

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C.  | R-5863                      | 1         | 5            |

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY CLAY

PROJECT DESCRIPTION US 64 BUSINESS FROM US 64  
TO SR 1307 (MAIN STREET)

SITE DESCRIPTION RETAINING WALL 2

**CONTENTS**

| <u>SHEET NO.</u> | <u>DESCRIPTION</u>   |
|------------------|----------------------|
| 1                | TITLE SHEET          |
| 2, 2A            | LEGEND (SOIL & ROCK) |
| 3                | SITE PLAN            |
| 4                | PROFILE              |

PERSONNEL

A. BLACKMORE

ELITE TECHNIQUES

INVESTIGATED BY A. BLACKMORE

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SUBMITTED BY ECS SOUTHEAST, LLP

DATE OCTOBER 2022

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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.

Prepared in the Office of:



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DocuSigned by:

*Kelly de Montbrun* 10/3/2022

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 SIGNATURE

DATE

**DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED**

**REFERENCE: R-5863**

**PROJECT: N/A**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

(PAGE 1 OF 2)

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 (AASHTO T 206, 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

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:  
ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE

MODERATELY COMPRESSIBLE

HIGHLY COMPRESSIBLE

LL < 31

LL = 31 - 50

LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL

TRACE OF ORGANIC MATTER

LITTLE ORGANIC MATTER

MODERATELY ORGANIC

HIGHLY ORGANIC

GRANULAR SOILS

2 - 3%

3 - 5%

5 - 10%

> 10%

SILT - CLAY SOILS

3 - 5%

5 - 12%

12 - 20%

> 20%

OTHER MATERIAL

TRACE

LITTLE

SOME

HIGHLY

1 - 10%

10 - 20%

20 - 35%

35% AND ABOVE

GROUND WATER

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING

STATIC WATER LEVEL AFTER 24 HOURS

PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA

SPRING OR SEEP

SOIL LEGEND AND AASHTO CLASSIFICATION

| GENERAL CLASS.                 | GRANULAR MATERIALS<br>(≤ 35% PASSING #200) |  |           |                                 |       |       | SILT-CLAY MATERIALS<br>(> 35% PASSING #200) |       |       |              | ORGANIC MATERIALS |       |              |       |                      |                                                         |                |  |
|--------------------------------|--------------------------------------------|--|-----------|---------------------------------|-------|-------|---------------------------------------------|-------|-------|--------------|-------------------|-------|--------------|-------|----------------------|---------------------------------------------------------|----------------|--|
| GROUP CLASS.                   | A-1                                        |  | A-3       |                                 | A-2   |       | A-4                                         |       | A-5   |              | A-6               |       | A-7          |       | A-1, A-2             |                                                         | A-4, A-5       |  |
| SYMBOL                         |                                            |  |           |                                 |       |       |                                             |       |       |              |                   |       |              |       |                      |                                                         |                |  |
| % PASSING                      | 50 MX                                      |  | 30 MX     | 15 MX                           | 50 MX | 10 MX | 51 MN                                       | 35 MX | 35 MX | 35 MX        | 35 MX             | 36 MN | 36 MN        | 36 MN | 36 MN                | GRANULAR SOILS                                          |                |  |
| MATERIAL PASSING #40           | -                                          |  | 6 MX      | NP                              | 40 MX | 41 MN | 40 MX                                       | 41 MN | 40 MX | 41 MN        | 40 MX             | 41 MN | 40 MX        | 41 MN | 41 MN                | SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER |                |  |
| GROUP INDEX                    | 0                                          |  | 0         | 0                               | 0     | 4 MX  | 8 MX                                        | 12 MX | 16 MX | NO MX        |                   |       |              |       | HIGHLY ORGANIC SOILS |                                                         |                |  |
| USUAL TYPES OF MAJOR MATERIALS | STONE FRAGS, GRAVEL, AND SAND              |  | FINE SAND | SILTY OR CLAYEY GRAVEL AND SAND |       |       | SILTY SOILS                                 |       |       | CLAYEY SOILS |                   |       |              |       |                      |                                                         |                |  |
| GEN. RATING AS SUBGRADE        | EXCELLENT TO GOOD                          |  |           |                                 |       |       | FAIR TO POOR                                |       |       |              |                   |       | FAIR TO POOR |       | POOR                 |                                                         | UNSATISFACTORY |  |

