

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	W-5516	1	32

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY Rowan
 PROJECT DESCRIPTION Old Beatty Ford Road from
West of Bostian Road Intersection to Lentz Road

SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road
over Cold Water Creek

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CAUTION NOTICE

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

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

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

PERSONNEL

Robbie DeLost

Mike Morgan

Harold Morris

INVESTIGATED BY D. Michael Gragg

DRAWN BY Wesley Shuecraft

CHECKED BY Kevin Walker

SUBMITTED BY HDR|ICA

DATE February 27, 2015

REFERENCE: W-5516

PROJECT: 44105

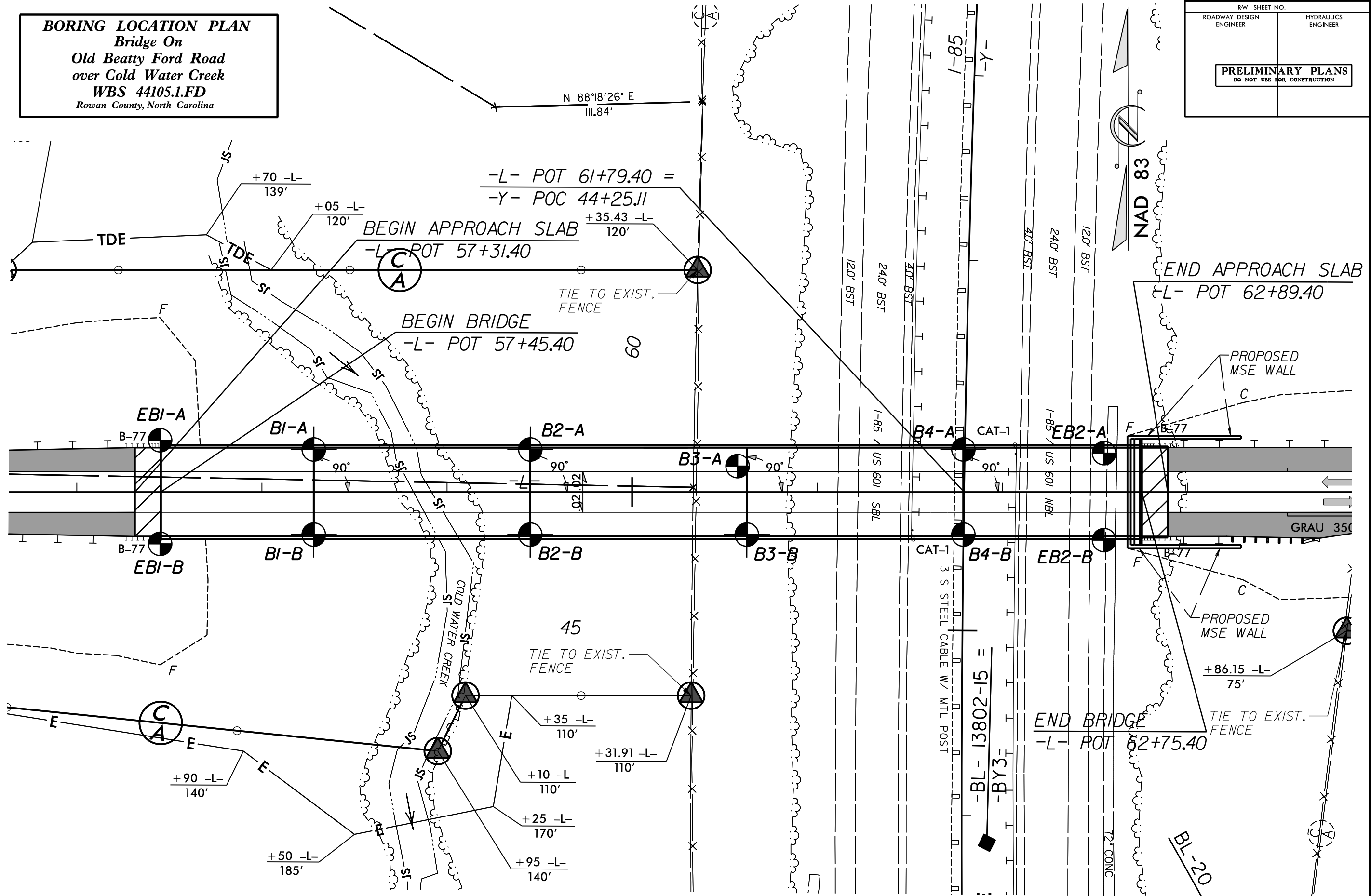


DocuSigned by:

