NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

LINE STATION 10+00.00 to 19+31.00 -I DFT-

PLAN PROFILE XSECT

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENGINEERING UNIT

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 38499.1.1 (B-4725)

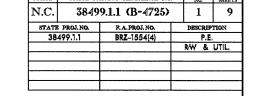
F.A. PROJ. *BRZ-1554(4)*

COUNTY __Caswell

PROJECT DESCRIPTION Bridge No. 12 over Country Line Creek on SR 1554

(Yarborough Mill Road)

INVENTORY



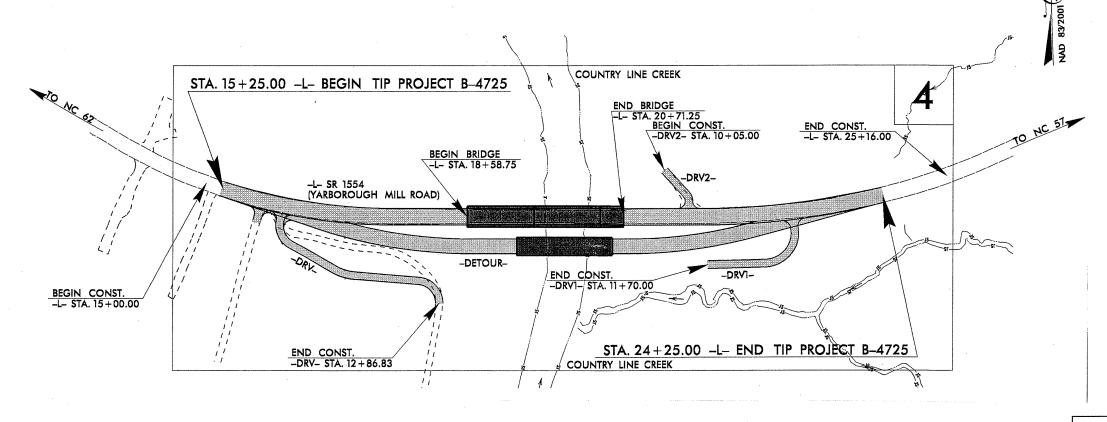
STATE STATE PROJECT REFERENCE NO.

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 PALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS. NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE 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 BORNINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU UN-PLACEITEST DATA CAN BE RELED ON ONLY TO THE DEGREE OF RELIABLITY NIMEBERT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE. THE OBSERVED WATER LEVELS ON SOIL MOST OF CONDITIONS INVOCATED IN THE SUBSIDIARY 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 THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSUPFACE PLANS ARE PRELIMBARY ONLY AND IM 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 INDEPPENDENT SUBSURFACE. INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY MINSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY PEASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.



PERSONNEL B.D. WORLEY

C.M. WHALEN, Jr.

INVESTIGATED BY B.D. WORLEY

C.M. WHALEN, Jr.

SUBMITTED BY K.B. MILLER

RTH CARO

NOTE - 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.

