| SF-810013 | CONTENTS <u>SHEET NO.</u> 1 2 3 4 5-6 | DESCRIPTION TITLE SHEET LEGEND SITE PLAN PROFILE BORE LOGS |
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| REFERENCE: SF-810013 | - | _ |
| PROJECT: 17BP.3.R.43 | | |

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY SAMPSON

PROJECT DESCRIPTION BRIDGE NO. 13 ON SR 1147 OVER CRANE CREEK

STATE N.C.

STATE PROJECT REFERENCE NO. SF-810013

TOTAL SHEETS NO.

6

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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 SOLI TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEICH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1991 707-680. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

GENERAL SOLUTION ONLY AND SOLE TEDE DATE AND NOTCATED TO THE CONTRACT OF A CONTRACT OF

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 WARANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPNION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONSTRUCTION STO 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 OF FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDENSATIONS FOR ANY EXTENSION OF TIME FOR ANY RESON RESULTING FOR THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

NOTES:

- TES: 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 WAVES ANY CLAIMS FOR INCRESSED COMPENSATION OR STETENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.
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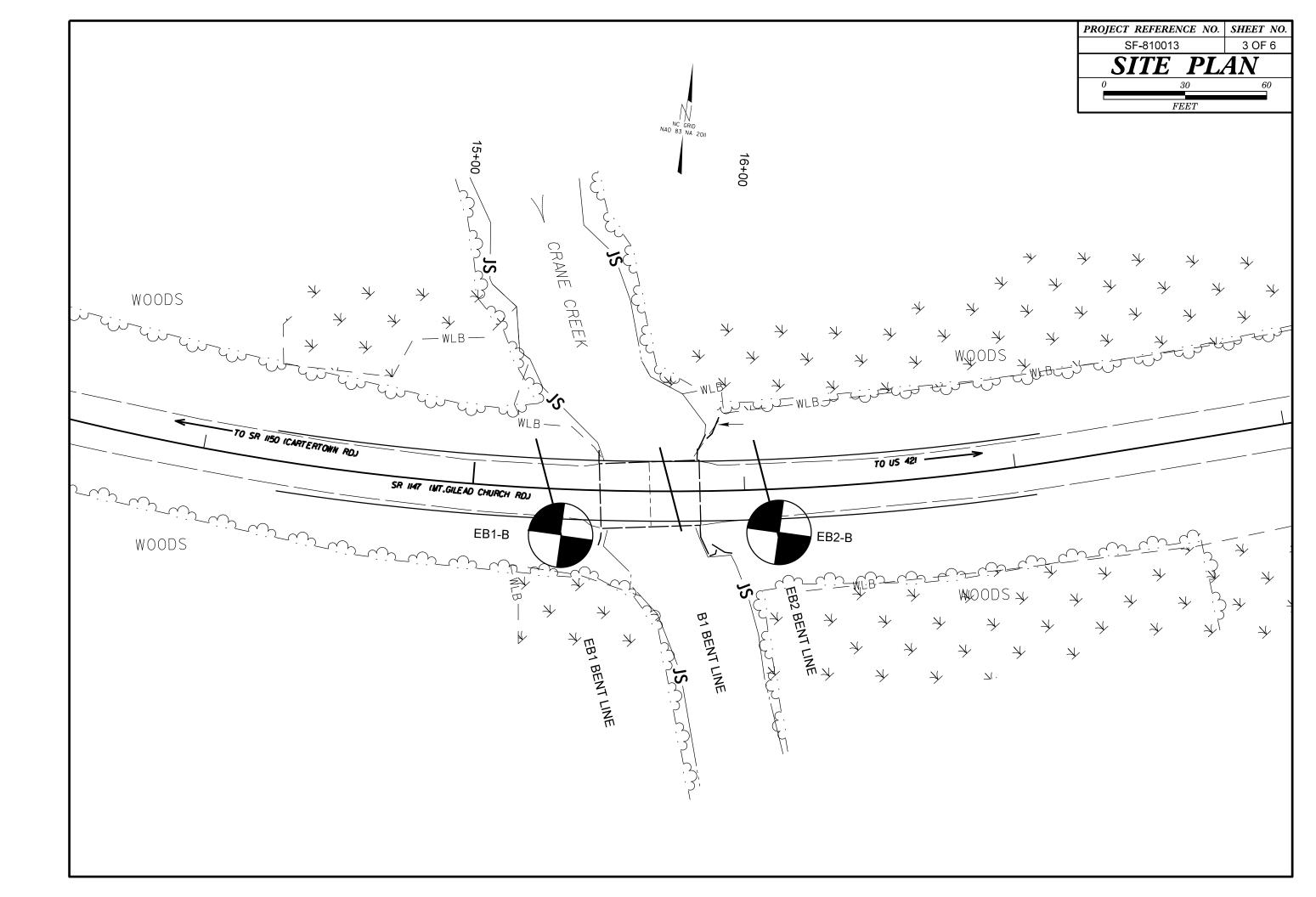
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

