

REFERENCE: B-5541

PROJECT: 55041

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY HAYWOOD
PROJECT DESCRIPTION REPLACE BRIDGE NO. 236 ON
I-40 OVER THICKETY RD

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
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| N.C. | B-5541 | 1 | 17 |

CAUTION NOTICE

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

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

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

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

| PERSONNEL |
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| <u>C.D. JOHNSON</u> |
| <u>D.O. CHEEK</u> |
| <u>C.J. COFFEY</u> |
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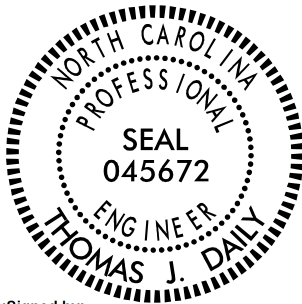
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SUBMITTED BY J. DAILY

DATE SEPTEMBER 2022



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RALEIGH, NC 27616
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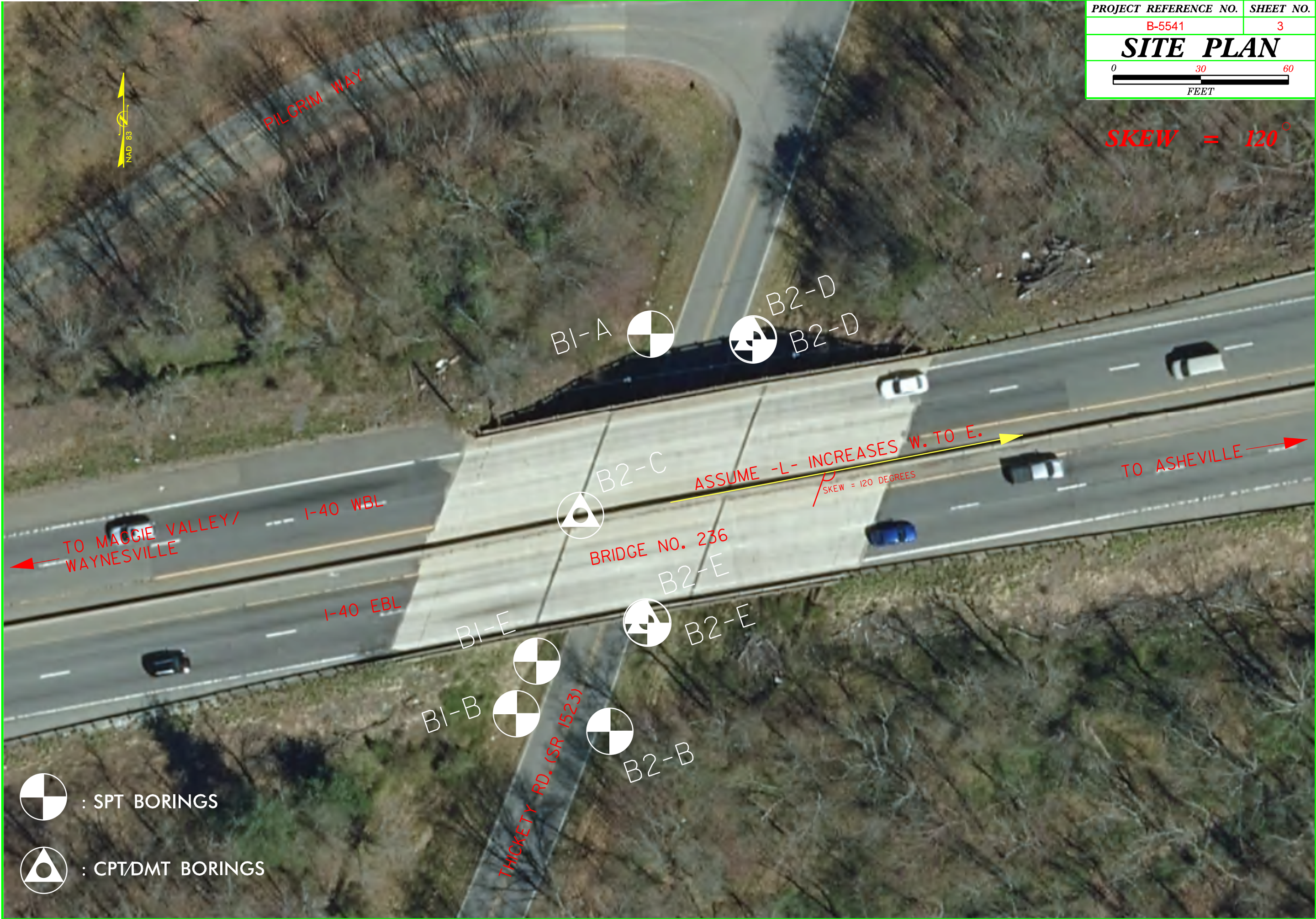
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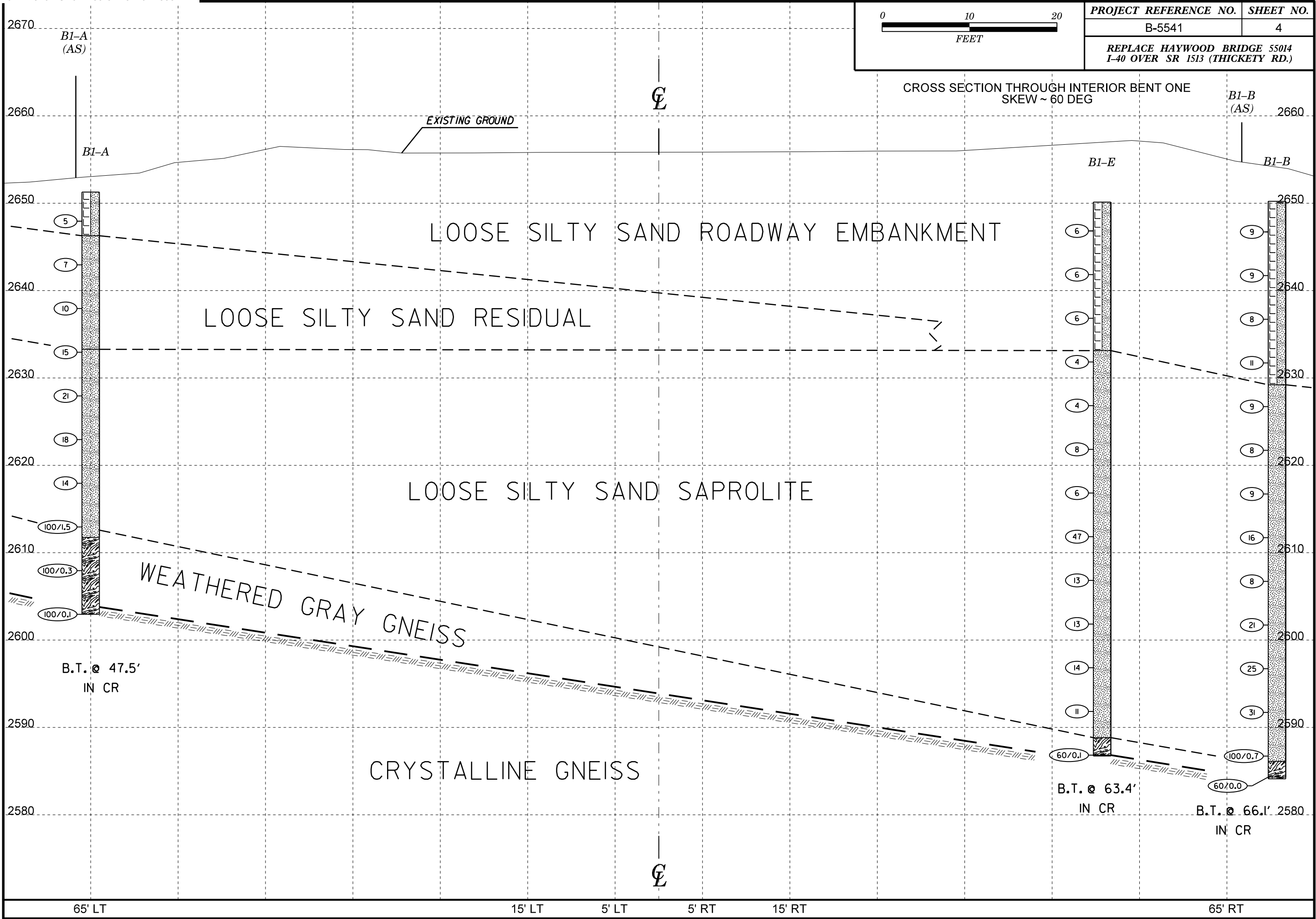
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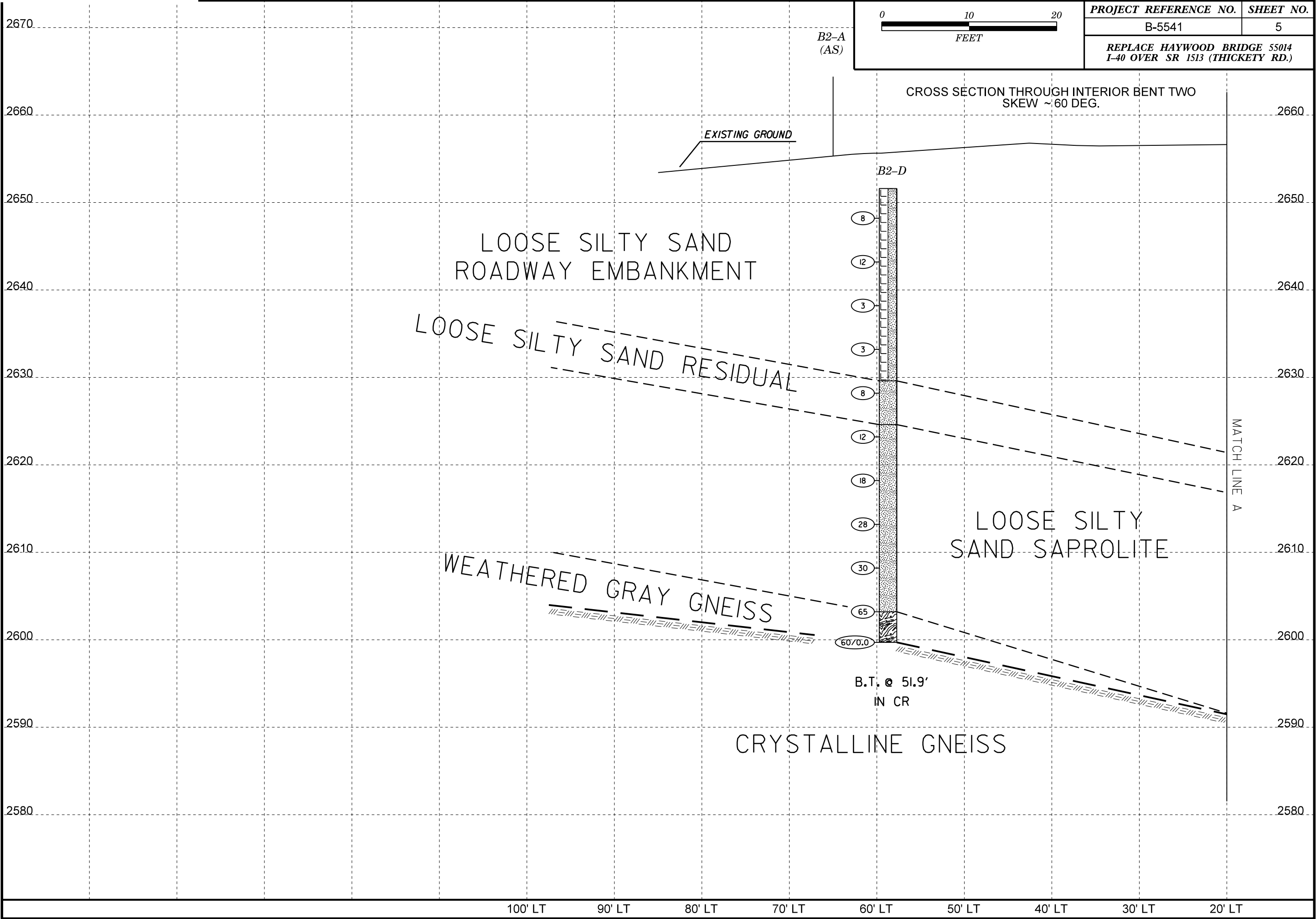
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

