

REFERENCE: U-2519BA

PROJECT: 34817

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY CUMBERLAND  
 PROJECT DESCRIPTION FAYETTEVILLE OUTER LOOP  
FROM SOUTH OF SR 1033 (CAMDEN RD) TO  
SOUTH OF SR 1104 (STRICKLAND BRIDGE RD)  
 SITE DESCRIPTION NOISE WALL NW5 RIGHT OF  
-L- 505 + 40 TO 516 + 66

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
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| N.C.  | U-2519BA                    | 1         | 4            |

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PERSONNEL

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INVESTIGATED BY STEVEN HUDSON

DRAWN BY STEVEN HUDSON

CHECKED BY J. LEE STONE, LG

SUBMITTED BY STEVEN HUDSON, LG

DATE FEBRUARY 2018



DocuSigned by:

Steven V. Hudson 3/9/2018

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SIGNATURE DATE

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

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

| SOIL DESCRIPTION  |   |   |  |                        |  |  |             |                       |                              | 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 208, 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><b>WELL GRADED</b> - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.<br/> <b>UNIFORMLY GRADED</b> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.<br/> <b>GAP-GRADED</b> - 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><b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.<br/> <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.<br/> <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.<br/> <b>ARGILLACEOUS</b> - 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.<br/> <b>ARTESIAN</b> - 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.<br/> <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.<br/> <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.<br/> <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.<br/> <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.<br/> <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.<br/> <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.<br/> <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.<br/> <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.<br/> <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.<br/> <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.<br/> <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.<br/> <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.<br/> <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.<br/> <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.<br/> <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.<br/> <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.<br/> <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.<br/> <b>ROCK QUALITY DESIGNATION (ROD)</b> - 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.<br/> <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.<br/> <b>SILL</b> - 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.<br/> <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.<br/> <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - 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.<br/> <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.<br/> <b>STRATA ROCK QUALITY DESIGNATION (SROD)</b> - 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.<br/> <b>TOPSOIL (TS.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p> |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                  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| <p><b>SOIL LEGEND AND AASHTO CLASSIFICATION</b></p> <table border="1" style="width: 100%; text-align: center;"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (&gt; 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th><th>A-2</th><th>A-3</th><th>A-4</th><th>A-5</th> <th>A-6</th><th>A-7</th><th>A-8</th><th>A-9</th><th>A-10</th> <th>A-11</th><th>A-12</th><th>A-13</th><th>A-14</th><th>A-15</th> <th>A-16</th><th>A-17</th><th>A-18</th><th>A-19</th><th>A-20</th> </tr> <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>A-8</td><td>A-9</td><td>A-10</td><td>A-11</td><td>A-12</td><td>A-13</td> </tr> <tr> <td>SYMBOL</td> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> <td colspan="5">[Pattern]</td> </tr> <tr> <td>% PASSING #10 #40 #200</td> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX</td> <td>51 MN 35 MX 35 MX</td> <td>40 MX 35 MX</td> <td>41 MN 35 MX</td> <td>41 MN 35 MX</td> <td>40 MX 36 MN</td> <td>41 MN 36 MN</td> <td>40 MX 36 MN</td> <td>41 MN 36 MN</td> <td>GRANULAR SOILS</td> <td>SILT-CLAY SOILS</td> <td>MUCK, PEAT</td> <td colspan="7"></td> </tr> <tr> <td>MATERIAL PASSING #40 LL PI</td> <td colspan="5"></td> <td colspan="5"></td> <td colspan="5"></td> <td colspan="5">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td colspan="5">HIGHLY ORGANIC SOILS</td> </tr> <tr> <td>GROUP INDEX</td> <td colspan="5">0</td> <td colspan="5">0</td> <td colspan="5">4 MX</td> <td colspan="5">8 MX</td> <td colspan="5">12 MX</td> <td colspan="5">16 MX</td> <td colspan="5">NO MX</td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</td> <td colspan="2">STONE FRAGS. GRAVEL, AND SAND</td> <td colspan="2">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> <td>GEN. RATING AS SUBGRADE</td> <td colspan="5">EXCELLENT TO GOOD</td> <td colspan="5">FAIR TO POOR</td> <td colspan="5">FAIR TO POOR</td> <td colspan="5">POOR</td> <td colspan="5">UNSATURABLE</td> </tr> <tr> <td colspan="10">PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS &gt; LL - 30</td> <td colspan="10"></td> <td colspan="10"></td> <td colspan="10"></td> </tr> <tr> <td colspan="10"> <p><b>CONSISTENCY OR DENSENESS</b></p> <table border="1" style="width: 100%;"> <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/FT<sup>2</sup>)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE<br/>LOOSE<br/>MEDIUM DENSE<br/>DENSE<br/>VERY DENSE</td> <td>&lt; 4<br/>4 TO 10<br/>10 TO 30<br/>30 TO 50<br/>&gt; 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT<br/>SOFT<br/>MEDIUM STIFF<br/>STIFF<br/>VERY STIFF<br/>HARD</td> <td>&lt; 2<br/>2 TO 4<br/>4 TO 8<br/>8 TO 15<br/>15 TO 30<br/>&gt; 30</td> <td>&lt; 0.25<br/>0.25 TO 0.5<br/>0.5 TO 1.0<br/>1 TO 2<br/>2 TO 4<br/>&gt; 4</td> </tr> </table> </td> <td colspan="10"> <p><b>MISCELLANEOUS SYMBOLS</b></p> <table border="1" style="width: 100%;"> <tr> <td>[Symbol]</td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td>[Symbol]</td> <td>DIP &amp; DIP DIRECTION OF ROCK STRUCTURES</td> </tr> <tr> <td>[Symbol]</td> <td>SOIL SYMBOL</td> <td>[Symbol]</td> <td>SPT TEST BORING</td> </tr> <tr> <td>[Symbol]</td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td>[Symbol]</td> <td>AUGER BORING</td> </tr> <tr> <td>[Symbol]</td> <td>INFERRED SOIL BOUNDARY</td> <td>[Symbol]</td> <td>CORE BORING</td> </tr> <tr> <td>[Symbol]</td> <td>INFERRED ROCK LINE</td> <td>[Symbol]</td> <td>MONITORING WELL</td> </tr> <tr> <td>[Symbol]</td> <td>ALLUVIAL SOIL BOUNDARY</td> <td>[Symbol]</td> <td>PIEZOMETER INSTALLATION</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>CONE PENETROMETER TEST</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SOUNDING ROD</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>TEST BORING WITH CORE</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SPT N-VALUE</td> </tr> </table> </td> <td colspan="10"> <p><b>ROCK HARDNESS</b></p> <table border="1" style="width: 100%;"> <tr> <th>VERY HARD</th> <td>CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</td> </tr> <tr> <th>HARD</th> <td>CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</td> </tr> <tr> <th>MODERATELY HARD</th> <td>CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.