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STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

ROBESON COUNTY_ PROJECT DESCRIPTION 1-95 IMPROVEMENTS FROM SOUTH OF US 301 (EXIT 22) TO NORTH OF SR 1758 (McDUFFIE CROSSING ROAD) SITE DESCRIPTION SITE 1 - BRIDGE ON -Y2-(SR 1529 – POWERSVILLE ROAD) OVER I-95 (-L-) AT STA. 210+00

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| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
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| N.C. | I–5987A | 1 | 11 |

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) TO7-GB50. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAIL

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARES 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 STIU (UN-PLACE) TEST DATA CAN BE RELED ON ONLY TO THE DEGREE OF RELIABILITY INTERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOLL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOL 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 OF CONTRACTOR IS CALIFONED THAT AND WHICH AS HELE AS SHOWN ON THE BUBSURFACE 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 GUARANTICE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPNION 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 NECESSART 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 CONDENS ENCOUNTERED AND THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

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

| | JUNNEL |
|---------------------------------------|---|
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| | IOT CONSIDERED FINAL IGNATURES COMPLETED |

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT SUBSURFACE INVESTIGATION

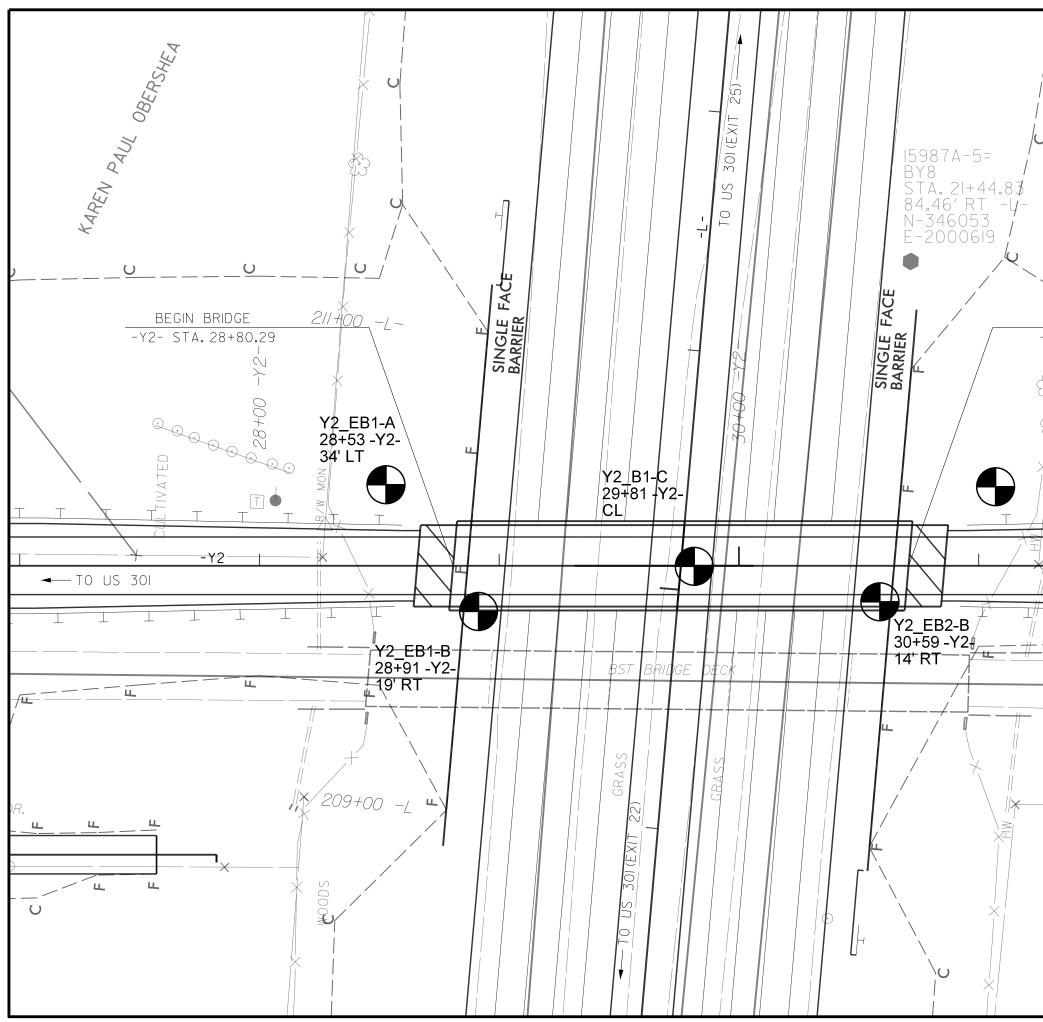
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

