

PROJECT: 17BP.7.R.140 REFERENCE: SF-780239

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<u>SHEET NO.</u>	<u>DESCRIPTION</u>
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY ROCKINGHAM
PROJECT DESCRIPTION BRIDGE NO. 239 OVER
WOLF ISLAND CREEK ON SR 1998 (WENTWORTH
STREET)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	SF-780239	1	6

CAUTION NOTICE

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

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

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THE PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

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

PERSONNEL

CATLIN, INC.

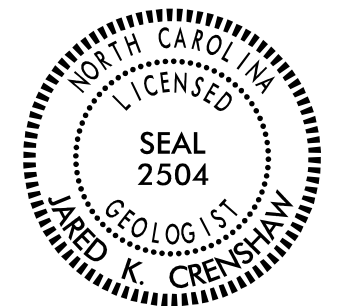
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CHECKED BY J. K. CRENSHAW

SUBMITTED BY E. HOWEY

DATE FEBRUARY, 2021



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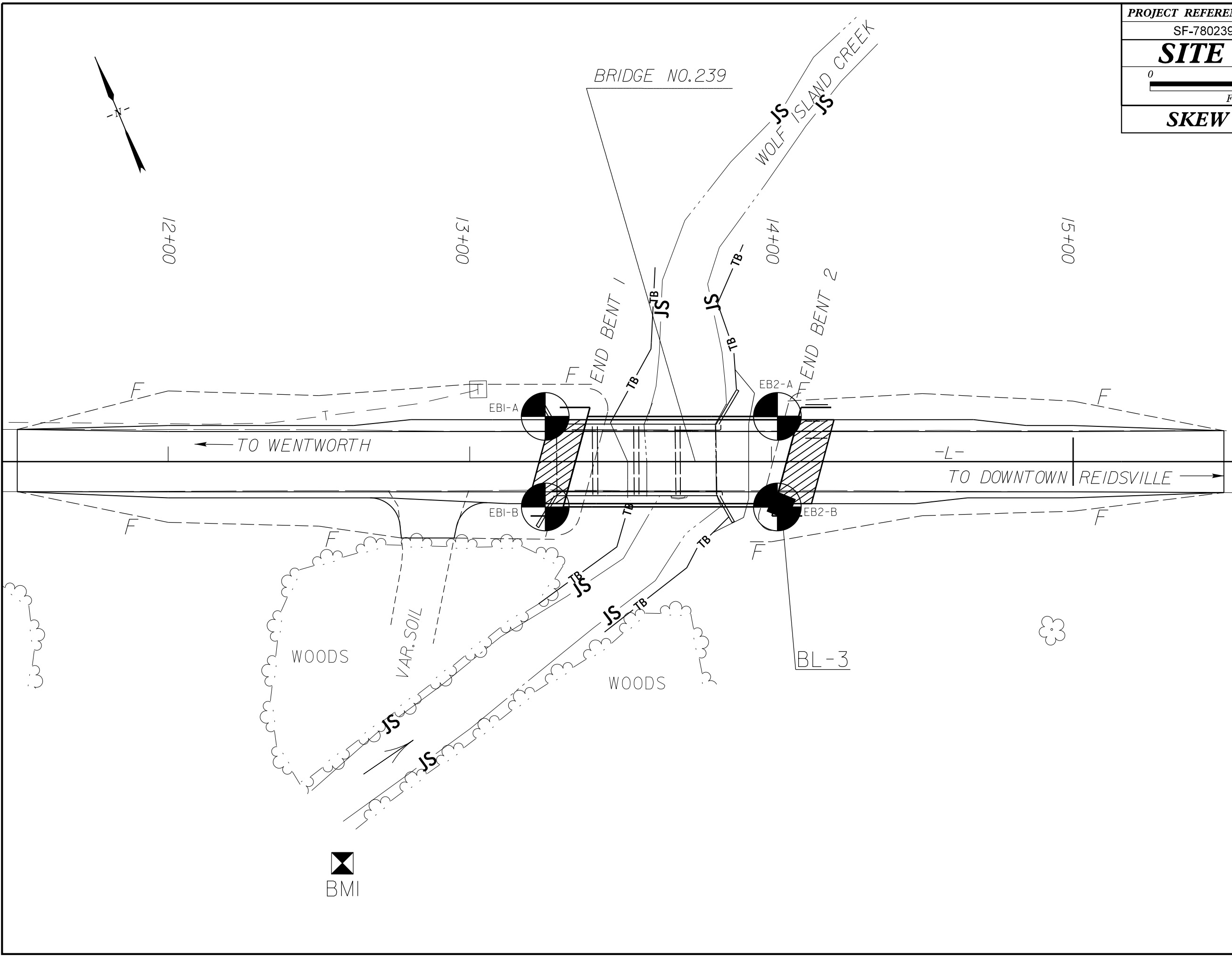
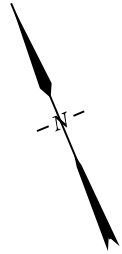
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UNLESS ALL SIGNATURES COMPLETED**

