REFERENCE

CONTENTS

DESCRIPTION

BORE LOGS & CORE LOGS

TITLE SHEET LEGEND SITE PLAN

PROFILE

SHEET NO.

34605

STATE OF NORTH CAROLINA

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

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY Alleghany PROJECT DESCRIPTION US 21 Western Loop from SR 1172 (Grandview Drive) to US 21 SITE DESCRIPTION Wall 1 Right of -L- Station 39+40 Wall 2 Left of -L Station 41+20Wall 3 Left of -Y2- Station 16+20

RETAINING WALLS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4060	1	14

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 1991 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

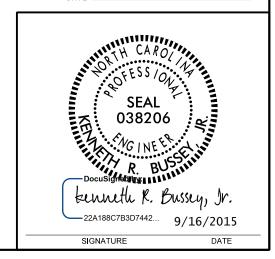
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND 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 MOILCATED IN THE SUBSURFACE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY WARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY WARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS MAY CONSIDERABLY WITH TIME TO CONDITIONS MAY WAR 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 SATISTY 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 FOR 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.

-	Robbie DeLost
-	Mike Morgan
-	Herold Morris
_	
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INVESTIGATED E	BY Michael Gragg
DRAWN BY	amara Stivers
	Kenny Bussey
	ICA Engineering
DATE May 2	