</td> </tr> <tr> <th>MEDIUM HARD</th> <td>CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</td> </tr> <tr> <th>SOFT</th> <td>CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</td> </tr> <tr> <th>VERY SOFT</th> <td>CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</td> </tr> </table> </td> <td colspan="10"> <p><b>TEXTURE OR GRAIN SIZE</b></p> <table border="1" style="width: 100%;"> <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> </tr> <tr> <td colspan="10"> <p><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p> <table border="1" style="width: 100%;"> <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>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> </table> </td> <td colspan="10"> <p><b>RECOMMENDATION SYMBOLS</b></p> <table border="1" style="width: 100%;"> <tr> <td>[Symbol]</td> <td>UNDERCUT</td> <td>[Symbol]</td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td>[Symbol]</td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td>[Symbol]</td> <td>SHALLOW UNDERCUT</td> <td>[Symbol]</td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td colspan="2"></td> </tr> </table> </td> <td colspan="10"> <p><b>ABBREVIATIONS</b></p> <table border="1" style="width: 100%;"> <tr> <td>AR - AUGER REFUSAL</td> <td>CL - CLAY</td> <td>CPT - CLAY 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><b>SAMPLE ABBREVIATIONS</b></p> <p>S - BULK<br/> SS - SPLIT SPOON<br/> ST - SHELBY TUBE<br/> RS - ROCK<br/> RT - RECOMPACTED TRIAXIAL<br/> CBR - CALIFORNIA BEARING RATIO</p> </td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p><b>PLASTICITY</b></p> <table border="1" style="width: 100%;"> <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><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p> <table border="1" style="width: 100%;"> <tr> <th>DRILL UNITS:</th> <th>ADVANCING TOOLS:</th> <th>HAMMER TYPE:</th> </tr> <tr> <td><input type="checkbox"/> CME-45C</td> <td><input type="checkbox"/> CLAY BITS</td> <td><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</td> </tr> <tr> <td><input type="checkbox"/> CME-55</td> <td><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> CME-550</td> <td><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</td> <td></td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td><input type="checkbox"/> HARD FACED FINGER BITS</td> <td></td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td> <td><input type="checkbox"/> TUNG-CARBIDE INSERTS</td> <td></td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</td> <td></td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> TRICONE <input type="checkbox"/> 2 1/16" STEEL TEETH</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE <input type="checkbox"/> TUNG-CARB.</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> CORE BIT</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> </td> <td colspan="10"> <p><b>FRACATURE SPACING</b></p> <table border="1" style="width: 100%;"> <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> </td> <td colspan="10"> <p><b>BEDDING</b></p> <table border="1" style="width: 100%;"> <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>&lt; 0.008 FEET</td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p><b>INDURATION</b></p> <table border="1" style="width: 100%;"> <tr> <th>FRIBLE</th> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <th>MODERATELY INDURATED</th> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <th>INDURATED</th> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <th>EXTREMELY INDURATED</th> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> </td> <td colspan="10"> <p><b>BENCH MARK: LOCATIONS AND ELEVATIONS OBTAINED WITH REAL TIME KINEMATICS (RTK) SURVEY GRADE POSITIONING SYSTEM (GPS)</b></p> <p style="text-align: right;">ELEVATION: FEET</p> </td> </tr> <tr> <td colspan="10"> <p><b>COLOR</b></p> <p>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.</p> </td> <td colspan="10"> <p><b>NOTES:</b></p> <p>U.C.P. = UNDIVIDED COASTAL PLAIN</p> </td> </tr> </table> |   |   |  |                        |  |  |             |                       |                              | GENERAL CLASS.  | GRANULAR MATERIALS (≤ 35% PASSING #200)  |  |   |  |  | SILT-CLAY MATERIALS (> 35% PASSING #200)                |   |   |  |  | ORGANIC MATERIALS  |   |                      |  |   | A-1              | A-2         | A-3             | A-4  | A-5   | A-6   | A-7      | A-8   | A-9      | A-10                                   | A-11     | A-12        | A-13                                       | A-14            | A-15   | A-16   | A-17             | A-18                             | A-19   | A-20  | 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     | A-8                    | A-9  | A-10                   | A-11     | A-12   | A-13                         | SYMBOL             | [Pattern]                         |               |                   |                       |                  | [Pattern]  |                          |                   |  |                   | [Pattern]       |                       |                      |          |                       | % PASSING #10 #40 #200 | 50 MX 30 MX 15 MX | 50 MX 25 MX     | 51 MN 35 MX 35 MX | 40 MX 35 MX   | 41 MN 35 MX  | 41 MN 35 MX   | 40 MX 36 MN     | 41 MN 36 MN   | 40 MX 36 MN    | 41 MN 36 MN  | GRANULAR SOILS      | SILT-CLAY SOILS  | MUCK, PEAT   |  |   |  |  |  |  |  | MATERIAL PASSING #40 LL PI |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      | 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><b>CONSISTENCY OR DENSENESS</b></p> <table border="1" style="width: 100%;"> <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/FT<sup>2</sup>)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE<br/>LOOSE<br/>MEDIUM DENSE<br/>DENSE<br/>VERY DENSE</td> <td>&lt; 4<br/>4 TO 10<br/>10 TO 30<br/>30 TO 50<br/>&gt; 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT<br/>SOFT<br/>MEDIUM