

REFERENCE: U-5797

PROJECT: 44367

SEE SHEET 3 FOR PLAN SHEET LAYOUT  
AT TIME OF INVESTIGATION

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

ROADWAY  
SUBSURFACE INVESTIGATION

COUNTY ROBESON  
PROJECT DESCRIPTION SR 1997 (FAYETTEVILLE ROAD)  
FROM FARRINGDOM STREET TO EAST 22ND STREET

PAVEMENT AND SUBGRADE INVESTIGATION

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C.  | U-5797                      | 1         | 13           |

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  - 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.

PERSONNEL

ROSS, S. I.

TRIGON EXP.

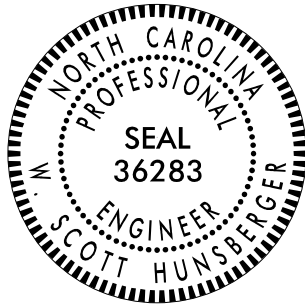
INVESTIGATED BY FALCON ENG.

DRAWN BY HUNSBERGER, W. S.

CHECKED BY CROCKETT, S. C.

SUBMITTED BY FALCON ENG.

DATE OCTOBER 2024



Signed by: W. Scott Hunsberger 12/20/2024

5A469AC809C0ND4P8RE DATE

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**

**GEOTECHNICAL ENGINEERING UNIT**

## *SUBSURFACE INVESTIGATION*

## SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

[illegible]

***ROBESON COUNTY***

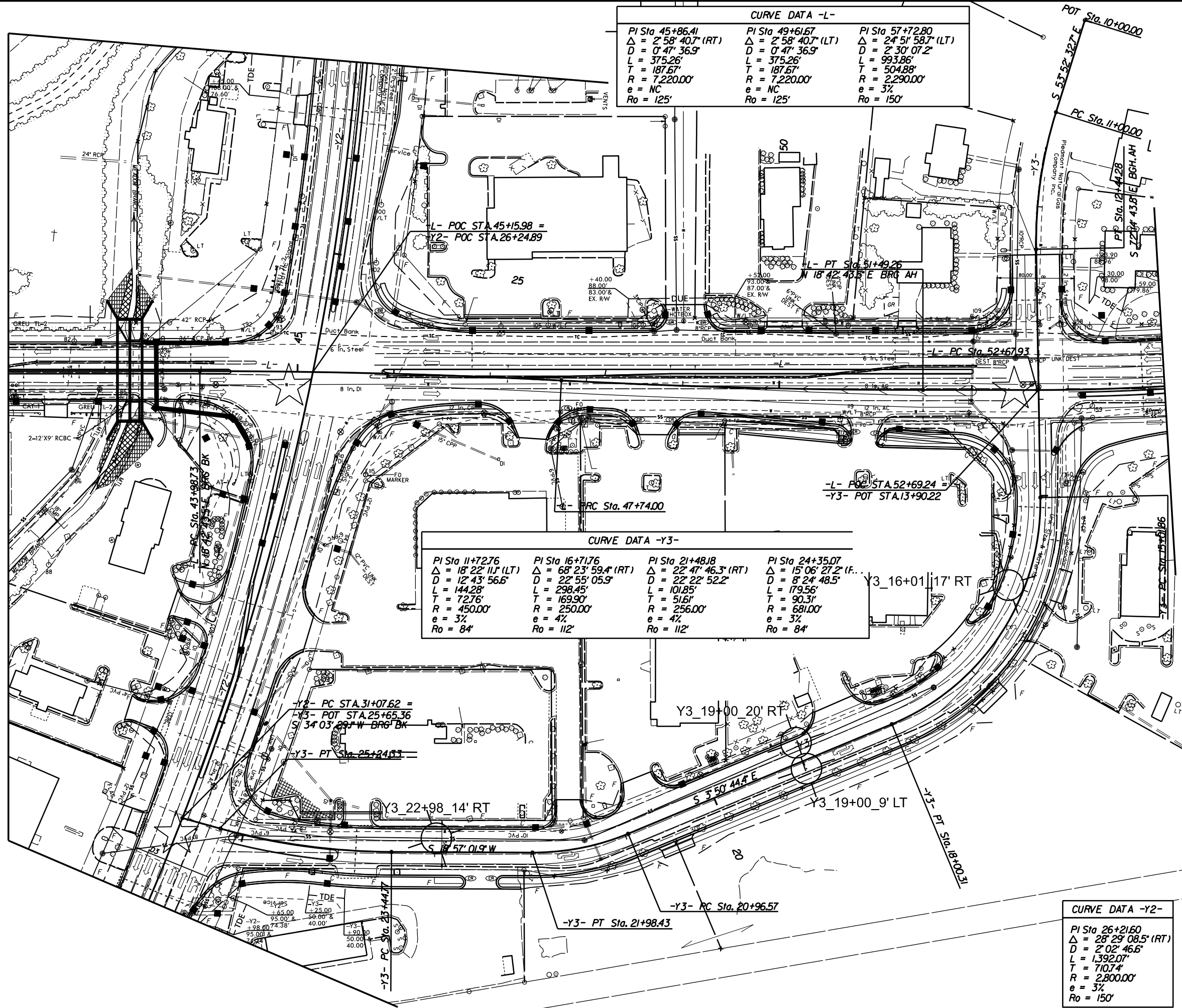
***TYPE OF WORK: GRADING, PAVING, DRAINAGE, CULVERTS, AND SIGNALS***

NAD 83/NA 2011

The seal of the North Carolina Department of Transportation is a circular emblem. It features a stylized map of North Carolina in the center, with the state's coastline and major waterways depicted. The words "STATE OF NORTH CAROLINA" are inscribed along the top inner edge of the circle, and "DEPARTMENT OF TRANSPORTATION" is inscribed along the bottom inner edge.

8/17/99

REVISIONS



| CURVE DATA -L-                                                                                                                                               |                                                                                                                                                              |                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PI Sta 45+86.41<br>$\Delta = 2^\circ 58' 40.7''$ (RT)<br>$D = 0' 47' 36.9''$<br>$L = 375.26'$<br>$T = 187.67'$<br>$R = 7,220.00'$<br>$e = NC$<br>$Ro = 125'$ | PI Sta 49+61.67<br>$\Delta = 2^\circ 58' 40.7''$ (LT)<br>$D = 0' 47' 36.9''$<br>$L = 375.26'$<br>$T = 187.67'$<br>$R = 7,220.00'$<br>$e = NC$<br>$Ro = 125'$ | PI Sta 57+72.80<br>$\Delta = 2^\circ 51' 58.7''$ (LT)<br>$D = 2' 30' 07.2''$<br>$L = 993.86'$<br>$T = 504.88'$<br>$R = 2,290.00'$<br>$e = 3\%$<br>$Ro = 150'$ |

| CURVE DATA -Y3-                                                                                                                                             |                                                                                                                                                               |                                                                                                                                                              |                                                                                                                                                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PI Sta 11+72.76<br>$\Delta = 18^\circ 22' 11.1''$ (LT)<br>$D = 12' 43' 56.6''$<br>$L = 144.28'$<br>$T = 72.76'$<br>$R = 450.00'$<br>$e = 3\%$<br>$Ro = 84'$ | PI Sta 16+71.76<br>$\Delta = 68^\circ 23' 59.4''$ (RT)<br>$D = 22' 55' 05.9''$<br>$L = 298.45'$<br>$T = 169.90'$<br>$R = 250.00'$<br>$e = 4\%$<br>$Ro = 112'$ | PI Sta 21+48.18<br>$\Delta = 22^\circ 47' 46.3''$ (RT)<br>$D = 22' 22' 52.2''$<br>$L = 101.85'$<br>$T = 51.61'$<br>$R = 256.00'$<br>$e = 4\%$<br>$Ro = 112'$ | PI Sta 24+35.07<br>$\Delta = 15^\circ 06' 27.2''$ (F...)<br>$D = 8' 24' 48.5''$<br>$L = 179.56'$<br>$T = 90.31'$<br>$R = 681.00'$<br>$e = 3\%$<br>$Ro = 84'$ |

| CURVE DATA -Y2-                                                                                                                                                  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PI Sta 26+21.60<br>$\Delta = 28^\circ 29' 08.5''$ (RT)<br>$D = 2' 02' 46.6''$<br>$L = 1,392.07'$<br>$T = 710.74'$<br>$R = 2,800.00'$<br>$e = 3\%$<br>$Ro = 150'$ |

|                                                                                                                                                                                                      |  |                       |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------|--|
| PROJECT REFERENCE NO.<br><b>U-5797</b>                                                                                                                                                               |  | SHEET NO.<br><b>4</b> |  |
| RW SHEET NO.                                                                                                                                                                                         |  | HYDRAULICS ENGINEER   |  |
| ROADWAY DESIGN ENGINEER                                                                                                                                                                              |  |                       |  |
| <b>DOCUMENT NOT CONSIDERED FINAL<br/>UNLESS ALL SIGNATURES COMPLETED</b>                                                                                                                             |  |                       |  |
|  STV Engineers, Inc.<br>1600 Perimeter Park Dr.<br>Suite 225<br>Morrisville, NC 27560<br>NC License Number F-0991 |  |                       |  |

NAD 83/2011

★ UPGRADED  
SIGNAL

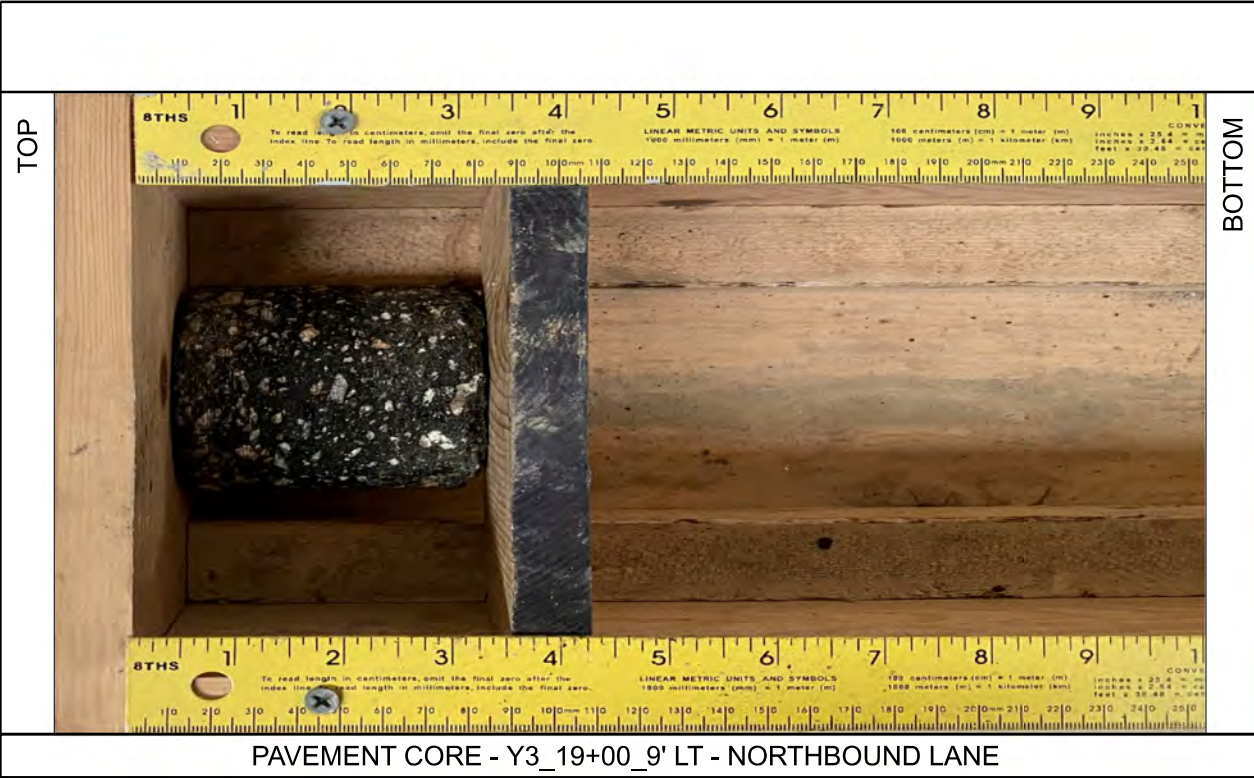




FALCON ENGINEERING, INC.  
1210 TRINITY ROAD, SUITE 110  
CARY, NC 27513  
PHONE: 919.871.0800

PAVEMENT CORE PHOTOGRAPHS

SR 1997 (FAYETTEVILLE ROAD) FROM  
FARRINGDOM STREET TO EAST 22ND STREET  
WBS NO.:44367.1.1 | TIP NO.: U-5797  
FALCON PROJECT NO.: G24042.00



FALCON ENGINEERING, INC.  
1210 TRINITY ROAD, SUITE 110  
CARY, NC 27513  
PHONE: 919.871.0800

PAVEMENT CORE PHOTOGRAPHS

SR 1997 (FAYETTEVILLE ROAD) FROM  
FARRINGDOM STREET TO EAST 22ND STREET  
WBS NO.:44367.1.1 | TIP NO.: U-5797  
FALCON PROJECT NO.: G24042.00



PAVEMENT CORE EVALUATION  
44367.1.1, U-5797, Robeson County

| LINE | STATION         | ABC<br>(in) | LAYER<br>THICKNESS<br>(in) | Lifts | LAYERS  | REMARKS                        |
|------|-----------------|-------------|----------------------------|-------|---------|--------------------------------|
| -Y3- | Y3_1601_17'RT   | -           | 3.50                       | 2     | Surface | Low oxidation                  |
|      | 3.5" Asphalt    |             |                            |       |         |                                |
|      |                 |             |                            |       |         |                                |
| -Y3- | Y3_1900_9' LT   | 5.0         | 2.50                       | 1     | Surface | Core broken at 1.0" in Asphalt |
|      | 2.5" Asphalt    |             |                            |       |         | Low oxidation                  |
|      |                 |             |                            |       |         |                                |
| -Y3- | Y3_1900_20' RT  | -           | 3.50                       | 2     | Surface | Low oxidation                  |
|      | 3.5" Asphalt    |             |                            |       |         |                                |
|      |                 |             |                            |       |         |                                |
| -Y3- | Y3_22+98_14' RT | 4.0         | 3.00                       | 1     | Surface | Low oxidation                  |
|      | 3.0" Asphalt    |             |                            |       |         |                                |
|      |                 |             |                            |       |         |                                |

## PAVEMENT INVESTIGATION DATA SHEET

|          |           |
|----------|-----------|
| Project: | 44367.1.1 |
| TIP:     | U-5797    |

|         |                                                                         |
|---------|-------------------------------------------------------------------------|
| Route:  | Fayetteville Rd (SR 1997) from Farringdom Street to east of 22nd Street |
| County: | Robeson                                                                 |

|           |             |
|-----------|-------------|
| Date:     | 08/07/24    |
| Notes By: | Ross, S. I. |

[illegible]

Notes:

OSL = Outside Lane  
ISL = Inside Lane  
CL = Center Lane  
LTL = Left Turn Lane

CTL = Center Turn Lane  
RTL = Right Turn Lane  
DECEL = Deceleration Lane  
ACCEL = Acceleration Lane

OSS = Outside Shoulder  
ISS = Inside Shoulder  
GM = Grass Median  
OGS = Outside Grass Shoulder

PS = Paved Shoulder  
RT LN = Right Lane  
LT LN = Left Lane  
COL = Collector Lane

RT = Right  
LT = Left  
(I) = Inside  
(O) = Outside

NB = Northbound  
SB = Southbound  
FW = From White  
FY = From Yellow

EOP = Edge of Pavement

CONE PENETROMETER  
DATA CODE SHEET

| CONE PENETROMETER<br>DATA CODE SHEET  |  |             |  |         |  |  |  |  |  | PROJECT NUMBER                        |  |             |  | PROJECT I.D.                   |  |  |  | ROUTE                  |  |  |  |           |  |  |  |
|---------------------------------------|--|-------------|--|---------|--|--|--|--|--|---------------------------------------|--|-------------|--|--------------------------------|--|--|--|------------------------|--|--|--|-----------|--|--|--|
|                                       |  |             |  |         |  |  |  |  |  | U-5797                                |  |             |  | 44367.1.1                      |  |  |  | (-Y3-) BOOMERANG DRIVE |  |  |  |           |  |  |  |
|                                       |  |             |  |         |  |  |  |  |  | COUNTY                                |  |             |  | GEOLOGIST                      |  |  |  | TECHNICIANS            |  |  |  |           |  |  |  |
|                                       |  |             |  |         |  |  |  |  |  | Robeson                               |  |             |  | Ross, S. I.                    |  |  |  |                        |  |  |  |           |  |  |  |
| Station (location) information        |  |             |  |         |  |  |  |  |  | Date run                              |  |             |  | Station (location) information |  |  |  |                        |  |  |  | Date run  |  |  |  |
| Y3_16+01_17' RT                       |  |             |  |         |  |  |  |  |  | 6/20/2024                             |  |             |  | Y3_19+00_20' RT                |  |  |  |                        |  |  |  | 6/20/2024 |  |  |  |
| Datum                                 |  | cut or fill |  | Remarks |  |  |  |  |  | Datum                                 |  | cut or fill |  | Remarks                        |  |  |  |                        |  |  |  |           |  |  |  |
| Soil Subgrade                         |  | Fill        |  |         |  |  |  |  |  | Soil Subgrae                          |  | Fill        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| Cumulative Penetration in Centimeters |  |             |  |         |  |  |  |  |  | Cumulative Penetration in Centimeters |  |             |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 0.3                                   |  | 24.4        |  | 89.2    |  |  |  |  |  | 0.4                                   |  | 21.3        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 2.0                                   |  | 25.0        |  | 90.9    |  |  |  |  |  | 1.5                                   |  | 22.4        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 2.5                                   |  | 25.5        |  | 92.5    |  |  |  |  |  | 2.6                                   |  | 23.4        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 3.0                                   |  | 26.0        |  | 93.9    |  |  |  |  |  | 3.8                                   |  | 24.4        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 3.5                                   |  | 26.5        |  |         |  |  |  |  |  | 4.1                                   |  | 25.4        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 4.0                                   |  | 27.0        |  |         |  |  |  |  |  | 4.4                                   |  | 26.4        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 4.7                                   |  | 27.9        |  |         |  |  |  |  |  | 4.7                                   |  | 27.5        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 5.0                                   |  | 28.9        |  |         |  |  |  |  |  | 5.0                                   |  | 28.6        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 5.3                                   |  | 30.0        |  |         |  |  |  |  |  | 5.4                                   |  | 29.7        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 5.6                                   |  | 31.5        |  |         |  |  |  |  |  | 5.6                                   |  | 30.2        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 5.9                                   |  | 33.1        |  |         |  |  |  |  |  | 5.8                                   |  | 30.7        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 6.3                                   |  | 35.3        |  |         |  |  |  |  |  | 6.0                                   |  | 31.2        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 6.5                                   |  | 37.2        |  |         |  |  |  |  |  | 6.2                                   |  | 31.7        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 6.7                                   |  | 39.0        |  |         |  |  |  |  |  | 6.4                                   |  | 32.3        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 6.9                                   |  | 40.4        |  |         |  |  |  |  |  | 6.6                                   |  | 32.9        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 7.1                                   |  | 41.6        |  |         |  |  |  |  |  | 6.8                                   |  | 33.5        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 7.6                                   |  | 42.9        |  |         |  |  |  |  |  | 7.4                                   |  | 34.1        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 7.9                                   |  | 44.2        |  |         |  |  |  |  |  | 7.6                                   |  | 34.7        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 8.2                                   |  | 45.7        |  |         |  |  |  |  |  | 7.8                                   |  | 35.3        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 8.5                                   |  | 47.2        |  |         |  |  |  |  |  | 8.0                                   |  | 36.0        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 8.8                                   |  | 49.0        |  |         |  |  |  |  |  | 8.2                                   |  | 36.7        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 9.3                                   |  | 51.0        |  |         |  |  |  |  |  | 8.4                                   |  | 37.4        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 9.6                                   |  | 52.0        |  |         |  |  |  |  |  | 8.6                                   |  | 38.2        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 9.9                                   |  | 53.1        |  |         |  |  |  |  |  | 8.8                                   |  | 39.0        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 10.2                                  |  | 53.7        |  |         |  |  |  |  |  | 9.0                                   |  | 39.8        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 10.5                                  |  | 54.3        |  |         |  |  |  |  |  | 9.2                                   |  | 40.6        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 11.1                                  |  | 54.9        |  |         |  |  |  |  |  | 9.9                                   |  | 41.5        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 11.5                                  |  | 55.5        |  |         |  |  |  |  |  | 10.1                                  |  | 42.7        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 11.9                                  |  | 56.2        |  |         |  |  |  |  |  | 10.3                                  |  | 44.0        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 12.3                                  |  | 56.8        |  |         |  |  |  |  |  | 10.5                                  |  | 44.8        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 12.7                                  |  | 57.4        |  |         |  |  |  |  |  | 10.7                                  |  | 46.7        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 13.1                                  |  | 58.0        |  |         |  |  |  |  |  | 10.9                                  |  | 48.0        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 13.5                                  |  | 58.6        |  |         |  |  |  |  |  | 11.1                                  |  | 49.4        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 14.3                                  |  | 59.5        |  |         |  |  |  |  |  | 11.3                                  |  | 51.0        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 14.8                                  |  | 60.4        |  |         |  |  |  |  |  | 11.5                                  |  | 52.6        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 15.3                                  |  | 61.3        |  |         |  |  |  |  |  | 11.7                                  |  | 55.1        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 15.8                                  |  | 62.2        |  |         |  |  |  |  |  | 12.7                                  |  | 57.6        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 16.6                                  |  | 63.1        |  |         |  |  |  |  |  | 13.0                                  |  | 60.2        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 17.0                                  |  | 64.3        |  |         |  |  |  |  |  | 13.3                                  |  | 63.1        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 17.4                                  |  | 65.7        |  |         |  |  |  |  |  | 13.6                                  |  | 67.0        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 17.8                                  |  | 67.2        |  |         |  |  |  |  |  | 13.9                                  |  | 71.2        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 18.2                                  |  | 68.5        |  |         |  |  |  |  |  | 14.2                                  |  | 75.7        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 19.0                                  |  | 69.9        |  |         |  |  |  |  |  | 14.5                                  |  | 84.9        |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 19.4                                  |  | 71.5        |  |         |  |  |  |  |  | 15.4                                  |  |             |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 19.8                                  |  | 73.2        |  |         |  |  |  |  |  | 15.8                                  |  |             |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 20.2                                  |  | 75.1        |  |         |  |  |  |  |  | 16.2                                  |  |             |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 20.6                                  |  | 77.1        |  |         |  |  |  |  |  | 16.6                                  |  |             |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 21.0                                  |  | 78.9        |  |         |  |  |  |  |  | 17.0                                  |  |             |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 21.4                                  |  | 80.8        |  |         |  |  |  |  |  | 17.7                                  |  |             |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 22.0                                  |  | 82.6        |  |         |  |  |  |  |  | 18.3                                  |  |             |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 22.6                                  |  | 84.4        |  |         |  |  |  |  |  | 18.9                                  |  |             |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 23.2                                  |  | 86.0        |  |         |  |  |  |  |  | 19.5                                  |  |             |  |                                |  |  |  |                        |  |  |  |           |  |  |  |
| 23.8                                  |  | 87.6        |  |         |  |  |  |  |  | 20.4                                  |  |             |  |                                |  |  |  |                        |  |  |  |           |  |  |  |

SG = Subgrade  
SS = Stabilized Soil  
ABC = Aggregate Base Course

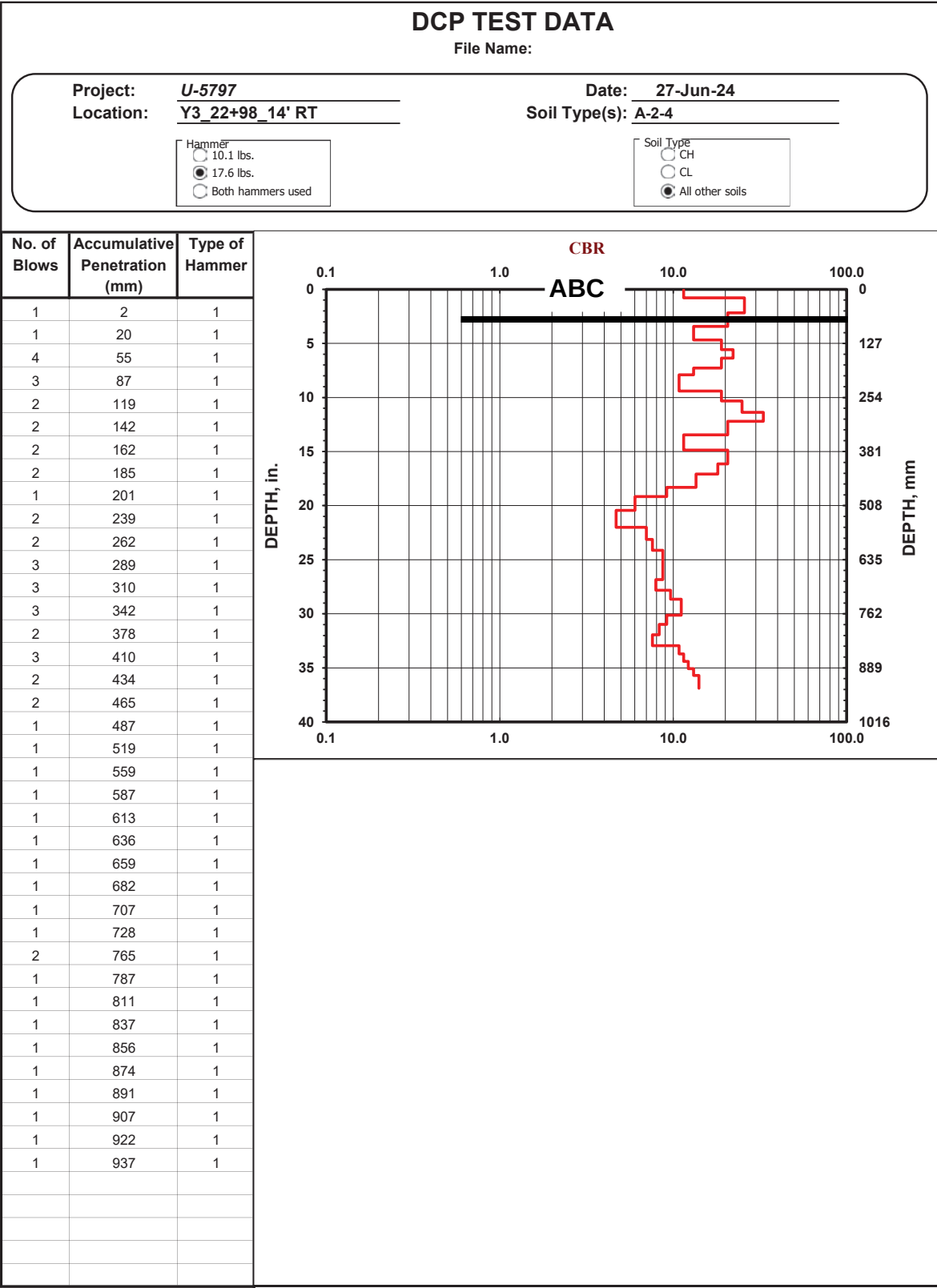
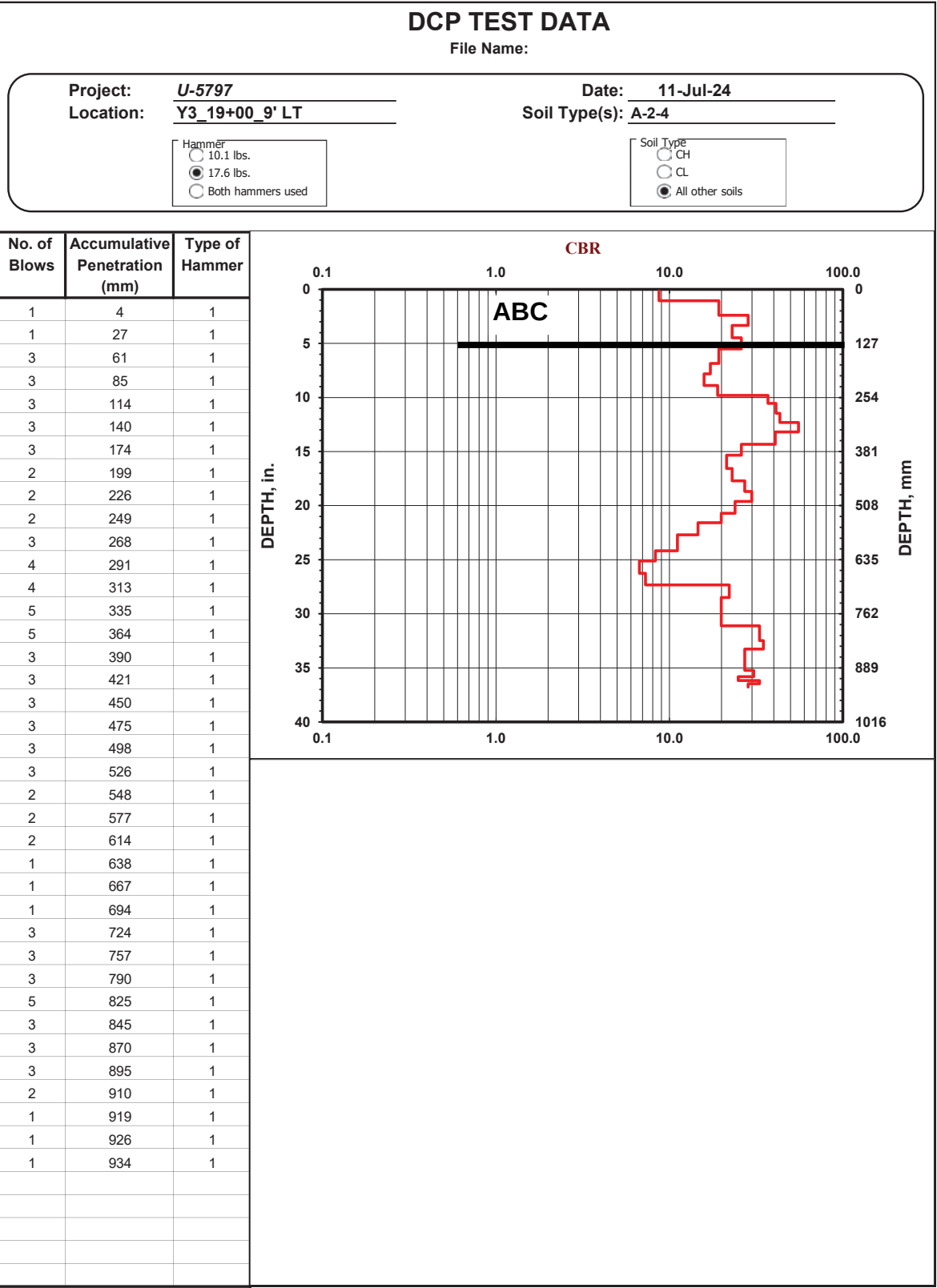
CONE PENETROMETER  
DATA CODE SHEET