| SOIL DESCRIPTION | | | | | | | | | | GRADATION | | | | | | | | | | ROCK DESCRIPTION | | | | | | | | | | TERMS AND DEFINITIONS | | | | | | | | | |
|---|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|---|--|--|--|--|--|--|--|--|--|
| SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN 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 IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i> | | | | | | | | | | WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES. | | | | | | | | | | HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS: | | | | | | | | | | ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. 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. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOOD - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER. | | | | | | | | | |
| SOIL LEGEND AND AASHTO CLASSIFICATION | | | | | | | | | | MINERALOGICAL COMPOSITION | | | | | | | | | | WEATHERING | | | | | | | | | | | | | | | | | | | |
| GENERAL CLASS. GRANULAR MATERIALS (≤ 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS | | | | | | | | | | MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE. | | | | | | | | | | FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. | | | | | | | | | | | | | | | | | | | |
| GROUP CLASS. 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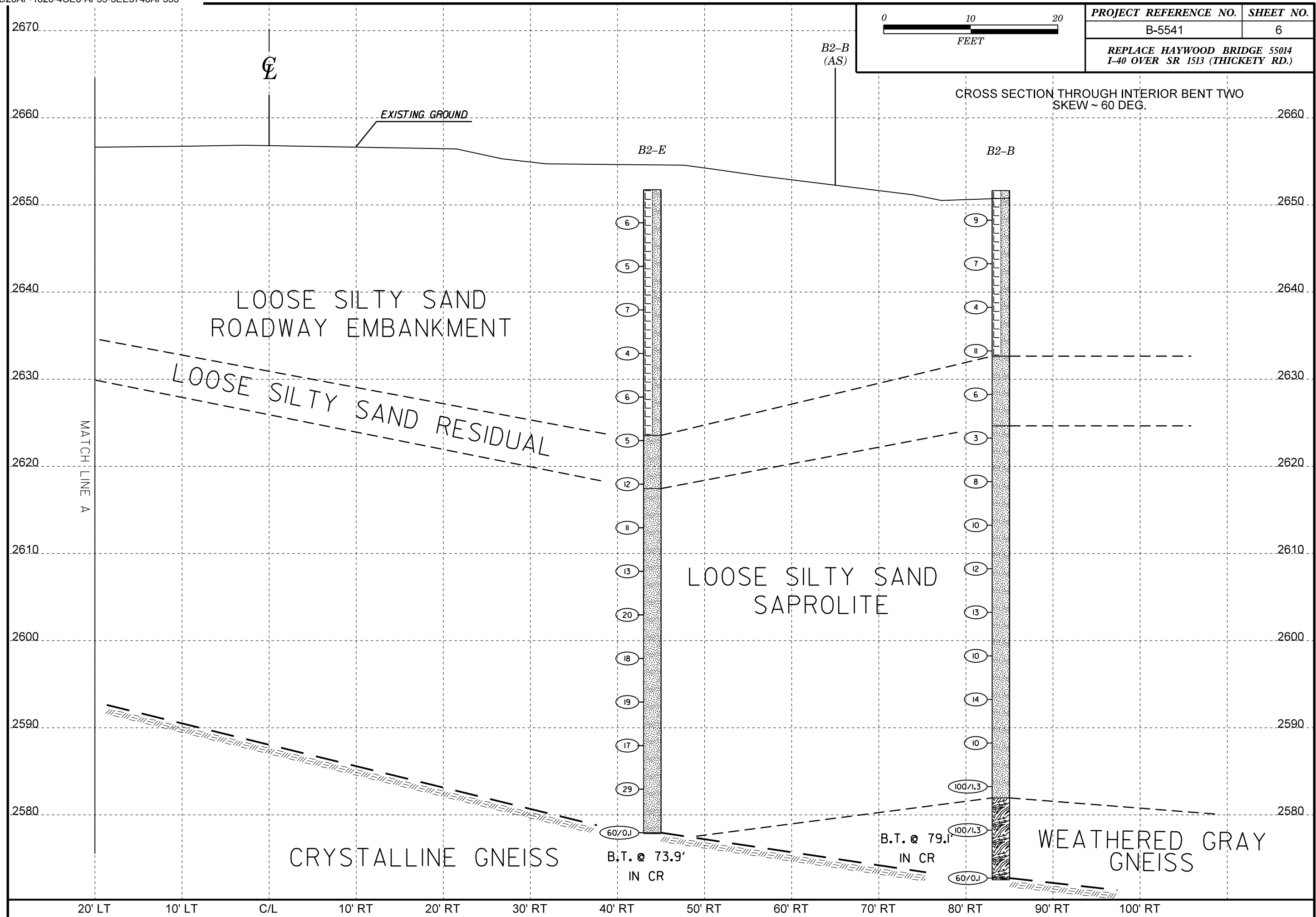
| PROJECT REFERENCE NO. | SHEET NO. |
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| B-5541 | 3 |
| SITE PLAN | |
| <div><div>03060</div><div>FEET</div></div> | |



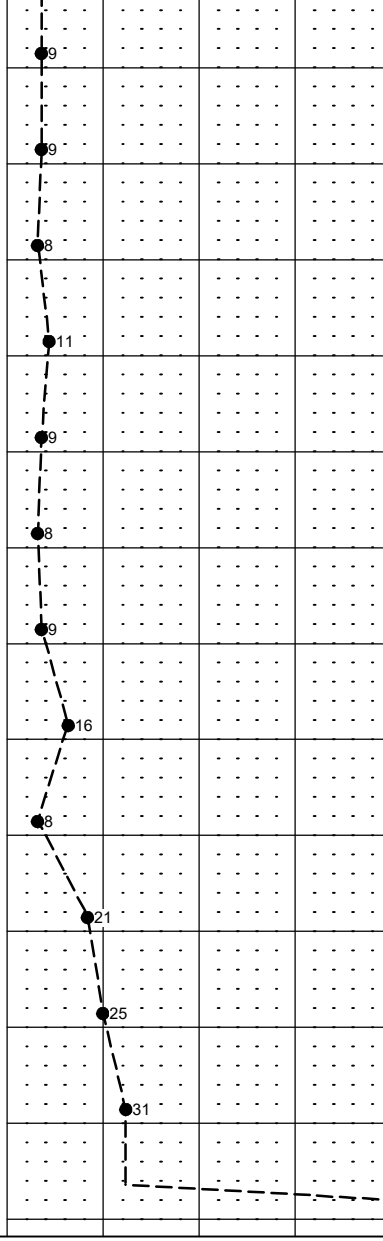




CROSS SECTION THROUGH INTERIOR BENT TWO
SKEW ~ 60 DEG.



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| WBS | | 55041.1.1 | | TIP | | B-5541 | | COUNTY | | HAYWOOD | | GEOLOGIST | | Johnson, C. D. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SITE DESCRIPTION | | | | | | | | | | | | BRIDGE NO. 236 ON -L- (I-40) OVER SR 1523 (THICKETY RD) | | | | GROUND WTR (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BORING NO. | | | | B1-A | | | | STATION | | | | N/A | | | | OFFSET | | | | N/A | | | | ALIGNMENT | | | | N/A | | | | 0 HR. | | Dry | | | | | | | | | | | | | | | | | | | | | | | | | |
| COLLAR ELEV. | | | | 2,651.3 ft | | | | TOTAL DEPTH | | | | 47.6 ft | | | | NORTHING | | | | 677,404 | | | | EASTING | | | | 844,445 | | | | 24 HR. | | 19.5 Caved | | | | | | | | | | | | | | | | | | | | | | | | | |
| DRILL RIG/HAMMER EFF./DATE | | | | | | | | | | AFC8963 CME-550X 94% 04/08/2019 | | | | | | | | | | DRILL METHOD | | | | | | | | | | H.S. Augers | | | | | | | | | | HAMMER TYPE | | | | | | | | | | Automatic | | | | | | | | | |
| DRILLER | | | | | | Cheek, D. O. | | | | | | START DATE | | | | | | 12/02/21 | | | | | | COMP. DATE | | | | | | 12/02/21 | | | | | | SURFACE WATER DEPTH | | | | | | | | | | | | N/A | | | | | | | | | | | |
| ELEV (ft) | | DRIVE ELEV (ft) | | DEPTH (ft) | | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | | | | LOG | | SOIL AND ROCK DESCRIPTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 0.5ft 0.5ft 0.5ft | | | 0 25 50 75 100 | | | | | | | | | | | ELEV. (ft) DEPTH (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2655 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2650 | | | | | | | | | | | | | | | | | | | | 2,651.3 GROUND SURFACE 0.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2645 | | 2,648.8 | | 2.5 | | 1 3 2 | | | | | | | | 5 | | | | M | | ROADWAY EMBANKMENT Red brown, Slightly micaceous, clayey silty SAND with few gravels | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2640 | | 2,643.8 | | 7.5 | | 2 4 3 | | | | | | | | 7 | | | | M | | 2,646.3 RESIDUAL Red brown, Slightly micaceous, clayey silty SAND with few gravels | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2635 | | 2,638.8 | | 12.5 | | 2 4 6 | | | | | | | | 10 | | | | M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2630 | | 2,633.8 | | 17.5 | | 3 7 8 | | | | | | | | 15 | | | | | | 2,633.3 | | 18.0 SAPROLITE Orange brown, Clayey sandy SILT with med rock fragments and Manganese oxide seams throughout | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2625 | | 2,628.8 | | 22.5 | | 3 10 11 | | | | | | | | 21 | | | | M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2620 | | 2,623.8 | | 27.5 | | 4 8 10 | | | | | | | | 18 | | | | M | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2615 | | 2,618.8 | | 32.5 | | 4 7 7 | | | | | | | | 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2610 | | 2,613.8 | | 37.5 | | 19 35 65/0.3 | | | | | | | | | | | | | | 2,612.6 WEATHERED ROCK Weathered gray gneiss 38.7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2605 | | | | | | 100/0.3 | | | | | | | | | | | | | | 2,603.8 47.5 2,603.7 47.6 CRYSTALLINE ROCK Gray gniess Boring Terminated BY AUGER REFUSAL at Elevation 2,603.7 ft IN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| WBS | | 55041.1.1 | | TIP | | B-5541 | | COUNTY | | HAYWOOD | | GEOLOGIST | | Johnson, C. D. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SITE DESCRIPTION | | | | | | | | | | | | BRIDGE NO. 236 ON -L- (I-40) OVER SR 1523 (THICKETY RD) | | | | | | GROUND WTR (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BORING NO. | | | | B1-B | | | | STATION | | | | N/A | | | | OFFSET | | | | N/A | | | | ALIGNMENT | | | | N/A | | | | 0 HR. | | Dry | | | | | | | | | | | | | | | | | |
| COLLAR ELEV. | | | | 2,650.2 ft | | | | TOTAL DEPTH | | | | 66.1 ft | | | | NORTHING | | | | 677,274 | | | | EASTING | | | | 844,399 | | | | 24 HR. | | Caved | | | | | | | | | | | | | | | | | |
| DRILL RIG/HAMMER EFF./DATE | | | | | | | | | | AFC8963 CME-550X 94% 04/08/2019 | | | | | | | | | | DRILL METHOD | | | | | | H.S. Augers | | | | | | HAMMER TYPE | | | | Automatic | | | | | | | | | | | | | | | |
| DRILLER | | | | | | Cheek, D. O. | | | | | | START DATE | | | | | | 12/03/21 | | | | | | COMP. DATE | | | | | | 12/03/21 | | | | | | SURFACE WATER DEPTH | | | | | | | | | | N/A | | | | | |
| ELEV (ft) | | DRIVE ELEV (ft) | | DEPTH (ft) | | BLOW COUNT | | | BLOWS PER FOOT | | | | | | | | | | SAMP. NO. | | LOG | | SOIL AND ROCK DESCRIPTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 0.5ft 0.5ft 0.5ft | | | 0 25 50 75 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2655 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2650 | | | | | | | | | | | | | | | | | | | | | | | 2,650.2 GROUND SURFACE 0.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2645 | | 2,646.7 | | 3.5 | | 2 4 5 | | |  | | | | | | | | | | | | | | ROADWAY EMBANKMENT Red brown, slightly micaceous, clayey sandy silt with gravels | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2640 | | 2,641.7 | | 8.5 | | 2 3 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2635 | | 2,636.7 | | 13.5 | | 2 3 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2630 | | 2,631.7 | | 18.5 | | 4 4 7 | | | | | | | | | | | | | | | | | 2,629.2 21.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2625 | | 2,626.7 | | 23.5 | | 2 4 5 | | | | | | | | | | | | | | | | | SAPROLITE Brown, slightly micaceous sandy SILT with a trace of clay and a few rock fragments | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2620 | | 2,621.7 | | 28.5 | | 1 4 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2615 | | 2,616.7 | | 33.5 | | 3 4 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2610 | | 2,611.7 | | 38.5 | | 3 8 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2605 | | 2,606.7 | | 43.5 | | 2 4 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2600 | | 2,601.7 | | 48.5 | | 2 7 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2595 | | 2,596.7 | | 53.5 | | 7 6 19 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2590 | | 2,591.7 | | 58.5 | | 7 13 18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2585 | | 2,586.7 | | 63.5 | | 34 66/0.2 | | | | | | | | | | | | | | | | | 2,586.1 64.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,584.1 | | 66.1 | | 60/0.0 | | | | | | | | | | | | | | | | | 2,584.3 65.9 2,584.1 66.1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | WEATHERED ROCK Weathered dark gray gneiss CRYSTALLINE ROCK Gray gneiss Boring Terminated BY AUGER REFUSAL at Elevation 2,584.1 ft IN | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

