

PROJECT: 33783.1.1 ID: B4583

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C. | 33785.1.1 (B-4583) | 1 | 16 |

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STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33783.1.1 (B-4583) F.A. PROJ. BRZ-1105(11)
 COUNTY MOORE
 PROJECT DESCRIPTION BR 176 OVER ABERDEEN CREEK ON SR 1105
(PINEBLUFF LAKE ROAD)

SITE DESCRIPTION _____

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, OR THE INTERPRETATIONS MADE, OR THE OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL

C. C. MURRAY

J. E. ESTEP

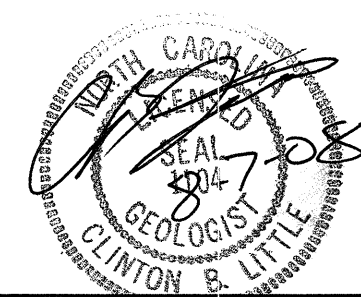
M. R. MOORE

INVESTIGATED BY C. C. MURRAY

CHECKED BY C. B. LITTLE

SUBMITTED BY C. B. LITTLE

DATE JULY 2008



DRAWN BY: C.B. LITTLE

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

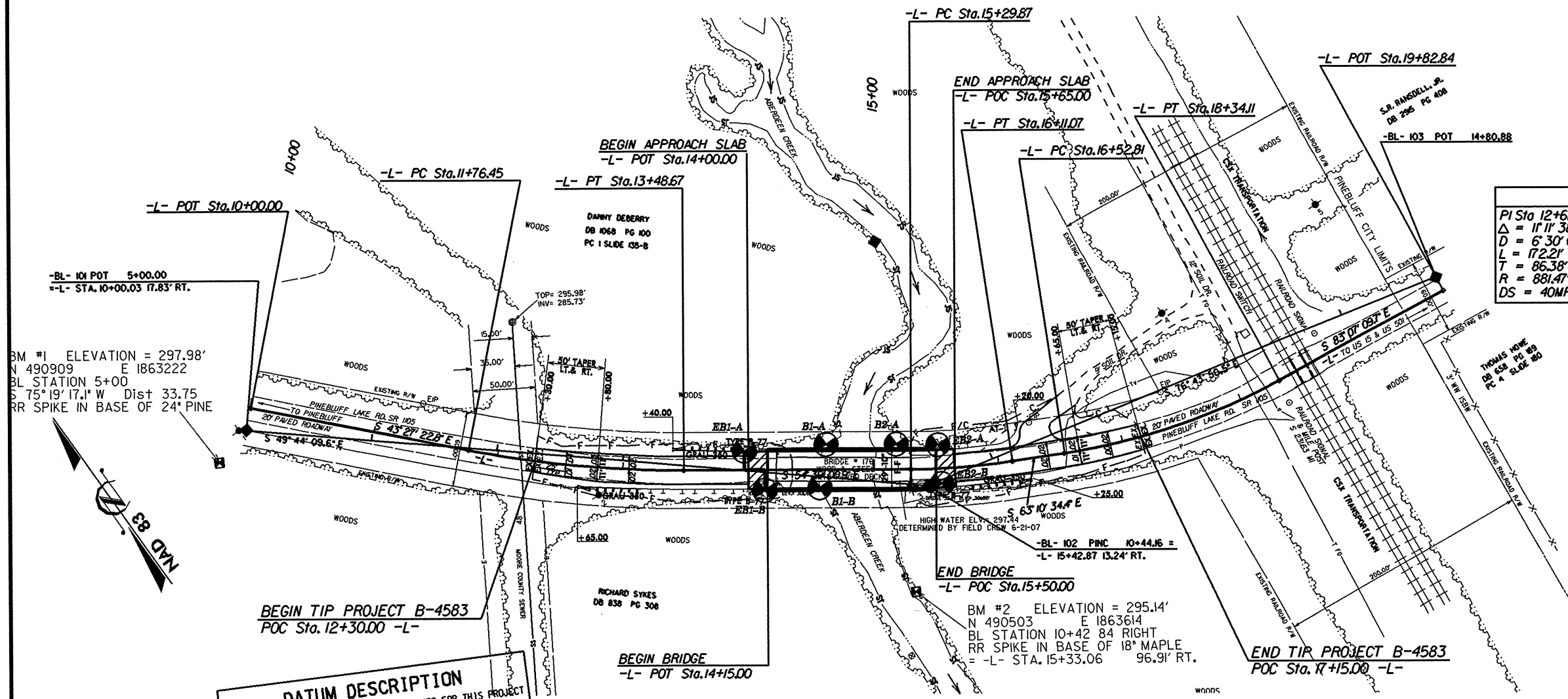
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

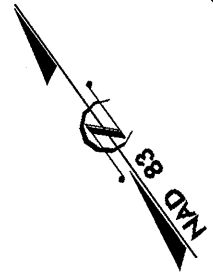
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with multiple columns and rows containing technical specifications for soil and rock. Columns include SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, CONSISTENCY OR DENSENESS, TEXTURE OR GRAIN SIZE, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, MISCELLANEOUS SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, and INDURATION. It includes various symbols, charts, and descriptive text for geotechnical engineering purposes.



| -L- | | |
|-------------------------------|------------------------------|-------------------------------|
| PI Sta 12+62.83 | PI Sta 15+70.55 | PI Sta 17+44.38 |
| $\Delta = 11' 11" 38.0" (LT)$ | $\Delta = 8' 31" 33.5" (LT)$ | $\Delta = 19' 56" 35.3" (LT)$ |
| $D = 6' 30' 00.0"$ | $D = 10' 30' 00.0"$ | $D = 11' 00' 00.0"$ |
| $L = 172.21'$ | $L = 81.20'$ | $L = 181.30'$ |
| $T = 86.38'$ | $T = 40.67'$ | $T = 91.58'$ |
| $R = 881.47'$ | $R = 545.67'$ | $R = 520.87'$ |
| $DS = 40MPH$ | $DS = 40MPH$ | $DS = 35MPH$ |

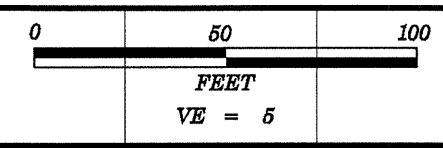
BM #1 ELEVATION = 297.98'
 N 490909 E 1863222
 BL STATION 5+00
 S 75° 19' 17.1" W Dist 33.75
 RR SPIKE IN BASE OF 24" PINE



DATUM DESCRIPTION
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B4583-1" WITH NAD 1983(CORS96) STATE PLANE GRID COORDINATES OF NORTHING: 490360.7778(±) EASTING: 1864425.3427(±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99986397 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4583-1" TO -L- STATION IS
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

BM #2 ELEVATION = 295.14'
 N 490503 E 1863614
 BL STATION 10+42 84 RIGHT
 RR SPIKE IN BASE OF 18" MAPLE
 = -L- STA. 15+33.06 96.91' RT.

