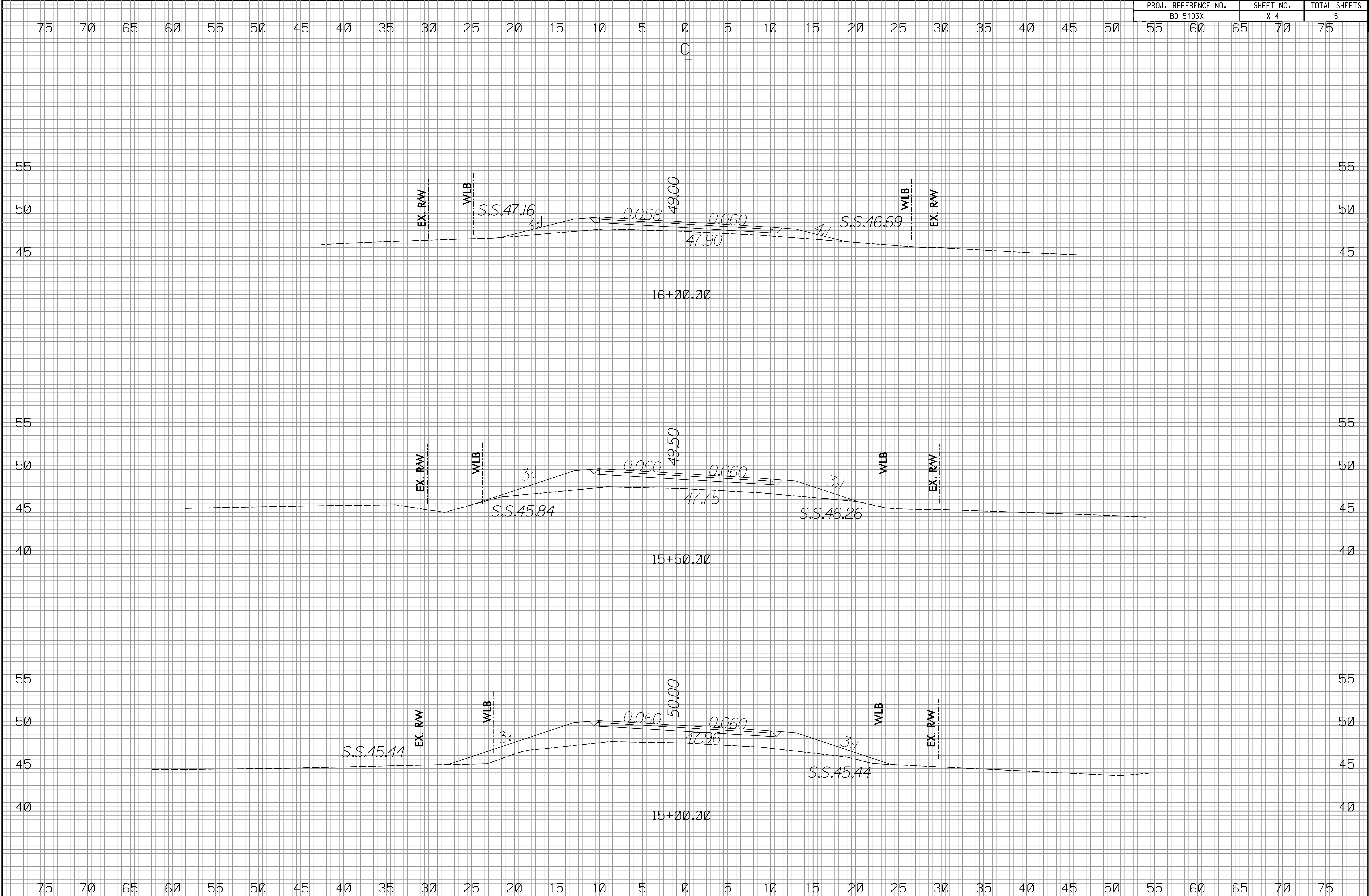




02/03/98

9452-35-AM05103X-rdy-xpl.dgn  
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| PROJ. REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---------------------|-----------|--------------|
| BD-5103X            | X-4       | 5            |



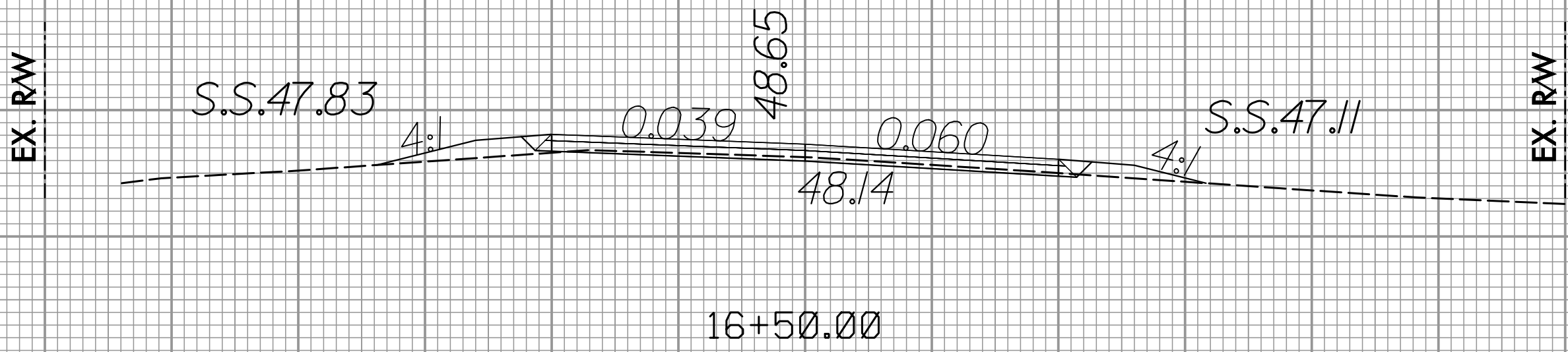
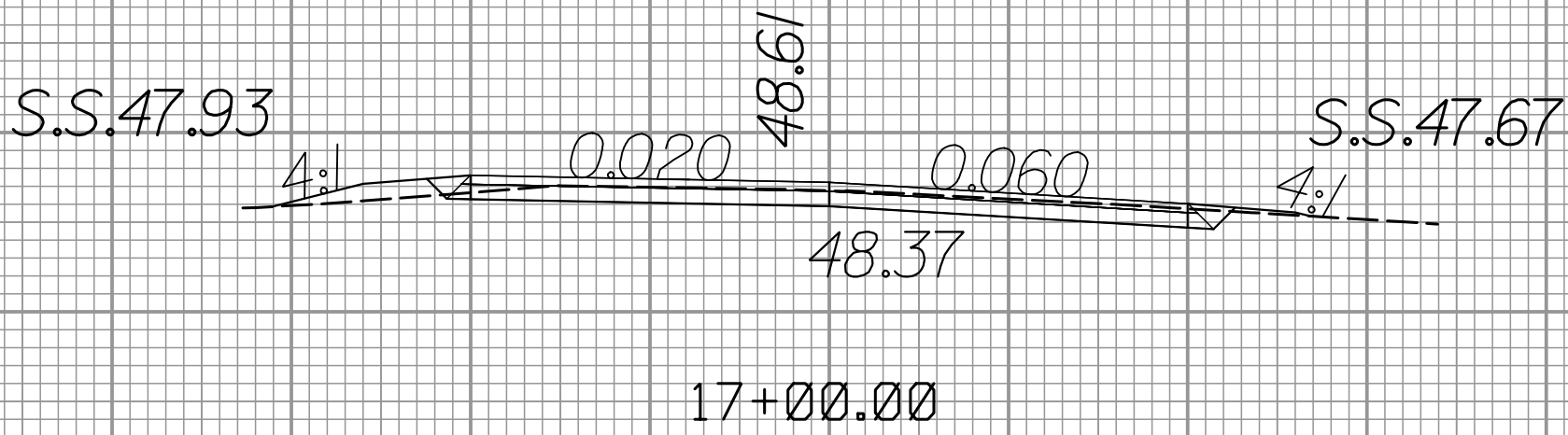
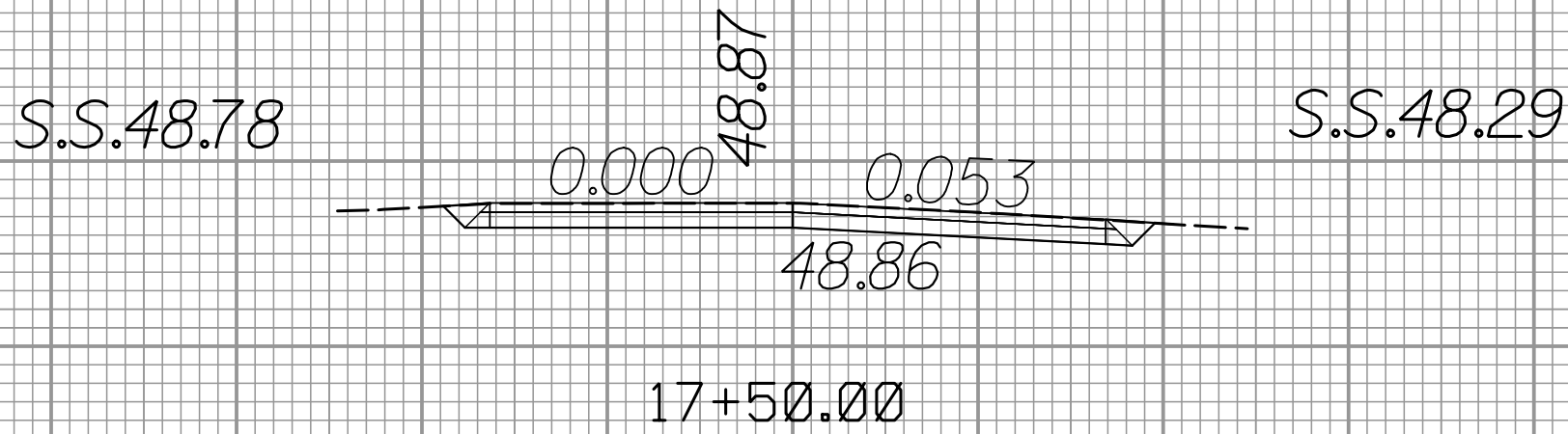


02/03/98

945237.A\05103X\_rdy\_xpl.dgn  
\$\$\$\$SEFMANC\$\$\$\$

| PROJ. REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---------------------|-----------|--------------|
| BD-5103X            | X-5       | 5            |
| 55                  | 60        | 65           |
| 70                  | 75        |              |

END PROJECT BD-5103X  
-L- STA 17+50.00





FOR GENERAL NOTES, SEE SHEET 2.

## BRIDGE HYDRAULIC DATA

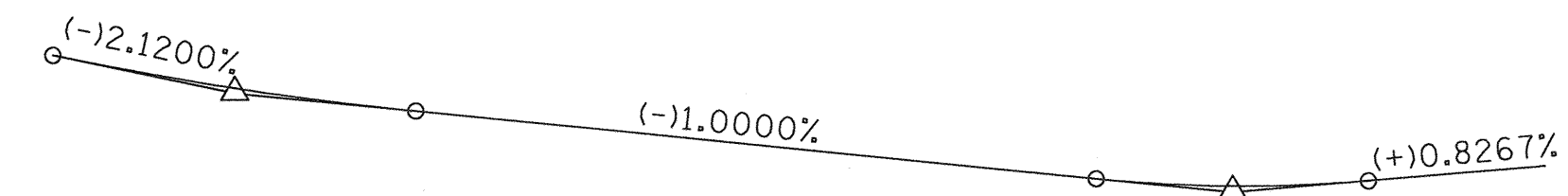
|                             |   |             |
|-----------------------------|---|-------------|
| DESIGN DISCHARGE            | = | 800 CFS     |
| FREQUENCY OF DESIGN FLOOD   | = | 25 YR       |
| DESIGN HIGH WATER ELEVATION | = | 48.8 FT.    |
| DRAINAGE AREA               | = | 6.7 SQ. MI. |
| BASIC DISCHARGE (Q100)      | = | 1875 CFS    |
| BASIC HIGH WATER ELEVATION  | = | 50.90 FT.   |

## OVERTOPPING FLOOD DATA

|                                |   |          |
|--------------------------------|---|----------|
| OVERTOPPING DISCHARGE          | = | 800 CFS  |
| FREQUENCY OF OVERTOPPING FLOOD | = | 25YR     |
| OVERTOPPING FLOOD ELEVATION    | = | 48.8 FT. |

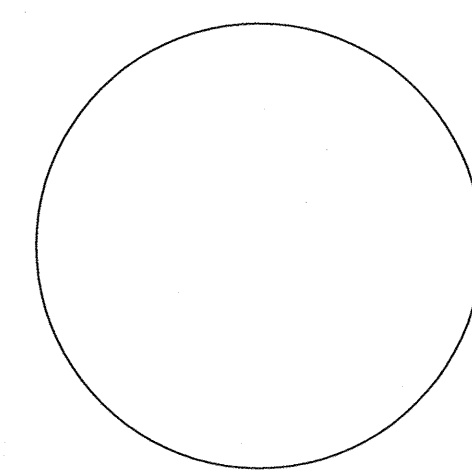
NOTE: OVERTOPPING OCCURS AT LT. EOP AT SAG,  
ROADWAY STA. 17+25±PI STA. = 11+25.00  
ELEV = 53.75  
V.C. = 200'PI STA. = 16+75.00  
ELEV = 48.25  
V.C. = 150'

## GRADE DATA -L-



## CURVE DATA -L-

|                                    |                                     |
|------------------------------------|-------------------------------------|
| PI STA. = 13+55.52                 | PI STA. = 15+77.05                  |
| $\Delta = 1^\circ 25' 56.8''$ (RT) | $\Delta = 19^\circ 11' 19.9''$ (RT) |
| D = 1°21'51.1"                     | D = 5°43'46.5"                      |
| L = 105.00'                        | L = 334.91'                         |
| T = 52.50'                         | T = 169.04'                         |
| R = 4,200.00'                      | R = 1,000.00'                       |

I HEREBY CERTIFY THESE PLANS  
ARE AS-BUILT PLANS

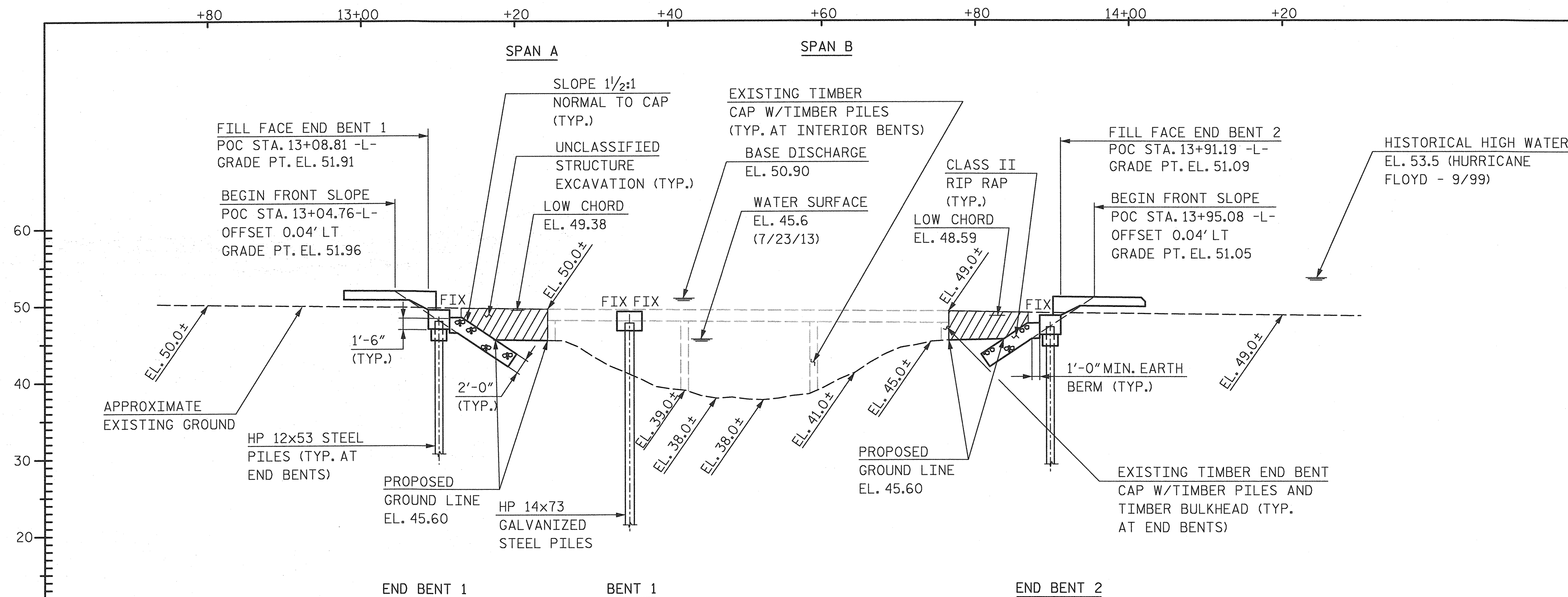
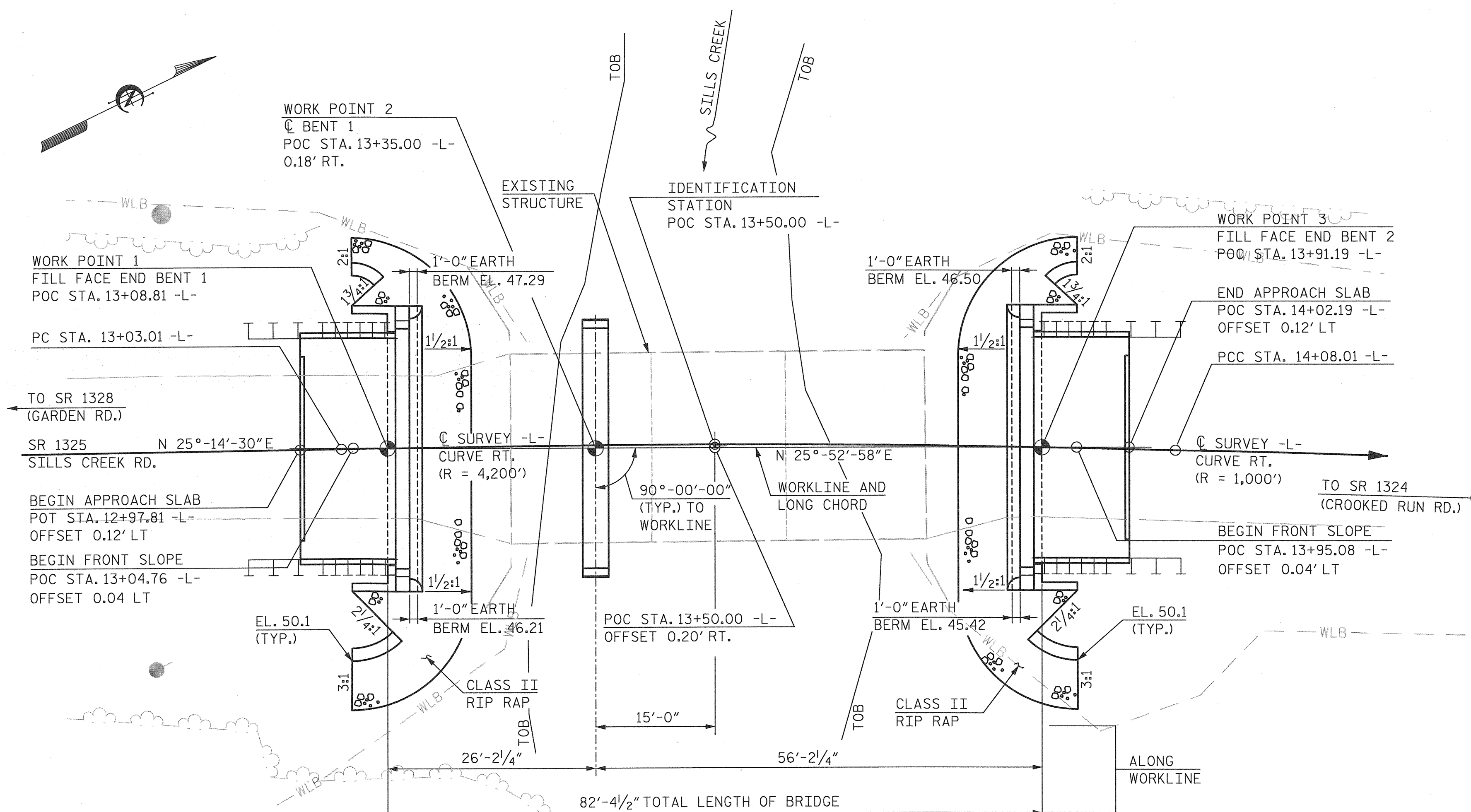
PROJECT NO. BD-5103X  
PENDER COUNTY  
 STATION: POC 13+50.00 -L-

SHEET 1 OF 2 REPLACES BRIDGE NO. 0202

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 GENERAL DRAWING  
 FOR BRIDGE ON SR 1325  
 OVER SILLS CREEK  
 BETWEEN SR 1328  
 AND SR 1324

|             |           |                                                                                                            |      |
|-------------|-----------|------------------------------------------------------------------------------------------------------------|------|
| <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                                                                                                       | 5/14 |
| CHECKED BY  | P. BARBER | DATE                                                                                                       | 5/14 |
| DWG. NO. 1  |           |                                                                                                            |      |

| REVISIONS |    |      |     |    |      | SHEET NO.<br>1        |
|-----------|----|------|-----|----|------|-----------------------|
| NO.       | BY | DATE | NO. | BY | DATE |                       |
| 1         |    |      | 3   |    |      | TOTAL<br>SHEETS<br>21 |
| 2         |    |      | 4   |    |      |                       |

SECTION ALONG  $\mathcal{C}$  SURVEY -L-

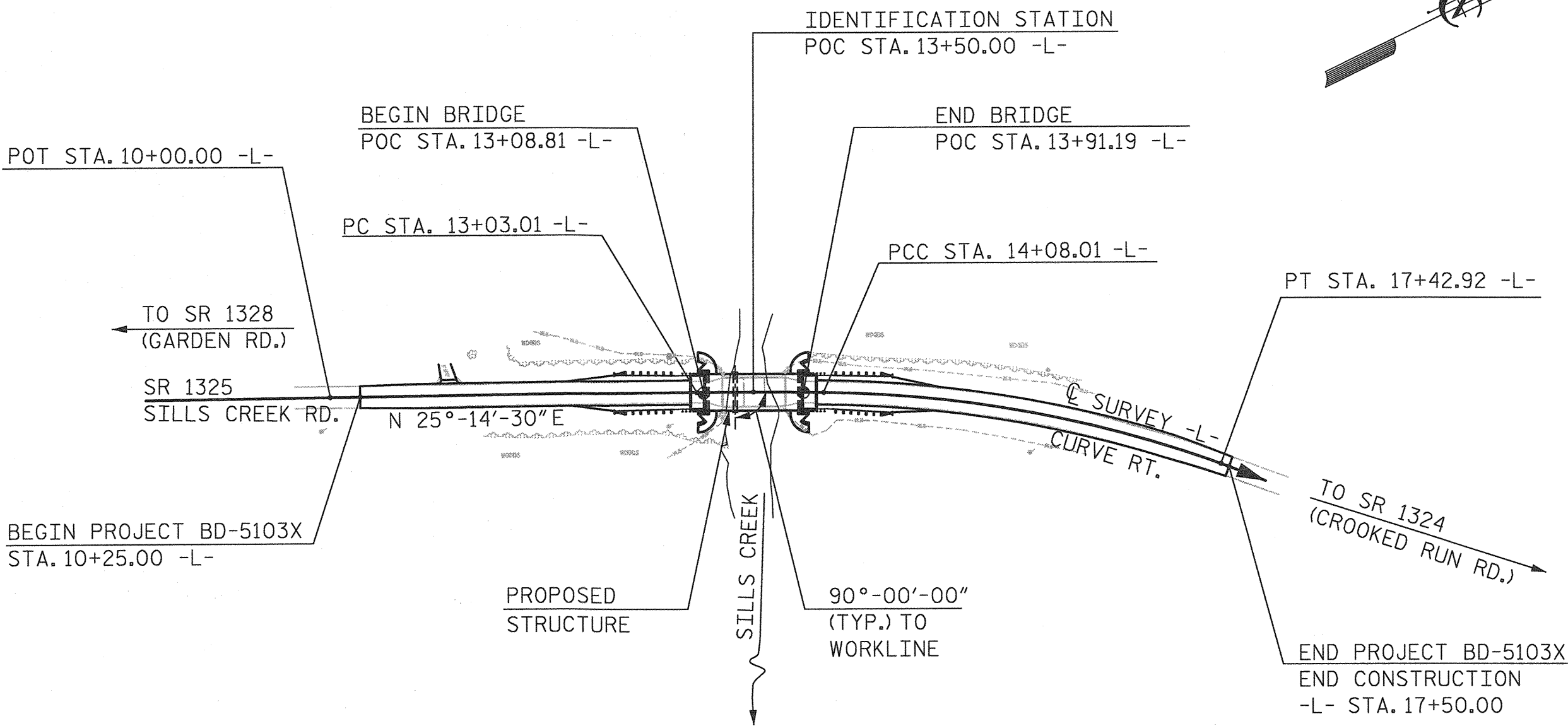
## PLAN

NOTES: PILES NOT SHOWN FOR CLARITY.

WORKLINE FOR BRIDGE SHALL BE THE ROADWAY LONG CHORD  
BETWEEN FILL FACE WORK POINTS AND ITS EXTENSION.



BM - 'BL-202-3', STA. 16+79.71 -L-, 13.77' LT, 30"#5 REBAR WITH ALUMINUM CAP, EL. 47.78



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 55 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 95 TONS PER PILE.

PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 100 TONS PER PILE.

DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 190 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR DOWNDRAW OR SCOUR.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 85 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 145 TONS PER PILE.

INSTALL PILES AT BENT NO.1 TO A TIP ELEVATION NO HIGHER THAN 9.0 FT.

THE SCOUR CRITICAL ELEVATION FOR BENT NO.1 IS ELEVATION 27.0 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 30 TO 45 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT END BENT NO.1 AND 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.

IT HAS BEEN ESTIMATED THAT A HAMMER WITH AN EQUIVALENT RATED ENERGY IN THE RANGE OF 40 TO 60 FT-KIPS PER BLOW WILL BE REQUIRED TO DRIVE PILES AT 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.

TESTING THE FIRST PRODUCTION PILE WITH THE PDA DURING DRIVING, RESTRIKING OR REDRIVING IS REQUIRED. FOR PDA TESTING, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS AND FOR PILE DRIVING CRITERIA, SEE PILE DRIVING CRITERIA PROVISION.

TOTAL BILL OF MATERIAL

|                | REMOVAL<br>OF EXISTING<br>STRUCTURE<br>AT STATION<br>13+50.00 -L- | PDA<br>TESTING | UNCLASSIFIED<br>STRUCTURE<br>EXCAVATION<br>AT STATION<br>13+50.00 -L- | CLASS A<br>CONCRETE | BRIDGE<br>APPROACH<br>SLABS<br>AT STATION<br>13+50.00 -L- | REINFORCING<br>STEEL | HP 12x53<br>STEEL<br>PILES |          | HP 14x73<br>GALVANIZED<br>STEEL<br>PILES |          | PILE<br>REDRIVES | TWO BAR<br>METAL RAIL | 1'-2" x 2'-9"<br>CONCRETE<br>PARAPET | RIP RAP<br>CLASS II<br>(2'-0" THICK) | GEOTEXTILE<br>FOR<br>DRAINAGE | ELASTOMERIC<br>BEARINGS | 3'-0" x 1'-9"<br>PRESTRESSED<br>CONCRETE<br>CORED SLABS |          |
|----------------|-------------------------------------------------------------------|----------------|-----------------------------------------------------------------------|---------------------|-----------------------------------------------------------|----------------------|----------------------------|----------|------------------------------------------|----------|------------------|-----------------------|--------------------------------------|--------------------------------------|-------------------------------|-------------------------|---------------------------------------------------------|----------|
|                | LUMP SUM                                                          | EACH           | LUMP SUM                                                              | CU. YDS.            | LUMP SUM                                                  | LBS.                 | NO.                        | LIN. FT. | NO.                                      | LIN. FT. | EACH             | LIN. FT.              | LIN. FT.                             | TONS                                 | SQ. YDS.                      | LUMP SUM                | NO.                                                     | LIN. FT. |
| SUPERSTRUCTURE | LUMP SUM                                                          |                |                                                                       |                     | LUMP SUM                                                  |                      |                            |          |                                          |          |                  | 145.25                | 160.50                               |                                      |                               | LUMP SUM                | 20                                                      | 800      |
| END BENT NO. 1 |                                                                   |                | LUMP SUM                                                              | 13.1                |                                                           | 1,979                | 5                          | 350      |                                          |          | 3                |                       |                                      | 96                                   | 107                           |                         |                                                         |          |
| BENT NO. 1     |                                                                   |                |                                                                       | 9.9                 |                                                           | 1,959                |                            |          | 7                                        | 595      | 4                |                       |                                      |                                      |                               |                         |                                                         |          |
| END BENT NO. 2 |                                                                   |                | LUMP SUM                                                              | 13.1                |                                                           | 1,979                | 5                          | 350      |                                          |          | 3                |                       |                                      | 85                                   | 94                            |                         |                                                         |          |
| TOTAL          | LUMP SUM                                                          | 1              | LUMP SUM                                                              | 36.1                | LUMP SUM                                                  | 5,917                | 10                         | 700      | 7                                        | 595      | 10               | 145.25                | 160.50                               | 181                                  | 201                           | LUMP SUM                | 20                                                      | 800      |

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

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

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED. CONTRACTOR SHALL NOT PLACE OR OPERATE CRANE ON SPAN B.

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

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

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

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 18'-0" 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 EXISTING 3 SPAN STRUCTURE WITH SPAN LENGTHS OF 17'-8", 16'-11" AND 17'-8" WITH REINFORCED CONCRETE DECK AND 19 LINES OF 6x12 TIMBER JOISTS AT VARIOUS CENTERS, WITH A 25.3' OUT TO OUT DECK WIDTH ON TIMBER CAPS 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 13+50.00 -L-".

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.

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.

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

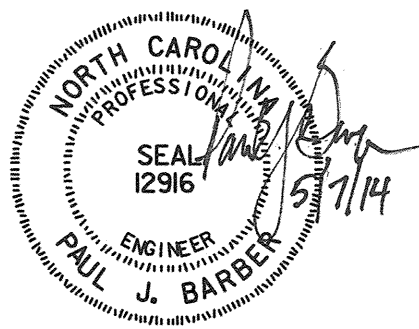
FOR INTERIOR BENT 1, ONLY PARTIAL GALVANIZING OF THE PILES IS REQUIRED. SEE INTERIOR BENT SHEET FOR REQUIRED GALVANIZED LENGTHS. PAYMENT FOR PARTIALLY GALVANIZED PILES WILL BE MADE UNDER THE CONTRACT UNIT PRICE FOR GALVANIZED STEEL PILES.

FOR EROSION CONTROL MEASURES SEE EROSION CONTROL PLANS.

