STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3615B	1	52

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34962.1.1	STP-1820(2)	P.E.
		CONST

PROJECT: 34962.1.1 I.D.: U-3615B

STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

For Letting

STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 34962.1.1 I.D. NO. U-3615B

F.A. PROJECT STP-1820(2)

COUNTY GUILFORD

PROJECT DESCRIPTION REPLACE BRIDGE NO. 65 ON SR 1820(SKEET CLUB RD.) OVER OAK HOLLOW LAKE BETWEEN SR 1818 AND SR 1834

SITE DESCRIPTION

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS 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 UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS 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 THIS 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.

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3) SITE VICINITY MAP (DRAWING No. 1, SHEET 9)
4) BORING INDENTIFICATION DIAGRAM (DRAWING No. 2, SHEET 10)
5) SUBSURFACE PROFILE AND CROSS-SECTIONS (DRAWING Nos. 3-8, SHEETS 11-16)
6) FINAL BORING LOGS, CORING LOGS, AND CORE PHOTOGRAPHS (SHEETS 17-42)
7) BRIDGE ROD SOUNDING LOG (SHEET 43)
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INVESTIGATED BY P WEAVER/ G LICAYAN

CHECKED BY J VINSON

SUBMITTED BY P WEAVER

DATE 8/3/06

PERSONNEL D KITCHEN, S WILLARD, W DUGGINS, E TRACEY, W WHICHARD, B SMALLWOOD, L STAFFORD

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, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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.

NORTH CAROLINA LICENSED SEAL 1500 GEOLOGIST PAUL M. WEAVER

SEAL

8/3/06

SIGNATURE

DRAWN BY: DRK

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-3615B	34962.1.1	2	52

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. 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 (≤35% PASSING #200)							SILT-CLAY MATERIALS (>35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING # 10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
# 40	30 MX	50 MX	51 MN											
# 200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT				40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX	6 MX		N.P.	10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	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 A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (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 1 TO 2 2 TO 4 >4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	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: 305 | 75 | 2.0 | 0.25 | 0.05 | 0.005
GRAIN SIZE IN.: 12" | 3"

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YEL-BRN, 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
UNIFORM- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE 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 WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

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

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.
- STATIC WATER LEVEL AFTER 24 HOURS.
- PW PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA
- SPRING OR SEEPAGE

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 DIP/DIP DIRECTION OF ROCK STRUCTURES
- SOUNDING ROD
- SPT DPT DMT PMT VST TEST BORING
- AUGER BORING
- CORE BORING
- MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF SPT REFUSAL

SAMPLE DESIGNATIONS
S- BULK SAMPLE
SS- SPLIT SPOON SAMPLE
ST- SHELBY TUBE SAMPLE
RS- ROCK SAMPLE
RT- RECOMPACTED TRIAXIAL SAMPLE
CBR - CBR SAMPLE

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CI. - CAVE IN
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
C.T. - CORING TERMINATED
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F. - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED
FRAGS. - FRAGMENTS
MED. - MEDIUM
NM - NOT MEASURED
PMT - PRESSUREMETER TEST
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
W - MOISTURE CONTENT
V. - VERY
VST - VANE SHEAR TEST

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B- 57
- [ ] BK-51
- [x] CME-45
- [ ] CME-55
- [ ] PORTABLE HOIST
- [ ] OTHER CME 850
- [x] OTHER ACKER MARK II

ADVANCING TOOLS:
- [ ] CLAY BITS
- [x] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [x] CASING [ ] W/ ADVANCER
- [ ] TRICONE ____" STEEL TEETH
- [x] TRICONE 3⅞" - TUNG.-CARB.
- [x] CORE BIT
- [ ] OTHER ____

HAMMER TYPE:
- [ ] AUTOMATIC
- [x] MANUAL

CORE SIZE:
- [ ] -B ____
- [x] -N 0
- [x] -H 0

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [x] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] OTHER ____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN TESTED, WOULD YIELD SPT REFUSAL. 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 FOLOWS:

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

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V. SLI.)	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.
SLIGHT (SLI.)	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.
MODERATE (MOD.)	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.
MODERATELY SEVERE (MOD. SEV.)	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*
SEVERE (SEV.)	ALL ROCKS 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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK 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*
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 ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGISTS PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGISTS PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGISTS PICK.
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 PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	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 FINGERNAIL.

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 FEET
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 THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS WHICH 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, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH 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 DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (F.P.) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (R.Q.D.) - 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 WHICH 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, WHICH 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 B.P.F.) 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 LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - 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 (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: U-3615-7: STA. 237+09.86 -BL-

ELEVATION: 812.30'

NOTES:

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ATTENTION: Mr. Njoroge W. Wainaina, P.E.
State Geotechnical Engineer

SUBMITTED BY: Trigon Engineering Consultants, Inc.
Post Office Box 18846
Greensboro, North Carolina 27419-8846
Trigon Project No. 071-05-025

DATE: August 3, 2006

STATE PROJECT: 34962.1.1

TIP : U-3615B

FEDERAL PROJECT: STP-1820(2)

COUNTY: Guilford

DESCRIPTION: Replace Bridge No. 65 on SR 1820 (Skeet Club Road) Over Oak Hollow Lake Between SR 1818 and SR 1834

SUBJECT: Geotechnical Report of Structure Subsurface Investigation

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2. Boring Quantity Summation Sheet
3. Field Boring and Coring Logs
4. Survey Notes
5. Property Owner Contact Report Sheet

TRIGON
ENGINEERING CONSULTANTS, INC.
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STATE PROJECT: 34962.1.1

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DESCRIPTION: Replace Bridge No. 65 on SR 1820 (Skeet Club Road) Over Oak Hollow Lake Between SR 1818 and SR 1834

SUBJECT: Geotechnical Report of Structure Subsurface Investigation

Trigon Engineering Consultants, Inc. has completed the authorized geotechnical investigation for the above referenced project in Guilford County, North Carolina. The purpose of this exploration was to investigate the subsurface conditions at the proposed bridge bent locations and to provide general construction considerations based on the subsurface conditions.

1.0 SITE DESCRIPTION

The project site is located in the southwestern portion of Guilford County within the city limits of High Point, North Carolina at the approximate location shown on the Site Vicinity Map (Drawing No. 1) attached behind this report. The site and project description of the proposed project is "Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake Between SR 1818 and SR 1834". Topographically, the site

slopes moderately down towards Oak Hollow Lake with relatively steep slopes down to the lake from the existing roadway embankment. The floodplain at the location of the existing bridge appears to be greater than 1,000 feet wide. The topography of the general site vicinity consists of gently rolling hills.

At the time of this investigation, a four-span bridge (existing Bridge No. 65) was present at the site of the proposed bridge. The existing bridge consists of a concrete deck supported by concrete piers. The existing bridge is approximately 165 feet in length and approximately 37 feet in width.

The water surface elevation surveyed by Trigon on July 14, 2006 was ±802 feet. According to the USGS Guilford Quadrangle topographic map, the normal pool elevation of Oak Hollow Lake is approximately 803 feet. According to the Bridge Survey and Hydraulic Report, the 10-year floodwater surface elevation is ±804 feet, the 50-year floodwater surface elevation is ±805 feet, the 100-year flood elevation is ±806 feet, and the 500-year flood elevation is 808 feet.

2.0 PROJECT DESCRIPTION

Proposed for construction is a new, three-span structure to replace the existing Bridge No. 65 on Skeet Club Road over Oak Hollow Lake. The proposed bridge will be a replacement-in-place of the existing bridge. Information for the proposed bridge structure was obtained from the Preliminary General Drawing and the Bridge Survey & Hydraulic Design Report provided to Trigon by the NCDOT. The proposed bridge will be 210 feet in length and approximately 99 feet in width (out to out) with a skew angle of 90°00'00" at each bent.

The proposed grade along the centerline of the proposed bridge on -L- will remain essentially unchanged from the existing grade. However, a total of approximately 750 cubic yards of excavation is proposed between the old and new abutments at End Bent-1 and End Bent-2. This excavation will involve both horizontal and vertical excavation, with vertical excavation extending to between approximately 7 and 9 feet below the existing top-of-soil at the -L- centerline. Slopes on the order of 1.5(H):1(V) are proposed for the new embankment slopes.

The Preliminary General Drawing and Bridge Survey & Hydraulic Design Report are in English units with feet as the primary unit of length.

3.0 SCOPE OF INVESTIGATION

3.1 FIELD TESTING

The as-drilled locations for the soil test borings drilled on land and through the bridge deck (the "A" and "D" borings) were located by personnel from Trigon using the existing bridge for reference. The as-drilled locations for the soil test borings (the "C", "E", and "B" borings) and rod sounding (EB1-B) performed within the water from the barge were located by personnel from Trigon using a Trimble GEOXT GPS system. Elevations at the as-drilled boring locations, along the existing ground surface at the bent locations, and along the structure profiles were surveyed by personnel from Trigon using the "Point 7 (U3615-7)" benchmark elevation (Elevation 812.30 feet) established by an NCDOT survey crew as a reference point.

Trigon's subsurface investigation for the proposed bridge was conducted between June 19 and July 18, 2006. This exploration consisted of fourteen soil test borings: two at each proposed end bent location and five at each interior bent location. In addition, two auger probe borings (EB1-A1 and EB2-A1) were drilled under the power lines near the left side of the existing bridge to provide additional top-of-rock data, and one auger probe boring with rock coring (EB1-Ab) was extended 10 feet into rock at End Bent-1 to evaluate if the soil test borings and other auger probe at End Bent-1 refused on boulders or crystalline rock. One bridge rod sounding was performed at the right side of the proposed End Bent-1 (EB1-B) to evaluate the extent of soft materials at that location since the lake water was too shallow to allow access to a barge. The proposed bridge rod sounding at the location of the proposed EB2-B could not be performed due to inaccessibility to that location by personnel (too much deep mud over too great a distance to walk along the lake bottom and water too shallow to access with a boat).

Borings EB1-A, EB1-A1, EB1-Ab, EB1-D, EB2-A, EB2-A1, and EB2-D were drilled from the existing roadway embankment, and Borings B1-A, B1-D, B2-A, and B2-D were drilled through the deck of the existing bridge using a truck-mounted Acker AD-II drilling machine equipped with a 140-pound manual hammer. Borings EB1-A, EB1-A1, EB2-A, EB2-A1, and EB2-D were advanced utilizing 0.5-foot (O.D.) continuous-flight hollow-stem auger techniques, while borings EB1-Ab, EB1-D, B1-A, B1-D, B2-A, and B2-D were advanced through soil utilizing 0.33-foot tricone/wash-drilling techniques. Lake water plus

polymer was used as the drilling fluid in Borings EB1-Ab, EB1-D, and B2-D with mud densities ranging from 63.0 to 63.2 pounds per cubic foot. Lake water alone was used as the drilling fluid in Borings B1-A, B1-D, and B2-A. Borings EB1-A, B1-A, B2-A, and EB2-A were offset in towards the centerline of -L- due to the existing overhead energized power lines present at the time of this investigation along the left side of the proposed/existing bridge. Boring EB2-D was offset 4 feet upstation of the proposed end bent location due to reinforcing steel within the approach slab for the existing bridge.

Borings B1-C, B1-E, B1-B, B2-C, B2-E, and B2-B (the "C", E", and "B" borings) were drilled within the lake/stream channel using a CME 45 skid-rig drilling machine equipped with a 140-pound manual hammer and mounted on a barge. These borings were advanced through soil utilizing 0.33-foot tricone/wash-drilling techniques and lake water alone was used as the drilling fluid. As-drilled soil test boring locations are shown on the Boring Identification Diagram (Drawing No. 2) following this report, and boring Logs and coring logs are included following this report.

The bridge-rod sounding (EB1-B) was performed utilizing ½-inch steel rods and an approximately 16-pound hammer with a 24-inch drop. The Sounding Observation Summary Log used to record the bridge-rod sounding results is included following this report.

Standard Penetration Tests were performed in the soil and weathered rock materials in the soil test borings in general accordance with NCDOT guidelines. In conjunction with this testing, split-barrel soil and weathered rock samples were recovered for visual classification and potential laboratory testing.

Rock coring was performed at the interior bent borings and in Boring EB1-Ab in order to evaluate the nature of the weathered rock/crystalline rock. The cored weathered rock/crystalline rock was returned to our laboratory for further classification and possible testing. The rock coring performed at Borings EB1-Ab, B1-A, B1-D, B2-A, and B2-D utilized an HQ size hollow double-tube core barrel, while the rock coring performed at the remaining interior bent borings utilized an NQ size hollow double-tube core barrel. Lake water alone was used as the drilling fluid during the rock coring.

3.2 LABORATORY TESTING

Laboratory soil testing was performed on eighteen representative split-barrel samples to aid in the assessment of AASHTO soil classification and to provide data for evaluation of engineering properties. The laboratory testing on the samples consisted of Natural Moisture Content, Atterberg Limit, and grain size analysis with hydrometer. In addition, four Unconfined Compressive Strength (Qu only) tests were performed on selected samples of the recovered rock core. Laboratory tests were performed in general accordance with AASHTO and NCDOT specifications. The results of the soil and rock laboratory tests are included on Sheet 44 located behind this report. Laboratory results of the rock testing are also included under separate cover in Appendix A.

3.3 SITE GEOLOGY

The site of the proposed project is located in the Carolina Slate Belt of the Piedmont Physiographic province. Carolina Slate Belt rocks are comprised of metamorphosed sedimentary and volcanic rocks intruded by a variety of plutons (Butler et al., 1991).

According to the 1985 Geologic Map of North Carolina, the site is located in an area generally consisting of metamorphosed gabbro and diorite. The crystalline rock encountered in our test borings generally consisted of moderately weathered to fresh, moderately hard to very hard, metamorphosed diorite with isolated metamorphosed diabase and metamorphosed granitic rock. The quality of the rock encountered ranged from very poor to very good with the majority being good to very good in quality. The overlying residual soils at the site are the product of the physical and chemical weathering of the underlying crystalline rock.

3.4 FOUNDATION MATERIALS

The generalized subsurface conditions indicated by the borings are described below. For soil descriptions and general stratification at a particular boring location, the respective Boring Log should be reviewed. For rock descriptions and stratification at a particular boring location, the respective Coring Log should be reviewed. The Boring Identification Diagram, Boring Logs, Coring Logs, Core Photographs, and bridge rod Sounding Observation Summary log are located behind this report. Representative subsurface cross-sections at each bent location and two subsurface profiles along the

proposed structure are also included behind this report. The subsurface properties for the project site are described below.

Foundation materials encountered included roadway embankment fill, alluvial soils, alluvial boulders, residual soils, weathered rock, and crystalline rock.

Roadway embankment fill was encountered beginning at the existing ground surface at the End Bent-1 and End Bent-2 borings. The fill extends to a depth of ±18 (Elevation ±796 feet) at the End Bent-1 borings, and to depths ranging from ±13 feet to ±15 feet (Elevations ±800 feet to ±798 feet) at the End Bent-2 borings. The roadway embankment fill encountered generally consists of medium dense to dense, variably clayey, silty, coarse to fine sand (A-2-4); and medium stiff to very stiff, clayey, coarse to fine sandy silt (A-4), and silty, coarse to fine sandy clay (A-6). The lower two feet of fill at Boring EB1-A consists of rip rap and gravel. Gravel is present in varying amounts within some of the roadway embankment fill material. Standard Penetration Resistance values of 7 to 35 blows per foot (bpf) were encountered within the roadway embankment fill.

Alluvial soil was encountered underlying the roadway embankment fill at the End Bent-1 borings, at Boring EB2-D, and beginning at the existing ground surface (lake bottom) at the interior bent borings. Alluvium was not encountered at Borings EB2-A or EB2-A1. The alluvial soil extends to depths of ±21 feet to ±22 feet (Elevations ±793 feet to ±792 feet) at the End Bent-1 borings, and to a depth of ±16 feet (Elevation ±798 feet) at Boring EB2-D. The alluvium at the interior bent borings extends to depths ranging from ±8 feet to ±15 feet (Elevations ±790 feet to ±783 feet). The alluvial soil generally consists of loose to very dense, variably clayey, silty, coarse to fine sand (A-1-b, A-2-4, and A-3); and very soft to hard, clayey, coarse to fine sandy silt (A-4), and variably sandy, silty clay (A-6, A-7-5, and A-7-6). Gravel is present in varying amounts within the majority of the alluvium. Boulders are present within the alluvium at all five of the Bent-1 borings and at Borings B2-D, B2-C, and B2-E. At Borings B1-A, B1-D, B2-D, B2-C, and B2-E, the boulders occur as a zone within the alluvium, while at Borings B1-C, B1-E, and B1-B, the boulders comprise the basal portion of the alluvium. The thickness of the boulder zone ranges from ±1 foot to ±5 feet. The alluvial material at Boring EB1-D was highly organic due to wood fragments within the recovered sample. Standard Penetration Resistance values within the alluvial soil ranged from Weight-of-Rod (W.O.R.) to 100+ bpf. However, the presence of gravel and boulders influenced the high blow counts.

Residual soil was encountered underlying the roadway embankment fill at Borings EB2-A and EB2-A1, and underlying the alluvium at Boring EB2-B. The residual soil extends to a depths ranging from ±21 feet to ±23 feet (Elevations ±792 feet to ±790 feet) at these borings. The residuum generally consists stiff to very stiff, clayey, coarse to fine sandy silt (A-4). Standard Penetration Resistance values within the residual soil ranged from 15 to 17 bpf.

Weathered rock was encountered underlying the alluvium at Borings EB1-Ab, B1-D, B2-D, B2-C, B2-E, B2-B, EB2-A, and EB2-D. The weathered rock generally consists of metamorphosed diorite. The weathered rock was encountered between the following depths and elevations: 21.8 feet to 22.3 feet (Elevations 792.2 feet to 791.7 feet) at Boring EB1-Ab, 9.5 feet to 11.7 feet (Elevations 788.5 feet to 786.3 feet) at Boring B1-D, 9.5 feet to 12.2 feet (Elevations 788.2 feet to 785.5 feet) at Boring B2-D, 14.3 feet to 15.8 feet (Elevations 782.7 feet to 781.2 feet) at Boring B2-C, 14.7 feet to 20.3 feet (Elevations 783.2 feet to 777.6 feet) at Boring B2-E, 13.5 feet to 17.5 feet (Elevations 783.2 feet to 779.2 feet) at Boring B2-B, 23.0 feet to 29.6 feet (Elevations 791.2 feet to 784.6 feet) at Boring EB2-A, and 23.5 feet to 38.6 feet (Elevations 790.5 feet to 775.4 feet) at Boring EB2-D. Weathered rock was encountered as a zone within the crystalline rock at Boring B1-C between 13.1 feet and 14.1 feet (Elevations 784.8 feet and 783.8 feet).

Crystalline rock was encountered directly underlying the alluvium at Borings EB1-A, EB1-A1, EB1-D, B1-A, B1-C, B1-E, B1-B, and B2-A. Weathered rock was encountered underlying the residual soil at Boring EB2-A1, and underlying the weathered rock at Borings EB1-Ab, B1-D, B2-D, B2-C, B2-E, B2-B, EB2-A, and EB2-D. The crystalline rock generally consists of metamorphosed diorite with isolated metamorphosed diabase and metamorphosed granitic rock. The top of the crystalline rock was encountered at the following depths and elevations: ±21 feet to ±22 feet (Elevations ±793 feet to ±792 feet) at the End Bent-1 borings, ±8 feet to ±20 feet (Elevations ±790 feet to ±778 feet) at the interior bent borings, and ±21 feet to ±39 feet (Elevations ±792 feet to ±775 feet) at the End Bent-2 borings.

Approximately 10 feet of rock was cored at Boring EB1-Ab to evaluate the nature of the refusal materials at End Bent-1, and between ±13 and ±23 feet of weathered rock/crystalline rock was cored at the interior bent borings. In general, the cored weathered rock is severely weathered, medium hard, metamorphosed diorite with very close fracture spacing. The strata recovery (REC) values within the weathered rock ranged from 0 to 20 percent. In general, the cored crystalline rock is moderately weathered to fresh, moderately hard to very hard metamorphosed diorite with very close to very wide fracture spacing. Strata

(REC) values within the crystalline rock ranged from 48 to 100 percent and strata Rock Quality Designation (RQD) values ranged from 0 to 100 percent. The majority of the crystalline rock cored was good to very good in quality.

3.5 GROUNDWATER

Groundwater was encountered at all of the borings drilled on land for this project. The groundwater elevation at these borings ranged from ±800 feet to ±796 feet at all of the borings. The water surface elevation of Oak Hollow Lake measured during the survey portion of our investigation on July 14 was ±802 feet. Fluctuation of groundwater and lake water surface levels can occur with seasonal and climatic variations. According to the Bridge Survey and Hydraulic Report, the 10-year floodwater surface elevation is ±804 feet, the 50-year floodwater surface elevation is ±805 feet, the 100-year flood elevation is ±806 feet, and the 500-year flood elevation is 808 feet.

4.0 CONSTRUCTION CONSIDERATIONS

Gravel to boulder size material is common within the alluvium present at the site. In addition, gravel and rip rap to boulder size material is present as scour protection against the existing abutment slopes and scattered along the bottom of the lake in the vicinity of the proposed bridge.

5.0 CLOSURE

The geotechnical investigation, analysis, and general construction considerations included in this report are based on the Bridge Survey & Hydraulic Design Reports, the Preliminary General Drawing, and the data obtained from our field and laboratory-testing program. If the proposed location and geometry, or finished grades are changed or are different from those outlined above, or if subsurface conditions are encountered during construction which differ from those indicated by our borings, we will require the opportunity to review these changed conditions and make any necessary modifications to the general conditions presented in this report.

Cross-sections and profiles are a generalized interpretation of soil conditions between borings and should not be considered accurate other than at the boring locations. Subsurface conditions between boring

locations or elsewhere on the site may vary, and subsurface anomalies may exist which were not detected.

Trigon Engineering Consultants, Inc. appreciates the opportunity to be of service to the NCDOT on this project. Should you have any questions concerning this report, please feel free to contact the undersigned.

Respectfully submitted,

TRIGON ENGINEERING CONSULTANTS, INC.

