

REFERENCE: B-3186/B-5898

PROJECT: 38332/48030

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<u>SHEET NO.</u>	<u>DESCRIPTION</u>
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2	LEGEND (SOIL & ROCK)
3	SITE PLAN
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY HAYWOOD
 PROJECT DESCRIPTION US 23/US 74/US 19 (GREAT SMOKY MOUNTAIN HWY) FROM WEST OF NC 209 (CRABTREE RD.) TO EAST OF RUSS AVE.
 SITE DESCRIPTION RETAINING WALL #3 FROM -YIRT- STA. 29+34.68 TO 40+54.00

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3186/B-5898	1	15

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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

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- THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
 - BY HAVING REQUESTED THIS INFORMATION, THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

PERSONNEL

R. DUGGER
N. YACOBI
GEOTECHNOLOGY, INC.

INVESTIGATED BY C. SWAFFORD
 DRAWN BY T. LYNN
 CHECKED BY K. BUSSEY
 SUBMITTED BY HDR
 DATE NOVEMBER 2021

HDR HDR Engineering, Inc. of the Carolinas
 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
 N.C.B.E.L.S. License Number: F-0116



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

 | | | | | | | | | | GRADATION | | | | | | | | | | ROCK DESCRIPTION | | | | | | | | | | TERMS AND DEFINITIONS
 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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<p>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, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>

 | | | | | | | | | | <p>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.</p> | | | | | | | | | | <p>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:</p> | | | | | | | | | | <p>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.
 ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
 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 DISLOADED 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 INTRUDED 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 (SROD) - 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.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th colspan="5"></th> </tr> <tr> <th>SYMBOL</th> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>% PASSING #10 #40 #200</th> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX</td> <td>51 MN 35 MX 35 MX</td> <td>35 MX 35 MX</td> <td>35 MX 35 MX</td> <td>35 MX 35 MX</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>GRANULAR SOILS</td> <td>SILT-CLAY SOILS</td> <td>MUCK, PEAT</td> <td colspan="5"></td> </tr> <tr> <th>MATERIAL PASSING #40 LL PI</th> <td colspan="5"></td> <td>40 MX 41 MN</td> <td>40 MX 41 MN</td> <td>40 MX 41 MN</td> <td>40 MX 41 MN</td> <td>40 MX 41 MN</td> <td>40 MX 41 MN</td> <td colspan="5"></td> <td>SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td>HIGHLY ORGANIC SOILS</td> <td colspan="5"></td> </tr> <tr> <th>GROUP INDEX</th> <td colspan="5"></td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td colspan="5"></td> <td></td> <td></td> <td colspan="5"></td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td colspan="2">STONE FRAGS. GRAVEL, AND SAND</td> <td>FINE SAND</td> <td colspan="2">SILTY OR CLAYEY GRAVEL AND SAND</td> <td colspan="2">SILTY SOILS</td> <td colspan="2">CLAYEY SOILS</td> <td colspan="5"></td> <td colspan="5"></td> <td colspan="5"></td> </tr> <tr> <th>GEN. RATING AS SUBGRADE</th> <td colspan="5">EXCELLENT TO GOOD</td> <td colspan="5">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSATURABLE</td> <td colspan="5"></td> <td colspan="5"></td> </tr> <tr> <td colspan="10">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30</td> <td colspan="10"></td> <td colspan="10"></td> <td colspan="10"></td> </tr> <tr> <td colspan="10"> <p style="text-align: center;">CONSISTENCY OR DENSENESS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)</td> <td>VERY LOOSE
LOOSE
MEDIUM DENSE
DENSE
VERY DENSE</td> <td>< 4
4 TO 10
10 TO 30
30 TO 50
> 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT
SOFT
MEDIUM STIFF
STIFF
VERY STIFF
HARD</td> <td>< 2
2 TO 4
4 TO 8
8 TO 15
15 TO 30
> 30</td> <td>< 0.25
0.25 TO 0.5
0.5 TO 1.0
1 TO 2
2 TO 4
> 4</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">MISCELLANEOUS SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td></td> <td>DIP & DIP DIRECTION OF ROCK STRUCTURES</td> <td></td> <td>SOIL SYMBOL</td> <td></td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td></td> <td>INFERRED SOIL BOUNDARY</td> <td></td> <td>INFERRED ROCK LINE</td> <td></td> <td>ALLUVIAL SOIL BOUNDARY</td> </tr> <tr> <td></td> <td>TEST BORING</td> <td></td> <td>AUGER BORING</td> <td></td> <td>CORE BORING</td> <td></td> <td>MONITORING WELL</td> <td></td> <td>PIEZOMETER INSTALLATION</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td></td> <td>CONE PENETROMETER TEST</td> <td></td> <td>SOUNDING ROD</td> <td></td> <td>TEST BORING WITH CORE</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SPT N-VALUE</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">RECOMMENDATION SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td></td> <td>SHALLOW UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td></td> <td></td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">ABBREVIATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>BT - BORING TERMINATED</td> <td>CL - CLAY</td> <td>CPT - CONE PENETRATION TEST</td> <td>CSE - COARSE</td> <td>DMT - DILATOMETER TEST</td> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>e - VOID RATIO</td> <td>F - FINE</td> <td>FOSS. - FOSSILIFEROUS</td> <td>FRAC. - FRACTURED, FRACTURES</td> <td>FRAGS. - FRAGMENTS</td> <td>HI. - HIGHLY</td> <td>MED. - MEDIUM</td> <td>MICA. - MICACEOUS</td> <td>MOD. - MODERATELY</td> <td>NP - NON PLASTIC</td> <td>ORG. - ORGANIC</td> <td>PMT - PRESSUREMETER TEST</td> <td>SAP. - SAPROLITIC</td> <td>SD. - SAND, SANDY</td> <td>SL. - SILT, SILTY</td> <td>SLI. - SLIGHTLY</td> <td>TCR - TRICONE REFUSAL</td> <td>w - MOISTURE CONTENT</td> <td>V - VERY</td> <td>VST - VANE SHEAR TEST</td> <td>WEA. - WEATHERED</td> <td>UNIT WEIGHT</td> <td>DRY UNIT WEIGHT</td> </tr> <tr> <td colspan="10"></td> <td colspan="10"> <p style="text-align: center;">SAMPLE ABBREVIATIONS</p> <p>S - BULK
 SS - SPLIT SPOON
 ST - SHELBY TUBE
 RS - ROCK
 RT - RECOMPACTED TRIAXIAL
 CBR - CALIFORNIA BEARING RATIO</p> </td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;">TEXTURE OR GRAIN SIZE</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <td>4</td> <td>10</td> <td>40</td> <td>60</td> <td>200</td> <td>270</td> </tr> <tr> <td></td> <td>4.75</td> <td>2.00</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> <tr> <th>BOULDER (BLDR.)</th> <th>COBBLE (COB.)</th> <th>GRAVEL (GR.)</th> <th>COARSE SAND (CSE. SD.)</th> <th>FINE SAND (F SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> <tr> <td>GRAIN SIZE</td> <td>MM 305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> </tr> <tr> <td></td> <td>IN. 12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">SOIL MOISTURE - CORRELATION OF TERMS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td>LL - LIQUID LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>PLASTIC RANGE (PI)</td> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM - OPTIMUM MOISTURE</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>SL - SHRINKAGE LIMIT</td> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">EQUIPMENT USED ON SUBJECT PROJECT</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td><input type="checkbox"/> CME-45C</td> <td><input type="checkbox"/> CLAY BITS</td> <td><input checked="" type="checkbox"/> AUTOMATIC</td> <td><input type="checkbox"/> MANUAL</td> </tr> <tr> <td><input checked="" type="checkbox"/> CME-55</td> <td><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</td> <td colspan="2">CORE SIZE:</td> </tr> <tr> <td><input checked="" type="checkbox"/> CME-550X</td> <td><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</td> <td><input type="checkbox"/> -B</td> <td><input type="checkbox"/> -H</td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td><input type="checkbox"/> HARD FACED FINGER BITS</td> <td><input type="checkbox"/> -N</td> <td></td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td> <td><input type="checkbox"/> TUNG-CARBIDE INSERTS</td> <td colspan="2">HAND TOOLS:</td> </tr> <tr> <td><input type="checkbox"/> CME-I7</td> <td><input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</td> <td><input type="checkbox"/> POST HOLE DIGGER</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE *STEEL TEETH</td> <td><input type="checkbox"/> HAND AUGER</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE *TUNG-CARB.</td> <td><input type="checkbox"/> SOUNDING ROD</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> CORE BIT</td> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td></td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;">PLASTICITY</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NON PLASTIC</th> <th colspan="2">PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>0-5</td> <td></td> <td>VERY LOW</td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>6-15</td> <td></td> <td>SLIGHT</td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>16-25</td> <td></td> <td>MEDIUM</td> </tr> <tr> <td></td> <td>26 OR MORE</td> <td></td> <td>HIGH</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">FRACATURE SPACING</p> <table border="1"
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ARE USED TO DESCRIBE APPEARANCE.</p> </td> <td colspan="10"> <p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;">NOTES:</p> <p>BORING ELEVATIONS OBTAINED USING b3186_br0022_r4047_Mer ged.1-12-21.tin</p> <p>FIAD - FILLED IMMEDIATELY AFTER DRILLING</p> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;">FRACATURE SPACING</p> <table border="1" style="width: 100%; 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 | A-5 | A-6 | A-7 | A-1, A-2 | A-3 | A-4, A-5 | A-6, A-7 | | | | | | SYMBOL | | | | | | | | | | | | | | | | | | | | | % PASSING #10 #40 #200 | 50 MX 30 MX 15 MX | 50 MX 25 MX | 51 MN 35 MX 35 MX | 35 MX 35 MX | 35 MX 35 MX | 35 MX 35 MX | 36 MN 36 MN | 36 MN 36 MN | 36 MN 36 MN | 36 MN 36 MN | 36 MN 36 MN | GRANULAR SOILS | SILT-CLAY SOILS | MUCK, PEAT | | | | | | MATERIAL PASSING #40 LL PI | | | | | | 40 MX 41 MN | 40 MX 41 MN | 40 MX 41 MN | 40 MX 41 MN | 40 MX 41 MN | 40 MX 41 MN | | | | | | SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER | HIGHLY ORGANIC SOILS | | | | | | GROUP INDEX | | | | | | 0 | 0 | 4 MX | 8 MX | 12 MX | 16 MX | NO MX | | | | | | | | | | | | | 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 | UNSATURABLE | | | | | | | | | | | PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | <p style="text-align: center;">CONSISTENCY OR DENSENESS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)</td> <td>VERY LOOSE
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SOFT
MEDIUM STIFF
STIFF
VERY STIFF
HARD</td> <td>< 2
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8 TO 15
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> 30</td> <td>< 0.25
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LOOSE
MEDIUM DENSE
DENSE
VERY DENSE | < 4
4 TO 10
10 TO 30
30 TO 50
> 50 | N/A | GENERALLY SILT-CLAY MATERIAL (COHESIVE) | VERY SOFT
SOFT
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STIFF
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> 4 | <p style="text-align: center;">MISCELLANEOUS SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td></td> <td>DIP & DIP DIRECTION OF ROCK STRUCTURES</td> <td></td> <td>SOIL SYMBOL</td> <td></td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td></td> <td>INFERRED SOIL BOUNDARY</td> <td></td> <td>INFERRED ROCK LINE</td> <td></td> <td>ALLUVIAL SOIL BOUNDARY</td> </tr> <tr> <td></td> <td>TEST BORING</td> <td></td> <td>AUGER BORING</td> <td></td> <td>CORE BORING</td> <td></td> <td>MONITORING WELL</td> <td></td> <td>PIEZOMETER INSTALLATION</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td></td> <td>CONE PENETROMETER TEST</td> <td></td> <td>SOUNDING ROD</td> <td></td> <td>TEST BORING WITH CORE</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SPT N-VALUE</td> </tr> </table> | | | | | | | | | | | ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION | | DIP & DIP DIRECTION OF ROCK STRUCTURES | | SOIL SYMBOL | | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT | | INFERRED SOIL BOUNDARY | | INFERRED ROCK LINE | | ALLUVIAL SOIL BOUNDARY | | TEST BORING | | AUGER BORING | | CORE BORING | | MONITORING WELL | | PIEZOMETER INSTALLATION | | SPT N-VALUE | | SLOPE INDICATOR INSTALLATION | | CONE PENETROMETER TEST | | SOUNDING ROD | | TEST BORING WITH CORE | | SPT N-VALUE | | SPT N-VALUE | | SPT N-VALUE | | SPT N-VALUE | <p style="text-align: center;">RECOMMENDATION SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td></td> <td>SHALLOW UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td></td> <td></td> </tr> </table> | | | | | | | | | | | UNDERCUT | | UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE | | UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL | | SHALLOW UNDERCUT | | UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK | | | <p style="text-align: center;">ABBREVIATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>BT - BORING TERMINATED</td> <td>CL - CLAY</td> <td>CPT - CONE PENETRATION TEST</td> <td>CSE - COARSE</td> <td>DMT - DILATOMETER TEST</td> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>e - VOID RATIO</td> <td>F - FINE</td> <td>FOSS. - FOSSILIFEROUS</td> <td>FRAC. - FRACTURED, FRACTURES</td> <td>FRAGS. - FRAGMENTS</td> <td>HI. - HIGHLY</td> <td>MED. - MEDIUM</td> <td>MICA. - MICACEOUS</td> <td>MOD. - MODERATELY</td> <td>NP - NON PLASTIC</td> <td>ORG. - ORGANIC</td> <td>PMT - PRESSUREMETER TEST</td> <td>SAP. - SAPROLITIC</td> <td>SD. - SAND, SANDY</td> <td>SL. - SILT, SILTY</td> <td>SLI. - SLIGHTLY</td> <td>TCR - TRICONE REFUSAL</td> <td>w - MOISTURE CONTENT</td> <td>V - VERY</td> <td>VST - VANE SHEAR TEST</td> <td>WEA. - WEATHERED</td> <td>UNIT WEIGHT</td> <td>DRY UNIT WEIGHT</td> </tr> <tr> <td colspan="10"></td> <td colspan="10"> <p style="text-align: center;">SAMPLE ABBREVIATIONS</p> <p>S - BULK
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MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p> | | | | | | | | | | <p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> | | | | | | | | | | 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; 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| GENERAL CLASS.