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

PROJECT NO. BD-5103X  
PENDER                      COUNTY  
STATION: POC 13+50.00 -L-

SHEET 2 OF 2



| HNTB                 |  | HNTB NORTH CAROLINA, P.C.<br>NC License No. C-1554<br>343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 |  | REVISIONS |    |      |     |    |      | SHEET NO.<br>2        |  |
|----------------------|--|------------------------------------------------------------------------------------------------------------|--|-----------|----|------|-----|----|------|-----------------------|--|
|                      |  |                                                                                                            |  | NO.       | BY | DATE | NO. | BY | DATE |                       |  |
| DRAWN BY J. BAYNE    |  | DATE 5/14                                                                                                  |  | 1         |    |      | 3   |    |      | TOTAL<br>SHEETS<br>21 |  |
| CHECKED BY P. BARBER |  | DATE 5/14                                                                                                  |  | 2         |    |      | 4   |    |      |                       |  |



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

| 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                          | 1.018                             | --            | 1.75                   | 0.284                        | 2.53          | 25'  | EL              | 12                                        | 0.591                        | 1.02          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.34          | 25'  | EL              | 12             |                                           |
|                          |      | HL-93(0pr) | N/A                  | --                         | 1.319                             | --            | 1.35                   | 0.284                        | 3.29          | 25'  | EL              | 12                                        | 0.591                        | 1.32          | 25'  | EL              | 1.2                                       | N/A                 | --                           | --            | --   | --              | --             |                                           |
|                          |      | HS-20(Inv) | 36.000               | 2                          | 1.178                             | 42.397        | 1.75                   | 0.284                        | 3.76          | 25'  | EL              | 12                                        | 0.591                        | 1.18          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 3.46          | 25'  | EL              | 12             |                                           |
|                          |      | HS-20(0pr) | 36.000               | --                         | 1.527                             | 54.959        | 1.35                   | 0.284                        | 4.87          | 25'  | EL              | 12                                        | 0.591                        | 1.53          | 25'  | EL              | 1.2                                       | N/A                 | --                           | --            | --   | --              | --             |                                           |
| LEGAL<br>LOAD<br>RATING  | SV   | SNSH       | 13.500               | --                         | 2.728                             | 36.833        | 1.4                    | 0.284                        | 6.83          | 25'  | EL              | 12                                        | 0.591                        | 2.73          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 5.04          | 25'  | EL              | 12             |                                           |
|                          |      | SNGARBS2   | 20.000               | --                         | 2.186                             | 43.718        | 1.4                    | 0.284                        | 6.39          | 25'  | EL              | 12                                        | 0.591                        | 2.19          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 4.72          | 25'  | EL              | 12             |                                           |
|                          |      | SNAGRIS2   | 22.000               | --                         | 2.141                             | 47.107        | 1.4                    | 0.284                        | 6.83          | 25'  | EL              | 12                                        | 0.591                        | 2.14          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 5.04          | 25'  | EL              | 12             |                                           |
|                          |      | SNCOTTS3   | 27.250               | --                         | 1.385                             | 37.731        | 1.4                    | 0.284                        | 3.57          | 25'  | EL              | 12                                        | 0.591                        | 1.38          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.64          | 25'  | EL              | 12             |                                           |
|                          |      | SNAGGRS4   | 34.925               | --                         | 1.332                             | 46.511        | 1.4                    | 0.284                        | 3.56          | 25'  | EL              | 12                                        | 0.591                        | 1.33          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.62          | 25'  | EL              | 12             |                                           |
|                          |      | SNS5A      | 35.550               | --                         | 1.392                             | 49.477        | 1.4                    | 0.284                        | 3.45          | 25'  | EL              | 12                                        | 0.591                        | 1.39          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.54          | 25'  | EL              | 12             |                                           |
|                          |      | SNS6A      | 39.950               | --                         | 1.334                             | 53.31         | 1.4                    | 0.284                        | 3.23          | 25'  | EL              | 12                                        | 0.591                        | 1.33          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.39          | 25'  | EL              | 12             |                                           |
|                          | TTST | SNS7B      | 42.000               | --                         | 1.344                             | 56.455        | 1.4                    | 0.284                        | 3.23          | 25'  | EL              | 12                                        | 0.591                        | 1.34          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.37          | 25'  | EL              | 12             |                                           |
|                          |      | TNAGRIT3   | 33.000               | --                         | 1.634                             | 53.934        | 1.4                    | 0.284                        | 4.55          | 25'  | EL              | 12                                        | 0.591                        | 1.63          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 3.36          | 25'  | EL              | 12             |                                           |
|                          |      | TNT4A      | 33.075               | --                         | 1.483                             | 49.049        | 1.4                    | 0.284                        | 3.95          | 25'  | EL              | 12                                        | 0.591                        | 1.48          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.92          | 25'  | EL              | 12             |                                           |
|                          |      | TNT6A      | 41.600               | --                         | 1.398                             | 58.138        | 1.4                    | 0.284                        | 3.71          | 25'  | EL              | 12                                        | 0.591                        | 1.4           | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.74          | 25'  | EL              | 12             |                                           |
|                          |      | TNT7A      | 42.000               | --                         | 1.391                             | 58.419        | 1.4                    | 0.284                        | 3.84          | 25'  | EL              | 12                                        | 0.591                        | 1.39          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.83          | 25'  | EL              | 12             |                                           |
|                          |      | TNT7B      | 42.000               | --                         | 1.343                             | 56.385        | 1.4                    | 0.284                        | 3.46          | 25'  | EL              | 12                                        | 0.591                        | 1.34          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.55          | 25'  | EL              | 12             |                                           |
|                          |      | TNAGRIT4   | 43.000               | --                         | 1.340                             | 57.604        | 1.4                    | 0.284                        | 3.71          | 25'  | EL              | 12                                        | 0.591                        | 1.34          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.73          | 25'  | EL              | 12             |                                           |
|                          |      | TNAGT5A    | 45.000               | --                         | 1.367                             | 61.501        | 1.4                    | 0.284                        | 3.71          | 25'  | EL              | 12                                        | 0.591                        | 1.37          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.73          | 25'  | EL              | 12             |                                           |
|                          |      | TNAGT5B    | 45.000               | 3                          | 1.239                             | 55.766        | 1.4                    | 0.284                        | 3.65          | 25'  | EL              | 9.6                                       | 0.591                        | 1.24          | 25'  | EL              | 1.2                                       | 0.80                | 0.284                        | 2.71          | 25'  | EL              | 9.6            |                                           |

LOAD FACTORS:

| DESIGN<br>LOAD<br>RATING<br>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:

- 
- 
- 
- 

CONTROLLING LOAD RATING

- DESIGN LOAD RATING (HL-93)
- DESIGN LOAD RATING (HS-20)
- LEGAL LOAD RATING \*\*

\*\* SEE CHART FOR VEHICLE TYPE

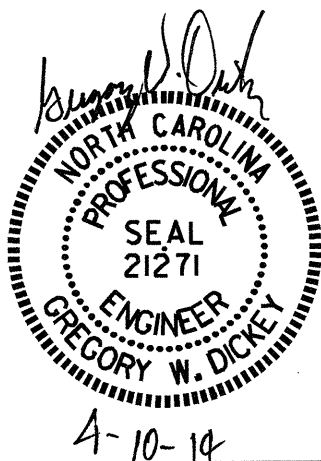
GIRDER LOCATION

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

PROJECT NO. BD-5103X  
PENDER COUNTY  
STATION: 13+50.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
LRFR SUMMARY FOR  
25' CORED SLAB UNIT  
90° SKEW  
(NON-INTERSTATE TRAFFIC)

| REVISIONS |     |       |     |     |       | SHEET NO.<br>- 3      |
|-----------|-----|-------|-----|-----|-------|-----------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                       |
| 1         |     |       | 3   |     |       | TOTAL<br>SHEETS<br>21 |
| 2         |     |       | 4   |     |       |                       |



|                            |                 |
|----------------------------|-----------------|
| ASSEMBLED BY : C.B. PRUETT | DATE : 10/28/13 |
| CHECKED BY : P.N.HOLDER    | DATE : 03/31/14 |
| DRAWN BY : CVC             | 6/10            |
| CHECKED BY : DNS           | 6/10            |



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

| 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                          | 1.055                             | --            | 1.75                   | 0.275                        | 1.23          | 55'  | EL              | 27                                        | 0.523                        | 1.23          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.05          | 55'  | EL              | 27             |                                           |
|                          |      | HL-93(0pr) | N/A                  | --                         | 1.591                             | --            | 1.35                   | 0.275                        | 1.59          | 55'  | EL              | 27                                        | 0.523                        | 1.59          | 55'  | EL              | 5.4                                       | N/A                 | --                           | --            | --   | --              | --             |                                           |
|                          |      | HS-20(Inv) | 36.000               | 2                          | 1.322                             | 47.585        | 1.75                   | 0.275                        | 1.54          | 55'  | EL              | 27                                        | 0.523                        | 1.47          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.32          | 55'  | EL              | 27             |                                           |
|                          |      | HS-20(0pr) | 36.000               | --                         | 1.9                               | 68.396        | 1.35                   | 0.275                        | 1.99          | 55'  | EL              | 27                                        | 0.523                        | 1.9           | 55'  | EL              | 5.4                                       | N/A                 | --                           | --            | --   | --              | --             |                                           |
| LEGAL<br>LOAD<br>RATING  | SV   | SNSH       | 13.500               | --                         | 2.776                             | 37.476        | 1.4                    | 0.275                        | 4.04          | 55'  | EL              | 27                                        | 0.523                        | 4.17          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 2.78          | 55'  | EL              | 27             |                                           |
|                          |      | SNGARBS2   | 20.000               | --                         | 2.155                             | 43.095        | 1.4                    | 0.275                        | 3.14          | 55'  | EL              | 27                                        | 0.523                        | 3.02          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 2.15          | 55'  | EL              | 27             |                                           |
|                          |      | SNAGRIS2   | 22.000               | --                         | 2.079                             | 45.734        | 1.4                    | 0.275                        | 3.03          | 55'  | EL              | 27                                        | 0.523                        | 2.83          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 2.08          | 55'  | EL              | 27             |                                           |
|                          |      | SNCOTTS3   | 27.250               | --                         | 1.384                             | 37.708        | 1.4                    | 0.275                        | 2.01          | 55'  | EL              | 27                                        | 0.523                        | 2.09          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.38          | 55'  | EL              | 27             |                                           |
|                          |      | SNAGGRS4   | 34.925               | --                         | 1.189                             | 41.527        | 1.4                    | 0.275                        | 1.73          | 55'  | EL              | 27                                        | 0.523                        | 1.77          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.19          | 55'  | EL              | 27             |                                           |
|                          |      | SNS5A      | 35.550               | --                         | 1.16                              | 41.255        | 1.4                    | 0.275                        | 1.69          | 55'  | EL              | 27                                        | 0.523                        | 1.82          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.16          | 55'  | EL              | 27             |                                           |
|                          |      | SNS6A      | 39.950               | --                         | 1.079                             | 43.102        | 1.4                    | 0.275                        | 1.57          | 55'  | EL              | 27                                        | 0.523                        | 1.68          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.08          | 55'  | EL              | 27             |                                           |
|                          |      | SNS7B      | 42.000               | --                         | 1.028                             | 43.175        | 1.4                    | 0.275                        | 1.5           | 55'  | EL              | 27                                        | 0.523                        | 1.67          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.03          | 55'  | EL              | 27             |                                           |
|                          | TTST | TNAGRIT3   | 33.000               | --                         | 1.32                              | 43.556        | 1.4                    | 0.275                        | 1.92          | 55'  | EL              | 27                                        | 0.523                        | 1.98          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.32          | 55'  | EL              | 27             |                                           |
|                          |      | TNT4A      | 33.075               | --                         | 1.33                              | 43.979        | 1.4                    | 0.275                        | 1.94          | 55'  | EL              | 27                                        | 0.523                        | 1.91          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.33          | 55'  | EL              | 27             |                                           |
|                          |      | TNT6A      | 41.600               | --                         | 1.101                             | 45.811        | 1.4                    | 0.275                        | 1.6           | 55'  | EL              | 27                                        | 0.523                        | 1.83          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.10          | 55'  | EL              | 27             |                                           |
|                          |      | TNT7A      | 42.000               | --                         | 1.114                             | 46.804        | 1.4                    | 0.275                        | 1.62          | 55'  | EL              | 27                                        | 0.523                        | 1.71          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.11          | 55'  | EL              | 27             |                                           |
|                          |      | TNT7B      | 42.000               | --                         | 1.163                             | 48.848        | 1.4                    | 0.275                        | 1.69          | 55'  | EL              | 27                                        | 0.523                        | 1.62          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.16          | 55'  | EL              | 27             |                                           |
|                          |      | TNAGRIT4   | 43.000               | --                         | 1.101                             | 47.33         | 1.4                    | 0.275                        | 1.6           | 55'  | EL              | 27                                        | 0.523                        | 1.56          | 55'  | EL              | 5.4                                       | 0.80                | 0.275                        | 1.10          | 55'  | EL              | 27             |                                           |
| TNAGT5A                  |      | 45.000     | --                   | 1.031                      | 46.405                            | 1.4           | 0.275                  | 1.5                          | 55'           | EL   | 27              | 0.523                                     | 1.58                         | 55'           | EL   | 5.4             | 0.80                                      | 0.275               | 1.03                         | 55'           | EL   | 27              |                |                                           |
| TNAGT5B                  |      | 45.000     | 3                    | 1.013                      | 45.582                            | 1.4           | 0.275                  | 1.47                         | 55'           | EL   | 27              | 0.523                                     | 1.48                         | 55'           | EL   | 5.4             | 0.80                                      | 0.275               | 1.01                         | 55'           | EL   | 27              |                |                                           |

LOAD FACTORS:

| DESIGN<br>LOAD<br>RATING<br>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:

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- 
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# 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

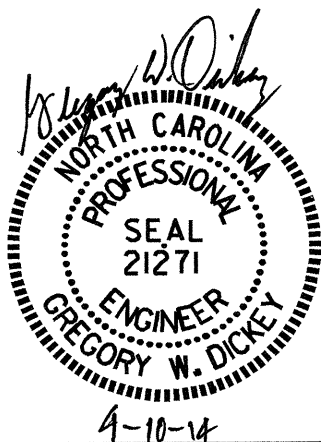
I - INTERIOR GIRDER  
EL - EXTERIOR LEFT GIRDER  
ER - EXTERIOR RIGHT GIRDER

PROJECT NO. BD-5103X  
PENDER COUNTY  
STATION: 13+50.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

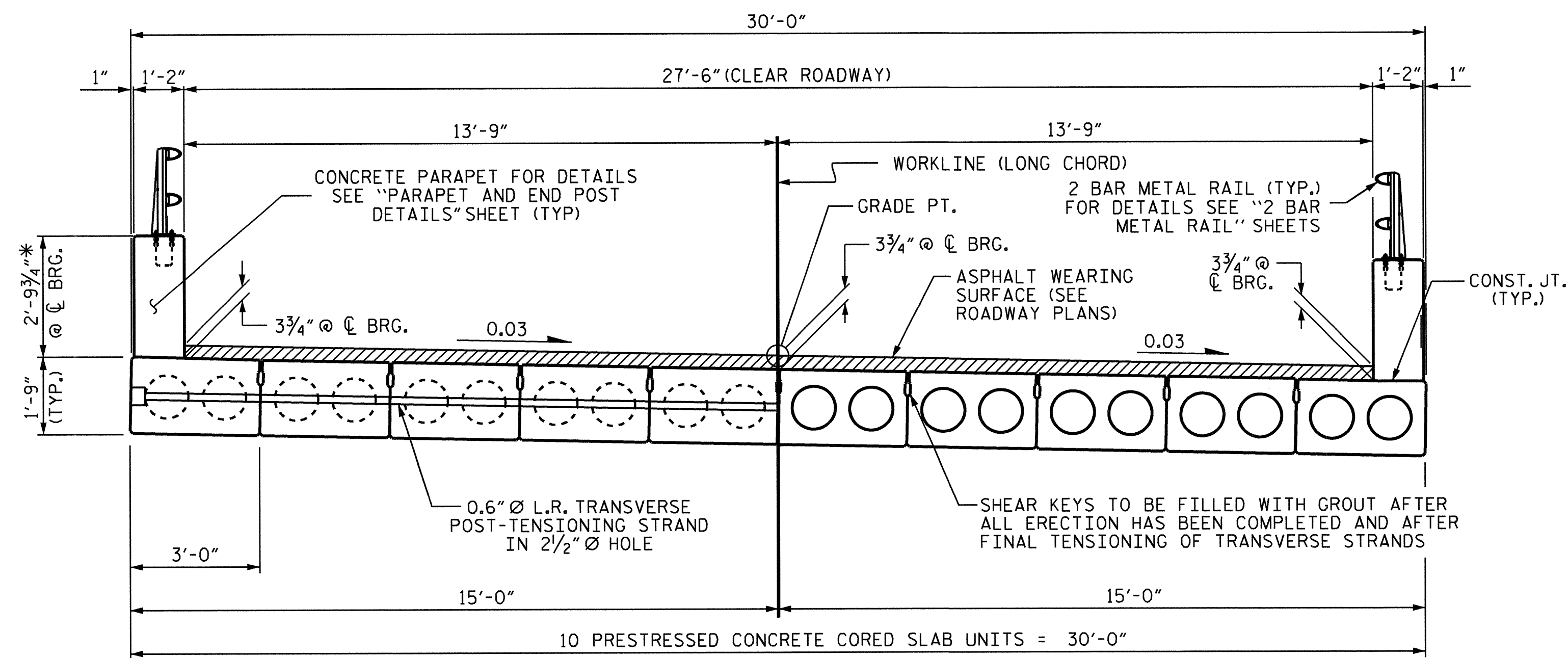
STANDARD  
LRFR SUMMARY FOR  
55' CORED SLAB UNIT  
90° SKEW  
(NON-INTERSTATE TRAFFIC)

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



|                            |                 |
|----------------------------|-----------------|
| ASSEMBLED BY : C.B. PRUETT | DATE : 10/28/13 |
| CHECKED BY : P.N.HOLDER    | DATE : 03/31/14 |
| DRAWN BY : CVC             | 6/10            |
| CHECKED BY : DNS           | 6/10            |





HALF SECTION  
AT INTERMEDIATE DIAPHRAGMS

HALF SECTION  
THROUGH VOIDS

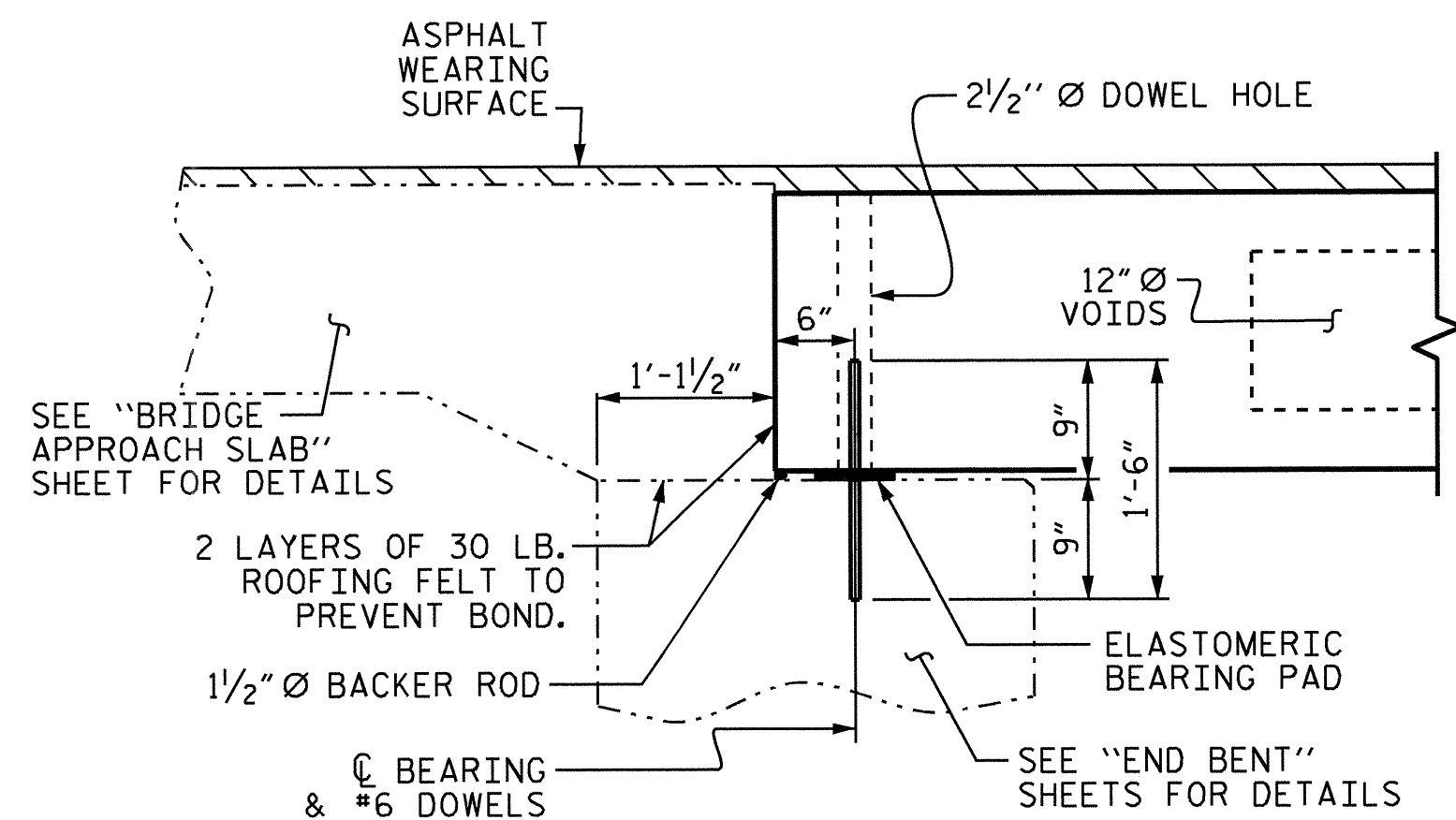
### TYPICAL SECTION

\* - THE MAXIMUM PARAPET HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE PARAPET AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE PARAPET FOLLOWS THE PROFILE OF THE GUTTERLINE. FOR PARAPET DETAILS AND ASPHALT THICKNESS SEE THE "CONCRETE PARAPET FOR 2 BAR METAL RAIL" DETAIL.

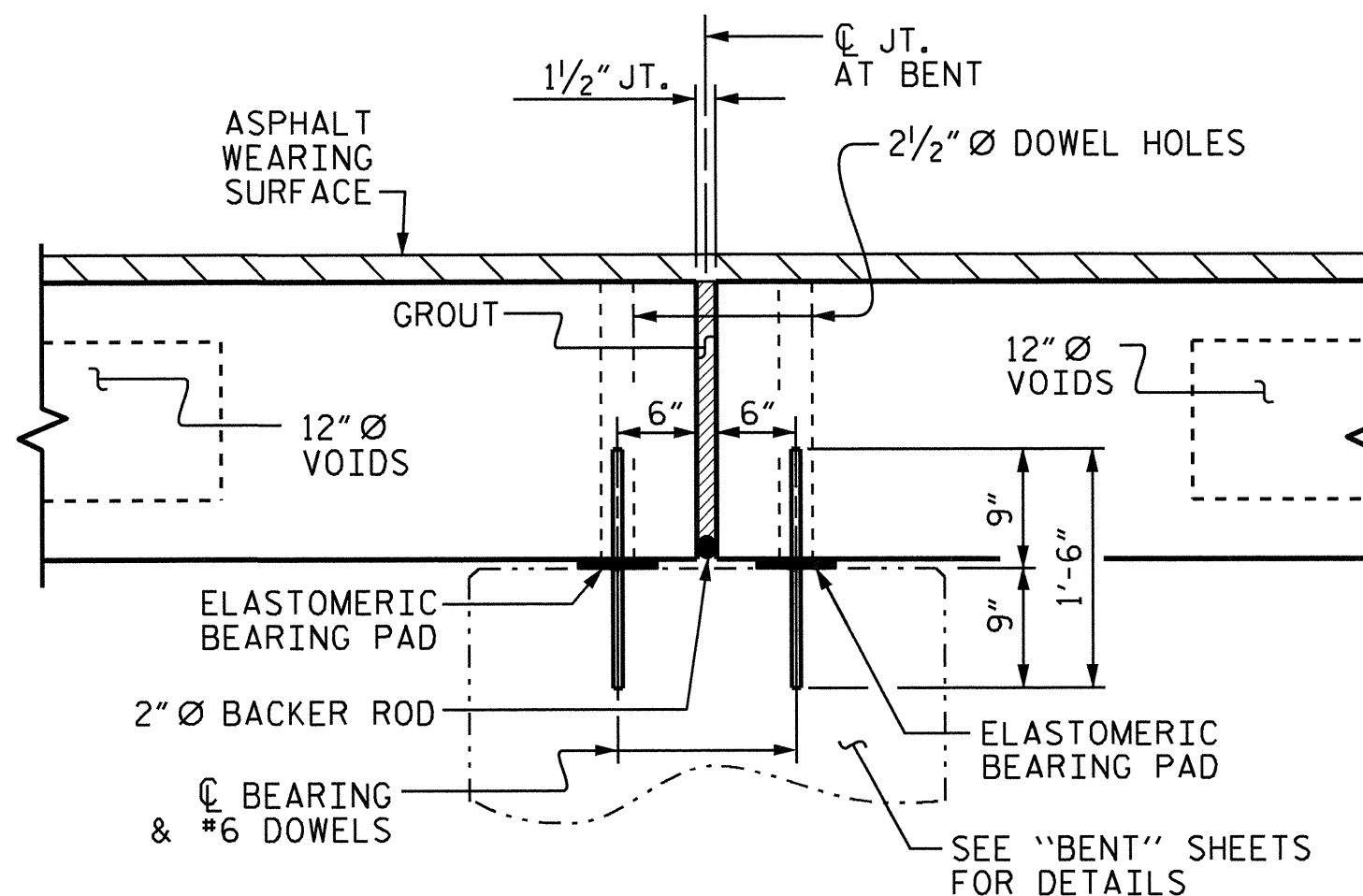
FIXED END

FIXED END

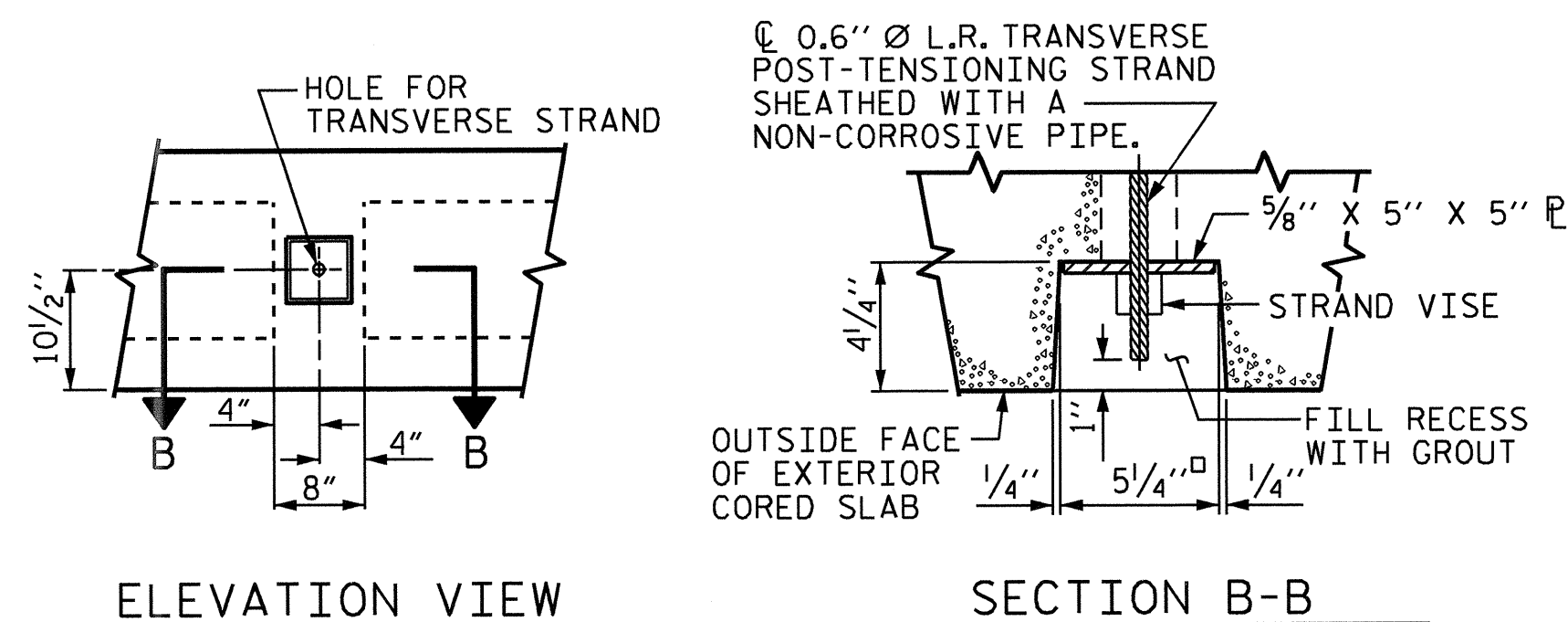
FIXED END



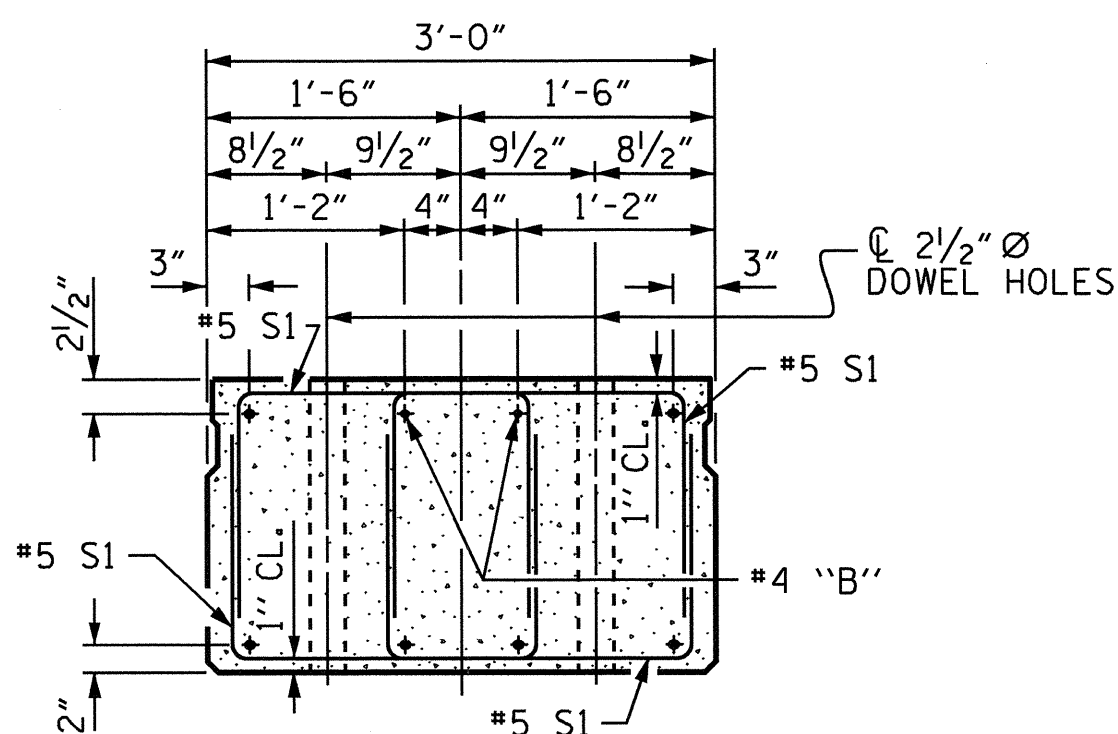
### SECTION AT END BENT



### SECTION AT BENT

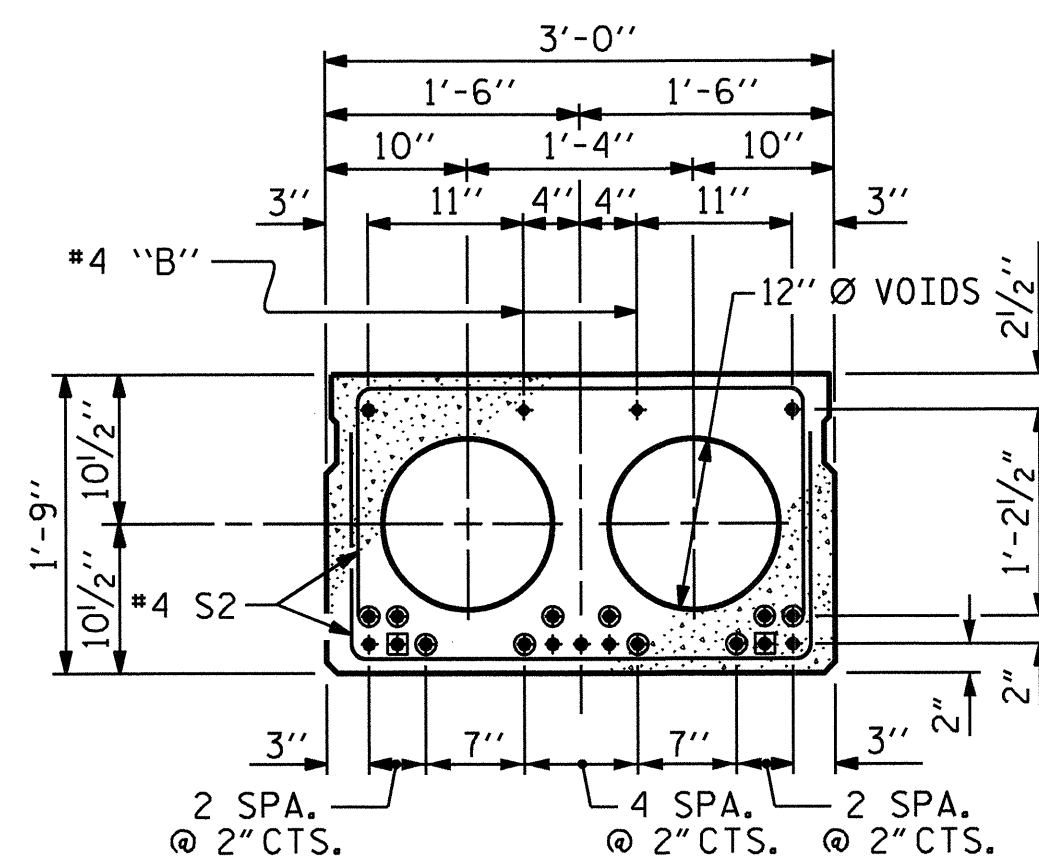


### GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS

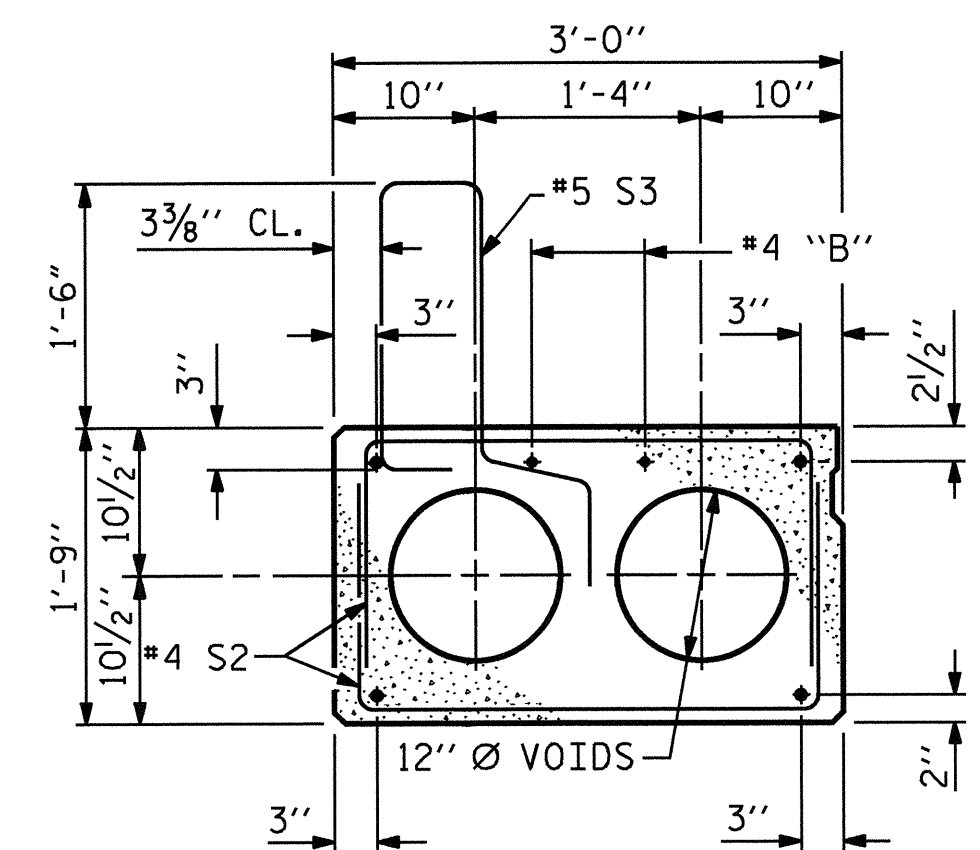


### END ELEVATION

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.

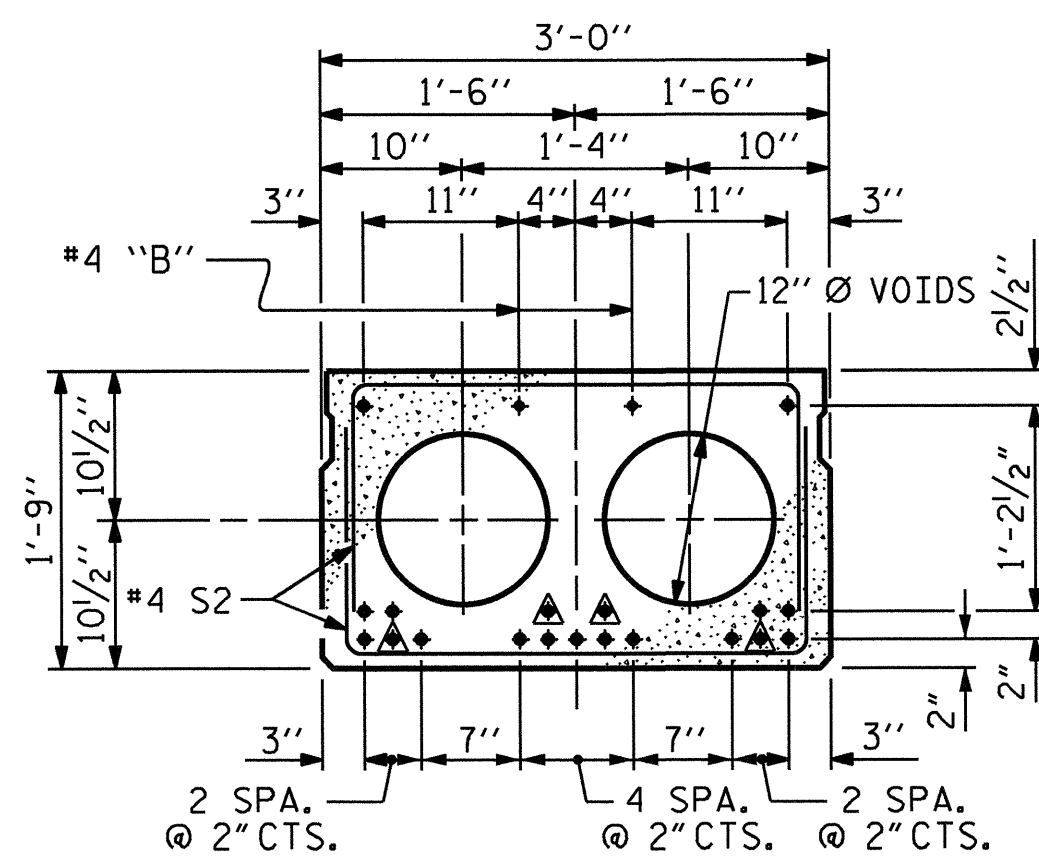


INTERIOR SLAB SECTION  
(25' UNIT)  
(9 STRANDS REQUIRED)



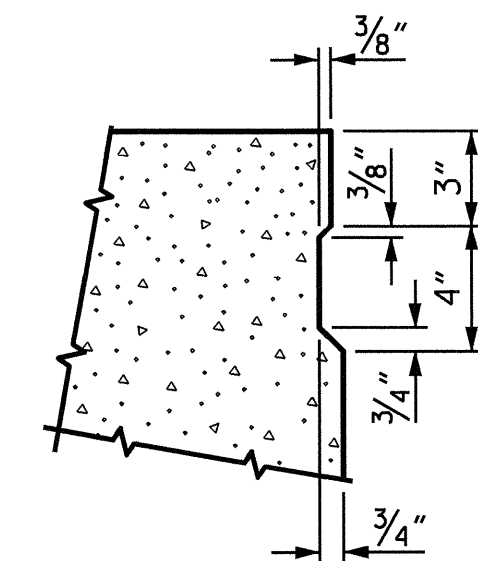
### EXT. SLAB SECTION

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



INTERIOR SLAB SECTION  
(55' UNIT)  
(19 STRANDS REQUIRED)

### 0.6" Ø LOW RELAXATION STRAND LAYOUT



### SHEAR KEY DETAIL

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

- ▲ 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.