Paul M. Weaver, P.G.
Registered North Carolina No. 1500

NORTH CAROLINA LICENSED SEAL 1500 GEOLOGIST PAUL M. WEAVER

8/21/06

Jeffrey R. Vinson, P.G.
Senior Project Manager

PMW/JRV:pmw

Attachments

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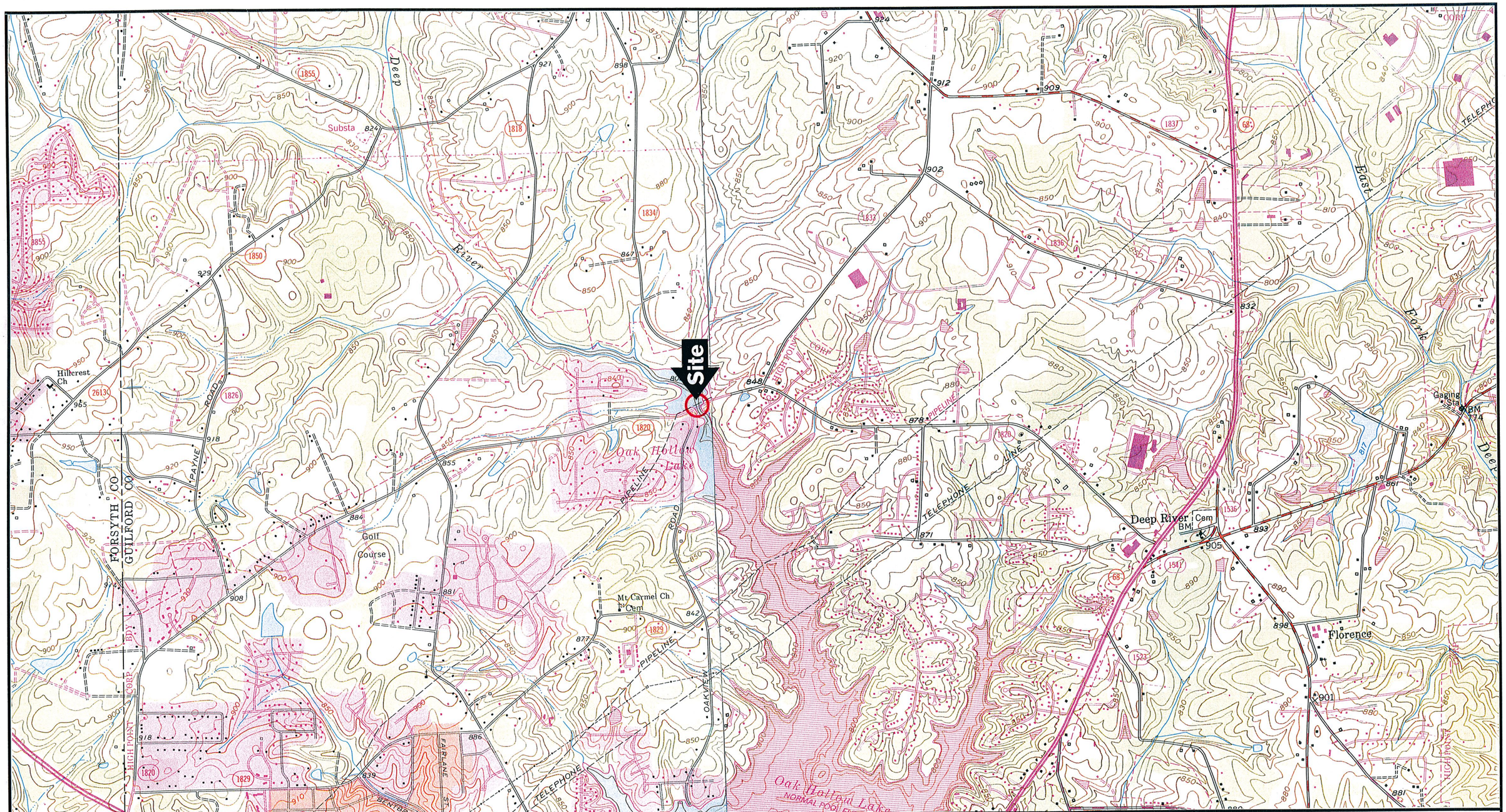

TRIGON Trigon Engineering Consultants, Inc. Greensboro North Carolina	SCALE: 1′ = 24,000′	DATE: 7/28/06	STATE PROJECT NO. 34962.1.1	TIP NO.: U-3615B

SITE VICINITY MAP

Replace Bridge No. 65 on SR 1820 (Skeet Club Road) Over Oak Hollow Lake Between SR 1818 and SR 1834, Guilford County, North Carolina

USGS Guilford and Kernersville Quadrangles	DRAWING NUMBER: 1

OAK HOLLOW LAKE

235+00

CB

OVERHEAD POWER LINES

EB1-A1
EB1-A
EB1-Ab
EB1-D

B1-A
B1-D
B1-C
B1-E
B1-B

B2-A
B2-D
B2-C
B2-E
B2-B

EB2-A1
EB2-A
EB2-D

240+00

OVERHEAD POWER LINES

FES
18" CONC
8" CONC
FES
CONC

KENDALE ROAD
-Y35-
18.0' BST

48" CHL
15" CONC
18" CONC
12" S
48" CHL
48" CHL
CONC
ISBK
48" CHL
A1
BST

EB1-B

APPROXIMATE LOCATION OF WATER & SEWER LINES

OAK HOLLOW LAKE

WATER VIEW ROAD
18.0' BT
-Y34-

Note: Skew Angle for All Bents = 90°00'00"

SCALE IN FEET

0 25 50

HORZ. SCALE

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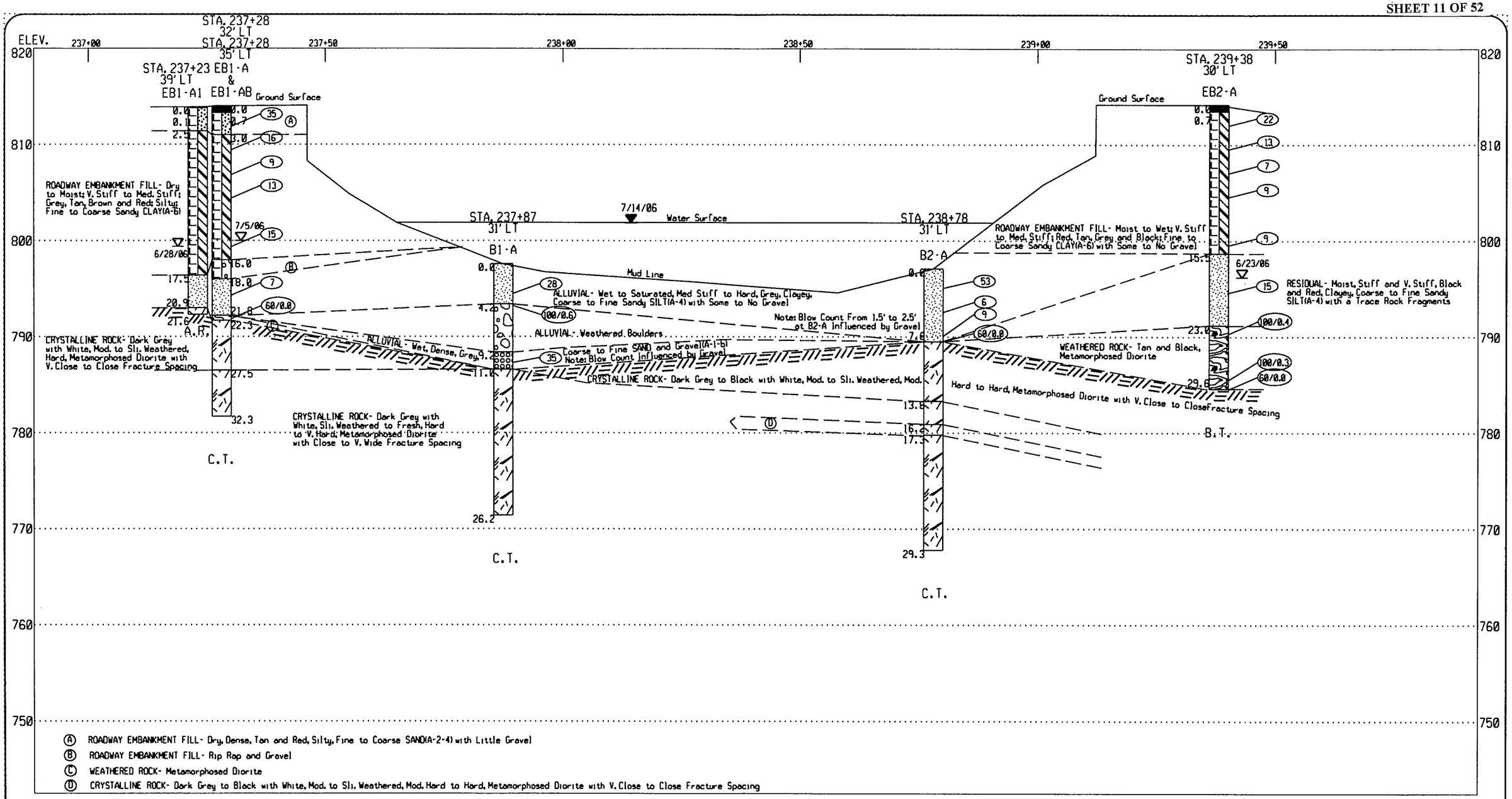
BORING IDENTIFICATION DIAGRAM

Replace Bridge No. 65 on SR 1820 (Skeet Club Rd.) Over Oak Hollow Lake

Guilford County, North Carolina

Project No. 34962.1.1	TIP No. U-3615B
Federal No. STP-1820(2)	Vert. Scale N/A
Date 8/2/06	Horiz. Scale 1" = 50'
Drawn by DRK	Drawing No. 2



Ⓐ ROADWAY EMBANKMENT FILL- Dry, Dense, Tan and Red, Silty, Fine to Coarse SAND(A-2-4) with Little Gravel
Ⓑ ROADWAY EMBANKMENT FILL- Rip Rap and Gravel
Ⓒ WEATHERED ROCK- Metamorphosed Diorite
Ⓓ CRYSTALLINE ROCK- Dark Grey to Black with White, Mod. to Sli. Weathered, Mod. Hard to Hard, Metamorphosed Diorite with V. Close to Close Fracture Spacing

SCALE IN FEET

0 5 10
VERT. SCALE

0 10 20
HORZ. SCALE

TRIGON
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PROFILE 31' LEFT OF -L-

Replace Bridge No. 65 on SR 1820 (Skeet Club Rd.) Over Oak Hollow Lake

Guilford County, North Carolina

Project No. 34962.1.1	TIP No. U-3615B
Federal No. STP-1820(2)	Vert. Scale 1" = 10'
Date 8/2/06	Horiz. Scale 1" = 20'
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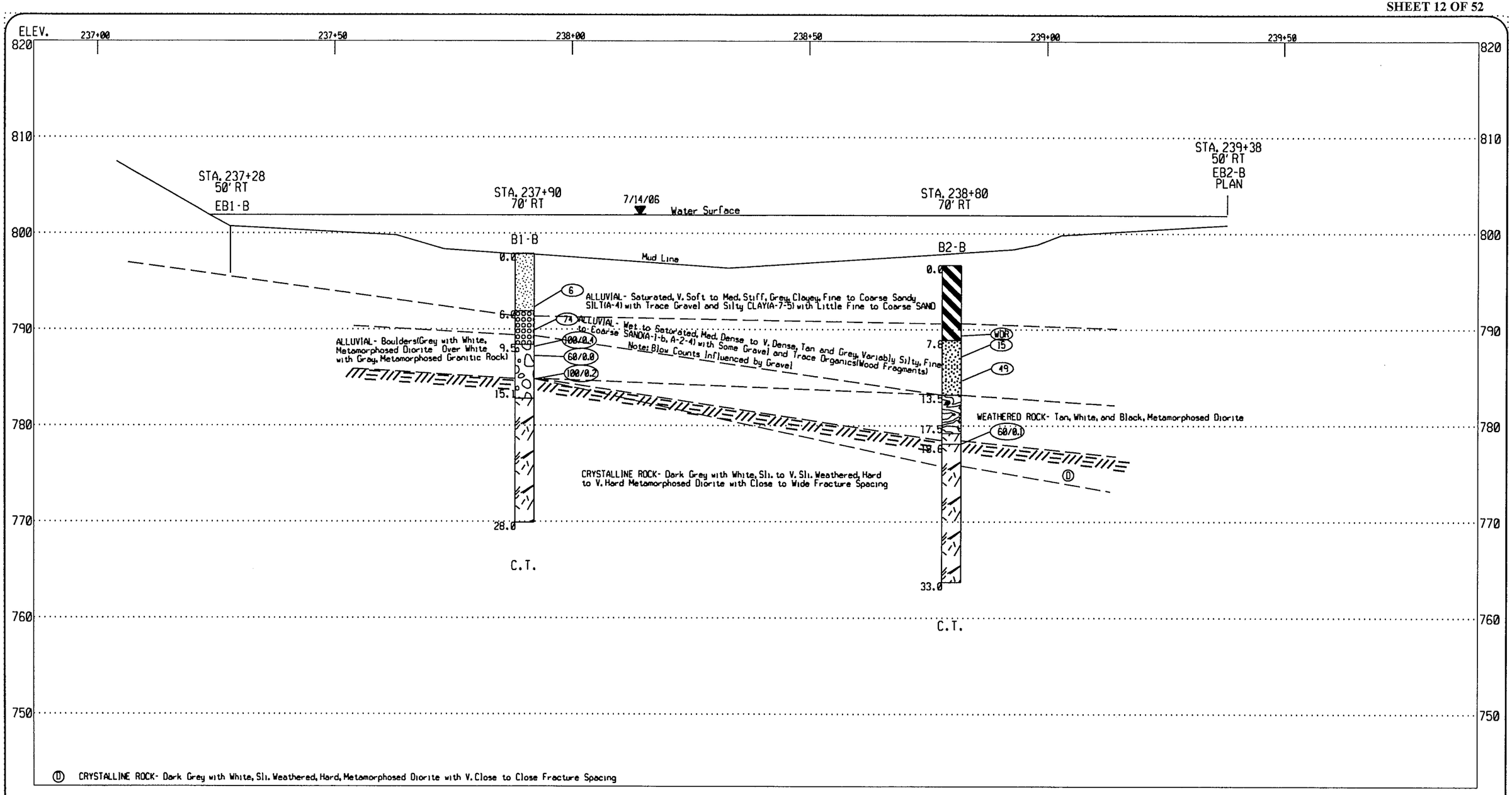

SCALE IN FEET

0 5 10
VERT. SCALE

0 10 20
HORZ. SCALE

TRIGON
ENGINEERING CONSULTANTS, INC.

PROFILE 50' RIGHT OF -L-

Replace Bridge No. 65 on SR 1820 (Skeet Club Rd.) Over Oak Hollow Lake

Guilford County, North Carolina

Project No. 34962.1.1	TIP No. U-3615B
Federal No. STP-1820(2)	Vert. Scale 1" = 10'
Date 8/2/06	Horiz. Scale 1" = 20'
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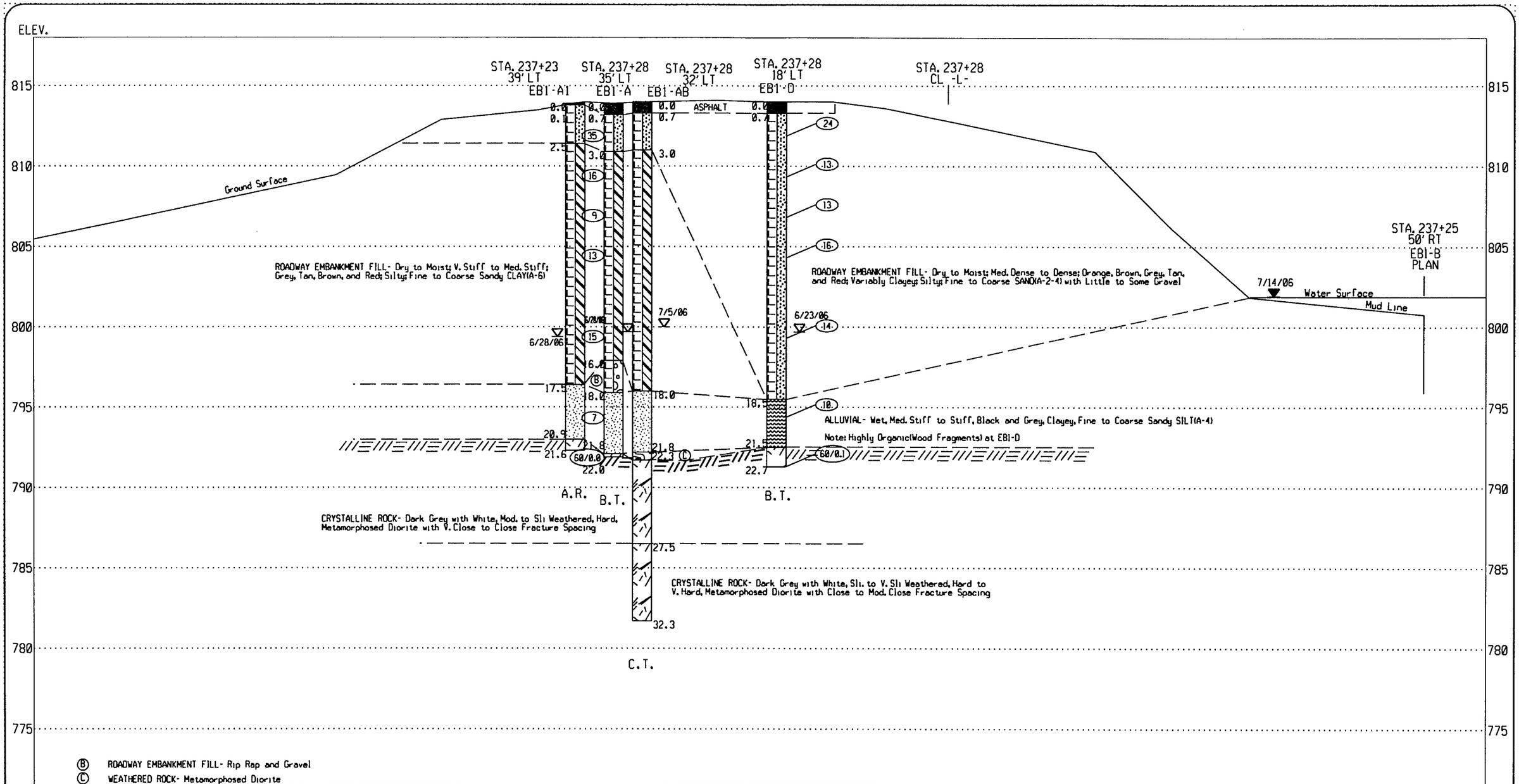

SCALE IN FEET

0 3 6
VERT. SCALE

0 5 10
HORZ. SCALE

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CROSS-SECTION ALONG END BENT-1

Replace Bridge No. 65 on SR 1820 (Skeet Club Rd.) Over Oak Hollow Lake

Guilford County, North Carolina

Project No. 34962.1.1	TIP No. U-3615B
Federal No. STP-1820(2)	Vert. Scale 1" = 6'
Date 8/2/06	Horiz. Scale 1" = 10'
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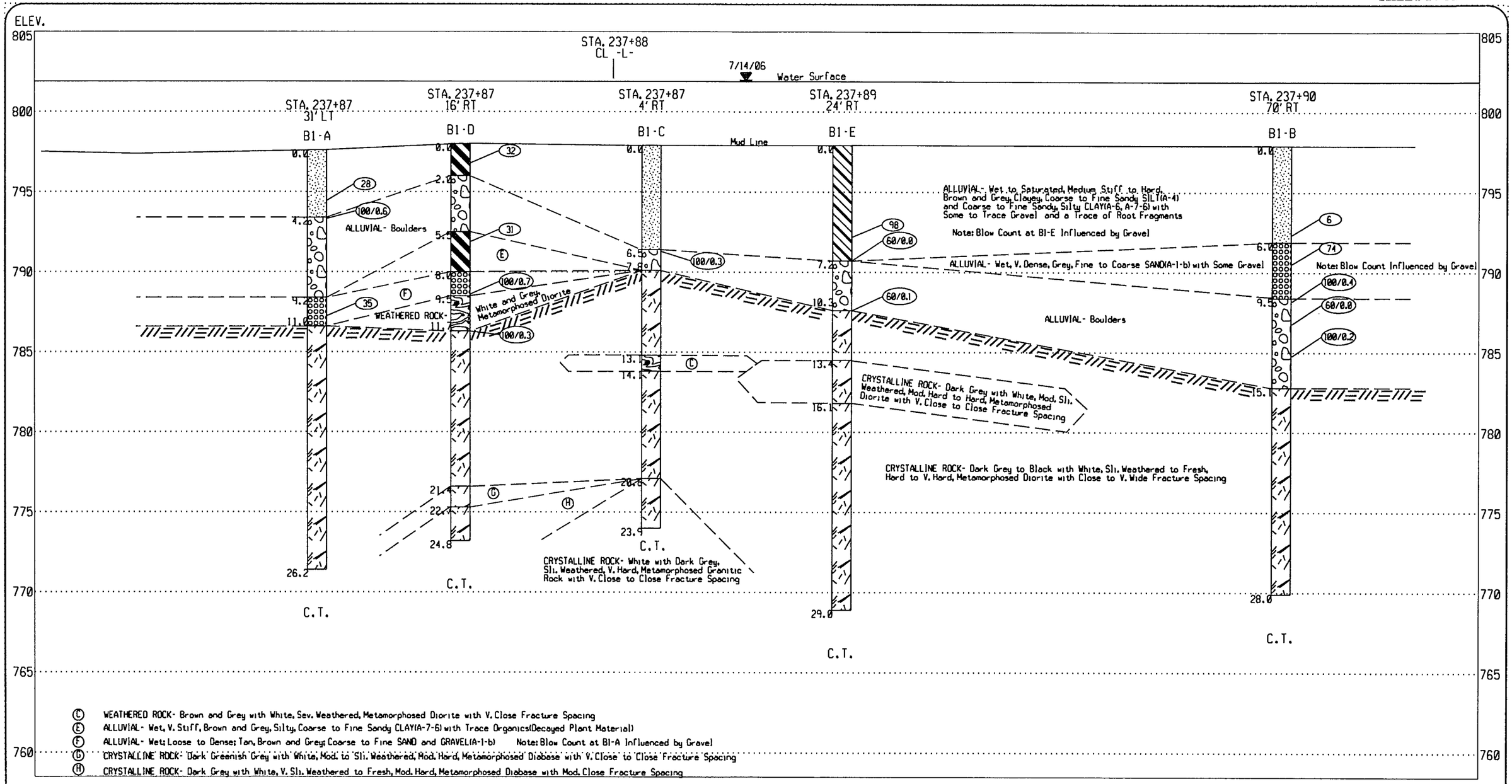