GEOTECHNICAL BORING REPORT
BORE LOG

| | | | | | | | | | | | | | | | |
|--|-----------------------|---------------|---------------------|-------|-------|--------------------------|----|----|--------------------------|-----|--------------|-------------------|-------------|---|------------|
| WBS 55041.1.1 | | | TIP B-5541 | | | COUNTY HAYWOOD | | | GEOLOGIST Johnson, C. D. | | | | | | |
| SITE DESCRIPTION BRIDGE NO. 236 ON -L- (I-40) OVER SR 1523 (THICKETY RD) | | | | | | | | | GROUND WTR (ft) | | | | | | |
| BORING NO. B1-E | | | STATION N/A | | | OFFSET N/A | | | ALIGNMENT N/A | | | 0 HR. N/A | | | |
| COLLAR ELEV. 2,650.1 ft | | | TOTAL DEPTH 63.4 ft | | | NORTHING 677,292 | | | EASTING 844,406 | | | 24 HR. 27.1 Caved | | | |
| DRILL RIGHAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | | | DRILL METHOD H.S. Augers | | | HAMMER TYPE Automatic | | | | | | |
| DRILLER Cheek, D. O. | | | START DATE 12/02/21 | | | COMP. DATE 12/02/21 | | | SURFACE WATER DEPTH N/A | | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | ▼ MOI | L O G | SOIL AND ROCK DESCRIPTION | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | ELEV. (ft) | DEPTH (ft) |
| 2655 | | | | | | | | | | | | | | | |
| 2650 | | | | | | | | | | | | | | 2,650.1 | 0.0 |
| 2645 | 2,646.8 | 3.3 | 1 | 3 | 3 | 6 | | | | | | | | GROUND SURFACE | |
| 2640 | 2,641.3 | 8.8 | 2 | 3 | 3 | 6 | | | | | | | | ROADWAY EMBANKMENT Red brown, micaceous, clayey sandy SILT with gravels | |
| 2635 | 2,636.8 | 13.3 | 2 | 3 | 3 | 6 | | | | | | | | | |
| 2630 | 2,631.8 | 18.3 | 2 | 2 | 2 | 4 | | | | | | | | 2,633.1 | 17.0 |
| 2625 | 2,626.8 | 23.3 | woh | 2 | 2 | 4 | | | | | | | | | |
| 2620 | 2,621.8 | 28.3 | woh | 4 | 4 | 3 | | | | | | | | | |
| 2615 | 2,616.8 | 33.3 | woh | 2 | 4 | 6 | | | | | | | | | |
| 2610 | 2,611.8 | 38.3 | 32 | 21 | 26 | 17 | | | | | | | | | |
| 2605 | 2,606.8 | 43.3 | 7 | 6 | 7 | 13 | | | | | | | | | |
| 2600 | 2,601.8 | 48.3 | 3 | 6 | 7 | 13 | | | | | | | | | |
| 2595 | 2,596.8 | 53.3 | 4 | 6 | 8 | 14 | | | | | | | | | |
| 2590 | 2,591.8 | 58.3 | 3 | 5 | 6 | 11 | | | | | | | | | |
| | 2,586.8 | 63.3 | 60/0.1 | | | | | | | | | | | 2,588.8 | 61.3 |
| | | | | | | | | | | | | | | 2,586.8 | 63.3 |
| | | | | | | | | | | | | | | 2,586.7 | 63.4 |
| | | | | | | | | | | | | | | WEATHERED ROCK Weathered gray schist | |
| | | | | | | | | | | | | | | CRYSTALLINE ROCK Crystalline gray schist | |
| | | | | | | | | | | | | | | Boring Terminated BY AUGER REFUSAL at Elevation 2,586.7 ft IN | |

NCDOT BORE DOUBLE B5541_GEO_BROG_HAYWOOD_55041.GPJ NC_DOT.GDT 8/3/22

GEOTECHNICAL BORING REPORT
BORE LOG

| | | | | | | | | | | | | | | | | |
|--|-----------------|---------------------|------------|--------------------------|-------|-------------------------|----|--------------------------|----|-----|-----------|-----|-----|----------------------------|---|--|
| WBS 55041.1.1 | | | | TIP B-5541 | | COUNTY HAYWOOD | | GEOLOGIST Johnson, C. D. | | | | | | | | |
| SITE DESCRIPTION BRIDGE NO. 236 ON -L- (I-40) OVER SR 1523 (THICKETY RD) | | | | | | | | GROUND WTR (ft) | | | | | | | | |
| BORING NO. B2-B | | STATION N/A | | OFFSET N/A | | ALIGNMENT N/A | | 0 HR. N/A | | | | | | | | |
| COLLAR ELEV. 2,651.6 ft | | TOTAL DEPTH 79.1 ft | | NORTHING 677,268 | | EASTING 844,431 | | 24 HR. 12.0 Dry | | | | | | | | |
| DRILL RIGHAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | DRILL METHOD H.S. Augers | | HAMMER TYPE Automatic | | | | | | | | | | |
| DRILLER Cheek, D. O. | | START DATE 12/01/21 | | COMP. DATE 12/01/21 | | SURFACE WATER DEPTH N/A | | | | | | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | | | |
| 2655 | | | | | | | | | | | | | | | | |
| 2650 | | | | | | | | | | | | | | 2,651.6 GROUND SURFACE 0.0 | | |
| 2645 | 2,647.6 | 4.0 | | 2 | 4 | 5 | | | | | | | | | ROADWAY EMBANKMENT | |
| 2640 | 2,642.6 | 9.0 | | 2 | 3 | 4 | | | | | | | | | Red brown, slightly micaceous, clayey sandy SILT with a few gravels | |
| 2635 | 2,637.6 | 14.0 | woh | 2 | 2 | | | | | | | | | | | |
| 2630 | 2,632.6 | 19.0 | | 4 | 6 | 5 | | | | | | | | | 2,632.6 19.0 | |
| 2625 | 2,627.6 | 24.0 | | 1 | 2 | 4 | | | | | | | | | RESIDUAL | |
| 2620 | 2,622.6 | 29.0 | woh | 1 | 2 | | | | | | | | | | Red brown to white tan, coarse clayey sandy SILT with clay layers to fine clay silty sand layers with a few gravels | |
| 2615 | 2,617.6 | 34.0 | | 2 | 3 | 5 | | | | | | | | | | |
| 2610 | 2,612.6 | 39.0 | | 3 | 4 | 6 | | | | | | | | | SAPROLITE | |
| 2605 | 2,607.6 | 44.0 | | 1 | 3 | 9 | | | | | | | | | Gray brown orange, micaceous, clayey SILT | |
| 2600 | 2,602.6 | 49.0 | | 3 | 5 | 8 | | | | | | | | | | |
| 2595 | 2,597.6 | 54.0 | | 2 | 4 | 6 | | | | | | | | | | |
| 2590 | 2,592.6 | 59.0 | woh | 4 | 10 | | | | | | | | | | | |
| 2585 | 2,587.6 | 64.0 | | 2 | 4 | 6 | | | | | | | | | | |
| 2580 | 2,582.6 | 69.0 | 15 | 85/0.3 | | | | | | | | | | | 2,581.9 69.7 | |
| 2575 | 2,577.6 | 74.0 | 25 | 75/0.3 | | | | | | | | | | | WEATHERED ROCK | |
| | | | | | | | | | | | | | | | Weathered gray gneiss | |

NCDOT BORE DOUBLE B5541_GEO_BROG_HAYWOOD_55041.GPJ NC_DOT.GDT 8/3/22

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|--|-----------------------|---------------|------------|---------------------|-------|----------------|----|--------------------------|----|-----|--------------|--------------------------|--------------------|---------------------------|--|-----------------|--|
| WBS 55041.1.1 | | | | TIP B-5541 | | | | COUNTY HAYWOOD | | | | GEOLOGIST Johnson, C. D. | | | | | |
| SITE DESCRIPTION BRIDGE NO. 236 ON -L- (I-40) OVER SR 1523 (THICKETY RD) | | | | | | | | | | | | GROUND WTR (ft) | | | | | |
| BORING NO. B2-B | | | | STATION N/A | | | | OFFSET N/A | | | | ALIGNMENT N/A | | | | 0 HR. N/A | |
| COLLAR ELEV. 2,651.6 ft | | | | TOTAL DEPTH 79.1 ft | | | | NORTHING 677,268 | | | | EASTING 844,431 | | | | 24 HR. 12.0 Dry | |
| DRILL RIGHAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | | | | | DRILL METHOD H.S. Augers | | | | HAMMER TYPE Automatic | | | | | |
| DRILLER Cheek, D. O. | | | | START DATE 12/01/21 | | | | COMP. DATE 12/01/21 | | | | SURFACE WATER DEPTH N/A | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | | | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | | | | |
| 2575 | | | | | | Match Line | | | | | | | | | | | |
| | 2,572.6 | 79.0 | | | | | | | | | | | 2,572.7 2,572.5 | 78.9 79.1 | | | |
| | | | 60/0.1 | | | | | | | | | | | | | | |
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| WBS 55041.1.1 | | | | | | TIP B-5541 | | | | | | COUNTY HAYWOOD | | | | | | GEOLOGIST Johnson, C. D. | | | | | | | |
| SITE DESCRIPTION BRIDGE NO. 236 ON -L- (I-40) OVER SR 1523 (THICKETY RD) | | | | | | | | | | | | | | | | | | GROUND WTR (ft) | | | | | | | |
| BORING NO. B2-D | | | | | | STATION N/A | | | | | | OFFSET N/A | | | | | | ALIGNMENT N/A | | | | | | 0 HR. 28.0 | |
| COLLAR ELEV. 2,651.6 ft | | | | | | TOTAL DEPTH 51.9 ft | | | | | | NORTHING 677,402 | | | | | | EASTING 844,480 | | | | | | 24 HR. 25.6 | |
| DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | | | | | | | | | DRILL METHOD H.S. Augers | | | | | | HAMMER TYPE Automatic | | | | | | | |
| DRILLER Cheek, D. O. | | | | | | START DATE 12/02/21 | | | | | | COMP. DATE 12/02/21 | | | | | | SURFACE WATER DEPTH N/A | | | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | MOI | L O G | SOIL AND ROCK DESCRIPTION | | DEPTH (ft) | | | | | | | | | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | | | | | | | | | | | | |
| 2655 | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2650 | | | | | | | | | | | | | | 2,651.6 GROUND SURFACE | | 0.0 | | | | | | | | | |
| | 2,648.2 | 3.4 | 2 | 3 | 5 | | | | | | | | | ROADWAY EMBANKMENT Red brown, micaceous, clayey sandy SILT with a few gravels | | | | | | | | | | | |
| 2645 | 2,643.2 | 8.4 | 3 | 5 | 7 | | | | | | | | | | | | | | | | | | | | |
| 2640 | 2,638.2 | 13.4 | 1 | 1 | 2 | | | | | | | | | | | | | | | | | | | | |
| 2635 | 2,633.2 | 18.4 | 1 | 2 | 1 | | | | | | | | | | | | | | | | | | | | |
| 2630 | 2,628.2 | 23.4 | 2 | 4 | 4 | | | | | | | | | 2,629.6 | | 22.0 | | | | | | | | | |
| 2625 | 2,623.2 | 28.4 | 3 | 5 | 7 | | | | | | | | | 2,624.6 | | 27.0 | | | | | | | | | |
| 2620 | 2,618.2 | 33.4 | 3 | 6 | 12 | | | | | | | | | | | | | | | | | | | | |
| 2615 | 2,613.2 | 38.4 | 5 | 12 | 16 | | | | | | | | | | | | | | | | | | | | |
| 2610 | 2,608.2 | 43.4 | 8 | 13 | 17 | | | | | | | | | | | | | | | | | | | | |
| 2605 | 2,603.2 | 48.4 | 16 | 30 | 30 35 | | | | | | | | | 2,603.2 | | 48.4 | | | | | | | | | |
| 2600 | 2,599.7 | 51.9 | 60/0.0 | | | | | | | | | | | 2,599.7 | | 51.9 | | | | | | | | | |
| | | | | | | | | | | | | | | CRYSTALLINE ROCK Gray gneiss Boring Terminated BY AUGER REFUSAL at Elevation 2,599.7 ft IN | | | | | | | | | | | |

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| WBS | | 55041.1.1 | | TIP | | B-5541 | | COUNTY | | HAYWOOD | | GEOLOGIST | | Johnson, C. D. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SITE DESCRIPTION | | | | | | | | | | | | BRIDGE NO. 236 ON -L- (I-40) OVER SR 1523 (THICKETY RD) | | | | GROUND WTR (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BORING NO. | | | | B2-E | | | | STATION | | | | N/A | | | | OFFSET | | | | N/A | | | | ALIGNMENT | | | | N/A | | | | 0 HR. | | 4.7 Caved | | | | | | | | | | | | | | | | | | | | | | | | | |
| COLLAR ELEV. | | | | 2,651.8 ft | | | | TOTAL DEPTH | | | | 73.9 ft | | | | NORTHING | | | | 677,305 | | | | EASTING | | | | 844,444 | | | | 24 HR. | | FIAD | | | | | | | | | | | | | | | | | | | | | | | | | |
| DRILL RIG/HAMMER EFF./DATE | | | | | | | | | | AFC8963 CME-550X 94% 04/08/2019 | | | | | | | | | | DRILL METHOD | | | | | | | | | | H.S. Augers | | | | | | | | | | HAMMER TYPE | | | | | | | | | | Automatic | | | | | | | | | |
| DRILLER | | | | | | Cheek, D. O. | | | | | | START DATE | | | | | | 12/01/21 | | | | | | COMP. DATE | | | | | | 12/01/21 | | | | | | SURFACE WATER DEPTH | | | | | | | | | | | | N/A | | | | | | | | | | | |
| ELEV (ft) | | DRIVE ELEV (ft) | | DEPTH (ft) | | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | | MOI | | LOG | | SOIL AND ROCK DESCRIPTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | 0.5ft 0.5ft 0.5ft | | | 0 25 50 75 100 | | | | | | | | | | | ELEV. (ft) DEPTH (ft) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2655 | | | | | | | | | | | | | | | | | | | | GROUND SURFACE 0.0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2650 | | | | | | | | | | | | | | | | | | | | ROADWAY EMBANKMENT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,648.0 | | 3.8 | | 2 2 4 | | | | | | | | | | | | | | Red brown, slightly micaceous, clayey silty SAND with a few gravels | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2645 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,643.0 | | 8.8 | | 1 2 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2640 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,638.0 | | 13.8 | | 1 3 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2635 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,633.0 | | 18.8 | | 1 2 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2630 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,628.0 | | 23.8 | | 2 2 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2625 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,623.0 | | 28.8 | | 1 2 3 | | | | | | | | | | | | | | 2,623.6 28.2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2620 | | | | | | | | | | | | | | | | | | | | RESIDUAL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,618.0 | | 33.8 | | 2 6 6 | | | | | | | | | | | | | | Orange Brown, fine to coarse, micaceous, moderately plastic, clayey silty SAND with a trace of Manganese oxide | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2615 | | | | | | | | | | | | | | | | | | | | 2,617.5 34.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,613.0 | | 38.8 | | 3 4 7 | | | | | | | | | | | | | | SAPROLITE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2610 | | | | | | | | | | | | | | | | | | | | Red brown, very micaceous, clayey silty SAND with a trace of manganese oxide | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,608.0 | | 43.8 | | 5 7 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2605 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,603.0 | | 48.8 | | 5 7 13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2600 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,598.0 | | 53.8 | | 3 6 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2595 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,593.0 | | 58.8 | | 3 7 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2590 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,588.0 | | 63.8 | | 6 6 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2585 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,583.0 | | 68.8 | | 7 13 16 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2580 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2,578.0 | | 73.8 | | 60/0.1 | | | | | | | | | | | | | | 2,578.0 73.8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | 2,577.9 73.9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | CRYSTALLINE ROCK | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | Crystalline gray gneiss | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

