

REFERENCE: U-3440

PROJECT: 39010.1.1

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY CABARRUS  
 PROJECT DESCRIPTION NC 3, PROPOSED WEST SIDE  
BYPASS (U-2009) TO SR 1691 (LOOP ROAD) IN  
KANNAPOLIS  
 SITE DESCRIPTION RETAINING WALLS 1-5

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C.  | 39010.1.1                   | 1         | 13           |

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 RELED 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:
1. 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.
  2. 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

KLEINFELDER

INVESTIGATED BY J.P. ROGERS

DRAWN BY T.T. WALKER

CHECKED BY J.E. BEVERLY JEB

SUBMITTED BY E.N. WILLIAMS

DATE JULY 2016



DocuSigned by: Eric N. Williams

7/13/2016

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SIGNATURE

DATE

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

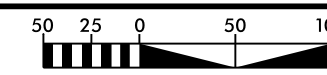
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION
SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

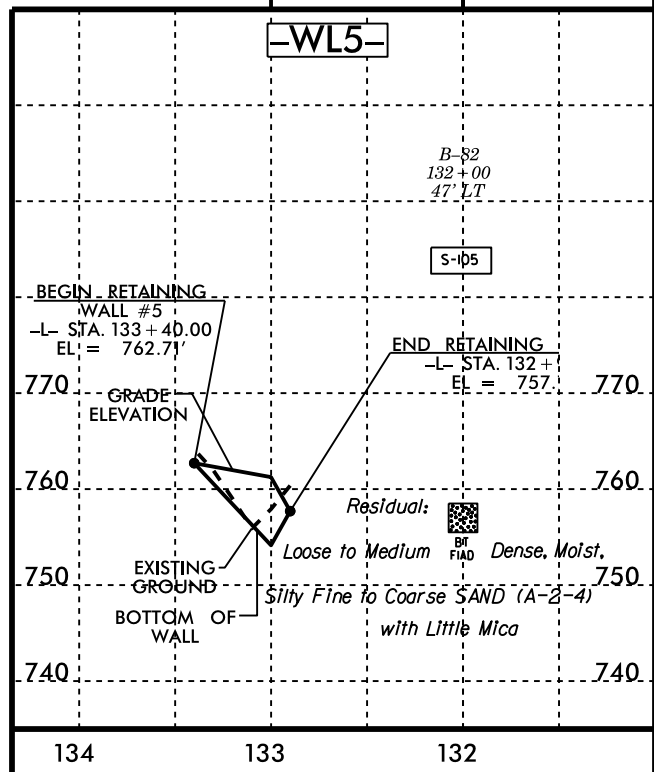
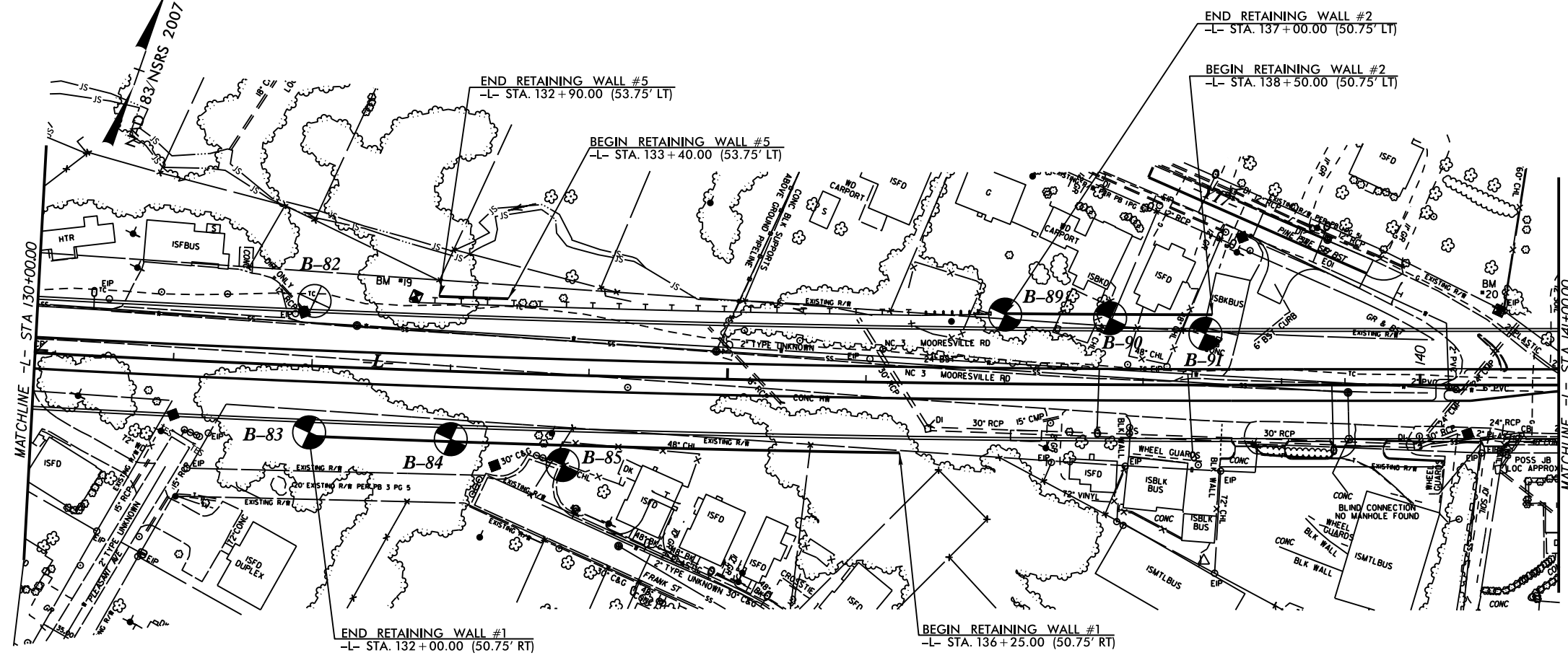
GRADATION
WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.
ANGULARITY OF GRAINS
MINERALOGICAL COMPOSITION
COMPRESSIBILITY
PERCENTAGE OF MATERIAL
GROUND WATER
MISCELLANEOUS SYMBOLS
RECOMMENDATION SYMBOLS
ABBREVIATIONS
EQUIPMENT USED ON SUBJECT PROJECT

ROCK DESCRIPTION
HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.
WEATHERED ROCK (WR)
CRYSTALLINE ROCK (CR)
NON-CRYSTALLINE ROCK (NCR)
COASTAL PLAIN SEDIMENTARY ROCK (CPS)
WEATHERING
ROCK HARDNESS
FRACTURE SPACING
BEDDING
INDURATION