STIFF<br/>STIFF<br/>VERY STIFF<br/>HARD</td> <td>&lt; 2<br/>2 TO 4<br/>4 TO 8<br/>8 TO 15<br/>15 TO 30<br/>&gt; 30</td> <td>&lt; 0.25<br/>0.25 TO 0.5<br/>0.5 TO 1.0<br/>1 TO 2<br/>2 TO 4<br/>&gt; 4</td> </tr> </table> |  |  |  |  |  |  |  |  |  | PRIMARY SOIL TYPE | COMPACTNESS OR CONSISTENCY | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> ) | GENERALLY GRANULAR MATERIAL (NON-COHESIVE) | VERY LOOSE<br>LOOSE<br>MEDIUM DENSE<br>DENSE<br>VERY DENSE | < 4<br>4 TO 10<br>10 TO 30<br>30 TO 50<br>> 50 | N/A | GENERALLY SILT-CLAY MATERIAL (COHESIVE) | VERY SOFT<br>SOFT<br>MEDIUM STIFF<br>STIFF<br>VERY STIFF<br>HARD | < 2<br>2 TO 4<br>4 TO 8<br>8 TO 15<br>15 TO 30<br>> 30 | < 0.25<br>0.25 TO 0.5<br>0.5 TO 1.0<br>1 TO 2<br>2 TO 4<br>> 4 | <p><b>MISCELLANEOUS SYMBOLS</b></p> <table border="1" style="width: 100%;"> <tr> <td>[Symbol]</td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td>[Symbol]</td> <td>DIP &amp; DIP DIRECTION OF ROCK STRUCTURES</td> </tr> <tr> <td>[Symbol]</td> <td>SOIL SYMBOL</td> <td>[Symbol]</td> <td>SPT TEST BORING</td> </tr> <tr> <td>[Symbol]</td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td>[Symbol]</td> <td>AUGER BORING</td> </tr> <tr> <td>[Symbol]</td> <td>INFERRED SOIL BOUNDARY</td> <td>[Symbol]</td> <td>CORE BORING</td> </tr> <tr> <td>[Symbol]</td> <td>INFERRED ROCK LINE</td> <td>[Symbol]</td> <td>MONITORING WELL</td> </tr> <tr> <td>[Symbol]</td> <td>ALLUVIAL SOIL BOUNDARY</td> <td>[Symbol]</td> <td>PIEZOMETER INSTALLATION</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>CONE PENETROMETER TEST</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SOUNDING ROD</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>TEST BORING WITH CORE</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SPT N-VALUE</td> </tr> </table> |  |  |  |  |  |  |  |  |  | [Symbol] | ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION | [Symbol] | DIP & DIP DIRECTION OF ROCK STRUCTURES | [Symbol] | SOIL SYMBOL | [Symbol] | SPT TEST BORING | [Symbol] | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT | [Symbol] | AUGER BORING | [Symbol] | INFERRED SOIL BOUNDARY | [Symbol] | CORE BORING | [Symbol] | INFERRED ROCK LINE | [Symbol] | MONITORING WELL | [Symbol] | ALLUVIAL SOIL BOUNDARY | [Symbol] | PIEZOMETER INSTALLATION | [Symbol] |  | [Symbol] | SLOPE INDICATOR INSTALLATION | [Symbol] |  | [Symbol] | CONE PENETROMETER TEST | [Symbol] |  | [Symbol] | SOUNDING ROD | [Symbol] |  | [Symbol] | TEST BORING WITH CORE | [Symbol] |  | [Symbol] | SPT N-VALUE | <p><b>ROCK HARDNESS</b></p> <table border="1" style="width: 100%;"> <tr> <th>VERY HARD</th> <td>CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</td> </tr> <tr> <th>HARD</th> <td>CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</td> </tr> <tr> <th>MODERATELY HARD</th> <td>CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.</td> </tr> <tr> <th>MEDIUM HARD</th> <td>CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</td> </tr> <tr> <th>SOFT</th> <td>CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</td> </tr> <tr> <th>VERY SOFT</th> <td>CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</td> </tr> </table> |  |  |  |  |  |  |  |  |  | VERY HARD | CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. | HARD | CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. | MODERATELY HARD | CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. | MEDIUM HARD | CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. | SOFT | CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. 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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><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p> <table border="1" style="width: 100%;"> <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>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> </table> |  |  |  |  |  |  |  |  |  | SOIL MOISTURE SCALE (ATTERBERG LIMITS) | FIELD MOISTURE DESCRIPTION | GUIDE FOR FIELD MOISTURE DESCRIPTION | LL - 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ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL | [Symbol] | SHALLOW UNDERCUT | [Symbol] | UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK |  |  | <p><b>ABBREVIATIONS</b></p> <table border="1" style="width: 100%;"> <tr> <td>AR - AUGER REFUSAL</td> <td>CL - CLAY</td> <td>CPT - CLAY 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><b>SAMPLE ABBREVIATIONS</b></p> <p>S - BULK<br/> SS - SPLIT SPOON<br/> ST - SHELBY TUBE<br/> RS - ROCK<br/> RT - RECOMPACTED TRIAXIAL<br/> CBR - CALIFORNIA BEARING RATIO</p> </td> </tr> </table> |  |  |  |  |  |  |  |  |  | AR - AUGER REFUSAL | CL - CLAY | CPT - CLAY 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><b>SAMPLE ABBREVIATIONS</b></p> <p>S - BULK<br/> SS - SPLIT SPOON<br/> ST - SHELBY TUBE<br/> RS - ROCK<br/> RT - RECOMPACTED TRIAXIAL<br/> CBR - CALIFORNIA BEARING RATIO</p> |  |  |  |  |  |  |  |  |  | <p><b>PLASTICITY</b></p> <table border="1" style="width: 100%;"> <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><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p> <table border="1" style="width: 100%;"> <tr> <th>DRILL UNITS:</th> <th>ADVANCING TOOLS:</th> <th>HAMMER TYPE:</th> </tr> <tr> <td><input type="checkbox"/> CME-45C</td> <td><input type="checkbox"/> CLAY BITS</td> <td><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</td> </tr> <tr> <td><input type="checkbox"/> CME-55</td> <td><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> CME-550</td> <td><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</td> <td></td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td><input type="checkbox"/> HARD FACED FINGER BITS</td> <td></td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td> <td><input type="checkbox"/> TUNG-CARBIDE INSERTS</td> <td></td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</td> <td></td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> TRICONE <input type="checkbox"/> 2 1/16" STEEL TEETH</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE <input type="checkbox"/> TUNG-CARB.