DRAWN BY: D. Racey

203079

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

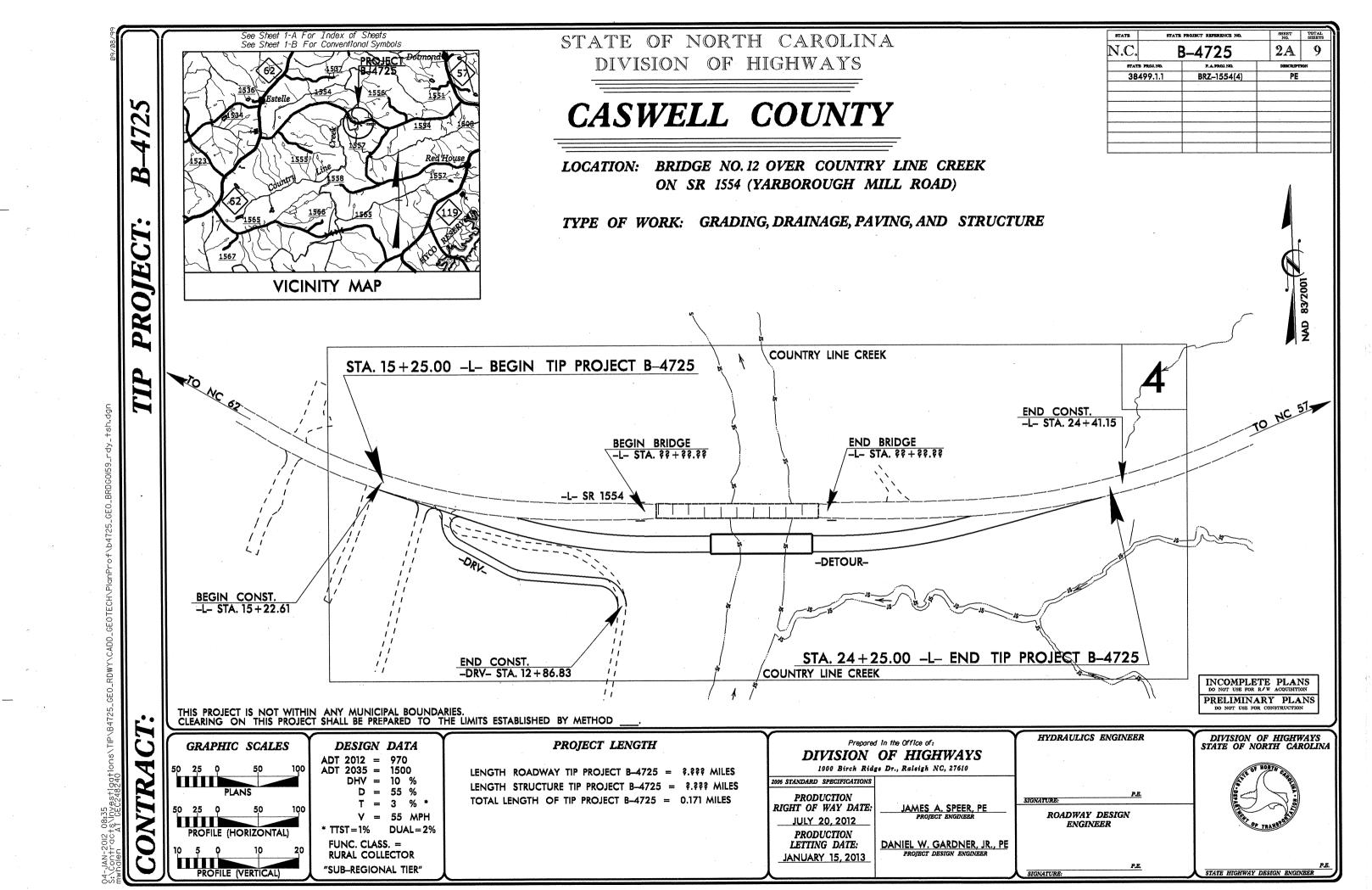
SUBSURFACE INVESTIGATION

	SOIL AND ROCK LEGEND, TERM	S, SYMBOLS, AND ABBREVIATIONS							
SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS						
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.						
THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN	POORLY GRADED) GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.	ST 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	AQUIFER - A WATER BEARING FORMATION OR STRATA.						
100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586), SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM, BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE:	ANGULARITY OF GRAINS	OF WEATHERED ROCK.	ARENACEDUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.						
CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR,	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, AS SHALE, SLATE, ETC.						
VERY STIFF, BRIA, SKIT CLAI, MOST WITH INTERBEDDED FINE SIND LIVERS, MIGHT PLASTIC, 4-7-6	SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 ROCK (WR) BLOWS PER FOOT IF TESTED.	ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL						
SOIL LEGEND AND AASHTO CLASSIFICATION	MINERALOGICAL COMPOSITION	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT	AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.						
GENERAL GRANULAR MATERIALS SILT-CLAY MATERIALS ORGANIC MATERIALS ORGANIC MATERIALS	MINERAL NAMES SUCH AS DUARTZ, FELDSPAR, MICA, TALC, KADLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.	ROCK (CR) would yield spt refusal if tested. ROCK type includes granite, gneiss, gabbro, schist, etc.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.						
CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) CONTROL 1 ATTENDED TO THE CONTROL 1 ATTENDED T	COMPRESSIBILITY	NON-CRYSTALLINE FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YELD SPT REFUSAL IF TESTED, ROCK TYPE	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM						
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5 A-6 A-7 CLASS. A-1-a A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-5 A-3 A-6, A-7	SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31	NOLL (NCR) INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	OF SLOPE.						
SYMBOL DOOO GOOD STANDARD SYMBOL DOOO GOOD STANDARD SYMBOL DOOD SYMBOL DOOD STANDARD SYMBOL DOOD SYMBOL DOOD STANDARD SYMBOL DOOD STANDARD SYMBOL DOOD STANDARD SYMBOL DOOD SYMBOL SYMBOL DOOD SYMBOL DOOD SYMBOL	MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SEDIMENTARY ROCK PYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.						
Z PASSING	PERCENTAGE OF MATERIAL	(CP) SHELL BEDS, ETC. WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT						
# 10 50 MX GRANULAR CLAY MUCK,	ORGANIC MATERIAL GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL		ROCKS OR CUTS MASSIVE ROCK.						
* 40 38 MX 50 MX 51 MN	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.	<u>DIP</u> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.						
LIGUID LIMIT 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN 48 MX 41 MN SOILS WITH	LITTLE ORGANIC MATTER	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN,	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF						
PLASTIC INDEX 6 MX NP 18 MX 19 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN LITTLE OR HIGHLY	HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE	(V SLI,) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.	THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.						