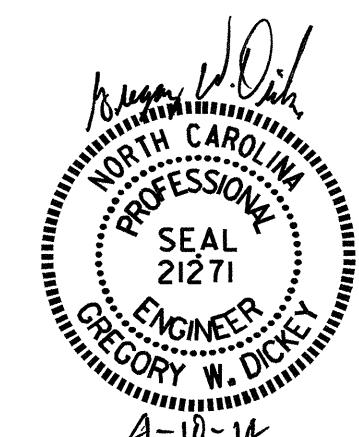
### DEBONDING LEGEND

PROJECT NO. BD-5103X  
PENDER COUNTY  
STATION: 13+50.00 -L-

SHEET 1 OF 5

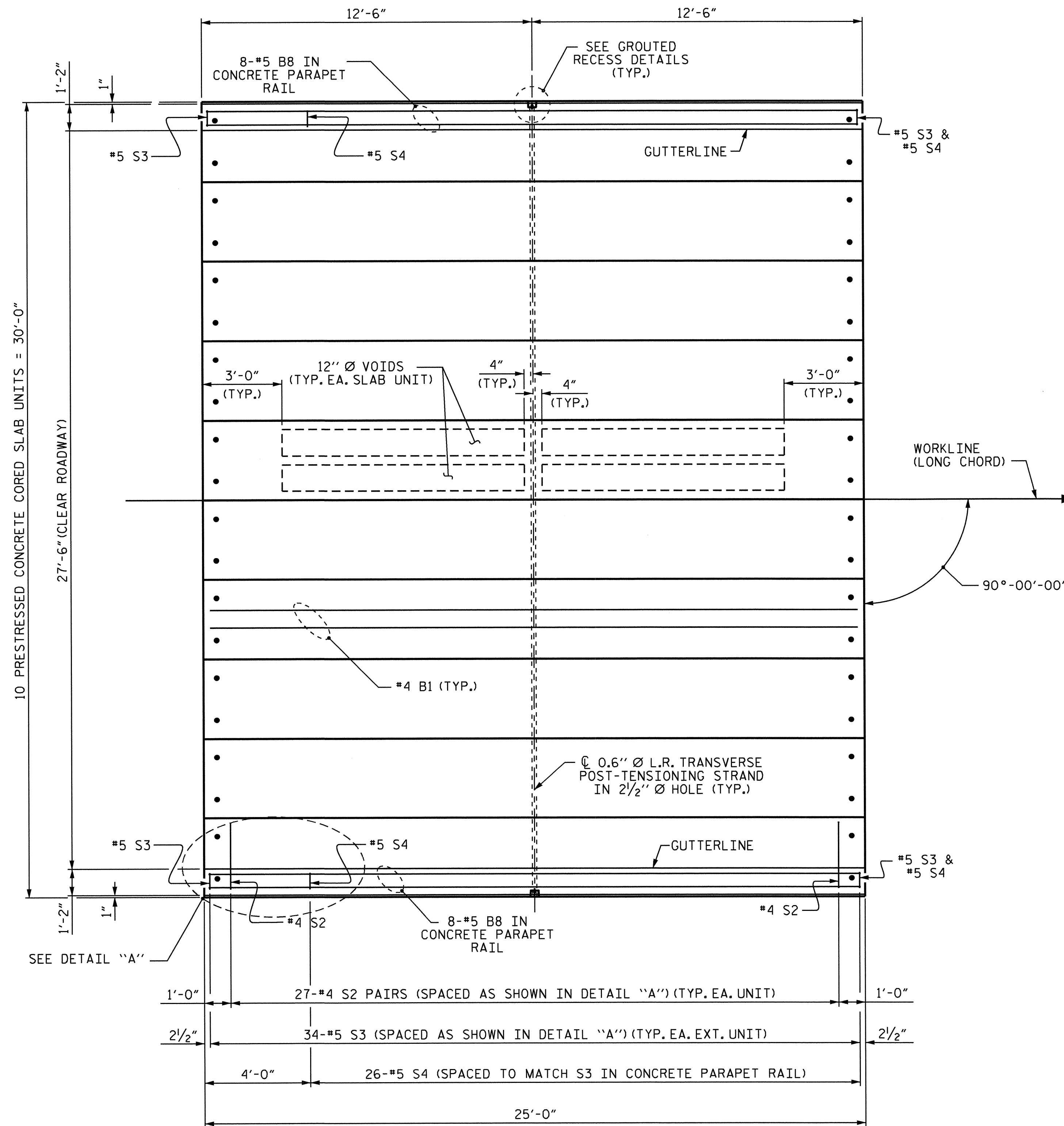
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 1'-9"  
PRESTRESSED CONCRETE  
CORED SLAB UNIT  
90° SKEW

| REVISIONS |     |       |     |     |       | SHEET NO.    |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |              |
| 1         |     |       | 3   |     |       | 5            |
| 2         |     |       | 4   |     |       | TOTAL SHEETS |
|           |     |       |     |     |       | 21           |



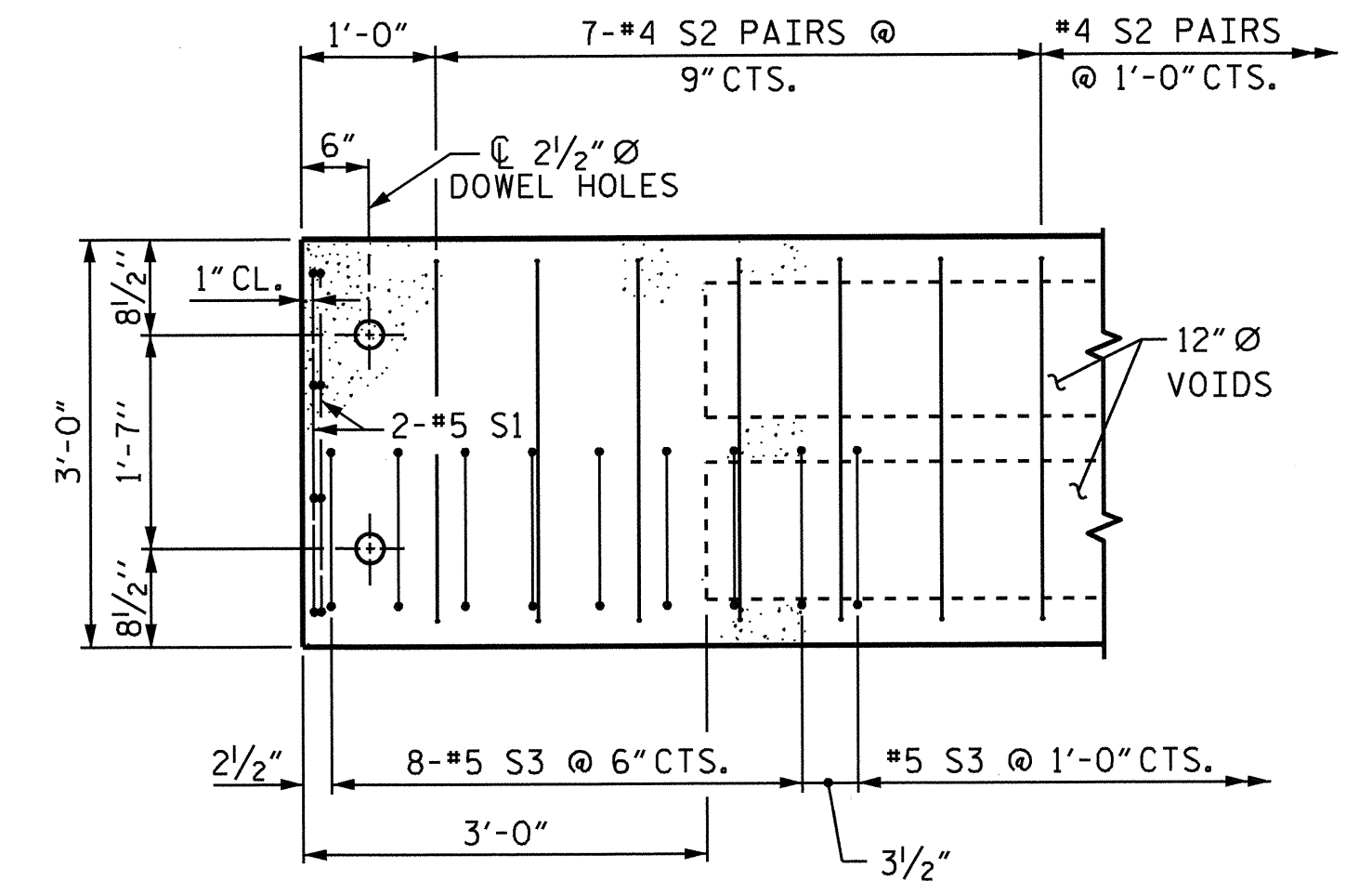
ASSEMBLED BY : C.B. PRUETT/D. A. GLADDEN DATE :10/28/13  
CHECKED BY : P.N. HOLDER DATE :03/31/14  
DRAWN BY : DGE 5/09 REV. 12/11 MAA/AAC  
CHECKED BY : BCH 6/09





### PLAN OF UNIT

DECK DRAINS NOT REQUIRED



### DETAIL "A"

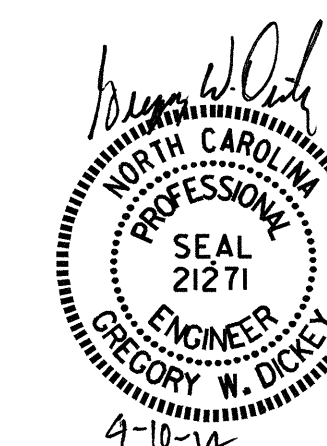
NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PROJECT NO. BD-5103X  
PENDER COUNTY  
 STATION: 13+50.00 -L-

SHEET 2 OF 5

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH

PLAN OF 25' UNIT  
 27'-6" CLEAR ROADWAY  
 90° SKEW



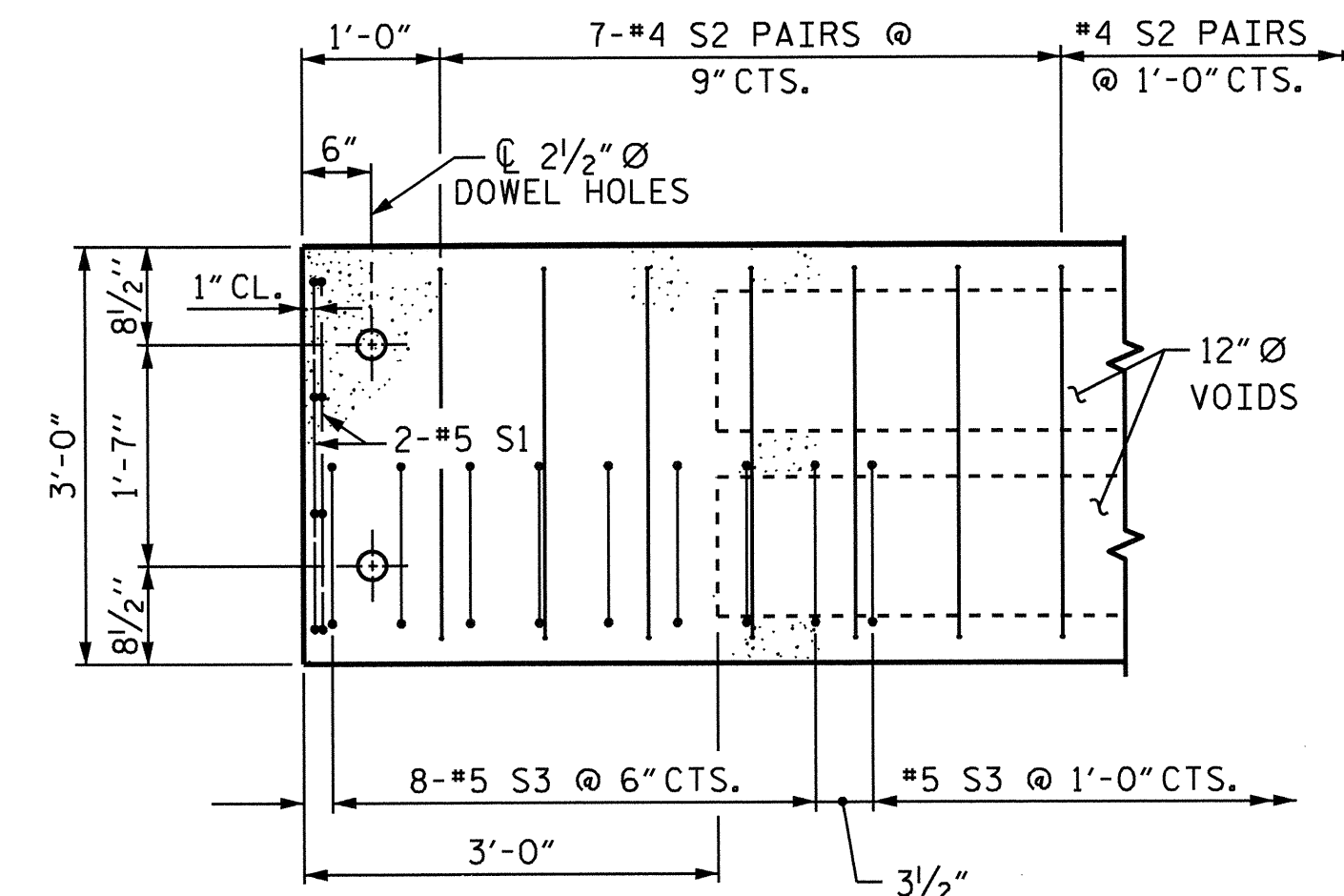
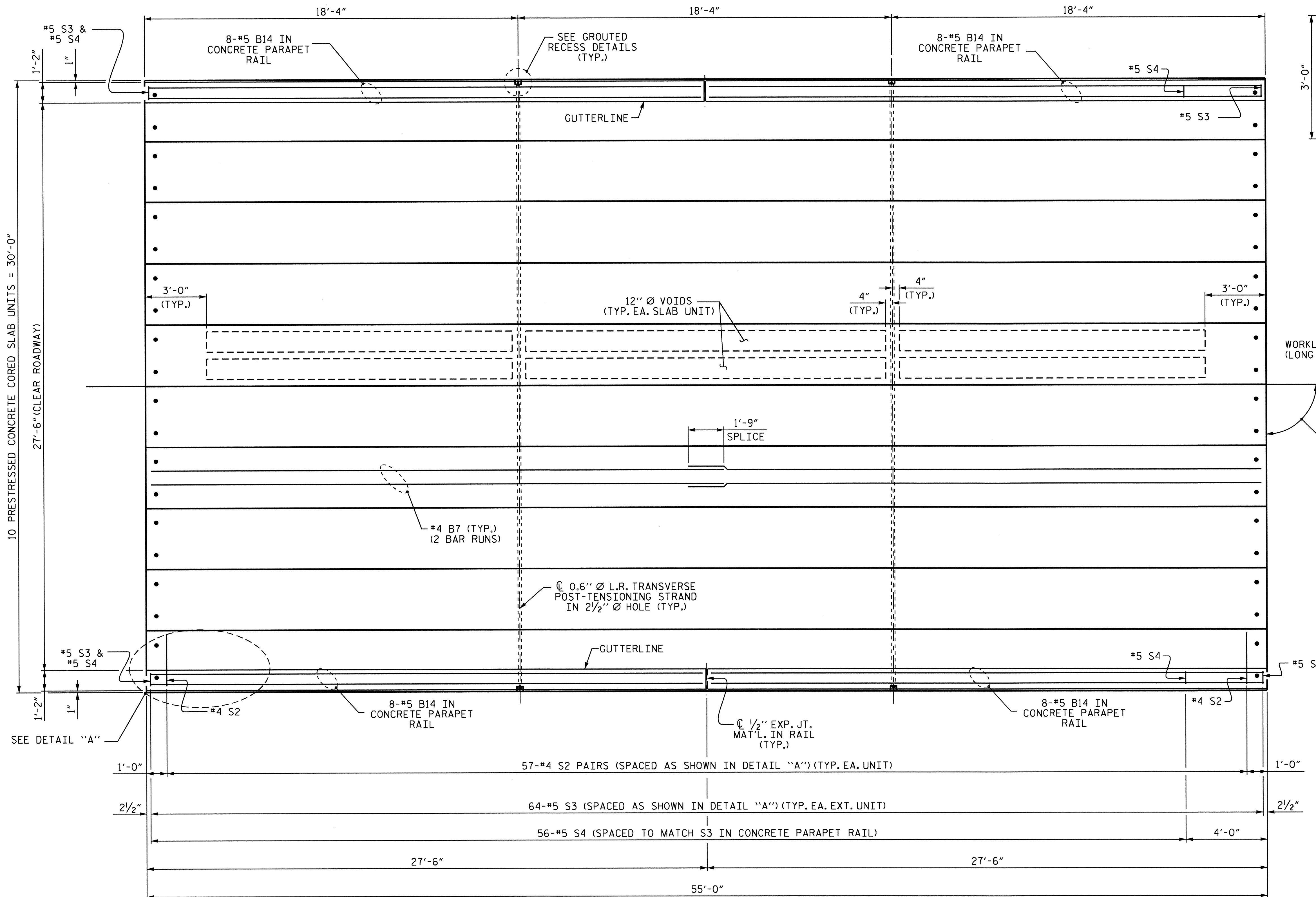
| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | 6               |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 21 |

STD. NO. 21" PCS-30-90S-25L

ASSEMBLED BY : C.B. PRUETT/D. A. GLADDEN DATE : 10/28/13  
 CHECKED BY : P.N. HOLDER DATE : 03/31/14  
 DRAWN BY : DGE 3/09 REV. 12/5/11 MAA/AAC  
 CHECKED BY : BCH 3/09

10-APR-2014 12:26  
 S:\DPG1\Division3\BD-5103X\Final Plans\Revised2barFinal.dgn  
 gdickey





DETAIL "A"

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

WORKLINE (LONG CHORD)

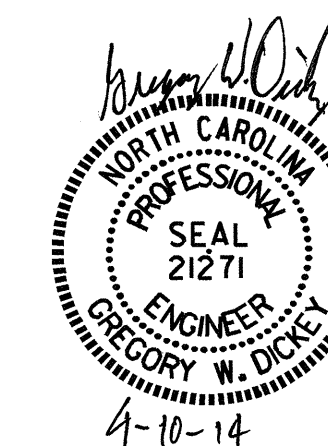
90°-00'-00"

# PLAN OF UNIT

DECK DRAINS NOT REQUIRED

ASSEMBLED BY : C.B. PRUETT/D. A. GLADDEN DATE : 10/28/13  
 CHECKED BY : P.N. HOLDER DATE : 03/31/14  
 DRAWN BY : DCE 3/09 REV. 12/5/11 MAA/AAC  
 CHECKED BY : BCH 3/09

10-APR-2014 12:26  
 S:\DPG1\Division3\BD-5103X\Final Plans\Revised2barFinal.dgn  
 gdickey



PROJECT NO. BD-5103X  
PENDER COUNTY  
 STATION: 13+50.00 -L-

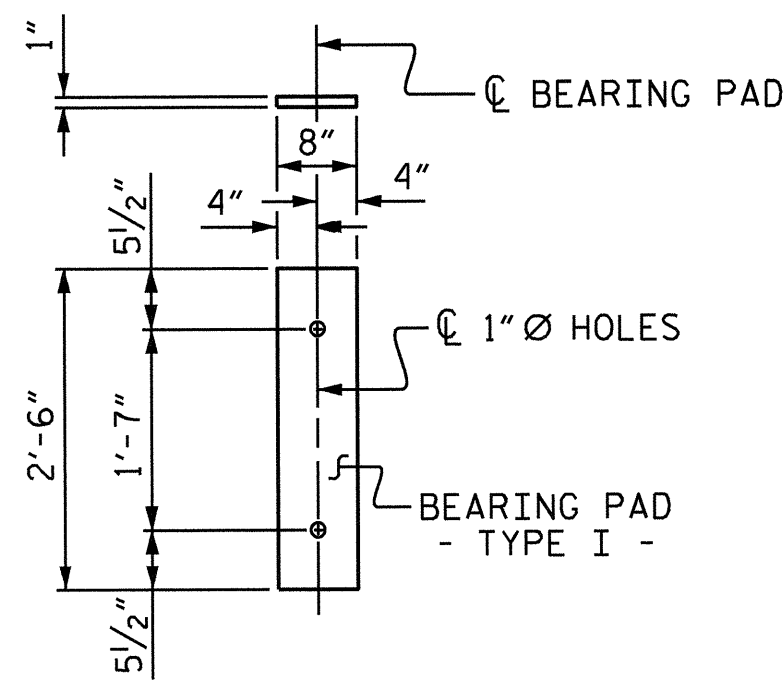
SHEET 3 OF 5

| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | 7               |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 21 |

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 PLAN OF 55' UNIT  
 27'-6" CLEAR ROADWAY  
 90° SKEW

STD. NO. 21" PCS-30-90S-55L

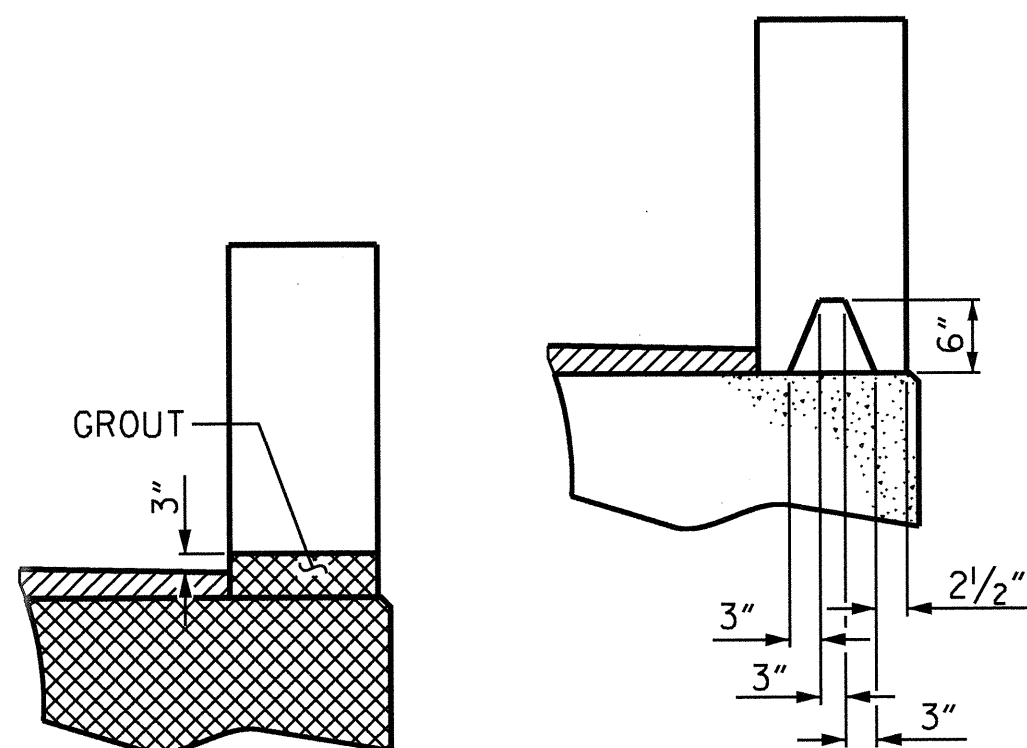




FIXED END  
(TYPE I - 40 REQ'D)

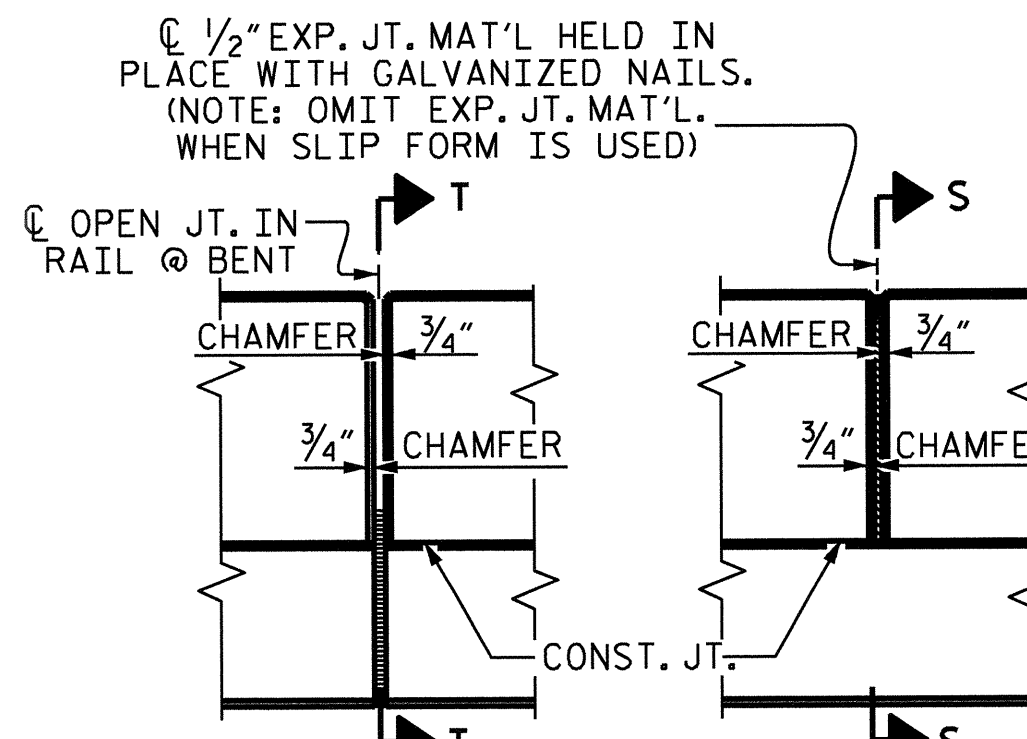
## ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.



SECTION T-T  
AT OPEN JOINT AT BENT  
(THIS IS TO BE USED WHERE  
FOAM JOINT IS NOT USED)

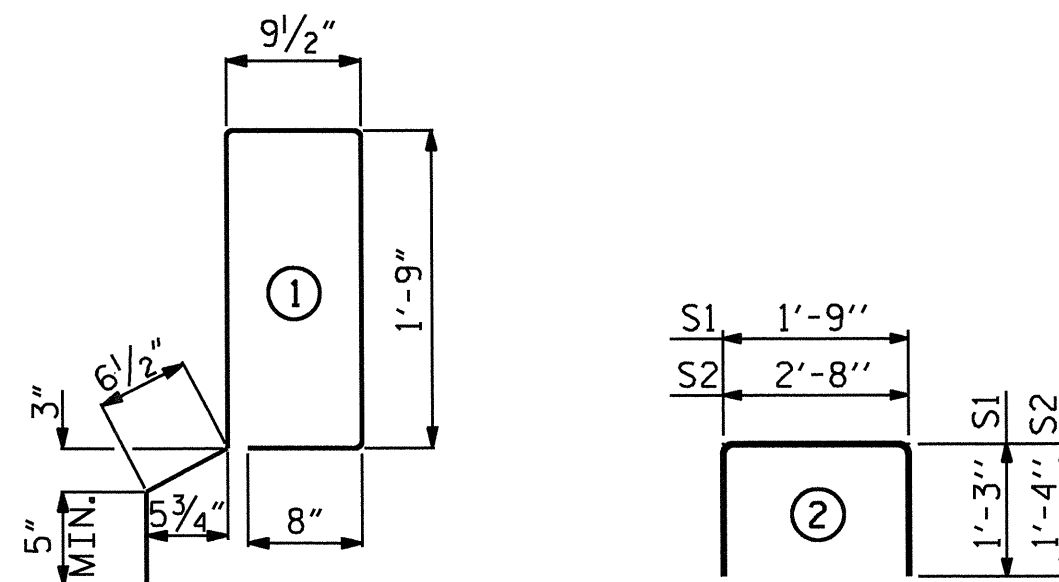
SECTION S-S  
AT DAM IN OPEN JOINT  
(THIS IS TO BE USED ONLY  
WHEN SLIP FORM IS USED)



ELEVATION AT EXPANSION JOINTS

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

## BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

## 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 SIDEWAYS. 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 CONCRETE PARAPET 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.

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.

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

\*\* INCLUDES FUTURE WEARING SURFACE

| DEAD LOAD DEFLECTION AND CAMBER            |                    |
|--------------------------------------------|--------------------|
| 55' CORED SLAB UNIT                        | 3'-0" x 1'-9"      |
| CAMBER (SLAB ALONE IN PLACE)               | 0.6" Ø L.R. STRAND |
| DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD** | 2 1/2" ↑           |
| FINAL CAMBER                               | 1/4" ↓             |

\*\* INCLUDES FUTURE WEARING SURFACE

| CORED SLABS REQUIRED |        |        |              |
|----------------------|--------|--------|--------------|
|                      | NUMBER | LENGTH | TOTAL LENGTH |
| 25' UNIT             |        |        |              |
| EXTERIOR C.S.        | 2      | 25'-0" | 50'-0"       |
| INTERIOR C.S.        | 8      | 25'-0" | 200'-0"      |
| TOTAL                | 10     |        | 250'-0"      |

| CORED SLABS REQUIRED |        |        |              |
|----------------------|--------|--------|--------------|
|                      | NUMBER | LENGTH | TOTAL LENGTH |
| 55' UNIT             |        |        |              |
| EXTERIOR C.S.        | 2      | 55'-0" | 110'-0"      |
| INTERIOR C.S.        | 8      | 55'-0" | 440'-0"      |
| TOTAL                | 10     |        | 550'-0"      |

## BILL OF MATERIAL FOR ONE 25' CORED SLAB UNIT

|                      |        |      |      | EXTERIOR UNIT |        | INTERIOR UNIT |        |
|----------------------|--------|------|------|---------------|--------|---------------|--------|
| BAR                  | NUMBER | SIZE | TYPE | LENGTH        | WEIGHT | LENGTH        | WEIGHT |
| B1                   | 2      | #4   | STR  | 24'-8"        | 33     | 24'-8"        | 33     |
| S1                   | 8      | #5   | 3    | 4'-3"         | 35     | 4'-3"         | 35     |
| S2                   | 54     | #4   | 3    | 5'-4"         | 192    | 5'-4"         | 192    |
| * S3                 | 34     | #5   | 1    | 5'-11"        | 210    |               |        |
| REINFORCING STEEL    |        |      |      | LBS.          | 260    |               | 260    |
| * EPOXY COATED       |        |      |      |               |        |               |        |
| REINFORCING STEEL    |        |      |      | LBS.          | 210    |               |        |
| 5000 P.S.I. CONCRETE |        |      |      | CU. YDS.      | 3.7    |               | 3.7    |
| 0.6" Ø L.R. STRANDS  |        |      |      | No.           | 9      |               | 9      |

## BILL OF MATERIAL FOR ONE 55' CORED SLAB UNIT

|                      |        |      |      | EXTERIOR UNIT |        | INTERIOR UNIT |        |
|----------------------|--------|------|------|---------------|--------|---------------|--------|
| BAR                  | NUMBER | SIZE | TYPE | LENGTH        | WEIGHT | LENGTH        | WEIGHT |
| B7                   | 4      | #4   | STR  | 28'-3"        | 75     | 28'-3"        | 75     |
| S1                   | 8      | #5   | 3    | 4'-3"         | 35     | 4'-3"         | 35     |
| S2                   | 114    | #4   | 3    | 5'-4"         | 406    | 5'-4"         | 406    |
| * S3                 | 64     | #5   | 1    | 5'-11"        | 395    |               |        |
| REINFORCING STEEL    |        |      |      | LBS.          | 516    |               | 516    |
| * EPOXY COATED       |        |      |      |               |        |               |        |
| REINFORCING STEEL    |        |      |      | LBS.          | 395    |               |        |
| 6500 P.S.I. CONCRETE |        |      |      | CU. YDS.      | 7.8    |               | 7.8    |
| 0.6" Ø L.R. STRANDS  |        |      |      | No.           | 19     |               | 19     |

## GUTTERLINE ASPHALT THICKNESS & PARAPET HEIGHT

| 27'-6" CLEAR ROADWAY | ASPHALT OVERLAY THICKNESS | PARAPET HEIGHT |
|----------------------|---------------------------|----------------|
|                      | @ MID-SPAN                | @ MID-SPAN     |
|                      | SUPERED SECTION           |                |
| 25' UNIT             | 3 3/8"                    | 2'-9 3/8"      |
| 55' UNIT             | 1 1/2"                    | 2'-7 1/2"      |

## CONCRETE RELEASE STRENGTH

| UNIT     | PSI  |
|----------|------|
| 25' UNIT | 4000 |
| 55' UNIT | 4900 |

PROJECT NO. BD-5103X  
PENDER COUNTY  
STATION: 13+50.00 -L-

SHEET 4 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
3'-0" X 1'-9"  
PRESTRESSED CONCRETE  
CORED SLAB UNIT  
90° SKEW

| REVISIONS |     |       |     |     |       | SHEET NO.<br>8        |
|-----------|-----|-------|-----|-----|-------|-----------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                       |
| 1         |     |       | 3   |     |       | TOTAL<br>SHEETS<br>21 |
| 2         |     |       | 4   |     |       |                       |



|                              |                 |
|------------------------------|-----------------|
| ASSEMBLED BY : D. A. GLADDEN | DATE : 3-13-14  |
| CHECKED BY : P. N. HOLDER    | DATE : 04/01/14 |
| DRAWN BY : DGE 5/09          | REV. 12/11      |
| CHECKED BY : BCH 6/09        | MAA/AAC         |



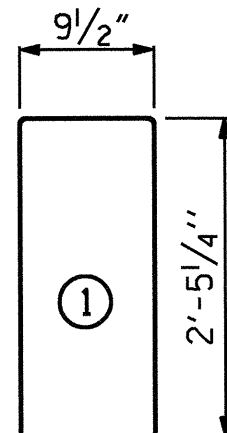
NOTES

ALL REINFORCING STEEL IN THE PARAPETS AND END POSTS SHALL BE EPOXY COATED.

FOR DETAILS OF CONCRETE INSERT AND GUARDRAIL ANCHOR ASSEMBLY, SEE "RAIL POST SPACINGS AND END OF RAIL DETAILS" SHEET AND "GUARDRAIL ANCHORAGE DETAILS" SHEET.

#5 S3 BARS ARE INCLUDED IN THE BILL OF MATERIAL FOR CORED SLAB UNITS.