**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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| 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>
 | | | | | | | | | | | | | 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. | | | | | | | | | | 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: | | | | | | | | | | 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 (ROD) - 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 O.D. 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. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| SOIL LEGEND AND AASHTO CLASSIFICATION
 | | | | | | | | | | | | | ANGULARITY OF GRAINS
 | | | | | | | | | | WEATHERED ROCK (WR) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <table border="1"> <thead> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="7">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th><th>A-3</th><th>A-2</th><th>A-2-4</th><th>A-2-5</th><th>A-2-6</th><th>A-2-7</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></th> </tr> </thead> <tbody> <tr> <td>GROUP CLASS.</td> <td>A-1-a</td><td>A-1-b</td><td>A-2-4</td><td>A-2-5</td><td>A-2-6</td><td>A-2-7</td><td>A-4</td><td>A-5</td><td>A-6</td><td>A-7</td> <td>A-1, A-2</td><td>A-3</td><td>A-4, A-5</td><td>A-6, A-7</td><td></td> </tr> <tr> <td>SYMBOL</td> <td>[Pattern]</td><td>[Pattern]</td><td>[Pattern]</td><td>[Pattern]</td><td>[Pattern]</td><td>[Pattern]</td><td>[Pattern]</td><td>[Pattern]</td><td>[Pattern]</td><td>[Pattern]</td> <td>[Pattern]</td><td>[Pattern]</td><td>[Pattern]</td><td>[Pattern]</td><td>[Pattern]</td> </tr> <tr> <td>% PASSING</td> <td colspan="7"></td> <td colspan="7"></td> <td colspan="5"></td> </tr> <tr> <td>*10 #200</td> <td colspan="7"></td> <td colspan="7"></td> <td colspan="5"></td> </tr> <tr> <td>*40</td> <td colspan="7"></td> <td colspan="7"></td> <td colspan="5"></td> </tr> <tr> <td>MATERIAL PASSING #40</td> <td colspan="7"></td> <td colspan="7"></td> <td colspan="5"></td> </tr> <tr> <td>LL</td> <td colspan="7"></td> <td colspan="7"></td> <td colspan="5"></td> </tr> <tr> <td>PI</td> <td colspan="7"></td> <td colspan="7"></td> <td colspan="5"></td> </tr> <tr> <td>GROUP INDEX</td> <td colspan="7"></td> <td colspan="7"></td> <td colspan="5"></td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td colspan="7"></td> <td colspan="7"></td> <td colspan="5"></td> </tr> <tr> <td>GEN. RATING AS SUBGRADE</td> <td colspan="7">EXCELLENT TO GOOD</td> <td colspan="7">FAIR TO POOR</td> <td colspan="5">FAIR TO POOR, POOR, UNSUITABLE</td> </tr> <tr> <td colspan="13">PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30</td> <td colspan="10">MINERALOGICAL COMPOSITION</td> <td colspan="10">NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</td> <td colspan="10"></td> </tr> <tr> <td colspan="13">CONSISTENCY OR DENSENESS</td> <td colspan="10">MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</td> <td colspan="10">FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</td> <td colspan="10">FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.</td> </tr> <tr> <td colspan="13"> <table border="1"> <thead> <tr> <th rowspan="2">PRIMARY SOIL TYPE</th> <th colspan="2">RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th colspan="2">RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <th>VERY LOOSE</th><th>LOOSE</th><th>MEDIUM DENSE</th><th>DENSE</th><th>VERY DENSE</th> <th>< 4</th><th>4 TO 10</th><th>10 TO 30</th><th>30 TO 50</th><th>> 50</th> </tr> </thead> <tbody> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)</td> <td colspan="4"></td> <td>N/A</td> <td colspan="5"></td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT</td><td>SOFT</td><td>MEDIUM STIFF</td><td>STIFF</td><td>VERY STIFF</td><td>< 2</td><td>2 TO 4</td><td>4 TO 8</td><td>8 TO 15</td><td>15 TO 30</td><td>< 0.25</td><td>0.25 TO 0.5</td><td>0.5 TO 1.0</td><td>1 TO 2</td><td>2 TO 4</td><td>> 4</td> </tr> </tbody> </table> </td> <td colspan="10">COMPRESSION</td> <td colspan="10">COASTAL PLAIN SEDIMENTARY ROCK (CP)</td> <td colspan="10"></td> </tr> <tr> <td colspan="13">TEXTURE OR GRAIN SIZE</td> <td colspan="10">COMPRESSIBILITY</td> <td colspan="10">CRSTALLINE ROCK (CR)</td> <td colspan="10">WEATHERING</td> </tr> <tr> <td colspan="13"> <table border="1"> <thead> <tr> <th rowspan="2">U.S. STD. SIEVE SIZE</th> <th colspan="2">4</th><th colspan="2">10</th><th colspan="2">40</th><th colspan="2">60</th><th colspan="2">200</th><th colspan="2">270</th> </tr> <tr> <th>OPENING (MM)</th><th>4.76</th><th>2.00</th><th>0.42</th><th>0.25</th><th>0.075</th><th>0.053</th><th>0.0075</th><th>0.005</th><th>0.0025</th><th>0.0015</th><th>0.00075</th> </tr> </thead> <tbody> <tr> <td>BOULDER (BLDR.)</td><td>COBBLE (COB.)</td><td>GRAVEL (GR.)</td><td>COARSE SAND (CSE. SD.)</td><td>FINE SAND (F. SD.)</td><td>SILT (SL.)</td><td>CLAY (CL.)</td><td colspan="6"></td> </tr> <tr> <td>GRAIN SIZE</td><td>MM</td><td>305</td><td>75</td><td>2.0</td><td>0.25</td><td>0.05</td><td>0.005</td><td colspan="5"></td> </tr> <tr> <td>SIZE</td><td>IN.</td><td>12</td><td>3</td><td></td><td></td><td></td><td></td><td colspan="5"></td> </tr> </tbody> </table> </td> <td colspan="10">SLIGHTLY COMPRESSIBLE LL < 31
MODERATELY COMPRESSIBLE LL = 31 - 50
HIGHLY COMPRESSIBLE LL > 50</td> <td colspan="10">FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (IV SLI.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK, IF TESTED, WOULD YIELD SPT REFUSAL.
SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN, IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF.