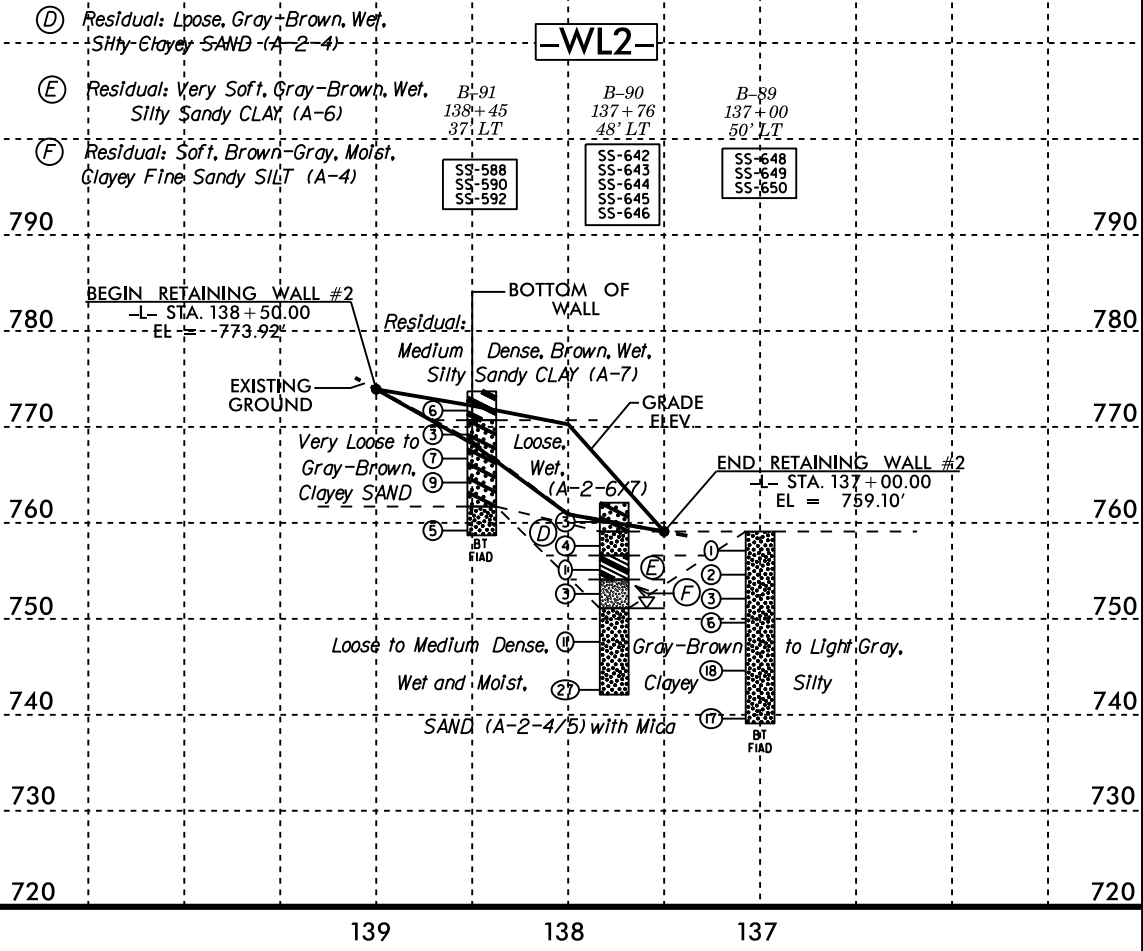
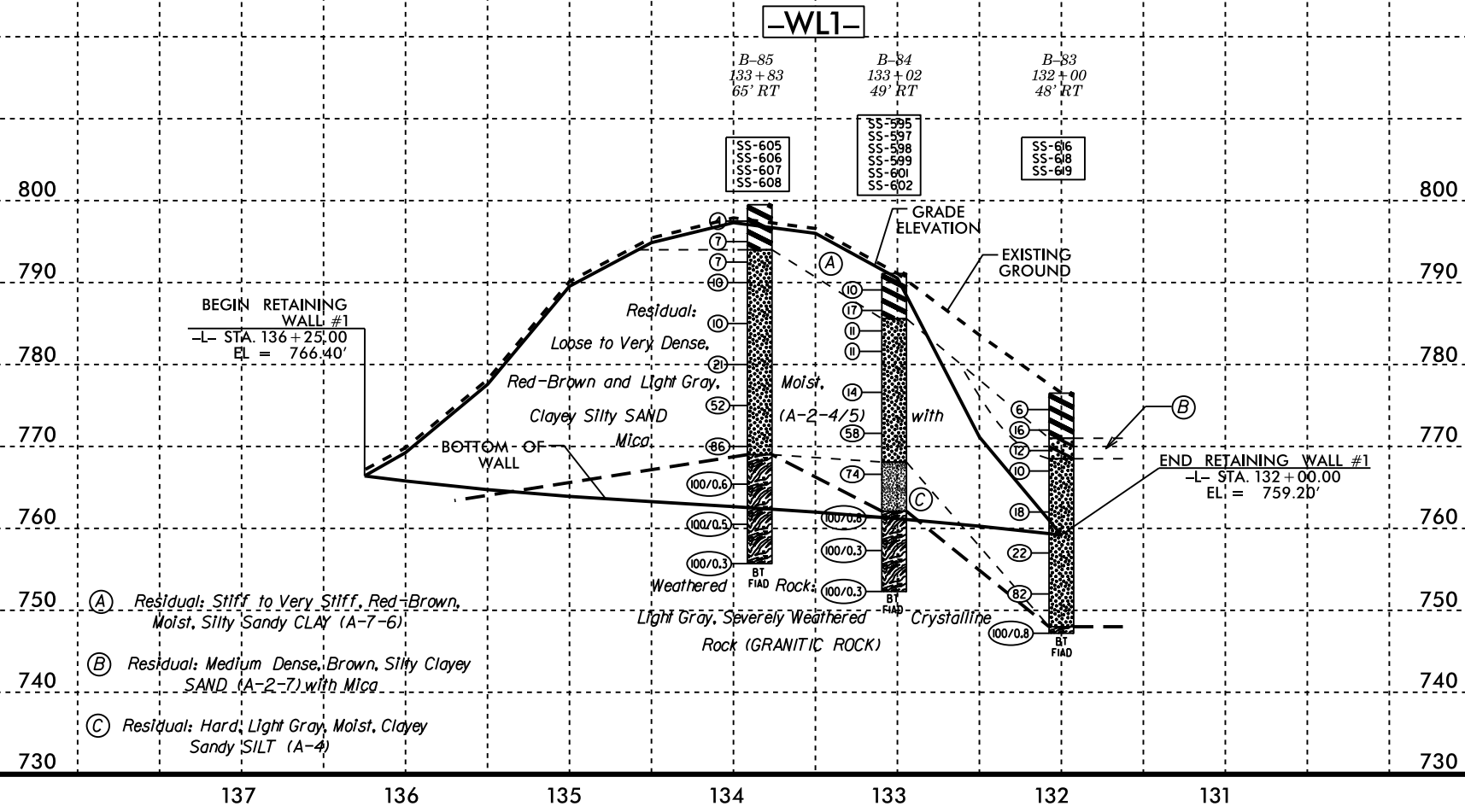
TERMS AND DEFINITIONS
ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
AQUIFER - A WATER BEARING FORMATION OR STRATA.
ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRODUCED ROCKS.
SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR BPF OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
STRATA ROCK QUALITY DESIGNATION (SROQ) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
BENCH MARK:
ELEVATION: FEET
NOTES:
BORING AND ELEVATION DATA DERIVED FROM NCDOT ROADWAY SUBSURFACE INVENTORY DATED MAY 2014
DATE: 8-15-14

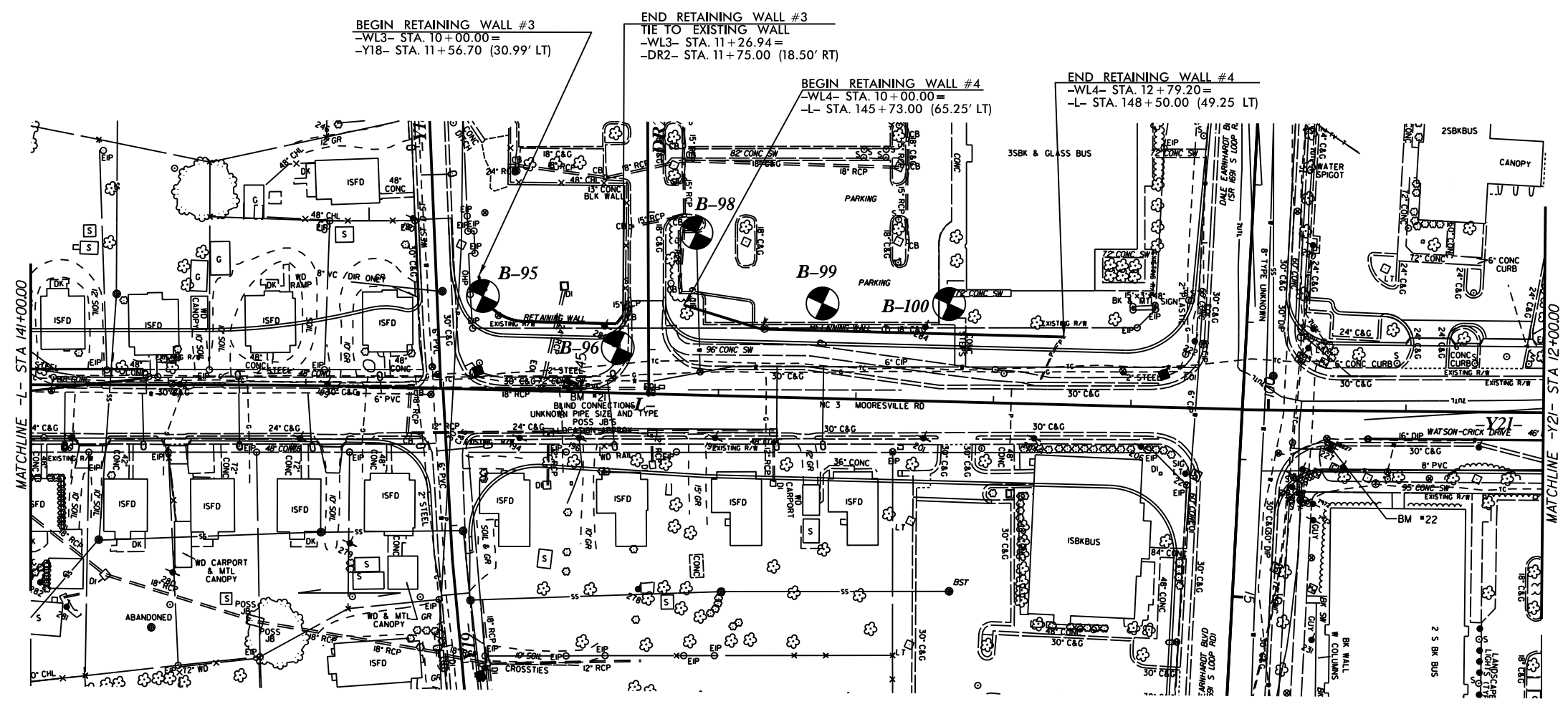
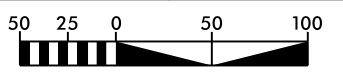


