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CONTENTS

DESCRIPTION

LEGEND (SOIL & ROCK)

& CORE PHOTOGRAPHS

SOIL TEST RESULTS SITE PHOTOGRAPHS

SUPPLEMENTAL LEGEND (GSI)

BORE LOGS, CORE REPORTS

TITLE SHEET

SITE PLAN CROSS SECTION(S)

SHEET NO.

2A

4-8

9-20

21

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY _CABARRUS

PROJECT DESCRIPTION NORFOLK SOUTHERN MAINLINE GRADE CROSSING SEPARATION AT ROGERS LAKE ROAD (CROSSING NO. 724408Y) IN KANNAPOLIS

SITE DESCRIPTION BRIDGE NO. 120407 ON ROGERS LAKE ROAD (31+94.08 -L-) OVER US 29A (SOUTH MAIN STREET), NCRR (NS) AND SOUTH RIDGE AVENUE BETWEEN LOWRANCE AVENUE AND MEADOW AVENUE

STATE PROJECT REFERENCE NO. Y-4810K

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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 NSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1999 707-6550. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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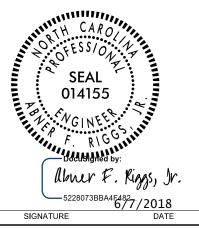
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Prepared in the Office of: Consulting Engineers and Scientists



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Y-4810K 2

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 | <u>UNIFORMLY GRADED</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <u>GAP-GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES. | 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: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH | ANGULARITY OF GRAINS | 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. |
| AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, | THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: | 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 SOIL LEGEND AND AASHTO CLASSIFICATION | ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED. | WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > ROCK (WR) 100 BLOWS PER FOOT IF TESTED. | A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT |
| CEMERAL CRANIII AR MATERIALS STIT-CLAY MATERIALS | MINERALOGICAL COMPOSITION | FINE TO COARSE CRAIN IGNEOUS AND METAMORPHIC ROCK THAT | WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND |
| CLASS. (≤35% PASSING *200) (>35% PASSING *200) UNGANIC MATERIALS | MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. | CRYSTALLINE ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, ONE ISS, CABBRO, SCHIST, ETC. | SURFACE. |
| CROUP 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-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-2-6 A-2-7 A-3 A-6, A-7 | COMPRESSIBILITY | NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN | CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. |
| 000000000000000000000000000000000000000 | SLIGHTLY COMPRESSIBLE LL < 31 | ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. | COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. |
| SYMBOL COORDING COORD | MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50 | COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED | 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. |
| #10 50 MX GRANULAR SIL1- | PERCENTAGE OF MATERIAL | (CP) SHELL BEDS, ETC. WEATHERING | DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT |
| *40 30 MX 50 MX 51 MN 5 MN 35 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN | GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL | FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER | ROCKS OR CUTS MASSIVE ROCK. |
| MATERIAL | TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% | HAMMER IF CRYSTALLINE. | DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. |
| PASSING *40 | 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, (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 18 MX 18 MX 11 MN 11 MN 18 MX 18 MX 11 MN 11 MN 1 MN MX 18 MX 11 MN 11 MN MODERATE ORGANIC | 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 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 (SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR | FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. |
| OF MATOR GRAVEL AND 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 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 EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE | <u> </u> | (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED | PARENT MATERIAL. 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 | WITH FRESH ROCK. | FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE |
| CONSISTENCY OR DENSENESS | MISCELLANEOUS SYMBOLS | MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH | FIELD. |
| COMPACTNIESS OF RANGE OF STANDARD RANGE OF UNCONFINED | TT 25,425 | (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 CONSISTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH (N-VALUE) (TONS/FT ²) | ROADWAY EMBANKMENT (RE) 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. |
| GENERALLY VERY LOOSE < 4 | SOIL SYMBOL SPET DATE TEST BORING SLOPE INDICATOR INSTALLATION | (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. |
| GRANULAR LUUSE 4 10 10 MC N/A | I M | TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. 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 AUGER BORING CONE PENETROMETER THAN ROADWAY EMBANKMENT AUGER BORING TEST | 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 VERY SOFT < 2 | INFERRED SOIL BOUNDARY CORE BORING SOUNDING ROD | SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK (V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR | PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. |
| GENERALLY SOFT 2 TO 4 0.25 TO 0.5 | MM - TECT DODING | 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 | MUNITURING 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 (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF |
| (COHESIVE) VERY STIFF 15 TO 30 2 TO 4 HARD > 30 > 4 | TTTT ALLUVIAL SOIL BOUNDARY A PIEZOMETER INSTALLATION - 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. |
| TEXTURE OR GRAIN SIZE | RECOMMENDATION SYMBOLS | ROCK HARDNESS | SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT |
| U.S. STD. SIEVE SIZE 4 10 40 60 200 270 | UNCLASSIFIED EXCAVATION - | VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. | ROCK. 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 |
| BOULDER COBBLE GRAVEL SAND SAND SILT CLAY | SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL | TO DETACH HAND SPECIMEN. | THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT |
| (BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.) | ABBREVIATIONS | MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE 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 A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL |
| SIZE IN. 12 3 | BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY 7 - UNIT WEIGHT | MEDIUM CAN BE GROOVED OR GOUGED 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 | 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 7 _d - DRY UNIT WEIGHT CSE COARSE ORG ORGANIC | 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 (ATTERBERG LIMITS) DESCRIPTION | DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS | 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 | STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. |
| - SATURATED - USUALLY LIQUID; VERY WET, USUALLY | DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON | PIECES CAN BE BROKEN BY FINGER PRESSURE. | STRATA ROCK QUALITY DESIGNATION (SRQD) - 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 | VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH 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 SEMISOLIDA PEDILIPES DRVING TO | FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK FRACT - FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL | FINGERNAIL. | TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. |
| RANGE - WEI - (W) ATTAIN OPTIMUM MOISTURE | FRAGS FRAGMENTS | FRACTURE SPACING BEDDING | BENCH MARK: SEE IN NOTES BELOW |
| | EQUIPMENT USED ON SUBJECT PROJECT | TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET | ELEVATION: FEET |
| OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE | DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: | WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET | |
| SL SHRINKAGE LIMIT | CME-45C CLAY BITS X AUTOMATIC MANUAL | CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET | NOTES: |
| - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE | 6' CONTINUOUS FLIGHT AUGER CORE SIZE: | VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET | FIAD - FILLED IMMEDIATELY AFTER DRILLING |
| PLASTICITY | CME-55 CORE SIZE: B*HOLLOW AUGERS -B X NO3 | INDURATION | BM1 BL-16; N=632,336.284, E=1,517,071.554 STA. 46+08.63 -BL- ELEVATION 781.49' |
| PLASTICITY INDEX (PI) DRY STRENGTH | CME-550 HARD FACED FINGER BITS X NO2 | FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. | BM2 BY6-33; N=632,269.19, E=1,516,332.23 |
| NON PLASTIC 0-5 VERY LOW | TUNGCARBIDE INSERTS | RUBBING WITH FINGER FREES NUMEROUS GRAINS; FRIABLE GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. | STA. 10+62.91 -Y6- ELEVATION 773.36' |
| SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM | VANE SHEAR TEST X CASING W/ ADVANCER HAND TOOLS: POST HOLE DIGGER | CRAINC CAN BE SERARATED FROM CAMPLE WITH STEEL PROBE. | |
| HIGHLY PLASTIC 26 OR MORE HIGH | X ACKER (TER92-0) X TRICONE 215/6 STEEL TEETH HAND AUGER | MODERATELY INDURATED MODERATELY INDURATED BREAKS EASILY WHEN HIT WITH HAMMER. | |
| COLOR | TRICONE 'TUNG,-CARB, COUNDING POR | INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; | |
| DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). | X D-50 (TER373) X CORE BIT SUGNITION AND VANE SHEAR TEST | DIFFICULT TO BREAK WITH HAMMER. | |
| MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE. | X CME-550X (HF00072) | EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS. | DATE: 8-15-1- |
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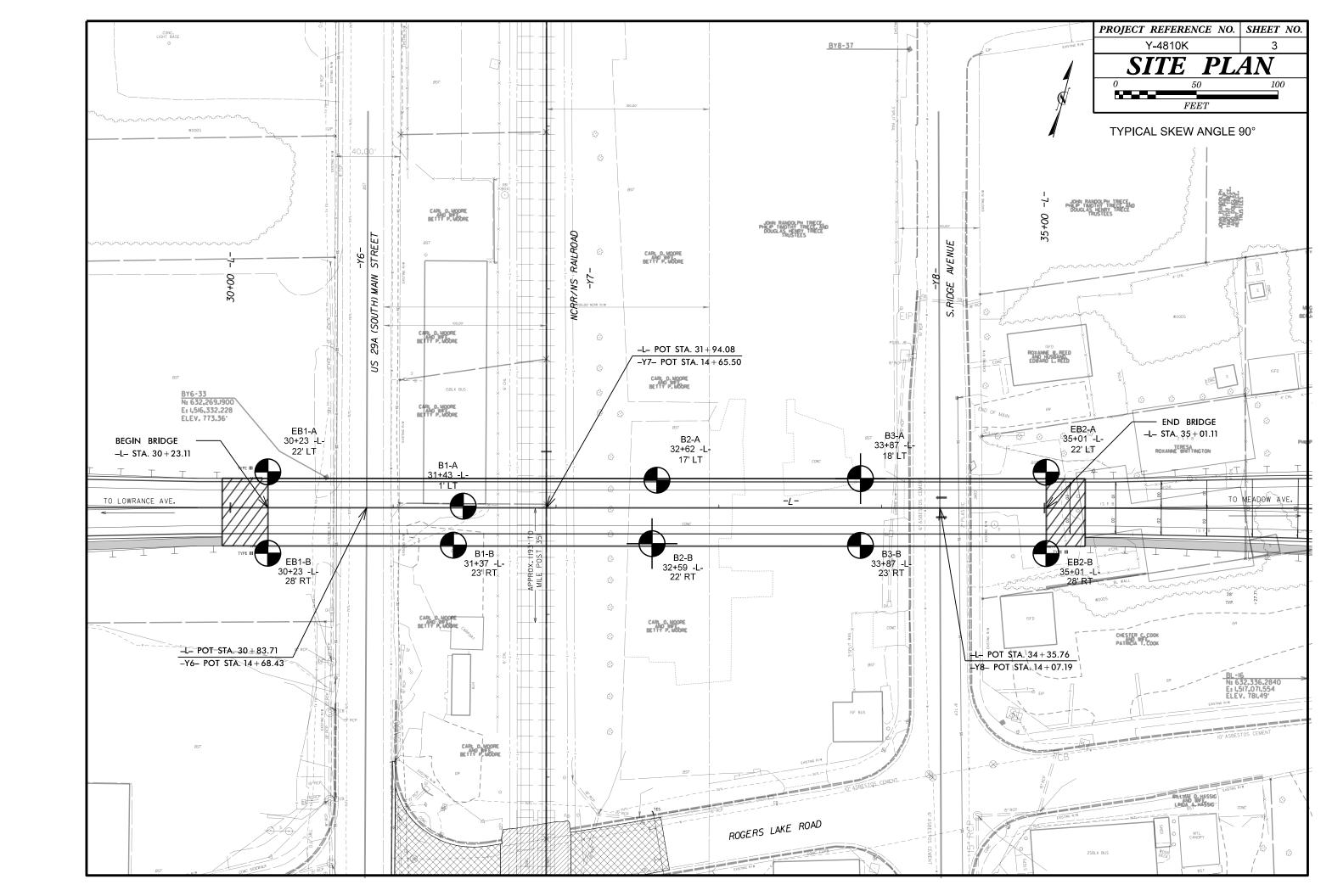
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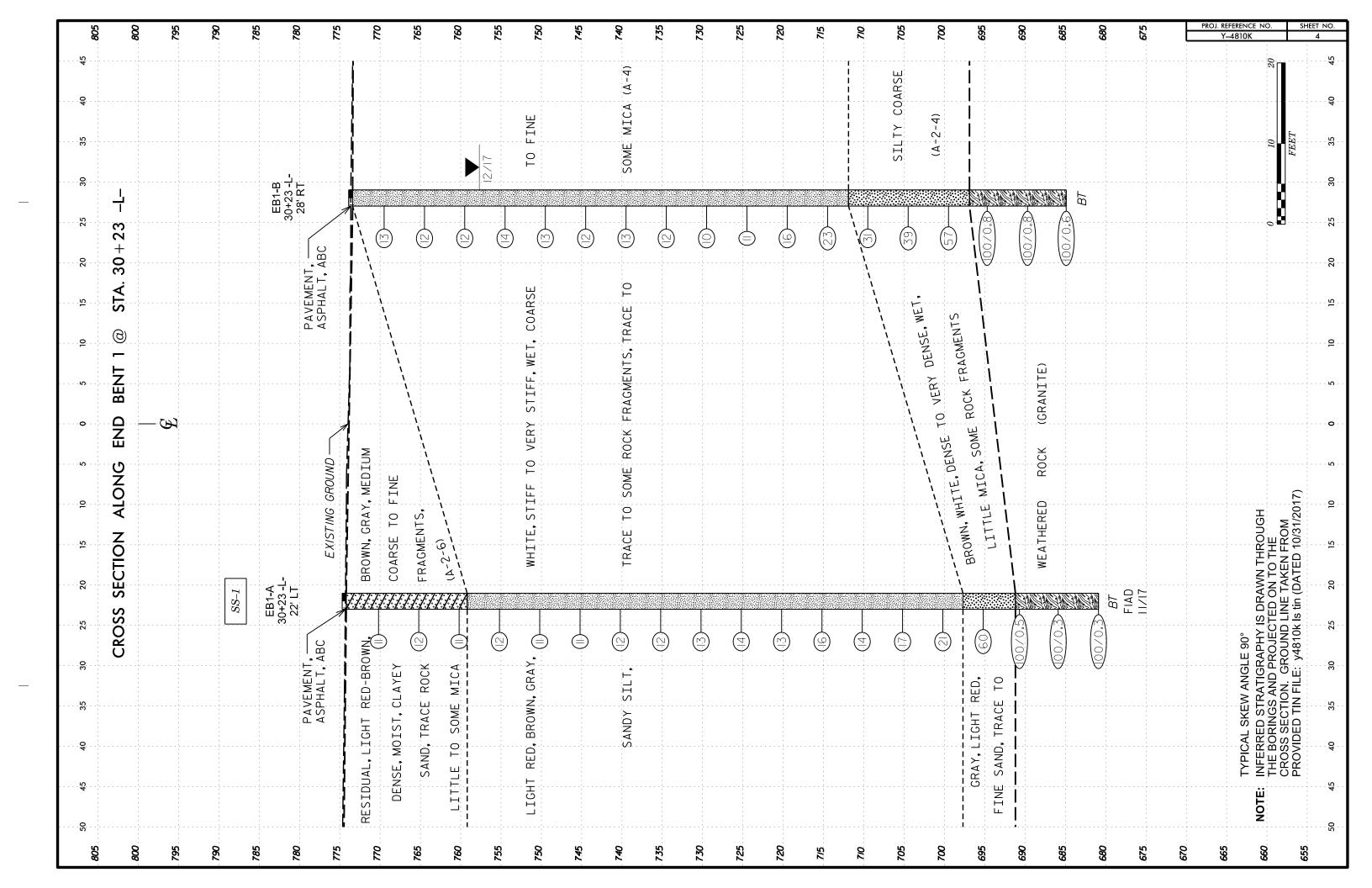
SUBSURFACE INVESTIGATION

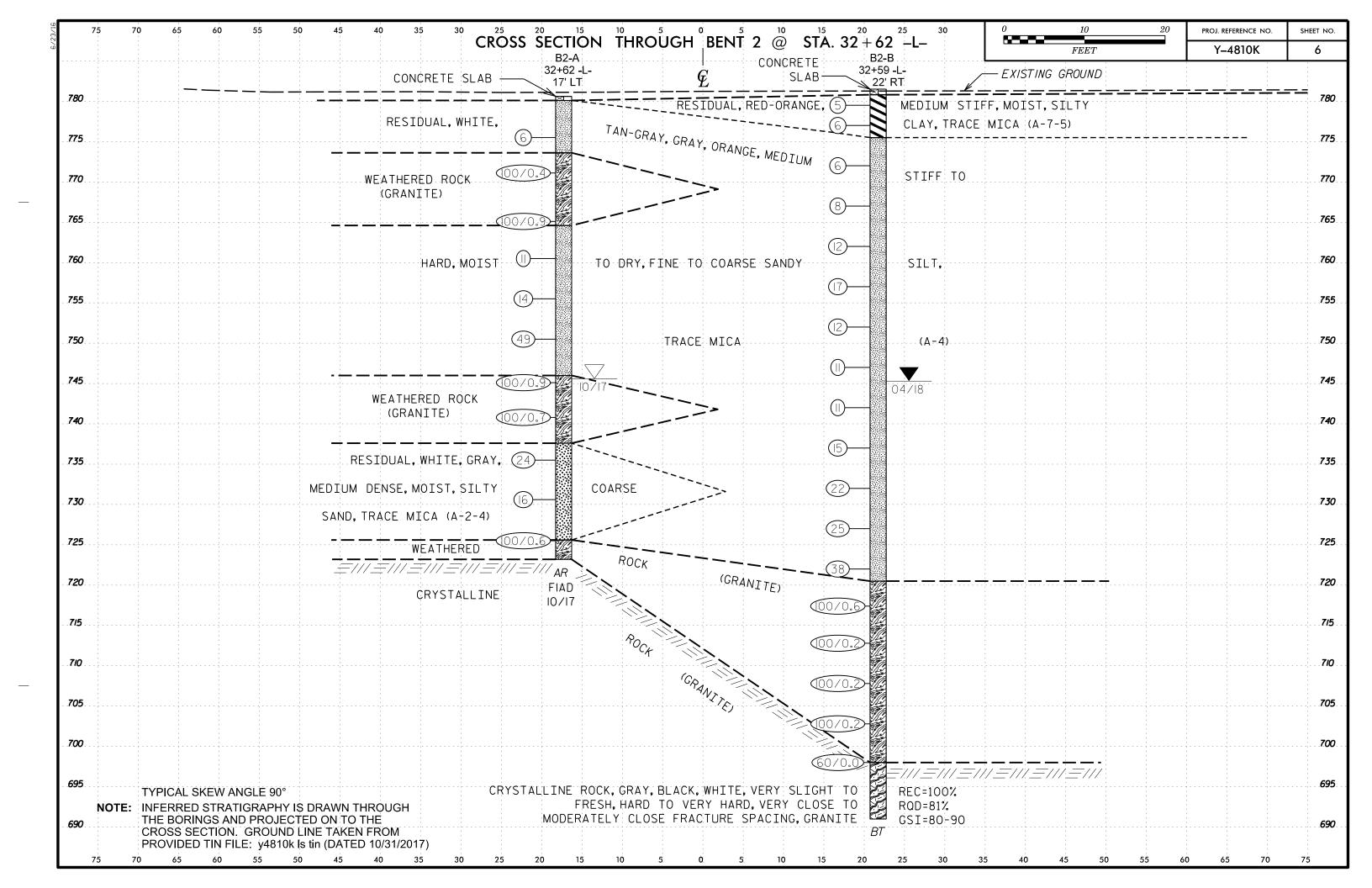
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES FROM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS

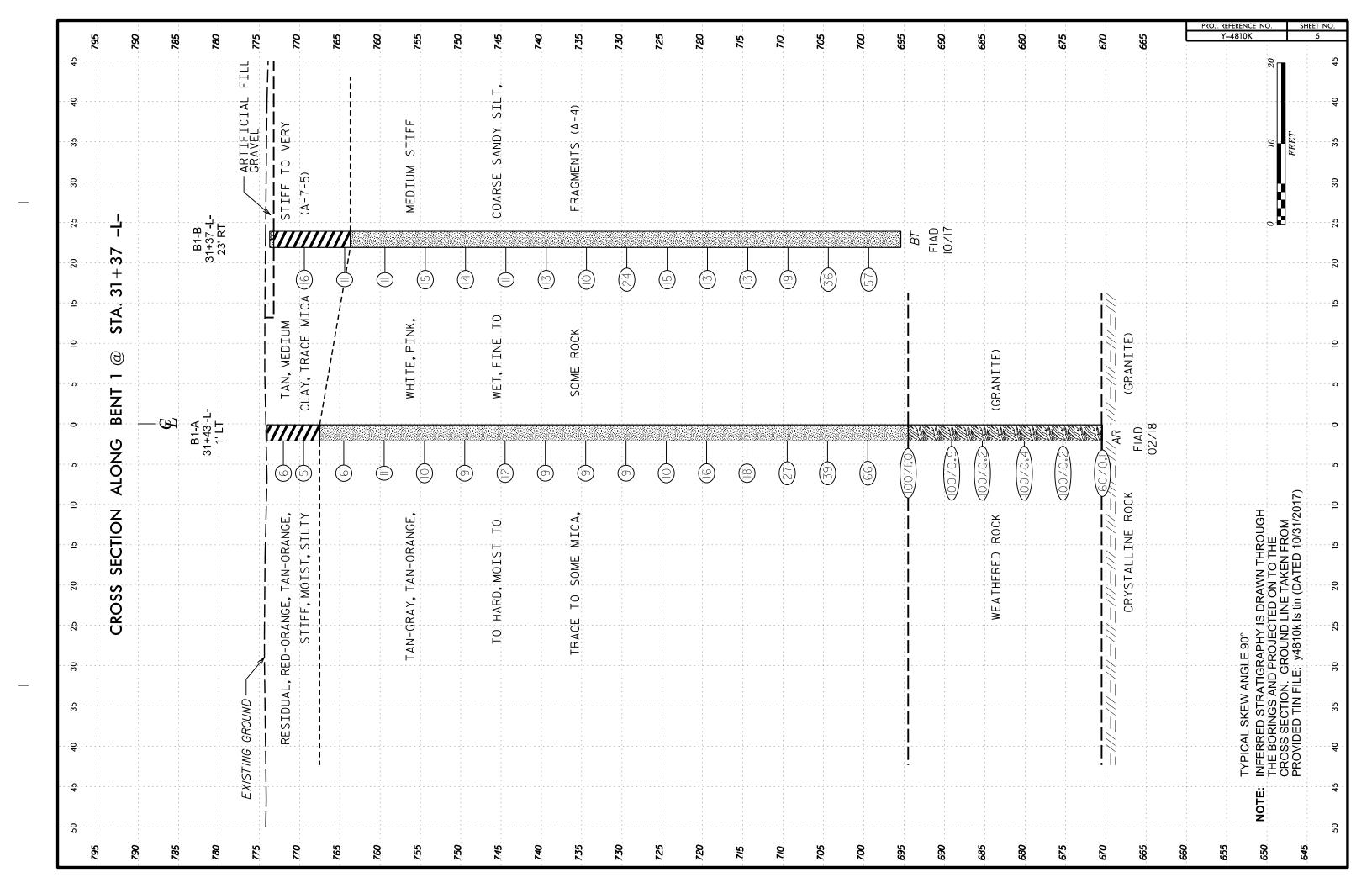
AASHTO LRFD Figure 10.4.6.4-2 — Determination of GSI for Tectonically Deformed Heterogeneous Rock Masses (Marinos and Hoek, 2000) AASHTO LRFD Figure 10.4.6.4-1 — Determination of GSI for Jointed Rock Mass (Marinos and Hoek, 2000)

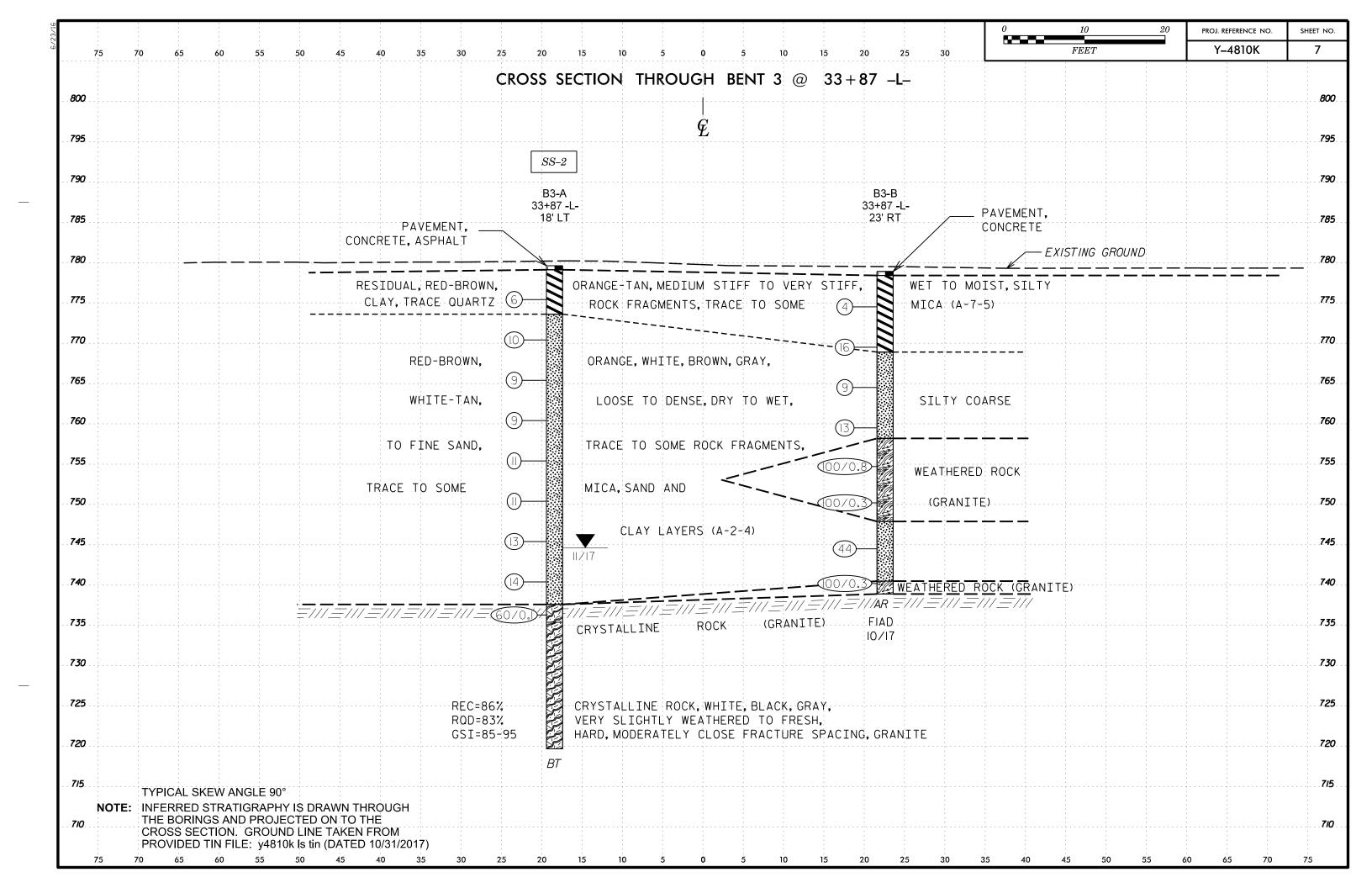
| HASTIO ETTE I I I BE LET III I BE LET III I I GOT TO COTTO | a nock Mass (Marinos and noek, שששט) | HH3H10 ENTU Figure 10.4.0.4-2 — Determination of USI for Fectorically Deformed neterogeneous nock Masses (Marinos and nock, 2006) |
|--|--|--|
| GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise, Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis. | esh unweathered surfaces weathered, iron stained ces iighly weathered surfaces coatings or fillings | GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000) From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis. |
| STRUCTURE | DECREASING SURFACE QUALITY | COMPOSITION AND STRUCTURE |
| INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities | 90 N/A N | A. Thick bedded, very blocky sandstone The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass, in shallow tunnels or slopes these bedding planes may cause structurally controlled instability. 70 A. Thick bedded, very blocky sandstone The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass, in shallow tunnels or slopes these bedding planes may cause structurally controlled instability. |
| BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets | 70 60 | B. Sand- stone with thin inter- C. Sand- stone and siltstone with sand- with |
| VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets | S O O O O O O O O O O O O O O O O O O O | stone with thin inter-layers of siltstone amounts amounts amounts along the siltstone or clayer shale with sandstone layers amounts amounts amounts amounts along the siltstone or clayer shale with sandstone layers |
| BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity | | C.O. E. and G - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to F and H. F. Tectonically deformed, intensively folded/faulted, shared clayey shale or siltstone with broken and deformed sandstone layers forming an almost chaotic structure |
| DISINTEGRATED - poorly inter- locked, heavily broken rock mass with mixture of angular and rounded rock pieces | DECREASING 30 20 | G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers H. Tectonically deformed silty or clayey shale with pockets of chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces. |
| LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes | V N/A N/A | Means deformation after tectonic disturbance □ Means deformation after tectonic disturbance |













| | ılting Enç | | nd Sci | entists | | | | ORE L | | | T | |
|--------------|-----------------------|----------------|--------------|---------|--------|---|-------------------|---------------------|-----------|----------------------|--------------------------------------|----------------------|
| | 40325 | | | | | P Y-4810K | | Y CABARR | | | GEOLOGIST SCHLEMM, | |
| | | | | GE N | | | S LAKE ROAD | | | AND SO | UTH RIDGE AVENUE | GROUND WTR (fi |
| BOR | NG NO. | . EB1-/ | 4 | | S | TATION 30+23 | | OFFSET | 22 ft LT | | ALIGNMENT -L- | 0 HR. N/A |
| COLI | AR ELI | EV . 77 | '4.7 ft | | T | OTAL DEPTH 9 | 3.8 ft | NORTHING | 632,264 | | EASTING 1,516,297 | 24 HR. FIAD |
| DRILL | RIG/HAN | MER EF | F./DATI | E TER | 373 DI | EDRICH D-50 99% | 03/09/2017 | | DRILL MET | HOD Mu | d Rotary H | AMMER TYPE Automatic |
| DRIL | LER T | URNAG | E, J. F | ₹. | S | TART DATE 11. | /29/17 | COMP. DA | TE 11/30, | /17 | SURFACE WATER DEPTH | I N/A |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLC 0.5ft | W COL | | BLC 0 25 | WS PER FOOT 50 | Γ 7 <u>5</u> 100 | SAMP. | MOI G | SOIL AND ROCK | |
| | (11) | | o.c.x | 0.0.1 | 0.0.1 | 1 | T | 1 | 1 10. | MOI G | ELEV. (ft) | DEPTH (|
| | | | | | | | | | | | | |
| 775 | | <u> </u> | | | | | | | | | _774.7 PAVEMENT -774.2 PAVEM | MENT / |
| | | <u> </u> | | | | ::::::::: | | | | | O.1' ASPHALT AND RESID | |
| 770 | 771.2 | 3.5 | 5 | 5 | 6 | 11 | | | | м | LIGHT RED-BROW | N, BROWN AND |
| | - | <u> </u> | | | | ::::::::: | | | | | GRAY, CLAYEY COAF | MENTS, LITTLE TO |
| | 766.2 | 8.5 | | | | : : :: : : | | | | | SOME | MICA |
| 765 | - | + | 5 | 5 | 7 | 12- | | | | M | _ | |
| | - | Ŧ | | | | ::::::::::::::::::::::::::::::::::::: | | | | | • | |
| 760 | 761.2 | 13.5 | 4 | 5 | 6 | | | | SS-1 | М | • | |
| | - | Ŧ | | | | | | | | | | VN. GRAY. AND — — 15 |
| | 756.2 | 18.5 | | | | :: ::: ::: | | | | | WHITE, COARSE TO TRACE TO SOME RO | FINE SANDY SILT, |
| 755 | -750.2 | - " | 4 | 5 | 7 | 12 <u>-</u> | | | | м | LITTLE | MICA |
| | - | ‡ | | | | ::::::::::::::::::::::::::::::::::::: | | | | | • | |
| | 751.2 | 23.5 | 3 | - | 6 | ::::::::: | | | | | • | |
| 750 | _ | ł | 3 | 5 | 6 | 11 | | | | М | - | |
| | - | ł | | | | ::::::::: | | | | | • | |
| 745 | 746.2 | 28.5 | 4 | 5 | 6 | 1 | | | | м | • | |
| | - | F | | | | 1 | | | | | - · | |
| | 741.2 | 33.5 | | | | | | | | | • | |
| 740 | | | 3 | 5 | 7 | 12- | | | | м | · - | |
| | - | ‡ | | | | : : : : : : | | | | | • | |
| 725 | 736.2 | 38.5 | 3 | 5 | 7 | | | | | 🔯 | • | |
| 735 | - | ‡ | | | , | 12- | | | | М | - · | |
| | | <u> </u> | | | | ::: :: :: | | | | | | |
| 730 | 731.2 | 43.5 | 4 | 5 | 8 | 13- | | | | w 🖺 | - | |
| | - | <u> </u> | | | | ::\:: :: | | | | | • | |
| | 726.2 | 48.5 | | | | | | | | | • | |
| 725 | _ | - | 4 | 6 | 8 | 14 | | | | w 🔛 | - | |
| | - | Ŧ | | | | :: :: :: | | | | | • | |
| 720 | 721.2 | 53.5 | 5 | 6 | 7 | | | | | w | • | |
| 720 | - | ‡ | | | | 13- | | | | " 🗱 | - · | |
| | 716.2 | 58.5 | | | | :: :: :: | | | | | • | |
| 715 | | 30.5 | 10 | 8 | 8 | 16 | | | | w | - | |
| | - | ‡ | | | | :: : :: | | | | | • | |
| _,_ | 711.2 | 63.5 | F | 6 | 0 | ::::::::::::::::::::::::::::::::::::: | | | | | | |
| 710 | _ | <u> </u> | 5 | 6 | 8 | 14 | | | | W | _ | |
| | - | <u> </u> | | | | \ . | | | | | | |
| 705 | 706.2 | 68.5 | 5 | 7 | 10 | 1 | | | | w | | |
| | - | F | | | | | | | | | - · | |
| | 701.2 | 73.5 | | | | :::; ::: | | | | | • | |
| 700 | | <u> </u> | 8 | 10 | 11 | 21 | | | | w 🔯 | • - | |
| | - | ‡ | | | | :::: >: | <u> </u> | | | | . <u>69</u> 7 <u>.7</u> | |
| | 696.2 | 78.5 | 10 | | 2. | :::: :: | | | | | | |
| 695 | | L | 16 | 26 | 34 | ш | 60_ | | | w <u> ::: </u> | | |