PERSONNEL



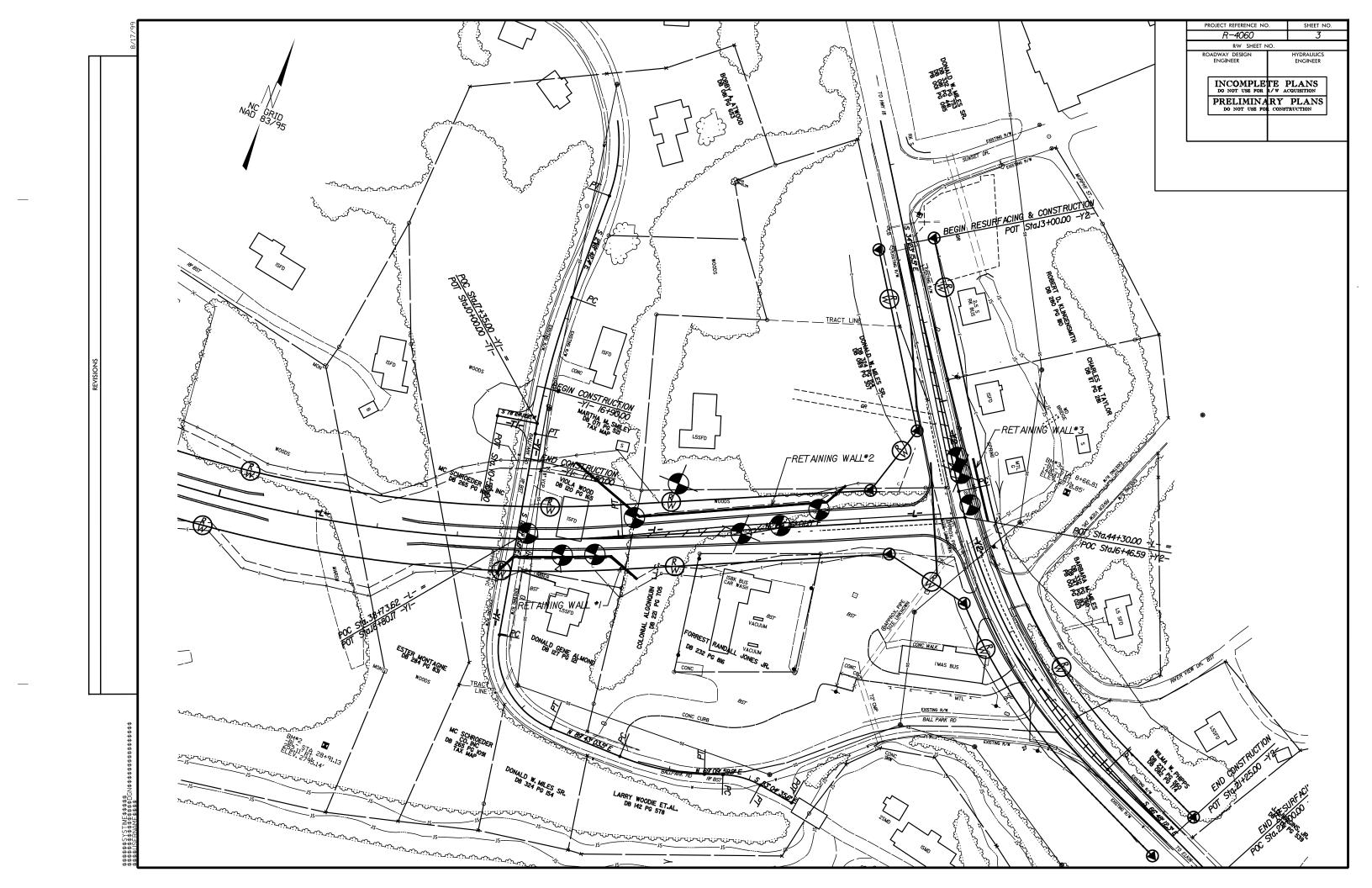
PROJECT REFERENCE NO. SHEET NO. 2

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 BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT	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.	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.	ALLUYIUM (ALLUY.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION	GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN Ø.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN	ADUIFER - 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	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, VERY STIFF.GRAY.SILTY CLAY.MOIST WITH INTERREDDED FINE SAND LAYERS.HIGHLY PLASTIC.A-7-6	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 A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, SUCH AS SHALE, SLATE, ETC.
SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, <u>SUBANGULAR</u> , <u>SUBROUNDED</u> , OR <u>ROUNDED</u> .	WEATHERED /// NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > ROCK (WR) 100 BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT
CENEDAL CRANIII AD MATERIAL C CILTCLAY MATERIAL C	MINERALOGICAL COMPOSITION	THE TO COARSE CRAIN ICNEOUS AND METAMORPHIC POCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND
CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAQLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	CRYSTALLINE ROCK (CR) WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.	SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-3 A-6, A-7 A-3 A-6, A-7	COMPRESSIBILITY	NON COVETAL INF. 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 000000000000000000000000000000000000	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
% PASSING SILT- GRANULAR SILT- MUCK,	PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
#40 30 MX 50 MX 51 MN SOILS SOILS PEAT	GRANULAR SILT - CLAY	- WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.
M 45. M 45. M 46. M 46. M 46. W 47. X 47. C. X 57. X 5	ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10%	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE
MATERIAL PASSING *40 COULD HITH	LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	HORIZONTAL.
LL 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 40 MX 41 MN LITTLE OR PI 6 MX NP 18 MX 18 MX 11 MN 18 MX 18	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	(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 LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
CROLLE INDEX A A A AMY B MY 12 MY 16 MY MD MY AMOUNTS OF ORGANIC	GROUND WATER	OF A CRYSTALLINE NATURE. SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE
USIAL TYPE CTOME EDACE ORGANIC SUILS	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR	SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
OF MAJOR GRAVEL, AND SAND SOULS SOULS SOULS	▼ STATIC WATER LEVEL AFTER 24 HOURS	CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
MATERIALS SANU	✓ PW PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN (MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.
GEN. RATING EXCELLENT TO GOOD FAIR TO POOR POOR POOR UNSUITABL	E	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	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	SPRING OR SEEP	WITH FRESH ROCK. MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FIELD.
PRIMARY COLL TYPE COMPACTNESS OR RANGE OF STANDARD RANGE OF UNCONFINED	ROADWAY EMBANKMENT (RE) 25/825 DIP & DIP DIRECTION	(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 (TONS/FT ²)	ROADWAY EMBANKMENT (RE) 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 SPT ONT TEST BORING SLOPE INDICATOR INSTALLATION	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
GRANULAR LUUSE 4 10 10 GRANULAR MEDIUM DENSE 10 TO 30 N/A	VST PMT UNSTREEMTION	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 ONE 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	MN - TECT POPING	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	INFERRED ROCK LINE MONITORING WELL WITH CORE	COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
(COHESIVE) VERY STIFF 15 TO 30 2 TO 4	***** ALLUVIAL SOIL BOUNDARY \(\triangle \text{PIEZOMETER} \\ \text{INSTALLATION} \\ O	ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
HARD > 30 > 4 TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	ROCK HARDNESS	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
		VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	ROCK.
U.S. STD. SIEVE SIZE 4 10 40 60 200 270 OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	I EXCAVATION	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	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
COARSE FINE	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.
BOULDER COBBLE GRAVEL SAND SAND SILT CLAY	ABBREVIATIONS	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM VST - VANE SHEAR TEST	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT.	A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL
SOIL MOISTURE - CORRELATION OF TERMS	CL CLAY MOD MODERATELY 7 - UNIT WEIGHT CPT - CONE PENETRATION TEST NP - NON PLASTIC 7 - DRY UNIT WEIGHT	HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER, SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE CHIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY
(ATTERBERG LIMITS) DESCRIPTION GOIDE FOR FIELD MOISTORE DESCRIPTION	DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.	TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH	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
	F - FINE SL SILT, SILTY ST - SHELBY TUBE FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY FINGERNAIL.	THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.
PLASTIC SEMISOLID; REQUIRES DRYING TO	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS W - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
(PI) PL PLASTIC LIMIT	FRAGS FRAGMENTS w - MOISTURE CONTENT CBR - CALIFORNIA BEARING HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS	BENCH MARK:
ON CONTINUE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	ELEVATION: FEET
OM OPTIMUM MOISTURE SL	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE	
PENLIPES ANDITIONAL WATER TO	X CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET	NOTES: ELEVATIONS DERIVED FROM r4060_ls_tin.tin FILE.
- DRY - (D) ATTAIN OPTIMUM MOISTURE	CME-55 6° CONTINUOUS FLIGHT AUGER CORE SIZE:	THINLY LAMINATED < 0.008 FEET	ELEVATIONS DERIVED FROM 14080_IS_TITL.TITL FILE.
PLASTICITY	X 8* HOLLOW AUGERS	INDURATION]
PLASTICITY INDEX (PI) DRY STRENGTH	CME-550 HARD FACED FINGER BITS X -N Q2	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NON PLASTIC 0-5 VERY LOW	TUNGCARBIDE INSERTS	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.	
MODERATELY PLASTIC 16-25 MEDIUM	VANE SHEAR TEST X CASING X W/ ADVANCER HAND TOOLS: POST HOLE DIGGER	CDAING CAN BE CEDADATED EDOM CAMBLE WITH CIFEL BRODE.	
HIGHLY PLASTIC 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH HAND AUGER	MODERATELY INDURATED MODERATELY INDURATED MODERATELY INDURATED BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	TRICONE TRICONE SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE;	
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY).	X CORE BIT VANE SHEAR TEST	DIFFICULT TO BREAK WITH HAMMER.	
MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.		EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-1-
			3



