

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5525	1	21

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. R-5525 F.A. PROJ. _____

COUNTY WATAUGA

PROJECT DESCRIPTION BLOWING ROCK POST ACUTE CARE
FACILITY ACCESS ROAD / US 321

SITE DESCRIPTION BRIDGE ON SUMMIT MEADOWS DRIVE OVER
MIDDLE FORK BETWEEN US 321 AND DEAD END

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PERSONNEL
NORVILLE, C. V.

HAMM, J. R.

HUNSBERGER, W. S.

EVANS, T. E.

TRIGON

HPC

INVESTIGATED BY T.E.E. / W.S.H.

CHECKED BY NORVILLE, C. N.

SUBMITTED BY FALCON

DATE SEPTEMBER 2013

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN ACCORDANCE WITH THE RULES OF THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT 1929 FOSTER BLVD. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

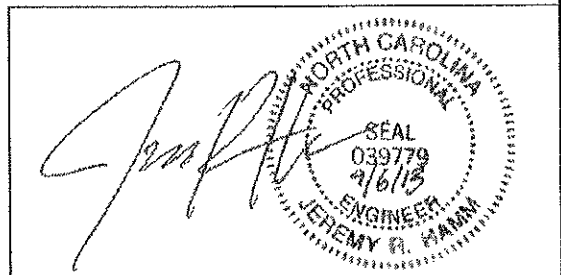
GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND LOCATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORIES OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INDICATED 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, ON BEHALF 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 SAFEGUARD 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.


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

DRAWN BY: T.E.E. / J.R.H.



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

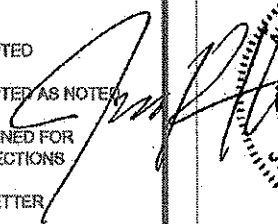
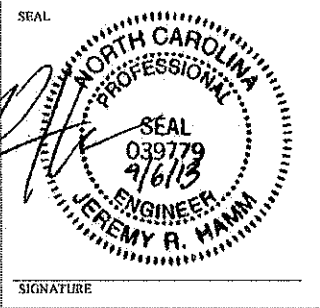
ROCK DESCRIPTION		TERMS AND DEFINITIONS	
<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>		<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARGILLACEOUS - 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 IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>	
		<p>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</p>	
WEATHERED ROCK (WR)		<p>FINE TO COARSE GRAIN HOMOGENEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p>	
CRYSTALLINE ROCK (CR)		<p>FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.</p>	
NON-CRYSTALLINE ROCK (NCR)		<p>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>	
COASTAL PLAIN SEDIMENTARY ROCK (CP)	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. <i>IF TESTED, WOULD YIELD SPT REFUSAL.</i>		
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES > 100 BPF.</i>		
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. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF.</i>		
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 GEOLOGIST'S 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. GROUDES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.		
MEDIUM HARD	CAN BE GROUDED OR GROUDED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.		
SOFT	CAN BE GROUDED OR GROUDED 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		BEDDING	
	TERM		THICKNESS
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	> 4 FEET
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET
CLOSE	0.16 TO 1 FEET	VERY THINLY BEDDED	0.03 - 0.16 FEET
VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET
VERY CLOSE	LESS THAN 0.16 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.		
		BENCH MARK:	
		ELEVATION: FT.	
NOTES:			
FIAD - FILLED IMMEDIATELY AFTER DRILLING			

FOUNDATION RECOMMENDATIONS

WBS # N/A DESCRIPTION Bridge on Summit Meadows Drive over Middle
 T.I.P. NO. R-5525 Fork Between US 321 and Dead End
 COUNTY Watauga
 STATION 11+00.19

N.C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 GEOTECHNICAL ENG. UNIT-WRO

- ACCEPTED
- ACCEPTED AS NOTED
- RETURNED FOR CORRECTIONS
- SEE LETTER

BY: Jonathan Almond, PE

DATE: 10/09/2013

	INITIALS	DATE
DESIGN	JRH	8/30/2013
CHECK	CVN	8/30/2013
APPROVAL		

	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS DETAILS
END BENT NO. 1	10+49.00 -L-	Cap on HP 12x53 Steel Piles	75 tons/pile	Average Bottom of Cap Elev. = 3419.05 ft Length of Pile = 15 ft Number of Vertical Piles = 11 Pile Spacing = 6 feet 6 inches
BENT NO. 2	11+00.19 -L-	Cap on Drilled-in HP 14x73 Steel Piles	105 tons/pile	Average Bottom of Cap Elev. = 3420.47 ft Length of Pile = 20 ft Number of Vertical Piles = 13 Pile Spacing = 5 feet 1 inches
END BENT NO. 2	11+51.38 -L-	Cap on HP 12x53 Steel Piles	75 tons/pile	Average Bottom of Cap Elev. = 3422.12 ft Length of Pile = 10 ft ← Number of Vertical Piles = 11 Pile Spacing = 6 feet 6 inches

20 ft (L) & 10 ft (R)

TIP # R-5525

County Watauga

FOUNDATION RECOMMENDATION NOTES ON PLANS

1. For Piles, see Section 450 of the Standard Specifications.
2. Piles at End Bents No. 1 and 2 are designed for a factored resistance of 75 tons per pile.
3. Drive piles at End Bents No. 1 and 2 to a required driving resistance of 125 tons per pile.
4. Piles at Bent No. 1 are designed for a factored resistance of 105 tons per pile.
5. Drive piles at Bent No. 1 to a required driving resistance of 175 tons per pile.
6. Pile excavation is required to install piles at Bent No. 1. Excavate holes at pile locations to elevation 3400 feet. For pile excavation see Section 450 of the Standard Specifications.
7. Pile excavation is required to install piles at End Bent No.2. Excavate holes at pile locations to elevation 3412 feet. For pile excavation see Section 450 of the Standard Specifications.
8. Concrete is required to fill holes for pile excavation at Bent No. 1 and End Bent No. 2.
9. Install Piles at Bent No. 1 to a tip elevation no higher than 3400 feet.
10. Steel H-pile points are required for steel H-piles at End Bent No. 1. For steel points, see Section 450 of the Standard Specifications.
11. The scour critical elevation for Bent No. 1 is elevation 3407 feet. Scour critical elevations are used to monitor possible scour problems during the life of the structure.

Excavate holes at pile locations to elevation 3410 at the left side and elevation 3412 at the right side of end bent.

FOUNDATION RECOMMENDATION COMMENTS

1. The average factored axial load at End Bents No. 1 and 2 is 75 tons per pile.
2. The maximum factored axial load at Bent No. 1 is 105 tons per pier.
3. The design scour elevation at Bent No. 1 is 3410 feet.