 | GRANULAR MATERIALS (≤ 35% PASSING #200) | | | | | SILT-CLAY MATERIALS (> 35% PASSING #200) | | | | | ORGANIC MATERIALS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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 | A-1 | A-3 | A-2 | A-4 | A-5 | A-6 | A-7 | A-1, A-2 | A-3 | A-4, A-5 | A-6, A-7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">CONSISTENCY OR DENSENESS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)</td> <td>VERY LOOSE
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2 TO 4
> 4</td> </tr> </table>

 | | | | | | | | | | PRIMARY SOIL TYPE | COMPACTNESS OR CONSISTENCY | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²) | GENERALLY GRANULAR MATERIAL (NON-COHESSIVE) | VERY LOOSE
LOOSE
MEDIUM DENSE
DENSE
VERY DENSE | < 4
4 TO 10
10 TO 30
30 TO 50
> 50 | N/A | GENERALLY SILT-CLAY MATERIAL (COHESIVE) | VERY SOFT
SOFT
MEDIUM STIFF
STIFF
VERY STIFF
HARD | < 2
2 TO 4
4 TO 8
8 TO 15
15 TO 30
> 30 | < 0.25
0.25 TO 0.5
0.5 TO 1.0
1 TO 2
2 TO 4
> 4 | <p style="text-align: center;">MISCELLANEOUS SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td></td> <td>DIP & DIP DIRECTION OF ROCK STRUCTURES</td> <td></td> <td>SOIL SYMBOL</td> <td></td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td></td> <td>INFERRED SOIL BOUNDARY</td> <td></td> <td>INFERRED ROCK LINE</td> <td></td> <td>ALLUVIAL SOIL BOUNDARY</td> </tr> <tr> <td></td> <td>TEST BORING</td> <td></td> <td>AUGER BORING</td> <td></td> <td>CORE BORING</td> <td></td> <td>MONITORING WELL</td> <td></td> <td>PIEZOMETER INSTALLATION</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td></td> <td>CONE PENETROMETER TEST</td> <td></td> <td>SOUNDING ROD</td> <td></td> <td>TEST BORING WITH CORE</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SPT N-VALUE</td> <td></td> <td>SPT N-VALUE</td> </tr> </table> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION | | DIP & DIP DIRECTION OF ROCK STRUCTURES | | SOIL SYMBOL | | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT | | INFERRED SOIL BOUNDARY | | INFERRED ROCK LINE | | ALLUVIAL SOIL BOUNDARY | | TEST BORING | | AUGER BORING | | CORE BORING | | MONITORING WELL | | PIEZOMETER INSTALLATION | | SPT N-VALUE | | SLOPE INDICATOR INSTALLATION | | CONE PENETROMETER TEST | | SOUNDING ROD | | TEST BORING WITH CORE | | SPT N-VALUE | | SPT N-VALUE | | SPT N-VALUE | | SPT N-VALUE | <p style="text-align: center;">RECOMMENDATION SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td></td> <td>SHALLOW UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td></td> <td></td> </tr> </table> | | | | | | | | | | | UNDERCUT | | UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE | | UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL | | SHALLOW UNDERCUT | | UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK | | | <p style="text-align: center;">ABBREVIATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>BT - BORING TERMINATED</td> <td>CL - CLAY</td> <td>CPT - CONE PENETRATION TEST</td> <td>CSE - COARSE</td> <td>DMT - DILATOMETER TEST</td> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>e - VOID RATIO</td> <td>F - FINE</td> <td>FOSS. - FOSSILIFEROUS</td> <td>FRAC. - FRACTURED, FRACTURES</td> <td>FRAGS. - FRAGMENTS</td> <td>HI. - HIGHLY</td> <td>MED. - MEDIUM</td> <td>MICA. - MICACEOUS</td> <td>MOD. - MODERATELY</td> <td>NP - NON PLASTIC</td> <td>ORG. - ORGANIC</td> <td>PMT - PRESSUREMETER TEST</td> <td>SAP. - SAPROLITIC</td> <td>SD. - SAND, SANDY</td> <td>SL. - SILT, SILTY</td> <td>SLI. - SLIGHTLY</td> <td>TCR - TRICONE REFUSAL</td> <td>w - MOISTURE CONTENT</td> <td>V - VERY</td> <td>VST - VANE SHEAR TEST</td> <td>WEA. - WEATHERED</td> <td>UNIT WEIGHT</td> <td>DRY UNIT WEIGHT</td> </tr> <tr> <td colspan="10"></td> <td colspan="10"> <p style="text-align: center;">SAMPLE ABBREVIATIONS</p> <p>S - BULK
 SS - SPLIT SPOON
 ST - SHELBY TUBE
 RS - ROCK
 RT - RECOMPACTED TRIAXIAL
 CBR - CALIFORNIA BEARING RATIO</p> </td> </tr> </table> | | | | | | | | | | 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 | UNIT WEIGHT | DRY UNIT WEIGHT | | | | | | | | | | | <p style="text-align: center;">SAMPLE ABBREVIATIONS</p> <p>S - BULK
 SS - SPLIT SPOON
 ST - SHELBY TUBE
 RS - ROCK
 RT - RECOMPACTED TRIAXIAL
 CBR - CALIFORNIA BEARING RATIO</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| PRIMARY SOIL TYPE