NOTE - DESIGN EXCEPTION REQUIRED FOR SHOULDER WIDTH



| PROJECT REFERENCE NO. | SHEET |
|-----------------------|-------|
| 33784.1.1 (B-4583) | 4 |
| PROFILE LEFT | |

320
310
300
290
280
270
260
250
240

12

13

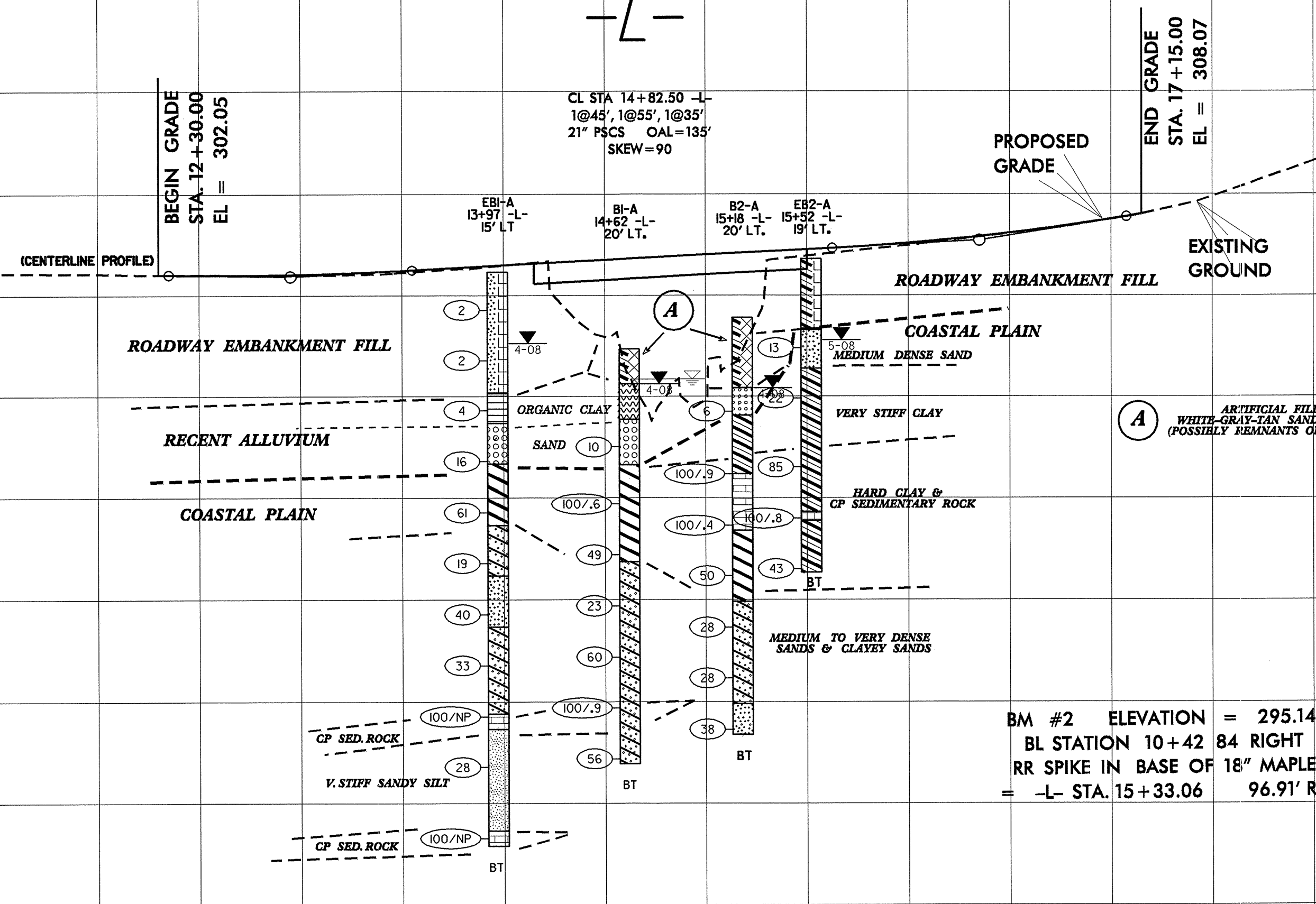
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15

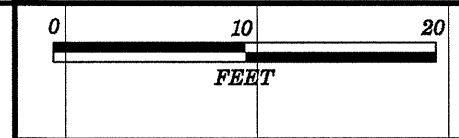
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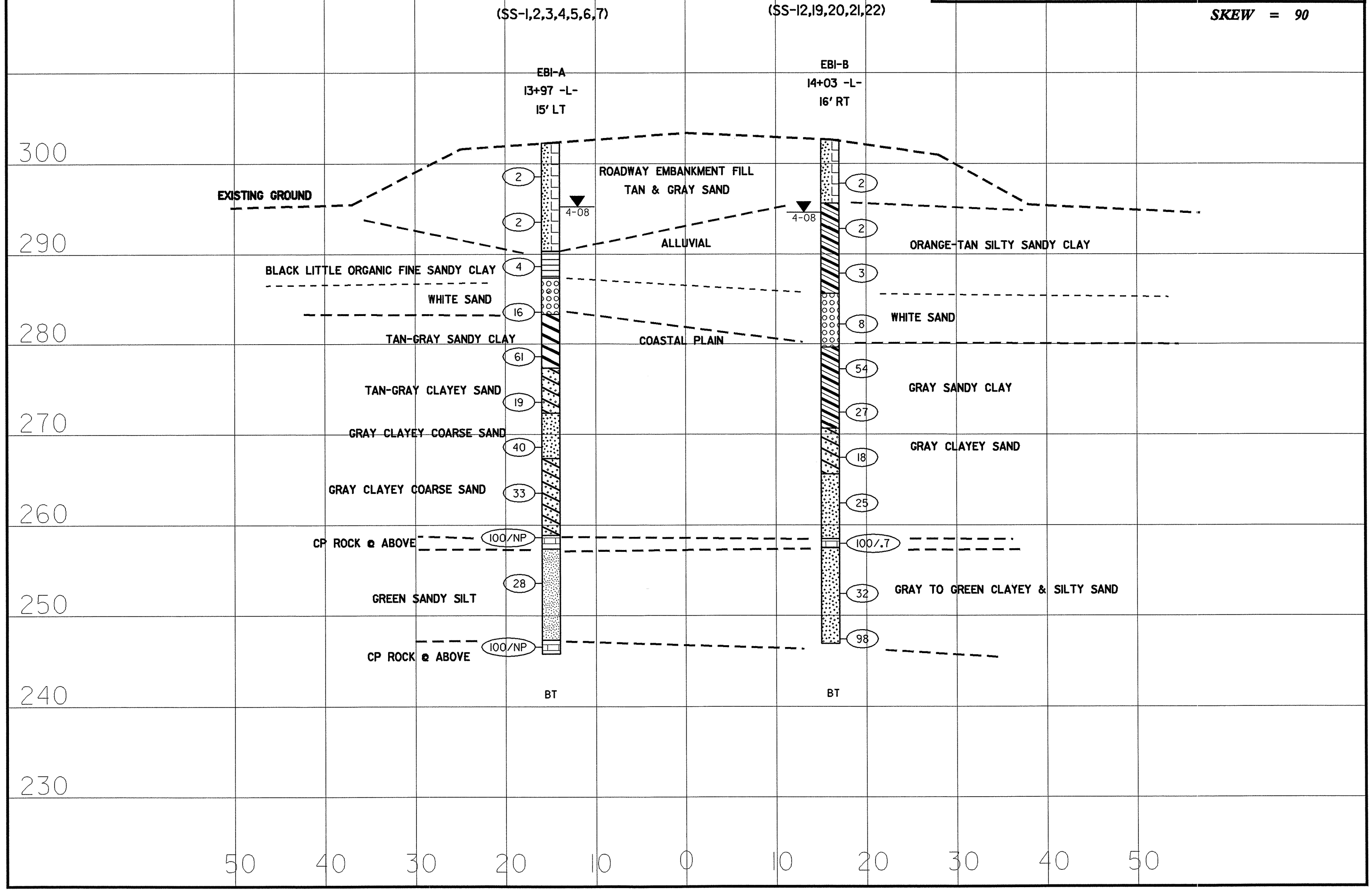
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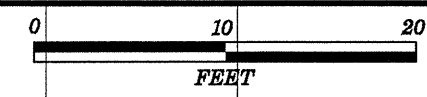


BM #2 ELEVATION = 295.14'
 BL STATION 10+42 84 RIGHT
 RR SPIKE IN BASE OF 18" MAPLE
 = -L- STA. 15+33.06 96.91' RT.



| PROJECT REFERENCE NO. | SHEET |
|--------------------------|-------|
| 33784.1.1 (B-4583) | 5 |
| SECTION THRU EB-1 | |
| SKREW = 90 | |