330 7'LT 20'RT 20'RT				R-4060 Roadway design hydrau engineer engini
AND ARTERIAL FILLINGS & MATERIAL FILL FILLY HOUSE STORY AND ARTERIAL FILLINGS OF THE PROPERTY				DO NOT USE FOR R/W ACQUISIT PRELIMINARY PLA
201		-WALL 1-	-WALL 2-	
200		-L-		-Y2-
## ANTIFICAL FILL INCOME STATE SHOWN CONTROL OF THE	840			
A MITHEMA FILL PER LY MUCKES SULTY SANCE MED. B RESIDUAL TO A PROPERTY SANCE MED. B		7' LT		
ANTIFICAL FILL HELT AN ORANGE STIP JUNCTURES STIP J	30	20' KT 20' RT	62' LT	
ANTIFICAL FILL HELT AN ORANGE STIP JUNCTURES STIP J	220			
1700 B RESIDUAL THA DEADER STAND SHOWN OF SHEET SHO	.20			
THE BY ANTIFORM FILL RED & TANLOSE, MACKEDIS, SITT SAND. B RESIDUAL FILE RED & TANLOSE, MACKEDIS, SITT SAND. B RESIDUAL FILE RED & TANLOSE, MACKEDIS, SITT SAND. B RESIDUAL FILL RED & TANLOSE, MACKEDIS, SITT SAND. A MITIFICIAL FILL RED, TAN-OPANCE, STIFF, MICACEUS, SITT, SAND, WITHOUT FILL RED, TAN-OPANCE, STIFF, MICACEUS, SITT, SAND. A MITIFICIAL FILL RED, TAN-OPANCE, STIFF, MICACEUS, SITT, SAND. B RESIDUAL TAN-OPANCE CORE INCACCOUS, SITT, SAND. C RESIDU	310			
A ARTIFRIM. FILL RED. & TAM LOOSE MICROSCOUS. SULTY SAND. B RESIDUAL TAM SHORE TAM OF SULCE WHITE FIRST WAS ARRESTED OF THE CONTROL OF SULTY SAND. A ARTIFRIM. FILL RED. TAM OF SULTY SAND. B RESIDUAL TAM SHORE TAM OF SULTY SAND. A ARTIFRIM. FILL RED. TAM OF SULTY SAND. B ARTIFRIM. FILL RED. TAM OF SULTY SAND. B ARTIFRIM. FILL RED. TAM OF SULTY SAND. B ARTIFRIM. FILL RED. TAM OF SULTY SAND. C RESIDUAL TAM OF SULTY SAND. C R				
TOO ATTIFICIAL FILL RED. & TAYLLOSS SID. TO ARTIFICIAL FILL RED. & TAYLLOSS SID. TO ARTIFICIAL FILL RED. TAYLOSS SID. TO WAS ONESS. THE PART OF MARKET STATE OF MARKET STATE STA	300	(B)		
190 B ARTIFICIAL FILL RED & TANLIDOSE SID. (A) ARTIFICIAL FILL RED & TANLIDOSE SID. (B) RESIDUAL TAN-BACK WRITE. (B) WIRGHESS. (B) WIRGHESS. (C) WIRGHESS. (E) WIRGHESS. (E) RESIDUAL TAN-ORNAGE SEFF-MICROCOUS SILTY, SAIDY, MED. (E) ARTIFICIAL FILL RED TAN-ORNAGE SEFF-MICROCOUS SILTY, SAIDY, MED. (E) ARTIFICIAL FILL RED TAN-ORNAGE SEFF-MICROCOUS SILTY, SAIDY, MED. (E) RESIDUAL TAN-ORNAGE SEFF-MICROCOUS SILTY SAIDY. (E) RESIDUAL TAN-ORNAGE SEFF-MICROCOUS SILTY SAIDY MED. (E) RESIDUAL TAN-ORNAGE SEFF-MICROCOUS SILTY SAIDY WRITE MED. (E) RESIDUAL TAN-ORNAGE SEFF-MICROCOUS SILTY SAID W ROCK (E) WIRD SEFF-MICROCOUS SILTY	790	BT @————————————————————————————————————	© 4'RT 3'LT 20'LT	7' LT
ARTIFICIAL FILL RED & TANLOGSE, MINACEOUS, SULTY SIND. (B) RESIDUAL TRA-PROMECTAN, GRAW-BLOCKWHITE, GRAW-GREEN LOOSE TO VERT DENSE, RIGHT MINACEOUS, SULTY SIND. (C) WAR GREESS (E) WAR GREESS (E) WAR GREESS (I) ARTIFICIAL FILL BED.T.MORANGE, STIFF, NICACEOUS, SULTY, SANDY, MED. (II) ARTIFICIAL FILL BED.T.MORANGE, STIFF, NICACEOUS, SULTY, SANDY, MED. (II) ARTIFICIAL FILL BED.T.MORANGE, STIFF, NICACEOUS, SULTY, SANDY, MED. (II) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITFY, SANDY, MED. (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITFY, SANDY, MED. (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITFY, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANGE, GREEN-BLOCK, SITF, MINITUM (CACCOUS, SANDY) (III) ARTIFICIAL FILL BED.T.MORANG		38————————————————————————————————————	BT BT	7'-LT 10' LT
### MICACOUS, SULTY SAND. ### RESIDUALT THE PROPERTY SULCE, WHITE EARLY SULCE OF THE CONSTRUCTION OF THE	780	U		
## RESIDUALT TAN-OPAMOE, TAN GRAY-BLACK, WHITE. ## GRAY-BLACK, WHI	The second secon	A) ARTIFICIAL FILL RED & TAN, LOOSE,		
## OF THE PROPERTY OF THE PROP	770	B) RESIDUAL TAN-ORANGE, TAN, GRAY-BLACK, WHITE, GRAY-GREEN. LOOSE TO VERY DENSE.		
ATTIFICIAL FILL RED.TAN—ORANGE.STIFF, MICACEOUS, SILTY, SANDY, MED. PLASTICITY CLAY: (B) ATTIFICIAL FILL RED.TAN—ORANGE, LOSSE, MICACEOUS, SILTY SAND. (C) RESIDUAL TAN—ORANGE, GREEN—BLACK, GRAY, WHITE MICACEOUS, SANDY; (D) RESIDUAL TAN—ORANGE, GREEN—BLACK, GRAY, WHITE MED.DENSE, HIGHLY (D) RESIDUAL TAN—ORANGE, GREEN—BLACK, GRAY, WHITE MED.DENSE, HIGHLY (E) RESIDUAL TAN—ORANGE, GREEN, WHITE, THO—ORANGE, BROWN, GRAX—SILTY SAND, DW. PROCK FRAGS. (E) RESIDUAL TAN—ORANGE, BROWN, GRAX—GREEN, LOOSE (I) OR SELS, AFROLITIC, HIGHLY MICACEOUS, SLITY, FINE SAND, WHOCK FRAGS. (I) ALLUMING, GK. BROWN—BLACK, MURITE, PROMP—GRAY, GREEN, WHITE, BLACK, TAN—ORANGE, LOOSE, TO MED. FRAGS-PROMS, FRANDHE, BROWN—GRAYMEE STAN, SLITO MOD, SEV, WEAR HERED WIS SENDER HIGHE OF IT, WALLE & SEALEN, WINDELY VARIABLES FRAGS-PROMS, FRANDER—BIOTITE—MUSCOVITE—GUARTZ GNESS. (I) WIRD, DESCRIPTION—BROWN, GRAY, SELWE ATTHERED SEAUS, SUBJECT OR MOD, LOOSE, FRAND, FOLLATE, SEAUS, WEATHERED WIS SELWED, TO WOOD, LOOSE, FRAND, FOLLATE, SEAUS, WEATHERED WIS SELWED, TO WOOD, LOOSE, FRAND, FOLLATE, SEAUS, WEATHERED WIS SELWED, TO WOOD, LOOSE, FRAND, FOLLATE, SEAUS, WEATHERED WIS SELVEN, DEPOSE, SAPROLITIC, SILTY SAND W/ BOULDERS & WR SEAUS. (FELDSPAR—QUARTZ—BIOTITE—MUSCOVITE GNESS. (FELDSPAR—QUARTZ—BIOTITE—	760	HIGHLY MICACEOUS, SILTY SAND.	(B) BT	
ARTIFICIAL FILL RED, TWDRAWGE, STIFF, MICACEOUS, SILTY, SAND. (B) ARTIFICIAL FILL RED, TWDRAWGE, LOOSE, MICACEOUS, SILTY SAND. (C) RESIDUAL TAN-ORANGE, GREEN-BLACK, STIFF, HIGHLY MICACEOUS, SANDY, SARDUTTO SILT. (D) RESIDUAL TAN-ORANGE, GREEN-BLACK, GRAY, WHITE, MED, DENSE, HIGHLY MICACEOUS, SILTY SAND W. ROCK FRASS. (C) RESIDUAL TAN-ORANGE, GREEN-BLACK, GRAY, WHITE, MED, DENSE, HIGHLY MICACEOUS, SILTY SAND W. ROCK FRASS. (C) RESIDUAL TAN-ORANGE, BREEN, MED, TO MOD, GREEN, V. LOOSE TO DENSE, SAPROLITIC, HIGHLY MICACEOUS, SILTY SAND W. ROCK FRASS. (C) RESIDUAL TAN-ORANGE, BREEN, MED, TO MOD, GREEN, V. LOOSE TO DENSE, SAPROLITIC, HIGHLY MICACEOUS, SILTY SAND W. ROCK FRASS. (C) CRI, GRAY, LT, GRAY, BLACK, WHITE, BROWN-ORANGE STAIN, SILTO MOD, SEV. WEATHERED W. SEV. WE			\\ _\	
### ARTIFICIAL FILL RED.TAN—ORANGE_LOOSE_MICACEOUS, SILTY SAND. RESIDUAL_TAN—ORANGE_GREEN—BLACK, STIFF, HIGHLY MICACEOUS, SANDY, SARDWITE, SULTY SAND WITE, MED. DENSE_HIGHLY MICACEOUS, SANDY, SAND WITE, MED. DENSE_HIGHLY MICACEOUS, SULTY SAND WITE, MED. DENSE_HIGHLY MICACEOUS, SULTY SAND WITE, MED. DENSE_HIGHLY MICACEOUS, SULTY SAND WITE, MED. DENSE_SILTY SAND. RESIDUAL_TAN—ORANGE_DENSE_SILTY SAND WITE, MED. DENSE_SILTY SAND WITE, MED. DENS	′50		(A) APTIFICIAL FILL DED TAN ORANGE STIFF MONOFOLIS SITTY SAMPY HED	® → ® T
© RESIDUAL TAN-ORANGE, GREEN-BLACK, STIFF, HIGHLY MICACEOUS, SANDY, SAPROLITIC SILT. © RESIDUAL TAN-ORANGE, GREEN-BLACK, GRAY, WHITE, MED. DENSE, HIGHLY MICACEOUS, SILTY SAND W. ROCK FRAGS. (E) RESIDUAL TAN-ORANGE, GREEN, WHITE, TAN-ORANGE, BROWN, GRAY GREEN, V. LOOSE TO DENSE, SAPROLITIC, HIGHLY MICACEOUS, SILTY SAND W. ROCK FRAGS. (E) RESIDUAL TAN-ORANGE, BROWN, GRAY -GREEN, V. LOOSE TO DENSE, SAPROLITIC, HIGHLY MICACEOUS, SILTY SAND W. ROCK FRAGS. (C) CRI, GRAY, I.T., GRAY, BLACK, WHITE, BROWN - ORANGE, STAN, SILTO MOD. SEV. WEATHERED W. SEV. WEATHERED SEAUS, MED. TO MOD. HARD, CLOSE FRACS. PACING, FRIABLE © JT, WALLS & SEANS, MIDELY VARIABLE FOLIATION, FELDS PRABEDIOTITE—MUSCOVITE—OUART Z GIVENS. (E) WIR, BROWN, GRAY, MED. DENSE, SAPROLITIC, SILTY SAND W. (D) RESIDUAL TAN, BROWN, GRAY, MED. DENSE, SAPROLITIC, SILTY SAND W. (D) RESIDUAL TAN, BROWN, GRAY, MED. DENSE, SAPROLITIC, SILTY SAND W. (D) RESIDUAL TAN, BROWN, GRAY, MED. DENSE, SAPROLITIC, SILTY SAND W.) (D) RESIDUAL TAN, BROWN, GRAY, MED. DENSE, SAPROLITIC, SILTY SAND W.) (D) DENSE, WR SEAMS.			PLASTICITY CLAY: (B) ARTIFICIAL FILL: RED.TAN-ORANGE, STIFF, MICACEOUS, SILTY, SAND.	
MICACEOUS, SILTY SAND W/ ROCK FRAGS. (E) RESIDUAL TAN, GRAY, WHITE, TAN—ORANGE, BROWN, GRAY—GREEN, V. LOOSE TO DENSE, SAPROLITIC, HIGHLY MICACEOUS, SILTY SAND W/ ROCK FRAGS. (F) CR. GRAY, LT, GRAY, BLACK, WHITE, BROWN—GRAYGE STAIN, SULTO MODD. SEV. WEATHERED W/SEV. WEATHERED SEAMS, MEDITO MOD. HARD, CLOSE FRAC, SPACING, FRIABLE & JT. WALLS & SEAMS, WIDELY VARIABLE FOLIATION, FELDSPAR—BUTTE—MUSCOVITE—QUARTZ GNEISS. (F) WR. BROWN, GRAYGE STAIN, V. SEV. WEATHERED W/SEAMS COMPLETELY WEATHERED, INTACT FRAGS, GNEISS. (F) RESIDUAL TAN, BROWN, GRAYGE STAIN, WED DENSE, SAPROLITIC, SILTY SAND W/ BOULDERS & WR SEAMS. (B) RESIDUAL TAN, BROWN, GRAY, MED. DENSE, SAPROLITIC, SILTY SAND W/ BOULDERS & WR SEAMS.	'40		© RESIDUAL: TAN-ORANGE, GREEN-BLACK, STIFF, HIGHLY MICACEOUS, SANDY,	(A) ROADWAY EMBANKMENT: TAN, ORANGE, RED-BROWN, BROWN, V. LOOSE
(E) RESIDUAL: TAN, GRAY, WHITE, TAN-ORANGE, BROWN, GRAY-GREEN, V. LOOSE TO DENSE, SAPROLITIC, HIGHLY MICACEOUS, SILTY SAND W/ROCK FRAGS. (F) CR: GRAY, LT. GRAY, BLACK, WHITE, BROWN-ORANGE STAIN, SLLTO MOD. SEV. WEATHERED W/SEV. WEATHERED SEAMS, MED. TO MOD. HARD, CLOSE FRAGC. SPACING, FRIABLE O. JT. WALLS & SEAMS, WIDELY VARIABLE FOLIATION, FELDSPAR-BIOTITE—MUSCOVITE—QUARTZ GNEISS. (G) WR: DK, BROWN, ORANGE STAIN, V. SEV. WEATHERED W/SEAMS COMPLETELY WEATHERED, INTACT FRAGS, GNEISS. (H) RESIDUAL: TAN, BROWN, GRAY, MED. DENSE, SAPROLITIC, SILTY SAND W/ BOULDERS & WR SEAMS.	730			
FRAGS. CR. GRAY, I.T. GRAY, BLACK, WHITE, BROWN-ORANGE STAIN, SULTO MOD. SEV. DENSE, HIGHLY MICACEOUS, SAPROLITIC, SILTY SAND.			(E) RESIDUAL: TAN GRAY WHITE TAN ORANGE BROWN GRAY - GREEN V. LOOSE	SAND. © RESIDUAL: GRAY, GREEN, WHITE, BLACK, TAN-ORANGE, LOOSE TO MED.
WEAT HERED W/SEV-WEAT HERED SEAMS, MED.TO MOD. HARD, CLOSE WEAT HERED W/SEV-WEAT HERED SEAMS, WEAT, W	720		FRAGS. (F) CR: GRAY, LT. GRAY, BLACK, WHITE, BROWN-ORANGE STAIN, SLI. TO MOD. SEV.	DENSE, HIGHLY MICACEOUS, SAPROLITIC, SILTY SAND.
(©) WR: DK. BROWN, ORANGE STAIN, V. SEV. WEATHERED W/SEAMS COMPLETELY HARD, CLOSE TO MOD. CLOSE FRAC. SPACING, FOLIATED, WEATHERED, INTACT FRAGS., GNEISS. (H) RESIDUAL: TAN, BROWN, GRAY, MED. DENSE, SAPROLITIC, SILTY SAND W/ BOULDERS & WR SEAMS. (O) BOULDERS & WR SEAMS.	710		WEAI HERED W/SEV.WEAI HERED SEAMS,MED.10 MOD.HARD,CLOSE FRAC.SPACING.FRIABLE @ JT.WALLS & SEAMS.WIDELY VARIABLE	
(H) RESIDUAL: TAN, BROWN, GRAY, MED. DENSE, SAPROLITIC, SILTY SAND W/ BOULDERS & WR SEAMS.	10		WR. DK. BROWN, ORANGE STAIN, V. SEV. WEATHERED W∕SEAMS COMPLETELY WEATHERED, INTACT FRAGS, GNEISS.	HARD,CLOSE-TO-MOD.CLOSE-FRAC.SPACING,FOLIATED,
.90	700		(H) RESIDUAL: TAN, BROWN, GRAY, MED. DENSE, SAPROLITIC, SILTY SAND W/BOULDERS & WR SEAWS.	
	90			