 | COMPACTNESS OR CONSISTENCY | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)

 | VERY LOOSE
LOOSE
MEDIUM DENSE
DENSE
VERY DENSE | < 4
4 TO 10
10 TO 30
30 TO 50
> 50 | N/A | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| GENERALLY SILT-CLAY MATERIAL (COHESIVE)

 | VERY SOFT
SOFT
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 | ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION | | DIP & DIP DIRECTION OF ROCK STRUCTURES | | SOIL SYMBOL | | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT | | INFERRED SOIL BOUNDARY | | INFERRED ROCK LINE | | ALLUVIAL SOIL BOUNDARY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">TEXTURE OR GRAIN SIZE</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <td>4</td> <td>10</td> <td>40</td> <td>60</td> <td>200</td> <td>270</td> </tr> <tr> <td></td> <td>4.75</td> <td>2.00</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> <tr> <th>BOULDER (BLDR.)</th> <th>COBBLE (COB.)</th> <th>GRAVEL (GR.)</th> <th>COARSE SAND (CSE. SD.)</th> <th>FINE SAND (F SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> <tr> <td>GRAIN SIZE</td> <td>MM 305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> </tr> <tr> <td></td> <td>IN. 12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>

 | | | | | | | | | | U.S. STD. SIEVE SIZE OPENING (MM) | 4 | 10 | 40 | 60 | 200 | 270 | | 4.75 | 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 | | | | | <p style="text-align: center;">SOIL MOISTURE - CORRELATION OF TERMS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td>LL - LIQUID LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>PLASTIC RANGE (PI)</td> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM - OPTIMUM MOISTURE</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>SL - SHRINKAGE LIMIT</td> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </table> | | | | | | | | | | SOIL MOISTURE SCALE (ATTERBERG LIMITS) | FIELD MOISTURE DESCRIPTION | GUIDE FOR FIELD MOISTURE DESCRIPTION | LL - LIQUID LIMIT | - SATURATED - (SAT.) | USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE | PLASTIC RANGE (PI) | - WET - (W) | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE | OM - OPTIMUM MOISTURE | - MOIST - (M) | SOLID; AT OR NEAR OPTIMUM MOISTURE | SL - SHRINKAGE LIMIT | - DRY - (D) | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE | <p style="text-align: center;">EQUIPMENT USED ON SUBJECT PROJECT</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td><input type="checkbox"/> CME-45C</td> <td><input type="checkbox"/> CLAY BITS</td> <td><input checked="" type="checkbox"/> AUTOMATIC</td> <td><input type="checkbox"/> MANUAL</td> </tr> <tr> <td><input checked="" type="checkbox"/> CME-55</td> <td><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</td> <td colspan="2">CORE SIZE:</td> </tr> <tr> <td><input checked="" type="checkbox"/> CME-550X</td> <td><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</td> <td><input type="checkbox"/> -B</td> <td><input type="checkbox"/> -H</td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td><input type="checkbox"/> HARD FACED FINGER BITS</td> <td><input type="checkbox"/> -N</td> <td></td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td> <td><input type="checkbox"/> TUNG-CARBIDE INSERTS</td> <td colspan="2">HAND TOOLS:</td> </tr> <tr> <td><input type="checkbox"/> CME-I7</td> <td><input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</td> <td><input type="checkbox"/> POST HOLE DIGGER</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE *STEEL TEETH</td> <td><input type="checkbox"/> HAND AUGER</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE *TUNG-CARB.</td> <td><input type="checkbox"/> SOUNDING ROD</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> CORE BIT</td> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td></td> </tr> </table> | | | | | | | | | | <input type="checkbox"/> CME-45C | <input type="checkbox"/> CLAY BITS | <input checked="" type="checkbox"/> AUTOMATIC | <input type="checkbox"/> MANUAL | <input checked="" type="checkbox"/> CME-55 | <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER | CORE SIZE: | | <input checked="" type="checkbox"/> CME-550X | <input checked="" type="checkbox"/> 8" HOLLOW AUGERS | <input type="checkbox"/> -B | <input type="checkbox"/> -H | <input type="checkbox"/> VANE SHEAR TEST | <input type="checkbox"/> HARD FACED FINGER BITS | <input type="checkbox"/> -N | | <input type="checkbox"/> PORTABLE HOIST | <input type="checkbox"/> TUNG-CARBIDE INSERTS | HAND TOOLS: | | <input type="checkbox"/> CME-I7 | <input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER | <input type="checkbox"/> POST HOLE DIGGER | | | <input type="checkbox"/> TRICONE *STEEL TEETH | <input type="checkbox"/> HAND AUGER | | | <input type="checkbox"/> TRICONE *TUNG-CARB. | <input type="checkbox"/> SOUNDING ROD | | | <input type="checkbox"/> CORE BIT | <input type="checkbox"/> VANE SHEAR TEST | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| SL - SHRINKAGE LIMIT

 | - DRY - (D) | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <input checked="" type="checkbox"/> CME-550X

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| <input type="checkbox"/> CME-I7

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| <p style="text-align: center;">PLASTICITY</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NON PLASTIC</th> <th colspan="2">PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>0-5</td> <td></td> <td>VERY LOW</td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>6-15</td> <td></td> <td>SLIGHT</td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>16-25</td> <td></td> <td>MEDIUM</td> </tr> <tr> <td></td> <td>26 OR MORE</td> <td></td> <td>HIGH</td> </tr> </table>

 | | | | | | | | | | NON PLASTIC | PLASTICITY INDEX (PI) | | DRY STRENGTH | SLIGHTLY PLASTIC | 0-5 | | VERY LOW | MODERATELY PLASTIC | 6-15 | | SLIGHT | HIGHLY PLASTIC | 16-25 | | MEDIUM | | 26 OR MORE | | HIGH | <p style="text-align: center;">FRACATURE SPACING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table>
 | | | | | | | | | | TERM | SPACING | VERY WIDE | MORE THAN 10 FEET | WIDE | 3 TO 10 FEET | MODERATELY CLOSE | 1 TO 3 FEET | CLOSE | 0.16 TO 1 FOOT | VERY CLOSE | LESS THAN 0.16 FEET | <p style="text-align: center;">BEDDING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table> | | | | | | | | | | TERM | THICKNESS | VERY THICKLY BEDDED | 4 FEET | THICKLY BEDDED | 1.5 - 4 FEET | THINLY BEDDED | 0.16 - 1.5 FEET | VERY THINLY BEDDED | 0.03 - 0.16 FEET | THICKLY LAMINATED | 0.008 - 0.03 FEET | THINLY LAMINATED | < 0.008 FEET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">COLOR</p> <p>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.</p>

 | | | | | | | | | | <p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> | | | | | | | | | | 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. | <p style="text-align: center;">NOTES:</p> <p>BORING ELEVATIONS OBTAINED USING b3186_br0022_r4047_Mer ged.1-12-21.tin</p> <p>FIAD - FILLED IMMEDIATELY AFTER DRILLING</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">FRACATURE SPACING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table>

