

REFERENCE: U-2525C

PROJECT: 34821

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

COUNTY GUILFORD  
 PROJECT DESCRIPTION GREENSBORO EASTERN LOOP I-85  
BYPASS (-L-) FROM US 29 NORTH OF GREENSBORO  
TO EAST OF LAWDALE DRIVE  
 SITE DESCRIPTION MSE WALLS AT END BENT 1 AND  
END BENT 2 - SITE NO. 5 (STRUCTURE NO. 7) BRIDGE  
NO. 1246 ON SR 1001 (NORTH CHURCH STREET) (-Y5-)  
OVER GREENSBORO EASTERN LOOP I-85 BYPASS (-L-)  
**RETAINING WALL INVESTIGATION**

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2525C	1	22

**CAUTION NOTICE**

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

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

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

NOTES:

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

PERSONNEL

C.R. PASTRANA

Trigon Exploration

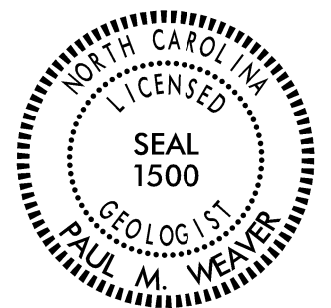
INVESTIGATED BY ESP Associates, P.A.

DRAWN BY C.R. PASTRANA

CHECKED BY P. WEAVER

SUBMITTED BY ESP Associates, P.A.

DATE OCTOBER 2017



DocuSigned by:

*Paul Weaver*

10/3/2017

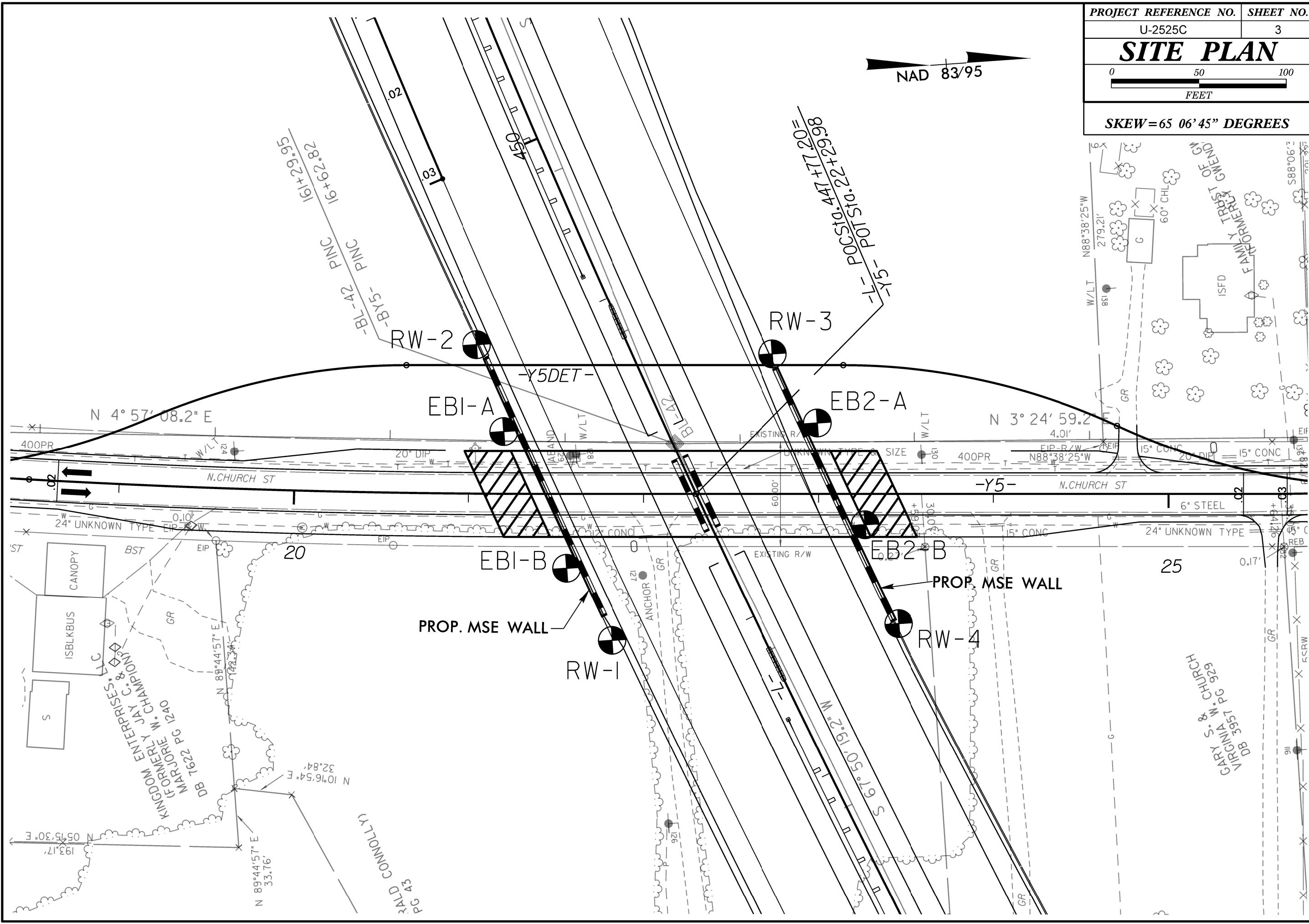
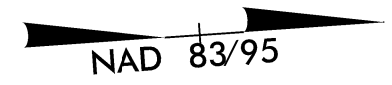
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**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION**  
**DIVISION OF HIGHWAYS**  
**GEOTECHNICAL ENGINEERING UNIT**  
**SUBSURFACE INVESTIGATION**  
**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