VERY SEVERE (IV SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN, IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF.
COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.</td> <td colspan="10">FRESH</td><td colspan="10">VERY SLIGHT (IV SLI.)</td><td colspan="10">SLIGHT (SLI.)</td><td colspan="10">MODERATE (MOD.)</td><td colspan="10">MODERATELY SEVERE (MOD. SEV.)</td><td colspan="10">SEVERE (SEV.)</td><td colspan="10">VERY SEVERE (IV SEV.)</td><td colspan="10">COMPLETE</td> </tr> <tr> <td colspan="13">EQUIPMENT USED ON SUBJECT PROJECT</td> <td colspan="10">GROUND WATER</td> <td colspan="10">NON-CRYSTALLINE ROCK (NCR)</td> <td colspan="10">CRSTALLINE ROCK (CR)</td> <td colspan="10">WEATHERING</td> </tr> <tr> <td colspan="13"> <table border="1"> <thead> <tr> <th colspan="2">DRILL UNITS:</th> <th colspan="2">ADVANCING TOOLS:</th> <th colspan="2">HAMMER TYPE:</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> CME-45C</td><td><input type="checkbox"/> CLAY BITS</td><td><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</td><td><input type="checkbox"/> 8" HOLLOW AUGERS</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"/> HARD FACED FINGER BITS</td><td><input type="checkbox"/> TUNG-CARBIDE INSERTS</td><td><input type="checkbox"/> CASING</td><td><input type="checkbox"/> W/ ADVANCER</td><td><input type="checkbox"/> -B</td> </tr> <tr> <td><input type="checkbox"/> CME-550</td><td><input type="checkbox"/> TRICONE</td><td><input type="checkbox"/> * STEEL TEETH</td><td><input type="checkbox"/> TRICONE</td><td><input type="checkbox"/> * TUNG-CARB.</td><td><input type="checkbox"/> -N</td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td><td><input type="checkbox"/> CORE BIT</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> </tbody> </table> </td> <td colspan="10">WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
STATIC WATER LEVEL AFTER 24 HOURS
PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
SPRING OR SEEP</td> <td colspan="10">FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.</td> <td colspan="10">WEATHERED ROCK (WR)</td> <td colspan="10">WEATHERING</td> </tr> <tr> <td colspan="13">PLASTICITY</td> <td colspan="10">MISCELLANEOUS SYMBOLS</td> <td colspan="10">NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</td> <td
colspan="10">WEATHERING</td> </tr> <tr> <td colspan="13"> <table border="1"> <thead> <tr> <th colspan="2">NON PLASTIC</th> <th colspan="2">PLASTICITY INDEX (PI)</th> <th colspan="2">DRY STRENGTH</th> </tr> </thead> <tbody> <tr> <td>VERY LOW</td><td>0-5</td><td>SLIGHT</td><td>6-15</td><td>MEDIUM</td><td>16-25</td> </tr> <tr> <td>SLIGHTLY PLASTIC</td><td>6-15</td><td>SLIGHT</td><td>16-25</td><td>MEDIUM</td><td>26 OR MORE</td> </tr> <tr> <td>MODERATELY PLASTIC</td><td>16-25</td><td>MEDIUM</td><td>26 OR MORE</td><td>HIGH</td><td></td> </tr> <tr> <td>HIGHLY PLASTIC</td><td>26 OR MORE</td><td>HIGH</td><td></td><td></td><td></td> </tr> </tbody> </table> </td> <td colspan="10">ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
SOIL SYMBOL
ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
INFERRED SOIL BOUNDARY
INFERRED ROCK LINE
ALLUVIAL SOIL BOUNDARY</td> <td colspan="10">DIP & DIP DIRECTION OF ROCK STRUCTURES
TEST BORING
AUGER BORING
CORE BORING
MONITORING WELL
PIEZOMETER INSTALLATION
SOUNDING ROD
TEST BORING WITH CORE
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 BT - BORING TERMINATED
 CL - CLAY
 CPT - CORE 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
 g - UNIT WEIGHT
 G - DRY UNIT WEIGHT
 S - BULK
 SS - SPLIT SPOON
 ST - SHELBY TUBE
 RS - ROCK
 RT - RECOMPACTED TRIAXIAL
 CBR - CALIFORNIA BEARING RATIO </td> <td colspan="10"> WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. </td> <td colspan="10"> WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. </td> </tr> <tr> <td colspan="13">FRACURE SPACING</td> <td colspan="10">RECOMMENDATION SYMBOLS</td> <td colspan="10">NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</td> <td colspan="10">WEATHERING</td> </tr> <tr> <td colspan="13"> <table border="1"> <thead> <tr> <th>TERM</th> <th>SPACING</th> <th>TERM</th> <th>THICKNESS</th> </tr> </thead> <tbody> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td></td> <td></td> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </tbody> </table> </td> <td colspan="10"> <input type="checkbox"/> UNDERCUT <input type="checkbox"/> UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE <input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL
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 | GRANULAR MATERIALS (≤ 35% PASSING #200) | | | | | | | SILT-CLAY MATERIALS (> 35% PASSING #200) | | | | | | | ORGANIC MATERIALS | | | | | A-1 | A-3 | A-2 | A-2-4 | A-2-5 | A-2-6 | A-2-7 | A-4 | A-5 | A-6 | A-7 | A-1, A-2 | A-3 | A-4, A-5 | A-6, A-7 | | GROUP CLASS. | A-1-a | A-1-b | A-2-4 | A-2-5 | A-2-6 | A-2-7 | A-4 | A-5 | A-6 | A-7 | A-1, A-2 | A-3 | A-4, A-5 | A-6, A-7 | | SYMBOL | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | [Pattern] | % PASSING | | | | | |