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX No MX MODERATE ORGANIC	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	<u>FAULT</u> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.						
USUAL TYPES STONE FRASS. FINE SILTY OR CLAYEY SILTY CLAYEY ORGANIC	WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.						
OF MAJOR GRAVEL, AND SAND GRAVEL AND SAND SOILS SOILS MATTER	STATIC WATER LEVEL AFTER 24 HDURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM						
GEN.RATING AS A EXCELLENT TO GOOD FAIR TO POOR POOR POOR UNSUITABLE	<u>∇PW</u> PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA	(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED	PARENT MATERIAL.						
AS A EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE SUBGRADE	O-NN→ SPRING OR SEEP	WITH FRESH ROCK.	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.						
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30	-	MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN						
CONSISTENCY OR DENSENESS RANGE OF STANDARD RANGE OF UNCONFINED	MISCELLANEOUS SYMBOLS	(MDD, SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK, ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	THE FIELD.						
PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) PT INT TEST BORING WITH SOIL DESCRIPTION PT INT TEST BORING W/ CORE	IF TESTED, WOULD YIELD SPT REFUSAL	JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.						
WERY LODGE 24	AUCED BODING SPT N-VALUE	SEVERE 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	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO						
GRANII AR LOOSE 4 TO 10	SUL STRIBUL	EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, YIELDS SPT N VALUES > 100 BPF	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.						
MATERIAL NENDE 10 TO 30	ARTIFICIAL FILL (AF) OTHER ————————————————————————————————————	VERY SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN						
(NON-COHESIVE) VERY DENSE >50	INFERRED SOIL BOUNDARY MONITORING WELL	(V SEV.) THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK	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						
VERY SOFT <2 <0.25 GENERALLY SOFT 2 TO 4 0.25 TO 0.50	PIETOMETER	REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF	INTERVENING IMPERVIOUS STRATUM.						
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0	INFERRED ROCK LINE A FLEZONETER INSTALLATION	COMPLETE ROCK REDUCED TO SDIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE DNLY IN SMALL AND	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.						
MATERIAL STIFF 8 TO 15 1 TO 2 (COHESIVE) VERY STIFF 15 TO 30 2 TO 4	SLOPE INDICATOR INSTALLATION	SCATTERED CONCENTRATIONS, DUARTZ MAY BE PRESENT AS DIKES OR STRINGERS, SAPROLITE IS ALSO AN EXAMPLE.	ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF						
HARD >30 >4	25/825 DIP & DIP DIRECTION OF	ROCK HARDNESS	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN EXPRESSED AS A PERCENTAGE.						
TEXTURE OR GRAIN SIZE	ROCK STRUCTURES CONE PENETROMETER TEST	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE						
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	SOUNDING ROD	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND						
OPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	ABBREVIATIONS	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY, HARD HAMMER BLOWS REQUIRED	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL						
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	AR - AUGER REFUSAL MED MEDIUM V - VERY	TO DETACH HAND SPECIMEN. MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.						