| CONE PENETROMETER<br>DATA CODE SHEET  |  |             |  |         |  |  |  |  |  | PROJECT NUMBER                        |  |             |  | PROJECT I.D.                   |  |  |  | ROUTE                  |  |           |  |  |  |
|---------------------------------------|--|-------------|--|---------|--|--|--|--|--|---------------------------------------|--|-------------|--|--------------------------------|--|--|--|------------------------|--|-----------|--|--|--|
|                                       |  |             |  |         |  |  |  |  |  | U-5797                                |  |             |  | 44367.1.1                      |  |  |  | (-Y3-) BOOMERANG DRIVE |  |           |  |  |  |
|                                       |  |             |  |         |  |  |  |  |  | COUNTY                                |  |             |  | GEOLOGIST                      |  |  |  | TECHNICIANS            |  |           |  |  |  |
|                                       |  |             |  |         |  |  |  |  |  | Robeson                               |  |             |  | Ross, S. I.                    |  |  |  |                        |  |           |  |  |  |
| Station (location) information        |  |             |  |         |  |  |  |  |  | Date run                              |  |             |  | Station (location) information |  |  |  |                        |  | Date run  |  |  |  |
| Y3_19+00_9' LT                        |  |             |  |         |  |  |  |  |  | 6/20/2024                             |  |             |  | Y3_22+98_14' RT                |  |  |  |                        |  | 6/20/2024 |  |  |  |
| Datum                                 |  | cut or fill |  | Remarks |  |  |  |  |  | Datum                                 |  | cut or fill |  | Remarks                        |  |  |  |                        |  |           |  |  |  |
| ABC                                   |  | Fill        |  |         |  |  |  |  |  | ABC                                   |  | Fill        |  |                                |  |  |  |                        |  |           |  |  |  |
| Cumulative Penetration in Centimeters |  |             |  |         |  |  |  |  |  | Cumulative Penetration in Centimeters |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 0.4                                   |  | 45.8        |  |         |  |  |  |  |  | 0.2                                   |  | 81.1        |  |                                |  |  |  |                        |  |           |  |  |  |
| 2.7                                   |  | 46.6        |  |         |  |  |  |  |  | 2.0                                   |  | 83.7        |  |                                |  |  |  |                        |  |           |  |  |  |
| 3.8                                   |  | 47.5        |  |         |  |  |  |  |  | 2.8                                   |  | 85.6        |  |                                |  |  |  |                        |  |           |  |  |  |
| 4.9                                   |  | 48.2        |  |         |  |  |  |  |  | 3.6                                   |  | 87.4        |  |                                |  |  |  |                        |  |           |  |  |  |
| 6.1                                   |  | 48.9        |  |         |  |  |  |  |  | 4.4                                   |  | 89.1        |  |                                |  |  |  |                        |  |           |  |  |  |
| 6.9                                   |  | 49.8        |  |         |  |  |  |  |  | 5.5                                   |  | 90.7        |  |                                |  |  |  |                        |  |           |  |  |  |
| 7.7                                   |  | 50.7        |  |         |  |  |  |  |  | 6.5                                   |  | 92.2        |  |                                |  |  |  |                        |  |           |  |  |  |
| 8.5                                   |  | 51.6        |  |         |  |  |  |  |  | 7.5                                   |  | 93.7        |  |                                |  |  |  |                        |  |           |  |  |  |
| 9.4                                   |  | 52.6        |  |         |  |  |  |  |  | 8.7                                   |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 10.3                                  |  | 53.7        |  |         |  |  |  |  |  | 10.3                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 11.4                                  |  | 54.8        |  |         |  |  |  |  |  | 11.9                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 12.2                                  |  | 56.2        |  |         |  |  |  |  |  | 13.0                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 13.0                                  |  | 57.7        |  |         |  |  |  |  |  | 14.2                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 14.0                                  |  | 59.5        |  |         |  |  |  |  |  | 15.2                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 15.1                                  |  | 63.8        |  |         |  |  |  |  |  | 16.2                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 16.2                                  |  | 66.7        |  |         |  |  |  |  |  | 17.3                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 17.4                                  |  | 69.4        |  |         |  |  |  |  |  | 18.5                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 18.6                                  |  | 70.4        |  |         |  |  |  |  |  | 20.1                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 19.9                                  |  | 71.4        |  |         |  |  |  |  |  | 22.0                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 21.2                                  |  | 72.4        |  |         |  |  |  |  |  | 23.9                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 22.6                                  |  | 73.5        |  |         |  |  |  |  |  | 25.0                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 23.7                                  |  | 74.6        |  |         |  |  |  |  |  | 26.2                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 24.9                                  |  | 75.7        |  |         |  |  |  |  |  | 27.1                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 25.5                                  |  | 76.8        |  |         |  |  |  |  |  | 28.0                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 26.1                                  |  | 77.9        |  |         |  |  |  |  |  | 28.9                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 26.8                                  |  | 79.0        |  |         |  |  |  |  |  | 29.6                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 27.4                                  |  | 79.7        |  |         |  |  |  |  |  | 30.3                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 28.0                                  |  | 80.4        |  |         |  |  |  |  |  | 31.0                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 28.6                                  |  | 81.1        |  |         |  |  |  |  |  | 32.0                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 29.1                                  |  | 81.8        |  |         |  |  |  |  |  | 33.0                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 29.6                                  |  | 82.5        |  |         |  |  |  |  |  | 34.2                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 30.1                                  |  | 83.1        |  |         |  |  |  |  |  | 36.0                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 30.6                                  |  | 83.7        |  |         |  |  |  |  |  | 37.8                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 31.3                                  |  | 84.5        |  |         |  |  |  |  |  | 38.8                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 31.7                                  |  | 85.3        |  |         |  |  |  |  |  | 39.8                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 32.1                                  |  | 86.1        |  |         |  |  |  |  |  | 41.0                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 32.5                                  |  | 87.0        |  |         |  |  |  |  |  | 42.2                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 32.9                                  |  | 87.8        |  |         |  |  |  |  |  | 43.4                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 33.5                                  |  | 88.6        |  |         |  |  |  |  |  | 44.9                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 34.0                                  |  | 89.5        |  |         |  |  |  |  |  | 46.5                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 34.5                                  |  | 90.2        |  |         |  |  |  |  |  | 48.7                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 35.0                                  |  | 91.0        |  |         |  |  |  |  |  | 51.9                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 35.5                                  |  | 91.9        |  |         |  |  |  |  |  | 55.9                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 36.4                                  |  | 92.6        |  |         |  |  |  |  |  | 58.7                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 37.2                                  |  | 93.4        |  |         |  |  |  |  |  | 61.3                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 38.0                                  |  |             |  |         |  |  |  |  |  | 63.6                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 39.0                                  |  |             |  |         |  |  |  |  |  | 65.9                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 40.0                                  |  |             |  |         |  |  |  |  |  | 68.2                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 41.0                                  |  |             |  |         |  |  |  |  |  | 70.7                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 42.1                                  |  |             |  |         |  |  |  |  |  | 72.8                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 43.0                                  |  |             |  |         |  |  |  |  |  | 74.6                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 43.9                                  |  |             |  |         |  |  |  |  |  | 76.5                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |
| 45.0                                  |  |             |  |         |  |  |  |  |  | 78.7                                  |  |             |  |                                |  |  |  |                        |  |           |  |  |  |

SG = Subgrade  
SS = Stabilized Soil  
ABC = Aggregate Base Course









**LABORATORY TEST RESULTS**  
**Fayetteville Road Proposed Widening from Farringdom Street to 22nd Street**  
**Lumberton, NC**  
**NCDOT Project: U-5797**  
**Falcon Engineering Project No: G24042.00**

| NO.   | SAMPLE<br>LOCATION      | DEPTH<br>INTERVAL | AASHTO<br>CLASS. | ATTERBERG LIMITS |    | PERCENT BY WEIGHT |        |      |      | PERCENT PASSING SIEVE |     |      | MOISTURE<br>(%) | SPECIFIC<br>GRAVITY | ORGANICS<br>(%) |
|-------|-------------------------|-------------------|------------------|------------------|----|-------------------|--------|------|------|-----------------------|-----|------|-----------------|---------------------|-----------------|
|       |                         |                   |                  | LL               | PI | C.SAND            | F.SAND | SILT | CLAY | #10                   | #40 | #200 |                 |                     |                 |
| BS-01 | Y3_19+00_20' RT & 9' LT | 1.0-3.0           | A-4(0)           | 19               | 5  | 24                | 45     | 12   | 19   | 100                   | 86  | 37   | 10              | 2.604               | N/A             |
| S-01  | Y3_16+01_17' RT         | 1.0-2.5           | A-2-4(0)         | 17               | 3  | 37                | 38     | 7    | 18   | 100                   | 77  | 29   | 10              | N/A                 | N/A             |
| S-02  | Y3_19+00_9' RT          | 1.0-2.0           | A-4(0)           | 18               | 3  | 23                | 45     | 12   | 20   | 100                   | 86  | 37   | 11              | N/A                 | N/A             |
| S-03  | Y3_19+00_20' RT         | 1.0-3.0           | A-2-4(0)         | 19               | 5  | 31                | 40     | 11   | 18   | 100                   | 81  | 33   | 10              | N/A                 | N/A             |
| S-04  | Y3_22+98_14' RT         | 4.0-5.0           | A-7-6(15)        | 48               | 30 | 4                 | 44     | 14   | 38   | 100                   | 98  | 61   | 18              | N/A                 | N/A             |

**Reviewed By**



FALCON ENGINEERING, INC.  
1210 TRINITY ROAD, SUITE 110  
CARY, NC 27513  
PHONE: 919.871.0800  
www.falconengineers.com

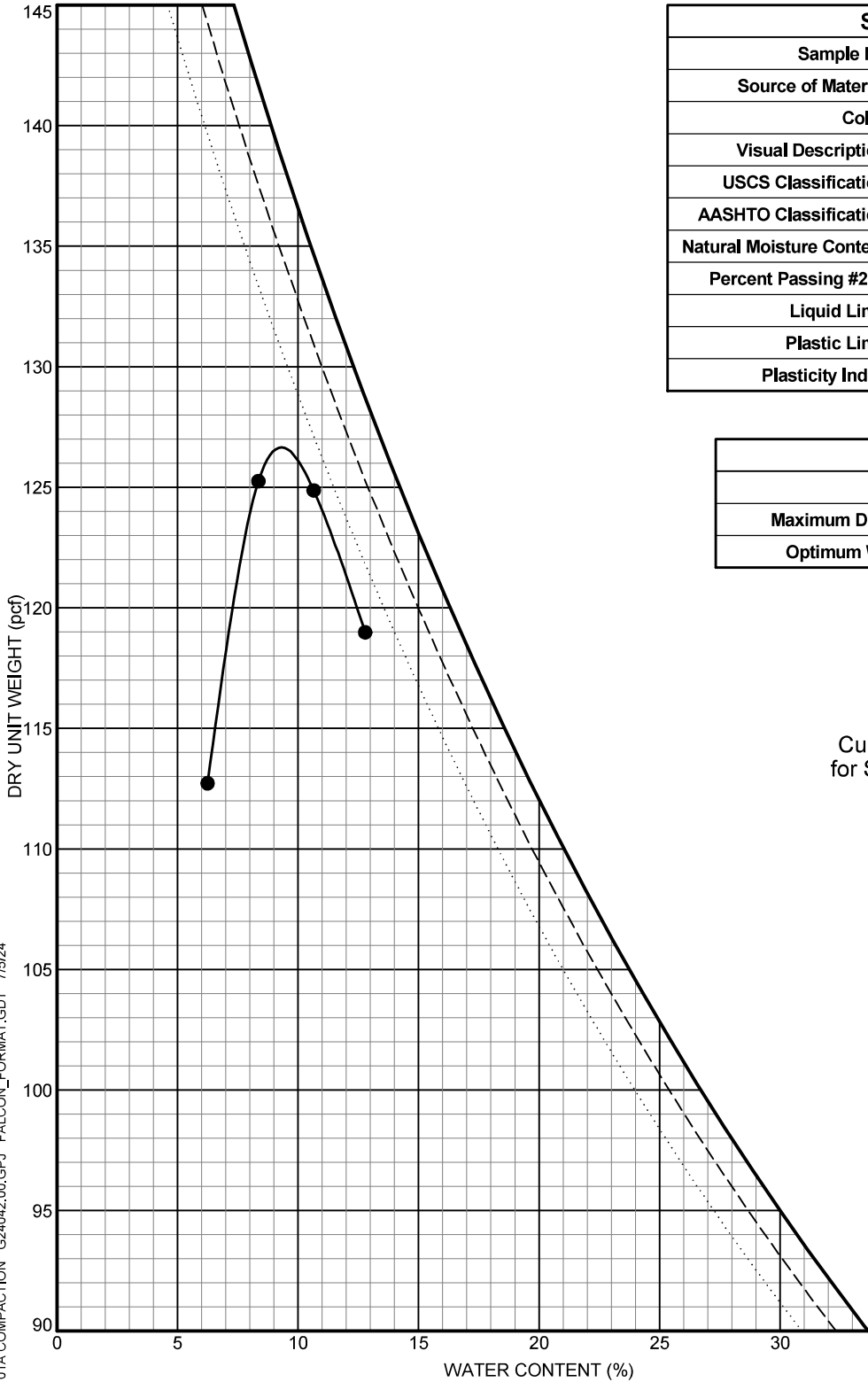
LABORATORY COMPACTION TEST RESULTS

PAGE 1 OF 1

Project No.: G24042.00  
Project Name: U-5797  
Project Location: Lumberton, NC

| SPECIMEN DATA             |                                    |
|---------------------------|------------------------------------|
| Sample No:                | BS-01                              |
| Source of Material:       | Y3_19+00_20' RT AND Y3_19+00_9' LT |
| Color:                    | Gray                               |
| Visual Description:       |                                    |
| USCS Classification:      | SILTY, CLAYEY SAND(SC-SM)          |
| AASHTO Classification:    | A-4                                |
| Natural Moisture Content: | 10.4 %                             |
| Percent Passing #200:     | 36.9 %                             |
| Liquid Limit:             | 19                                 |
| Plastic Limit:            | 14                                 |
| Plasticity Index:         | 5                                  |

| TEST RESULTS             |             |
|--------------------------|-------------|
| Test Method:             | AASHTO T-99 |
| Maximum Dry Unit Weight: | 126.7 pcf   |
| Optimum Water Content:   | 9.3 %       |



FALCON ENGINEERING, INC.  
1210 TRINITY ROAD, SUITE 110  
CARY, NC 27513  
PHONE: 919.871.0800  
www.falconengineers.com

CALIFORNIA BEARING RATIO TEST RESULTS  
ASTM D1883 / AASHTO T193

|                                               |  |                                                 |  |                                              |  |
|-----------------------------------------------|--|-------------------------------------------------|--|----------------------------------------------|--|
| Project No.: G24042.00                        |  | Tested By: J. Grabner                           |  | Test Date: 2024-15-07                        |  |
| Project Name: U-5797                          |  |                                                 |  |                                              |  |
| Boring ID: Y3_19+00_20' RT AND Y3_19+00_9' LT |  | Sample ID: BS-01                                |  | Sample Depth: 1.0-3.0 ft                     |  |
| MOLDED SPECIMEN TEST DATA                     |  |                                                 |  |                                              |  |
| Wt. of Mold + Wet Soil: 21111 g               |  | Moisture Content Before Molding                 |  | After Molding                                |  |
| Wt. of Mold: 16478 g                          |  | Tare Wt.: 201.30 g                              |  | 184.80 g                                     |  |
| Wt. of Wet Soil: 4633 g                       |  | Wt. Tare + Wet Soil: 585.90 g                   |  | 916.20 g                                     |  |
| Mold Volume: 0.0752 cf                        |  | Wt. Tare + Dry Soil: 553.40 g                   |  | 853.10 g                                     |  |
| Wet Unit Weight: 135.8 pcf                    |  | Moisture Content: 9.2%                          |  | 9.4%                                         |  |
| Dry Unit Weight: 124.2 pcf                    |  | Average Moisture Content: 9.3%                  |  | Conversion Factors                           |  |
|                                               |  |                                                 |  | 1 lb = 453.6 gram 1 cu. foot = 1728 cu. inch |  |
| LOAD TEST DATA                                |  |                                                 |  |                                              |  |
| Penetration (in)                              |  | Load (lb)                                       |  | Stress (psi)                                 |  |
| 0.000                                         |  | 0                                               |  | 0.0                                          |  |
| 0.025                                         |  | 127                                             |  | 42.4                                         |  |
| 0.050                                         |  | 248                                             |  | 82.7                                         |  |
| 0.075                                         |  | 406                                             |  | 135.4                                        |  |
| 0.100                                         |  | 548                                             |  | 182.7                                        |  |
| 0.125                                         |  | 683                                             |  | 227.8                                        |  |
| 0.150                                         |  | 817                                             |  | 272.4                                        |  |
| 0.175                                         |  | 947                                             |  | 315.8                                        |  |
| 0.200                                         |  | 1072                                            |  | 357.5                                        |  |
| 0.225                                         |  | 1178                                            |  | 392.8                                        |  |
| 0.250                                         |  | 1268                                            |  | 422.8                                        |  |
| 0.275                                         |  | 1365                                            |  | 455.2                                        |  |
| 0.300                                         |  | 1455                                            |  | 485.2                                        |  |
| 0.400                                         |  | 1790                                            |  | 596.9                                        |  |
| 0.500                                         |  | 2082                                            |  | 694.3                                        |  |
| Readings After Soak                           |  | Additional Specimen Data                        |  |                                              |  |
| Wt. Mold + Soaked Soil: 21150 g               |  | Liquid Limit: 19 Percent Passing #4: %          |  |                                              |  |
| Wt. Tare: 6 g                                 |  | Plastic Limit: 14 Percent Passing #10: 100%     |  |                                              |  |
| Wt. Wet Soil + Tare: 176 g                    |  | Plasticity Index: 5 Percent Passing #40: 86%    |  |                                              |  |
| Wt. Tare + Dry Soil: 161 g                    |  | Percent Passing #200: 36.9%                     |  |                                              |  |
| Moisture Content: 9.8%                        |  |                                                 |  |                                              |  |
| Wet Unit Weight: 137.0 pcf                    |  |                                                 |  |                                              |  |
| Dry Unit Weight: 124.8 pcf                    |  |                                                 |  |                                              |  |
| BEARING RATIO                                 |  | Color: Gray                                     |  |                                              |  |
| CBR at 0.1 inch: 18.3                         |  | Visual Description:                             |  |                                              |  |
| CBR at 0.2 inch: 23.8                         |  | USCS Classification: SILTY, CLAYEY SAND (SC-SM) |  |                                              |  |
|                                               |  | AASHTO Classification: A-4 (0)                  |  |                                              |  |



REFERENCE: U-5797

PROJECT: 44367

SEE SHEET 2A FOR PLAN SHEET LAYOUT  
AT TIME OF INVESTIGATION

CONTENTS

| LINE | STATION             | PLAN    | PROFILE |
|------|---------------------|---------|---------|
| -L-  | 20+38.00 - 87+20.00 | 4-9     | 12-14   |
| -Y2- | 15+60.00 - 37+15.00 | 6,10,11 | 15      |
| -Y3- | 12+50.00 - 25+65.36 | 6       | 16      |
| -Y4- | 10+00.00 - 17+07.80 | 8       | 17      |
| -Y5- | 10+00.00 - 11+50.00 | 9       | 17      |

APPENDICES

| APPENDIX | TITLE                  | SHEETS |
|----------|------------------------|--------|
| A        | PAVEMENT INVESTIGATION | 18-35  |
| B        | LABORATORY RESULTS     | 36-39  |

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

ROADWAY  
SUBSURFACE INVESTIGATION

COUNTY ROBESON  
PROJECT DESCRIPTION FAYETTEVILLE ROAD (SR 1997)  
FROM EAST OF 22nd STREET TO FARRINGDOM  
STREET

INVENTORY

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C.  | U-5797                      | 1         | 42           |

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) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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, NOR THE INTERPRETATIONS MADE, OR 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 THE 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.

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

PERSONNEL

CAROLINA DRILLING

WEIS, J.M.

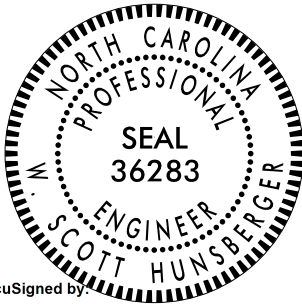
INVESTIGATED BY FALCON ENG.

DRAWN BY HILL, M.J.

CHECKED BY HUNSBERGER, W.S.

SUBMITTED BY FALCON ENG.

DATE MARCH 2019



DocuSigned by:

W. Scott Hunsberger

5A469AC80FCD49E...

3/5/2019

SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

## SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

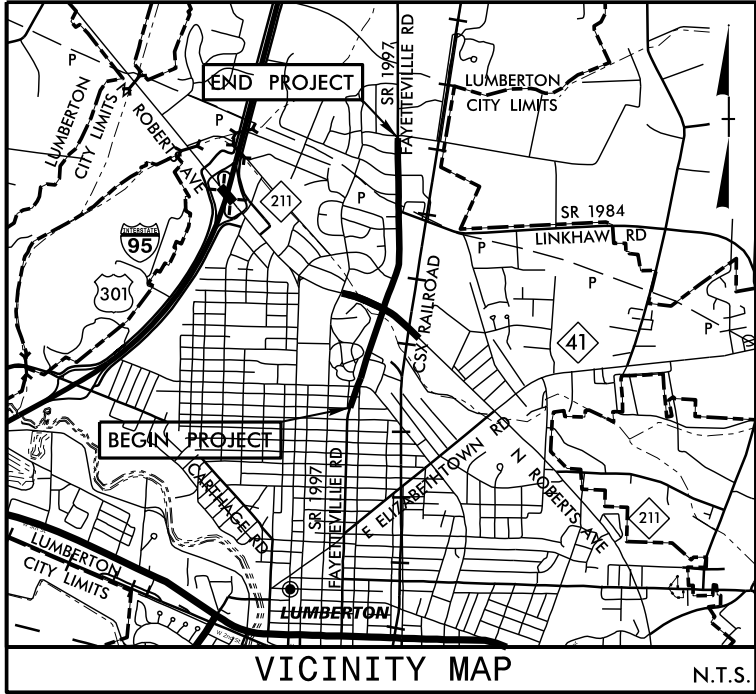
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09/28/2017 10:04:00 AM 17057.00 STV U-5797 Fayetteville Road\GEO\_PDWY\CADD\_GEO\TECH\PlanProf\U5797\_GEO\_tsh.dgn

TIP PROJECT: U-5797

CONTRACT: 44367



N.T.S.

25% PRELIMINARY PLANS

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

ROBESON COUNTY

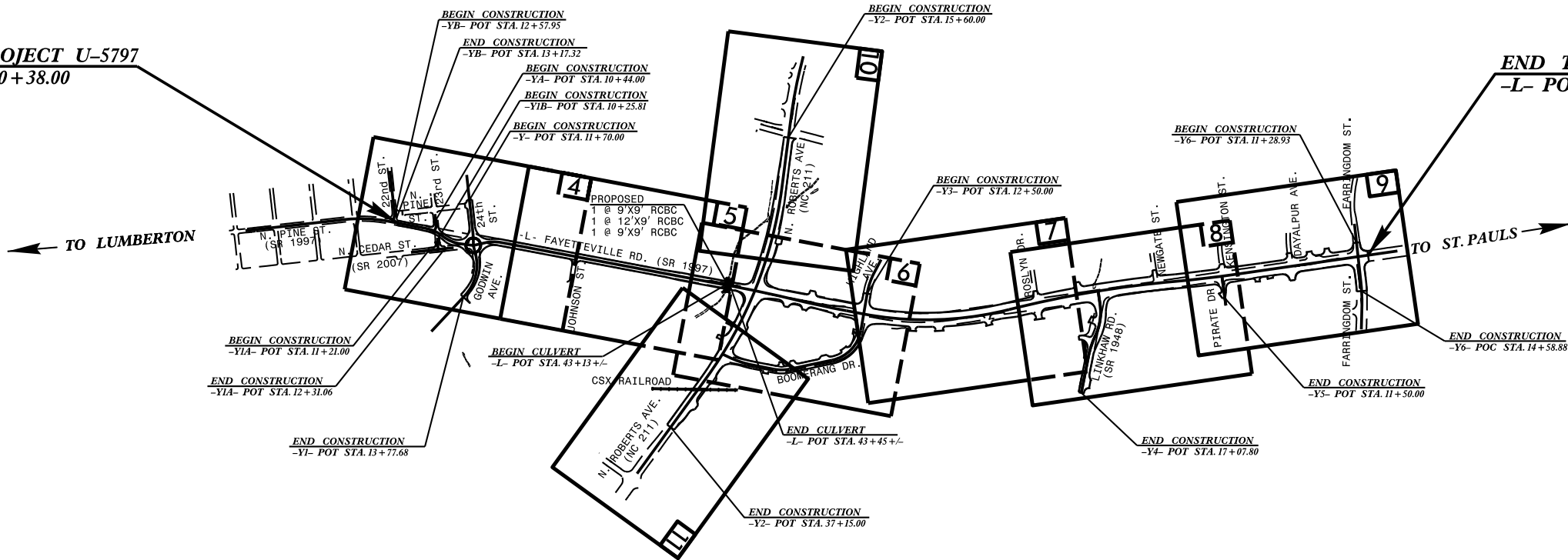
LOCATION: FAYETTEVILLE ROAD (SR 1997) FROM EAST OF  
22nd STREET TO FARRINGDOM STREET

TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND CULVERTS



BEGIN TIP PROJECT U-5797  
-L- POT STA. 20+38.00

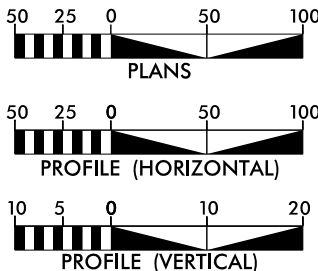
END TIP PROJECT U-5797  
-L- POT STA. 87+20.00



THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF LUMBERTON.  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO  
THE LIMITS ESTABLISHED BY METHOD \_\_\_\_.

INCOMPLETE PLANS  
DO NOT USE FOR R/W ACQUISITION  
DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2020 = 31,800  
ADT 2040 = 38,800  
K = 55 %  
D = 9 %  
T = 4 % \*  
V = 50 MPH  
\* TTST = 3% DUAL = 1%  
FUNC CLASS =  
URBAN ARTERIAL

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT U-5797 = 1.260 MILES  
LENGTH OF STRUCTURE TIP PROJECT U-5797 = 0.006 MILES  
TOTAL LENGTH OF TIP PROJECT U-5797 = 1.266 MILES

NCDOT CONTACT: CRAIG A. FREEMAN JR., PE  
NCDOT DIVISION 6

PLANS PREPARED FOR THE NCDOT BY:

STV ENGINEERS, INC.