| SOIL DESCRIPTION | GRADATION | ROCK DESCRIPTION | TERMS AND DEFINITIONS |
|--|--|---|---|
| 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 ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. | 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. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES. | 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: | | BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. | 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 | 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: ANGULAR, <u>SUBANGULAR, SUBROUNDED</u> , OR <u>ROUNDED</u> . | 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 | MINERALOGICAL COMPOSITION | ROCK (WR) 100 BLOWS PER FOOT IF TESTED. | ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT |
| GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS | MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. | CRYSTALLINE FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT | WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. |
| | ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. | HULK (CH) GNEISS, GABBRO, SCHIST, ETC. | CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. |
| GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7 A-1, A-2 A-4, A-5 | COMPRESSIBILITY | NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN | COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM |
| SYMBOL | SLIGHTLY COMPRESSIBLE LL < 31 | ROCK (NCR) ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. | OF SLOPE. |
| | MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50 | COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SANDSTONE, CEMENTED | CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED |
| 7 PASSING *10 50 MX SILT- GRANULAR SILT- | PERCENTAGE OF MATERIAL | (CP) SHELL BEDS, ETC. | BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. |
| #40 30 MX 50 MX 51 MN SOILS SOILS SOILS SOILS | 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 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 PASSING =40 | TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% | HAMMER IF CRYSTALLINE. | HORIZONTAL. |
| LI | 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, (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF | DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE |
| PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN 10 MX 1 | HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE | OF A CRYSTALLINE NATURE. | LINE OF DIP. MEASURED CLOCKWISE FROM NORTH. |
| GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF SOILS | GROUND WATER | SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO | FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. |
| USUAL TYPES STONE FRAGS. EINE STITY OF CLAVEY STITY CLAVEY MATTER | WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING | (SLI.) 1 INCH. OPEN JDINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. | FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. |
| OF MAJOR GRAVEL, AND 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 |
| CEN PATING EAIR TO | ✓ 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-MM→ 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. |
| COMPACTNESS OR RANGE OF STANDARD RANGE OF UNCONFINED | | (MOD.SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL | JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. |
| PRIMARY SOIL TYPE CONFIGENCE COMPRESSIVE STRENGTH CONSISTENCY (N-VALUE) (TONS/FT ²) | ROADWAY EMBANKMENT (RE) 23/023 DIP & DIP DIRECTION WITH SOIL DESCRIPTION OF ROCK STRUCTURES | SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT | LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. |
| | | (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED | LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. |
| GRANILAR LOOSE 4 TO 10 | SOIL SYMBOL | TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. | MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS |
| MATERIAL MEDIUM DENSE 10/10/30/ N/A | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANYMENT AUGER BORING CONE PENETROMETER | IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE | USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. |
| (NON-COHESIVE) 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 T0 4 0.25 T0 0.5 SILT-CLAY MEDIUM STIFF 4 T0 8 0.5 T0 1.0 | | VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF | RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. |
| MATERIAL STIFF 8 TO 15 1 TO 2 | 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 | TTTTT ALLUVIAL SOIL BOUNDARY A PIEZOMETER - SPT N-VALUE | ALSO AN EXAMPLE. | ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. |
| HARD 30 > 4 TEXTURE OR GRAIN SIZE | | ROCK HARDNESS | SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT |
| | RECOMMENDATION SYMBOLS | VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES | ROCK. |
| U.S. STD. SIEVE SIZE 4 10 40 60 200 270 DPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053 | UNDERCUT UNCLASSIFIED EXCAVATION - | SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. | SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND |
| | SHALLOW UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF | HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. | RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. |
| BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY | UNDERCUT ACCEPTABLE DEGRADABLE ROCK EMBANKMENT OR BACKFILL | 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 |
| (BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.) | 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 CL CLAY MOD MODERATELY γ - UNIT WEIGHT | MEDIUM CAN BE GROOVED OR COUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE | 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 | CPT - CONE PENETRATION TEST NP - NON PLASTIC γ_{d}^{-} DRY UNIT WEIGHT | POINT OF A GEOLOGIST'S PICK. | TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. |
| SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION | 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 BOILD FOR THE PROTOCOL | DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST <u>SAMPLE ABBREVIATIONS</u> DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK | FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. | TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. |
| - SATURATED - USUALLY LIQUID; VERY WET, USUALLY | e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON | VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH | <u>STRATA ROCK QUALITY DESIGNATION (SROD)</u> - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY |
| (SAT.) FROM BELOW THE GROUND WATER TABLE | F - FINE SL SILT, SILTY ST - SHELBY TUBE FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK | SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY | THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. |
| PLASTIC SEMICOLID. REQUIRES DRAINS TO | FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL | FINGERNAIL. | TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. |
| (PI) - WEI - (W) ATTAIN OPTIMUM MOISTURE | FRAGS FRAGMENTS W - MOISTURE CONTENT CBR - CALIFORNIA BEARING | FRACTURE SPACING BEDDING | BENCH MARK: 15987A-5=BY8: STA. 21+44.83 -L- |
| " " PLL + PLASTIC LIMIT | HI HIGHLY V - VERY RATIO | TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET | 84.46' RIGHT |
| OM _ OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE | EQUIPMENT USED ON SUBJECT PROJECT | WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET | <u>N: 346,053; E: 2,000,619</u> ELEVATION: N/A FEET |
| SL _ SHRINKAGE LIMIT | DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: | MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET | NOTES: |
| - DRY - (D) REQUIRES ADDITIONAL WATER TO | CME-45C CLAY BITS X AUTOMATIC MANUAL | CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET | FIAD - FILLED IMMEDIATELY AFTER DRILLING |
| - DRY - (D) ATTAIN OPTIMUM MOISTURE | CME-55 6' CONTINUOUS FLIGHT AUGER CORE SIZE: | THINLY LAMINATED < 0.008 FEET | |
| PLASTICITY | 8" HOLLOW AUGERS | INDURATION | NOTE: ELEVATIONS OF BORINGS EBI-A, BI-C AND EB2-A PERFORMED BY F&R Inc. OBTAINED FROM PROVIDED |
| PLASTICITY INDEX (PI) DRY STRENGTH | CME-550 HARD FACED FINGER BITS -NNNN | FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. | TIN FILE: i5987_Is_tinl.tin DATED: 11-14-2019 |
| NON PLASTIC 0-5 VERY LOW | TUNGCARBIDE INSERTS | FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; | |
| SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM | VANE SHEAR TEST | GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. | |
| 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 DISCIPLET TO SERADATE WITH STEEL PROPE. | |
| | X CME-55 TRICONE TRICONE SOUNDING ROD | INDURATED DIFFICULT TO BREAK WITH HAMMER. | |
| DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). | X 21/4" HOLLOW STEM AUGERS VANE SHEAR TEST | SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; | |
| MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE. | X DEDRICH D-50 X 3¼" HOLLOW STEM AUGERS | EXTREMELY INDURATED SAMPLE BREAKS ACROSS GRAINS. | |

PROJECT REFERENCE NO.