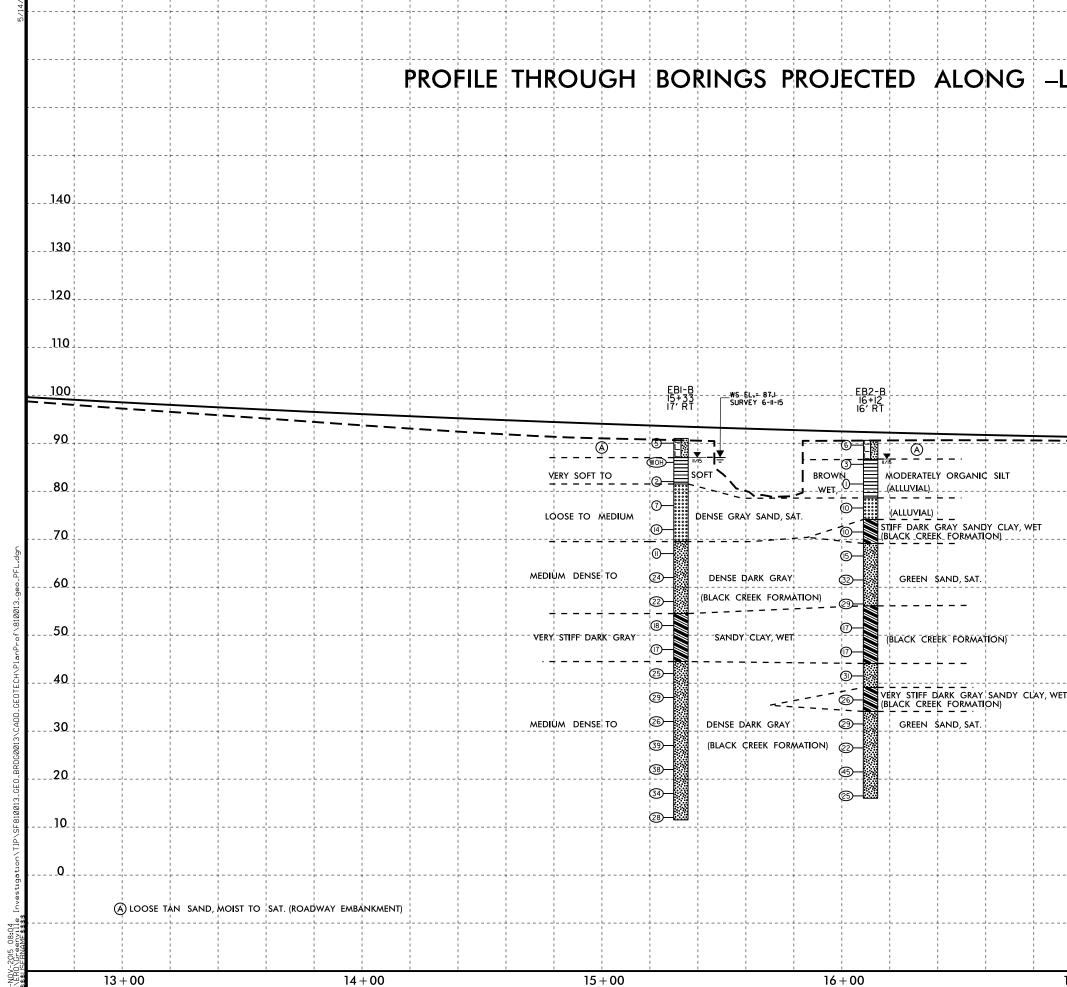
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