1600 Perimeter Park Drive, Ste 225, Morrisville, NC 27560  
NC License Number F-0991

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
NOVEMBER 15, 2018

LETTING DATE:  
AUGUST 6, 2020

PATRICK A. LIVINGSTON, PE  
PROJECT ENGINEER

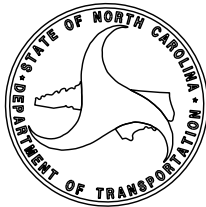
WESTON D. MURPHY, EI  
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN  
ENGINEER

SIGNATURE: P.E.





Roadway Subsurface Investigation Report - Inventory

**Fayetteville Road (SR 1997) From East of 22<sup>nd</sup> Street to Farringdom Street**  
**Robeson County, North Carolina**  
**WBS: 44367.1.1, TIP: U-5797**  
**Falcon Project No.: G17057.00**

**Prepared for:**  
STV Engineers, Inc.  
1500 Perimeter Park Drive, Suite 200  
Morrisville, NC 27560

Submitted by:  
Falcon Engineering, Inc.  
1210 Trinity Road, Suite 110  
Cary, North Carolina 27513  
(919) 871-0800  
www.falconengineers.com

March 5, 2019

**TIP:** U-5797  
**WBS:** 44367.1.1  
**COUNTY:** Robeson  
**DESCRIPTION:** Fayetteville Road (SR 1997) From East of 22nd Street to Farringdom Street  
  
**SUBJECT:** Roadway Subsurface Investigation – Inventory

PROJECT DESCRIPTION

This project consists of 1.26 miles of proposed widening and intersection improvements on Fayetteville Road in Lumberton in Robeson County. Fayetteville Road will be widened from east of 22<sup>nd</sup> Street to Farringdom Street. The intersection of Fayetteville Road and Godwin Avenue will be converted to a new roundabout. Boomerang Drive will be improved to facilitate additional traffic while eliminating left turns from Fayetteville Road onto Roberts Avenue. In addition to the roadway widening, two reinforced concrete box culverts will be constructed. Tie-ins and minor improvements to Y-lines and small drives are also included at various locations.

The investigation was conducted between October 24<sup>th</sup> and November 7<sup>th</sup>, 2018 in general accordance with our Scope and Fee Estimate for Geotechnical Investigation and Engineering Services. The information provided in this report is based solely on our site reconnaissance, soil test borings and laboratory test data, engineering evaluation of these data, and generally accepted soil and foundation engineering practices and principles.

A total of forty four (44) Standard Penetration Test (SPT) and five (5) hand auger borings were drilled for the proposed roadway alignments and culverts. All mechanical borings were drilled using a CME 55 ATV mounted drill rig equipped with mud rotary drilling equipment, and SPT testing was performed with an automatic hammer. Representative soil samples, collected with a split-barrel sampler were selected for laboratory testing to verify visual field classifications. In addition, bulk samples were collected for standard Proctor compaction and California Bearing Ratio (CBR) testing.





Portions of the following alignments, totaling approximately 2.1 miles were investigated. Other minor Y-lines and driveways are included on the project but improvements are not anticipated to be significant enough to warrant investigation.

| <u>Alignment</u>         | <u>Station (ft)</u> |
|--------------------------|---------------------|
| -L- (Fayetteville Road)  | 20+38 to 87+20      |
| -Y2- (N. Roberts Avenue) | 15+60 to 37+15      |
| -Y3- (Boomerang Drive)   | 12+50 to 25+65      |
| -Y4- (Linkhaw Road)      | 10+00 to 17+08      |
| -Y5- (Pirate Drive)      | 10+00 to 11+50      |

AREAS OF SPECIAL GEOTECHNICAL INTEREST

- I. The following locations encountered groundwater within six feet of the proposed subgrade:

| <u>Alignment</u> | <u>Station (ft)</u> |
|------------------|---------------------|
| -L-              | 25+55               |
| -L-              | 26+64               |
| -L-              | 69+89               |
| -Y4-             | 12+03               |
| -Y4-             | 14+00               |

- II. The following locations contain very soft to soft/very loose soils with an N-value less than 4 near the ground surface:

| <u>Alignment</u> | <u>Station (ft)</u> |
|------------------|---------------------|
| -L-              | 42+91               |
| -L-              | 43+07               |
| -L-              | 73+83               |
| -L-              | 77+71               |
| -L-              | 82+24               |
| -L-              | 84+03               |
| -Y2-             | 34+35               |

PHYSIOGRAPHY AND GEOLOGY

The project site is in the Coastal Plain Physiographic Province of North Carolina. According to the **Geologic Map of North Carolina** (1985), the site is underlain by one major geologic unit in the Coastal Plain Physiographic Province. The primary unit is the Duplin Formation (**Tpy**) of the Tertiary Period.

The Duplin Formation is noted to consist of shelly, bluish gray medium- to coarse-grained sand, sandy marl, and limestone.

Existing site topography is flat in the general project vicinity, typical of this area of the Coastal Plain. Drainage swales and ditches parallel existing roadway alignments, and carry roadway drainage toward various natural drainage features. Meadow Branch Creek runs from the northwest to the southwest of the corridor crossing under both Fayetteville Road and Roberts Avenue.







SOIL PROPERTIES

A variety of soils were encountered along the project, including existing Roadway Embankments and Undivided Coastal Plain soils.

Roadway Embankment soils were encountered at the ground surface beneath and adjacent to existing roadways. These soils consist of up to 3 feet of moist, loose, clayey sand (A-2-6).

Undivided Coastal Plain soils were encountered at ground surface or beneath the roadway embankment fills. These soils consist of moist to saturated, very loose to medium dense, clean, silty and clayey sand (A-2-4, A-2-6, A-2-7, A-3) and very soft to very stiff, sandy silt and sandy and silty clay (A-4, A-6, A-7).

GROUNDWATER PROPERTIES

Groundwater levels were measured at the time of boring completion, and in many cases after a waiting period of at least 24 hours. Borings drilled within and in close proximity to existing roadways, and within residential or commercial areas were backfilled immediately after completion due to safety considerations.

Detailed groundwater measurements are included in the attached subsurface profiles and cross sections, and noted areas of shallow groundwater are included in the Areas of Special Geotechnical Interest earlier in this report.

ADDITIONAL LABORATORY TESTING

The following bulk samples were obtained:

| <u>Sample</u> | <u>Location</u>     | <u>Depth (ft)</u> | <u>Test</u>                                |
|---------------|---------------------|-------------------|--------------------------------------------|
| BS-1          | 26+64, 25' RT, -L-  | 3.5 – 8.5         | California Bearing Ratio, Standard Proctor |
| BS-2          | 77+71, 54' LT, -L-  | 1.0 – 5.0         | California Bearing Ratio, Standard Proctor |
| BS-3          | 15+00, 27' LT, -Y3- | 3.5 – 8.5         | California Bearing Ratio, Standard Proctor |

Classification test results for bulk samples are included in the subsurface profiles and cross sections and Standard Proctor and California Bearing Ratio (CBR) data is attached in the Appendix.

CLOSING

Falcon appreciates the opportunity to have provided our geotechnical engineering services for the above referenced project. If you have any questions concerning the contents of this report or need additional information, please do not hesitate to contact our office.

FALCON ENGINEERING, INC.

Report Prepared By:

Report Reviewed By:

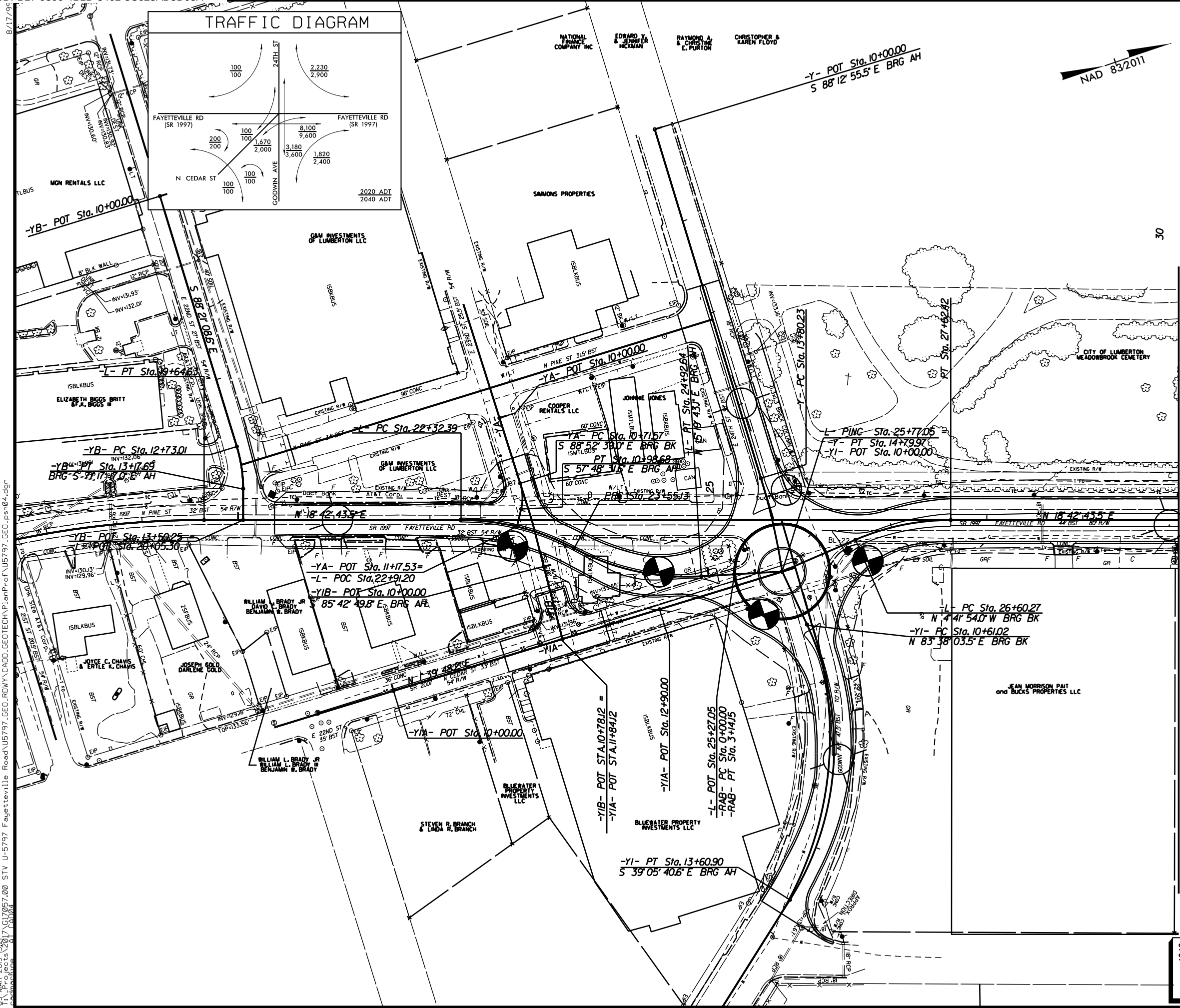
W. Scott Hunsberger, PE  
Geotechnical Engineer

Jeremy R. Hamm, PE  
Geotechnical Engineering Manager



|                                                                                     |  |                                                                                                                   |  |
|-------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------|--|
| PROJECT REFERENCE NO.                                                               |  | SHEET NO.                                                                                                         |  |
| U-5797                                                                              |  | 4                                                                                                                 |  |
| RW SHEET NO.                                                                        |  |                                                                                                                   |  |
| ROADWAY DESIGN ENGINEER                                                             |  | HYDRAULICS ENGINEER                                                                                               |  |
| <div>INCOMPLETE PLANS<br/>DO NOT USE FOR R/W ACQUISITION</div>                      |  |                                                                                                                   |  |
| DOCUMENT NOT CONSIDERED FINAL<br>UNLESS ALL SIGNATURES COMPLETED                    |  |                                                                                                                   |  |
|  |  | STV Engineers, Inc.<br>1600 Perimeter Park Dr.<br>Suite 225<br>Morrisville, NC 27560<br>No. License Number F-0991 |  |

PAVEMENT REMOVAL 

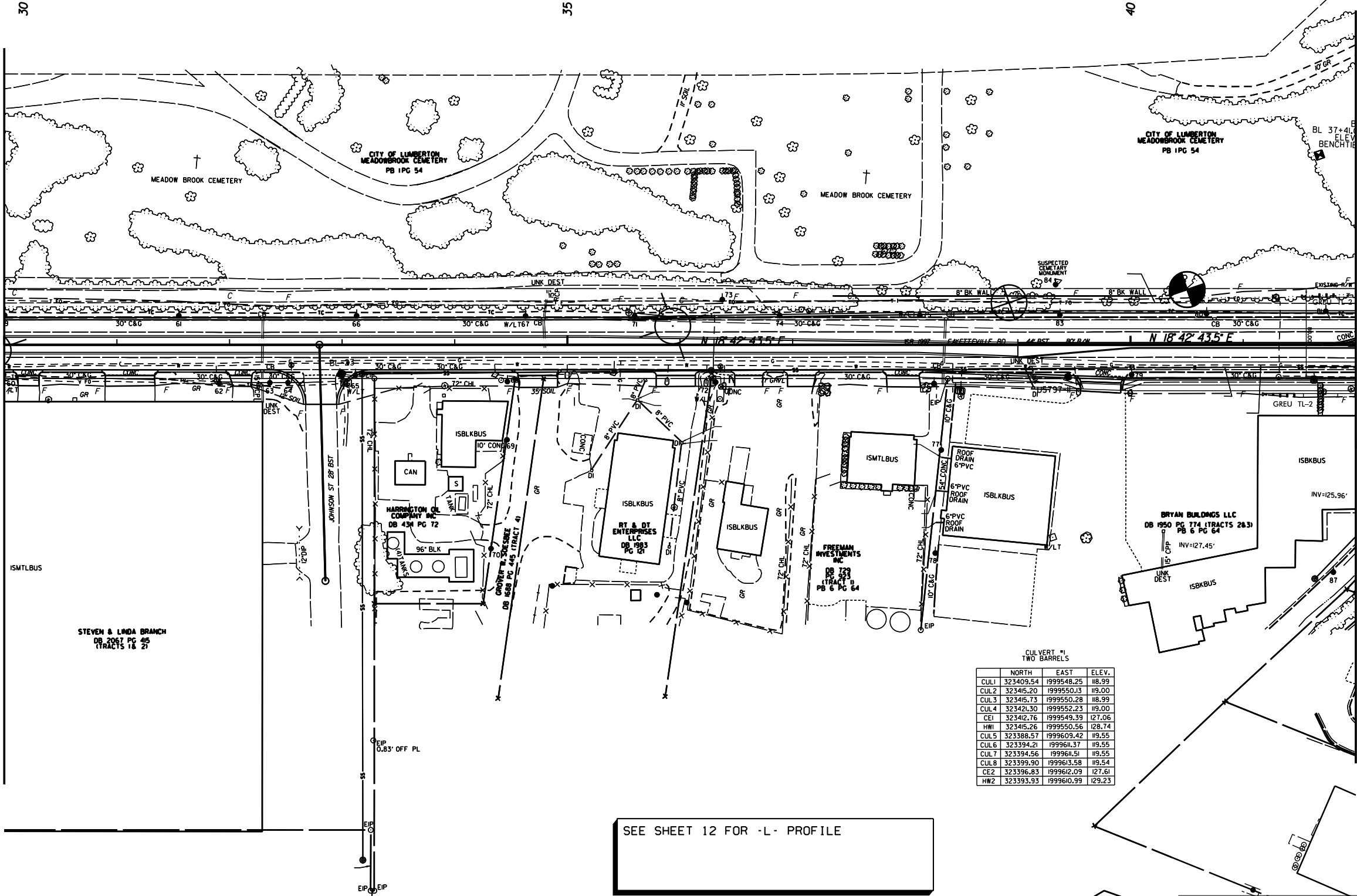


MATCHLINE -L- STA 30+00 SEE SHEET 5

SEE SHEET 12 FOR -L- PROFILE  
SEE SHEET 15 FOR -Y-, -RAB-,  
-Y1- AND -YA- PROFILES

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MATCHLINE -L- STA 30+00 SEE SHEET 4



SEE SHEET 12 FOR -L- PROFILE

|      | NORTH     | EAST       | ELEV.  |
|------|-----------|------------|--------|
| CUL1 | 323409.54 | 1999548.25 | 118.99 |
| CUL2 | 323415.20 | 1999550.13 | 119.00 |
| CUL3 | 323415.73 | 1999550.28 | 119.99 |
| CUL4 | 323421.30 | 1999552.23 | 119.00 |
| CE1  | 323412.76 | 1999549.39 | 127.06 |
| HW1  | 323415.26 | 1999550.56 | 128.74 |
| CUL5 | 323388.57 | 1999609.42 | 119.55 |
| CUL6 | 323394.21 | 1999611.37 | 119.55 |
| CUL7 | 323394.56 | 1999611.51 | 119.55 |
| CUL8 | 323399.90 | 1999613.58 | 119.54 |
| CE2  | 323396.83 | 1999612.09 | 127.61 |
| HW2  | 323393.93 | 1999610.99 | 129.23 |

PROJECT REFERENCE NO.  
**U-5797**

SHEET NO.  
**5**

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS

DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL

UNLESS ALL SIGNATURES COMPLETED

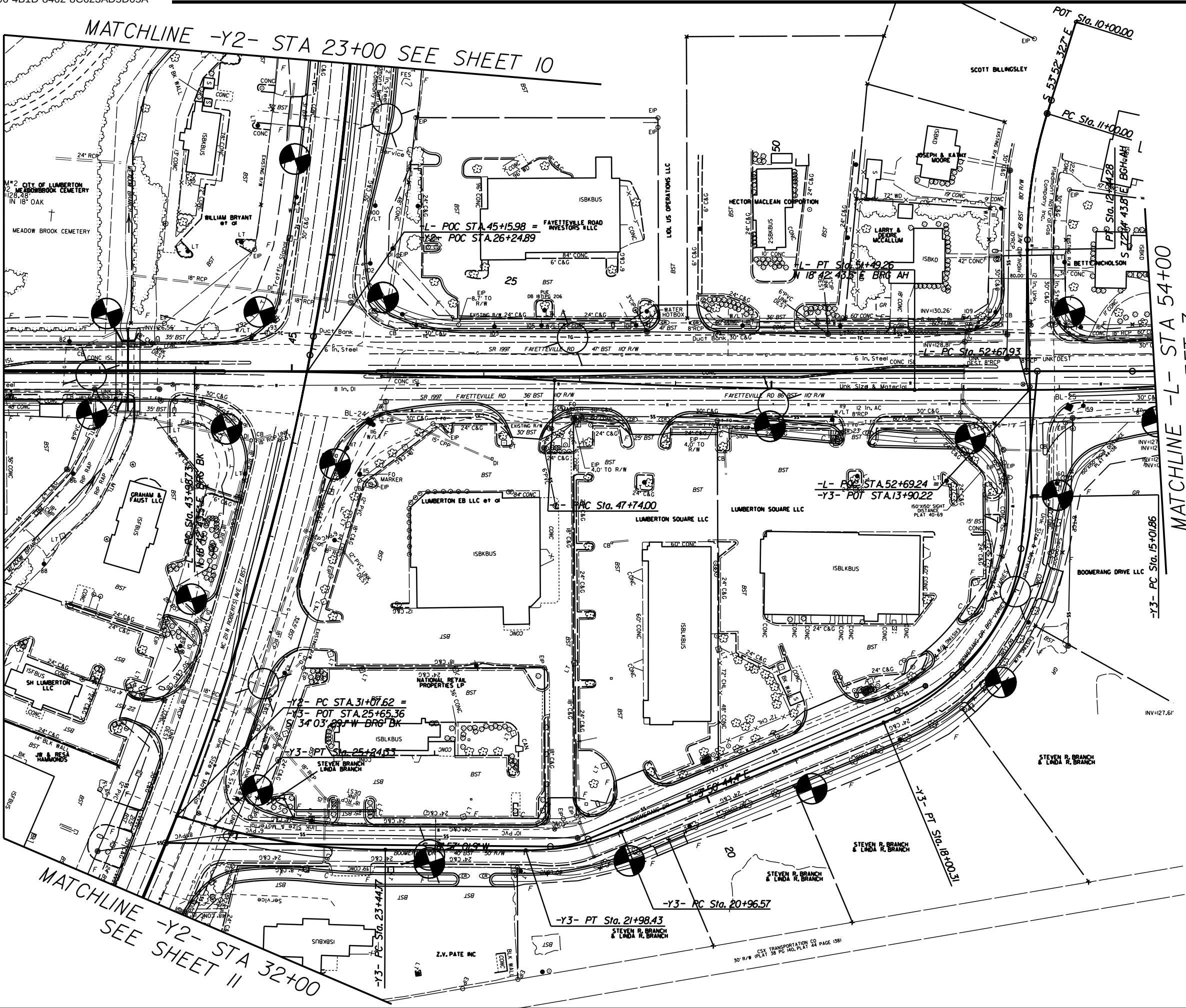
STV 100 Years

STV Engineers, Inc.  
1600 Perimeter Park Dr.  
Suite 225  
Morrisville, NC 27560  
NC License Number F-0991

8/17/95

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MATCHLINE -L- STA 42+00 SEE SHEET 5

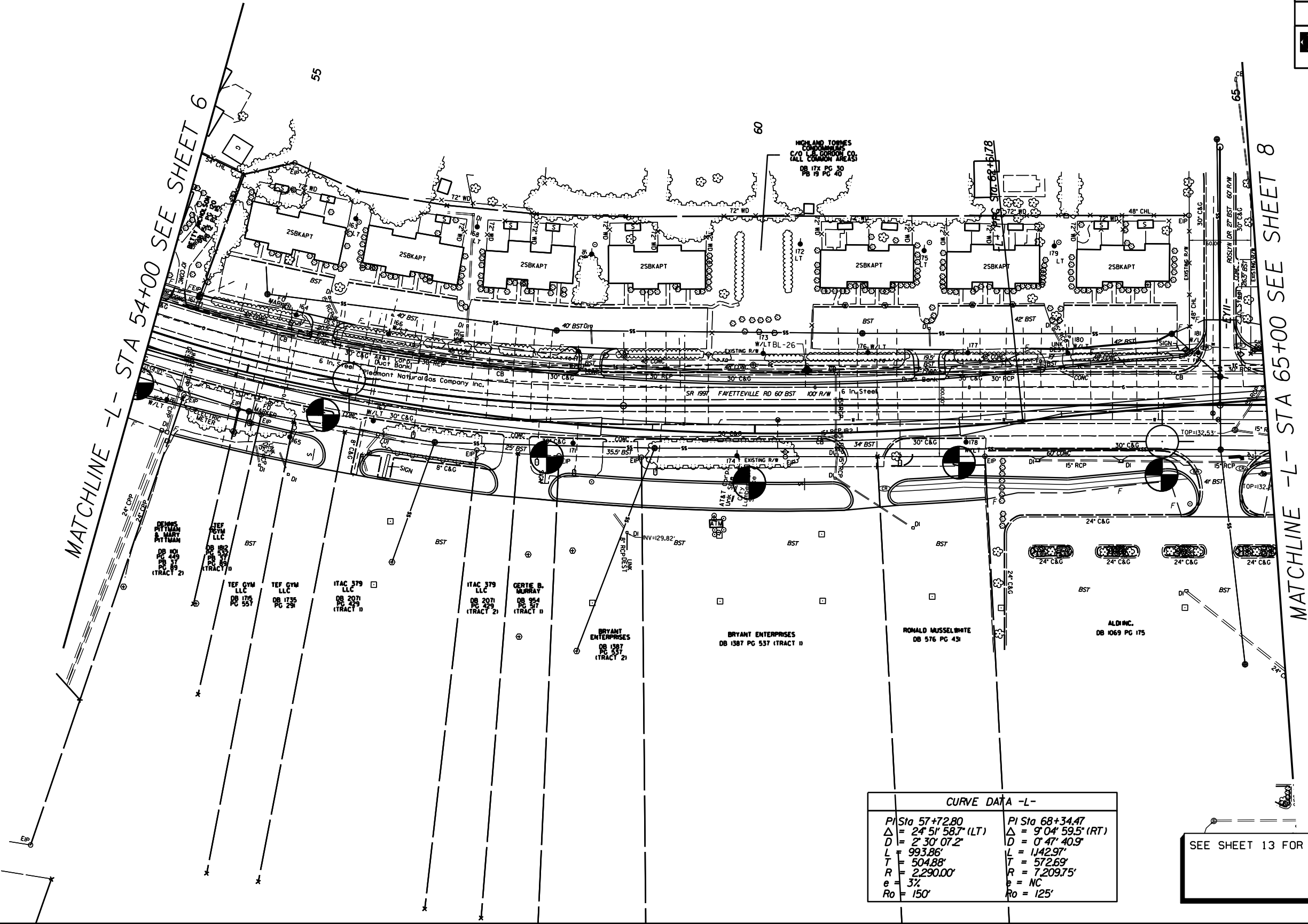


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| U-5797                                                                                                                            | 6                   |
| R/W SHEET NO.                                                                                                                     |                     |
| ROADWAY DESIGN ENGINEER                                                                                                           | HYDRAULICS ENGINEER |
| INCOMPLETE PLANS<br>DO NOT USE FOR R/W ACQUISITION                                                                                |                     |
| DOCUMENT NOT CONSIDERED FINAL<br>UNLESS ALL SIGNATURES COMPLETED                                                                  |                     |
| STV 100 Years<br>STV Engineers, Inc.<br>1600 Perimeter Park Dr.<br>Suite 225<br>Morrisville, NC 27560<br>NC License Number F-0991 |                     |

NAD 83/2011

8/17/95

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NAD 83/2011

|                                                                         |  |                                                                                                                  |  |
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| PROJECT REFERENCE NO.                                                   |  | SHEET NO.                                                                                                        |  |
| U-5797                                                                  |  | 7                                                                                                                |  |
| RW SHEET NO.                                                            |  |                                                                                                                  |  |
| ROADWAY DESIGN ENGINEER                                                 |  | HYDRAULICS ENGINEER                                                                                              |  |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION               |  |                                                                                                                  |  |
| <b>DOCUMENT NOT CONSIDERED FINAL</b><br>UNLESS ALL SIGNATURES COMPLETED |  |                                                                                                                  |  |
|                                                                         |  | STV Engineers, Inc.<br>1600 Perimeter Park Dr.<br>Suite 225<br>Morrisville, NC 27560<br>NC License Number F-0991 |  |

| CURVE DATA -L-                       |                                     |
|--------------------------------------|-------------------------------------|
| PI Sta 57+72.80                      | PI Sta 68+34.47                     |
| $\Delta = 24^{\circ} 51' 58.7" (LT)$ | $\Delta = 9^{\circ} 04' 59.5" (RT)$ |
| $D = 2^{\circ} 30' 07.2"$            | $D = 0^{\circ} 47' 40.9"$           |
| $L = 993.86'$                        | $L = 1,142.97'$                     |
| $T = 504.88'$                        | $T = 572.69'$                       |
| $R = 2,290.00'$                      | $R = 7,209.75'$                     |
| $e = 3\%$                            | $e = NC$                            |
| $Ro = 150'$                          | $Ro = 125'$                         |

SEE SHEET 13 FOR -L- PROFILE





**TRAFFIC DIAGRAM**

| FAYETTEVILLE RD<br>(SR 1997) |       | FAYETTEVILLE RD<br>(SR 1997) |  |
|------------------------------|-------|------------------------------|--|
| 29,820                       | 4,520 | 31,800                       |  |
| 36,900                       | 7,100 | 38,800                       |  |

