

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-3837	8.2625001	2	13

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																																																																																																																																																																										
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>	<p>WELL GRADED- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)</p> <p>GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>	<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL. 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>WEATHERED ROCK (WR)</p> <p>CRYSTALLINE ROCK (CR)</p> <p>NON-CRYSTALLINE ROCK (NCR)</p> <p>COASTAL PLAIN SEDIMENTARY ROCK (CP)</p>	<p>ALLUVIUM (ALLUV.) - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.</p> <p>ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.</p> <p>CALCAREOUS (CALC.) - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (F.P.) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>ROCK QUALITY DESIGNATION (R.Q.D.) - 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.</p> <p>SAPROLITE (SAP.) - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR B.P.F. 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 LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.</p> <p>STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.) - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.</p> <p>TOPSOIL (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																										
<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>GENERAL CLASS.</th> <th colspan="2">GRANULAR MATERIALS (< 75% PASSING #200)</th> <th colspan="2">SILT-CLAY MATERIALS (> 75% PASSING #200)</th> <th colspan="2">ORGANIC MATERIALS</th> </tr> <tr> <td>GROUP CLASS.</td> <td>A-1</td> <td>A-3</td> <td>A-2</td> <td>A-4</td> <td>A-5</td> <td>A-6</td> </tr> <tr> <td>SYMBOL</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>% PASSING</td> <td>10 30 40 200</td> <td>10 30 40 200</td> <td>10 30 40 200</td> <td>10 30 40 200</td> <td>10 30 40 200</td> <td>10 30 40 200</td> </tr> <tr> <td>LIQUID LIMIT</td> <td>6 MX</td> <td>N.P.</td> <td>40 MX, 41 MN, 10 MX, 10 MN, 11 MN, 11 MN</td> <td>10 MX, 10 MN, 11 MN, 11 MN</td> <td>10 MX, 10 MN, 11 MN, 11 MN</td> <td>10 MX, 10 MN, 11 MN, 11 MN</td> </tr> <tr> <td>GROUP INDEX</td> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX, 12 MX, 16 MX, No MX</td> <td>0</td> </tr> <tr> <td>USUAL TYPES OF MAJOR MATERIALS</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>SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> </tr> <tr> <td>GEN. RATING AS A SUBGRADE</td> <td colspan="2">EXCELLENT TO GOOD</td> <td colspan="2">FAIR TO POOR</td> <td>POOR</td> <td>UNSUITABLE</td> </tr> </table> <p style="text-align: center;">P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30</p>	GENERAL CLASS.	GRANULAR MATERIALS (< 75% PASSING #200)		SILT-CLAY MATERIALS (> 75% PASSING #200)		ORGANIC MATERIALS		GROUP CLASS.	A-1	A-3	A-2	A-4	A-5	A-6	SYMBOL							% PASSING	10 30 40 200	10 30 40 200	10 30 40 200	10 30 40 200	10 30 40 200	10 30 40 200	LIQUID LIMIT	6 MX	N.P.	40 MX, 41 MN, 10 MX, 10 MN, 11 MN, 11 MN	10 MX, 10 MN, 11 MN, 11 MN	10 MX, 10 MN, 11 MN, 11 MN	10 MX, 10 MN, 11 MN, 11 MN	GROUP INDEX	0	0	0	4 MX	8 MX, 12 MX, 16 MX, No MX	0	USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER	GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD		FAIR TO POOR		POOR	UNSUITABLE	<p style="text-align: center;">MINERALOGICAL COMPOSITION</p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p> <p style="text-align: center;">COMPRESSIBILITY</p> <p>SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 30 MODERATELY COMPRESSIBLE LIQUID LIMIT 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50</p> <p style="text-align: center;">PERCENTAGE OF MATERIAL</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT-CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>> 10%</td> <td>> 20%</td> <td>HIGHLY</td> </tr> <tr> <td></td> <td></td> <td></td> <td>35% AND ABOVE</td> </tr> </table> <p style="text-align: center;">GROUND WATER</p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.</p> <p> STATIC WATER LEVEL AFTER 24 HOURS.</p> <p> PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA</p> <p> SPRING OR SEEPAGE</p> <p style="text-align: center;">MISCELLANEOUS SYMBOLS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td> ROADWAY EMBANKMENT WITH SOIL DESCRIPTION</td> <td> TEST BORING</td> <td> SAMPLE DESIGNATIONS</td> </tr> <tr> <td> SOIL SYMBOL</td> <td> AUGER BORING</td> <td>S - BULK SAMPLE</td> </tr> <tr> <td> ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS</td> <td> CORE BORING</td> <td>SS - SPLIT SPOON SAMPLE</td> </tr> <tr> <td> INFERRED SOIL BOUNDARIES</td> <td> MONITORING WELL</td> <td>ST - SHELBY TUBE SAMPLE</td> </tr> <tr> <td> INFERRED ROCK LINE</td> <td> PIEZOMETER INSTALLATION</td> <td>RS - ROCK SAMPLE</td> </tr> <tr> <td> ALLUVIAL SOIL BOUNDARY</td> <td> RE-COMPACTED INSTALLATION</td> <td>RT - RE-COMPACTED TRIAXIAL SAMPLE</td> </tr> <tr> <td> DIP/DIP DIRECTION OF ROCK STRUCTURES</td> <td> SLOPE INDICATOR INSTALLATION</td> <td>CBR - CBR SAMPLE</td> </tr> <tr> <td> SOUNDING ROD</td> <td> SPT