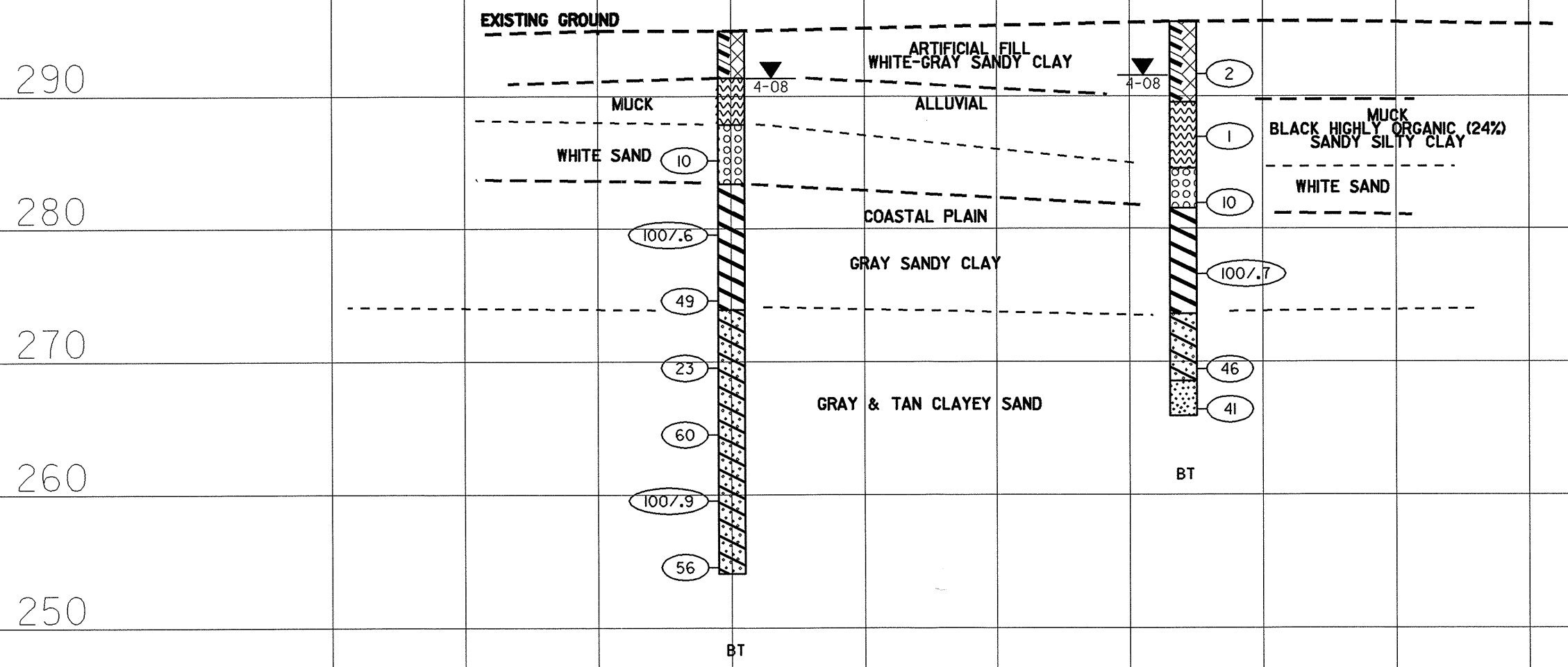
SKEW = 90

SS-13,14,15,16,17,18

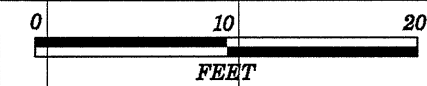
BI-A
14+62 -L-
20' LT.

BI-B
14+57 -L-
14' RT.

BRIDGE DECK



40 30 20 10 0 10 20 30 40



SS-24,25,26,27,28,29

B2-A
15+18 -L-
20' LT.

BRIDGE DECK

EXISTING GROUND

ARTIFICIAL FILL
GRAY-TAN SANDY CLAY

4-08

ALLUVIAL WHITE SAND W/ LENSES OF BLACK ORGANIC CLAY

COASTAL PLAIN

GRAY SILTY FINE SANDY CLAY

COASTAL PLAIN SEDIMENTARY ROCK
(GRAY CLAYEY SANDY SILT)

GRAY SANDY CLAY

GRAY CLAYEY SAND & SAND

290

280

270

260

250

240

6

100/.9

100/.4

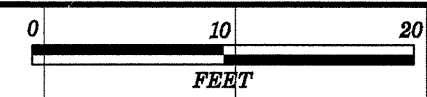
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28

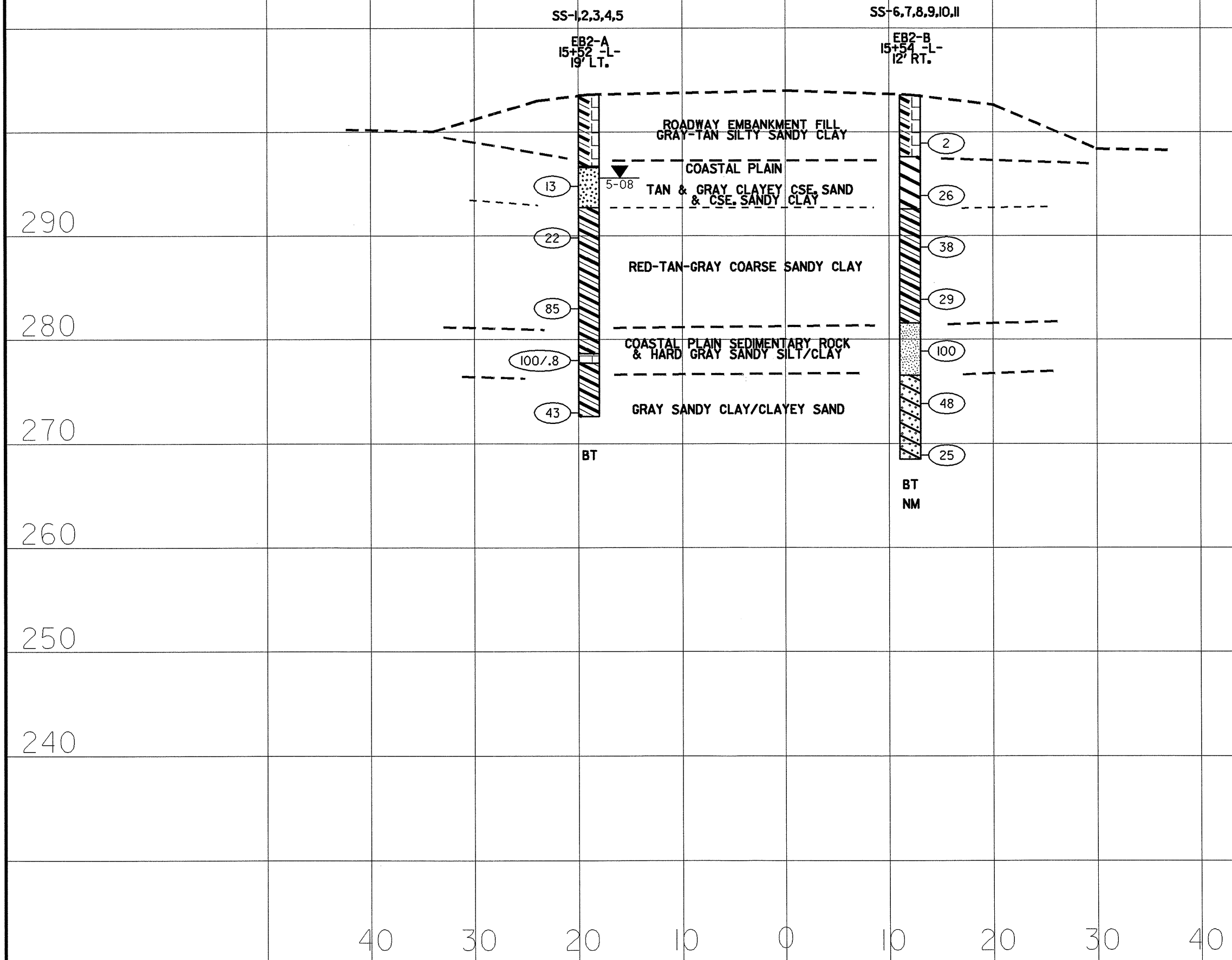
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38