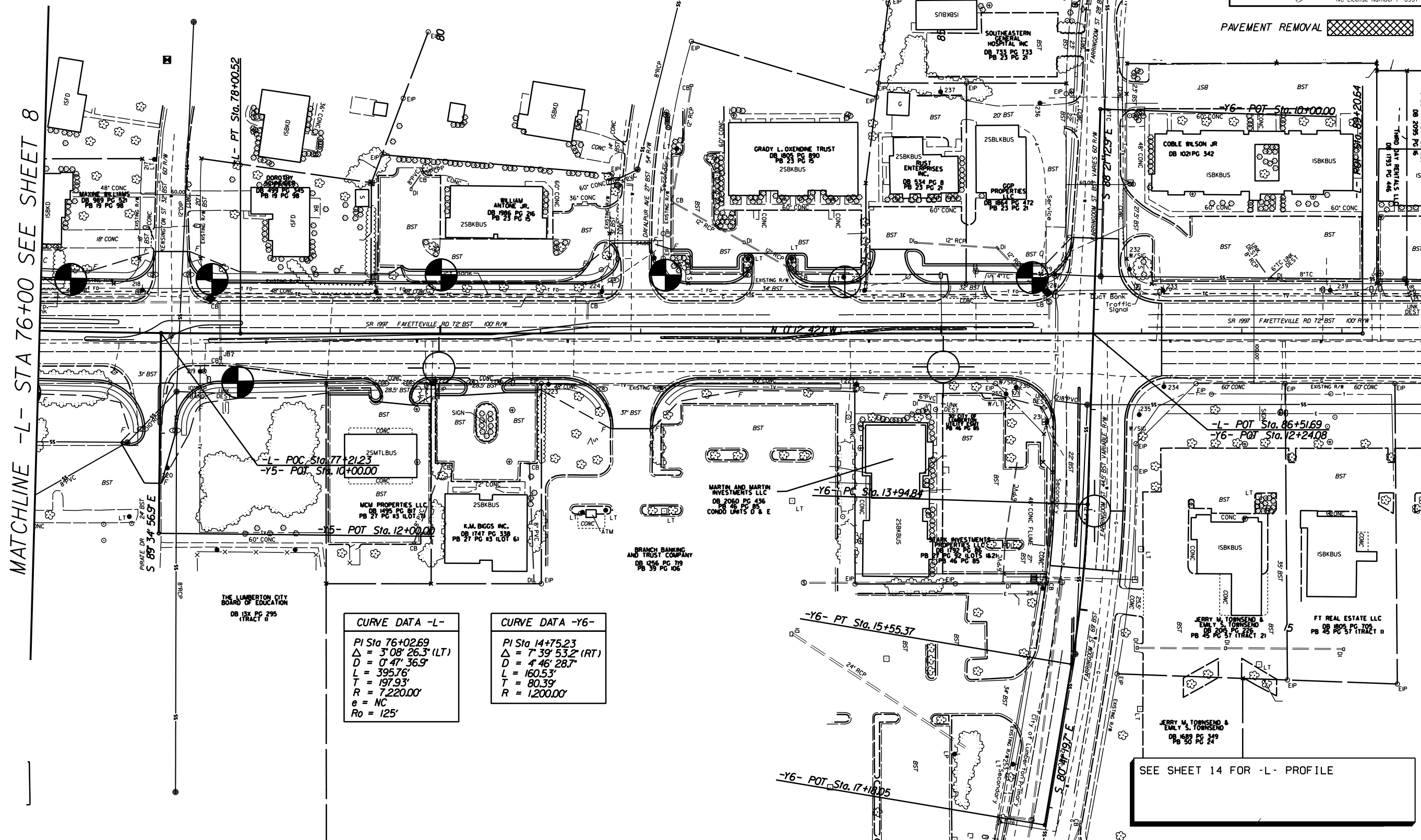
  

| LINKHAW RD<br>(SR 1948) |        | LINKHAW RD<br>(SR 1948) |  |
|-------------------------|--------|-------------------------|--|
|                         | 11,020 |                         |  |
|                         | 16,100 |                         |  |

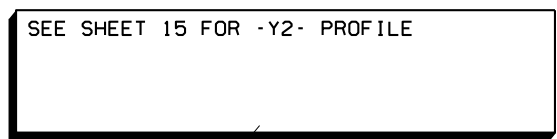
2020 ADT  
2040 ADT

| CURVE DATA -L-                    |                                   | CURVE DATA -Y4-                    |                                    |
|-----------------------------------|-----------------------------------|------------------------------------|------------------------------------|
| PI Sta 68+34.47                   | PI Sta 76+02.69                   | PI Sta 12+06.43                    | PI Sta 13+82.37                    |
| $\Delta = 9^{\circ}04'59.5"$ (RT) | $\Delta = 3^{\circ}08'26.3"$ (LT) | $\Delta = 34^{\circ}09'29.7"$ (RT) | $\Delta = 14^{\circ}41'54.0"$ (LT) |
| D = $0^{\circ}47'40.9"$           | D = $0^{\circ}47'36.9"$           | D = $15^{\circ}26'37.0"$           | D = $10^{\circ}44'58.8"$           |
| L = 1142.97'                      | L = 395.76'                       | L = 22118'                         | L = 1367.3'                        |
| T = 572.69'                       | T = 197.93'                       | T = 113.99'                        | T = 68.74'                         |
| R = 7209.75'                      | R = 7220.00'                      | R = 371.00'                        | R = 533.00'                        |
| e = NC                            | e = NC                            | e = 3%                             | e = 4%                             |
| Ro = 125'                         | Ro = 125'                         | Ro = 78'                           | Ro = 112'                          |

SEE SHEET 14 FOR -L- PROFILE  
SEE SHEET 17 FOR -Y4- PROFILE

PAVEMENT REMOVAL 


 NAD 83/2011



8/17/9c

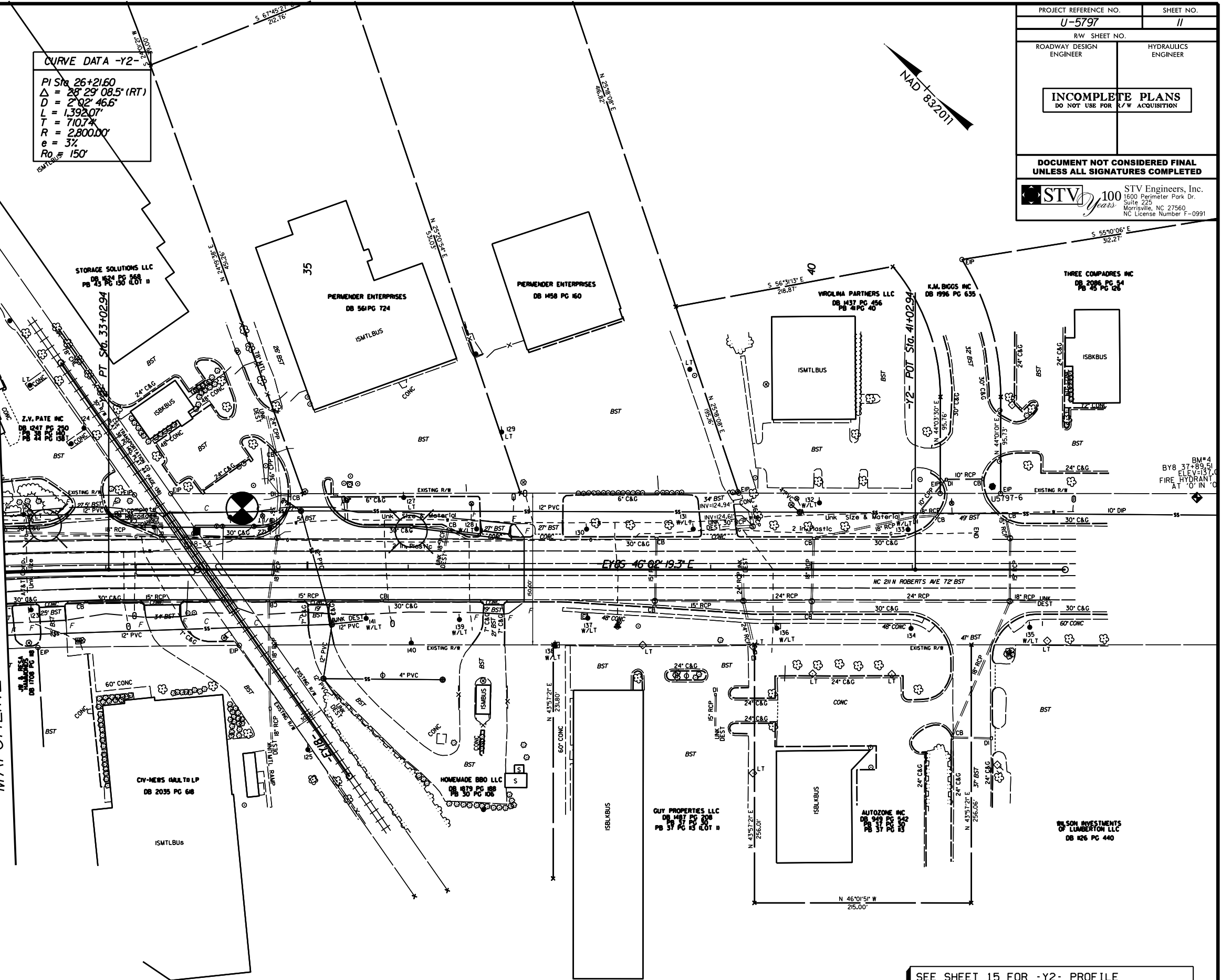
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MATCHLINE -Y2- STA 32+00 SEE SHEET 6

CURVE DATA -Y2-  
PI Sta 26+2160  
 $\Delta = 28^{\circ} 29' 08.5" (RT)$   
 $D = 2^{\circ} 02' 46.6"$   
 $L = 1,392.07'$   
 $T = 710.74'$   
 $R = 2,800.00'$   
 $e = 3\%$   
 $R_0 = 150'$



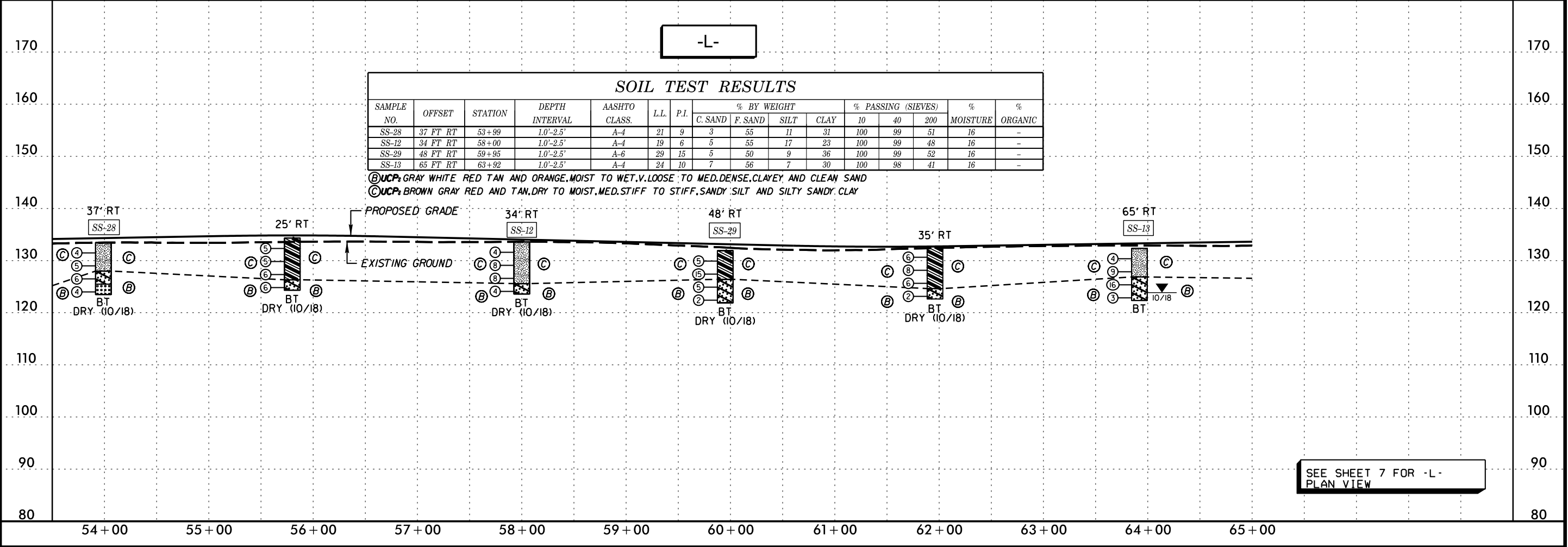
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| U-5797                                                                                                   |                        | 11                                                                                                               |  |
| RW SHEET NO.                                                                                             |                        |                                                                                                                  |  |
| ROADWAY DESIGN<br>ENGINEER                                                                               | HYDRAULICS<br>ENGINEER |                                                                                                                  |  |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR R/W ACQUISITION                                                |                        |                                                                                                                  |  |
| <b>DOCUMENT NOT CONSIDERED FINAL<br/>UNLESS ALL SIGNATURES COMPLETED</b>                                 |                        |                                                                                                                  |  |
|  <b>STV</b> 100 years |                        | STV Engineers, Inc.<br>1600 Perimeter Park Dr.<br>Suite 225<br>Morrisville, NC 27560<br>NC License Number F-0991 |  |



SEE SHEET 15 FOR -Y2- PROFILE







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PROJECT REFERENCE NO.  
U-5797

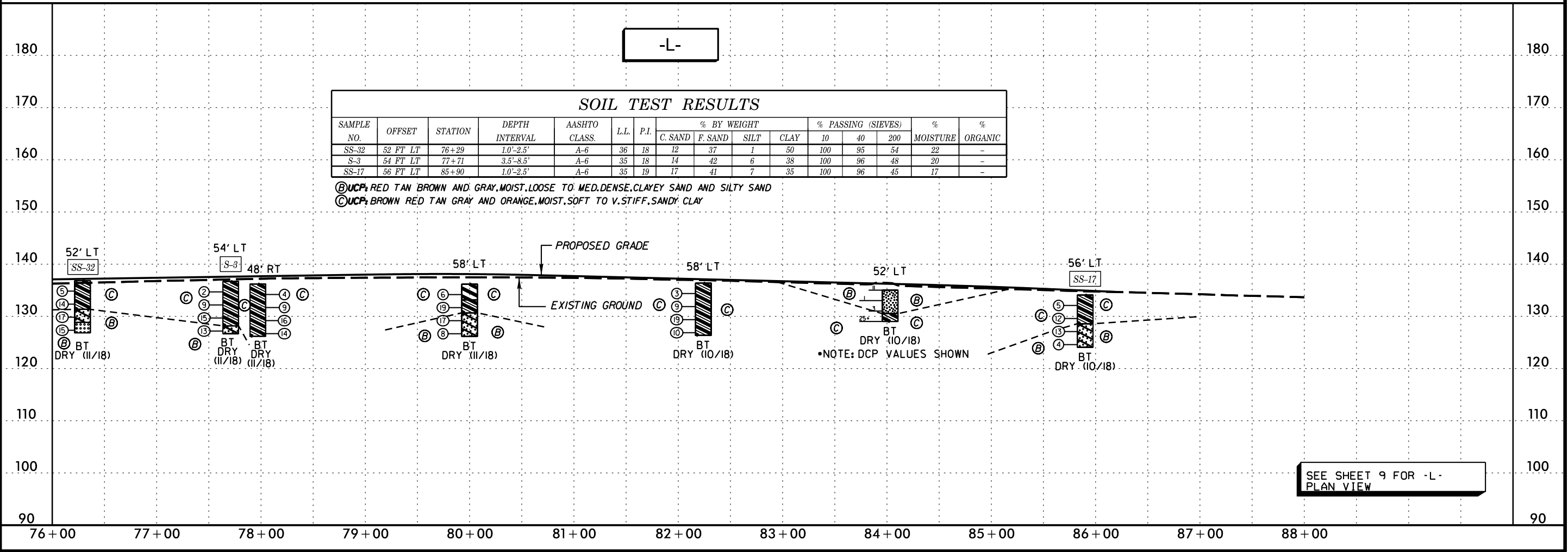
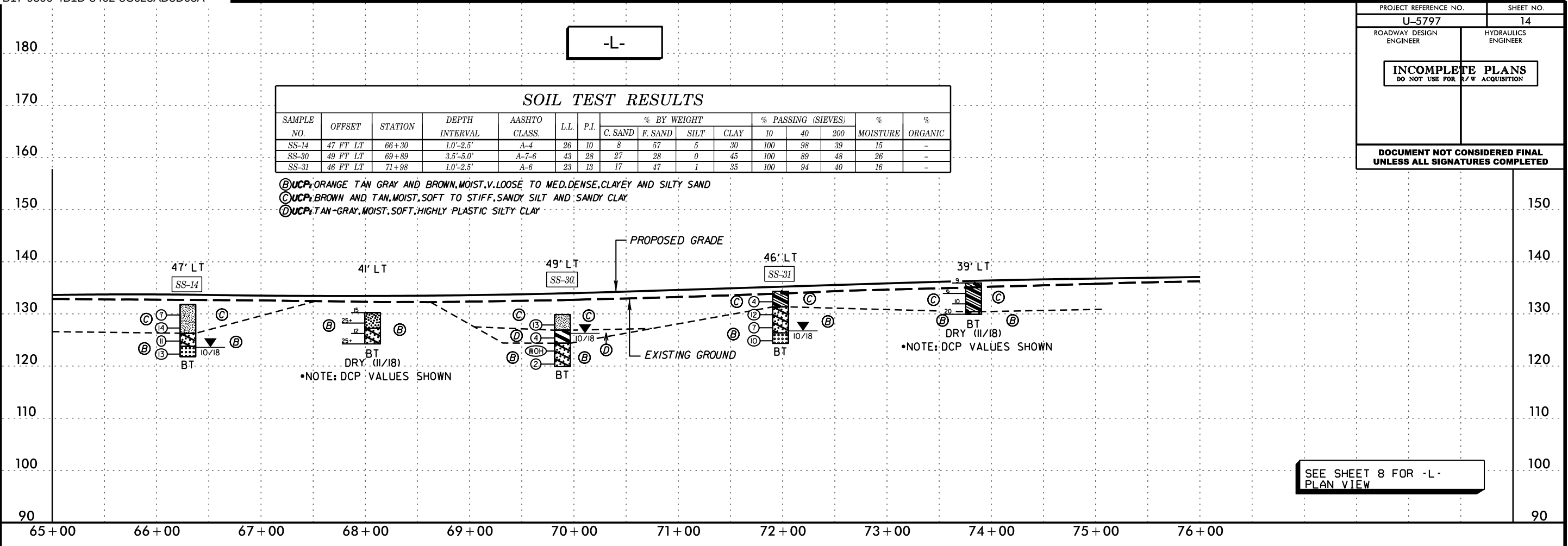
SHEET NO.  
14

ROADWAY DESIGN  
ENGINEER

HYDRAULICS  
ENGINEER

INCOMPLETE PLANS  
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



5/28/97  
21-FEB-2018 20:57  
11-FEB-2018 20:57  
2017\017057.00 STV U-5797 Fayetteville Road\U5797\_GEO.RDW\CADD\GEOTECH\PlanPro\U5797\_geo.plt\psh.15.dgn  
cadman

PROJECT REFERENCE NO.  
U-5797

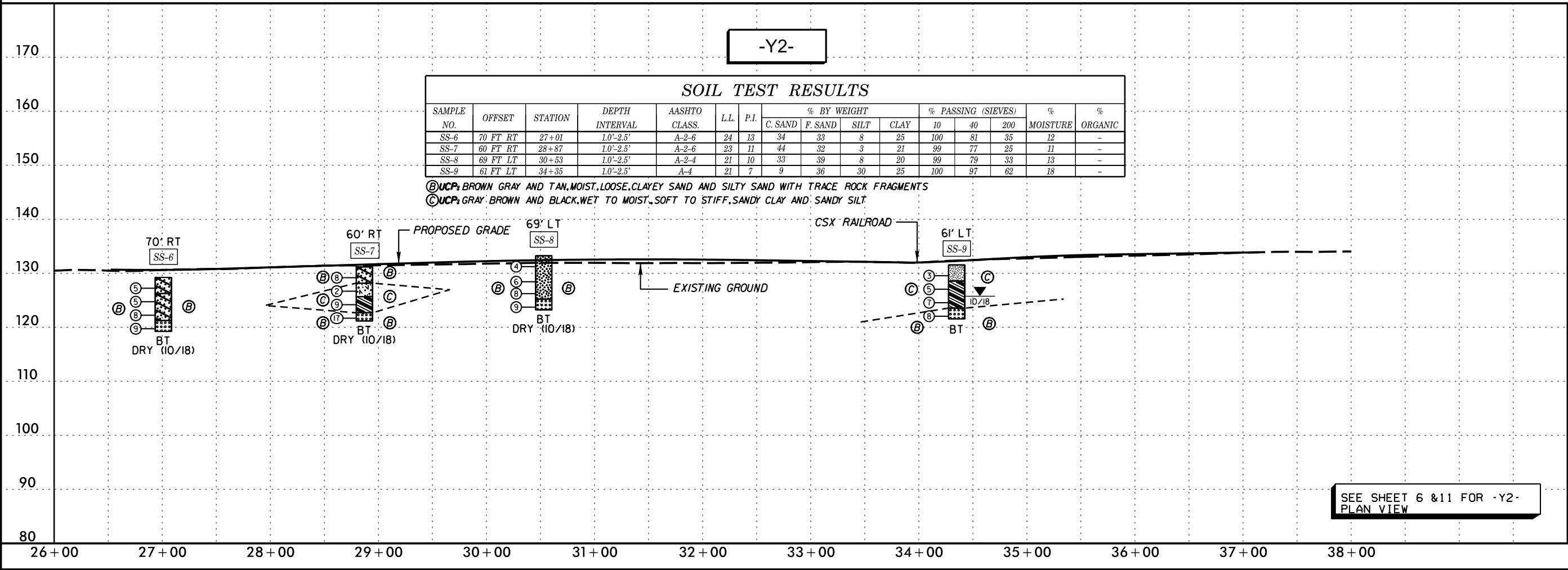
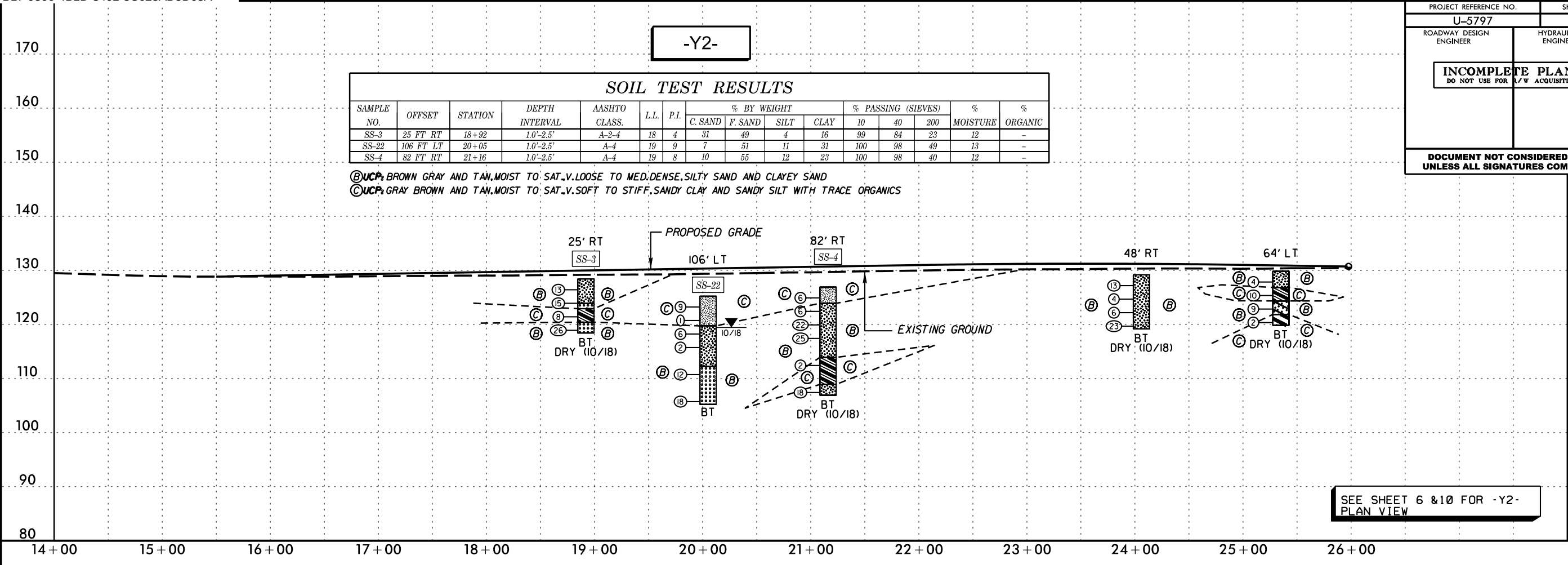
SHEET NO.  
15

ROADWAY DESIGN  
ENGINEER

HYDRAULICS  
ENGINEER

INCOMPLETE PLANS  
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

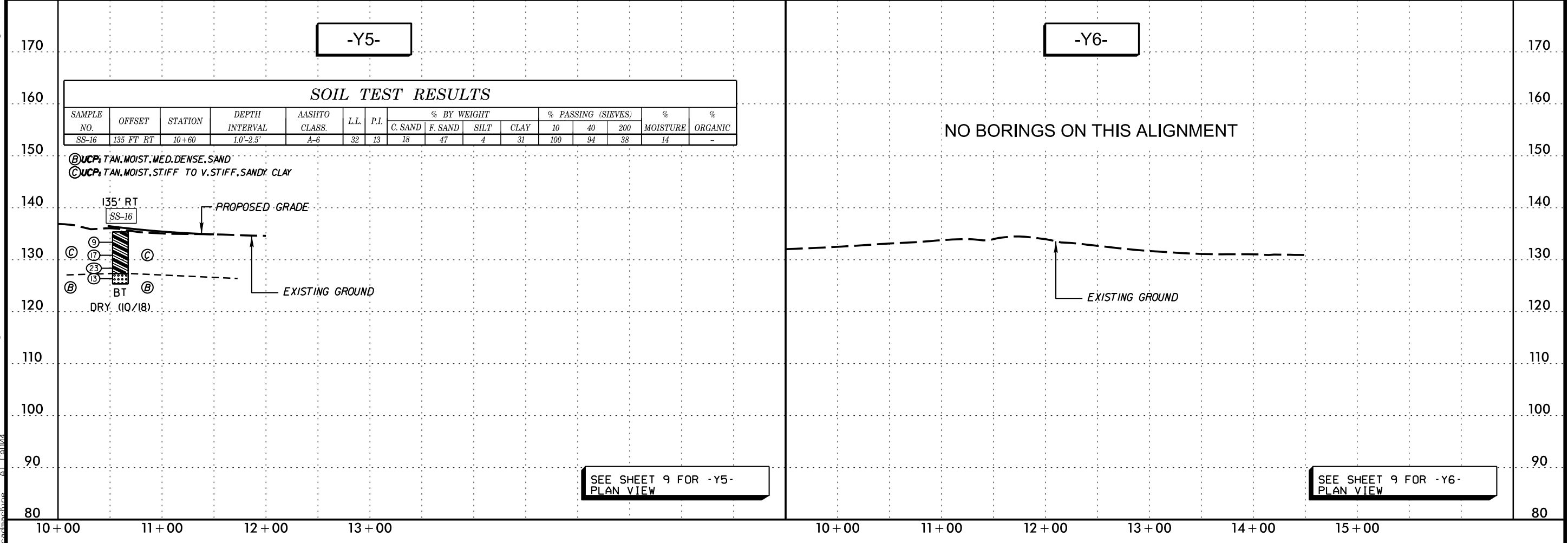




SEE SHEET 8 FOR -Y4-  
PLAN VIEW



SEE SHEET 9 FOR -Y6-  
PLAN VIEW





| PROJECT REFERENCE NO. | SHEET NO. |
|-----------------------|-----------|
| U-5797                | 18        |

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT  
SUBSURFACE INVESTIGATION  
APPENDIX A  
PAVEMENT INVESTIGATION

REFERENCE: U-5797

PROJECT: 44367

|          |          |
|----------|----------|
| DS       |          |
| WSH      | 3/5/2019 |
| INITIALS | DATE     |

PAVEMENT SECTION AND SUBGRADE CONDITION SUMMARY

FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22ND STREET TO FARRINGDOM STREET