 | | | | | | | | | | | | | | *10 #200 | | | | | | | | | | | | | | | | | | | | *40 | | | | | | | | | | | | | | | | | | | | MATERIAL PASSING #40 | | | | | | | | | | | | | | | | | | | | LL | | | | | | | | | | | | | | | | | | | | PI | | | | | | | | | | | | | | | | | | | | GROUP INDEX | | | | | | | | | | | | | | | | | | | | USUAL TYPES OF MAJOR MATERIALS | | | | | | | | | | | | | | | | | | | | GEN. RATING AS SUBGRADE | EXCELLENT TO GOOD | | | | | | | FAIR TO POOR | | | | | | | FAIR TO POOR, POOR, UNSUITABLE | | | | | PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30 | | | | | | | | | | | | | MINERALOGICAL COMPOSITION | | | | | | | | | | NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. | | | | | | | | | | | | | | | | | | | | CONSISTENCY OR DENSENESS | | | | | | | | | | | | | MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. | | | | | | | | | | FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. | | | | | | | | | | FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. | | | | | | | | | | <table border="1"> <thead> <tr> <th rowspan="2">PRIMARY SOIL TYPE</th> <th colspan="2">RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th colspan="2">RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <th>VERY LOOSE</th><th>LOOSE</th><th>MEDIUM DENSE</th><th>DENSE</th><th>VERY DENSE</th> <th>< 4</th><th>4 TO 10</th><th>10 TO 30</th><th>30 TO 50</th><th>> 50</th> </tr> </thead> <tbody> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)</td> <td colspan="4"></td> <td>N/A</td> <td colspan="5"></td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT</td><td>SOFT</td><td>MEDIUM STIFF</td><td>STIFF</td><td>VERY STIFF</td><td>< 2</td><td>2 TO 4</td><td>4 TO 8</td><td>8 TO 15</td><td>15 TO 30</td><td>< 0.25</td><td>0.25 TO 0.5</td><td>0.5 TO 1.0</td><td>1 TO 2</td><td>2 TO 4</td><td>> 4</td> </tr> </tbody> </table> | | | | | | | | | | | | | PRIMARY SOIL TYPE | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) | | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²) | | VERY LOOSE | LOOSE | MEDIUM DENSE | DENSE | VERY DENSE | < 4 | 4 TO 10 | 10 TO 30 | 30 TO 50 | > 50 | GENERALLY GRANULAR MATERIAL (NON-COHESSIVE) | | | | | N/A | | | | | | GENERALLY SILT-CLAY MATERIAL (COHESIVE) | VERY SOFT | SOFT | MEDIUM STIFF | STIFF | VERY STIFF | < 2 | 2 TO 4 | 4 TO 8 | 8 TO 15 | 15 TO 30 | < 0.25 | 0.25 TO 0.5 | 0.5 TO 1.0 | 1 TO 2 | 2 TO 4 | > 4 | COMPRESSION | | | | | | | | | | COASTAL PLAIN SEDIMENTARY ROCK (CP) | | | | | | | | | | | | | | | | | | | | TEXTURE OR GRAIN SIZE | | | | | | | | | | | | | COMPRESSIBILITY | | | | | | | | | | CRSTALLINE ROCK (CR) | | | | | | | | | | WEATHERING | | | | | | | | | | <table border="1"> <thead> <tr> <th rowspan="2">U.S. STD. SIEVE SIZE</th> <th colspan="2">4</th><th colspan="2">10</th><th colspan="2">40</th><th colspan="2">60</th><th colspan="2">200</th><th colspan="2">270</th> </tr> <tr> <th>OPENING (MM)</th><th>4.76</th><th>2.00</th><th>0.42</th><th>0.25</th><th>0.075</th><th>0.053</th><th>0.0075</th><th>0.005</th><th>0.0025</th><th>0.0015</th><th>0.00075</th> </tr> </thead> <tbody> <tr> <td>BOULDER (BLDR.)</td><td>COBBLE (COB.)</td><td>GRAVEL (GR.)</td><td>COARSE SAND (CSE. SD.)</td><td>FINE SAND (F. SD.)</td><td>SILT (SL.)</td><td>CLAY (CL.)</td><td colspan="6"></td> </tr> <tr> <td>GRAIN SIZE</td><td>MM</td><td>305</td><td>75</td><td>2.0</td><td>0.25</td><td>0.05</td><td>0.005</td><td colspan="5"></td> </tr> <tr> <td>SIZE</td><td>IN.</td><td>12</td><td>3</td><td></td><td></td><td></td><td></td><td colspan="5"></td> </tr> </tbody> </table> | | | | | | | | | | | | | U.S. STD. SIEVE SIZE | 4 | | 10 | | 40 | | 60 | | 200 | | 270 | | OPENING (MM) | 4.76 | 2.00 | 0.42 | 0.25 | 0.075 | 0.053 | 0.0075 | 0.005 | 0.0025 | 0.0015 | 0.00075 | 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 | | | | | | SIZE | IN. | 12 | 3 | | | | | | | | | | SLIGHTLY COMPRESSIBLE LL < 31
MODERATELY COMPRESSIBLE LL = 31 - 50
HIGHLY COMPRESSIBLE LL > 50 | | | | | | | | | | FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (IV SLI.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK, IF TESTED, WOULD YIELD SPT REFUSAL.
SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN, IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF.
VERY SEVERE (IV SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN, IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF.
COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE. | | | | | | | | | | FRESH | | | | | | | | | | VERY SLIGHT (IV SLI.) | | | | | | | | | | SLIGHT (SLI.) | | | | | | | | | | MODERATE (MOD.) | | | | | | | | | | MODERATELY SEVERE (MOD. SEV.) | | | | | | | | | | SEVERE (SEV.) | | | | | | | | | | VERY SEVERE (IV SEV.) | | | | | | | | | | COMPLETE | | | | | | | | | | EQUIPMENT USED ON SUBJECT PROJECT | | | | | | | | | | | | | GROUND WATER | | | | | | | | | | NON-CRYSTALLINE ROCK (NCR) | | | | | | | | | | CRSTALLINE ROCK (CR) | | | | | | | | | | WEATHERING | | | | | | | | | | <table border="1"> <thead> <tr> <th colspan="2">DRILL UNITS:</th> <th colspan="2">ADVANCING TOOLS:</th> <th colspan="2">HAMMER TYPE:</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> CME-45C</td><td><input type="checkbox"/> CLAY BITS</td><td><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</td><td><input type="checkbox"/> 8" HOLLOW AUGERS</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"/> HARD FACED FINGER BITS</td><td><input type="checkbox"/> TUNG-CARBIDE INSERTS</td><td><input type="checkbox"/> CASING</td><td><input type="checkbox"/> W/ ADVANCER</td><td><input type="checkbox"/> -B</td> </tr> <tr> <td><input type="checkbox"/> CME-550</td><td><input type="checkbox"/> TRICONE</td><td><input type="checkbox"/> * STEEL TEETH</td><td><input type="checkbox"/> TRICONE</td><td><input type="checkbox"/> * TUNG-CARB.</td><td><input type="checkbox"/> -N</td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td><td><input type="checkbox"/> CORE BIT</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> </tbody> </table> | | | | | | | | | | | | | DRILL UNITS: | | ADVANCING TOOLS: | | HAMMER TYPE: | | <input type="checkbox"/> CME-45C | <input type="checkbox"/> CLAY BITS | <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER | <input type="checkbox"/> 8" HOLLOW AUGERS | <input checked="" type="checkbox"/> AUTOMATIC | <input type="checkbox"/>