40 30 20 10 0 10 20 30 40

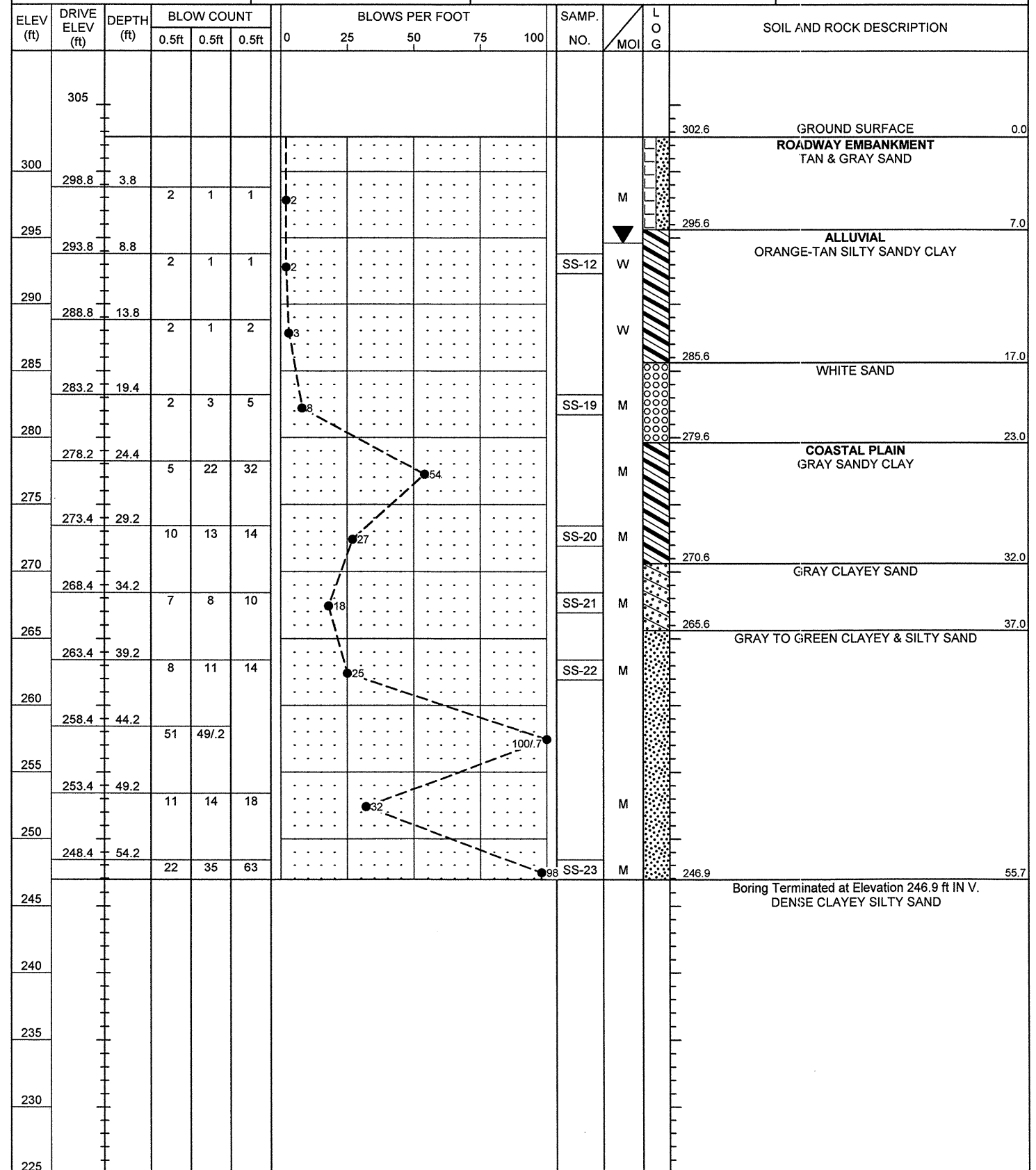
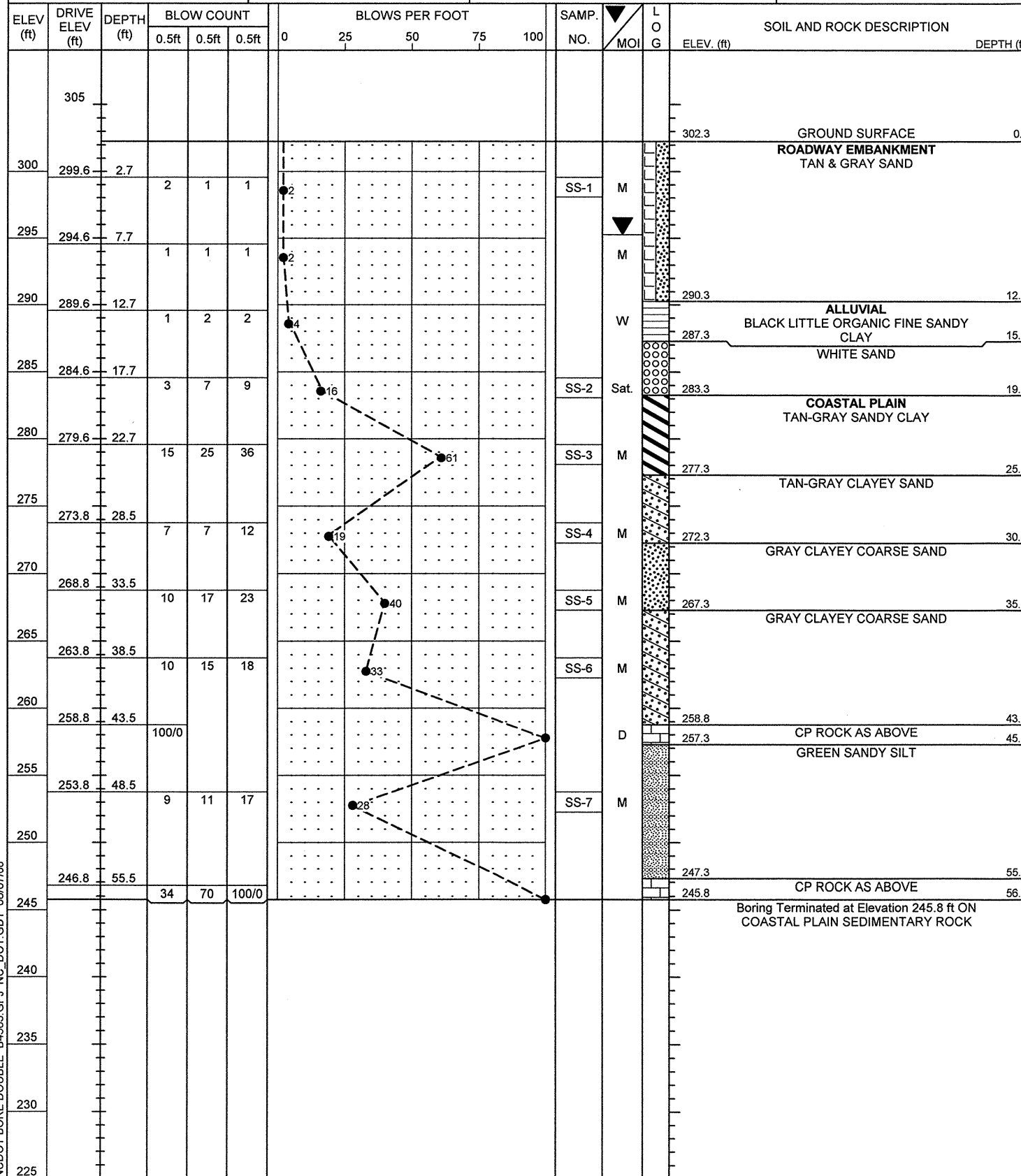


SKEW = 90



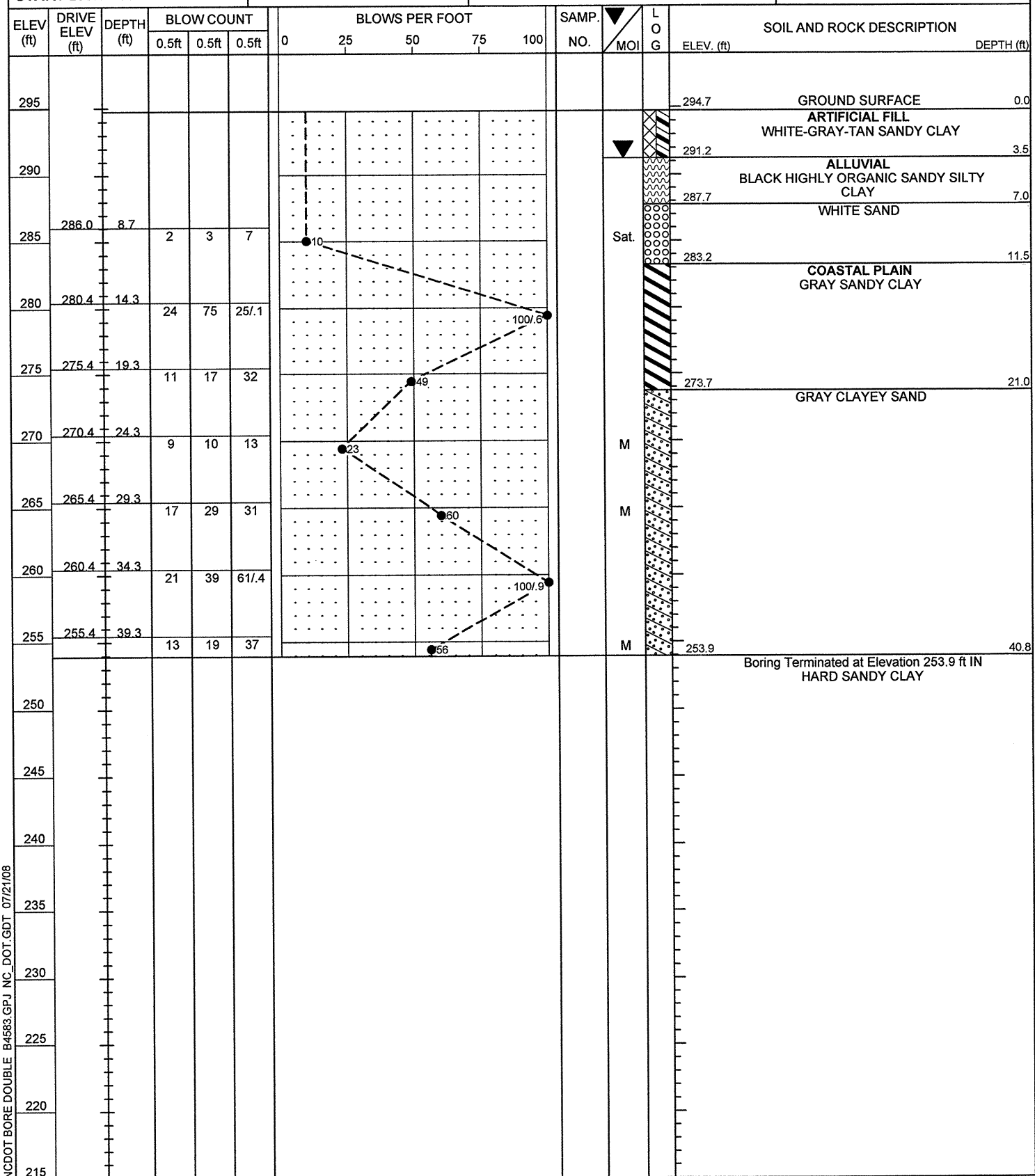
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|--|------------------------------------|-------------------------|-------------------------|
| PROJECT NO. 33784.1.1 | ID. B-4583 | COUNTY MOORE | GEOLOGIST Murray, C. C. |
| SITE DESCRIPTION BRIDGE 176 ON SR 1105 OVER ABERDEEN CREEK | | | GROUND WTR (ft) |
| BORING NO. EB1-A | STATION 13+97 | OFFSET 15ft LT | ALIGNMENT L |
| COLLAR ELEV. 302.3 ft | TOTAL DEPTH 56.5 ft | NORTHING N/A | EASTING N/A |
| DRILL MACHINE CME-550X | DRILL METHOD NW Casing w/ Advancer | HAMMER TYPE Automatic | |
| START DATE 04/08/06 | COMP. DATE 04/08/08 | SURFACE WATER DEPTH N/A | DEPTH TO ROCK 43.5 ft |