| SOIL DESCRIPTION | GRADATION | ROCK DESCRIPTION | TERMS AND DEFINITIONS |
|---|--|---|---|
| SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN | WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. | HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED | ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. |
| BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206. ASTM D1586), SOIL CLASSIFICATION | UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. | 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 | AQUIFER - A WATER BEARING FORMATION OR STRATA. |
| IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: | GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES. | BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN | ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. |
| CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, | ANGULARITY OF GRAINS | REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: | ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING |
| VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6 | THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: | WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > | A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. |
| SOIL LEGEND AND AASHTO CLASSIFICATION | ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED. | ROCK (WR) | ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT |
| | MINERALOGICAL COMPOSITION | THE TO COARSE GRAIN IGNEOUS AND METAMORPHIC POCK THAT | WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND |
| CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS | MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. | ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, | SURFACE. |
| GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 | ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. | ENERGY ONELSS, GABBRI, SCHIST, ETC. | CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. |
| CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-3 A-6 A-7 | COMPRESSIBILITY | NON-CRYSTALLINE SEDIMENTARY ROCK THAT WOULD YELD STREFUSAL IF TESTED. | COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM |
| SYMBOL SCOORDOODOOD | SLIGHTLY COMPRESSIBLE LL < 31 | RUCK ITPE INCLUDES PHILLITE, SLATE, SANDSTUNE, ETC. | OF SLOPE. |
| | MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50 | COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED | CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED |
| 7. PASSING 10 50 MX SILT- GRANULAR SILT- MUCK, | PERCENTAGE OF MATERIAL | (CP) SHELL BEDS, ETC. | BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. |
| 10 50 MA CONTROLMENT CLAY PROT | GRANULAR SILT - CLAY | WEATHERING | DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. |
| *200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN | ORGANIC MATERIAL SOILS OTHER MATERIAL | FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER | DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE |
| MATERIAL | TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% | HAMMER IF CRYSTALLINE. | UIF - THE HINGLE AT WHICH A STRATOM OR ANT PLANAR PERFORE IS INCLINED FROM THE |
| PASSING #40 SOILS WITH | LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% | VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, | DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE |
| LL – – 48 MX 41 MN 46 MX 41 MN 46 MX 41 MN 46 MX 41 MN 56 MX 41 MN LITTLE OR PI 6 MX NP 16 MX 16 MX 11 MN 11 MN 16 MX 16 MX 11 MN 11 MN HOUSE AT | HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE | (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. | LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. |
| GROUP INDEX Ø Ø Ø 4 MX 8 MX 12 MX 16 MX IN MX AMOUNTS OF | GROUND WATER | | FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE |
| OBGANIC SUILS | | SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO (SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR | SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. |
| USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER | WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING | CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. | FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. |
| MATERIALS SAND GRAVEL AND SAND SOILS SOILS | STATIC WATER LEVEL AFTER <u>24</u> HOURS | MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN | FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM |
| GEN. RATING FAIR TO BOOD FAIR TO BOOD HIGHLIGHT | ∇PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA | (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS | PARENT MATERIAL. |
| AS SUBGRADE EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE | | DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. | FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. |
| PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30 | - O-M- Spring or Seep | MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL | FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE |
| CONSISTENCY OR DENSENESS | MISCELLANEOUS SYMBOLS | SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION, ROCK SHOWS SEVERE LOSS OF STRENGTH | FIELD. |
| | | (MOD.SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES CLUNK SOUND WHEN STRUCK. | JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. |
| PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH | L ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION | <u>IF TESTED, WOULD YIELD SPT REFUSAL</u> | LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO |
| CUNSISTENCY (N-VALUE) (TONS/FT ²) | WITH SOIL DESCRIPTION - OF ROCK STRUCTURES | SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT | ITS LATERAL EXTENT. |
| GENERALLY VERY LOOSE < 4 | SOIL SYMBOL | (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. | LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. |