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	BT - BORING TERMINATED MICA MICACEOUS VST - VANE SHEAR TEST CL CLAY MOD MODERATELY WEA WEATHERED	HARD EXCAVATED BY HARD BLOW OF A GEDLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED	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	CPT - CONE PENETRATION TEST NP - NON PLASTIC 7 - UNIT WEIGHT	BY MODERATE BLOWS.	STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF						
SIZE IN. 12 3	CSE COARSE ORG ORGANIC To DMT - DILATOMÉTER TEST PMT - PRESSUREMETER TEST SAMPLE ARREVIATIONS	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	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						
SOIL MOISTURE - CORRELATION OF TERMS SOIL MOISTURE SCALE FIELD MOISTURE CONTROL OF TERMS	DPT - DYNAMIC PENETRATION TEST R.E ROADWAY EMBANKMENT S - BULK	POINT OF A GEOLOGIST'S PICK.	THAN 0.1 FOOT PER 60 BLOWS.						
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION GATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION	• - VOID RATIO SAP SAPROLITIC SS - SPLIT SPOON	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT, SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH						
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY	FOSS FOSSILIFEROUS SL SILT, SILTY RS - ROCK	PIECES CAN BE BROKEN BY FINGER PRESSURE.	OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROD) A MEASURE OF ROCK QUALITY DESCRIBED BY						
(SAT.) FROM BELOW THE GROUND WATER TABLE	FRAC FRACTURED, FRACTURES SLI SLIGHTLY RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS TCR - TRICONE REFUSAL CBR - CALIFORNIA BEARING	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK, PIECES 1 INCH SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY	TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE						
La correct T ± 13000 Ellis	HI HIGHLY W - MOISTURE CONTENT RATIO	FINGERNAIL.	TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.						
RANGE - WET - (W) ATTAIN OPTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	FRACTURE SPACING BEDDING	TOTOVIL 1101 SURFACE SUILS USUALLY CONTINUING UNDANGE MATTERS						
(PI) PL PLASTIC LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	TERM SPACING TERM THICKNESS VERY THICKLY BEDDED > 4 FEET	BENCH MARK:						
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE	AUTOMATIC MANUAL	VERY MUDE MODE THAN 10 FEET THICKLY BEDDED 1.5 - 4 FEET	ELEVATION: FT.						
SL SHRINKAGE LIMIT	MOBILE B-	MODERATELY CLOSE 1 TO 3 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET							
REQUIRES ADDITIONAL WATER TO - DRY - (D) ATTAIN OPTIMUM MOISTURE	BK-51 SHAPL ON AUGER CORE SIZE:	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	NOTES:						
ATTHIN OFFINON MOISTONE	- O ROLLOW HODERS	INDURATION							
PLASTICITY	HARD FACED FINGER BITS	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.							
PLASTICITY INDEX (PI) DRY STRENGTH NDNPLASTIC 0-5 VERY LOW	TUNG,-CARBIDE INSERTS -H	FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS;							
LOW PLASTICITY 6-15 SLIGHT	CASING W/ ADVANCER HAND TOOLS:	GENILE BLUW BY HAMMER DISINIEGRATES SAMPLE.							
MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH	PORTABLE HOIST TRICONE STEEL TEETH POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.							
COLOR	TRICONE TUNGCARB. X HAND AUGER								
	CORE BIT X SOUNDING ROD	INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE: DIFFICULT TO BREAK WITH HAMMER.							
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.	VANE SHEAR TEST	EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;							
		SAMPLE BREAKS ACROSS GRAINS.							