 SIGNATURE DATE
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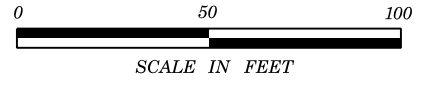
PROJECT REFERENCE NO. W-5516	SHEET NO. 3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

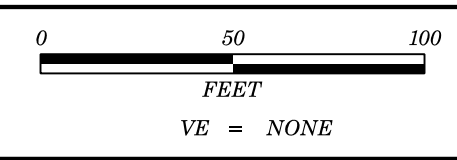
BORING LOCATION PLAN
 Bridge On
 Old Beatty Ford Road
 over Cold Water Creek
 WBS 44105.1.FD
 Rowan County, North Carolina



REVISIONS

\$\$\$\$SYTIME\$\$\$\$
 \$\$\$\$DESIGN\$\$\$\$
 \$\$\$\$DATE\$\$\$\$
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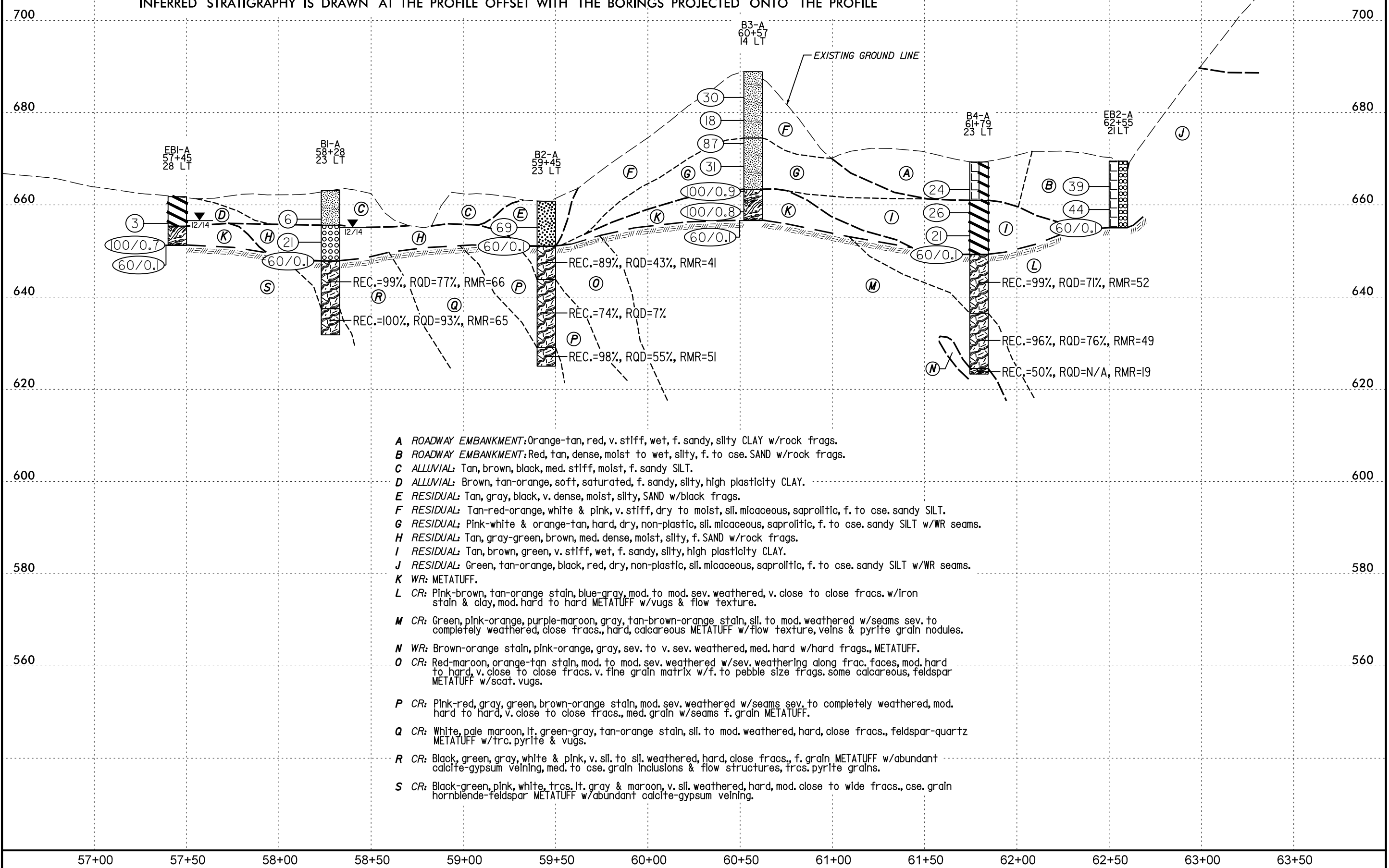