[illegible]

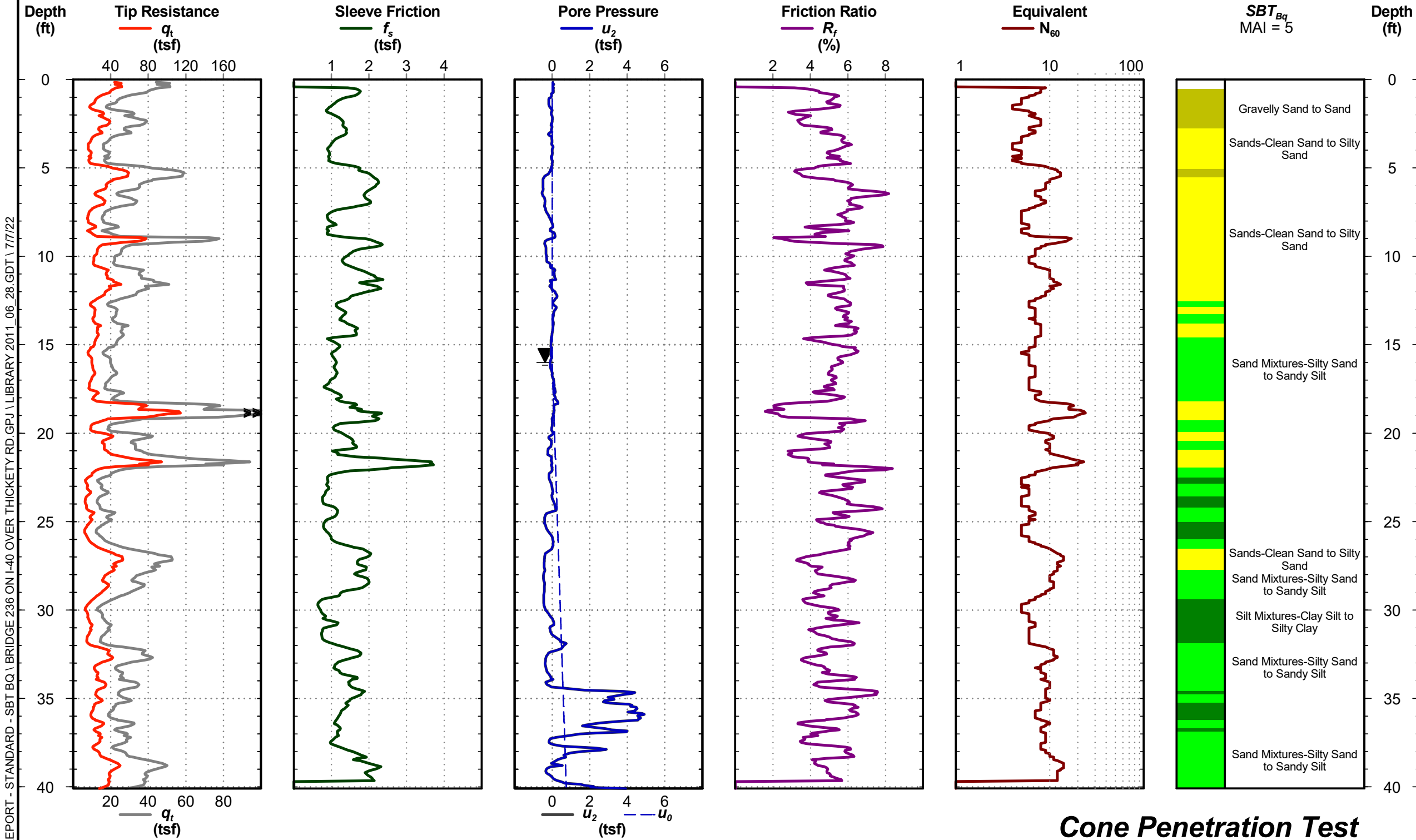


Bridge 236 on I-40 over Thickety Rd
Haywood County, North Carolina
S&ME Project No: 22350010

Sounding ID: 236-B2-C

Date: Jun. 23, 2022
Estimated Water Depth: 16 ft
Rig/Operator: ATV/MW | TC

Total Depth: 40.1 ft
Termination Criteria: Target Depth
Cone Size: 1.75



CPT REPORT - STANDARD - SBT BQ \ BRIDGE 236 ON I-40 OVER THICKETY RD.GPJ \ LIBRARY 2011_06_28.GDT \ 7/7/22

Cone Penetration Test

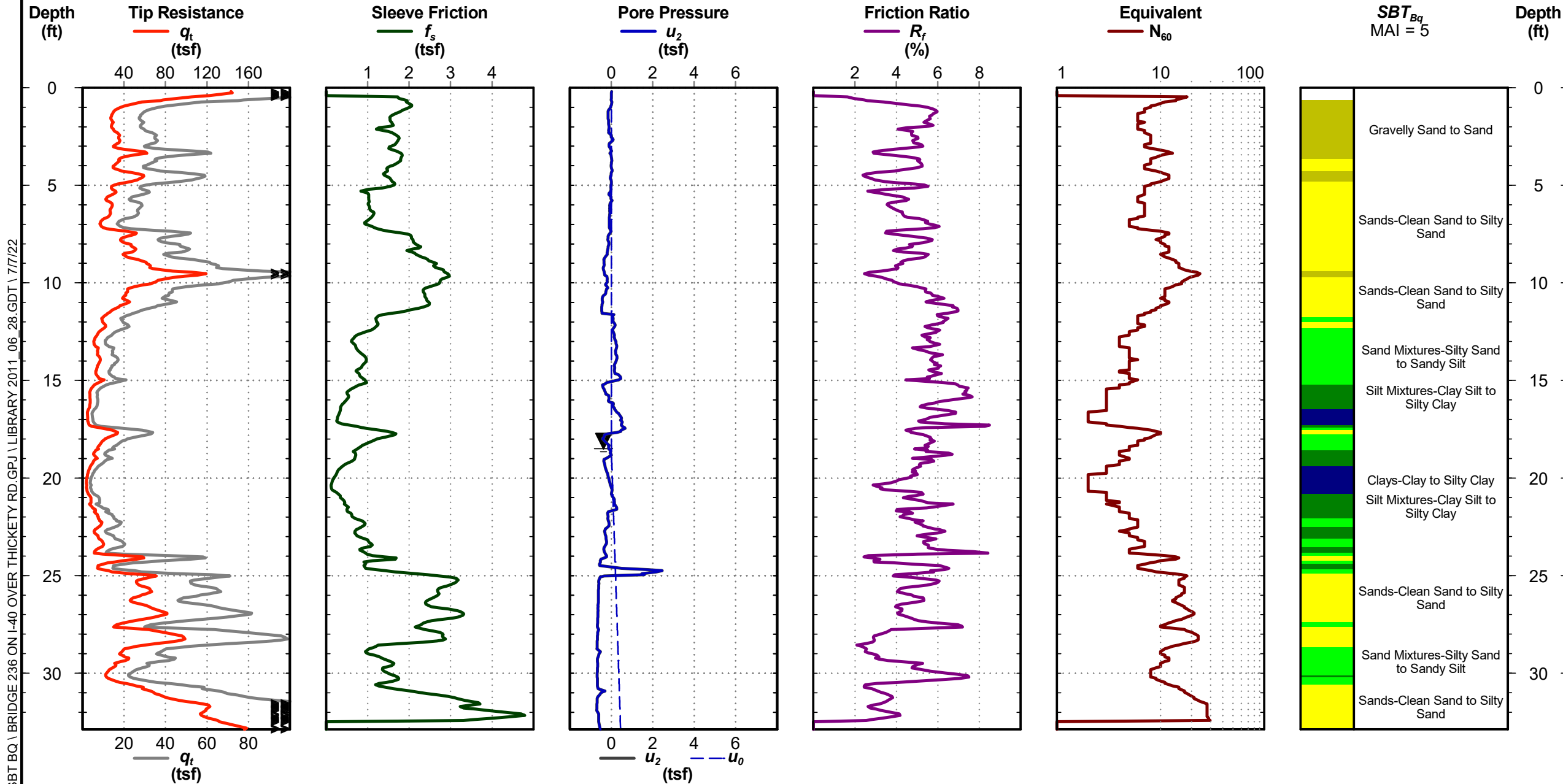


Bridge 236 on I-40 over Thickety Rd
Haywood County, North Carolina
S&ME Project No: 22350010

Sounding ID: 236-B2-D

Date: Jun. 23, 2022
Estimated Water Depth: 18.5 ft
Rig/Operator: ATV/MW | TC

Total Depth: 32.9 ft
Termination Criteria: Maximum Reaction Force
Cone Size: 1.75



CPT REPORT - STANDARD - SBT BQ \ BRIDGE 236 ON I-40 OVER THICKETY RD.GPJ \ LIBRARY 2011_06_28.GDT \ 7/7/22

Cone Penetration Test

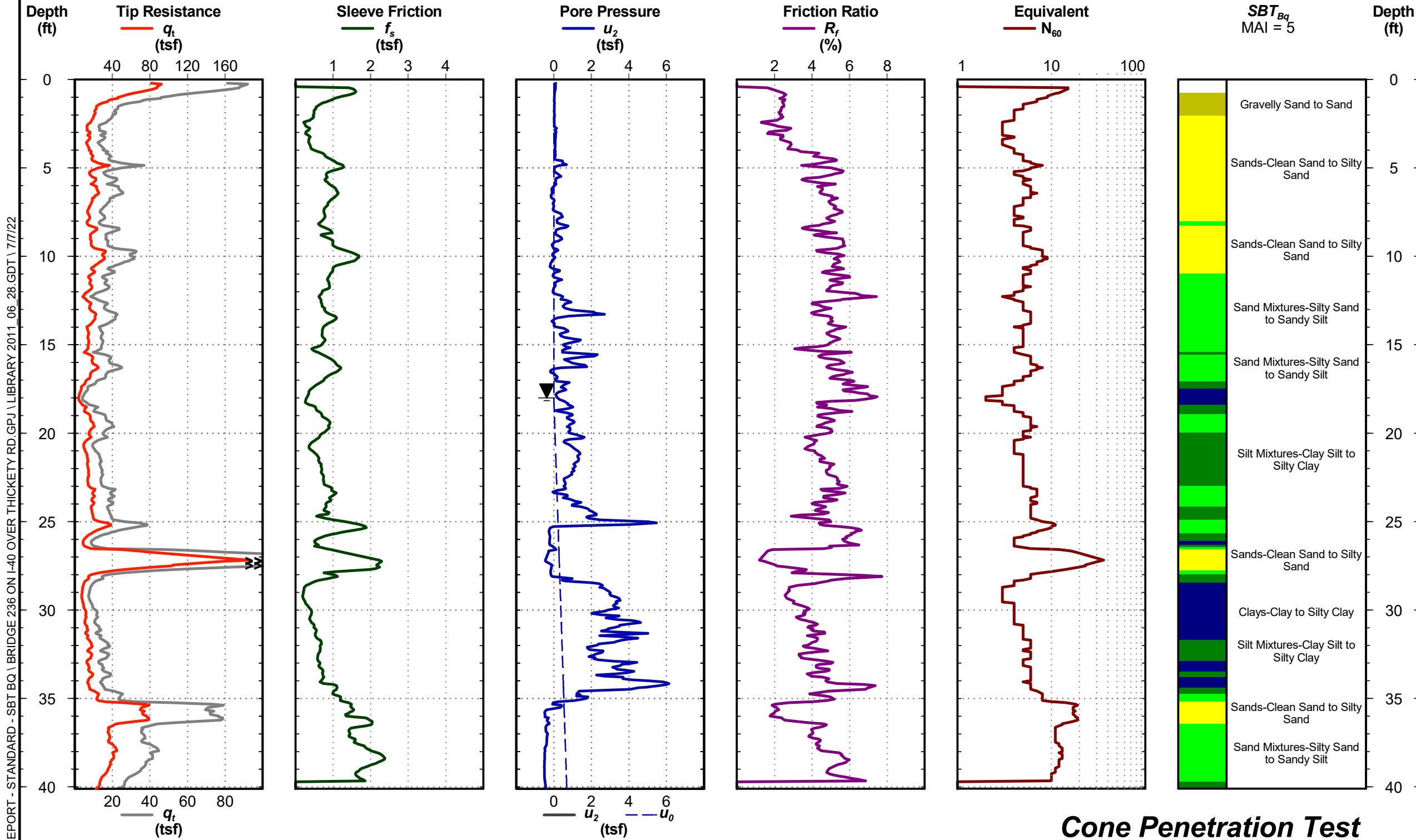


Bridge 236 on I-40 over Thickety Rd
Haywood County, North Carolina
S&ME Project No: 22350010