SCALE IN FEET

0 3 6
VERT. SCALE

0 5 10
HORZ. SCALE

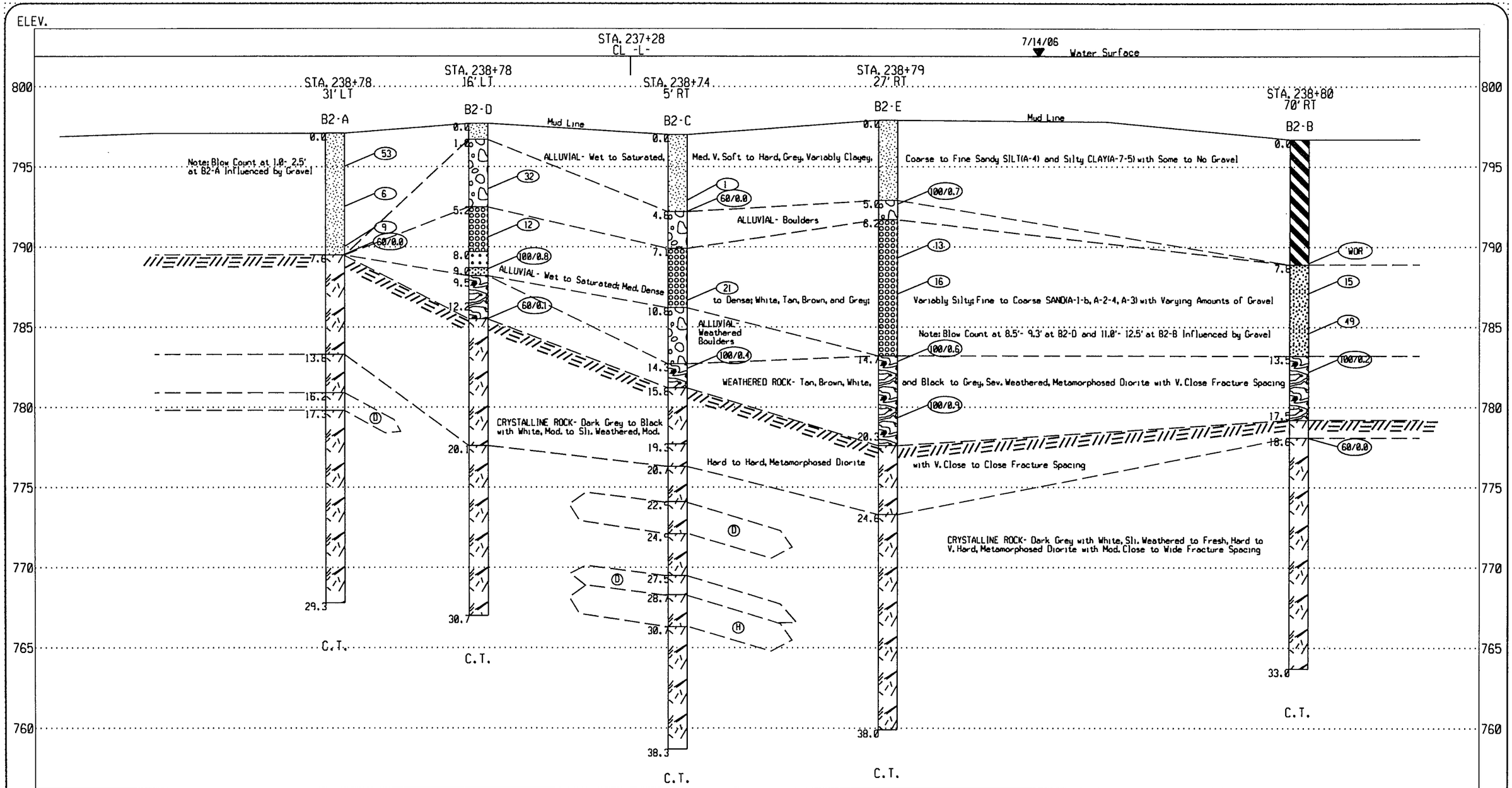
TRIGON
ENGINEERING CONSULTANTS, INC.

CROSS-SECTION ALONG BENT-1

Replace Bridge No. 65 on SR 1820 (Skeet Club Rd.) Over Oak Hollow Lake

Guilford County, North Carolina

Project No. 34962.1.1	TIP No. U-3615B
Federal No. STP-1820(2)	Vert. Scale 1" = 6'
Date 8/2/06	Horiz. Scale 1" = 10'
Drawn by DRK	Drawing No. 6



(D) CRYSTALLINE ROCK- Dark Grey with White, Mod. to Sli. Weathered, Mod. Hard to Hard, Metamorphosed Diorite with V. Close to Close Fracture Spacing

(H) CRYSTALLINE ROCK- Dark Greenish Grey with White, Sli. to V. Sli. Weathered, Hard, Metamorphosed Diabase with Mod. Close Fracture Spacing

SCALE IN FEET

0 3 6
VERT. SCALE

0 5 10
HORZ. SCALE

TRIGON
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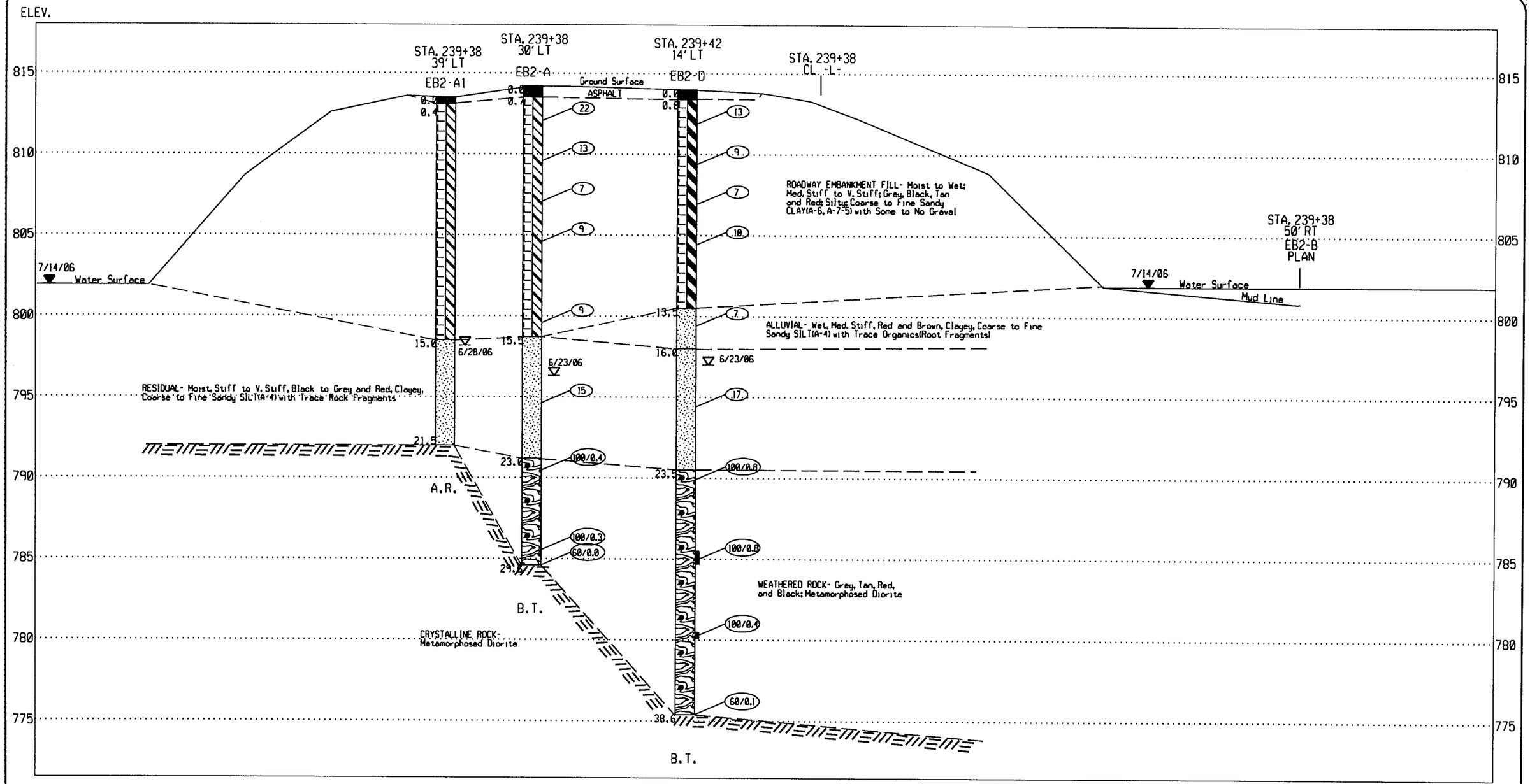
CROSS-SECTION ALONG BENT-2

Replace Bridge No. 65 on SR 1820 (Skeet Club Rd.) Over Oak Hollow Lake

Guilford County, North Carolina

Project No. 34962.1.1	TIP No. U-3615B
Federal No. STP-1820(2)	Vert. Scale 1" = 6'
Date 8/2/06	Horiz. Scale 1" = 10'
Drawn by DRK	Drawing No. 7



SCALE IN FEET

0 3 6

VERT. SCALE

0 5 10

HORZ. SCALE

TRIGON ENGINEERING CONSULTANTS, INC.

CROSS-SECTION ALONG END BENT-2

Replace Bridge No. 65 on SR 1820 (Skeet Club Rd.) Over Oak Hollow Lake

Guilford County, North Carolina

Project No. 34962.1.1	TIP No. U-3615B
Federal No. STP-1820(2)	Vert. Scale 1" = 6'
Date 8/2/06	Horiz. Scale 1" = 10'
Drawn by DRK	Drawing No. 8

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. EB1-A	BORING LOCATION 237+28	OFFSET 35ft LT	ALIGNMENT -L- / 0 HR. 14.2
COLLAR ELEV. 813.9 ft	NORTHING 834664	EASTING 1703991	24 HR. NM
TOTAL DEPTH 22.0 ft	DRILL MACHINE Acker AD-II	DRILL METHOD HSA	HAMMER TYPE 140lb Manual
DATE STARTED 6/28/06	COMPLETED 6/28/06	SURFACE WATER DEPTH NA	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
813.9									813.9 — 0.00
812.9	1.0								813.2 — ASPHALT — 0.7
810.4	3.5	4	20	15	35		D		810.9 — ROADWAY EMBANKMENT FILL: Dense, Tan And Red, Silty, Fine To Coarse SAND With Little Gravel — 3.0
807.9	6.0	5	7	9	16	SS-1	19.8%		ROADWAY EMBANKMENT FILL: Very Stiff To Medium Stiff; Grey, Tan, Brown And Red; Silty; Fine To Coarse Sandy CLAY
805.4	8.5	5	4	5	9		D		
800.4	13.5	5	6	7	13		M		
795.4	18.5	5	7	8	15				797.9 — 16.0; ROADWAY EMBANKMENT FILL: Rip Rap And Gravel — 795.9 — 18.0
791.9	22.0	4	3	4	7	SS-2	29.5%		ALLUVIAL: Medium Stiff, Grey, Clayey, Coarse To Fine Sandy SILT — 792.1 — 21.8
		60/0.0			60/0.0				791.9 — CRYSTALLINE ROCK: Metamorphosed DIORITE — 22.0; Boring Terminated At Elevation 791.9ft, With SPT Refusal In CRYSTALLINE ROCK: Metamorphosed DIORITE

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. EB1-A1	BORING LOCATION 237+23	OFFSET 39ft LT	ALIGNMENT -L- / 0 HR. 14.5
COLLAR ELEV. 813.9 ft	NORTHING 834666	EASTING 1703985	24 HR. NM
TOTAL DEPTH 21.6 ft	DRILL MACHINE Acker AD-II	DRILL METHOD HSA	HAMMER TYPE
DATE STARTED 6/28/06	COMPLETED 6/28/06	SURFACE WATER DEPTH NA	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
813.9									813.9 — 0.00
									813.2 — ASPHALT — 0.7
									811.4 — ROADWAY EMBANKMENT FILL: Red, Silty, Fine To Coarse SAND With Gravel — 2.5
									ROADWAY EMBANKMENT FILL: Brown And Red, Silty, Fine To Coarse Sandy CLAY
									796.4 — 17.5
									ALLUVIAL: Grey, Clayey, Fine To Coarse Sandy SILT
									793.0 — 20.9
									792.3 — CRYSTALLINE ROCK: Metamorphosed DIORITE — 21.6; Boring Terminated With Auger Refusal At Elevation 792.3ft In CRYSTALLINE ROCK: Metamorphosed DIORITE

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. EB1-AB	BORING LOCATION 237+28	OFFSET 32ft LT	ALIGNMENT -L- / 0 HR. 14.0
COLLAR ELEV. 814.0 ft	NORTHING 834661	EASTING 1703992	24 HR. NM
TOTAL DEPTH 32.3 ft	DRILL MACHINE Acker AD-II	DRILL METHOD Mud Rotary/HQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/5/06	COMPLETED 7/5/06	SURFACE WATER DEPTH NA	

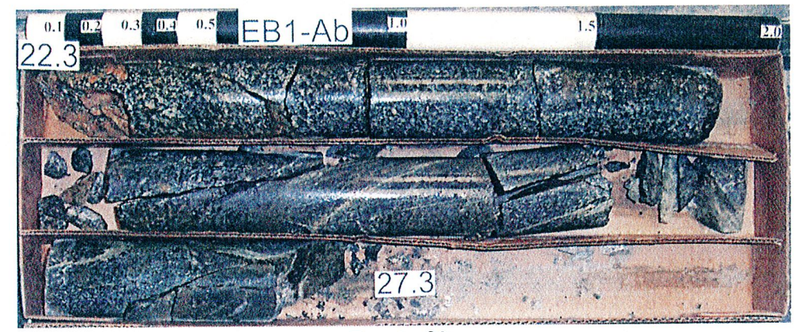
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
814.0									814.0 — 0.00 ASPHALT — 0.7
									813.3 — ROADWAY EMBANKMENT FILL: Tan And Red, Silty, Fine To Coarse SAND With Little Gravel — 3.0
									811.0 — Note: Set Casing to 3.5ft
									ROADWAY EMBANKMENT FILL: Grey, Brown, Tan And Red; Silty; Fine To Coarse Sandy CLAY
									796.0 — 18.0
									ALLUVIAL: Grey, Clayey, Fine To Coarse Sandy SILT
									792.2 — Note: Set Casing to 13.0ft — 21.8
									791.7 — WEATHERED ROCK: Metamorphosed DIORITE — 22.3
									CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing — 27.5
									786.5
									CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard To Very Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing — 32.3
									781.7
									Coring Terminated At Elevation 781.7ft In CRYSTALLINE ROCK: Metamorphosed DIORITE
									Note: Drilling Fluid = Polymer Plus Lake Water
									Mud Density = 63.0 lbs/cu. ft. at 3.5 ft.

CORE BORING REPORT
SHEET 18 OF 52

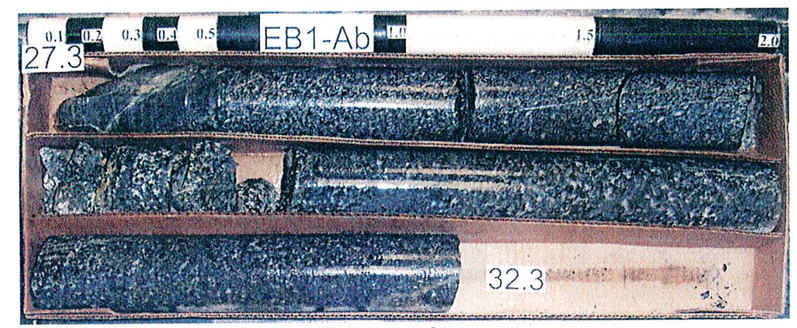
PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. EB1-AB	BORING LOCATION 237+28	OFFSET 32ft LT	ALIGNMENT -L- / 0 HR. 14.0
COLLAR ELEV. 814.0 ft	NORTHING 834661	EASTING 1703992	24 HR. NM
TOTAL DEPTH 32.3 ft	DRILL MACHINE Acker AD-II	DRILL METHOD Mud Rotary/HQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/5/06	COMPLETED 7/5/06	SURFACE WATER DEPTH NA	
CORE SIZE HQ	TOTAL RUN 10.0 ft	DRILLER Duggins	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 22.3 ft
791.7	22.3	5.0	13:42 5:04 6:10 5:54 6:39	(4.1) 82%	(1.3) 26%		(4.3) 83%	(1.3) 25%		791.7 — CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing — 22.3
786.7	27.3	5.0	6:26 5:14 6:26 6:21 6:49	(4.8) 96%	(4.2) 84%		(4.6) 96%	(4.2) 88%		786.5 — 3 Joints At 70° To 80° Ranging In Length From 0.3ft To 0.7ft; 9 Joints At 10° To 20° — 27.5
										Very Broken With Core Loss From 24.2ft To 24.6ft And 25.9ft To 26.4ft
781.7	32.3									781.7 — CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard To Very Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing — 32.3
										8 Joints At 10° To 20°
										Very Close Fracture Spacing 29.2ft To 29.9ft
										Coring Terminated At Elevation 781.7ft In CRYSTALLINE ROCK: Metamorphosed DIORITE

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING EB1-Ab



Box 1 of 2



Box 2 of 2

Scale = 1:4

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. EB1-D	BORING LOCATION 237+28	OFFSET 18ft LT	ALIGNMENT -L- / 0 HR. 14.3
COLLAR ELEV. 814.0 ft	NORTHING 834648	EASTING 1703997	24 HR. NM
TOTAL DEPTH 22.7 ft	DRILL MACHINE Acker AD-II	DRILL METHOD Wash Rotary	HAMMER TYPE 140lb Manual
DATE STARTED 6/22/06	COMPLETED 6/22/06	SURFACE WATER DEPTH	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT (0 20 40 60 80 100)	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
814.0									814.0 — 0.00
813.0	1.0								813.3 — ASPHALT — 0.7
810.5	3.5	5	19	5	24	SS-3	M		ROADWAY EMBANKMENT FILL: Medium Dense; Orange, Grey And Tan; Clayey; Silty; Fine To Coarse SAND With Some Gravel
808.0	6.0	3	5	8	13		M		
805.5	8.5	5	5	8	13		M		
800.5	13.5	5	8	8	16	SS-4	M		
795.5	18.5	6	6	8	14				795.5 — 18.5
791.4	22.6	3	4	6	10		W		ALLUVIAL: Stiff, Grey And Black, Highly Organic (Wood Fragments), Clayey, Fine To Coarse Sandy SILT — 21.5
		60/0.1			60/0.1				792.5 — 791.3 — CRYSTALLINE ROCK: Metamorphosed DIORITE — 22.7

Boring Terminated With SPT Refusal At Elevation 791.3ft In CRYSTALLINE ROCK: Metamorphosed DIORITE

Note: Drilling Fluid = Polymer Plus Lake Water

Mud Density = 63.0 lbs/cu. ft. at 3.5 ft.