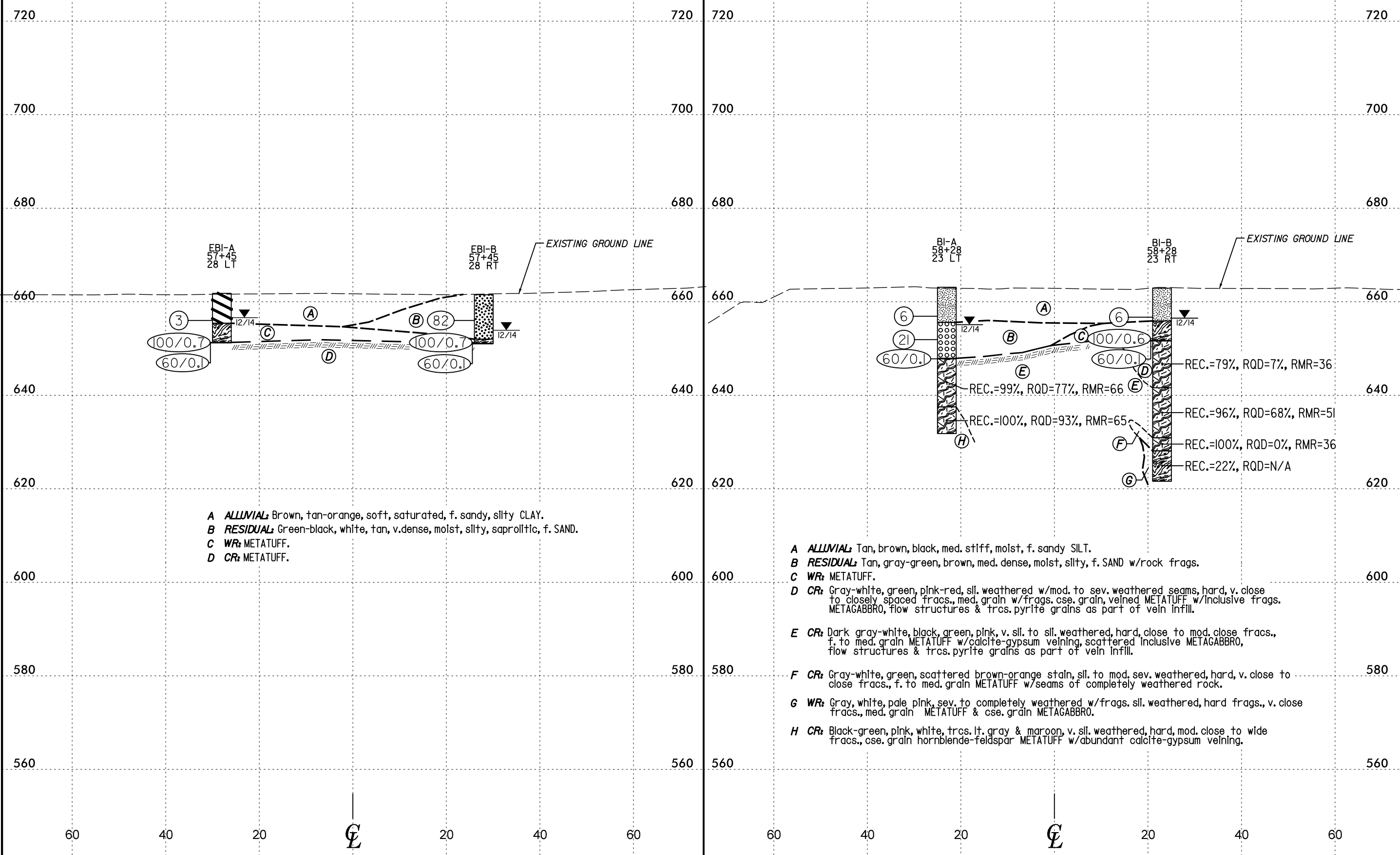
PROJECT REFERENCE NO.	SHEET NO.
W-5516	4
PROFILE	

GENERALIZED SUBSURFACE PROFILE 23' Lt. of -L-

GROUNDLINE PROFILE OBTAINED FROM DTM PROVIDED BY OTHERS
 INFERRED STRATIGRAPHY IS DRAWN AT THE PROFILE OFFSET WITH THE BORINGS PROJECTED ONTO THE PROFILE