|   |        |           |   |
|---|--------|-----------|---|
| PROJECT REFERENCE NO.                                   | U-3440 | SHEET NO. | 3 |
| R/W SHEET NO.   |        |           |   |
| ROADWAY DESIGN ENGINEER                                 |        |           |   |
| <b>INCOMPLETE PLANS</b><br>DO NOT USE FOR A/CQUISITION  |        |           |   |
| <b>PRELIMINARY PLANS</b><br>DO NOT USE FOR CONSTRUCTION |        |           |   |

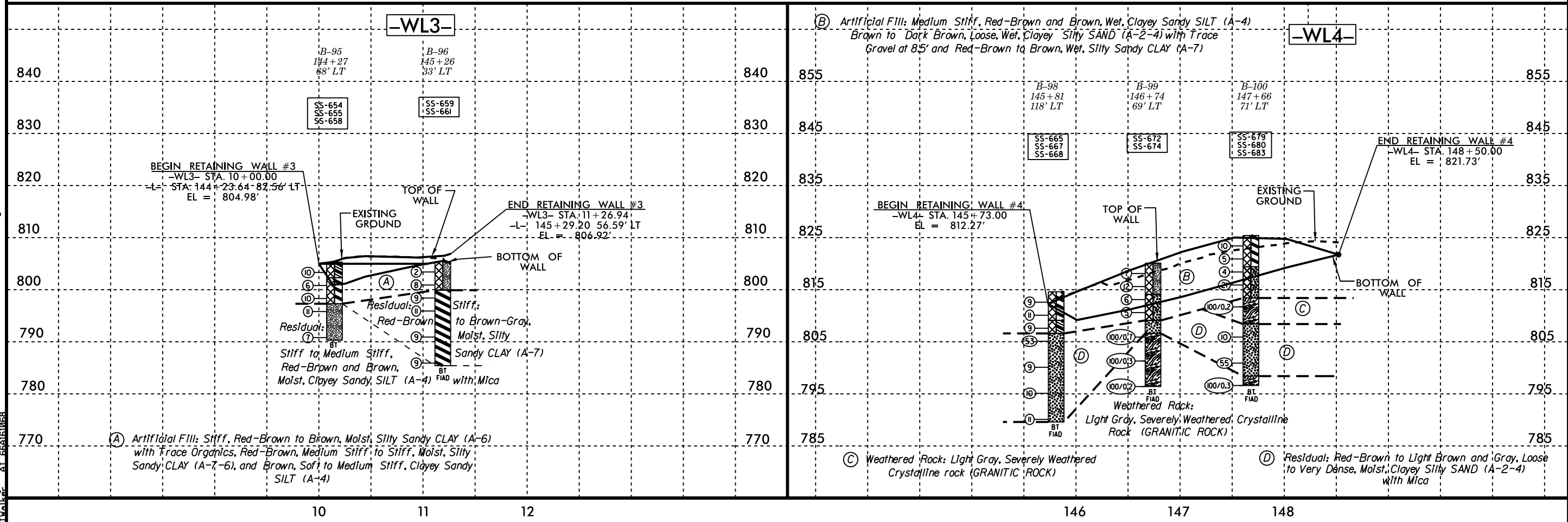


NOTE: OFFSET DIMENSIONS ARE FROM FACE OF WALL





NOTE: OFFSET DIMENSIONS ARE FROM FACE OF WALL



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# GEOTECHNICAL BORING REPORT BORE LOG

|   |                     |                          |                         |
|---|---------------------|--------------------------|-------------------------|
| WBS 39010.1.1   | TIP U-3440          | COUNTY CABARRUS          | GEOLOGIST Wells, T.     |
| SITE DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP RD.) IN KANNAPOLIS |                     |                          | GROUND WTR (ft)         |
| BORING NO. B-85   | STATION 133+83      | OFFSET 65 ft RT          | ALIGNMENT -L-           |
| COLLAR ELEV. 799.5 ft   | TOTAL DEPTH 43.8 ft | NORTHING 639,809         | EASTING 1,513,366       |
| DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 93% 12/08/2011                                 |                     | DRILL METHOD H.S. Augers | HAMMER TYPE Automatic   |
| DRILLER Gower, S.   | START DATE 12/05/13 | COMP. DATE 12/05/13      | SURFACE WATER DEPTH N/A |

| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT |        |       | BLOWS PER FOOT |    |    |    |     | SAMP. NO. | MOI    | LOG | SOIL AND ROCK DESCRIPTION  | DEPTH (ft) |     |
|---|-----------------|------------|------------|--------|-------|----------------|----|----|----|-----|-----------|--------|-----|--|------------|-----|
|   |                 |            | 0.5ft      | 0.5ft  | 0.5ft | 0              | 25 | 50 | 75 | 100 |           |        |     |  |            |     |
| 800   |                 |            |            |        |       |                |    |    |    |     |           |        |     |  | 799.5      | 0.0 |
|   | 798.5           | 1.0        | 2          | 2      | 2     | 4              |    |    |    |     |           | SS-605 | M   | RESIDUAL<br>RED-BRN MED. STIFF MOIST MED.<br>(PI=24) TO LOW (PI=11) PLASTIC MICA.<br>SILTY SANDY CLAY (A-7-6, A-7-5) |            |     |
| 795   | 796.0           | 3.5        | 2          | 3      | 4     | 7              |    |    |    |     |           | SS-606 | M   |  | 794.0      | 5.5 |
|   | 793.5           | 6.0        | 3          | 3      | 4     | 7              |    |    |    |     |           | SS-607 | M   | RESIDUAL<br>RED-BRN TO BRN & LT. GRAY LOOSE TO<br>V. DENSE MOIST MICA. CLAYEY SILTY<br>SAND (A-2-4)                  |            |     |
| 790   | 791.0           | 8.5        | 5          | 5      | 5     | 10             |    |    |    |     |           | SS-608 | M   |  |            |     |
|   | 786.0           | 13.5       | 3          | 4      | 6     | 10             |    |    |    |     |           |        | M   |  |            |     |
|   | 781.0           | 18.5       | 6          | 9      | 12    | 21             |    |    |    |     |           |        | M   |  |            |     |
|   | 776.0           | 23.5       | 16         | 24     | 28    | 52             |    |    |    |     |           |        | M   |  |            |     |
|   | 771.0           | 28.5       | 26         | 36     | 50    | 86             |    |    |    |     |           |        | M   |  |            |     |
|   | 766.0           | 33.5       | 71         | 29/0.1 |       | 100/6          |    |    |    |     |           |        | M   | 769.0  | 30.5       |     |
|   | 761.0           | 38.5       | 100/0.5    |        |       | 100/5          |    |    |    |     |           |        |     |  |            |     |
|   | 756.0           | 43.5       | 100/0.3    |        |       | 100/3          |    |    |    |     |           |        |     | 755.7  | 43.8       |     |
| WEATHERED ROCK<br>LT. GRAY SEV. WEATH. CRYSTALLINE<br>ROCK (GRANITIC ROCK)                    |                 |            |            |        |       |                |    |    |    |     |           |        |     |  |            |     |
| Boring Terminated at Elevation 755.7 ft IN<br>SEV. WEATH. CRYSTALLINE ROCK<br>(GRANITIC ROCK) |                 |            |            |        |       |                |    |    |    |     |           |        |     |  |            |     |
| NOTE: BORING USED FOR RETAINING<br>WALL   |                 |            |            |        |       |                |    |    |    |     |           |        |     |  |            |     |