ROBESON COUNTY, NORTH CAROLINA

TIP No.: U-5797 WBS No.: 44367.1.1

Falcon Project No.: G17057.00

| TEST LOCATION          |         |        |                   | PAVEMENT SECTION THICKNESS (INCHES) |          |                   |       | SUBGRADE       | NOTES                                                           |
|------------------------|---------|--------|-------------------|-------------------------------------|----------|-------------------|-------|----------------|-----------------------------------------------------------------|
| ALIGNMENT              | STATION | OFFSET | LANE              | HMA                                 | CONCRETE | AGGREGATE<br>BASE | TOTAL | IN-SITU<br>CBR |                                                                 |
| -L-                    | 21+04   | CL     | CENTRAL TURN LANE | 6.00                                | 6.00     | 0.00              | 12.00 | 20             | Asphalt over concrete, Multiple Layers                          |
| -L-                    | 29+90   | 5' RT  | NORTHBOUND, ISL   | 5.00                                | 6.00     | 0.00              | 11.00 | 15             | Asphalt over concrete, Multiple Layers                          |
| -L-                    | 35+94   | 17' LT | SOUTHBOUND, OSL   | 7.00                                | 6.00     | 0.00              | 13.00 | 10             | Asphalt over concrete, Multiple Layers, delaminated at 6 inches |
| -L-                    | 42+91   | 4' RT  | NORTHBOUND, ISL   | 6.00                                | 6.00     | 0.00              | 12.00 | 9              | Asphalt over concrete, Multiple Layers, delaminated at 5 inches |
| -L-                    | 50+02   | 16' LT | NORTHBOUND, OSL   | 6.00                                | 0.00     | 5.00              | 11.00 | 10             | Multiple Layers                                                 |
| -L-                    | 55+99   | 14' LT | CENTRAL TURN LANE | 12.00                               | 7.00     | 0.00              | 19.00 | 8              | Asphalt over concrete, Multiple Layers                          |
| -L-                    | 63+96   | 33' RT | NORTHBOUND, OTL   | 7.00                                | 0.00     | 5.00              | 12.00 | 6              | Multiple Layers                                                 |
| -L-                    | 70+50   | 21' RT | CENTRAL TURN LANE | 7.00                                | 5.00     | 0.00              | 12.00 | 25             | Asphalt over concrete, Multiple Layers                          |
| -L-                    | 79+99   | 35' RT | NORTHBOUND, OTL   | 5.00                                | 0.00     | 0.00              | 5.00  | 6              | Multiple Layers                                                 |
| -L-                    | 85+02   | 33' RT | NORTHBOUND, OTL   | 11.00                               | 0.00     | 0.00              | 11.00 | 10             | Multiple Layers                                                 |
| -Y-                    | 12+00   | 3' LT  | CENTRAL TURN LANE | 6.00                                | 0.00     | 10.00             | 16.00 | 6              | Multiple Layers, base course crumbling                          |
| -Y1-                   | 12+06   | 5' LT  | WESTBOUND, ISL    | 8.00                                | 0.00     | 0.00              | 8.00  | 12             | Multiple Layers                                                 |
| -Y2-                   | 19+99   | 2' LT  | CENTRAL TURN LANE | 8.00                                | 0.00     | 8.00              | 16.00 | 10             | Multiple Layers                                                 |
| -Y2-                   | 23+53   | 43' LT | WESTBOUND, OTL    | 6.00                                | 0.00     | 3.00              | 9.00  | 12             | Multiple Layers                                                 |
| -Y2-                   | 29+48   | 38' LT | WESTBOUND, OTL    | 6.00                                | 0.00     | 6.00              | 12.00 | 9              | Multiple Layers                                                 |
| -Y2-                   | 32+41   | 44' LT | WESTBOUND, OTL    | 8.00                                | 0.00     | 6.00              | 14.00 | 20             | Multiple Layers                                                 |
| -Y2-                   | 36+03   | 38' LT | WESTBOUND, OTL    | 6.00                                | 0.00     | 6.00              | 12.00 | 8              | Multiple Layers                                                 |
| -Y3-                   | 16+02   | 1' LT  | WESTBOUND, ISL    | 4.00                                | 0.00     | 4.00              | 8.00  | 20             | Multiple Layers                                                 |
| -Y3-                   | 22+99   | 5' LT  | NORTHBOUND, TL    | 3.00                                | 0.00     | 3.00              | 6.00  | 15             | Multiple Layers                                                 |
| -Y4-                   | 13+99   | 5' LT  | WESTBOUND, ITL    | 7.00                                | 0.00     | 5.00              | 12.00 | 6              | Multiple Layers, base course intact                             |
| -Y6-                   | 14+01   | 7' LT  | WESTBOUND, ITL    | 4.00                                | 0.00     | 3.00              | 7.00  | 10             | Multiple Layers                                                 |
| REPRESENTATIVE AVERAGE |         |        |                   | 6.6                                 | 1.7      | 3.0               | 11.3  | N/A            | -                                                               |

Legend: TL - Travel Lane, ISL - Inside Travel Lane, OSL - Outside Travel Lane, ITL - Inside Turn Lane, OTL - Outside Turn Lane





|                                                                                                                                                                                                                         |                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>FALCON ENGINEERING, INC.<br/>1210 TRINITY ROAD, SUITE 110<br/>CARY, NC 27513<br/>PHONE: 919.871.0800<br/>FAX: 919.871.0803</p> | <p>PAVEMENT CORE PHOTOGRAPHS</p> <p>FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22nd STREET TO FARRINGDOM STREET<br/>ROBESON / LUMBERTON, NORTH CAROLINA<br/>WBS NO.:44367.1.1   TIP NO.: U-5797<br/>FALCON PROJECT NO.: G17057.00</p> |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|



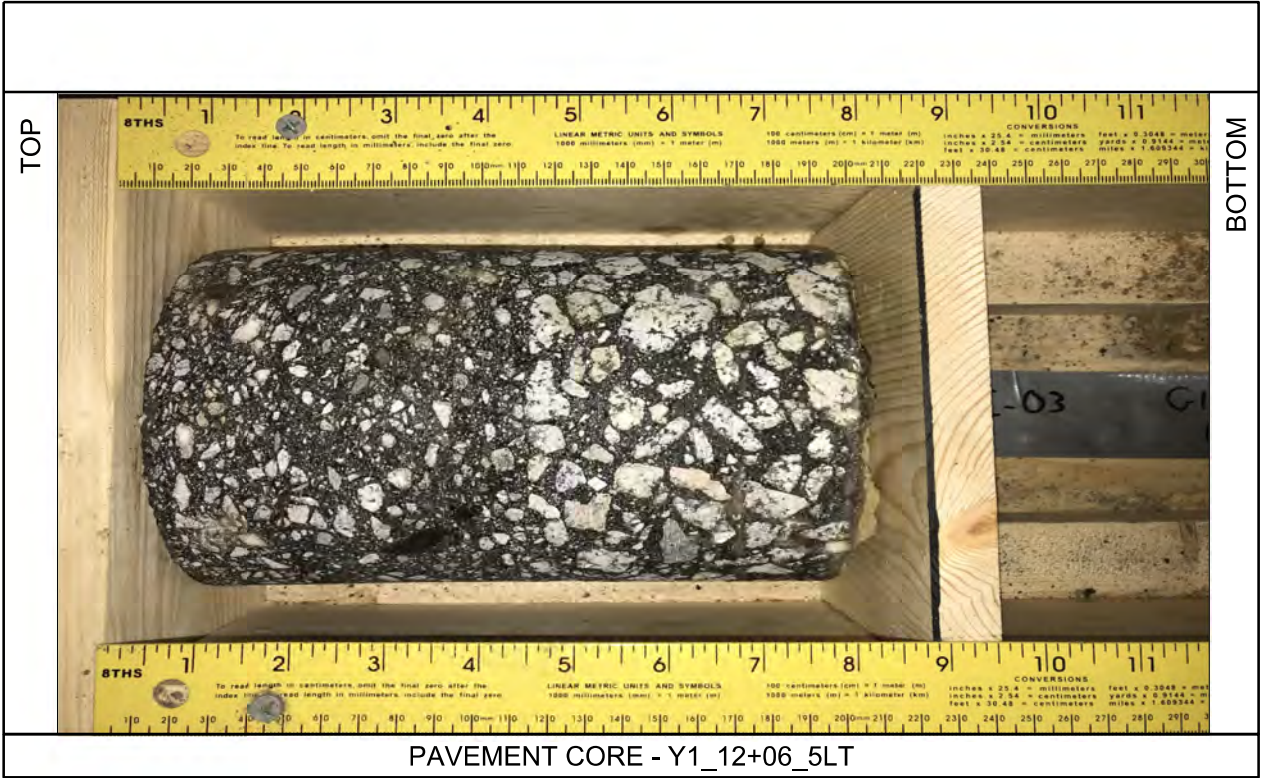


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CARY, NC 27513  
PHONE: 919.871.0800  
FAX: 919.871.0803

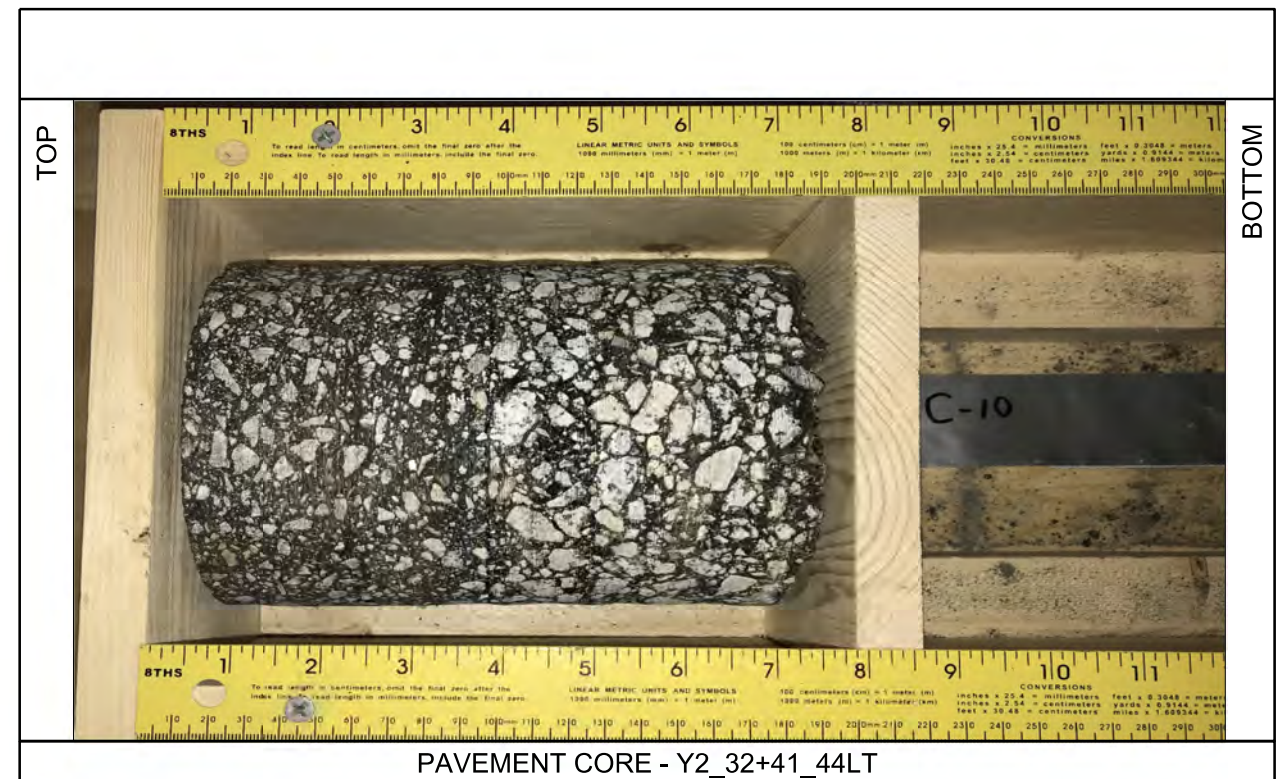
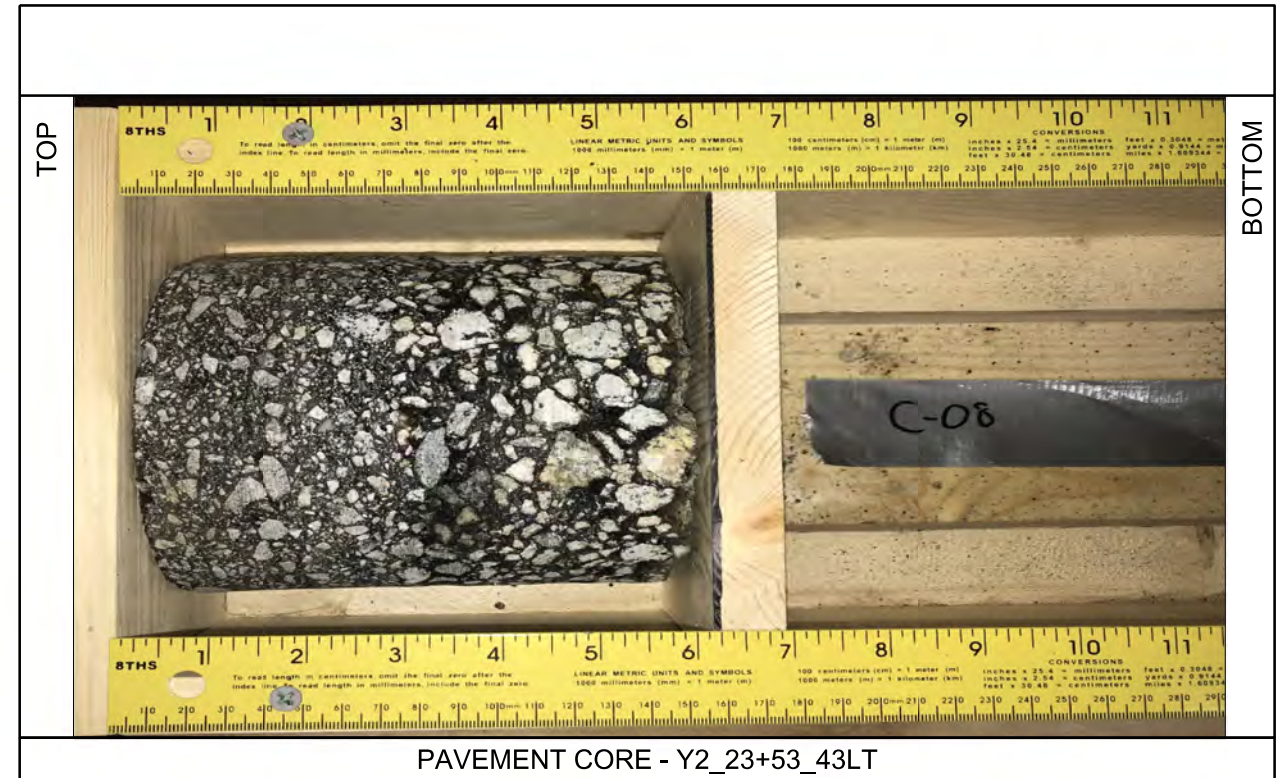
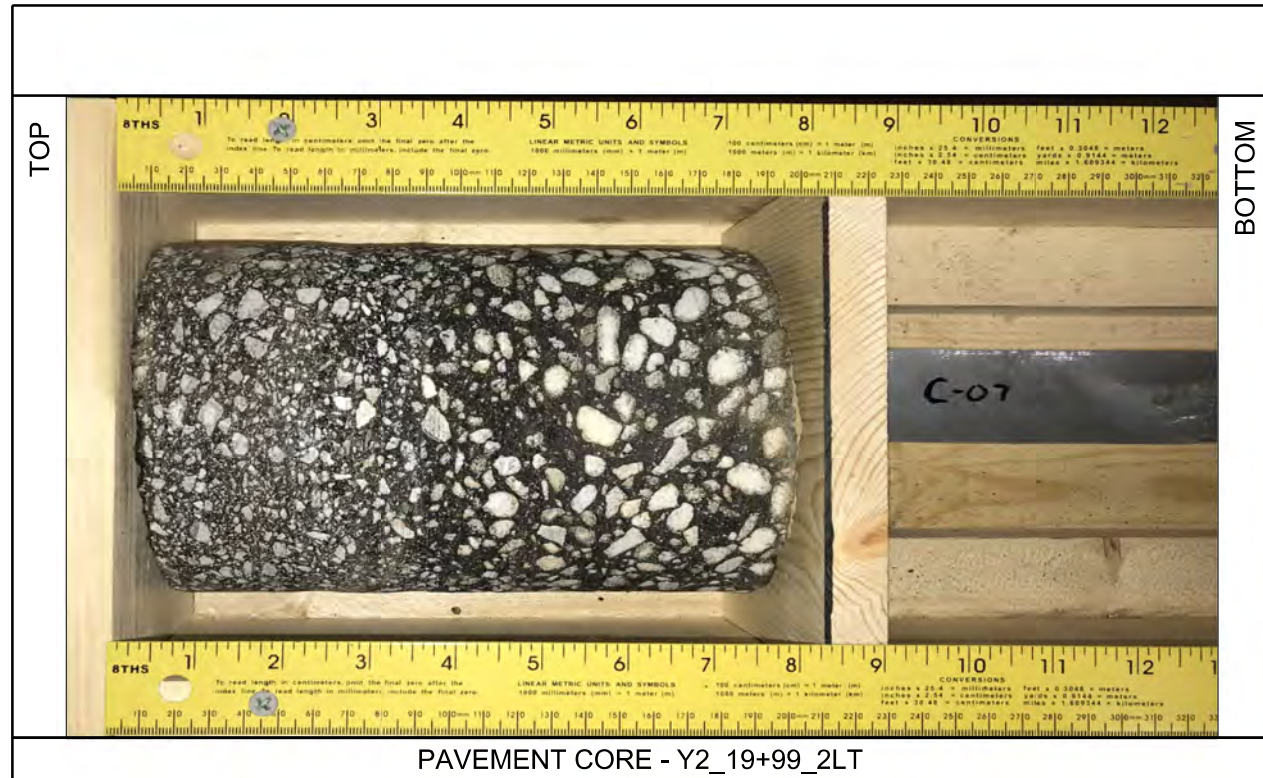
PAVEMENT CORE PHOTOGRAPHS

FAYETTEVILLE ROAD (SR 1997) FROM EAST OF 22nd  
STREET TO FARRINGDOM STREET  
ROBESON / LUMBERTON, NORTH CAROLINA  
WBS NO.:44367.1.1 | TIP NO.: U-5797  
FALCON PROJECT NO.: G17057.00

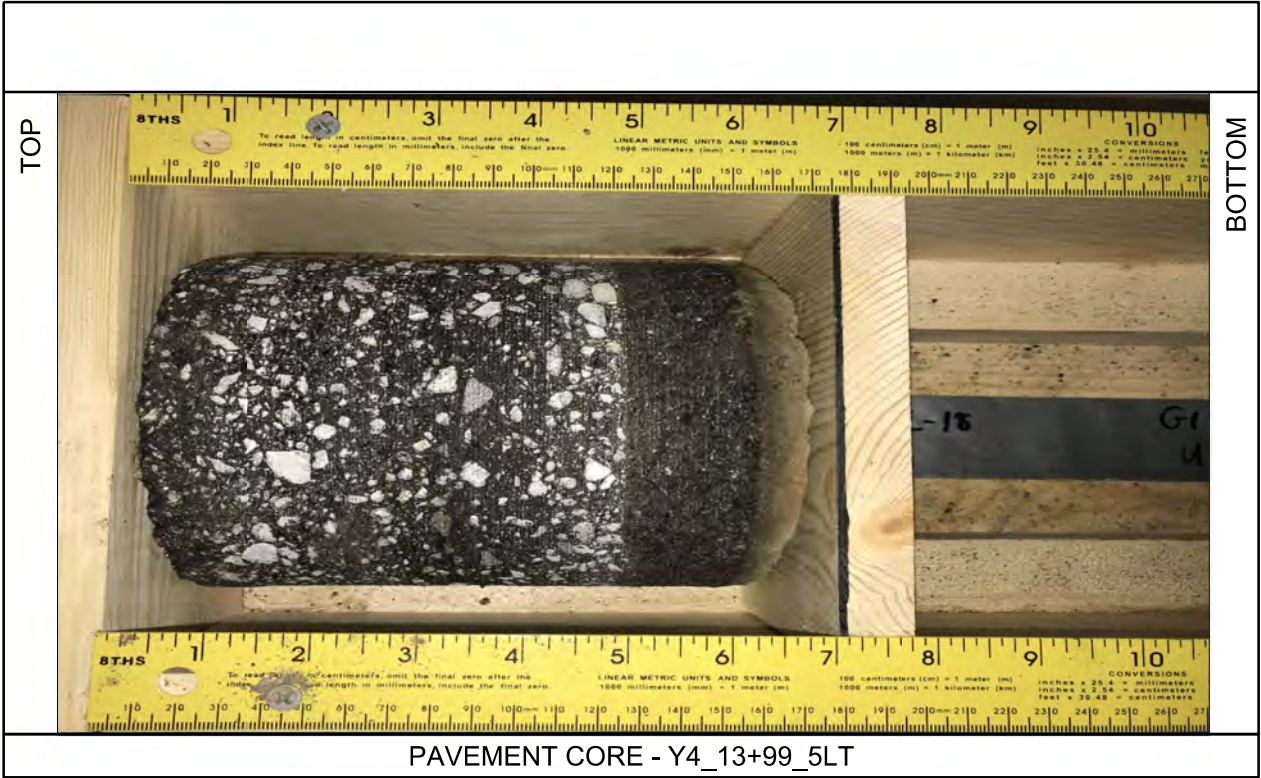
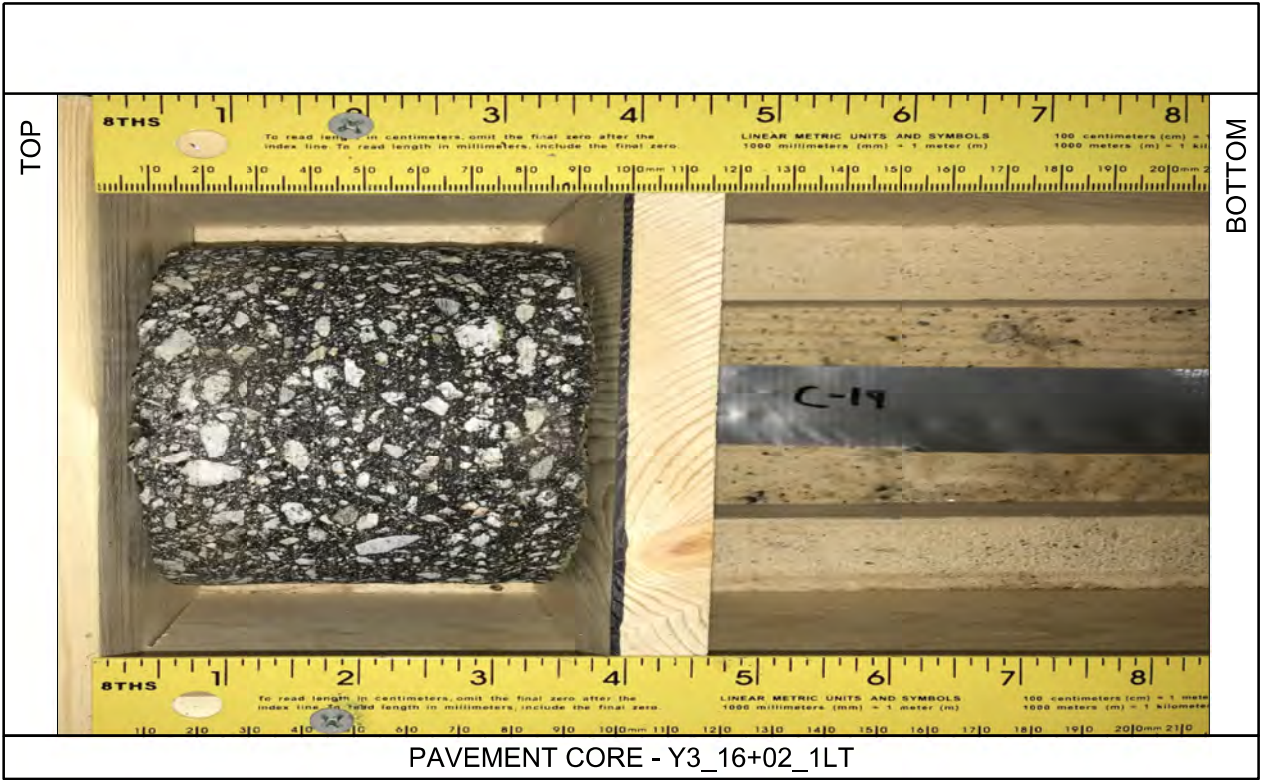