WBS 34605.1.2	TIP R-4060 COUNT	TY ALLEGHANY	GEOLOGIST DeLost, R.	WBS 34605.1.2	TIP R-4060 COUN	TY ALLEGHANY	GEOLOGIST DeLost, R.
SITE DESCRIPTION US 21 Wester	ern Loop from SR 1172 (Grandvie	ew Drive) to US 21	GROUND WTR (ft)	SITE DESCRIPTION US 21 Weste	ern Loop from SR 1172 (Grandvi	ew Drive) to US 21	GROUND WTR (ft
BORING NO. L_3887L	STATION 38+87	OFFSET 7 ft LT	ALIGNMENT -L- 0 HR. Dry	BORING NO. L_3930R	STATION 39+30	OFFSET 20 ft RT	ALIGNMENT -L- 0 HR. Dry
COLLAR ELEV. 2,828.0 ft	TOTAL DEPTH 31.5 ft	NORTHING N/A	EASTING N/A 24 HR. FIAD	COLLAR ELEV. 2,825.2 ft	TOTAL DEPTH 36.4 ft	NORTHING N/A	EASTING N/A 24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE ICA04	04 CME-45C 90% 08/25/2014	DRILL METHOD H.S	S. Augers HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE ICA04	04 CME-45C 90% 08/25/2014	DRILL METHOD H.	.S. Augers HAMMER TYPE Automatic
DRILLER Morgan, M.	START DATE 11/18/14	COMP. DATE 11/18/14	SURFACE WATER DEPTH N/A	DRILLER Morgan, M.	START DATE 11/18/14	COMP. DATE 11/18/14	SURFACE WATER DEPTH N/A
ELEV (ft)	I	75 100 110 0	SOIL AND ROCK DESCRIPTION ELEV. (ft) DEPTH (ft)	DENTH DENTH BLOW COUNT Color Color		75 100 NO. MOI G	SOIL AND ROCK DESCRIPTION
2825 2.823.0 5.0 2.818.0 10.0 2.813.0 15.0 2.813.0 15.0 2.808.0 20.0 2.808.0 20.0 3 7 1 2805 2.803.0 25.0 4 7 8 2.798.0 30.0 5 9 1	4 · • • • • • • • • • • • • • • • • • •	M	2,828.0 GROUND SURFACE 0.0 RESIDUAL Tan, gray-black, white, loose to med. dense, highly micaceous, silty, saprolitic SAND (A-2-4). 2,796.5 Boring Terminated at Elevation 2,796.5 ft in Residual Soils. Boring moved due to underground utilities & backfilled upon completion.	2825 2820 2820 2820 2815 2815 2810 2810 2810 2810 2810 2805 2805 2800	9 014 000	M M M M M M M M M M M M M M M M M M M	Z,825.2 GROUND SURFACE 0. RESIDUAL Tan-orange, white, gray-black, loose to very dense, highly micaceous, silty SAND (A-2-4).
UNI BORE DOUBLE RAUGO_GEO_RWALLS. SPAKTA BYPASS.GFJ NC_DOT.GDT 8/8/15			a backined upon completion.	2790 2,790.3 34.9 10 17 2		M M	2,788.8 36. Boring Terminated at Elevation 2,788.8 ft in Residual Soils.