NCDOT BORE DOUBLE U3440\_GEO\_BH\_WALL\_CABARRUS.GPJ NC\_DOT\_GDT 7/12/16

# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS 39010.1.1   |                 | TIP U-3440          |                          | COUNTY CABARRUS     |       | GEOLOGIST Wells, T.     |                 |    |    |     |           |     |     |                           |            |      |
|---|-----------------|---------------------|--------------------------|---------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|-----|---------------------------|------------|------|
| SITE DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP RD.) IN KANNAPOLIS |                 |                     |                          |                     |       |                         | GROUND WTR (ft) |    |    |     |           |     |     |                           |            |      |
| BORING NO. B-89   |                 | STATION 137+00      |                          | OFFSET 50 ft LT     |       | ALIGNMENT -L-           |                 |    |    |     |           |     |     |                           |            |      |
| COLLAR ELEV. 759.1 ft   |                 | TOTAL DEPTH 20.0 ft |                          | NORTHING 640,042    |       | EASTING 1,513,610       |                 |    |    |     |           |     |     |                           |            |      |
| DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 93% 12/08/2011                                 |                 |                     | DRILL METHOD H.S. Augers |                     |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |     |                           |            |      |
| DRILLER Gower, S.   |                 | START DATE 12/10/13 |                          | COMP. DATE 12/10/13 |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |     |     |                           |            |      |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT               |                     |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |      |
|   |                 |                     | 0.5ft                    | 0.5ft               | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |     |     |                           |            |      |
| 760   |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |     |                           | 759.1      | 0.0  |
|   | 758.1           | 1.0                 | 1                        | 0                   | 1     |                         |                 |    |    |     |           |     |     |                           |            |      |
| 755   | 755.6           | 3.5                 | 1                        | 1                   | 1     |                         |                 |    |    |     |           |     |     |                           |            |      |
|   | 753.1           | 6.0                 | 1                        | 1                   | 2     |                         |                 |    |    |     |           |     |     |                           |            |      |
| 750   | 750.6           | 8.5                 | 1                        | 2                   | 4     |                         |                 |    |    |     |           |     |     |                           |            |      |
|   | 745.6           | 13.5                | 3                        | 7                   | 11    |                         |                 |    |    |     |           |     |     |                           |            |      |
| 740   | 740.6           | 18.5                | 9                        | 7                   | 10    |                         |                 |    |    |     |           |     |     |                           |            |      |
|   |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |     |                           | 739.1      | 20.0 |
| Boring Terminated at Elevation 739.1 ft IN MED. DENSE WET SILTY CLAYEY SAND (A-2-4)           |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |     |                           |            |      |

| WBS 39010.1.1   |                 | TIP U-3440          |                          | COUNTY CABARRUS     |       | GEOLOGIST Wells, T.     |                 |    |    |     |           |     |     |                           |            |      |
|---|-----------------|---------------------|--------------------------|---------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|-----|---------------------------|------------|------|
| SITE DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP RD.) IN KANNAPOLIS |                 |                     |                          |                     |       |                         | GROUND WTR (ft) |    |    |     |           |     |     |                           |            |      |
| BORING NO. B-90   |                 | STATION 137+76      |                          | OFFSET 48 ft LT     |       | ALIGNMENT -L-           |                 |    |    |     |           |     |     |                           |            |      |
| COLLAR ELEV. 762.1 ft   |                 | TOTAL DEPTH 20.0 ft |                          | NORTHING 640,071    |       | EASTING 1,513,679       |                 |    |    |     |           |     |     |                           |            |      |
| DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 93% 12/08/2011                                 |                 |                     | DRILL METHOD H.S. Augers |                     |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |     |                           |            |      |
| DRILLER Gower, S.   |                 | START DATE 12/10/13 |                          | COMP. DATE 12/10/13 |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |     |     |                           |            |      |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT               |                     |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |      |
|   |                 |                     | 0.5ft                    | 0.5ft               | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |     |     |                           |            |      |
| 765   |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |     |                           | 762.1      | 0.0  |
|   | 761.1           | 1.0                 | 1                        | 1                   | 2     |                         |                 |    |    |     |           |     |     |                           |            |      |
| 760   | 758.6           | 3.5                 | 2                        | 2                   | 2     |                         |                 |    |    |     |           |     |     |                           |            |      |
|   | 756.1           | 6.0                 | 0                        | 0                   | 1     |                         |                 |    |    |     |           |     |     |                           |            |      |
| 755   | 753.6           | 8.5                 | 1                        | 1                   | 2     |                         |                 |    |    |     |           |     |     |                           |            |      |
|   | 748.6           | 13.5                | 4                        | 4                   | 7     |                         |                 |    |    |     |           |     |     |                           |            |      |
| 750   | 743.6           | 18.5                | 11                       | 13                  | 14    |                         |                 |    |    |     |           |     |     |                           |            |      |
|   |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |     |                           | 742.1      | 20.0 |
| Boring Terminated at Elevation 742.1 ft IN MED. DENSE MOIST SILTY SAND (A-2-5)                |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |     |                           |            |      |

NCDOT BORE DOUBLE U3440\_GEO\_BH\_WALL\_CABARRUS.GPJ NC\_DOT.GDT 7/12/16

# GEOTECHNICAL BORING REPORT BORE LOG

| WBS 39010.1.1   |                 | TIP U-3440          |            | COUNTY CABARRUS          |       | GEOLOGIST Wells, T.     |                 |    |    |     |           |        |     |                           |            |      |  |  |
|---|-----------------|---------------------|------------|--------------------------|-------|-------------------------|-----------------|----|----|-----|-----------|--------|-----|---------------------------|------------|------|--|--|
| SITE DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP RD.) IN KANNAPOLIS |                 |                     |            |                          |       |                         | GROUND WTR (ft) |    |    |     |           |        |     |                           |            |      |  |  |
| BORING NO. B-91   |                 | STATION 138+45      |            | OFFSET 37 ft LT          |       | ALIGNMENT -L-           |                 |    |    |     |           |        |     |                           |            |      |  |  |
| COLLAR ELEV. 773.7 ft   |                 | TOTAL DEPTH 15.0 ft |            | NORTHING 640,090         |       | EASTING 1,513,746       |                 |    |    |     |           |        |     |                           |            |      |  |  |
| DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 93% 12/08/2011                                 |                 |                     |            | DRILL METHOD H.S. Augers |       | HAMMER TYPE Automatic   |                 |    |    |     |           |        |     |                           |            |      |  |  |
| DRILLER Gower, S.   |                 | START DATE 12/05/13 |            | COMP. DATE 12/05/13      |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |        |     |                           |            |      |  |  |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT |                          |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | MOI    | LOG | SOIL AND ROCK DESCRIPTION |            |      |  |  |
|   |                 |                     | 0.5ft      | 0.5ft                    | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |        |     | ELEV. (ft)                | DEPTH (ft) |      |  |  |
| 775   |                 |                     |            |                          |       |                         |                 |    |    |     |           |        |     |                           | 773.7      | 0.0  | GROUND SURFACE   |  |
|   | 772.7           | 1.0                 | 2          | 2                        | 4     | 6                       |                 |    |    |     |           | SS-588 | W   |                           | 770.7      | 3.0  | <b>RESIDUAL</b><br>BROWN MED. STIFF WET MED. (PI=24)<br>PLASTIC SILTY SANDY CLAY (A-7-6)             |  |
| 770   | 770.2           | 3.5                 | 1          | 1                        | 2     | 3                       |                 |    |    |     |           |        | W   |                           |            |      | <b>RESIDUAL</b><br>GRAY & BROWN V. LOOSE TO LOOSE<br>WET MED. (PI=22) PLASTIC CLAYEY<br>SAND (A-2-6) |  |
|   | 767.7           | 6.0                 | 2          | 3                        | 4     | 7                       |                 |    |    |     |           | SS-590 | W   |                           |            |      |  |  |
| 765   | 765.2           | 8.5                 | 3          | 4                        | 5     | 9                       |                 |    |    |     |           |        | W   |                           |            |      |  |  |
|   |                 |                     |            |                          |       |                         |                 |    |    |     |           |        |     |                           | 761.7      | 12.0 | <b>RESIDUAL</b>  |  |
| 760   | 760.2           | 13.5                | 2          | 2                        | 3     | 5                       |                 |    |    |     |           | SS-592 | M   |                           | 758.7      | 15.0 | LT. BROWN LOOSE MOIST CLAYEY SILTY<br>SAND (A-2-4)   |  |
|   |                 |                     |            |                          |       |                         |                 |    |    |     |           |        |     |                           |            |      |  | Boring Terminated at Elevation 758.7 ft IN<br>LOOSE MOIST CLAYEY SILTY SAND<br>(A-2-4) |