Terracon GEOTECHNICAL BORING REPORT

SHEET 9 OF 22

| | 40325 | | | | TI | IP | Y-4810K | | | Y CABARE | | | | GEOLOGIST SCHLEM | M.T.S | | |
|------------|--------------|---------------------|---------|---------|----|----|-----------|---------|--------|--------------------|----------|--------|------------|-------------------------------|---------|----------|------------|
| | | | I BRIC | GF N | | | | | | | | RR AN | D SO | UTH RIDGE AVENUE | , 1. 0 | 1 | D WTR (f |
| | NG NO. | | | . UL IV | | | TION 30- | | NOAL | OFFSET | | | | ALIGNMENT -L- | | 0 HR. | N/A |
| | AR ELE | | | | | | TAL DEPTI | | | NORTHIN | | 64 | | EASTING 1,516,297 | | 24 HR. | FIAI |
| | | | | TER | | | RICH D-50 | | | NORTHIN | | | D Mi | id Rotary | НАММ | ER TYPE | |
| | LER TU | | | | | | RT DATE | | | COMP. DA | | | D IVIO | SURFACE WATER DEF | | | ratoriatio |
| EV | ם איר | DEPTH | | w co | | П | INI DAIL | BLOWS F | | | SAMP | | 11 | OOK! AGE WATER DEI | 111 14/ | | |
| ft) | ELEV (ft) | (ft) | 0.5ft | 0.5ft | | | 0 2 | | 50 | 7 ₅ 100 | | MO | O G | SOIL AND RO | CK DES | CRIPTION | DEPTH |
| | () | | | | | Ħ | | | | | | 1 1110 | | LLL V. (II) | | | DEI III |
| 95_ | | | | | | | | Matc | h Line | | | | | | | | |
| - | | | | | | TI | | | | | | Γ | | WHITE, BROWN A COARSE TO FINE | | | |
| | 691.2 | - 83.5 | | | | | | | | | | | | FRAGMENTS, TR | | | |
| 90 | | - | 100/0.5 | | | - | | | | 100/0.5 | • | | | WEATHI (BROWN, GRAY A | | | ITF) |
| | 1 | - | | | | | | | | | | | | - | | , | , |
| 85 85 | 686.2 | 88.5 | 100/0.3 | | | | | | | 100/0.3 | | | | - - | | | |
| 00 | _ | - | | | | | | | | | <u> </u> | | | - | | | |
| | 004.0 | - 93.5 | | | | | | | | | | | | <u>.</u> | | | |
| ŀ | 681.2 | _ 93.5 _ | 100/0.3 | | | Н | | | L | 100/0.3 | • | 1 | THE S | Boring Terminated | | | ft IN |
| | | - | | | | | | | | | | | | - WEATHERED - | ROCK (| GRANITE) | |
| | | - | | | | | | | | | | | | - - | | | |
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| Cons | ulting En | gineers a | and Sci | entists | | | | <u>B</u> | <u>ORE</u> | : <u>L</u> | OG | | | | | | | |
|---|--------------|-----------|---------|---------|--------|---------------------------------------|------------------|--|------------|------------|----------------|--------|---|----------------|-------------------------------|---------------------------|-----------|------------|
| WBS | 40325 | 5.1.46 | | | TI | P Y-4810 | K | COUNT | Y CABA | RRI | JS | | | GEOLOGI | ST SCHLE | им, т. S | | |
| SITE | DESCR | IPTION | BRI | DGE N | O. 120 | 407 ON R | OGERS LA | KE ROAD | OVER U | JS 2 | 9A, NCF | RR ANI | D SOL | JTH RIDGE | AVENUE | | GROUN | D WTR (ft) |
| BOR | ING NO | . EB1-l | В | | S | TATION 3 | 0+23 | | OFFSE | T 2 | 28 ft RT | | | ALIGNME | NT -L- | | 0 HR. | N/A |
| COL | LAR EL | EV. 77 | '3.9 ft | | T | OTAL DEP | TH 89.0 f | t | NORTH | IING | 632,2 | 15 | | EASTING | 1,516,309 | | 24 HR. | 16.2 |
| DRILL | . RIG/HAN | MER EF | F./DAT | E TER | 373 DI | EDRICH D-5 | 99% 03/09 | | | | DRILL N | METHOD |) Mu | d Rotary | | HAMM | ER TYPE | Automatic |
| DRIL | LER T | URNAG | E. J. F | ₹. | S | TART DAT | E 12/04/1 | 7 | COMP. | DA. | TE 12/0 | 05/17 | | SURFACE | WATER DE | PTH N/ | Α | |
| ELEV | DRIVE | DEPTH | | OW COL | | | | PER FOOT | | | SAMP. | | L | | | | | |
| (ft) | ELEV (ft) | (ft) | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | NO. | МОІ | 0 G | ELEV. (ft) | SOIL AND RO | OCK DES | CRIPTION | DEPTH (f |
| | | | | | | | | | • | | | | | | | | | |
| 775 | | | | | | | | | | | | | | | | | | |
| 10 | - | <u> </u> | | | | | 1 | | | | | | | 773.9 773.4 | | NT SURF | ACE | 0. 0. |
| | | ‡ | | | | | | | | - | | | | 0. | .1' ASPHALT / | AND 0.4' A | BC STON | E |
| 770 | 770.5 | 3.4 | 5 | 6 | 7 | 12 | | | ļ : : : | | | М | | - w | RE HITE, RED-BI | ESIDUAL ROWN, G | RAY, LIGH | łT |
| | | ‡ | | | | 13 | | | | - | | '*' | | RE | D, AND BROWNDY SILT, CO | VN, CÓAI | RSE TO FI | NE |
| 705 | 765.5 | 8.4 | | | | ::¦:: | | | | - | | | | | RACE TO SO SOME RO | ME MICA, | TRACE T | |
| 765 | 700.0 | | 4 | 6 | 6 | 12 | 1 | | + | | | М | | - | SOIVIL RO | UKT NAG | IVILIVI 3 | |
| | | ţ | | | | ::i::: | | | | - | | | | | | | | |
| 760 | 760.5 | 13.4 | 5 | 5 | 7 | | | | | • | | ١ | ₩Ł | _ | | | | |
| | - | + | 3 | | , | . •12. | | | | - | | M | ₩- | | | | | |
| | | Ŧ | | | | : :¦: : | | : : : : | | - | | _ | F | | | | | |
| 755 | 755.5 | 18.4 | 5 | 6 | 8 | 1 | | <u> </u> | + | | | М | ₩F | - | | | | |
| | | ‡ | | | | | | | | - | | | F | | | | | |
| 750 | 750.5 | 23.4 | | | | ::¦:: | | | | | | | # | | | | | |
| 750 | - | <u> </u> | 4 | 6 | 7 | . ●13 | | | <u> </u> | - | | М | # | - | | | | |
| | | ţ | | | | | | | | - | | | Mt. | | | | | |
| 745 | 745.5 | 28.4 | 4 | 5 | 7 | <u> j</u> | | | | • | | l | 鮲 | _ | | | | |
| | - | F | 4 | 3 | , | . •12 | | | | - | | W | F | - | | | | |
| | | Ŧ | | | | ::::::::::::::::::::::::::::::::::::: | | | : : : | - | | | | | | | | |
| 740 | 740.5 | 33.4 | 7 | 6 | 7 | 12 | | | ļ : : : | | | l w | | - | | | | |
| | | ‡ | | | | • 13. | | | | - | | '' | | | | | | |
| | 735.5 | 38.4 | | | | ::¦:: | | | | - | | | | | | | | |
| 735 | 735.5 | 30.4 | 4 | 5 | 7 | . •12 | | | + | _ | | W | | _ | | | | |
| | | ł | | | | : j : : | | | | - | | | æŁ | | | | | |
| 730 | 730.5 | 43.4 | | | | :}:: | | | | | | | F | | | | | |
| | - | Ŧ | 4 | 5 | 5 | • 10 | 1 | 1 | | - | | W | F | - | | | | |
| | | ‡ | | | | :¦:: | | | | - | | | M. | | | | | |
| 725 | 725.5 | 48.4 | 4 | 5 | 6 | <u>: j : :</u> | | | ļ · · · | • | | l w | # | _ | | | | |
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| <u></u> | 720 5 | F 52 4 | | | | / | | | | : | | | Mt. | | | | | |
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| 3 | - | + | | | | : : :/: | - : : : | | | - | | | ₩F | | | | | |
| 715 | 715.5 | 58.4 | | | | <i>[</i> | | | : : : | : | | | | | | | | |
| 20 | - | Ŧ | 10 | 11 | 12 | | 23 | 1 | 1 | - | | W | | - | | | | |
| | : | ‡ | | | | | \:::: | | : : : | : | | | | <u>711.9</u> | 557775 | | | <u> </u> |
| 710 | 710.5 | 63.4 | 20 | 16 | 15 | | <u>'````</u> | : : : : | : : : | | | w | | _ WH | GRAY, LIGHT IITE, SILTY CO | DARSE TO | O FINÉ SA | ND, |
| | | ‡ | | | | :::: | ₹31 | | | : | | " | | LITT | LE MICA, SO | ME ROCK | FRAGME | NTS |
| <u> </u> | 705.5 | <u> </u> | | | | | | | | | | | <u> </u> | | | | | |
| 705 | 705.5 | 68.4 | 14 | 17 | 22 | | 39 | | + | - | | w | | _ | | | | |
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| 700 | 700.5 | 73.4 | | | | :::: | | \: | : : : | : | | | ## | | | | | |
| 5 700 | - | ‡ | 18 | 24 | 33 | | 1 | 57 | 1 | - | | W | | - | | | | |
| | : | ‡ | | | | :::: | | :i <u></u> ; | <u> </u> | | | | | 696.9 | | | | 77. |
| 695 | 695.5 | 78.4 | | | | <u> </u> | | | | | | | | | | | | |



GEOTECHNICAL BORING REPORT BORE LOG

SHEET 10 OF 22

| | ulting Enginee | | u ook | ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | | | | | UKE L | <u>.UG</u> | | | | |
|-------------------|----------------|-------------|--------------|--|---------------|-----|--------------------|-------------|-----------|--------------|--------|-------------|--|---------------------------|
| WBS | 40325.1.4 | -6 | | | Т | ΊP | Y-4810K | COUNT | Y CABARR | US | | | GEOLOGIST SCHLEMM, T. S | i. |
| SITE | DESCRIPT | ION | BRID | GE NO | D. 12 | 040 | 07 ON ROGERS | LAKE ROAD | OVER US 2 | 9A, NCF | RR ANI | D SOL | JTH RIDGE AVENUE | GROUND WTR (ft) |
| BOR | ING NO. E | B1-B | | | S | STA | ATION 30+23 | | OFFSET 2 | 28 ft RT | | | ALIGNMENT -L- | 0 HR. N/A |
| | LAR ELEV. | | 9 ft | | _ | | TAL DEPTH 89. | | NORTHING | | 15 | | EASTING 1,516,309 | 24 HR. 16.2 |
| — | | | | - TED | - 1 | | | | NORTHING | DRILL N | |) M | 1 | IER TYPE Automatic |
| | | | | | $\overline{}$ | | DRICH D-50 99% 03 | | | l | |) IVIU | | |
| DRIL | LER TURN | NAGE | | | | STA | ART DATE 12/0 | | COMP. DA | | | | SURFACE WATER DEPTH N | ′A |
| ELEV (ft) | | PTH_ ft) | BLO 0.5ft | W COL | JNT 0.5ft | | 0 25 | /S PER FOOT | 75 100 | SAMP. NO. | MOI | L O G | SOIL AND ROCK DES | CRIPTION DEPTH (ft) |
| 695 690 | 690.5 + 83 | 3.4 | | 40/0.3 38/0.3 | | + | | latch Line | . 100/0.8 | , | | | WEATHERED R (BROWN AND LIGHT RE (continued) | D, GRANITE) |
| 685 | 685.5 = 88 | 3.4 | 80 | 20/0.1 | | | | | 100/0.6 | - | | | _684.9 Boring Terminated at Eleva WEATHERED ROCK (| 89.0 stion 684.9 ft IN |
| | | | | | | | | | | | | | | |



| Consi | ulting En | gineers a | and Sci | entists | | | В | ORE L | OG | | | | | | |
|-------|--------------|-------------------|---------|---------|--------|--|--|----------------|---------|------------|------------|------------------------------|----------|------------|-----------------|
| WBS | 40325 | 5.1.46 | | | Т | ΓΙΡ Υ-4810Κ | COUNT | Y CABARRU | JS | | | GEOLOGIST Riggs, A | .F. Jr. | | |
| SITE | DESCR | RIPTION | BRI | OGE N | O. 12 | 20407 ON ROGERS LA | KE ROAD | OVER US 29 | A, NCR | RR AN | D SO | UTH RIDGE AVENUE | | GROUN | D WTR (f |
| BOR | ING NO | . B1-A | | | S | STATION 31+43 | | OFFSET 1 | ft LT | | | ALIGNMENT -L- | | 0 HR. | N/ |
| COLI | LAR EL | EV. 77 | 74.0 ft | | Т | FOTAL DEPTH 103.6 | ft | NORTHING | 632,27 | 73 | | EASTING 1,516,418 | | 24 HR. | FIAI |
| DRILL | . RIG/HAN | MMER EF | F./DAT | E TER | 92-0 A | ACKER RENEGADE 95% 02 | 24/2018 | | DRILL M | 1ETHO | D Mu | d Rotary | HAMM | ER TYPE | Automatic |
| DRIL | LER D | ouggins, | W.T. | | S | START DATE 04/26/1 | В | COMP. DAT | E 04/2 | 27/18 | | SURFACE WATER DE | PTH N/ | 'A | |
| ELEV | DRIVE | | 1 | W COL | JNT | BLOWS | PER FOOT | | SAMP. | V / | 11 | | | | - |
| (ft) | ELEV (ft) | (ft) | 0.5ft | 0.5ft | 0.5ft | 0 25 | 50 | 75 100 | NO. | МО | O G | SOIL AND RO | JCK DES | CRIPTION | DEPTH |
| | | | | | | | | | | | | | | | |
| 775 | | | | | | | | | | | | | | | |
| | 773.0 | 1.0 | | | | | | T | | | H | | ND SURF | | |
| | | + | 1 | 3 | 3 | 6 | | 1 1 | | М | | RED-ORANGE A | | SILTY CLA | Α Υ, |
| 770 | 770.5 | 3.5 | 1 | 2 | 3 | 1 | | | | М | | - | ٦. | | |
| | , | ‡ | | | | | | | | | | 767 <u>.5</u> | | | |
| 705 | 765.5 | + + 8.5 | | | | | | | | | | TAN-GRAY, WHI COARSE SAND | TE AND F | PINK, FINE | TO |
| 765 | 705.5 | † " | 2 | 2 | 4 | 6 | | | | М | | - | / | TO TOLIVIO | 7. |
| | | ŧ | | | | | | | | | | | | | |
| 760 | 760.5 | 13.5 | | | |] ' | | | | | | | | | |
| | - | Ŧ | 3 | 5 | 6 | . ∳11 | | | | M | F | - | | | |
| | | ‡ | | | | | | | | | | | | | |
| 755 | 755.5 | 18.5 | 3 | 5 | 5 | - · <u> · · · · · · ·</u> | | | | M | | - | | | |
| | | ‡ | | | | 1 . • 10 | | | | ''' | | | | | |
| | 7505 | 1 | | | | | | | | | | | | | |
| 750 | /50.5_ | 23.5 | 4 | 4 | 5 | | ļ | <u> </u> | | М | - | _ | | | |
| | , | Ŧ | | | | :(::::::::::::::::::::::::::::::::::: | | | | | | | | | |
| 745 | 745.5 | † † 28.5 | | | | | | | | | | | | | |
| 743 | _ | ‡ `` | 3 | 5 | 7 | 12 | : : : : | | | М | | - | | | |
| | | ‡ | | | | $ \cdot \cdot \cdot \cdot$ | | | | | | | | | |
| 740 | 740.5 | 33.5 | 2 | 4 | 5 | _ | | | | ١ | | _ | | | |
| | | † | | | 3 | . • 9 | | | | M | | | | | |
| | | Ŧ | | | | | : : : : | | | | F | | | | |
| 735 | 735.5 | 38.5 | 2 | 4 | 5 | | | | | М | | - - | | | |
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| | 730.5 | + + 43.5 | | | | | | | | | | | | | |
| 730 | 750.5 | 1 73.3 | 3 | 3 | 6 | - • • • • • • • • • • • • • • • • • • • | | | | М | | = | | | |
| | | † | | | | - | | | | | | | | | |
| 725 | 725.5 | T 48.5 | | | |] :;;:: :::: | : : : : | | | | | | | | |
| | | Ŧ | 3 | 4 | 6 | . •10 | | | | M | | - | | | |
| | | ‡ | | | | | | | | | | | | | |
| 720 | 720.5 | 53.5 | 4 | 7 | 9 | - · · · · · · · · · · · · · · · · · · | | | | М | | - | | | |
| | | ‡ | | | | 1 16 | | | | ''' | | | | | |
| | 745.5 | <u> </u> | | | | : : : : : : : : : | | | | | | | | | |
| 715 | 715.5 | 58.5 | 5 | 7 | 11 | 18 | <u> </u> | | | М | | _ | | | |
| | | Ŧ | | | | | : : : : | | | | | | | | |
| 710 | 710.5 | † = 63.5 | | | |] :::::\ ::::: | : : : : | | | | | | | | |
| , 10 | - | ‡ | 7 | 11 | 16 | 27 | | 1 | | М | | - · | | | |
| | | ‡ | | | | | | | | | | | | | |
| 705 | 705.5 | 68.5 | 12 | 17 | 22 | | | | | N.4 | | - | | | |
| | | <u> </u> | 12 | " | | 39 | | | | M | | - | | | |
| | ; | <u> </u> | | | | | \. · · · · | | | | | | | | |
| 700 | 700.5 | † 73.5 † | 21 | 30 | 36 | | 1 | 6 | | М | | <u></u> | | | |
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| | 695.5 | † _{79 5} | | | | | | | | | | | | | |
| 695 | 090.5 | T 10.5 | t | | | 11 | L | | | | RANK N | | | | |