Sounding ID: 236-B2-E

Date: Jun. 23, 2022
Estimated Water Depth: 18 ft
Rig/Operator: ATV/MW | TC

Total Depth: 40.1 ft
Termination Criteria: Target Depth
Cone Size: 1.75



CPT REPORT - STANDARD - SBT BQ \ BRIDGE 236 ON I-40 OVER THICKETY RD.GPJ \ LIBRARY 2011_06_28.GDT \ 7/7/22

Cone Penetration Test

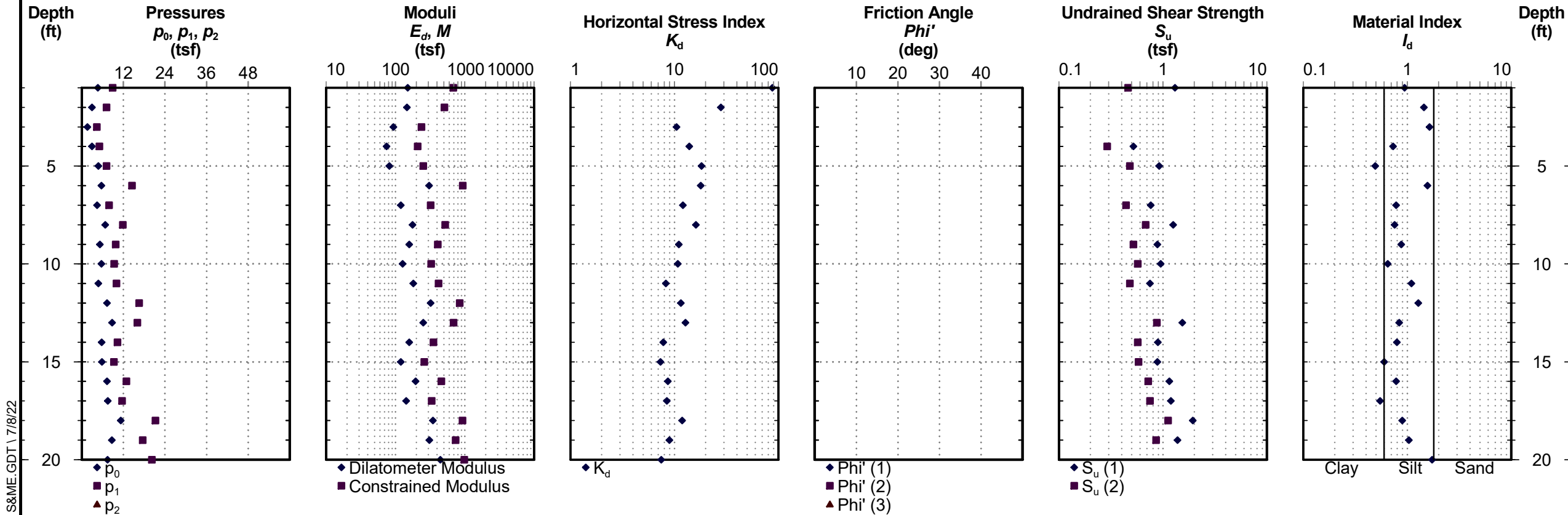


Bridge 236 on I-40 over Thickety Rd
Haywood County, North Carolina
S&ME Project No: 22350010

Sounding ID: 236-B2-C

Date: Jun. 23, 2022
Estimated Water Depth: 18 ft
Rig/Operator: ATV/MW | TC

Total Depth: 20.0 ft
Termination Criteria: Target Depth
Membrane Type: H25



DMT REPORT - DYNAMIC | BRIDGE 236 ON I-40 OVER THICKETY RD.GPJ | S&ME.GDT | 7/8/22

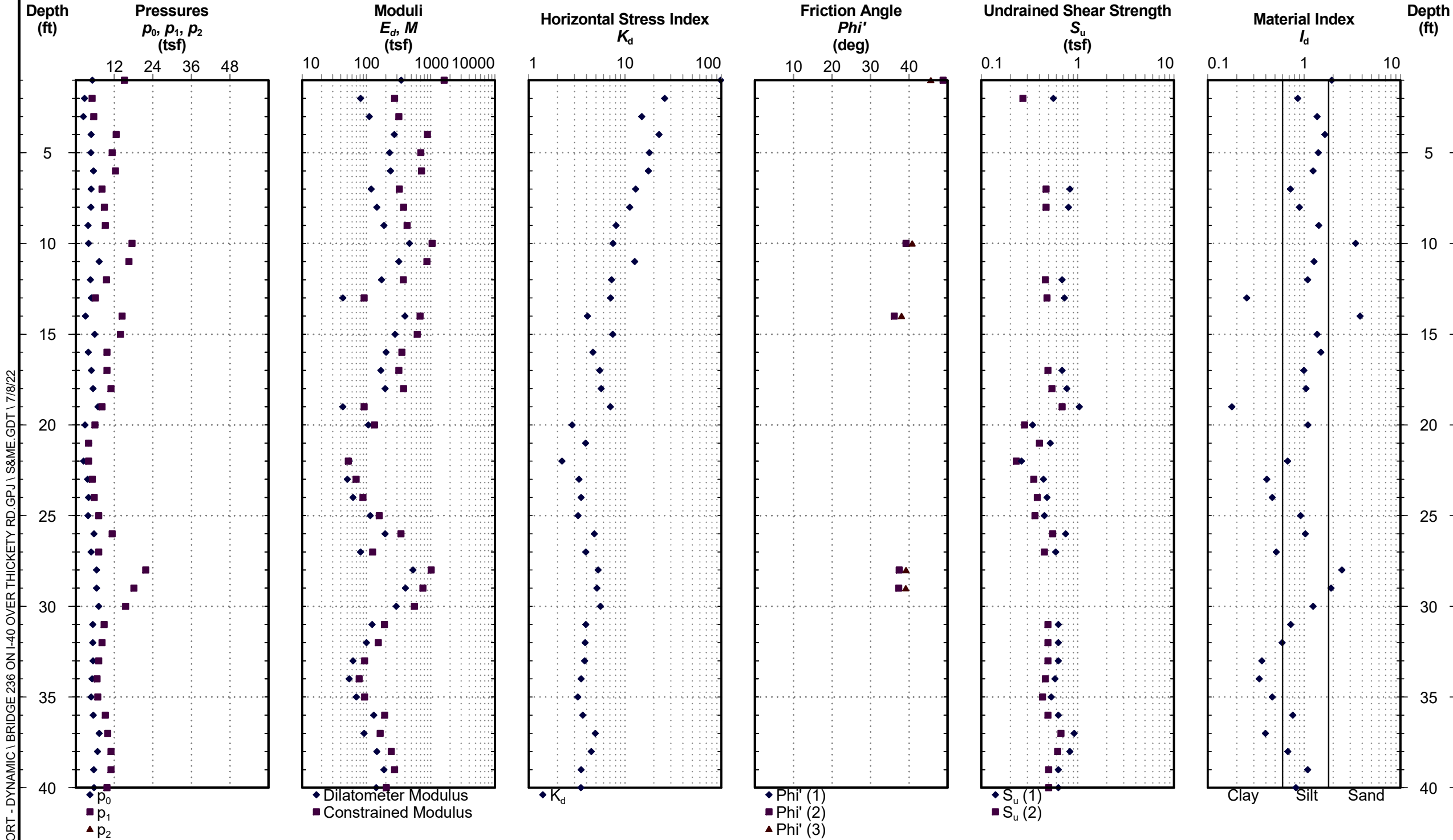


Bridge 236 on I-40 over Thickety Rd
Haywood County, North Carolina
S&ME Project No: 22350010

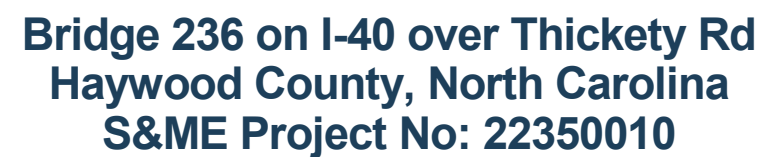
Sounding ID: 236-B2-D

Date: Jun. 23, 2022
Estimated Water Depth: 18.5 ft
Rig/Operator: ATV/MW | TC

Total Depth: 40.0 ft
Termination Criteria: Maximum Reaction Force
Membrane Type: H25



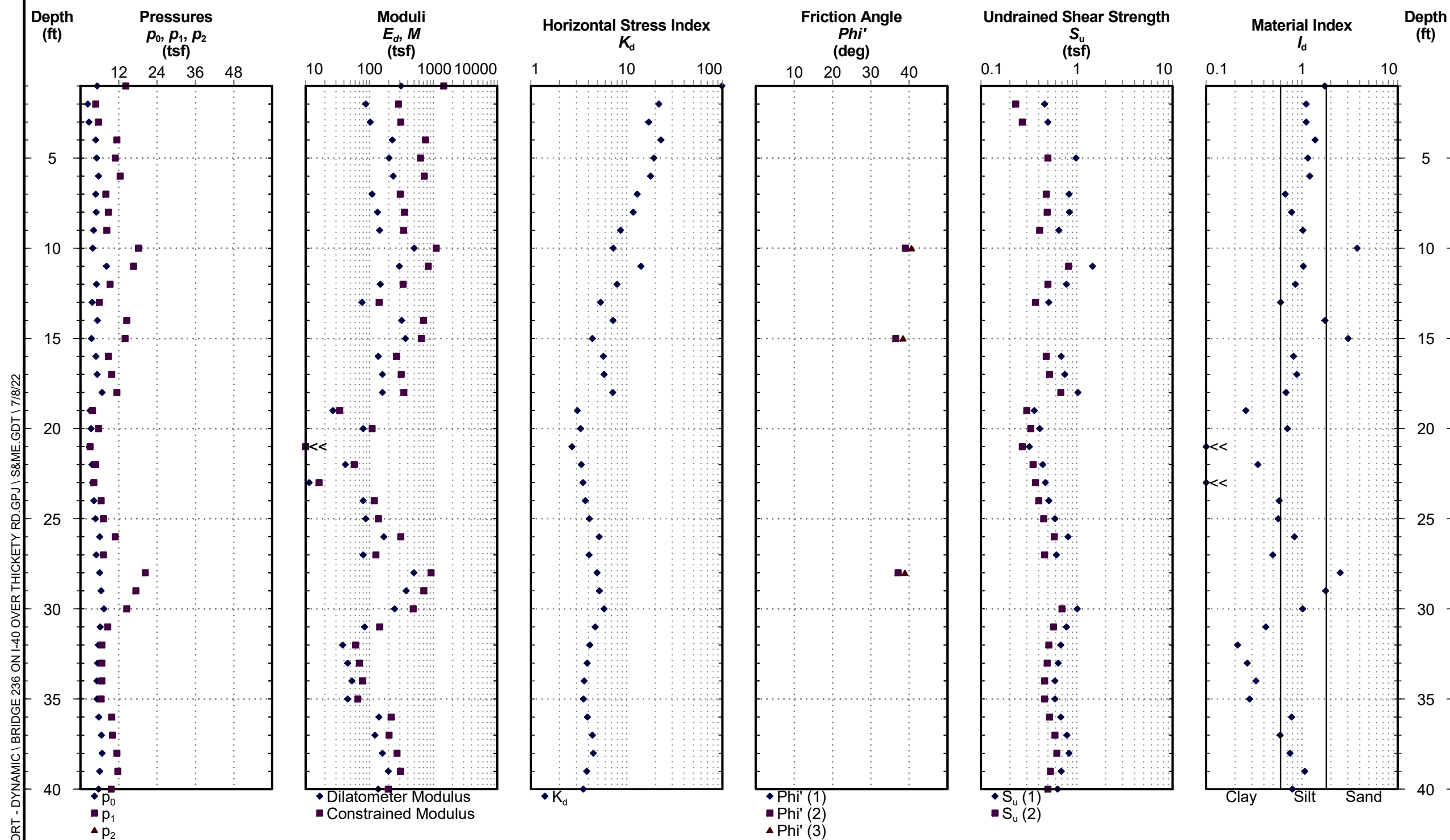
DMT REPORT - DYNAMIC | BRIDGE 236 ON I-40 OVER THICKETY RD.GPJ | S&ME.GDT | 7/8/22



Date: Jun. 23, 2022
Estimated Water Depth: 18 ft
Rig/Operator: ATV/MW | TC

Total Depth: 40.0 ft
Termination Criteria: Target Depth
Membrane Type: H25

Sounding ID: 236-B2-E



REFERENCE: B-5541

PROJECT: 55041

CONTENTS

| SHEET NO. | DESCRIPTION |
|-----------|----------------------|
| 1 | TITLE SHEET |
| 2 | LEGEND (SOIL & ROCK) |
| 3 | SITE PLAN |
| 4-6 | CROSS SECTIONS |
| 7-10 | BORE LOGS |

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY HAYWOOD
PROJECT DESCRIPTION REPLACE BRIDGE #236 ON I-40
OVER SR 1513 (THICKETY RD)

SITE DESCRIPTION _____

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C. | 55041 | 1 | 10 |

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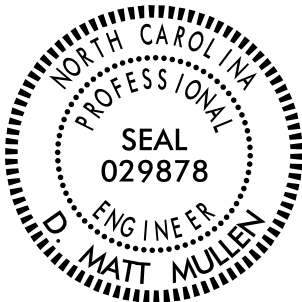
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PERSONNEL

CD JOHNSON
DO CHEEK
CJ COFFEY

INVESTIGATED BY DM MULLEN
DRAWN BY DMM
CHECKED BY JCK 
SUBMITTED BY JCK
DATE 27/2022



DocuSigned by:
 02/07/2022
180098D3CD5440C...
SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, *VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6*