WBS	34605	5.1.2			TI	IP R-4060	COUNT	Y ALLEGH	IANY			GEOLOGIST DeLost,	R.	
SITE	DESCF	RIPTIO	N US	21 W	estern	Loop from SR 1172 (Grandvie	w Drive) to l	JS 21					GROUND WTR (
BOR	ING NO). L_39	970R		S.	TATION 39+70		OFFSET	20 ft RT			ALIGNMENT -L-		0 HR. Di
COL	LAR EL	EV. 2	,823.8	ft	T	OTAL DEPTH 36.4 f	t	NORTHING	G N/A			EASTING N/A		24 HR . FIA
	. RIG/HAI				A0404	CME-45C 90% 08/25/201	1		DRILL	ИЕТНО	D H.	S. Augers	HAMM	JER TYPE Automatic
DRIL	LER M	lorgan.	M.			TART DATE 11/18/1		COMP. DA				SURFACE WATER DE		
LEV	DRIVE	DEPTH		ow co		T	PER FOOT		SAMP.	V /	1 - 1	<u> </u>		
(ft)	ELEV (ft)	(ft)	0.5ft			0 25	50	75 100	NO.	MO	O G	SOIL AND RO	CK DES	CRIPTION DEPTH
2825														
.020	-	‡					T					2,823.8 GROUN		
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2820	-	‡				1						- -	A-2-4).	
	2,818.9 <u>-</u>	4.9	2	3	3					М		• •		
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2815	2,813.9	9.9				 	 	 				_ . 2,813.8		10
	-	T	1	2	3	5				М			SIDUAL	
2810	-	Ŧ										 dense, highly mica 	aceous,	silty, saprolitic
	2,808.9	14.9	3	3	4					,,		- SAN	D (A-2-4)).
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2805	2,803.9	‡,,,				- 1						-		
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2000	2,798.9	24.9			<u> </u>							- ·		
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2790	2,788.9	I I 34 0						1				-		
	2,700.3	34.3	13	26	74	::::) 1122		100/1.0	<u>.</u>	М	an	_ 2,787.8 _ 2,787.4 ∕\	EDEN D	30 CK 236
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	-	‡										 Boring Terminated a Weathered 		'.
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IBS 34	605.1	.2			TI	P R-406	60		COUN	TY ALI	EGH/	ANY		GEO	LOGIST DeLost, R.			WBS	3 3460	05.1.2			TII	P R-400	60	C	OUNT	' ALLEGH	ANY			GEOLOGIST Del	_ost, R.	
ITE DE	SCRIP	MOIT	US 2	21 We	stern	Loop froi	m SR	1172 (0	Grandvi	ew Drive	e) to U	IS 21				GROUN	ND WTR (ft	SITE	DESC	CRIPTIO	N US	21 W	estern l	Loop fro	m SR 1′	172 (Gr	andviev	/ Drive) to l	JS 21				GROU	ND WTR
ORING	NO.	L_402	21L		S	TATION	40+2	21		OFFS	ET 2	3 ft LT		ALIG	NMENT -L-	0 HR.	Dry	BOR	RING N	O. L_4	078L		ST	TATION	40+78			OFFSET (62 ft LT			ALIGNMENT -L-	0 HR.	D
OLLAR	ELEV	/. 2,8	326.8 f	ft	T	OTAL DE	EPTH	36.3 ft		NOR	THING	N/A		EAS	Γ ING N/A	24 HR.	FIAD	COL	LAR E	LEV. 2	,824.2	ft	TC	OTAL DE	PTH 2	9.8 ft		NORTHING	3 N/A			EASTING N/A	24 HR.	FIA
RILL RIG	/HAMM	IER EF	F./DAT	TE ICA	40404	CME-45C 9	90% 08	3/25/2014				DRILL N	IETHOD	H.S. Auger	S HAMI	MER TYPE	Automatic	DRILI	L RIG/H	AMMER E	FF./DA	TE IC	CA0404 C	CME-45C	90% 08/2	5/2014			DRILL N	METHO	D NW	Casing w/ Advancer	HAMMER TYPE	Automation
RILLER		gan, I	M.		S.	TART DA	ATE 1	11/18/14	4	СОМ	P. DAT	TE 11/	18/14	SUR	FACE WATER DEPTH	N/A		DRIL	LLER	Morgan	, M.		ST	TART DA	ATE 11.	/18/14		COMP. DA	TE 11/	/20/14		SURFACE WATE	R DEPTH N/A	
EV DRI	VE DE	EPTH_		w cou				LOWS P					▼	1	SOIL AND ROCK DES	SCRIPTION	I	ELEV	DRIVE	DEPTH	BLC	ow co					R FOOT		SAMP.	. /	LO	SOIL AN	D ROCK DESCRIPTION	N
ft) [f		(ft)	0.5ft	0.5ft	0.5ft	0	25	5	0	75	100	NO.	MOI G	ELEV. (DEPTH (ft		(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25	50	-	75 100	NO.	МО				
30														L				2825														2,824.2 GF	OUND SURFACE	
	<u> </u>													E						<u> </u>			+	: :[:				T : : : :				-	ARTIFICIAL FILL	
	F					H . L .							XI	2,826.8	GROUND SURF ARTIFICIAL F		0.0	⊣ I		1				: : :	: : :	: :							ange, stiff, micaceous, s d. plasticity CLAY (A-7-	
325	\pm														Red, tan-orange, loose, m SAND (A-2-4	nicaceous, s	silty,	2820	2,820.	3 3.9	3	5	8	• 1:	3					М				
2.82	2.0	4.8					. :							:E	SAND (A-2	*).				Ŧ				$ \cdot '$.	: :						2,817.0		
20	+		2	5	5	· •10	: :				: :		М	2,819.8_			7.0	2815	2,815.	3 8.9				'/: :								Tan-orange	, loose, silty SAND (A-2	-4).
	Ŧ												· ·	2,013.0	RESIDUAL					Ŧ	3	2	2	4						М	MF.			
2,81	7.0	9.8	2	4	5								N.	<u>:</u>	Tan-orange, green-blac micaceous, sandy, saprol				2 811	2 13.0				: :``:								2,811.7		
5	#		_	7	3	· • 9 ·							M N					2810		13.0	5	16	16		• <u>• 3</u>	2	· · · ·			D		2,809.7 Tan, gray-	RESIDUAL white, black, dense, high	nly _
	‡					: :							,	2,813.7 -	Tan-orange, green-black	, gray & wh	<u>13</u> .1 ite,	1		‡												micaceous,	silty, saprolitic SAND w/ frags. (A-2-4).	rock
	2.0 1	14.8	3	5	6	· ↓ · • ●11	: :						D		med. dense, highly mic SAND w/rock frags.	aceous, silt	ty			‡												CR	YSTALLINE ROCK	
0	\pm													Ŀ	Grang annoon mage.	(**= :):		2805	-	\pm				<u> </u>								Crys	talline rock (Gneiss)	
2 80	7.0 I	198					. .						000							Ŧ														
5			8	7	6	- • 1:	3. .				::		М	<u>:</u> [2800		Ŧ														
	‡					· · · \												1 2000	2,799.	4 24.8	1	2	98									2,799.4 WI	EATHERED ROCK	-
2,80	2.0 2	24.8	8	11	8	i::	V: :						**************************************							‡								100/0.9	'			Weat	hered rock (Gneiss), YSTALLINE ROCK	
0	#		°	"	0		19				• •		М					2795		‡						• •							talline rock (Gneiss)	
	<u> </u>						<u> </u>													 									1			Boring Termin	ated at Elevation 2,794.	4 ft in
	7.0 2	29.8	4	7	9	: : i							м							+											l -	•	alline Rock (Gneiss).	
5	Ŧ					\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	7							:F						Ŧ											l F		lled upon completion. Be so slope steepness and	
2.70	2.0	, ,					$ \lambda $.							:[Ŧ											l F		trees.	
2,73	2.01.	04.0	10	13	14		. •2	7 · · ·					М	2,790.5			36.3	.]		‡														
	#						-							F	Boring Terminated at Eleva Residual Soi	ation 2,790.	5 ft in			‡														
	‡													Ė						‡											<u> </u>			
	<u></u>													Ł						1											ΙĿ			
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WBS	34605	5.1.2			TIP	R-406	60	С	OUNT	ΓY /	LLEGH	IANY	GEOLOGIST DeLost,	R.		
SITE	DESCR	RIPTIOI	N US	21 Weste	ern Lo	op fror	n SR 117	′2 (Gra	andvie	ew D	rive) to l	JS 21	<u> </u>		GROUN	D WTR (ft
	ING NO						40+78	· -		_		62 ft LT	ALIGNMENT -L-		0 HR.	Dry
COL	LAR EL	EV. 2,	824.2	ft	тот	AL DE	PTH 29	.8 ft		NC	RTHIN	G N/A	EASTING N/A		24 HR.	FIAD
				ΓΕ ICA04	04 CMI	E-45C 9	0% 08/25/2	2014				DRILL METHOD NW		HAMMI	ER TYPE	Automatic
DRIL	LER M	lorgan,	М.		STA	RT DA	TE 11/1	8/14		СС	MP. DA	TE 11/20/14	SURFACE WATER DE	PTH N/	A	
	E SIZE				тот	AL RU	N 13.9 f	t								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STF REC. (ft) %	RATA RQD (ft) %	L O G	ELEV. (ESCRIPTION AND REMARI	KS		DEPTH (fi
2809.7		14.5	0.0	4.05/0.0	(0.0)	(0.0)		(7.0)	(4.4)				Begin Coring @ 14.5 ft			
	2,809.7 2,809.4 <u>]</u>	14.8	0.3 5.0	\ <u>1:25/0.3</u> 0:42	(0.3) 100%	(0.0) 0%		(7.3) 71%	(4.1) 40%		- 2,809.7 -	Grav. It. grav. blad	CRYSTALLINE ROCK ck, white, brown-orange stai	n. mod. to	mod. sev	14.5
2805	-	-		0:42 1:18 1:22 1:31 1:39	(4.3) 86%	(1.8) 36%					- -	spacing, fria	weathered seams, med. to rable @ joint walls, widely val	riable folia	, close fra ation,	C.
2003	2,804.4	- 19.8 -	5.0	1:39 1:30	(2.7)	(2.3)					-		oar-biotite-muscovite-quartz eathered walls, iron stain &		mm open;	3
	-	-		1:43 0:58	54%	46%					- -		ı, clay & iron stain, 3-5mm o n stain & clay 1mm open, se			
2800	2,799.4	- 24.8		1:11 0:27							- 2,799.4	•				24.8
	2,798.0	L	2.6	N=100	(4.4)	(0.7)		(4.4)	(0.7)		2,798.0		WEATHERED ROCK thered rock inferred from co	re loss.		26.2
2795	-	-	3.6	1:12 0:44	(1.4) 39%	(0.7) 19%		(1.4) 39%	(0.7) 19%		- -		CRYSTALLINE ROCK			/
2/95	2,794.4	- 29.8 -		0:18 <u>0:12/0.6</u>	-						<u></u> 2,794.4	2 80° jts. w/sev. w	As described above 14.5'-24 eathered walls, iron stain &	mica, 1-2		
	-	-									- -	clay	ain & clay, 1mm open; 4 20° / 1mm open, sev. weathered	d walls		
	-	_									_	Boring Terminated a	at Elevation 2,794.4 ft in Cry	stalline R	ock (Gneis	ss).
	-	_									-	Boring backfilled upo	n completion. Boring moved and pine trees.	due to sl	ope steep	ness
	-	_									-		and pine needs			
	-	-									_					
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SHEET 8