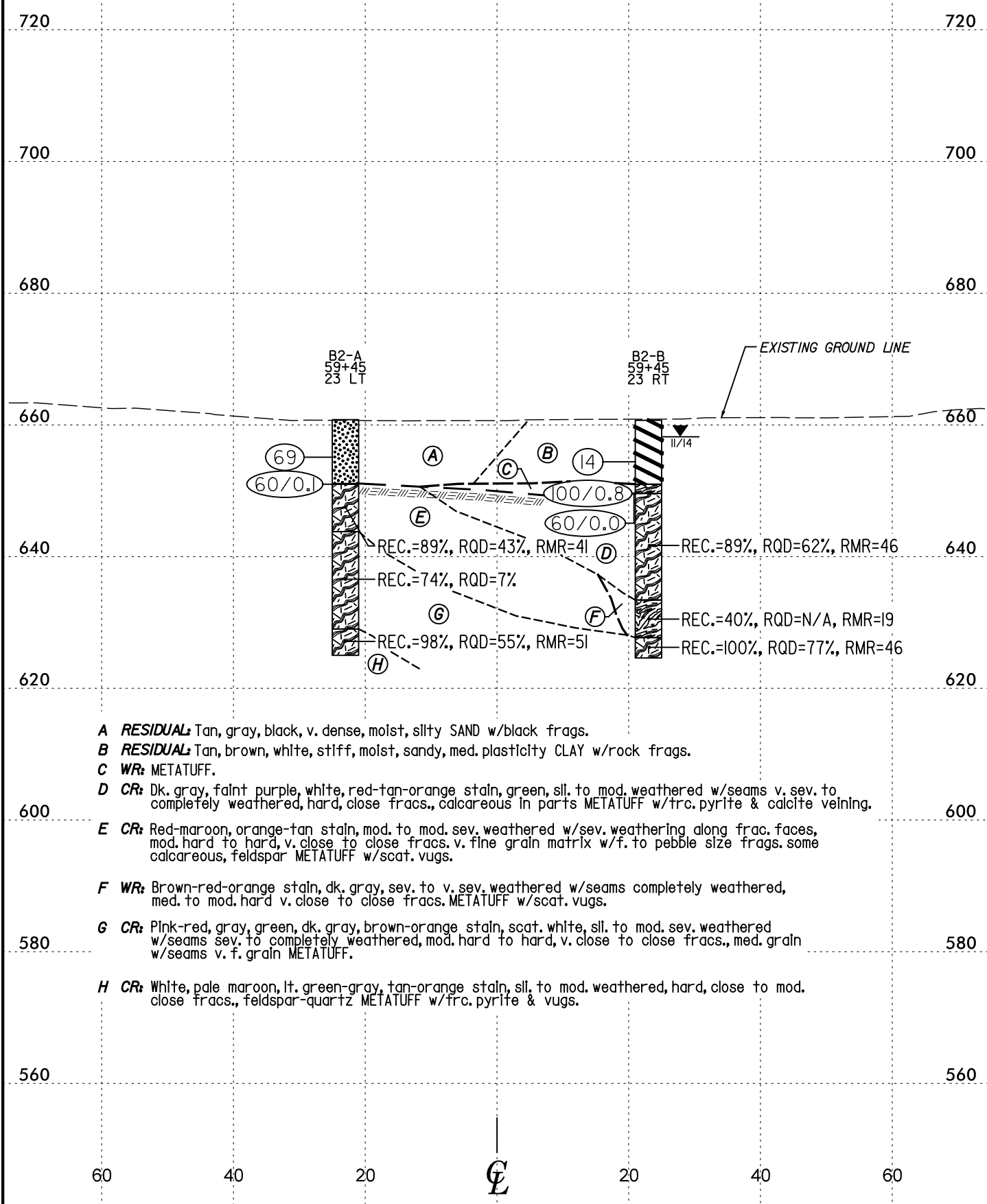


- A ROADWAY EMBANKMENT:** Orange-tan, red, v. stiff, wet, f. sandy, silty CLAY w/rock frags.
- B ROADWAY EMBANKMENT:** Red, tan, dense, moist to wet, silty, f. to cse. SAND w/rock frags.
- C ALLUVIAL:** Tan, brown, black, med. stiff, moist, f. sandy SILT.
- D ALLUVIAL:** Brown, tan-orange, soft, saturated, f. sandy, silty, high plasticity CLAY.
- E RESIDUAL:** Tan, gray, black, v. dense, moist, silty, SAND w/black frags.
- F RESIDUAL:** Tan-red-orange, white & pink, v. stiff, dry to moist, sil. micaceous, saprolitic, f. to cse. sandy SILT.
- G RESIDUAL:** Pink-white & orange-tan, hard, dry, non-plastic, sil. micaceous, saprolitic, f. to cse. sandy SILT w/WR seams.
- H RESIDUAL:** Tan, gray-green, brown, med. dense, moist, silty, f. SAND w/rock frags.
- I RESIDUAL:** Tan, brown, green, v. stiff, wet, f. sandy, silty, high plasticity CLAY.
- J RESIDUAL:** Green, tan-orange, black, red, dry, non-plastic, sil. micaceous, saprolitic, f. to cse. sandy SILT w/WR seams.
- K WR:** METATUFF.
- L CR:** Pink-brown, tan-orange stain, blue-gray, mod. to mod. sev. weathered, v. close to close frags. w/iron stain & clay, mod. hard to hard METATUFF w/vugs & flow texture.