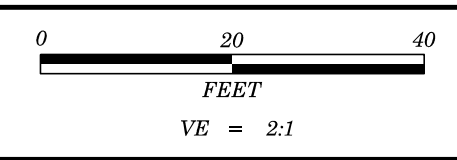
| SOIL DESCRIPTION   
  |   |   |  |                        |  |  |                   |                       |                              | GRADATION  |   |  |  |  |   |  |                               |   |  | ROCK DESCRIPTION   |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             | 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 style="text-align: center;"><b>SOIL LEGEND AND AASHTO CLASSIFICATION</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <th colspan="5">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="5">SILT-CLAY MATERIALS (&gt; 35% PASSING #200)</th> <th colspan="5">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <th>A-1</th> <th>A-3</th> <th>A-2</th> <th>A-2-4</th> <th>A-2-5</th> <th>A-2-6</th> <th>A-2-7</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th></th> </tr> <tr> <th>SYMBOL</th> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>% PASSING #10 #40 #200</th> <td>50 MX 30 MX 15 MX</td> <td>50 MX 25 MX</td> <td>51 MN 35 MX 35 MX</td> <td>40 MX 41 MN 10 MX</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>40 MX 41 MN 11 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td>36 MN 36 MN</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>MATERIAL PASSING #40 LL PI</th> <td colspan="15"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>LL</td> <td>6 MX</td> <td>NP</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> </tr> <tr> <td>PI</td> <td>6 MX</td> <td>NP</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> </tr> </table> </td> </tr> <tr> <th>GROUP INDEX</th> <td colspan="15"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> </td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td colspan="15"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>STONE FRAGS. GRAVEL, AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>SILTY SOILS</td> <td>CLAYEY SOILS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> </td> </tr> <tr> <th>GEN. RATING AS SUBGRADE</th> <td colspan="15"> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td colspan="5">EXCELLENT TO GOOD</td> <td colspan="5">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSATURABLE</td> </tr> </table> </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> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>CONSISTENCY OR DENSENESS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/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 style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <td>4</td> <td>10</td> <td>40</td> <td>60</td> <td>200</td> <td>270</td> </tr> <tr> <td></td> <td>4.75</td> <td>2.00</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> <tr> <th>BOULDER (BLDR.)</th> <th>COBBLE (COB.)</th> <th>GRAVEL (GR.)</th> <th>COARSE SAND (CSE. SD.)</th> <th>FINE SAND (F SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>GRAIN SIZE</th> <td>MM 305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> </tr> <tr> <td></td> <td>IN. 12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td></td> <td>SHALLOW UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td></td> <td></td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;"><b>ABBREVIATIONS</b></p> <table border="1" style="width: 100%; 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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> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>PLASTICITY</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NON PLASTIC</th> <th>PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td></td> <td>0-5</td> <td>VERY LOW</td> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>6-15</td> <td>SLIGHT</td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>16-25</td> <td>MEDIUM</td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>26 OR MORE</td> <td>HIGH</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;"><b>FRACATURE SPACING</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table> </td> <td colspan="10"> <p style="text-align: center;"><b>BEDDING</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>&lt; 0.008 FEET</td> </tr> </table> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>COLOR</b></p> <p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p> </td> <td colspan="10"> <p style="text-align: center;"><b>INDURATION</b></p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>FRIABLE</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 style="text-align: center;"><b>NOTES:</b></p> <p>F.J.A.D.= FILLED IMMEDIATELY AFTER DRILLING</p> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>ROCK HARDNESS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>TERMS AND DEFINITIONS</b></p> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>CONSISTENCY OR DENSENESS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>ABBREVIATIONS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>FRACATURE SPACING</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>BEDDING</b></p> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>INDURATION</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>NOTES:</b></p> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>ROCK HARDNESS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>TERMS AND DEFINITIONS</b></p> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>CONSISTENCY OR DENSENESS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>ABBREVIATIONS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>FRACATURE SPACING</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>BEDDING</b></p> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>INDURATION</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>NOTES:</b></p> </td> </tr> <tr> <td colspan="10"> <p style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>ROCK HARDNESS</b></p> </td> <td colspan="10"> <p style="text-align: center;"><b>TERMS AND DEFINITIONS</b></p> </td> </tr> </table> |   |   |  |                        |  |  |                   |                       |                              | GENERAL CLASS.   | GRANULAR MATERIALS (≤ 35% PASSING #200) |  |  |  |   | SILT-CLAY MATERIALS (> 35% PASSING #200)       |                               |   |  |  | ORGANIC MATERIALS  |   |   |  |                            
  | GROUP CLASS.        | A-1   | A-3   | A-2         | A-2-4   | A-2-5 | A-2-6                             | A-2-7 | A-4  | A-5          | A-6              | A-7          | A-1, A-2                         | A-3                                | A-4, A-5  | A-6, A-7                                   |   | SYMBOL |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     | % PASSING #10 #40 #200                        | 50 MX 30 MX 15 MX | 50 MX 25 MX  | 51 MN 35 MX 35 MX                 | 40 MX 41 MN 10 MX | 40 MX 41 MN 11 MN  | 40 MX 41 MN 11 MN  | 40 MX 41 MN 11 MN | 36 MN 36 MN   | 36 MN 36 MN      | 36 MN 36 MN  | 36 MN 36 MN |  |  |  |  |  | MATERIAL PASSING #40 LL PI | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>LL</td> <td>6 MX</td> <td>NP</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> </tr> <tr> <td>PI</td> <td>6 MX</td> <td>NP</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> </tr> </table> |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  | LL   | 6 MX | NP | 40 MX  | 41 MN | 40 MX | 41 MN | 40 MX | 41 MN | 40 MX | 41 MN | 40 MX | 41 MN | 40 MX              | 41 MN      | 40 MX                       | 41 MN         | PI                     | 6 MX                           | NP             | 40 MX    | 41 MN                 | 40 MX                        | 41 MN              | 40 MX        | 41 MN         | 40 MX             | 41 MN             | 40 MX            | 41 MN          | 40 MX                    | 41 MN             | 40 MX             | 41 MN             | GROUP INDEX     | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       | 0                            | 0                  | 0            | 4 MX          | 8 MX              | 12 MX             | 16 MX            | NO MX          |                          |                   |                   |                   |                 |                       |                      |          | USUAL TYPES OF MAJOR MATERIALS | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>STONE FRAGS. GRAVEL, AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>SILTY SOILS</td> <td>CLAYEY SOILS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  | STONE FRAGS. GRAVEL, AND SAND | FINE SAND | SILTY OR CLAYEY GRAVEL AND SAND | SILTY SOILS | CLAYEY SOILS |  |  |  |  |  |  |  |  |  |  |  | GEN. RATING AS SUBGRADE | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td colspan="5">EXCELLENT TO GOOD</td> <td colspan="5">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSATURABLE</td> </tr> </table> |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | EXCELLENT TO GOOD |  |  |  |  | FAIR TO POOR |  |  |  |  | FAIR TO POOR | POOR | UNSATURABLE | PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>CONSISTENCY OR DENSENESS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/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 style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <td>4</td> <td>10</td> <td>40</td> <td>60</td> <td>200</td> <td>270</td> </tr> <tr> <td></td> <td>4.75</td> <td>2.00</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> <tr> <th>BOULDER (BLDR.)</th> <th>COBBLE (COB.)</th> <th>GRAVEL (GR.)</th> <th>COARSE SAND (CSE. SD.)</th> <th>FINE SAND (F SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>GRAIN SIZE</th> <td>MM 305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> </tr> <tr> <td></td> <td>IN. 12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> |  |  |  |  |  |  |  |  |  | U.S. STD. SIEVE SIZE OPENING (MM) | 4 | 10 | 40 | 60 | 200 | 270 |  | 4.75 | 2.00 | 0.42 | 0.25 | 0.075 | 0.053 | BOULDER (BLDR.) | COBBLE (COB.) | GRAVEL (GR.) | COARSE SAND (CSE. SD.) | FINE SAND (F SD.) | SILT (SL.) | CLAY (CL.) |  |  |  |  |  |  |  | GRAIN SIZE | MM 305 | 75 | 2.0 | 0.25 | 0.05 | 0.005 |  | IN. 12 | 3 |  |  |  |  | <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td></td> <td>SHALLOW UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td></td> <td></td> </tr> </table> |  |  |  |  |  |  |  |  |  |  | UNDERCUT |  | UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE |  | UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL |  | SHALLOW UNDERCUT |  | UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK |  |  | <p style="text-align: center;"><b>ABBREVIATIONS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>CL. - CLAY</td> <td>CPT - CONE PENETRATION TEST</td> <td>CSE. - COARSE</td> <td>DPT - DILATOMETER TEST</td> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>Ø - 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>UW - UNIT WEIGHT</td> <td>UWG - DRY UNIT
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CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. | VERY SOFT | CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL. | <p style="text-align: center;"><b>PLASTICITY</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NON PLASTIC</th> <th>PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td></td> <td>0-5</td> <td>VERY LOW</td> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>6-15</td> <td>SLIGHT</td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>16-25</td> <td>MEDIUM</td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>26 OR MORE</td> <td>HIGH</td> </tr> </table> |  |  |  |  |  |  |  |  |  | NON PLASTIC | PLASTICITY INDEX (PI) | DRY STRENGTH |  | 0-5 | VERY LOW | SLIGHTLY PLASTIC | 6-15 | SLIGHT | MODERATELY PLASTIC | 16-25 | MEDIUM | HIGHLY PLASTIC | 26 OR MORE | HIGH | <p style="text-align: center;"><b>FRACATURE SPACING</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table> |  |  |  |  |  |  |  |  |  | TERM | SPACING | VERY WIDE | MORE THAN 10 FEET | WIDE | 3 TO 10 FEET | MODERATELY CLOSE | 1 TO 3 FEET | CLOSE | 0.16 TO 1 FOOT | VERY CLOSE | LESS THAN 0.16 FEET | <p style="text-align: center;"><b>BEDDING</b></p> <table border="1" style="width: 100%;
border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>&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 style="text-align: center;"><b>COLOR</b></p> <p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>INDURATION</b></p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>FRIABLE</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> |  |  |  |  |  |  |  |  |  | FRIABLE | RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. | MODERATELY INDURATED | GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. | INDURATED | GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. | EXTREMELY INDURATED | SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS. | <p style="text-align: center;"><b>NOTES:</b></p> <p>F.J.A.D.= FILLED IMMEDIATELY AFTER DRILLING</p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>ROCK HARDNESS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>TERMS AND DEFINITIONS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>CONSISTENCY OR DENSENESS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>ABBREVIATIONS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>FRACATURE SPACING</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>BEDDING</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>INDURATION</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>NOTES:</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>ROCK HARDNESS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>TERMS AND DEFINITIONS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>CONSISTENCY OR DENSENESS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>ABBREVIATIONS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>FRACATURE SPACING</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>BEDDING</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>INDURATION</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>NOTES:</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>ROCK HARDNESS</b></p> |  |  |  |  |  |  |  |  |  | <p style="text-align: center;"><b>TERMS AND DEFINITIONS</b></p> |  |  |  |  |  |  |  |  |  |
| GENERAL CLASS.   
  | GRANULAR MATERIALS (≤ 35% PASSING #200)   |   |  |                        |  | SILT-CLAY MATERIALS (> 35% PASSING #200) |                   |                       |                              |  | ORGANIC MATERIALS                       |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| GROUP CLASS.   
  | A-1   | A-3   | A-2  | A-2-4                  | A-2-5  | A-2-6                                    | A-2-7             | A-4                   | A-5                          | A-6  | A-7                                     | A-1, A-2   | A-3  | A-4, A-5                                   | A-6, A-7  |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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| SYMBOL   
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  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
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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 41 MN 10 MX      | 40 MX 41 MN 11 MN  | 40 MX 41 MN 11 MN                        | 40 MX 41 MN 11 MN | 36 MN 36 MN           | 36 MN 36 MN                  | 36 MN 36 MN  | 36 MN 36 MN                             |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| MATERIAL PASSING #40 LL PI   
  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>LL</td> <td>6 MX</td> <td>NP</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> </tr> <tr> <td>PI</td> <td>6 MX</td> <td>NP</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> </tr> </table> |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   | LL   | 6 MX                          | NP  | 40 MX  | 41 MN  | 40 MX  | 41 MN   | 40 MX   | 41 MN  | 40 MX                          
  | 41 MN               | 40 MX   | 41 MN   | 40 MX       | 41 MN   | 40 MX | 41 MN                             | PI    | 6 MX | NP           | 40 MX            | 41 MN        | 40 MX                            | 41 MN                              | 40 MX   | 41 MN                                      | 40 MX   | 41 MN  | 40 MX                            | 41 MN                                     | 40 MX               | 41 MN   | 40 MX   | 41 MN                  |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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| LL   
  | 6 MX  | NP  | 40 MX  | 41 MN                  | 40 MX  | 41 MN                                    | 40 MX             | 41 MN                 | 40 MX                        | 41 MN  | 40 MX                                   | 41 MN  | 40 MX  | 41 MN                                      | 40 MX   | 41 MN  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  | 6 MX  | NP  | 40 MX  | 41 MN                  | 40 MX  | 41 MN                                    | 40 MX             | 41 MN                 | 40 MX                        | 41 MN  | 40 MX                                   | 41 MN  | 40 MX  | 41 MN                                      | 40 MX   | 41 MN  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| GROUP INDEX  
  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>NO MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  | 0                             | 0   | 0  | 4 MX   | 8 MX   | 12 MX   | 16 MX   | NO MX  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| USUAL TYPES OF MAJOR MATERIALS   
  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>STONE FRAGS. GRAVEL, AND SAND</td> <td>FINE SAND</td> <td>SILTY OR CLAYEY GRAVEL AND SAND</td> <td>SILTY SOILS</td> <td>CLAYEY SOILS</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table>  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  | STONE FRAGS. GRAVEL, AND SAND | FINE SAND   | SILTY OR CLAYEY GRAVEL AND SAND                                  | SILTY SOILS  | CLAYEY SOILS   |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  | STONE FRAGS. GRAVEL, AND SAND   | FINE SAND   | SILTY OR CLAYEY GRAVEL AND SAND                                  | SILTY SOILS            | CLAYEY SOILS   |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
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| GEN. RATING AS SUBGRADE  
  | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td colspan="5">EXCELLENT TO GOOD</td> <td colspan="5">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td>UNSATURABLE</td> </tr> </table>  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  | EXCELLENT TO GOOD             |   |  |  |  | FAIR TO POOR  |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     | FAIR TO POOR  | POOR  | UNSATURABLE |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
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  | 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 style="text-align: center;"><b>CONSISTENCY OR DENSENESS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PRIMARY SOIL TYPE</th> <th>COMPACTNESS OR CONSISTENCY</th> <th>RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE)</th> <th>RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/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 style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>U.S. STD. SIEVE SIZE OPENING (MM)</th> <td>4</td> <td>10</td> <td>40</td> <td>60</td> <td>200</td> <td>270</td> </tr> <tr> <td></td> <td>4.75</td> <td>2.00</td> <td>0.42</td> <td>0.25</td> <td>0.075</td> <td>0.053</td> </tr> <tr> <th>BOULDER (BLDR.)</th> <th>COBBLE (COB.)</th> <th>GRAVEL (GR.)</th> <th>COARSE SAND (CSE. SD.)</th> <th>FINE SAND (F SD.)</th> <th>SILT (SL.)</th> <th>CLAY (CL.)</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>GRAIN SIZE</th> <td>MM 305</td> <td>75</td> <td>2.0</td> <td>0.25</td> <td>0.05</td> <td>0.005</td> </tr> <tr> <td></td> <td>IN. 12</td> <td>3</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       | U.S. STD. SIEVE SIZE OPENING (MM) | 4     | 10   | 40           | 60               | 200          | 270                              |                                    | 4.75  | 2.00                                       | 0.42  | 0.25   | 0.075                            | 0.053                                     | BOULDER (BLDR.)     | COBBLE (COB.)   | GRAVEL (GR.)                                    | COARSE SAND (CSE. SD.) | FINE SAND (F SD.) | SILT (SL.)                                    | CLAY (CL.) |  |   |  |   |  |           |                     | GRAIN SIZE                                    | MM 305            | 75           | 2.0                               | 0.25              | 0.05               | 0.005  |                   | IN. 12  | 3                |              |             |  |  | <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td></td> <td>UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL</td> </tr> <tr> <td></td> <td>SHALLOW UNDERCUT</td> <td></td> <td>UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK</td> <td></td> <td></td> </tr> </table> |  |  |                            |   |   |      |  