</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> CORE BIT</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> |  |  |  |  |  |  |  |  |  | DRILL UNITS: | ADVANCING TOOLS: | HAMMER TYPE: | <input type="checkbox"/> CME-45C | <input type="checkbox"/> CLAY BITS | <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL | <input type="checkbox"/> CME-55 | <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER |  | <input checked="" type="checkbox"/> CME-550 | <input checked="" type="checkbox"/> 8" HOLLOW AUGERS |  | <input type="checkbox"/> VANE SHEAR TEST | <input type="checkbox"/> HARD FACED FINGER BITS |  | <input type="checkbox"/> PORTABLE HOIST | <input type="checkbox"/> TUNG-CARBIDE INSERTS |  |  | <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER |  |  | <input checked="" type="checkbox"/> TRICONE <input type="checkbox"/> 2 1/16" STEEL TEETH |  |  | <input type="checkbox"/> TRICONE <input type="checkbox"/> TUNG-CARB. |  |  | <input type="checkbox"/> CORE BIT |  |  |  |  | <p><b>FRACATURE SPACING</b></p> <table border="1" style="width: 100%;"> <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><b>BEDDING</b></p> <table border="1" style="width: 100%;"> <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>&lt; 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><b>INDURATION</b></p> <table border="1" style="width: 100%;"> <tr> <th>FRIBLE</th> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <th>MODERATELY INDURATED</th> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <th>INDURATED</th> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <th>EXTREMELY INDURATED</th> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table> |  |  |  |  |  |  |  |  |  | FRIBLE | 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><b>BENCH MARK: LOCATIONS AND ELEVATIONS OBTAINED WITH REAL TIME KINEMATICS (RTK) SURVEY GRADE POSITIONING SYSTEM (GPS)</b></p> <p style="text-align: right;">ELEVATION: FEET</p> |  |  |  |  |  |  |  |  |  | <p><b>COLOR</b></p> <p>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.</p> |  |  |  |  |  |  |  |  |  | <p><b>NOTES:</b></p> <p>U.C.P. = UNDIVIDED COASTAL PLAIN</p> |  |  |  |  |  |  |  |  |  |
| GENERAL CLASS.  | GRANULAR MATERIALS (≤ 35% PASSING #200)   |   |  |                        |  | SILT-CLAY MATERIALS (> 35% PASSING #200) |             |                       |                              |   | ORGANIC MATERIALS  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |          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                   |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |               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|   | A-1   | A-2   | A-3  | A-4                    | A-5  | A-6                                      | A-7         | A-8                   | A-9                          | A-10  | A-11   | A-12   | A-13  | A-14                                       | A-15   | A-16  | A-17  | A-18  | A-19   | A-20   |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |            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 |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |              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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                                   | A-8  | A-9   | A-10  | A-11  | A-12   | A-13   |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |           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| SYMBOL  | [Pattern]   |   |  |                        |  | [Pattern]                                |             |                       |                              |   | [Pattern]  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |         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| % PASSING #10 #40 #200  | 50 MX 30 MX 15 MX   | 50 MX 25 MX   | 51 MN 35 MX 35 MX  | 40 MX 35 MX            | 41 MN 35 MX  | 41 MN 35 MX                              | 40 MX 36 MN | 41 MN 36 MN           | 40 MX 36 MN                  | 41 MN 36 MN   | GRANULAR SOILS   | SILT-CLAY SOILS                                    | MUCK, PEAT  |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                          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| MATERIAL PASSING #40 LL PI  |   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  | SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER |   |   |  |  | HIGHLY ORGANIC SOILS   |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                    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| GROUP INDEX   | 0   |   |  |                        |  | 0  |             |                       |                              |   | 4 MX   |  |   |  |  | 8 MX  |   |   |  |  | 12 MX  |   |                      |  |   | 16 MX            |             |                 |      |   | NO MX |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |        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| USUAL TYPES OF MAJOR MATERIALS  | STONE FRAGS. GRAVEL, AND SAND   |   | FINE SAND  |                        | SILTY OR CLAYEY GRAVEL AND SAND  |  | SILTY SOILS |                       | CLAYEY SOILS                 |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |           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| GEN. RATING AS SUBGRADE   | EXCELLENT TO GOOD   |   |  |                        |  | FAIR TO POOR                             |             |                       |                              |   | FAIR TO POOR   |  |   |  |  | POOR  |   |   |  |  | UNSATURABLE  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                 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| PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30   |   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  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| <p><b>CONSISTENCY OR DENSENESS</b></p> <table border="1" style="width: 100%;"> <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/FT<sup>2</sup>)</th> </tr> <tr> <td>GENERALLY GRANULAR MATERIAL (NON-COHESIVE)</td> <td>VERY LOOSE<br/>LOOSE<br/>MEDIUM DENSE<br/>DENSE<br/>VERY DENSE</td> <td>&lt; 4<br/>4 TO 10<br/>10 TO 30<br/>30 TO 50<br/>&gt; 50</td> <td>N/A</td> </tr> <tr> <td>GENERALLY SILT-CLAY MATERIAL (COHESIVE)</td> <td>VERY SOFT<br/>SOFT<br/>MEDIUM STIFF<br/>STIFF<br/>VERY STIFF<br/>HARD</td> <td>&lt; 2<br/>2 TO 4<br/>4 TO 8<br/>8 TO 15<br/>15 TO 30<br/>&gt; 30</td> <td>&lt; 0.25<br/>0.25 TO 0.5<br/>0.5 TO 1.0<br/>1 TO 2<br/>2 TO 4<br/>&gt; 4</td> </tr> </table>  |   |   |  |                        |  |  |             |                       |                              | PRIMARY SOIL TYPE   | COMPACTNESS OR CONSISTENCY   | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )                          | GENERALLY GRANULAR MATERIAL (NON-COHESIVE) | VERY LOOSE<br>LOOSE<br>MEDIUM DENSE<br>DENSE<br>VERY DENSE                         | < 4<br>4 TO 10<br>10 TO 30<br>30 TO 50<br>> 50          | N/A   | GENERALLY SILT-CLAY MATERIAL (COHESIVE)   | VERY SOFT<br>SOFT<br>MEDIUM STIFF<br>STIFF<br>VERY STIFF<br>HARD | < 2<br>2 TO 4<br>4 TO 8<br>8 TO 15<br>15 TO 30<br>> 30   | < 0.25<br>0.25 TO 0.5<br>0.5 TO 1.0<br>1 TO 2<br>2 TO 4<br>> 4 | <p><b>MISCELLANEOUS SYMBOLS</b></p> <table border="1" style="width: 100%;"> <tr> <td>[Symbol]</td> <td>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</td> <td>[Symbol]</td> <td>DIP &amp; DIP DIRECTION OF ROCK STRUCTURES</td> </tr> <tr> <td>[Symbol]</td> <td>SOIL SYMBOL</td> <td>[Symbol]</td> <td>SPT TEST