PROJECT REFERENCE NO.

38499.l.l (B-4725)

SHEET NO.





STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE GOVERNOR

EUGENE A. CONTI, JR. SECRETARY

January 6, 2012

STATE PROJECT:

38499.1.1 (B-4725)

F.A. PROJECT:

BRZ-1554(4)

COUNTY:

Caswell

DESCRIPTION:

Bridge No. 12 Over Country Line Creek on SR 1554

SUBJECT:

Geotechnical Report - Inventory

Project Description

The project consists of replacing the existing bridge with a new bridge, raising the grade of the existing roadway approaches and constructing on new location a temporary detour bridge.

The geotechnical investigation was conducted on October 4, 2011 and consisted of two hand auger borings, and two bridge rods. The hand auger borings were advanced to a depth of three feet. The bridge rods were advanced to a depth of fifteen feet.

The following alignment was investigated for this project:

Line

Station(±)

-LDET-

11+39.1 to 17+33.18

MAILING ADDRESS:

NC DEPARTMENT OF TRANSPORTATION GEOTECHNICAL ENGINEERING UNIT 1589 MAIL SERVICE CENTER RALEIGH NC 27699-1589

TELEPHONE: 919-707-6850 Fax: 919-250-4237

www.ncdot.gov/doh/preconstruct/highway/geotech

LOCATION: CENTURY CENTER COMPLEX ENTRANCE B-2 1020 BIRCH RIDGE DRIVE RALEIGH NC 27610

Areas of Special Geotechnical Interest

1) Alluvial Soils-Flood plain deposits, consisting of sands and silty sands are evident in the following section of the project

Line

Station (\pm)

-LDET-

14+30 to 15+30

2) Roadway Embankment Fill- Roadway embankment fill was encountered at the following locations.

Line

Station (\pm)

-LDET-

-LDET-

10+00 to 13+50

15+50 to 17+40

Physiography, Geology and Surface Water

The project corridor is located in the north central portion of the Milton Belt in the Piedmont Physiographic Province in central Caswell County. Topography in the area is generally flat to gently rolling. The project area is comprised of farmland, and medium dense forest with nearby residential structures.

Geologically the project area consists of Proterozoic to Cambrian age gneiss and schist plus the associated residual soils derived from this rock.

Surface water is drained from the corridor by Country Line Creek and several smaller unnamed creeks and tributaries that generally trend north across the project.

Soils Properties

Soils encountered along the project corridor consist of roadway embankment, alluvial soils deposited by Country Line Creek, and residual soils derived from the Proterozoic and Cambrian age gneisses and schists of the Milton Belt.

Roadway embankment soils are present along existing SR 1554, parallel to and immediately adjacent to the proposed detour bridge structure.

Alluvial soils are located within the floodplain of Country Line Creek, and consist of sands and silty sands.

Residual soils generally are present throughout the surrounding region, and consist of silty sands and silty clays.

Ground Water

Ground water data was not collected during this investigation.

Respectfully Submitted,

Clal m whaley. Charles M. Whalen, Jr.

PROJECT REFERENCE NO.

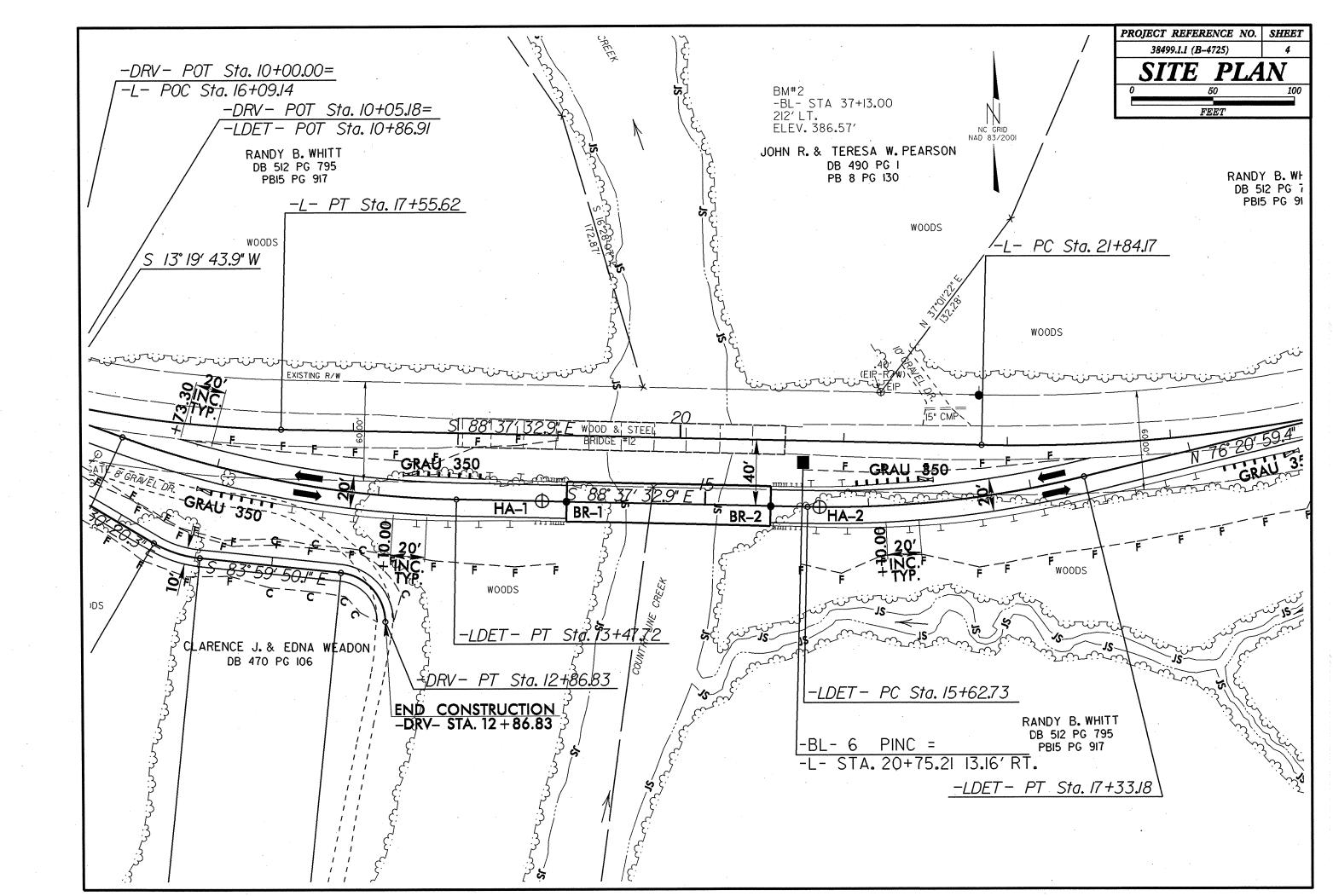
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