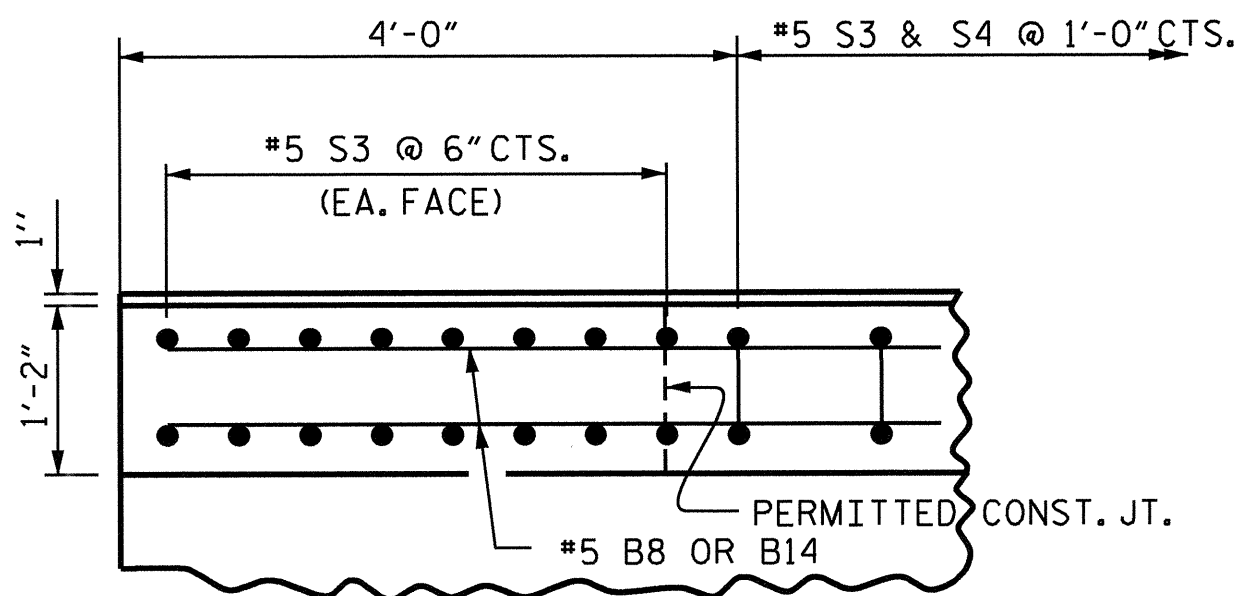
GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE PARAPET AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN PARAPET EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT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

| BAR TYPE                                                                            | BILL OF MATERIAL<br>PARAPETS AND END POSTS |     |      |      |        |        |
|-------------------------------------------------------------------------------------|--------------------------------------------|-----|------|------|--------|--------|
|                                                                                     | BAR                                        | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|  | * B8                                       | 16  | #5   | STR  | 24'-7" | 410    |
|                                                                                     | * B14                                      | 32  | #5   | STR  | 27'-1" | 904    |
|                                                                                     | * E1                                       | 8   | #7   | STR  | 2'-9"  | 45     |
|                                                                                     | * E2                                       | 8   | #7   | STR  | 3'-3"  | 53     |
|                                                                                     | * E3                                       | 8   | #7   | STR  | 3'-9"  | 61     |
|                                                                                     | * E4                                       | 8   | #7   | STR  | 4'-3"  | 69     |
|                                                                                     | * E5                                       | 8   | #7   | STR  | 4'-7"  | 75     |
|                                                                                     | * F1                                       | 8   | #6   | STR  | 1'-10" | 22     |
|                                                                                     | * F2                                       | 8   | #6   | STR  | 3'-0"  | 36     |
|                                                                                     | * F3                                       | 8   | #6   | STR  | 3'-10" | 46     |
|                                                                                     | * S4                                       | 164 | #5   | 1    | 5'-8"  | 969    |
|                                                                                     | * EPOXY COATED REINFORCING STEEL LBS.      |     |      |      |        | 2690   |
|                                                                                     | CLASS AA CONCRETE CU.YDS.                  |     |      |      |        | 13.3   |
|                                                                                     | CONCRETE PARAPET LIN. FT.                  |     |      |      |        | 160.50 |

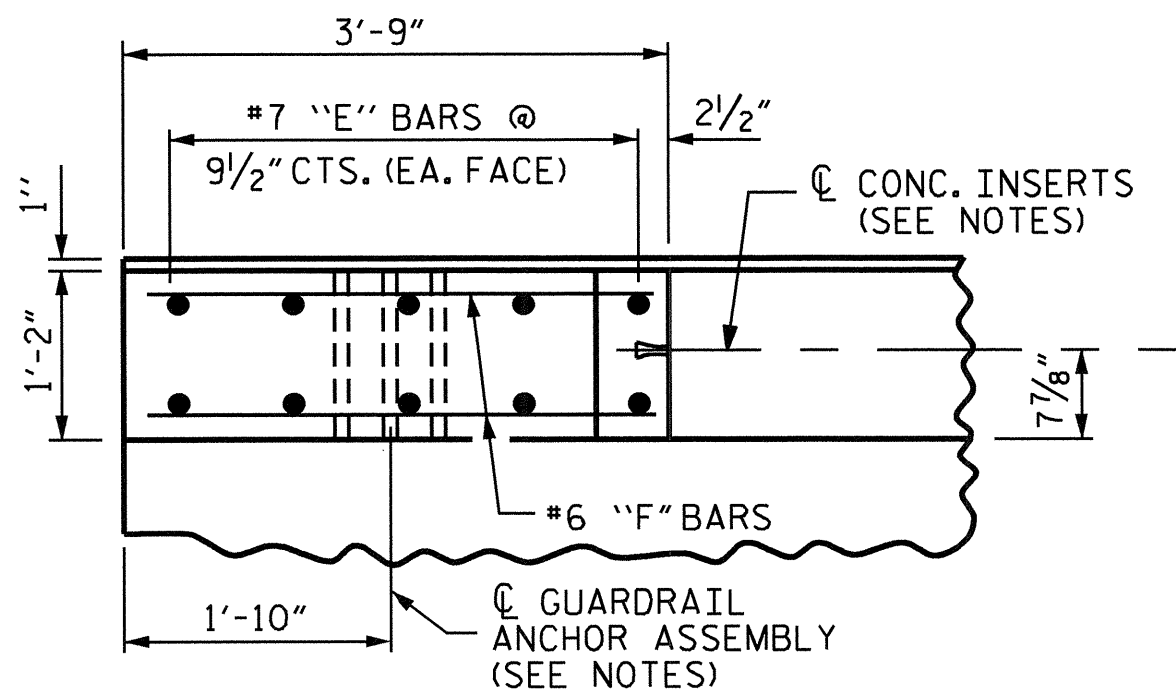
ALL BAR DIMENSIONS ARE OUT TO OUT

PARAPET HEIGHT CHART

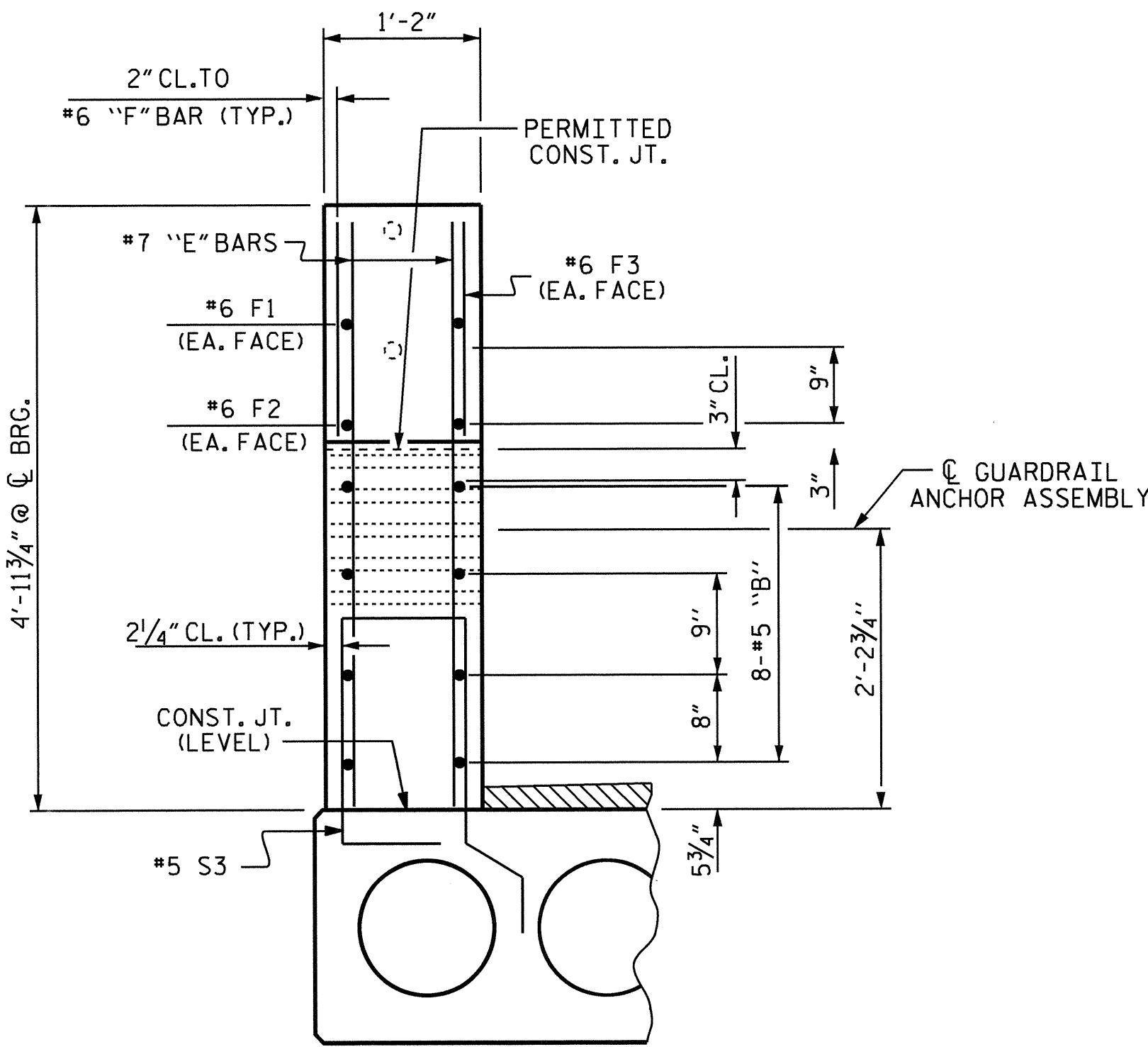
|          | @ CL BRG. | @ MID SPAN |
|----------|-----------|------------|
| 25' UNIT | 2'-9 3/4" | 2'-9 3/8"  |
| 55' UNIT | 2'-9 3/4" | 2'-7 1/2"  |



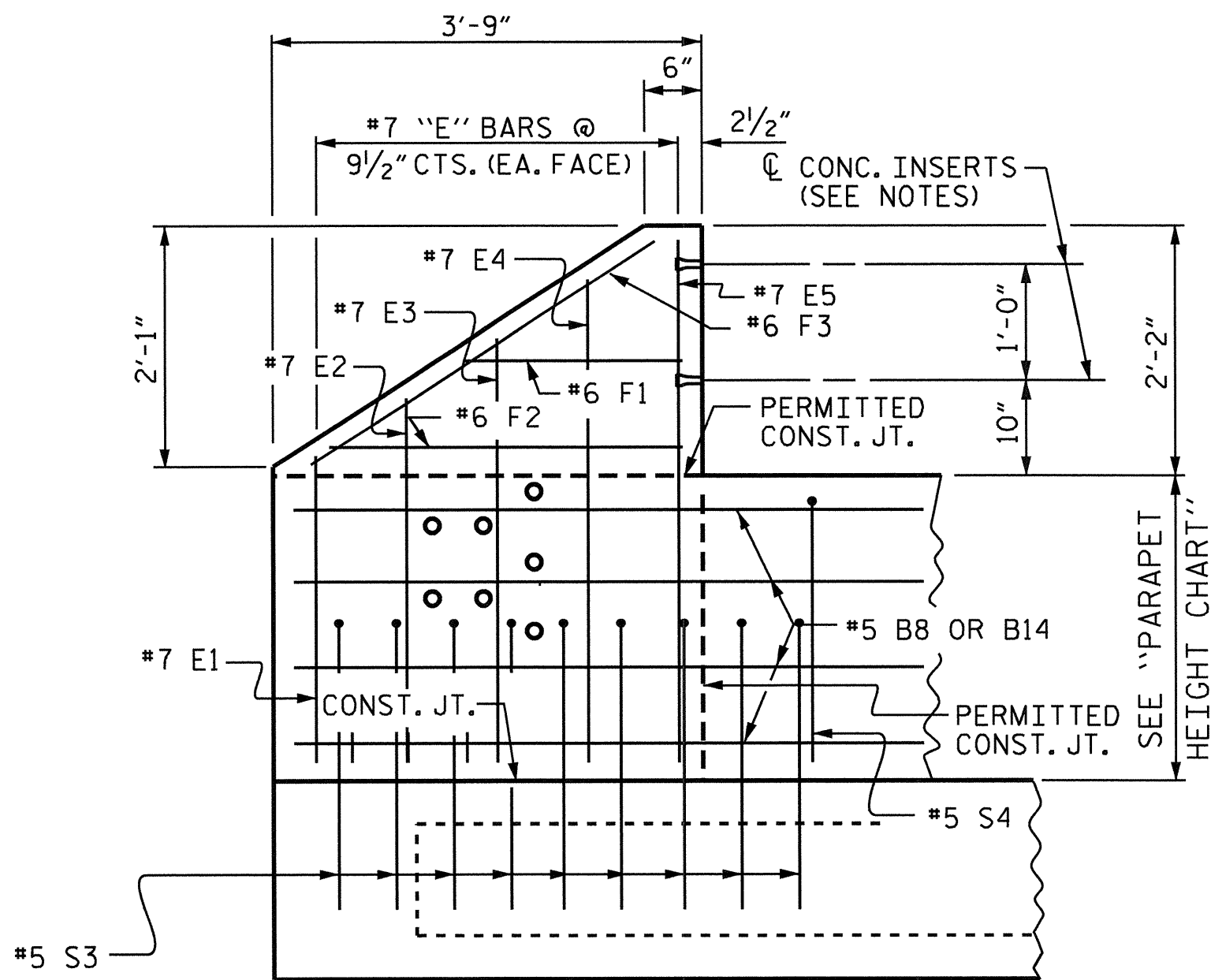
PLAN OF PARAPET



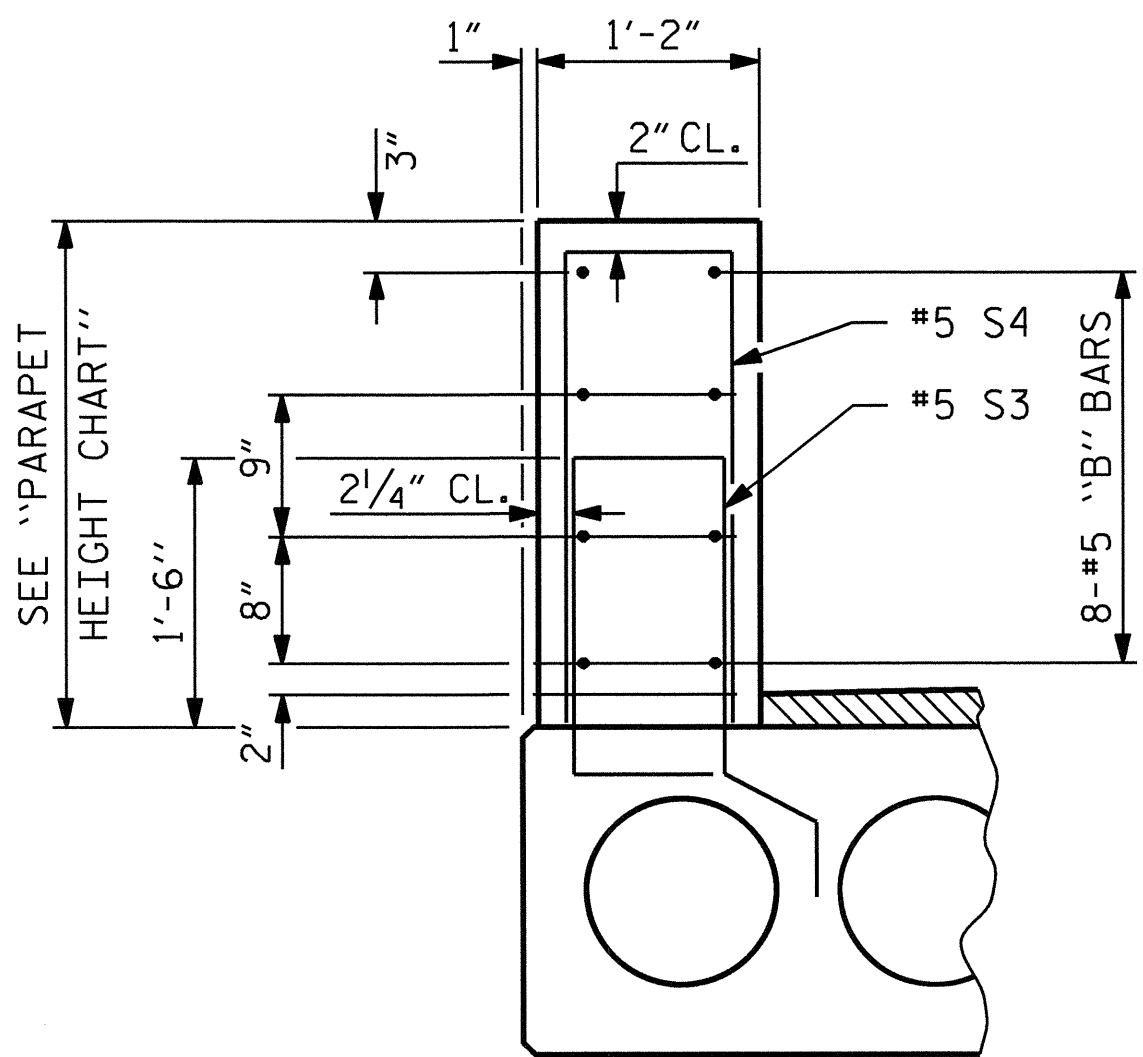
PLAN OF END POST



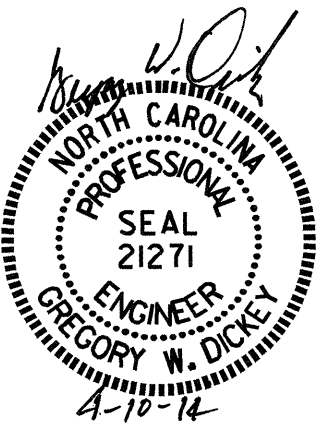
END VIEW



ELEVATION



PARAPET SECTION



PROJECT NO. BD-5103X  
PENDER COUNTY  
STATION: 13+50.00 -L-

SHEET 5 OF 5

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

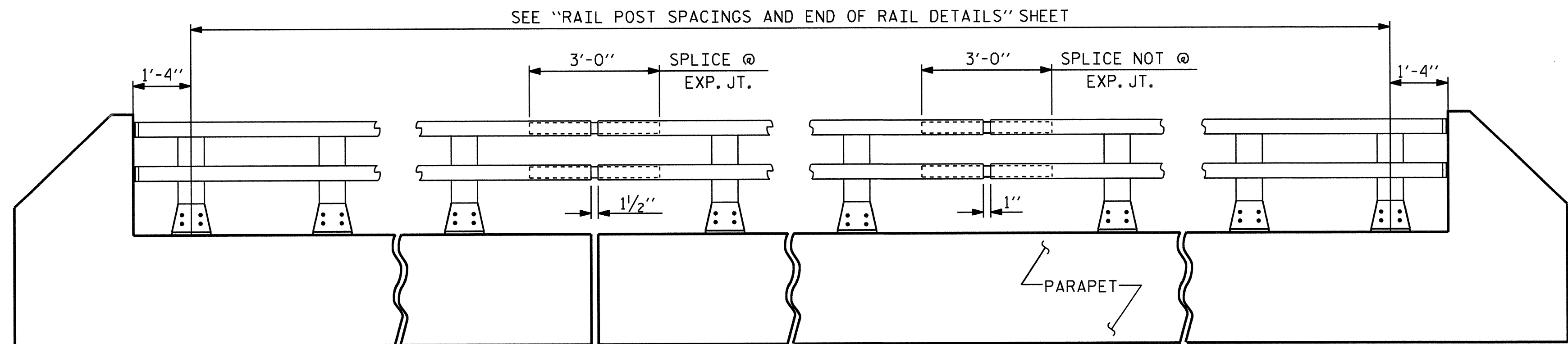
PARAPET AND  
END POST DETAILS

ASSEMBLED BY : D. A. GLADDEN DATE : 3-13-14  
CHECKED BY : P.N.HOLDER DATE : 04/01/14  
DRAWN BY : DGE 5/09  
CHECKED BY : BCH 6/09

PARAPET AND END POST FOR TWO BAR RAIL

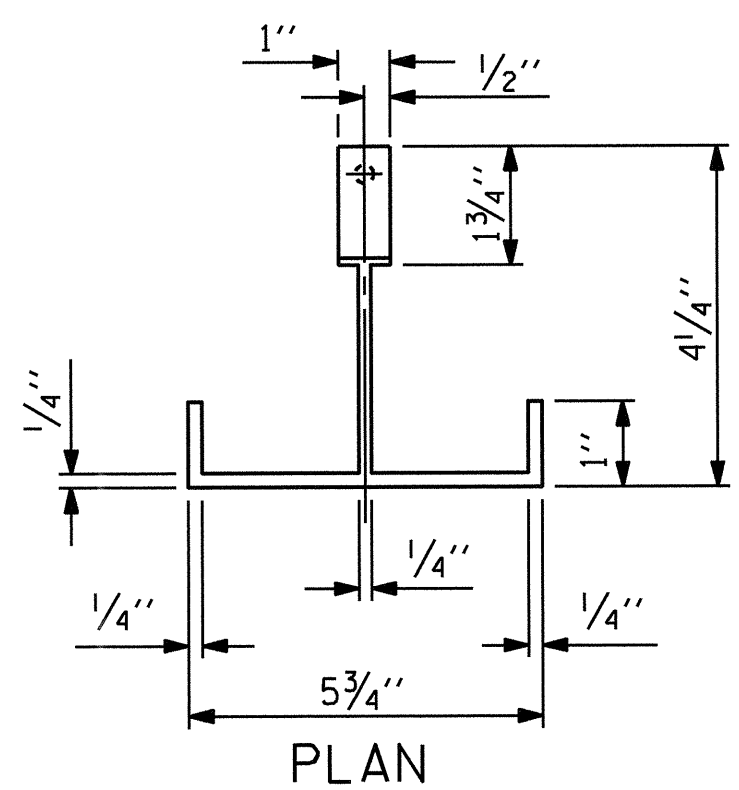
| REVISIONS |     |       |     |     |       | SHEET NO.<br>9        |
|-----------|-----|-------|-----|-----|-------|-----------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                       |
| 1         |     |       | 3   |     |       | TOTAL<br>SHEETS<br>21 |
| 2         |     |       | 4   |     |       |                       |



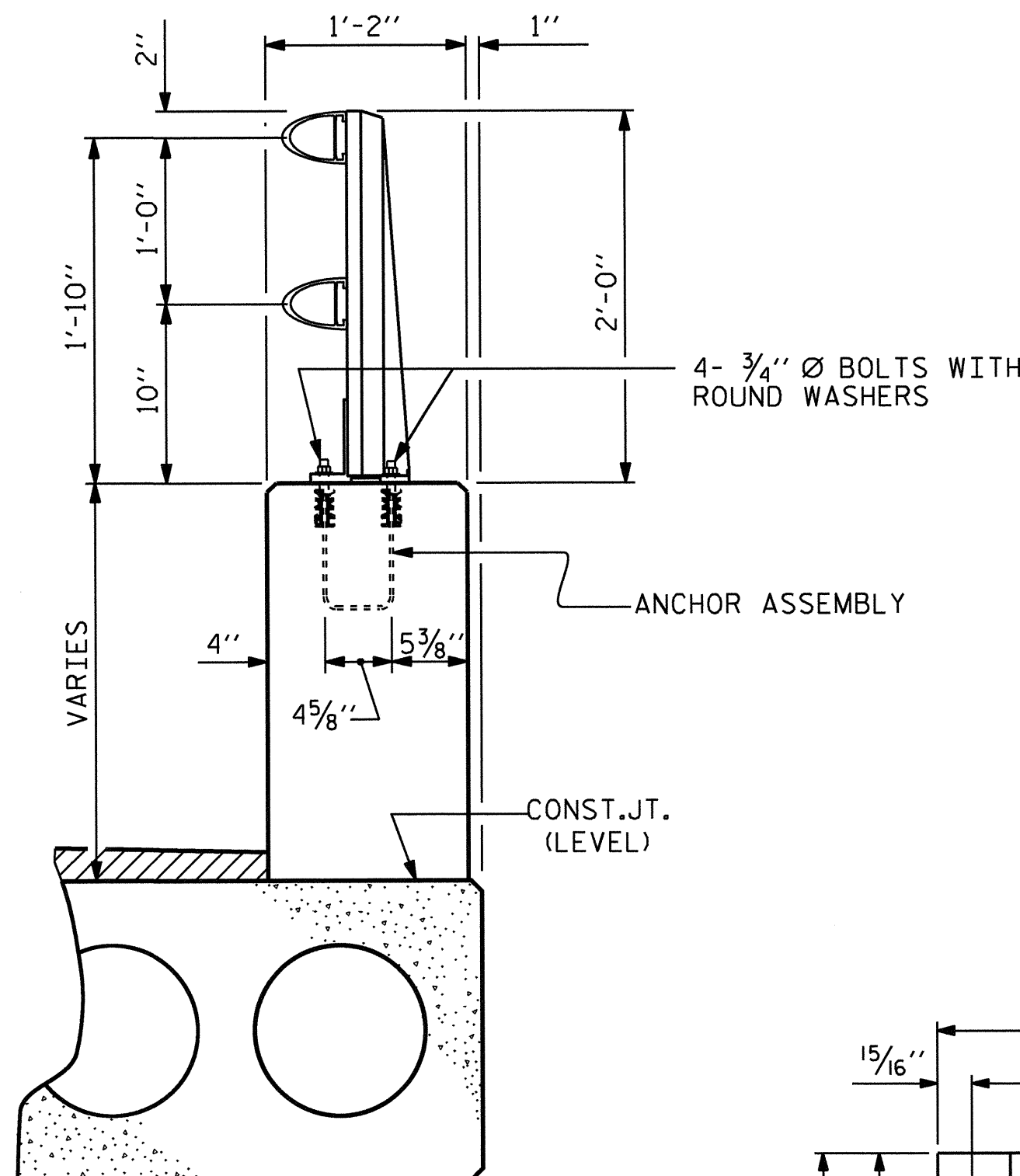


## ELEVATION

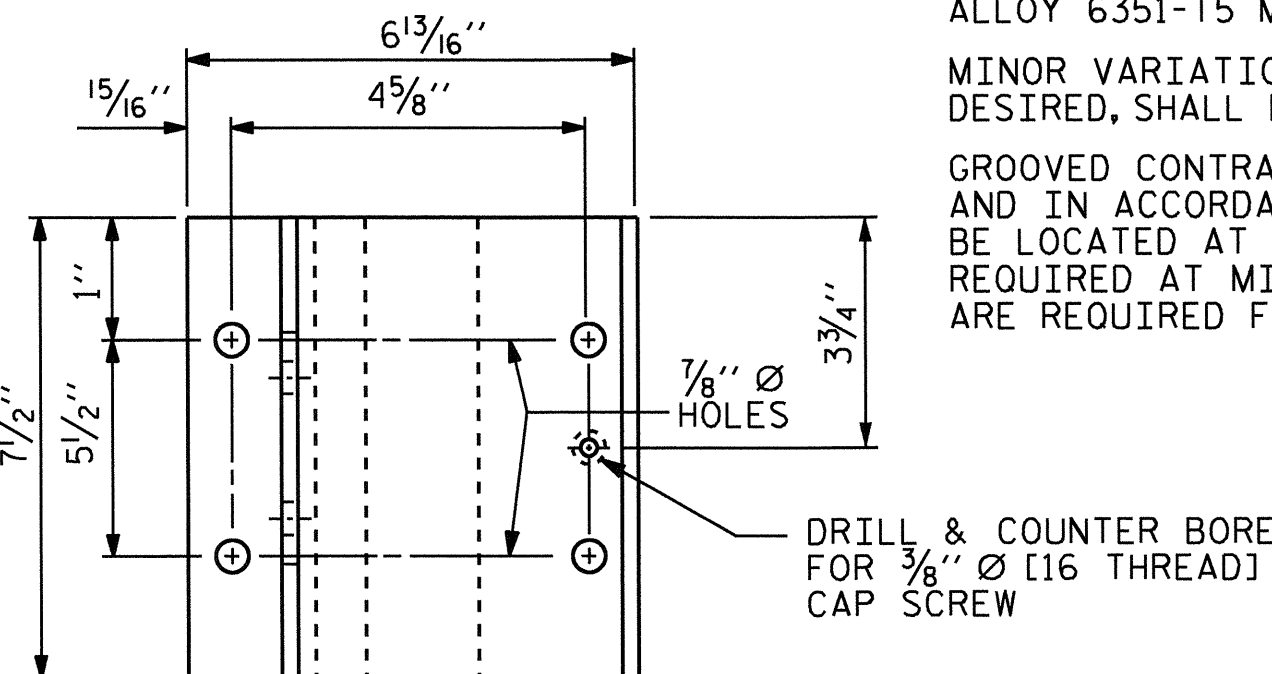
NOTE : FOR ATTACHMENT OF METAL RAIL TO END POST, SEE STANDARD NO. BMR2.



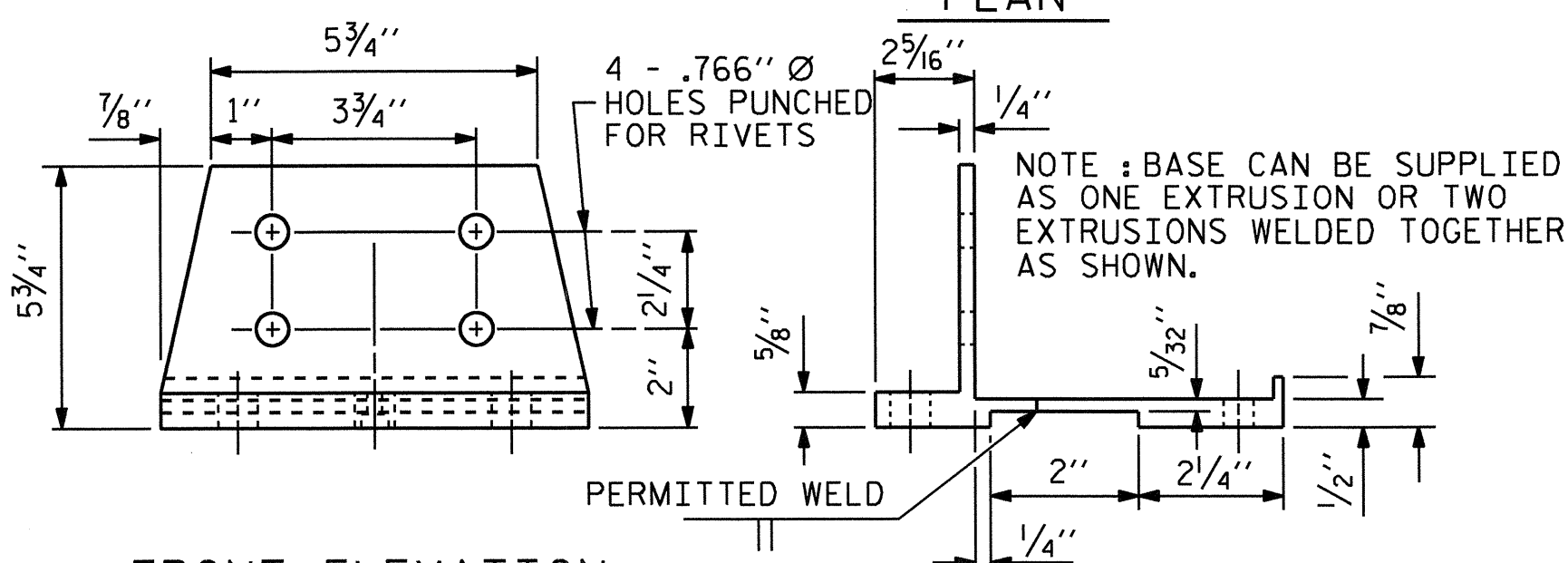
## PLAN



## SECTION THRU PARAPET AND RAIL



## PLAN



## FRONT ELEVATION

## SIDE ELEVATION

## POST BASE DETAILS

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

UNLESS OTHERWISE REQUIRED IN THE CONTRACT DOCUMENTS, THE CONTRACTOR HAS THE OPTION TO USE AN ALTERNATE TO THE 2 BAR METAL RAIL. THE ALTERNATE RAIL SHALL MEET THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS AND MUST BE LISTED ON THE DEPARTMENT'S APPROVED PRODUCTS LIST (APL) UNDER "2 BAR METAL RAIL ALTERNATE". ADJUSTMENTS TO THE CONCRETE PARAPET WILL NOT BE ALLOWED.

## ALUMINUM RAILS

MATERIAL FOR POSTS, BASES AND RAILS, EXPANSION BARS AND CLAMP BARS SHALL BE ASTM B-221 ALLOY 6061-T6. MATERIAL FOR RIVETS SHALL BE ASTM B316 ALLOY 6061-T6. RIVETS SHALL BE STANDARD BUTTON HEAD AND CONE POINT COLD DRIVEN AS PER DRAWING.

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

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

## GALVANIZED STEEL RAILS

MATERIAL AND GALVANIZING ARE TO CONFORM TO THE FOLLOWING SPECIFICATIONS:

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

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

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

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

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

## GENERAL NOTES

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

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

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

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

METAL RAIL POSTS SHALL BE SET NORMAL TO CURB GRADE.

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

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

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

SHIMS SHALL BE USED AS NECESSARY FOR POST ALIGNMENT.

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

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

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

PAY LENGTH = 145.25 LIN. FT.