Terracon GEOTECHNICAL BORING REPORT BORE LOG

SHEET 11 OF 22

| Consi | ulting En | gineers | and Sci | entists | | | | В | ORE L | OG | | | | | | |
|-------|---------------|----------------|---------------|---------|-----------|------------------|-----------------|--------------|-----------|----------------|------------|-------------------|---|-------------------|----------------|------------------|
| WBS | 4032 | 5.1.46 | | | TI | P Y-4810h | (| COUNT | Y CABARR | US | | | GEOLOGIST Riggs, A. | F. Jr. | | |
| SITE | DESCR | IPTION | I BRID | OGE N | O. 120 | 407 ON RC | GERS LAI | KE ROAD | OVER US 2 | 9A, NCF | RR AN | D SC | OUTH RIDGE AVENUE | | GROUI | ND WTR (ft) |
| BOR | ING NO | . B1-A | | | S | TATION 3 | 1+43 | | OFFSET | 1 ft LT | | | ALIGNMENT -L- | | 0 HR. | N/A |
| COL | LAR EL | EV . 77 | 74.0 ft | | TO | OTAL DEPT | TH 103.6 | ft | NORTHING | 632,2 | 73 | | EASTING 1,516,418 | | 24 HR. | FIAD |
| DRILL | RIG/HAM | MER E | F./DAT | E TER | R92-0 AC | CKER RENEG | ADE 95% 02/ | /24/2018 | | DRILL N | 1ETHOI | D Mu | ud Rotary | HAMM | ER TYPE | Automatic |
| DRIL | LER D | | , W.T. | | S | TART DATE | E 04/26/1 | 8 | COMP. DA | TE 04/ | 27/18 | | SURFACE WATER DEF | TH N/ | A | |
| ELEV | DRIVE ELEV | DEPTH | BLC | w co | UNT | | | PER FOOT | | SAMP. | lacksquare | | SOIL AND RO | CK DES | CRIPTION | J |
| (ft) | (ft) | (ft) | 0.5ft | 0.5ft | 0.5ft | 0 2 | 25 ! | 50 | 75 100 | NO. | MO | | ELEV. (ft) | | | DEPTH (ft) |
| | | | | | | | | | | | | | | | | |
| 695 | | <u> </u> | <u></u> - | 45 | <u></u> - | | Matc | h Line | | . | Ьм- | 200000 | 694.5 | | | 79.5 |
| | | ‡ | 20 | ~~ | 33 | | | | 100/1.0 | | " | | - 694.5 WEATH - (TAN-GRAY, WHIT | | | |
| 690 | 690.5 | † - 83.5 | | | | | | | | | | | - - | | | • |
| 030 | - | ‡ | 26 | 48 | 52/0.4 | | | 1 : : : : | 100/0.9 | , | | | - - | | | |
| | | ‡ | | | | | | | | | | | - - | | | |
| 685 | 685.5 | 88.5 | 100/0.2 | | | | | | 100/0.2 | • | | | - - | | | |
| | | ‡ | | | | | | | | | | | - - | | | |
| 600 | 680.5 | + + 93.5 | 1 | | | | | | | | | | - - | | | |
| 680 | | | 100/0.4 | | | | | | 100/0.4 | ' | | | _ - | | | |
| | | ‡ | | | | | | | | | | | - - | | | |
| 675 | 675.5 | 98.5 | 100/0.2 | | | | | | 100/0.2 | , | | | - | | | |
| | | ‡ | . 00, 012 | | | | | | | | | | - - | | | |
| | 670.5 | + + 103.5 | | | | | | | | | | | - - 670.5 | | | 103.5 |
| | - 670.5 | 103.3 | 60/0.1 | | | | | 1 | 60/0.1 | 7 | | | CRYSTA - (GRAY, BLACK A | LLINE R | OCK TE GRAN | 103.5 _103.6 |
| | | ŧ | | | | | | | | | | | Boring Terminated | by SPT | REFUSA | L at |
| | _ | Ŧ | | | | | | | | | | | Elevation 670.4 ft IN (GF | I CRYST ANITE) | ALLINE F | ROCK |
| | - | Ŧ | | | | | | | | | | | - | • | | |
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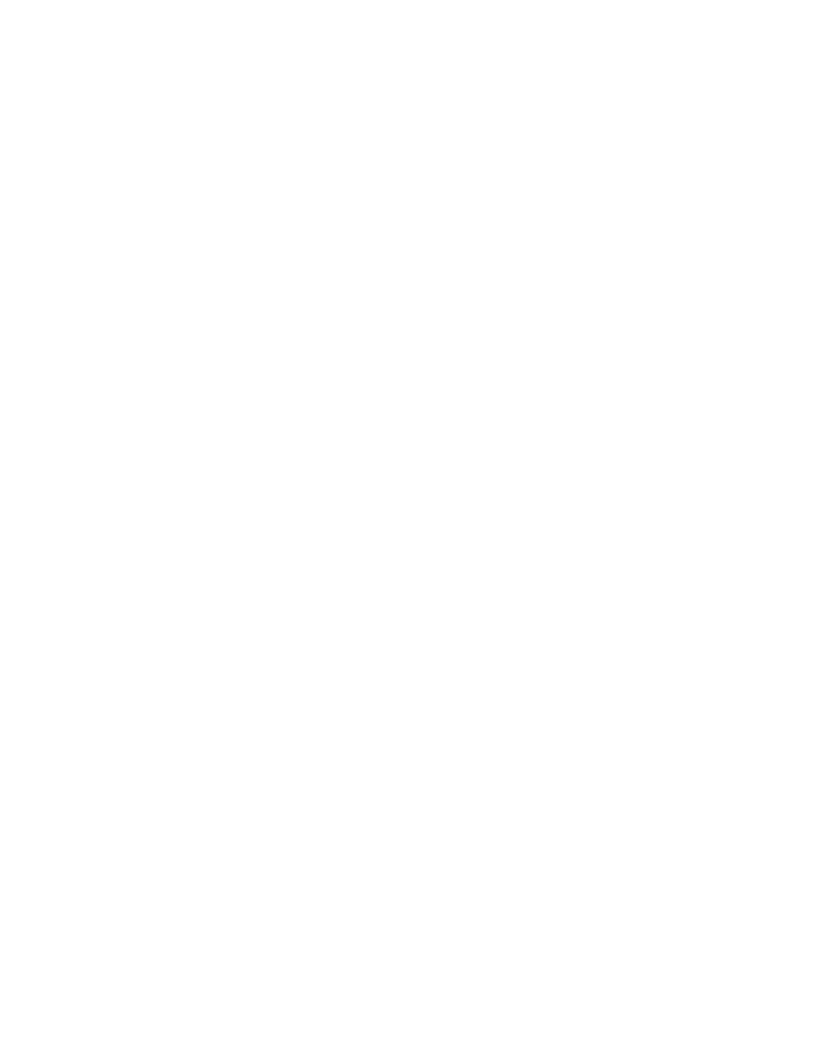
| Consulting E | ngineers | and Sci | entists | | | | B | ORE | L | <u>OG</u> | | | | | | | |
|--|-------------------------------------|---------------|---------|--------|--|-------------------|---------------|-----------|---------------|-----------|----------|------------|---------------------|--------------------------|----------------------------|---------------------|--------------|
| WBS 403 | 25.1.46 | | | TI | IP Y-4810h | (| COUNT | Y CABA | RRI | JS | | | GEOLOGI | ST Stickney, | J. K. | | |
| SITE DESC | RIPTION | I BRII | OGE NO | D. 120 | 0407 ON RC | GERS LA | KE ROAD | OVER U | S 29 | A, NCR | RR AN | D SO | JTH RIDGE | AVENUE | | GROUN | ID WTR (ft) |
| BORING N | O . B1-B | | | S | TATION 3 | 1+37 | | OFFSE | T 2 | 3 ft RT | | | ALIGNME | NT -L- | | 0 HR. | FIAD |
| COLLAR E | LEV. 77 | 73.7 ft | | T | OTAL DEPI | TH 78.3 ft | | NORTH | ING | 632,24 | 48 | | EASTING | 1,516,418 | | 24 HR. | FIAD |
| | | | E HFO | | ME-550X 909 | | | | | DRILL M | | D H.S | ı | | HAMME | R TYPE | Automatic |
| DRILLER | | | | \neg | TART DATE | | | COMP. | DA | | | | | WATER DEF | | | |
| ELEV DRIV | E DEDTI | 1 | OW COL | | | | PER FOOT | | T | SAMP. | _ | 11 | | | | | |
| (ft) ELE | / (ft) | 0.5ft | | 0.5ft | o : | 25 5 | 50 | 75 | 100 | NO. | мо | 0 G | ELEV. (ft) | SOIL AND RO | CK DESC | CRIPTION | DEPTH (ft |
| (1) | | | | | | | 1 | | | | , wie | | LLL V. (II) | | | | DEI III (II |
| 775 | | | | | | | | | | | | | | | | | |
| 1/15 | ᅻ | | | | | | | | | | | | - 773.7 773.2 | GROUN | D SURF | ACE | 0.0 |
| | ‡ | | | | | | | | - | | | | 113.2 | | ICIAL FIL GRAVEL | .L | |
| 770 770.4 | 4 | | | 0 | | | | | • | | | | | RE | SIDUAL | == | |
| | Ŧ | 6 | 8 | 8 | 16 | | | 1 | - | | М | | - O F | RANGE-TAN, OCK FRAGME | SILTY CL ENTS, TR | AY, TRAC ACE MIC | CE A |
| | ‡ | | | | | | | | - | | | | | | | | |
| 765 765.4 | 4 ‡ 8.3 | 5 | 5 | 6 | 1 . 1 | | | | - | | М | | _ | | | | |
| | ‡ | | | Ü | . •11 . . j | | | | - | | IVI | | | RANGE-TAN, | TAN-OR | ANGE AN | <u>10</u> .0 |
| | <u> </u> | | | | | | | | - | | | | V | VHITE, SANDY | ' SILT, SC | OME ROC | K |
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| 755 | + 4 + 18.3 | | | | ::/:: | | | | - | | | | | | | | |
| 755 755.4 | † | 5 | 6 | 9 | 15 | | | + | | | М | | - | | | | |
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| 750 750.4 | 4 23.3 | <u>.</u> | | | | | | | - | | | | | | | | |
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| 745 745. | 4 28.3 | 2 | 4 | 7 | : ;; : : | | | | • | | ١ | | _ | | | | |
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| žL | \pm | 1 | | | | | <u> </u> | | - | 4 | <u> </u> | 10000 | 695.4 | | | | 78.3 |



GEOTECHNICAL BORING REPORT BORF LOG

SHEET 12 OF 22

| Cons | ulting En | gineers a | and Scie | entists | | | | | | BORE | | | | 1 | | | | |
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| WBS | 40325 | 5.1.46 | | | T | IP Y-4 | 810K | | COUNT | Y CABAR | RUS | | | GEOLOGIS | ST Stickney | , J. K. | _ | |
| SITE | DESCR | IPTION | BRID | DGE N | O. 120 | 0407 ON | N ROGE | RS LAP | KE ROAI | OVER US | 29A, NC | RR AN | ID SC | OUTH RIDGE A | VENUE | | GROUI | ND WTR (f |
| BOR | ING NO | . B1-B | | | S | TATIO | 1 31+3 | 7 | | OFFSET | 23 ft RT | • | | ALIGNMEN | IT -L- | | 0 HR. | FIAI |
| COL | LAR EL | EV . 77 | 73.7 ft | | T | OTAL [| DEPTH | 78.3 ft | | NORTHIN | I G 632,2 | 248 | | EASTING | 1,516,418 | | 24 HR. | FIAI |
| DRILL | . RIG/HAN | /IMER EF | F./DATI | E HFC | 00072 | ME-550 | X 90% 0 | 5/23/201 | 7 | | DRILL | METHO | D H. | S. Augers | | HAMN | MER TYPE | Automatic |
| DRIL | LER S | mith, C | . L. | | S | TART [| DATE 1 | 10/25/17 | 7 | COMP. D | ATE 10 | /25/17 | | SURFACE | WATER DE | PTH N | /A | |
| ELEV | DRIVE ELEV | DEPTH | BLC | w co | UNT | | Bl | LOWSF | PER FOO | Ť | SAMP | . 🔻 | O L | | SOIL AND RO | OCK DES | CRIPTION | J |
| (ft) | (ft) | (ft) | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 5 | 50 | 75 10 | NO. | МО | ı G | ELEV. (ft) | SOIL AND INC | | JOINI TIOI | DEPTH |
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TECCHNICAL BORING REPORT

SHEET 13 OF 22

| WBS | 40325 | .1.46 | | | T | IP Y-4810K | COUNT | Y CABARF | RUS | | | GEOLOGIST Stickney, J. K. | |
|-------|---|---------------|--------------|--------|---------|---|---------------------------------------|---------------------------------------|----------------|--|---|---|--------------------------|
| SITE | DESCR | IPTION | BRID | GE N | O. 120 | 0407 ON ROGERS LA | KE ROAD | OVER US | 29A, NCR | R AND | SOL | UTH RIDGE AVENUE | GROUND WTR (ft |
| BORI | NG NO. | B2-A | | | S | TATION 32+62 | | OFFSET | 17 ft LT | | | ALIGNMENT -L- | 0 HR. 35. |
| COLL | AR ELI | EV. 78 | 0.6 ft | | T | OTAL DEPTH 57.41 | t | NORTHIN | G 632,3 | 18 | | EASTING 1,516,529 | 24 HR. FIAI |
| DRILL | RIG/HAN | MER EF | F./DATE | E HFC | 00072 (| CME-550X 90% 05/23/20 | <u></u> | | DRILL M | ETHOD | H.S | S. Augers HAMM | ER TYPE Automatic |
| DRILI | LER S | mith, C. | L. | | S | TART DATE 10/24/ | 17 | COMP. DA | TE 10/2 | 26/17 | | SURFACE WATER DEPTH N/A | A |
| (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLO 0.5ft | W CO | | - | PER FOOT | 75 100 | SAMP. NO. | / | L O G | SOIL AND ROCK DESC | CRIPTION DEPTH |
| 785 | - | - | | | | | | | | | - | - | |
| 780 | - - - | | | | | 1 | | | | | | 780.6 CONCRETE SL CONCRETE SL 0.5' CONCRET | AB |
| 775 | 776.5 | 4.1 | 4 | 3 | 3 | - 1 · · · · · · · · · · · · · · · · · · | | | | М | | RESIDUAL ORANGE, SANDY SILT, 1 | |
| 770 | - 771.5 - - - | 9.1 | 100/0.4 | | | | | 100/0.4 | | स्वापदस्वापदस्व | | WEATHERED RO (WHITE AND GRAY, C | |
| 765 | 766.5 - - | 14.1 | 39 | 30 | 70/0.4 | | + | 100/0.9 | | 24 (SA) (SA) (SA) (SA) (SA) (SA) (SA) (SA) | | -764.6 RESIDUAL | |
| 760 | 761.5 - - | 19.1 | 8 | 6 | 5 | 11 | | | | М | ŧ | WHITE AND GRAY, SANDY | / SILT, TRACE |
| 755 | 756.5 - - | 24.1 | 14 | 7 | 7 | •14 | | | | М | ŧ | - | |
| 750 | - 751.5 - - | 29.1 | 20 | 35 | 14 | | 49 | | | D | | - | |
| 745 | 746.5 - | 34.1 | 22 | 35 | 65/0.4 | | | 100/0.9 | | | | | |
| 740 | 741.5 - - | 39.1 | 66 | 34/0.2 | | | | 100/0.7 | | ध्याप्टरखापट्टस्वा | | (WITTE AND GIVAT, C | >: 3 u vi : ∟j |
| 735 | 736.5 - - | 44.1 | 14 | 16 | 8 | 9 24 | · · · · · · · · · · · · · · · · · · · | · · · · · · · · · · · · · · · · · · · | | M | | 737.6 RESIDUAL WHITE AND GRAY, SILT SAND, TRACE N | Y COARSE |
| 730 | 731.6 | 49.0 | 4 | 6 | 10 | 16 · · · · · · · · · · · · · · · · · · · | | | | М | | - - | |
| 725 | 726.6 - - | 54.0 | 29 | 52 | 48/0.1 | | | 100/0.6 | | | | | DANITE) |
| | - - - - - - - - - - - - - - - - - - - | - | | | | | | | | | - - - - - - - - - - - - - - - - - - - | Boring Terminated By AUG at Elevation 723.2 ft ON CI ROCK (GRANII | ER REFUSAL RYSTALLINE |