 | | | | | | | | | | TERM | SPACING | VERY WIDE | MORE THAN 10 FEET | WIDE | 3 TO 10 FEET | MODERATELY CLOSE | 1 TO 3 FEET | CLOSE | 0.16 TO 1 FOOT | VERY CLOSE | LESS THAN 0.16 FEET | <p style="text-align: center;">BEDDING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">FRACATURE SPACING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table>

 | | | | | | | | | | TERM | SPACING | VERY WIDE | MORE THAN 10 FEET | WIDE | 3 TO 10 FEET | MODERATELY CLOSE | 1 TO 3 FEET | CLOSE | 0.16 TO 1 FOOT | VERY CLOSE | LESS THAN 0.16 FEET | <p style="text-align: center;">BEDDING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">FRACATURE SPACING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table>

 | | | | | | | | | | TERM | SPACING | VERY WIDE | MORE THAN 10 FEET | WIDE | 3 TO 10 FEET | MODERATELY CLOSE | 1 TO 3 FEET | CLOSE | 0.16 TO 1 FOOT | VERY CLOSE | LESS THAN 0.16 FEET | <p style="text-align: center;">BEDDING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | TERM | THICKNESS | VERY THICKLY BEDDED | 4 FEET | THICKLY BEDDED | 1.5 - 4 FEET | THINLY BEDDED | 0.16 - 1.5 FEET | VERY THINLY BEDDED | 0.03 - 0.16 FEET | THICKLY LAMINATED | 0.008 - 0.03 FEET | THINLY LAMINATED | < 0.008 FEET | <p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> | | | | | | | | | | 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. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">FRACATURE SPACING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table>

 | | | | | | | | | | TERM | SPACING | VERY WIDE | MORE THAN 10 FEET | WIDE | 3 TO 10 FEET | MODERATELY CLOSE | 1 TO 3 FEET | CLOSE | 0.16 TO 1 FOOT | VERY CLOSE | LESS THAN 0.16 FEET | <p style="text-align: center;">BEDDING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | TERM | THICKNESS | VERY THICKLY BEDDED | 4 FEET | THICKLY BEDDED | 1.5 - 4 FEET | THINLY BEDDED | 0.16 - 1.5 FEET | VERY THINLY BEDDED | 0.03 - 0.16 FEET | THICKLY LAMINATED | 0.008 - 0.03 FEET | THINLY LAMINATED | < 0.008 FEET | <p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> | | | | | | | | | | 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. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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 | 0.008 - 0.03 FEET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;">FRACATURE SPACING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table>

 | | | | | | | | | | TERM | SPACING | VERY WIDE | MORE THAN 10 FEET | WIDE | 3 TO 10 FEET | MODERATELY CLOSE | 1 TO 3 FEET | CLOSE | 0.16 TO 1 FOOT | VERY CLOSE | LESS THAN 0.16 FEET | <p style="text-align: center;">BEDDING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
 | | TERM | THICKNESS | VERY THICKLY BEDDED | 4 FEET | THICKLY BEDDED | 1.5 - 4 FEET | THINLY BEDDED | 0.16 - 1.5 FEET | VERY THINLY BEDDED | 0.03 - 0.16 FEET | THICKLY LAMINATED | 0.008 - 0.03 FEET | THINLY LAMINATED | < 0.008 FEET | <p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>FRIABLE</td> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <td>MODERATELY INDURATED</td> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <td>INDURATED</td> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <td>EXTREMELY INDURATED</td> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> | | | | | | | | | | 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. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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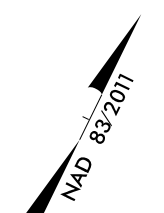
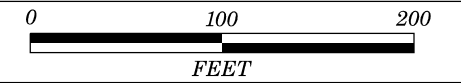
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 | 0.03 - 0.16 FEET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| THICKLY LAMINATED

 | 0.008 - 0.03 FEET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| THINLY LAMINATED

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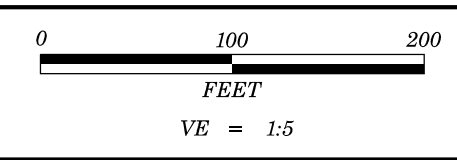
SITE PLAN



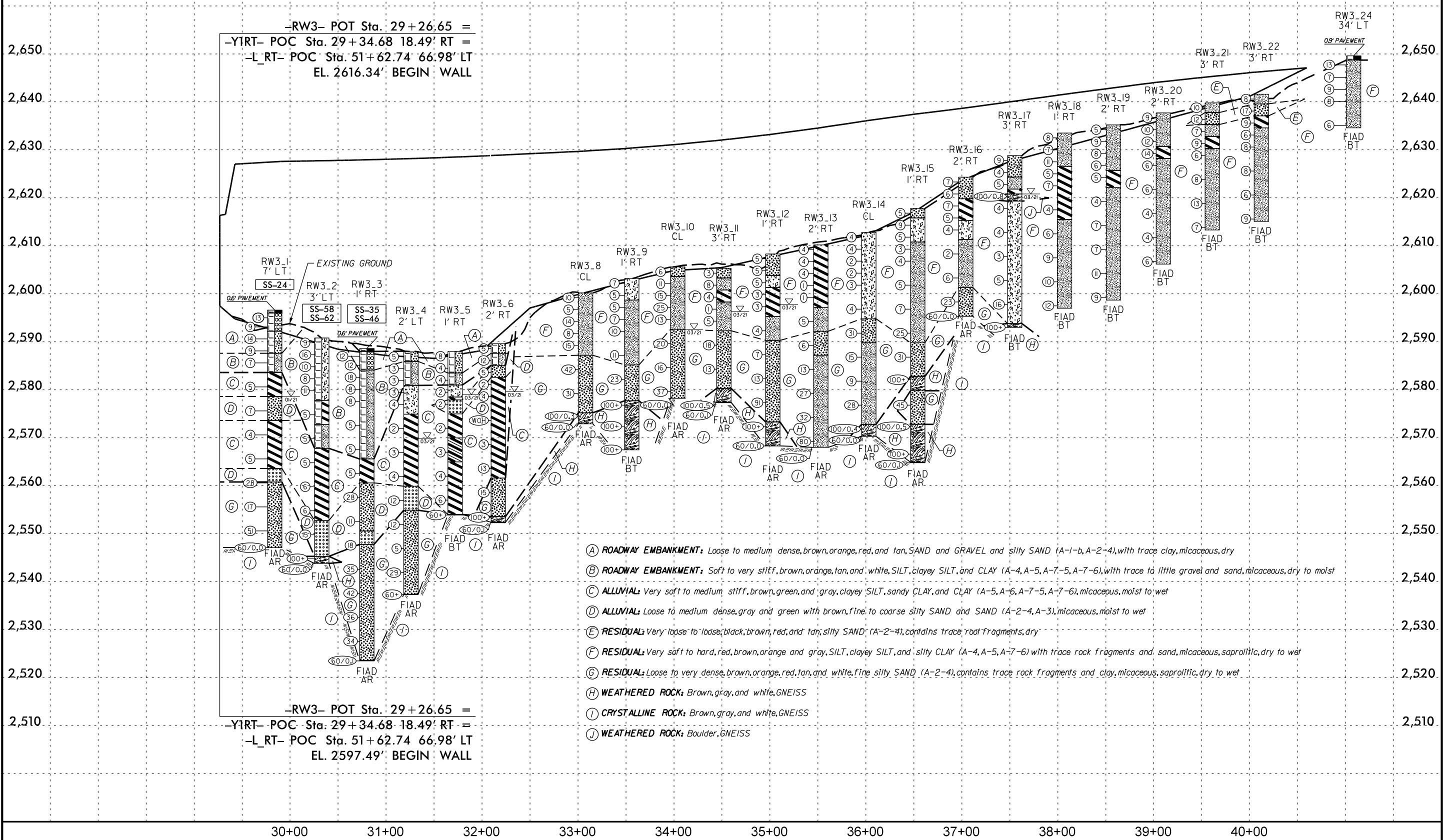
-RW3- POT Sta. 29+26.65 =
 -YIRT- POC Sta. 29+34.68 18.49' RT =
 -L_RT- POC Sta. 51+62.74 66.98' LT
 EL. 2616.34' BEGIN WALL

-RW3- STA. 40+59.25 =
 -YIRT- STA. 40+54.00 24.5' RT
 EL. 2647.10'
 END WALL

DELTA = 14°46'10"
 RADIUS = 388.10'
 ARC LENGTH = 214.29'



SOIL TEST RESULTS															
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-24	7' LT	29+84	15.0' - 16.1'	A-7-6 (11)	47	23	20.8	20.5	23.6	35.1	92.0	79.1	58.5	26	-
SS-58	3' LT	30+33	7.5' - 9.0'	A-5 (2)	44	10	26.6	29.4	23.9	20.1	88.8	73.7	44.4	28	-
SS-62	3' LT	30+33	25.0' - 26.5'	A-7-5 (31)	82	33	16.9	8.5	58.4	16.2	100	87.0	77.1	71	-
SS-35	1' RT	30+80	10.0' - 11.5'	A-4 (2)	38	9	27.5	26.8	24.5	21.2	94.3	76.9	48.8	25	-
SS-46	1' RT	30+80	55.0' - 56.5'	A-2-4	32	NP	47.6	32.0	9.7	10.7	98.9	67.6	26.2	18	-