N-VALUE</td> <td></td> </tr> <tr> <td></td> <td> SPT REFUSAL</td> <td></td> </tr> </table> <p style="text-align: center;">ABBREVIATIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>AR - AUGER REFUSAL</td> <td>PMT - PRESSUREMETER TEST</td> </tr> <tr> <td>BT - BORING TERMINATED</td> <td>SD. - SAND, SANDY</td> </tr> <tr> <td>CL. - CLAY</td> <td>SL. - SILT, SILTY</td> </tr> <tr> <td>CPT - CONE PENETRATION TEST</td> <td>SLI. - SLIGHTLY</td> </tr> <tr> <td>CSE. - COARSE</td> <td>TCR - TRICONE REFUSAL</td> </tr> <tr> <td>DMT - DILATOMETER TEST</td> <td>U - UNIT WEIGHT</td> </tr> <tr> <td>DPT - DYNAMIC PENETRATION TEST</td> <td>U_d - DRY UNIT WEIGHT</td> </tr> <tr> <td>e - VOID RATIO</td> <td>W - MOISTURE CONTENT</td> </tr> <tr> <td>F. - FINE</td> <td>V. - VERY</td> </tr> <tr> <td>FOSS. - FOSSILIFEROUS</td> <td>VST - VANE SHEAR TEST</td> </tr> <tr> <td>FRAC. - FRACTURED FRAGS. - FRAGMENTS</td> <td></td> </tr> <tr> <td>MED. - MEDIUM</td> <td></td> </tr> </table>	ORGANIC MATERIAL	GRANULAR SOILS	SILT-CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	> 10%	> 20%	HIGHLY				35% AND ABOVE	ROADWAY EMBANKMENT WITH SOIL DESCRIPTION	TEST BORING	SAMPLE DESIGNATIONS	SOIL SYMBOL	AUGER BORING	S - BULK SAMPLE	ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS	CORE BORING	SS - SPLIT SPOON SAMPLE	INFERRED SOIL BOUNDARIES	MONITORING WELL	ST - SHELBY TUBE SAMPLE	INFERRED ROCK LINE	PIEZOMETER INSTALLATION	RS - ROCK SAMPLE	ALLUVIAL SOIL BOUNDARY	RE-COMPACTED INSTALLATION	RT - RE-COMPACTED TRIAXIAL SAMPLE	DIP/DIP DIRECTION OF ROCK STRUCTURES	SLOPE INDICATOR INSTALLATION	CBR - CBR SAMPLE	SOUNDING ROD	SPT N-VALUE			SPT REFUSAL		AR - AUGER REFUSAL	PMT - PRESSUREMETER TEST	BT - BORING TERMINATED	SD. - SAND, SANDY	CL. - CLAY	SL. - SILT, SILTY	CPT - CONE PENETRATION TEST	SLI. - SLIGHTLY	CSE. - COARSE	TCR - TRICONE REFUSAL	DMT - DILATOMETER TEST	U - UNIT WEIGHT	DPT - DYNAMIC PENETRATION TEST	U _d - DRY UNIT WEIGHT	e - VOID RATIO	W - MOISTURE CONTENT	F. - FINE	V. - VERY	FOSS. - FOSSILIFEROUS	VST - VANE SHEAR TEST	FRAC. - FRACTURED FRAGS. - FRAGMENTS		MED. - MEDIUM		<p style="text-align: center;">ROCK HARDNESS</p> <p>VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGISTS PICK.</p> <p>HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>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 GEOLOGISTS PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.</p> <p>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 GEOLOGISTS PICK.</p> <p>SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</p> <p>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> <p style="text-align: center;">FRACATURE SPACING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>SPACING</th> </tr> <tr> <td>VERY WIDE</td> <td>MORE THAN 10 FEET</td> </tr> <tr> <td>WIDE</td> <td>3 TO 10 FEET</td> </tr> <tr> <td>MODERATELY CLOSE</td> <td>1 TO 3 FEET</td> </tr> <tr> <td>CLOSE</td> <td>0.16 TO 1 FEET</td> </tr> <tr> <td>VERY CLOSE</td> <td>LESS THAN 0.16 FEET</td> </tr> </table> <p style="text-align: center;">BEDDING</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>TERM</th> <th>THICKNESS</th> </tr> <tr> <td>VERY THICKLY BEDDED</td> <td>> 4 FEET</td> </tr> <tr> <td>THICKLY BEDDED</td> <td>1.5 - 4 FEET</td> </tr> <tr> <td>THINLY BEDDED</td> <td>0.16 - 1.5 FEET</td> </tr> <tr> <td>VERY THINLY BEDDED</td> <td>0.03 - 0.16 FEET</td> </tr> <tr> <td>THICKLY LAMINATED</td> <td>0.008 - 0.03 FEET</td> </tr> <tr> <td>THINLY LAMINATED</td> <td>< 0.008 FEET</td> </tr> </table> <p style="text-align: center;">INDURATION</p> <p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.</p> <p>FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>	TERM	SPACING	VERY WIDE	MORE THAN 10 FEET	WIDE	3 TO 10 FEET	MODERATELY CLOSE	1 TO 3 FEET	CLOSE	0.16 TO 1 FEET	VERY CLOSE	LESS THAN 0.16 FEET	TERM	THICKNESS	VERY THICKLY BEDDED	> 4 FEET	THICKLY BEDDED	1.5 - 4 FEET	THINLY BEDDED	0.16 - 1.5 FEET	VERY THINLY BEDDED	0.03 - 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET	THINLY LAMINATED	< 0.008 FEET	<p style="text-align: center;">EQUIPMENT USED ON SUBJECT PROJECT</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td> <p>DRILL UNITS:</p> <p><input type="checkbox"/> MOBILE B- _____</p> <p><input type="checkbox"/> BK-51</p> <p><input type="checkbox"/> CME-45</p> <p><input checked="" type="checkbox"/> CME-550</p> <p><input type="checkbox"/> PORTABLE HOIST</p> <p><input type="checkbox"/> OTHER _____</p> <p><input type="checkbox"/> OTHER _____</p> </td> <td> <p>ADVANCING TOOLS:</p> <p><input type="checkbox"/> CLAY BITS</p> <p><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</p> <p><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</p> <p><input type="checkbox"/> HARD FACED FINGER BITS</p> <p><input checked="" type="checkbox"/> TUNG.-CARBIDE INSERTS</p> <p><input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</p> <p><input type="checkbox"/> TRICONE _____ * STEEL TEETH</p> <p><input type="checkbox"/> TRICONE _____ * TUNG.-CARB.