| | | | |
|--|------------------------------------|-------------------------|-------------------------|
| PROJECT NO. 33784.1.1 | ID. B-4583 | COUNTY MOORE | GEOLOGIST Murray, C. C. |
| SITE DESCRIPTION BRIDGE 176 ON SR 1105 OVER ABERDEEN CREEK | | | GROUND WTR (ft) |
| BORING NO. EB1-B | STATION 14+13 | OFFSET 16ft RT | ALIGNMENT L |
| COLLAR ELEV. 302.6 ft | TOTAL DEPTH 55.7 ft | NORTHING N/A | EASTING N/A |
| DRILL MACHINE CME-550X | DRILL METHOD NW Casing w/ Advancer | HAMMER TYPE Automatic | |
| START DATE 05/27/08 | COMP. DATE 05/28/08 | SURFACE WATER DEPTH N/A | DEPTH TO ROCK N/A |

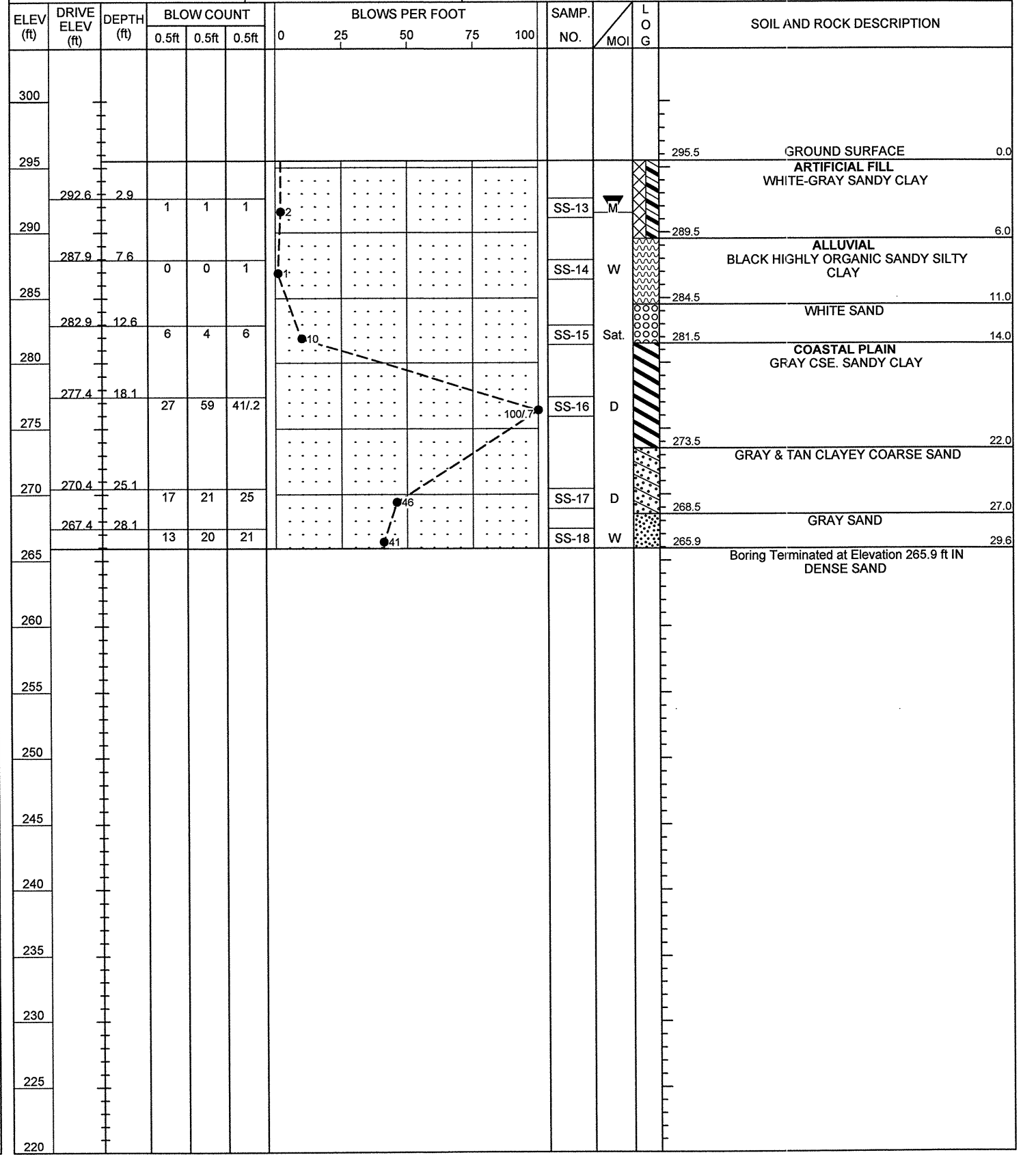


NCDOT BORE DOUBLE B4583.GPJ NC_DOT_GDT 08/07/08

| | | | |
|--|------------------------------------|-------------------------|-------------------------|
| PROJECT NO. 33784.1.1 | ID. B-4583 | COUNTY MOORE | GEOLOGIST Murray, C. C. |
| SITE DESCRIPTION BRIDGE 176 ON SR 1105 OVER ABERDEEN CREEK | | | GROUND WTR (ft) |
| BORING NO. B1-A | STATION 14+62 | OFFSET 20ft LT | ALIGNMENT -L- |
| COLLAR ELEV. 294.7 ft | TOTAL DEPTH 40.8 ft | NORTHING N/A | EASTING N/A |
| DRILL MACHINE CME-550X | DRILL METHOD NW Casing w/ Advancer | HAMMER TYPE Automatic | |
| START DATE 05/29/08 | COMP. DATE 05/29/08 | SURFACE WATER DEPTH N/A | DEPTH TO ROCK N/A |



| | | | |
|--|------------------------------------|-------------------------|-------------------------|
| PROJECT NO. 33784.1.1 | ID. B-4583 | COUNTY MOORE | GEOLOGIST Murray, C. C. |
| SITE DESCRIPTION BRIDGE 176 ON SR 1105 OVER ABERDEEN CREEK | | | GROUND WTR (ft) |
| BORING NO. B1-B | STATION 14+57 | OFFSET 14ft RT | ALIGNMENT -L- |
| COLLAR ELEV. 295.5 ft | TOTAL DEPTH 29.6 ft | NORTHING N/A | EASTING N/A |
| DRILL MACHINE CME-550X | DRILL METHOD NW Casing w/ Advancer | HAMMER TYPE Automatic | |
| START DATE 05/28/08 | COMP. DATE 05/28/08 | SURFACE WATER DEPTH N/A | DEPTH TO ROCK N/A |