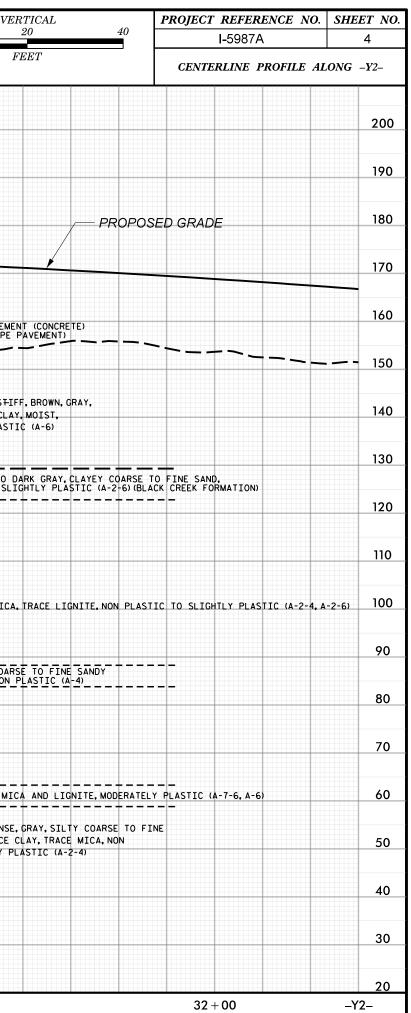
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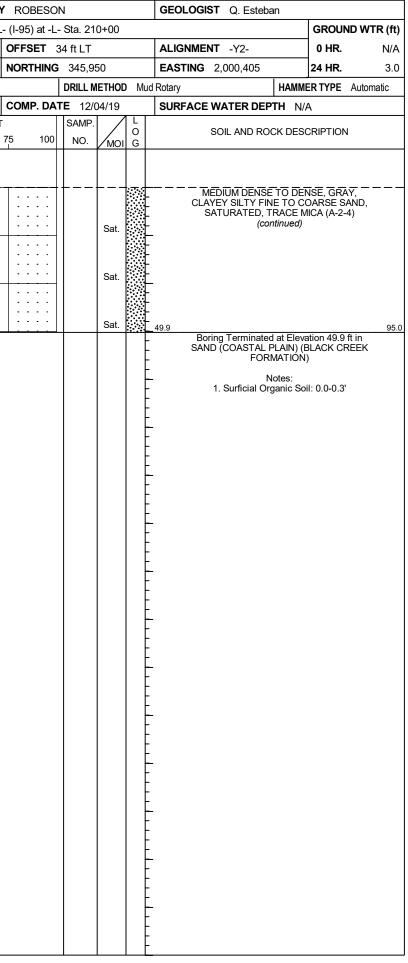
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| 20 8 | , SASTITLE CONSTRETENTING SOLT, UNANGE ONAT, FINE TO COAP | SE SANDI SILII CLAI, SATURATED, MUDER | | |
|------|---|---------------------------------------|---|--|
| ő |) ROADWAY EMBANKMENT, MEDIUM DENSE, BROWN-GRAY, CLAYEY SI) UNDIVIDED COASTAL PLAIN, SOFT, ORANGE-GRAY, FINE TO COAF | | | |
| 30 | | | | |
| 40 | | 51 | | |
| | | 30 BT VE | RY STIFF. GRAY. DARK CRAY. BT SILIT COLLECTION | BT |
| 50 | | 46- 56- | BT SILTY CLAIT | (44) SAND, SATURATED, TRACE |
| 60 | | 45- (1) | (B) BT SILTY CLAY, FINE SA | NDY CLAY (2) MOIST TO WET, TRACE MI |
| | | 36- | 36) 40) | E |
| 70 | | 3 3 | 33 | |
| 80 | YERT STIFF, DARK GRAT, SILIT | (35) WET, TRACE M | ICA, HIGHLY PLASTIC (B) (A-7-6) | |
| | VERY STIFF, DARK GRAY, COARSE TO FI SATURATED, TRACE MICA, MODERATEL VERY STIFF, DARK GRAY, SILTY | Y_PLASTIC (A-6) | 46 | HARD, DARK GRAY, COAR |
| 90 | | | 32 | (1) (1) |
| 00 | VERY LOOSE TO VERY DENSE, GRAY, DARK GRAY, SILTY | FINE TO COARSE 6 SAND, CLAY | EY FINE TO COARSE SAND, WET TO SATUR | ated, ⁽²⁶⁾ trace clay, trace mica (27) |
| | | 4 - | () () () | © |
| 10 | | <u> </u> | 29 | O |
| 20 | | © | <u> </u> | (Q |
| | COARSE TO FINE SAND, MOIST TO SATURATED, TRACE LIGN | ITE, MODERATELY WOH PLASTIC (A-2 | | |
| 30 | HIGHLY PLASTIC (A-7-6) (BLACK (| | | FF, GRAY- |
| 40 | SANDY CLAY, MOIST, TRACE ORGANICS, MODERATE | | VIDED COASTAL PLAIN. () MEDIUM COARSE VIDED COASTAL PLAIN. () MEDIUM STIFF TO STIFF TO STI RANGE, SILTY FINE TO () COARSE SANDY CLAY. MOIST. HIGHLY () PLASTIC (A-7-6) | TO FINE 8 |
| 10 | UNDIVIDED COASTAL PLAIN, MEDIUM STIFF TO STIFF, GRA | AY, BROWN, ORANGE, | | COASTAL 3 PLAIN, SOFT TO STIL |
| 50 | | ` | EXISTING PAVEMENT (ASPHALT) | / |
| 60 | EXISTING PAVEME | 28.01 12 | ĊL | 30+59-Y2- 14' RTCXISTING PAVEME |
| 40 | | SS=119 SS-120 Y2_EB1-B | SS-30 Y2_B1-C 29+81 -Y2- | SS-101 Y2_EB2-B |
| 70 | | SS-119 | | |
| 80 | | | | |
| ~~ | PROPOSED GRADE | -GIN BRIDGE 28+80.29 | PROPOSED BRID | |
| 90 | | 3+80 | | END BRIDGE 30+71.29 |
| 00 | | BE E 200 | | |
| | | CENTERLINE | PROFILE ALONG -Y2- AT | STA. 210+10 -L- |
| | | | | · |
| 210 | SKEW ANGLE - 95° | | FEET | VE = 2 |



| THE DESCRIPTION 9130 0.770 (01 100-100-00010 More) and or et - July 24 - 38 - 20 + 000 DOBUMO 10, 12, 12 - 14 - 100 July 21-05 FORMULA 12 - 100 July 21-05 ALLOWAND 12 - 20 - 000 DOBUMO 10, 12, 12 - 100 July 21-05 FORMULA 12 - 100 July 21-05 ALLOWAND 12 - 20 - 000 DOBUMO 10, 12, 12 - 100 July 21-05 FORMULA 12 - 000 FORMULA 12 - 000 FORMULA 12 - 000 DOBUMO 10, 12 - 100 July 21-05 FORMULA 12 - 000 FORMULA 12 - 000 FORMULA 12 - 000 FORMULA 12 - 000 DOBUMO 10, 12 - 000 FORMULA 12 - 000 DOBUMO 10, 12 - 000 FORMULA 12 - 0000 FORMULA 12 - 000 FORMUL | | | | | | | | | | - 1 | | | | | | | | | | | | | | - I | | | |
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| COLLAR LLW, 144.9.1 TOTAL DEPTH 40.0.1 NORTHING 30.6.600 PLATING 2.00.455 24.48 30.0 TOTAL DEPTH 40.0.1 NORTHING 30.6.600 DBILLISONAMENTER LATURE 10.0119 IDBL 10040000000000000000000000000000000000 | | | | | ge on -` | ` | | | | Road |) over -L | , , | | 10+00 |) | | | - | | | | | e on - | — È | | | ad) over -L- (|