N.C. DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS GEOTECHNICAL ENG. UNIT-WRO	
<input type="checkbox"/> ACCEPTED	
<input checked="" type="checkbox"/> ACCEPTED AS NOTED	
<input type="checkbox"/> RETURNED FOR CORRECTIONS	
<input type="checkbox"/> SEE LETTER	
BY: <u>Jonathan Almond, PE</u>	
DATE: <u>10/09/2013</u>	

PILE PAY ITEMS

(Revised 8/15/12)

WBS ELEMENT N/A DATE 8/30/2013
 TIP NO. R-5525 DESIGNED BY JRH
 COUNTY Watauga CHECKED BY CVN
 STATION 11+00.19
 DESCRIPTION Bridge on Summit Meadows Drive over Middle Fork Between US 321 and Dead End

NUMBER OF BENTS WITH PILES 1
 NUMBER OF PILES PER BENT 13
 NUMBER OF END BENTS WITH PILES 1
 NUMBER OF PILES PER END BENT 11

Only required for "Predrilling for Piles" & "Pile Excavation" pay items

Bent # or End Bent #	PILE PAY ITEM QUANTITIES						PDA Testing (per each)		
	Steel Pile Points (yes/no)	Pipe Pile Plates (yes/no/maybe)	Predrilling For Piles (per linear ft)	Pile Redrives (per each)	*Pile Excavation (per linear ft)				
					In Soil	Not In Soil			
End Bent No. 1	yes no				65	130	X		
Bent No. 1	no				30	35			
End Bent No. 2	no				80	85			
TOTALS			0	0	-95	100	210	215	0

Notes:

Blanks or "no" represent quantity of zero.

If steel pile points are required, calculate quantity of "Steel Pile Points" as equal to the number of steel piles.

If pipe pile plates are or may be required, calculate the quantity of "Pipe Pile Plates" as equal to the number of pipe pile.

Show quantity of "PDA Testing" on the plans as total only.

If quantity of "PDA Testing" is 3 or less, reference "Pile Driving Criteria" provision in PDA notes and plans and include "Pile Driving Criteria" provision in the contract.

N.C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 GEOTECHNICAL ENG. UNIT-WRO

ACCEPTED

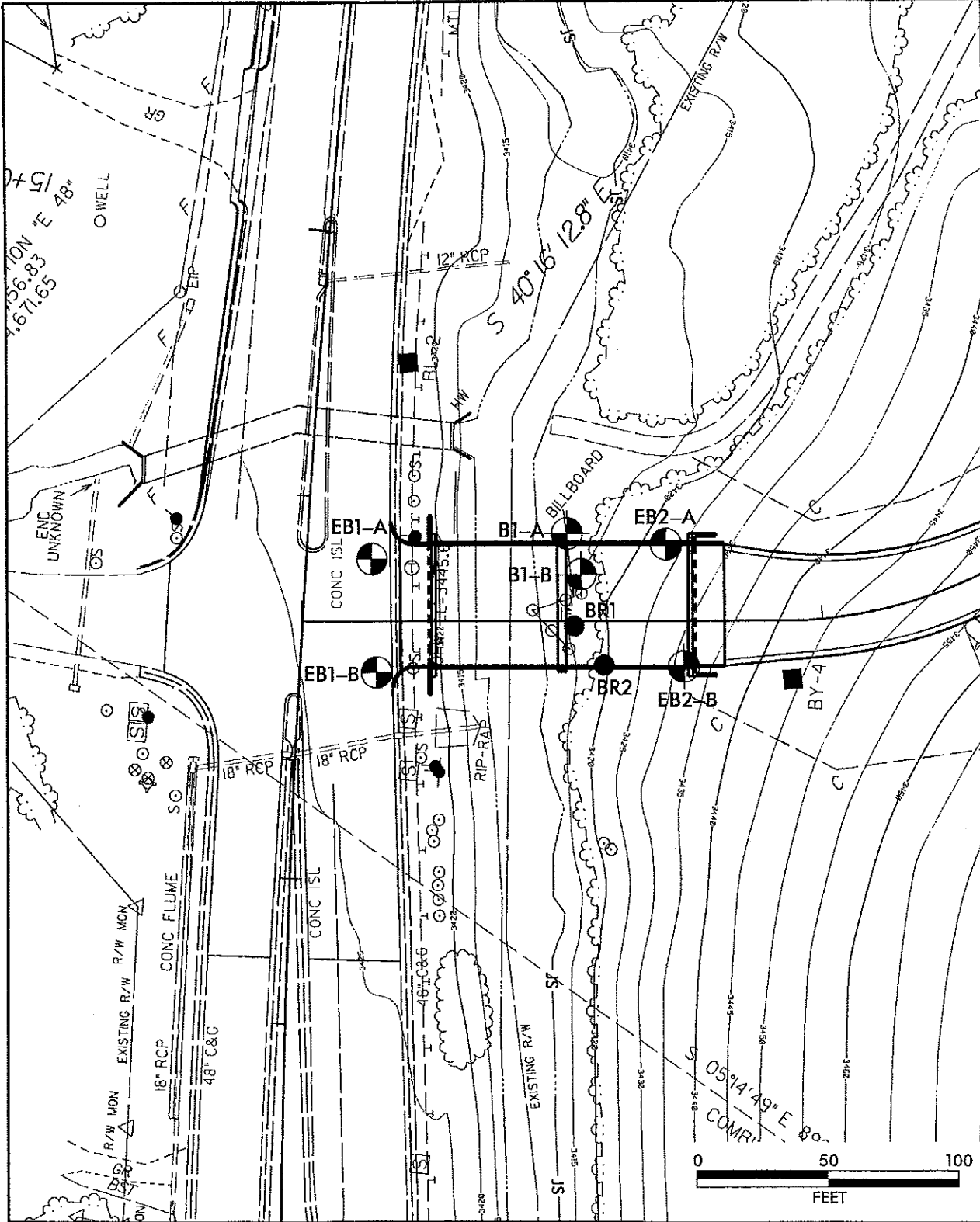
ACCEPTED AS NOTED

CORRECTIONS

___ SEE LETTER

BY: Jonathan Almond, PE

DATE: 10/09/2013



NOTES:

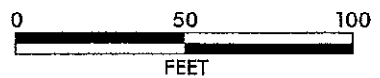
• PLANS ADOPTED FROM ELECTRONIC FILES PROVIDED BY THE LOUIS BERGER GROUP, INC. IN JUNE 2013.