SUMMARY OF EARTHWORK IN CUBIC YARDS

The state of the s			EXCAVATION	1		UDIC IA		KMENT			1	WAS	TE	
LOCATION	TOTAL UNCL.	ROCK	UNDERCUT	UNSUIT. UNCL.	SUITABLE UNCL.	TOTAL	ROCK	EARTH	EMBANK (+) 20%	BORROW	ROCK	SUITABLE	UNSUIT.	TOTAL
PHASE NO. I (DETOUR)									1					
-LDET- STA. 10+00.00 TO STA. 14+10.00	51				51	4022		4022	4827	4776				
-LDET- STA. 15 + 40.00 TO STA. 19 + 31.00	6			***************************************	6	3093		3093	3712	3706				
-DRV- STA. 10+15.25 TO STA. 10+83.43						66		66	80	80				
-DRV- STA. 12 + 48.78 TO STA. 12 + 86.83	21				21							21		21
PHASE NO. I TOTALS	78				78	7181		7181	8619	8562		21		21
PHASE NO. II (-L-/-DRV2-)														
-L- STA. 16+50.00 TO STA. 18+58.75	2				2	692		692	831	829				
-L- STA. 20+71.25 TO STA. 22+75.00	47				47	445		445	534	487				
-DRV2- STA. 10+05.00 TO STA. 10+68.49	11				11	24		24	29	18				
PHASE NO. II TOTALS	60				60	1161		1161	1394	1334				
PHASE NO. III (DETOUR REMOVAL/-DRV1-)														
-LDET- STA. 10+00.00 TO STA. 14+10.00	2331				2331	143		143	172			2159		2159
-LDET- STA. 15+40.00 TO STA. 19+31.00	2738				2738	504		504	605			2133		2133
-DRV1- STA. 10+11.00 TO STA. 10+74.17						836		836	1004	1004				
PHASE NO. III TOTALS	5069				5069	1483		1483	1781	1004		4292		4292
SUMMARY TOTALS	5207				5207	9825		9825	11794	10900		4313		4313
WASTE IN LIEU OF BORROW										-21		21		-21
PROJECT TOTALS	5207				5207	9825		9825	11794	10879		4292		4292
5% TO REPLACE TOPSOIL ON BORROW PIT										544				
PROJECT GRAND TOTALS	5207				5207	9825		9825	11794	11423		4292		4292
SAY	5300					· · · · · · · · · · · · · · · · · · ·				11500				
EST. UNDERCUT CONTINGENCY = 300 G	CY													
GEOTEXTILE FOR SOIL STABILIZATION =	300 SY													
SELECT GRANULAR MATERIAL = 300 CY										,				, , , , , , , , , , , , , , , , , , , ,

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."