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

| PRIMARY SOIL TYPE                          | COMPACTNESS OR CONSISTENCY | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> ) |
|--------------------------------------------|----------------------------|----------------------------------------------------|------------------------------------------------------------------|
| GENERALLY GRANULAR MATERIAL (NON-COHESIVE) | VERY LOOSE                 | < 4                                                | N/A                                                              |
|                                            | LOOSE                      | 4 TO 10                                            |                                                                  |
|                                            | MEDIUM DENSE               | 10 TO 30                                           |                                                                  |
| GENERALLY SILT-CLAY MATERIAL (COHESIVE)    | DENSE                      | 30 TO 50                                           | < 0.25                                                           |
|                                            | VERY DENSE                 | > 50                                               |                                                                  |
|                                            | VERY SOFT                  | < 2                                                |                                                                  |
| GENERALLY SILT-CLAY MATERIAL (COHESIVE)    | SOFT                       | 2 TO 4                                             | 0.25 TO 0.5                                                      |
|                                            | MEDIUM STIFF               | 4 TO 8                                             | 0.5 TO 1.0                                                       |
|                                            | STIFF                      | 8 TO 15                                            | 1 TO 2                                                           |
| GENERALLY SILT-CLAY MATERIAL (COHESIVE)    | VERY STIFF                 | 15 TO 30                                           | 2 TO 4                                                           |
|                                            | HARD                       | > 30                                               | > 4                                                              |

TEXTURE OR GRAIN SIZE

| U.S. STD. SIEVE SIZE   | 4      | 10   | 40   | 60   | 200   | 270   |
|------------------------|--------|------|------|------|-------|-------|
| OPENING (MM)           | 4.76   | 2.00 | 0.42 | 0.25 | 0.075 | 0.053 |
| BOULDER (BLDR.)        |        |      |      |      |       |       |
| COBBLE (COB.)          |        |      |      |      |       |       |
| GRAVEL (GR.)           |        |      |      |      |       |       |
| COARSE SAND (CSE, SD.) |        |      |      |      |       |       |
| FINE SAND (F SD.)      |        |      |      |      |       |       |
| SILT (SL.)             |        |      |      |      |       |       |
| CLAY (CL.)             |        |      |      |      |       |       |
| GRAIN SIZE             | MM 305 | 75   | 2.0  | 0.25 | 0.05  | 0.005 |
| IN.                    | 12     | 3    |      |      |       |       |

SOIL MOISTURE - CORRELATION OF TERMS

| SOIL MOISTURE SCALE (ATTERBERG LIMITS) | FIELD MOISTURE DESCRIPTION | GUIDE FOR FIELD MOISTURE DESCRIPTION                                |
|----------------------------------------|----------------------------|---------------------------------------------------------------------|
| LL<br>PLASTIC RANGE (PI)<br>PL         | - SATURATED - (SAT.)       | USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE |
|                                        | - WET - (W)                | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE               |
| OM<br>SHRINKAGE LIMIT<br>SL            | - MOIST - (M)              | SOLID; AT OR NEAR OPTIMUM MOISTURE                                  |
|                                        | - DRY - (D)                | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE                |

PLASTICITY

| PLASTICITY INDEX (PI) |            | DRY STRENGTH |
|-----------------------|------------|--------------|
| NON PLASTIC           | 0-5        | VERY LOW     |
| SLIGHTLY PLASTIC      | 6-15       | SLIGHT       |
| MODERATELY PLASTIC    | 16-25      | MEDIUM       |
| HIGHLY PLASTIC        | 26 OR MORE | HIGH         |