NCDOT BORE DOUBLE B4583.GPJ NC_DOT_GDT_07/21/08



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

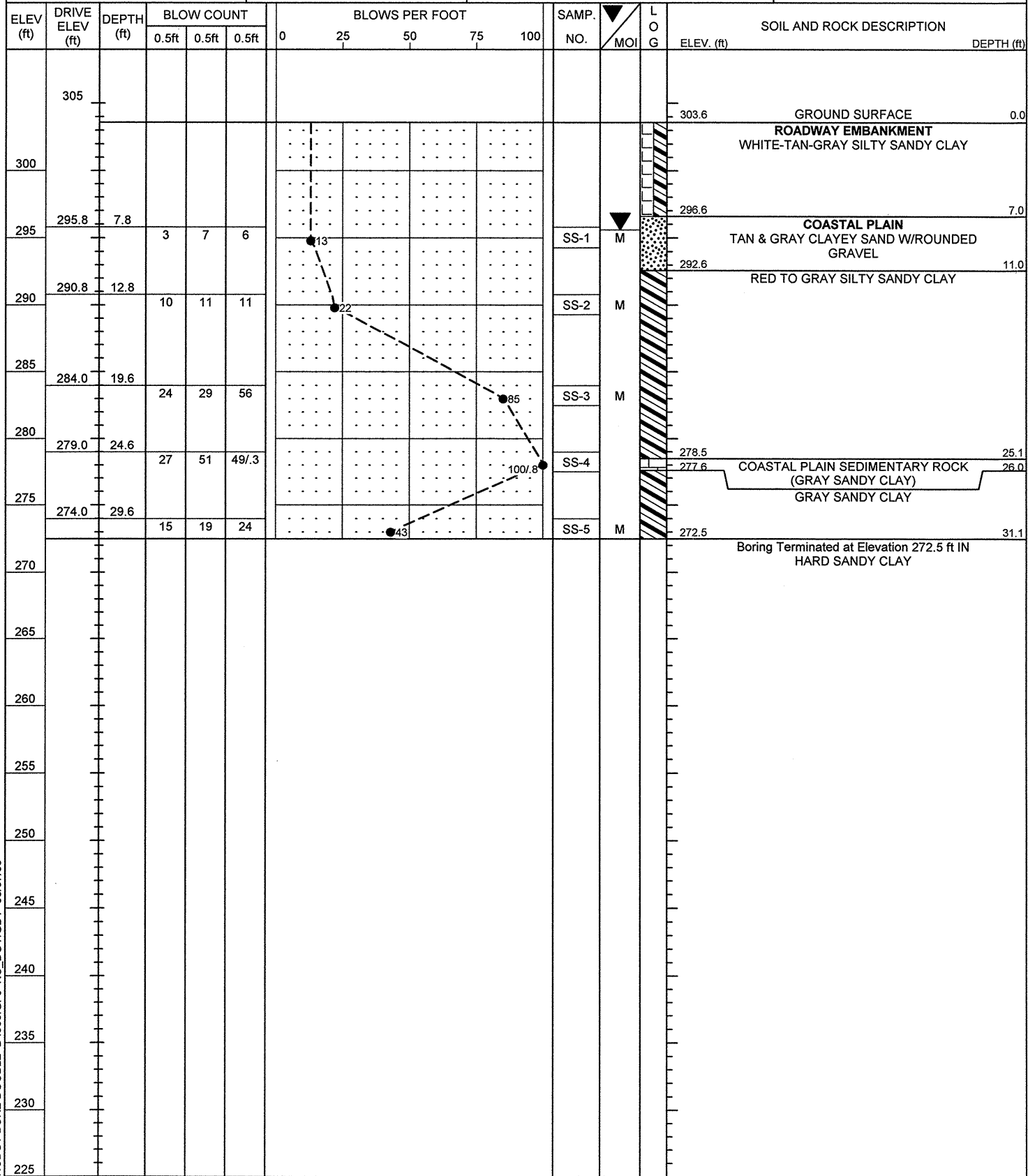
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|--|------------------------------------|-------------------------|-------------------------|
| PROJECT NO. 33784.1.1 | ID. B-4583 | COUNTY MOORE | GEOLOGIST Murray, C. C. |
| SITE DESCRIPTION BRIDGE 176 ON SR 1105 OVER ABERDEEN CREEK | | | GROUND WTR (ft) |
| BORING NO. B2-A | STATION 15+18 | OFFSET 20ft LT | ALIGNMENT L |
| COLLAR ELEV. 297.8 ft | TOTAL DEPTH 41.0 ft | NORTHING N/A | EASTING N/A |
| DRILL MACHINE CME-550X | DRILL METHOD NW Casing w/ Advancer | HAMMER TYPE Automatic | |
| START DATE 05/29/08 | COMP. DATE 05/29/08 | SURFACE WATER DEPTH N/A | DEPTH TO ROCK 15.5 ft |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |
|-----------|-----------------|------------|------------|-------|-------|----------------|----|----|----|-----|-----------|-----|-----|--|------------|
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | | |
| | 300 | | | | | | | | | | | | | GROUND SURFACE | 0.0 |
| 295 | | | | | | | | | | | | | | ARTIFICIAL FILL GRAY-TAN SANDY CLAY | |
| 290 | 289.5 | 8.3 | 2 | 3 | 3 | | | | | | | | | ALLUVIAL WHITE SAND W/THIN LENSES OF BLACK HIGHLY ORGANIC SANDY SILTY CLAY | 7.0 |
| 285 | | | | | | | | | | | | | | COASTAL PLAIN GRAY SILTY FINE SANDY CLAY | 9.7 |
| 280 | 283.3 | 14.5 | 7 | 21 | 79/4 | | | | | | | | | COASTAL PLAIN SEDIMENTARY ROCK (GRAY CLAYEY SANDY SILT) | 15.5 |
| 275 | 278.3 | 19.5 | 44 | 56/4 | | | | | | | | | | GRAY SANDY CLAY | 21.0 |
| 270 | 273.3 | 24.5 | 9 | 23 | 27 | | | | | | | | | GRAY CLAYEY SAND | 28.0 |
| 265 | 268.3 | 29.5 | 8 | 12 | 16 | | | | | | | | | GRAY SAND | 38.0 |
| 260 | 263.3 | 34.5 | 13 | 14 | 14 | | | | | | | | | | |
| 255 | 258.3 | 39.5 | 12 | 19 | 19 | | | | | | | | | Boring Terminated at Elevation 256.8 ft IN DENSE COARSE SAND | 41.0 |

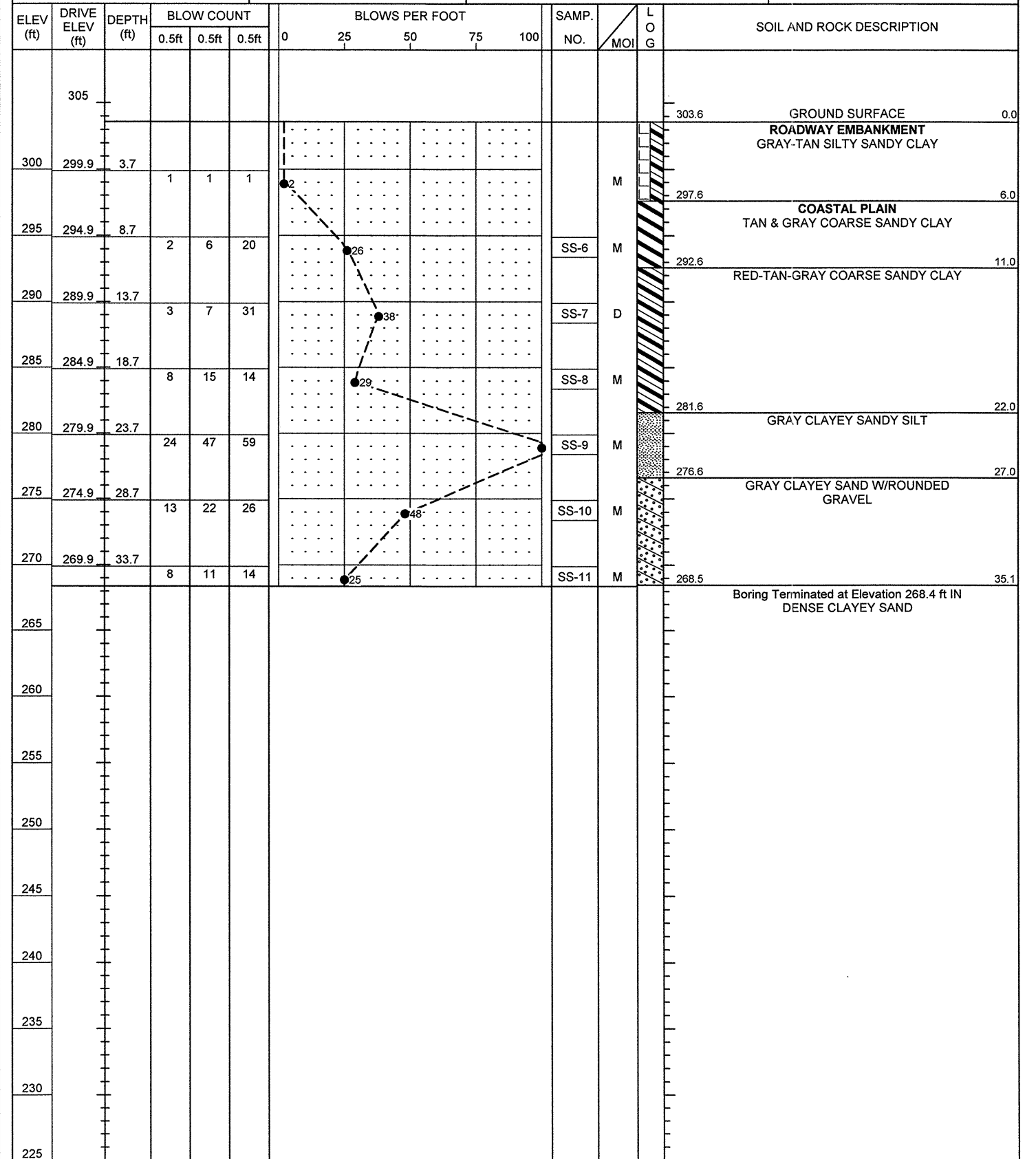
NCDOT BORE DOUBLE B4583.GPJ NC_DOT_GDT_08/07/08