- (A) ROADWAY EMBANKMENT: Loose to medium dense, brown, orange, red, and tan, SAND and GRAVEL and silty SAND (A-1-b, A-2-4), with trace clay, micaceous, dry
- (B) ROADWAY EMBANKMENT: Soft to very stiff, brown, orange, tan, and white, SILT, clayey SILT, and CLAY (A-4, A-5, A-7-5, A-7-6), with trace to little gravel and sand, micaceous, dry to moist
- (C) ALLUVIAL: Very soft to medium stiff, brown, green, and gray, clayey SILT, sandy CLAY, and CLAY (A-5, A-6, A-7-5, A-7-6), micaceous, moist to wet
- (D) ALLUVIAL: Loose to medium dense, gray and green with brown, fine to coarse silty SAND and SAND (A-2-4, A-3), micaceous, moist to wet
- (E) RESIDUAL: Very loose to loose, black, brown, red, and tan, silty SAND (A-2-4), contains trace root fragments, dry
- (F) RESIDUAL: Very soft to hard, red, brown, orange and gray, SILT, clayey SILT, and silty CLAY (A-4, A-5, A-7-6) with trace rock fragments and sand, micaceous, saprolitic, dry to wet
- (G) RESIDUAL: Loose to very dense, brown, orange, red, tan, and white, fine silty SAND (A-2-4), contains trace rock fragments and clay, micaceous, saprolitic, dry to wet
- (H) WEATHERED ROCK: Brown, gray, and white, GNEISS
- (I) CRYSTALLINE ROCK: Brown, gray, and white, GNEISS
- (J) WEATHERED ROCK: Boulder, GNEISS

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger									
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)								
BORING NO. RW3_1		STATION 29+84		OFFSET 7 ft LT		ALIGNMENT -RW3-									
COLLAR ELEV. 2,596.6 ft		TOTAL DEPTH 49.5 ft		NORTHING 666,986		EASTING 819,622									
DRILL RIGHAMMER EFF./DATE GTC9083 CME-550X 80%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/28/21		COMP. DATE 01/28/21		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					
2600															
2595	2,596.0	0.6	8	7	6										
	2,594.1	2.5	3	4	5										
	2,591.6	5.0	7	7	7										
2590	2,589.1	7.5	6	5	4										
	2,586.6	10.0	3	3	4										
2585															
	2,581.6	15.0	3	2	3										
2580															
	2,576.6	20.0	3	3	4										
2575															
	2,571.6	25.0	1	2	2										
2570															
	2,566.6	30.0	WOH	2	3										
2565															
	2,561.6	35.0	4	15	13										
2560															
	2,556.6	40.0	5	7	10										
2555															
	2,551.6	45.0	18	19	32										
2550															
	2,547.1	49.5													
		60/0.0													

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger									
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)								
BORING NO. RW3_2		STATION 30+33		OFFSET 3 ft LT		ALIGNMENT -RW3-									
COLLAR ELEV. 2,590.8 ft		TOTAL DEPTH 47.0 ft		NORTHING 666,998		EASTING 819,670									
DRILL RIGHAMMER EFF./DATE GTC9083 CME-550X 80%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 01/29/21		COMP. DATE 01/29/21		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					
2595															
	2,590.8	0.0													
2590			4	4	5										
	2,588.3	2.5	5	8	8										
	2,585.8	5.0	5	5	5										
2585			3	3	5										
	2,583.3	7.5													
	2,580.8	10.0	3	5	6										
2580															
	2,575.8	15.0	1	2	3										
2575															
	2,570.8	20.0	2	2	3										
2570															
	2,565.8	25.0	2	2	3										
2565															
	2,560.8	30.0	1	2	4										
2560															
	2,555.8	35.0	2	2	4										
2555															
	2,550.8	40.0	7	7	11										
2550															
	2,545.8	45.0	6	100/0.3											
2545															
	2,543.8	47.0													
		60/0.0													

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ_NC_DOT.GDT 8/11/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger								
SITE DESCRIPTION Retaining Wall No. 12 from -Y1RT- STA 40+54 to 44+26							GROUND WTR (ft)							
BORING NO. RW3_3		STATION 30+80		OFFSET 1 ft RT		ALIGNMENT -RW3-								
COLLAR ELEV. 2,588.6 ft		TOTAL DEPTH 65.1 ft		NORTHING 667,010		EASTING 819,716								
DRILL RIGHAMMER EFF./DATE GTC9083 CME-550X 80%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic								
DRILLER L. Wanstrath		START DATE 01/28/21		COMP. DATE 01/28/21		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2590														2,588.6 GROUND SURFACE 0.0
	2,588.0	0.6	5	4	8								D	2,588.0 0.6
	2,586.1	2.5	5	5	7								D	2,586.1 2.5
2585	2,583.6	5.0	7	9	9								D	2,583.6 5.0
	2,581.1	7.5	3	3	5								D	2,581.1 7.5
2580	2,578.6	10.0	4	4	4								D	2,578.6 10.0
	2,573.6	15.0	2	2	3								D	2,573.6 15.0
2575	2,568.6	20.0	3	2	3								D	2,568.6 20.0
	2,563.6	25.0	3	2	3								M	2,563.6 25.0
2565	2,560.6	28.0	1	2	2								M	2,560.6 28.0
	2,555.6	30.0	3	3	25								W	2,555.6 30.0
2560	2,553.6	35.0	4	4	7								W	2,553.6 35.0
	2,548.6	40.0	11	8	10								W	2,548.6 40.0
2555	2,543.6	45.0	20	15	20								M	2,543.6 45.0
	2,538.6	50.0	14	18	24								D	2,538.6 50.0
2550	2,533.6	55.0	11	17	19								D	2,533.6 55.0
	2,528.6	60.0	6	18	16								D	2,528.6 60.0
2545	2,523.6	65.0	60/0.1										D	2,523.6 65.0
2540														2,523.5

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi								
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)							
BORING NO. RW3_4		STATION 31+26		OFFSET 2 ft LT		ALIGNMENT -RW3-								
COLLAR ELEV. 2,587.9 ft		TOTAL DEPTH 50.6 ft		NORTHING 667,028		EASTING 819,758								
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic								
DRILLER L. Wanstrath		START DATE 03/12/21		COMP. DATE 03/12/21		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2590														2,587.9 GROUND SURFACE 0.0
	2,587.9	0.0	2	2	3								D	2,587.9 0.0
2585	2,585.4	2.5	1	2	1								D	2,585.4 2.5
	2,582.9	5.0	1	2	1								D	2,582.9 5.0
2580	2,580.4	7.5	1	1	2								D	2,580.4 7.5
	2,577.9	10.0	1	2	2								M	2,577.9 10.0
2575	2,572.9	15.0	1	1	1								M	2,572.9 15.0
	2,567.9	20.0	2	1	2								M	2,567.9 20.0
2570	2,562.9	25.0	1	2	2								W	2,562.9 25.0
	2,557.9	30.0	4	6	6								W	2,557.9 30.0
2565	2,552.9	35.0	3	5	7								W	2,552.9 35.0
	2,547.9	40.0	2	2	3								W	2,547.9 40.0
2560	2,542.9	45.0	6	12	17								D	2,542.9 45.0
	2,537.9	50.0	40	100/0.1									D	2,537.9 50.0
2555														2,537.3

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC DOT.GDT 8/11/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)									
BORING NO. RW3_5		STATION 31+72		OFFSET 1 ft RT		ALIGNMENT -RW3-										
COLLAR ELEV. 2,588.0 ft		TOTAL DEPTH 34.1 ft		NORTHING 667,041		EASTING 819,802										
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 03/02/21		COMP. DATE 03/12/21		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						
2590																
	2,588.0	0.0	2	4	4										2,588.0	GROUND SURFACE
2585	2,585.5	2.5	4	2	2										2,583.5	ROADWAY EMBANKMENT Loose, brown and tan, silty SAND (A-2-4), with trace clay, micaceous
	2,583.0	5.0	2	2	2										2,581.0	Soft to medium stiff, brown, SILT (A-4)
2580	2,580.5	7.5	1	1	1										2,578.0	ALLUVIAL Soft, gray and green, clayey SILT (A-5), micaceous
	2,578.0	10.0	1	1	1										2,575.0	ALLUVIAL Very loose, gray and green, SAND (A-3), with a layer of clay 10.0 to 10.1'
2575																
	2,573.0	15.0	1	1	1											
2570																
	2,568.0	20.0	0	1	2											
2565																
	2,563.0	25.0	1	2	2											
2560																
	2,558.0	30.0	5	1	5											
2555																
	2,554.0	34.0	100/0.1												60+	