| Consu | ulting Engin | eers a | nd Sci | entists | | | | | B | <u>ORI</u> | <u> </u> | <u>OG</u> | | | | | | | |
|---|--|--------------|---------|---------|---------|--------------|--|-------------------|--|------------|-------------|---------------|-------------------|------|-------------------------|---------------------------|--------------------|-----------|-------------|
| WBS | 40325.1 | .46 | | | TI | P Y-4 | 1810K | | COUNT | Y CAB | ARRL | JS | | | GEOLOGI | ST Riggs, A | .F. Jr. | | |
| SITE | DESCRIP | TION | BRID | OGE NO |). 120 | 407 O | N ROC | GERS LA | KE ROAD | OVER | US 29 | A, NCR | RR AN | D SO | UTH RIDGE | AVENUE | | GROUN | ID WTR (ft) |
| BORI | NG NO. | B2-B | | | S | TATIO | N 32- | +59 | | OFFSI | ET 2 | 2 ft RT | | | ALIGNME | NT -L- | | 0 HR. | N/A |
| COLI | AR ELEV | /. 78 | 1.5 ft | | TO | DTAL | DEPTI | -1 90.5 ft | | NORT | HING | 632,28 | 30 | | EASTING | 1,516,536 | | 24 HR. | 36.2 |
| DRILL | RIG/HAMM | ER EF | F./DAT | E TERS | 92-0 AC | CKER R | ENEGA | DE 95% 02 | 24/2018 | | | DRILL M | IETHOI | D Mu | ıd Rotary | | HAMM | ER TYPE | Automatic |
| DRIL | LER Dug | gins, | W.T. | | S | TART | DATE | 04/25/1 | 8 | COMP | . DAT | E 04/2 | 26/18 | | SURFACE | WATER DE | PTH N/ | A | |
| ELEV | DRIVE ELEV D | EPTH | BLC | W COU | INT | | | BLOWS | PER FOOT | | | SAMP. | lacktriangledown/ | | • | SOIL AND RO | OCK DES | ^RIDTI∩N | |
| (ft) | (ft) | (ft) | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 5 ; | 50 | 75 | 100 | NO. | /мо | | ELEV. (ft) | OOIL / II VD I (C | OK DEO | | DEPTH (ff |
| | | | | | | | | | | | | | | | | | | | |
| 785 | | | | | | | | | | | | | | | _ | | | | |
| | ‡ | | | | | | | | | | | | | | - - | | | | |
| | 780.5 | 1.0 | | | | | | | T | T | | | | | - 781.5 - 780.8 | | RETE SL | | 0. 0. |
| 780 | -/ _{00.5} + | 1.0 | 2 | 2 | 3 | \$ 5 | | | | + | | | М | | _ | CON | CRETE 0 | | |
| | 778.0 | 3.5 | 3 | 2 | 4 | | | | | | | | М | | R | RE ED-ORANGE, | SIDUAL SILTY CI | _AY, TRAC | Œ |
| 775 | Ŧ | | | | | T°. | | | | | | | ''' | | - <u>77</u> 5 <u>.5</u> | | MICA | | |
| | 773.0 | 8.5 | | | | | | | | | | | | | | TAN-GRAY AN OARSE SAND | | | |
| | -//3.0 | 0.0 | 2 | 3 | 3 | 6 | | | | : : | | | М | | - | | | | |
| 770 | ‡ | | | | | ښ | | | | + | | | | | - - | | | | |
| | 768.0 | 13.5 | 3 | 4 | 4 | : : | | | | | | | ١ | | = = | | | | |
| 765 | ‡ | | 3 | | 7 | :¶8 | 3 | | | | | | М | | - - | | | | |
| 703 | | | | | | | | | | 1 : : | | | | | - - | | | | |
| | 763.0 | 18.5 | 4 | 5 | 7 | | 12- | | | | | | М | | - - | | | | |
| 760 | ‡ | | | | | | <u>\i: : </u> | | | | | | | | - | | | | |
| | 758.0 | 23.5 | | | | : : | 1. | | | | | | | | - | | | | |
| | ‡ | | 5 | 9 | 8 | : : | ♦ 17 | | | | | | М | | - - | | | | |
| 755 | \pm | | | | | | : | | | + : : | | | | | - | | | | |
| | 753.0 | 28.5 | 4 | 5 | 7 | : : | 1 | | | | | | М | | - | | | | |
| 750 | Ŧ | | | | | | 12. | | | | | | ''' | | - | | | | |
| | 748.0 | 33.5 | | | | | | | | 1 | | | | | - | | | | |
| | - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 | 00.0 | 4 | 5 | 6 | | 11 - | | | | | | М | | - | | | | |
| 745 | ‡ | | | | | | | · · · · | | + | | | | | - - | | | | |
| | 743.0 | 38.5 | 3 | 5 | 6 | | | | | | | | | | - | | | | |
| 740 | ‡ | | | | O | :9 | 11 - | | | | | | М | | - - | | | | |
| 740 | - | 40.5 | | | | | 1 | | | 1 | | | | | - - | | | | |
| | 738.0 | 43.5 | 4 | 6 | 9 | | 1 • 15 | | | | | | М | | - - | | | | |
| 735 | ‡ | | | | | | 7. | | | - : : | | | | | - | | | | |
| | 733.0 | 48.5 | - | 40 | 40 | :: | - /- | | | | | | | | - - | | | | |
| <u> </u> | ‡ | | 7 | 10 | 12 | : : | · •2 | 2 · · · · | | | : : | | M | | - - | | | | |
| 730 | † | | | | | | 1 | | | + | | | | | - - | | | | |
| 5 | 728.0 | 53.5 | 8 | 11 | 14 | : : | \ | 25 | | | | | М | | - - | | | | |
| 725 | <u> </u> | | | | | | · ·] | <u> </u> | | | | | | | - | | | | |
| <u> </u> | 723.0 | 58.5 | | | | : | ::[| ·\ | | | : : | | | | - - | | | | |
| | Ŧ | | 19 | 20 | 18 | : : | | . ♦38- | | | | | М | | - - 720 5 | | | | 24.5 |
| 720 | - | | | | | | | | | +== | === | | | 70 | - 720.5 - /7 | WEATH | IERED RO | OCK | 61.0 |
| 730 725 720 720 715 710 710 700 700 700 700 700 700 700 700 | 718.0 | 63.5 | 60 | 40/0.1 | | [- | | | | | 0/0 6 | | | 970 | - - | AN-GRAY AN | VV HITE ע | ., GKANII | -) |
| 715 | Ŧ | | | | | | | | : : : : | . 10 | 0/0.6 | | | | - | | | | |
| ابا ا | 713.0 | 68.5 | | | | | | | | | | | | | - | | | | |
| | | | 100/0.2 | | | :: | | | | . 10 | 0/0.2 | | | | - - | | | | |
| 710 | ‡ | | | | | | | | | | | | | | - | | | | |
| | 708.0 | 73.5 | 100/0.2 | | | :: | | : : : : | : : : : | | 0/0.2 | | | | - - | | | | |
| 3 705 | ‡ | | 100/0.2 | 1 | | :: | | | | 1. 10 | 0/0.2 | | | | - - | | | | |
| 705 | | | | | | Ш | | | | | | | L | 11/2 | _ | | | | |



GEOTECHNICAL BORING REPORT BORE LOG

SHEET 14 OF 22

| | | | entists | | | | D | <u>ORE L</u> | UG | | | | | | | |
|--------------|-------------------------------------|------------------|---------|--------------|------------------|-------------------|----------|--------------|----------------|--------|---------------|------------|-----------------------------|------------------------------------|--------------------------|--------------------|
| WBS | 40325.1.46 | | | TI | P Y-4810k | (| COUNTY | CABARR | JS | | | GEOLOGI | ST Riggs, A | A.F. Jr. | | |
| SITE | DESCRIPTION | BRID | GE N | O. 120 | 407 ON RC | GERS LAI | KE ROAD | OVER US 2 | 9A, NCF | RR AN | D SO | UTH RIDGE | AVENUE | | GROUN | ND WTR (ft) |
| BOR | ING NO. B2-B | | | ST | TATION 32 | 2+59 | | OFFSET 2 | 22 ft RT | | | ALIGNME | NT -L- | | 0 HR. | N/A |
| COL | LAR ELEV. 78 | 1.5 ft | | тс | OTAL DEPT | FH 90.5 ft | | NORTHING | 632,2 | 80 | | EASTING | 1,516,536 | | 24 HR. | 36.2 |
| DRILI | RIG/HAMMER EF | F./DATI | E TER | 92-0 AC | CKER RENEG | ADE 95% 02 | 24/2018 | | DRILL IV | 1ETHO[|) Mu | d Rotary | | HAMM | ER TYPE | Automatic |
| DRIL | LER Duggins, | W.T. | | S1 | TART DATE | E 04/25/1 | 8 | COMP. DA | TE 04/2 | 26/18 | | SURFACE | WATER DE | PTH N/ | 'A | |
| ELEV (ft) | DRIVE ELEV (ft) DEPTH (ft) | BLC 0.5ft | W COL | JNT 0.5ft | 0 2 | | PER FOOT | 75 100 | SAMP. NO. | MOI | L O I G | ELEV. (ft) | SOIL AND RO | OCK DES | CRIPTION | l DEPTH (ft) |
| 705 700 | 703.0 78.5 | — — - 100/0.2 | | | | Matc | h Line | 100/0.2 | | | | | AN-GRAY AN | HERED RO ID W HITE ontinued) | | |
| 695 | 698.0 83.5 | 60/0.0 | | | | | | 60/0.0 | , | | | _ | CRYST. RAY, BLACK A | ALLINE R | R OCK TE, GRAN | , |
| | | | | | | | | | | | | 691.0 Bor | ing Terminate CRYSTALLIN | d at Eleva E ROCK (| tion 691.0 (GRANITE | 90.5 ft IN) |





SHEET 15 OF 22

| /BS | 40325 | 5.1.46 | | | TIP | Y-481 | 0K | С | OUNT | Y C | ABARRUS | GEOLOGIST Riggs, A.F. Jr. | |
|-----|----------------|--------------|--------|----------------------------------|---------------|------------------|-----------------|-------------------|------------------|--------|-----------------------------|--|--------------------|
| ITE | DESCR | IPTION | BRID | DGE NO. | 12040 | 7 ON F | ROGERS | LAKE | ROAL | OVE | ER US 29A, NCRR AND SOU | | GROUND WTR (|
| | ING NO | | | | | | 32+59 | | | 1 | FSET 22 ft RT | ALIGNMENT -L- | OHR. N |
| | LAR EL | | 1.5 ft | | | | PTH 90. | 5 ft | | 1 | RTHING 632,280 | EASTING 1,516,536 | 24 HR. 36 |
| | | | | E TER92- | | | | | 2018 | 1 | DRILL METHOD Mud | | IER TYPE Automatic |
| | LER D | | | | | | TE 04/2 | | | СО | MP. DATE 04/26/18 | SURFACE WATER DEPTH N | |
| | E SIZE | | | | - | | N 7.0 ft | 0, .0 | | - | 1 2 1 1 2 1 1 2 1 1 2 1 1 2 | | ,, |
| .EV | RUN ELEV | DEPTH | RUN | DRILL | RI | JN | | | ATA | | | | |
| ft) | ELEV (ft) | (ft) | (ft) | RATE (Min/ft) | REC. (ft) | RQD (ft) % | SAMP. NO. | REC. (ft) % | RQD (ft) % | O G | D ELEV. (ft) | ESCRIPTION AND REMARKS | DEPTH |
| 98 | . , | | | | 70 | 70 | | 70 | 70 | | ELE V. (III) | Begin Coring @ 83.5 ft | DEI III |
| - | 698.0 696.0 | 83.5 85.5 | 2.0 | 2:40/1.0 1:30/1.0 | (2.0) 100% | (2.0) 100% | | (7.0) 100% | (5.7) 81% | R | . 698.0 | CRYSTALLINE ROCK CK AND WHITE, VERY SLIGHT TO F | 8 EDEQU |
| 95 | - 030.0 | - 00.0 | 5.0 | 1:30/1.0 | (5.0) | (3.7) | | 100% | 0176 | | _ HARD TO VERY H | HARD, VERY CLOSE TO MODERAT | |
| | | ‡ | | 1:30/1.0 1:16/1.0 1:05/1.0 | 100% | 74% | | | | | . F | RACTURE SPACING, GRANITE 12 JOINTS AT 10º-20º | |
| | 691.0 | 90.5 | | 1:17/1.0 1:32/1.0 | | | | | | | 691.0 | GSI= 80-90 | 9 |
| | - | <u> </u> | | | | | | | | | _ Boring Terminate . | ed at Elevation 691.0 ft IN CRYSTALI (GRANITE) | LINE ROCK |
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CORE PHOTOGRAPHS

Y-4810K 16

PROJECT NO. 40325.1.46 (Y-4810K)
BRIDGE NO. 120407 ON SR 1625 (ROGER LAKE ROAD) OVER US 29A (SOUTH MAIN STREET), NCRR (NS)
AND SOUTH RIDGE AVENUE BETWEEN LOWRANCE AVE. AND MEADOW AVENUE

B2-B BOX 1 OF 1 83.5' - 90.5' FEET





| Consi | ulting En | gineers | and Sci | ientists | | | | | | | В | <u>Or</u> | KE L | <u>.OG</u> | | | | | | | | | | |
|--------------|--------------|----------------|---------------|----------|--------|---|--|------------|----------|-------------|--|------------|---------|------------|-------|--------|----------------------|--------------|---------|----------|-------------------|-----------------------------|---------------|---------|
| WBS | 40325 | 5.1.46 | | | Т | IP Y | '-4810 | K | | CC | TAUC | Y C | ABARR | US | | | GEOL | OGIS | ST SC | CHLEN | IM, T. \$ | S. | | |
| SITE | DESCR | IPTION | I BRII | DGE N | O. 120 | 0407 | ON RO | OGE | RS LA | KE F | ROAD | OVE | R US 2 | 9A, NCI | RR AN | ID SO | UTH RID | GE A | AVENU | ΙE | | GROU | JND WT | R (ft) |
| BOR | ING NO | . B3-A | | | S | TATI | ON 3 | 33+87 | 7 | | | OF | SET | 18 ft LT | | | ALIGN | NMEN | NT -L- | | | 0 HR | | N/A |
| COLI | LAR EL | EV . 77 | 79.6 ft | | Т | OTAL | _ DEP | тн | 59.9 f | t | | NO | RTHING | 632,3 | 50 | | EAST | ING | 1,516 | .650 | | 24 HR. | _ | 35.0 |
| | . RIG/HAN | | | | | | | | | | , | | | · · | | D Mu | id Rotary | | ., | ,,,,,, | Тнами | MER TYPE | | |
| | LER T | | | | | | DAT | | | | | CO | MD DA | TE 11/ | | D IVIU | | ·^CE | WATE | D DEC | | | . Autom | auc |
| | DRIVE | | T | OW CO | | T | DAI | | -0WS | | | | VIP. DA | SAMP. | _ | 11 | SUKF | ACE | WAIE | K DEF | 'IH N | I/A | | |
| ELEV (ft) | ELEV (ft) | DEPTH (ft) | 0.5ft | | 0.5ft | 0 | | 25 | | 50 50 | | 7 5 | 100 | NO. | МО | 0 | ELEV. (ft | | SOIL A | ND RO | CK DE | SCRIPTIC | | :PTH (f |
| 780 | | <u> </u> | | | | | | T. | | <u> </u> | | . | | | | | 779.6 779.1 | • | P/ | | NT SUF | | | 0. |
| | | <u> </u> | | | | <u>i</u> | | - | | - | | | | | | | ٠ ١ | 0.1 | 5' CON | CRETE | AND (|).35' ASPI | HALT | |
| 775 | 776.4 | 3.2 | 2 | 3 | 3 | | 6 | <u> </u> | | <u> :</u> | | ļ: +- | | | w | | - - | | | OWN, S | | - CLAY, TRA , TRACE N | | |
| | | ‡ | | | | :' | \ \ | : | : : : | : | : : : | : | | | | | <u>- 773.6</u> - | | | | | BROWN, | | |
| 770 | 771.4 | 8.2 | 4 | 5 | 5 | { ∶ | 10. | : | : : : | | | : | | | М | | - - | GR/ LITTI | AY, SIL | TY CO. | ARSE T MICA, C | O FINE S | SAND, SAND | |
| | - | Ŧ | | | | | Ť' | - | | 1: | | - | | | | | - | LA' | YERS, | | TO LIT GMENT | TLE QUA S | ARTZ | |
| | 766.4 | 13.2 | | | |] : | į | : | : : : | : | : : : | : | | | | | - | | | | | | | |
| 765 | - | ‡ ` | 3 | 4 | 5 | ا | 9 | <u> </u> | | +: | | <u> </u> | | | М | | - | | | | | | | |
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| 760 | 761.4 | 18.2 | 4 | 4 | 5 | $\{ \mid : \mid$ | F | : | : : : | : | : : : | | | | М | | - | | | | | | | |
| 700 | - | ‡ | | | | | T 9 | 1: | | T : | | T : | | | | | - | | | | | | | |
| | 756.4 | 23.2 | | | | | 1:: | : | : : : | : | : : : | | | | | | - - | | | | | | | |
| 755 | 750.4 | - 23.2 | 5 | 5 | 6 | النا | 11_ | : | | <u> </u> : | | <u> </u> : | | | М | | - | | | | | | | |
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| | 751.4 | 28.2 | 4 | 5 | 6 | : | 1:: | : | | : | : : : | | | 00.0 | ⊦ | | - | | | | | | | |
| 750 | _ | <u>†</u> | - | " | | - | 9 11 | +: | | +- | | +: | | SS-2 | М | | - | | | | | | | |
| | | <u> </u> | | | | : | 3:: | - | | : | | : | | | | | - | | | | | | | |
| 745 | 746.4 | 33.2 | 4 | 6 | 7 | ┨ . | . I | . | | • | | | | | | | • | | | | | | | |
| | - | Ŧ | | | | | - [| - | | | | - | | | _ | †F | - | | | | | | | |
| | 741.4 | 38.2 | | | |] : | 1 | - | | : | | : | | | | | - | | | | | | | |
| 740 | _ | Ŧ | 5 | 6 | 8 | <u> </u> | _ 14_ | <u> </u> | | ļ: | • • • | <u> </u> | | | W | | - | | | | | | | |
| | | ‡ | | | | | : i <u>. </u> |] <u>:</u> | <u> </u> | <u>ا۔</u> ٰ | · · · | _ | · · · | | | | - 737.6 | | | | | | | 42 |
| 735 | 736.4 | 43.2 | 60/0.1 | 1 | | | | : | | : | | | 60/0.1 | | | | - - 735 <u>.4</u> | (WH | | | LLINE And Gf | ROCK RAY, GRA | NITE) | 44 |
| 700 | - | ‡ | | | | | | 1: | | 1: | | : | | | | | - | | С | RYSTA | LLINE | | | |
| | | ‡ | | | | | : : : | - | : : : | : | : : : | | | | | | - | (| , _, | _ 1011,7 | | , | / | |
| 730 | _ | ‡ | | | | | | <u> </u> : | | <u> </u> : | | <u> </u> : | | | | | - | | | | | | | |
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| 705 |] : | ‡ | | | | : | | : | | : | | : | | | | | - - | | | | | | | |
| 725 | - | ‡ | | | | - | | +: | | +: | | +: | | | | | - - | | | | | | | |
| | | ‡ | | [| | [] : | | - | : : : | : | | : | | | | | - | | | | | | | |
| 720 | | ‡_ | | L | L | | | <u> </u> : | | <u> </u> : | · · · | : | | | | | - - 719.7 | | | | | | | 59. |
| | | <u> </u> | | | | | | | | | | | | | | | - | Bori | ng Terr | ninated | at Elev | ation 719. | .7 ft IN | |
| | | <u> </u> | | | | | | | | | | | | | | | - | ` | | !! _ | | , 0.0 | -, | |
| | - | <u> </u> | | 1 | | | | | | | | | | | | [| - | | | | | | | |
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| | | Ŧ | | 1 | | | | | | | | | | | | | - | | | | | | | |
| 725 | | Ŧ | | | | | | | | | | | | | | | - | | | | | | | |
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GEOTECHNICAL BORING REPORT