SOIL LEGEND AND AASHTO CLASSIFICATION

| GENERAL CLASS. | GRANULAR MATERIALS ($\leq 35\%$ PASSING #200) | | | | | | SILT-CLAY MATERIALS ($> 35\%$ PASSING #200) | | | | | | ORGANIC MATERIALS | | |
|--------------------------------|---|-------------|---------------------------------|-------------|-------------|-------------|---|-------------|-------------|--------------|---|------------|-------------------|----------------------|--|
| GROUP CLASS. | A-1 | A-3 | A-2 | | A-2-7 | | A-4 | A-5 | A-6 | A-7 | A-1, A-2 | A-3 | A-4, A-5 | A-6, A-7 | |
| SYMBOL | | | | | | | | | | | | | | | |
| % PASSING #10 #40 #200 | 50 MX 30 MX 15 MX | 50 MX 25 MX | 51 MN 10 MX | 35 MX | 35 MX | 35 MX | 35 MX | 36 MN | 36 MN | 36 MN | 36 MN | 36 MN | GRANULAR SOILS | SILT-CLAY SOILS | |
| MATERIAL PASSING #40 LL PI | — 6 MX | — NP | 40 MX 10 MX | 41 MN 10 MX | 40 MX 11 MN | 41 MN 11 MN | 40 MX 10 MX | 41 MN 10 MX | 40 MX 11 MN | 41 MN 11 MN | SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER | | | HIGHLY ORGANIC SOILS | |
| GROUP INDEX | 0 | 0 | 0 | 0 | 4 MX | 8 MX | 12 MX | 16 MX | NO MX | | | | | | |
| USUAL TYPES OF MAJOR MATERIALS | STONE FRAGS. GRAVEL, AND SAND | FINE SAND | SILTY OR CLAYEY GRAVEL AND SAND | | SILTY SOILS | | CLAYEY SOILS | | | | | | | | |
| GEN. RATING AS SUBGRADE | EXCELLENT TO GOOD | | | | | | FAIR TO POOR | | | FAIR TO POOR | POOR | UNSUITABLE | | | |

PI OF A-7-5 SUBGROUP IS \leq LL - 30 ; PI OF A-7-6 SUBGROUP IS $>$ LL - 30

CONSISTENCY OR DENSENESS

| PRIMARY SOIL TYPE | COMPACTNESS OR CONSISTENCY | RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) | RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²) |
|--|--|--|--|
| GENERALLY GRANULAR MATERIAL (NON-COHESIVE) | VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE | < 4 4 TO 10 10 TO 30 30 TO 50 > 50 | N/A |
| GENERALLY SILT-CLAY MATERIAL (COHESIVE) | VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD | < 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30 | < 0.25 0.25 TO 0.5 0.5 TO 1.0 1 TO 2 2 TO 4 > 4 |

TEXTURE OR GRAIN SIZE

| U.S. STD. SIEVE SIZE OPENING (MM) | 4 | 10 | 40 | 60 | 200 | 270 |
|-----------------------------------|---------------|--------------|------------------------|-------------------|------------|------------|
| | 4.75 | 2.00 | 0.42 | 0.25 | 0.075 | 0.053 |
| BOULDER (BLDR.) | COBBLE (COB.) | GRAVEL (GR.) | COARSE SAND (CSE. SD.) | FINE SAND (F SD.) | SILT (SL.) | CLAY (CL.) |

| GRAIN SIZE | MM IN. | 305 12 | 75 3 | 2.0 | 0.25 | 0.05 | 0.005 |
|------------|--------|--------|------|-----|------|------|-------|
|------------|--------|--------|------|-----|------|------|-------|

SOIL MOISTURE - CORRELATION OF TERMS

| SOIL MOISTURE SCALE (ATTERBERG LIMITS) | | FIELD MOISTURE DESCRIPTION | GUIDE FOR FIELD MOISTURE DESCRIPTION |
|--|----------------------------------|----------------------------|---|
| LL PLASTIC RANGE (PI) PL | LIQUID LIMIT | - SATURATED - (SAT.) | USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE |
| | PLASTIC LIMIT | - WET - (W) | SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE |
| | | - MOIST - (M) | SOLID; AT OR NEAR OPTIMUM MOISTURE |
| OM SL | OPTIMUM MOISTURE SHRINKAGE LIMIT | - DRY - (D) | REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE |

PLASTICITY

| | PLASTICITY INDEX (PI) | DRY STRENGTH |
|--------------------|-----------------------|--------------|
| NON PLASTIC | 0-5 | VERY LOW |
| SLIGHTLY PLASTIC | 6-15 | SLIGHT |
| MODERATELY PLASTIC | 16-25 | MEDIUM |
| HIGHLY PLASTIC | 26 OR MORE | HIGH |

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:
ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

| | |
|-------------------------|--------------|
| SLIGHTLY COMPRESSIBLE | LL < 31 |
| MODERATELY COMPRESSIBLE | LL = 31 - 50 |
| HIGHLY COMPRESSIBLE | LL > 50 |

PERCENTAGE OF MATERIAL

| ORGANIC MATERIAL | GRANULAR SOILS | SILT - CLAY SOILS | OTHER MATERIAL |
|-------------------------|----------------|-------------------|----------------|
| TRACE OF ORGANIC MATTER | 2 - 3% | 3 - 5% | TRACE |
| LITTLE ORGANIC MATTER | 3 - 5% | 5 - 12% | LITTLE |
| MODERATELY ORGANIC | 5 - 10% | 12 - 20% | SOME |
| HIGHLY ORGANIC | $> 10\%$ | $> 20\%$ | HIGHLY |

GROUND WATER

WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
 STATIC WATER LEVEL AFTER 24 HOURS
 PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
 SPRING OR SEEP

MISCELLANEOUS SYMBOLS

ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
 SOIL SYMBOL
 ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
 INFERRED SOIL BOUNDARY
 INFERRED ROCK LINE
 ALLUVIAL SOIL BOUNDARY
 DIP & DIP DIRECTION OF ROCK STRUCTURES
 TEST BORING
 AUGER BORING
 CORE BORING
 MONITORING WELL
 PIEZOMETER INSTALLATION
 SLOPE INDICATOR INSTALLATION
 CONE PENETROMETER TEST
 SOUNDING ROD
 TEST BORING WITH CORE
 SPT N-VALUE

RECOMMENDATION SYMBOLS

UNDERCUT
 SHALLOW UNDERCUT
 UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
 UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
 UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL - CLAY
CPT - CONE PENETRATION TEST
CSE - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HL - HIGHLY
MED. - MEDIUM
MICA - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
% - UNIT WEIGHT
%g - DRY UNIT WEIGHT
SAMPLE ABBREVIATIONS
S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
☐ CME-45C
☐ CME-55
☒ CME-550
☐ VANE SHEAR TEST
☐ PORTABLE HOIST
☐ _____
☐ _____

ADVANCING TOOLS:
☐ CLAY BITS
☐ 6" CONTINUOUS FLIGHT AUGER
☒ 8" HOLLOW AUGERS
☐ HARD FACED FINGER BITS
☐ TUNG-CARBIDE INSERTS
☐ CASING ☐ W/ ADVANCER
☐ TRICONE _____ * STEEL TEETH
☐ TRICONE _____ * TUNG.-CARB.
☐ CORE BIT
☐ _____

HAMMER TYPE:
☒ AUTOMATIC ☐ MANUAL
CORE SIZE:
☐ -B _____ ☐ -H _____
☐ -N _____
HAND TOOLS:
☐ POST HOLE DIGGER
☐ HAND AUGER
☐ SOUNDING ROD
☐ VANE SHEAR TEST
☐ _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

WEATHERED ROCK (WR)
 CRYSTALLINE ROCK (CR)
 NON-CRYSTALLINE ROCK (NCR)
 COASTAL PLAIN SEDIMENTARY ROCK (CP)

NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH
VERY SLIGHT (V SLI.)
SLIGHT (SLI.)
MODERATE (MOD.)
MODERATELY SEVERE (MOD. SEV.)
SEVERE (SEV.)
VERY SEVERE (V SEV.)
COMPLETE

ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
ROCK GENERALLY FRESH, JOINTS STAINED. SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN 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 WITH FRESH ROCK.
ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*
ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF*
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 ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD
HARD
MODERATELY HARD
MEDIUM HARD
SOFT
VERY SOFT

CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.

FRACTURE SPACING

| TERM | SPACING |
|------------------|---------------------|
| VERY WIDE | MORE THAN 10 FEET |
| WIDE | 3 TO 10 FEET |
| MODERATELY CLOSE | 1 TO 3 FEET |
| CLOSE | 0.16 TO 1 FOOT |
| VERY CLOSE | LESS THAN 0.16 FEET |

BEDDING

| TERM | THICKNESS |
|---------------------|-------------------|
| VERY THICKLY BEDDED | 4 FEET |
| THICKLY BEDDED | 1.5 - 4 FEET |
| THINLY BEDDED | 0.16 - 1.5 FEET |
| VERY THINLY BEDDED | 0.03 - 0.16 FEET |
| THICKLY LAMINATED | 0.008 - 0.03 FEET |
| THINLY LAMINATED | < 0.008 FEET |

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.
FRIABLE
MODERATELY INDURATED
INDURATED
EXTREMELY INDURATED
RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
AQUIFER - A WATER BEARING FORMATION OR STRATA.
ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.
CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
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.
DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOOED FROM PARENT MATERIAL.
FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.
JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.
LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.
SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
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 WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: N/A ALL ELEVATIONS FROM TIN

ELEVATION: N/A FEET

NOTES:

DATE: 8-15-14

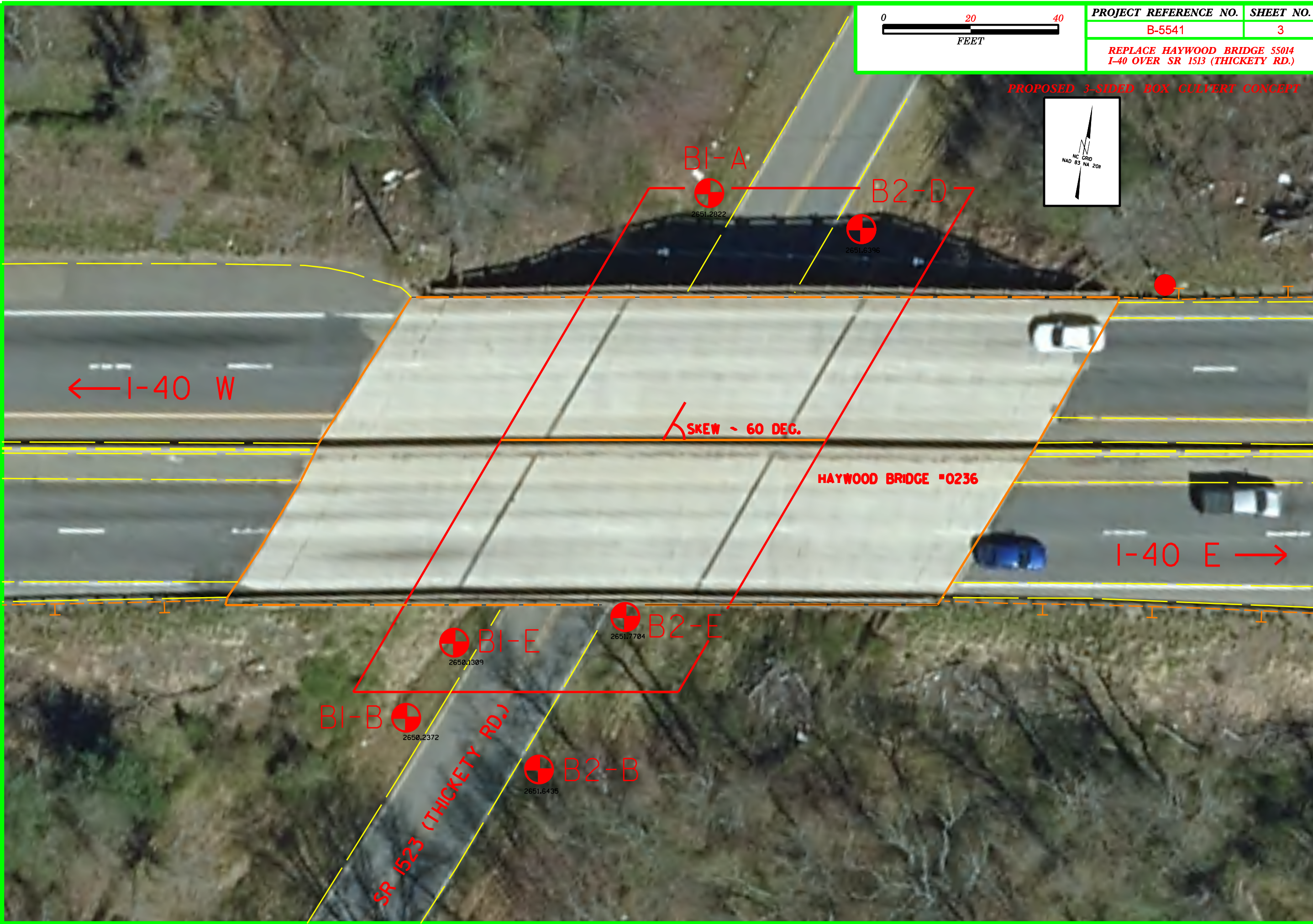
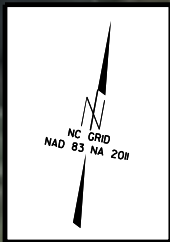