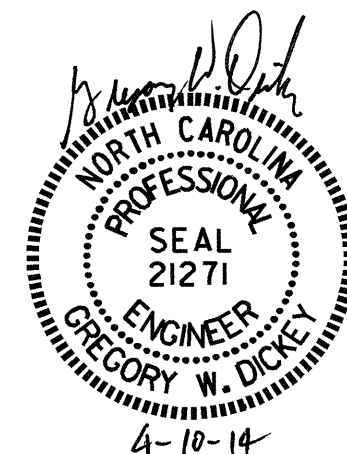
PROJECT NO. BD-5103X  
PENDER COUNTY  
 STATION: 13+50.00 -L-

SHEET 1 OF 3

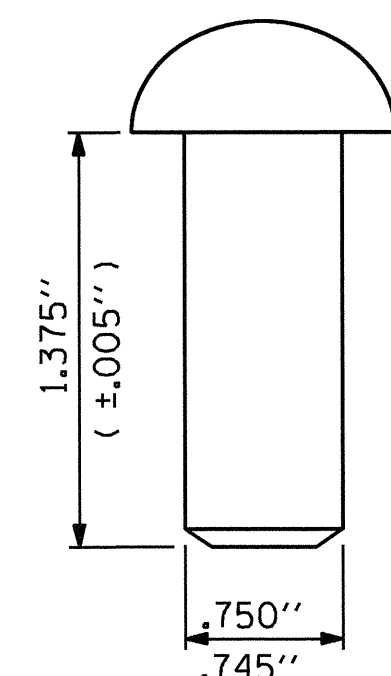
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD

2 BAR METAL RAIL

| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | 10              |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 21 |



## RIVET DETAIL



|                                     |                        |
|-------------------------------------|------------------------|
| ASSEMBLED BY : <u>D. A. GLADDEN</u> | DATE : <u>3-13-14</u>  |
| CHECKED BY : <u>P. N. HOLDER</u>    | DATE : <u>04/01/14</u> |
| DRAWN BY : <u>EEM</u>               | 6/94                   |
| CHECKED BY : <u>RGW</u>             | 6/94                   |
| REV. 5/1/06                         | TLA/GM                 |
| REV. 10/1/11                        | MAA/GM                 |
| REV. 6/13                           | MAA/GM                 |



NOTES

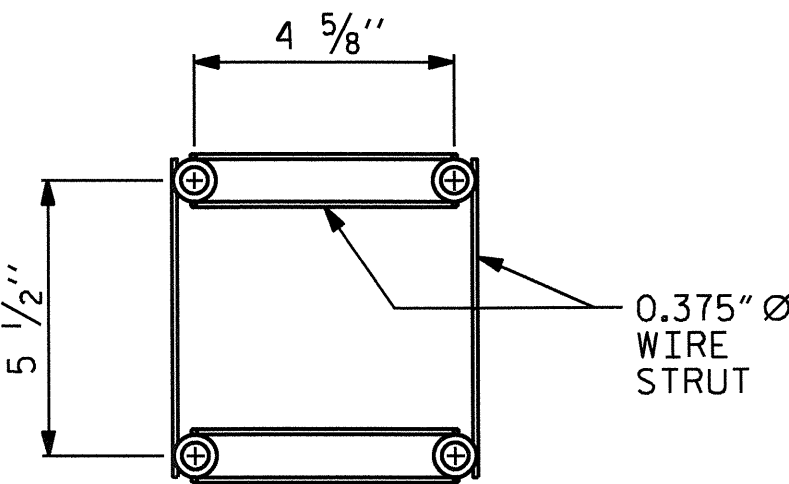
STRUCTURAL CONCRETE ANCHOR ASSEMBLY

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

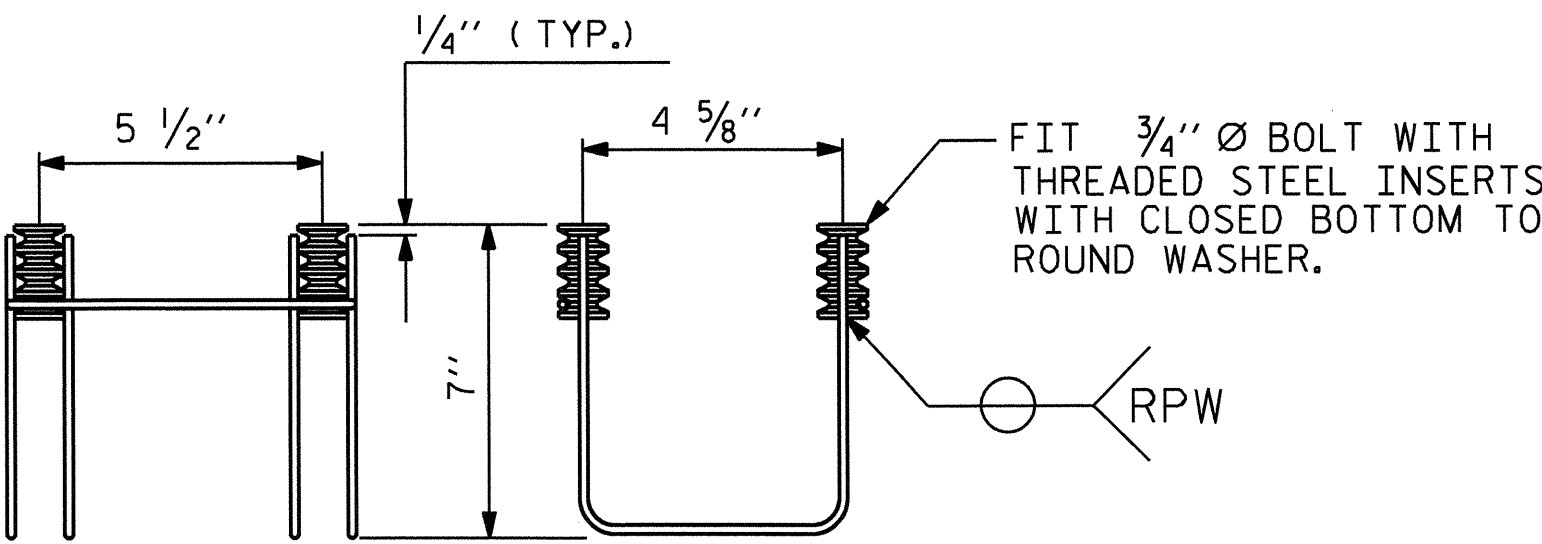
- A. FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 2" FOR 3/4" FERRULES.
- B. 4 - 3/4" Ø X 2 1/2" BOLTS WITH WASHERS. BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLTS AND WASHERS SHALL BE GALVANIZED. AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 3/4" Ø X 2 1/2" GALVANIZED BOLTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.
- C. WIRE STRUT SHOWN IN THE CONCRETE ANCHOR ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 7/16" Ø WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.
- D. THE METAL RAIL ANCHOR ASSEMBLIES TO BE HOT DIPPED GALVANIZED TO CONFORM TO REQUIREMENTS OF AASHTO M111.
- E. THE COST OF THE METAL RAIL ANCHOR ASSEMBLY WITH BOLTS AND WASHERS COMPLETE IN PLACE SHALL BE INCLUDED IN THE PRICE BID FOR LINEAR FEET OF METAL RAIL.
- F. BOLTS TO BE TIGHTENED ONE-HALF TURN WITH A WRENCH FROM A FINGER-TIGHT POSITION.

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

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



PLAN

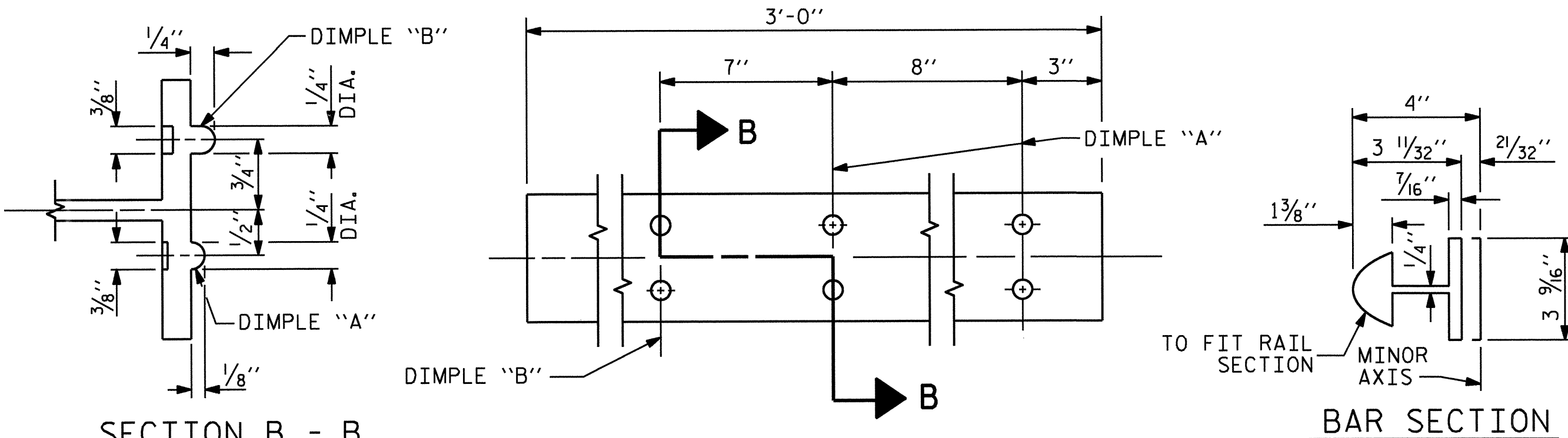


SIDE VIEW

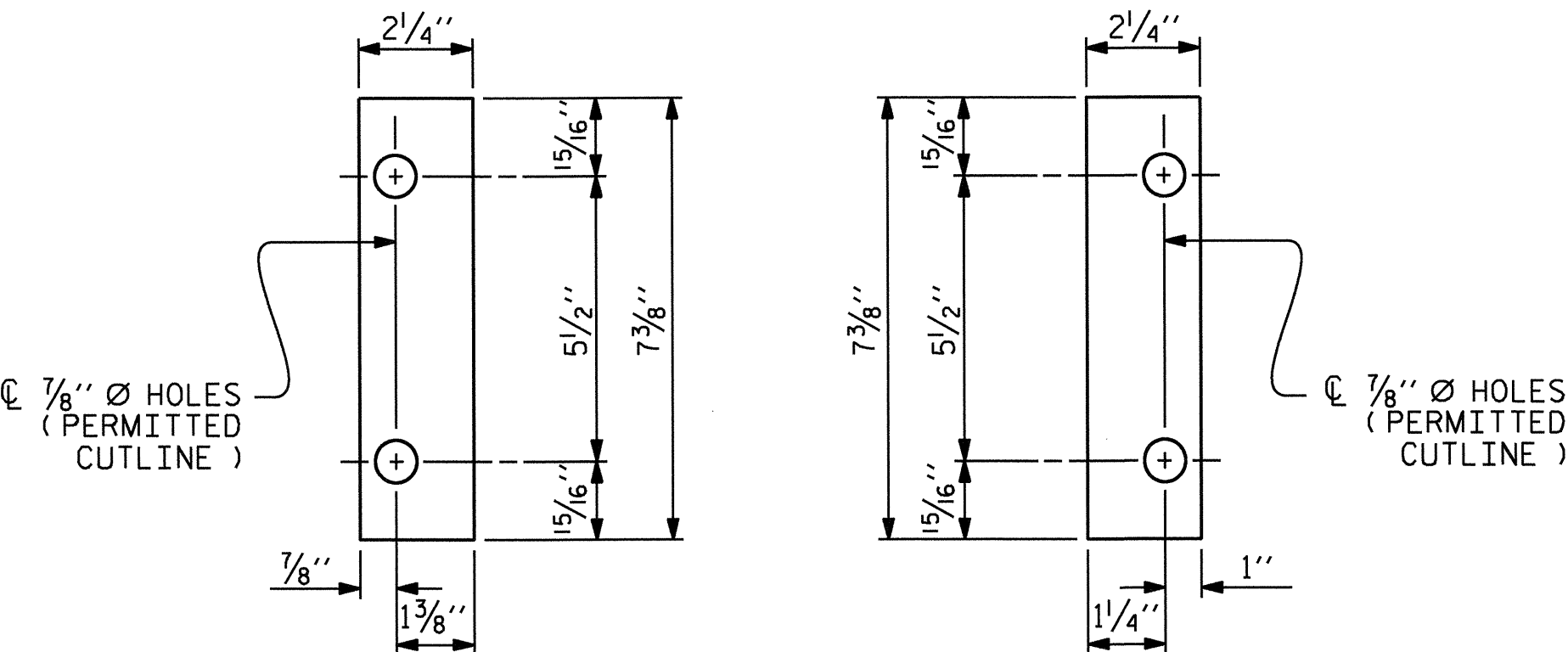
ELEVATION

4-BOLT METAL RAIL ANCHOR ASSEMBLY

( 26 ASSEMBLIES REQUIRED )



EXPANSION BAR DETAILS

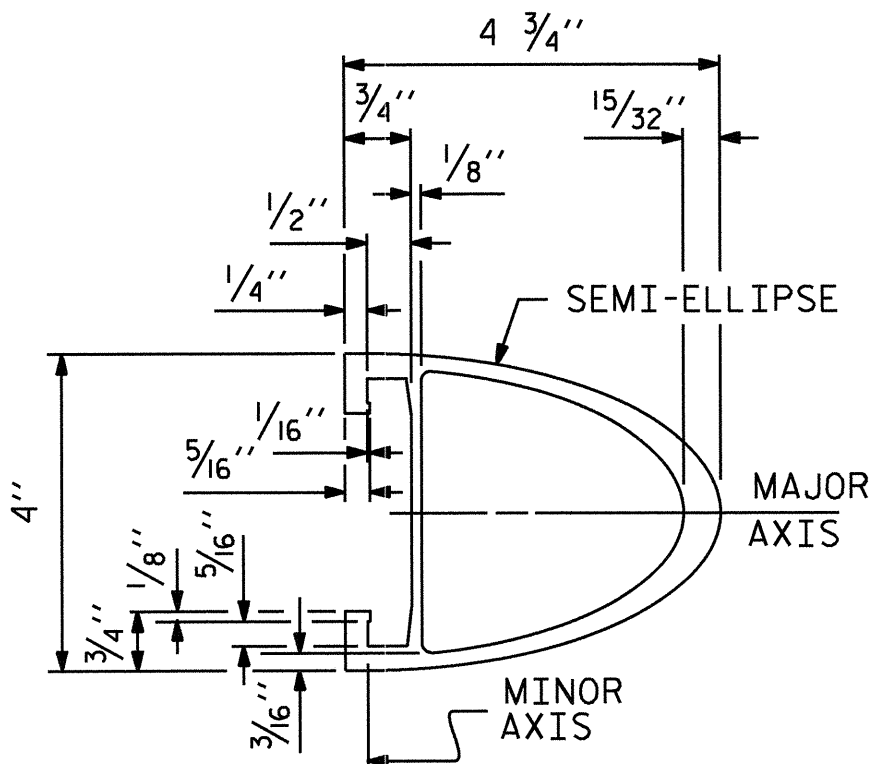


FRONT PLATE

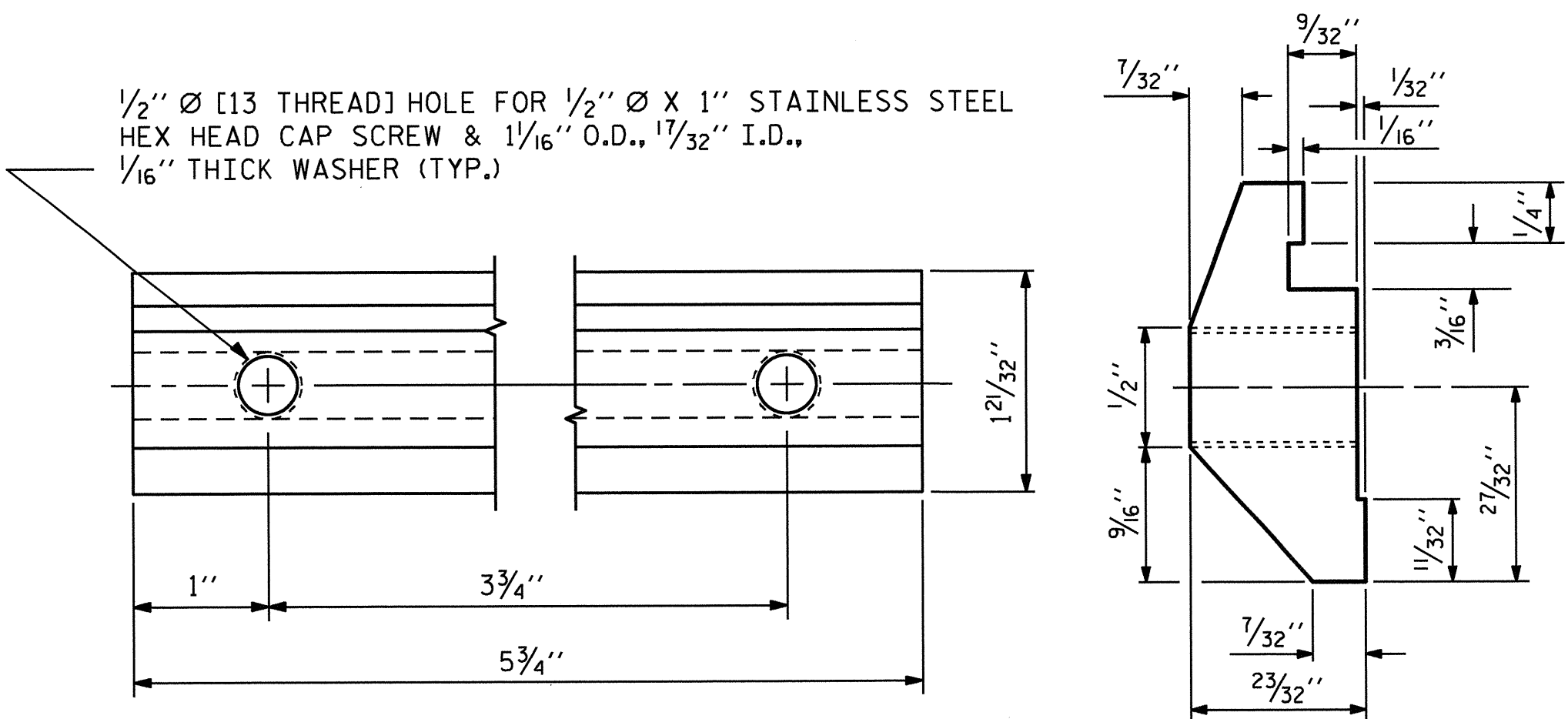
REAR PLATE

SHIM DETAILS

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

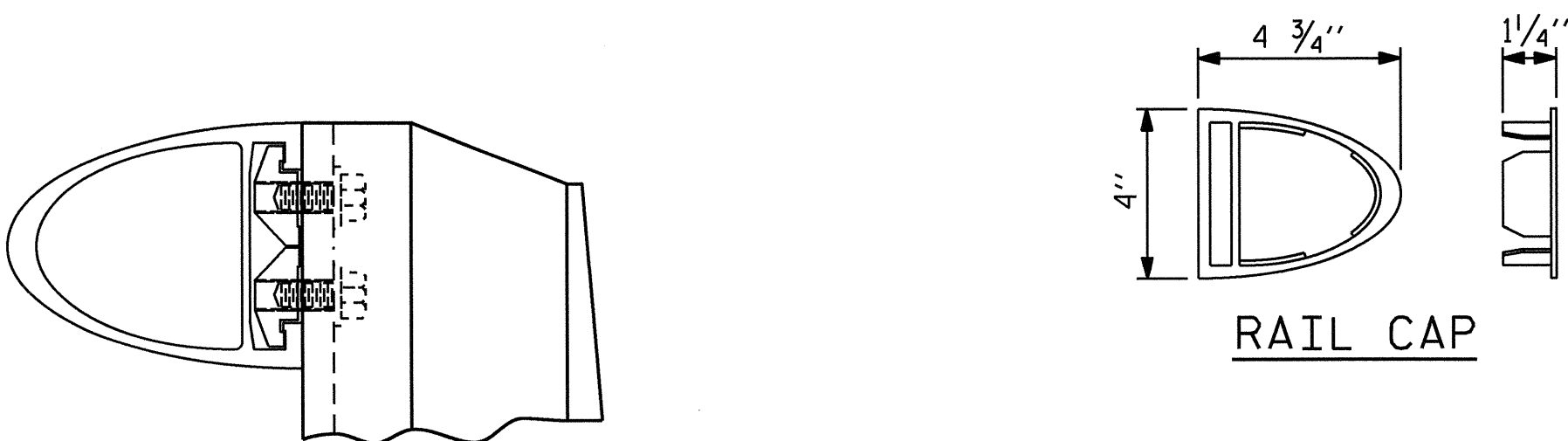


RAIL SECTION



CLAMP BAR DETAIL

( 4 REQUIRED PER POST )



CLAMP ASSEMBLY

RAIL CAP

PROJECT NO. BD-5103X  
PENDER COUNTY  
STATION: 13+50.00 -L-

SHEET 2 OF 3

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

STANDARD

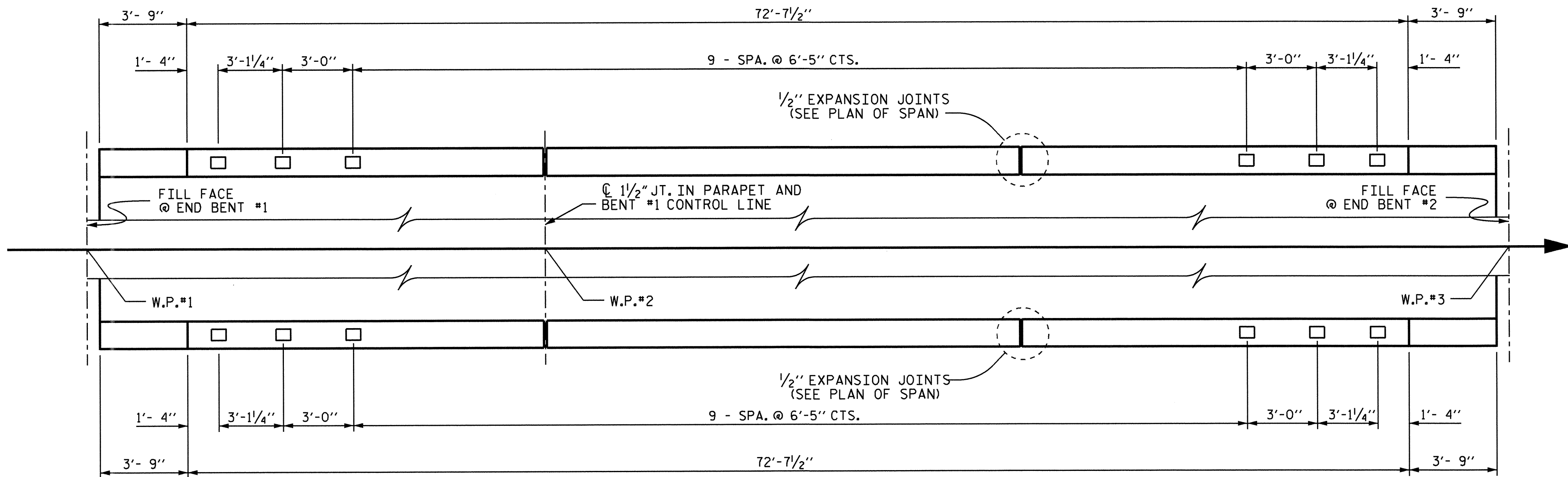
2 BAR METAL RAIL

| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | 11              |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 21 |

|                              |                      |
|------------------------------|----------------------|
| ASSEMBLED BY : D. A. CLADDEN | DATE : 3-13-14       |
| CHECKED BY : P. N. HOLDER    | DATE : 04/01/14      |
| DRAWN BY : EEM 6/94          | REV. 8/16/99 MAB/LES |
| CHECKED BY : RCW 6/94        | REV. 5/1/06R KMM/GM  |
|                              | REV. 10/1/11 MAA/GM  |

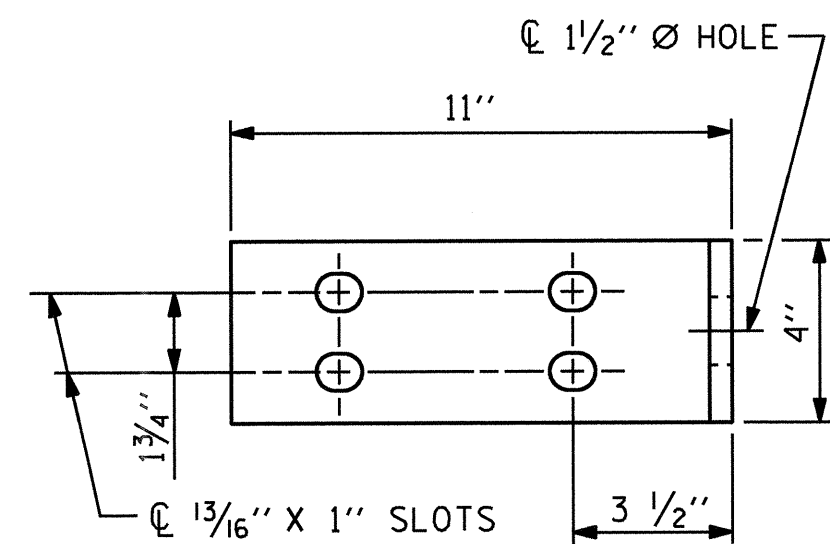




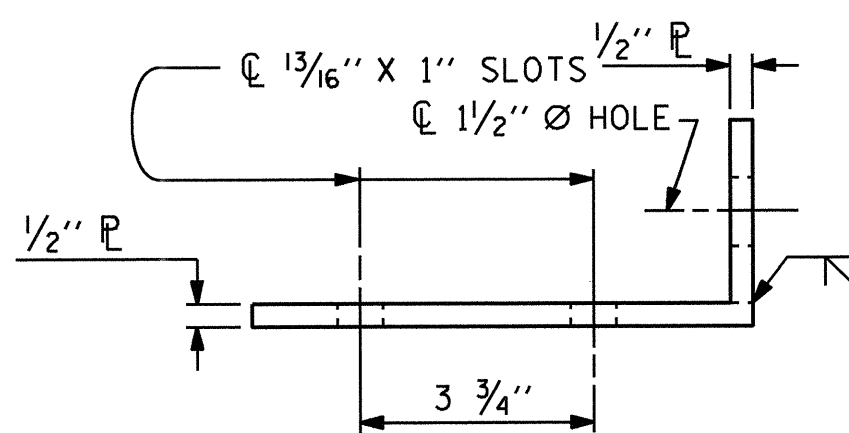


## PLAN OF RAIL POST SPACINGS

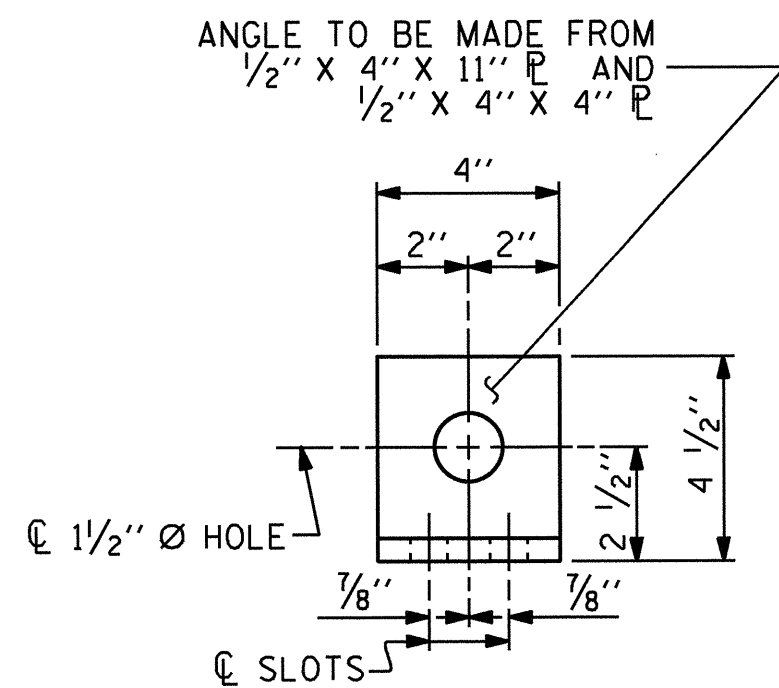
TOTAL NUMBER OF POST = 28



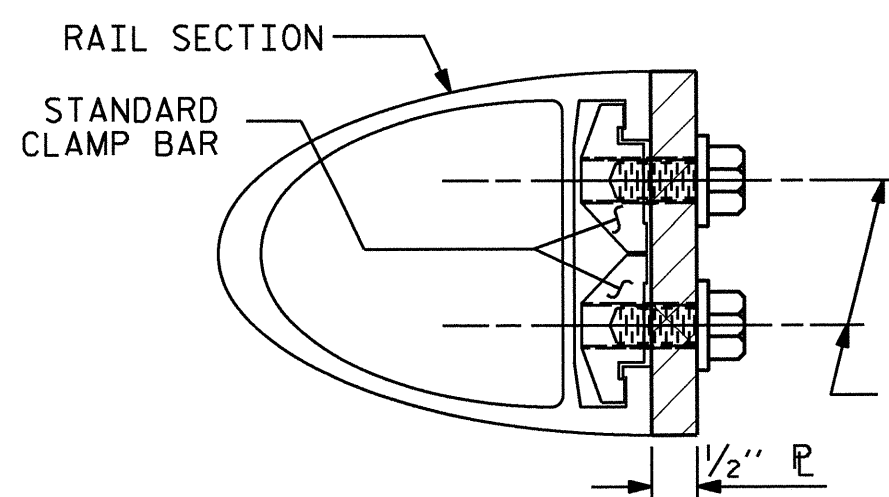
ELEVATION



TOP VIEW

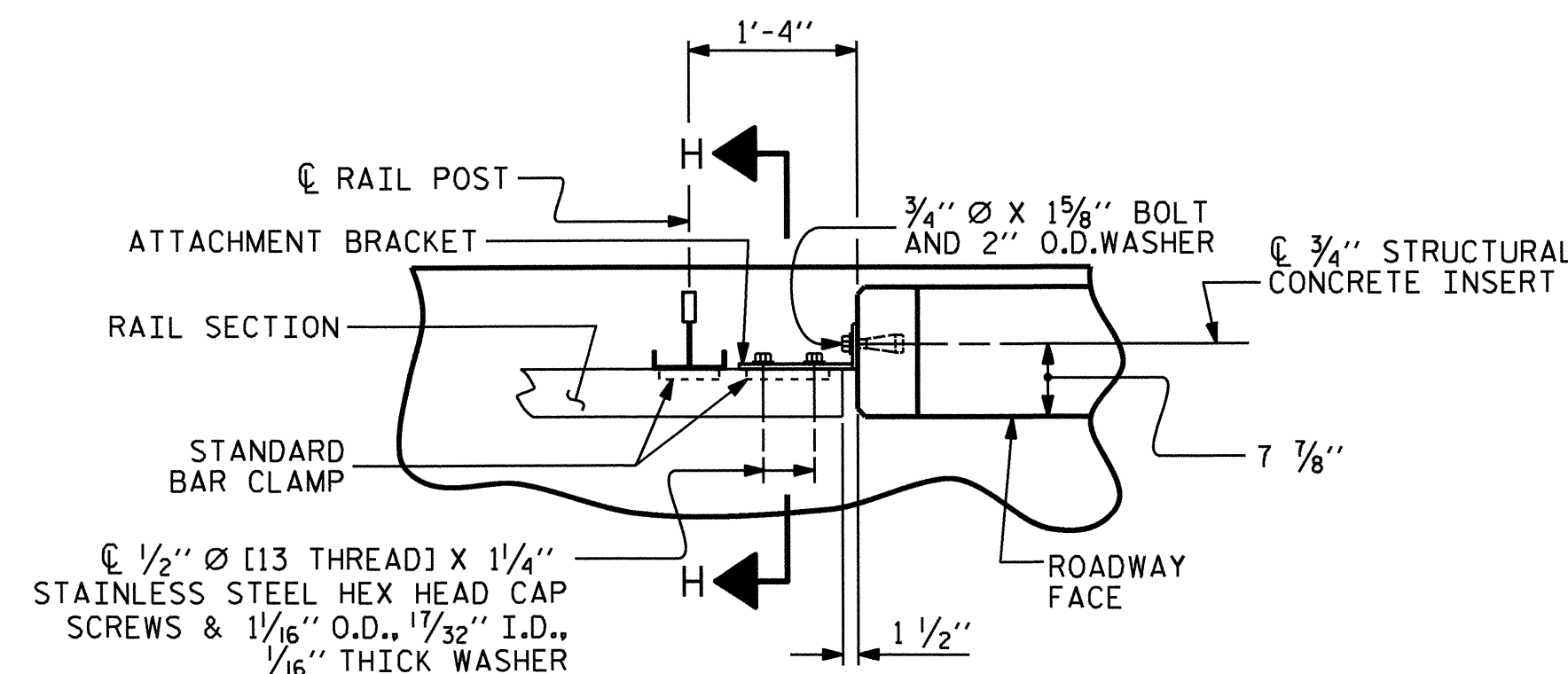


END VIEW (FIX AND EXP.)

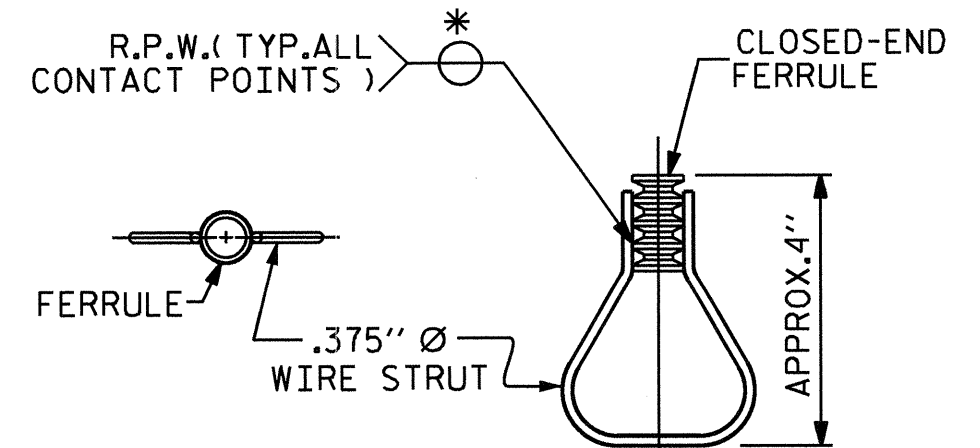


SECTION H-H (FIX)

FIXED



PLAN - RAIL AND END POST



PLAN ELEVATION  
STRUCTURAL CONCRETE INSERT

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

## NOTES

### STRUCTURAL CONCRETE INSERT

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

- FERRULES SHALL BE MADE FROM STEEL MEETING THE REQUIREMENTS OF AASHTO M169, GRADE 12L14 AND SHALL HAVE A MINIMUM LENGTH OF THREADS OF 1 1/2".
- 1 - 3/4"  $\varnothing$  X 1 5/8" BOLT WITH WASHER. BOLT SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307. BOLT AND WASHER SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLT AND WASHER MAY BE USED AS AN ALTERNATE FOR THE 3/4"  $\varnothing$  X 1 5/8" GALVANIZED BOLT AND WASHER. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
- WIRE STRUT SHOWN IN THE CONCRETE INSERT ASSEMBLY DETAIL IS THE MINIMUM ALLOWABLE SIZE AND SHALL HAVE A MINIMUM TENSILE STRENGTH OF 100,000 PSI. AS AN OPTION, A 1/16"  $\varnothing$  WIRE STRUT WITH A MINIMUM TENSILE STRENGTH OF 90,000 PSI IS ACCEPTABLE.

## NOTES

### METAL RAIL TO END POST CONNECTION

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

- 1/2" PLATES SHALL CONFORM TO AASHTO M270 GRADE 36 AND SHALL BE GALVANIZED AFTER FABRICATION.
- 3/4" STRUCTURAL CONCRETE INSERT SHALL HAVE A WORKING LOAD SHEAR CAPACITY OF 4800 LBS. THE FERRULES SHALL ENGAGE A 3/4"  $\varnothing$  X 1 5/8" BOLT WITH 2" O.D. WASHER IN PLACE. THE 3/4"  $\varnothing$  X 1 5/8" BOLT SHALL HAVE N.C. THREADS.
- CAP SCREWS FOR RAIL ATTACHMENT TO ANGLE SHALL CONFORM TO THE REQUIREMENTS OF ASTM F593 ALLOY 305 STAINLESS STEEL. CAP SCREWS TO BE CENTERED IN SLOTS AT 60°F.
- STANDARD CLAMP BARS (SEE METAL RAIL SHEET).
- 1/2"  $\varnothing$  PIPE SLEEVES (IF REQUIRED) TO BE GALVANIZED.

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

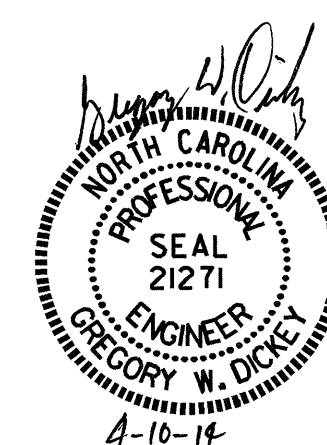
THE 3/4" STRUCTURAL CONCRETE INSERT WITH BOLT SHALL BE ASSEMBLED IN THE SHOP.

THE COST OF THE 3/4" STRUCTURAL CONCRETE INSERT ASSEMBLY, AND THE 1/2" PLATES COMPLETE IN PLACE SHALL BE INCLUDED IN THE VARIOUS PAY ITEMS.