NCDOT BORE SINGLE 07106019.GPJ NC_DOT.GDT 8/2/06

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B1-A	BORING LOCATION 237+87	OFFSET 31ft LT	ALIGNMENT -L- / 0 HR. NA
COLLAR ELEV. 797.6 ft	NORTHING 834682	EASTING 1704047	24 HR. NA
TOTAL DEPTH 26.2 ft	DRILL MACHINE Acker AD-II	DRILL METHOD Wash Rotary/HQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 6/30/06	COMPLETED 7/3/06	SURFACE WATER DEPTH 4.2 ft.	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
814.3					Bridge Deck Surface				
801.8					Water Line				
					Mud Line				797.6 — 0.00 ALLUVIAL: Very Stiff, Grey, Clayey, Coarse To Fine Sandy SILT With Some Gravel And A Trace Of Root Fragments
795.6	2.0								
794.0	3.6	16	16	12	28		SAT		793.4 — 4.2 Note: Set Casing to 4.2ft; ALLUVIAL: Weathered Boulders
		60	40/0.1		100/0.6		W		
788.4	9.2	5	4	31	35				788.4 — 9.2 ALLUVIAL: Dense, Grey, Coarse To Fine SAND And Gravel
									786.6 — 11.0 Note: Blow Count Influenced By Gravel; CRYSTALLINE ROCK: Dark Grey To Black With White, Slightly To Very Slightly Weathered, Hard To Very Hard, Metamorphosed DIORITE With Wide To Very Wide Fracture Spacing
									771.4 — 26.2 Coring Terminated At Elevation 771.4ft In Crystalline Rock: Metamorphosed DIORITE

Note: Lake Water Alone Used As Drilling Fluid

CORE BORING REPORT

PAGE 1 OF 1

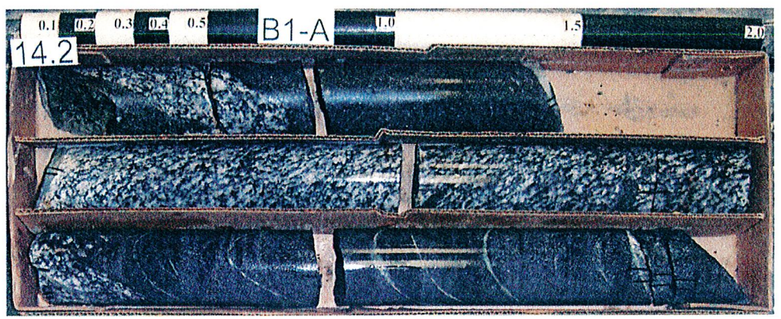
PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B1-A	BORING LOCATION 237+87	OFFSET 31ft LT	ALIGNMENT -L- / 0 HR. NA
COLLAR ELEV. 797.6 ft	NORTHING 834682	EASTING 174047	24 HR. NA
TOTAL DEPTH 26.2 ft	DRILL MACHINE Acker AD-II	DRILL METHOD Wash Rotary/HQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 6/30/06	COMPLETED 7/3/06	SURFACE WATER DEPTH 4.2 ft.	
CORE SIZE HQ	TOTAL RUN 20.5 ft	DRILLER Duggins	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 4.2 ft
793.4	4.2	5.0	4:05 10:41 8:09 2:33 1:20	(1.7) 34%	(0.0) 0%		(2.0) 40%	(0.0) 0%		793.4 — 4.2 ALLUVIAL: BOULDERS
788.4	9.2		N=35							788.4 — 9.2 ALLUVIAL: Dense, Grey, Fine To Coarse SAND And Gravel
786.9	10.7	3.5	5:13/0.5 6:35 6:36 4:40	(3.5) 100%	(3.0) 86%		(15.2) 100%	(14.7) 97%		786.6 — 11.0 Note: Blow Count Influenced By Gravel; CRYSTALLINE ROCK: Dark Grey To Black With White, Slightly To Very Slightly Weathered, Hard To Very Hard, Metamorphosed DIORITE With Wide To Very Wide Fracture Spacing
783.4	14.2	5.0	6:42 11:52 18:09 17:48	(5.0) 100%	(4.7) 94%					Note: Run No. 5 Cut Short To Get Off Road By Work Cut Off Time And Due To Dull Drill Bit
778.4	19.2	5.0	15:50 13:26 14:49 15:00 21:23	(5.0) 100%	(5.0) 100%					Note: 0.7ft Of Rock From Run No. 5 Not Retrieved From Borehole. REC And RQD Calculations Assume Unretrieved Rock Is The Same As The Retrieved Rock
773.4	24.2	2.0	29:02 19:24 31:35	(2.0) 100%	(2.0) 100%					
771.4	26.2									771.4 — 26.2 Coring Terminated At Elevation 771.4ft In Crystalline Rock: Metamorphosed DIORITE

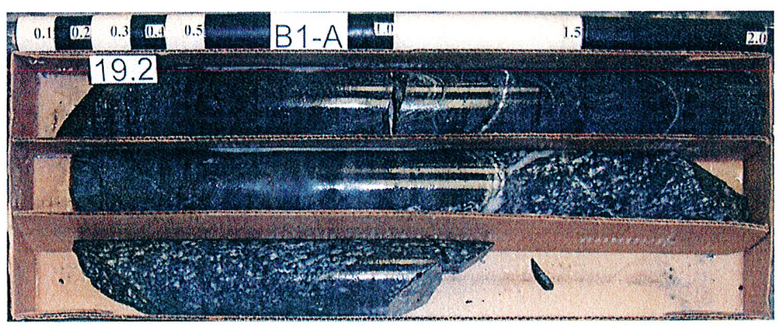
Note: Lake Water Alone Used As Drilling Fluid

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B1-A

Box 1 of 4



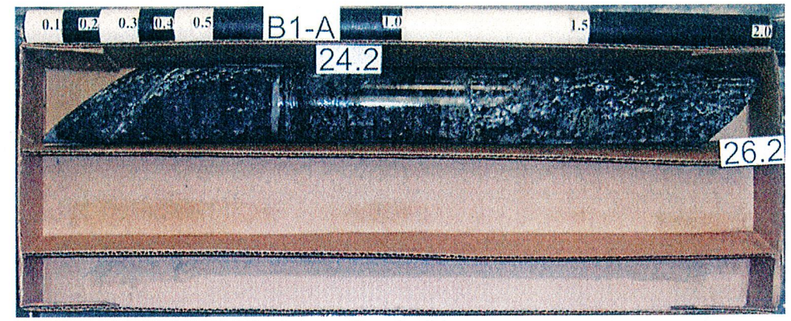
Box 2 of 4



Box 3 of 4

Scale = 1:4

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B1-A



Box 4 of 4

Scale = 1:4

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B1-D	BORING LOCATION 237+87	OFFSET 16ft RT	ALIGNMENT -L- / 0 HR. NA
COLLAR ELEV. 798.0 ft	NORTHING 834668	EASTING 1704053	24 HR. NA
TOTAL DEPTH 24.8 ft	DRILL MACHINE Acker AD-II	DRILL METHOD Wash Rotary/HQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 6/20/06	COMPLETED 6/21/06	SURFACE WATER DEPTH 3.6 ft.	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	ELEV.	DEPTH
814.2					Bridge Deck Surface						
801.6					Water Line						
798.0	0.0				Mud Line					798.0	0.00
		10	13	19	32	SS-5	69.5%		ALLUVIAL: Hard, Grey, Micaceous, Fine Sandy, Silty CLAY	796.0	2.0
793.0	5.0								ALLUVIAL: BOULDERS	792.5	5.5
		45	16	15	31	SS-6	33.3%		ALLUVIAL: Very Stiff, Brown And Grey, Silty, Coarse To Fine Sandy CLAY With Trace Organics (Decayed Plant Material)	790.0	8.0
789.5	8.5								ALLUVIAL: Loose And Medium Dense, Tan And Brown, Coarse SAND With Some Gravel	788.5	9.5
		4	6	94/0.2	100/0.7	SS-7	W		WEATHERED ROCK: White And Grey, Metamorphosed DIORITE	786.3	11.7
786.6	11.4								CRYSTALLINE ROCK: Dark Grey With White, Very Slightly Weathered To Fresh, Hard To Very Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing		
		100/0.3			100/0.3						
						RS-1				776.6	21.4
									CRYSTALLINE ROCK: Dark Greenish Grey With White, Moderately To Slightly Weathered, Moderately Hard, Metamorphosed DIABASE With Very Close To Close Fracture Spacing	775.3	22.7
									CRYSTALLINE ROCK: Dark Grey With White, Very Slightly Weathered To Fresh, Moderately Hard, Metamorphosed DIABASE With Moderately Close Fracture Spacing	773.2	24.8

Coring Terminated At Elevation 773.2ft In Crystalline Rock: Metamorphosed DIABASE

Note: Lake Water Alone Used As Drilling Fluid

Note: Final Casing Depth = 10.7ft

CORE BORING REPORT
SHEET 23 OF 52

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B1-D	BORING LOCATION 237+87	OFFSET 16ft RT	ALIGNMENT -L- / 0 HR. NA
COLLAR ELEV. 798.0 ft	NORTHING 834668	EASTING 1704053	24 HR. NA
TOTAL DEPTH 24.8 ft	DRILL MACHINE Acker AD-II	DRILL METHOD Wash Rotary/HQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 6/20/06	COMPLETED 6/21/06	SURFACE WATER DEPTH 3.6 ft.	
CORE SIZE NQ	TOTAL RUN 13.1 ft	DRILLER Duggins	

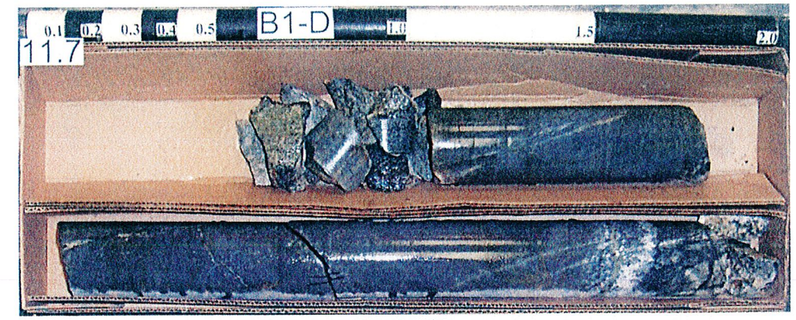
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	ELEV.	DESCRIPTION AND REMARKS	DEPTH
											Begin Coring @ 11.7 ft	
786.3	11.7	3.4	7:04 5:47 6:56	(3.4) 100%	(3.0) 88%		(9.7) 100%	(9.3) 96%		786.3	CRYSTALLINE ROCK: Dark Grey With White, Very Slightly Weathered To Fresh, Hard To Very Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing	11.7
782.9	15.1	4.7	3:52/0.7 7:30 7:11 7:53 8:03	(4.7) 100%	(4.7) 100%						Very Broken (very Close Fracture Spacing) From 11.4ft To 11.8ft 5 Joints At 10° To 20° With Light Iron Staining	
778.2	19.8	5.0	1:19/0.7 8:57 6:00 5:35 5:33 7:11	(5.0) 100%	(4.2) 84%					776.6	Note: Run No. 2 Cut Short To Recover Rock Left In Hole After Run No. 1	21.4
773.2	24.8					RS-1	(1.3) 100% (2.1) 100%	(0.5) 38% (2.1) 100%		775.3	CRYSTALLINE ROCK: Dark Greenish Grey, With White, Moderately To Slightly Weathered, Moderately Hard, Metamorphosed DIABASE With Very Close To Close Fracture Spacing	22.7
										773.2	Series Of 3 - 70° To 80° Fractures Between 21.4ft And 22.7ft CRYSTALLINE ROCK: Dark Grey With White, Very Slightly Weathered To Fresh, Moderately Hard, Metamorphosed DIABASE With Moderately Close Fracture Spacing No Natural Fractures	24.8

Coring Terminated At Elevation 773.2ft In Crystalline Rock: Metamorphosed DIABASE

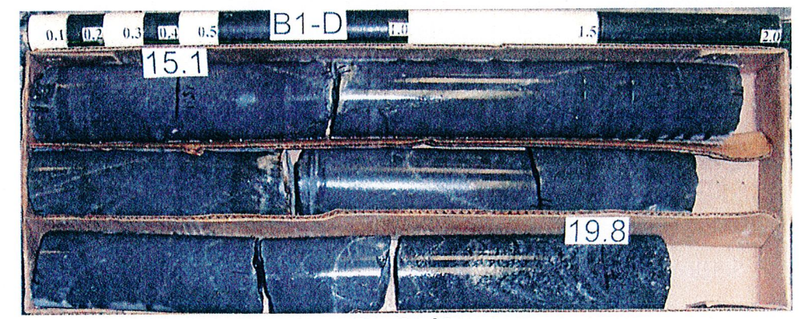
Note: Lake Water Alone Used As Drilling Fluid

Note: High Angle Fractures Between 21.4ft And 22.7ft Caused Rock To Fall Into Core Barrel, Wedging Core Barrel In Hole. We Were Able To Extricate Core Barrel, But Could Not Go Back Into Hole To Core Any Further.

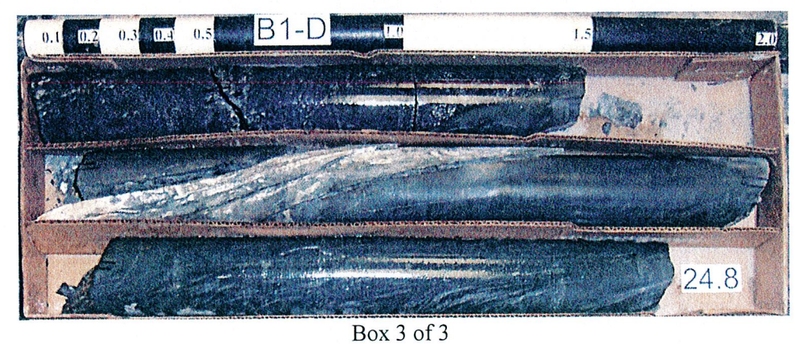
State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B1-D



Box 1 of 3



Box 2 of 3



Box 3 of 3

Scale = 1:4

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B1-C	BORING LOCATION 237+87	OFFSET 4ft RT	ALIGNMENT 0 HR. NA
COLLAR ELEV. 797.9 ft	NORTHING 834649	EASTING 1704058	24 HR. NA
TOTAL DEPTH 23.9 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/18/06	COMPLETED 7/18/06	SURFACE WATER DEPTH 4.0 ft.	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
801.9					Water Line					
					Mud Line				797.9	0.00
									ALLUVIAL: Grey, Clayey, Fine To Coarse Sandy SILT With Gravel	
791.4	6.5	100/0.3			100/0.3				791.4	6.5
									790.1 ALLUVIAL: Weathered BOULDERS	7.8
						RS-2			CRYSTALLINE ROCK: Dark Grey With White, Slightly Weathered, Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing	
									784.8	13.1
									783.8 WEATHERED ROCK: Brown And Grey With White, Severely Weathered, Metamorphosed DIORITE With Very Close Fracture Spacing	14.1
									CRYSTALLINE ROCK: Dark Grey With White, Slightly Weathered, Hard, Metamorphosed DIORITE With Moderately Close To Wide Fracture Spacing	
									777.1	20.8
									CRYSTALLINE ROCK: White With Dark Grey, Slightly Weathered, Very Hard, Metamorphosed GRANITIC ROCK With Very Close To Close Fracture Spacing	
									774.0	23.9

Coring Terminated At Elevation 774.0ft In CRYSTALLINE ROCK: Metamorphosed Granitic Rock

Note: Lake Water Alone Used As Drilling Fluid

Note: Final Casing Depth = 6.9ft

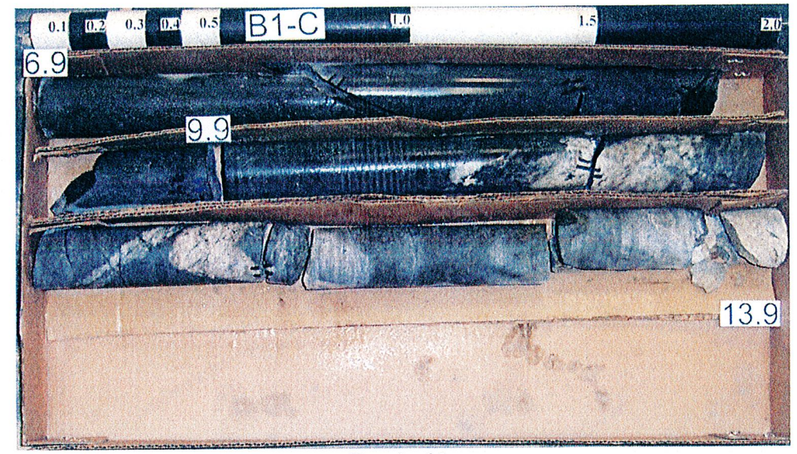
CORE BORING REPORT
SHEET 25 OF 52

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B1-C	BORING LOCATION 237+87	OFFSET 4ft RT	ALIGNMENT -L- 0 HR. NA
COLLAR ELEV. 797.9 ft	NORTHING 834649	EASTING 1704058	24 HR. NA
TOTAL DEPTH 23.9 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/18/06	COMPLETED 7/18/06	SURFACE WATER DEPTH 4.0 ft.	
CORE SIZE NQ	TOTAL RUN 17.0 ft	DRILLER Duggins	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS	
										Begin Coring @ 6.9 ft	
791.0	6.9	3.0	7:11 10:21 10:32	(2.1) 70%	(2.1) 70%		(0.0) 0%	(0.0) 0%		790.1 ALLUVIAL: Core Loss In Weathered BOULDERS	7.8
788.0	9.9						(5.3) 100%	(5.3) 100%		CRYSTALLINE ROCK: Dark Grey With White, Slightly Weathered, Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing	
		4.0	3:27 5:57 5:00 2:30	(3.4) 85%	(3.2) 80%	RS-2				3 Joints At 10°	
784.0	13.9						(0.2) 20%	(NA) (6.7) 100%		784.8	13.1
		5.0	8:07 39:41 8:21 6:02	(4.8) 96%	(4.8) 96%		(6.7) 100%			783.8 Zones Of Metamorphosed Granitic Rock From 10.7ft to 12.0ft	14.1
779.0	18.9									Mostly Core Loss In WEATHERED ROCK: Brown And Grey With White, Severely Weathered, Medium Hard, Metamorphosed DIORITE With Very Close Fracture Spacing	
		5.0	9:54 9:01 7:46 6:47 5:31 5:56	(4.2) 84%	(3.5) 70%		(2.3) 74%	(1.6) 52%		Only Pieces Of Strong Rock Recovered	
										777.1	20.8
										Note: Run No. 2 Was Not A 5ft Run Because A 2ft Rod Was Used For Run No. 1	
774.0	23.9									774.0 CRYSTALLINE ROCK: Dark Grey With White, Slightly Weathered, Hard, Metamorphosed DIORITE With Moderately Close To Wide Fracture Spacing	23.9
										1 Joint At 10°	
										Zone Of Metamorphosed Granitic Rock From 18.9ft To 19.6ft	
										CRYSTALLINE ROCK: White With Dark Grey, Slightly Weathered, Very Hard, Metamorphosed GRANITIC ROCK With Very Close To Close Fracture Spacing	
										4 Joints At 10°	
										2 Joints At 70° With Iron Staining	
										Mostly Broken Below 22.6ft	
										Note: Core Loss At End Of Run No. 4 Most Likely Due To Broken Rock Falling Out Of Core Barrel Upon Extraction Of Core Barrel From Hole	

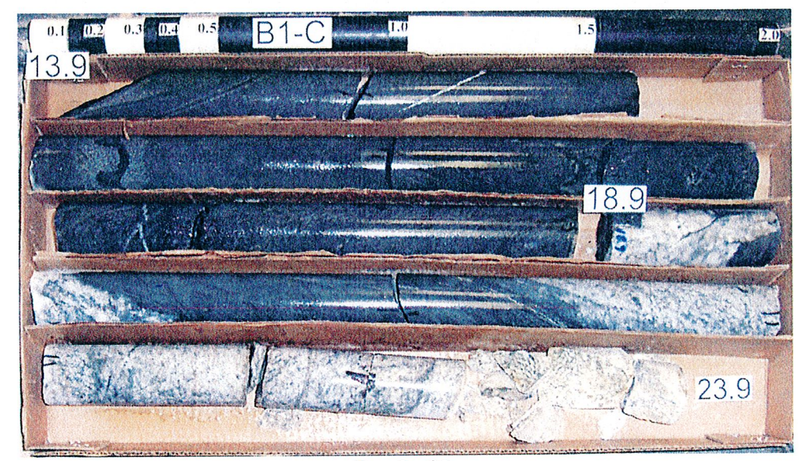
Coring Terminated At Elevation 774.0ft In CRYSTALLINE ROCK: Metamorphosed GRANITIC ROCK

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B1-C



Box 1 of 2

Scale = 1:4



Box 2 of 2

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B1-E	BORING LOCATION 237+89	OFFSET 24ft RT	ALIGNMENT -L- — 0 HR. NA
COLLAR ELEV. 797.9 ft	NORTHING 834631	EASTING 1704068	24 HR. NA
TOTAL DEPTH 29.0 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash/Mud Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/14/06	COMPLETED 7/18/06	SURFACE WATER DEPTH 4.0 ft.	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
801.9					Water Line				
					Mud Line				797.9 — 0.00
									ALLUVIAL: Grey And Brown, Coarse To Fine Sandy, Silty CLAY With Gravel Below 5.7ft.
									Note: Blow Count Influenced By Gravel
793.2	4.7								
		16	0	98	98	SS-14	43.4%		Note: Set Casing to 7.2ft
790.7	7.2								790.7 — 7.2
		60/0.0			60/0.0				ALLUVIAL: BOULDERS
									Note: Set Casing to 9.0ft
787.3	10.6								787.6 — 10.3
		60/0.1			60/0.1				CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing
									784.5 — 13.4
									CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Moderately Hard To Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing
									781.8 — 16.1
									CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard To Very Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing
									768.9 — 29.0
									Coring Terminated At Elevation 768.9ft In CRYSTALLINE ROCK: Metamorphosed DIORITE
									Note: Lake Water Alone Used As Drilling Fluid
									Note: Final Casing Depth = 9.5ft

CORE BORING REPORT
SHEET 27 OF 52

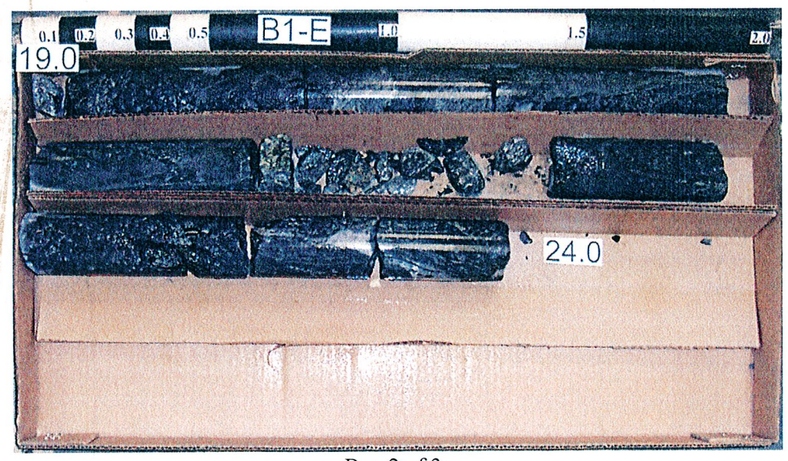
PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B1-E	BORING LOCATION 237+89	OFFSET 24ft RT	ALIGNMENT -L- — 0 HR. NA
COLLAR ELEV. 797.9 ft	NORTHING 834631	EASTING 1704068	24 HR. NA
TOTAL DEPTH 29.0 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash/Mud Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/14/06	COMPLETED 7/18/06	SURFACE WATER DEPTH 4.0 ft.	
CORE SIZE NQ	TOTAL RUN 21.3 ft	DRILLER Duggins	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 7.6 ft
790.3	7.6	3.0	6:48 7:38 4:44	(0.3) 10%	(0.0) 0%		(0.0) 0%	(0.0) 0%		790.3 — ALLUVIAL: BOULDERS — 7.6
787.3	10.6									787.6 — 10.3
787.2	10.7	3.3	N=60/0.1 6:39/0.9 5:03	(2.7) 82%	(2.4) 73%		(3.1) 100%	(2.5) 80%		CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing
783.9	14.0									784.5 — 13.4
		5.0	2:48 :59/0.4 6:29 2:05 12:36	(4.2) 84%	(2.6) 52%		(1.3) 48%	(0.0) 0%		1 Joint At 10°
							(12.0) 93%	(10.9) 84%		10.4ft To 12.7ft Is All One Piece
										781.8 — 16.1
										Note: Run No. 2 Is Not A 5ft Run Because A 2ft Rod Was Used For Run No. 1
778.9	19.0									CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Moderately Hard To Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing
		5.0	19:39 12:20 8:13 7:40	(4.4) 88%	(4.1) 82%					1 Joint At 90°, 0.2ft Long With Iron Staining
773.9	24.0									5 Joints At 10° To 20°
		5.0	4:40 8:31 15:56 7:17	(4.7) 94%	(4.2) 84%					2 Joints At 30° With Iron Staining
768.9	29.0		11:42 18:18 15:45 17:13							CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard To Very Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing
										768.9 — 29.0
										10 Joints At 10° To 20°
										2 Joints At 45°
										Very Close Fracture Spacing (Very Broken) With Core Loss From 21.4ft To 22.3ft And 26.3ft To 27.1ft
										Note: Last 0.6ft Of Run No. 5 Could Not Be Retrieved From Borehole. REC And RQD Calculations Assume Unrecovered Rock Is Same As Recovered Rock
										Coring Terminated At Elevation 768.9ft In CRYSTALLINE ROCK: Metamorphosed DIORITE