</p> <p><input type="checkbox"/> CORE BIT</p> <p><input type="checkbox"/> OTHER _____</p> </td> <td> <p>HAMMER TYPE:</p> <p><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</p> <p>CORE SIZE:</p> <p><input type="checkbox"/> -B _____</p> <p><input type="checkbox"/> -N _____</p> <p><input type="checkbox"/> -H _____</p> <p>HAND TOOLS:</p> <p><input type="checkbox"/> POST HOLE DIGGER</p> <p><input type="checkbox"/> HAND AUGER</p> <p><input type="checkbox"/> SOUNDING ROD</p> <p><input type="checkbox"/> VANE SHEAR TEST</p> <p><input type="checkbox"/> OTHER _____</p> </td> </tr> </table> <p style="text-align: center;">PLASTICITY</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>PLASTICITY INDEX (PI)</th> <th>DRY STRENGTH</th> </tr> <tr> <td>NONPLASTIC</td> <td>VERY LOW</td> </tr> <tr> <td>LOW PLASTICITY</td> <td>SLIGHT</td> </tr> <tr> <td>MED. PLASTICITY</td> <td>MEDIUM</td> </tr> <tr> <td>HIGH PLASTICITY</td> <td>HIGH</td> </tr> </table> <p style="text-align: center;">COLOR</p> <p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL.-BRN, BLUE-GRAY) MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>	<p>DRILL UNITS:</p> <p><input type="checkbox"/> MOBILE B- _____</p> <p><input type="checkbox"/> BK-51</p> <p><input type="checkbox"/> CME-45</p> <p><input checked="" type="checkbox"/> CME-550</p> <p><input type="checkbox"/> PORTABLE HOIST</p> <p><input type="checkbox"/> OTHER _____</p> <p><input type="checkbox"/> OTHER _____</p>	<p>ADVANCING TOOLS:</p> <p><input type="checkbox"/> CLAY BITS</p> <p><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</p> <p><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</p> <p><input type="checkbox"/> HARD FACED FINGER BITS</p> <p><input checked="" type="checkbox"/> TUNG.-CARBIDE INSERTS</p> <p><input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</p> <p><input type="checkbox"/> TRICONE _____ * STEEL TEETH</p> <p><input type="checkbox"/> TRICONE _____ * TUNG.-CARB.</p> <p><input type="checkbox"/> CORE BIT</p> <p><input type="checkbox"/> OTHER _____</p>	<p>HAMMER TYPE:</p> <p><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</p> <p>CORE SIZE:</p> <p><input type="checkbox"/> -B _____</p> <p><input type="checkbox"/> -N _____</p> <p><input type="checkbox"/> -H _____</p> <p>HAND TOOLS:</p> <p><input type="checkbox"/> POST HOLE DIGGER</p> <p><input type="checkbox"/> HAND AUGER</p> <p><input type="checkbox"/> SOUNDING ROD</p> <p><input type="checkbox"/> VANE SHEAR TEST</p> <p><input type="checkbox"/> OTHER _____</p>	PLASTICITY INDEX (PI)	DRY STRENGTH	NONPLASTIC	VERY LOW	LOW PLASTICITY	SLIGHT	MED. PLASTICITY	MEDIUM	HIGH PLASTICITY	HIGH
GENERAL CLASS.	GRANULAR MATERIALS (< 75% PASSING #200)		SILT-CLAY MATERIALS (> 75% PASSING #200)		ORGANIC MATERIALS																																																																																																																																																																								
GROUP CLASS.	A-1	A-3	A-2	A-4	A-5	A-6																																																																																																																																																																							
SYMBOL																																																																																																																																																																													
% PASSING	10 30 40 200	10 30 40 200	10 30 40 200	10 30 40 200	10 30 40 200	10 30 40 200																																																																																																																																																																							
LIQUID LIMIT	6 MX	N.P.	40 MX, 41 MN, 10 MX, 10 MN, 11 MN, 11 MN	10 MX, 10 MN, 11 MN, 11 MN	10 MX, 10 MN, 11 MN, 11 MN	10 MX, 10 MN, 11 MN, 11 MN																																																																																																																																																																							
GROUP INDEX	0	0	0	4 MX	8 MX, 12 MX, 16 MX, No MX	0																																																																																																																																																																							
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND	SILTY SOILS	CLAYEY SOILS	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER																																																																																																																																																																							
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD		FAIR TO POOR		POOR	UNSUITABLE																																																																																																																																																																							
ORGANIC MATERIAL	GRANULAR SOILS	SILT-CLAY SOILS	OTHER MATERIAL																																																																																																																																																																										
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE																																																																																																																																																																										
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE																																																																																																																																																																										
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME																																																																																																																																																																										