FALCON ENGINEERING, INC.
 1210 TRINITY ROAD, SUITE 110
 RALEIGH, NC 27607
 PHONE: 919.871.0800
 FAX: 919.871.0803

SITE PLAN

BLOWING ROCK POST ACUTE CARE FACILITY
 ACCESS ROAD 2/15 321
 WATAUGA COUNTY, NORTH CAROLINA
 TIP: R-5525, FALCON PROJECT NO. G13036.00





NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 7

WBS N/A		TIP R-5525		COUNTY WATAUGA		GEOLOGIST Hunsberger, W. S.								
SITE DESCRIPTION Blowing Rock Post Acute Care Facility Access Road / US 321							GROUND WTR (ft)							
BORING NO. EB1-A		STATION 10+27		OFFSET 24 ft LT		ALIGNMENT -L-								
COLLAR ELEV. 3,424.0 ft		TOTAL DEPTH 30.1 ft		NORTHING 884,011		EASTING 1,214,776								
DRILL RIG/HAMMER EFF./DATE Mobile B-57				DRILL METHOD HSA		HAMMER TYPE Automatic								
DRILLER Gower, S.		START DATE 04/25/13		COMP. DATE 04/25/13		SURFACE WATER DEPTH N/A								
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT				SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75					100
3425												3,424.0	EXISTING PAVEMENT	0.0
	3,422.5	1.5										3,422.5	6" BITUMINOUS CONCRETE	1.5
	3,420.5	3.5	15	14	9								12" AGGREGATE BASE COURSE	
3420	3,420.5	3.5	10	8	10							3,419.3	ROADWAY EMBANKMENT	
	3,418.0	6.0										3,419.3	GRAY AND TAN, CLAYEY CSE. SAND (A-2-6) W/ GRAVEL	4.7
	3,415.5	8.5	6	6	11							3,418.0	ROADWAY EMBANKMENT	
3415	3,415.5	8.5										3,418.0	GRAY AND TAN, CLAYEY F. SAND (A-2-4) W/ GRAVEL	8.0
	3,410.5	13.5	100/0.4									3,414.0	ROADWAY EMBANKMENT	
3410	3,410.5	13.5	1	1	7							3,414.0	GRAY AND TAN, CLAYEY SAND (A-2-4) W/ GRAVEL (NOTE: INFLATED BLOW COUNT DUE TO PRESENCE OF GRAVEL)	10.0
	3,405.5	18.5											ALLUVIAL	
3405	3,405.5	18.5	100/0.3									3,406.5	DARK GRAY, SILTY MED. SAND (A-2-4) W/ ROCK FRAGMENTS	17.8
	3,400.5	23.5											WEATHERED ROCK	
3400	3,400.5	23.5	100/0.4										LIGHT AND DARK GRAY AND TAN, WEATHERED GRANITIC GNEISS	
	3,395.5	28.5												
3395	3,395.5	28.5	62	38/0.1								3,393.9		30.1
													Boring Terminated at Elevation 3,393.9 ft in Weathered Rock	

NCDOT BORE SINGLE R-5525 BLOWING ROCK_GINTLOGS.GPJ NC_DOT.GDT 8/30/13



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS N/A		TIP R-6525		COUNTY WATAUGA		GEOLOGIST Hunsberger, W. S.										
SITE DESCRIPTION Blowing Rock Post Acute Care Facility Access Road / US 321							GROUND WTR (ft)									
BORING NO. EB1-B		STATION 10+29		OFFSET 19 ft RT		ALIGNMENT -L-		0 HR. Dry								
COLLAR ELEV. 3,424.0 ft		TOTAL DEPTH 40.5 ft		NORTHING 883,982		EASTING 1,214,744		24 HR. FIAD								
DRILL RIG/HAMMER EFF./DATE Mobile B-57				DRILL METHOD HSA		HAMMER TYPE Automatic										
DRILLER Gower, S.		START DATE 04/25/13		COMP. DATE 04/25/13		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
3425														3,424.0	EXISTING PAVEMENT	0.0
	3,423.5	0.5	10	9	5	14							D	3,422.2	7" BITUMINOUS CONCRETE 14" AGGREGATE BASE COURSE	1.8
3420	3,420.5	3.5	7	6	6	12							D		ROADWAY EMBANKMENT TAN AND GRAY, SILTY MED. TO CSE. SAND (A-2-4) W/ GRAVEL	
	3,418.0	6.0	4	8	3	11							D	3,417.0		7.0
3415	3,415.5	8.5	1	1	4	5							M		ALLUVIAL DARK BROWN, SILTY F. SAND (A-2-4) W/ ORGANICS, W/ ROCK FRAGMENTS	
	3,410.5	13.5	3	9	1	10							Sat.	3,409.8		14.2
3405	3,405.5	18.5	59	41/0.2						100/0.7				3,407.0	LIGHT AND DARK GRAY BROWN AND TAN, SILTY CSE. SAND (A-1-b) W/ ROCK FRAGMENTS	17.0
	3,400.5	23.5	100/0.4							100/0.4					WEATHERED ROCK LIGHT AND DARK GRAY BROWN AND TAN, WEATHERED GRANITIC GNEISS	
3395	3,385.5	28.5	12	15	18	33							D	3,397.0	RESIDUAL ORANGE BROWN AND WHITE, SILTY SAND (A-2-4) SAPROLITIC	27.0
	3,390.5	33.5	100/0.5							100/0.5				3,393.0	WEATHERED ROCK TAN BROWN AND WHITE, WEATHERED GRANITIC GNEISS	31.0
3390	3,385.5	38.5	58	42/0.3						100/0.8				3,387.0	GRAY BLACK AND WHITE, WEATHERED GRANITIC GNEISS	37.0
	3,383.5	40.5	60/0.0							60/0.0				3,383.5	Boring Terminated by Auger Refusal at Elevation 3,383.5 ft on Crystalline Rock	40.5