WBS	3460	5.1.2			TI	IP R-4060	COUNT	Y ALLEGH	ANY			GEOLOGIST DeLost, R.	
SITE	DESCI	RIPTIO	N US	21 W	estern	Loop from SR 1172 (Grandvie	w Drive) to l	JS 21				GROUND WTR (f
BOR	NG NC). L_41	152R		S.	TATION 41+52		OFFSET -	4 ft RT			ALIGNMENT -L-	0 HR. Dry
COLI	AR EL	EV. 2,	787.4	ft	T	OTAL DEPTH 27.8 f	t	NORTHING	3 N/A			EASTING N/A	24 HR. FIAD
DRILL	RIG/HA	MMER E	FF./DA	TE IC	A0404	CME-45C 90% 08/25/2014	ļ		DRILL N	1ETHO	D NV	V Casing w/ Advancer HA	AMMER TYPE Automatic
DRIL	LER N	∕lorgan,	M.		S.	TART DATE 11/18/1	4	COMP. DA	TE 11/	20/14		SURFACE WATER DEPTH	1 N/A
LEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	0.5ft	0.5ft		 	PER FOOT 50	75 100	SAMP. NO.	MOI	L O G	SOIL AND ROCK (ELEV. (ft)	DESCRIPTION DEPTH (
790		 									-	2,787.4 GROUND SI	
785	2,782.7	4.7	5	11	10					D		Tan-orange, brown, dense, fine, silty, hig saprolitic SAND w/ro	white-gray, med. ghly micaceous,
780	2,777.7	9.7	5	5	6	P21						-	
775	2,772.7	14.7				. J				D		2,772.6	14
770	- - -	‡ ‡	60/0.1									CRYSTALLII Crystalline roc - 2,768.4 WEATHERE	k (Gneiss)
765	- - -	‡ ‡										Weathered Roo	
760	2,761.1	26.3	5	9	13	22			-			2,761.1 RESIDU -2,759.6 Tan, brown, gray, med saprolitic SAND w/bou	l. dense, fine, silty,
	- - -	† - - - -									-	rock seams Boring Terminated at EI Residual Boring backfilled upon	(A-2-4). evation 2,759.6 ft in Soils.
	- - -	 - -										moved due to slope st tree.	eepness and pine
	- -	 - - -									-	-	
	- - - -	<u>+</u> + + +										_	
	- - - -	<u>+</u> + +										-	
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	- -	 - -										-	
	<u>-</u> -	‡ ‡									-	-	