HIGHLY ORGANIC	> 10%	> 20%	HIGHLY																																																																																																																																																																										
			35% AND ABOVE																																																																																																																																																																										
ROADWAY EMBANKMENT WITH SOIL DESCRIPTION	TEST BORING	SAMPLE DESIGNATIONS																																																																																																																																																																											
SOIL SYMBOL	AUGER BORING	S - BULK SAMPLE																																																																																																																																																																											
ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS	CORE BORING	SS - SPLIT SPOON SAMPLE																																																																																																																																																																											
INFERRED SOIL BOUNDARIES	MONITORING WELL	ST - SHELBY TUBE SAMPLE																																																																																																																																																																											
INFERRED ROCK LINE	PIEZOMETER INSTALLATION	RS - ROCK SAMPLE																																																																																																																																																																											
ALLUVIAL SOIL BOUNDARY	RE-COMPACTED INSTALLATION	RT - RE-COMPACTED TRIAXIAL SAMPLE																																																																																																																																																																											
DIP/DIP DIRECTION OF ROCK STRUCTURES	SLOPE INDICATOR INSTALLATION	CBR - CBR SAMPLE																																																																																																																																																																											
SOUNDING ROD	SPT N-VALUE																																																																																																																																																																												
	SPT REFUSAL																																																																																																																																																																												
AR - AUGER REFUSAL	PMT - PRESSUREMETER TEST																																																																																																																																																																												
BT - BORING TERMINATED	SD. - SAND, SANDY																																																																																																																																																																												
CL. - CLAY	SL. - SILT, SILTY																																																																																																																																																																												
CPT - CONE PENETRATION TEST	SLI. - SLIGHTLY																																																																																																																																																																												
CSE. - COARSE	TCR - TRICONE REFUSAL																																																																																																																																																																												
DMT - DILATOMETER TEST	U - UNIT WEIGHT																																																																																																																																																																												
DPT - DYNAMIC PENETRATION TEST	U _d - DRY UNIT WEIGHT																																																																																																																																																																												
e - VOID RATIO	W - MOISTURE CONTENT																																																																																																																																																																												
F. - FINE	V. - VERY																																																																																																																																																																												
FOSS. - FOSSILIFEROUS	VST - VANE SHEAR TEST																																																																																																																																																																												
FRAC. - FRACTURED FRAGS. - FRAGMENTS																																																																																																																																																																													
MED. - MEDIUM																																																																																																																																																																													
TERM	SPACING																																																																																																																																																																												