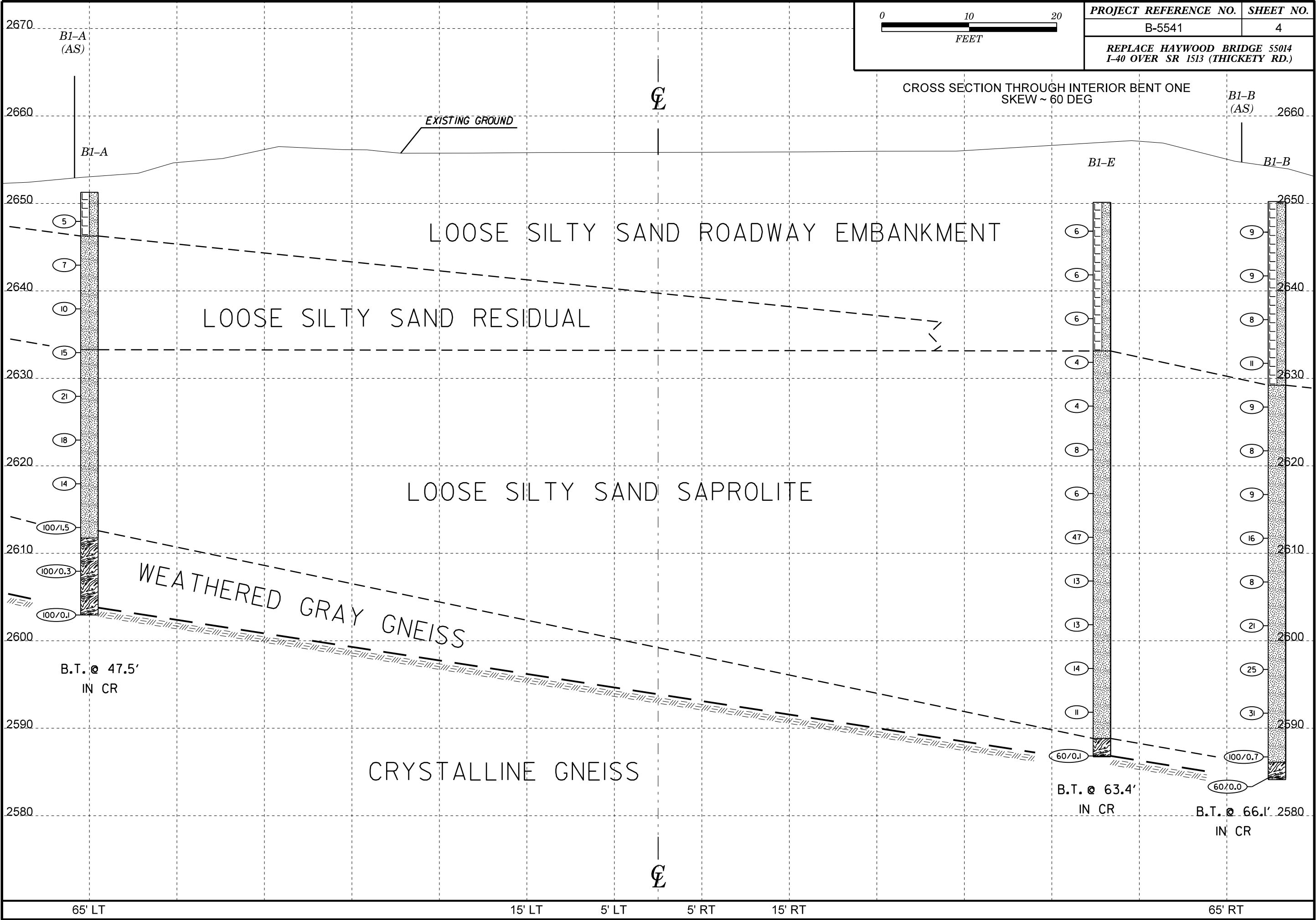
PROJECT REFERENCE NO. SHEET NO.

B-5541 3

REPLACE HAYWOOD BRIDGE 55014
I-40 OVER SR 1513 (THICKETY RD.)

PROPOSED 3-SIDED BOX CULVERT CONCEPT





2670

2660

2650

2640

2630

2620

2610

2600

2590

2580

100' LT

90' LT

80' LT

70' LT

60' LT

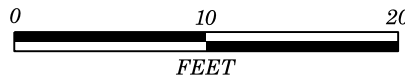
50' LT

40' LT

30' LT

20' LT

B2-A
(AS)



PROJECT REFERENCE NO. SHEET NO.

B-5541

5

REPLACE HAYWOOD BRIDGE 55014
I-40 OVER SR 1513 (THICKETY RD.)

CROSS SECTION THROUGH INTERIOR BENT TWO
SKEW ~60 DEG.

EXISTING GROUND

B2-D

LOOSE SILTY SAND
ROADWAY EMBANKMENT

LOOSE SILTY SAND RESIDUAL

LOOSE SILTY
SAND SAPROLITE

WEATHERED GRAY GNEISS

B.T. @ 51.9'
IN CR

CRYSTALLINE GNEISS

MATCH LINE A

GEOTECHNICAL BORING REPORT
 BORE LOG

| | | | | | | | | | | | | | | | | | |
|--|-----------------------|---------------|------------|---------------------|-------|----------------|----|--------------------------|----|-----|--------------|--------------------------|-----|---------------------------|--|-------------------|--|
| WBS 55041.1.1 | | | | TIP B-5541 | | | | COUNTY HAYWOOD | | | | GEOLOGIST Johnson, C. D. | | | | | |
| SITE DESCRIPTION N/A | | | | | | | | | | | | GROUND WTR (ft) | | | | | |
| BORING NO. B1-A | | | | STATION N/A | | | | OFFSET N/A | | | | ALIGNMENT N/A | | | | 0 HR. Dry | |
| COLLAR ELEV. 2,651.3 ft | | | | TOTAL DEPTH 47.6 ft | | | | NORTHING 677,404 | | | | EASTING 844,445 | | | | 24 HR. 19.5 Caved | |
| DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | | | | | DRILL METHOD H.S. Augers | | | | HAMMER TYPE Automatic | | | | | |
| DRILLER Cheek, D. O. | | | | START DATE 12/02/21 | | | | COMP. DATE 12/02/21 | | | | SURFACE WATER DEPTH N/A | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | | | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | ELEV. (ft) | DEPTH (ft) | | |
| 2655 | | | | | | | | | | | | | | | | | |
| 2650 | | | | | | | | | | | | | | 2,651.3 | GROUND SURFACE 0.0 | | |
| 2645 | 2,648.8 | 2.5 | | | | | | | | | | M | | 2,646.3 | ROADWAY EMBANKMENT Red brown, Slightly micaceous, clayey silty SAND with few gravels 5.0 | | |
| 2640 | 2,643.8 | 7.5 | | | | | | | | | | M | | | RESIDUAL Red brown, Slightly micaceous, clayey silty SAND with few gravels | | |
| 2635 | 2,638.8 | 12.5 | | | | | | | | | | M | | | | | |
| 2630 | 2,633.8 | 17.5 | | | | | | | | | | | | 2,633.3 | SAPROLITE Orange brown, Clayey sandy SILT with med rock fragments and Manganese oxide seams throughout 18.0 | | |
| 2625 | 2,628.8 | 22.5 | | | | | | | | | | M | | | | | |
| 2620 | 2,623.8 | 27.5 | | | | | | | | | | M | | | | | |
| 2615 | 2,618.8 | 32.5 | | | | | | | | | | | | | | | |
| 2610 | 2,613.8 | 37.5 | | | | | | | | | | | | 2,612.6 | WEATHERED ROCK Weathered gray gneiss 38.7 | | |
| 2605 | | | | | | | | | | | | | | 2,603.8 | CRYSTALLINE ROCK Gray gniess Boring Terminated BY AUGER REFUSAL at Elevation 2,603.7 ft IN 47.5 | | |

| | | | | | | | | | | | | | | | |
|--|-----------------|------------|------------|---------------------|-------|--------------------------|----|--------------------------|-----------------------|--------------|-----------|-----|---------------------------|------------|--|
| WBS 55041.1.1 | | | | TIP B-5541 | | COUNTY HAYWOOD | | GEOLOGIST Johnson, C. D. | | | | | | | |
| SITE DESCRIPTION N/A | | | | | | | | GROUND WTR (ft) | | | | | | | |
| BORING NO. B1-B | | | | STATION N/A | | OFFSET N/A | | ALIGNMENT N/A | | 0 HR. Dry | | | | | |
| COLLAR ELEV. 2,650.2 ft | | | | TOTAL DEPTH 66.1 ft | | NORTHING 677,274 | | EASTING 844,399 | | 24 HR. Caved | | | | | |
| DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | | | DRILL METHOD H.S. Augers | | | HAMMER TYPE Automatic | | | | | | |
| DRILLER Cheek, D. O. | | | | START DATE 12/03/21 | | COMP. DATE 12/03/21 | | SURFACE WATER DEPTH N/A | | | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | LOG | SOIL AND ROCK DESCRIPTION | | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | MOI | | ELEV. (ft) | DEPTH (ft) |
| 2655 | | | | | | | | | | | | | | | |
| 2650 | | | | | | | | | | | | | | 2,650.2 | GROUND SURFACE 0.0 |
| 2645 | 2,646.7 | 3.5 | 2 | 4 | 5 | 9 | | | | | | | | | ROADWAY EMBANKMENT |
| 2640 | 2,641.7 | 8.5 | 2 | 3 | 6 | 9 | | | | | | | | | Red brown, slightly micaceous, clayey sandy silt with gravels |
| 2635 | 2,636.7 | 13.5 | 2 | 3 | 5 | 8 | | | | | | | | | |
| 2630 | 2,631.7 | 18.5 | 4 | 4 | 7 | 11 | | | | | | | | 2,629.2 | 21.0 |
| 2625 | 2,626.7 | 23.5 | 2 | 4 | 5 | 9 | | | | | | | | | SAPROLITE |
| 2620 | 2,621.7 | 28.5 | 1 | 4 | 4 | 8 | | | | | | | | | Brown, slightly micaceous sandy SILT with a trace of clay and a few rock fragments |
| 2615 | 2,616.7 | 33.5 | 3 | 4 | 5 | 9 | | | | | | | | | |
| 2610 | 2,611.7 | 38.5 | 3 | 8 | 8 | 16 | | | | | | | | | |
| 2605 | 2,606.7 | 43.5 | 2 | 4 | 4 | 8 | | | | | | | | | |
| 2600 | 2,601.7 | 48.5 | 2 | 7 | 14 | 21 | | | | | | | | | |
| 2595 | 2,596.7 | 53.5 | 7 | 6 | 19 | 25 | | | | | | | | | |
| 2590 | 2,591.7 | 58.5 | 7 | 13 | 18 | 31 | | | | | | | | | |
| 2585 | 2,586.7 | 63.5 | 34 | 66/0.2 | | | | | | | | | | 2,586.1 | 64.1 |
| | 2,584.1 | 66.1 | 60/0.0 | | | | | | | | | | | 2,584.3 | 65.9 |
| | | | | | | | | | | | | | | 2,584.1 | 66.1 |
| | | | | | | | | | | | | | | | WEATHERED ROCK |
| | | | | | | | | | | | | | | | Weathered dark gray gneiss |
| | | | | | | | | | | | | | | | CRYSTALLINE ROCK |
| | | | | | | | | | | | | | | | Gray gneiss |
| | | | | | | | | | | | | | | | Boring Terminated BY AUGER REFUSAL at Elevation 2,584.1 ft IN |

NCDOT BORE DOUBLE B5541_GEO_BRDG_HAYWOOD_55041.GPJ NC_DOT.GDT 12/25/22

GEOTECHNICAL BORING REPORT
BORE LOG

| | | | | | | | | | | | | | | |
|--|-----------------|------------|---------------------|-------|-------|--------------------------|----|----|--------------------------|-----|-----------|-------------------|---|------------|
| WBS 55041.1.1 | | | TIP B-5541 | | | COUNTY HAYWOOD | | | GEOLOGIST Johnson, C. D. | | | | | |
| SITE DESCRIPTION N/A | | | | | | | | | GROUND WTR (ft) | | | | | |
| BORING NO. B1-E | | | STATION N/A | | | OFFSET N/A | | | ALIGNMENT N/A | | | 0 HR. N/A | | |
| COLLAR ELEV. 2,650.1 ft | | | TOTAL DEPTH 63.4 ft | | | NORTHING 677,292 | | | EASTING 844,406 | | | 24 HR. 27.1 Caved | | |
| DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | | | DRILL METHOD H.S. Augers | | | HAMMER TYPE Automatic | | | | | |
| DRILLER Cheek, D. O. | | | START DATE 12/02/21 | | | COMP. DATE 12/02/21 | | | SURFACE WATER DEPTH N/A | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | LOG | SOIL AND ROCK DESCRIPTION | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | ELEV. (ft) | DEPTH (ft) |
| 2655 | | | | | | | | | | | | | | |
| 2650 | | | | | | | | | | | | | 2,650.1 | 0.0 |
| | | | | | | | | | | | | | GROUND SURFACE | |
| 2645 | 2,646.8 | 3.3 | 1 | 3 | 3 | 6 | | | | | | | ROADWAY EMBANKMENT | |
| | | | | | | | | | | | | | Red brown, micaceous, clayey sandy SILT with gravels | |
| 2640 | 2,641.3 | 8.8 | 2 | 3 | 3 | 6 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2635 | 2,636.8 | 13.3 | 2 | 3 | 3 | 6 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2630 | 2,631.8 | 18.3 | 2 | 2 | 2 | 4 | | | | | | | 2,633.1 | 17.0 |
| | | | | | | | | | | | | | SAPROLITE | |
| 2625 | 2,626.8 | 23.3 | woh | 2 | 2 | 4 | | | | | | | White gray, kaolinized, very micaceous clayey sandy SILT with mica and weathered rock fragments | |
| 2620 | 2,621.8 | 28.3 | woh | 4 | 4 | 3 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2615 | 2,616.8 | 33.3 | woh | 2 | 4 | 6 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2610 | 2,611.8 | 38.3 | 32 | 21 | 26 | 17 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2605 | 2,606.8 | 43.3 | 7 | 6 | 7 | 13 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2600 | 2,601.8 | 48.3 | 3 | 6 | 7 | 13 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2595 | 2,596.8 | 53.3 | 4 | 6 | 8 | 14 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2590 | 2,591.8 | 58.3 | 3 | 5 | 6 | 11 | | | | | | | | |
| | | | | | | | | | | | | | | |
| | 2,586.8 | 63.3 | 60/0.1 | | | | | | | | | | 2,588.8 | 61.3 |
| | | | | | | | | | | | | | 2,586.8 | 63.3 |
| | | | | | | | | | | | | | 2,586.7 | 63.4 |
| | | | | | | | | | | | | | WEATHERED ROCK | |
| | | | | | | | | | | | | | Weathered gray schist | |
| | | | | | | | | | | | | | CRYSTALLINE ROCK | |
| | | | | | | | | | | | | | Crystalline gray schist | |
| | | | | | | | | | | | | | Boring Terminated BY AUGER REFUSAL at Elevation 2,586.7 ft IN | |