S 38	8499	1.1				TIP	B-472	:5		COU	NTY	CASW	ELL			G	EOLOG	IST World	ey, B. D.			WB	384	99.1.1			TIF	B-47	25	COL	JNTY C	ASWEL	<u> </u>		GEC	JLOGIS	vvorie	y, B. D.		
E DES			I N/A	A		1														GRO	UND WTF	(ft) SIT	E DESC	RIPTIO	N/A	\													GROUN	ND WTF
RING						STA	TION	14+0	0		OFFSET CL			Α	ALIGNMENT LDET		0 HR. N/A		N/A BO	BORING NO. BR-1				ST	STATION 14+15				OFFSET CL			ALI	ALIGNMENT L			0 HR.				
LLAR							AL DE				NORTHING 999,400			E				24 HF	₹.	N/A CO	COLLAR ELEV. N/A		то	TOTAL DEPTH 15.0 ft		NO	RTHING			EASTING 1,939,196			24 HR.							
LL RIG				ATE	N/A								DF	RILL ME	THOD	Hand A	Auger		HAN	IMER TYP	PE N/A	DRI	LL RIG/H	AMMER	EFF/DA	TE N	/A								Rod Soun	nding		HAMN	IER TYPE	N/A
ILLER	R N/	Α				STA	RT DA	TE 1	0/04/1	1	С	OMP. [DATE	10/04	/11	s	URFACE	WATER I	DEPTH	N/A		DR	ILLER					ART DA	TE 10/0			MP. DAT	,	04/11	SUF	RFACE \	WATER D	EPTH N	/A	
DR EL			0.5ft	OW 0			0	Bi 25	LOWS	PER FO	OOT 75	1	11	- 1	MOI C		EV. (ft)	SOIL AND	ROCK DE	SCRIPTIO	ON DEP	TH (ft) ELE	V DRIV ELEV (ft)	E DEPT	H BL0	OW CO	UNT 0.5ft	0	25 25	WS PER F	OOT 75	100	SAMP. NO.	MOI C	- D G		SOIL AND I	ROCK DES	CRIPTION	1
									,										OUND SUF			0.0								······								UND SURF		
					N.					·								Dark Browr		nse Silty S		3.0		20 30 40 50 60 70 80 90 100		16 22 11	14 9 8 8 11		15 22 24 21 22 24 24 22 4 22	3						Da		fedium Den		and
																								13.0		12	6 8 12 12 13		20 24 28 24 24							Bor	ing Termina	ated at Dep Sand	th 15.0 ft S	Silty
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BS 38499.1.1	TIP B-4725	COUNT	Y CASWEL	.L		GEOLOGIST Worley,				38499				TIP	B-4725	COUN	TY CASWE	LL		GEOLOGIST Worley			
TE DESCRIPTION N/A							G	ROUND WTR (f	` 	DESCR												GROUND W	
ORING NO. BR-2	ING NO. BR-2 STATION 15+40 OFFSET CL			ALIGNMENT LDET	0	HR. N/A	BOR	ING NO.	IG NO. HA-2			STATION 15+70			OFFSET			ALIGNMENT LDET		0 HR.			
OLLAR ELEV. N/A			NORTHING	999,397	7	EASTING 1,939,321	24	HR. N/	COL	COLLAR ELEV. N/A DRILL RIG/HAMMER EFF/DATE N/A				тот	AL DEPTH	3.0 ft	NORTHIN			EASTING 1,939,352		24 HR.	
DRILL RIG/HAMMER EFF/DATE N/A DRILLER N/A START DATE 10/04/11		· · · · · · · · · · · · · · · · · · ·	L	DRILL ME	THOD R	od Sounding	HAMMER	TYPE N/A	DRIL									DRILL	METHOD H	Hand Auger	HAMMI	R TYPE N/A	
		4/11	COMP. DA	TE 10/04	1/11	SURFACE WATER DEF		DRIL	LER N	R N/A			START DATE 10/04/11			COMP. DA	ATE 10	04/11	SURFACE WATER DE	PTH N/	A		
EV DRIVE ELEV (ft) DEPTH BLOW COU	NT BLOW	S PER FOOT	75 100	SAMP.	/ 101	SOIL AND RO	OCK DESCRI	PTION DEPTH	ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOV 0.5ft	0.5ft 0			LOWS PER FOO	OT 75 100	SAMP.	MOI G	SOIL AND R	OCK DESC	RIPTION	
5							ND SURFACE	<u> </u>	0.0						÷						ND SURFA	CE	
	2 3					RF	FSIDLIAL													Ri Dark Brov	ESIDUAL wn Stiff Silt	y Clay	
3.0 - 8	16 13 18 14 15 8 9 17					Orange Brown to D w/ some		. 1	5.0											Boring Terminated			
							•																