NCDOT BORE SINGLE R-6525 BLOWING ROCK_GINTLOGS.GPJ NC_DOT_GDT 8/30/13



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS N/A		TIP R-5525		COUNTY WATAUGA		GEOLOGIST Hunsberger, W. S.											
SITE DESCRIPTION Blowing Rock Post Acute Care Facility Access Road / US 321							GROUND WTR (ft)										
BORING NO. B1-A		STATION 11+02		OFFSET 33 ft LT		ALIGNMENT -L-	0 HR. 4.1										
COLLAR ELEV. 3,414.0 ft		TOTAL DEPTH 27.8 ft		NORTHING 883,960		EASTING 1,214,831	24 HR. FIAD										
DRILL RIG/HAMMER EFF./DATE Mobile B-57				DRILL METHOD HSA		HAMMER TYPE Automatic											
DRILLER Gower, S.		START DATE 04/29/13		COMP. DATE 04/29/13		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION				
			0.5ft	0.5ft	0.5ft	0	25	50	75	100			ELEV. (ft)	DEPTH (ft)			
3415														3,414.0	0.0	4" TOPSOIL	
	3,413.0	1.0	WOH 1 1			.....						M		3,411.0	3.0	ALLUVIAL DARK BROWN AND GRAY, SILTY F. SAND (A-2-4) W/ ROCK FRAGMENTS, W/ ORGANICS
3410	3,410.5	3.5	6	54	46/0.3	.....								3,408.5	5.5	WEATHERED ROCK GRAY TAN AND BROWN, WEATHERED GRANITIC GNEISS
	3,408.0	6.0	100/0.4			.....								3,405.9	8.1	LIGHT AND DARK GRAY AND TAN, WEATHERED GRANITIC GNEISS
3405	3,405.9	8.1	60/0.0			.....								3,401.9	12.1	CRYSTALLINE ROCK TAN GRAY AND WHITE, MOD. SEV. TO MOD. WEATHERED, MED. HARD TO HARD, V. CLOSE TO CLOSELY FRACTURED, GRANITIC GNEISS
3400						.....								3,393.9	20.1	DARK AND LIGHT GRAY AND WHITE, MOD. TO SLIGHTLY WEATHERED, HARD, CLOSE TO MOD. CLOSELY FRACTURED, GRANITIC GNEISS
3395						.....								3,389.9	24.1	DARK AND LIGHT GRAY AND TAN, MOD. SEV. TO MOD. WEATHERED, MOD. HARD TO HARD, V. CLOSE TO CLOSELY FRACTURED, GRANITIC GNEISS
3390						.....								3,386.2	27.8	DARK AND LIGHT GRAY AND WHITE, MOD. TO SLIGHTLY WEATHERED, HARD, CLOSE TO MOD. CLOSELY FRACTURED, GRANITIC GNEISS
																Boring Terminated at Elevation 3,386.2 ft in Crystalline Rock

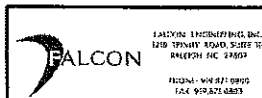
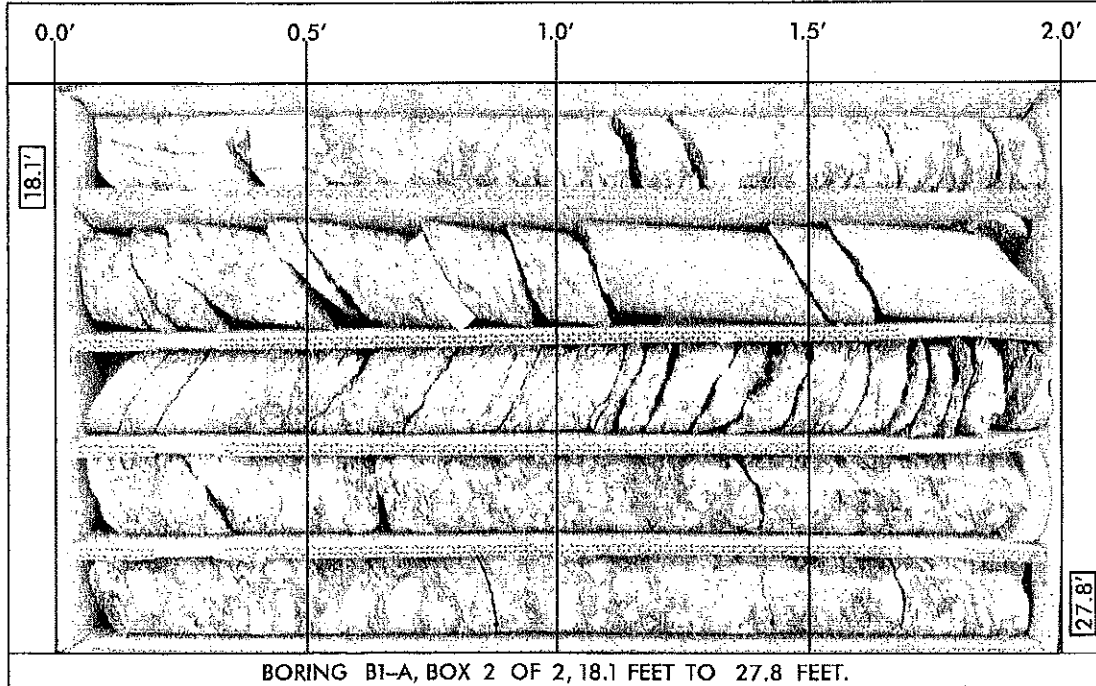
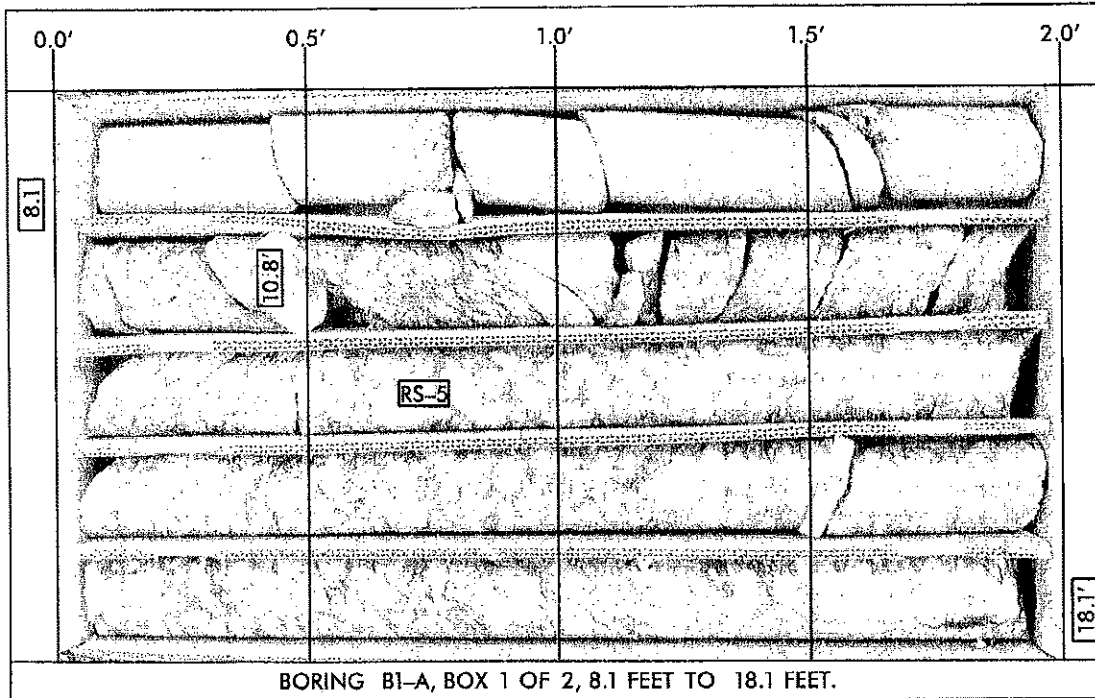
NCDOT BORE SINGLE R-5525 BLOWING ROCK_GINTLOGS.GPJ_NC_DOT.GDT_8/30/13



NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

WBS N/A		TIP R-5625		COUNTY WATAUGA		GEOLOGIST Hunsberger, W. S.						
SITE DESCRIPTION Blowing Rock Post Acute Care Facility Access Road / US 321							GROUND WTR (ft)					
BORING NO. B1-A		STATION 11+02		OFFSET 33 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 3,414.0 ft		TOTAL DEPTH 27.8 ft		NORTHING 883,960		EASTING 1,214,831						
DRILL RIG/HAMMER EFF./DATE Mobile 8-57				DRILL METHOD HSA		HAMMER TYPE Automatic						
DRILLER Gower, S.		START DATE 04/29/13		COMP. DATE 04/29/13		SURFACE WATER DEPTH N/A						
CORE SIZE NQ				TOTAL RUN 19.7 ft								
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	ROD (%)		REC. (%)	ROD (%)			
3405.9	3405.9	8.1	2.7	N=60/0.0 2:21/1.0	(2.7)	(0.9)					Begin Coring @ 8.1 ft CRYSTALLINE ROCK	8.1
	3403.2	10.8	5.0	2:40/1.0 1:43/0.7	100%	33%					TAN GRAY AND WHITE, MOD. SEV. TO MOD. WEATHERED, MED. HARD TO HARD, V. CLOSE TO CLOSELY FRACTURED, GRANITIC GNEISS	12.1
	3398.2	15.8	5.0	2:21/1.0 2:08/1.0 2:45/1.0 3:28/1.0 4:12/1.0	(5.0)	(3.9)					DARK AND LIGHT GRAY AND WHITE, MOD. TO SLIGHTLY WEATHERED, HARD, CLOSE TO MOD. CLOSELY FRACTURED, GRANITIC GNEISS	20.1
	3393.2	20.8	5.0	4:39/1.0 3:30/1.0 4:00/1.0 3:22/1.0 3:31/1.0	(5.0)	(3.6)					DARK AND LIGHT GRAY AND TAN, MOD. SEV. TO MOD. WEATHERED, MOD. HARD TO HARD, V. CLOSE TO CLOSELY FRACTURED, GRANITIC GNEISS	24.1
	3388.2	25.8	2.0	3:49/1.0 2:55/1.0 2:27/1.0 4:12/1.0 5:28/1.0	(2.0)	(2.1)					DARK AND LIGHT GRAY AND WHITE, MOD. TO SLIGHTLY WEATHERED, HARD, CLOSE TO MOD. CLOSELY FRACTURED, GRANITIC GNEISS	27.8
	3386.2	27.8	2.0	5:11/1.0 4:48/1.0	(2.0)	(2.0)					Boring Terminated at Elevation 3,386.2 ft in Crystalline Rock	

NCDOT CORE SINGLE R-5625 BLOWING ROCK_GINTLOGS.GPJ NC_DOT.GDT 8/30/13



ROCK CORE PHOTOS

BLOWING ROCK POST-ACUTE CARE FACILITY
 BRIDGE ON SUMMIT MEADOWS DRIVE OVER
 MIDDLE FORK BETWEEN US 321 AND DEAD END
 WATAUGA COUNTY, NORTH CAROLINA
 TIP: 8-3525, FALCON PROJECT NO. G13036.00



NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

SHEET 12

WBS N/A		TIP R-5525		COUNTY WATAUGA		GEOLOGIST Hunsberger, W. S.											
SITE DESCRIPTION Blowing Rock Post Acute Care Facility Access Road / US 321							GROUND WTR (ft)										
BORING NO. B1-B		STATION 11+07		OFFSET 18 ft LT		ALIGNMENT -1-											
COLLAR ELEV. 3,415.0 ft		TOTAL DEPTH 25.1 ft		NORTHING 883,946		EASTING 1,214,823											
DRILL RIG/HAMMER EFF./DATE Mobile B-57				DRILL METHOD HSA		HAMMER TYPE Automatic											
DRILLER Gower, S.		START DATE 04/26/13		COMP. DATE 04/26/13		SURFACE WATER DEPTH N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
3415	3,414.5	0.5	WOH	1	1									3,415.0	0.0	3" TOPSOIL	
3410	3,411.5	3.5		33	67/0.3									3,410.7	4.3	ALLUVIAL DARK BROWN, SILTY F. SAND (A-2-4) W/ ORGANICS	
	3,409.0	6.0		76	25/0.1									3,405.9	9.1	WEATHERED ROCK LIGHT GRAY BROWN AND TAN, WEATHERED GRANITIC GNEISS	
3405	3,405.9	9.1		60/0.0										3,405.9	9.1	CRYSTALLINE ROCK LIGHT AND DARK GRAY AND WHITE, MOD. TO SLI. WEATHERED. HARD, CLOSE TO MOD. CLOSELY FRACTURED, GRANITIC GNEISS	
3400																	
3395														3,395.9	19.1	TAN GRAY AND WHITE, MOD. SEV TO MOD. WEATHERED, MED. TO MOD. HARD, V. CLOSE TO MOD. CLOSELY FRACTURED, GRANITIC GNEISS	
														3,392.2	22.8		
3390														3,389.9	25.1	LIGHT AND DARK GRAY AND WHITE, MOD. WEATHERED, HARD, V. CLOSE TO CLOSELY FRACTURED, GRANITIC GNEISS	
																	Boring Terminated at Elevation 3,389.9 ft in Crystalline Rock