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STATIC WATER LEVEL AFTER 24 HOURS
PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
SPRING OR SEEP | | | | | | | | | | FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. | | | | | | | | | | WEATHERED ROCK (WR) | | | | | | | | | | WEATHERING | | | | | | | | | | PLASTICITY | | | | | | | | | | | | | MISCELLANEOUS SYMBOLS | | | | | | | | | | NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. | | | | | | | | | | WEATHERING | | | | | | | | | | <table border="1"> <thead> <tr> <th colspan="2">NON PLASTIC</th> <th colspan="2">PLASTICITY INDEX (PI)</th> <th colspan="2">DRY STRENGTH</th> </tr> </thead> <tbody> <tr> <td>VERY LOW</td><td>0-5</td><td>SLIGHT</td><td>6-15</td><td>MEDIUM</td><td>16-25</td> </tr> <tr> <td>SLIGHTLY PLASTIC</td><td>6-15</td><td>SLIGHT</td><td>16-25</td><td>MEDIUM</td><td>26 OR MORE</td> </tr> <tr> <td>MODERATELY PLASTIC</td><td>16-25</td><td>MEDIUM</td><td>26 OR MORE</td><td>HIGH</td><td></td> </tr> <tr> <td>HIGHLY PLASTIC</td><td>26 OR MORE</td><td>HIGH</td><td></td><td></td><td></td> </tr> </tbody> </table> | | | | | | | | | | | | | NON PLASTIC | | PLASTICITY INDEX (PI) | | DRY STRENGTH | | VERY LOW | 0-5 | SLIGHT | 6-15 | MEDIUM | 16-25 | SLIGHTLY PLASTIC | 6-15 | SLIGHT | 16-25 | MEDIUM | 26 OR MORE | MODERATELY PLASTIC | 16-25 | MEDIUM | 26 OR MORE | HIGH | | HIGHLY PLASTIC | 26 OR MORE | HIGH | | | | ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
SOIL SYMBOL
ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
INFERRED SOIL BOUNDARY
INFERRED ROCK LINE
ALLUVIAL SOIL BOUNDARY | | | | | | | | | | DIP & DIP DIRECTION OF ROCK STRUCTURES
TEST BORING
AUGER BORING
CORE BORING
MONITORING WELL
PIEZOMETER INSTALLATION
SOUNDING ROD
TEST BORING WITH CORE
SPT N-VALUE | | | | | | | | | | WEATHERED ROCK (WR) | | | | | | | | | | WEATHERING | | | | | | | | | | COLOR | | | | | | | | | | | | | RECOMMENDATION SYMBOLS | | | | | | | | | | NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. | | | | | | | | | | WEATHERING | | | | | | | | | | DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE. | | | | | | | | | | | | | <input checked="" type="checkbox"/> UNDERCUT <input type="checkbox"/> UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE <input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL
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BT - BORING TERMINATED
CL - CLAY
CPT - CORE 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
g - UNIT WEIGHT
G - DRY UNIT WEIGHT
S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
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| GENERAL CLASS.
 | GRANULAR MATERIALS (≤ 35% PASSING #200) | | | | | | | SILT-CLAY MATERIALS (> 35% PASSING #200) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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 | A-4, A-5 | A-6, A-7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| GROUP CLASS.
 | A-1-a | A-1-b | A-2-4 | A-2-5 | A-2-6 | A-2-7 | 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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ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. | | | | | | | | | | FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. | | | | | | | | | | FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <table border="1"> <thead> <tr> <th rowspan="2">PRIMARY SOIL TYPE</th> <th colspan="2">RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th colspan="2">RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT²)</th> </tr> <tr> <th>VERY LOOSE</th><th>LOOSE</th><th>MEDIUM DENSE</th><th>DENSE</th><th>VERY DENSE</th> <th>< 4</th><th>4 TO 10</th><th>10 TO 30</th><th>30 TO 50</th><th>> 50</th> </tr> </thead> <tbody> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESSIVE)</td> <td colspan="4"></td> <td>N/A</td> <td colspan="5"></td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT</td><td>SOFT</td><td>MEDIUM STIFF</td><td>STIFF</td><td>VERY STIFF</td><td>< 2</td><td>2 TO 4</td><td>4 TO 8</td><td>8 TO 15</td><td>15 TO 30</td><td>< 0.25</td><td>0.25 TO 0.5</td><td>0.5 TO 1.0</td><td>1 TO 2</td><td>2 TO 4</td><td>> 4</td> </tr> </tbody> </table>
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 | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) | | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²) | | VERY LOOSE | LOOSE | MEDIUM DENSE | DENSE | VERY DENSE | < 4 | 4 TO 10 | 10 TO 30 | 30 TO 50 | > 50 | GENERALLY GRANULAR MATERIAL (NON-COHESSIVE) | | | | | N/A | | | | | | GENERALLY SILT-CLAY MATERIAL (COHESIVE) | VERY SOFT | SOFT | MEDIUM STIFF | STIFF | VERY STIFF | < 2 | 2 TO 4 | 4 TO 8 | 8 TO 15 | 15 TO 30 | < 0.25 | 0.25 TO 0.5 | 0.5 TO 1.0 | 1 TO 2 | 2 TO 4 | > 4 | COMPRESSION | | | | | | | | | | COASTAL PLAIN SEDIMENTARY ROCK (CP) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <table border="1"> <thead> <tr> <th rowspan="2">U.S. STD. SIEVE SIZE</th> <th colspan="2">4</th><th colspan="2">10</th><th colspan="2">40</th><th colspan="2">60</th><th colspan="2">200</th><th colspan="2">270</th> </tr> <tr> <th>OPENING (MM)</th><th>4.76</th><th>2.00</th><th>0.42</th><th>0.25</th><th>0.075</th><th>0.053</th><th>0.0075</th><th>0.005</th><th>0.0025</th><th>0.0015</th><th>0.00075</th> </tr> </thead> <tbody> <tr> <td>BOULDER (BLDR.)</td><td>COBBLE (COB.)</td><td>GRAVEL (GR.)</td><td>COARSE SAND (CSE. SD.)</td><td>FINE SAND (F. SD.)</td><td>SILT (SL.)</td><td>CLAY (CL.)</td><td colspan="6"></td> </tr> <tr> <td>GRAIN SIZE</td><td>MM</td><td>305</td><td>75</td><td>2.0</td><td>0.25</td><td>0.05</td><td>0.005</td><td colspan="5"></td> </tr> <tr> <td>SIZE</td><td>IN.</td><td>12</td><td>3</td><td></td><td></td><td></td><td></td><td colspan="5"></td> </tr> </tbody> </table>