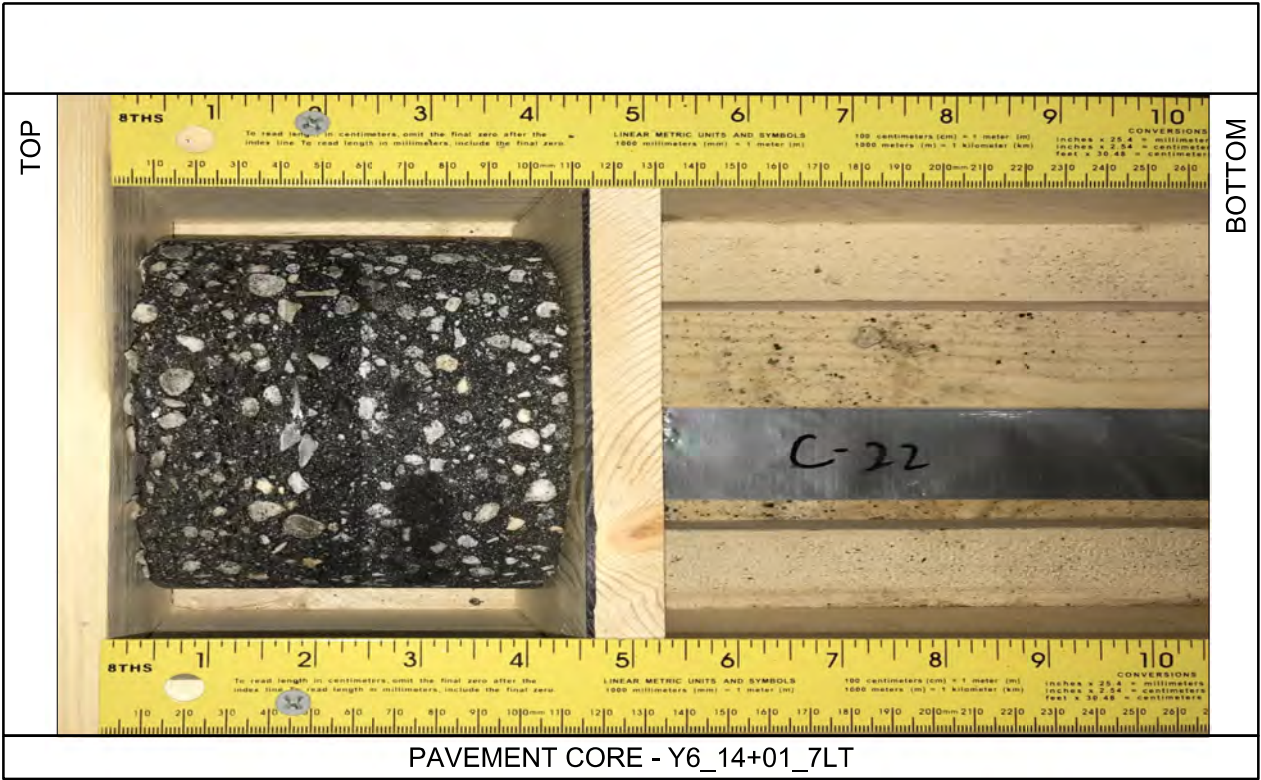


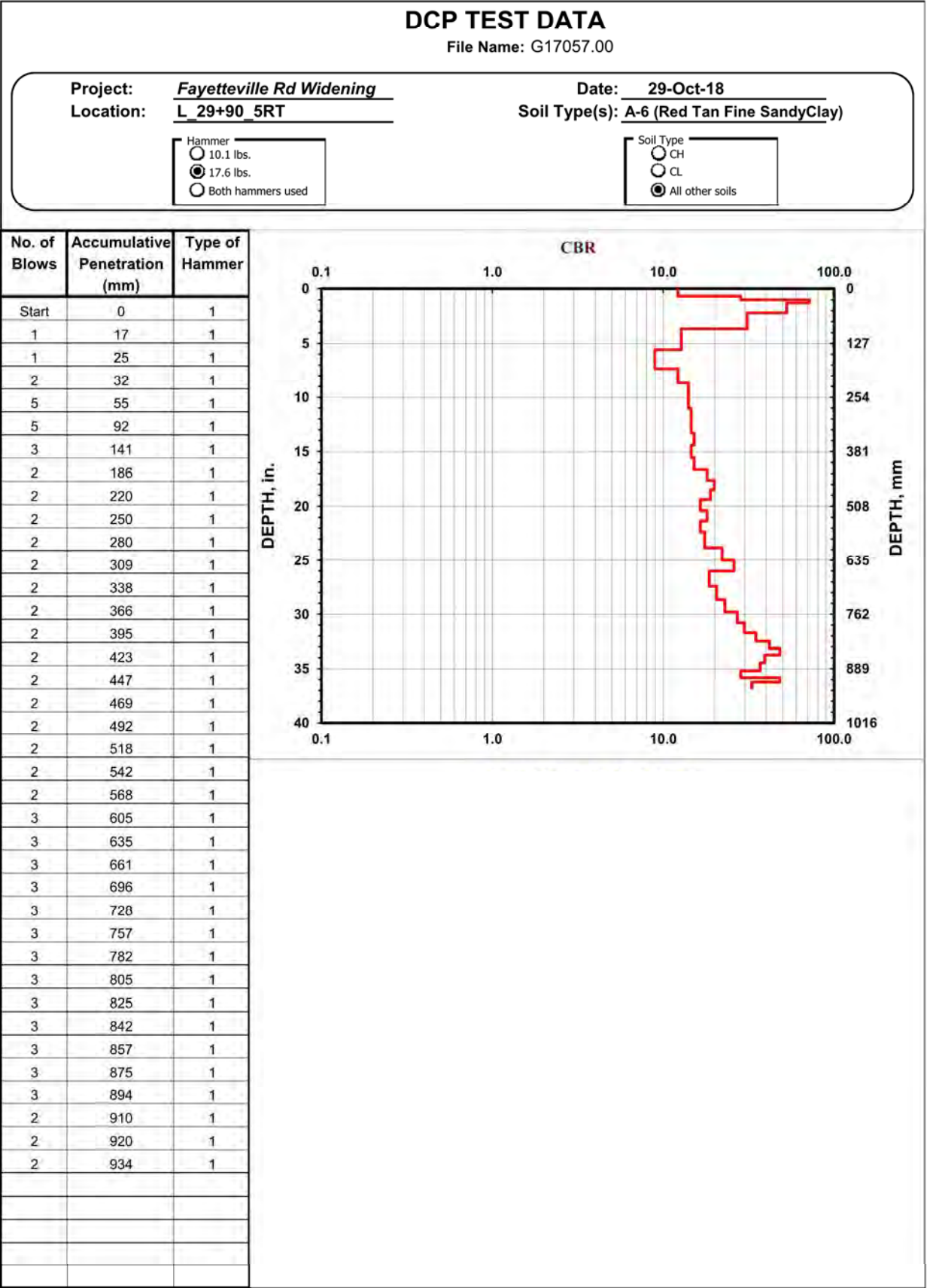
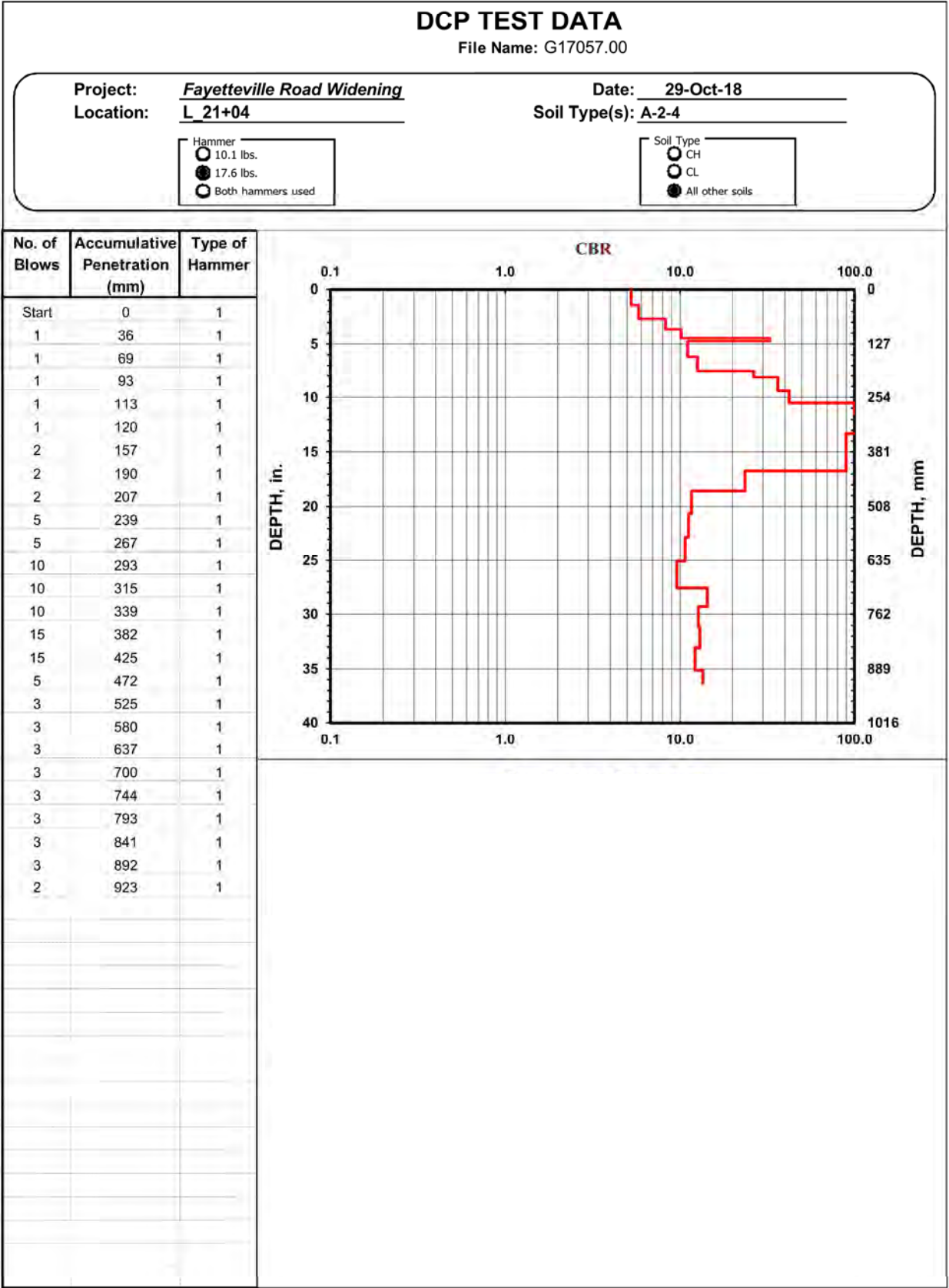














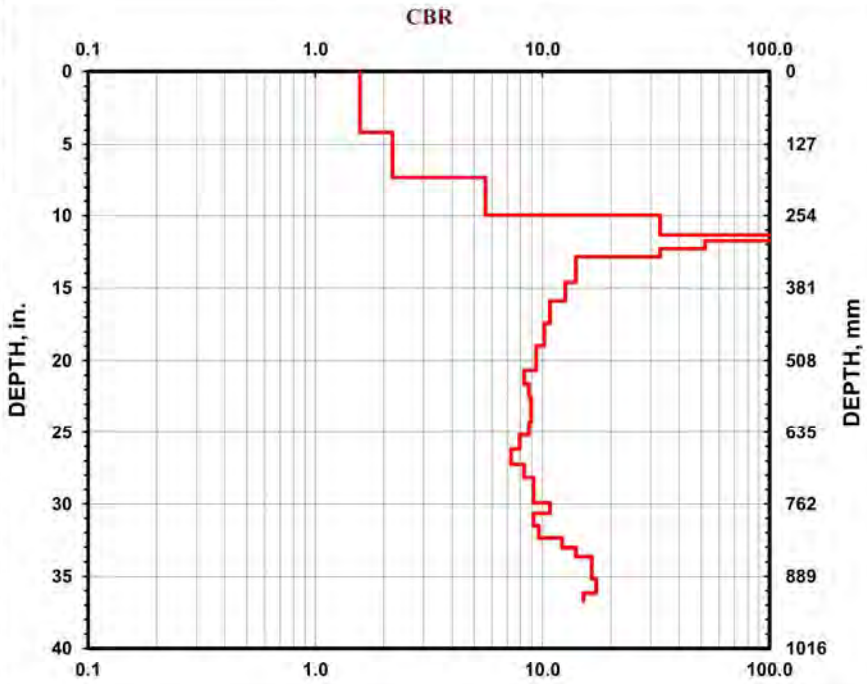
**File Name:** G17057.00

Date: 29-Oct-18  
Soil Type(s): A-7 (Tan Gray Clay)

Hammer ☐ 10.1 lbs.  
☒ 17.6 lbs.  
☐ Both hammers used

Soil Type

- CH
- CL
- All other soils

[illegible]

**File Name:** G17057.00

Date: 29-Oct-18  
Soil Type(s): A-2-6

Hammer

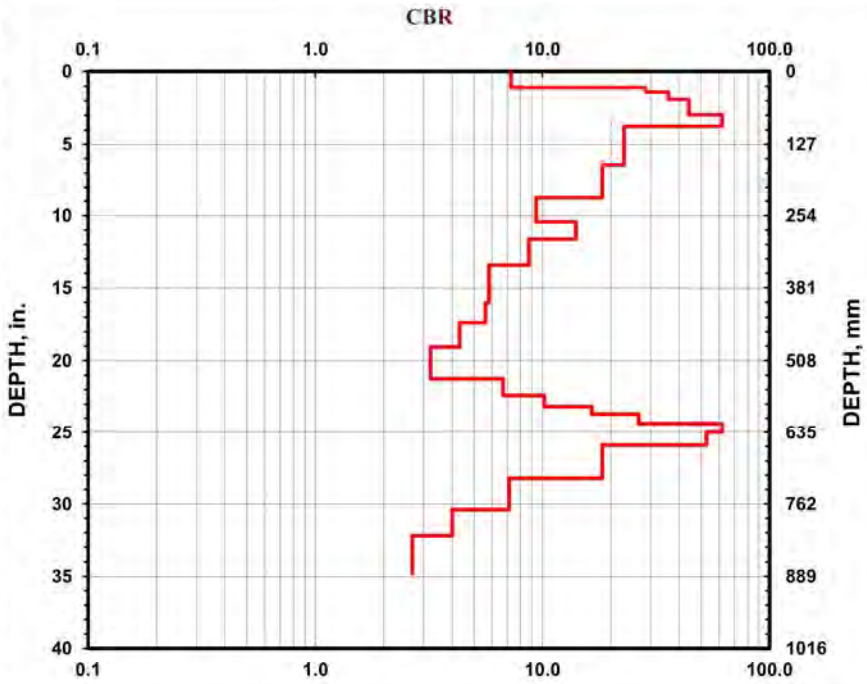
☐ 10.1 lbs.

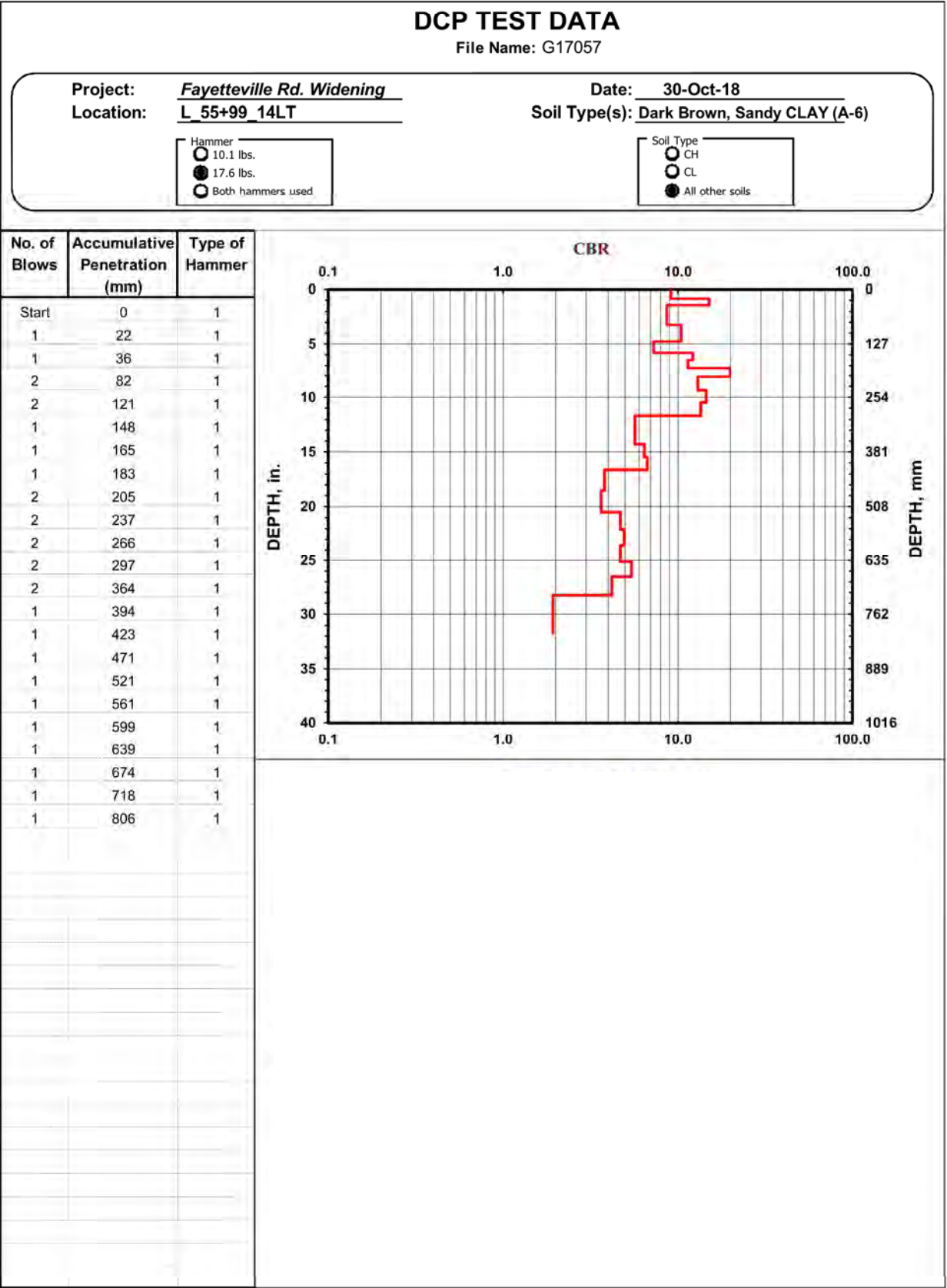
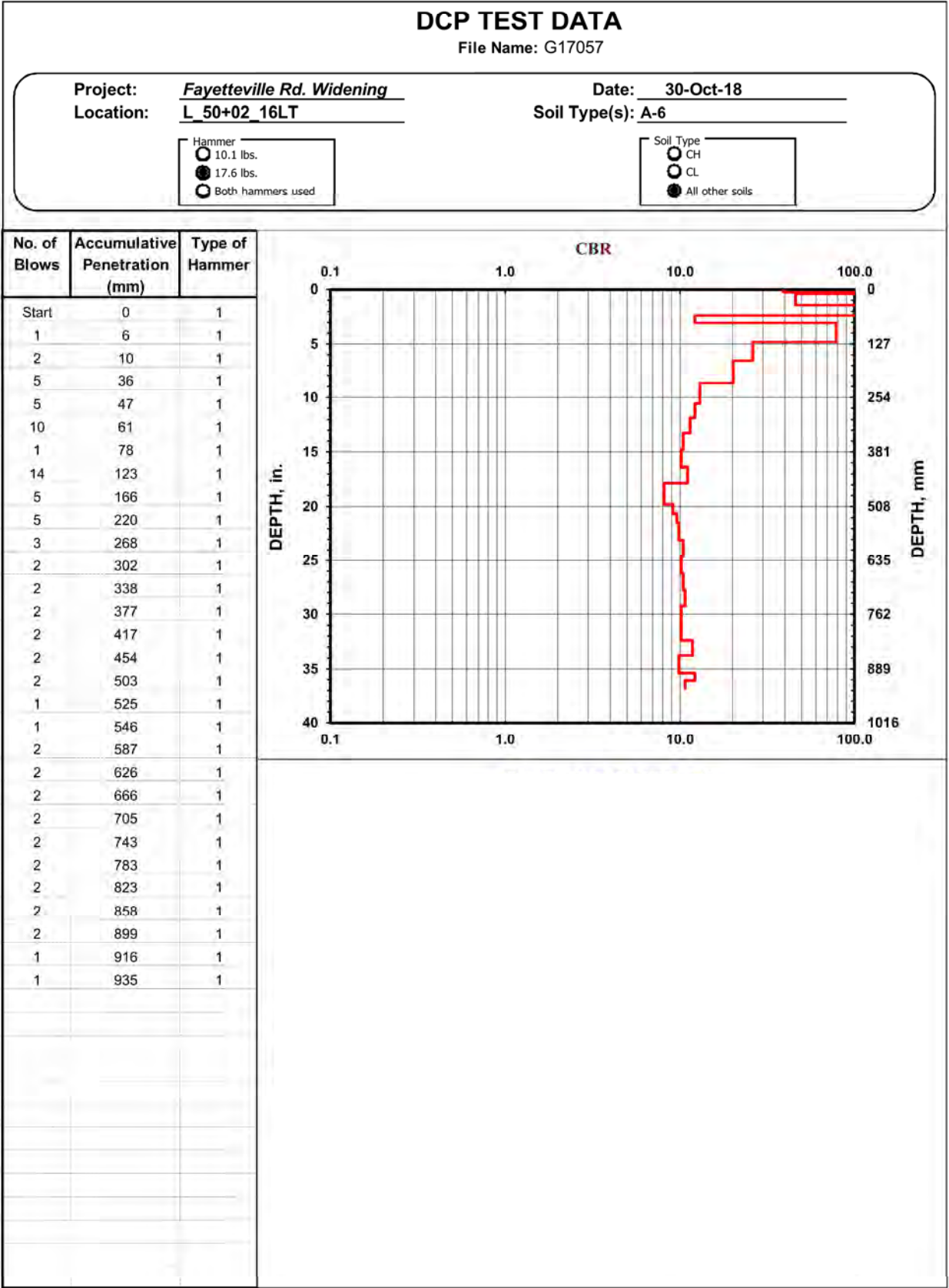
☒ 17.6 lbs.

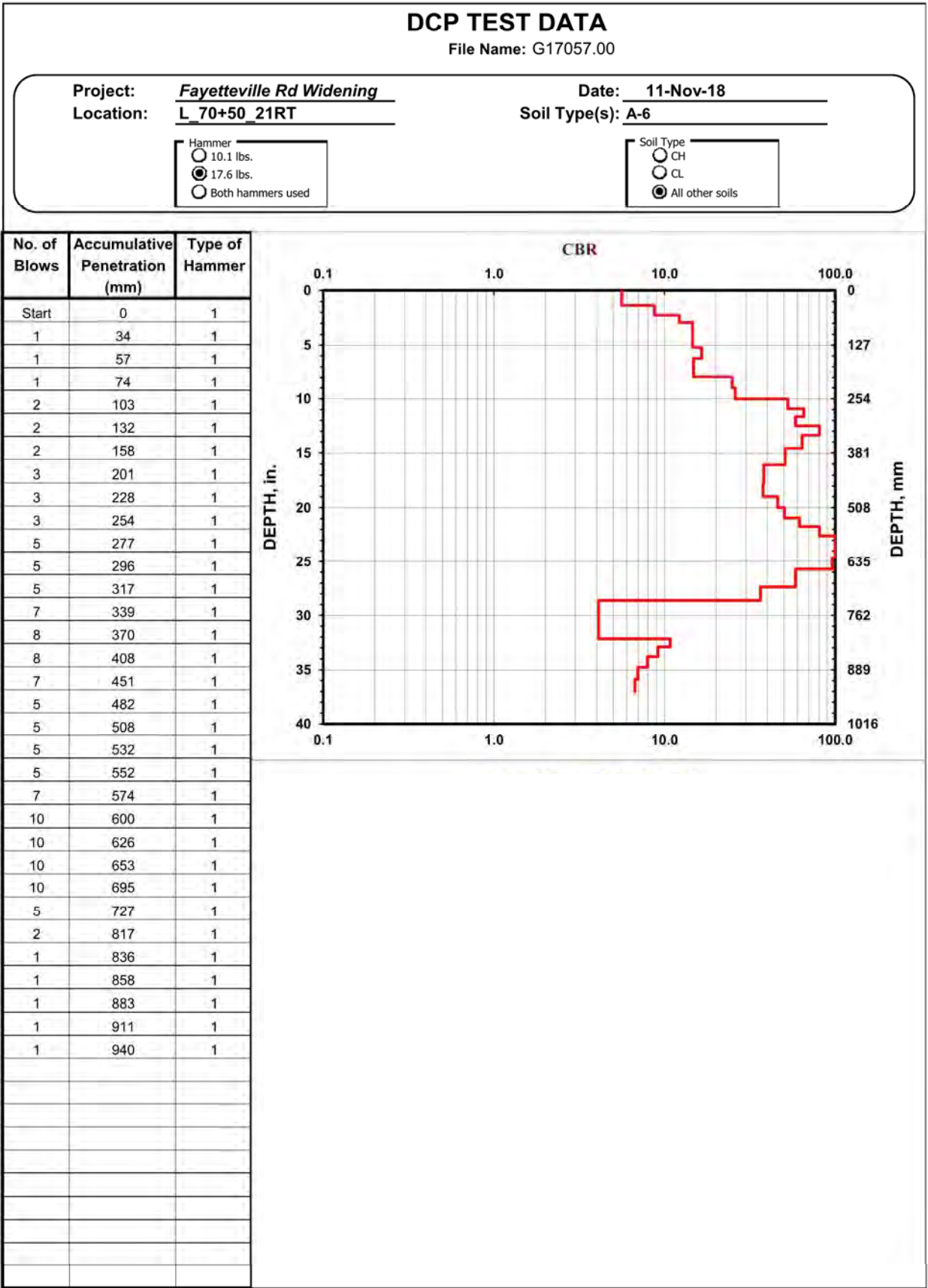
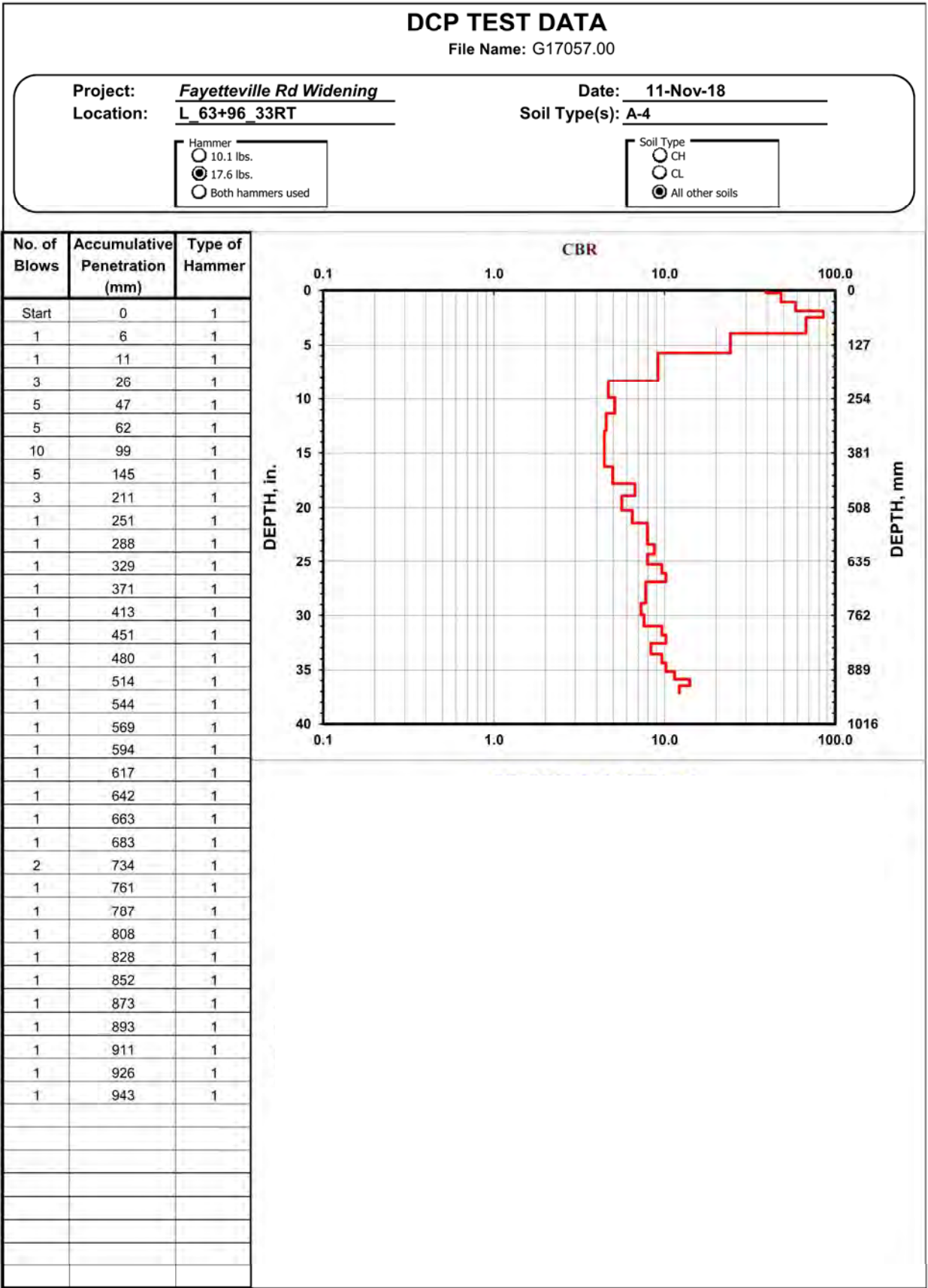
☐ Both hammers used

Soil Type

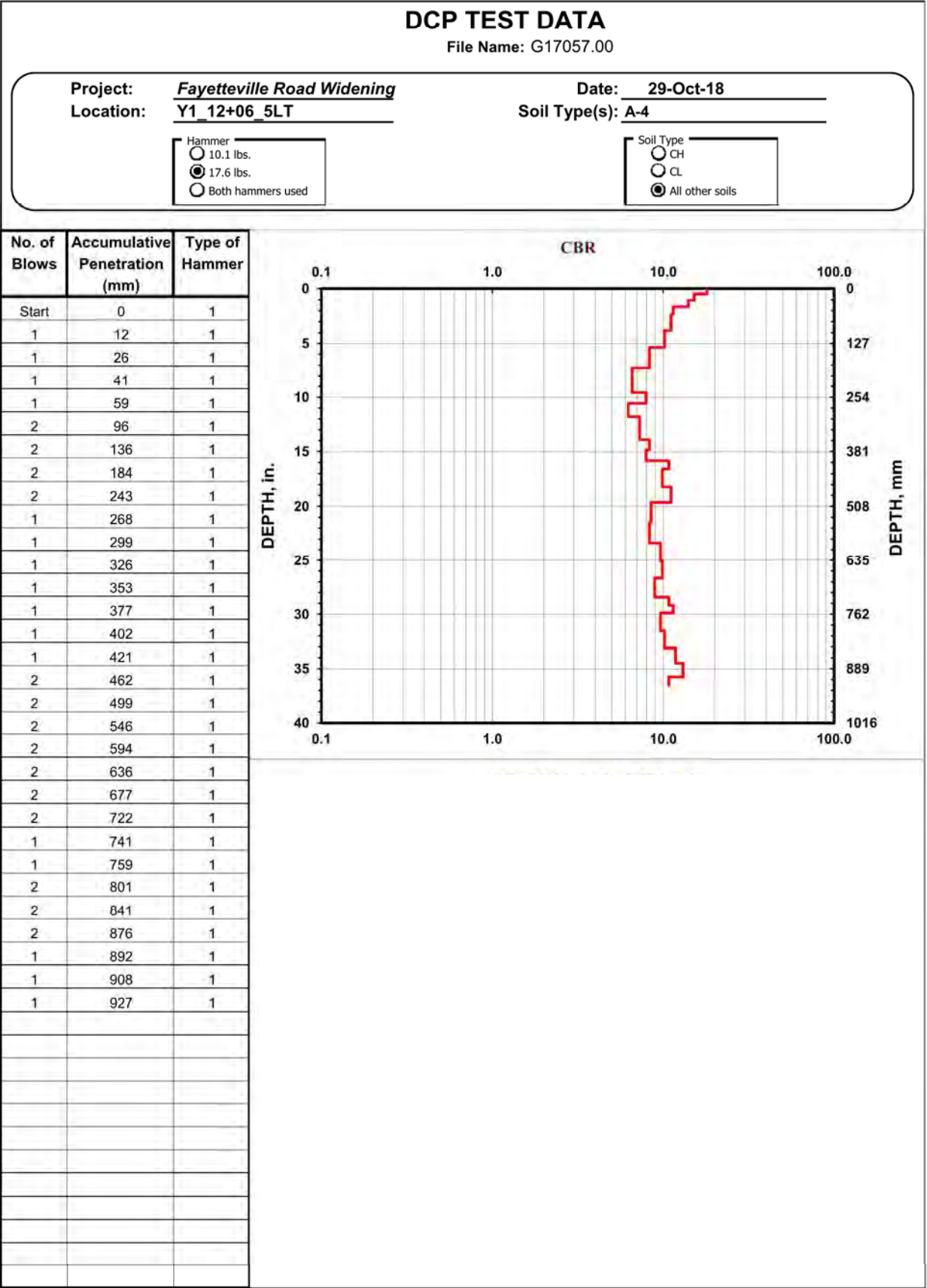
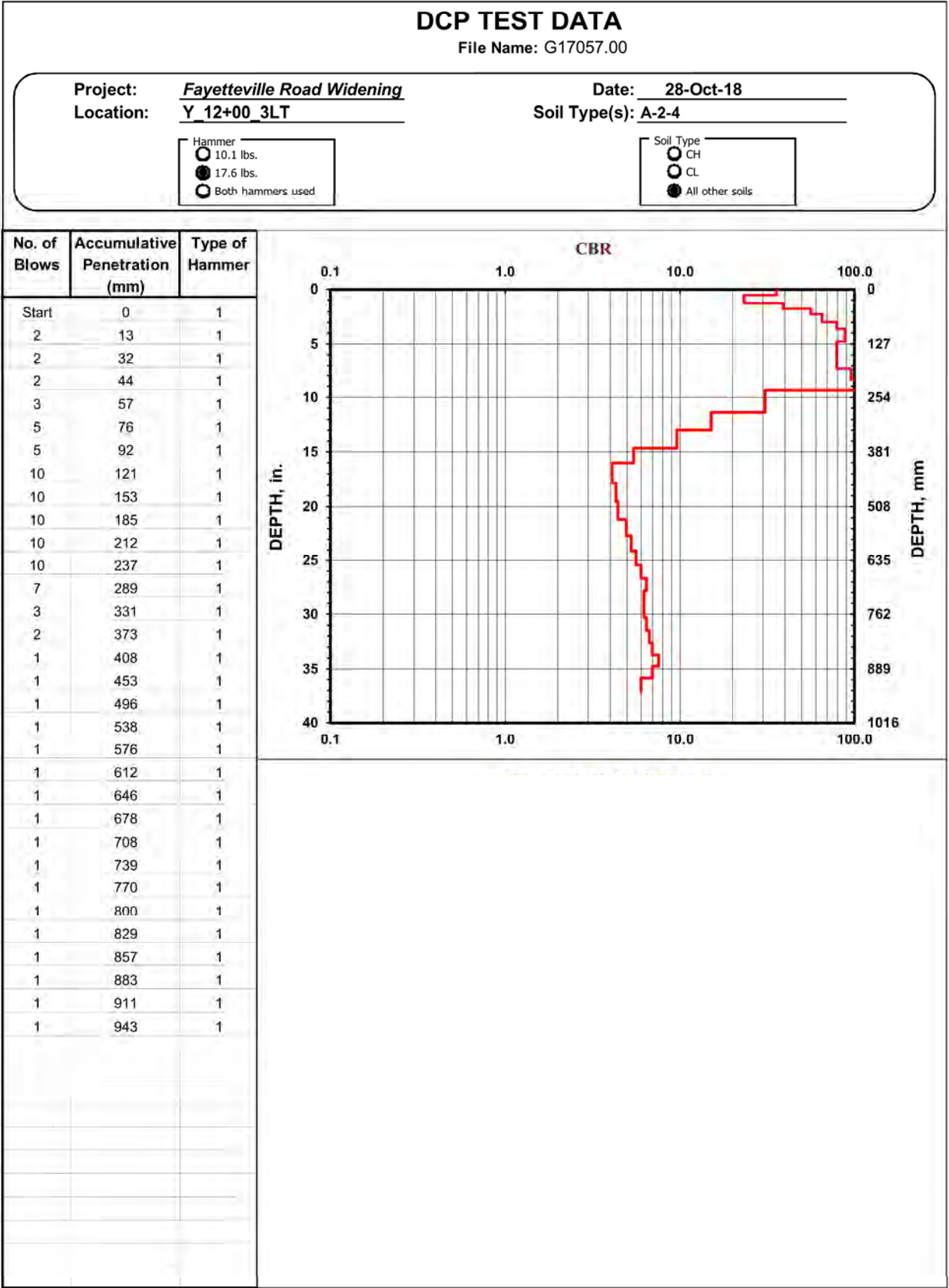
- CH
- CL
- All other soils