  |                 |   |             | UNDERCUT   |      | UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE  |           | UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL   |  | SHALLOW UNDERCUT |  | UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK |      |    | <p style="text-align: center;"><b>ABBREVIATIONS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>CL. - CLAY</td> <td>CPT - CONE PENETRATION TEST</td> <td>CSE. - COARSE</td> <td>DPT - DILATOMETER TEST</td> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>Ø - 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>UW - UNIT WEIGHT</td> <td>UWG - DRY UNIT WEIGHT</td> </tr> <tr> <td>BT - BORING TERMINATED</td> <td>CL. - CLAY</td> <td>CPT - CONE PENETRATION TEST</td> <td>CSE. - COARSE</td> <td>DPT - DILATOMETER TEST</td> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>Ø - 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>UW - UNIT WEIGHT</td> <td>UWG - DRY UNIT WEIGHT</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> |       |       |       |       |       |       |       |       |       | AR - AUGER REFUSAL | CL. - CLAY | CPT - CONE PENETRATION TEST | CSE. - COARSE | DPT - DILATOMETER TEST | DPT - DYNAMIC PENETRATION TEST | Ø - 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 | UW - UNIT WEIGHT | UWG - DRY UNIT WEIGHT | BT - BORING TERMINATED | CL. - CLAY | CPT - CONE PENETRATION TEST | CSE. - COARSE | DPT - DILATOMETER TEST | DPT - DYNAMIC PENETRATION TEST | Ø - 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   | UW - UNIT WEIGHT | UWG - DRY UNIT WEIGHT |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
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| 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   |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| 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                                    |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
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| BOULDER (BLDR.)  
  | COBBLE (COB.)   | GRAVEL (GR.)  | COARSE SAND (CSE. SD.)   | FINE SAND (F SD.)      | SILT (SL.)   | CLAY (CL.)                               |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
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  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| GRAIN SIZE   
  | MM 305  | 75  | 2.0  | 0.25                   | 0.05   | 0.005                                    |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
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  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
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  | IN. 12  | 3   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  | UNDERCUT  |   | UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE                       |                        | UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
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  | SHALLOW UNDERCUT  |   | UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK             |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| AR - AUGER REFUSAL   
  | CL. - CLAY  | CPT - CONE PENETRATION TEST   | CSE. - COARSE  | DPT - DILATOMETER TEST | DPT - DYNAMIC PENETRATION TEST   | Ø - 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    | UW - UNIT WEIGHT  | UWG - DRY UNIT WEIGHT   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| BT - BORING TERMINATED   
  | CL. - CLAY  | CPT - CONE PENETRATION TEST   | CSE. - COARSE  | DPT - DILATOMETER TEST | DPT - DYNAMIC PENETRATION TEST   | Ø - 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    | UW - UNIT WEIGHT  | UWG - DRY UNIT WEIGHT   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
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| <p style="text-align: center;"><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SOIL MOISTURE SCALE (ATTERBERG LIMITS)</th> <th>FIELD MOISTURE DESCRIPTION</th> <th>GUIDE FOR FIELD MOISTURE DESCRIPTION</th> </tr> <tr> <td>LL - LIQUID LIMIT</td> <td>- SATURATED - (SAT.)</td> <td>USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE</td> </tr> <tr> <td>PL - PLASTIC LIMIT</td> <td>- WET - (W)</td> <td>SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE</td> </tr> <tr> <td>OM - OPTIMUM MOISTURE</td> <td>- MOIST - (M)</td> <td>SOLID; AT OR NEAR OPTIMUM MOISTURE</td> </tr> <tr> <td>SL - SHRINKAGE LIMIT</td> <td>- DRY - (D)</td> <td>REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE</td> </tr> </table>   
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center;"><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <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 checked="" type="checkbox"/> CME-55</td> <td><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</td> <td></td> </tr> <tr> <td><input type="checkbox"/> CME-550</td> <td><input type="checkbox"/> 8" HOLLOW AUGERS</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> HARD FACED FINGER BITS</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> TUNG-CARBIDE INSERTS</td> <td></td> </tr> <tr> <td><input type="checkbox"/> VANE SHEAR TEST</td> <td><input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</td> <td></td> </tr> <tr> <td><input type="checkbox"/> PORTABLE HOIST</td> <td><input checked="" type="checkbox"/> TRICONE 2 1/8" STEEL TEETH</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> TRICONE " TUNG-CARB.</td> <td></td> </tr> <tr> <td></td> <td><input type="checkbox"/> CORE BIT</td> <td></td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> TRICONE 3 1/8" STEEL TEETH</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 checked="" type="checkbox"/> CME-55 | <input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER |        | <input type="checkbox"/> CME-550 | <input type="checkbox"/> 8" HOLLOW AUGERS |                     |   | <input type="checkbox"/> HARD FACED FINGER BITS |                        |                   | <input type="checkbox"/> TUNG-CARBIDE INSERTS |            | <input type="checkbox"/> VANE SHEAR TEST | <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER |  | <input type="checkbox"/> PORTABLE HOIST | <input checked="" type="checkbox"/> TRICONE 2 1/8" STEEL TEETH |           |                     | <input type="checkbox"/> TRICONE " TUNG-CARB. |                   |              | <input type="checkbox"/> CORE BIT |                   |                    | <input checked="" type="checkbox"/> TRICONE 3 1/8" STEEL TEETH |                   | <p style="text-align: center;"><b>ROCK HARDNESS</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <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.
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  | 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           |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| PL - PLASTIC LIMIT   
  | - WET - (W)   | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE                         |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| OM - OPTIMUM MOISTURE  
  | - MOIST - (M)   | SOLID; AT OR NEAR OPTIMUM MOISTURE  |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| SL - SHRINKAGE LIMIT   
  | - DRY - (D)   | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE                          |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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| DRILL UNITS:   
  | ADVANCING TOOLS:  | HAMMER TYPE:  |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| <input type="checkbox"/> CME-45C   
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  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| <input checked="" type="checkbox"/> CME-55   
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| <input type="checkbox"/> CME-550   
  | <input type="checkbox"/> 8" HOLLOW AUGERS   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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  | <input type="checkbox"/> HARD FACED FINGER BITS   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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|  
  | <input type="checkbox"/> TUNG-CARBIDE INSERTS   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <input type="checkbox"/> VANE SHEAR TEST   
  | <input checked="" type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <input type="checkbox"/> PORTABLE HOIST  
  | <input checked="" type="checkbox"/> TRICONE 2 1/8" STEEL TEETH  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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|  
  | <input type="checkbox"/> TRICONE " TUNG-CARB.   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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|  
  | <input type="checkbox"/> CORE BIT   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
|  
  | <input checked="" type="checkbox"/> TRICONE 3 1/8" STEEL TEETH  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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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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  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| 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.  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
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  | 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.  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p style="text-align: center;"><b>PLASTICITY</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NON PLASTIC</th> <th>PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td></td> <td>0-5</td> <td>VERY LOW</td> </tr> <tr> <td>SLIGHTLY PLASTIC</td> <td>6-15</td> <td>SLIGHT</td> </tr> <tr> <td>MODERATELY PLASTIC</td> <td>16-25</td> <td>MEDIUM</td> </tr> <tr> <td>HIGHLY PLASTIC</td> <td>26 OR MORE</td> <td>HIGH</td> </tr> </table>  
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center;"><b>FRACATURE SPACING</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FOOT</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table>   |                     |   |   |             |   |       |                                   |       |      | TERM         | SPACING          | VERY WIDE    | MORE THAN 10 FEET                | WIDE                               | 3 TO 10 FEET  | MODERATELY CLOSE                           | 1 TO 3 FEET   | CLOSE  | 0.16 TO 1 FOOT                   | VERY CLOSE                                | LESS THAN 0.16 FEET | <p style="text-align: center;"><b>BEDDING</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>&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 |             |  |  |  |  |  |                            |   |   |      |  
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| SLIGHTLY PLASTIC   
  | 6-15  | SLIGHT  |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  | 16-25   | MEDIUM  |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  | 26 OR MORE  | HIGH  |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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  | SPACING   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| VERY WIDE  
  | MORE THAN 10 FEET   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
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| WIDE   
  | 3 TO 10 FEET  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| MODERATELY CLOSE   
  | 1 TO 3 FEET   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| CLOSE  
  | 0.16 TO 1 FOOT  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
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  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
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  | LESS THAN 0.16 FEET   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| TERM   
  | THICKNESS   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| VERY THICKLY BEDDED  
  | 4 FEET  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| THICKLY BEDDED   
  | 1.5 - 4 FEET  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| THINLY BEDDED  
  | 0.16 - 1.5 FEET   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| VERY THINLY BEDDED   
  | 0.03 - 0.16 FEET  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| THICKLY LAMINATED  
  | 0.008 - 0.03 FEET   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| THINLY LAMINATED   
  | < 0.008 FEET  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
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| <p style="text-align: center;"><b>COLOR</b></p> <p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>  
  |   |   |  |                        |  |  |                   |                       |                              | <p style="text-align: center;"><b>INDURATION</b></p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>FRIABLE</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> |   |  |  |  |   |  |                               |   |  | FRIABLE  | RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. | MODERATELY INDURATED  | GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. | INDURATED  | GRAINS ARE DIFFICULT TO
SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.  | EXTREMELY INDURATED | SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS. | <p style="text-align: center;"><b>NOTES:</b></p> <p>F.J.A.D.= FILLED IMMEDIATELY AFTER DRILLING</p> |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
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  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| INDURATED  
  | GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.  |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| EXTREMELY INDURATED  
  | SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.   |   |  |                        |  |  |                   |                       |                              |  |   |  |  |  |   |  |                               |   |  |  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             |   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| <p style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p>  
  |   |   |  |                        |  |  |                   |                       |                              | <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p>   |   |  |  |  |   |  |                               |   |  | <p style="text-align: center;"><b>ROCK HARDNESS</b></p>  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             | <p style="text-align: center;"><b>TERMS AND DEFINITIONS</b></p>   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| <p style="text-align: center;"><b>CONSISTENCY OR DENSENESS</b></p>   
  |   |   |  |                        |  |  |                   |                       |                              | <p style="text-align: center;"><b>ABBREVIATIONS</b></p>  |   |  |  |  |   |  |                               |   |  | <p style="text-align: center;"><b>FRACATURE SPACING</b></p>  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             | <p style="text-align: center;"><b>BEDDING</b></p>   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| <p style="text-align: center;"><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p>   
  |   |   |  |                        |  |  |                   |                       |                              | <p style="text-align: center;"><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p>  |   |  |  |  |   |  |                               |   |  | <p style="text-align: center;"><b>INDURATION</b></p>   |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             | <p style="text-align: center;"><b>NOTES:</b></p>  |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| <p style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p>  
  |   |   |  |                        |  |  |                   |                       |                              | <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p>   |   |  |  |  |   |  |                               |   |  | <p style="text-align: center;"><b>ROCK HARDNESS</b></p>  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             | <p style="text-align: center;"><b>TERMS AND DEFINITIONS</b></p>   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| <p style="text-align: center;"><b>CONSISTENCY OR DENSENESS</b></p>   
  |   |   |  |                        |  |  |                   |                       |                              | <p style="text-align: center;"><b>ABBREVIATIONS</b></p>  |   |  |  |  |   |  |                               |   |  | <p style="text-align: center;"><b>FRACATURE SPACING</b></p>  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             | <p style="text-align: center;"><b>BEDDING</b></p>   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| <p style="text-align: center;"><b>SOIL MOISTURE - CORRELATION OF TERMS</b></p>   
  |   |   |  |                        |  |  |                   |                       |                              | <p style="text-align: center;"><b>EQUIPMENT USED ON SUBJECT PROJECT</b></p>  |   |  |  |  |   |  |                               |   |  | <p style="text-align: center;"><b>INDURATION</b></p>   |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             | <p style="text-align: center;"><b>NOTES:</b></p>  |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |
| <p style="text-align: center;"><b>TEXTURE OR GRAIN SIZE</b></p>  
  |   |   |  |                        |  |  |                   |                       |                              | <p style="text-align: center;"><b>RECOMMENDATION SYMBOLS</b></p>   |   |  |  |  |   |  |                               |   |  | <p style="text-align: center;"><b>ROCK HARDNESS</b></p>  |  |   |   |  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
  |                     |   |   |             | <p style="text-align: center;"><b>TERMS AND DEFINITIONS</b></p>   |       |                                   |       |      |              |                  |              |                                  |                                    |   |  |   |        |                                  |   |                     |   |   |                        |                   |   |            |  |   |  |   |  |           |                     |   |                   |              |                                   |                   |                    |  |                   |   |                  |              |             |  |  |  |  |  |                            |   |   |      |  
  |                 |   |             |  |      |   |           |  |  |                  |  |  |      |    |  |       |       |       |       |       |       |       |       |       |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |  |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                                |  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |                               |           |                                 |             |              |  |  |  |  |  |  |  |  |  |  |  |                         |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                   |  |  |  |  |              |  |  |  |  |              |      |             |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |                   |                            |  |  |  |  |  |     |   |  |  |  |   |  |  |  |  |  |  |  |  |  |                                   |   |    |    |    |     |     |  |      |      |      |      |       |       |                 |               |              |                        |                   |            |            |  |  |  |  |  |  |  |            |        |    |     |      |      |       |  |        |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |          |  |  |  |  |  |                  |  |  |  |  |   
  |  |  |  |  |  |  |  |  |  |                    |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |                        |            |                             |               |                        |                                |                |          |                       |                              |                    |              |               |                   |                   |                  |                |                          |                   |                   |                   |                 |                       |                      |          |                       |                  |                  |                       |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |                            |                                      |                   |                      |   |                    |             |   |                       |               |                                    |                      |             |  |   |  |  |  |  |  |  |  |  |  |              |                  |              |                                  |                                    |   |  |   |  |                                  |   |  |  |   |  |  |   |  |  |   |  |   |  |  |  |   |  |  |                                   |  |  |  |  |   |  |  |  |  |  |  |  |  |  |           |   |      |   |                 |   |             |  |      |   |           |  |   |  |  |  |  |  |  |  |  |  |             |                       |              |  |     |          |                  |      |        |                    |       |        |                |            |      |   |  |  |  |  |  |  |  |  |  |      |         |           |                   |      |              |                  |             |       |                |            |                     |  
  |  |  |  |  |  |  |  |  |  |      |           |                     |        |                |              |               |                 |                    |                  |                   |                   |                  |              |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |         |  |                      |   |           |  |                     |   |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |   |  |  |  |  |  |  |  |  |  |