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)									
BORING NO. RW3_6		STATION 32+17		OFFSET 2 ft RT		ALIGNMENT -RW3-										
COLLAR ELEV. 2,589.6 ft		TOTAL DEPTH 37.3 ft		NORTHING 667,058		EASTING 819,844										
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wansrath		START DATE 03/12/21		COMP. DATE 03/12/21		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						
2590																
	2,589.6	0.0	3	3	2										2,589.6	GROUND SURFACE
	2,587.1	2.5	10	7	5										2,587.6	ROADWAY EMBANKMENT Loose, red and brown, silty SAND (A-2-4)
2585	2,584.6	5.0	3	2	3										2,585.1	Stiff, brown and white, SILT (A-4), with trace sand
	2,582.1	7.5	1	1	1										2,582.6	ALLUVIAL Loose, gray with brown, silty SAND (A-2-4)
2580	2,579.6	10.0	1	2	2											Very soft to stiff, gray, silty CLAY (A-7-6), with trace sand, micaceous
2575	2,574.6	15.0	1	WOH	WOH											
2570	2,569.6	20.0	1	1	2											
2565	2,564.6	25.0	9	9	4											
2560	2,559.6	30.0	7	6	9											
2555	2,554.6	35.0	13	17	100/0.3											
	2,552.4	37.2	60/0.1												60/0.1	

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ_NC_DOT.GDT 8/11/21

CRYSTALLINE ROCK
Gray, GNEISS

Boring Terminated with Standard Penetration Test Refusal at Elevation 2,553.9 ft in Crystalline Rock (GNEISS). A.R. at a depth of 34.0'.

NOTES
Split spoons at 15.0' and 34.0' resulted in no recovery

WEATHERED ROCK
Brown, GNEISS

CRYSTALLINE ROCK
Brown, GNEISS

Boring Terminated with Standard Penetration Test Refusal at Elevation 2,552.3 ft in Crystalline Rock (GNEISS). A.R. at a depth of 37.2'.

NOTES
Split spoons at 25.0' and 37.2' resulted in no recovery

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)								
BORING NO. RW3_8		STATION 33+08		OFFSET CL		ALIGNMENT -RW3-									
COLLAR ELEV. 2,600.2 ft		TOTAL DEPTH 27.3 ft		NORTHING 667,094		EASTING 819,928									
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wansrath		START DATE 03/12/21		COMP. DATE 03/12/21		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					
2605															
2600	2,600.2	0.0	12	6	4								D	2,600.2 GROUND SURFACE 0.0	
	2,597.7	2.5	2	2	3								D	RESIDUAL Medium stiff, red and orange, clayey SILT (A-5), with trace sand, saprolitic	
2595	2,595.2	5.0	4	7	7								D	2,598.7 Medium stiff to stiff, brown/orange, fine sandy SILT (A-4) 4.5	
	2,592.7	7.5	2	3	5								D		
2590	2,590.2	10.0	7	7	8								D		
	2,587.2	13.0											D	2,587.2 Dense, brown, red, and white, fine silty SAND (A-2-4), with trace clay, contains trace rock fragments, saprolitic 13.0	
2585	2,585.2	15.0	10	18	24								D		
	2,583.2	18.0											D	2,585.2 Medium dense, brown and white, silty SAND (A-2-4), saprolitic 18.0	
2580	2,580.2	20.0	10	11	20								D		
	2,578.2	23.0											D	2,577.7 WEATHERED ROCK White and gray, migmatic GNEISS 25.5	
2575	2,575.2	25.0	50	100/0.3										2,575.2 WEATHERED ROCK Gray, GNEISS 25.0	
	2,572.9	27.3												2,572.9 Boring Terminated with Standard Penetration Test Refusal at Elevation 2,572.9 ft on Crystalline Rock (GNEISS) A.R. at a depth of 27.3'. 27.3	
		60/0.0													60/0.0

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)								
BORING NO. RW3_9		STATION 33+56		OFFSET 1 ft RT		ALIGNMENT -RW3-									
COLLAR ELEV. 2,603.2 ft		TOTAL DEPTH 35.7 ft		NORTHING 667,113		EASTING 819,971									
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wansrath		START DATE 03/12/21		COMP. DATE 03/12/21		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					
2605															
	2,603.2	0.0	5	3	4								D	2,603.2 GROUND SURFACE 0.0	
2600	2,600.7	2.5	2	3	2								D	RESIDUAL Medium stiff, red and orange, clayey SILT (A-5), with trace sand, saprolitic	
	2,598.2	5.0	3	2	3								M	2,598.7 Medium stiff to stiff, brown/orange, fine sandy SILT (A-4) 4.5	
2595	2,595.7	7.5	2	4	3								M		
	2,593.2	10.0	3	5	5								M		
2590	2,590.2	13.0	3	5	6								M		
	2,588.2	15.0	3	5	6								M		
2585	2,585.2	18.0	5	8	15								M	2,585.2 Medium dense, brown and white, silty SAND (A-2-4), saprolitic 18.0	
	2,583.2	20.0	5	8	15								M		
2580	2,580.2	23.0	32	56	65/0.5									2,577.7 WEATHERED ROCK White and gray, migmatic GNEISS 25.5	
	2,578.2	25.0													
2575	2,575.2	27.3	42	80	100/0.4									2,575.2 WEATHERED ROCK Gray, GNEISS 25.0	
	2,573.2	30.0													
2570	2,570.2	33.0	50	100/0.4										2,570.2 Boring Terminated at Elevation 2,567.5 ft in Weathered Rock (GNEISS) 35.7	
	2,568.2	35.0													

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 8/11/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)								
BORING NO. RW3_10		STATION 34+04		OFFSET CL		ALIGNMENT -RW3-									
COLLAR ELEV. 2,605.6 ft		TOTAL DEPTH 27.4 ft		NORTHING 667,135		EASTING 820,014									
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 03/13/21		COMP. DATE 03/13/21		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					
2610															
2605	2,605.6	0.0	2	3	3									2,605.6	0.0
	2,603.1	2.5	3	5	6									2,603.6	2.9
2600	2,600.6	5.0	6	6	9										
	2,598.1	7.5	3	9	16										
2595	2,595.6	10.0	10	5	8										
	2,592.6	13.0												2,592.6	13.0
2590	2,590.6	15.0	5	8	12										
	2,585.6	20.0	4	6	10										
2585	2,585.6	20.0	4	6	10										
	2,580.6	25.0	15	17	20										
2580	2,580.6	25.0	15	17	20										
	2,578.2	27.4	60/0.0											2,578.2	27.4
Boring Terminated with Standard Penetration Test Refusal at Elevation 2,578.2 ft on Crystalline Rock (GNEISS). A.R. at a depth of 27.4'.															

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi									
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)								
BORING NO. RW3_11		STATION 34+52		OFFSET 3 ft RT		ALIGNMENT -RW3-									
COLLAR ELEV. 2,605.3 ft		TOTAL DEPTH 28.0 ft		NORTHING 667,153		EASTING 820,060									
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic									
DRILLER L. Wanstrath		START DATE 03/13/21		COMP. DATE 03/13/21		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					
2610															
2605	2,605.3	0.0	2	2	1									2,605.3	0.0
	2,602.8	2.5	3	3	5									2,603.3	2.0
2600	2,600.3	5.0	2	2	2									2,600.8	4.5
	2,597.8	7.5	1	0	1									2,598.3	7.0
2595	2,595.3	10.0	2	2	3										
	2,592.3	13.0												2,592.3	13.0
2590	2,590.3	15.0	5	11	7										
	2,585.3	20.0	3	4	9										
2585	2,585.3	20.0	3	4	9										
	2,580.3	25.0	100/0.5											2,580.3	25.0
2580	2,580.3	25.0	100/0.5												
	2,577.4	27.9	60/0.1											2,577.4	27.9
	2,577.3	28.0												2,577.3	28.0
Boring Terminated with Standard Penetration Test Refusal at Elevation 2,577.3 ft in Crystalline Rock (GNEISS). A.R. at a depth of 27.9'.															