SHEET 17 OF 22

| | | | | | | | | | | | LOG | |
|----------|---|--------------|--|--|-------------------|------------------------|-----------------|-------------------|------------------|--|--|----------|
| WBS - | 40325.1. | .46 | | | TIP | Y-481 | 0K | С | OUNT | Y C | ARRUS GEOLOGIST SCHLEMM, T. S. | |
| SITE D | ESCRIP | TION | BRID | GE NO. | | | | LAKE | ROAD | _ | JS 29A, NCRR AND SOUTH RIDGE AVENUE GROUND W | /TR (ft) |
| BORIN | G NO. | B3-A | | | STA | TION | 33+87 | | | OF | T 18 ft LT ALIGNMENT -L- 0 HR. | N/A |
| COLLA | AR ELEV | . 779 | 9.6 ft | | TOT | AL DEI | PTH 59. | 9 ft | | NO | HING 632,350 EASTING 1,516,650 24 HR. | 35.0 |
| DRILL RI | IG/HAMMI | ER EFF | ./DATE | E TER373 | DIEDF | RICH D- | 50 99% 0 | 3/09/201 | 7 | | DRILL METHOD Mud Rotary HAMMER TYPE Auto | matic |
| DRILLE | ER TUR | RNAGI | E, J. R | ₹. | STAF | RT DA | TE 11/2 | 8/17 | | CO | DATE 11/29/17 SURFACE WATER DEPTH N/A | |
| | SIZE N | Q3 | | | | | N 15.7 f | | | | | |
| | | EPTH (ft) | RUN (ft) | DRILL RATE (Min/ft) | REC. (ft) % | JN RQD (ft) % | SAMP. NO. | REC. (ft) % | RQD (ft) % | LOG | DESCRIPTION AND REMARKS EV. (ft) | DEPTH (f |
| | ‡ | 44.2 49.9 | 5.7 | 1:36/0.7 5:10/1.0 2:16/1.0 2:29/1.0 1:48/1.0 | (3.8) 67% | (3.3) 58% | | (13.5) 86% | (13.0) 83% | | Begin Coring @ 44.2 ft 5.4 CRYSTALLINE ROCK WHITE, GRAY, AND BLACK, VERY SLIGHTLY WEATHERED TO FRESH, HARD, MODERATELY CLOSE FRACTURE SPACING, GRANITE 10 JOINTS AT 10°-20° | 44.2 |
| | 729.7 | 5.0 | 3:39/1.0 3:21/1.0 2:46/1.0 3:16/1.0 3:52/1.0 4:29/1.0 | (4.8) 96% | (4.8) 96% | | | | | GSI=85-95 LOST CIRCULATION IN FRACTURED ROCK SEAM 51.6' - 51.8' | | |
| | 719.7 | 5.0 | 4:40/1.0 4:24/1.0 4:12/1.0 4:36/1.0 5:21/1.0 | 98% | (4.9) 98% | | | | KIKK | 9.7 Boring Terminated at Elevation 719.7 ft IN CRYSTALLINE ROCK | 59 | |
| | +++++++++++++++++++++++++++++++++++++++ | | | | | | | | | | | |

CORE PHOTOGRAPHS

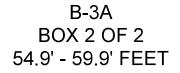
Y-4810K

18

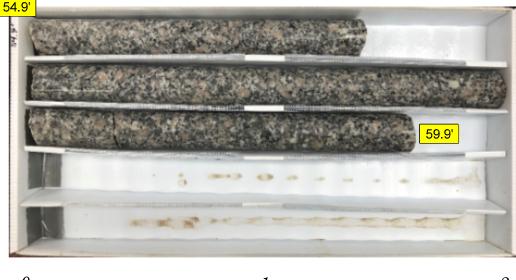
PROJECT NO. 40325.1.46 (Y-4810K)

BRIDGE NO. 120407 ON SR 1625 (ROGER LAKE ROAD) OVER US 29A (SOUTH MAIN STREET), NCRR (NS)
AND SOUTH RIDGE AVENUE BETWEEN LOWRANCE AVE. AND MEADOW AVENUE

B-3A BOX 1 OF 2 44.2' - 54.9' FEET







FEET





Terracon GEOTECHNICAL BORING REPORT

SHEET 19 OF 22

| WBS | 40325 | .1.46 | | | TI | IP | Y-4810K | | | ORE L Y CABARR | | | | GEOLOGIST Stickney, | J. K. | |
|------|--------------------|----------|---------|--------|--------|---------|-------------|------------------|---------|-------------------|----------------|------------|----------|--|----------------------|-------------|
| SITE | DESCR | IPTION | I BRID | DGE N | O. 120 |)407 | 7 ON ROG | ERS LA | | | | RR AN | D SO | UTH RIDGE AVENUE | | UND WTR (fi |
| | ING NO. | | | | | | TION 33+ | | | OFFSET | | | | ALIGNMENT -L- | 0 HR | |
| COL | LAR ELE | EV. 77 | 78.9 ft | | T | OT/ | AL DEPTH | 4 40.0 ft | | NORTHING | G 632,3 | 11 | | EASTING 1,516,660 | 24 HR | |
| | | | | E HFC | | | E-550X 90% | | | | , <u> </u> | |) H.S | <u> </u> | HAMMER TYPI | |
| | . LER Si | | | | | | RT DATE | | | COMP. DA | 1 | | | SURFACE WATER DEPT | | |
| ELEV | DRIVE | DEPTH | | W CO | UNT | П | | BLOWS F | ER FOOT | - | SAMP. | V / | | 201 411 700 | | |
| (ft) | ELEV (ft) | (ft) | 0.5ft | 0.5ft | 0.5ft | 0 | 0 25 | 5 5 | 50 I | 75 100 | NO. | MOI | 0 G | SOIL AND ROC ELEV. (ft) | K DESCRIPTION | ON DEPTH |
| | | | | | | | | | | | | | | | | |
| 780 | | L | | | | | | | | | | | | _ | | |
| | _ | | | | | ₩ | 1 | | | | | | | | T SURFACE_ EMENT | |
| | - | | | | | | | | | | | | | | NCRETE IDUAL | |
| 775 | 775.5 | 3.4 | 2 | 1 | 3 | H | 4 | | | + : : : : | 1 | М | | ORANGE, AND TAN | I, SILTY CLAY | |
| | - | | | | | | <u> </u> | | | | | | | MICA, TRACE RO | JCK FRAGINEI | NIS |
| 770 | 770.5 | 8.4 | | | | | : 7: : | | | : : : : | | | | • | | |
| | _ | F | 6 | 7 | 9 | | • 16 | | | 1 | | M | | | | SOME 10 |
| | - | - | | | | | / | | | | | | | MICA, SOME RC | | |
| 765 | 765.5 | 13.4 | 4 | 4 | 5 | ╁ | . / | | | <u> </u> | | D | | · - | | |
| | - | - | | | | | : 7°: : | | | | | | | • | | |
| 760 | 760.5 ⁻ | 18.4 | | | | | | | | | | | | • | | |
| 700 | _ | | 3 | 4 | 9 | | 13 | | | | - | D | | - 758.2 | | 20 |
| | - | _ | | | | | ' | | | | ! | | | WEATHE | RED ROCK | |
| 755 | 755.5 | 23.4 | 20 | 80/0.3 | | | | | | | | | | . (WHITE-TA | N, GRANITE) | |
| | _ | | 20 | 00/0.5 | | | | | | . 100/0.8 | [| | | | | |
| | - | | | | | | | | | | <u> </u> | | | • | | |
| 750 | 750.5 | 28.4 | 100/0.3 | | | ╟ | | | | 100/0.3 | • | | | - | | |
| |] - | <u> </u> | | | | | | | | + | i I | | | _ 747.9 _ RES | IDUAL | 3: |
| 745 | 745.5 | 33.4 | | L | | \prod | | | | | | | | . WHITE-TAN, SILTY - SOME ANUGLAR I | SAND, SOME | MICA, |
| 0 | - | F | 15 | 16 | 28 | | | •44 | | | - | D | | SOIVIE ANUGLAR I | ROCK FRAGIVI | ENIS |
| | - | <u> </u> | | | | | | | | | | | | • | | |
| 740 | 740.5 | 38.4 | 100/0.3 | 3 | | | | <u> </u> | -:-:: | 100/0.3 | | | 777 | · 740.5 | RED ROCK | 38 |
| | - | - | | | | H | | | L | | + | | VIE | | N, GRANITE) | |
| | - - | - | | | | | | | | | | | | at Elevation 738.9 f | | |
| | - | F | | | | | | | | | | | | 0 HR. WATER LE\ | /EL CAVED DF FEET | RY AT |
| | _ | <u> </u> | | | | | | | | | | | | . 40.0 | FEEI | |
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GEOTECHNICAL BORING REPORT

| WBS | 40325 | .1.46 | | | T | IP Y-48 | 10K | COUNT | Y CABARR | US | | | GEOLOGIST SCHLEMN | <u> </u> | |
|-------|---------------|----------|---------|-------|---------|----------------|------------------|-----------|-----------|----------|------------|-------|---|--|----------|
| SITE | DESCR | IPTION | BRID | OGE N | O. 120 | 0407 ON | ROGERS L | AKE ROAD | OVER US 2 | 9A, NCF | RR AN | D SO | UTH RIDGE AVENUE | GROUND | WTR (f |
| BORII | NG NO. | EB2- | A | | S | TATION | 35+01 | | OFFSET 2 | 22 ft LT | | | ALIGNMENT -L- | 0 HR. | Cave |
| COLL | AR ELE | EV. 77 | 8.7 ft | | T | OTAL DE | EPTH 35.6 | ft | NORTHING | 632,38 | 33 | | EASTING 1,516,759 | 24 HR. | FIAI |
| ORILL | RIG/HAM | IMER EF | F./DATI | E TER | R373 DI | IEDRICH D | -50 99% 03/ | 09/2017 | | DRILL N | IETHOL |).H.C | S. Augers | HAMMER TYPE AL | utomatic |
| DRILL | ER TU | JRNAG | E, J. F | ₹. | S | TART DA | ATE 11/27 | /17 | COMP. DA | TE 11/2 | 27/17 | | SURFACE WATER DEPT | Γ H N/A | |
| LE V | DRIVE ELEV | DEPTH | BLO | W CO | UNT | 1 | BLOW | S PER FOO | Г | SAMP. | lacksquare |] L | SOIL AND ROC | K DESCRIPTION | |
| (ft) | (ft) | (ft) | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 100 | NO. | /MOI | | ELEV. (ft) | | DEPTH |
| | | | | | | | | | | | | | | | |
| 780 | | _ | | | | | | | | | | | _ | | |
| | - | | | | | | | | | + | | | | T_SURFACE EMENT | |
| | - | _ | | | | • • • • | | | | | | | | D 0.2' ABC STONE | |
| 775 | - | - | | | | | | | | | | | RED-BROWN, SII | LTY CLAY, TRACE | |
| ŀ | 773.2 | 5.5 | 7 | 8 | 8 | | 16 | | . | SS-3 | 19% | | QUARTZ FRAGME | ENTS, TRACE MICA | |
| 770 | - | Ł | | | | : :/: | | | | | | | - 770.7WHITE LIGH | HT RED, AND | |
| | 768.2 | [| | | | | | | | | | | - GRAY-BROWN, (| COARSÉ TO FINE | |
| | - | - | 3 | 3 | 4 | 7 . | | | | | М | | | CE TO LITTLE MICA ΓΖ FRAGMENTS | ۱, |
| 65 | _ | - | | | | - | | | | | | | - - | | |
| - | 763.2 | 15.5 | 3 | 3 | 4 | - | | | | | М | | - - | | |
| 60 | - | - | | | ' | | | | | | IVI | | . • | | |
| 50 | 7500 | | | | | | | | | | | | <u>-</u> - | | |
| f | 758.2 | 20.5 | 3 | 3 | 4 | 7 . | | | | | М | | <u>-</u> - | | |
| 55 | - | Ĺ | | | | : :`` | | | | | | | - | | |
| | 753.2 | 25.5 | | | 10 | : : : | | | . | | | | 754.2 WHITE, BROWN, | AND BLACK, SILTY | |
| | - | | 24 | 17 | 18 | | | | | | М | | COARSE TO FINE S FRAGMENTS, TRA | SAND, LITTLE ROC .CE TO LITTLE MICA | K A |
| 50 | _ | F | | | | | · / · · · | | | | | | - - | | |
| H | 748.2 | 30.5 | 23 | 6 | 3 | : : : / | ' . | | | | М | | - 747.7 | SILT, MICACEOUS | 3 |
| 45 | - | F | | | | | | | | | | 1, 1 | - BROWN, CLAYEY | SILT, MICACEOUS | ' |
| | 743.2 | 35.5 | | | | . i | | : | | | | | - 743.7 - 743.1 CDVSTAL | | |
| Ī | - | | 60/0.1 | | | | ' | | 60/0.1 |) | | | - \(WHITE, GRAY, AND | | E) |
| | - | - | | | | | | | | | | | Boring Terminated Elevation 743.1 ft IN | by SPT REFUSAL a CRYSTALLINE ROO | it CK |
| | - | ‡ | | | | | | | | | | | | ANITE) | |
| | - | <u> </u> | | | | | | | | | | | | EL CAVED DRY AT | - |
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Terracon GEOTECHNICAL BORING REPORT BORF LOG

SHEET 20 OF 22

| | 40325 | | | | T | P Y | -4810K | <u> </u> | | | RE L :ABARRI | | | | GEOLOGIST SCHLEM | M, T. S | | |
|------|--------------------|-------------------|---------|--------|---------|--|--------|---------------|-------------|----------|-----------------|----------|----------------|------------|---|--------------------------|-----------|------------------|
| ITE | DESCR | IPTION | BRID | OGE N | | | | | | | | | RR AN | D SO | UTH RIDGE AVENUE | | 1 | D WTR (f |
| ORI | NG NO. | EB2-l | В | | S | TATIO | ON 35 | 5+01 | | OF | FSET 2 | 28 ft RT | | | ALIGNMENT -L- | | 0 HR. | Cave |
| OLI | AR ELE | EV. 77 | '8.9 ft | | T | OTAL | DEPT | H 33.5 | ft | NO | RTHING | 632,3 | 34 | | EASTING 1,516,772 | | 24 HR. | FIAI |
| RILL | RIG/HAM | MER EF | F./DAT | E TER | R373 DI | EDRIC | H D-50 | 99% 03/0 | 19/2017 | | | DRILL N | 1ETHOI | D H.: | S. Augers | HAMM | ER TYPE | Automatic |
| RIL | LER TU | JRNAG | E, J. F | | S | TART | DATE | 11/27/ | <u>'</u> 17 | СО | MP. DA | | | | SURFACE WATER DEP | TH N/ | A | |
| EV | DRIVE | DEPTH | BLC | w co | UNT | | | BLOWS | PER FOO | T | | SAMP. | V / | | 0011 4412 200 | 01/ 050 | | |
| ft) | ELEV (ft) | (ft) | | 0.5ft | 0.5ft | 0 | 2 | 25 | 50 | 75 | 100 | NO. | MO | O G | SOIL AND RO | JK DESC | CRIPTION | DEPTH |
| | | | | | | | | | | | | | | | | | | |
| 80 | | | | | | | | | | | | | | | _ | | | |
| | | | | | | | | | | | | | | | 778.9 PAVEMEN | NT SURF /EMENT | FACE | |
| | - | - | | | | | | | . | . . | | | | | - 0.2' ASPHALT A | | ABC STON | E |
| 75 | 775.4 | 3.5 | 50 | 50/0.3 | | <u> </u> | | | | + | 100/0.8 | , | | 977 | ^{774.9} \ RED-BROWN, S | SILTY CL | | |
| | - | = | | | | | | | . | - - | | | | | - ∖ MICA, TRACE QU - 771.9 WEATHI | ERED RO | | 15] |
| 70 | 770.4 | 8.5 | | | | | | - | | - - | | | | | (WHITE, GRAY, A | ND BLAC SIDUAL | CK, GRANI | TE) / |
| | - | - - | 37 | 16 | 18 | | | ●34 | | - - | | | D | | WHITE, GRAY, | AND BLA | | |
| | - | - | | | | | | | | : : | | | | | COARSE TO FINE LITTLE ROC | K FRAG | MENTS | <u>1</u> ــر ـــ |
| 65 | 765.4 | 13.5 | 2 | 3 | 32 | ŀ | | - 1 - | | <u> </u> | | | l _M | | WHITE AND BROV 764.4 SANDY SILT, SOM | | | |
| | - | - - | | | | : | | . ♥35 | | : : | | | " | | FRAG WHITE, GRAY, | GMENTS | | ′ |
| | - 760.4 | - 18.5 | | | | : | | : [: : | | : : | | | | | COARSE TO FINE | SAND, I | LITTLE RC | OCK , |
| 60 | 700.4 | - - | 60/0.1 |] | | - | | | | | 60/0.1 | ' | | | CRYSTA | LLINE R | OCK | ICA ,— |
| | - | _ | | | | - | | | | - - | | | | | - (WHITE, BLAC - GR | CK, AND ANITE) | BROWN, | |
| 55 | 755.4 | 23.5 | 40 | 60/0.3 | | | | | | | | | | | 755.4 | | OCK. | 2 |
| | _ | _ | 40 | 00/0.3 | | : | | | | - - | 100/0.8 | ' | | | (WHITE, BLAC | | | |
| | - | - | | | | | | | . | . . | | | | | GR | ANITE) | | |
| 50 | 750.4 | 28.5 | 100/0.2 | | | | | | | <u> </u> | 100/0.2 | , | | | - - | | | |
| | - | - - | | | | | | | | - - | | | | | - - | | | |
| | 745.4 ⁻ | - - 33.5 | | | | | | | | | <u>:</u> : :] | | | | - - 745.4 | | | 3 |
| | - | - | 60/0.0 | | | | | | | | 60/0.0 | 7 | | | Boring Terminated Elevation 745.4 f | | | |
| | - | - | | | | | | | | | | | | | | (GRANIT | | _ |
| | - | - | | | | | | | | | | | | | 0 HR. WATER LE | ^ FEET | VED DRY | AT |
| | - | _ | | | | | | | | | | | | | _ 13.! - | 9 FEET | | |
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LABORATORY TESTING SUMMARY

| PROJECT NUMBER: | 40325.1.46 | TIP : Y-4810K | COUNTY: | CABARRUS |
|-----------------|------------|----------------------|---------|----------|
| | | | | |