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B1-E

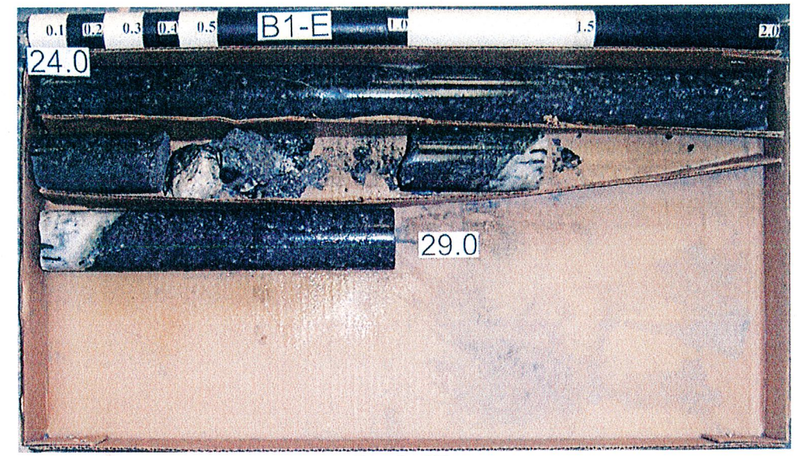
Box 1 of 3

Scale = 1:4



Box 2 of 3

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B1-E



Box 3 of 3

Scale = 1:4

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B1-B	BORING LOCATION 237+90	OFFSET 70ft RT	ALIGNMENT -L- / 0 HR. NA
COLLAR ELEV. 797.9 ft	NORTHING 834588	EASTING 1704086	24 HR. NA
TOTAL DEPTH 28.0 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/13/06	COMPLETED 7/14/06	SURFACE WATER DEPTH 4.0 ft.	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
801.9					Water Line				
					Mud Line				797.9 / 0.00
793.4	4.5	3	3	3	6	SS-15	28.1% W		ALLUVIAL: Medium Stiff, Grey, Clayey, Fine To Coarse Sandy SILT With Trace Gravel; 791.9 / 6.0
790.9	7.0	10	30	44	74				ALLUVIAL: Very Dense, Grey, Fine To Coarse SAND With Some Gravel
788.4	9.5	100/0.4			100/0.4 60/0.0				788.4 / 9.5; Note: Blow Count Influenced By Gravel; ALLUVIAL: Boulders (Grey With White, Metamorphosed DIORITE Over White With Grey, Metamorphosed GRANITIC ROCK)
787.1	10.8	60/0.0							
784.9	13.0	100/0.2			100/0.2				782.8 / 15.1; CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing
									769.9 / 28.0; Coring Terminated At Elevation 769.9ft In CRYSTALLINE ROCK: Metamorphosed DIORITE

Note: Lake Water Alone Used As Drilling Fluid

Note: Final Casing Depth = 9.5ft

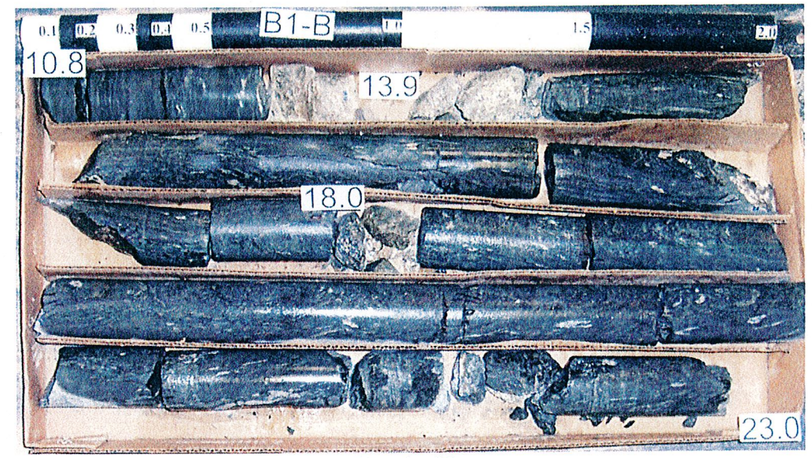
CORE BORING REPORT

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B1-B	BORING LOCATION 237+90	OFFSET 70ft RT	ALIGNMENT -L- / 0 HR. NA
COLLAR ELEV. 797.9 ft	NORTHING 834588	EASTING 1704086	24 HR. NA
TOTAL DEPTH 28.0 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash/Mud Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/13/06	COMPLETED 7/14/06	SURFACE WATER DEPTH 4.0 ft.	
CORE SIZE NQ	TOTAL RUN 16.3 ft	DRILLER Duggins	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 10.8 ft
787.1	10.8	2.2	6:10	(0.8)	(0.0)		(1.3)	(0.0)		787.1 / 10.8; ALLUVIAL: Boulders (Grey With White Metamorphosed DIORITE Over White With Grey, Metamorphosed GRANITIC ROCK)
784.9	13.0		3:33	36%	0%		29%	0%		
			:10/0.2							
784.0	13.9	4.1	N=100/0.2	(3.1)	(2.5)					782.8 / 15.1; Wood From 13.2ft To 13.9ft
			6:14	76%	61%		(12.7)	(10.7)		
			6:20				98%	83%		Note: Core Barrel Refused At 13.2ft, Put Tricone Down And Wood Came Up For 0.7ft
779.9	18.0		5:37							
		5.0	3:01	(5.0)	(4.2)					CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing
			:21/0.1	100%	84%					
			6:49							
			6:06							
774.9	23.0		7:33							Open To Partially Healed Vertical Fracture From 15.1ft To 15.6ft
		5.0	7:09	(4.8)	(4.0)					
			6:26	96%	80%					12 Joints At 10° To 20°
			5:03							2 Joints At 30° To 40°
769.9	28.0		6:03							769.9 / 28.0; Core Block At 18.0ft
			7:47							
			7:24							Very Close Fracture Spacing (Very Broken) From 18.0ft To 18.2ft, 22.2ft To 22.4ft, 23.0ft To 23.1ft, 26.5ft To 26.6ft, And 27.5ft To 28.0ft
			8:34							Coring Terminated At Elevation 769.9ft In CRYSTALLINE ROCK: Metamorphosed DIORITE

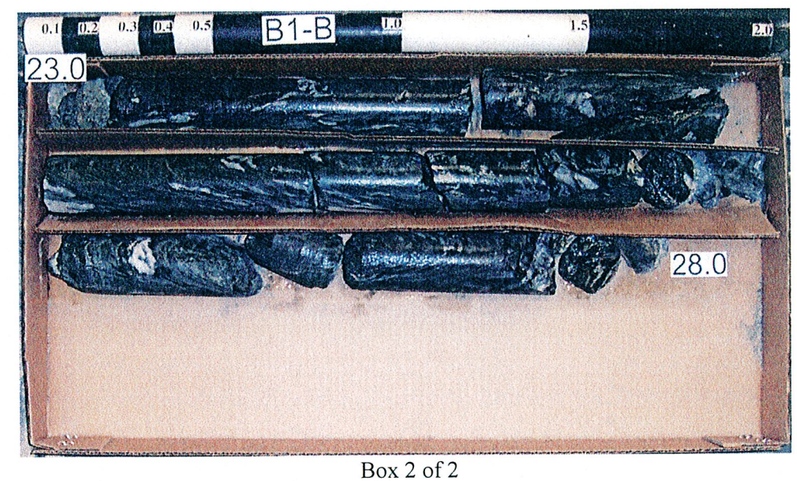
Note: Core Barrel Locked In Hole And Sand Caving In At 28.0ft. Could Not Core Further.

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B1-B



Box 1 of 2

Scale = 1:4



Box 2 of 2

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B2-A	BORING LOCATION 238+78	OFFSET 31ft LT	ALIGNMENT -L-	0 HR. NA
COLLAR ELEV. 797.1 ft	NORTHING 834715	EASTING 1704130	24 HR. NA
TOTAL DEPTH 29.3 ft	DRILL MACHINE Acker AD-II	DRILL METHOD Mud Rotary/HQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 6/28/06	COMPLETED 6/30/06	SURFACE WATER DEPTH 4.7 ft.	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
814.3					Bridge Deck Surface					
801.8					Water Line					
					Mud Line				797.1	0.00
796.1	1.0								ALLUVIAL: Hard To Medium Stiff, Grey, Clayey, Fine To Coarse Sandy SILT With Some To Trace Gravel	
793.6	3.5	3	30	23	53		SAT			
791.1	6.0	5	2	4	6	SS-8	31.8%		Note: Blow Count Influenced By Gravel	
789.5	7.6	7	5	4	9		W		Note: Set Casing to 3.5ft then to 7.5ft	7.6
		60/0.0			60/0.0	RS-3			CRYSTALLINE ROCK: Dark Grey To Black With White, Moderately To Slightly Weathered, Moderately Hard To Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing	
									783.3	13.8
									CRYSTALLINE ROCK: Dark Grey With White, Very Slightly Weathered To Fresh, Hard, Metamorphosed DIORITE With Moderately Close Fracture Spacing	
									780.9	16.2
									779.8	17.3
									CRYSTALLINE ROCK: Dark Grey To Black With White, Moderately To Slightly Weathered, Moderately Hard To Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing	
									CRYSTALLINE ROCK: Dark Grey With White, Very Slightly Weathered To Fresh, Hard To Very Hard, Metamorphosed DIORITE With Moderately Close To Wide Fracture Spacing	
									767.8	29.3
									Coring Terminated At Elevation 767.8ft In CRYSTALLINE ROCK: Metamorphosed DIORITE	

Note: Lake Water Alone Used As Drilling Fluid

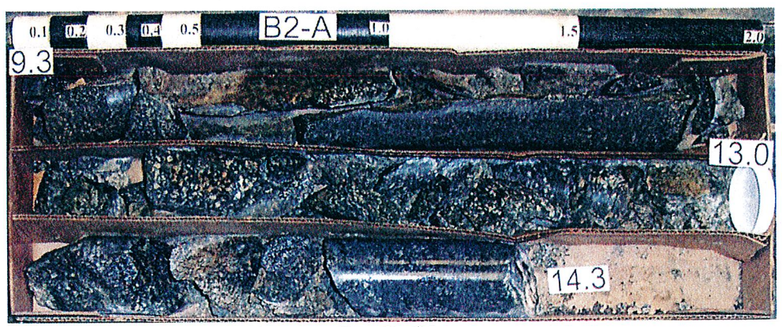
CORE BORING REPORT
SHEET 31 OF 52

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B2-A	BORING LOCATION 238+78	OFFSET 31ft LT	ALIGNMENT -L-	0 HR. NA
COLLAR ELEV. 797.1 ft	NORTHING 834715	EASTING 1704130	24 HR. NA
TOTAL DEPTH 29.3 ft	DRILL MACHINE Acker AD-II	DRILL METHOD Mud Rotary/HQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 6/28/06	COMPLETED 6/30/06	SURFACE WATER DEPTH 4.7 ft.	
CORE SIZE HQ	TOTAL RUN 21.7 ft	DRILLER Duggins	

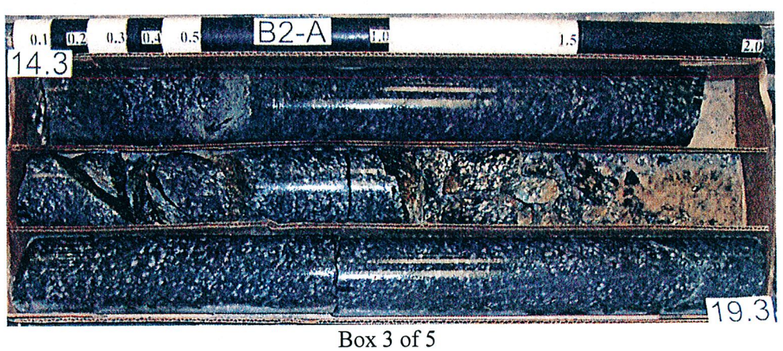
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS	
										Begin Coring @ 7.6 ft	
789.5	7.6	1.7	8:25	(1.7) 100%	(0.6) 35%	RS-3	(6.2) 100%	(0.6) 10%		789.5 CRYSTALLINE ROCK: Dark Grey To Black With White, Moderately To Slightly Weathered, Moderately Hard To Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing	7.6
787.8	9.3	3.7	3:10/0.7 4:51 5:01 4:55	(3.7) 100%	(0.0) 0%					Abundant High Angle Fractures Throughout With Iron Staining And With Intersecting Low Angle Fractures	
784.1	13.0									783.3	13.8
782.8	14.3	1.3	25:13/0.7	(1.3) 100%	(0.5) 38%		(2.4) 100%	(2.4) 100%		Note: Run No. 2 Stopped Short Of 5ft Due To Core Block	
		5.0	2:27/0.3 9:08 7:14 4:30 3:12	(5.0) 100%	(3.9) 78%		(1.1) 100%	(0.0) 0%		780.9	16.2
777.8	19.3						(11.4) 95%	(11.0) 92%		779.8 CRYSTALLINE ROCK: Dark Grey With White, Very Slightly Weathered To Fresh, Hard, Metamorphosed DIORITE With Moderately Close Fracture Spacing	17.3
		5.0	7:32 7:48 5:00 7:13 5:42	(4.6) 92%	(4.4) 88%					No Natural Fractures	
772.8	24.3									Note: Run No. 3 Completed Run No. 2	
		5.0	5:55 6:47 5:01 5:07 5:59 7:11 5:56	(4.8) 96%	(4.6) 92%					CRYSTALLINE ROCK: Dark Grey To Black With White, Moderately To Slightly Weathered, Moderately Hard To Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing	
767.8	29.3									767.8 3 Joints At 45° With Iron Staining 6 Joints At 10° To 20° With Iron Staining 1 Vertical Joint 0.2ft Long With Iron Staining Very Broken 17.1ft To 17.3ft	29.3
										CRYSTALLINE ROCK: Dark Grey With Wite, Very Slightly Weathered To Fresh, Hard To Very Hard, Metamorphosed DIORITE With Moderately Close To Wide Fracture Spacing	
										Moderately Weathered With Very Close Fracture Spacing And Core Loss From 19.3ft To 19.9ft And From 24.3ft To 24.7ft	
										Coring Terminated At Elevation 767.8ft In CRYSTALLINE ROCK: Metamorphosed DIORITE	

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B2-A

Box 1 of 5



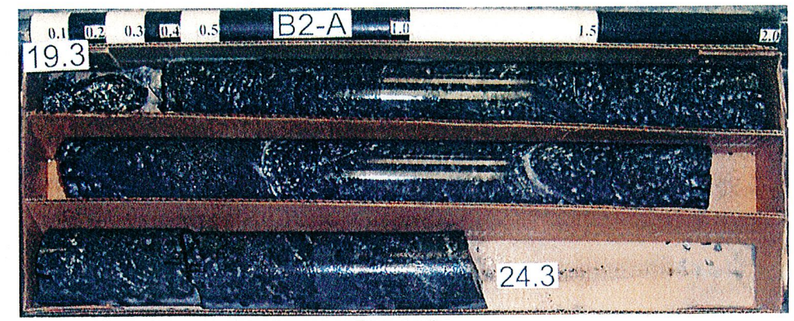
Box 2 of 5



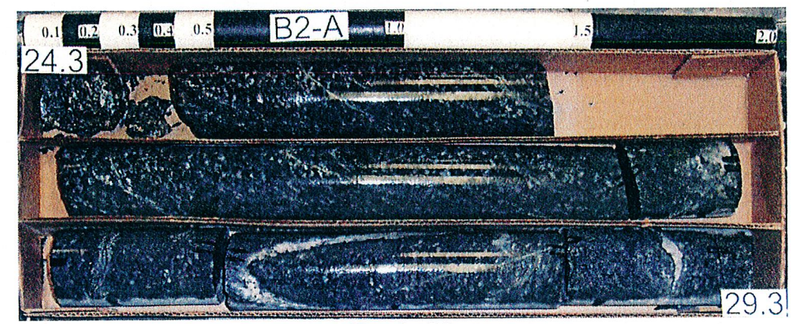
Box 3 of 5

Scale = 1:4

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B2-A



Box 4 of 5



Box 5 of 5

Scale = 1:4

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PAGE 1 OF 1

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B2-D	BORING LOCATION 238+78	OFFSET 16ft LT	ALIGNMENT -L-	0 HR. NA
COLLAR ELEV. 797.7 ft	NORTHING 834701	EASTING 1704135		24 HR. NA
TOTAL DEPTH 30.7 ft	DRILL MACHINE Acker AD-II	DRILL METHOD Wash Rotary/HQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 6/19/06	COMPLETED 6/20/06	SURFACE WATER DEPTH 4.0 ft.	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
814.2					Bridge Deck Surface				
801.7					Water Line				
					Mud Line				797.7 — 0.00
									796.7 — 1.0 ALLUVIAL: Grey, Coarse To Fine Sandy SILT; ALLUVIAL: BOULDERS
794.7	3.0						W		
		38	23	9	•32				792.5 — 5.2
791.7	6.0								ALLUVIAL: Medium Dense, Grey With White, Fine To Coarse SAND And Gravel
		13	8	4	•12	SS-9	W		789.7 — 8.0
789.2	8.5								788.7 — 9.0 ALLUVIAL: Grey, Micaceous, Silty, Fine To Coarse SAND
		37	63/0.3		100/0.8		W		788.2 — 9.5
785.6	12.1								785.5 — 12.2 ALLUVIAL: Grey And Brown, Micaceous, Fine To Coarse SAND And Gravel; Note: Blow Count Influenced By Gravel; WEATHERED ROCK: White And Grey, Metamorphosed DIORITE
		60/0.1			60/0.1				CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing
									777.6 — 20.1 CRYSTALLINE ROCK: Dark Grey With White, Very Slightly Weathered To Fresh, Hard To Very Hard, Metamorphosed DIORITE With Moderately Close To Wide Fracture Spacing
									767.0 — 30.7
									Coring Terminated At Elevation 767.0ft In CRYSTALLINE ROCK: Metamorphosed DIORITE

Note: Polymer Plus Lake Water Used As Drilling Fluid

Mud Density = 63.2 lbs/cu.ft.

Note: Final Casing Depth = 9.5ft

NCDOT BORE SINGLE 07106019.GPJ NC_DOT.GDT 8/29/06

CORE BORING REPORT
SHEET 33 OF 52

PAGE 1 OF 1

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B2-D	BORING LOCATION 238+78	OFFSET 16ft LT	ALIGNMENT -L-	0 HR. NA
COLLAR ELEV. 797.7 ft	NORTHING 834701	EASTING 1704135		24 HR. NA
TOTAL DEPTH 30.7 ft	DRILL MACHINE Acker AD-II	DRILL METHOD Wash Rotary/HQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 6/19/06	COMPLETED 6/20/06	SURFACE WATER DEPTH 4.0 ft.	
CORE SIZE HQ	TOTAL RUN 18.5 ft	DRILLER Duggins	

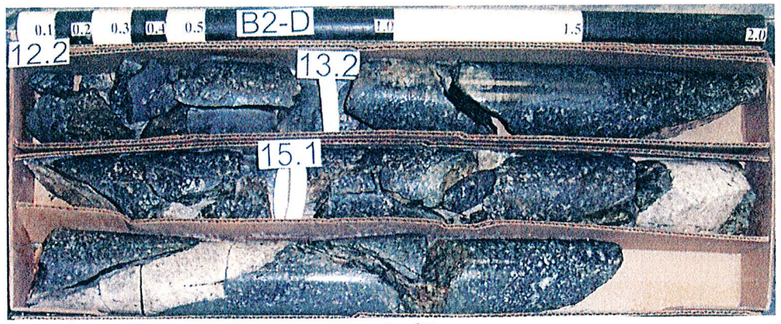
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 12.2 ft
785.5	12.2	1.0	23:05	(0.8)	(0.0)		(6.2)	(1.7)		785.5 — 12.2 CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing
784.5	13.2	1.9	6:21	80%	0%		78%	22%		
782.6	15.1		8:24/0.9	(1.4)	(0.5)					
		5.0	8:33	74%	26%					High Angle (> 70°) To Vertical Fractures Throughout With Iron Staining
			6:16	(4.0)	(1.2)					
			5:25	80%	24%					
			4:38							9 Joints At 0° To 10° With Iron Staining
777.6	20.1		5:02							777.6 — 20.1 5 Joints At 20° To 30° With Iron Staining
		5.0	5:05	(5.0)	(5.0)		(10.6)	(10.3)		
			5:12	100%	100%		100%	97%		Very Broken From 19.5ft To 20.1ft
			4:14							
772.6	25.1		3:52							Note: Total Water Loss Below 13.6ft
		4.6	4:16	(4.6)	(4.6)					
			4:15	100%	100%					Note: Core Block At 15.1ft
			4:02							CRYSTALLINE ROCK: Dark Grey With White, Very Slightly Weathered To Fresh, Hard To Very Hard, Metamorphosed DIORITE With Moderately Close To Wide Fracture Spacing
			3:50							
768.0	29.7		3:35							
767.0	30.7	1.0	2:22/0.6	(1.0)	(0.7)					767.0 — 30.7
			5:07	100%	70%					Slightly Weathered 20.1ft To 20.8ft
										2 Joints At 10° To 20° Below 30.4ft
										Very Close To Close Fracture Spacing 30.4ft To 30.7ft
										Note: Run No. 5 Stopped Short Due To Rock Left In Hole From Run No. 4. Core From Run No. 5 Broke Off 0.4ft Above Bottom Of Run No. 5.
										Note: Run No. 6 Performed To Retrieve Rock Left In Hole From Run No. 5. Extra 0.1ft Of Rock Recovered From Run No. 6.
										Coring Terminated At Elevation 767.0ft In CRYSTALLINE ROCK: Metamorphosed DIORITE

Note: Polymer Plus Lake Water Used As Drilling Fluid

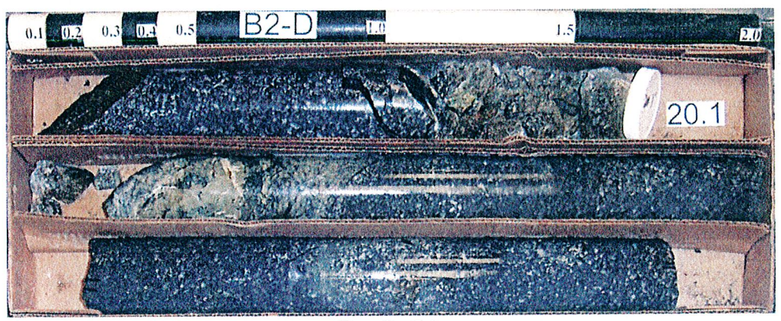
Mud Density = 65.7 lbs/cu.ft.