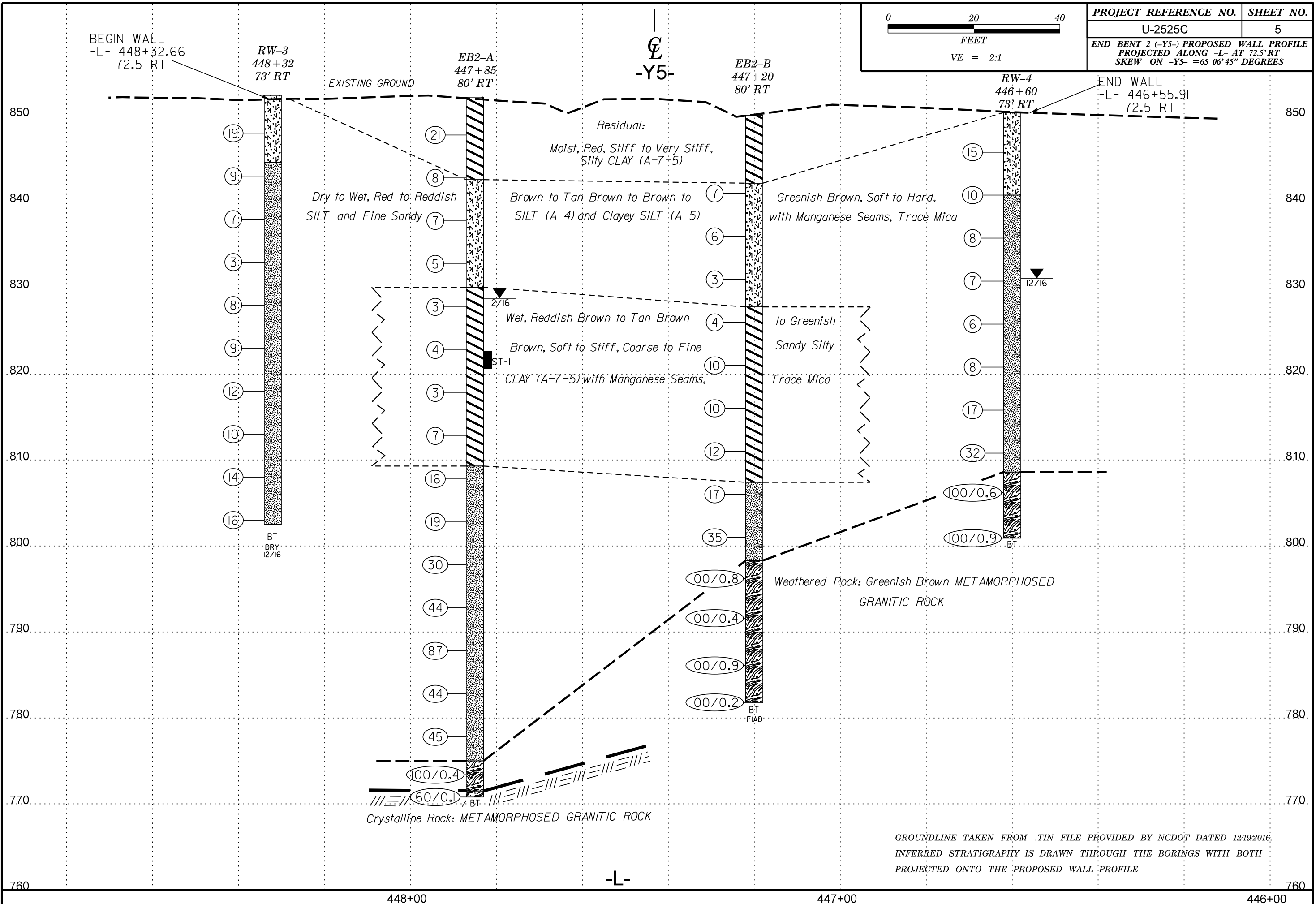
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193.17'  
N 05°15'30" E  
DB 1622 PG 1240  
MARJORIE W. CHAMPION  
KINGDOM ENTERPRISES, LLC  
ISBLKBUS CANOPY  
S