THE CONTRACTOR, AT HIS OPTION, MAY USE AN ADHESIVE BONDING SYSTEM IN LIEU OF THE STRUCTURAL CONCRETE INSERT EMBEDDED IN THE END POST. IF THE ADHESIVE BONDING SYSTEM IS USED, THE 3/4"  $\varnothing$  X 1 5/8" BOLT WITH WASHER SHALL BE REPLACED WITH A 3/4"  $\varnothing$  X 6 1/2" BOLT AND 2" O.D. WASHER. ALL SPECIFICATIONS THAT APPLY TO THE 3/4"  $\varnothing$  X 1 5/8" BOLT SHALL APPLY TO THE 3/4"  $\varnothing$  X 6 1/2" BOLT. FIELD TESTING OF THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

ASSEMBLED BY : D. A. GLADDEN DATE : 3-13-14  
CHECKED BY : P. N. HOLDER DATE : 04/01/14  
DRAWN BY : FCJ 1/88 REV. 5/7/03 RWW/JTE  
CHECKED BY : CRK 3/89 REV. 5/1/06 TLA/GM  
REV. 10/1/11 MAA/GM

10-APR-2014 12:26  
S:\DPO\Division\BD-5103X\Final Plans\Revised2bar\Final.dgn  
gdcickey



PROJECT NO. BD-5103X  
PENDER COUNTY  
STATION: 13+50.00 -L-

SHEET 3 OF 3

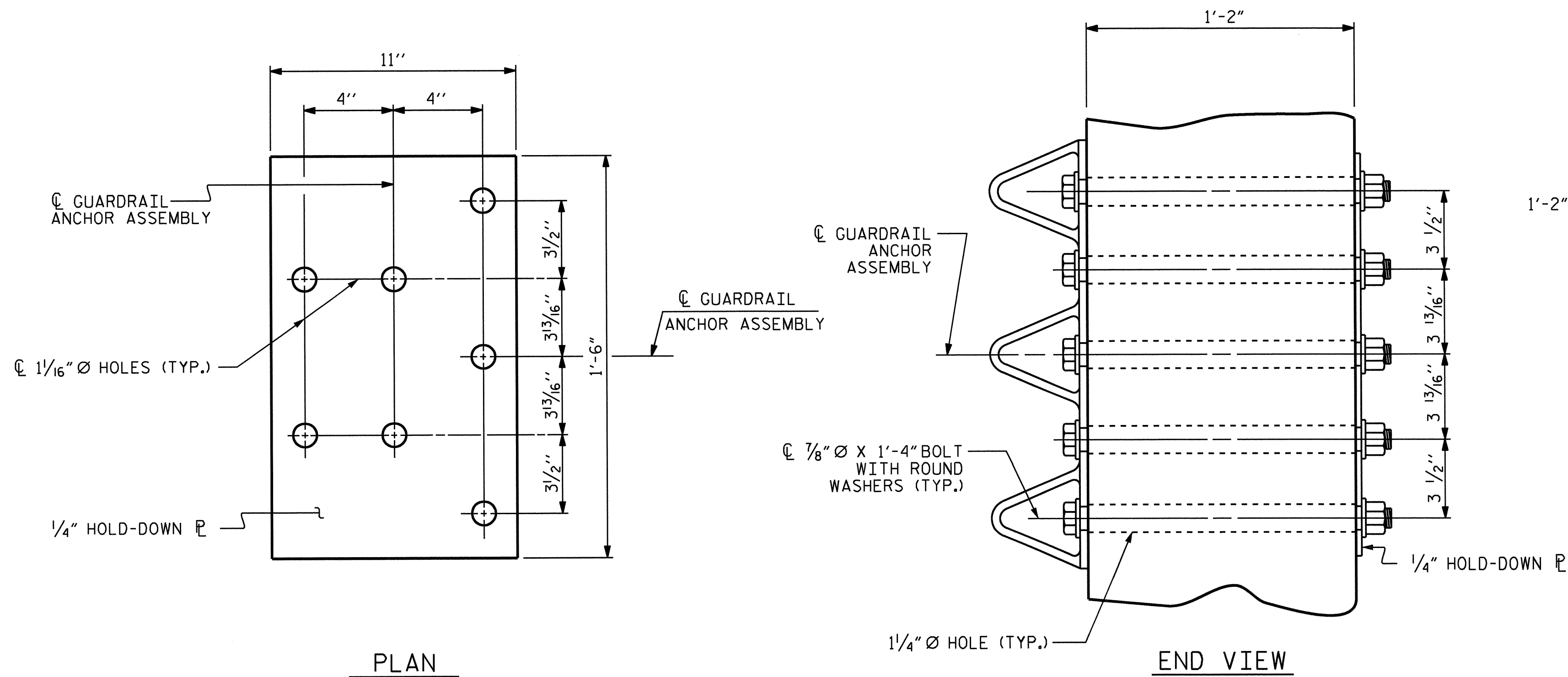
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD

RAIL POST SPACINGS  
AND  
END OF RAIL DETAILS  
FOR ONE OR TWO BAR METAL RAILS

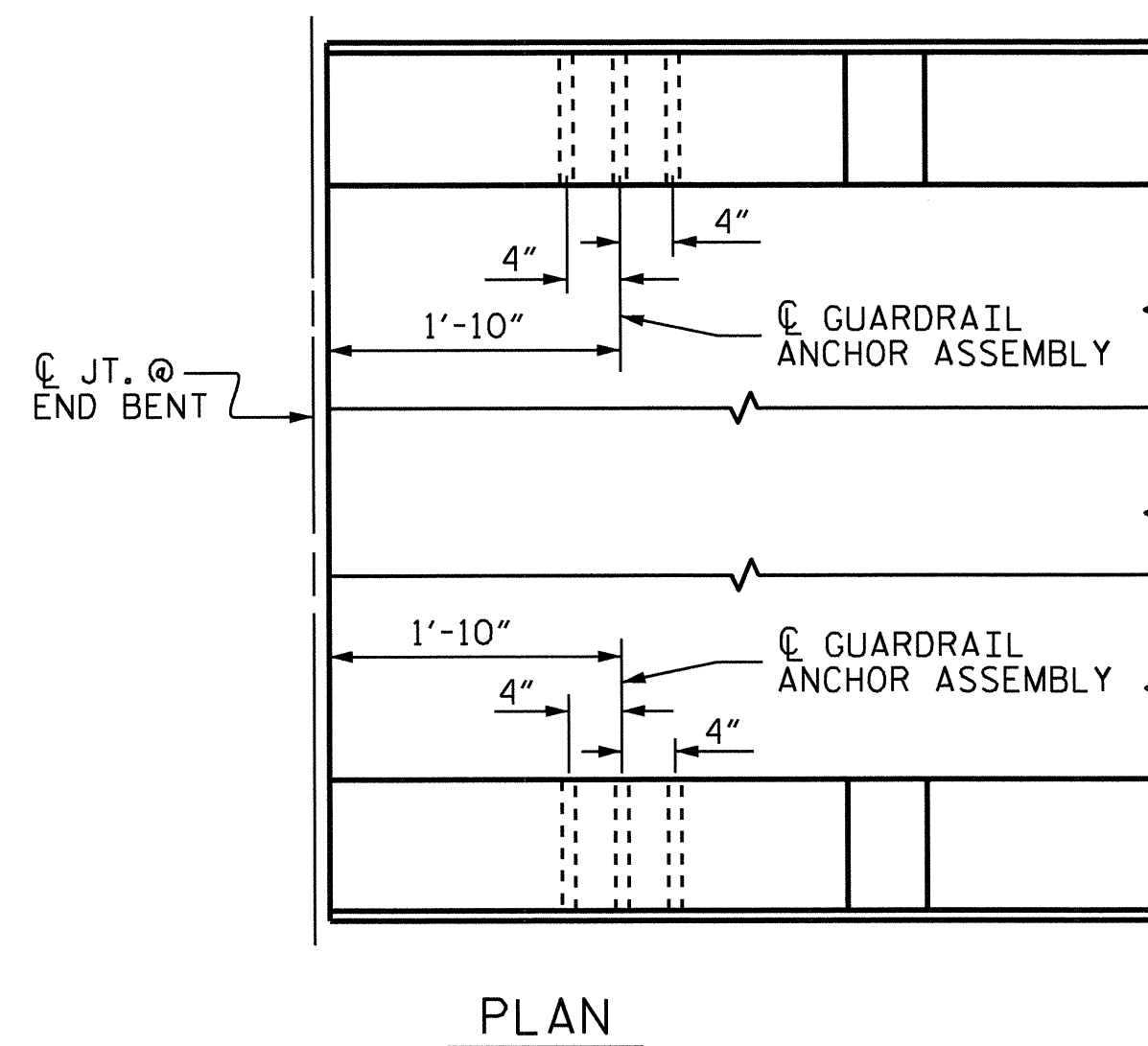
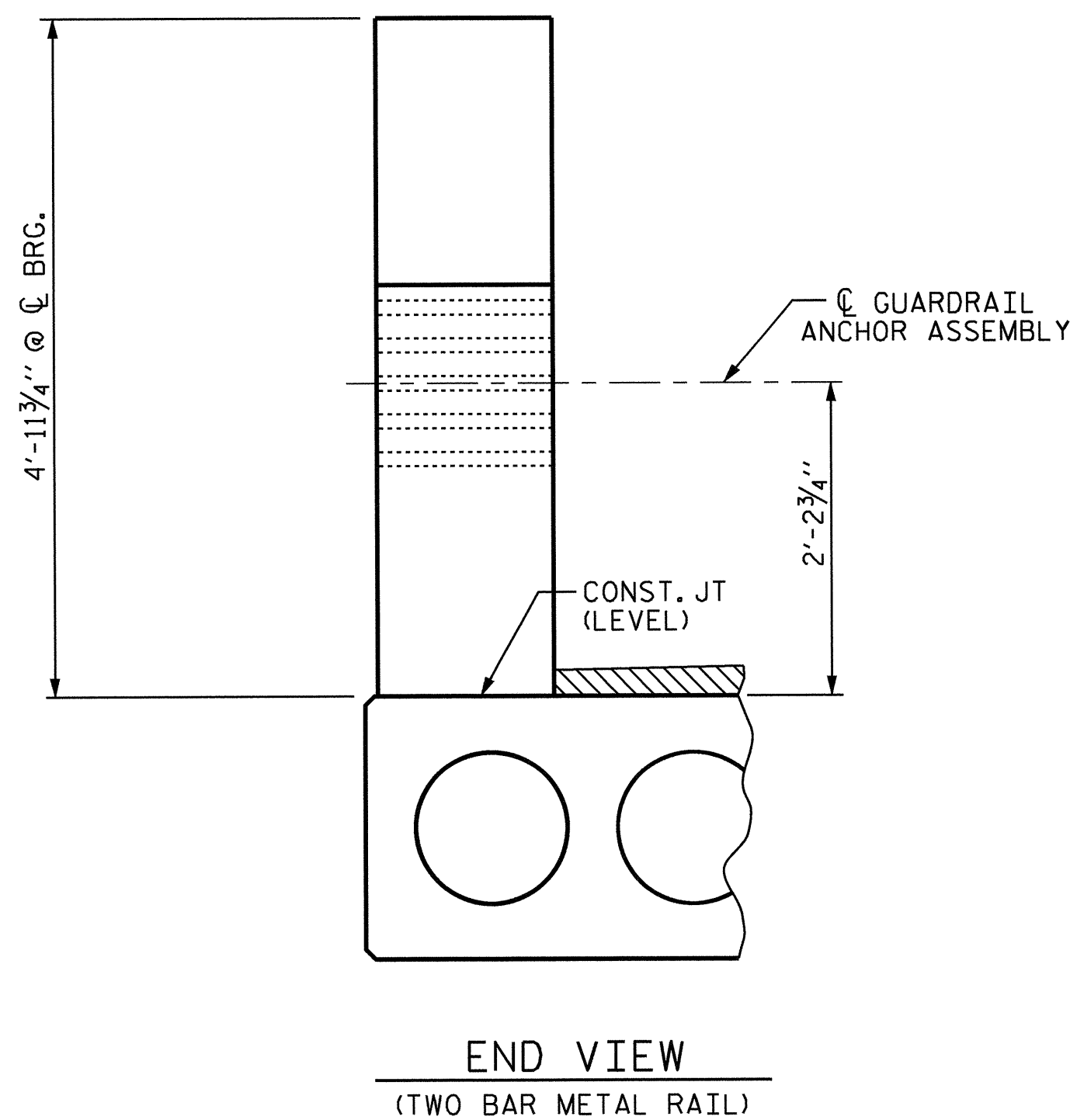
| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | 12              |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 21 |

STD. NO. BMR2





GUARDRAIL ANCHOR ASSEMBLY DETAILS



LOCATION OF GUARDRAIL ANCHOR AT END POST

## NOTES

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

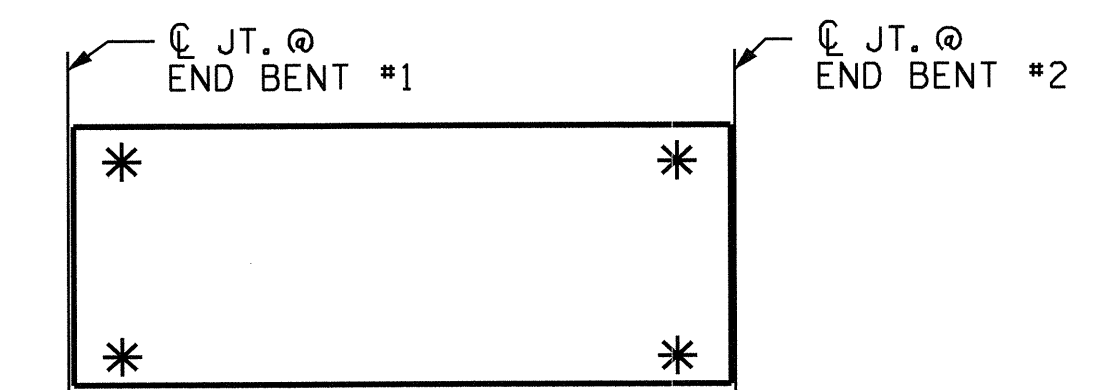
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF THE PARAPET. FOR POINTS OF ATTACHMENT, SEE SKETCH.

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

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

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

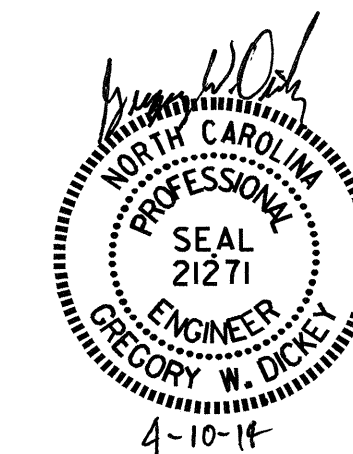
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.



SKETCH SHOWING POINTS OF ATTACHMENT

\* LOCATION OF GUARDRAIL ATTACHMENT

PROJECT NO. BD-5103X  
PENDER COUNTY  
 STATION: 13+50.00 -L-



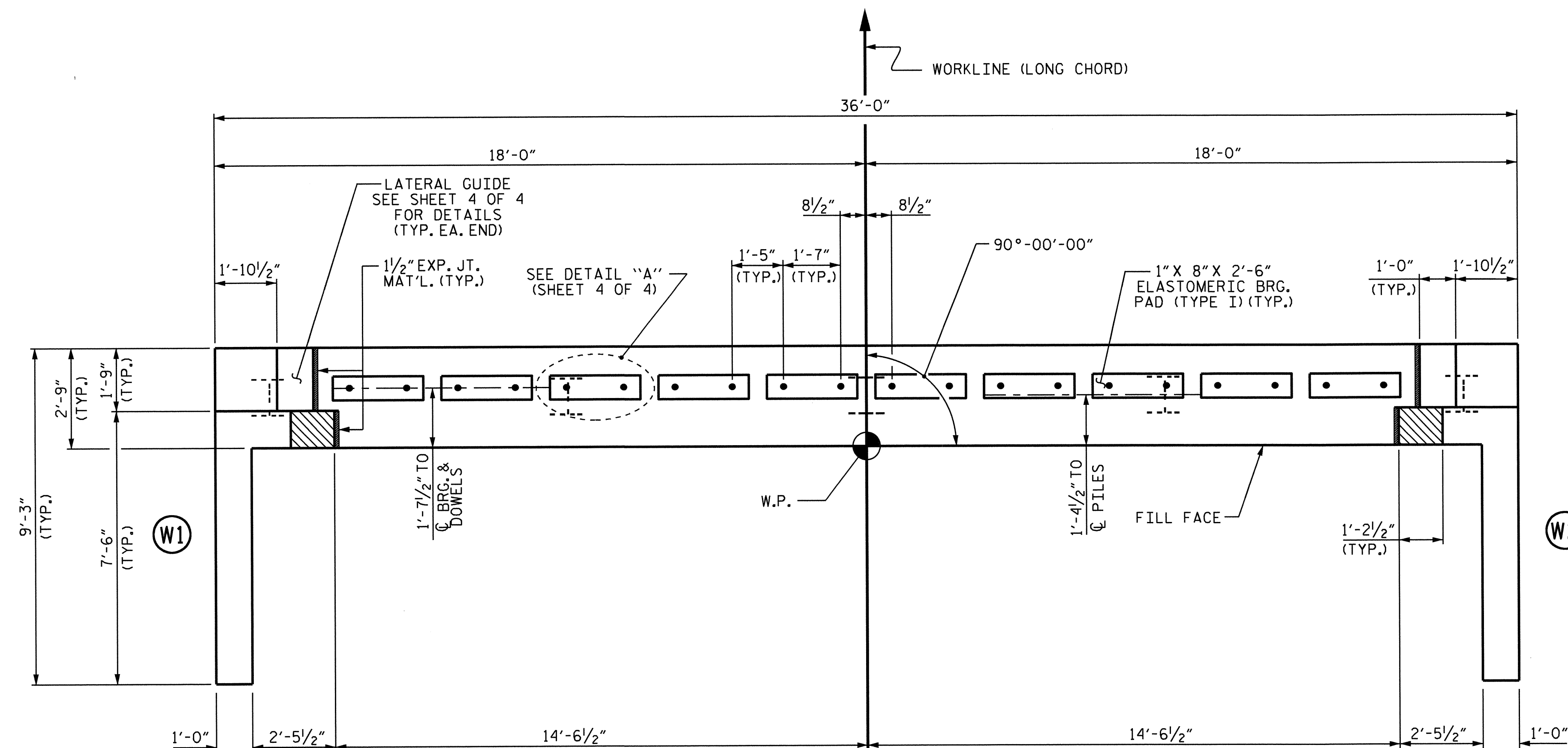
STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 GUARDRAIL ANCHORAGE  
 DETAILS  
 FOR METAL RAILS

| REVISIONS |     |       |     |     |       | SHEET NO.<br>13       |
|-----------|-----|-------|-----|-----|-------|-----------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                       |
| 1         |     |       | 3   |     |       | TOTAL<br>SHEETS<br>21 |
| 2         |     |       | 4   |     |       |                       |

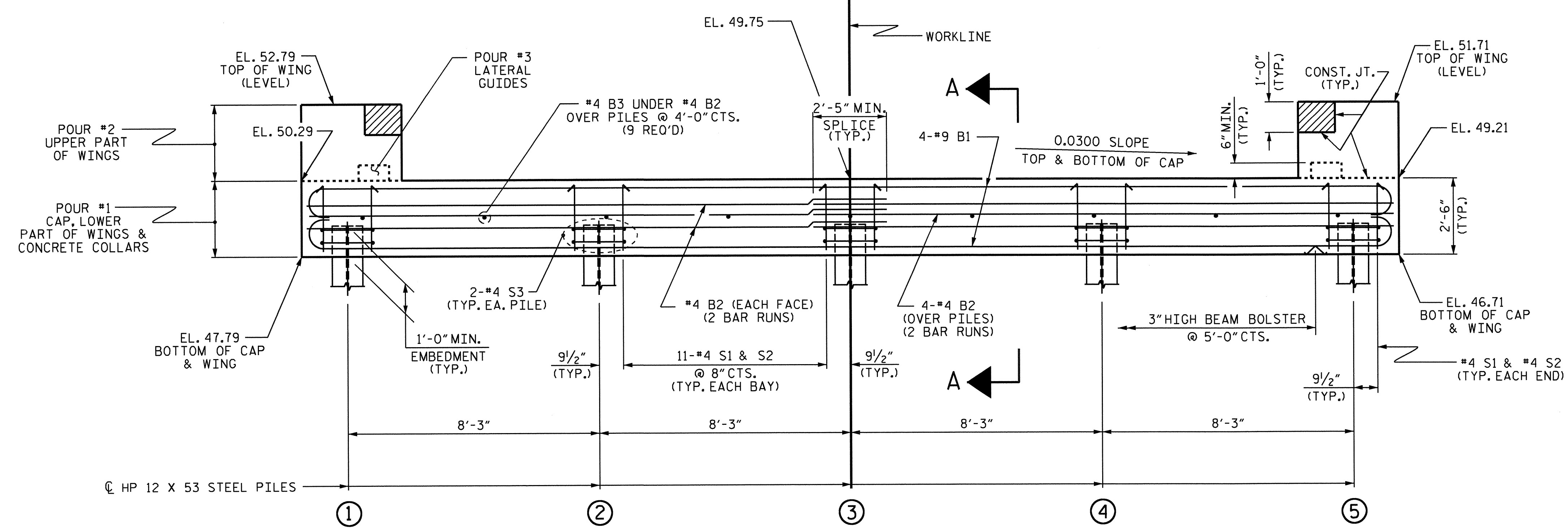
(SHT 4) STD. NO. GRA3

|                              |                      |
|------------------------------|----------------------|
| ASSEMBLED BY : D. A. GLADDEN | DATE : 3-13-14       |
| CHECKED BY : P. N. HOLDER    | DATE 04/07/14        |
| DRAWN BY : MAA 5/10          | REV. 10/12/11 MAA/GM |
| CHECKED BY : GM 5/10         | REV. 12/5/11 MAA/GM  |
|                              | REV. 6/13 MAA/GM     |





PLAN



ELEVATION

# NOTES

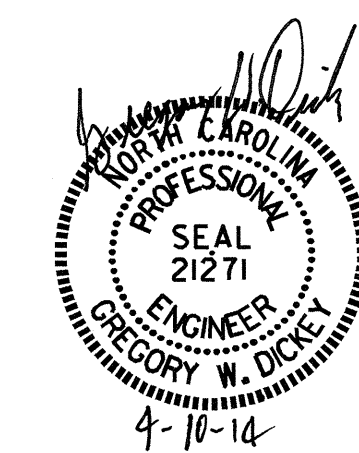
- STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
- THE LATERAL GUIDES ARE NOT TO BE POURED UNTIL AFTER THE CORED SLAB UNITS ARE IN PLACE.
- THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.
- FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.
- FOR WING DETAILS, SEE SHEET 3 OF 4.
- THE CONTRACTOR HAS THE OPTION TO OMIT THE LATERAL GUIDE IF APPROVED BY THE ENGINEER.
- INSTALL THE 4"Ø 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.

| TOP OF PILE ELEVATIONS |       |
|------------------------|-------|
| ①                      | 48.76 |
| ②                      | 48.52 |
| ③                      | 48.27 |
| ④                      | 48.01 |
| ⑤                      | 47.76 |

PROJECT NO. BD-5103X  
PENDER COUNTY  
 STATION: 13+50.00 -L-

SHEET 1 OF 4

| STATE OF NORTH CAROLINA<br>DEPARTMENT OF TRANSPORTATION<br>RALEIGH |     |       |     |     |           |
|--------------------------------------------------------------------|-----|-------|-----|-----|-----------|
| SUBSTRUCTURE<br>END BENT No. 1                                     |     |       |     |     |           |
| REVISIONS                                                          |     |       |     |     | SHEET NO. |
| NO.                                                                | BY: | DATE: | NO. | BY: | DATE:     |
| 1                                                                  |     |       | 3   |     |           |
| 2                                                                  |     |       | 4   |     |           |
| TOTAL SHEETS                                                       |     |       |     |     | 21        |



ASSEMBLED BY : C.B. PRUETT DATE : 10/28/13  
 CHECKED BY : P.N. HOLDER DATE : 04/01/14  
 DRAWN BY : DGE 02/10  
 CHECKED BY : MKT 02/10

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.

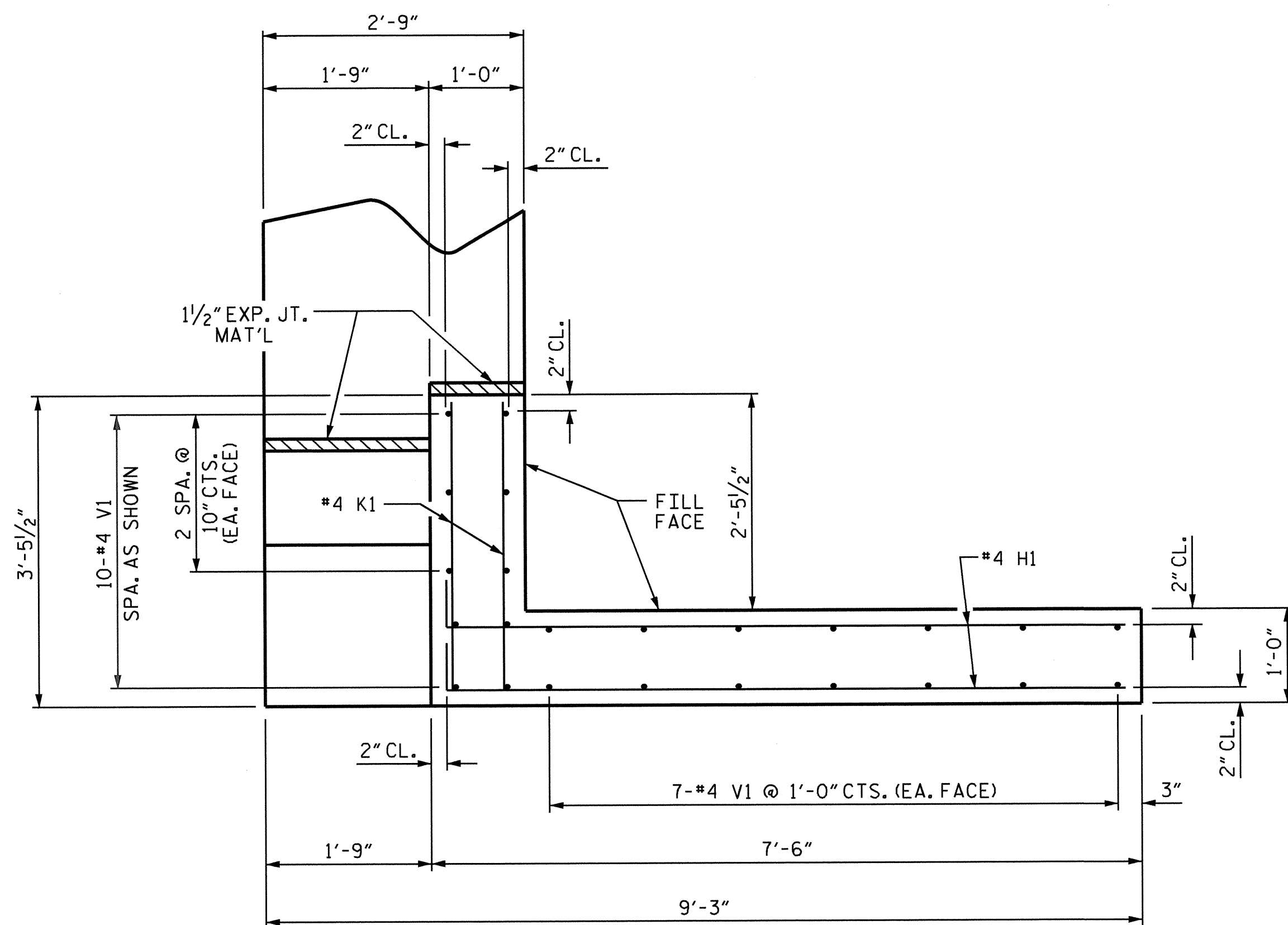


INSTALL THE 4" Ø DRAIN PIPE THROUGH THE WING WALL AS REQUIRED. FOR REINFORCED BRIDGE APPROACH FILLS, SEE THE ROADWAY PLANS. REINFORCING STEEL IN THE WING WALL MAY BE SHIFTED AS NECESSARY TO CLEAR THE DRAIN PIPE.

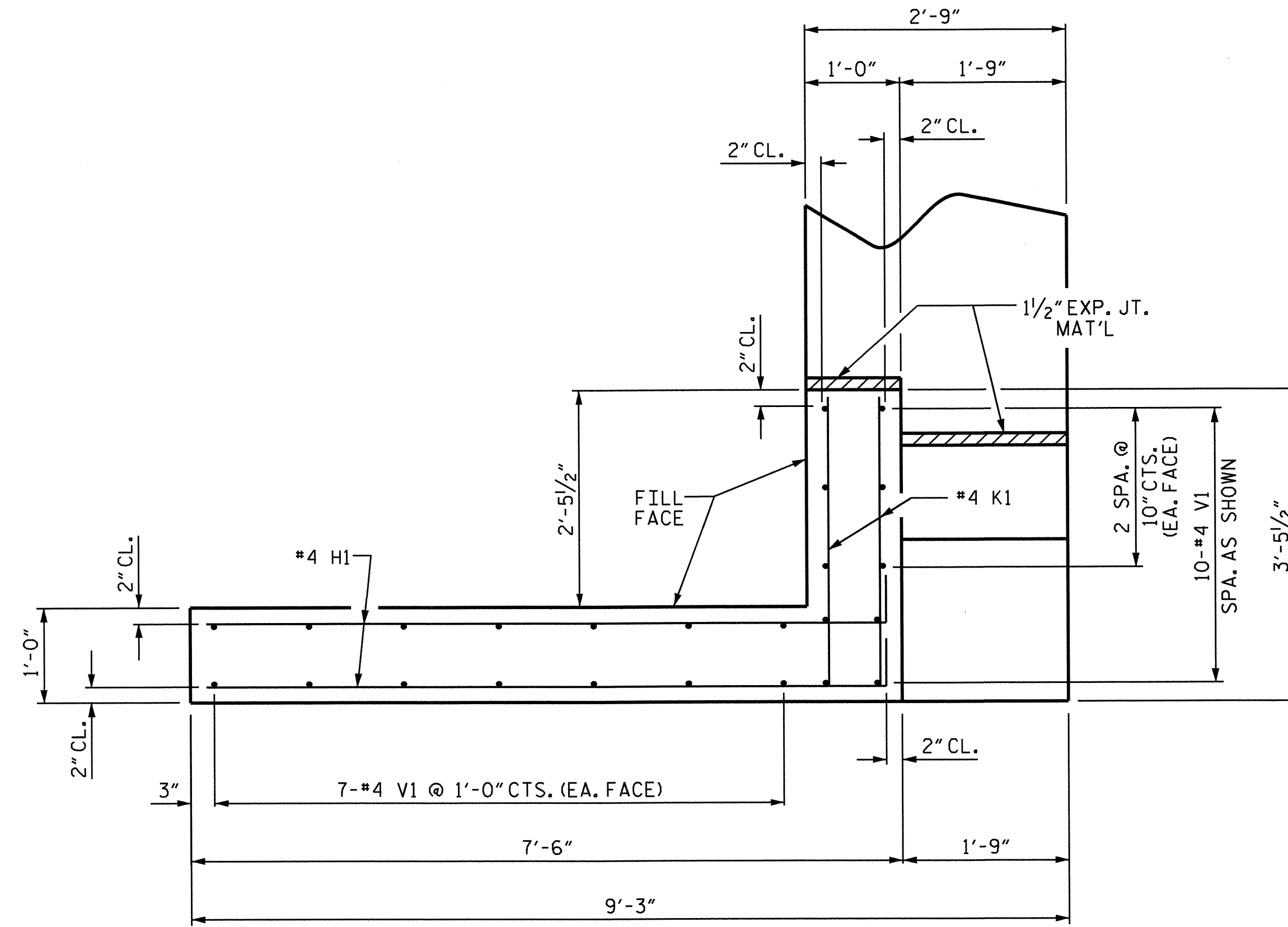
STD. NO. EB\_30\_90S

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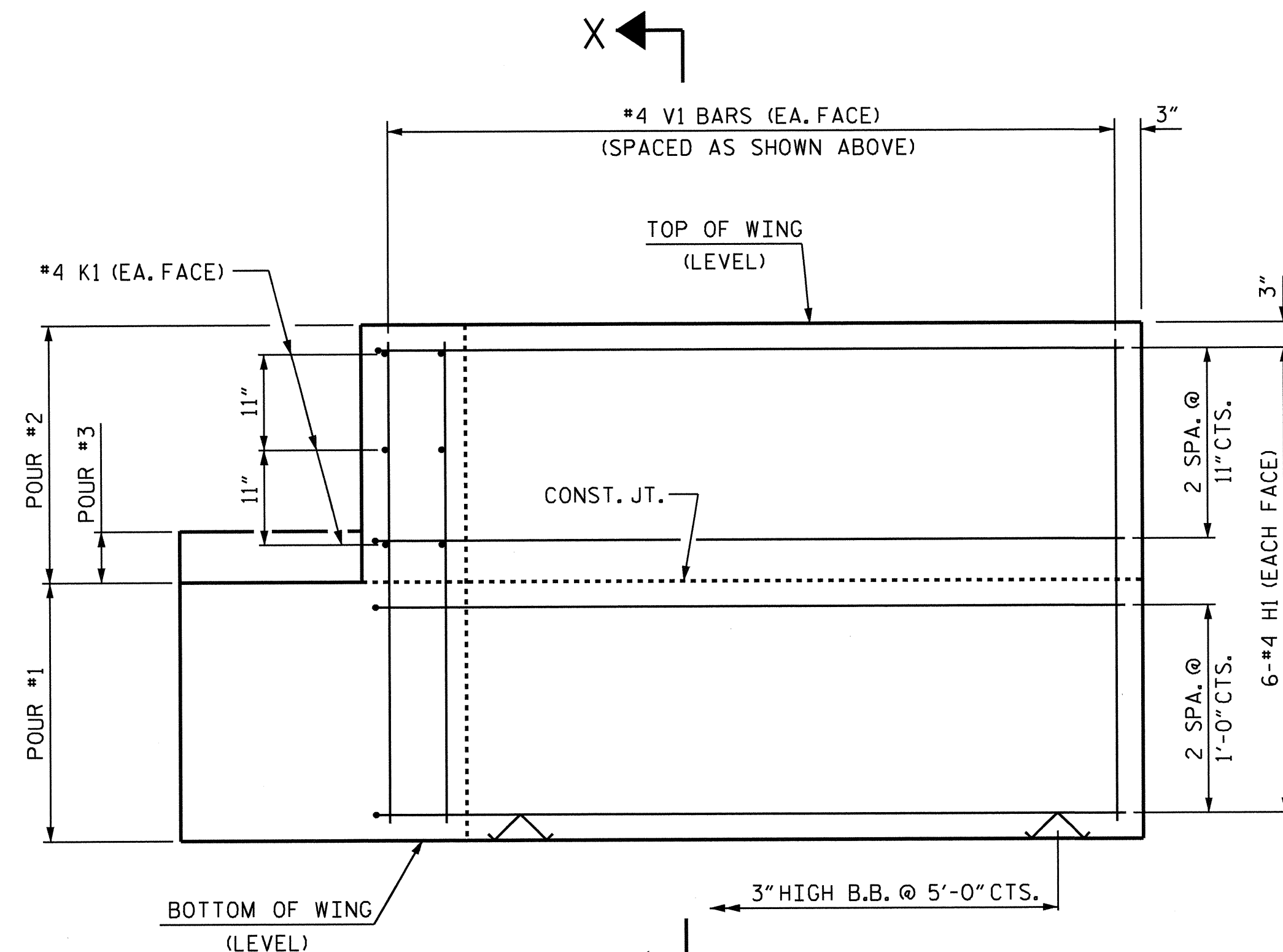