[illegible]









## DCP TEST DATA

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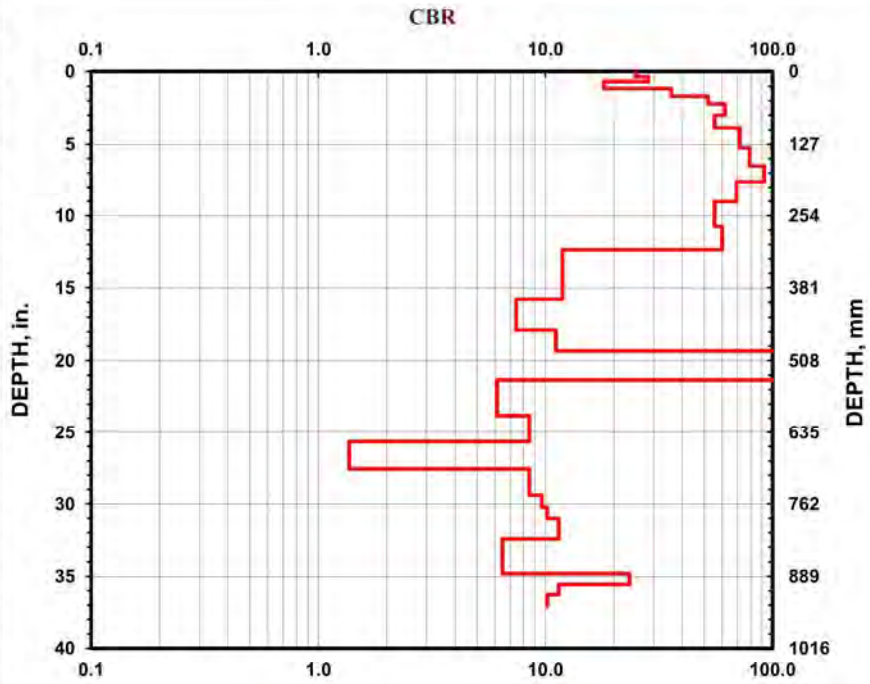
**Project:** Fayetteville Rd. Widening  
**Location:** Y2\_19+99\_2LT

Date: 30-Oct-18  
Soil Type(s): A-2-4

Hammer ☐ 10.1 lbs.  
☒ 17.6 lbs.  
☐ Both hammers used

Soil Type

- ☐ CH
- ☐ CL
- ☒ All other soils

[illegible]

## DCP TEST DATA

File Name: G17057

**Project:** Fayetteville Rd. Widening  
**Location:** Y2\_23+53\_43LT

Date: 30-Oct-18  
Soil Type(s): Gray, Clayey SAND (A-2-6)

Hammer

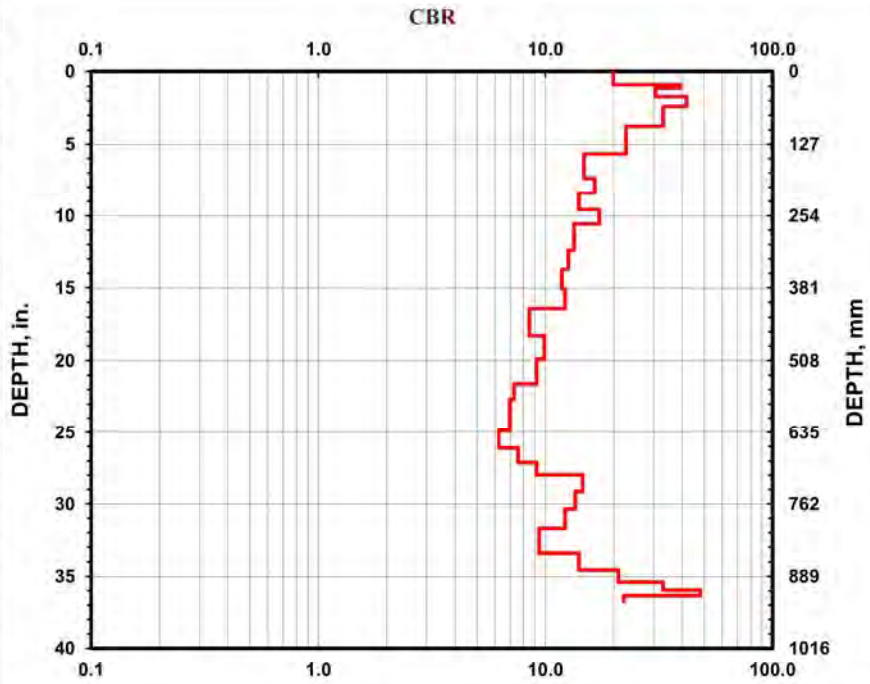
☐ 10.1 lbs.

☒ 17.6 lbs.

☐ Both hammers used

Soil Type

- ☐ CH
- ☐ CL
- ☒ All other soils

[illegible]

## DCP TEST DATA

**File Name:** G17057

**Project:** Fayetteville Rd. Widening  
**Location:** Y2\_29+48\_38LT

Date: 30-Oct-18  
Soil Type(s): Tan-Brown, Clayey SAND (A-2-6)

Hammer

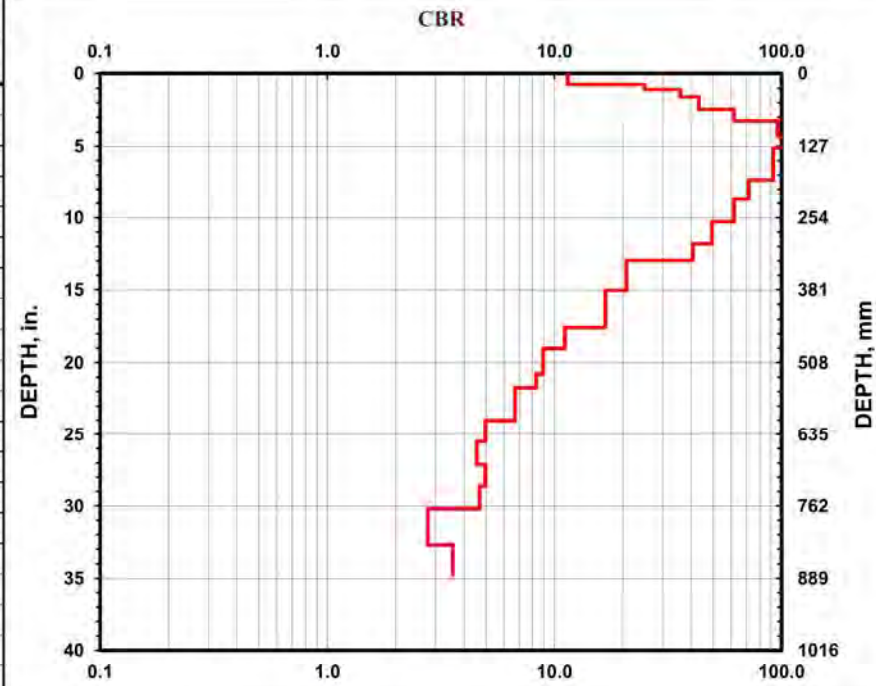
☐ 10.1 lbs.

☒ 17.6 lbs.

☐ Both hammers used

Soil Type

- ☐ CH
- ☐ CL
- ☒ All other soils

[illegible]

## DCP TEST DATA

**File Name:** G17057

Project: Fayetteville Rd. Widening  
Location: Y2\_32+41\_44LT

Date: 30-Oct-18  
Soil Type(s): Brown-Tan, Sandy Clay (A-4)

Hammer \_\_\_\_\_

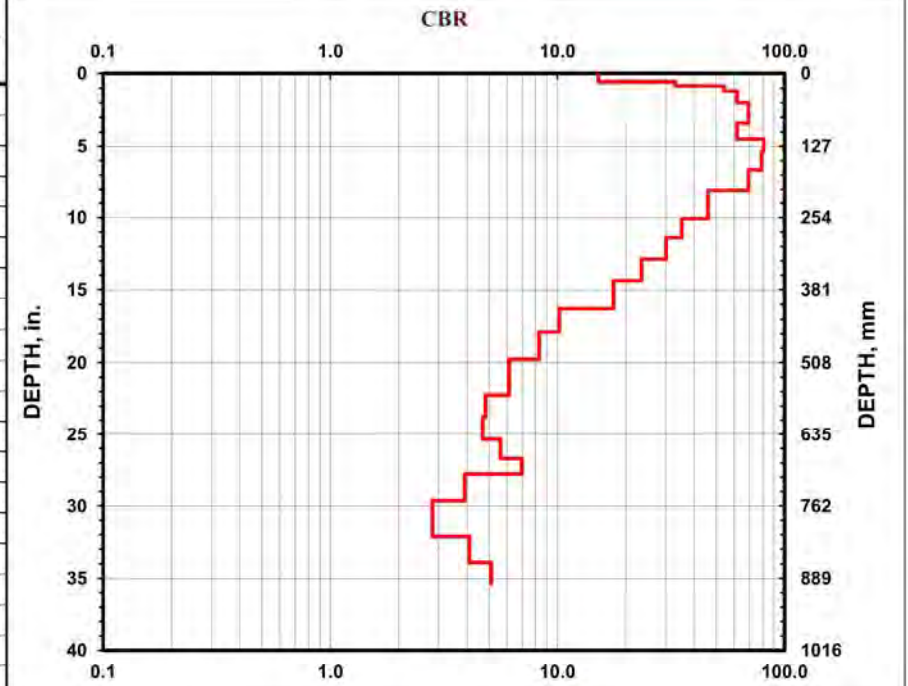
☐ 10.1 lbs.

☒ 17.6 lbs.

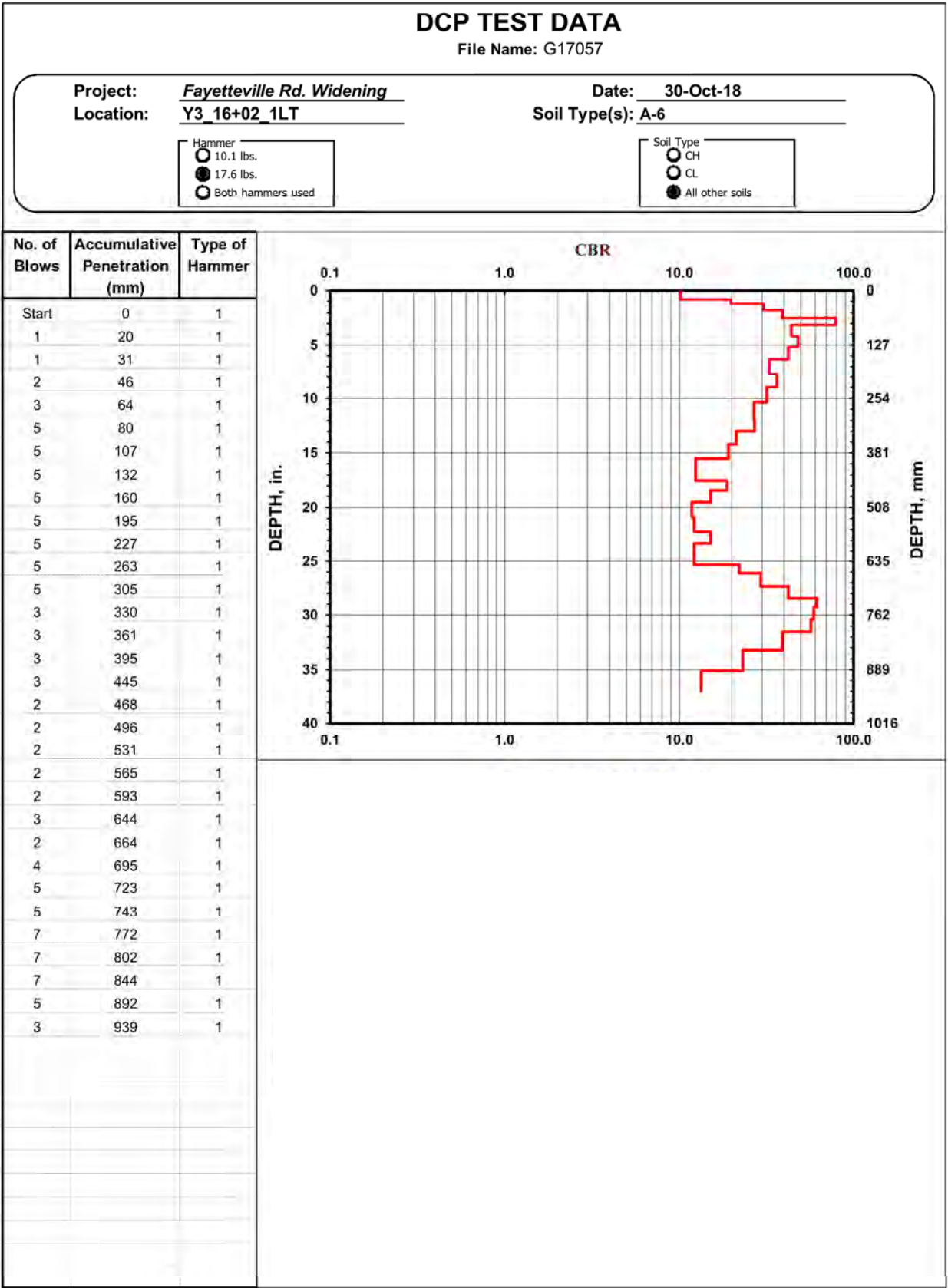
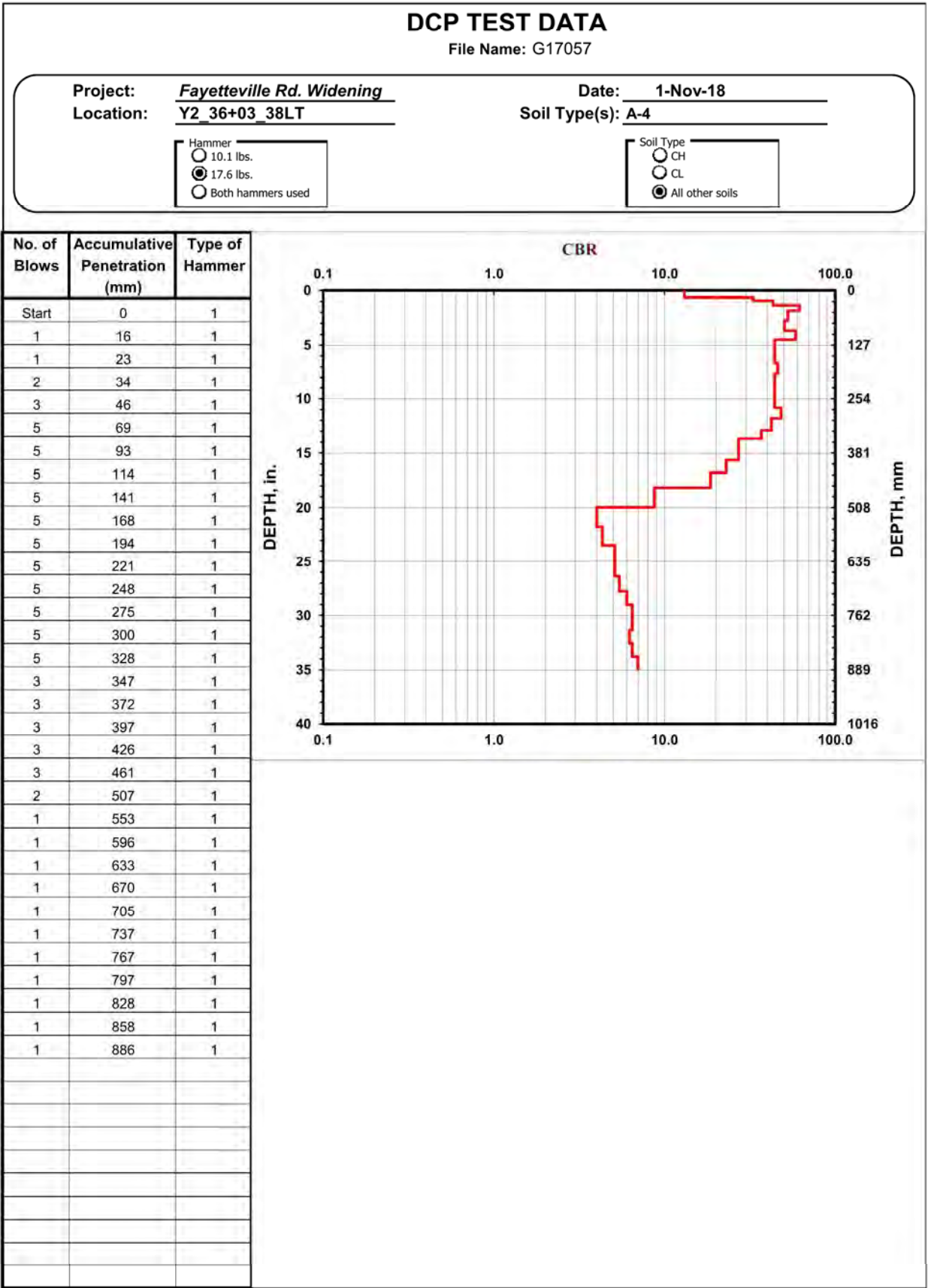
☐ Both hammers used

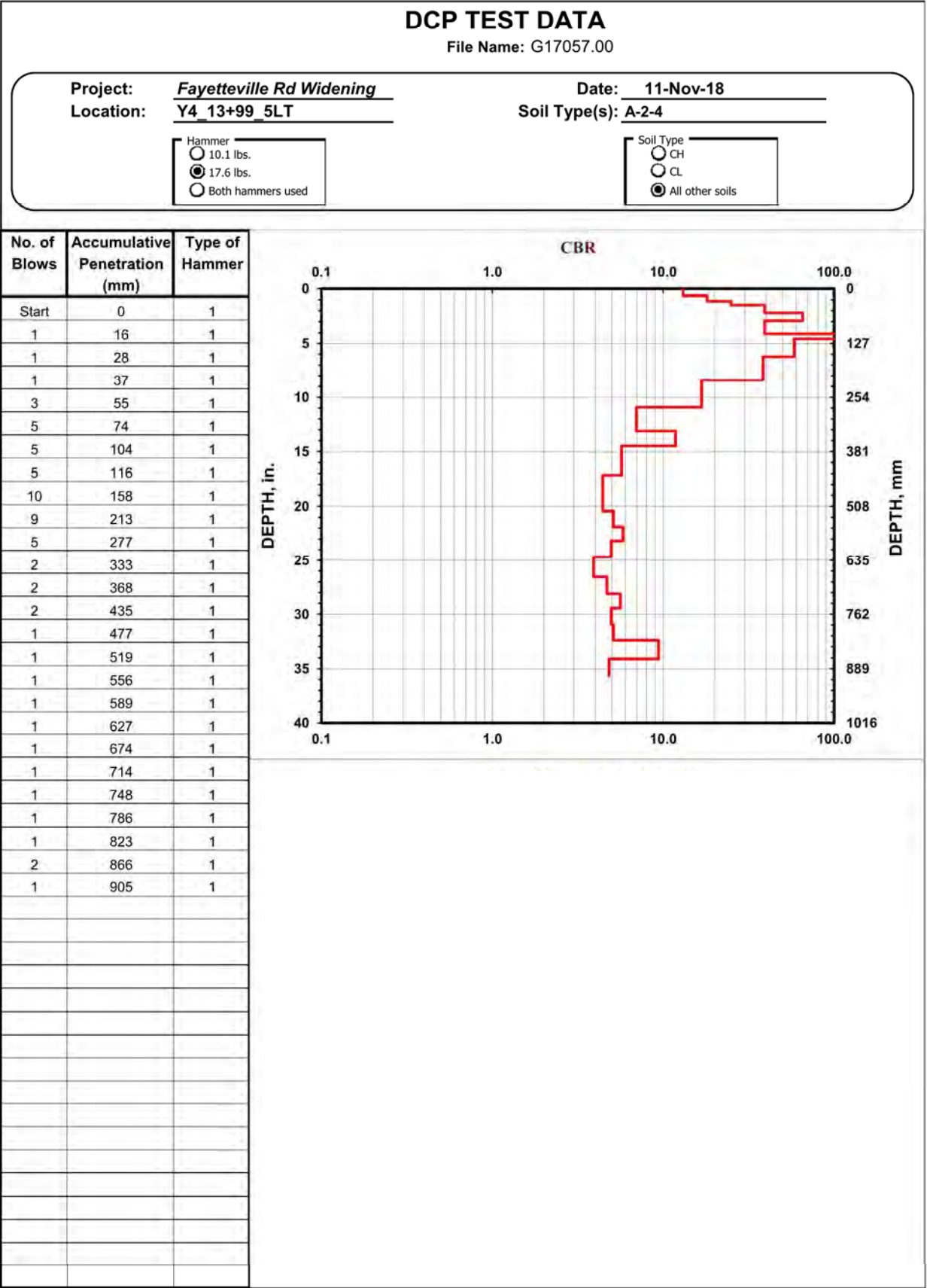
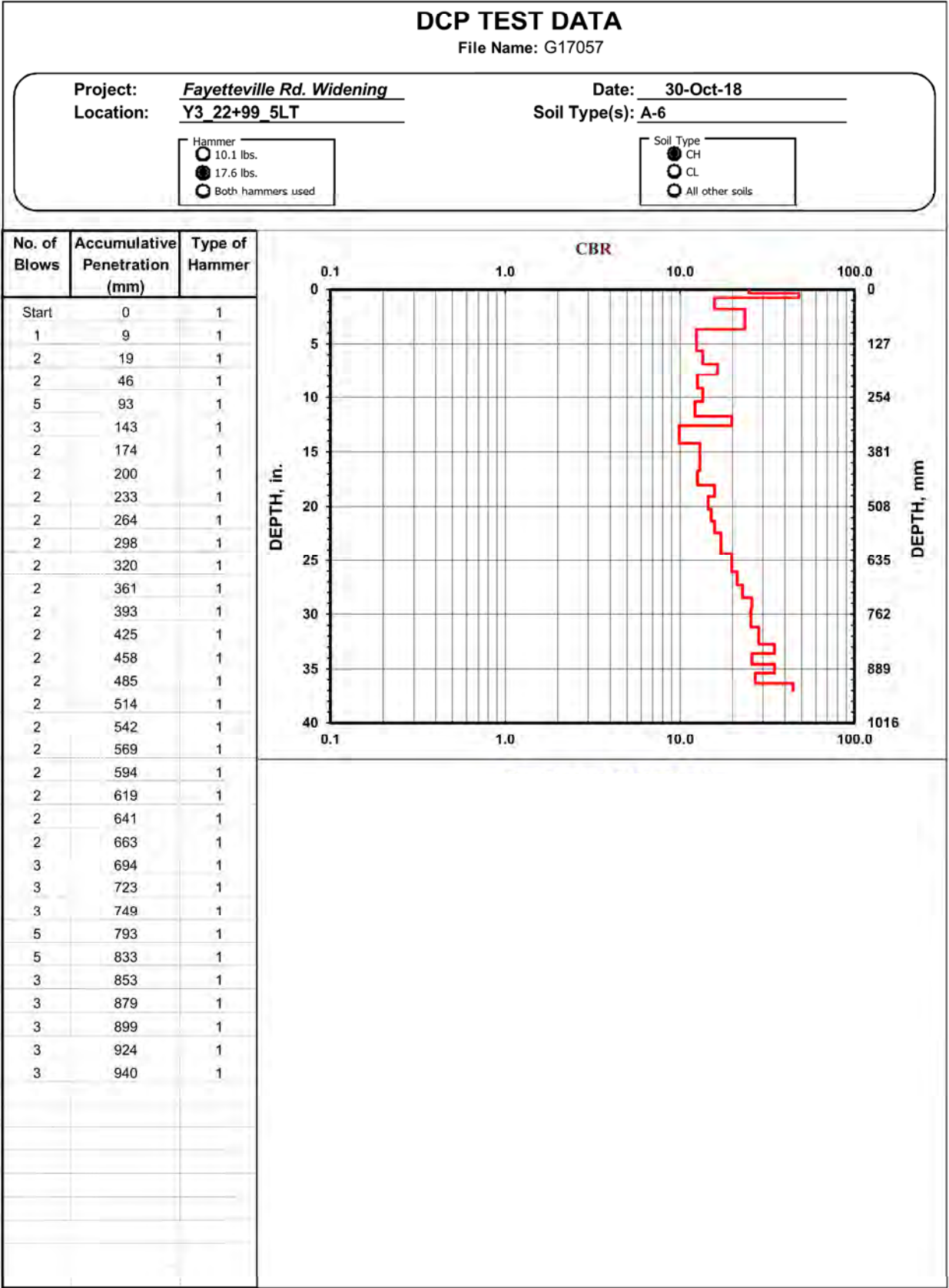
Soil Type

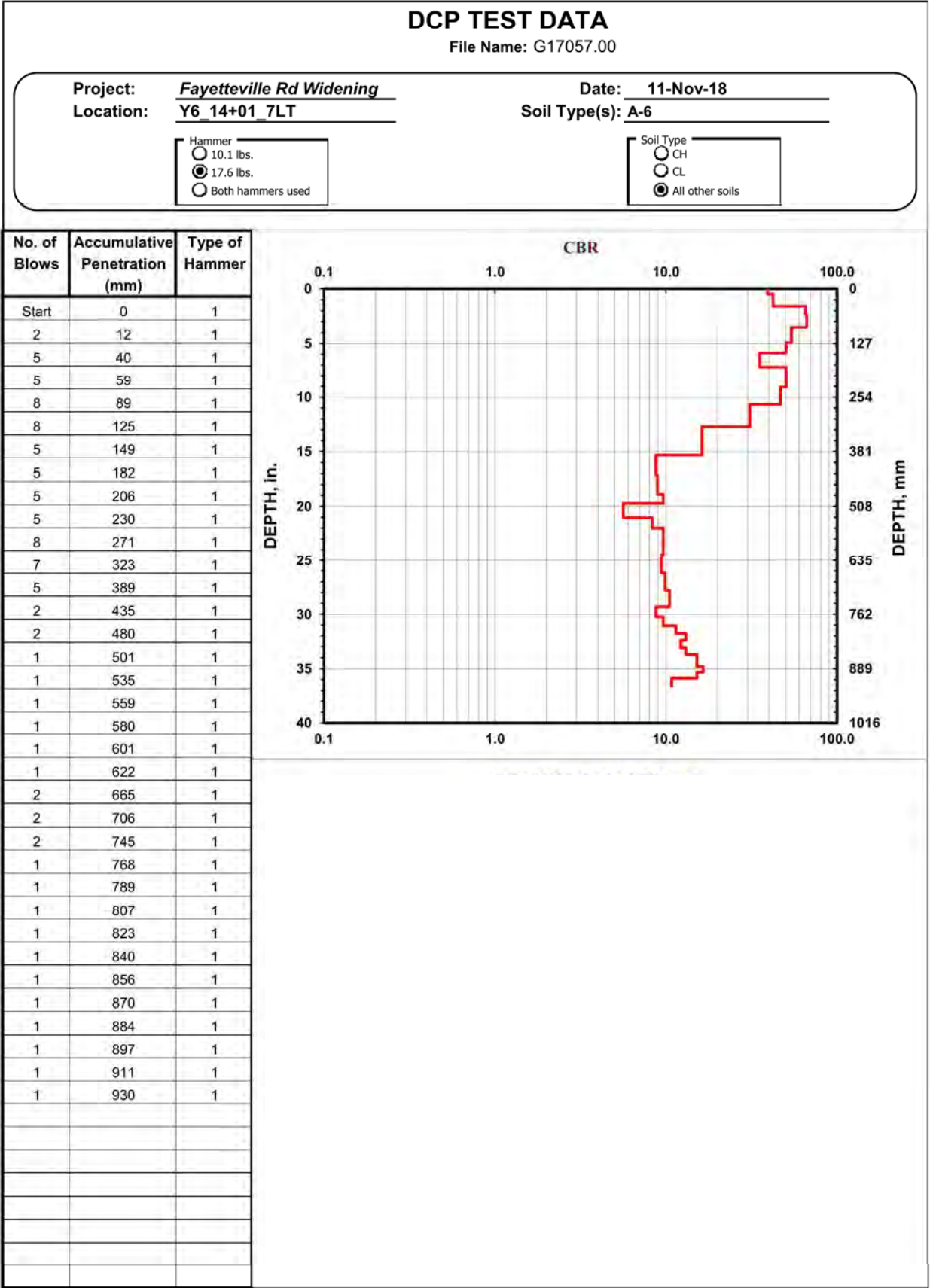
- ☐ CH
- ☐ CL
- ☒ All other soils

[illegible]