NCDOT CORE SINGLE 07106019C.GPJ NC_DOT.GDT 8/2/06

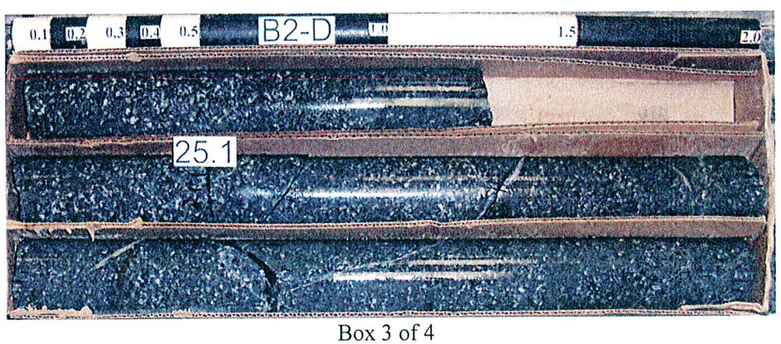
State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B2-D



Box 1 of 4



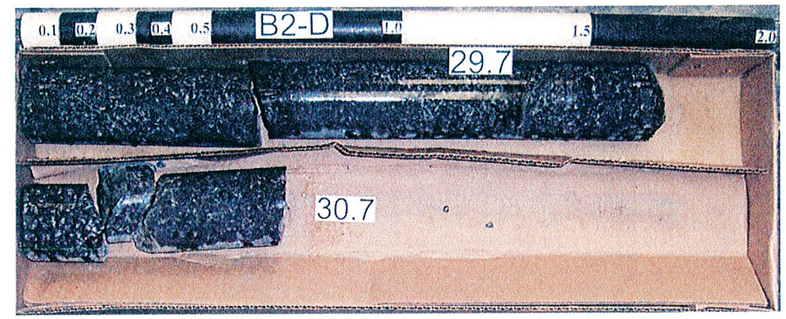
Box 2 of 4



Box 3 of 4

Scale = 1:4

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B2-D



Box 4 of 4

Scale = 1:4

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B2-C	BORING LOCATION 238+74	OFFSET 5ft RT	ALIGNMENT -L-	0 HR. NA
COLLAR ELEV. 797.0 ft	NORTHING 834681	EASTING 1704139		24 HR. NA
TOTAL DEPTH 38.3 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash/Mud Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/7/06	COMPLETED 7/11/06	SURFACE WATER DEPTH 5.0 ft.	

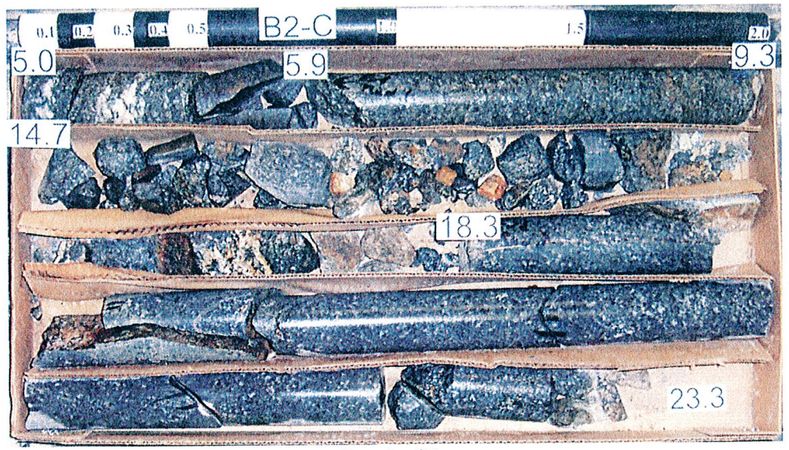
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
802.0					Water Line					
					Mud Line				797.0	0.00
794.0	3.0								ALLUVIAL: Very Soft, Grey, Coarse To Fine Sandy SILT	
792.0	5.0	1	1	WOH	1		SAT		Note: Set Casing to 1.0ft, Sank in Silt	
		60/0.0			60/0.0				792.2 ALLUVIAL: Boulders (Metamorphosed DIORITE)	4.8
787.7	9.3								789.9 ALLUVIAL: Medium Dense, Tan And Grey, Fine To Coarse SAND With Trace Gravel	7.1
		5	9	12	21	SS-16	SAT		786.2 ALLUVIAL: Weathered BOULDERS	10.8
782.7	14.3								782.7 Note: Set Casing to 14.3ft	14.3
		100/0.4			100/0.4				781.2 WEATHERED ROCK: Dark Grey With White, Metamorphosed DIORITE	15.8
									777.7 CRYSTALLINE ROCK: Dark Grey With White, Moderately Weathered, Moderately Hard To Hard, Metamorphosed DIORITE With Very Close Fracture Spacing	19.3
									776.3 CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Hard, Metamorphosed DIORITE With Close Fracture Spacing	20.7
									774.1 CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIORITE With Moderately Close Fracture Spacing	22.9
									772.1 CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Moderately Hard To Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing	24.9
									769.5 CRYSTALLINE ROCK: Dark Grey With White And Pink, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing	27.5
									768.3 CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Moderately Hard to Hard, Metamorphosed DIORITE With Very Close Fracture Spacing	28.7
									766.3 CRYSTALLINE ROCK: Dark Greenish Grey With White, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIABASE With Moderately Close Fracture Spacing	30.7
									758.7 CRYSTALLINE ROCK: Dark Grey With White, Very Slightly Weathered, Hard To Very Hard, Metamorphosed DIORITE With Wide Fracture Spacing	38.3
									Coring Terminated At Elevation 758.7ft In CRYSTALLINE ROCK: Metamorphosed DIORITE	
									Note: Lake Water Alone Used As Drilling Fluid	

CORE BORING REPORT
SHEET 35 OF 52

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B2-C	BORING LOCATION 238+74	OFFSET 5ft RT	ALIGNMENT -L-	0 HR. NA
COLLAR ELEV. 797.0 ft	NORTHING 834681	EASTING 1704139		24 HR. NA
TOTAL DEPTH 38.3 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash/Mud Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/7/06	COMPLETED 7/11/06	SURFACE WATER DEPTH 5.0 ft.	
CORE SIZE NQ	TOTAL RUN 27.9 ft	DRILLER Duggins	

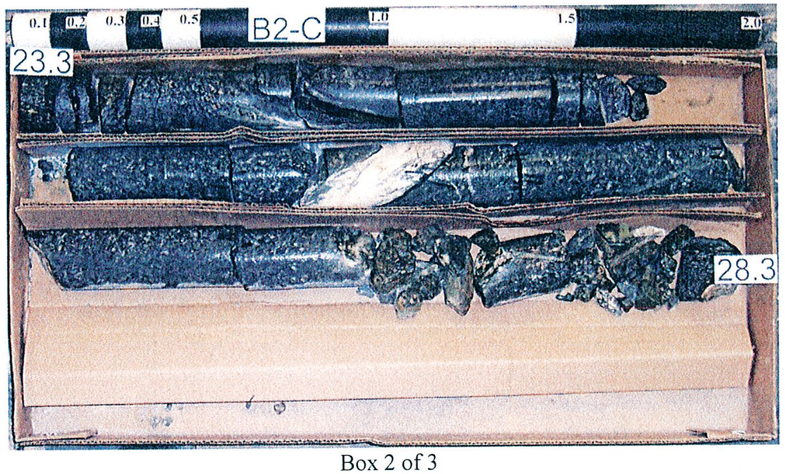
ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS	
										Begin Coring @ 5.0 ft	
792.0	5.0	0.9	23:41/0.9	(0.9) 100%	(0.3) 33%		(2.1) 100%	(1.5) 71%		792.0 ALLUVIAL: BOULDERS (Dark Grey With White, Metamorphosed DIORITE)	5.0
791.1	5.9	3.4	3:09/0.4							789.9 Note: Stopped Run To Change Bit	7.1
			4:07	(1.2) 35%	(1.2) 35%		(0.0) 0%	(NA)		ALLUVIAL: Medium Dense, Tan And Trey, Fine To Coarse SAND With Trace Gravel	
787.7	9.3		1:01							786.2 ALLUVIAL: Weathered BOULDERS (Wash Drilled)	10.8
			:32			SS-16					
			:10/0.3							782.7	14.3
			N=21								
782.3	14.7	3.6	N=100/0.4	(2.1) 58%	(0.0) 0%		(0.0) 0%	(NA)		781.2 WEATHERED ROCK: Dark Grey With White, Metamorphosed DIORITE	15.8
			3:20				(2.1) 60%	(0.0) 0%		CRYSTALLINE ROCK: Dark Grey With White, Moderately Weathered, Moderately Hard To Hard, Metamorphosed DIORITE With Very Close Fracture Spacing	
778.7	18.3		2:40							777.7	19.3
			10:50							776.3 Iron Staining Of Most Joint Faces And Some Fabric	20.7
		5.0	2:10/0.6	(4.1) 82%	(2.7) 54%		(1.4) 100%	(0.5) 36%		CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Hard, Metamorphosed DIORITE With Close Fracture Spacing	
			3:43				(2.2) 100%	(2.2) 100%		774.1	22.9
			5:34								
773.7	23.3		4:48							772.1 Partially Healed To Open Vertical Fracture Throughout With Iron Staining	24.9
			5:28				(2.0) 100%	(0.7) 35%			
		5.0	4:14	(5.0) 100%	(3.3) 66%						
			3:59				(2.6) 100%	(2.6) 100%		769.5 2 Joints At 10° To 20°	27.5
			5:47							768.3 1 Joint At 45° With Iron Staining	28.7
768.7	28.3		5:55								
		5.0	7:19	(4.6) 92%	(4.6) 92%		(0.9) 75%	(0.0) 0%		CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIORITE With Moderately Close Fracture Spacing	
			5:16				(2.0) 100%	(2.0) 100%		766.3	30.7
			6:00								
			8:55				(7.6) 100%	(7.6) 100%		No Natural Fractures	
763.7	33.3		7:20								
		5.0	6:53	(5.0) 100%	(5.0) 100%					CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Moderately Hard To Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing	
			7:11								
			9:03								
			9:04								
758.7	38.3		11:12							758.7	38.3
			9:02							8 Joints At 10° To 20°	
			7:01							1 Joint At 80° With Iron Staining	
										CRYSTALLINE ROCK: Dark Grey With White And Pink, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIORITE With Close To Moderately Close Fracture Spacing	
										1 Joint At 20°	
										CRYSTALLINE ROCK: Dark Grey With White, Moderately To Slightly Weathered, Moderately Hard to Hard, Metamorphosed DIORITE With Very Close Fracture Spacing	
										Most Joint Faces Are Iron Stained	
										CRYSTALLINE ROCK: Dark Greenish Grey With White, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIABASE With Moderately Close Fracture Spacing	
										No Natural Fractures	
										CRYSTALLINE ROCK: Dark Grey With White, Very Slightly Weathered, Hard To Very Hard, Metamorphosed DIORITE With Wide Fracture Spacing	
										Note: 0.5ft Of Core From Run No. 7 Could Not Be Retrieved From Borehole. REC and RQD Calculations Assume Unretrieved Rock Is The Same As Retrieved Rock.	
										Coring Terminated At Elevation 758.7ft In CRYSTALLINE ROCK: Metamorphosed DIORITE	

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B2-C



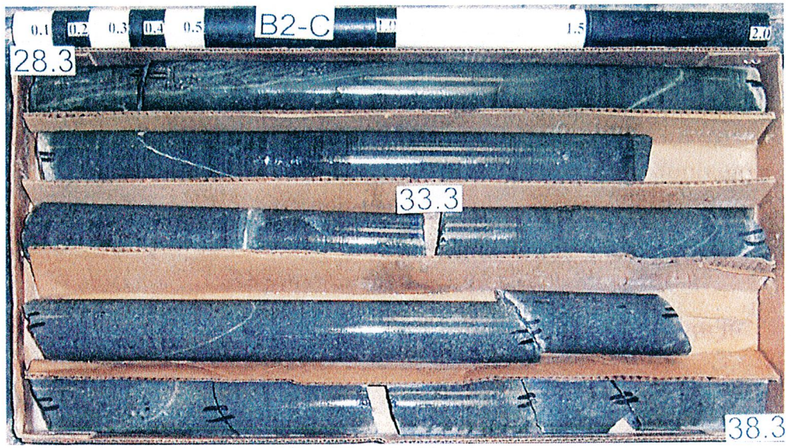
Box 1 of 3

Scale = 1:4



Box 2 of 3

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B2-C



Box 3 of 3

Scale = 1:4

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B2-E	BORING LOCATION 238+79	OFFSET 27ft RT	ALIGNMENT 0 HR. NA
COLLAR ELEV. 797.9 ft	NORTHING 834662	EASTING 1704152	24 HR. NA
TOTAL DEPTH 38.0 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/11/06	COMPLETED 7/12/06	SURFACE WATER DEPTH 4.0 ft.	

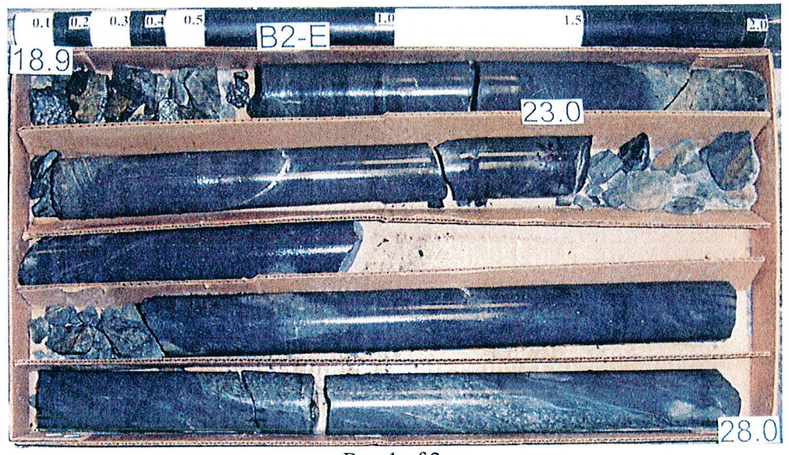
ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
801.9					Water Line				
					Mud Line				797.9 / 0.00 ALLUVIAL: Grey, Coarse To Fine Sandy SILT Note: Set Casing to 1.0ft, sank to 4.5ft
793.4	4.5	23	77/0.2		100/0.7		W		792.9 / 5.0 ALLUVIAL: WEATHERED BOULDER
790.4	7.5	43	6	7	13	SS-17	W		791.7 / 6.2 Note: Set Casing to 7.0ft ALLUVIAL: Medium Dense, Tan And Grey, Silty, Fine To Coarse SAND And Gravel
788.2	9.7	8	6	10	16		SAT		Note: Set Casing to 14.7ft
783.2	14.7	82	18/0.1		100/0.6				783.2 / 14.7 WEATHERED ROCK: Dark Grey With White, Severely Weathered, Metamorphosed DIORITE With Very Close Fracture Spacing
779.9	18.0	58	42/0.4		100/0.9				777.6 / 20.3 CRYSTALLINE ROCK: Dark Grey With White, Slightly Weathered, Hard, Metamorphosed DIORITE With Close Fracture Spacing
									773.3 / 24.6 CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIORITE With Moderately Close To Wide Fracture Spacing
									759.9 / 38.0 Coring Terminated At Elevation 759.9ft In CRYSTALLINE ROCK: Metamorphosed DIORITE Note: Lake Water Alone Used As Drilling Fluid

CORE BORING REPORT

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B2-E	BORING LOCATION 238+79	OFFSET 27ft RT	ALIGNMENT -L- 0 HR. NA
COLLAR ELEV. 797.9 ft	NORTHING 834662	EASTING 1704152	24 HR. NA
TOTAL DEPTH 38.0 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/11/06	COMPLETED 7/12/06	SURFACE WATER DEPTH 4.0 ft.	
CORE SIZE NQ	TOTAL RUN 21.8 ft	DRILLER Duggins	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 15.3 ft
782.6	15.3	2.7	3:23 5:36	(0.0) 0%	(NA)		(0.4) 10%	(NA)		Mostly Core Loss In WEATHERED ROCK: Dark Grey With White, Severely Weathered, Metamorphosed DIORITE With Very Close Fracture Spacing *(continued)*
779.9	18.0		1:27/0.7							
779.0	18.9	4.1	N=100/0.9 :32/0.1 1:23 15:16	(3.1) 76%	(2.7) 66%		(4.3) 100%	(3.9) 91%		777.6 / 20.3 CRYSTALLINE ROCK: Dark Grey With White, Slightly Weathered, Hard, Metamorphosed DIORITE With Close Fracture Spacing
774.9	23.0	5.0	9:22 8:14	(5.0) 100%	(4.3) 86%					773.3 / 24.6 3 Joints At 0° To 10° 4 Joints At 20° To 30° With Iron Staining
769.9	28.0		11:15 16:01 10:45				(13.2) 99%	(12.9) 96%		Very Close Fracture Spacing (Very Broken) From 23.1ft to 23.3ft And 24.4ft To 24.6ft
		5.0	9:57 10:47	(5.0) 100%	(5.0) 100%					CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard, Metamorphosed DIORITE With Moderately Close To Wide Fracture Spacing
764.9	33.0		10:05 12:56 14:28							
		5.0	9:43 7:28	(4.8) 96%	(4.8) 96%					3 Joints At 0° To 10° 2 Joints At 45°
759.9	38.0		8:37 8:27 9:26 10:18 4:27							759.9 / 38.0 Coring Terminated at Elevation 759.9ft In CRYSTALLINE ROCK: Metamorphosed DIORITE

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B2-E



Box 1 of 2

Scale = 1:4

Box 2 of 2

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B2-B	BORING LOCATION 238+80	OFFSET 70ft RT	ALIGNMENT -L- — 0 HR. NA
COLLAR ELEV. 796.7 ft	NORTHING 834622	EASTING 1704165	24 HR. NA
TOTAL DEPTH 33.0 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash/Mud Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/12/06	COMPLETED 7/13/06	SURFACE WATER DEPTH 5.2 ft.	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
814.3					Bridge Deck Surface				
801.9					Water Line				
					Mud Line				796.7 — 0.00 ALLUVIAL: Very Soft, Grey, Silty CLAY With Little Fine to Coarse SAND Note: Set Casing to 1.0ft, Sank to 3.5ft
790.4	6.3	WOR	WOR	WOR	WOR	SS-18	71.5%		788.9 — 7.8 ALLUVIAL: Medium Dense To Dense, Tan And Grey, Silty, Fine To Coarse SAND With Some Gravel And Trace Organics (Wood Fragments)
788.2	8.5	6	6	9	15		SAT		
785.7	11.0	13	20	29	49		SAT		
782.9	13.8	26	74	100/1.0	100/1.0				783.2 — 13.5 Note: Blow Count Influenced By Gravel Note: Set Casing to 11.2ft
778.2	18.5	60/0.0			60/0.0	RS-4			779.2 — 17.5 WEATHERED ROCK: Tan, White And Black, Metamorphosed DIORITE 778.1 — 18.6 Note: Hole Caved, Set Casing to 15.8ft CRYSTALLINE ROCK: Dark Grey With White, Slightly Weathered, Hard, Metamorphosed DIORITE With Very Close To Close Fracture Spacing CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard To Very Hard, Metamorphosed DIORITE With Moderately Close To Wide Fracture Spacing
									763.7 — 33.0 Coring Terminated At Elevation 763.7ft In CRYSTALLINE ROCK: Metamorphosed DIORITE Note: Lake Water Alone Used As Drilling Fluid

CORE BORING REPORT
SHEET 39 OF 52

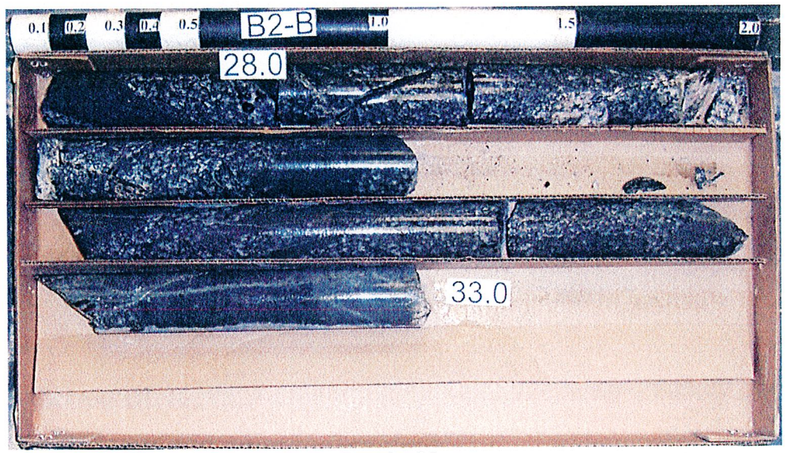
PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. B2-B	BORING LOCATION 238+80	OFFSET 70ft RT	ALIGNMENT -L- — 0 HR. NA
COLLAR ELEV. 796.7 ft	NORTHING 834622	EASTING 1704169	24 HR. NA
TOTAL DEPTH 33.0 ft	DRILL MACHINE CME 45 Barge	DRILL METHOD Wash Rotary/NQ Core	HAMMER TYPE 140lb Manual
DATE STARTED 7/12/06	COMPLETED 7/13/06	SURFACE WATER DEPTH 5.2 ft.	
CORE SIZE NQ	TOTAL RUN 18.2 ft	DRILLER Duggins	