VBS 34605.1.2			TIP	R-406	60	C	OUNT	Y A	LLEGH.	ANY	GEOLOGIST DeLost,	R.		
SITE DESCRIPTION	N US	21 Weste	ern Lo	op fror	n SR 117						<u> </u>		GROUN	ID WTR (f
BORING NO. L_4					41+52			_	FSET 4		ALIGNMENT -L-		0 HR.	Dr
OLLAR ELEV. 2	.787.4	ft	-		PTH 27	.8 ft		NO	RTHING	N/A	EASTING N/A		24 HR.	FIAD
PRILL RIG/HAMMER										DRILL METHOD NW				Automatic
ORILLER Morgar	, M.		STAI	RT DA	TE 11/1	8/14		СО	MP. DA	TE 11/20/14	SURFACE WATER DE	PTH N/A	`	
ORE SIZE NQ2	•		тоти	AL RU	N 11.51	ft					1	-		
LEV RUN DEPT (ft) (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft) %	SAMP. NO.	STR REC. (ft) %	ATA RQD (ft) %	L O G	ELEV. (f		ESCRIPTION AND REMAR	(S		DEPTH (
72.6	1.5	1:40/0.5	(1.5)	(1.5)		(4.2)	(2.1)		- 27726		Begin Coring @ 14.8 ft CRYSTALLINE ROCK			1.4
2.772.6 14.8 2.771.1 16.3 2.766.1 21.3	1.5 5.0 5.0	1:40/0.5 1:44 1:36 0:51 1:04 1:30 0:36 0:21 0:25 0:32	(1.5) 100% (3.1) 62% (0.0) 0%	(1.5) (100%) (1.5) 30% N/A		(4.2) 100% (0.4) 5%	(3.1) 74% N/A		- 2,772.6 - - - 2,768.4 - - -	w/sev. weathered se in seams, foliate 2 70°-80° jts. w/irc w/hard, rough walls; Dark brown, oran	unge stain, white, black, sli. to ams, med. to mod. hard, clo ed, feldspar, quartz, biotite, ron oxide stain, rough walls, < 7+ 20°-30° jts. w/iron oxide sopen WEATHERED ROCK uge stain, v. sev. weathered v.	se frac. sp nuscovite, 1mm oper stain, some	acing, fria Gneiss. a; 2 60° jt e w/clay 1	able 19 s. I mm
2,761.1 26.3		0:42 0:32							2,761.1		frags. Gneiss, no recovery ir WR. Resumed SPT samplin		rpreted a	is
760		N=22							2,759.6		RESIDUAL			27
1										· ·	ated at Elevation 2,759.6 ft in completion. Boring moved			

SHEET 10

WBS 34605.1.2	OG REPORT TIP R-4060 COUNTY ALLEG	GHANY GEOLOGIST DeLost, R.		WBS 34605.1.2	TIP R-4060 COUN	ITY ALLEGHANY	GEOLOGIST DeLost, R.	
SITE DESCRIPTION US 21 Wes	stern Loop from SR 1172 (Grandview Drive) to	o US 21	GROUND WTR (ft)	SITE DESCRIPTION US 21 W	estern Loop from SR 1172 (Grandvi	iew Drive) to US 21	•	GROUND WTR (ft)
BORING NO. L_4201L	STATION 42+01 OFFSET	T 3 ft LT ALIGNMENT -L-	0 HR. Dry	BORING NO. L_4250L	STATION 42+50	OFFSET 20 ft LT	ALIGNMENT -L-	0 HR. Dry
COLLAR ELEV. 2,785.6 ft	TOTAL DEPTH 25.8 ft NORTHI	ING N/A EASTING N/A	24 HR. FIAD	COLLAR ELEV. 2,786.6 ft	TOTAL DEPTH 20.9 ft	NORTHING N/A	EASTING N/A	24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE ICA	0404 CME-45C 90% 08/25/2014	DRILL METHOD H.S. Augers HAMI	MER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE IC	CA0404 CME-45C 90% 08/25/2014	DRILL METHOD	H.S. Augers HA	AMMER TYPE Automatic
DRILLER Morgan, M.	START DATE 11/18/14 COMP. D	DATE 11/18/14 SURFACE WATER DEPTH	N/A	DRILLER Morgan, M.	START DATE 11/16/14	COMP. DATE 11/16/14	SURFACE WATER DEPTH	1 N/A
DRIVE DEPTH BLOW COU O.5ft O.5ft		SAMP. L O SOIL AND ROCK DES	SCRIPTION DEPTH (ft)	$\begin{array}{c c} ELEV & DRIVE \\ (ft) & (ft) \end{array} \qquad \begin{array}{c c} DEPTH & BLOW \ CO \\ (ft) & 0.5ft \end{array}$		OT SAMP. 75 100 NO. MOI	L O SOIL AND ROCK I G	DESCRIPTION
2785 2780 2781.3 4.3 2780 2,776.3 9.3 2775 2,776.3 14.3	7	NO. MOI G ELEV. (ft) 2,785.6 GROUND SUR RESIDUAL Tan, gray, white, tan-ora med. dense to dense, sil saprolitic fine SANI D D D D D D D D D D D D D	DEPTH (ft) IFACE 0.0 L ange & brown, Ity, micaceous, D (A-2-4). 25.8 ation 2,759.8 ft in ils. mpletion. Boring	(ft) (ft) 0.5ft 0.5ft 2790 2785 2782 4.4 5 10 2,777.2 9.4 7 10 2,777.2 19.4 WOH 2	10	D D		JRFACE 0.0 JAL en, white, v. loose e, silty, highly sAND w/rock frags2-4). 20.9 evation 2,765.7 ft in Soils.