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 8/11/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi	
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)
BORING NO. RW3_12		STATION 35+03		OFFSET 1 ft RT		ALIGNMENT -RW3-	
COLLAR ELEV. 2,608.3 ft		TOTAL DEPTH 40.0 ft		NORTHING 667,178		EASTING 820,103	
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER L. Wanstrath		START DATE 03/13/21		COMP. DATE 03/13/21		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				
2610	2,608.3	0.0											GROUND SURFACE	0.0
2605	2,605.8	2.5	2	2	3	5						D	RESIDUAL Loose, red and brown, silty SAND (A-2-4)	
	2,603.3	5.0	3	3	2							D		4.5
2600	2,600.8	7.5	2	2	3							M	Medium stiff, red and orange, clayey SILT (A-5)	7.0
	2,598.3	10.0	1	1	2							M	Soft, orange and brown, silty CLAY (A-7-6)	
	2,595.3	13.0	2	1	2							M		13.0
2595	2,593.3	15.0	3	2	2							M	Soft to medium stiff, orange, white, and brown, SILT (A-4), with trace sand, micaceous, saprolitic	
	2,590.3	18.0										M		18.0
2585	2,588.3	20.0	2	3	4							M	Loose to very dense, black, white, and brown, silty SAND (A-2-4), micaceous, saprolitic	
	2,583.3	25.0	5	5	8							M		
2580	2,578.3	30.0	24	38	53							M		
	2,573.3	35.0	46	72	100/0.5							M		
2570	2,568.3	40.0											WEATHERED ROCK Dark brown with white, GNEISS	35.0
													Boring Terminated with Standard Penetration Test Refusal at Elevation 2,568.3 ft on Crystalline Rock (GNEISS). A.R. at a depth of 40.0'.	40.0

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi	
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)
BORING NO. RW3_13		STATION 35+53		OFFSET 2 ft RT		ALIGNMENT -RW3-	
COLLAR ELEV. 2,610.2 ft		TOTAL DEPTH 42.2 ft		NORTHING 667,202		EASTING 820,147	
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic	
DRILLER L. Wanstrath		START DATE 03/13/21		COMP. DATE 03/13/21		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				
2615														
2610	2,610.2	0.0											GROUND SURFACE	0.0
	2,607.7	2.5	1	2	2	4						M	RESIDUAL Very soft to medium stiff, orange, gray, and brown, silty CLAY (A-7-6), with trace sand, micaceous	
2605	2,605.2	5.0	2	1	3							M		
	2,602.7	7.5	2	2	2							M		
2600	2,600.2	10.0	1	0	1							M		
	2,597.2	13.0	1	0	1							M		
2595	2,595.2	15.0	1	3	2							M	Medium stiff, brown, orange, and white, SILT (A-4), with trace sand, micaceous	13.0
	2,592.2	18.0										M		18.0
2590	2,590.2	20.0	2	3	3							D	Loose, gray and white, fine silty SAND (A-2-4), saprolitic	
	2,587.2	23.0	3	5	8							D		
2585	2,585.2	25.0	3	5	8							D	Stiff to hard, brown, red, and white, SILT (A-4), with trace sand and rock fragments, micaceous	23.0
	2,580.2	30.0	14	14	13							D		
2575	2,575.2	35.0	6	6	26							D		
	2,570.2	40.0	30	30	50							D		
2570	2,568.0	42.2											Boring Terminated with Standard Penetration Test Refusal at Elevation 2,568.0 ft on Crystalline Rock (GNEISS). A.R. at a depth of 42.2'.	42.2

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ_NC_DOT.GDT 8/11/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)									
BORING NO. RW3_14		STATION 36+03		OFFSET CL		ALIGNMENT -RW3-										
COLLAR ELEV. 2,612.8 ft		TOTAL DEPTH 42.5 ft		NORTHING 667,228		EASTING 820,191										
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 03/13/21		COMP. DATE 03/13/21		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						
2615	2,612.8	0.0												2,612.8	GROUND SURFACE	0.0
2610	2,610.3	2.5	2	2	2	4							M	RESIDUAL Very soft to medium stiff, brown and red, clayey SILT (A-5), micaceous		
	2,607.8	5.0	2	1	1								M			
2605	2,605.3	7.5	1	1	1								M			
	2,602.8	10.0	2	1	2								M			
2600	2,597.8	15.0	1	2	2								M			
2595	2,592.8	20.0	3	11	20								D	Dense, red, brown, and white, silty SAND (A-2-4), micaceous, saprolitic	18.0	
2590	2,587.8	25.0	4	5	10								M	Stiff to very stiff, red, brown, and orange, SILT (A-4), with trace sand	23.0	
2585	2,582.8	30.0	2	3	6								M			
2580	2,577.8	35.0	6	11	17								M			
2575	2,572.8	40.0	100/0.4										M	WEATHERED ROCK Black and white, migmatitic GNEISS	40.0	
	2,570.3	42.5	60/0.0											Boring Terminated with Standard Penetration Test Refusal at Elevation 2,570.3 ft on Crystalline Rock (GNEISS). A.R. at a depth of 42.5'.	42.5	

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)									
BORING NO. RW3_15		STATION 36+54		OFFSET 1 ft RT		ALIGNMENT -RW3-										
COLLAR ELEV. 2,617.8 ft		TOTAL DEPTH 53.0 ft		NORTHING 667,253		EASTING 820,235										
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 03/14/21		COMP. DATE 03/14/21		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						
2620	2,617.8	0.0												2,617.8	GROUND SURFACE	0.0
2615	2,615.3	2.5	2	4	5								D	RESIDUAL Loose, brown, silty SAND (A-2-4)	2.0	
	2,612.8	5.0	2	2	3								D	Stiff to medium stiff, brown and red, clayey SILT (A-5)		
2610	2,610.3	7.5	2	1	2								D			
	2,607.8	10.0	2	2	2								M	Soft to very stiff, brown, red, and black, SILT (A-4), with trace sand, micaceous, saprolitic	7.0	
2605	2,602.8	15.0	2	2	3								M			
2600	2,597.8	20.0	2	3	4								M			
2595	2,592.8	25.0	7	9	16								M			
2590	2,587.8	30.0	22	10	21								M	Dense, gray and white, silty SAND (A-2-4), saprolitic	28.0	
2585	2,582.8	35.0	82	100/0.4									M			
2580	2,577.8	40.0	20	20	25								M	WEATHERED ROCK Gray, black and red, GNEISS with SILT (A-4)	38.0	
2575	2,572.8	45.0	100/0.5										M	RESIDUAL Dense, gray and white, silty SAND (A-2-4), saprolitic	45.0	
2570	2,567.8	50.0	23	47	100/0.4									WEATHERED ROCK Gray, black and red, GNEISS, with silt (A-4)	45.0	
2565	2,564.9	52.9	60/0.1											WEATHERED ROCK White and black, GNEISS	52.9	
	2,564.8	53.0												Boring Terminated with Standard Penetration Test Refusal at Elevation 2,564.8 ft in Crystalline Rock (GNEISS). A.R. at a depth of 52.9'.	53.0	

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ_NC_DOT.GDT 8/11/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi											
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)										
BORING NO. RW3_16		STATION 37+04		OFFSET 2 ft RT		ALIGNMENT -RW3-											
COLLAR ELEV. 2,624.3 ft		TOTAL DEPTH 29.0 ft		NORTHING 667,278		EASTING 820,278											
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic											
DRILLER L. Wanstrath		START DATE 03/14/21		COMP. DATE 03/14/21		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							
2625	2,624.3	0.0												2,624.3	0.0	GROUND SURFACE	
	2,621.8	2.5	3	3	4								D	2,621.8		RESIDUAL Loose, brown and tan, silty SAND (A-2-4)	
2620	2,619.3	5.0	3	3	3								D	2,619.8	4.5	Medium stiff, brown and orange, silty CLAY (A-7-6)	
	2,616.8	7.5	4	3	4								M	2,615.3	9.0	Medium stiff, light gray, clayey SILT (A-4)	
2615	2,614.3	10.0	2	2	3								M	2,611.3	13.0	Soft to medium stiff, red, brown, and black, SILT (A-4), with trace sand, micaceous	
2610	2,609.3	15.0	1	2	2								M	2,601.3	23.0	Medium dense, red, brown, and tan, silty SAND (A-2-4), micaceous, saprolitic	
2605	2,604.3	20.0	2	2	4								M				
2600	2,599.3	25.0	6	9	14								M				
	2,595.3	29.0															
		60/0.0													60/0.0		Boring Terminated with Standard Penetration Test Refusal at Elevation 2,595.3 ft on Crystalline Rock (GNEISS). A.R. at a depth of 29.0'.