DESCRIPTION: BRIDGE NO. 120407 ON ROGERS LAKE ROAD OVER US 29A (S. MAIN STREET), NCRR (NS) AND SOUTH RIDGE AVENUE

| | | | | Donath | | I | 1 | T | % by V | Voight | | % | 0/2 | Passing (siev | (AS) | | | A | | Shear Strer | nath Values | |
|------------|------------------|---------|--------|--------------------|-----------|------|----------|--|-----------|--------|----------|--|-----|---------------|--|-------------|---------|--|--|--------------------|--------------|------------------|
| Commis No | Allement | Ctation | Offset | Depth | AASHTO | | P.I. | Caaraa | | | | | | | | 0/ Maintura | % | Ave. Wet Unit Wt. | Total | | Effective | Effective |
| Sample No. | Alignment | Station | (feet) | Interval (feet) | Class. | L.L. | P.I. | Coarse Sand | Fine Sand | Silt | Clay | Retained #4 Sieve | #10 | #40 | #200 | % Moisture | Organic | (pcf) | Cohesion | Total Friction (φ) | Cohesion | Friction (φ') |
| SS-1 | -L- | 30+23 | 22' LT | 13.5-15.0 | A-2-7 (0) | 49 | 13 | 38.4 | 28.5 | 16.4 | 16.7 | 4 | 79 | 58 | 31 | N/D | N/D | N/D | (psf) N/D | N/D | (psf) N/D | N/D |
| SS-2 | -L- | 33+87 | 18' LT | 28.2-29.7 | A-2-5 (0) | 41 | 8 | 42.6 | 24.7 | 19.7 | 13 | 3 | 85 | 57 | 32 | N/D | N/D | N/D | N/D | N/D | N/D | N/D |
| SS-3 | -L- | 35+01 | 22' LT | 5.5-7.0 | A-7-5 (2) | 52 | 12 | 28.8 | 28.3 | 14.1 | 28.8 | 3 | 86 | 70 | 41 | 19.0 | N/D | N/D | N/D | N/D | N/D | N/D |
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N/D - NOT DETERMINED

Stephanie H. Huffman

Certified Lab Technician Signature

114-01-1203

Certification Number

SITE PHOTOGRAPHS (Y-4810K) BRIDGE NO. 120407 ON ROGERS LAKE ROAD OVER US 29A (SOUTH MAIN STREET), NCRR (NS) AND SOUTH RIDGE AVENUE



PHOTOGRAPH NO. 1: WEST APPROACH TO END BENT NO. 1, ALONG -L-ALIGNMENT, WEST OF SOUTH MAIN STREET, LOOKING EAST



PHOTOGRAPH NO. 2: SOUTH OF -L- ALIGNMENT, LOOKING NORTH ACROSS INTERIOR BENT NO. 1



PHOTOGRAPH NO. 3: SOUTH OF -L- ALIGNMENT, LOOKING NORTH ACROSS INTERIOR BENT NO. 2



PHOTOGRAPH NO. 4: EAST APPROACH TO END BENT NO. 2, ALONG -L-ALIGNMENT, EAST OF SOUTH RIDGE AVENUE, LOOKING WEST

4810K REFERENCE

STATE OF NORTH CAROLINA

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

CONTENTS

SHEET NO. **DESCRIPTION** TITLE SHEET LEGEND SITE PLAN & PROFILE BORE LOGS SOIL TEST RESULTS

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY CABARRUS

PROJECT DESCRIPTION SR 1625 (ROGERS LAKE ROAD) GRADE SEPARATION OVER NCRRNS RAILROAD (CROSSING NO. 724408Y)

SITE DESCRIPTION RETAINING WALL ON SR 1625 (ROGERS LAKE ROAD) FROM STA. 38+50 -L- TO STA. 40 + 50 - L

STATE PROJECT REFERENCE NO Y-4810K

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 (99) 707-650. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

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

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

- 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 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.

SCHLEMM, T. S. TURNAGE, J. R. ROUSH, J. K. WERITZ, M. A. BUNCH, C. M.

PERSONNEL

INVESTIGATED BY TERRACON CONSULTANTS

DRAWN BY

FIELDS, W.D.

CHECKED BY

SUBMITTED BY TERRACON CONSULTANTS

DECEMBER 2017

Prepared in the Office of: Consulting Engineers and Scientists

RIGGS, Jr., A. F.



About F. Riggs, Jr. 1/18/2018

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

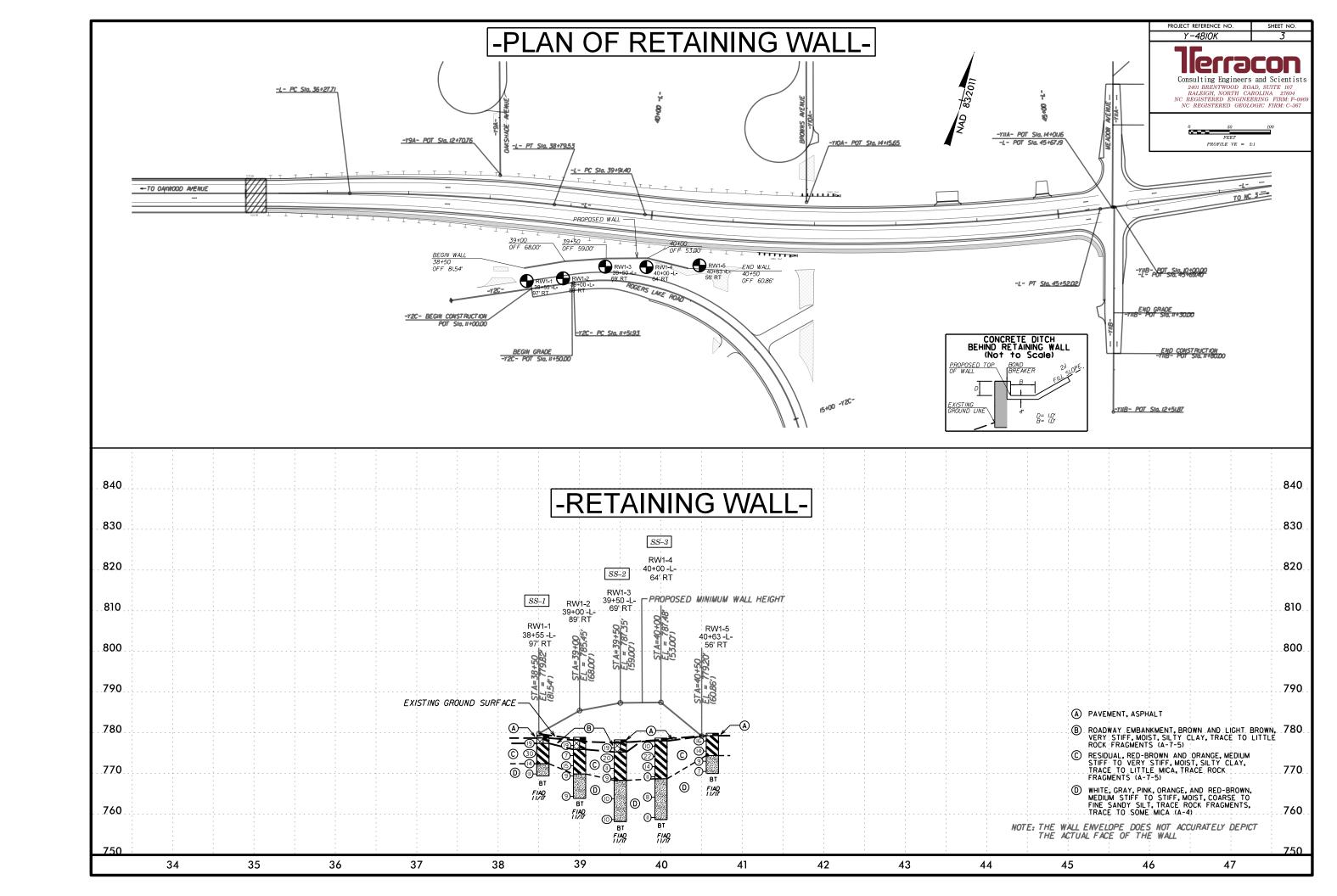
Y-4810K 2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

| Column C | | | | |
|--|--|---|--|--|
| Company Comp | | | | TERMS AND DEFINITIONS |
| The content of the | | | ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. | |
| March Control Contro | ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION | | | |
| Married Color Colo | CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH | ANGULARITY OF GRAINS | REPRESENTED BY A ZONE OF WEATHERED ROCK. | |
| Fig. Laborate Company Compan | | | Y(1/129(1/12) | |
| March Control Contro | | | | |
| March 1 | | | | WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND |
| Company Comp | LLASS. (\$30% PASSING "2000) (>30% PASSING "2000) | | POCK (CD) WOULD FIELD SPI REFUSAL IF TESTED, RUCK TIPE INCLUDES GRANITE, | |
| ## 15 Section 1 | | | | |
| The control of the | 000000000000000000000000000000000000000 | SLIGHTLY COMPRESSIBLE LL < 31 | ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. | |
| The column Column | 000000000000000000000000000000000000000 | | | CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED |
| Column C | *10 50 MX GRANULAR SIL1- | PERCENTAGE OF MATERIAL | | |
| March Marc | Soles con c | GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL | | |
| Part | MATERIAL | TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% | | |
| Total Continue | LI 40 MV 41 MM 40 MV 41 MM 40 MV 41 MM 40 MV 41 MM 50 LS WITH | | | |
| The content of the | PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN LITILE UN HIGHLY | | | |
| The column 1 | BCRUUP INDEX W 4 MX 8 MX 12 MX 16 MX NU MX AMUUN IS UF SOU S | | | |
| ### STATES 19 19 19 19 19 19 19 1 | USUAL 17PES STUNE FROM: FINE SILTY OR CLAYEY SILTY CLAYEY MATTER | | | FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. |
| CALL DELIVERY CONTROL The Part of Part of Part o | | lacksquare static water level after 24 hours | | |
| March Marc | | <u>√PW</u> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA | | |
| CASH STEAM OF DESIGNATES MISSELL MERIUS STREAM STEAM OF THE STREA | AS SUBDINABLE PROPERTY. | - O-M√► SPRING OR SEEP | | <u> </u> |
| ## 1500 FOR CONTROL 1 10 | | MISCELL ANEOLIS SYMBOLS | | |
| ## 15 CHAPLE OF CHAPLES | COMPACTNESS OR RANGE OF STANDARD RANGE OF UNCONFINED | TT 25,425 | (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. |
| ## ADDRESS 1.6 1.0 | PRIMART SUIL TIPE CONSTSTENCY PENETRATION RESISTENCE COMPRESSIVE STRENGTH | TO TO TO THE TOTAL CONTROL OF THE TOTAL CONTROL OT THE TOTAL CONTROL OF THE TOTAL CONTROL OF THE TOTAL CONTROL OT THE TOTAL CONTROL OF THE TOTAL CONTROL OF THE TOTAL CONTROL OF | | |
| March Marc | VERY LOOSE (4 | SOTI SYMPOL STATE TEST POPING SLOPE INDICATOR | (SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED | |
| ## 19 10 10 10 10 10 10 10 | GRANULAR LUUSE 4 10 100 GRANULAR MEDIUM DENSE 10 TO 30 N/A | | | MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS |
| STATE 1 | MAILERIAL DENSE 30 TO 50 | ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER TEST | VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE | |
| STATE OF CORPORATION DEPTHS CONTROL CONT | VENT DENSE / SW | TIMETERED SOLI BOUNDARY - CORE BORING SOLINDING ROD | | |
| Content of the cont | GENERALLY SOFT 2 TO 4 0.25 TO 0.5 | MA - TECT BODING | | RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. |
| Part | | | | |
| FEATURE OR GRAIN SIZE | | TTTTT ALLUVIAL SOIL BOUNDARY A PIEZOMETER INSTALLATION - SPT N-VALUE | | |
| MARCHAN CHARLES 10 10 10 10 10 10 10 1 | | RECOMMENDATION SYMBOLS | ROCK HARDNESS | |
| Part | | | | |
| Delication Collect Collect Piece Stit Collec | | LICED IN THE TOP 2 FEET OF | | RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO |
| ## ABBREVIATIONS May 15 / 5 2.0 0.25 0.05 | ■ BOULDER CORRIE CRAVEL | SUBLICON ONCEHSSIFIED EXCHANITION - EMBANISMENT OF DACKETH | TO DETACH HAND SPECIMEN. | |
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| SOIL MOISTURE - CORRELATION OF TERMS OFF. COMPONENT OF C | | | | |
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| SENTING ELLOW THE COULDU WHITE HOLD PRANTE OF THE COULD WHITE HOLD PRANTE WHITE HOLD WHITE HOLD PRANTE WHITE HOLD PRANTE WHITE HOLD PRANTE WHITE HOLD PRANTE WHITE HOLD PRANTE WHITE SEARCH PASTE OF THE COULD WHITE WHITE HOLD WHITE WHITE HOLD WHITE WHITE HOLD WHITE HOLD PRANTE WHITE SEARCH PASTE OF THE COULD WHITE WHITE WHITE HOLD WHITE WHITE HOLD WHITE WHITE HOLD WHITE WHITE HOLD WHITE WHITE HOLD WHITE WHITE HOLD WHITE WHITE HOLD WHITE WHITE WHITE HOLD WHITE WHITE HOLD WHITE WHITE HOLD WHITE WHITE HOLD WHITE WH | - SATURATED - USUALLY LIQUID: VERY WET, USUALLY | | | STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL |
| PLASTIC LIMIT - WET TWO SEMSOLID REQUIRES ORYING TO ATTAIN OPTIMUM MOISTURE - WET TWO SOLID ATTAIN OPTIMUM MOISTURE - WET TWO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WO SOLID ATTAIN OPTIMUM MOISTURE - WOIST - WOIS | | F - FINE SL SILT, SILTY ST - SHELBY TUBE | | THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. |
| ATTAIN OPTIMUM MOISTURE PLASTIC LIMIT PLASTIC LIMIT OM OPTIMUM MOISTURE SL SHRINKAGE LIMIT ON OPTIMUM MOISTURE SL SHRINKAGE LIMIT ON OPTIMUM MOISTURE SL SHRINKAGE LIMIT ON OPTIMUM MOISTURE SL SHRINKAGE LIMIT ON OPTIMUM MOISTURE SL SHRINKAGE LIMIT ON OPTIMUM MOISTURE SL SHRINKAGE LIMIT ON OPTIMUM MOISTURE SL SHRINKAGE LIMIT ON OPTIMUM MOISTURE ON OPTIMUM MOISTURE SL SHRINKAGE LIMIT ON OPTIMUM MOISTURE ON O | PLASTIC SEMISOLITO PEDILIPES DEVINE TO | | | TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. |
| OPTIMEM MOISTURE SLEVATION SOLID; AT OR NEAR OPTIMEM MOISTURE SLEVATION; SOLID; AT OR NEAR OPTIMEM MOISTURE SLEVATION; SOLID; AT OR NEAR OPTIMEM MOISTURE SLEVATION; SOLID; AT OR NEAR OPTIMEM MOISTURE SLEVATION; SOLID; AT OR NEAR OPTIMEM MOISTURE SHRINKAGE LIMIT - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMEM MOISTURE - ORY - (D) REQUIRES ADDITIONAL WATER TO A STRENGTH OPTIMEM TO DECRETE AND RECORD TO A STRENGTH OPTIMEM TO BE ARE SERVED OR STEEL TEET HINKLY BEDDED 3.15 - 15 FEET HINKY BEDDED 3.15 - 15 FEET HINKLY BEDDED 3.15 - 15 FEET HINKLY BEDD | | | | |
| OM OPTIMUM MOISTURE SL SHRINKAGE LIMIT REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE PLASTICITY PLASTICITY PLASTICITY OM: 0-5 VERY LOW SLICHTLY PLASTIC 0-5 VERY LOW SLICHTLY PLASTIC 0-5 VERY LOW SLICHTLY PLASTIC 0-5 VERY LOW SLICHTLY PLASTIC 0-5 VERY LOW SLICHTLY PLASTIC 0-5 MODERATELY PLASTIC 0-5 MODERATELY PLASTIC 0-15 SLICHTLY PLASTIC 0-5 MODERATELY LOSE 1 TO 3 FEET THICKLY BEDDED 0.16 - 1.5 FEET THICKLY MENDED 0.20 - 0.16 - 1.5 FEET THICKLY MENDED 0.20 - 0.16 - 1.5 FEET THICKLY MENDED 0.20 - 0.16 - 1.5 FEET THICKLY MENDED 0.20 - 0. | | | | |
| CMC-45C CLAY BITS CALOUR STREAMS CLOSE | OM TOLLHOW WOIZLORE | | | ELEVATION: 181.43 FEET |
| PLASTICITY PLASTICITY INDEX (PI) NON PLASTIC SILIGHT AUGER SILICHT PLASTIC SI | | CME-45C CLAY BITS X AUTOMATIC MANUAL | CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET | |
| PLASTICITY PLASTICITY PLASTICITY PLASTICITY PLASTICITY NON PLASTIC O-5 VERY LOW SLIGHTLY PLASTIC G-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM HIGH PORTABLE HOIST TIRICONE | | 6' CONTINUOUS FLIGHT AUGER CORE SIZE: | | FIAD - FILLED IMMEDIATELY AFTER DRILLING |
| PLASTICITY INDEX (P) DRY STRENGTH NON PLASTIC SLIGHTY PLASTIC 16-5 VERY LOW SLIGHTY PLASTIC MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH PORTABLE HOIST TRICONE TRICONE DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SLICH AS LIGHT, DARK, STREAKED, FTG. ARE LISED CME-550 HARD FACED FINGER BITS TUNG,-CARBIDE INSERTS TUNG,-CARBIDE INSERTS TUNG,-CARBIDE INSERTS TUNG,-CARBIDE INSERTS TRIABLE TO NO. — N. — HAND TOOLS: FRIABLE CASING W/ ADVANCER POST HOLE DIGGER HAND TOOLS: POST HOLE DIGGER HAND TOOLS: POST HOLE DIGGER HAND TOOLS: POST HOLE DIGGER HAND TOOLS: POST HOLE DIGGER HAND TOOLS: POST HOLE DIGGER HAND TOOLS: POST HOLE DIGGER HAND AUGER FRIABLE GRAINS ARE DIFFICULT TO SPEARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. SOUNDING ROD VANE SHEAR TEST VANE SHEAR TEST VANE SHEAR TEST STREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; | PLASTICITY | CME-33 | L | |
| NUN PLASTIC SLIGHTLY PLASTIC 6-15 SLIGHT MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH PORTABLE HOIST DESCRIPTIONS MAY INCLUDE COLOR OR C | | - | | |
| MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH PORTABLE HOIST TRICONE 'STEEL TEETH HAND AUGER COLOR DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MEDIUM PORTABLE HOIST TRICONE 'STEEL TEETH HAND AUGER SOUNDING ROD INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. OF THE MEDIUM TO BREAK WITH HAMMER. SYPEMELY INDURATED SHAPP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; | NON PLASTIC 0-5 VERY LOW | TUNGCARBIDE INSERTS | | |
| HIGHLY PLASTIC 26 OR MORE HIGH PORTABLE HOIST TRICONE STEEL TEETH HAND AUGER SOUNDING ROD TRICONE TRI | MODERATELY PLASTIC 16-25 MEDIUM | CASING W/ ADVANCER | CDAING CAN BE CERABATED FROM CAMPLE WITH CTEEL PROPE. | |
| COLOR DESCRIPTIONS MAY INCLUDE COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUICH AS LIGHT, DARK, STREAKED, FTC, ARE LISED TO DESCRIBE APPEARANCE. MODIFIERS SUICH AS LIGHT, DARK, STREAKED, FTC, ARE LISED TO DESCRIBE APPEARANCE. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; | | PORTABLE HOTET TRICONE SCREEN TEETH | | |
| DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SLICH AS LIGHT, DARK, STREAKED, ETC, ARE LISED TO DESCRIBE APPEARANCE. SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; | COLOR | TRICONE TUNG, CARB. | | |
| | | CORE BIT VANE SHEAR TEST | SHAPP HAMMER BLOWS REQUIRED TO RREAK SAMPLE. | |
| | MUDIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE. | X 3½" HSA | | DATE: 8-15-14 |