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|--|------------------------------------|-------------------------|-------------------------|
| PROJECT NO. 33784.1.1 | ID. B-4583 | COUNTY MOORE | GEOLOGIST Murray, C. C. |
| SITE DESCRIPTION BRIDGE 176 ON SR 1105 OVER ABERDEEN CREEK | | | GROUND WTR (ft) |
| BORING NO. EB2-A | STATION 15+52 | OFFSET 19ft LT | ALIGNMENT L |
| COLLAR ELEV. 303.6 ft | TOTAL DEPTH 31.1 ft | NORTHING N/A | EASTING N/A |
| DRILL MACHINE CME-550X | DRILL METHOD NW Casing w/ Advancer | HAMMER TYPE Automatic | |
| START DATE 05/14/08 | COMP. DATE 05/14/08 | SURFACE WATER DEPTH N/A | DEPTH TO ROCK 25.1 ft |



| | | | |
|--|--------------------------|-------------------------|-------------------------|
| PROJECT NO. 33784.1.1 | ID. B-4583 | COUNTY MOORE | GEOLOGIST Murray, C. C. |
| SITE DESCRIPTION BRIDGE 176 ON SR 1105 OVER ABERDEEN CREEK | | | GROUND WTR (ft) |
| BORING NO. EB2-B | STATION 15+54 | OFFSET 12ft RT | ALIGNMENT L |
| COLLAR ELEV. 303.6 ft | TOTAL DEPTH 35.2 ft | NORTHING N/A | EASTING N/A |
| DRILL MACHINE CME-550X | DRILL METHOD H.S. Augers | HAMMER TYPE Automatic | |
| START DATE 05/27/08 | COMP. DATE 05/27/08 | SURFACE WATER DEPTH N/A | DEPTH TO ROCK N/A |



NCDOT BORE DOUBLE B4583.GPJ NC_DOT_GDT 08/07/08

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY**

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY**

T. I. P. No. B-4583

T. I. P. No. B-4583

REPORT ON SAMPLES OF SOILS FOR QUALITY

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 3378411 County MOORE Owner _____
 Date: Sampled 5/27/08 Received 6/2/08 Reported 6/4/2008
 Sampled from _____ By C C MURRAY
 Submitted by N WAINAINA 1995 Standard Specifications

Project 3378311 County MOORE Owner _____
 Date: Sampled 5/14/08 Received 5/21/08 Reported 5/23/08
 Sampled from _____ By C C MURRAY
 Submitted by N WAINAINA 1995 Standard Specifications

746357 TO 746380
6/5/08

746260 TO 746264
6/2/08

TEST RESULTS

| Proj. Sample No. | SS-6 | SS-7 | SS-8 | SS-9 | SS-10 | SS-11 |
|--------------------|--------|--------|--------|--------|--------|--------|
| Lab. Sample No. | 746357 | 746358 | 746359 | 746360 | 746361 | 746362 |
| Retained #4 Sieve | % | - | - | - | - | - |
| Passing #10 Sieve | % | 98 | 100 | 100 | 98 | 93 |
| Passing #40 Sieve | % | 67 | 98 | 96 | 83 | 53 |
| Passing #200 Sieve | % | 38 | 62 | 72 | 40 | 28 |

TEST RESULTS

| Proj. Sample No. | SS-1 | SS-2 | SS-3 | SS-4 | SS-5 |
|--------------------|--------|--------|--------|--------|--------|
| Lab. Sample No. | 746260 | 746261 | 746262 | 746263 | 746264 |
| Retained #4 Sieve | % | 3 | - | - | - |
| Passing #10 Sieve | % | 90 | 98 | 98 | 98 |
| Passing #40 Sieve | % | 64 | 84 | 84 | 76 |
| Passing #200 Sieve | % | 23 | 58 | 48 | 39 |

MINUS NO. 10 FRACTION

| SOIL MORTAR - 100% | | | | | | |
|-----------------------|---|------|------|------|------|------|
| Coarse Sand Ret - #60 | % | 49.0 | 4.4 | 8.2 | 32.3 | 52.7 |
| Fine Sand Ret - #270 | % | 13.3 | 41.8 | 26.9 | 32.7 | 16.0 |
| Silt 0.05 - 0.005 mm | % | 3.6 | 19.7 | 28.7 | 14.9 | 6.2 |
| Clay < 0.005 mm | % | 34.1 | 34.1 | 36.1 | 20.1 | 25.1 |
| Passing #40 Sieve | % | - | - | - | - | - |
| Passing #200 Sieve | % | - | - | - | - | - |

MINUS NO. 10 FRACTION

| SOIL MORTAR - 100% | | | | | |
|-----------------------|---|------|------|------|------|
| Coarse Sand Ret - #60 | % | 30.7 | 22.8 | 21.6 | 44.8 |
| Fine Sand Ret - #270 | % | 47.4 | 22.0 | 36.5 | 21.8 |
| Silt 0.05 - 0.005 mm | % | 5.8 | 18.9 | 15.6 | 13.2 |
| Clay < 0.005 mm | % | 16.1 | 36.3 | 26.2 | 20.2 |
| Passing #40 Sieve | % | - | - | - | - |
| Passing #200 Sieve | % | - | - | - | - |

| | | | | | | |
|-----------------------|----------|--------|--------|--------|----------|----------|
| L. L. | 44 | 33 | 33 | 23 | 34 | 38 |
| P. I. | 20 | 15 | 15 | 8 | 14 | 19 |
| AASHTO Classification | A-7-6(3) | A-6(7) | A-6(9) | A-4(0) | A-2-6(1) | A-2-6(1) |
| Station | 15+54 | 15+54 | 15+54 | 15+54 | 15+54 | 15+54 |
| OFFSET | 12 RT | 12 RT | 12 RT | 12 RT | 12 RT | 12 RT |
| ALIGNMENT | L | L | L | L | L | L |
| Depth (Ft) | 8.70 | 13.70 | 18.70 | 23.70 | 28.70 | 33.70 |
| to | 10.20 | 15.20 | 20.20 | 25.20 | 30.20 | 35.20 |
| %ORGANIC | | | | | | |

| | | | | | |
|-----------------------|----------|--------|--------|--------|--------|
| L. L. | 24 | 40 | 31 | 29 | 37 |
| P. I. | 7 | 20 | 11 | 14 | 19 |
| AASHTO Classification | A-2-4(0) | A-6(9) | A-6(2) | A-6(1) | A-6(3) |
| Station | 15+52 | 15+52 | 15+52 | 15+52 | 15+52 |
| OFFSET | 19 LT | 19 LT | 19 LT | 19 LT | 19 LT |
| ALIGNMENT | L | L | L | L | L |
| Depth (Ft) | 7.80 | 12.80 | 19.60 | 24.60 | 29.60 |
| to | 9.30 | 14.30 | 21.10 | 26.10 | 31.10 |

cc: C C MURRAY
Soils File

cc: C C MURRAY
Soils File

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAY
 MATERIALS & TESTS UNIT
 SOILS LABORATORY

T. I. P. No. B-4583

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 3378411 County MOORE Owner _____
 Date: Sampled 5/27/08 Received 6/2/08 Reported 6/4/2008
 Sampled from _____ By C C MURRAY
 Submitted by N WAINAINA 1995 Standard Specifications

746357 TO 746380
 6/5/08

TEST RESULTS

| Proj. Sample No. | SS-18 | SS-19 | SS-20 | SS-21 | SS-22 | SS-23 |
|--------------------|--------|--------|--------|--------|--------|--------|
| Lab. Sample No. | 746369 | 746370 | 746371 | 746372 | 746373 | 746374 |
| Retained #4 Sieve | % - | - | - | - | - | - |
| Passing #10 Sieve | % 98 | 99 | 96 | 96 | 97 | 98 |
| Passing #40 Sieve | % 54 | 35 | 73 | 63 | 53 | 67 |
| Passing #200 Sieve | % 16 | 1 | 39 | 31 | 16 | 31 |

MINUS NO. 10 FRACTION

| SOIL MORTAR - 100% | | | | | | |
|-----------------------|--------|------|------|------|------|------|
| Coarse Sand Ret - #60 | % 67.9 | 88.7 | 41.4 | 50.1 | 65.7 | 45.4 |
| Fine Sand Ret - #270 | % 17.6 | 10.3 | 19.7 | 18.8 | 19.0 | 27.5 |
| Silt 0.05 - 0.005 mm | % 5.5 | 0.0 | 7.8 | 6.0 | 3.3 | 19.1 |
| Clay < 0.005 mm | % 9.0 | 1.0 | 31.1 | 25.1 | 12.0 | 8.0 |
| Passing #40 Sieve | % - | - | - | - | - | - |
| Passing #200 Sieve | % - | - | - | - | - | - |

| | | | | | | |
|-----------------------|----------|----------|--------|----------|----------|----------|
| L. L. | 33 | 23 | 30 | 35 | 38 | 37 |
| P. I. | 9 | NP | 13 | 14 | 10 | 4 |
| AASHTO Classification | A-2-4(0) | A-1-b(0) | A-6(1) | A-2-6(1) | A-2-4(0) | A-2-4(0) |
| Station | 14+57 | 14+13 | 14+13 | 14+13 | 14+13 | 14+13 |
| OFFSET | 14 RT | 16 RT | 16 RT | 16 RT | 16 RT | 16 RT |
| ALIGNMENT | L | L | L | L | L | L |
| Depth (Ft) | 28.10 | 19.40 | 29.20 | 34.20 | 39.20 | 54.20 |
| to | 29.60 | 20.90 | 30.70 | 35.70 | 40.70 | 55.70 |
| %ORGANIC | | | | | | |