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# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS 39010.1.1   |                 | TIP U-3440          |                          | COUNTY CABARRUS     |       | GEOLOGIST Wells, T.     |                 |    |    |     |           |     |                           |            |   |      |
|---|-----------------|---------------------|--------------------------|---------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|---------------------------|------------|---|------|
| SITE DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP RD.) IN KANNAPOLIS |                 |                     |                          |                     |       |                         | GROUND WTR (ft) |    |    |     |           |     |                           |            |   |      |
| BORING NO. B-95   |                 | STATION 144+27      |                          | OFFSET 68 ft LT     |       | ALIGNMENT -L-           |                 |    |    |     |           |     |                           |            |   |      |
| COLLAR ELEV. 805.3 ft   |                 | TOTAL DEPTH 15.0 ft |                          | NORTHING 640,361    |       | EASTING 1,514,264       |                 |    |    |     |           |     |                           |            |   |      |
| DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 93% 12/08/2011                                 |                 |                     | DRILL METHOD H.S. Augers |                     |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |                           |            |   |      |
| DRILLER Gower, S.   |                 | START DATE 12/10/13 |                          | COMP. DATE 12/10/13 |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |     |                           |            |   |      |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT               |                     |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |   |      |
|   |                 |                     | 0.5ft                    | 0.5ft               | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |     |                           |            |   |      |
| 810   |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |                           |            |   |      |
| 805   | 804.3           | 1.0                 | 4                        | 6                   | 4     |                         |                 |    |    |     |           |     |                           | 805.3      | GROUND SURFACE  | 0.0  |
|   | 801.8           | 3.5                 | 3                        | 3                   | 3     |                         |                 |    |    |     | SS-654    | M   |                           | 802.3      | ARTIFICIAL FILL<br>RED-BRN STIFF MOIST LOW (PI=14)<br>PLASTIC SILTY SANDY CLAY (A-6) W/<br>TRACE ORGANICS | 3.0  |
| 800   | 799.3           | 6.0                 | 2                        | 3                   | 7     |                         |                 |    |    |     |           | M   |                           | 797.3      | ARTIFICIAL FILL<br>RED-BRN MED. STIFF TO STIFF MOIST<br>MED. (PI=22) PLASTIC SILTY SANDY CLAY<br>(A-7-6)  | 8.0  |
|   | 796.8           | 8.5                 | 4                        | 5                   | 6     |                         |                 |    |    |     |           | M   |                           |            | RESIDUAL<br>RED-BRN & BRN STIFF TO MED. STIFF<br>MOIST NON-MICA. TO MICA. CLAYEY<br>SANDY SILT (A-4)      |      |
| 795   | 791.8           | 13.5                | 2                        | 3                   | 4     |                         |                 |    |    |     | SS-658    | M   |                           | 790.3      | Boring Terminated at Elevation 790.3 ft IN<br>MED. STIFF MOIST MICA. CLAYEY SANDY<br>SILT (A-4)           | 15.0 |

| WBS 39010.1.1   |                 | TIP U-3440          |                          | COUNTY CABARRUS     |       | GEOLOGIST Wells, T.     |                 |    |    |     |           |     |                           |            |  |      |
|---|-----------------|---------------------|--------------------------|---------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|---------------------------|------------|--|------|
| SITE DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP RD.) IN KANNAPOLIS |                 |                     |                          |                     |       |                         | GROUND WTR (ft) |    |    |     |           |     |                           |            |  |      |
| BORING NO. B-96   |                 | STATION 145+26      |                          | OFFSET 33 ft LT     |       | ALIGNMENT -L-           |                 |    |    |     |           |     |                           |            |  |      |
| COLLAR ELEV. 805.4 ft   |                 | TOTAL DEPTH 20.0 ft |                          | NORTHING 640,368    |       | EASTING 1,514,369       |                 |    |    |     |           |     |                           |            |  |      |
| DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 93% 12/08/2011                                 |                 |                     | DRILL METHOD H.S. Augers |                     |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |                           |            |  |      |
| DRILLER Gower, S.   |                 | START DATE 12/11/13 |                          | COMP. DATE 12/11/13 |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |     |                           |            |  |      |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT               |                     |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |  |      |
|   |                 |                     | 0.5ft                    | 0.5ft               | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |     |                           |            |  |      |
| 810   |                 |                     |                          |                     |       |                         |                 |    |    |     |           |     |                           |            |  |      |
| 805   | 804.4           | 1.0                 | 1                        | 1                   | 1     |                         |                 |    |    |     |           |     |                           | 805.4      | GROUND SURFACE   | 0.0  |
|   | 801.9           | 3.5                 | 3                        | 3                   | 5     |                         |                 |    |    |     | SS-659    | W   |                           |            | ARTIFICIAL FILL<br>BRN SOFT TO MED. STIFF WET LOW<br>(PI=7) PLASTIC CLAYEY SANDY SILT (A-4)          |      |
| 800   | 799.4           | 6.0                 | 4                        | 4                   | 5     |                         |                 |    |    |     |           | W   |                           | 799.9      |  | 5.5  |
|   | 796.9           | 8.5                 | 3                        | 5                   | 6     |                         |                 |    |    |     | SS-661    | M   |                           |            | RESIDUAL<br>RED-BRN TO BRN-GRAY STIFF MOIST<br>LOW (PI=11) PLASTIC MICA. SILTY<br>SANDY CLAY (A-7-5) |      |
| 795   | 791.9           | 13.5                | 4                        | 4                   | 5     |                         |                 |    |    |     |           | M   |                           |            |  |      |
| 790   | 786.9           | 18.5                | 3                        | 4                   | 5     |                         |                 |    |    |     |           | M   |                           | 785.4      | Boring Terminated at Elevation 785.4 ft IN<br>STIFF MOIST MICA. SILTY SANDY CLAY<br>(A-7-5)          | 20.0 |

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# GEOTECHNICAL BORING REPORT