VERY WIDE	MORE THAN 10 FEET																																																																																																																																																																												
WIDE	3 TO 10 FEET																																																																																																																																																																												
MODERATELY CLOSE	1 TO 3 FEET																																																																																																																																																																												
CLOSE	0.16 TO 1 FEET																																																																																																																																																																												
VERY CLOSE	LESS THAN 0.16 FEET																																																																																																																																																																												
TERM	THICKNESS																																																																																																																																																																												
VERY THICKLY BEDDED	> 4 FEET																																																																																																																																																																												
THICKLY BEDDED	1.5 - 4 FEET																																																																																																																																																																												
THINLY BEDDED	0.16 - 1.5 FEET																																																																																																																																																																												
VERY THINLY BEDDED	0.03 - 0.16 FEET																																																																																																																																																																												
THICKLY LAMINATED	0.008 - 0.03 FEET																																																																																																																																																																												
THINLY LAMINATED	< 0.008 FEET																																																																																																																																																																												
<p>DRILL UNITS:</p> <p><input type="checkbox"/> MOBILE B- _____</p> <p><input type="checkbox"/> BK-51</p> <p><input type="checkbox"/> CME-45</p> <p><input checked="" type="checkbox"/> CME-550</p> <p><input type="checkbox"/> PORTABLE HOIST</p> <p><input type="checkbox"/> OTHER _____</p> <p><input type="checkbox"/> OTHER _____</p>	<p>ADVANCING TOOLS:</p> <p><input type="checkbox"/> CLAY BITS</p> <p><input type="checkbox"/> 6" CONTINUOUS FLIGHT AUGER</p> <p><input checked="" type="checkbox"/> 8" HOLLOW AUGERS</p> <p><input type="checkbox"/> HARD FACED FINGER BITS</p> <p><input checked="" type="checkbox"/> TUNG.-CARBIDE INSERTS</p> <p><input type="checkbox"/> CASING <input type="checkbox"/> W/ ADVANCER</p> <p><input type="checkbox"/> TRICONE _____ * STEEL TEETH</p> <p><input type="checkbox"/> TRICONE _____ * TUNG.-CARB.</p> <p><input type="checkbox"/> CORE BIT</p> <p><input type="checkbox"/> OTHER _____</p>	<p>HAMMER TYPE:</p> <p><input checked="" type="checkbox"/> AUTOMATIC <input type="checkbox"/> MANUAL</p> <p>CORE SIZE:</p> <p><input type="checkbox"/> -B _____</p> <p><input type="checkbox"/> -N _____</p> <p><input type="checkbox"/> -H _____</p> <p>HAND TOOLS:</p> <p><input type="checkbox"/> POST HOLE DIGGER</p> <p><input type="checkbox"/> HAND AUGER</p> <p><input type="checkbox"/> SOUNDING ROD</p> <p><input type="checkbox"/> VANE SHEAR TEST</p> <p><input type="checkbox"/> OTHER _____</p>																																																																																																																																																																											
PLASTICITY INDEX (PI)	DRY STRENGTH																																																																																																																																																																												
NONPLASTIC	VERY LOW																																																																																																																																																																												
LOW PLASTICITY	SLIGHT																																																																																																																																																																												
MED. PLASTICITY	MEDIUM																																																																																																																																																																												
HIGH PLASTICITY	HIGH																																																																																																																																																																												
<p style="text-align: right;">BENCH MARK:</p> <hr/> <p style="text-align: right;">ELEVATION:</p> <hr/> <p>NOTES:</p>																																																																																																																																																																													