W BOREL	OG REPORT					
WBS 34605.1.2	TIP R-4060 COUNTY ALLEC	GHANY GEOLOGIST DeLost,	, R.	WBS 34605.1.2	TIP R-4060 COUNTY ALLE	GHANY GEOLOGIST DeLost, R.
SITE DESCRIPTION US 21 Wes	tern Loop from SR 1172 (Grandview Drive) t	to US 21	GROUND WTR (ft)	SITE DESCRIPTION US 21 W	estern Loop from SR 1172 (Grandview Drive)	to US 21 GROUND WTR (ft)
BORING NO. Y2_1572L		T 7 ft LT ALIGNMENT -Y2-	0 HR. N/A	BORING NO. Y2_1592L		T 7 ft LT ALIGNMENT -Y2- 0 HR. N/A
COLLAR ELEV. 2,782.4 ft		HING N/A EASTING N/A	24 HR. N/A	COLLAR ELEV. 2,782.0 ft		ING N/A EASTING N/A 24 HR. N/A
DRILL RIG/HAMMER EFF./DATE ICAG		DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic	DRILL RIG/HAMMER EFF./DATE IC		DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic
DRILLER Morgan, M.	<u> </u>	DATE 11/19/14 SURFACE WATER DI	EPTH N/A	DRILLER Morgan, M.		DATE 11/19/14 SURFACE WATER DEPTH N/A
ELEV (ft) DRIVE ELEV (ft) DEPTH BLOW COUNTY (ft) 0.5ft 0.5ft 0		100 NO. MOI G ELEV. (ft)	OCK DESCRIPTION DEPTH (ft)	ELEV DRIVE ELEV (ft) DEPTH BLOW CO	 	00 SOIL AND ROCK DESCRIPTION NO. MOI G
(ii)		NOT G ELEV. (II)	DEPTH (II)	(ii)		No. 7 WOT G
2785				2785		
+			UD CUDEACE	+		
		ROADWA	ND SURFACE 0.0 Y EMBANKMENT		 	2,782.0 GROUND SURFACE 0.0 ROADWAY EMBANKMENT
2780		silty SANDw	ose, highly micaceous, /rock frags. (A-2-4).	2780		SILT w/roadway gravel (A-4).
2,777.7+ 4.7	<u> </u>			2,777.2 4.8 60/0.0		. 1 2,777.2 4.8
2775	T			2775		
2,772.7+ 9.7	‡::: :::: :::: ::::					
2770	1 6					
				 		Boring Terminated at Elevation 2,770.2 ft in Crystalline Rock (Gneiss).
	2 4	· Sat				
2765			LLUVIAL — — — — — 18.0			[-
2,762.7 19.7 7 10		Dark brown-blace	ck, multi-colored, med. /ey, fine SAND (A-2-4).			
2760	1		/ey, lifle SAND (A-2-4).			
2,757.7+ 24.7	:::::::::::::::::::::::::::::::::::	·				
3 8	92	VVEAII	HERED ROCK 25.7			
		Boring Terminated	d rock (Gneiss).			
		Weathered	d Rock (Gneiss).	‡		
						[-
4 4						
				‡		
9: 1						
						[-
988.0						
4 4 4 1						
38.88				‡		
						[-
		[-				[-
R406		<u> </u>				
		‡				
						[

NBS 34605.1.2	TIP R-4060 COUN	ry alleghany	GEOLOGIST DeLost, R.			
SITE DESCRIPTION US 21 Wes	ern Loop from SR 1172 (Grandvi	ew Drive) to US 21		GROUND WTR (f		
BORING NO. Y2_1592L	STATION 15+92	OFFSET 7 ft LT	ALIGNMENT -Y2-	0 HR. N/A		
COLLAR ELEV. 2,782.0 ft	TOTAL DEPTH 11.8 ft	NORTHING N/A	EASTING N/A	24 HR . N/A		
DRILL RIG/HAMMER EFF./DATE ICAC	404 CME-45C 90% 08/25/2014	DRILL METHOD NW	Casing W/SPT & Core HAMM	MER TYPE Automatic		
DRILLER Morgan, M.	START DATE 11/19/14	COMP. DATE 11/19/14	SURFACE WATER DEPTH N/A			
ORE SIZE NQ2	TOTAL RUN 7.0 ft					
LEV RUN DEPTH RUN RATE (Min/ft)	RUN SAMP. REC. RQD REC. RQD RC. RQD RQD	L O DE	ESCRIPTION AND REMARKS	DEPTH		
77.2			Begin Coring @ 4.8 ft			
2,777.2 4.8 0.9 N=60/0.1 36/0.9 1.36/0.0 1.36/0.9 1.36/0.9 1.36/0.9 1.36/0.9 1.36/0.9 1.36/0.9 1.36/0.	0.7) (0.7) (2.8) (5.4) (4.2) (77% 60% 60% 60% 60% 60% 60% 60% 60% 60% 60	sev. to completely w fracs., scat. vugs, foli sev. to comp. weath 2,770.2 1 80° jt. w/sli. rough w/clay, hard walls, 11	CRYSTALLINE ROCK In-brown-orange stain, v. sli. to mod. reathered seams, hard, close to mod ated, feldspar-quartz-boitite-muscov hered seam 6.9'-8.6' includes core los additional core loss 11.6'-11.8'. h & hard walls; 8 40°-70° jts. w/iron ox open at Elevation 2,770.2 ft in Crystalline F	I. close spaced ite, Gneiss w/v. ss @ 7.0'-8.4', oxide & some xide stain 1 mm		

WBS 34605.1.2						ΓΙΡ R-4060	Y ALLEGH	ANY			GEOLOGIST DeLost, R.			
SITE D	ESCR	IPTIO	N US	21 We	estern	Loop from SR 1172	(Grandvie	w Drive) to	US 21			•	GROUN	ID WTR (
BORIN	G NO	. Y2_′	1633		s	STATION 16+33		OFFSET	10 ft LT			ALIGNMENT -Y2-	0 HR.	N/
									ING N/A			EASTING N/A 24		N/
						I CME-45C 90% 08/25/20		_		/FTHOI	D NI	N Casing w/ Advancer	HAMMER TYPE	
						START DATE 11/19/	COMP. DATE 11/19/14				 		riationiatio	
D	D1) /E		1	W CO			PER FOOT				1 L 1	SURFACE WATER DEPTH N/A		
(ft) E	(ft)	DEPTH (ft)	0.5ft	0.5ft	_	- .		75 100	NO.	MOI	O G		OCK DESCRIPTION	l DEPTH
	(11)							1		7 WOI		ELEV. (ft)		DEFIN
705														
785		-										_		
	1	-										· 2,781.4 GROUN	ID SURFACE	
780	Ė											ROADWAY	EMBANKMENT	
	+	_										dense, highly m	own, v. loose to med icaceous, silty SAN	
2,	776.9	4.5	11	11	12					l		w/roadway	/ gravel (A-2-4).	
75		_	''	''	12	23				M	L.	-		
	+	-				$ \cdot \cdot \cdot f \cdot \cdot \cdot$								
2,	771.7	- 9.7				_						•		
770			5	8	8	16				Sat.		· -		
	1					: ½: : ::::								
2,	766.7	- 14.7				_						•		
765		_	1	1	1	• 2 · · · · · · · · · · · · · · · · · · ·	1 : : : :	1		Sat.	L	· - -		
	f	_												
2,	761.7-	- 19.7	1	WOH	12	- <u> ∟ -</u>						2,761.4		2
'60	4		'	WOH	12	12				Sat.			SIDUAL te, tan, orange, bla	ck
	1					:/: : : : : : :						loose to med. der	nse, highly micaced	us,
2,	756.7	- 24.7	1	2	3	$\exists \mid \not ! \cdots \mid \cdots$						saprolitic sil	ty SAND (A-2-4).	
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