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| HI 4 A.S. P </td <td>145</td> <td>144.9</td> <td>0.0</td> <td>2</td> <td>3</td> <td>3</td> <td></td> <td>2</td> <td>T</td> <td></td> <td></td> <td></td> <td></td> <td>м</td> <td></td> <td>144.9</td> <td></td> <td></td> <td>65</td> <td>+</td> <td><u>+</u></td> <td> </td> <td></td> <td>+</td> <td></td> <td></td> <td></td> | 145 | 144.9 | 0.0 | 2 | 3 | 3 | | 2 | T | | | | | м | | 144.9 | | | 65 | + | <u>+</u> | | | + | | | |
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| 1984 | | - | ŧ | | | | | | | • | | | | | | 137.9 | · · | , 7.0 | | | ł | | | | | : : <u> </u> : : | 1 1 |
| 305 - | | 136.4 | 8.5 | 2 | 2 | 1 | | · · · | · · · | • | | | | | | _ | | SILTY CLAY, | | 56.4 | 88.5 | 15 | 18 | 10 | | | |
| 10 184 185 2 3 4 1 <td>135</td> <td>-</td> <td>ŧ</td> <td></td> <td></td> <td>-</td> <td> +¶⁶</td> <td>3<u></u></td> <td><u> </u></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td>· ·</td> <td></td> <td>55</td> <td>-</td> <td>ŧ</td> <td></td> <td>10</td> <td>10</td> <td></td> <td><u><u><u></u></u>37<u></u>.</u></td> <td>+ +</td> | 135 | - | ŧ | | | - | + ¶ ⁶ | 3 <u></u> | <u> </u> | | | | | | | - | · · | | 55 | - | ŧ | | 10 | 10 | | <u><u><u></u></u>37<u></u>.</u> | + + |
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| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | N L | | Ŧ | | | | | | | | | | | | | 92.9 | DENSE. GRAY. SILTY FINE | E TO COARSE | | | Ŧ | | | | | | |
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| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | r 2(F8 | | Ŧ | | | | | | · · · · | • | | | | | | | | | | | Ŧ | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 500 | 86.4 | 58.5 | | 10 | | _ - | | | - | | | | | | l | | | | | £ | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | ਸ਼ <u>85</u> | - | £ | × | 12 | _∠∪ | | | <u><u></u>32</u> | - | | + | | Sat. | | ŀ | | | | - | f | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | FOG | | I. | | | | : | · · · | <i>j</i> | - | | | | | V | <u>82.9</u> . | | 7. SILTY CLAY 62.0 | | | Ŧ | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 80 | 81.4 | T 63.5 | 3 | 9 | 14 | | | 23 | - | | | | м | | 80.2 | MOIST (A-7-6 | 64.7 | | | Í | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | | - | Ŧ | | | | | | $\backslash \cdots$ | - | | | | | | | CLAYEY SILTY FINE TO C | OARSE SAND, | | | Ŧ | | | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 2/ 6 | 76.4 | 68.5 | | | 45 | | | N | - | | | | | | F | | | | | Ŧ | | | | | | |
| | | - | Ŧ | 9 | 15 | 15 | | | • 30_ | | | + • • • • | | Sat | | F | | | | - | Ŧ | | | | | | |
| | UBLE | - | Ŧ | | | | | · · · | | - | · · · · · | | | | | F | | | | | Ŧ | | | | | | |
| | | 71.4 | 73.5 | 10 | 13 | 15 | | | ●28 | - | | | | Sat | | F | | | | | Ŧ | | | | | | |
| | HOH I | - | Ŧ | | | | | | | - | | | | | | F | | | | - | Ŧ | | | | | | |
| 2 65 1 10 21 27 1 · · · · · · · · · · · · · · · · · · | 1000 65 | 66.4 | 78.5 | | | | _ - | | | $\langle \cdot $ | · · · · · | | | | | F | | | | | ŧ | | | | | | |
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SHEET 5 OF 11