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi										
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)									
BORING NO. RW3_17		STATION 37+55		OFFSET 3 ft RT		ALIGNMENT -RW3-										
COLLAR ELEV. 2,628.8 ft		TOTAL DEPTH 36.3 ft		NORTHING 667,305		EASTING 820,322										
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wanstrath		START DATE 03/14/21		COMP. DATE 03/14/21		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						
2630	2,628.8	0.0												2,628.8	0.0	GROUND SURFACE
	2,626.3	2.5	2	5	4								D	2,624.3		RESIDUAL Loose, brown and black, silty SAND (A-2-4)
2625	2,623.8	5.0	3	2	2								D	2,621.8	4.5	Medium stiff, brown and tan, SILT (A-4), micaceous
	2,621.3	7.5	2	3	2								M	2,620.8	7.0	Brown and gray, silty CLAY (A-7-6), contains few rock fragments, micaceous
2620	2,618.8	10.0	2	3	97/0.3								M	2,619.3	9.5	WEATHERED ROCK Gray, BOULDER
	2,618.8	10.0	2	2	2								W			RESIDUAL Soft to very stiff, gray, orange, and black, clayey SILT (A-5), with trace sand, micaceous, saprolitic
2615	2,613.8	15.0	1	2	2								W			
2610	2,608.8	20.0	2	1	2								W			
2605	2,603.8	25.0	1	2	3								W			
2600	2,598.8	30.0	3	5	11								W			
2595	2,593.8	35.0	58	100/0.3									W	2,593.8	35.0	WEATHERED ROCK Brown and orange, GNEISS
														2,593.0	35.8	Boring Terminated at Elevation 2,592.5 ft in Weathered Rock (GNEISS)

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger											
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)										
BORING NO. RW3_18		STATION 38+07		OFFSET 1 ft RT		ALIGNMENT -RW3-											
COLLAR ELEV. 2,633.5 ft		TOTAL DEPTH 36.5 ft		NORTHING 667,333		EASTING 820,365											
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER L. Wansrath		START DATE 03/24/21		COMP. DATE 03/24/21		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
2635	2,633.5	0.0	1	4	4										2,633.5	GROUND SURFACE	0.0
2630	2,631.0	2.5	3	3	4								M		2,626.5	RESIDUAL Medium stiff to stiff, brown, SILT (A-4), with trace rock fragments, micaceous	7.0
	2,628.5	5.0	10	7	4								M				
2625	2,626.0	7.5	3	2	3								M		2,615.5	Medium stiff, brown and gray, silty CLAY (A-7-6), with trace rock fragments and sand, micaceous	18.0
	2,623.5	10.0	3	3	4								M				
2620	2,618.5	15.0	2	1	3								M		2,615.5	Medium stiff to stiff, brown, orange, and tan, SILT (A-4), micaceous	18.0
	2,613.5	20.0	2	3	3								M				
2610	2,608.5	25.0	3	4	5								M				
2605	2,603.5	30.0	2	5	5								M				
2600	2,598.5	35.0	2	5	7								M				
															2,597.0	Boring Terminated at Elevation 2,597.0 ft in SILT	36.5

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger											
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)										
BORING NO. RW3_19		STATION 38+58		OFFSET 2 ft RT		ALIGNMENT -RW3-											
COLLAR ELEV. 2,635.2 ft		TOTAL DEPTH 36.5 ft		NORTHING 667,359		EASTING 820,409											
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER L. Wansrath		START DATE 03/23/21		COMP. DATE 03/23/21		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
2640																	
2635	2,635.2	0.0	1	2	3								M		2,635.2	GROUND SURFACE	0.0
2630	2,632.7	2.5	3	5	4								M		2,625.7	RESIDUAL Medium stiff to stiff, brown and orange, SILT (A-4), with trace clay, micaceous	9.5
	2,630.2	5.0	3	3	5								M				
2625	2,627.7	7.5	2	3	3								M		2,622.2	Medium stiff, brown and gray, silty CLAY (A-7-6), micaceous	13.0
	2,625.2	10.0	2	2	3								M				
2620	2,620.2	15.0	2	2	2								M				
2615	2,615.2	20.0	2	3	4								M				
2610	2,610.2	25.0	3	3	4								M				
2605	2,605.2	30.0	3	4	7								M				
2600	2,600.2	35.0	3	4	5								M				
															2,598.7	Boring Terminated at Elevation 2,598.7 ft in SILT	36.5

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger										
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)									
BORING NO. RW3_20		STATION 39+10		OFFSET 2 ft RT		ALIGNMENT -RW3-										
COLLAR ELEV. 2,637.7 ft		TOTAL DEPTH 31.5 ft		NORTHING 667,387		EASTING 820,453										
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wansrath		START DATE 03/24/21		COMP. DATE 03/24/21		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						
2640																
	2,637.7	0.0	2	3	6									2,637.7	GROUND SURFACE	0.0
2635	2,635.2	2.5	5	4	6								M	RESIDUAL		
	2,632.7	5.0	3	8	4								M	Stiff, brown, tan, and orange, SILT (A-4), with trace sand and rock fragments, micaceous		
2630	2,630.2	7.5	3	3	11								M			
	2,627.7	10.0	2	3	3								M	Stiff, brown and orange, silty CLAY (A-7-6), with trace sand, micaceous	7.0	
2625	2,627.7	10.0	2	3	3								M	Medium stiff, orange, brown, and tan, SILT (A-4), with trace rock fragments, micaceous, saprolitic	9.5	
	2,622.7	15.0	2	3	3								M			
2620	2,617.7	20.0	2	1	3								M			
2615	2,612.7	25.0	2	1	3								M			
2610	2,607.7	30.0	2	2	4								M			
															Boring Terminated at Elevation 2,606.2 ft in SILT	31.5

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger										
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)									
BORING NO. RW3_21		STATION 39+61		OFFSET 3 ft RT		ALIGNMENT -RW3-										
COLLAR ELEV. 2,639.8 ft		TOTAL DEPTH 26.5 ft		NORTHING 667,412		EASTING 820,497										
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)			DRILL METHOD H.S. Augers			HAMMER TYPE Automatic										
DRILLER L. Wansrath		START DATE 03/24/21		COMP. DATE 03/24/21		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						
2640																
	2,639.8	0.0	3	5	5									2,639.8	GROUND SURFACE	0.0
	2,637.3	2.5	3	5	7								M	RESIDUAL		
2635	2,634.8	5.0	3	3	4								M	Stiff, brown and orange, SILT (A-4), with trace rock fragments and sand, micaceous	2.0	
	2,632.3	7.5	4	4	5								M	Medium dense, brown and orange, silty SAND (A-2-4)	4.5	
2630	2,629.8	10.0	2	2	4								M	Medium stiff, brown and orange, fine sandy SILT (A-4), with trace clay, micaceous	7.0	
	2,628.2	9.5	2	2	4								M	Stiff, brown and black, silty CLAY (A-7-6), micaceous	9.5	
2625	2,624.8	15.0	2	4	4								M	Medium stiff to stiff, brown and tan, SILT (A-4), with trace rock fragments, micaceous		
2620	2,619.8	20.0	2	4	9								M			
2615	2,614.8	25.0	3	3	4								M			
														2,613.3	Boring Terminated at Elevation 2,613.3 ft in SILT	26.5

NCDOT BORE DOUBLE B3186_GEO_SPT.GPJ NC_DOT.GDT 8/11/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST R. Dugger								
SITE DESCRIPTION Retaining Wall No. 3 from -Y1RT- STA 29+35 to 40+54							GROUND WTR (ft)							
BORING NO. RW3_22		STATION 40+12		OFFSET 3 ft RT		ALIGNMENT -RW3-								
COLLAR ELEV. 2,641.6 ft		TOTAL DEPTH 26.5 ft		NORTHING 667,437		EASTING 820,542								
DRILL RIGHAMMER EFF./DATE GTC8255 CME-55 93%(11/24/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER L. Wansrath		START DATE 03/24/21		COMP. DATE 03/24/21		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2645														
2640	2,641.6	0.0	4	4	4									2,641.6 GROUND SURFACE 0.0
	2,639.1	2.5	7	8	9									2,639.6 RESIDUAL 2.0
	2,636.6	5.0	3	4	5									2,637.1 Medium stiff to stiff, brown and orange, SILT (A-4), with trace rock fragments and sand 4.5
2635	2,634.1	7.5	2	3	3									2,634.6 Medium dense, brown and tan, silty SAND (A-2-4), with trace rock fragments 7.0
	2,631.6	10.0	3	4	4									2,634.6 Stiff, brown and orange, silty CLAY (A-7-6), micaceous
2630	2,626.6	15.0	3	3	5									Medium stiff to stiff, brown, tan, orange, and white, SILT (A-4), micaceous
2625	2,621.6	20.0	2	2	4									
2620	2,616.6	25.0	2	3	6									
														2,615.1 Boring Terminated at Elevation 2,615.1 ft in SILT 26.5

WBS 38332.1.FS1		TIP B-3186 / B-5898		COUNTY HAYWOOD		GEOLOGIST N. Yacobi								
SITE DESCRIPTION Retaining Wall No. 12 from -Y1RT- STA 40+54 to 44+26							GROUND WTR (ft)							
BORING NO. RW3_24		STATION 47+43		OFFSET 4 ft LT		ALIGNMENT -RW12-								
COLLAR ELEV. 2,649.6 ft		TOTAL DEPTH 15.0 ft		NORTHING 667,487		EASTING 820,630								
DRILL RIGHAMMER EFF./DATE GTC3277 CME-75 83%(09/15/2020)				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic								
DRILLER K. Boone		START DATE 02/17/21		COMP. DATE 02/17/21		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2650														
	2,648.7	0.9	4	6	7									2,649.6 GROUND SURFACE 0.0
	2,646.1	3.5	4	3	4									2,648.7 0.9' Pavement 0.9
2645	2,643.6	6.0	3	4	5									RESIDUAL 7.0
	2,641.1	8.5	2	4	4									Medium stiff to stiff, brown, orange, and white, SILT (A-4), with trace sand, micaceous
2640	2,636.1	13.5	2	2	4									
2635														2,634.6 Boring Terminated at Elevation 2,634.6 ft in SILT 15.0

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