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAY
 MATERIALS & TESTS UNIT
 SOILS LABORATORY

T. I. P. No. B-4583

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 3378411 County MOORE Owner _____
 Date: Sampled 5/27/08 Received 6/2/08 Reported 6/4/2008
 Sampled from _____ By C C MURRAY
 Submitted by N WAINAINA 1995 Standard Specifications

746357 TO 746380
 6/5/08

TEST RESULTS

| Proj. Sample No. | SS-12 | SS-13 | SS-14 | SS-15 | SS-16 | SS-17 |
|--------------------|--------|--------|--------|--------|--------|--------|
| Lab. Sample No. | 746363 | 746364 | 746365 | 746366 | 746367 | 746368 |
| Retained #4 Sieve | % - | - | - | - | - | - |
| Passing #10 Sieve | % 97 | 97 | 100 | 95 | 99 | 93 |
| Passing #40 Sieve | % 76 | 71 | 94 | 45 | 69 | 51 |
| Passing #200 Sieve | % 41 | 38 | 64 | 15 | 43 | 31 |

MINUS NO. 10 FRACTION

| SOIL MORTAR - 100% | | | | | | |
|-----------------------|--------|------|------|------|------|------|
| Coarse Sand Ret - #60 | % 35.7 | 40.4 | 13.9 | 68.2 | 43.6 | 60.8 |
| Fine Sand Ret - #270 | % 24.9 | 23.5 | 27.5 | 16.8 | 14.9 | 11.0 |
| Silt 0.05 - 0.005 mm | % 11.2 | 8.0 | 40.6 | 6.0 | 11.4 | 4.0 |
| Clay < 0.005 mm | % 28.1 | 28.1 | 18.1 | 9.0 | 30.1 | 24.1 |
| Passing #40 Sieve | % - | - | - | - | - | - |
| Passing #200 Sieve | % - | - | - | - | - | - |

| | | | | | | |
|-----------------------|--------|--------|-----------|----------|----------|----------|
| L. L. | 32 | 33 | 80 | 19 | 48 | 39 |
| P. I. | 14 | 15 | 15 | 2 | 23 | 17 |
| AASHTO Classification | A-6(2) | A-6(2) | A-7-5(14) | A-1-b(0) | A-7-6(6) | A-2-6(1) |
| Station | 14+13 | 14+57 | 14+57 | 14+57 | 14+57 | 14+57 |
| OFFSET | 16 RT | 14 RT | 14 RT | 14 RT | 14 RT | 14 RT |
| ALIGNMENT | | L | L | L | L | L |
| Depth (Ft) | 8.80 | 2.90 | 7.60 | 12.60 | 18.10 | 25.10 |
| to | 10.30 | 4.40 | 9.10 | 14.10 | 20.60 | 26.60 |
| %ORGANIC | | | 23.7 | | | |

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY**

T. I. P. No. B-4583

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 3378411 **County** MOORE **Owner** _____
Date: Sampled 5/27/08 **Received** 6/2/08 **Reported** 6/4/2008
Sampled from _____ **By** C C MURRAY
Submitted by N WAINAINA **1995 Standard Specifications**

746357 TO 746380
6/5/08

TEST RESULTS

| Proj. Sample No. | SS-24 | SS-25 | SS-26 | SS-27 | SS-28 | SS-29 |
|----------------------|--------|--------|--------|--------|--------|--------|
| Lab. Sample No. | 746375 | 746376 | 746377 | 746378 | 746379 | 746380 |
| Retained #4 Sieve % | - | - | - | - | - | - |
| Passing #10 Sieve % | 99 | 100 | 100 | 98 | 94 | 100 |
| Passing #40 Sieve % | 61 | 97 | 75 | 70 | 59 | 55 |
| Passing #200 Sieve % | 9 | 47 | 37 | 39 | 27 | 14 |

MINUS NO. 10 FRACTION

| SOIL MORTAR - 100% | | | | | | | |
|-------------------------|------|------|------|------|------|------|--|
| Coarse Sand Ret - #60 % | 68.5 | 8.8 | 41.9 | 51.0 | 53.3 | 75.0 | |
| Fine Sand Ret - #270 % | 23.9 | 48.6 | 24.6 | 10.7 | 18.6 | 12.7 | |
| Silt 0.05 - 0.005 mm % | 3.6 | 15.5 | 15.5 | 5.1 | 5.0 | 5.3 | |
| Clay < 0.005 mm % | 4.0 | 27.1 | 18.1 | 33.1 | 23.1 | 7.0 | |
| Passing #40 Sieve % | - | - | - | - | - | - | |
| Passing #200 Sieve % | - | - | - | - | - | - | |

| | | | | | | |
|-----------------------|--------|--------|--------|----------|----------|----------|
| L. L. | 24 | 34 | 23 | 41 | 33 | 36 |
| P. I. | NP | 12 | 8 | 20 | 14 | NP |
| AASHTO Classification | A-3(0) | A-6(3) | A-4(0) | A-7-6(3) | A-2-6(0) | A-2-4(0) |
| Station | 15+18 | 15+18 | 15+18 | 15+18 | 15+18 | 15+18 |
| OFFSET | 20 LT | 20 LT | 20 LT | 20 LT | 20 LT | 20 LT |
| ALIGNMENT | L | L | L | L | L | L |
| Depth (Ft) | 8.30 | 4.50 | 9.50 | 24.50 | 29.50 | 19.60 |
| to | 9.80 | 6.00 | 10.00 | 26.00 | 30.00 | 21.10 |
| %ORGANIC | 1.9 | | | | | |



**FIELD
 SCOUR REPORT**

WBS: 33784 TIP: B-4583 COUNTY: Moore

DESCRIPTION(1): Bridge 176 over Aberdeen Creek on SR 1105

EXISTING BRIDGE

Information from: Field Inspection Microfilm _____ (reel _____ pos: _____)
 Other (explain) _____

Bridge No.: 176 Length: 108' Total Bents: 6 Bents in Channel: 1 Bents in Floodplain: 5
 Foundation Type: _____

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None noted.

Interior Bents: No evidence of scour.

Channel Bed: None

Channel Bank: None

EXISTING SCOUR PROTECTION

Type(3): Timber abutment walls.

Extent(4): _____

Effectiveness(5): Good

Obstructions(6): Large pieces of concrete under existing bridge.

INSTRUCTIONS

- 1 Describe the specific site's location, including route number and body of water crossed.
- 2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
- 3 Note existing scour protection (e.g. rip rap).
- 4 Describe extent of existing scour protection.
- 5 Describe whether or not the scour protection appears to be working.
- 6 Note obstructions such as dams, fallen trees, debris at bents, etc.
- 7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
- 8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
- 9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
- 10 Determine the approximate floodplain width from field observation or a topographic map.
- 11 Describe the material covering the floodplain (e.g. grass, trees, crops).
- 12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
- 13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
- 14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoretical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

DESIGN INFORMATION

Channel Bed Material(7): Sand

Channel Bank Material(8): Alluvial silty clay with some organics.

Channel Bank Cover(9): Trees

Floodplain Width(10): 1000'

Floodplain Cover(11): Trees

Stream is(12): Aggrading _____ Degrading _____ Static

Channel Migration Tendency(13): Minor. To east just upstream; to west under bridge.

Observations and Other Comments: Concrete in channel is reportedly the remains of a dam.

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

| | | 25/50 yr | | | | | | | | | |
|----------|-----|----------|--|--|--|--|--|--|--|--|--|
| Bent One | 287 | | | | | | | | | | |
| Bent Two | 291 | | | | | | | | | | |
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Comparison of DSE to Hydraulics Unit theoretical scour:
DSE is equivalent to theoretical.

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

| | | | | | | | | | | | |
|-------------|--|--|--|--|--|--|--|--|--|--|--|
| Bed or Bank | | | | | | | | | | | |
| Sample No. | | | | | | | | | | | |
| Retained #4 | | | | | | | | | | | |
| Passed #10 | | | | | | | | | | | |
| Passed #40 | | | | | | | | | | | |
| Passed #200 | | | | | | | | | | | |
| Coarse Sand | | | | | | | | | | | |
| Fine Sand | | | | | | | | | | | |
| Silt | | | | | | | | | | | |
| Clay | | | | | | | | | | | |
| LL | | | | | | | | | | | |
| PI | | | | | | | | | | | |
| AASHTO | | | | | | | | | | | |
| Station | | | | | | | | | | | |
| Offset | | | | | | | | | | | |
| Depth | | | | | | | | | | | |

Template Revised 02/07/06

Reported by:
 C. Murray / C. Little

Date: 7/31/2008