NCDOT BORE SINGLE R-5525 BLOWING ROCK_GINTLOGS.GPJ NC_DOT_GBT 8/30/13

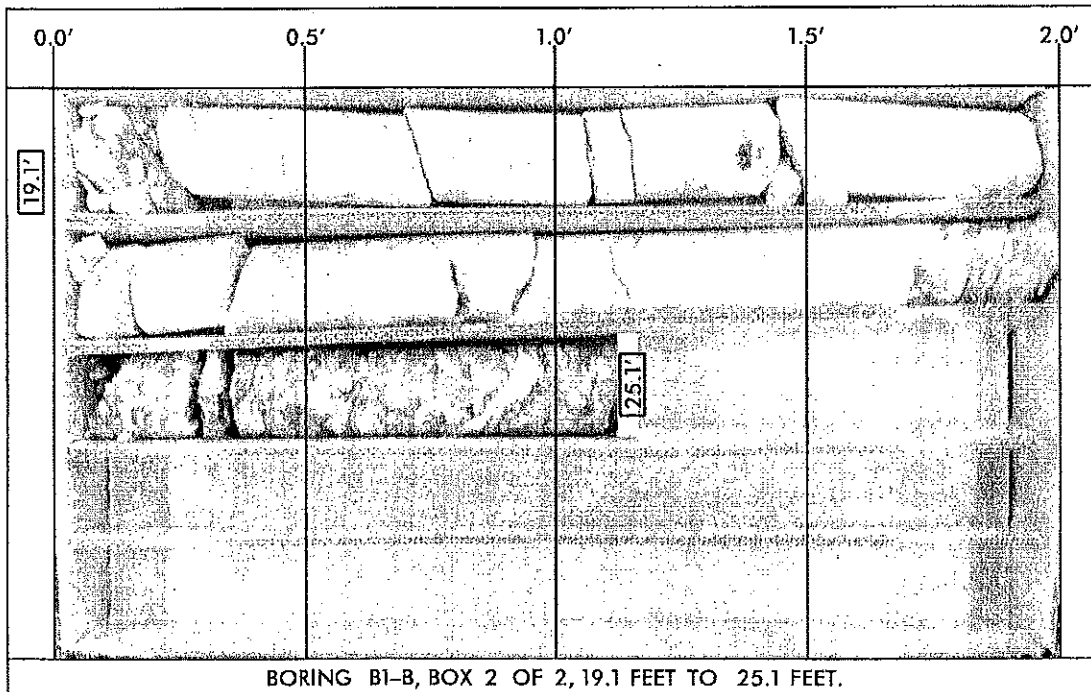
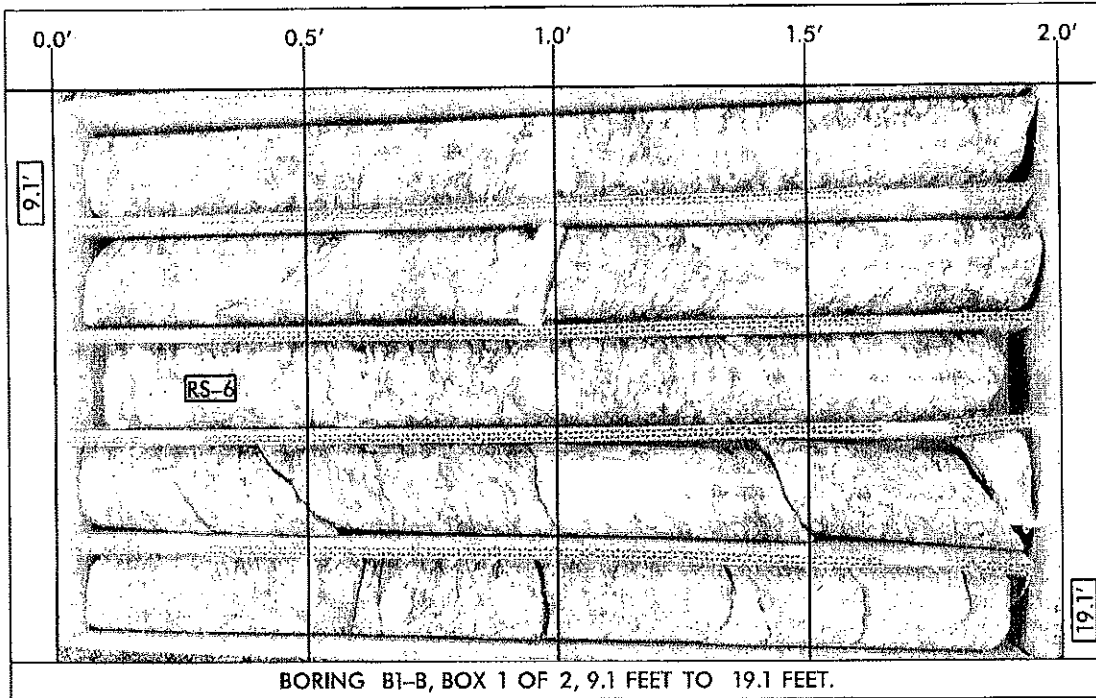


NCDOT GEOTECHNICAL ENGINEERING UNIT CORE BORING REPORT

SHEET 13

WBS N/A		TIP R-5525		COUNTY WATAUGA		GEOLOGIST Hunsberger, W. S.					
SITE DESCRIPTION Blowing Rock Post Acute Care Facility Access Road / US 321							GROUND WTR (ft)				
BORING NO. B1-B		STATION 11+07		OFFSET 18 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 3,415.0 ft		TOTAL DEPTH 25.1 ft		NORTHING 883,946		EASTING 1,214,823					
DRILL RIG/HAMMER EFF./DATE Mobile B-57				DRILL METHOD HSA		HAMMER TYPE Automatic					
DRILLER Gower, S.		START DATE 04/26/13		COMP. DATE 04/26/13		SURFACE WATER DEPTH N/A					
CORE SIZE NQ		TOTAL RUN 18.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		L O G	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	ROD (%)	REC. (%)	ROD (%)			
3405.9											
3405	3,405.9	9.1	3.0	N=60/0.0 3:30/1.0 3:48/1.0 4:42/1.0	(3.0) 100%	(3.0) 100%				3,405.9	9.1
	3,402.9	12.1	5.0	4:02/1.0 3:53/1.0 3:46/1.0 3:27/1.0 3:24/1.0	(4.9) 98%	(4.5) 90%					
3400											
	3,397.9	17.1	5.0	3:43/1.0 2:28/1.0 2:02/1.0 2:59/1.0 2:44/1.0	(4.2) 84%	(2.6) 52%				3,395.9	18.1
3395											
	3,392.9	22.1	3.0	3:52/1.0 3:48/1.0 3:09/1.0	(3.0) 100%	(2.6) 87%				3,392.2	22.8
3390	3,389.9	25.1								3,389.9	25.1

NCDOT CORE SINGLE R-5525 BLOWING ROCK_GINTLOSS.GPJ NC_DOT_GDT_8/30/13



FALCON
 FALCON INVESTIGATIONS, INC.
 1210 TRINITY ROAD, SUITE 100
 RALEIGH, NC 27607
 PHONE: 919.811.0900
 FAX: 919.875.2405

ROCK CORE PHOTOS

BLOWING ROCK FOST ACUTE CARE FACILITY
 BRIDGE ON SUMMIT MEADOWS DRIVE OVER
 MIDDLE FORK BETWEEN US 321 AND DEAD END
 WATAUGA COUNTY, NORTH CAROLINA
 TWP: 8-3525, FALCON PROJECT NO. 013036.00