 | | | | | | | | | | | | | U.S. STD. SIEVE SIZE
 | 4 | | 10 | | 40 | | 60 | | 200 | | 270 | | OPENING (MM) | 4.76 | 2.00 | 0.42 | 0.25 | 0.075 | 0.053 | 0.0075 | 0.005 | 0.0025 | 0.0015 | 0.00075 | 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 | | | | | | SIZE | IN. | 12 | 3 | | | | | | | | | | SLIGHTLY COMPRESSIBLE LL < 31
MODERATELY COMPRESSIBLE LL = 31 - 50
HIGHLY COMPRESSIBLE LL > 50 | | | | | | | | | | FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (IV SLI.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK, IF TESTED, WOULD YIELD SPT REFUSAL.
SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN, IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF.
VERY SEVERE (IV SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL
STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN, IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF.
COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE. | | | | | | | | | | FRESH | | | | | | | | | | VERY SLIGHT (IV SLI.) | | | | | | | | | | SLIGHT (SLI.) | | | | | | | | | | MODERATE (MOD.) | | | | | | | | | | MODERATELY SEVERE (MOD. SEV.) | | | | | | | | | | SEVERE (SEV.) | | | | | | | | | | VERY SEVERE (IV SEV.) | | | | | | | | | | COMPLETE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <table border="1"> <thead> <tr> <th colspan="2">DRILL UNITS:</th> <th colspan="2">ADVANCING TOOLS:</th> <th colspan="2">HAMMER TYPE:</th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/> CME-45C</td><td><input type="checkbox"/> CLAY BITS</td><td><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</td><td><input type="checkbox"/> 8" HOLLOW AUGERS</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"/> HARD FACED FINGER BITS</td><td><input type="checkbox"/> TUNG-CARBIDE INSERTS</td><td><input type="checkbox"/> CASING</td><td><input type="checkbox"/> W/ ADVANCER</td><td><input type="checkbox"/> -B</td> </tr> <tr> <td><input type="checkbox"/> CME-550</td><td><input type="checkbox"/> TRICONE</td><td><input type="checkbox"/> * STEEL TEETH</td><td><input type="checkbox"/> TRICONE</td><td><input type="checkbox"/> * TUNG-CARB.</td><td><input type="checkbox"/> -N</td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td><td><input type="checkbox"/> CORE BIT</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td><input type="checkbox"/></td> </tr> </tbody> </table>
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| <table border="1"> <thead> <tr> <th colspan="2">NON PLASTIC</th> <th colspan="2">PLASTICITY INDEX (PI)</th> <th colspan="2">DRY STRENGTH</th> </tr> </thead> <tbody> <tr> <td>VERY LOW</td><td>0-5</td><td>SLIGHT</td><td>6-15</td><td>MEDIUM</td><td>16-25</td> </tr> <tr> <td>SLIGHTLY PLASTIC</td><td>6-15</td><td>SLIGHT</td><td>16-25</td><td>MEDIUM</td><td>26 OR MORE</td> </tr> <tr> <td>MODERATELY PLASTIC</td><td>16-25</td><td>MEDIUM</td><td>26 OR MORE</td><td>HIGH</td><td></td> </tr> <tr> <td>HIGHLY PLASTIC</td><td>26 OR MORE</td><td>HIGH</td><td></td><td></td><td></td> </tr> </tbody> </table>
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| <table border="1"> <thead> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> </thead> <tbody> <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>PL - PLASTIC LIMIT</td> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM - OPTIMUM MOISTURE SHRINKAGE LIMIT</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> </tbody> </table>
 | | | | | | | | | | | | | SOIL MOISTURE SCALE (ATTERBERG LIMITS)
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CPT - CORE 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
g - UNIT WEIGHT
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 | - MOIST - (M) | SOLID; AT OR NEAR OPTIMUM MOISTURE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| SL - SHRINKAGE LIMIT
 | - DRY - (D) | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE <input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL
<input type="checkbox"/> SHALLOW UNDERCUT <input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK | | | | | | | | | | WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. | | | | | | | | | | WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| FRACURE SPACING
 | | | | | | | | | | | | | RECOMMENDATION SYMBOLS
 | | | | | | | | | | NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. | | | | | | | | | | WEATHERING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.
 | | | | | | | | | | | | | <input checked="" type="checkbox"/> UNDERCUT <input type="checkbox"/>
UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE <input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL
<input type="checkbox"/> SHALLOW UNDERCUT <input type="checkbox"/> UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK | | | | | | | | | | WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. | | | | | | | | | | WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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PROJECT REFERENCE NO.	SHEET NO.
SF-780239	3
SITE PLAN	
SKEW = 105°	



GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.7.R.140		TIP SF-780239		COUNTY ROCKINGHAM		GEOLOGIST C. Benhoff									
SITE DESCRIPTION Bridge No. 239 over Wolf Island Creek on SR 1998 (Wentworth Street)							GROUND WTR (ft)								
BORING NO. EB1-A		STATION 13+25		OFFSET 15 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 669.8 ft		TOTAL DEPTH 23.3 ft		NORTHING 955,166		EASTING 1,798,085									
DRILL RIG/HAMMER EFF./DATE CAT4425 CME-55 87% 01/16/2019			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Edmondson, J. M.		START DATE 01/13/21		COMP. DATE 01/13/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
670	669.8	0.0	1	1	2								M	GROUND SURFACE	0.0
	666.4	3.4	WOH	1	3								M	ROADWAY EMBANKMENT Very soft to soft, brown, sandy CLAY (A-6)	
665	661.4	8.4	WOH	WOH	WOH								W		
660	656.4	13.4	14	21	14								M	RESIDUAL Dense, grey, silty SAND (A-2-4), saprolitic	11.0
655	651.4	18.4	39	39	61/0.3										
650	646.6	23.2	60/0.1												

WBS 17BP.7.R.140		TIP SF-780239		COUNTY ROCKINGHAM		GEOLOGIST C. Benhoff									
SITE DESCRIPTION Bridge No. 239 over Wolf Island Creek on SR 1998 (Wentworth Street)							GROUND WTR (ft)								
BORING NO. EB1-B		STATION 13+25		OFFSET 15 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 669.8 ft		TOTAL DEPTH 13.8 ft		NORTHING 955,139		EASTING 1,798,073									
DRILL RIG/HAMMER EFF./DATE CAT4425 CME-55 87% 01/16/2019			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Edmondson, J. M.		START DATE 01/13/21		COMP. DATE 01/13/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
670	669.8	0.0	2	3	2								M	GROUND SURFACE	0.0
	666.4	3.4	WOH	WOH	WOH								W	ROADWAY EMBANKMENT Very soft to soft, brown and tan, CLAY (A-7-5 (20)) with trace gravel	
665	661.4	8.4	2	1	1								SS-14	18%	
660	656.4	13.4	100/0.5												
	656.0	13.8	60/0.0											WEATHERED ROCK Grey and white, GNEISS	13.4
														CRYSTALLINE ROCK Grey and white, GNEISS	13.8
														Boring Terminated with Standard Penetration Test Refusal at Elevation 656.0 ft on Crystalline Rock	
														Auger Refusal at 13.8'	

NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 2/11/21

GEOTECHNICAL BORING REPORT

BORE LOG

WBS 17BP.7.R.140		TIP SF-780239		COUNTY ROCKINGHAM		GEOLOGIST C. Benhoff									
SITE DESCRIPTION Bridge No. 239 over Wolf Island Creek on SR 1998 (Wentworth Street)							GROUND WTR (ft)								
BORING NO. EB2-A		STATION 14+02		OFFSET 15 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 669.9 ft		TOTAL DEPTH 17.1 ft		NORTHING 955,136		EASTING 1,798,156									
DRILL RIG/HAMMER EFF./DATE CAT4425 CME-55 87% 01/16/2019			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Edmondson, J. M.		START DATE 01/13/21		COMP. DATE 01/13/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
675															
670	669.9	0.0	3	3	2									669.9	0.0
														667.4	2.5
	666.5	3.4	3	5	6									667.4	2.5
665														663.9	6.0
														663.9	6.0
	661.5	8.4	5	6	11									660.4	9.5
660														660.4	9.5
														656.5	13.4
	656.5	13.4	100/0.5											656.5	13.4
655														652.8	17.1
														652.8	17.1
	652.8	17.1	60/0.0											652.8	17.1

WBS 17BP.7.R.140		TIP SF-780239		COUNTY ROCKINGHAM		GEOLOGIST C. Benhoff									
SITE DESCRIPTION Bridge No. 239 over Wolf Island Creek on SR 1998 (Wentworth Street)							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 14+02		OFFSET 15 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 670.1 ft		TOTAL DEPTH 9.1 ft		NORTHING 955,109		EASTING 1,798,144									
DRILL RIG/HAMMER EFF./DATE CAT4425 CME-55 87% 01/16/2019			DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Edmondson, J. M.		START DATE 01/13/21		COMP. DATE 01/13/21		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
675															
670	670.1	0.0	2	3	3									670.1	0.0
														667.6	2.5
	666.8	3.3	4	5	10									667.6	2.5
665														661.8	8.3
														661.8	8.3
	661.8	8.3	18	82/0.2										661.0	9.1
	661.1	9.0	60/0.1											661.0	9.1

NCDOT BORE DOUBLE BORINGS.GPJ NC_DOT.GDT 2/11/21

SF-780239

6

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-2	15' LT	14+02	3.4-4.9	A-6 (2)	33	13	20.6	29.1	8.7	29.2	87.6	77.2	43.3	19	-
SS-3	15' LT	14+02	8.4-9.5	A-4 (0)	26	8	20.9	41.4	11.4	19.7	93.4	83.5	37.3	22	-
SS-14	15' RT	13+25	8.4-9.9	A-7-5 (20)	56	26	11.7	15.7	21.1	47.8	96.3	88.7	72.8	18	-