ELEV. (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
										Begin Coring @ 14.8 ft
781.9	14.8	3.2	1:46 2:07 3:18	(0.3) 9%	(0.0) 0%		(0.0) 0%	(NA)		WEATHERED ROCK: Tan, White, And Black; Weathered DIORITE
778.7	18.0	5.0	1:34/0.2 N=60/0.0 9:31 8:35 8:30	(5.0) 100%	(4.5) 90%	RS-4	(0.9) 82% (14.3) 99%	(0.0) 0% (13.7) 95%		779.2 — 17.5 778.1 — 18.6 CRYSTALLINE ROCK: Dark Grey With White, Slightly Weathered, Hard, Very Broken To 18.0ft Metamorphosed DIORITE With Very Close To Close Fracture Spacing 2 Joints At 30° With Iron Staining
773.7	23.0	4.0	8:04 5:46 8:15 9:20	(4.0) 100%	(3.6) 90%					CRYSTALLINE ROCK: Dark Grey With White, Slightly To Very Slightly Weathered, Hard To Very Hard, Metamorphosed DIORITE With Moderately Close To Wide Fracture Spacing
769.7	27.0	1.0	8:38	(1.0) 100%	(1.0) 100%					1 Joint At 60° 1 Joint At 80° 2 Joints At 20° To 30°
768.7	28.0	5.0	8:13 8:09 8:45 10:27 11:10 10:03 9:03	(4.9) 98%	(4.6) 92%					Note: Core Block At 27.0ft
763.7	33.0									763.7 — 33.0 Coring Terminated At Elevation 763.7ft In CRYSTALLINE ROCK: Metamorphosed DIORITE

State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) over Oak Hollow Lake
CORE PHOTOGRAPHS- BORING B2-B

Box 1 of 2

Scale = 1:4



Box 2 of 2

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. EB2-A	BORING LOCATION 239+38	OFFSET 30ft LT	ALIGNMENT -L-	0 HR. 17.9
COLLAR ELEV. 814.2 ft	NORTHING 834737	EASTING 1704186	24 HR. NM
TOTAL DEPTH 29.6 ft	DRILL MACHINE Acker AD-II	DRILL METHOD HSA	HAMMER TYPE 140lb Manual
DATE STARTED 6/23/06	COMPLETED 6/23/06	SURFACE WATER DEPTH	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
814.2									814.2 0.00
813.2	1.0								813.5 ASPHALT 0.7
810.7	3.5	6	16	6	22	SS-10	16.6% M		ROADWAY EMBANKMENT FILL: Very Stiff To Medium Stiff; Red, Tan, Grey And Black; Silty; Fine To Coarse Sandy CLAY With Some To No Gravel
808.2	6.0	4	6	7	13		M		
805.7	8.5	2	3	4	7		W		
800.7	13.5	2	4	5	9		W		
795.7	18.5	4	4	5	9				798.7 15.5 RESIDUAL: Stiff And Very Stiff, Black And Red, Clayey, Coarse To Fine Sandy SILT With Trace Rock Fragments
790.7	23.5	5	7	8	15	SS-11	24.2%		
785.7	28.5	100/0.4			100/0.4				791.2 23.0 WEATHERED ROCK: Tan And Black, Metamorphosed DIORITE
784.6	29.6	100/0.3			100/0.3				784.6 29.6
		60/0.0			60/0.0				Boring Terminated At With SPT Refusal Elevation 784.6ft On Crystalline Rock: Metamorphosed DIORITE

NCDOT BORE SINGLE 07106019.GPJ NC_DOT.GDT 8/2/06

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	ID No. U-3615B	COUNTY Guilford	GEOLOGIST G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			GROUND WATER (ft)
BORING NO. EB2-A1	BORING LOCATION 239+38	OFFSET 39ft LT	ALIGNMENT -L-	0 HR. 15.3
COLLAR ELEV. 813.5 ft	NORTHING 834745	EASTING 1704183	24 HR. NM
TOTAL DEPTH 21.5 ft	DRILL MACHINE Acker AD-II	DRILL METHOD HSA	HAMMER TYPE 140lb Manual
DATE STARTED 6/28/06	COMPLETED 6/28/06	SURFACE WATER DEPTH NA	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
813.5									813.5 0.00
									813.1 ASPHALT 0.4
									ROADWAY EMBANKMENT FILL: Red, Silty, Fine To Coarse Sandy CLAY With Some Gravel
									798.5 15.0
									RESIDUAL: Black And Red, Clayey, Coarse to fine Sandy SILT With Trace Rock Fragments
									792.0 21.5
									Boring Terminated With Auger Refusal At Elevation 792.0ft On CRYSTALLINE ROCK: Metamorphosed DIORITE

NCDOT BORE SINGLE 07106019.GPJ NC_DOT.GDT 8/2/06

N.C.D.O.T. GEOTECHNICAL UNIT
BORING LOG

PROJECT NO. 34962.1.1	**ID No.** U-3615B	**COUNTY** Guilford	**GEOLOGIST** G.Licayan/P.Weaver
SITE DESCRIPTION Replace Bridge #65 on Skeet Club Rd over Oak Hollow Lake			**GROUND WATER (ft)**
BORING NO. EB2-D	**BORING LOCATION** 239+42	**OFFSET** 14ft LT	**ALIGNMENT** -L-	**0 HR.** 17.0
COLLAR ELEV. 814.0 ft	**NORTHING** 834723	**EASTING** 1704196	**24 HR.** NM
TOTAL DEPTH 38.6 ft	**DRILL MACHINE** Acker AD-II	**DRILL METHOD** HSA	**HAMMER TYPE** 140lb Manual
DATE STARTED 6/22/06	**COMPLETED** 6/23/06	**SURFACE WATER DEPTH** NA	

ELEV. (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT (0 20 40 60 80 100)	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
814.0									814.0 — 0.00
813.0	1.0								813.4 ASPHALT — 0.6
810.5	3.5	10	7	6	13		M		ROADWAY EMBANKMENT FILL: Stiff To Medium Stiff; Grey, Tan And Red; Silty; Coarse To Fine Sandy CLAY With Little To No Gravel
808.0	6.0	3	4	5	9		M		
805.5	8.5	3	4	3	7	SS-12	31.3%		
800.5	13.5	3	5	5	10		M		800.5 — 13.5
795.5	18.5	4	3	4	7		W		ALLUVIAL: Medium Stiff, Red And Brown, Clayey, Coarse To Fine Sandy SILT With Trace Organics (Root Fragments) — 798.0 — 16.0
790.5	23.5	6	7	10	17	SS-13	28.1%		RESIDUAL: Very Stiff, Grey And Red, Clayey, Coarse To Fine Sandy SILT
785.5	28.5	37	63/0.3		100/0.8				790.5 — 23.5
780.5	33.5	42	58/0.3		100/0.8				WEATHERED ROCK: Grey, Tan, Red And Black; Metamorphosed DIORITE
775.5	38.5	100/0.4			100/0.4				775.4 — 38.6
		60/0.1			60/0.1				Boring Terminated At Elevation 775.4ft On Crystalline Rock: Metamorphosed DIORITE

NCDOT BORE SINGLE 07106019.GPJ NC_DOT.GDT 8/2/06

TRIGON ENGINEERING CONSULTANTS, INC.

TRIGON ENGINEERING CONSULTANTS, INC.
SOUNDING OBSERVATION SUMMARY

Date: July 28, 2006

Job Name: Bridge No. 65 on Skeet Club Rd. Location: Guilford County, North Carolina
State Project No.: 34962.1.1 (U-3615B) Present at Site: G. Licayan/W. Barnett

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers [ ] Heavy Rain [ ] Snow

Sounding No.: EB1-B Elevation: 800.8' Surface Water Elev.: 801.8'
Station: 237+35 Offset: 50' Rt.
Northing: 834,588 Easting: 1,704,021
Equipment: Bridge Sounding Rods with16 lb. Hammer

Depth (Feet)		Elev. (Feet)		Soil Description	Depth	Blows per Foot
From	To	From	To			
0.0		800.8		ALLUVIAL: Most Likely Clayey, Coarse to Fine Sandy	0.0-1.0	8
				SILT (A-4) with Gravel	1.0-2.0	13
					2.0-3.0	5
					3.0-4.0	10
	4.9		795.9	Refusal at 4.9' (Elevation 795.9')	4.0-5.0	25/0.9
				Refusal most likely occurred on large gravel or boulders		
				Note: Three attempts were required before space		
				between large gravel on lake bed could be found to		
				allow bridge rods to penetrate into alluvial material		

State Project No. 34962.1.1
TIP No. U-3615B F.A. No. STP-1820(2)
Replace Bridge No. 65 on SR 1820 (Skeet Club Rd.) Over Oak Hollow Lake
Guilford County, North Carolina
SUMMARY OF LABORATORY TEST DATA

						Atterberg Limits			Gradation Results							
Boring Number	Sample Depth (ft.)	Sample No.*	Natural Moisture Content (%)	AASHTO Class (Group Index)	N-Value (blows/ ft.)	L.L.	P.L.	P.I.	Pass #10 Sieve	Pass #40 Sieve	Pass #200 Sieve	Retained #270 Sieve	Coarse Sand (%)	Fine Sand (%)	Silt (%)	Clay (%)
EB1-A	3.5-5.0	SS-1	19.8	A-6 (2)	16	34	22	16	96	74	42	60	34	25	10	31
EB1-A	18.5-20.0	SS-2	29.5	A-4 (5)	7	33	23	10	97	89	66	40	15	23	35	27
EB1-D	1.0-2.5	SS-3	-	A-2-4 (0)	24	30	22	8	67	49	33	70	33	23	31	13
EB1-D	8.5-10.0	SS-4	-	A-2-4 (0)	16	30	23	7	87	55	29	74	48	21	16	15
B1-D	0.0-1.5	SS-5	69.5	A-7-6 (11)	22	41	28	13	100	98	79	26	2	24	42	32
B1-D	5.0-6.5	SS-6	33.3	A-7-6 (8)	31	41	28	13	93	85	64	41	13	24	35	28
B1-D	8.5-10.0	SS-7	-	A-1-b (0)	10	20	NP	NP	76	16	6	94	85	8	7	0
B1-E	4.7-6.2	SS-14	43.4	A-6 (5)	98	35	23	12	87	78	58	46	13	24	42	21
B1-B	4.5-6.0	SS-15	28.1	A-4 (2)	6	31	22	9	91	75	49	56	24	28	26	22
B2-A	3.5-5.0	SS-8	31.8	A-4 (4)	6	32	23	9	97	85	64	40	18	20	35	27
B2-D	6.0-7.5	SS-9	-	A-1-b (0)	12	20	NP	NP	53	17	7	94	74	14	8	4
B2-C	9.3-10.8	SS-16	-	A-1-b (0)	21	13	NP	NP	91	41	9	92	76	15	7	2
B2-E	7.5-9.0	SS-17	-	A-1-b (0)	13	19	NP	NP	55	39	16	86	42	33	20	5
B2-B	6.3-7.8	SS-18	71.5	A-7-5 (16)	W.O.R.	45	31	14	100	98	91	12	3	9	50	38
EB2-A	1.0-2.5	SS-10	16.6	A-6 (3)	22	39	23	16	78	59	42	62	30	21	28	21
EB2-A	18.5-20.0	SS-11	24.2	A-4 (1)	15	33	29	4	93	86	59	53	11	38	33	18
EB2-D	6.0-7.5	SS-12	31.3	A-7-5 (10)	7	48	35	13	98	86	70	34	16	17	20	47
EB2-D	18.5-20.0	SS-13	28.1	A-4 (6)	17	39	30	9	98	91	71	38	9	27	43	21

* SS = Split-Spoon Sample (ASTM-D-1586)
** G = Grab Sample
***ST=Shelby Tube (Undisturbed) Sample
NP -- Non Plastic NA-- Non Applicable

TRIGON ENGINEERING CONSULTANTS, INC.
GREENSBORO, NORTH CAROLINA
Trigon Job Number: 071-06-019
Page: 1 of 1

LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

PROJECT NO.: 34962.1.1
TIP NO.: U-3615B
F.A. NO.: STP-1820(2)
COUNTY: Guilford
DESCRIPTION: Replace Bridge No.65 on SR 1820 (Skeet Club Rd.) over Oak Hollow Lake

Sample #	Boring #	Depth (ft.)	Rock Type	Geologic Map Unit	Run RQD	Length (ft.)	Diameter (ft.)	Dry Density (lbs/cu. ft.)	Unconfined Compressive Strength (psi)	Maximum Load (lbs.)	Loading Rate (in./min.)
RS-1	B1-D	23.3-23.7	Metamorphosed Diabase	Jd	84%	0.4150	0.2083	180.6	6,247	30,650	0.009
RS-2	B1-C	11.6-11.9	Metamorphosed Diorite & Metamorphosed Granitic Rock	PzZg & ~~C~~Zg	80%	0.3350	0.1666	162.6	14,280	44,840	0.009
RS-3	B2-A	7.8-8.2	Metamorphosed Diorite	PzZg	35%	0.4225	0.2083	187.7	18,892	92,690	0.009
RS-4	B2-B	19.6-19.9	Metamorphosed Diorite	PzZg	90%	0.3467	0.1666	182.3	22,051	69,240	0.009

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT

FIELD SCOUR REPORT

WBS: 34962.1.1 TIP: U-3615B COUNTY: Guilford

DESCRIPTION(1): Replace Bridge No. 65 on SR 1820 (Skeet Club Road) Over Oak Hollow Lake

EXISTING BRIDGE

Information from: Field Inspection X Microfilm ____ (reel ____ pos: ____)
Other (explain) Bridge Survey & Hydraulic Design Report

Bridge No.: 65 Length: 165 Total Bents: 6 Bents in Channel: 2 Bents in Floodplain: 4
Foundation Type: Concrete deck on reinforced concrete post and beam, superstructure is 36" PPC girders

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None observed

Interior Bents: None observed

Channel Bed: None observed

Channel Bank: None observed

EXISTING SCOUR PROTECTION

Type(3): Concrete abutments with rip rap slopes from toe of abutments to lake bottom

Extent(4): Abutments extend approx. 10' past bridge; rip rap extends about 60' left of EB1 abutment

Effectiveness(5): Appears to be effective

Obstructions(6): None observed

INSTRUCTIONS

1 Describe the specific site's location, including route number and body of water crossed.
2 Note scour evidence at existing end bents or abutments (e.g. undermining, sloughing, degradations).
3 Note existing scour protection (e.g. rip rap).
4 Describe extent of existing scour protection.
5 Describe whether or not the scour protection appears to be working.
6 Note obstructions such as dams, fallen trees, debris at bents, etc.
7 Describe the channel bed material based on observation and/or samples. Include any lab results with report.
8 Describe the channel bank material based on observation and/or samples. Include any lab results with report.
9 Describe the material covering the banks (e.g. grass, trees, rip rap, none).
10 Determine the approximate floodplain width from field observation or a topographic map.
11 Describe the material covering the floodplain (e.g. grass, trees, crops).
12 Use professional judgement to specify if the stream is degrading, aggrading, or static.
13 Describe potential and direction of the stream to migrate laterally during the bridge's life (approx. 100 years).
14 Give the design scour elevation (DSE) expected over the life of the bridge (approx. 100 years). This elevation can be given as a range across the site, or for each bent. Discuss the relationship between the Hydraulics Unit theoritical scour and the DSE. If the DSE is dependent on scour counter measures, explain (e.g. rip rap armoring on slopes). The DSE is based on the erodability of materials, giving consideration to the influence of joints, foliation, bedding characteristics, % core recovery, % RQD, differential weathering, shear strength, observations at existing structures, other tests deemed appropriate, and overall geologic conditions at the site.

DESIGN INFORMATION

Channel Bed Material(7): Coarse to fine sandy, silty CLAY (A-6 and A-7-6); clayey, coarse to fine sandy SILT (A-4); and variably silty, fine to coarse SAND and GRAVEL (A-1-b)

Channel Bank Material(8): Silty, coarse to fine sandy CLAY (A-7-5); and clayey, silty, coarse to fine SAND (A-2-4) with a little gravel

Channel Bank Cover(9): Hardwood, brush, and grass/weeds

Floodplain Width(10): greater than 1000 feet

Floodplain Cover(11): Hardwood, brush, and grass/weeds

Stream is(12): Aggrading ____ Degrading X Static ____

Channel Migration Tendency(13): could not be determined

Observations and Other Comments: A city owned water and sewer line is present between approximately 45 feet and 65 feet right of the -L- centerline and runs underneath the lake bottom

Reported by: Paul Mohr **Date:** 8/1/2006

DESIGN SCOUR ELEVATIONS(14) Feet X Meters ____

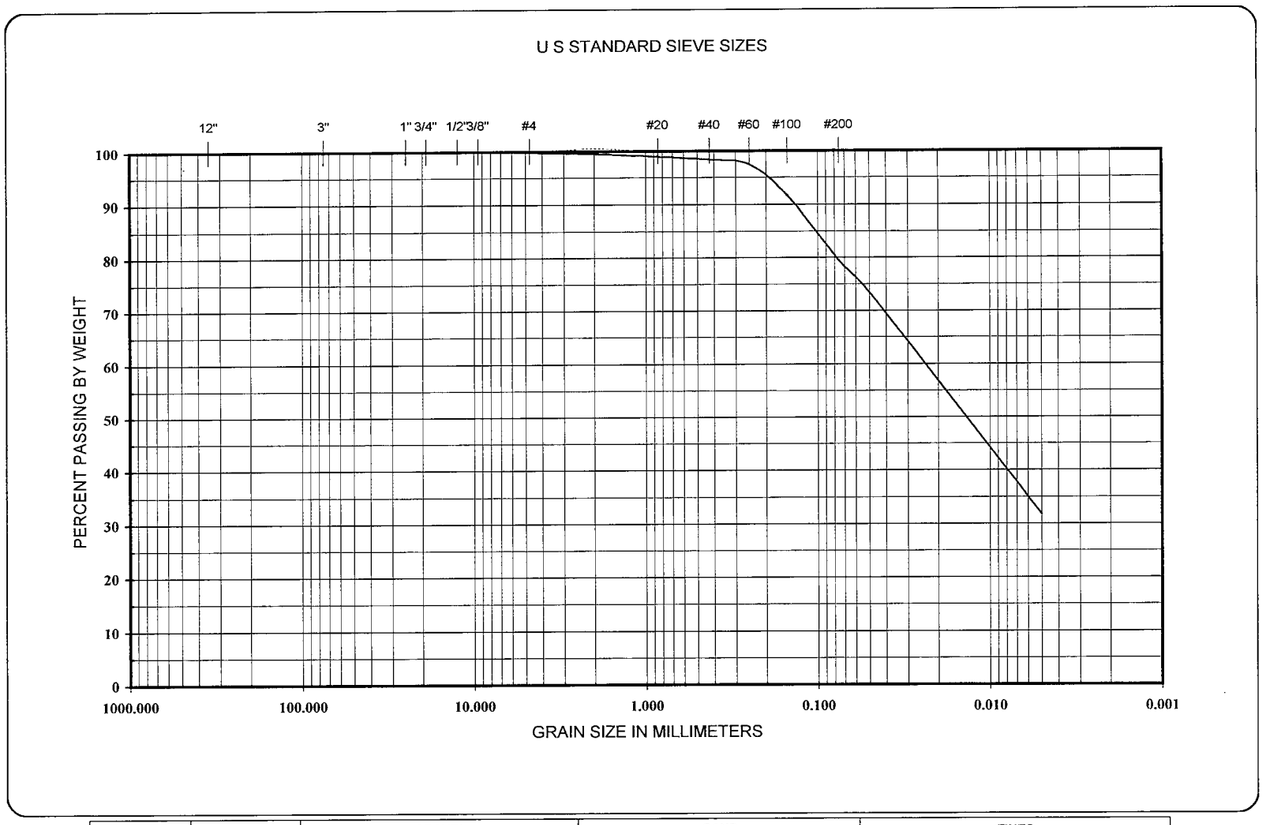
	BENTS B1	B2									
100 YR	792.1	791.5									

Comparison of DSE to Hydraulics Unit theoretical scour:
The DSE is based on the Bridge Survey & Hydraulic Design Report dated 12/15/05

DSE determined by: Chris M Wally **Date:** 8/11/2006

SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL

Bed or Bank	Bed	Bed	Bed	Bed	Bed	Bank	Bank
Sample No.	SS-5	SS-14	SS-15	SS-9	SS-18	SS-4	SS-12
Retained #4	0%	10%	6%	9%	0%	9%	0%
Passed #10	100%	87%	91%	53%	100%	87%	98%
Passed #40	98%	78%	75%	17%	98%	55%	86%
Passed #200	79%	58%	49%	7%	91%	29%	70%
Coarse Sand	2%	13%	24%	74%	3%	48%	16%
Fine Sand	24%	24%	28%	14%	9%	21%	17%
Silt	42%	42%	26%	8%	50%	16%	20%
Clay	32%	21%	22%	4%	38%	15%	47%
LL	41	35	31	20	45	30	48
PI	13	12	9	NP	14	7	13
AASHTO	A-7-6 (11)	A-6 (5)	A-4 (2)	A-1-b (0)	A-7-5 (16)	A-2-4 (0)	A-7-5 (10)
Station	237+87	237+89	237+92	238+78	238+80	237+28	239+42
Offset	16' LT	24' RT	70' RT	16' LT	70' RT	18' LT	14' LT
Depth	0.0'-1.5'	4.7'-6.2'	4.5'-6.0'	6.0'-7.5'	6.3'-7.8'	8.5'-10.0'	6.0'-7.5'



BOULDERS	COBBLES	GRAVEL		SAND		FINES	
		COARSE	FINE	COARSE	FINE	SILT	CLAY

BORING NO.	SAMPLE NO.	ELEVATION OR DEPTH	NMC %	LL	PL	PI	CLASSIFICATION
B1-D	SS-5	0.0-1.5	69.5	41	28	13	ALLUVIAL: Fine Sandy, Silty CLAY (A-7-6)