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS		TIP		COUNTY		GEOLOGIST											
N/A		R-5525		WATAUGA		Hunsberger, W. S.											
SITE DESCRIPTION							GROUND WTR (ft)										
Blowing Rock Post Acute Care Facility Access Road / US 321							0 HR.	23.0									
BORING NO.		STATION		OFFSET		ALIGNMENT											
EB2-A		11+40		29 ft LT		-L-											
COLLAR ELEV.		TOTAL DEPTH		NORTHING		EASTING											
3,424.0 ft		23.6 ft		883,928		1,214,853											
DRILL RIG/HAMMER EFF./DATE				DRILL METHOD		HAMMER TYPE											
CME-550X				HSA		Automatic											
DRILLER		START DATE		COMP. DATE		SURFACE WATER DEPTH											
Cain, J.		05/02/13		05/02/13		N/A											
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION			
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				ELEV. (ft)	DEPTH (ft)		
3425															3,424.0	2" TOPSOIL	0.0
	3,423.0	1.0	4	6	21										3,422.2	RESIDUAL BROWN, F. SANDY SILT (A-4)	1.8
3420	3,420.5	3.5	24	21	23											GRAY TAN AND WHITE, SILTY CSE. SAND (A-1-b) W/ ROCK FRAGMENTS	
	3,418.0	6.0	41	59/0.4											3,417.1		6.9
3415	3,415.5	8.5	32	58	42/0.3											WEATHERED ROCK GRAY BROWN AND WHITE, WEATHERED GRANITIC GNEISS	
	3,410.5	13.5	9	27	45										3,411.5	RESIDUAL GRAY TAN AND WHITE, SILTY SAND (A-2-4) SAPROLITIC	12.5
3410	3,405.5	18.5	100/0.4												3,405.1	WEATHERED ROCK GRAY WHITE AND BROWN, WEATHERED GRANITIC GNEISS	18.9
3405	3,400.5	23.5	60/0.1												3,400.4	Boring Terminated by Auger Refusal at Elevation 3,400.4 ft on Crystalline Rock	23.6

NCDOT BORE SINGLE R-5525 BLOWING ROCK_GNTLOGS.GPJ NC_DOT_GDT 8/30/13



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

SHEET 16

WBS N/A		TIP R-5525		COUNTY WATAUGA		GEOLOGIST Hunsberger, W. S.									
SITE DESCRIPTION Blowing Rock Post Acute Care Facility Access Road / US 321							GROUND WTR (ft)								
BORING NO. EB2-B		STATION 11+47		OFFSET 17 ft RT		ALIGNMENT -L-									
COLLAR ELEV. 3,431.0 ft		TOTAL DEPTH 15.3 ft		NORTHING 883,893		EASTING 1,214,822									
DRILL RIG/HAMMER EFF./DATE Mobile B-57				DRILL METHOD HSA		HAMMER TYPE Automatic									
DRILLER Gower, S.		START DATE 04/24/13		COMP. DATE 04/24/13		SURFACE WATER DEPTH N/A									
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					ELEV. (ft)
3435															
3430	3,430.0	1.0												3,431.0	3" TOPSOIL 0.0
	3,427.5	3.5	1	1	2									3,427.0	RESIDUAL TAN AND BROWN, CLAYEY CSE. SAND (A-2-6) W/ ROCK FRAGMENTS 4.0
			5	27	73/0.4										
3425	3,425.0	6.0								100/0.9				3,424.3	WEATHERED ROCK TAN AND WHITE, WEATHERED GRANITIC GNEISS 6.7
	3,423.3	5.0	100/0.3							60/0.0					
			60/0.0												
3420														3,415.7	CRYSTALLINE ROCK LIGHT AND DARK GRAY GREEN AND WHITE, MOD. SEV. TO SLIGHT WEATHERING, MED. HARD TO MOD. HARD, V. CLOSE TO CLOSELY FRACTURED, GRANITIC GNEISS 15.3
															Boring Terminated at Elevation 3,415.7 ft in Crystalline Rock