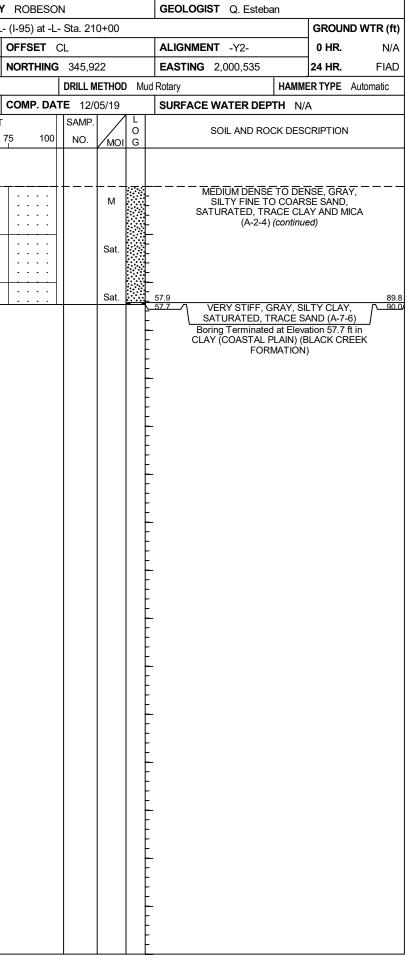
| | liung Engi | u de la constantición de | | musts | | | | | - | | | | | | | | | | ۲ | | | | | | | | | |
|-------|---------------|--------------------------|--------|-------|----------|----------------|-------------|-------------|-----------|-------|-----------|---------------|--------|-------|-----------------------|--------------------------------------|------------------|-------------------|--------|---------------|------------------------|---------|-------|--------|-------------|----------------------------|---------------------------------------|---------|
| | 47533. | | | | | P 1-598 | - | | | | ROBESC | | | | | LOGIST DEGON, A | | | - | 47533 | | | | | IP 1-5987/ | | COUNT | |
| | DESCRIF | | | DGE O | N -Y2- | (SR 15 | 29-PC | OWERS | VILLE R | | | , , | | - STA | 210+0 |) | | GROUND WTR (ft) | SITE | DESCR | IPTION | BRID | OGE O | N -Y2- | - (SR 1529- | -POWERS | VILLE RO | AD) |
| BORI | NG NO. | Y2_E | 31-B | | S | TATION | 28+ | -91 | | OF | FSET | 19 ft RT | | | ALIG | NMENT -Y2- | | 0 HR. N/A | BOR | ING NO. | Y2_E | B1-B | | S | TATION 2 | 28+91 | | OF |
| COLI | AR ELE | V. 14 | 5.7 ft | | т | DTAL D | EPTH | 99.81 | ft | NC | ORTHING | 3 45,8 | 99 | | EAS | FING 2,000,446 | | 24 HR. 6.9 | COL | LAR EL | EV. 14 | 5.7 ft | | т | OTAL DEP | TH 99.8 | ft | NC |
| DRILL | RIG/HAMN | MER EF | /DATE | E TER | 299 DI | EDRICH [| D-50 7 | 79% 12/3 | 1/2020 | | | DRILL N | NETHO | DD Mu | d Rotary | | HAMME | RTYPE Automatic | DRILL | RIG/HAN | /MER EF | F./DATE | E TER | 299 DI | EDRICH D-5 | 0 79% 12/3 | 1/2020 | |
| DRIL | LER TU | | | R. | S | FART D | ATE | 05/13/2 | 21 | CC | omp. Da | TE 05/ | 14/21 | | SUR | FACE WATER DEPT | H N/A | 4 | DRIL | LER T | | | R. | S | TART DAT | E 05/13/2 | 21 | CC |
| | DRIVE ELEV | | | W CO | | | | | PER FOO | | | SAMP. | · 🔨 | | | SOIL AND ROCI | K DESC | RIPTION | ELEV | DRIVE ELEV | DEPTH | | W COI | | | | SPER FOOT | |
| (ft) | (ft) | (ft) | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 1 | 50 | 75 | 100 | NO. | /мс | DI G | ELEV. (| ft) | | DEPTH (ft |) (ft) | (ft) | (ft) | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 I |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 150 | | | | | | | | | | | | | | | _ | | | | 70 | + | | | | | | Mat | tch Line | |
| | ‡ | | | | | | | | | | | | | | - | | | | | 67.4 | + - 78.3 | | | | | | · · · · · · | |
| 145 | ‡ | | | | | | | | | | | | | | 145.7 | GROUND | | | | | ŧ | 8 | 13 | 23 | | | . . | |
| | 144.7 - | | 2 | 2 | 2 | 4 | | | | | | | м | | <u> 144.7</u> • | | MENT | | | 1 - | Ŧ | | | | | · · · \ · | | T |
| | 142.4 + | 3.3 | 3 | 4 | 4 | | | · · · · · | | - - | | | м | | - | UNDIVIDED CO MEDIUM STIFF | TO STIF | F, GRAY, | | 62.4 | - 83.3 - | 19 | 22 | 23 | | . 1 I IV | • • • • • • • • • • • • | |
| 140 | | 6.0 | 3 | 4 | 7 | | | | + | | | | | | - | BROWN, ORANGE SANDY CLAY, | MOIST, | TRACE | 60 | | Ŧ | | | | | <u> </u> | <u> </u> | + |
| | 137.4 | 8.3 | | | <u> </u> | [• 1 | 1. | · · · · · | | - - | | | ┢ | | 137.7 | ORGANICS, MODE | | | | 57.4 | + 88.3 | | | | | . ! | | |
| 135 | Ŧ | | 3 | 4 | 4 | 4 8 | | | | | · · · · | SS-119 | 19% | | - | COASTA STIFF, DARK GRAY, | AL PLAI | | 55 | | Ŧ | 18 | 22 | 24 | | . : : : (| 46 | |
| | + | · | | | | | | | | | | | | | - | HIGHLY PLASTIC (A | | | | 1 - | Ŧ | | | | | | | \top |
| | 132.4 + | 13.3 | 3 | 6 | 7 | | 13 | | | - - | · · · · | | м | | <u>131.7</u> | | , | | | 52.4 | <u>† 93.3</u> † | 23 | 27 | 29 | | | • • • • • • • • • • • • • • • • • • • | . . |
| 130 | Ŧ | | | | | | | | + • • • | | · · · · · | | | /// | - | LIGHT GRAY, ORAN | NGE, GF | RAY, CLAYEY | 50 | - | Ŧ | | | | | | ·/···· | + |
| | 127.4 | 18.3 | | | | <i>i</i> | | | | | | | | | - | COARSE TO FINE SATURATED, MOD | DERATE | | | 47.4 | 98.3 | | | | | | : . | |
| 125 | Ŧ | | WOH | WOH | WOH | • 1 | | | | | | SS-120 |) Sat. | /// | - | (A∹ TRACE | 2-6) Lignite | Ξ | | | ŧ | 13 | 13 | 17 | | • <u>30</u> | · · · · · | |
| | Ŧ | | | | | 1. · · · | | | | | | | | | <u>123.7</u> | | | | | - | Ŧ | | | | | | | |
| | 122.4 + | 23.3 | 2 | 3 | 3 | | | | | - - | | | Sat. | | - | VERY LOOSE TO ME GRAY, SILTY COAF | RSE TO | FINE SAND, | | | Ŧ | | | | | | | |
| 120 | Ŧ | | | | | | | | + • • • | | | | | | - | SATURATED, NO | IN PLAS | TIC (A-2-4) | | - | Ŧ | | | | | | | |
| | 117.4 | 28.3 | | | | | ••• | | | | · · · · · | | | | - | | | | | | Ŧ | | | | | | | |
| 115 | Ŧ | | 1 | 1 | 1 | • 2 | | | | | | | Sat. | | - | | | | | | Ŧ | | | | | | | |
| | Ŧ | | | | | 1 | | | | | · · · · | | | | - | | | | | - | Ŧ | | | | | | | |
| | 112.4 + | 33.3 | 4 | 5 | 4 | 9 | | | | - - | | | Sat. | | - | | | | | | Ŧ | | | | | | | |
| 110 | Ŧ | | | | | | | | + • • • | | | | | | - | | | | | - | Ŧ | | | | | | | |
| | _107.4 | 38.3 | | | |]] | | · · · · · | · · · · · | | · · · · · | | | | - | | | | | | Ŧ | | | | | | | |
| 105 | Ŧ | | 3 | 2 | 2 | • 4 | | | | | | | Sat. | | - | | | | | | Ŧ | | | | | | | |
| | Ŧ | | | | | | | | | | | | | | - | | | | | - | Ŧ | | | | | | | |
| | 102.4 + | 43.3 | 4 | 3 | 3 | 1 | | | | - - | · · · · · | | Sat. | | - | | | | | | Ŧ | | | | | | | |
| 100 | Ŧ | | | | | | | | + • • • | | | | | | _ | | | | | - | Ŧ | | | | | | | |
| | 97.4 | 48.3 | | | | | | | | | | | | | - | | | | | | Ŧ | | | | | | | |
| 95 | Ŧ | | 5 | 6 | 9 | | 15 | | | | | | Sat. | | - | | | | | | Ŧ | | | | | | | |
| | Ŧ | | | | | | . \ | | | | | | | | - | | | | | - | Ŧ | | | | | | | |
| | 92.4 + | 53.3 | 7 | 10 | 16 | | | 26 | | | · · · · · | | Sat. | | - | | | | | | Ŧ | | | | | | | |
| 90 | Ŧ | | | | | | | | + • • • | | | | | | | | | 57.0 | | - | Ŧ | | | | | | | |
| | 87.4 | 58.3 | | _ | 10 | | • / | | | | | | | | - 00.7 | | | COARSE TO | | | Ŧ | | | | | | | |
| 85 | ŧ | | 4 | 5 | 12 | | 6 17 | | | | | | Sat. | | - | FINE SANDY CLAY, S MICA, MODERATE | | ASTIC (A-6) | | | Ŧ | | | | | | | |
| - | Ŧ | | | | | | <u>.</u> | | | | | | | | 84.2 | VERY STIFF, DARK | | | | - | Ŧ | | | | | | | |
| | 82.4 + | 63.3 | 4 | 4 | 11 | | 15 | | | - - | · · · · · | | w | | - 81.2 | WET, TRAĆE MICA - (A- | 4, HIGHI 7-6) | LY PLASTIC | | | Ŧ | | | | | | | |
| 80 | + | . | | | | | <u> </u> | | + • • • | | | | | | - | MEDIUM DENSE GRAY, SILTY COAF | TOVER | TY DENSE, | | - | Ŧ | | | | | | | |
| | | 68.3 | 10 | | | | | · · · · · | | | | | | | - | WET, TRACE MICA | AND LI | GNITE, NON | | | Ŧ | | | | | | | |
| 75 | ŧ | | 12 | 17 | 18 | | | 9 35 | | | | | W | | - | PLASTI | U (A-2-4 |) | | | Ŧ | | | | | | | |
| | _ + | | | | | | | ·/· · · | | | | | | | - | | | | | | Ŧ | | | | | | | |
| | 72.4 + | 73.3 | 10 | 12 | 18 | | | <i>1</i> | | - - | | | w | | - | | | | | | Ŧ | | | | | | | |
| 70 | | | | | | | | <u> </u> | | | | | | | - | | | | | | İ | | | | L | | | |