## BORE LOG

| WBS 39010.1.1   |                 | TIP U-3440          |            | COUNTY CABARRUS          |       | GEOLOGIST Wells, T.     |                 |    |    |     |           |     |     |                           |            |     |   |
|---|-----------------|---------------------|------------|--------------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|-----|---------------------------|------------|-----|---|
| SITE DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP RD.) IN KANNAPOLIS |                 |                     |            |                          |       |                         | GROUND WTR (ft) |    |    |     |           |     |     |                           |            |     |   |
| BORING NO. B-98   |                 | STATION 145+81      |            | OFFSET 118 ft LT         |       | ALIGNMENT -L-           |                 |    |    |     |           |     |     |                           |            |     |   |
| COLLAR ELEV. 814.6 ft   |                 | TOTAL DEPTH 25.0 ft |            | NORTHING 640,468         |       | EASTING 1,514,386       |                 |    |    |     |           |     |     |                           |            |     |   |
| DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 93% 12/08/2011                                 |                 |                     |            | DRILL METHOD H.S. Augers |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |     |                           |            |     |   |
| DRILLER Gower, S.   |                 | START DATE 12/11/13 |            | COMP. DATE 12/11/13      |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |     |     |                           |            |     |   |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT |                          |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION |            |     |   |
|   |                 |                     | 0.5ft      | 0.5ft                    | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |     |     | ELEV. (ft)                | DEPTH (ft) |     |   |
| 815   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           | 814.6      | 0.0 | GROUND SURFACE  |
|   | 813.6           | 1.0                 | 3          | 4                        | 5     |                         |                 |    |    |     |           |     |     |                           |            |     | <b>ARTIFICIAL FILL</b><br>BRN STIFF WET TO MOIST LOW (PI=14)<br>PLASTIC SILTY SANDY CLAY (A-7-6)                        |
|   | 811.1           | 3.5                 | 8          | 6                        | 5     |                         |                 |    |    |     |           |     |     |                           |            |     |   |
| 810   | 808.6           | 6.0                 | 3          | 4                        | 5     |                         |                 |    |    |     |           |     |     |                           |            |     |   |
|   | 806.1           | 8.5                 | 15         | 28                       | 25    |                         |                 |    |    |     |           |     |     |                           |            |     | <b>ARTIFICIAL FILL</b><br>RED-BRN STIFF MOIST MED. (PI=17)<br>PLASTIC SILTY SANDY CLAY (A-6)                            |
| 805   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |     | <b>RESIDUAL</b><br>RED-BRN TO LT. BRN & GRAY V. DENSE<br>TO LOOSE & MED. DENSE MOIST MICA.<br>CLAYEY SILTY SAND (A-2-4) |
|   | 801.1           | 13.5                | 3          | 4                        | 5     |                         |                 |    |    |     |           |     |     |                           |            |     |   |
| 800   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |     |   |
|   | 796.1           | 18.5                | 4          | 5                        | 5     |                         |                 |    |    |     |           |     |     |                           |            |     |   |
| 795   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |     |   |
|   | 791.1           | 23.5                | 3          | 5                        | 6     |                         |                 |    |    |     |           |     |     |                           |            |     |   |
| 790   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |     |   |
|   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |     | Boring Terminated at Elevation 789.6 ft IN<br>MED. DENSE MOIST MICA. CLAYEY SILTY<br>SAND (A-2-4)                       |

| WBS 39010.1.1   |                 | TIP U-3440          |            | COUNTY CABARRUS          |       | GEOLOGIST Wells, T.     |                 |    |    |     |           |     |     |                           |            |  |  |
|---|-----------------|---------------------|------------|--------------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-----|-----|---------------------------|------------|--|--|
| SITE DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP RD.) IN KANNAPOLIS |                 |                     |            |                          |       |                         | GROUND WTR (ft) |    |    |     |           |     |     |                           |            |  |  |
| BORING NO. B-99   |                 | STATION 146+74      |            | OFFSET 69 ft LT          |       | ALIGNMENT -L-           |                 |    |    |     |           |     |     |                           |            |  |  |
| COLLAR ELEV. 820.1 ft   |                 | TOTAL DEPTH 23.7 ft |            | NORTHING 640,460         |       | EASTING 1,514,491       |                 |    |    |     |           |     |     |                           |            |  |  |
| DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 93% 12/08/2011                                 |                 |                     |            | DRILL METHOD H.S. Augers |       | HAMMER TYPE Automatic   |                 |    |    |     |           |     |     |                           |            |  |  |
| DRILLER Gower, S.   |                 | START DATE 12/11/13 |            | COMP. DATE 12/11/13      |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |     |     |                           |            |  |  |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT |                          |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION |            |  |  |
|   |                 |                     | 0.5ft      | 0.5ft                    | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |     |     | ELEV. (ft)                | DEPTH (ft) |  |  |
| 825   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  |  |
|   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  |  |
| 820   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  |  |
|   | 819.1           | 1.0                 | 3          | 3                        | 4     |                         |                 |    |    |     |           |     |     |                           |            |  | 820.1  |
|   | 816.6           | 3.5                 | 5          | 6                        | 6     |                         |                 |    |    |     |           |     |     |                           |            |  | <b>ARTIFICIAL FILL</b><br>RED-BRN & BRN MED. STIFF TO STIFF<br>WET LOW (PI=9) PLASTIC CLAYEY<br>SANDY SILT (A-4) |
| 815   | 814.1           | 6.0                 | 2          | 3                        | 3     |                         |                 |    |    |     |           |     |     |                           |            |  | 814.1  |
|   | 811.6           | 8.5                 | 6          | 3                        | 2     |                         |                 |    |    |     |           |     |     |                           |            |  | <b>ARTIFICIAL FILL</b><br>BRN TO DARK BRN. LOOSE WET LOW<br>(PI=8) PLASTIC CLAYEY SILTY SAND<br>(A-2-4)          |
| 810   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  |  |
|   | 806.6           | 13.5                | 20         | 80/0.2                   |       |                         |                 |    |    |     |           |     |     |                           |            |  | 809.1  |
| 805   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  | 806.6  |
|   | 801.6           | 18.5                |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  | <b>RESIDUAL</b><br>LT. GRAY MED. DENSE MOIST MICA.<br>SILTY SAND (A-2)   |
| 800   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  |  |
|   | 796.6           | 23.5                |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  | 806.6  |
|   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  | <b>WEATHERED ROCK</b><br>LT. GRAY SEV. WEATH. CRYSTALLINE<br>ROCK (GRANITIC ROCK)                                |
|   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  |  |
|   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  | 796.4  |
|   |                 |                     |            |                          |       |                         |                 |    |    |     |           |     |     |                           |            |  | Boring Terminated at Elevation 796.4 ft IN<br>SEV. WEATH. CRYSTALLINE ROCK<br>(GRANITIC ROCK)                    |

# GEOTECHNICAL BORING REPORT

## BORE LOG

|   |                     |                          |                         |
|---|---------------------|--------------------------|-------------------------|
| WBS 39010.1.1   | TIP U-3440          | COUNTY CABARRUS          | GEOLOGIST Wells, T.     |
| SITE DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP RD.) IN KANNAPOLIS |                     |                          | GROUND WTR (ft)         |
| BORING NO. B-100  | STATION 147+66      | OFFSET 71 ft LT          | ALIGNMENT -L-           |
| COLLAR ELEV. 825.4 ft   | TOTAL DEPTH 28.8 ft | NORTHING 640,498         | EASTING 1,514,574       |
| DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 93% 12/08/2011                                 |                     | DRILL METHOD H.S. Augers | HAMMER TYPE Automatic   |
| DRILLER Gower, S.   | START DATE 12/11/13 | COMP. DATE 12/11/13      | SURFACE WATER DEPTH N/A |

| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT |       |       | BLOWS PER FOOT |    |    |    |     | SAMP. NO. | MOI    | LOG    | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |   |  |
|-----------|-----------------|------------|------------|-------|-------|----------------|----|----|----|-----|-----------|--------|--------|---------------------------|------------|---|--|
|           |                 |            | 0.5ft      | 0.5ft | 0.5ft | 0              | 25 | 50 | 75 | 100 |           |        |        |                           |            |   |  |
| 830       |                 |            |            |       |       |                |    |    |    |     |           |        |        |                           |            |   |  |
| 825       | 824.4           | 1.0        | 3          | 4     | 6     |                |    |    |    |     |           |        |        |                           | 825.4      | GROUND SURFACE  |  |
|           | 821.9           | 3.5        | 3          | 3     | 2     | 10             |    |    |    |     |           | SS-679 | W      |                           |            | <b>ARTIFICIAL FILL</b><br>RED-BRN & BRN STIFF TO MED. STIFF WET MED. (PI=24) PLASTIC SILTY SANDY CLAY (A-7-5)         |  |
| 820       | 819.4           | 6.0        | 1          | 2     | 2     | 5              |    |    |    |     |           |        | W      |                           | 819.4      | <b>ARTIFICIAL FILL</b><br>GRAY & BRN LOOSE TO MED. DENSE WET TO MOIST CLAYEY SILTY SAND (A-2-4) W/ TRACE GRAVEL @ 8.5 |  |
|           | 816.9           | 8.5        | 4          | 14    | 7     | 4              |    |    |    |     |           |        | M      |                           |            |   |  |
| 815       |                 |            |            |       |       |                |    |    |    |     |           |        |        |                           |            |   |  |
|           | 811.9           | 13.5       | 100/0.2    |       |       |                |    |    |    |     |           |        |        |                           | 813.4      | <b>WEATHERED ROCK</b><br>LT. GRAY SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)  |  |
| 810       |                 |            |            |       |       |                |    |    |    |     |           |        |        |                           |            |   |  |
|           | 806.9           | 18.5       | 3          | 4     | 6     | 10             |    |    |    |     |           |        | SS-683 | M                         | 808.4      | <b>RESIDUAL</b><br>GRAY-BRN TO LT. GRAY MED. DENSE TO V. DENSE MOIST MICA. CLAYEY SILTY SAND (A-2-4)                  |  |
| 805       |                 |            |            |       |       |                |    |    |    |     |           |        |        |                           |            |   |  |
|           | 801.9           | 23.5       | 8          | 30    | 25    |                |    |    |    |     |           |        |        | M                         |            |   |  |
| 800       |                 |            |            |       |       |                |    |    |    |     |           |        |        |                           |            |   |  |
|           | 796.9           | 28.5       | 100/0.3    |       |       |                |    |    |    |     |           |        |        |                           | 798.4      | <b>WEATHERED ROCK</b><br>LT. GRAY SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)  |  |
|           |                 |            |            |       |       |                |    |    |    |     |           |        |        |                           | 796.6      | <b>WEATHERED ROCK</b><br>LT. GRAY SEV. WEATH. CRYSTALLINE ROCK (GRANITIC ROCK)  |  |

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# GEOTECHNICAL BORING REPORT BORE LOG

| WBS 39010.1.1   |                 | TIP U-3440          |            | COUNTY CABARRUS         |       | GEOLOGIST Goodnight, D. |                 |    |    |     |           |       |     |                           |            |  |     |
|---|-----------------|---------------------|------------|-------------------------|-------|-------------------------|-----------------|----|----|-----|-----------|-------|-----|---------------------------|------------|--|-----|
| SITE DESCRIPTION NC 3, PROPOSED WEST SIDE BYPASS (U-2009) TO SR 1691 (LOOP RD.) IN KANNAPOLIS |                 |                     |            |                         |       |                         | GROUND WTR (ft) |    |    |     |           |       |     |                           |            |  |     |
| BORING NO. B-82   |                 | STATION 132+00      |            | OFFSET 47 ft LT         |       | ALIGNMENT -L-           |                 |    |    |     |           |       |     |                           |            |  |     |
| COLLAR ELEV. 758.5 ft   |                 | TOTAL DEPTH 3.0 ft  |            | NORTHING 639,841        |       | EASTING 1,513,153       |                 |    |    |     |           |       |     |                           |            |  |     |
| DRILL RIG/HAMMER EFF./DATE N/A  |                 |                     |            | DRILL METHOD Hand Auger |       | HAMMER TYPE Automatic   |                 |    |    |     |           |       |     |                           |            |  |     |
| DRILLER Goodnight, D.   |                 | START DATE 11/20/13 |            | COMP. DATE 11/20/13     |       | SURFACE WATER DEPTH N/A |                 |    |    |     |           |       |     |                           |            |  |     |
| ELEV (ft)   | DRIVE ELEV (ft) | DEPTH (ft)          | BLOW COUNT |                         |       | BLOWS PER FOOT          |                 |    |    |     | SAMP. NO. | MOI   | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |  |     |
|   |                 |                     | 0.5ft      | 0.5ft                   | 0.5ft | 0                       | 25              | 50 | 75 | 100 |           |       |     |                           |            | ELEV. (ft)   |     |
| 760   |                 |                     |            |                         |       |                         |                 |    |    |     |           |       |     |                           |            |  |     |
|   |                 |                     |            |                         |       |                         |                 |    |    |     |           |       |     |                           | 758.5      | GROUND SURFACE   | 0.0 |
|   |                 |                     |            |                         |       |                         |                 |    |    |     |           |       |     |                           | 755.5      | RESIDUAL<br>TAN LOOSE TO MED. DENSE MOIST<br>SILTY F. TO CSE. SAND (A-2-4) W/ LITTLE<br>MICA.            | 3.0 |
|   |                 |                     |            |                         |       |                         |                 |    |    |     |           | S-105 | 14% |                           |            | Boring Terminated at Elevation 755.5 ft IN<br>LOOSE TO MED. DENSE MOIST SILTY F.<br>TO CSE. SAND (A-2-4) |     |
|   |                 |                     |            |                         |       |                         |                 |    |    |     |           |       |     |                           |            | Other Samples:<br>M-105 (2.7 - 3.0)  |     |

NCDOT BORE DOUBLE U3440\_GEO\_BH\_WALL\_CABARRUS.GPJ NC\_DOT\_GDT 7/12/16

**WALL NO. 1**

| <b>SOIL TEST RESULTS</b> |        |         |                |               |      |      |             |        |      |      |                    |    |     |            |           |
|--------------------------|--------|---------|----------------|---------------|------|------|-------------|--------|------|------|--------------------|----|-----|------------|-----------|
| SAMPLE NO.               | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.I. | % BY WEIGHT |        |      |      | % PASSING (SIEVES) |    |     | % MOISTURE | % ORGANIC |
|                          |        |         |                |               |      |      | C.SAND      | F.SAND | SILT | CLAY | 10                 | 40 | 200 |            |           |
| SS-605                   | 65' RT | 133+83  | 1.0-2.5        | A-7-6(12)     | 51   | 24   | 15.3        | 28.4   | 12.1 | 44.3 | 98                 | 93 | 58  | -          | -         |
| SS-606                   | 65' RT | 133+83  | 3.5-5.0        | A-7-5(3)      | 42   | 11   | 18.3        | 39.0   | 14.5 | 28.2 | 98                 | 93 | 46  | -          | -         |
| SS-607                   | 65' RT | 133+83  | 6.0-7.5        | A-2-4(0)      | 36   | NP   | 22.5        | 48.1   | 15.3 | 14.1 | 97                 | 92 | 35  | -          | -         |
| SS-608                   | 65' RT | 133+83  | 0.0-0.0        | A-2-4(0)      | 32   | NP   | 25.6        | 49.1   | 15.3 | 10.1 | 96                 | 89 | 30  | -          | -         |
| SS-595                   | 49' RT | 133+02  | 1.0-2.5        | A-7-5(4)      | 48   | 16   | 27.4        | 31.9   | 14.5 | 26.2 | 98                 | 88 | 44  | -          | -         |
| SS-597                   | 49' RT | 133+02  | 6.0-7.5        | A-2-4(0)      | 28   | NP   | 29.6        | 46.7   | 15.6 | 8.1  | 97                 | 87 | 29  | -          | -         |
| SS-598                   | 49' RT | 133+02  | 8.5-10.0       | A-2-4(0)      | 38   | NP   | 34.3        | 40.5   | 11.1 | 14.1 | 97                 | 85 | 28  | -          | -         |
| SS-599                   | 49' RT | 133+02  | 13.5-15.0      | A-2-4(0)      | 36   | NP   | 50.9        | 27.9   | 12.1 | 9.1  | 93                 | 60 | 24  | -          | -         |
| SS-601                   | 49' RT | 133+02  | 23.5-25.0      | A-4(0)        | 35   | NP   | 30.6        | 36.9   | 12.3 | 20.2 | 98                 | 87 | 36  | -          | -         |
| SS-602                   | 49' RT | 133+02  | 0.0-0.0        | A-2-4(0)      | 29   | NP   | 29.3        | 47.2   | 15.4 | 8.1  | 98                 | 87 | 29  | -          | -         |
| SS-616                   | 49' RT | 132+00  | 1.0-2.5        | A-7-6(5)      | 49   | 23   | 35.0        | 19.3   | 13.5 | 32.2 | 85                 | 63 | 41  | -          | -         |
| SS-618                   | 49' RT | 132+00  | 6.0-7.5        | A-2-7(0)      | 44   | 12   | 41.9        | 18.1   | 19.9 | 20.1 | 81                 | 55 | 35  | -          | -         |
| SS-619                   | 49' RT | 132+00  | 8.5-10.0       | A-2-5(0)      | 43   | 8    | 40.8        | 22.3   | 22.7 | 14.1 | 79                 | 53 | 33  | -          | -         |