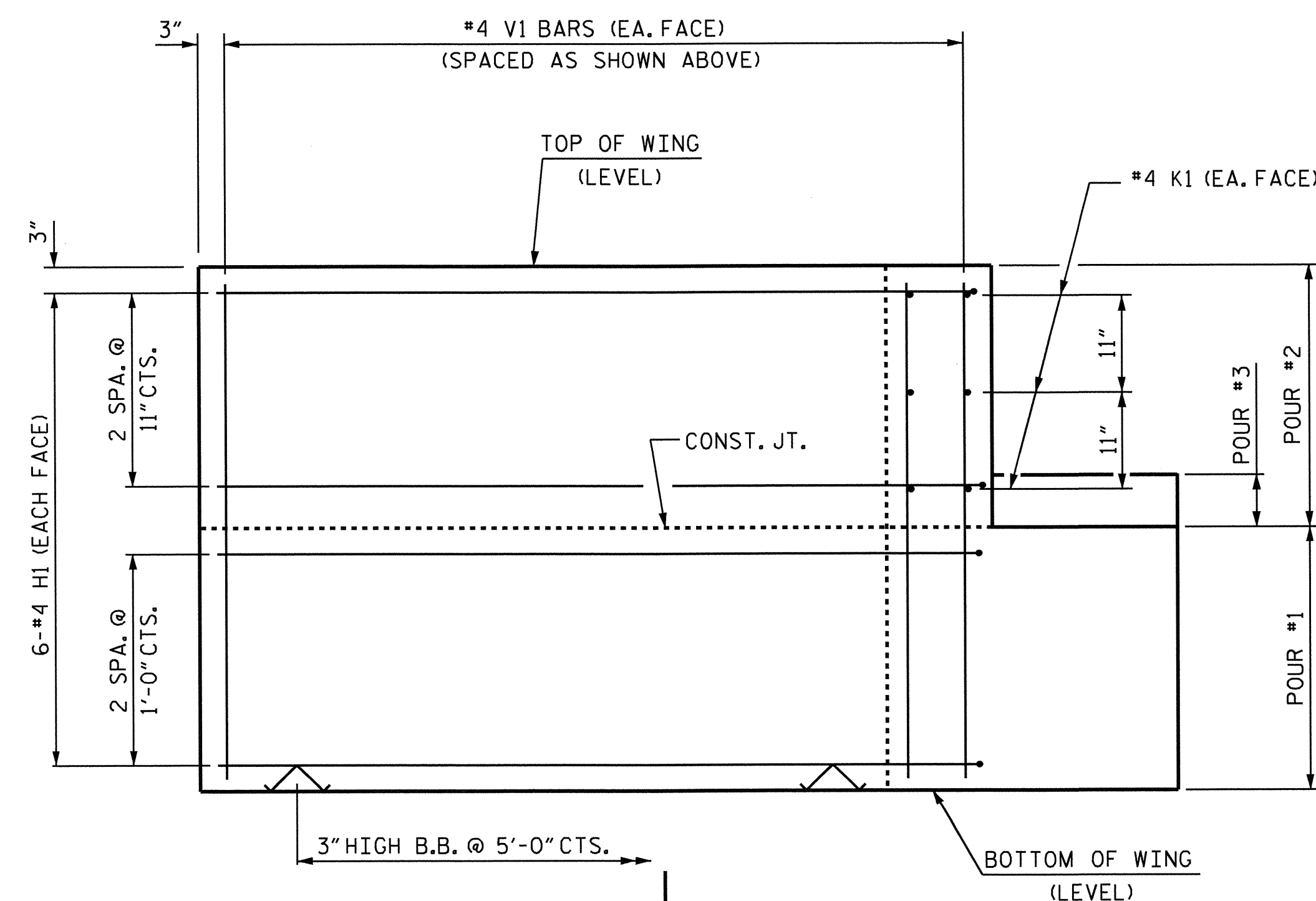
PLAN OF WING (W1)



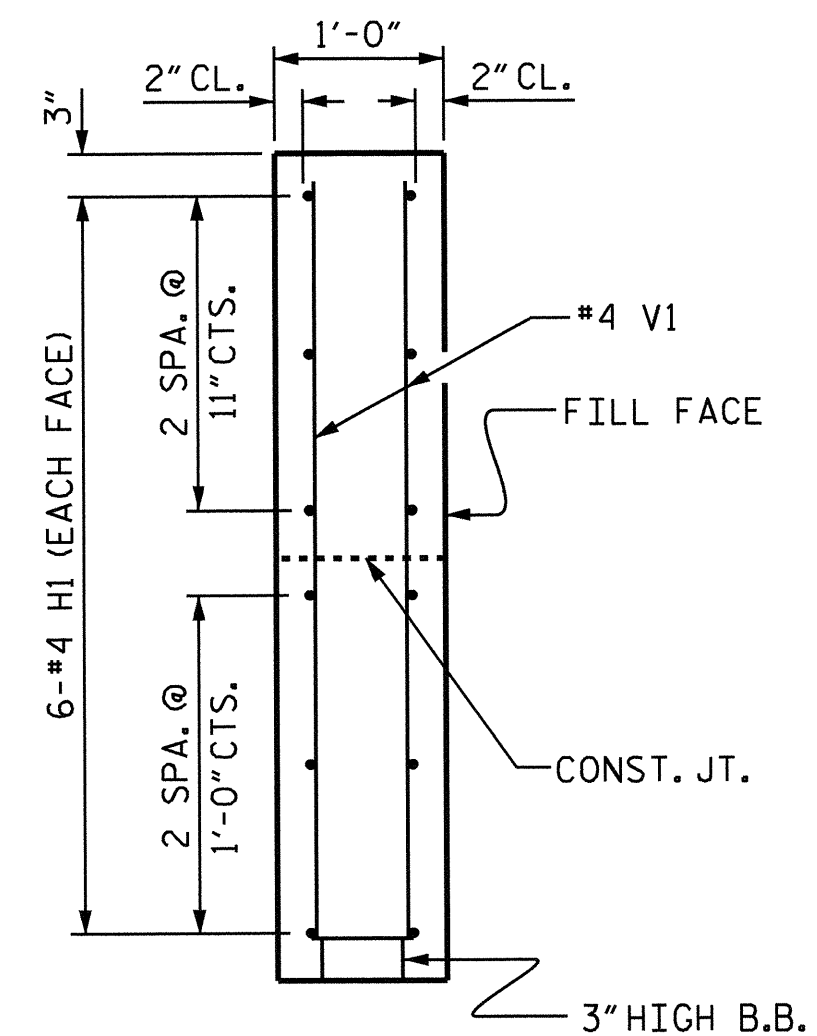
PLAN OF WING (W2)



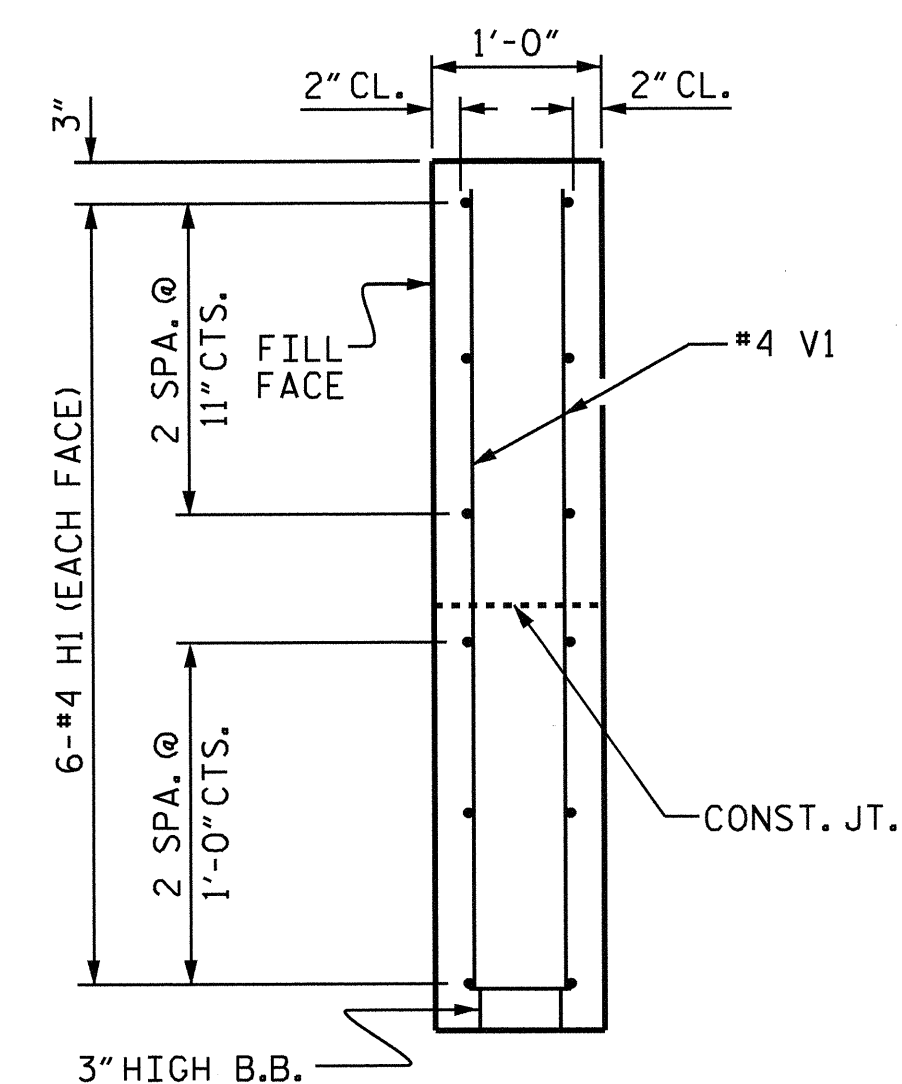
ELEVATION OF WING (W1)



ELEVATION OF WING (W2)



SECTION X-X



SECTION Y-Y

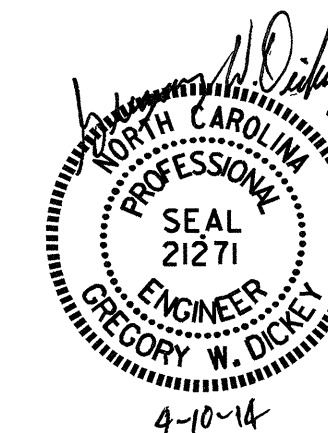
PROJECT NO. BD-5103X  
PENDER COUNTY  
STATION: 13+50.00 -L-

SHEET 3 OF 4

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
END BENT  
WING DETAILS

| REVISIONS |     |       |     |     |       | SHEET NO.       |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | 16              |
| 2         |     |       | 4   |     |       | TOTAL SHEETS 21 |



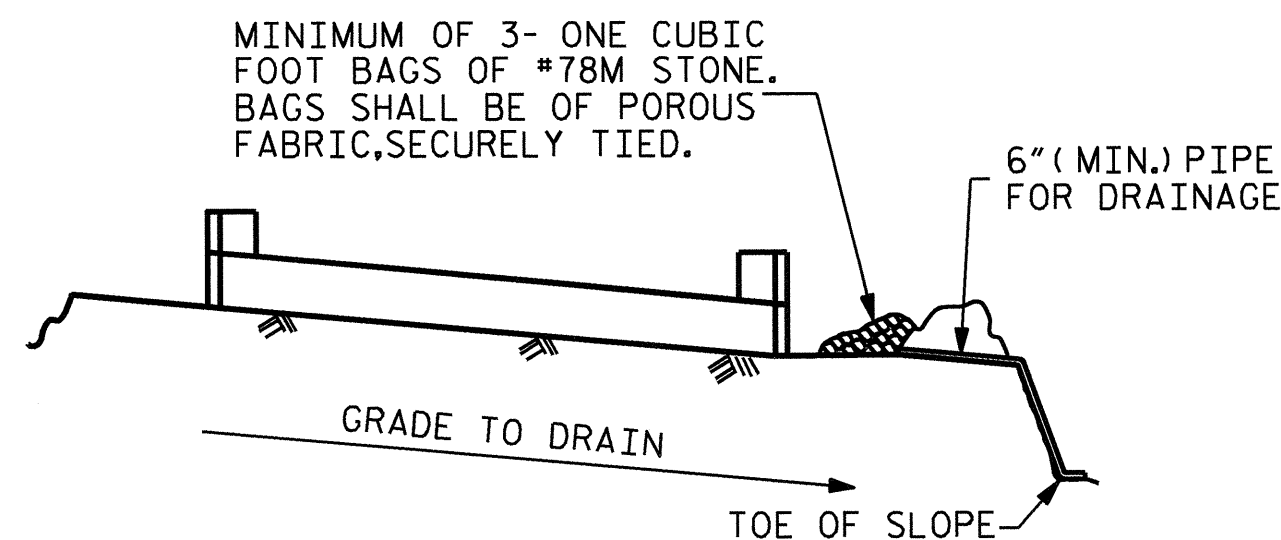
ASSEMBLED BY : C.B. PRUETT  
CHECKED BY : P.N. HOLDER  
DATE : 10/28/13  
DATE : 04/01/14  
DRAWN BY : DGE 02/10  
CHECKED BY : MKT 02/10

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STD. NO. EB-30-90S

WING DETAILS



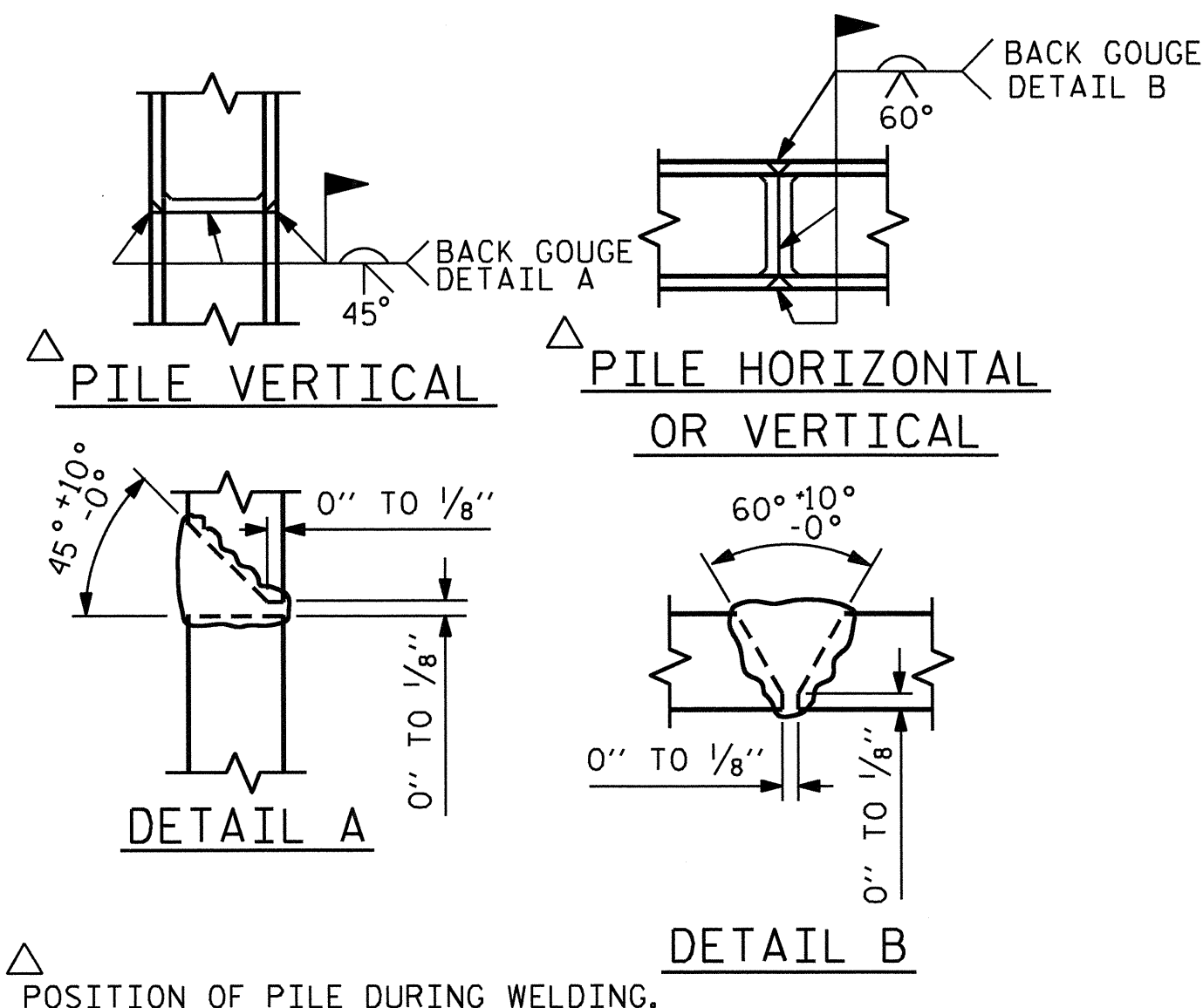


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

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



## PILE SPLICE DETAILS

| BAR TYPES                                                                            |  |  |  |  | BILL OF MATERIAL<br>FOR ONE END BENT                                                 |  |  |  |  |  |
|--------------------------------------------------------------------------------------|--|--|--|--|--------------------------------------------------------------------------------------|--|--|--|--|--|
|                                                                                      |  |  |  |  |                                                                                      |  |  |  |  |  |
|                                                                                      |  |  |  |  |                                                                                      |  |  |  |  |  |
|                                                                                      |  |  |  |  |                                                                                      |  |  |  |  |  |
| ALL BAR DIMENSIONS ARE OUT TO OUT.                                                   |  |  |  |  |                                                                                      |  |  |  |  |  |
| END BENT No. 1<br>HP 12 X 53 STEEL PILES<br>NO: 5                      LIN. FT.= 350 |  |  |  |  | END BENT No. 2<br>HP 12 X 53 STEEL PILES<br>NO: 5                      LIN. FT.= 350 |  |  |  |  |  |

| BAR                                              | NO.                                   | SIZE | TYPE | LENGTH    | WEIGHT    |
|--------------------------------------------------|---------------------------------------|------|------|-----------|-----------|
| B1                                               | 8                                     | #9   | 1    | 38'-0"    | 1034      |
| B2                                               | 16                                    | #4   | STR  | 19'-1"    | 204       |
| B3                                               | 9                                     | #4   | STR  | 2'-5"     | 15        |
| D1                                               | 20                                    | #6   | STR  | 1'-6"     | 45        |
| H1                                               | 24                                    | #4   | 2    | 7'-10"    | 126       |
| K1                                               | 12                                    | #4   | STR  | 3'-1"     | 25        |
| S1                                               | 46                                    | #4   | 3    | 7'-5"     | 228       |
| S2                                               | 46                                    | #4   | 4    | 3'-2"     | 97        |
| S3                                               | 10                                    | #4   | 5    | 6'-6"     | 43        |
| S4                                               | 4                                     | #4   | 6    | 4'-5"     | 12        |
| V1                                               | 48                                    | #4   | STR  | 4'-8"     | 150       |
|                                                  |                                       |      |      |           |           |
|                                                  |                                       |      |      |           |           |
|                                                  |                                       |      |      |           |           |
| REINFORCING STEEL<br>(FOR ONE END BENT)          |                                       |      |      |           | 1979 LBS. |
| CLASS A CONCRETE BREAKDOWN<br>(FOR ONE END BENT) |                                       |      |      |           |           |
| POUR #1                                          | CAP, LOWER PART<br>OF WINGS & COLLARS |      |      | 11.2 C.Y. |           |
| POUR #2                                          | UPPER PART OF<br>WINGS                |      |      | 1.8 C.Y.  |           |
| POUR #3                                          | LATERAL GUIDES                        |      |      | 0.1 C.Y.  |           |
| TOTAL CLASS A CONCRETE                           |                                       |      |      | 13.1 C.Y. |           |



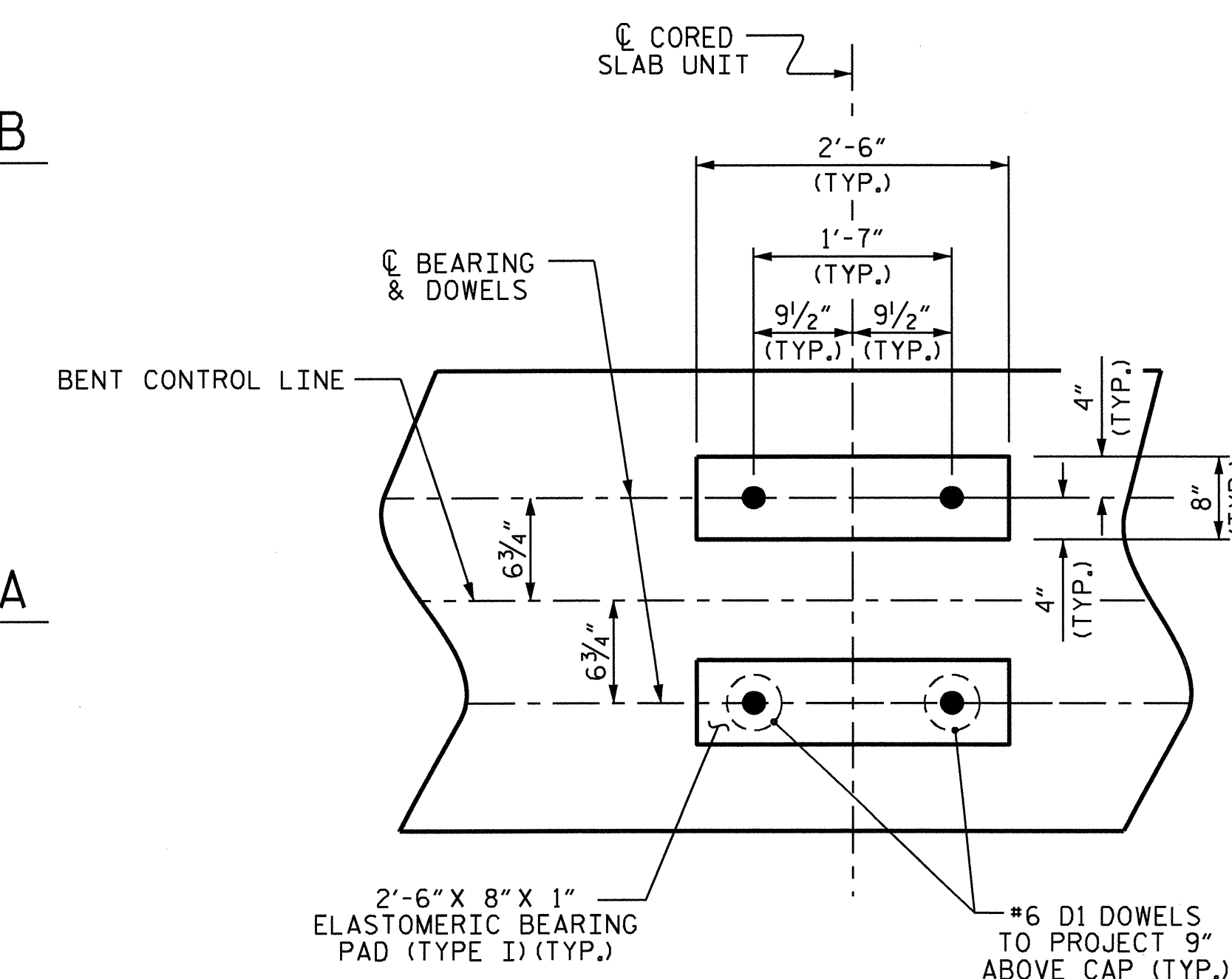
STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY  
TO CLEAR DOWELS.

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

X INVERT ALTERNATE STIRRUPS.

GALVANIZE THE TOP OF EACH INTERIOR BENT PILE  
A MINIMUM OF 50 FEET. GALVANIZE IN ACCORDANCE  
WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS.

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

[illegible]

FOR SECTION A-A, SEE SHEET 2 OF 2

| TOP OF PILL ELEVATIONS |       |
|------------------------|-------|
| ①                      | 48.45 |
| ②                      | 48.31 |
| ③                      | 48.16 |
| ④                      | 48.02 |
| ⑤                      | 47.87 |
| ⑥                      | 47.73 |
| ⑦                      | 47.58 |

PROJECT NO. BD-5103X  
PENDER COUNTY  
 STATION: 13+50.00 -L-

SHEET 1 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENT No. 1

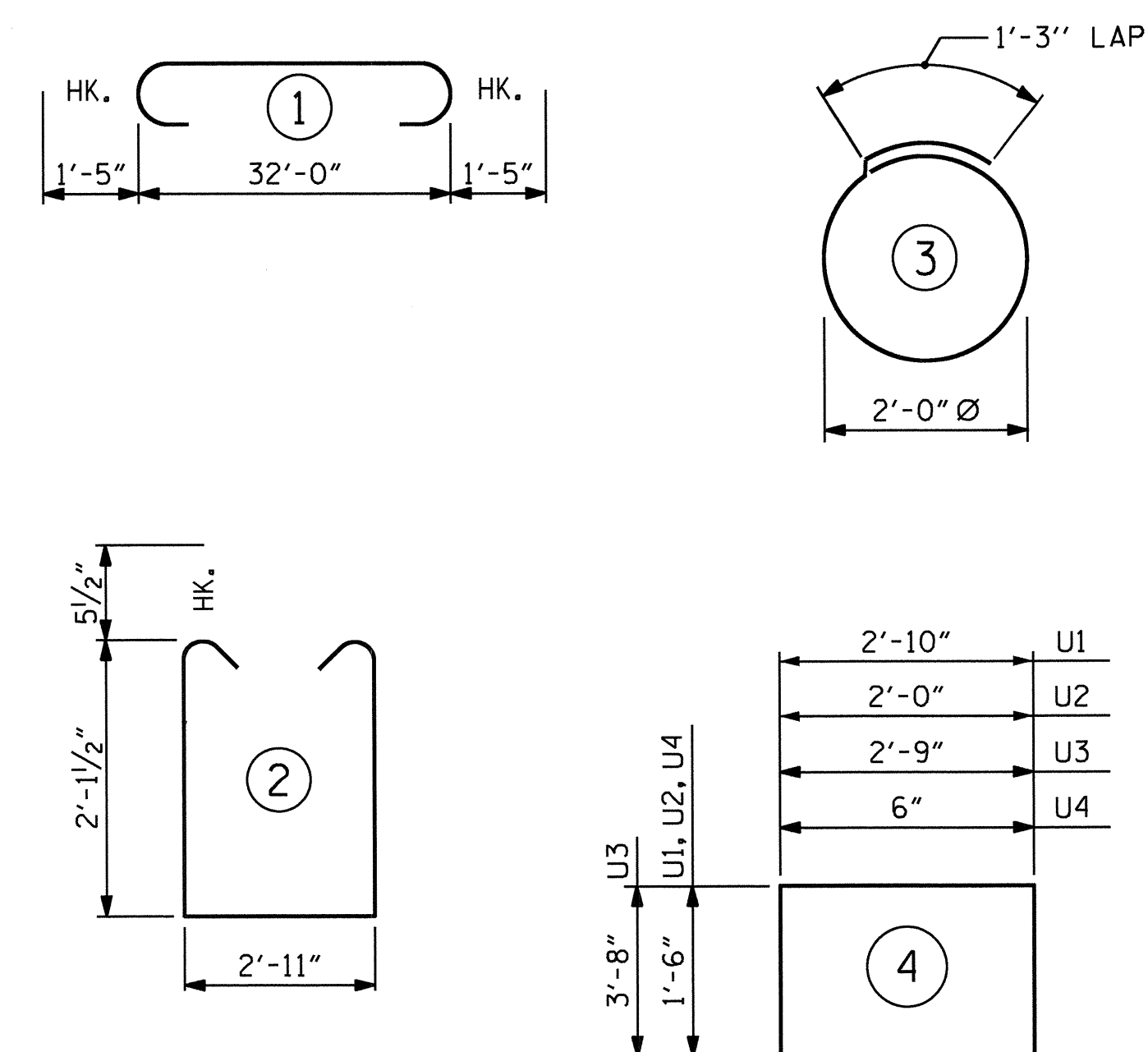
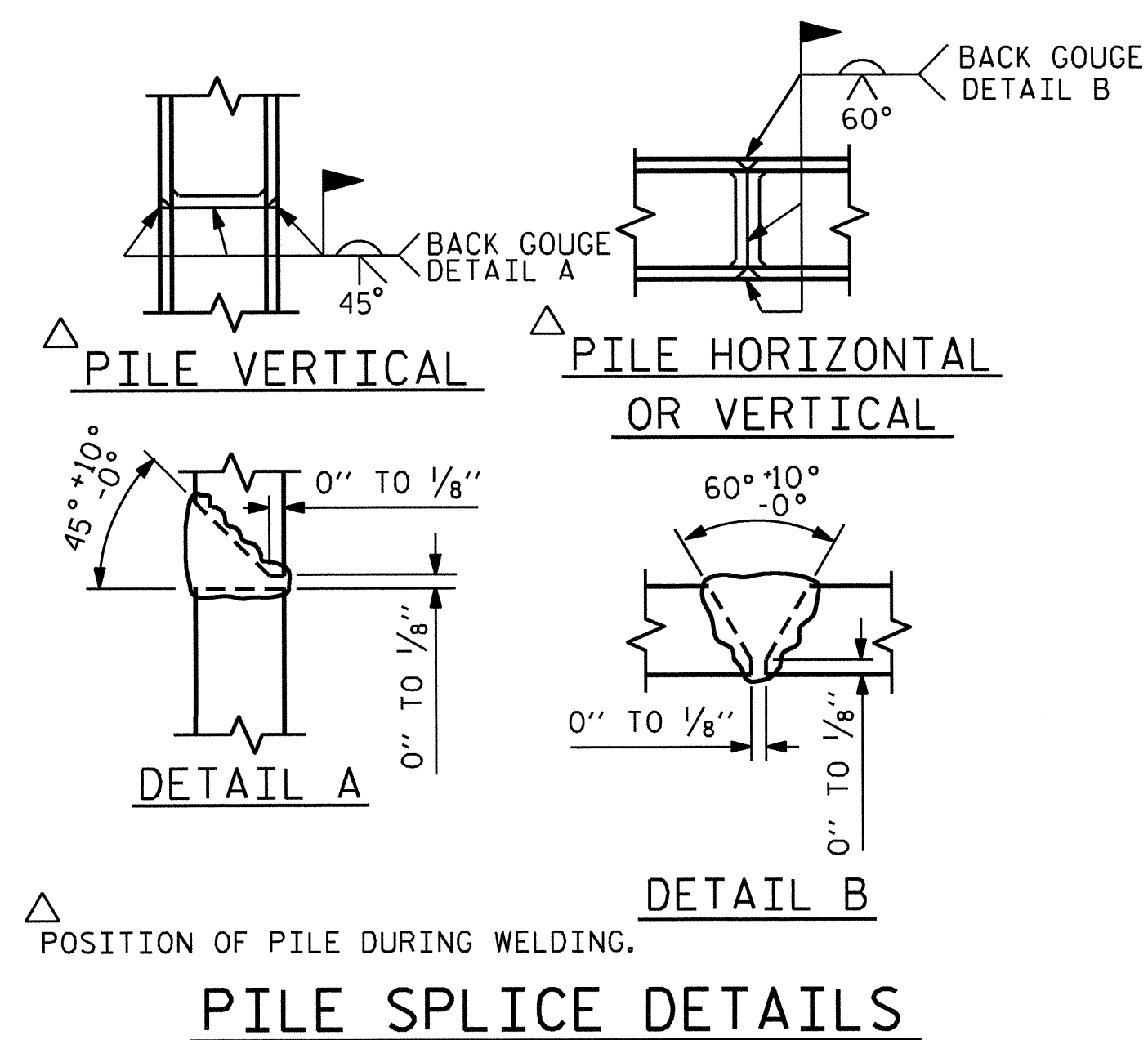
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|-----------|-----|-------|-----|-----|-------|-----------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                 |
| 1         |     |       | 3   |     |       | TOTAL<br>SHEETS |
| 2         |     |       | 4   |     |       |                 |

|                                                          |  |
|----------------------------------------------------------|--|
| ASSEMBLED BY : <u>C.B. PRUETT</u> DATE : <u>10/28/13</u> |  |
| CHECKED BY : <u>P.N.HOLDER</u> DATE : <u>04/01/14</u>    |  |
| DRAWN BY : DGE 05/10                                     |  |
| CHECKED BY : MKT 05/10                                   |  |