SHEET 6 OF 11

| ROBESON | | | | GEOLOGIST DEGON, A | . N. | | |
|-------------|---------------|--------|--------|---|-----------|-----------|-------------|
| D) OVER -L- | (I-95) A | ΑT -L- | STA. | 210+00 | | GROUN | ID WTR (ft) |
| OFFSET 19 | 9 ft RT | | | ALIGNMENT -Y2- | | 0 HR. | N/A |
| NORTHING | 345,89 | 99 | | EASTING 2,000,446 | | 24 HR. | 6.9 |
| | DRILL M | ethod | Muc | l Rotary | HAMME | R TYPE | Automatic |
| COMP. DAT | E 05/1 | 4/21 | | SURFACE WATER DEPTI | H N/A | ۱ | |
| | SAMP. | | L O | SOIL AND ROCK | < DESC | RIPTION | |
| 75 100 | NO. | /моі | G | | | | |
| | | | | | | | |
| T | | | | | | | |
| | | | | GRAY, SILTY COAR WET, TRACE MICA | AND LI | GNITE, N | ND, JON |
| | | W | | PLASTIC (A-2- | -4) (con | tinued) | |
| | | | | | | | |
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| · · · · · | | | | | | | |
| | | W | - | NO LIC | GNITE | | |
| | | | - | - | | | |
| | | w | - | 45.9 TRACE | LIGNITI | E | 99.8 |
| | | | | Boring Terminated a COASTAL PLAIN SI | at Elevat | tion 45.9 | ft IN |
| | | | E | CREEK FO | RMATI | ON) | |
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| WBS | 47533 | 3.1.1 | | | Т | IP 1-5987 | | | (ROBESC | | | | GEOLOGIST Q. Esteban | | WBS | 47533 | 3.1.1 | | | TIF | P I-5987 | COUNTY |
|------|---------------|----------------------|----------|---------|-------|--|-------------------|-----------|----------------|-------|-------|----------|---|------------------------|------|--------------|----------|--------|---------|-------|---------------------------------------|----------|
| | | | Brid | qe on - | | | werville Roa | | - (I-95) at -L | | 10+00 | | | GROUND WTR (ft) | | | | Bridae | e on -Y | | R 1529-Powerville Roa | |
| | NG NO. | | | 5 | ` | TATION 2 | | , | OFFSET | | | | ALIGNMENT -Y2- | 0 HR. N/A | | ING NO. | | 0 | | | ATION 29+81 | |
| | AR ELI | | | | | | TH 90.0 ft | | NORTHING | - | 922 | | EASTING 2,000,535 | 24 HR. FIAD | | LAR ELI | | | | | DTAL DEPTH 90.0 ft | |
| | | | | | | CME-55 82% | | | | | | D Mu | · · · | MER TYPE Automatic | | | | | F&R3 | | ME-55 82% 03/01/2019 | |
| | LER D | | | | | | E 12/04/1 | 9 | COMP. DA | | | | SURFACE WATER DEPTH N | | | .LER D | | | | _ | ART DATE 12/04/1 | |
| ELEV | DRIVE ELEV | | | ow co | | | | PER FOOT | | SAMP. | | 1-1 | | · | ELEV | | | 1 | v cou | | 1 | PER FOOT |
| (ft) | ELEV (ft) | (ft) | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 100 | NO. | Имо | O I G | SOIL AND ROCK DES | SCRIPTION DEPTH (ft | (ft) | ELEV (ft) | (ft) | 0.5ft | 0.5ft | 0.5ft | 0 25 | 50 75 |
| | | | | | | | · | · | | | | | | | | | | | | | | |
| 150 | | | | | | | | | | | | | | | 70 | | | | | | Mate | ch Line |
| | - | Ŧ | | | | | | | | | | | | FACE 0.0 | | 69.2 | 78.5 | 10 | 14 | 22 | | |
| | 147.3 | 0.4 | 10 | 9 | 6 | . <u></u> ¶15 | | | | | м | | ROADWAY EMBAN | | | | Ŧ | | | | | |
| 145 | 144.2 | 3.5 | | | | | | | | | | | MEDIUM DENSE, BRC | DWN-GRAY, | 65 | 64.2 | 83.5 | | | | | + |
| | | Ŧ | 4 | 4 | 3 | • 7 • • | | | | SS-30 | 25% | | CLAYEY SILTY FINE TO C MOIST (A-2- | | | | Ŧ | 8 | 17 | 23 | | |
| 140 | | Ŧ | | | | | | | | | | | UNDIVIDED COAST MEDIUM STIFF TO | | 60 | | Ŧ | | | | | |
| | 139.2 | 8.5 | 3 | 4 | 4 | | | | | | М | | GRAY-ORANGE, SILT | TY FINE TO | | 59.2 | 88.5 | 7 | 9 | 10 | · · · · · · · · · · · · · · · · · · · | |
| | - | ŧ | | | | · • • • • • | | | | | | | PLASTIC (A-7 | | | | ŧ | | | | <u> </u> | <u> </u> |
| 135 | 134.2 | 13.5 | | | | | | | · · · · | | | | - | | | - | ŧ | | | | | |
| | | - | 2 | 3 | 3 | 6 | | | | | м | | • | | | | ŧ | | | | | |
| 130 | - | ‡ | | | | <i> </i> | | | | | | | - <u>- 130.7 </u> | <u>17.0</u> | | | ŧ | | | | | |
| 150 | 129.2 | 18.5 | WOH | I WOH | WOH | / · · · · | | | | | Cot. | | - SOFT, ORANGE-GRA COARSE SANDY SIL | LTY CLAY, | | - | ŧ | | | | | |
| | | ‡ | | | | $\left \begin{array}{cccc} \bullet 0 & \cdot & \cdot & \cdot \\ \bullet & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot \end{array} \right $ | | · · · · | | | Sat. | | - SATURATED, MODERAT - (A-7-6) | | | | ŧ | | | | | |
| 125 | | 1 | | | | | · · · · | | | | | | COASTAL PL | AIN22.0 | | - | ‡ | | | | | |
| | 124.2 | 23.5 | 1 | 1 | 3 | · · · · ●4 · · · | | · · · · | | | Sat. | | - LOOSE TO VERY DEM - CLAYEY SILTY FINE TO (| | | | ŧ | | | | | |
| | • | ł | | | | ;::: | | | | | | | - SATURATED, TRACE - (BLACK CREEK FOR | MICA (A-2-4) | | | ł | | | | | |
| 120 | 119.2 | 28.5 | | | | | <u> </u> | <u> </u> | <u> </u> | | | | | | | - | ŧ | | | | | |
| | | Ŧ | 2 | 3 | 2 | €5 | | | | | Sat. | | - | | | | Ŧ | | | | | |
| 115 | - | Ŧ | | | | | | | | | | | - - | | | | Ŧ | | | | | |
| | 114.2 | 33.5 | 9 | 13 | 16 | | 29 | | | 1 | Sat. | | • | | | - | Ŧ | | | | | |
| | | Ŧ | | | | | | | | | | | • • | | | | Ŧ | | | | | |
| 110 | 109.2 | 38.5 | | | | , | / | | · · · · | | | | - | | | - | ŧ | | | | | |
| | | ļ. | 4 | 7 | 10 |] · · · •; · · · ∳1 | 7 | · · · · · | | | Sat. | | • | | | | ŧ | | | | | |
| 105 | - | ŧ | | | | | | | | | | | - | | | - | ŧ | | | | | |
| | 104.2 | 43.5 | 6 | 8 | 11 | | <u> </u> | | | | Set | | - | | | | ŧ | | | | | |
| | - | ‡ | | | | | 19 | | | | Sat. | | | | | | ‡ | | | | | |
| 100 | 00.2 | 48.5 | | | | | | | | | | | - | | | - | ‡ | | | | | |
| | <u>. 35.7</u> | + +0.0 | 5 | 8 | 10 | 1 : : : \ | 18 | · · · · · | · · · · · | | Sat. | | | | | | ‡ | | | | | |
| 95 | - | ‡ | | 1 | | | | · · · · · | | | | | - - | | | | ‡ | | | | | |
| 95 | 94.2 | 53.5 | 10 | 15 | 17 | | \sum | | | | | | _ | | | | ŧ | | | | | |
| ļ | - | ŧ | | | 17 | | 32 | | | | Sat. | | | | | - | ŧ | | | | | |
| 90 | | + | | | | | · · · · · | | | | | | - | | | - | ŧ | | | | | |
| 85 | 89.2 | 58.5 | 18 | 23 | 23 | | | 46 | | | Sat. | | | | | | ŧ | | | | | |
| | • | ł | | | | | | NIII | | | | | | | | | ł | | | | | |
| 85 | 84.2 | 63.5 | | | | | | | | | | | - | | | - | ŧ | | | | | |
| | | Ŧ | 25 | 33 | 34 | | | 6 | 7 | | Sat. | | - | | | | Ŧ | | | | | |
| 80 | - | Ŧ | | 1 | | | | <u> </u> | | | | | - - 80.7 | | | | Ŧ | | | | | |
| | 79.2 | 68.5 | 5 | 8 | 10 | | | | | | м | | - MOIST, TRACE MIC | CA (A-7-6) | | | Ŧ | | | | | |
| | - | Ŧ | | 1 | | | | | | | | | - 75 7 | 70.0 | | . | Ŧ | | | | | |
| 75 | 74.2 | 73.5 | | | |] | <u> </u> | | | | | | | | | - | Ŧ | | | | | |
| | | Ŧ | 11 | 17 | 16 | $\left \left \begin{array}{c} \cdot \cdot \cdot \cdot \cdot \\ \cdot \cdot \cdot \cdot \end{array} \right \right $ | 1 | | | | Sat. | | - SILTY FINE TO COAF - SATURATED, TRACE CI | | | | Ŧ | | | | | |
| 70 | - | ŧ | | | | | | | | | | | (A-2-4) | | | | ŧ | | | | | |
| 10 | _ | L | | 1 | | · · · · · · · · | \ | · · · · · | _ <u> </u> | 1 | - | | | | ı L | I | <u> </u> | | | | | |