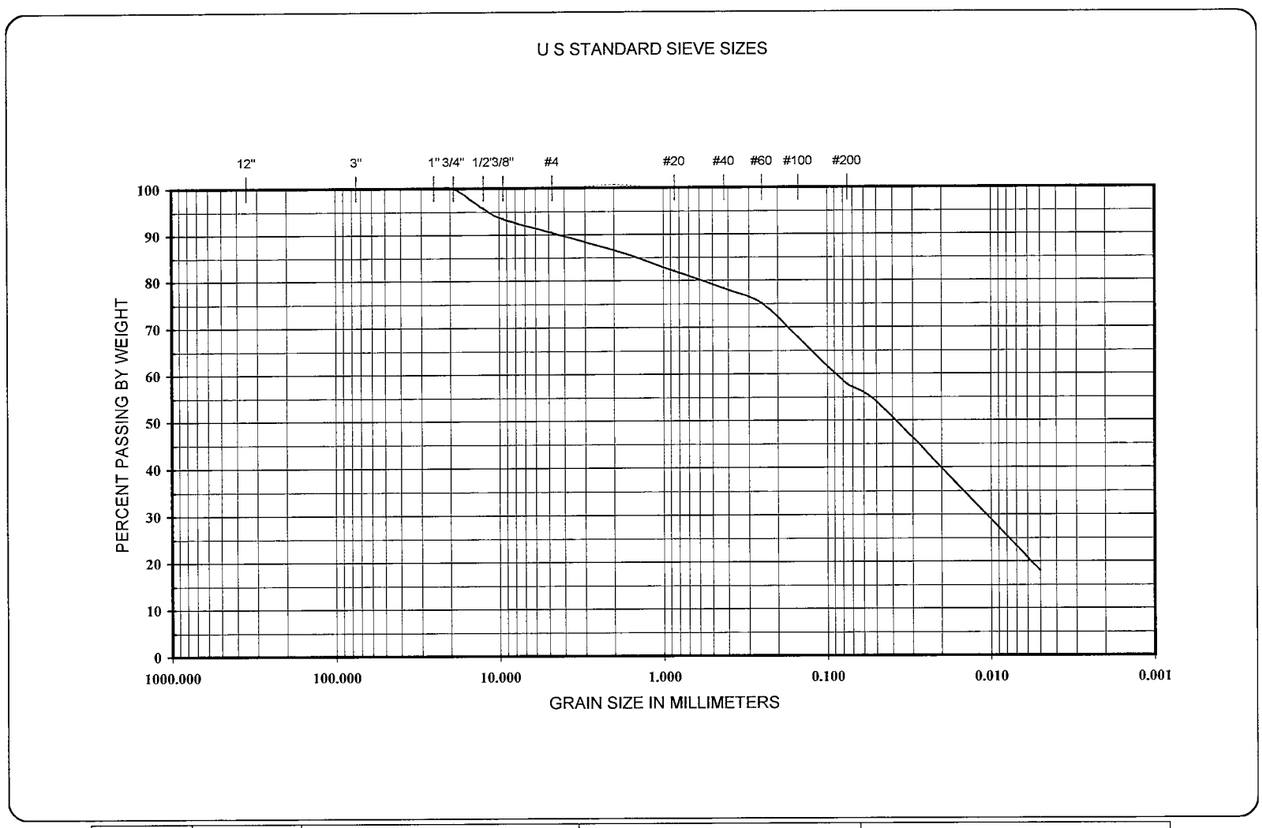
GRAIN SIZE DISTRIBUTION

Bridge No. 65 (U-3615B)

071-06-019

7/31/2006

TRIGON



BOULDERS	COBBLES	GRAVEL		SAND		FINES	
		COARSE	FINE	COARSE	FINE	SILT	CLAY

BORING NO.	SAMPLE NO.	ELEVATION OR DEPTH	NMC %	LL	PL	PI	CLASSIFICATION
B1-E	SS-14	4.7-6.2	43.4	35	23	12	ALLUVIAL: Coarse to Fine Sandy, Silty CLAY (A-6)

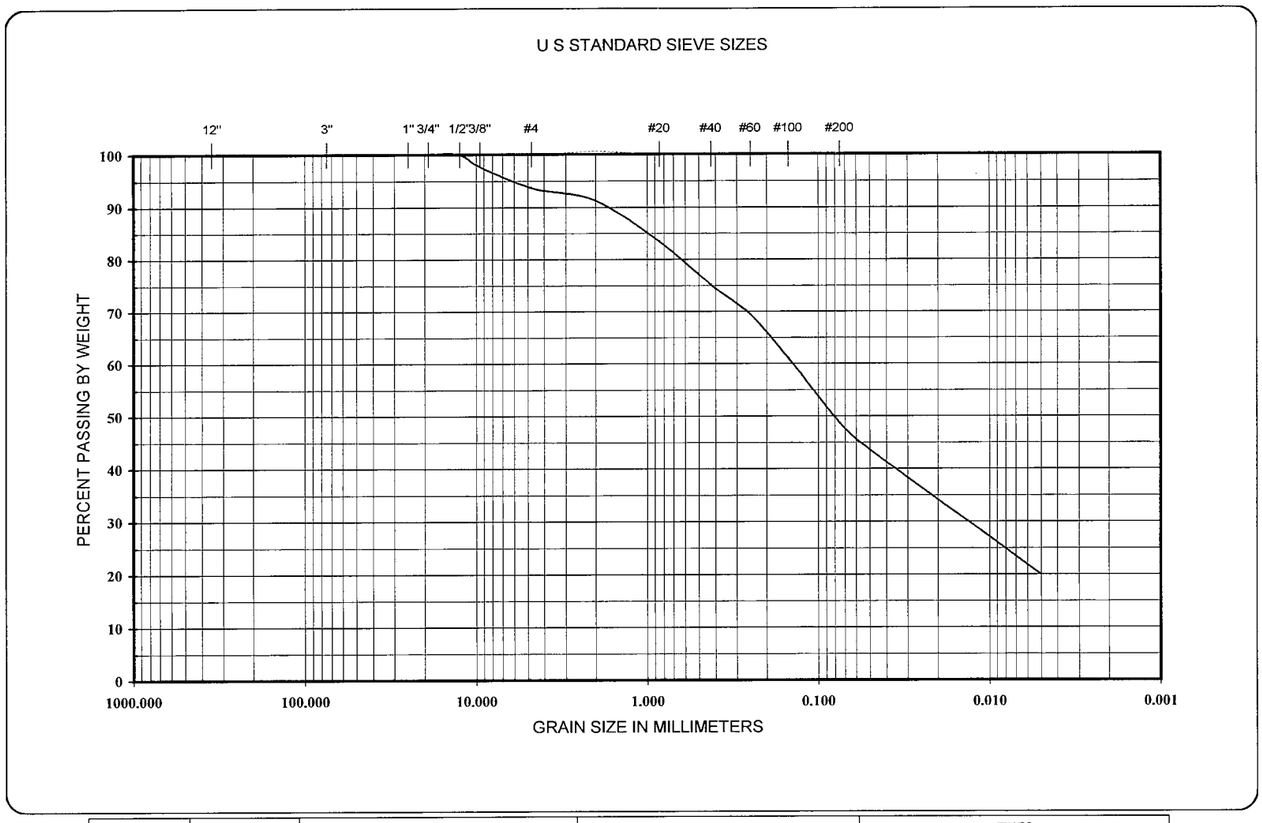
GRAIN SIZE DISTRIBUTION

Bridge No. 65 (U-3615B)

071-06-019

7/31/2006

TRIGON



BOULDERS	COBBLES	GRAVEL		SAND		FINES	
		COARSE	FINE	COARSE	FINE	SILT	CLAY

BORING NO.	SAMPLE NO.	ELEVATION OR DEPTH	NMC %	LL	PL	PI	CLASSIFICATION
B1-B	SS-15	4.5-6.0	28.1	31	22	9	ALLUVIAL: Clayey, Fine to Coarse Sandy SILT (A-4)

GRAIN SIZE DISTRIBUTION

Bridge No. 65 (U-3615B)

071-06-019

7/31/2006

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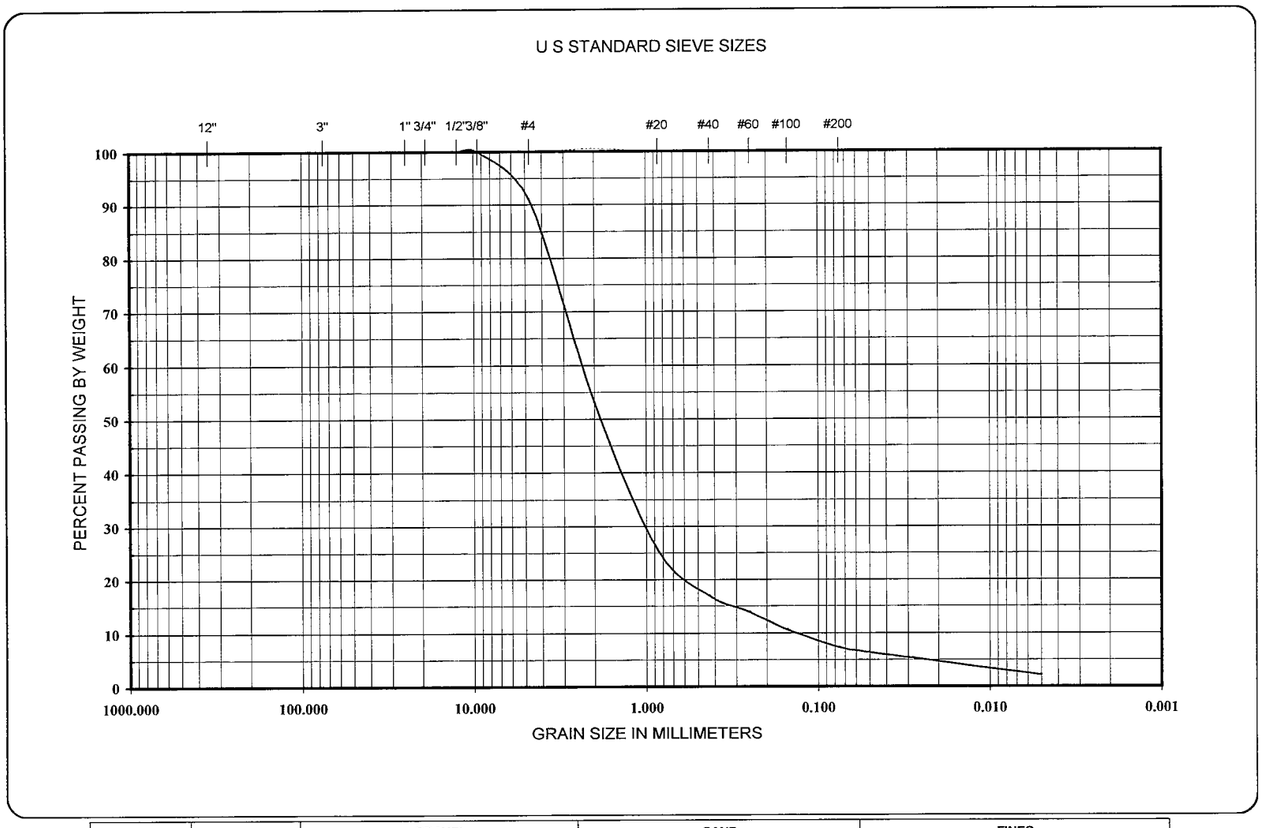


BOULDERS	COBBLES	GRAVEL		SAND		FINES	
		COARSE	FINE	COARSE	FINE	SILT	CLAY

BORING NO.	SAMPLE NO.	ELEVATION OR DEPTH	NMC %	LL	PL	PI	CLASSIFICATION
B2-D	SS-9	6.0-7.5	NA	20	NP	NP	ALLUVIAL: Fine to Coarse SAND and GRAVEL (A-1-b)

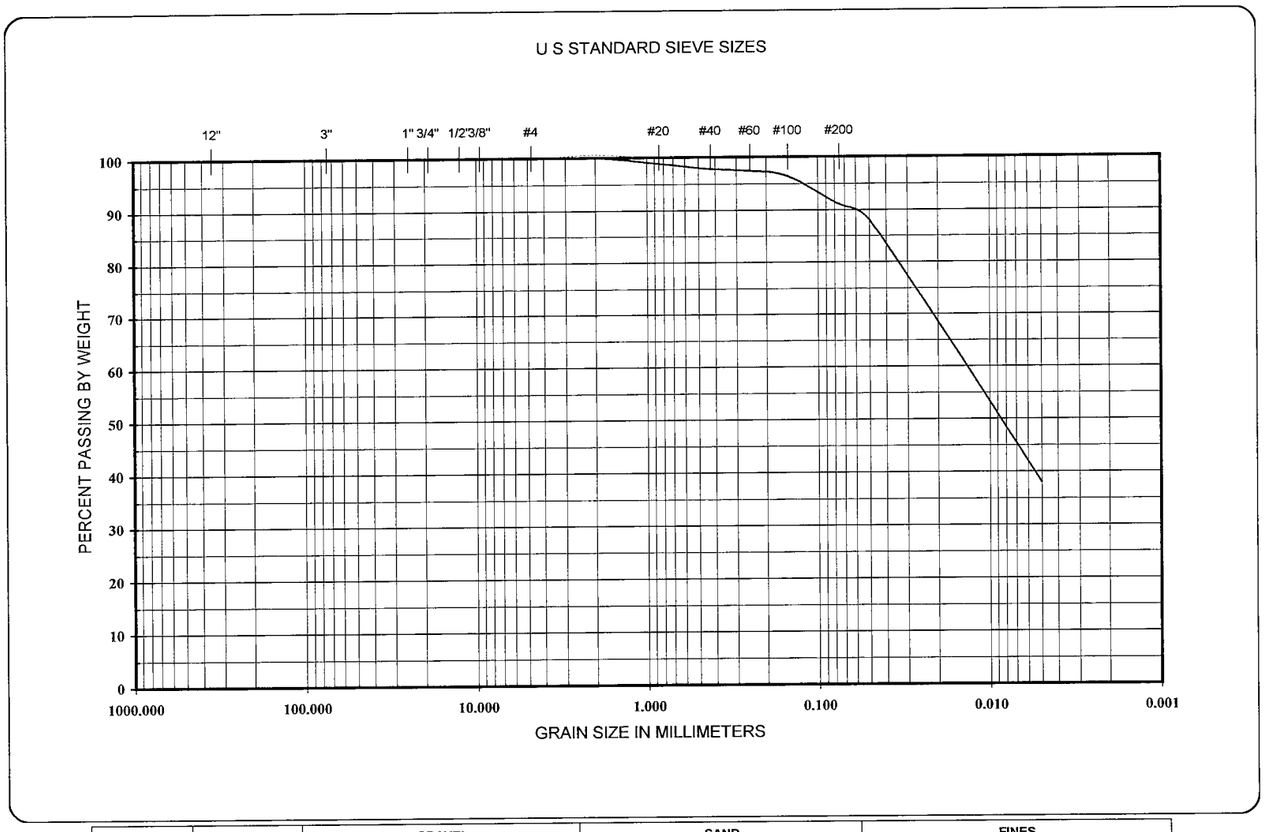
GRAIN SIZE DISTRIBUTION

Bridge No. 65 (U-3615B)

071-06-019

7/31/2006

TRIGON



BOULDERS	COBBLES	GRAVEL		SAND		FINES	
		COARSE	FINE	COARSE	FINE	SILT	CLAY

BORING NO.	SAMPLE NO.	ELEVATION OR DEPTH	NMC %	LL	PL	PI	CLASSIFICATION
B2-B	SS-18	6.3-7.8	71.5	45	31	14	ALLUVIAL: Silty CLAY (A-7-5)

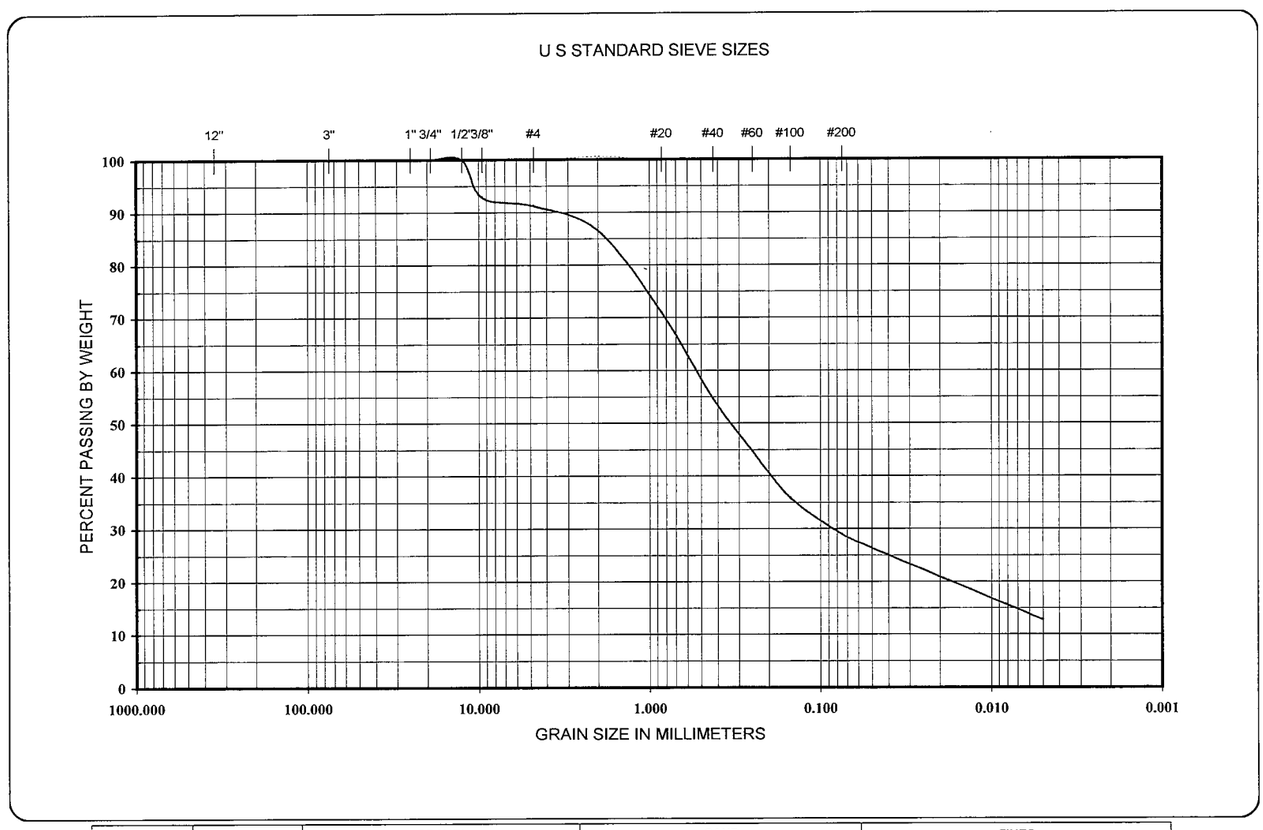
GRAIN SIZE DISTRIBUTION

Bridge No. 65 (U-3615B)

071-06-019

7/31/2006

TRIGON



BOULDERS	COBBLES	GRAVEL		SAND		FINES	
		COARSE	FINE	COARSE	FINE	SILT	CLAY

BORING NO.	SAMPLE NO.	ELEVATION OR DEPTH	NMC %	LL	PL	PI	CLASSIFICATION
EB1-D	SS-4	8.5-10.0	NA	30	23	7	ALLUVIAL: Clayey, Silty, Fine to Coarse SAND (A-2-4) with some gravel

GRAIN SIZE DISTRIBUTION

Bridge No. 65 (U-3615B)

071-06-019

7/31/2006

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GRAIN SIZE DISTRIBUTION

Bridge No. 65 (U-3615B)

071-06-019

7/31/2006

BORING NO.	SAMPLE NO.	ELEVATION OR DEPTH	NMC %	LL	PL	PI	CLASSIFICATION
EB2-D	SS-12	6.0-7.5	31.3	48	35	13	ALLUVIAL: Silty, Coarse to Fine Sandy CLAY (A-7-5)

SITE PHOTOGRAPHS
State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) Over Oak Hollow Lake
Haywood County, North Carolina
Page 1 of 5

Photograph 1 – View of Existing Bridge Looking Upstation

Photograph 2 – View Along Left Side of Proposed/Existing Bridge Looking Upstation

SITE PHOTOGRAPHS
State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) Over Oak Hollow Lake
Haywood County, North Carolina
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Photograph 3 – View Approximately 31' Left of -L- Looking Upstation

Photograph 4 – View Approximately Along -L- Center Line Looking Upstation

Photograph 5 – View Approximately 50' Right of -L- Looking Upstation

Photograph 6 – View Along End Bent-1 From Left to Right

SITE PHOTOGRAPHS
State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) Over Oak Hollow Lake
Haywood County, North Carolina

Photograph 7 – View Along Bent-1 From Left to Right

Photograph 8 – View Along Bent-2 From Left to Right

SITE PHOTOGRAPHS
State Project No. 34962.1.1 TIP No. U-3615B
Replace Bridge No. 65 on SR 1820 (Skeet Club Road) Over Oak Hollow Lake
Haywood County, North Carolina
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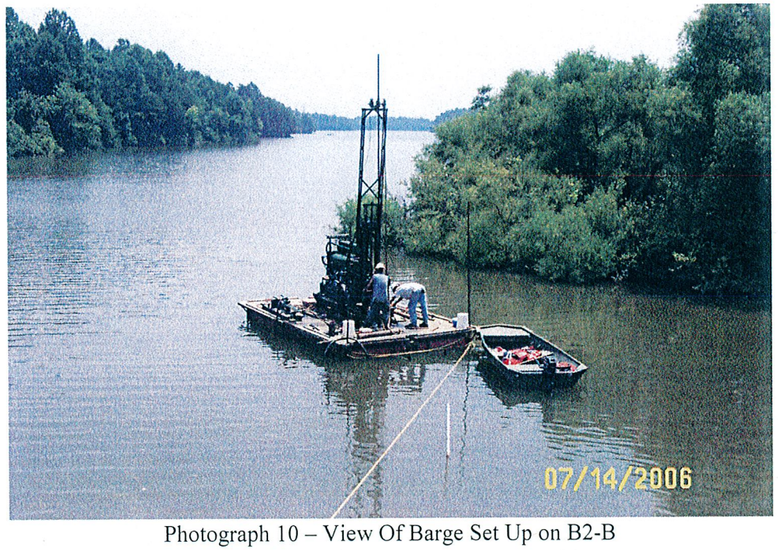
Photograph 9 – View Along End Bent-2 From Left to Right



Photograph 10 – View Of Barge Set Up on B2-B