GARY S. & VIRGINIA W. CHURCH  
DB 3957 PG 929





PROJECT REFERENCE NO.	SHEET NO.
U-2525C	5
END BENT 2 (-Y5-) PROPOSED WALL PROFILE PROJECTED ALONG -L- AT 72.5' RT SKEW ON -Y5- = 65° 06' 45" DEGREES	



GROUNDLINE TAKEN FROM TIN FILE PROVIDED BY NCDOT DATED 12/19/2016.  
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH  
PROJECTED ONTO THE PROPOSED WALL PROFILE

-L-

# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 34821.1.1		TIP U-2525C		COUNTY GUILFORD		GEOLOGIST Pastrana, C.R.										
SITE DESCRIPTION Site #5 (Structure #7) - Bridge No. 1246 on SR 1001 (North Church Street) (-Y5-) over I-85 Bypass (-L-)							GROUND WTR (ft)									
BORING NO. RW-1		STATION 447+22		OFFSET 79 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 854.2 ft		TOTAL DEPTH 59.8 ft		NORTHING 870,836		EASTING 1,766,791										
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 77% 02/22/2016				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic										
DRILLER Toothman, R.		START DATE 12/09/16		COMP. DATE 12/09/16		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)		
855														854.2	0.0	GROUND SURFACE
850	850.7	3.5	6	8	9								M	845.4	8.8	RESIDUAL Red, Very Stiff, Clayey SILT (A-5)
845	845.7	8.5	3	5	6								M			Red to Tan Brown to Greenish Brown, Medium Stiff to Hard, SILT (A-4) with Manganese Seams, Some Fine Sand, Trace Clay, and Trace Mica
840	840.7	13.5	3	5	5								M			
835	835.7	18.5	2	3	3								M			
830	830.7	23.5	5	3	5								M			
825	825.7	28.5	3	5	6								M			
820	820.7	33.5	4	4	9								M			
815	815.7	38.5	5	9	11								M			
810	810.7	43.5	9	13	30								M			
805	805.7	48.5	21	60	40/0.2								M	805.2	49.0	WEATHERED ROCK Greenish Brown METAMORPHOSED GRANITIC ROCK
800	800.7	53.5	9	12	14								M	801.5	52.7	RESIDUAL Greenish Brown, Very Stiff, Fine Sandy SILT (A-4) with Manganese Seams
795	795.7	58.5	23	49	51/0.3									795.5	58.7	WEATHERED ROCK Greenish Brown METAMORPHOSED GRANITIC ROCK Boring Terminated at Elevation 794.4 ft In Weathered Rock: METAMORPHOSED GRANITIC ROCK
														794.4	59.8	

NCDOT BORE DOUBLE U2525C\_GEO\_RWAL\_SITE\_7\_GINTLOGS.GPJ NC\_DOT.GDT 10/2/17











# GEOTECHNICAL BORING REPORT

## BORE LOG

WBS 34821.1.1		TIP U-2525C		COUNTY GUILFORD		GEOLOGIST Pastrana, C.R.									
SITE DESCRIPTION Site #5 (Structure #7) - Bridge No. 1246 on SR 1001 (North Church Street) (-Y5-) over I-85 Bypass (-L-)							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 447+20		OFFSET 80 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 850.1 ft		TOTAL DEPTH 68.3 ft		NORTHING 870,985		EASTING 1,766,735									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 77% 02/22/2016				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic									
DRILLER Toothman, R.		START DATE 12/15/16		COMP. DATE 12/15/16		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
855															
850														850.1	0.0
845															
840	842.0	8.1	3	3	4								M	842.2	7.9
835	837.0	13.1	3	3	3								M		
830	832.0	18.1	1	1	2								W		
825	827.0	23.1	1	2	2								W	827.8	22.3
820	822.0	28.1	2	5	5								W		
815	817.0	33.1	2	4	6								W		
810	812.0	38.1	3	5	7								W		
805	807.0	43.1	5	8	9								M	807.4	42.7
800	802.0	48.1	9	15	20								D		
795	797.0	53.1	53	47/0.3										798.3	51.8
790	792.0	58.1	100/0.4												
785	787.0	63.1	28	72/0.4											
	782.0	68.1	100/0.2											781.8	68.3
Boring Terminated at Elevation 781.8 ft In Weathered Rock: METAMORPHOSED GRANITIC ROCK															
Equivalent -Y5- Sta: 23+26, 17' RT															

WBS 34821.1.1		TIP U-2525C		COUNTY GUILFORD		GEOLOGIST Pastrana, C.R.									
SITE DESCRIPTION Site #5 (Structure #7) - Bridge No. 1246 on SR 1001 (North Church Street) (-Y5-) over I-85 Bypass (-L-)							GROUND WTR (ft)								
BORING NO. RW-4		STATION 446+60		OFFSET 73 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 850.4 ft		TOTAL DEPTH 49.5 ft		NORTHING 871,001		EASTING 1,766,793									
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 77% 02/22/2016				DRILL METHOD Mud Rotary		HAMMER TYPE Automatic									
DRILLER Toothman, R.		START DATE 12/13/16		COMP. DATE 12/13/16		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
855															
850														850.4	0.0
845	846.8	3.6	5	7	8								M		
840	841.8	8.6	3	4	6								M	840.8	9.6
835	836.8	13.6	2	4	4								M		
830	831.8	18.6	2	3	4								M		
825	826.8	23.6	2	2	4								M		
820	821.8	28.6	3	3	5								M		
815	816.8	33.6	4	6	11								M		
810	811.8	38.6	9	13	19								M		
805	806.8	43.6	75	25/0.1										806.6	41.8
	801.8	48.6	32	68/0.4											
														800.9	49.5
Boring Terminated at Elevation 800.9 ft In Weathered Rock: METAMORPHOSED GRANITIC ROCK															

NCDOT BORE DOUBLE U2525C\_GEO\_RWAL\_SITE\_7\_GINTLOGS.GPJ NC\_DOT\_GDT\_10/2/17

SOILS LABORATORY TESTS RESULTS

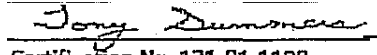
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TIP NO.: U-2525C