SHEET 7 OF 11



| WBS 47533.1.1 | | ROBESON | GEOLOGIST W. Pesl | WBS 47533.1.1 | TIP 1-5987 COUNT | Y ROBESON | GEOLOGIST W. Pesl |
|--|--|---|--|--|---|---------------------|------------------------------|
| | 2- (SR 1529-Powerville Road) over -L- (| | GROUND WTR (ft) | SITE DESCRIPTION Bridge on -Y2- | | | GROUND WTR (ft) |
| BORING NO. Y2 EB2-A | · · · · · · · · · · · · · · · · · · · | , , , | ALIGNMENT -Y2- 0 HR. N/A | BORING NO. Y2 EB2-A | STATION 31+07 | OFFSET 33 ft LT | ALIGNMENT -Y2- 0 HR. N/A |
| COLLAR ELEV. 146.2 ft | | | EASTING 2,000,659 24 HR. 4.2 | COLLAR ELEV. 146.2 ft | TOTAL DEPTH 80.0 ft | NORTHING 345,961 | EASTING 2,000,659 24 HR. 4.2 |
| DRILL RIG/HAMMER EFF./DATE F&R21 | | DRILL METHOD Mud | | DRILL RIG/HAMMER EFF./DATE F&R217 | L | | |
| DRILLER S. Davis | START DATE 12/03/19 C | I | SURFACE WATER DEPTH N/A | DRILLER S. Davis | START DATE 12/03/19 | COMP. DATE 12/03/19 | SURFACE WATER DEPTH N/A |
| ELEV (ft) DRIVE DEPTH BLOW COUN (ft) (ft) 0.5ft 0.5ft 0 | | 5 100 SAMP. V L NO. MOI G I | SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft) | ELEV DRIVE DEPTH BLOW COUNT (ft) (ft) 0.5ft 0.5ft 0.5 | BLOWS PER FOC 5ft 0 25 50 | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 5 100 NO. MOI G 100 NO. MOI G 100 SS-501 18% M 18% M 18% M W SS-502 40% W SS-502 40% W Sst. SS-502 40% W Sst. Sst. Sst. W W Sst. Sst. Sst. W W Sst. | 146.2 GROUND SURFACE 0.0 UNDIVIDED COASTAL PLAIN MEDIUM STIFF TO STIFF, ORANGE-BROWN-GRAY, SILTY FINE TO COARSE SANDY CLAY, MOIST, TRACE ORGANICS, HIGHLY PLASTIC (A-7-6) 12.0 134.2 | (ft) (ft) 0.5ft 0.5ft 0.4 70 | 5ft 0 25 50 | 75 100 NO. MOI G | |
| | 36 | | | | | | |
| | 30 | | 74.2 | | | | |

SHEET 8 OF 11



| | | | | | | | |
|--|--|--|--|---|---|--------------------------------|--|
| WBS 47533.1.2 | | Y ROBESON | GEOLOGIST DEGON, A. N. | WBS 47533.1.2 | | ITY ROBESON | GEOLOGIST DEGON, A. N. |
| SITE DESCRIPTION BRIDGE ON - | | , , , | | SITE DESCRIPTION BRIDGE ON | 1 | , , , | |
| BORING NO. Y2_EB2-B | STATION 30+59 | OFFSET 14 ft RT | ALIGNMENT -Y2- 0 HR. N/A | BORING NO. Y2_EB2-B | STATION 30+59 | OFFSET 14 ft RT | ALIGNMENT -Y2- 0 HR. N/A |
| COLLAR ELEV. 145.7 ft | TOTAL DEPTH 99.8 ft | NORTHING 345,912 | EASTING 2,000,613 24 HR. 6.7 | COLLAR ELEV. 145.7 ft | TOTAL DEPTH 99.8 ft | NORTHING 345,912 | EASTING 2,000,613 24 HR. 6.7 |
| DRILL RIG/HAMMER EFF./DATE TER299 | | DRILL METHOD Mud | Rotary HAMMER TYPE Automatic | DRILL RIG/HAMMER EFF./DATE TER29 | 99 DIEDRICH D-50 79% 12/31/2020 | DRILL METHOD | Mud Rotary HAMMER TYPE Automatic |
| DRILLER TURNAGE, J. R. | START DATE 05/04/21 | COMP. DATE 05/04/21 | SURFACE WATER DEPTH N/A | DRILLER TURNAGE, J. R. | START DATE 05/04/21 | COMP. DATE 05/04/21 | SURFACE WATER DEPTH N/A |
| ELEV (ft) DRIVE ELEV (ft) DEPTH (ft) BLOW COUN 0.5ft 0.5ft 0.5ft 0.5ft | | T SAMP. ▼ L 0 75 100 NO. MOI G | SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft) | ELEV (ft) DRIVE ELEV (ft) DEPTH BLOW COUNT (ft) 0.5ft 0.5ft 0 | | OT SAMP. L 75 100 NO. MOI G | SOIL AND ROCK DESCRIPTION |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | M M M M M M M M M M M M M M | - <u>145.7</u> GROUND SURFACE 0.0 ROADWAY EMBANKMENT PAVEMENT UNDIVIDED COASTAL PLAIN SOFT TO STIFF, BROWN, GRAY, ORANGE, COARSE TO FINE SANDY CLAY, MOIST, MODERATELY PLASTIC (A-6) | $\begin{array}{cccccccccccccccccccccccccccccccccccc$ | Match Line 13 16 11 12 12 14 15 16 | Sat. | MEDIUM DENSE TO DENSE, GRAY, SILTY COARSE TO FINE SAND, SATURATED, NON PLASTIC (A-2-4) (continued) 63.2 VERY STIFF, DARK GRAY, FINE SANDY CLAY, MOIST, TRACE MICA AND LIGNITE, MODERATELY PLASTIC (A-6) 58.7 MEDIUM DENSE, GRAY, CLAYEY SILTY COARSE TO FINE SAND, SATURATED, TRACE MICA, SLIGHTLY PLASTIC (A-2-5) 52.7 DENSE, GRAY, LIGNITE WITH SILTY COARSE TO FINE SAND, SATURATED, 10.7 |
| 127.4 18.3 WOH WOH W 125 122.4 23.3 | | SS-101 W | 129.2 16.5 COASTAL PLAIN VERY LOOSE, LIGHT TO DARK GRAY, CLAYEY COARSE TO FINE SAND, WET, TRACE LIGNITE, SLIGHTLY PLASTIC (A-2-6) (BLACK CREEK FORMATION) 122.7 23.0 | 47.4 98.3 | 21 21 21 21 21 21 21 21 21 21 | | A9.7 NON PLASTIC (A-2-4) 96.0 DENSE, GRAY, SILTY COARSE TO FINE SAND, SATURATED, NON PLASTIC (A-2-4) 99.8 Boring Terminated at Elevation 45.9 ft IN COASTAL PLAIN SILTY SAND (BLACK CREEK FORMATION) |
| 120 120 117.4 28.3 115 115 120 117.4 28.3 1 2 115 1 2 1 2 | | · · · · · · · · · · · · · · · · · · · | LOOSE TO DENSE, GRAY, SILTY COARSE TO FINE SAND, WET TO SATURATED, TRACE CLAY, NON PLASTIC (A-2-4) | | | | |
| 112.4 7 33.3 110 107.4 38.3 107.4 38.3 105 105 105 107.4 38.3 107.4 38.3 105 105 105 105 105 105 105 105 | $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | · · · · · · · · · · · · · · · · · · · | - LIGHT GRAY, TRACE MICA | | | | - - - - - - - - - |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | · · · · · · · · · · · · · · · · · · · | W | - | | | | - - - - - - - - |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 49 | Sat. | - 88.2 | | | | |
| $ \begin{array}{c ccccccccccccccccccccccccccccccccccc$ | · · · · · · · · · · · · · · · · · · · | Sat. | SANDY SILT, SATURATED, NON PLASTIC (A-4) <u>83.7</u> | | | | |
| $\begin{array}{c ccccccccccccccccccccccccccccccccccc$ | 1 4 | Sat. | - 78.7 | | | | |