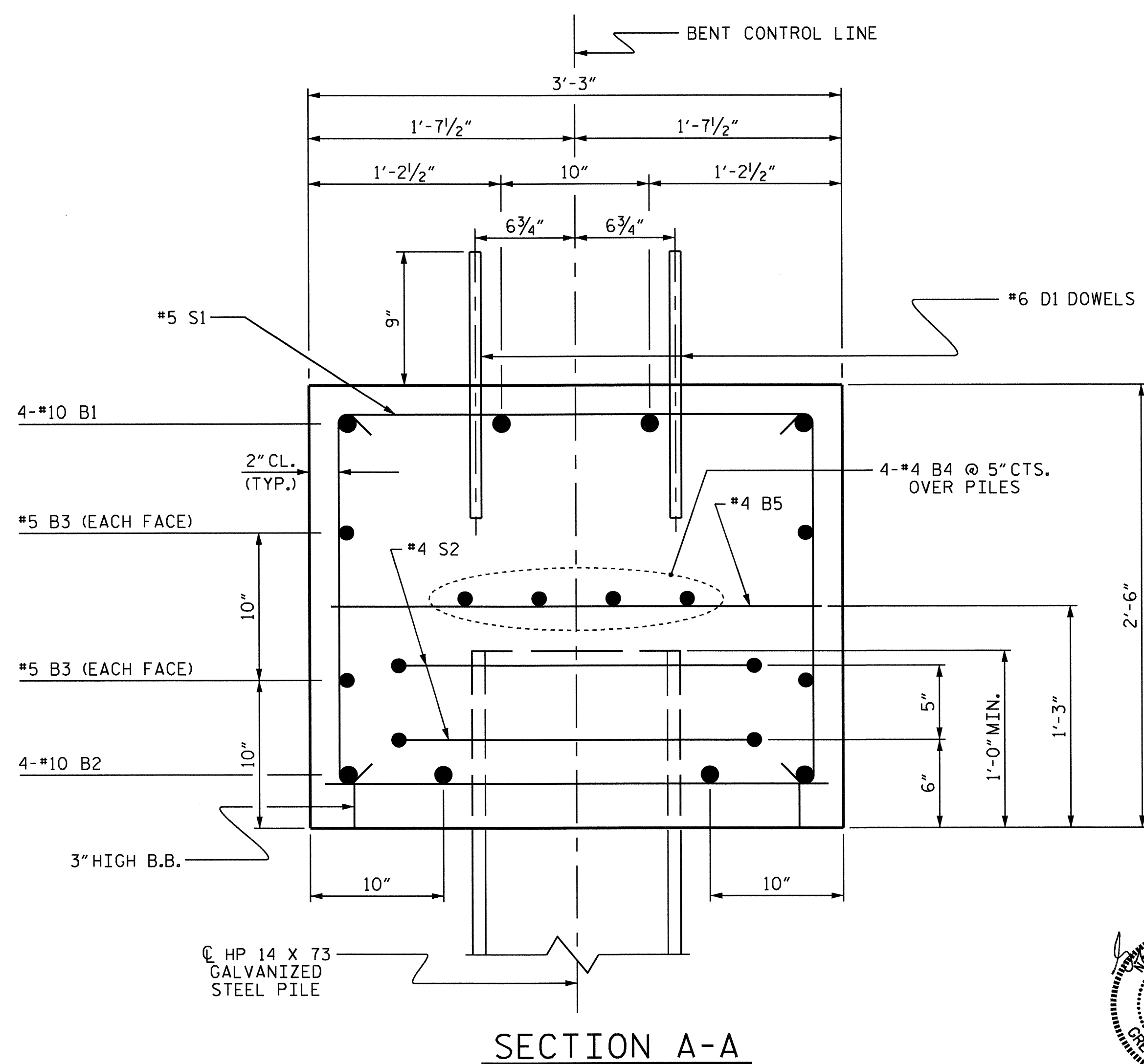
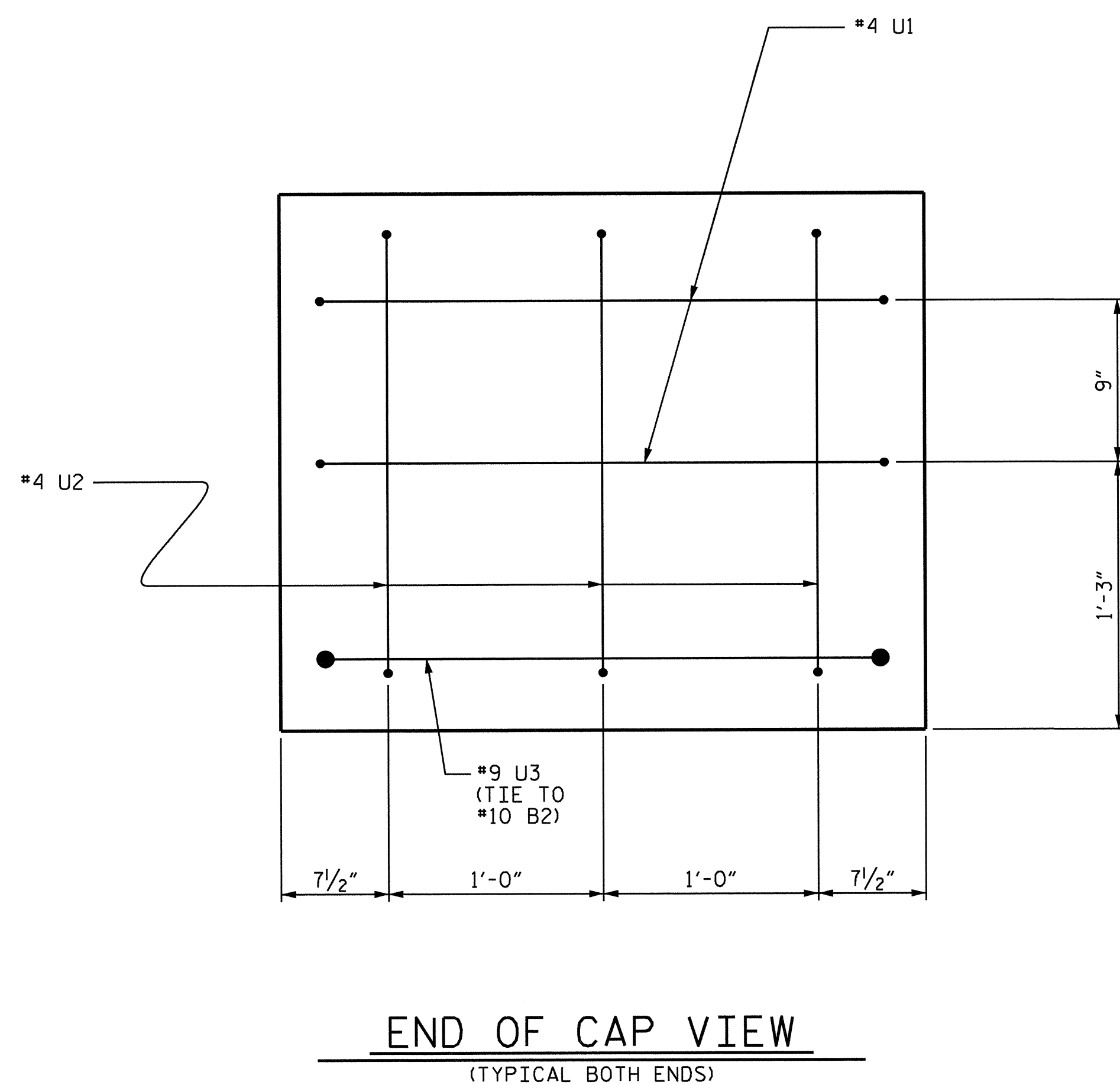
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STD. NO. 14" HP\_BT\_30\_90S\_<60'





| BILL OF MATERIAL                  |     |              |      |          |        |
|-----------------------------------|-----|--------------|------|----------|--------|
| FOR ONE BENT                      |     |              |      |          |        |
| BAR                               | NO. | SIZE         | TYPE | LENGTH   | WEIGHT |
| B1                                | 4   | #10          | 1    | 34'-10"  | 600    |
| B2                                | 4   | #10          | STR  | 32'-2"   | 554    |
| B3                                | 4   | #5           | STR  | 32'-2"   | 134    |
| B4                                | 8   | #4           | STR  | 17'-4"   | 93     |
| B5                                | 12  | #4           | STR  | 2'-11"   | 23     |
|                                   |     |              |      |          |        |
| D1                                | 40  | #6           | STR  | 1'-6"    | 90     |
|                                   |     |              |      |          |        |
| S1                                | 32  | #5           | 2    | 8'-1"    | 270    |
| S2                                | 14  | #4           | 3    | 7'-7"    | 71     |
|                                   |     |              |      |          |        |
| U1                                | 4   | #4           | 4    | 5'-10"   | 16     |
| U2                                | 6   | #4           | 4    | 5'-0"    | 20     |
| U3                                | 2   | #9           | 4    | 10'-1"   | 69     |
| U4                                | 8   | #4           | 4    | 3'-6"    | 19     |
| REINFORCING STEEL                 |     |              |      | 1959 LBS |        |
| (FOR ONE BENT)                    |     |              |      |          |        |
| CLASS A CONCRETE BREAKDOWN        |     |              |      |          |        |
| (FOR ONE BENT)                    |     |              |      |          |        |
| POUR #1 (CAP)                     |     |              |      | 9.8 C.Y. |        |
| POUR #2 (LATERAL GUIDES)          |     |              |      | 0.1 C.Y. |        |
| TOTAL CLASS A CONCRETE            |     |              |      | 9.9 C.Y. |        |
| HP 14 X 73 GALVANIZED STEEL PILES |     |              |      |          |        |
| (FOR ONE BENT)                    |     |              |      |          |        |
| NO. 7                             |     | LIN. FT. 595 |      |          |        |



PROJECT NO. BD-5103X  
           PENDER            COUNTY  
STATION: 13+50.00 -L-

SHEET 2 OF 2

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

SUBSTRUCTURE  
BENT No. 1

| REVISIONS |     |       |     |     |       | SHEET NO.<br>19       |
|-----------|-----|-------|-----|-----|-------|-----------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                       |
| 1         |     |       | 3   |     |       | TOTAL<br>SHEETS<br>21 |
| 2         |     |       | 4   |     |       |                       |

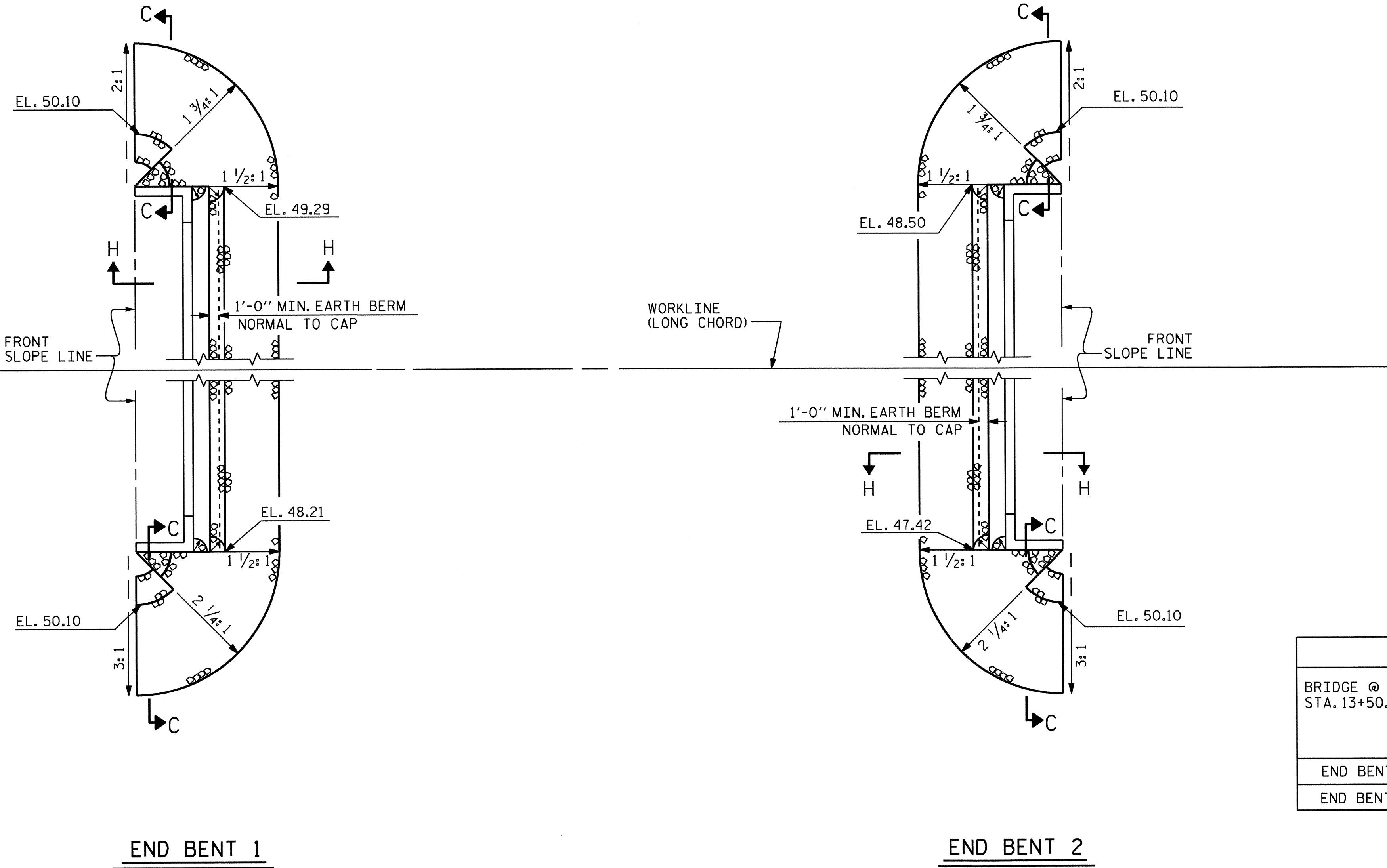
STD. NO. 14" HP\_BT\_30\_90S\_<60'

|                          |  |                 |
|--------------------------|--|-----------------|
| DRAWN BY : C.B. PRUETT   |  | DATE : 10/28/13 |
| CHECKED BY : P.N. HOLDER |  | DATE : 04/01/14 |
| DRAWN BY : DGE 05/10     |  |                 |
| CHECKED BY : MKT 05/10   |  |                 |

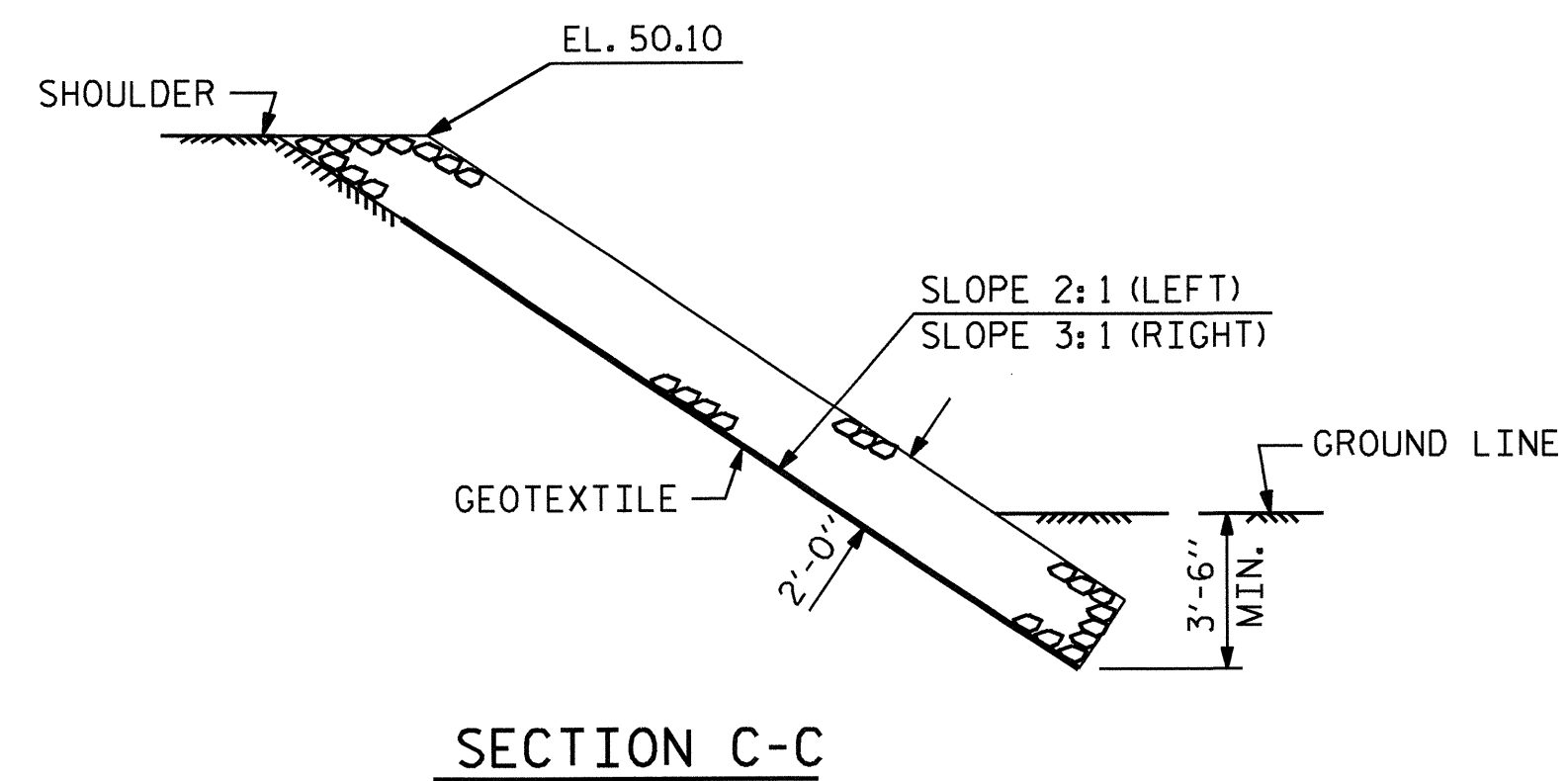
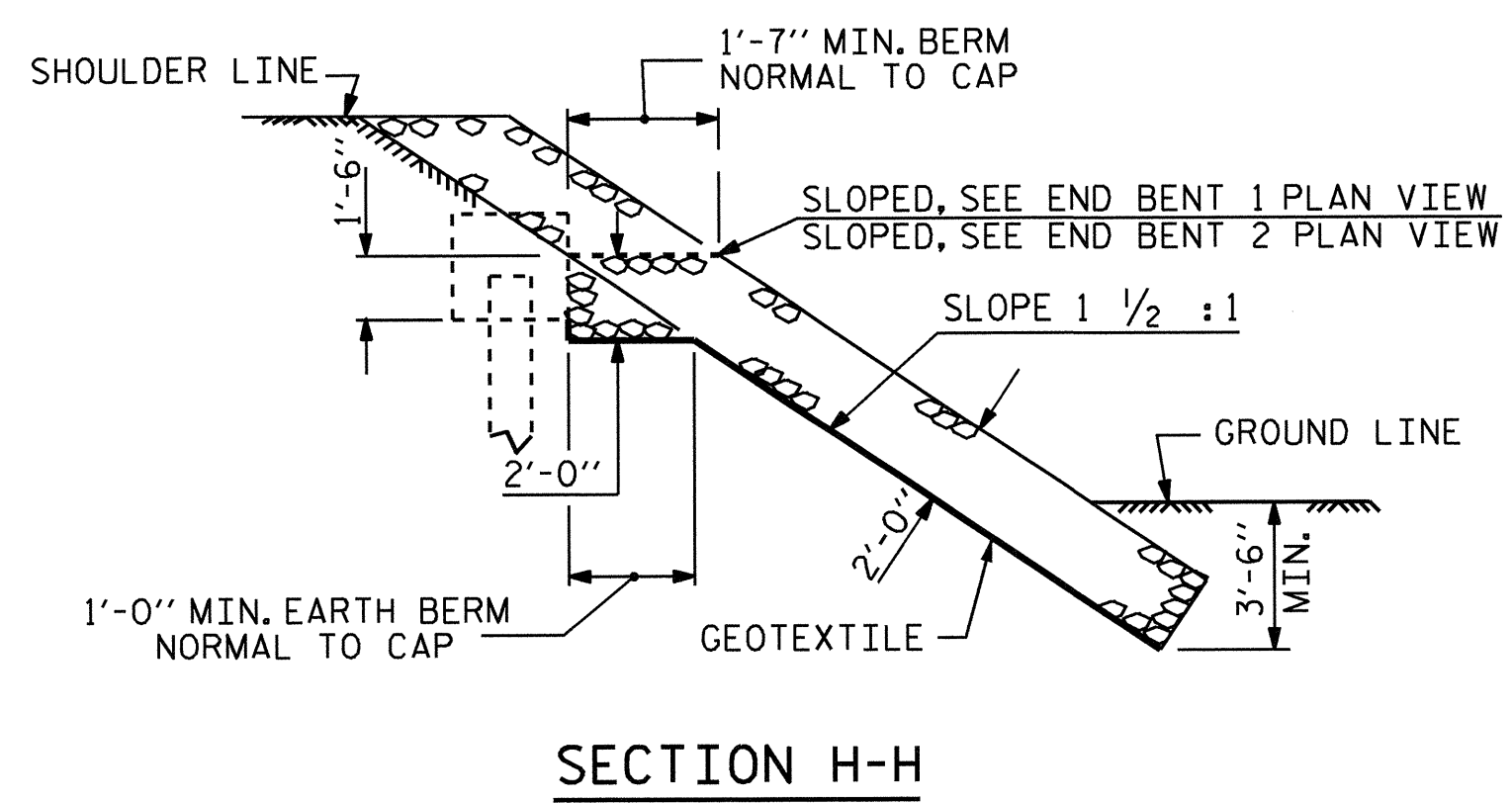
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NOTES :  
FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.



| ESTIMATED QUANTITIES         |                                      |                            |
|------------------------------|--------------------------------------|----------------------------|
| BRIDGE @<br>STA.13+50.00 -L- | RIP RAP<br>CLASS II<br>(2'-0" THICK) | GEOTEXTILE<br>FOR DRAINAGE |
|                              | TONS                                 | SQUARE YARDS               |
| END BENT 1                   | 96                                   | 107                        |
| END BENT 2                   | 85                                   | 94                         |



PROJECT NO. BD-5103X  
PENDER COUNTY  
 STATION: 13+50.00 -L-

STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
STANDARD  
—RIP RAP DETAILS—

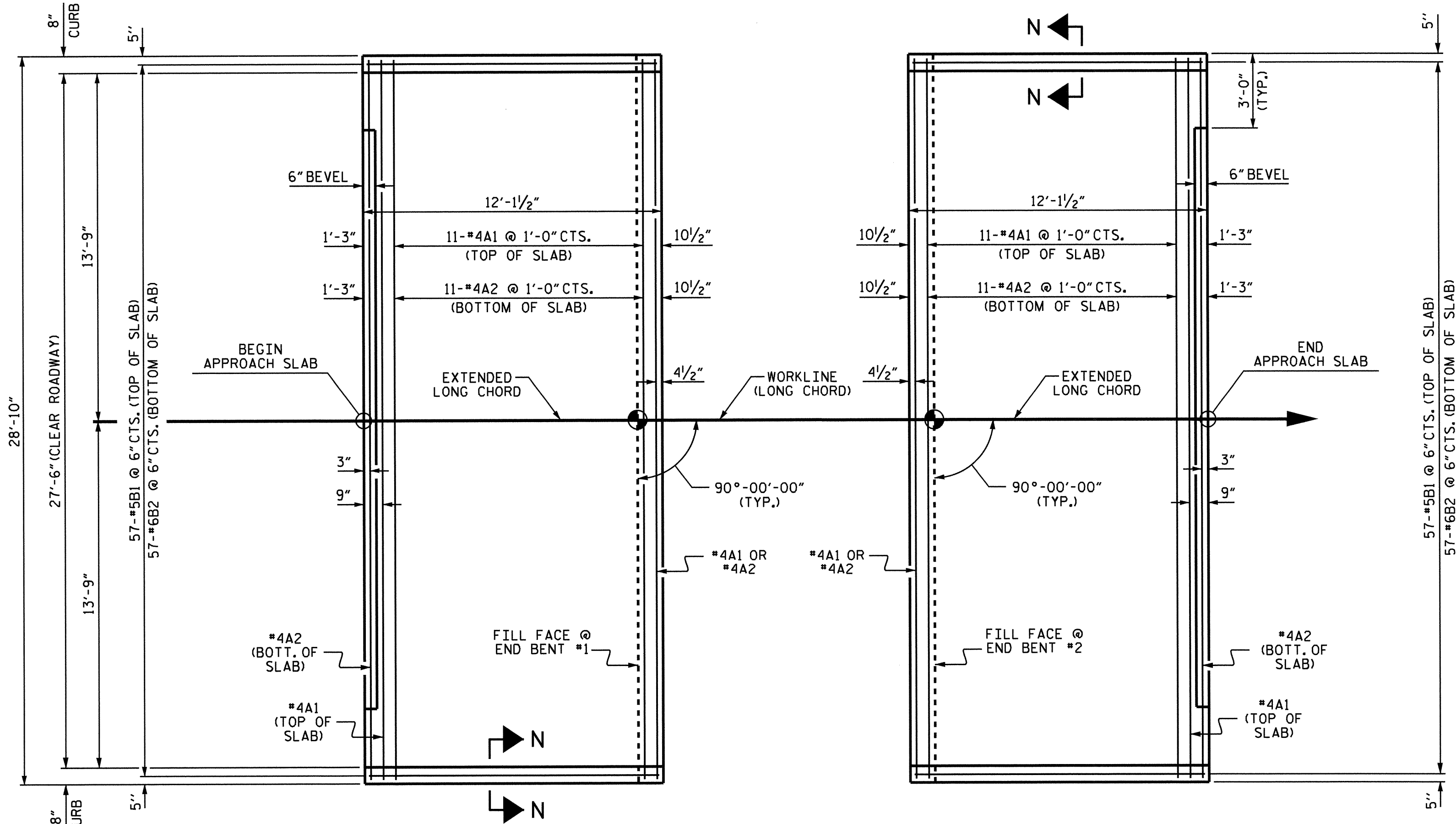
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|-----------|-----|-------|-----|-----|-------|-----------------------|
| NO.       | BY: | DATE: | NO. | BY: | DATE: |                       |
| 1         |     |       | 3   |     |       | TOTAL<br>SHEETS<br>21 |
| 2         |     |       | 4   |     |       |                       |

STD. NO. RR1 (Sh+ 2)

|                            |  |                 |        |
|----------------------------|--|-----------------|--------|
| ASSEMBLED BY : C.B. PRUETT |  | DATE : 10/28/13 |        |
| CHECKED BY : P.N.HOLDER    |  | DATE : 04/01/13 |        |
| DRAWN BY : REK 1/84        |  | REV. 5/1/06R    | TLA/GM |
| CHECKED BY : RDU 1/84      |  | REV. 10/1/11    | MAA/GM |
|                            |  | REV. 12/21/11   | MAA/GM |

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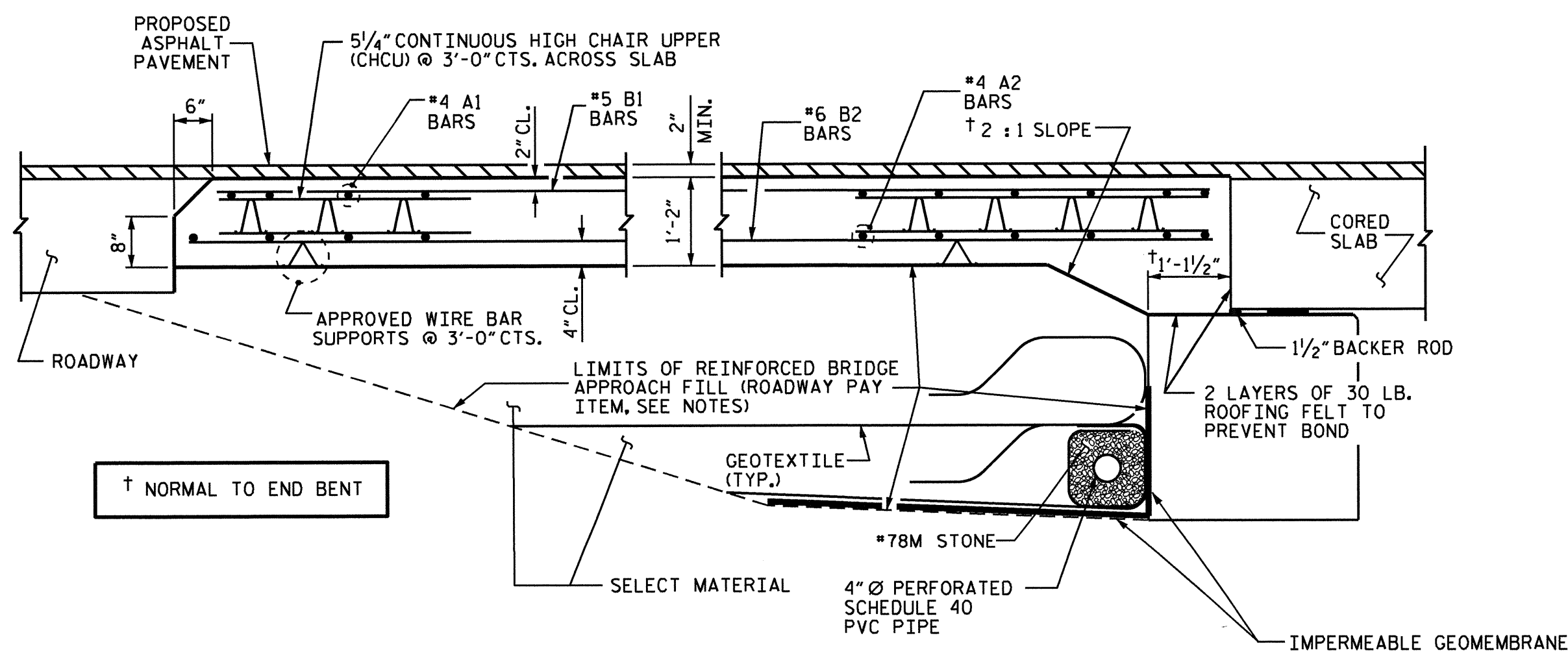




PLAN @ END BENT #1

PLAN @ END BENT #2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



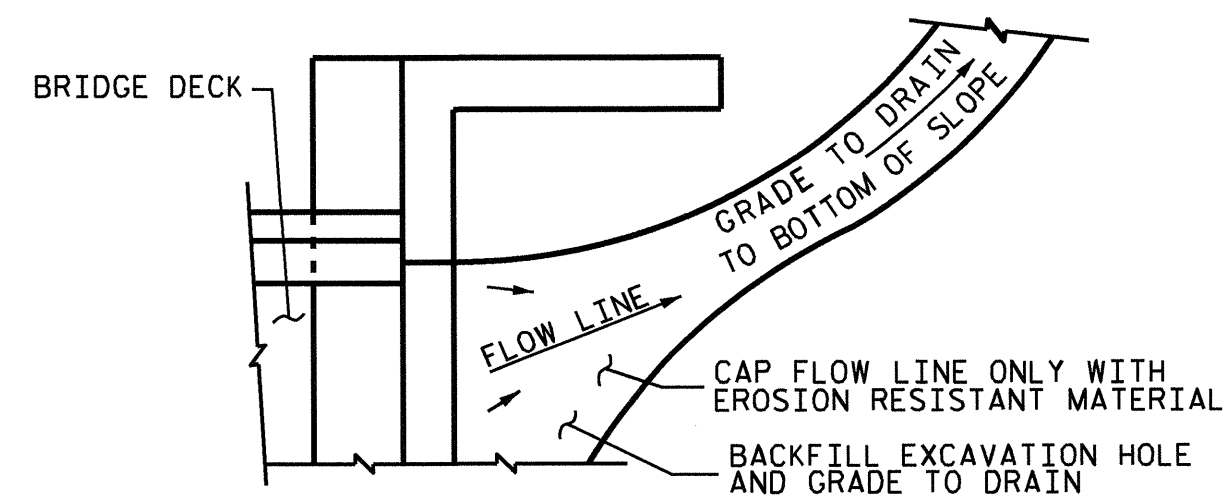
SECTION THRU SLAB

## NOTES

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE ROADWAY PLANS.

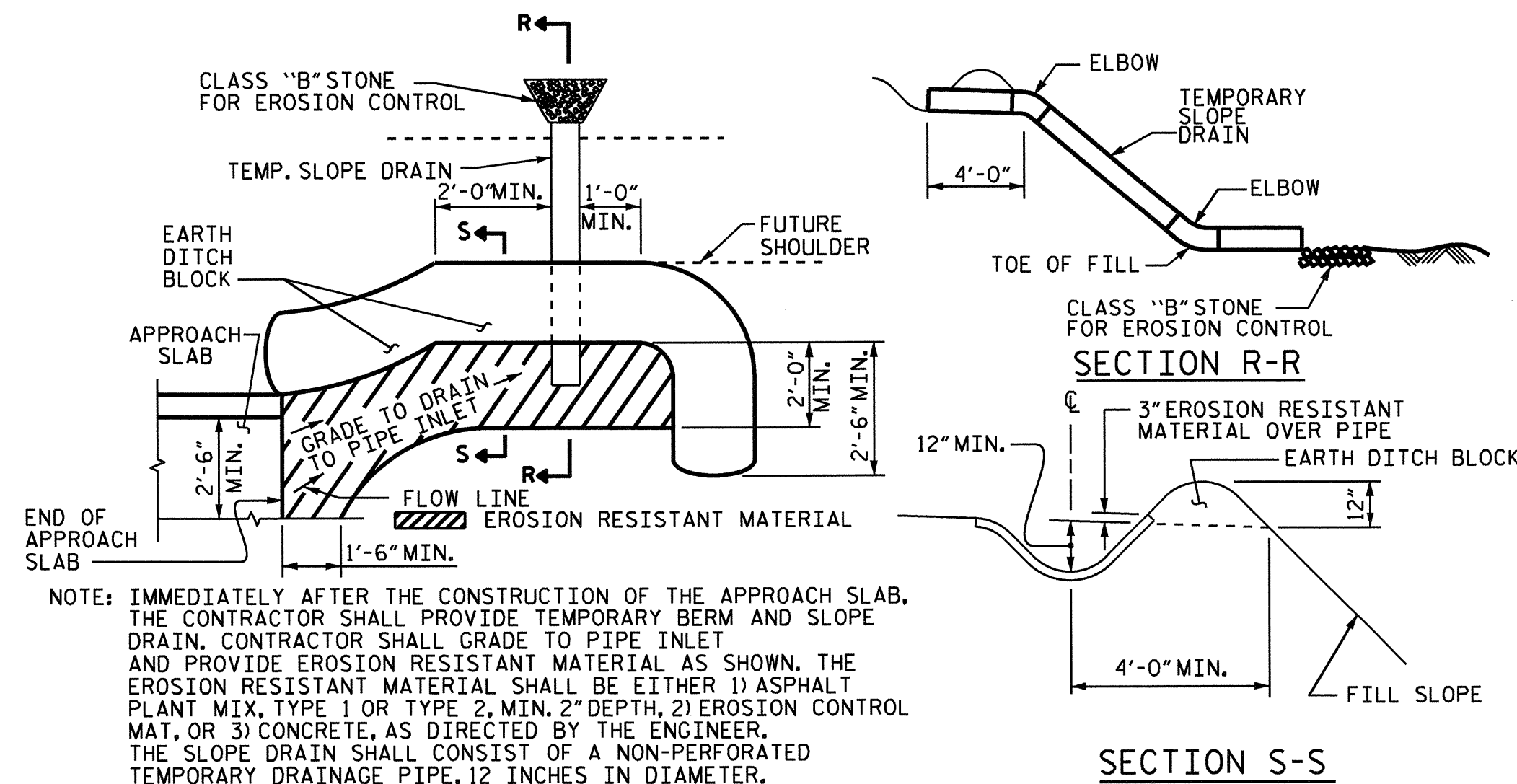
AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

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.

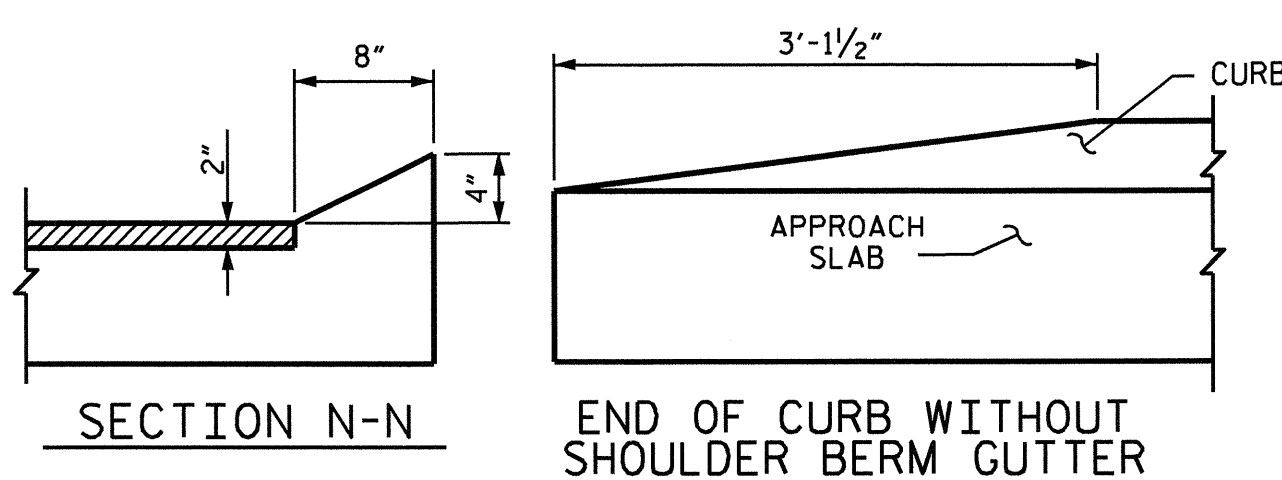
TEMPORARY DRAINAGE DETAIL



PLAN VIEW

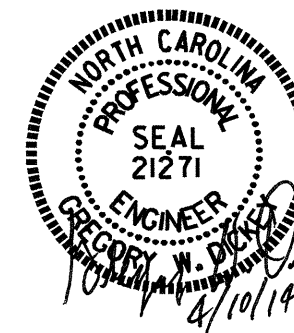
TEMPORARY BERM AND SLOPE DRAIN DETAILS

(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 | 13  | #4   | STR  | 28'-6" | 247    |
| A2  | 13  | #4   | STR  | 28'-6" | 247    |
| *B1 | 57  | #5   | STR  | 11'-2" | 664    |
| B2  | 57  | #6   | STR  | 11'-8" | 999    |

REINFORCING STEEL LBS. 1246

\*EPOXY COATED REINFORCING STEEL LBS. 911

CLASS AA CONCRETE C. Y. 16.6

### APPROACH SLAB AT EB #2

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|-----|-----|------|------|--------|--------|
| *A1 | 13  | #4   | STR  | 28'-6" | 247    |
| A2  | 13  | #4   | STR  | 28'-6" | 247    |
| *B1 | 57  | #5   | STR  | 11'-2" | 664    |
| B2  | 57  | #6   | STR  | 11'-8" | 999    |

REINFORCING STEEL LBS. 1246

\*EPOXY COATED REINFORCING STEEL LBS. 911

CLASS AA CONCRETE C. Y. 16.6

PROJECT NO. BD-5103X  
PENDER COUNTY  
 STATION: 13+50.00 -L-

STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 STANDARD  
 BRIDGE APPROACH SLAB  
 FOR PRESTRESSED CONCRETE  
 CORED SLAB UNIT  
 (SUB-REGIONAL TIER)  
 90° SKEW

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

ASSEMBLED BY : C.B. PRUETT/D. A. GLADDEN DATE : 10/28/13  
 CHECKED BY : P.N.HOLDER DATE : 04/02/14  
 DRAWN BY : SHS/MAA 5-09 REV. 12-11 MAA/AAC  
 CHECKED BY : BCH 5-09



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.

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