| | | | | | | | | | | | | | | |
|--|-----------------|------------|---------------------|--------|-------|--------------------------|----|----|--------------------------|-----|-----------|-----------------|---------------------------|---|
| WBS 55041.1.1 | | | TIP B-5541 | | | COUNTY HAYWOOD | | | GEOLOGIST Johnson, C. D. | | | | | |
| SITE DESCRIPTION N/A | | | | | | | | | GROUND WTR (ft) | | | | | |
| BORING NO. B-2B | | | STATION N/A | | | OFFSET N/A | | | ALIGNMENT N/A | | | 0 HR. N/A | | |
| COLLAR ELEV. 2,651.6 ft | | | TOTAL DEPTH 79.1 ft | | | NORTHING 677,268 | | | EASTING 844,431 | | | 24 HR. 12.0 Dry | | |
| DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | | | DRILL METHOD H.S. Augers | | | HAMMER TYPE Automatic | | | | | |
| DRILLER Cheek, D. O. | | | START DATE 12/01/21 | | | COMP. DATE 12/01/21 | | | SURFACE WATER DEPTH N/A | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | LOG | SOIL AND ROCK DESCRIPTION | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | MOI | | |
| 2655 | | | | | | | | | | | | | | |
| 2650 | | | | | | | | | | | | | | 2,651.6 GROUND SURFACE 0.0 |
| | | | | | | | | | | | | | | ROADWAY EMBANKMENT |
| | | | | | | | | | | | | | | Red brown, slightly micaceous, clayey sandy SILT with a few gravels |
| 2645 | 2,647.6 | 4.0 | 2 | 4 | 5 | 9 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2640 | 2,642.6 | 9.0 | 2 | 3 | 4 | 7 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2635 | 2,637.6 | 14.0 | woh | 2 | 2 | 4 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2630 | 2,632.6 | 19.0 | 4 | 6 | 5 | 11 | | | | | | | | 2,632.6 19.0 |
| | | | | | | | | | | | | | | RESIDUAL |
| | | | | | | | | | | | | | | Red brown to white tan, coarse clayey sandy SILT with clay layers to fine clay silty sand layers with a few gravels |
| 2625 | 2,627.6 | 24.0 | 1 | 2 | 4 | 6 | | | | | | | | 2,624.6 27.0 |
| | | | | | | | | | | | | | | SAPROLITE |
| | | | | | | | | | | | | | | Gray brown orange, micaceous, clayey SILT |
| 2620 | 2,622.6 | 29.0 | woh | 1 | 2 | 3 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2615 | 2,617.6 | 34.0 | 2 | 3 | 5 | 8 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2610 | 2,612.6 | 39.0 | 3 | 4 | 6 | 10 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2605 | 2,607.6 | 44.0 | 1 | 3 | 9 | 12 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2600 | 2,602.6 | 49.0 | 3 | 5 | 8 | 13 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2595 | 2,597.6 | 54.0 | 2 | 4 | 6 | 10 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2590 | 2,592.6 | 59.0 | woh | 4 | 10 | 14 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2585 | 2,587.6 | 64.0 | 2 | 4 | 6 | 10 | | | | | | | | |
| | | | | | | | | | | | | | | |
| 2580 | 2,582.6 | 69.0 | 15 | 85/0.3 | | | | | | | | | | 2,581.9 69.7 |
| | | | | | | | | | | | | | | WEATHERED ROCK |
| | | | | | | | | | | | | | | Weathered gray gneiss |
| 2575 | 2,577.6 | 74.0 | 25 | 75/0.3 | | | | | | | | | | |

NCDOT BORE DOUBLE B5541_GEO BRDG_HAYWOOD_55041.GPJ NC_DOT.GDT 1/25/22

GEOTECHNICAL BORING REPORT
BORE LOG

| | | | | | | | | | | | | | | | |
|--|-----------------------|---------------|---------------------|------------|-------|--------------------------|----|--------------------------|-----------------------|-----------------|--------------|-----|-----|---|--------------|
| WBS 55041.1.1 | | | | TIP B-5541 | | COUNTY HAYWOOD | | GEOLOGIST Johnson, C. D. | | | | | | | |
| SITE DESCRIPTION N/A | | | | | | | | | | GROUND WTR (ft) | | | | | |
| BORING NO. B-2B | | | STATION N/A | | | OFFSET N/A | | ALIGNMENT N/A | | 0 HR. N/A | | | | | |
| COLLAR ELEV. 2,651.6 ft | | | TOTAL DEPTH 79.1 ft | | | NORTHING 677,268 | | EASTING 844,431 | | 24 HR. 12.0 Dry | | | | | |
| DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | | | DRILL METHOD H.S. Augers | | | HAMMER TYPE Automatic | | | | | | |
| DRILLER Cheek, D. O. | | | START DATE 12/01/21 | | | COMP. DATE 12/01/21 | | SURFACE WATER DEPTH N/A | | | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | DEPTH (ft) |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | | |
| 2575 | | | | | | Match Line | | | | | | | | | |
| | 2,572.6 | 79.0 | | | | | | | | | | | | 2,572.7 2,572.5 | 78.9 79.1 |
| | | 60/0.1 | | | | | | | | | | | | CRYSTALLINE ROCK Gray gneiss Boring Terminated BY AUGER REFUSAL at Elevation 2,572.5 ft IN | |

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|--|-----------------------|---------------|------------|---------------------|-------|----------------|--------------------------|----|--------------------------|-------------------------|-----------------------|-------------|-----|---------------------------|---|-----|
| WBS 55041.1.1 | | | | TIP B-5541 | | COUNTY HAYWOOD | | | GEOLOGIST Johnson, C. D. | | | | | | | |
| SITE DESCRIPTION N/A | | | | | | | | | | GROUND WTR (ft) | | | | | | |
| BORING NO. B2-D | | | | STATION N/A | | | OFFSET N/A | | | ALIGNMENT N/A | | 0 HR. 28.0 | | | | |
| COLLAR ELEV. 2,651.6 ft | | | | TOTAL DEPTH 51.9 ft | | | NORTHING 677,402 | | | EASTING 844,480 | | 24 HR. 25.6 | | | | |
| DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | | | | DRILL METHOD H.S. Augers | | | | HAMMER TYPE Automatic | | | | | |
| DRILLER Cheek, D. O. | | | | START DATE 12/02/21 | | | COMP. DATE 12/02/21 | | | SURFACE WATER DEPTH N/A | | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | | | |
| 2655 | | | | | | | | | | | | | | | | |
| 2650 | | | | | | | | | | | | | | 2,651.6 | GROUND SURFACE | 0.0 |
| | 2,648.2 | 3.4 | | | | | | | | | | | | | ROADWAY EMBANKMENT | |
| | | | | | | | | | | | | | | | Red brown, micaceous, clayey sandy SILT | |
| 2645 | 2,643.2 | 8.4 | | | | | | | | | | | | | with a few gravels | |
| | | | | | | | | | | | | | | | | |
| 2640 | 2,638.2 | 13.4 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| 2635 | 2,633.2 | 18.4 | | | | | | | | | | | | | | |
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| 2630 | 2,628.2 | 23.4 | | | | | | | | | | | | | | |
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| 2625 | 2,623.2 | 28.4 | | | | | | | | | | | | | | |
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| 2620 | 2,618.2 | 33.4 | | | | | | | | | | | | | | |
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| 2615 | 2,613.2 | 38.4 | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| 2610 | 2,608.2 | 43.4 | | | | | | | | | | | | | | |
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| 2605 | 2,603.2 | 48.4 | | | | | | | | | | | | | | |
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| 2600 | 2,599.7 | 51.9 | | | | | | | | | | | | | | |
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| WBS 55041.1.1 | | | | TIP B-5541 | | COUNTY HAYWOOD | | GEOLOGIST Johnson, C. D. | | | | | | | | |
|--|-----------------|------------|---------------------|------------|-------|--------------------------|----|--------------------------|-------------------------|-----------------|-----------|---------|-----|---------------------------|------------|---|
| SITE DESCRIPTION N/A | | | | | | | | | | GROUND WTR (ft) | | | | | | |
| BORING NO. B2-E | | | STATION N/A | | | OFFSET N/A | | | ALIGNMENT N/A | | | | | | | |
| COLLAR ELEV. 2,651.8 ft | | | TOTAL DEPTH 73.9 ft | | | NORTHING 677,305 | | | EASTING 844,444 | | | | | | | |
| DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | | | DRILL METHOD H.S. Augers | | | HAMMER TYPE Automatic | | | | | | | |
| DRILLER Cheek, D. O. | | | START DATE 12/01/21 | | | COMP. DATE 12/01/21 | | | SURFACE WATER DEPTH N/A | | | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | LOG MOI | LOG | SOIL AND ROCK DESCRIPTION | | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | ELEV. (ft) | DEPTH (ft) | |
| 2655 | | | | | | | | | | | | | | | | |
| 2650 | 2,648.0 | 3.8 | 2 | 2 | 4 | 6 | | | | | | | | | 2,651.8 | GROUND SURFACE |
| 2645 | 2,643.0 | 8.8 | 1 | 2 | 3 | 5 | | | | | | | | | | |
| 2640 | 2,638.0 | 13.8 | 1 | 3 | 4 | 7 | | | | | | | | | | |
| 2635 | 2,633.0 | 18.8 | 1 | 2 | 2 | 4 | | | | | | | | | | |
| 2630 | 2,628.0 | 23.8 | 2 | 2 | 4 | 6 | | | | | | | | | | |
| 2625 | 2,623.0 | 28.8 | 1 | 2 | 3 | 5 | | | | | | | | | 2,623.6 | 28.2 |
| 2620 | 2,618.0 | 33.8 | 2 | 6 | 6 | 12 | | | | | | | | | 2,617.5 | 34.3 |
| 2615 | 2,613.0 | 38.8 | 3 | 4 | 7 | 11 | | | | | | | | | | |
| 2610 | 2,608.0 | 43.8 | 5 | 7 | 6 | 13 | | | | | | | | | | |
| 2605 | 2,603.0 | 48.8 | 5 | 7 | 13 | 20 | | | | | | | | | | |
| 2600 | 2,598.0 | 53.8 | 3 | 6 | 12 | 18 | | | | | | | | | | |
| 2595 | 2,593.0 | 58.8 | 3 | 7 | 12 | 19 | | | | | | | | | | |
| 2590 | 2,588.0 | 63.8 | 6 | 6 | 11 | 17 | | | | | | | | | | |
| 2585 | 2,583.0 | 68.8 | 7 | 13 | 16 | 29 | | | | | | | | | | |
| 2580 | 2,578.0 | 73.8 | | | | | | | | | | | | | 2,578.0 | 73.8 |
| | | 60/0.1 | | | | | | | | | | | | | 2,577.9 | 73.9 |
| | | | | | | | | | | | | | | | | CRYSTALLINE ROCK Crystalline gray gneiss |

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|--|-----------------------|---------------|------------|---------------------|-------|----------------|----|--------------------------|----|-----|--------------|--------------------------|-----|--|--|-----------------|--|
| WBS 55041.1.1 | | | | | | TIP B-5541 | | COUNTY HAYWOOD | | | | GEOLOGIST Johnson, C. D. | | | | | |
| SITE DESCRIPTION N/A | | | | | | | | | | | | GROUND WTR (ft) | | | | | |
| BORING NO. B2-E | | | | STATION N/A | | | | OFFSET N/A | | | | ALIGNMENT N/A | | | | 0 HR. 4.7 Caved | |
| COLLAR ELEV. 2,651.8 ft | | | | TOTAL DEPTH 73.9 ft | | | | NORTHING 677,305 | | | | EASTING 844,444 | | | | 24 HR. FIAD | |
| DRILL RIG/HAMMER EFF./DATE AFO8963 CME-550X 94% 04/08/2019 | | | | | | | | DRILL METHOD H.S. Augers | | | | HAMMER TYPE Automatic | | | | | |
| DRILLER Cheek, D. O. | | | | START DATE 12/01/21 | | | | COMP. DATE 12/01/21 | | | | SURFACE WATER DEPTH N/A | | | | | |
| ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT | | | BLOWS PER FOOT | | | | | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION | | | |
| | | | 0.5ft | 0.5ft | 0.5ft | 0 | 25 | 50 | 75 | 100 | | | | | | | |
| 2575 | | | | | | Match Line | | | | | | | | Boring Terminated BY AUGER REFUSAL at Elevation 2,577.9 ft IN | | | |
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