| GRANULAR LOOSE 4 TO 10 GRANULAR MEDIUM DENSE 10 TO 30 N/A | R1 | IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF | MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS |
| MATERIAL DENSE 30 TO 50 | ARTIFICIAL FILL (AF) OTHER OUGER BORING CONE PENETROMETER | VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE | USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. |
| VERY DENSE > 50 | | SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK | PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE |
| VERY SOFT < 2 < 0.25 | → → INFERRED SOIL BOUNDARY -()- CORE BORING ● SOUNDING ROD | (V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR | OF AN INTERVENING IMPERVIOUS STRATUM. |
| GENERALLY SOFT 2 TO 4 0.25 TO 0.5 | | VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. <u>IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF</u> | RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. |
| SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0 MATERIAL STIFF 8 TO 15 1 TO 2 | INFERRED ROCK LINE MONITORING WELL WITH CORE | COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS | ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF |
| (COHESIVE) VERY STIFF 15 TO 30 2 TO 4 | ALLUVIAL SOIL BOUNDARY A PIEZOMETER | ALSO AN EXAMPLE. | ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE |
| HARD > 30 > 4 | | ROCK HARDNESS | RUN AND EXPRESSED AS A PERCENTAGE. |
| TEXTURE OR GRAIN SIZE | RECOMMENDATION SYMBOLS | | SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. |
| U.S. STD. SIEVE SIZE 4 10 40 60 200 270 | UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAV | VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. | SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND |
| OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053 | | HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED | RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO |
| | SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE OF BACKET | TO DETACH HAND SPECIMEN. | THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. |
| BOULDER COBBLE GRAVEL SAND SAND SILT CLAY (BLDR.) (COB.) (GR.) (SL.) (CL.) | | MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE | SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT |
| (BEDR.) (COB.) (OR.) (CSE. SD.) (F SD.) (SL.) (CE.) | ABBREVIATIONS | HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED | OR SLIP PLANE. |
| GRAIN MM 305 75 2.0 0.25 0.05 0.005 | AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST | BY MODERATE BLOWS. | STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF |
| SIZE IN. 12 3 | BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED | MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. | 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 |
| SOIL MOISTURE - CORRELATION OF TERMS | CLCLAY MODMODERATELY γ -UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC $\gamma_{\rm A}$ -DRY UNIT WEIGHT | HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. | TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. |
| | CSE COARSE ORG ORGANIC | SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS | STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY |
| (ATTERBERG LIMITS) DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION | DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS | FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN | TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. |
| - SATURATED - USUALLY LIQUID: VERY WET, USUALLY | DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK | PIECES CAN BE BROKEN BY FINGER PRESSURE. | STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL |
| (SAT.) FROM BELOW THE GROUND WATER TABLE | e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON F - FINE SL SILT, SILTY ST - SHELBY TUBE | VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH | 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. |
| | FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK | SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY | |
| PLASTIC SEMISOLID; REQUIRES DRYING TO | FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL | FINGERNAIL. | TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. |
| RANGE - WET - (W) ATTAIN OPTIMUM MOISTURE | FRAGS FRAGMENTS W - MOISTURE CONTENT CBR - CALIFORNIA BEARING HI HIGHLY V - VERY RATIO | FRACTURE SPACING BEDDING | BENCH MARK: BM 134 |
| | | TERM SPACING TERM THICKNESS | |
| OM _ OPTIMUM MOISTURE - MOIST - (M) SOLID: AT OR NEAR OPTIMUM MOISTURE | EQUIPMENT USED ON SUBJECT PROJECT | VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET | ELEVATION: 91.4 FEET |
| SL SHRINKAGE LIMIT | DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: | MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET | NOTES: |
| | X CME-45C CLAY BITS X AUTOMATIC MANUAL | CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET | |
| - DRY - (D) ATTAIN OPTIMUM MOISTURE | G* CONTINUOUS FLIGHT AUGER CORE SIZE: | VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET | - |
| | UME-55 | INDURATION | |
| PLASTICITY | | FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. | |
| PLASTICITY INDEX (PI) DRY STRENGTH | CME-550 L_ HARD FACED FINGER BITSN | FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. | |
| NON PLASTIC 0-5 VERY LOW SLIGHTLY PLASTIC 6-15 SLIGHT | TUNG-CARBIDE INSERTS | FRIABLE RUBBING WITH FINGER FREES NUMERUUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. | |
| SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM | | | |
| HIGHLY PLASTIC 26 OR MORE HIGH | | MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. | |
| COLOR | | CRAINS ARE DISECTURE TO SERARATE WITH STEEL PROPE. | |
| COLON | TUNGCARB. | INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. | |
| DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). | CORE BIT | | |
| MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE. | | EXTREMELY INDURATED SHARP HAMMER BLOWS REDUIRED TO BREAK SAMPLE: SAMPLE BREAKS ACROSS GRAINS. | DATE: 8-15-14 |