SHEET 9 OF 11

LABORATORY TESTING SUMMARY

PROJECT NUMBER: 47533.1.2

TIP: I-5987A

COUNTY: ROBESON

DESCRIPTION:

BRIDGE ON - Y2- (SR 1529 - POWERSVILLE ROAD) OVER -L- STA. 210+00

| Sample No. | Station | Alignment | (feet) | Depth Interval (feet) | AASHTO Class. | L.L. | P.I. | % by Weight | | | | % | % Passing (sieves) | | |
|------------|---------|-----------|--------|-----------------------------|------------------|------|------|----------------|-----------|------|------|----------------------|--------------------|-----|----|
| | | | | | | | | Coarse Sand | Fine Sand | Silt | Clay | Retained #4 Sieve | #10 | #40 | #2 |
| SS-119 | 28+91 | -Y2- | 19 RT | 8.3-9.8 | A-7-6(13) | 45 | 32 | 11.9 | 36.5 | 15.8 | 35.8 | 0 | 100 | 97 | 5 |
| SS-120 | 28+91 | -Y2- | 19 RT | 18.3-19.8 | A-2-6(0) | 32 | 16 | 8.4 | 64.5 | 6.0 | 21.1 | 0 | 100 | 98 | 2 |
| SS-101 | 30+59 | -Y2- | 14 RT | 18.3-19.8 | A-2-6(0) | 31 | 11 | 10.2 | 64.9 | 6.1 | 18.8 | 0 | 100 | 95 | 2 |
| | | | | | | | | | | | | | | | |
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NP - NON-PLASTIC

| Sample No. | Station | Alignment | Offset (feet) | Depth Interval (feet) | AASHTO Class. | L.L. | P.I. | | % by V | % | % Passing | | | |
|------------|---------|-----------|------------------|-----------------------------|------------------|------|------|----------------|-----------|------|-----------|----------------------|-----|----|
| | | | | | | | | Coarse Sand | Fine Sand | Silt | Clay | Retained #4 Sieve | #10 | #4 |
| SS-24 | 28+53 | -Y2- | 34 LT | 18.5-20.0 | A-2-4(0) | NP | NP | 16.3 | 62.7 | 8.5 | 12.5 | 0 | 100 | 95 |
| SS-501 | 31+07 | -Y2- | 33 LT | 3.5-5.0 | A-7-6(14) | 50 | 30 | 20.0 | 27.4 | 10.7 | 41.9 | 0 | 100 | 91 |
| ST-100 | 31+03 | -Y2- | 33 LT | 12.0-14.0 | A-6 (11) | 36 | 16 | 4.6 | 25.0 | 38.5 | 31.9 | 0 | 100 | 99 |
| SS-502 | 31+07 | -Y2- | 33 LT | 14.0-15.0 | A-7-5(17) | 54 | 21 | 9.4 | 21.4 | 36.8 | 32.4 | 0 | 100 | 96 |
| SS-30 | 29+81 | -Y2- | CL | 3.5-5.0 | A-7-6(14) | 49 | 28 | 19.4 | 23.8 | 16.1 | 40.7 | 0 | 100 | 90 |
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Certified Lab Technician Signature

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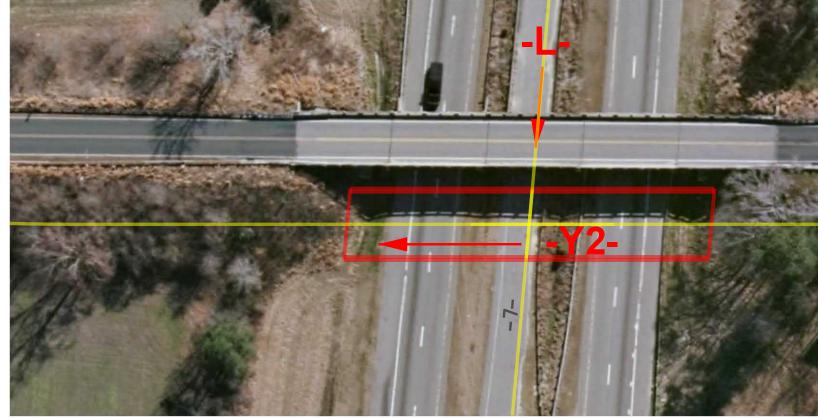
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SITE PHOTOGRAPHS

SITE 1 - BRIDGE ON -Y2- (SR 1529 - POWERSVILLE ROAD) OVER -L- (I-95) AT STA. 210+00



NORTH OF BRIDGE ON -L- LOOKING SOUTH FROM EB2 (LEFT) TOWARD EB1 (RIGHT)



LOOKING SOUTH ON -L- AT BRIDGE (EB2 ON LEFT EB1 ON RIGHT)

| | PROJECT | REFERENCE | <i>i NO</i> . | SHEET | NO. |
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