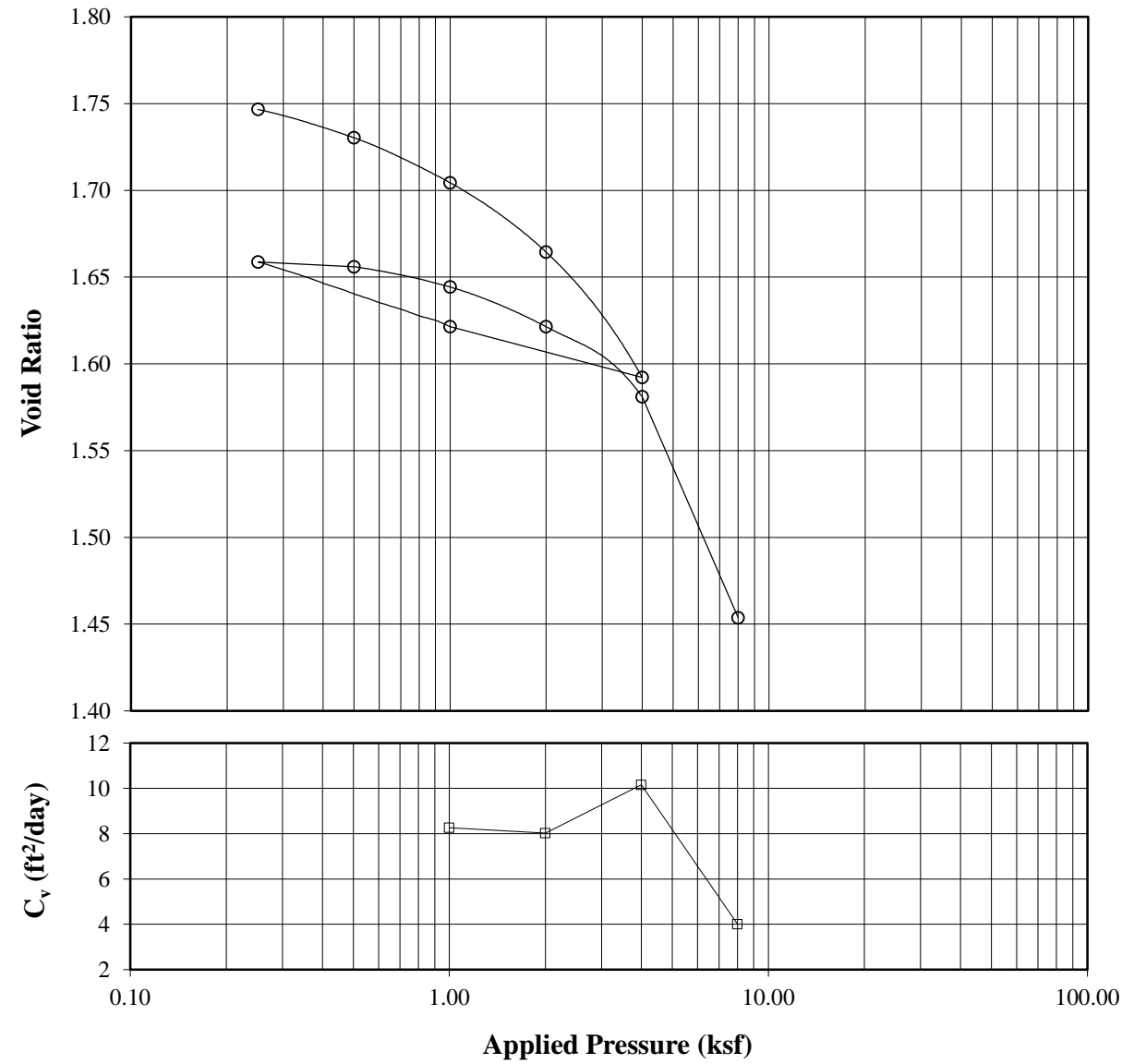
COUNTY: Guilford

SITE DESCRIPTION: Site #5, (Structure #7 - Bridge No. 1246 on SR 1001 (North Church Street) (-Y5-) over Greensboro Eastern Loop, I-85 Bypass (-L-)

SAMPLE NO.	Boring	DEPTH INTERVAL (ft.)	AASHTO CLASS	N	L.L	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							CSE. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	EB1-A	33.5-35.0	A-5 (4)	17	51	7	8	51	35	6	99	96	56	47.2	-
SS-2	EB1-B	33.5-35.0	A-5 (2)	13	45	3	13	43	38	6	98	90	58	50.8	-
SS-3	B1-A	38.3-39.8	A-5 (6)	12	41	8	5	42	47	6	100	99	70	31.2	-
SS-4	B1-B	38.3-39.8	A-7-5 (10)	9	50	11	9	30	49	12	99	94	73	38.9	-
SS-5	EB2-A	33.4-34.9	A-7-5 (24)	3	72	16	2	16	57	25	100	99	90	80.3	-
SS-6	EB2-B	28.1-29.6	A-7-5 (14)	10	58	12	7	23	51	19	99	95	79	60.3	-
ST-1	EB2-A1	29.5-31.6	A-7-5 (23)	N/A	67	17	3	16	54	27	100	98	89	65.5	-

  
 Certification No. 121-01-1108

**Consolidation Test - ASTM D2435**  
**SUMMARY REPORT**



	<b>Before</b>	<b>After</b>	<b>Liquid Limits:</b> 67	<b>Test Date:</b> 1/5/2017
<b>Moisture (%):</b>	65.46	63.56	<b>Plastic Limits:</b> 50	
<b>Dry Density (pcf):</b>	61.20	62.20	<b>Plasticity Index (%):</b> 17	
<b>Saturation (%):</b>	100.75	100.36	<b>Specific Gravity:</b> 2.700	Assumed
<b>Void Ratio:</b>	1.7513	1.6990	<b>Sample Type:</b> Undisturbed	
<b>C<sub>c</sub></b>	0.45	-		
<b>C<sub>r</sub></b>	0.051	-		
<b>P<sub>c</sub> (ksf)</b>	2.95	-		
<b>Soil Classification:</b>	A-7-5 (Clayey Soils)/ MH (Elastic Silt)			
<b>Project:</b>	U2525C	<b>Depth:</b>	29.5'-31.6'	
<b>Sample Number:</b>	ST-1	<b>Boring Number:</b>	EB2-A1	
<b>Project:</b>	U2525C			
<b>Client:</b>	NCDOT			
<b>Location:</b>	EB-2-A1 (29.5'-31.6")			

**Consolidation Test Results  
(Sequence 1) Load 0.250 ksf**

Project: U2525C Project Number: CS34.348  
 Location: EB-2-A1 (29.5'-31.6")  
 Job Number 34821  
 Test Date: 1/5/2017  
 Test Number: -  
 Sample Number: ST-1 Soil Classification:  
 Boring Number: EB2-A1 A-7-5 (23) (Clayey Soils)  
 Depth: 29.5'-31.6' Remarks:  
 Sample Type: Undisturbed Undisturbed

Index	Time	Displacement (in)	Settlement (in)	Axial Strain (%)	Void Ratio
0	00:00:00	0.3528	0.0000	0.0000	1.7513
1	00:00:01	0.3528	0.0000	0.0000	1.7513
2	00:00:02	0.3528	0.0001	0.0085	1.7511
3	00:00:03	0.3528	0.0001	0.0085	1.7511
4	00:00:04	0.3528	0.0001	0.0085	1.7511
5	00:00:05	0.3527	0.0002	0.0170	1.7508
6	00:00:06	0.3527	0.0002	0.0170	1.7508
7	00:00:12	0.3527	0.0002	0.0170	1.7508
8	00:00:15	0.3527	0.0002	0.0170	1.7508
9	00:00:30	0.3526	0.0003	0.0255	1.7506
10	00:01:00	0.3525	0.0003	0.0340	1.7504
11	00:02:00	0.3524	0.0004	0.0425	1.7501
12	00:04:00	0.3523	0.0005	0.0510	1.7499
13	00:08:00	0.3523	0.0005	0.0510	1.7499
14	00:10:00	0.3523	0.0005	0.0510	1.7499
15	00:15:01	0.3523	0.0005	0.0510	1.7499
16	00:30:01	0.3522	0.0007	0.0680	1.7494
17	01:00:03	0.3521	0.0008	0.0765	1.7492
18	02:00:06	0.3519	0.0009	0.0935	1.7487
19	04:00:13	0.3518	0.0010	0.1020	1.7485
20	08:00:26	0.3518	0.0010	0.1020	1.7485
21	12:00:40	0.3519	0.0009	0.0935	1.7487
22	16:00:53	0.3519	0.0009	0.0935	1.7487
23	20:01:06	0.3519	0.0009	0.0935	1.7487
24	23:59:57	0.3518	0.0010	0.1020	1.7485

Tested By: TS

**Consolidation Test Results  
(Sequence 2) Load 0.500 ksf**

Project: U2525C Project Number: CS34.348  
 Location: EB-2-A1 (29.5'-31.6")  
 Job Number 34821  
 Test Date: 1/5/2017  
 Test Number: -  
 Sample Number: ST-1 Soil Classification:  
 Boring Number: EB2-A1 A-7-5 (23) (Clayey Soils)  
 Depth: 29.5'-31.6' Remarks:  
 Sample Type: Undisturbed Undisturbed

Index	Time	Displacement (in)	Settlement (in)	Axial Strain (%)	Void Ratio
0	00:00:00	0.3518	0.0010	0.1020	1.7485
1	00:00:01	0.3477	0.0052	0.5183	1.7370
2	00:00:02	0.3475	0.0054	0.5353	1.7366
3	00:00:03	0.3474	0.0054	0.5438	1.7363
4	00:00:04	0.3473	0.0055	0.5523	1.7361
5	00:00:05	0.3472	0.0056	0.5607	1.7359
6	00:00:06	0.3472	0.0056	0.5607	1.7359
7	00:00:12	0.3472	0.0057	0.5692	1.7356
8	00:00:15	0.3472	0.0057	0.5692	1.7356
9	00:00:30	0.3470	0.0059	0.5862	1.7352
10	00:01:00	0.3469	0.0059	0.5947	1.7349
11	00:02:00	0.3468	0.0060	0.6032	1.7347
12	00:04:00	0.3468	0.0060	0.6032	1.7347
13	00:08:00	0.3467	0.0061	0.6117	1.7345
14	00:10:00	0.3467	0.0061	0.6117	1.7345
15	00:15:01	0.3466	0.0063	0.6287	1.7340
16	00:30:02	0.3464	0.0065	0.6457	1.7335
17	01:00:03	0.3463	0.0065	0.6542	1.7333
18	02:00:07	0.3462	0.0066	0.6627	1.7331
19	04:00:13	0.3459	0.0070	0.6967	1.7321
20	08:00:26	0.3459	0.0070	0.6967	1.7321
21	12:00:40	0.3459	0.0070	0.6967	1.7321
22	16:00:53	0.3460	0.0069	0.6882	1.7324
23	20:01:06	0.3460	0.0069	0.6882	1.7324
24	23:59:57	0.3459	0.0070	0.6967	1.7321

Tested By:

Checked By:









**Consolidation Test Results  
(Sequence 6) Rebound 1.000 ksf**

Project: U2525C Project Number: CS34.348  
 Location: EB-2-A1 (29.5'-31.6")  
 Job Number 34821 Test Date: 1/5/2017  
 Test Number: -  
 Sample Number: ST-1 Soil Classification:  
 Boring Number: EB2-A1 A-7-5 (23) (Clayey Soils)  
 Depth: 29.5'-31.6' Remarks:  
 Sample Type: Undisturbed Undisturbed

Index	Time	Displacement (in)	Settlement (in)	Axial Strain (%)	Void Ratio
0	00:00:00	0.2957	0.0572	5.7179	1.5940
1	00:00:01	0.3038	0.0490	4.9023	1.6164
2	00:00:02	0.3043	0.0485	4.8513	1.6178
3	00:00:03	0.3045	0.0483	4.8343	1.6183
4	00:00:04	0.3047	0.0482	4.8173	1.6187
5	00:00:05	0.3047	0.0482	4.8173	1.6187
6	00:00:06	0.3048	0.0481	4.8088	1.6190
7	00:00:12	0.3049	0.0479	4.7918	1.6194
8	00:00:15	0.3050	0.0478	4.7833	1.6197
9	00:00:30	0.3052	0.0477	4.7664	1.6201
10	00:01:00	0.3053	0.0476	4.7579	1.6204
11	00:02:00	0.3054	0.0474	4.7409	1.6209
12	00:04:00	0.3056	0.0472	4.7239	1.6213
13	00:08:00	0.3058	0.0471	4.7069	1.6218
14	00:10:00	0.3057	0.0472	4.7154	1.6216
15	00:15:00	0.3058	0.0471	4.7069	1.6218
16	00:30:01	0.3059	0.0469	4.6899	1.6223
17	01:00:03	0.3059	0.0470	4.6984	1.6220
18	02:00:06	0.3061	0.0467	4.6729	1.6227
19	04:00:13	0.3062	0.0466	4.6644	1.6230
20	08:00:26	0.3062	0.0466	4.6644	1.6230
21	12:00:39	0.3063	0.0466	4.6559	1.6232
22	16:00:53	0.3063	0.0466	4.6559	1.6232
23	20:01:06	0.3065	0.0463	4.6304	1.6239
24	23:59:57	0.3063	0.0466	4.6559	1.6232

Tested By: TS

**Consolidation Test Results  
(Sequence 7) Rebound 0.250 ksf**

Project: U2525C Project Number: CS34.348  
 Location: EB-2-A1 (29.5'-31.6")  
 Job Number 34821 Test Date: 1/5/2017  
 Test Number: -  
 Sample Number: ST-1 Soil Classification:  
 Boring Number: EB2-A1 A-7-5 (23) (Clayey Soils)  
 Depth: 29.5'-31.6' Remarks:  
 Sample Type: Undisturbed Undisturbed

Index	Time	Displacement (in)	Settlement (in)	Axial Strain (%)	Void Ratio
0	00:00:00	0.3063	0.0466	4.6559	1.6232
1	00:00:01	0.3129	0.0399	3.9932	1.6414
2	00:00:02	0.3139	0.0389	3.8912	1.6442
3	00:00:03	0.3146	0.0382	3.8233	1.6461
4	00:00:04	0.3152	0.0376	3.7638	1.6477
5	00:00:05	0.3155	0.0374	3.7383	1.6484
6	00:00:06	0.3156	0.0372	3.7213	1.6489
7	00:00:12	0.3162	0.0366	3.6619	1.6505
8	00:00:15	0.3163	0.0365	3.6534	1.6508
9	00:00:30	0.3167	0.0361	3.6109	1.6519
10	00:01:00	0.3170	0.0359	3.5854	1.6526
11	00:02:00	0.3173	0.0355	3.5514	1.6536
12	00:04:00	0.3177	0.0352	3.5174	1.6545
13	00:08:01	0.3180	0.0348	3.4834	1.6554
14	00:10:01	0.3181	0.0347	3.4749	1.6557
15	00:15:01	0.3182	0.0347	3.4664	1.6559
16	00:30:02	0.3184	0.0344	3.4410	1.6566
17	01:00:03	0.3187	0.0342	3.4155	1.6573
18	02:00:07	0.3189	0.0339	3.3900	1.6580
19	04:00:13	0.3192	0.0336	3.3645	1.6587
20	08:00:27	0.3195	0.0334	3.3390	1.6594
21	12:00:40	0.3196	0.0332	3.3220	1.6599
22	16:00:53	0.3197	0.0331	3.3135	1.6601
23	56:01:06	0.3198	0.0331	3.3050	1.6604
24	23:59:59	0.3199	0.0330	3.2965	1.6606

Tested By: TS

**Consolidation Test Results**  
**(Sequence 8) Load 0.500 ksf**

**Project:** U2525C **Project Number:** CS34.348  
**Location:** EB-2-A1 (29.5'-31.6")  
**Job Number:** 34821 **Test Date:** 1/5/2017  
**Test Number:** -  
**Sample Number:** ST-1 **Soil Classification:**  
**Boring Number:** EB2-A1 A-7-5 (23) (Clayey Soils)  
**Depth:** 29.5'-31.6' **Remarks:**  
**Sample Type:** Undisturbed Undisturbed

Index	Time	Displacement (in)	Settlement (in)	Axial Strain (%)	Void Ratio
0	00:00:00	0.3199	0.0330	3.2965	1.6606
1	00:00:01	0.3193	0.0336	3.3560	1.6590
2	00:00:02	0.3193	0.0336	3.3560	1.6590
3	00:00:03	0.3193	0.0336	3.3560	1.6590
4	00:00:04	0.3193	0.0336	3.3560	1.6590
5	00:00:05	0.3193	0.0336	3.3560	1.6590
6	00:00:06	0.3193	0.0336	3.3560	1.6590
7	00:00:12	0.3193	0.0336	3.3560	1.6590
8	00:00:15	0.3193	0.0336	3.3560	1.6590
9	00:00:30	0.3193	0.0336	3.3560	1.6590
10	00:01:00	0.3192	0.0336	3.3645	1.6587
11	00:02:01	0.3192	0.0336	3.3645	1.6587
12	00:04:01	0.3192	0.0336	3.3645	1.6587
13	00:08:01	0.3191	0.0337	3.3730	1.6585
14	00:10:01	0.3190	0.0338	3.3815	1.6583
15	00:15:01	0.3190	0.0338	3.3815	1.6583
16	00:30:02	0.3191	0.0337	3.3730	1.6585
17	01:00:04	0.3190	0.0338	3.3815	1.6583
18	02:00:07	0.3190	0.0338	3.3815	1.6583
19	04:00:14	0.3189	0.0339	3.3900	1.6580
20	08:00:27	0.3189	0.0340	3.3985	1.6578
21	12:00:40	0.3189	0.0340	3.3985	1.6578
22	16:00:53	0.3189	0.0340	3.3985	1.6578
23	20:01:07	0.3189	0.0340	3.3985	1.6578
24	23:59:59	0.3189	0.0340	3.3985	1.6578

Tested By: TS

**Consolidation Test Results**  
**(Sequence 9) Load 1.000 ksf**

**Project:** U2525C **Project Number:** CS34.348  
**Location:** EB-2-A1 (29.5'-31.6")  
**Job Number:** **Test Date:** 1/5/2017  
**Test Number:** -  
**Sample Number:** ST-1 **Soil Classification:**  
**Boring Number:** EB2-A1 A-7-5 (23) (Clayey Soils)  
**Depth:** 29.5'-31.6' **Remarks:**  
**Sample Type:** Undisturbed Undisturbed

Index	Time	Displacement (in)	Settlement (in)	Axial Strain (%)	Void Ratio
0	00:00:00	0.3189	0.0340	3.3985	1.6578
1	00:00:01	0.3161	0.0368	3.6788	1.6501
2	00:00:02	0.3159	0.0370	3.6958	1.6496
3	00:00:03	0.3158	0.0370	3.7043	1.6494
4	00:00:04	0.3157	0.0371	3.7128	1.6491
5	00:00:05	0.3157	0.0371	3.7128	1.6491
6	00:00:06	0.3157	0.0371	3.7128	1.6491
7	00:00:12	0.3156	0.0372	3.7213	1.6489
8	00:00:15	0.3155	0.0373	3.7298	1.6487
9	00:00:30	0.3155	0.0373	3.7298	1.6487
10	00:01:00	0.3155	0.0374	3.7383	1.6484
11	00:02:01	0.3155	0.0374	3.7383	1.6484
12	00:04:01	0.3154	0.0375	3.7468	1.6482
13	00:08:01	0.3153	0.0376	3.7553	1.6480
14	00:10:01	0.3152	0.0376	3.7638	1.6477
15	00:15:01	0.3152	0.0376	3.7638	1.6477
16	00:30:02	0.3153	0.0376	3.7553	1.6480
17	01:00:04	0.3151	0.0377	3.7723	1.6475
18	02:00:07	0.3150	0.0378	3.7808	1.6473
19	04:00:14	0.3150	0.0379	3.7893	1.6470
20	08:00:27	0.3148	0.0381	3.8063	1.6466
21	12:00:40	0.3148	0.0381	3.8063	1.6466
22	16:00:53	0.3148	0.0381	3.8063	1.6466
23	20:01:07	0.3147	0.0381	3.8148	1.6463
24	23:59:58	0.3146	0.0382	3.8233	1.6461

Tested By: TS

**Consolidation Test Results**  
**(Sequence 10) Load 2.000 ksf**

Project: U2525C Project Number: CS34.348  
 Location: EB-2-A1 (29.5'-31.6")  
 Job Number: 34821 Test Date: 1/5/2017  
 Test Number: -  
 Sample Number: ST-1 Soil Classification:  
 Boring Number: EB2-A1 A-7-5 (23) (Clayey Soils)  
 Depth: 29.5'-31.6' Remarks:  
 Sample Type: Undisturbed Undisturbed