project reference no.







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GEOTECHNICAL BORING REPORT BORE LOG

| Click ELEV DEPTH (ft) O. Sft 0. Sft | OFF: 0.5 ft NOR 015 D5/15 COM WS PER FOOT 50 75 Match Line |
|---|--|
| BORING NO. EB1-B STATION 15+33 OFFSET 17 ft RT ALIGNMENT -L 0 HR. N/A COLLAR ELEV. 91.0 ft TOTAL DEPTH 79.5 ft NORTHING 423,627 EASTING 2,20,801 24 HR. 4.0 DRILL RIGHAMMER EFF./DATE GF00075 CME-45C 87% 02/27/2015 DRILL METHOD Mud Rotary HAMMER TYPE Automatic DRILL RIGHAMMER EFF./DATE GF00075 CME-45C 87% 02/27/2015 DRILL METHOD Mud Rotary HAMMER TYPE Automatic DRILL RIGHAMMER EFF./DATE GF00075 CME-45C 87% 02/27/2015 DRILL METHOD Mud Rotary HAMMER TYPE Automatic DRILL RIGHAMMER EFF./DATE GF00075 CME-45C 87% 02/27/2015 DRILL METHOD Mud Rotary HAMMER TYPE Automatic DRILL RIGHAMMER EFF./DATE GF00075 CME-45C 87% 02/27/2015 DRILL METHOD Mud Rotary DRILL RIGHAMMER EFF./DATE GF00075 CME-45C 87% 02/27/2015 DRILL RIGHAMMER EFF./DATE BLOW COUNT BLOW COUNT BLOW COUNT BLOW COUNT BLOW COUNT Coll And Rock DESCRIPTION g65 | OFF 0.5 ft NOR 015 CON 05/15 CON WS PER FOOT 75 50 75 Match Line |
| COLLAR ELEV. 91.0 ft TOTAL DEPTH 79.5 ft NORTHING 423.627 EASTING 2,220,801 24 HR. 4.0 DRILL RIGHAMMER EFF.JDATE GF00075 CME-45C 87% 02/27/2015 DRILL METHOD Mud Rotary HAMMER TYPE Automatic DRILL RG/HAMMER EFF.JDATE GF00075 CME-45C 87% 02/27/2015 DRILL METHOD Mud Rotary HAMMER TYPE Automatic DRILL RG/HAMMER EFF.JDATE START DATE 11/05/15 SURFACE WATER DEPTH N/A ELEV DEVTH BLOW COUNT BLOW SPER FOOT SOIL AND ROCK DESCRIPTION DEPTH (ft) 0.5ft | D.5 ft NOR 015 CON 05/15 CON WS PER FOOT 50 50 75 Match Line - - - - |
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SHEET 5 OF 6