**WALL NO. 2**

| <b>SOIL TEST RESULTS</b> |        |         |                |               |      |      |             |        |      |      |                    |    |     |            |           |
|--------------------------|--------|---------|----------------|---------------|------|------|-------------|--------|------|------|--------------------|----|-----|------------|-----------|
| SAMPLE NO.               | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.I. | % BY WEIGHT |        |      |      | % PASSING (SIEVES) |    |     | % MOISTURE | % ORGANIC |
|                          |        |         |                |               |      |      | C.SAND      | F.SAND | SILT | CLAY | 10                 | 40 | 200 |            |           |
| SS-588                   | 49' LT | 138+50  | 1.0-1.5        | A-7-6(9)      | 45   | 24   | 29.1        | 19.5   | 13.3 | 38.1 | 92                 | 74 | 51  | -          | -         |
| SS-590                   | 49' LT | 138+50  | 6.0-7.5        | A-2-6(2)      | 37   | 22   | 38.7        | 24.5   | 6.7  | 30.1 | 86                 | 64 | 34  | -          | -         |
| SS-592                   | 49' LT | 138+50  | 13.5-15.0      | A-2-4(0)      | 39   | NP   | 33.1        | 38.7   | 14.1 | 14.0 | 91                 | 75 | 31  | -          | -         |
| SS-642                   | 48' LT | 137+75  | 1.0-2.5        | A-2-6(0)      | 32   | 12   | 45.9        | 22.9   | 7.0  | 24.1 | 76                 | 52 | 25  | -          | -         |
| SS-643                   | 48' LT | 137+75  | 3.5-5.0        | A-2-4(0)      | 28   | 2    | 31.0        | 38.2   | 12.7 | 18.1 | 80                 | 66 | 28  | -          | -         |
| SS-644                   | 48' LT | 137+75  | 6.0-7.5        | A-6(1)        | 32   | 12   | 31.6        | 27.0   | 11.3 | 30.2 | 90                 | 74 | 41  | -          | -         |
| SS-645                   | 48' LT | 137+75  | 8.5-10.0       | A-4(0)        | 38   | NP   | 3.0         | 65.0   | 21.9 | 10.1 | 100                | 99 | 44  | -          | -         |
| SS-646                   | 48' LT | 137+75  | 13.5-15.0      | A-2-5(0)      | 41   | NP   | 24.3        | 50.9   | 16.7 | 8.0  | 90                 | 81 | 28  | -          | -         |
| SS-648                   | 50' LT | 137+00  | 1.0-2.5        | A-2-4(0)      | 28   | 5    | 44.8        | 26.3   | 16.8 | 12.1 | 85                 | 58 | 28  | -          | -         |
| SS-649                   | 50' LT | 137+00  | 3.5-5.0        | A-2-4(0)      | 31   | 4    | 40.6        | 30.7   | 14.5 | 14.1 | 86                 | 63 | 29  | -          | -         |
| SS-650                   | 50' LT | 137+00  | 6.0-7.5        | A-2-4(0)      | 26   | NP   | 45.1        | 33.7   | 9.1  | 12.1 | 88                 | 62 | 22  | -          | -         |

**WALL NO. 3**

| <b>SOIL TEST RESULTS</b> |        |         |                |               |      |      |             |        |      |      |                    |    |     |            |           |
|--------------------------|--------|---------|----------------|---------------|------|------|-------------|--------|------|------|--------------------|----|-----|------------|-----------|
| SAMPLE NO.               | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.I. | % BY WEIGHT |        |      |      | % PASSING (SIEVES) |    |     | % MOISTURE | % ORGANIC |
|                          |        |         |                |               |      |      | C.SAND      | F.SAND | SILT | CLAY | 10                 | 40 | 200 |            |           |
| SS-654                   | 68' LT | 144+27  | 1.0-2.5        | A-6(2)        | 35   | 14   | 33.8        | 21.1   | 16.9 | 28.2 | 84                 | 63 | 41  | -          | -         |
| SS-655                   | 68' LT | 144+27  | 3.5-5.0        | A-7-6(10)     | 46   | 22   | 27.2        | 16.7   | 13.9 | 42.3 | 94                 | 76 | 56  | -          | -         |
| SS-658                   | 68' LT | 144+27  | 13.5-15.0      | A-4(0)        | 37   | NP   | 23.9        | 39.0   | 22.9 | 14.1 | 97                 | 88 | 40  | -          | -         |
| SS-659                   | 33' LT | 145+26  | 1.0-2.5        | A-4(0)        | 25   | 7    | 40.0        | 19.3   | 16.5 | 24.1 | 91                 | 66 | 40  | -          | -         |
| SS-661                   | 56' LT | 145+26  | 6.0-7.5        | A-7-5(5)      | 44   | 11   | 20.1        | 31.4   | 20.3 | 28.2 | 100                | 92 | 54  | -          | -         |

**WALL NO. 4**

| <b>SOIL TEST RESULTS</b> |         |         |                |               |      |      |             |        |      |      |                    |    |     |            |           |
|--------------------------|---------|---------|----------------|---------------|------|------|-------------|--------|------|------|--------------------|----|-----|------------|-----------|
| SAMPLE NO.               | OFFSET  | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.I. | % BY WEIGHT |        |      |      | % PASSING (SIEVES) |    |     | % MOISTURE | % ORGANIC |
|                          |         |         |                |               |      |      | C.SAND      | F.SAND | SILT | CLAY | 10                 | 40 | 200 |            |           |
| SS-665                   | 118' LT | 145+81  | 0.0-0.0        | A-7-6(3)      | 42   | 14   | 34.4        | 21.1   | 20.3 | 24.1 | 89                 | 67 | 44  | -          | -         |
| SS-667                   | 118' LT | 145+81  | 6.0-7.5        | A-6(5)        | 37   | 17   | 31.0        | 21.3   | 17.5 | 30.2 | 96                 | 78 | 49  | -          | -         |
| SS-668                   | 118' LT | 145+81  | 8.5-10.0       | A-2-4(0)      | 31   | NP   | 50.7        | 25.2   | 12.1 | 12.1 | 83                 | 52 | 24  | -          | -         |
| SS-672                   | 69' LT  | 146+94  | 1.0-2.5        | A-4(2)        | 40   | 9    | 33.4        | 20.3   | 22.1 | 24.1 | 87                 | 65 | 44  | -          | -         |
| SS-674                   | 61' LT  | 146+94  | 6.0-7.5        | A-2-5(0)      | 46   | 8    | 45.5        | 21.3   | 21.1 | 12.1 | 85                 | 56 | 31  | -          | -         |
| SS-679                   | 71' LT  | 147+65  | 1.0-2.5        | A-7-5(15)     | 57   | 24   | 17.7        | 23.7   | 22.3 | 36.2 | 98                 | 86 | 63  | -          | -         |
| SS-680                   | 71' LT  | 147+65  | 6.0-7.5        | A-2-4(0)      | 38   | NP   | 41.9        | 24.1   | 23.9 | 10.1 | 80                 | 55 | 31  | -          | -         |
| SS-683                   | 71' LT  | 147+65  | 18.5-20.0      | A-2-4(0)      | 40   | NP   | 44.5        | 23.9   | 17.5 | 14.1 | 86                 | 60 | 31  | -          | -         |

**WALL NO. 5**

| <b>SOIL TEST RESULTS</b> |        |         |                |               |      |      |             |        |      |      |                    |    |     |            |           |
|--------------------------|--------|---------|----------------|---------------|------|------|-------------|--------|------|------|--------------------|----|-----|------------|-----------|
| SAMPLE NO.               | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.I. | % BY WEIGHT |        |      |      | % PASSING (SIEVES) |    |     | % MOISTURE | % ORGANIC |
|                          |        |         |                |               |      |      | C.SAND      | F.SAND | SILT | CLAY | 10                 | 40 | 200 |            |           |
| S-105                    | 47' LT | 132+00  | 2.7-3.0        | A-2-4(0)      | 30   | NP   | 29.4        | 49.9   | 14.6 | 6.0  | 99                 | 90 | 27  | -          | -         |