PROJECT: 44367 REFERENCE: U-5797

| PROJECT REFERENCE NO. | SHEET NO. |
|-----------------------|-----------|
| U-5797                | 36        |

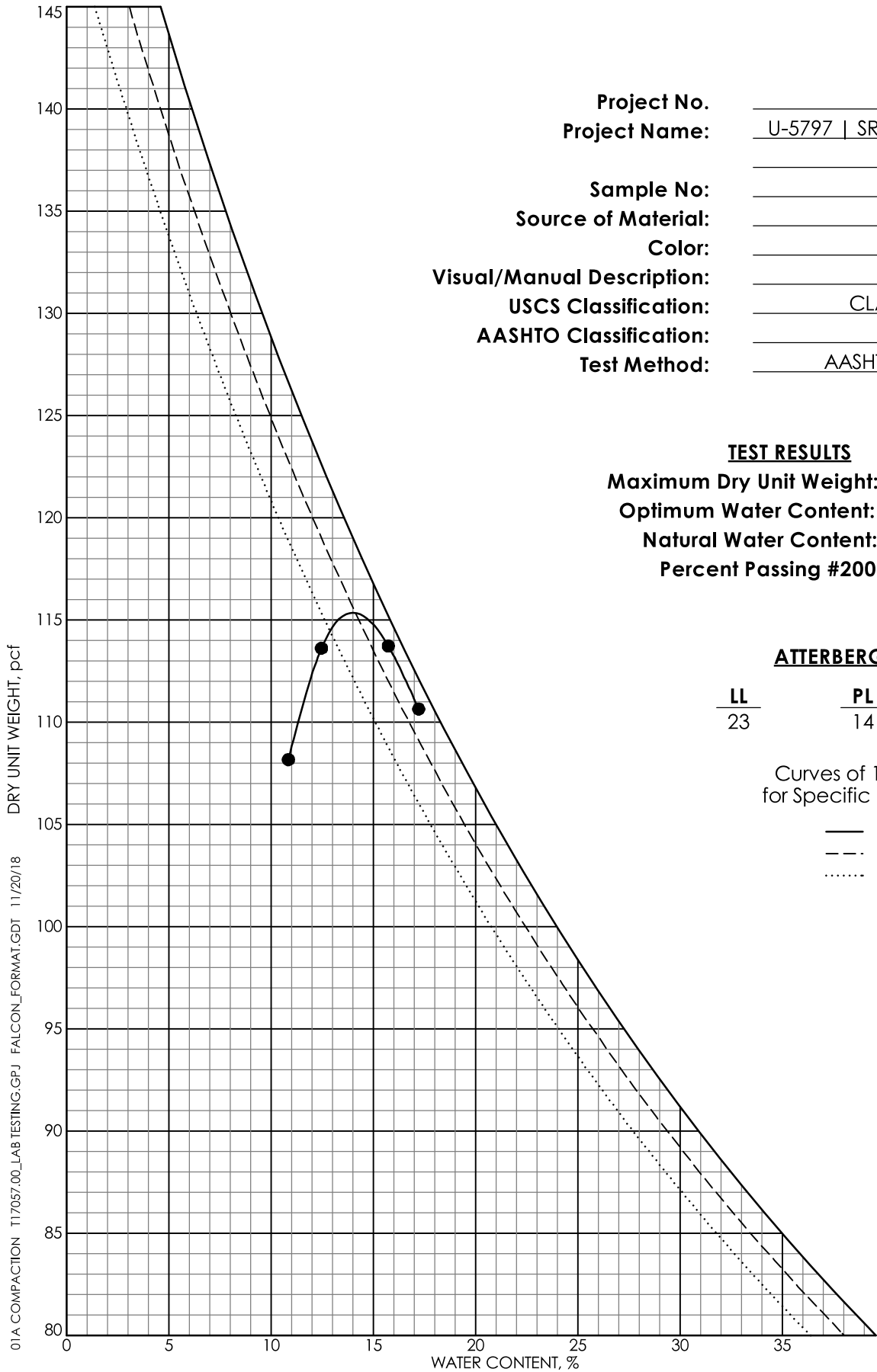
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
GEOTECHNICAL ENGINEERING UNIT  
SUBSURFACE INVESTIGATION  
APPENDIX B  
LABORATORY RESULTS



1210 TRINITY ROAD, SUITE 110  
CARY, NC 27513

PHONE: 919.871.0800  
www.falconengineers.com

LABORATORY COMPACTION TEST RESULTS



|                            |                                             |
|----------------------------|---------------------------------------------|
| Project No:                | G17057.00                                   |
| Project Name:              | U-5797   SR 1997 Fayetteville Road Widening |
| Sample No:                 | BS-01                                       |
| Source of Material:        | B-05                                        |
| Color:                     | Red Brown                                   |
| Visual/Manual Description: |                                             |
| USCS Classification:       | CLAYEY SAND(SC)                             |
| AASHTO Classification:     | A-2-4                                       |
| Test Method:               | AASHTO T-99 Method A                        |

TEST RESULTS

|                          |           |
|--------------------------|-----------|
| Maximum Dry Unit Weight: | 115.5 PCF |
| Optimum Water Content:   | 14.3 %    |
| Natural Water Content:   | 19.1 %    |
| Percent Passing #200:    | 19.7 %    |

ATTERBERG LIMITS

|    |    |    |
|----|----|----|
| LL | PL | PI |
| 23 | 14 | 9  |

Curves of 100% Saturation  
for Specific Gravity Equal to:

- 2.6
- - - 2.5
- ..... 2.4

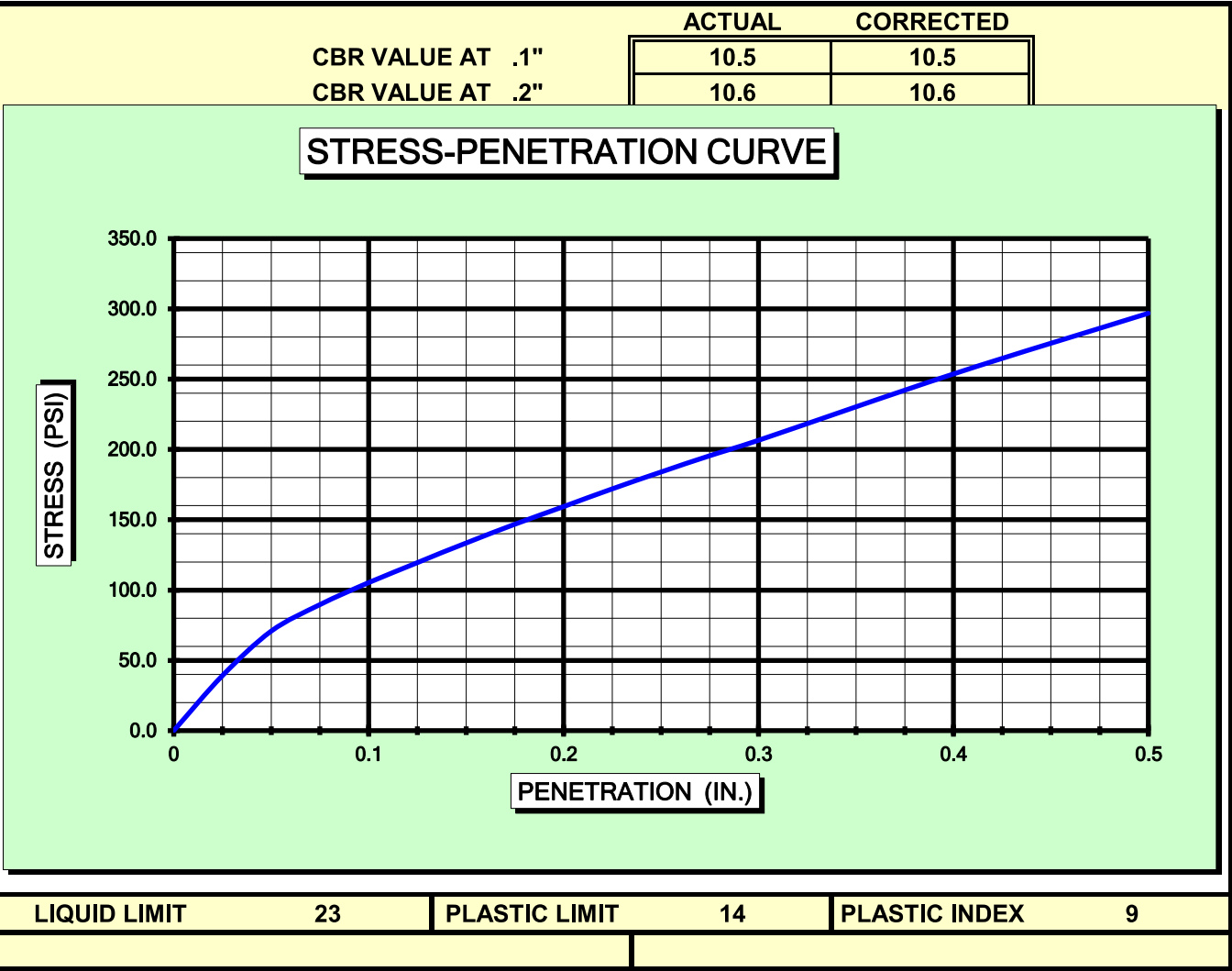
FALCON ENGINEERING

1210 TRINITY RD., SUITE 110, Cary, NC 27513

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

AASHTO T-193 \ ASTM D-1883

|                          |                                             |                           |               |
|--------------------------|---------------------------------------------|---------------------------|---------------|
| PROJECT #:               | G17057.00                                   | DATE:                     | 11/20/2018    |
| PROJECT NAME:            | U-5797   SR 1997 Fayetteville Road Widening |                           |               |
| BORING:                  | B-05                                        | SAMPLE:                   | BS-01         |
| DEPTH:                   | 3.5-8.5                                     |                           |               |
| SOIL DESCRIPTION:        | Red Brown Clayey Sand (A-2-4)               |                           |               |
| COMPACTION METHOD        | AASHTO T-99A                                | SOAK                      | 96 HRS.       |
| MAXIMUM DRY DENSITY      | 115.5 PCF                                   | STRAIN RATE               | .05 IN / MIN. |
| OPTIMUM MOISTURE CONTENT | 14.3%                                       | LOAD CELL                 | 6000          |
| TEST DATA                |                                             | SURCHARGE WEIGHT          | 10 lb.        |
| DRY DENSITY              | 112.9 PCF                                   | SURCHARGE PER SQUARE FOOT | 51 lbs/sq.ft. |
| MOISTURE CONTENT         | 14.7%                                       | FINAL MOISTURE CONTENT    | N/A           |
| PERCENT COMPACTION       | 97.7%                                       | SWELL                     | 0.04%         |

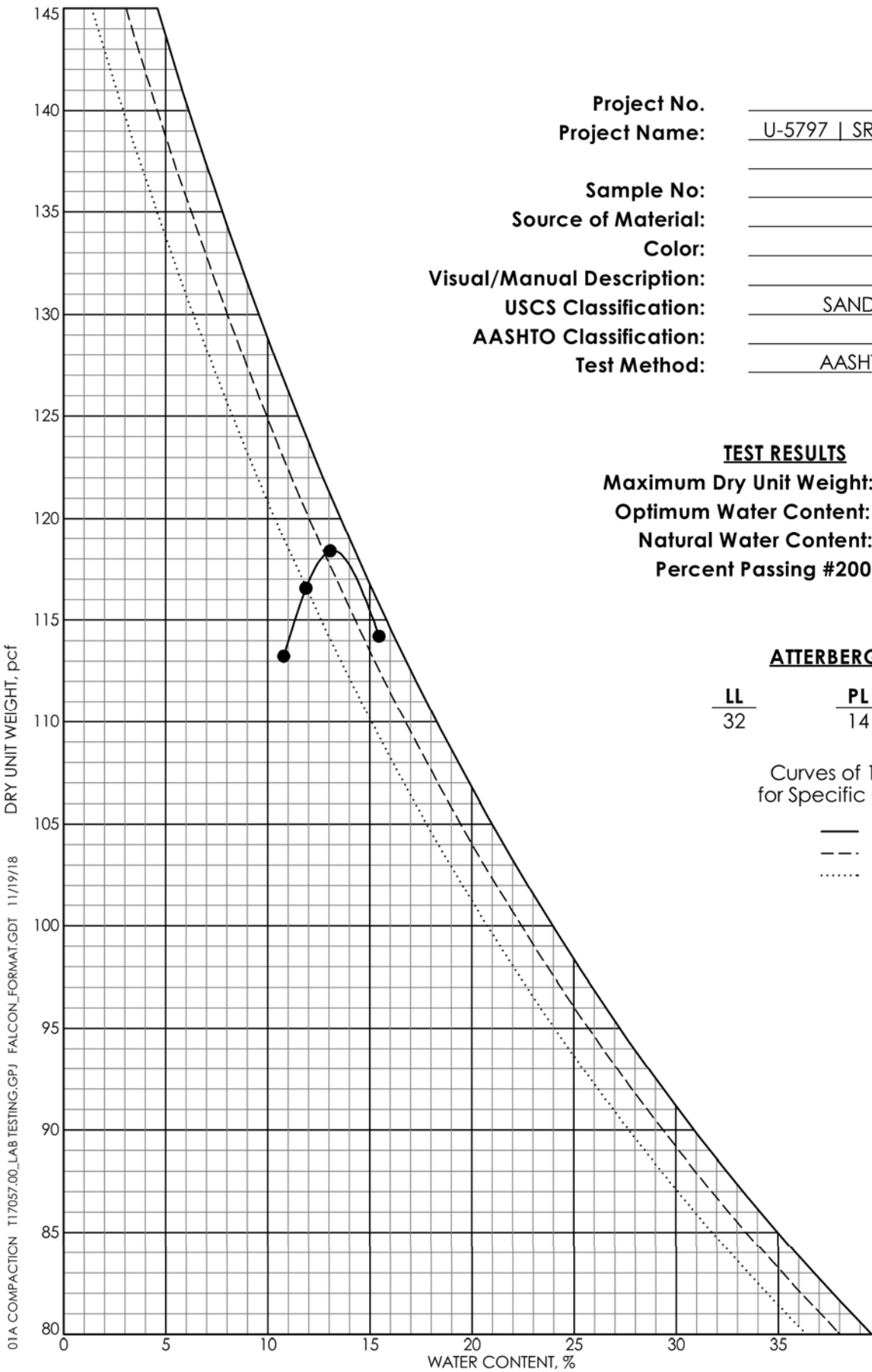




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CARY, NC 27513

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www.falconengineers.com

LABORATORY COMPACTION TEST RESULTS



|                            |                                    |
|----------------------------|------------------------------------|
| Project No.                | G17057.00                          |
| Project Name:              | U-5797   SR 1997 Fayetteville Road |
|                            | Widening                           |
| Sample No:                 | BS-02                              |
| Source of Material:        | B-23                               |
| Color:                     | Brown                              |
| Visual/Manual Description: |                                    |
| USCS Classification:       | SANDY LEAN CLAY (CL)               |
| AASHTO Classification:     | A-6                                |
| Test Method:               | AASHTO T-99 Method A               |

TEST RESULTS

|                          |           |
|--------------------------|-----------|
| Maximum Dry Unit Weight: | 118.4 PCF |
| Optimum Water Content:   | 13.2 %    |
| Natural Water Content:   | 18.2 %    |
| Percent Passing #200:    | 52.6 %    |

ATTERBERG LIMITS

|    |    |    |
|----|----|----|
| LL | PL | PI |
| 32 | 14 | 18 |

Curves of 100% Saturation  
for Specific Gravity Equal to:

|       |     |
|-------|-----|
| —     | 2.6 |
| - - - | 2.5 |
| ..... | 2.4 |

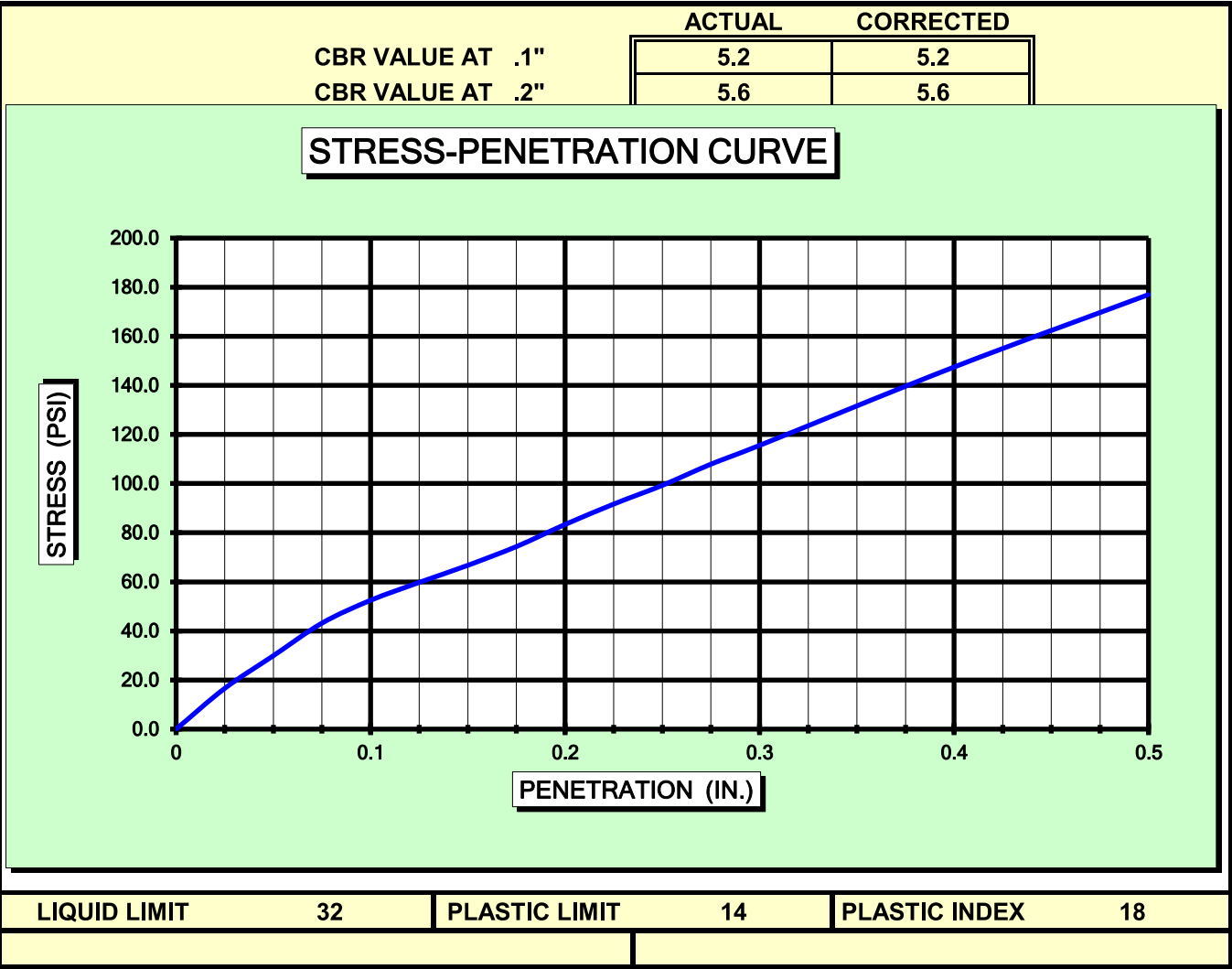
FALCON ENGINEERING

1210 TRINITY RD., SUITE 110, Cary, NC 27513

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

AASHTO T-193 \ ASTM D-1883

|                          |                                             |                           |               |
|--------------------------|---------------------------------------------|---------------------------|---------------|
| PROJECT #:               | G17057.00                                   | DATE:                     | 11/20/2018    |
| PROJECT NAME:            | U-5797   SR 1997 Fayetteville Road Widening |                           |               |
| BORING:                  | B-23                                        | SAMPLE:                   | BS-02         |
|                          |                                             | DEPTH:                    | 1.0-5.0       |
| SOIL DESCRIPTION:        | Brown Sandy Clay (A-6)                      |                           |               |
| COMPACTION METHOD        | AASHTO T-99A                                | SOAK                      | 96 HRS.       |
| MAXIMUM DRY DENSITY      | 118.4 PCF                                   | STRAIN RATE               | .05 IN / MIN. |
| OPTIMUM MOISTURE CONTENT | 13.2%                                       | LOAD CELL                 | 6000          |
| TEST DATA                |                                             | SURCHARGE WEIGHT          | 10 lb.        |
| DRY DENSITY              | 116.0 PCF                                   | SURCHARGE PER SQUARE FOOT | 51 lbs/sq.ft. |
| MOISTURE CONTENT         | 13.3%                                       | FINAL MOISTURE CONTENT    | N/A           |
| PERCENT COMPACTION       | 98.0%                                       | SWELL                     | 0.15%         |







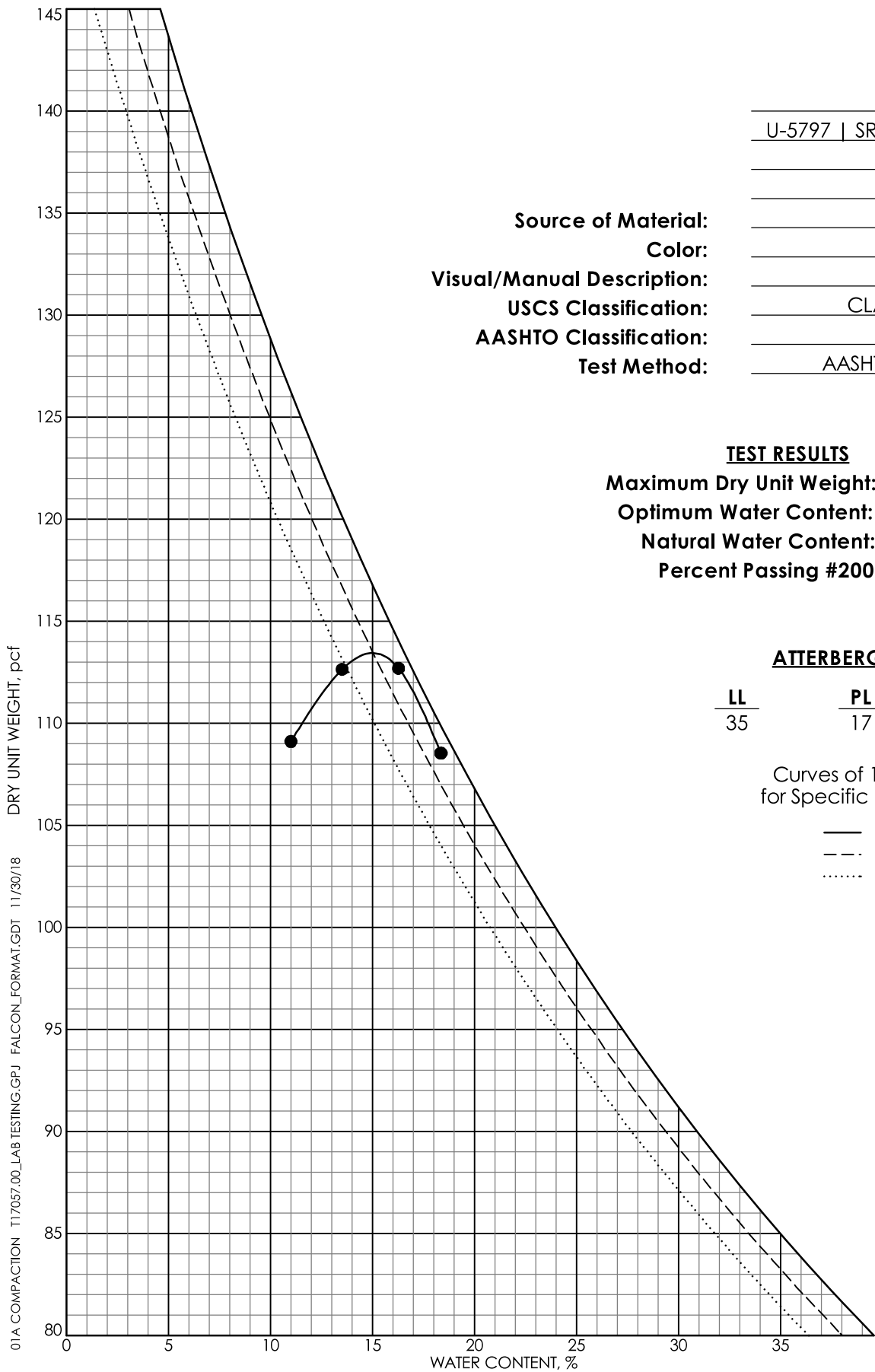
1210 TRINITY ROAD, SUITE 110  
CARY, NC 27513

PHONE: 919.871.0800  
www.falconengineers.com

LABORATORY COMPACTION TEST RESULTS

PAGE 1 OF 1

SHEET 39



Source of Material:

Color:

Visual/Manual Description:

USCS Classification:

AASHTO Classification:

Test Method:

|                                    |
|------------------------------------|
| G17057.00                          |
| U-5797   SR 1997 Fayetteville Road |
| Widening                           |
|                                    |
| B-44                               |
| Light Brown                        |
|                                    |
| CLAYEY SAND(SC)                    |
| A-6                                |
| AASHTO T-99 Method A               |

TEST RESULTS

Maximum Dry Unit Weight: 113.5 PCF

Optimum Water Content: 15.0 %

Natural Water Content: 19.8 %

Percent Passing #200: 48.2 %

ATTERBERG LIMITS

|    |    |    |
|----|----|----|
| LL | PL | PI |
| 35 | 17 | 18 |

Curves of 100% Saturation  
for Specific Gravity Equal to:

- 2.6
- - - 2.5
- ..... 2.4

FALCON ENGINEERING

1210 TRINITY RD., SUITE 110, Cary, NC 27513

CBR (CALIFORNIA BEARING RATIO) OF LABORATORY COMPACTED SOIL

AASHTO T-193 \ ASTM D-1883

|                          |                                             |                           |               |
|--------------------------|---------------------------------------------|---------------------------|---------------|
| PROJECT #:               | G17057.00                                   | DATE:                     | 11/21/2018    |
| PROJECT NAME:            | U-5797   SR 1997 Fayetteville Road Widening |                           |               |
| BORING:                  | B-44                                        | SAMPLE:                   | BS-03         |
|                          |                                             | DEPTH:                    | 3.5-8.5       |
| SOIL DESCRIPTION:        | Light Brown Sandy Clay (A-6)                |                           |               |
| COMPACTION METHOD        | AASHTO T-99A                                | SOAK                      | 96 HRS.       |
| MAXIMUM DRY DENSITY      | 113.5 PCF                                   | STRAIN RATE               | .05 IN / MIN. |
| OPTIMUM MOISTURE CONTENT | 15.0%                                       | LOAD CELL                 | 6000          |
| TEST DATA                |                                             | SURCHARGE WEIGHT          | 10 lb.        |
| DRY DENSITY              | 112.1 PCF                                   | SURCHARGE PER SQUARE FOOT | 51 lbs/sq.ft. |
| MOISTURE CONTENT         | 14.4%                                       | FINAL MOISTURE CONTENT    | N/A           |
| PERCENT COMPACTION       | 98.8%                                       | SWELL                     | 0.15%         |