BORING</td> </tr> <tr> <td>[Symbol]</td> <td>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</td> <td>[Symbol]</td> <td>AUGER BORING</td> </tr> <tr> <td>[Symbol]</td> <td>INFERRED SOIL BOUNDARY</td> <td>[Symbol]</td> <td>CORE BORING</td> </tr> <tr> <td>[Symbol]</td> <td>INFERRED ROCK LINE</td> <td>[Symbol]</td> <td>MONITORING WELL</td> </tr> <tr> <td>[Symbol]</td> <td>ALLUVIAL SOIL BOUNDARY</td> <td>[Symbol]</td> <td>PIEZOMETER INSTALLATION</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SLOPE INDICATOR INSTALLATION</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>CONE PENETROMETER TEST</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SOUNDING ROD</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>TEST BORING WITH CORE</td> </tr> <tr> <td>[Symbol]</td> <td></td> <td>[Symbol]</td> <td>SPT N-VALUE</td> </tr> </table> |                      |  |   |                  |             |                 |      |   |       | [Symbol] | ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION | [Symbol] | DIP & DIP DIRECTION OF ROCK STRUCTURES | [Symbol] | SOIL SYMBOL | [Symbol]                                   | SPT TEST BORING | [Symbol]   | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT | [Symbol]         | AUGER BORING                     | [Symbol]   | INFERRED SOIL BOUNDARY  | [Symbol]                        | CORE BORING  | [Symbol] | INFERRED ROCK LINE                          | [Symbol]   | MONITORING WELL | [Symbol]                                 | ALLUVIAL SOIL BOUNDARY                          | [Symbol] | PIEZOMETER INSTALLATION                 | [Symbol]                                      |                    | [Symbol]  | SLOPE INDICATOR INSTALLATION  | [Symbol]     |                        | [Symbol]   | CONE PENETROMETER TEST | [Symbol] |  | [Symbol]                     | SOUNDING ROD       | [Symbol]                          |               | [Symbol]          | TEST BORING WITH CORE | [Symbol]         |  | [Symbol]                 | SPT N-VALUE       | <p><b>ROCK HARDNESS</b></p> <table border="1" style="width: 100%;"> <tr> <th>VERY HARD</th> <td>CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</td> </tr> <tr> <th>HARD</th> <td>CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</td> </tr> <tr> <th>MODERATELY HARD</th> <td>CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.</td> </tr> <tr> <th>MEDIUM HARD</th> <td>CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</td> </tr> <tr> <th>SOFT</th> <td>CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</td> </tr> <tr> <th>VERY SOFT</th> <td>CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.</td> </tr> </table> |                   |                 |                       |                      |          |                       |                        |                   |                 | VERY HARD         | CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. | HARD         | CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. | MODERATELY HARD | CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. | MEDIUM HARD    | CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. 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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 |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PRIMARY SOIL TYPE   | COMPACTNESS OR CONSISTENCY  | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)                            | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> ) |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                    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| GENERALLY GRANULAR MATERIAL (NON-COHESIVE)  | VERY LOOSE<br>LOOSE<br>MEDIUM DENSE<br>DENSE<br>VERY DENSE  | < 4<br>4 TO 10<br>10 TO 30<br>30 TO 50<br>> 50                                | N/A  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| GENERALLY SILT-CLAY MATERIAL (COHESIVE)   | VERY SOFT<br>SOFT<br>MEDIUM STIFF<br>STIFF<br>VERY STIFF<br>HARD  | < 2<br>2 TO 4<br>4 TO 8<br>8 TO 15<br>15 TO 30<br>> 30                        | < 0.25<br>0.25 TO 0.5<br>0.5 TO 1.0<br>1 TO 2<br>2 TO 4<br>> 4   |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |    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| [Symbol]  | ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION   | [Symbol]  | DIP & DIP DIRECTION OF ROCK STRUCTURES                           |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| [Symbol]  | SOIL SYMBOL   | [Symbol]  | SPT TEST BORING  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  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|  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| [Symbol]  | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT  | [Symbol]  | AUGER BORING   |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |     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| [Symbol]  | INFERRED SOIL BOUNDARY  | [Symbol]  | CORE BORING  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  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|  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| [Symbol]  | INFERRED ROCK LINE  | [Symbol]  | MONITORING WELL  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| [Symbol]  | ALLUVIAL SOIL BOUNDARY  | [Symbol]  | PIEZOMETER INSTALLATION  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  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|  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                        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| [Symbol]  |   | [Symbol]  | SLOPE INDICATOR INSTALLATION                                     |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| [Symbol]  |   | [Symbol]  | CONE PENETROMETER TEST   |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   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| [Symbol]  |   | [Symbol]  | SOUNDING ROD   |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |  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| [Symbol]  |   | [Symbol]  | TEST BORING WITH CORE  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  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  |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  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| [Symbol]  |   | [Symbol]  | SPT N-VALUE  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |            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                 |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   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| VERY HARD   | CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  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                       |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |            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| HARD  | CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  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           |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   | 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| MODERATELY HARD   | CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.                               |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |   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| MEDIUM HARD   | CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.            |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |  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           |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SOFT  | CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  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| VERY SOFT   | CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.                          |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 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                                    |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  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|   | IN. 12  | 3   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |       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| <p><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p> <table border="1" style="width: 100%;"> <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>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> </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                | PL - PLASTIC LIMIT                                      | - WET - (W)   | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE   | OM - OPTIMUM MOISTURE SHRINKAGE LIMIT                            | - MOIST - (M)  | SOLID; AT OR NEAR OPTIMUM MOISTURE                             | SL - SHRINKAGE LIMIT  | - DRY - (D)          | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE | <p><b>RECOMMENDATION SYMBOLS</b></p> <table border="1" style="width: 100%;"> <tr> <td>[Symbol]</td> <td>UNDERCUT</td> <td>[Symbol]</td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td>[Symbol]</td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td>[Symbol]</td> <td>SHALLOW UNDERCUT</td> <td>[Symbol]</td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td colspan="2"></td> </tr> </table> |                  |             |                 |      |   |       |          |   |          | [Symbol]                               | UNDERCUT | [Symbol]    | UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE | [Symbol]        | UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL | [Symbol]   | SHALLOW UNDERCUT | [Symbol]                         | UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK |   |                                 | <p><b>ABBREVIATIONS</b></p> <table border="1" style="width: 100%;"> <tr> <td>AR - AUGER REFUSAL</td> <td>CL - CLAY</td> <td>CPT - CLAY 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><b>SAMPLE ABBREVIATIONS</b></p> <p>S - BULK<br/> SS - SPLIT SPOON<br/> ST - SHELBY TUBE<br/> RS - ROCK<br/> RT - RECOMPACTED TRIAXIAL<br/> CBR - CALIFORNIA BEARING RATIO</p> </td> </tr> </table> |          |   |  |                 |  |   |          |   |   | AR - AUGER REFUSAL | CL - CLAY | CPT - CLAY 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><b>SAMPLE ABBREVIATIONS</b></p> <p>S - BULK<br/> SS - SPLIT SPOON<br/> ST - SHELBY TUBE<br/> RS - ROCK<br/> RT - RECOMPACTED TRIAXIAL<br/> CBR - CALIFORNIA BEARING RATIO</p> |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SOIL MOISTURE SCALE (ATTERBERG LIMITS)  | FIELD MOISTURE DESCRIPTION  | GUIDE FOR FIELD MOISTURE DESCRIPTION  |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                      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| LL - LIQUID LIMIT   | - SATURATED - (SAT.)  | USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE           |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |             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| PL - PLASTIC LIMIT  | - WET - (W)   | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE                         |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |           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  |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                     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| OM - OPTIMUM MOISTURE SHRINKAGE LIMIT   | - MOIST - (M)   | SOLID; AT OR NEAR OPTIMUM MOISTURE  |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| SL - SHRINKAGE LIMIT  | - DRY - (D)   | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE                          |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                   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| [Symbol]  | UNDERCUT  | [Symbol]  | UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE                       | [Symbol]               | UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |        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| [Symbol]  | SHALLOW UNDERCUT  | [Symbol]  | UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK             |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |  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| AR - AUGER REFUSAL  | CL - CLAY   | CPT - CLAY 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 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        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 |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   |   |   |  |                        |  |  |             |                       |                              | <p><b>SAMPLE ABBREVIATIONS</b></p> <p>S - BULK<br/> SS - SPLIT SPOON<br/> ST - SHELBY TUBE<br/> RS - ROCK<br/> RT - RECOMPACTED TRIAXIAL<br/> CBR - CALIFORNIA BEARING RATIO</p>  |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |       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             |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <p><b>PLASTICITY</b></p> <table border="1" style="width: 100%;"> <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><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p> <table border="1" style="width: 100%;"> <tr> <th>DRILL UNITS:</th> <th>ADVANCING TOOLS:</th> <th>HAMMER TYPE:</th> </tr> <tr> <td><input type="checkbox"/> CME-45C</td> <td><input type="checkbox"/> CLAY BITS</td> <td><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</td> </tr> <tr> <td><input type="checkbox"/> CME-55</td> <td><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</td> <td></td> </tr> <tr> <td><input checked="" type="checkbox"/> CME-550</td> <td><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</td> <td></td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td><input type="checkbox"/> HARD FACED FINGER BITS</td> <td></td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td> <td><input type="checkbox"/> TUNG-CARBIDE INSERTS</td> <td></td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</td> <td></td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> TRICONE <input type="checkbox"/> 2 1/16" STEEL TEETH</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE <input type="checkbox"/> TUNG-CARB.