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

MISCELLANEOUS SYMBOLS

ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION

SOIL SYMBOL

ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT

INFERRED SOIL BOUNDARY

INFERRED ROCK LINE

ALLUVIAL SOIL BOUNDARY

DIP & DIP DIRECTION OF ROCK STRUCTURES

TEST BORING

AUGER BORING

CORE BORING

MONITORING WELL

PIEZOMETER INSTALLATION

SLOPE INDICATOR INSTALLATION

CONE PENETROMETER TEST

SOUNDING ROD

TEST BORING WITH CORE

SPT N-VALUE

RECOMMENDATION SYMBOLS

UNDERCUT

SHALLOW UNDERCUT

UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE

UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK

UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL

BT - BORING TERMINATED

CL - CLAY

CPT - CONE PENETRATION TEST

CSE - COARSE

DMT - DILATOMETER TEST

DPT - DYNAMIC PENETRATION TEST

e - VOID RATIO

F - FINE

FOSS - FOSSILIFEROUS

FRAC. - FRACTURED, FRACTURES

FRAGS. - FRAGMENTS

HI. - HIGHLY

MED. - MEDIUM

MICA. - MICACEOUS

MOD. - MODERATELY

NP - NON PLASTIC

ORG. - ORGANIC

PMT - PRESSUREMETER TEST

SAP. - SAPROLITIC

SD. - SAND, SANDY

SL. - SILT, SILTY

SLI. - SLIGHTLY

TCR - TRICONE REFUSAL

w - MOISTURE CONTENT

V - VERY

VST - VANE SHEAR TEST

WEA. - WEATHERED

γ - UNIT WEIGHT

γ<sub>d</sub> - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS

S - BULK

SS - SPLIT SPOON

ST - SHELBY TUBE

RS - ROCK

RT - RECOMPACTED TRIAXIAL

CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:

☐ CME-45C

☐ CME-55

☐ CME-550

☐ VANE SHEAR TEST

☐ PORTABLE HOIST

☒ GEOPROBE 7822

☐

☐

ADVANCING TOOLS:

☐ CLAY BITS

☐ 6" CONTINUOUS FLIGHT AUGER

☒ 8" HOLLOW AUGERS

☐ HARD FACED FINGER BITS

☐ TUNG-CARBIDE INSERTS

☐ CASING ☐ W/ ADVANCER

☐ TRICONE ☐ STEEL TEETH

☐ TRICONE ☐ TUNG.-CARB.

☐ CORE BIT

☐

☐

HAMMER TYPE:

☒ AUTOMATIC ☐ MANUAL

CORE SIZE:

☐ -B ☐ -H

☐ -N

HAND TOOLS:

☐ POST HOLE DIGGER

☐ HAND AUGER

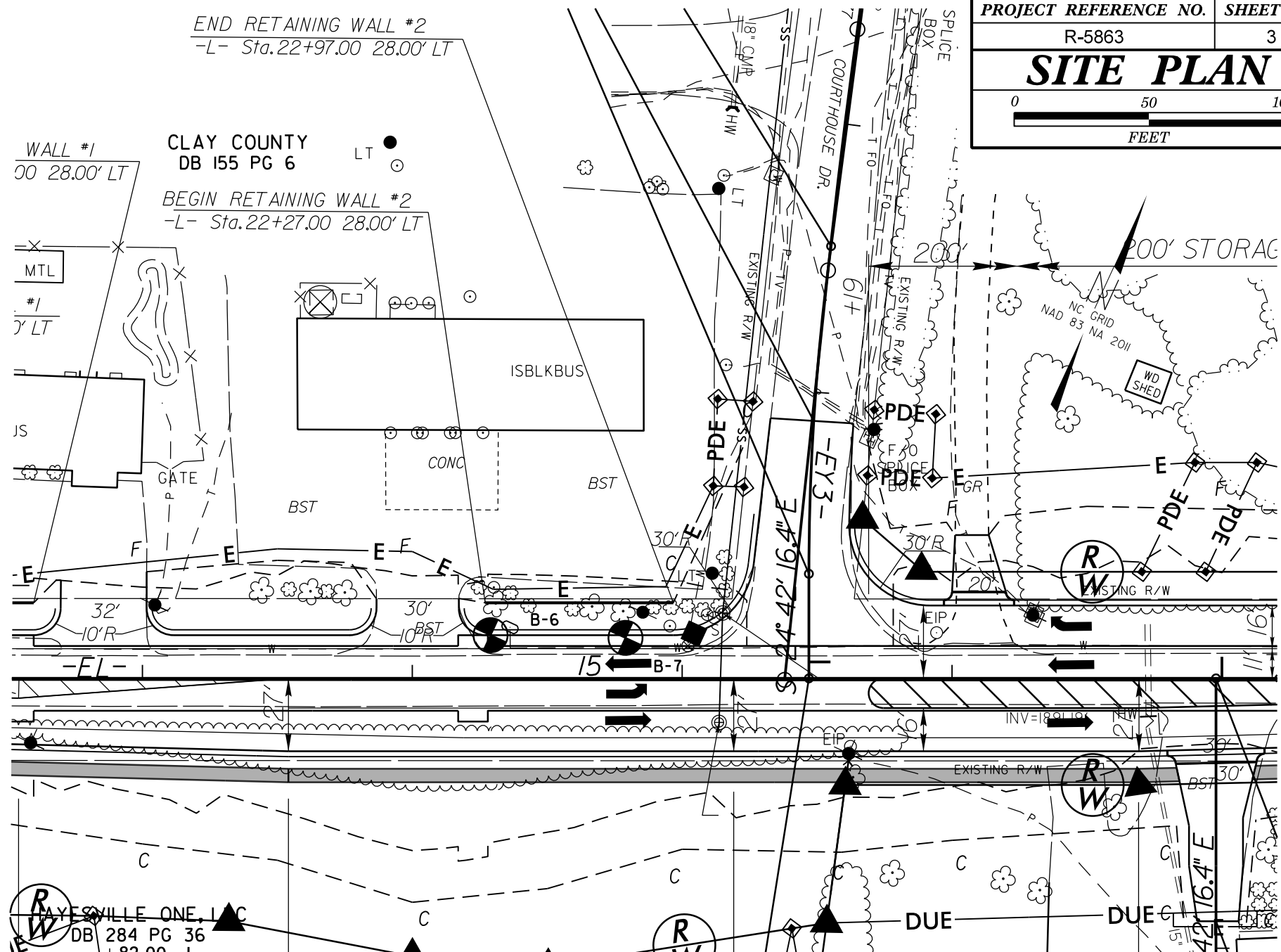
☐ SOUNDING ROD

☐ VANE SHEAR TEST

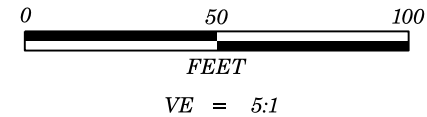
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| ROCK DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                         | TERMS AND DEFINITIONS                                                                                                                                               |                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| 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. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: |                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                     |                   |
| WEATHERED ROCK (WR)                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                        | NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.                                                                            |                   |
| CRYSTALLINE ROCK (CR)                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                        | FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.                  |                   |
| NON-CRYSTALLINE ROCK (NCR)                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                        | FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. |                   |
| COASTAL PLAIN SEDIMENTARY ROCK (CP)                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                        | COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.                       |                   |
| WEATHERING                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                     |                   |
| FRESH                                                                                                                                                                                                                                                                                                                                                                                                                                                          | ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.                                                                                                                                                                                                                                               |                                                                                                                                                                     |                   |
| VERY SLIGHT (V SLI.)                                                                                                                                                                                                                                                                                                                                                                                                                                           | ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.                                                                                                                                                     |                                                                                                                                                                     |                   |
| SLIGHT (SLI.)                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.                                                                                                           |                                                                                                                                                                     |                   |
| MODERATE (MOD.)                                                                                                                                                                                                                                                                                                                                                                                                                                                | SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.                                                                                          |                                                                                                                                                                     |                   |
| MODERATELY SEVERE (MOD. SEV.)                                                                                                                                                                                                                                                                                                                                                                                                                                  | ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <u>IF TESTED, WOULD YIELD SPT REFUSAL</u>                                                 |                                                                                                                                                                     |                   |
| SEVERE (SEV.)                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &gt; 100 BPF</u>                                                               |                                                                                                                                                                     |                   |
| VERY SEVERE (V SEV.)                                                                                                                                                                                                                                                                                                                                                                                                                                           | ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES &lt; 100 BPF</u> |                                                                                                                                                                     |                   |
| COMPLETE                                                                                                                                                                                                                                                                                                                                                                                                                                                       | ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.                                                                                                                                                                |                                                                                                                                                                     |                   |
| ROCK HARDNESS                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                     |                   |
| VERY HARD                                                                                                                                                                                                                                                                                                                                                                                                                                                      | CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.                                                                                                                                                                                                                             |                                                                                                                                                                     |                   |
| HARD                                                                                                                                                                                                                                                                                                                                                                                                                                                           | CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.                                                                                                                                                                                                                                             |                                                                                                                                                                     |                   |
| MODERATELY HARD                                                                                                                                                                                                                                                                                                                                                                                                                                                | CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.                                                                                                                                                                         |                                                                                                                                                                     |                   |
| MEDIUM HARD                                                                                                                                                                                                                                                                                                                                                                                                                                                    | CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.                                                                                                                                                      |                                                                                                                                                                     |                   |