| ٦ | SAMPSON | 1 | | | GEOLOGIST | Swartley, J. R. | | | | |
|----|-----------|---------|-----|--------|--------------|--------------------------------------|------------------------|-------------|--|--|
| JE | E CREEK | | | | | GROUND WTR (ft) | | | | |
| | OFFSET 1 | 7 ft RT | | | ALIGNMENT - | ·L- | 0 HR. | N/A | | |
| 1 | NORTHING | 423,62 | 27 | | EASTING 2,22 | 20,801 | 24 HR. | 4.0 | | |
| 1 | | DRILL M | |) Mu | d Rotary | | RTYPE Auto | omatic | | |
| | COMP. DAT | | | | 1 | TER DEPTH N/A | | | | |
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GEOTECHNICAL BORING REPORT BORE LOG

| 42.5 48.1 | | 1700 | 2 D 42 | | | 1- | | 012 | | | | | | | | | MPC | 1700 | 2 0 40 | | | | | 00111 | |
|---|--------------|--------|--------------------|-------|-------|----|---|---------------------------------------|------------------|-------------|----------|-----|-----------|--|--|--------------|--------------|------|---------------|------|-------|-----|-----------------------|------------|---|
| SOPPORO ELG2 STATION Total UPPH 72.61 ADDREHM 62.2001 STATION Total UPPH 72.61 SOPPORO ELG2 STATION SOPPORO ELG2 SOPPORO ELG2 STATION SOPPORO ELG2 SOPPORO ELG2 <th< th=""><th></th><th></th><th></th><th>DDI</th><th></th><th></th><th></th><th></th><th></th><th></th><th>JIN</th><th></th><th></th><th>GEOLOGIST Swartley, J. R.</th><th></th><th>ft)</th><th></th><th></th><th></th><th>PDIF</th><th></th><th></th><th></th><th></th><th></th></th<> | | | | DDI | | | | | | | JIN | | | GEOLOGIST Swartley, J. R. | | f t) | | | | PDIF | | | | | |
| COLLAR LLV, USE h TOTAL DEPTH 4-0.6 MORTHUG 24300 EARTHO 2-201841 24-88 ColLAR LLAV, USE h TOTAL DEPTH 4-0.6 N DBILLOW DBILLOW COLLAR LLV, USE h TOTAL DEPTH 4-0.6 N N MMRET ME ADDIL TOTAL DEPTH 4-0.6 N N MMRET ME ADDIL TOTAL DEPTH 4-0.6 N N MMRET ME ADDIL TOTAL DEPTH 4-0.6 N <t< th=""><th></th><th></th><th></th><th></th><th></th><th></th><th>•</th><th></th><th></th><th>1</th><th>16 ft DT</th><th>-</th><th></th><th></th><th>-</th><th></th><th></th><th></th><th></th><th></th><th></th><th></th><th>, ,</th><th></th><th>_</th></t<> | | | | | | | • | | | 1 | 16 ft DT | - | | | - | | | | | | | | , , | | _ |
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| No. BLACK COUNT SUDVERSERVICE SUM No. | | | | | E GFC | | | | | | | | | · · · · · · · · · · · · · · · · · · · | | | | | | | E GFC | | | | |
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| 8 86 9 | | - | Ŧ | | | - | • ⁶ | | | | | | L | TAN SAND, MOIST | | | | _ | | | | | | | |
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| Jo < | | - | | | | | :::: | | | | | | | COASTAL PL | <u> </u> | 16.5 | | - | L | | | | | | |
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