</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> CORE BIT</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table>  |       |          |   |          |  |          |             |  |                 | DRILL UNITS:   | ADVANCING TOOLS:                                   | HAMMER TYPE:     | <input type="checkbox"/> CME-45C | <input type="checkbox"/> CLAY BITS                   | <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL | <input type="checkbox"/> CME-55 | <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER  |          | <input checked="" type="checkbox"/> CME-550 | <input checked="" type="checkbox"/> 8" HOLLOW AUGERS |                 | <input type="checkbox"/> VANE SHEAR TEST | <input type="checkbox"/> HARD FACED FINGER BITS |          | <input type="checkbox"/> PORTABLE HOIST | <input type="checkbox"/> TUNG-CARBIDE INSERTS |                    |           | <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER |              |                        | <input checked="" type="checkbox"/> TRICONE <input type="checkbox"/> 2 1/16" STEEL TEETH |                        |          | <input type="checkbox"/> TRICONE <input type="checkbox"/> TUNG-CARB. |                              |                    | <input type="checkbox"/> CORE BIT |               |                   |                       |                  | <p><b>FRACATURE SPACING</b></p> <table border="1" style="width: 100%;"> <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><b>BEDDING</b></p> <table border="1" style="width: 100%;"> <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>&lt; 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 |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| NON PLASTIC   | PLASTICITY INDEX (PI)   |   | DRY STRENGTH   |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                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 |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   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| SLIGHTLY PLASTIC  | 0-5   |   | VERY LOW   |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |       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       |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| MODERATELY PLASTIC  | 6-15  |   | SLIGHT   |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| HIGHLY PLASTIC  | 16-25   |   | MEDIUM   |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|   | 26 OR MORE  |   | HIGH   |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| DRILL UNITS:  | ADVANCING TOOLS:  | HAMMER TYPE:  |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   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| <input type="checkbox"/> CME-45C  | <input type="checkbox"/> CLAY BITS  | <input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |            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 |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                    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| <input type="checkbox"/> CME-55   | <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              | 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   |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  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| <input checked="" type="checkbox"/> CME-550   | <input checked="" type="checkbox"/> 8" HOLLOW AUGERS  |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |  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   |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                               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| <input type="checkbox"/> VANE SHEAR TEST  | <input type="checkbox"/> HARD FACED FINGER BITS   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |            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         |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| <input type="checkbox"/> PORTABLE HOIST   | <input type="checkbox"/> TUNG-CARBIDE INSERTS   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              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     |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   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|   | <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  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 |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |     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|   | <input checked="" type="checkbox"/> TRICONE <input type="checkbox"/> 2 1/16" STEEL TEETH  |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |            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         |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |  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|   | <input type="checkbox"/> TRICONE <input type="checkbox"/> TUNG-CARB.  |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |       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                 |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                  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|   | <input type="checkbox"/> CORE BIT   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |      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|                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  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|   |   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |               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                      |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| TERM  | SPACING   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |   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|                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      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 |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| VERY WIDE   | MORE THAN 10 FEET   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         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     |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| WIDE  | 3 TO 10 FEET  |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   | 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| MODERATELY CLOSE  | 1 TO 3 FEET   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| CLOSE   | 0.16 TO 1 FOOT  |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| VERY CLOSE  | LESS THAN 0.16 FEET   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |              |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                         |                   |  |  |  |  |              |  |  |  |  |              |  |  |  |  |      |  |  |  |  |             |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |          |   |          |  |          |             |          |                 |          |  |          |              |          |                        |          |             |          |                    |          |                 |          |                        |          |                         |          |  |          |                              |          |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 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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                 |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   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| <p><b>INDURATION</b></p> <table border="1" style="width: 100%;"> <tr> <th>FRIBLE</th> <td>RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</td> </tr> <tr> <th>MODERATELY INDURATED</th> <td>GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</td> </tr> <tr> <th>INDURATED</th> <td>GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</td> </tr> <tr> <th>EXTREMELY INDURATED</th> <td>SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</td> </tr> </table>   |   |   |  |                        |  |  |             |                       |                              | FRIBLE  | 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><b>BENCH MARK: LOCATIONS AND ELEVATIONS OBTAINED WITH REAL TIME KINEMATICS (RTK) SURVEY GRADE POSITIONING SYSTEM (GPS)</b></p> <p style="text-align: right;">ELEVATION: FEET</p> |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |               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         |  |          |                        |          |  |          |              |          |  |          |                       |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |  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| FRIBLE  | RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.  |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |        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|  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                  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| MODERATELY INDURATED  | GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |       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      |          |  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |                                 |   |  |   |  |  |  |   |  |   |   |  |  |   |  |  |  |  |  |  |  |  |                                   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |        |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| INDURATED   | GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.  |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |        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|  |          |             |  |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |            |        |    |     |      |      |       |  |        |   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |          |          |          |  |          |  |          |                  |          |  |  |  |  |  |  |  |  |  |  |  |  |  |                    |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                  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| EXTREMELY INDURATED   | SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.   |   |  |                        |  |  |             |                       |                              |   |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |                      |          |                       |                        |                   |                 |                   |   |              |   |                 |   |                |  |                     |  |  |  |   |  |  |  |  |  |                            |      |           |                     |                                   |                |              |               |                 |                    |                  |                   |                   |                  |              |      |   |       |                 |               |              |                        |                   |            |            |            |             |    |     |      |      |       |   |        |   |  |  |      |  |  |  |  |      |  |  |  |  |       |  |  |  |  |       |  |  |  |  |       |  |  |  |  |                                |                               |  |           |  |                                 |  |             |  |      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 |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                 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| <p><b>COLOR</b></p> <p>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.</p>  |   |   |  |                        |  |  |             |                       |                              | <p><b>NOTES:</b></p> <p>U.C.P. = UNDIVIDED COASTAL PLAIN</p>  |  |  |   |  |  |   |   |   |  |  |  |   |                      |  |   |                  |             |                 |      |   |       |          |   |          |  |          |             |  |                 |  |  |                  |                                  |  |   |                                 |  |          |   |  |                 |  |   |          |   |   |                    |           |   |              |                        |  |                        |          |  |                              |                    |                                   |               |                   |                       |                  |  |                          |                   |  |                   |                 |                       |    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 |           |                             |              |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |             |                 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |             |                       |  |              |                  |     |  |          |                    |      |  |        |                |       |  |        |  |            |  |      |  |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                 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