Index	Time	Displacement (in)	Settlement (in)	Axial Strain (%)	Void Ratio
0	00:00:00	0.3146	0.0382	3.8233	1.6461
1	00:00:01	0.3085	0.0444	4.4350	1.6293
2	00:00:02	0.3082	0.0447	4.4690	1.6283
3	00:00:03	0.3080	0.0449	4.4860	1.6279
4	00:00:04	0.3079	0.0449	4.4945	1.6276
5	00:00:05	0.3078	0.0450	4.5030	1.6274
6	00:00:06	0.3078	0.0450	4.5030	1.6274
7	00:00:12	0.3076	0.0452	4.5200	1.6269
8	00:00:15	0.3076	0.0452	4.5200	1.6269
9	00:00:30	0.3076	0.0453	4.5285	1.6267
10	00:01:00	0.3075	0.0454	4.5370	1.6265
11	00:02:00	0.3073	0.0455	4.5539	1.6260
12	00:04:01	0.3072	0.0456	4.5624	1.6258
13	00:08:01	0.3071	0.0457	4.5709	1.6255
14	00:10:01	0.3071	0.0457	4.5709	1.6255
15	00:15:01	0.3071	0.0458	4.5794	1.6253
16	00:30:02	0.3070	0.0459	4.5879	1.6251
17	01:00:04	0.3068	0.0460	4.6049	1.6246
18	02:00:07	0.3066	0.0462	4.6219	1.6241
19	04:00:14	0.3066	0.0462	4.6219	1.6241
20	08:00:27	0.3065	0.0463	4.6304	1.6239
21	12:00:40	0.3065	0.0464	4.6389	1.6237
22	16:00:53	0.3065	0.0463	4.6304	1.6239
23	20:01:07	0.3065	0.0464	4.6389	1.6237
24	23:59:57	0.3063	0.0466	4.6559	1.6232

Tested By: TS

**Consolidation Test Results**  
**(Sequence 11) Load 4.000 ksf**

Project: U2525C Project Number: CS34.348  
 Location: EB-2-A1 (29.5'-31.6")  
 Job Number: 34821 Test Date: 1/5/2017  
 Test Number: -  
 Sample Number: ST-1 Soil Classification:  
 Boring Number: EB2-A1 A-7-5 (23) (Clayey Soils)  
 Depth: 29.5'-31.6' Remarks:  
 Sample Type: Undisturbed Undisturbed

Index	Time	Displacement (in)	Settlement (in)	Axial Strain (%)	Void Ratio
0	00:00:00	0.3063	0.0466	4.6559	1.6232
1	00:00:01	0.2981	0.0547	5.4715	1.6007
2	00:00:02	0.2967	0.0562	5.6160	1.5968
3	00:00:03	0.2963	0.0565	5.6500	1.5958
4	00:00:04	0.2962	0.0567	5.6670	1.5954
5	00:00:05	0.2960	0.0568	5.6839	1.5949
6	00:00:06	0.2959	0.0569	5.6924	1.5947
7	00:00:12	0.2956	0.0573	5.7264	1.5937
8	00:00:15	0.2955	0.0573	5.7349	1.5935
9	00:00:30	0.2952	0.0577	5.7689	1.5926
10	00:01:00	0.2950	0.0579	5.7859	1.5921
11	00:02:00	0.2946	0.0582	5.8199	1.5912
12	00:04:01	0.2944	0.0585	5.8454	1.5905
13	00:08:01	0.2941	0.0587	5.8709	1.5898
14	00:10:01	0.2941	0.0588	5.8794	1.5895
15	00:15:01	0.2939	0.0590	5.8963	1.5891
16	00:30:02	0.2936	0.0592	5.9218	1.5884
17	01:00:04	0.2933	0.0596	5.9558	1.5874
18	02:00:07	0.2929	0.0599	5.9898	1.5865
19	04:00:14	0.2926	0.0602	6.0238	1.5856
20	08:00:27	0.2923	0.0606	6.0578	1.5846
21	12:00:40	0.2920	0.0608	6.0833	1.5839
22	16:00:53	0.2919	0.0609	6.0918	1.5837
23	20:01:07	0.2918	0.0611	6.1088	1.5832
24	23:59:57	0.2916	0.0613	6.1257	1.5827

Tested By: TS

**Consolidation Test Results**  
**(Sequence 12) Load 8.000 ksf**

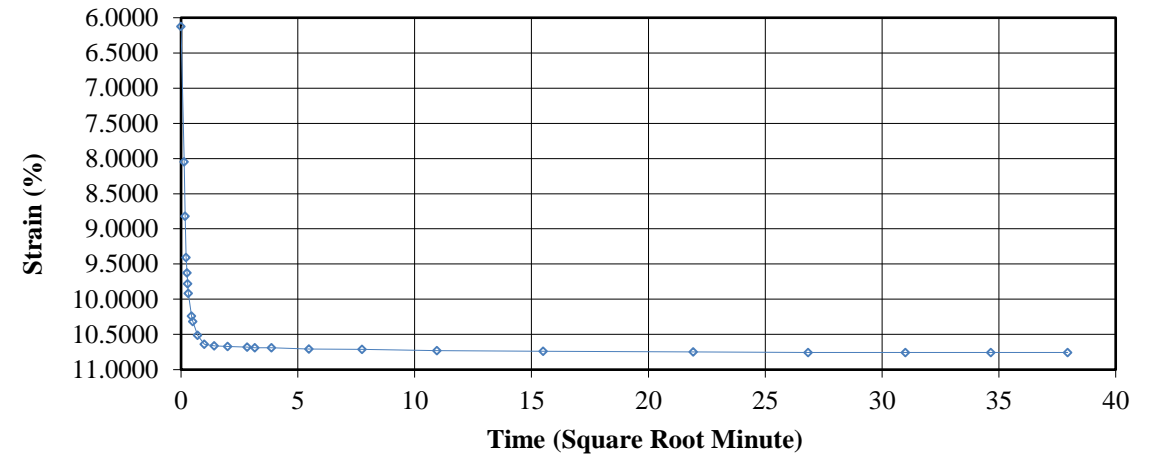
Project: U2525C Project Number: CS34.348  
 Location: EB-2-A1 (29.5'-31.6")  
 Job Number: 34821 Test Date: 1/5/2017  
 Sample Number: ST-1 Soil Classification: A-7-5 (23) (Clayey Soils)  
 Boring Number: EB2-A1 Remarks:  
 Depth: 29.5'-31.6' Undisturbed  
 Sample Type: Undisturbed

Index	Time	Elapsed Time (min)	Square Root of Time ( $\sqrt{t}$ )	Displacement (in)	Settlement (in)	Axial Strain (%)	Void Ratio
0	00:00:00	0.00	0.00	0.2916	0.0613	6.1257	1.5827
1	00:00:01	0.02	0.13	0.2724	0.0805	8.0459	1.5299
2	00:00:02	0.03	0.18	0.2647	0.0882	8.8190	1.5086
3	00:00:03	0.05	0.22	0.2588	0.0941	9.4053	1.4925
4	00:00:04	0.07	0.26	0.2566	0.0963	9.6262	1.4864
5	00:00:05	0.08	0.29	0.2551	0.0978	9.7791	1.4822
6	00:00:06	0.10	0.32	0.2537	0.0992	9.9150	1.4785
7	00:00:12	0.20	0.45	0.2505	0.1024	10.2379	1.4696
8	00:00:15	0.25	0.50	0.2497	0.1031	10.3144	1.4675
9	00:00:30	0.50	0.71	0.2477	0.1051	10.5098	1.4621
10	00:01:00	1.00	1.00	0.2465	0.1064	10.6372	1.4586
11	00:02:01	2.02	1.42	0.2462	0.1066	10.6627	1.4579
12	00:04:01	4.02	2.00	0.2461	0.1067	10.6712	1.4577
13	00:08:01	8.02	2.83	0.2460	0.1068	10.6797	1.4575
14	00:10:01	10.02	3.16	0.2460	0.1069	10.6882	1.4572
15	00:15:01	15.02	3.88	0.2460	0.1069	10.6882	1.4572
16	00:30:02	30.03	5.48	0.2458	0.1071	10.7052	1.4568
17	01:00:04	60.07	7.75	0.2457	0.1071	10.7137	1.4565
18	02:00:07	120.12	10.96	0.2455	0.1073	10.7307	1.4561
19	04:00:14	240.23	15.50	0.2455	0.1074	10.7392	1.4558
20	08:00:27	480.45	21.92	0.2454	0.1075	10.7477	1.4556
21	12:00:40	720.67	26.85	0.2453	0.1076	10.7562	1.4554
22	16:00:53	960.88	31.00	0.2453	0.1076	10.7562	1.4554
23	20:01:07	1201.12	34.66	0.2453	0.1076	10.7562	1.4554
24	23:59:58	1439.97	37.95	0.2453	0.1076	10.7562	1.4554

Tested By: TS

**Consolidation Test Results**  
**(Sequence 12) Load 8.000 ksf**

**Consolidation Graph (Square-root Time)**





**SITE PHOTOGRAPHS**

**State Project No. 34821 – TIP No. U-2525C – Site # 5 (Structure # 7) Bridge No. 1246 on SR 1001 (N. Church Street) (-Y5-) over Greensboro Eastern Loop, I-85 Bypass (-L-) - Guilford County, NC**

View Looking Upstation Along -Y5-



View Looking Downstation Along -Y5-



View Looking Upstation Along -L-



View Looking Downstation Along -L-