| SOFT                                                                                                                                                                                                                                                                                                                                                                                                                                                           | CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.                                                                                                                                            |                                                                                                                                                                     |                   |
| VERY SOFT                                                                                                                                                                                                                                                                                                                                                                                                                                                      | CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.                                                                                                                                                                     |                                                                                                                                                                     |                   |
| FRACTURE SPACING                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                         | BEDDING                                                                                                                                                             |                   |
| TERM                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SPACING                                                                                                                                                                                                                                                                                                                                                 | TERM                                                                                                                                                                | THICKNESS         |
| VERY WIDE                                                                                                                                                                                                                                                                                                                                                                                                                                                      | MORE THAN 10 FEET                                                                                                                                                                                                                                                                                                                                       | VERY THICKLY BEDDED                                                                                                                                                 | 4 FEET            |
| WIDE                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 3 TO 10 FEET                                                                                                                                                                                                                                                                                                                                            | THICKLY BEDDED                                                                                                                                                      | 1.5 - 4 FEET      |
| MODERATELY CLOSE                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1 TO 3 FEET                                                                                                                                                                                                                                                                                                                                             | THINLY BEDDED                                                                                                                                                       | 0.16 - 1.5 FEET   |
| CLOSE                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 0.16 TO 1 FOOT                                                                                                                                                                                                                                                                                                                                          | VERY THINLY BEDDED                                                                                                                                                  | 0.03 - 0.16 FEET  |
| VERY CLOSE                                                                                                                                                                                                                                                                                                                                                                                                                                                     | LESS THAN 0.16 FEET                                                                                                                                                                                                                                                                                                                                     | THICKLY LAMINATED                                                                                                                                                   | 0.008 - 0.03 FEET |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                         | THINLY LAMINATED                                                                                                                                                    | < 0.008 FEET      |
| INDURATION                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                     |                   |
| FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                     |                   |
| FRIABLE                                                                                                                                                                                                                                                                                                                                                                                                                                                        | RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.                                                                                                                                                                                                                                                                  |                                                                                                                                                                     |                   |
| MODERATELY INDURATED                                                                                                                                                                                                                                                                                                                                                                                                                                           | GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.                                                                                                                                                                                                                                                               |                                                                                                                                                                     |                   |
| INDURATED                                                                                                                                                                                                                                                                                                                                                                                                                                                      | GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.                                                                                                                                                                                                                                                                      |                                                                                                                                                                     |                   |
| EXTREMELY INDURATED                                                                                                                                                                                                                                                                                                                                                                                                                                            | SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.                                                                                                                                                                                                                                                                               |                                                                                                                                                                     |                   |
| BENCH MARK: N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                         | ELEVATION: FEET                                                                                                                                                     |                   |
| NOTES:<br>ROADWAY DESIGN FILES, .TIN, AND GPK FILE PROVIDED BY V&M.<br>NORTHING AND EASTING OBTAINED USING A TRIMBLE GEO7X.                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                     |                   |
| DATE: 8-15-14                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                     |                   |



-WALL2- GROUNDLINE TAKEN FROM ROADWAY DESIGN FILES PROVIDED BY VAUGHN & MELTON IN AUGUST 2021. INFERRED STRATIGRAPHY IS DRAWN BORING TO BORING, WITH BOTH PROJECTED ON THE PROFILE.



| PROJECT REFERENCE NO.                      | SHEET NO. |
|--------------------------------------------|-----------|
| R-5863                                     | 4         |
| PROFILE BORINGS PROJECTED<br>ALONG -WALL2- |           |