NCDOT BORE SINGLE R-5525 BLOWING ROCK_GINTLOGS.GPJ NC_DOT_GDT_8/30/13



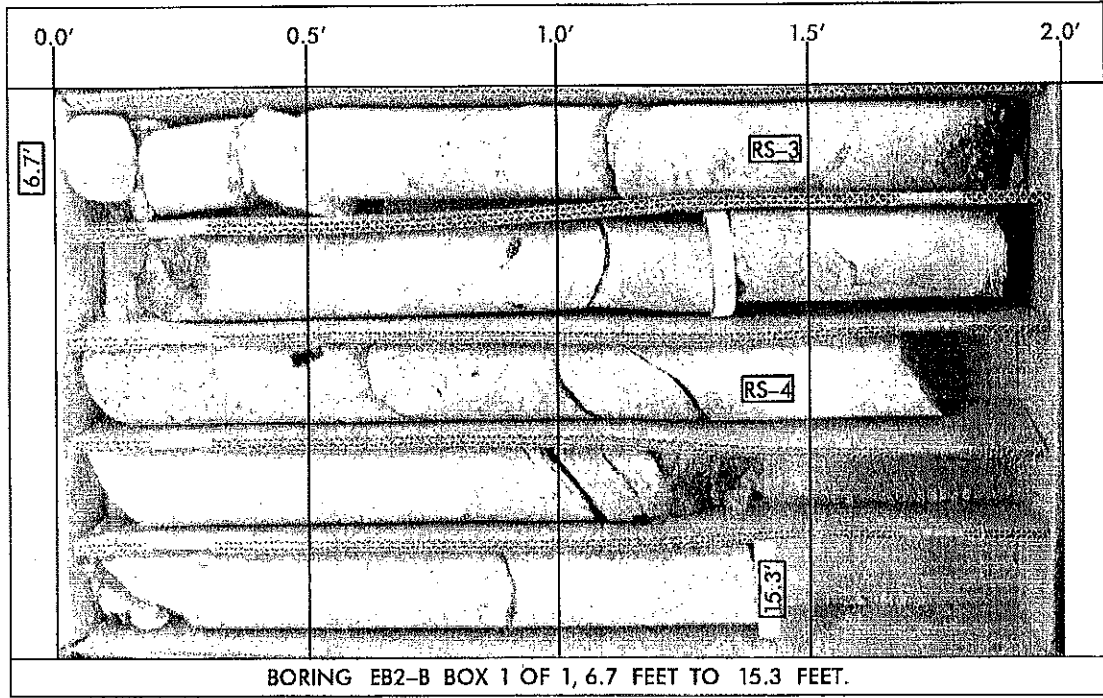
NCDOT GEOTECHNICAL ENGINEERING UNIT

CORE BORING REPORT

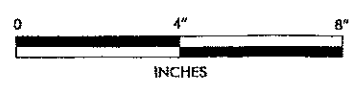
SHEET 17

WBS N/A		TIP R-5525		COUNTY WATAUGA		GEOLOGIST Hunsberger, W. S.					
SITE DESCRIPTION Blowing Rock Post Acute Care Facility Access Road / US 321							GROUND WTR (ft)				
BORING NO. EB2-B		STATION 11+47		OFFSET 17 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 3,431.0 ft		TOTAL DEPTH 15.3 ft		NORTHING 883,893		EASTING 1,214,822					
DRILL RIG/HAMMER EFF./DATE Mobile B-57				DRILL METHOD HSA		HAMMER TYPE Automatic					
DRILLER Gower, S.		START DATE 04/24/13		COMP. DATE 04/24/13		SURFACE WATER DEPTH N/A					
CORE SIZE NQ		TOTAL RUN 8.6 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	ROD (%)	REC. (%)	ROD (%)			
3424.3	3,424.3	6.7	3.6	N=60/0.0 2:46/1.0 2:40/1.0 2:59/1.0 1:45/0.6	(3.4) 94%	(1.6) 44%				Begin Coring @ 6.7 ft CRYSTALLINE ROCK	6.7
3420	3,420.7	10.3	5.0	2:07/1.0 2:38/1.0 2:47/1.0 1:55/1.0 2:01/1.0	(4.8) 96%	(4.1) 82%				LIGHT AND DARK GRAY GREEN AND WHITE, MOD. SEV. TO SLIGHT WEATHERING, MED. HARD TO MOD. HARD, V. CLOSE TO CLOSELY FRACTURED, GRANITIC GNEISS	
	3,415.7	15.3								Boring Terminated at Elevation 3,415.7 ft in Crystalline Rock	15.3

NCDOT CORE SINGLE R-5525 BLOWING ROCK_GINTLOGS.GPJ, NC_DOT.GDT, 8/30/13



BORING EB2-B BOX 1 OF 1, 6.7 FEET TO 15.3 FEET.



 FALCON ENGINEERING, INC.
1200 FENNER ROAD SUITE 110
RALEIGH, NC 27607
PHONE: 919.877.0850
FAX: 919.877.0811

ROCK CORE PHOTOS

BLOWING ROCK POST ACUTE CARE FACILITY
BRIDGE ON SUMMIT MEADOWS DRIVE OVER
MIDDLE FORK BETWEEN US 321 AND DEAD END
WATAUGA COUNTY, NORTH CAROLINA
TIP: R-5525, FALCON PROJECT NO. G13036.00



FALCON ENGINEERING, INC.
 1210 TRINITY ROAD, SUITE 110
 RALEIGH, NORTH CAROLINA 27607
 Phone (919) 871-0800 Fax (919) 871-0803

DCP BORING LOG
 SHEET 19

PROJECT NO. G13036.00		SITE LOCATION Watauga County, North Carolina				LOGGED BY Hunsberger, W. S.									
SITE DESCRIPTION Blowing Rock Post Acute Care Facility Access Road / US 321						GROUND WATER (ft.)									
BORING NO. BR-1		BORING LOCATION 11+00		2 ft RT		0 HR. NM									
COLLAR ELEV. 3416		NORTHING 883,935		EASTING 1,214,806		24 HR. NM									
TOTAL DEPTH 2.70 ft		DRILL MACHINE N/A		DRILL METHOD N/A		HAMMER TYPE 16 lb SR									
DATE STARTED 5/3/2013		COMPLETED 5/3/2013		SURFACE WATER DEPTH											
ELEV. (ft.)	DEPTH (ft.)	DCP BLOW COUNT			DCP & SOUNDING ROD GRAPH					SAMP. NO.	L O G	SOIL AND ROCK DESCRIPTION			
		1.75 in	1.75 in	1.75 in	0	30	60	90	120				150		
3416.00													3416.00	0.00	
	3415														MATERIAL NOT SAMPLED. SOUNDING ROD ONLY.
														3413.30	2.70
															Boring Terminated by Sounding Rod Refusal at 2.7 ft on Weathered Rock.

FALCON DCP LOG SR LOSS NEW FORMAT.GPJ FALCON_FORMAT.GDT 8/30/13



FALCON ENGINEERING, INC.
 1210 TRINITY ROAD, SUITE 110
 RALEIGH, NORTH CAROLINA 27607
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DCP BORING LOG
 SHEET 20

PROJECT NO. G13036.00		SITE LOCATION Watauga County, North Carolina				LOGGED BY Hunsberger, W. S.								
SITE DESCRIPTION Blowing Rock Post Acute Care Facility Access Road / US 321						GROUND WATER (ft.)								
BORING NO. BR-2		BORING LOCATION 11+02		17 ft RT		0 HR. NM								
COLLAR ELEV. 3420		NORTHING 883,917		EASTING 1,214,802		24 HR. NM								
TOTAL DEPTH 2.80 ft		DRILL MACHINE N/A		DRILL METHOD N/A		HAMMER TYPE 16 lb SR								
DATE STARTED 5/3/2013		COMPLETED 5/3/2013		SURFACE WATER DEPTH										
ELEV. (ft.)	DEPTH (ft.)	DCP BLOW COUNT			DCP & SOUNDING ROD GRAPH					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION		
		1.75 in	1.75 in	1.75 in	0	30	60	90	120				150	
3420.00													3420.00 0.00	MATERIAL NOT SAMPLED. SOUNDING ROD ONLY.
													3417.20 2.80	Boring Terminated by Sounding Rod Refusal at 2.8 ft on Weathered Rock.

FALCON DCP LOG - SR LOGS NEW FORMAT.GPJ FALCON_FORMAT.GDT 8/30/13

Louis Berger Group
 1001 Wade Avenue Suite 400
 Raleigh Nc 27605

Project: R-5525
 Pile Factored Loads

14" H Pile Bent

Controlling Pile Factored Loads

For bridge width 63'

Average CS Unit Length on Cap	Max. Axial Load Fy- Kips	Long. Shear Fz- Kips	Long. Moment Mx K-Ft	Max. Long. Shear Fz- Kips	Axial Load Fy- Kips	Long. Moment Mx K-Ft	Max. Trans. Shear Fx- Kips	Axial Load Fy- Kips	Trans. Moment Mz K-Ft
50'	-210	-3	-5	4	-165	5	-2	-100	-20

12" H Pile Bent

Controlling Pile Factored Loads

Average CS Unit Length on Cap	Max. Axial Load Fy- Kips
50'	-144