| Consulting Engineers & So | 31011010 | | BORE | LOG | | |
|-------------------------------------|---------------|---------------------------|---------------------|-------------------------|--|--------------------------|
| WBS 40235.1.46 | | TIP Y-4810K | COUNTY CABAI | RRUS | GEOLOGIST SCHLEN | MM, T.S. |
| SITE DESCRIPTION | SR 1625 (RO | GERS LAKE RD) GRADE | SEPARATION OVI | R NCRR/NS RAILRO | AD | GROUND WTR (ft) |
| BORING NO. RW1- | 1 | STATION 38+55 | OFFSET | 97 ft RT | ALIGNMENT -L- | 0 HR. Caved |
| COLLAR ELEV. 77 | 9.4 ft | TOTAL DEPTH 10.0 f | t NORTH | NG 632,343 | EASTING 1,517,125 | 24 HR. FIAD |
| DRILL RIG/HAMMER EFI | F./DATE TER34 | 6 DIEDRICH D-50 90% 03/10 |)/2017 | DRILL METHOD H.S | S. Augers | HAMMER TYPE Automatic |
| DRILLER TURNAG | E, J.R. | START DATE 11/22/1 | 7 COMP. I | DATE 11/22/17 | SURFACE WATER DEF | PTH N/A |
| ELEV DRIVE ELEV (ft) DEPTH (ft) | 0.5ft 0.5ft 0 | | PER FOOT 50 75 1 | SAMP. L ON NO. MOI G | ELEV. (ft) | DEPTH (f |
| 778.4 1.0 | 0 44 | | | | - 778.7 PA | NT SURFACE 0. VEMENT 0. |
| 775.9 3.5 773.4 6.0 770.9 8.5 | 10 14 7 7 7 | 8 19 30 7 14 6 11 1 | | SS-1 23% M M | ROADWAY BROWN AND LI CLAY, TRACE I 772.4 RED-BROWN A CLAY, TRACE I CLAY, TRACE I TRA | |
| 770 7709 8.5 | 5 5 | | | M M | TRA WHITE, PINK, AN TO FINE SANDY S MICA, TRACE F Boring Terminate RESIDUA | |

GEOTECHNICAL BORING REPORT

SHEET 4 OF 7

| | | | | | | | | B | BORE L | .(| <u>OG</u> | | | | | |
|--------------|--------------|-----------------------------|---|--------|----|----|---------------------|---------|----------|-----------|-----------|--------|-------|--|-------------------|-------------|
| WBS | 40235 | 1.46 | | | TI | Р | Y-4810K | COUNT | Y CABARR | U | S | | | GEOLOGIST SCHLEMM, T.S. | | |
| | | | | 625 (F | | | LAKE RD) GRADI | SEPARA | | | | IS RAI | LRO | | i | ND WTR (ft) |
| | ING NO. | | | | _ | | ATION 39+00 | | OFFSET | _ | | | | ALIGNMENT -L- | 0 HR. | Caved |
| | LAR ELE | | | | | | TAL DEPTH 15.0 | | NORTHING | | | | | EASTING 1,517,167 | 24 HR. | FIAD |
| — | | | | | | | DRICH D-50 90% 03/1 | | 20112 24 | _ | | |) H.S | | | Automatic |
| | LER TU | | 1 | | | IΑ | RT DATE 11/22/ | PER FOO | COMP. DA | _ | SAMP. | _ | L | SURFACE WATER DEPTH N/ | 4 | |
| ELEV (ft) | ELEV (ft) | EV (ft) 0 511 0 511 0 05 50 | | | | | | | 75 100 | П | NO. | MOI | 0 | SOIL AND ROCK DES | CRIPTION | DEPTH (ft) |
| 780 | | _ | | | | | | | | | | | | 778.9 PAVEMENT SURI | | |
| | 777.9 | 1.0 | _ | | 40 | H | | | | \dagger | | | | PAVEMENT | | 0.0 0.7 |
| 775 | 775.4 | 3.5 | 5 | 7 | 12 | | 19 | | | | | M | | ASPHALT 0.7 775.9 ROADWAY EMBAN RED-BROWN, COARSE T | KMENT | 3.0 |
| | 772.9 | - - 6.0 | 6 | 7 | 8 | | | | - | | | M | | CLAY, TRACE TO LITT | LE ROC | |
| 770 | 770.4 | - 8.5 | 4 | 4 | 5 | | | | | | | M M | | RESIDUAL 769.9 RED-BROWN AND ORA CLAY, TRACE MICA, TR | | |
| |] | - - | | | | | . ¶9 | | | | | IVI | | FRAGMENTS WHITE, GRAY, AND PINK | 5 | |
| 765 | 765.4 | 13.5 | 4 | 5 | 4 | | 9 | | | | | М | | FINE SANDY SILT, TRACE TO FRAGMENTS, TRACE TO | CE ROC | K |
| | - | - | | | | | . 🕶 | | - | ٦ | | | | Boring Terminated at Elev RESIDUAL SANDY | ation 763 SILT | .9 ft |
| | - | - - | | | | | | | | | | | | – 0 Hr. Water Level Caved | Dry at 8. | 5' |
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|--------------|-----------------------|----------------|---------|--------|--------|------------------------------------|------------------------------|-----------|--------------|----------|-------------|------------------------|--|-------------------|
| WBS | 40235 | 5.1.46 | | | Т | TP Y-4810K | COUNT | Y CABARRI | JS | | | GEOLOGIST SCH | ILEMM, T.S. | |
| SITE | DESCR | IPTION | SR 1 | 625 (F | ROGE | RS LAKE RD) GRAI | DE SEPARA | TION OVER | NCRR/N | IS RA | ILRO | AD . | G | ROUND WTR (|
| BORII | NG NO | . RW1 | -3 | | S | STATION 39+50 | | OFFSET 6 | 9 ft RT | | | ALIGNMENT -L- | | HR. Cav |
| COLL | AR EL | EV . 77 | '8.3 ft | | Т | OTAL DEPTH 20.1 | ft | NORTHING | 632,38 | 34 | | EASTING 1,517,2 | 14 24 | HR. FIA |
| | | | | | | IEDRICH D-50 90% 03 | | | DRILL N | |) H.S | 1 | | TYPE Automatic |
| | | URNAG | · | | | START DATE 11/22 | | COMP. DA | | _ | 1 | SURFACE WATER | DEPTH N/A | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | 0.5ft | 0.5ft | | - | S PER FOO ⁻ 50 | 75 100 | SAMP. NO. | MOI | L O G | SOIL ANI | ROCK DESCR | IPTION DEPTI |
| 780 | 777.3 | 1.0 | 6 | 11 | 8 | | <u> </u> | | | | | 777.7 | EMENT SURFAC | CE |
| 775 | 774.8- - 772.3 | + | 6 | 8 | 12 | 19 • • • • • • • • • • • • • • • • | | | | M M | | RED-BROW | ASPHALT 0.6' WAY EMBANKM N, SILTY CLAY, 1 CK FRAGMENTS | TRACE TO |
| 770 | 769.8- | Į | 4 | 5 4 | 6 5 | 11. | | | SS-2 | M 20% | | - RED-BROV | MICA RESIDUAL VN AND ORANG CE ROCK FRAG | EE, SILTY GMENTS, |
| 765 | 764.8- | 13.5 | 4 | - | E | | | | | | | WHITE, P COARSE TO | TRACE MICA INK, AND RED-B FINE SANDY SII O LITTLE MICA | ROWN, |
| 760 | - - - 750 7 | 18.6 | 4 | 5 | 5 | 10 | | | | М | | ' | O ETT TEE IVIIOA | |
| | | - 10.0 | 4 | 5 | 5 | 10 | | | | М | | 758.2 | inated at Elevation | 750.0 # |
| | | | | | | | | | | | | O Hr. Wate | r Level Caved Dr | y at 11.0 |

GEOTECHNICAL BORING REPORT

SHEET 5 OF 7

| WBS 40235.1.46 | TC |
|--|-----------------------|
| BORING NO. RW1-4 | GROUND WTR (ft |
| COLLAR ELEV. 778.7 ft | 0 HR. Caved |
| DRILLER TURNAGE J.R. START DATE 11/22/17 COMP. DATE 11/22/17 SURFACE WATER DEPTH | 24 HR. FIAD |
| DRILLER TURNAGE, J.R. START DATE 11/22/17 COMP. DATE 11/22/17 SURFACE WATER DEPTH | HAMMER TYPE Automatic |
| ELEV (ft) | |
| (ft) (ft) 0.5ft | |
| 777.7 1.0 6 5 5 5 | DESCRIPTION DEPTH (|
| 777.7 1.0 6 5 5 5 | |
| 777.7 1.0 6 5 5 5 10 10 12 RESIDION AND CLAY, TRACE TO LIT ROCK FRAGE 770 770.2 8.5 5 5 6 11 | |
| 775 775.2 3.5 7 10 12 22. SS-3 23% RED-BROWN AND CLAY, TRACE TO LIT ROCK FRACE TO LI | |
| 770 770 8.5 5 5 6 111 | |
| 770 770.2 8.5 6 6 6 8 911 | ORANGE, SILTY |
| 770 770.2 8.5 5 5 6 | GMENTS |
| 765 765.2 13.5 3 4 4 M 760 760.2 18.5 4 5 6 M 760 760.2 18.5 A 5 6 M 76 | |
| 765 765 2 13.5 3 4 4 | GRAY, COARSE TO 10 |
| 3 4 4 | |
| 4 5 6 | |
| 4 5 6 | |
| Boring Terminated at | 20. |
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SHEET 6 OF 7

| DESCRIPTION SR 1625 (ROGERS LAKE RD) GRADE SEPARATION OVER NCRR/NS RAILROAD ING NO. RW1-5 STATION 40+63 OFFSET 56 ft RT ALIGNMENT -L- O HR. LAR ELEV. 779.9 ft TOTAL DEPTH 9.9 ft NORTHING 632,414 EASTING 1,517,326 24 HR. LER TURNAGE, J.R. START DATE 11/22/17 COMP. DATE 11/22/17 SURFACE WATER DEPTH N/A BLOWS PER FOOT ELEV (ftt) 0.5 ft 0 | VBS | 40235 | .1.46 | | | Т | ΓIP | Y-4810k | (| COUNT | OR Y CAE | | | | | GEOLO | OGIST SCHLEMM, T | .S. | |
|--|------|--------------------|--------------|------|--------|---|-------|--------------------|----|-------|-------------|-----|-----|--------------|---------|-------------------|------------------------|-----------------|-----------|
| NORTHING STATION 40+63 OFFSET 56 ft RT ALIGNMENT L- O HR. | | | | N SR | 1625 (| | | | | | | | | NS RA | ILRO | | · | | ID WTR (f |
| RIG/HAMMER EFF./DATE TER346 DIEDRICH D-50 90% 03/10/2017 DRILL METHOD H.S. Augers HAMMER TYPE Automatical Au | | | | | | | | | | | | | | | | | MENT -L- | | Cave |
| RIG/HAMMER EFF / DATE TER346 DIEDRICH D-50 90% 03/10/2017 DRILL METHOD H.S. Augers HAMMER TYPE Auto | | | | | | | | | | i i | - | | | | | _ | | | FIAI |
| DRIVE DEPTH ELEV (ft) DEPTH ELEV (ft) O.5ft | | | | | | | | | | | | | | | D H.S | | | | |
| DRIVE ELEV (ft) | | | | | | | | | | | СОМІ | | | | | | | | |
| ELEV (ft) 0.5ft 0. | | DRIVE | | | | | П | | | | | | | _ | | | | | |
| 779.0 0.9 6 7 9 16 | (ft) | ELEV | | 1 | | | - o |) 2 | 25 | 50 | 75 | 100 | NO. | MOI | | ELEV. (ft) | | ESCRIPTION | DEPTH |
| 779.0 0.9 6 7 9 16 | | | | | | | | | • | | | | | | | | | | |
| 779.0 0.9 6 7 9 16 | 780 | | | | | | | | | | | | | | | 779.9 | PAVEMENT S | URFACE | |
| 776.5 | - | 779.0 | 0.9 | 6 | 7 | 9 | \mp | | | | | | | M | T | | PAVEMI | ENT | |
| 774.0 5.9 4 4 5 771.5 8.4 3 3 4 4 5 770.0 MICA, TRACE ROCK FRAGMENTS, SOME CLAY LAYERS Boring Terminated at Elevation 770.0 ft RESIDUAL SANDY SILT | | 776.5 ⁻ | 3.4 | | | | | 16 | | . | | | | IVI | | - L | RESIDU | AL | |
| 771.5 8.4 3 3 4 4 5 | 75 | 7740 | , , | 6 | 7 | 7 | | 14 | | | - : : | | | М | | - | | | |
| 771.5 T 8.4 3 3 4 771.5 T 8.4 3 3 4 4 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 | f | - 774.0 | 5.9 | 4 | 4 | 5 | 1 | . j | | . | | | | М | | - ` | RED-BROWN, ORANG | GE, AND WHI | TE, |
| Boring Terminated at Elevation 770.0 ft | , | 771.5 | 8.4 | 3 | 3 | 4 | + | · <u> </u> · · · · | | . | | | | _M | | - | MICA, TRACE ROCK | FRAGMENTS | S, |
| | 70 | | | + | + | + | ╁ | <u>•</u> 7 | L | | | | 1 | IVI | 3038534 | | Boring Terminated at I | Elevation 770.0 | O ft |
| O Hr. Water Level Caved Dry at 4.2' | | - | _ | | | | | | | | | | | | | - - | RESIDUAL SAI | NDY SILT | |
| | | _ | E | | | | | | | | | | | | | - | 0 Hr. Water Level Ca | aved Dry at 4.2 | 2' |
| | | - | - | | | | | | | | | | | | | - | | | |
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LABORATORY TESTING SUMMARY

| PROJECT NUMBER: | 40325.1.46 | TIP: | Y-4810K | COUNTY: | CABARRUS |
|-----------------|------------|------|---------|---------|----------|
| | | | | | |

DESCRIPTION: SR 1625 (Rogers Lake Road) Grade Separation over NCRR/NS Railroad

| | | | | Depth | | | | % by Weight | | | % Passing (sieves) | | | | | | Ave. Wet | | Shear Strength Values Total Friction Effective Effective | | | |
|------------|-----------|---------|---------------|--------------------|--|------|------|----------------|--|------|--------------------|----------------------|------|-----|------|------------|--------------|----------|---|--------------------|--------------|--|
| Sample No. | Alignment | Station | Offset (feet) | Interval (feet) | AASHTO Class. | L.L. | P.I. | Coarse Sand | Fine Sand | Silt | Clay | Retained #4 Sieve | #10 | #40 | #200 | % Moisture | % Organic | Unit Wt. | Total Cohesion | Total Friction (φ) | Cohesion | Friction |
| SS-1 | -L- | 38+55 | 97' RT | 3.5-5.0 | A-7-5 (21) | 70 | 33 | 17.1 | 17.7 | 18.9 | 46.3 | 1 | 91 | 80 | 64 | 23.2 | N/D | N/D | (psf) N/D | N/D | (psf) N/D | (ф') N/D |
| SS-2 | -L- | 39+50 | 69' RT | 8.5-10.0 | A-7-5 (21) | 53 | 16 | 28.9 | 29.9 | 23.6 | 17.6 | 3 | 86 | 70 | 40 | 19.7 | N/D | N/D | N/D | N/D | N/D | N/D |
| SS-3 | -L- | 40+00 | 64' RT | 3.5-5.0 | A-7-5 (16) | 65 | 28 | 16.7 | 21.8 | 22.5 | 39.0 | 2 | 89 | 78 | 59 | 22.9 | N/D | N/D | N/D | N/D | N/D | N/D |
| 300 | | 10.00 | 0 | 0.0 0.0 | 711 6 (16) | | | | 2.10 | | 00.0 | _ | - 55 | 1 | - 55 | | .,,_ | .,,,, | .,, | .,,, | .,,, | 1 |
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N/D - NOT DETERMINED

Stephanie H. Huffman

Certified Lab Technician Signature

114-01-1203

Certification Number