- M CR:** Green, pink-orange, purple-maroon, gray, tan-brown-orange stain, sil. to mod. weathered w/seams sev. to completely weathered, close frags., hard, calcareous METATUFF w/flow texture, veins & pyrite grain nodules.
- N WR:** Brown-orange stain, pink-orange, gray, sev. to v. sev. weathered, med. hard w/hard frags., METATUFF.
- O CR:** Red-maroon, orange-tan stain, mod. to mod. sev. weathered w/sev. weathering along frac. faces, mod. hard to hard, v. close to close frags. v. fine grain matrix w/f. to pebble size frags. some calcareous, feldspar METATUFF w/scat. vugs.
- P CR:** Pink-red, gray, green, brown-orange stain, mod. sev. weathered w/seams sev. to completely weathered, mod. hard to hard, v. close to close frags., med. grain w/seams f. grain METATUFF.
- Q CR:** White, pale maroon, lt. green-gray, tan-orange stain, sil. to mod. weathered, hard, close frags., feldspar-quartz METATUFF w/trc. pyrite & vugs.
- R CR:** Black, green, gray, white & pink, v. sil. to sil. weathered, hard, close frags., f. grain METATUFF w/abundant calcite-gypsum veining, med. to cse. grain inclusions & flow structures, trcs. pyrite grains.
- S CR:** Black-green, pink, white, trcs. lt. gray & maroon, v. sil. weathered, hard, mod. close to wide frags., cse. grain hornblende-feldspar METATUFF w/abundant calcite-gypsum veining.

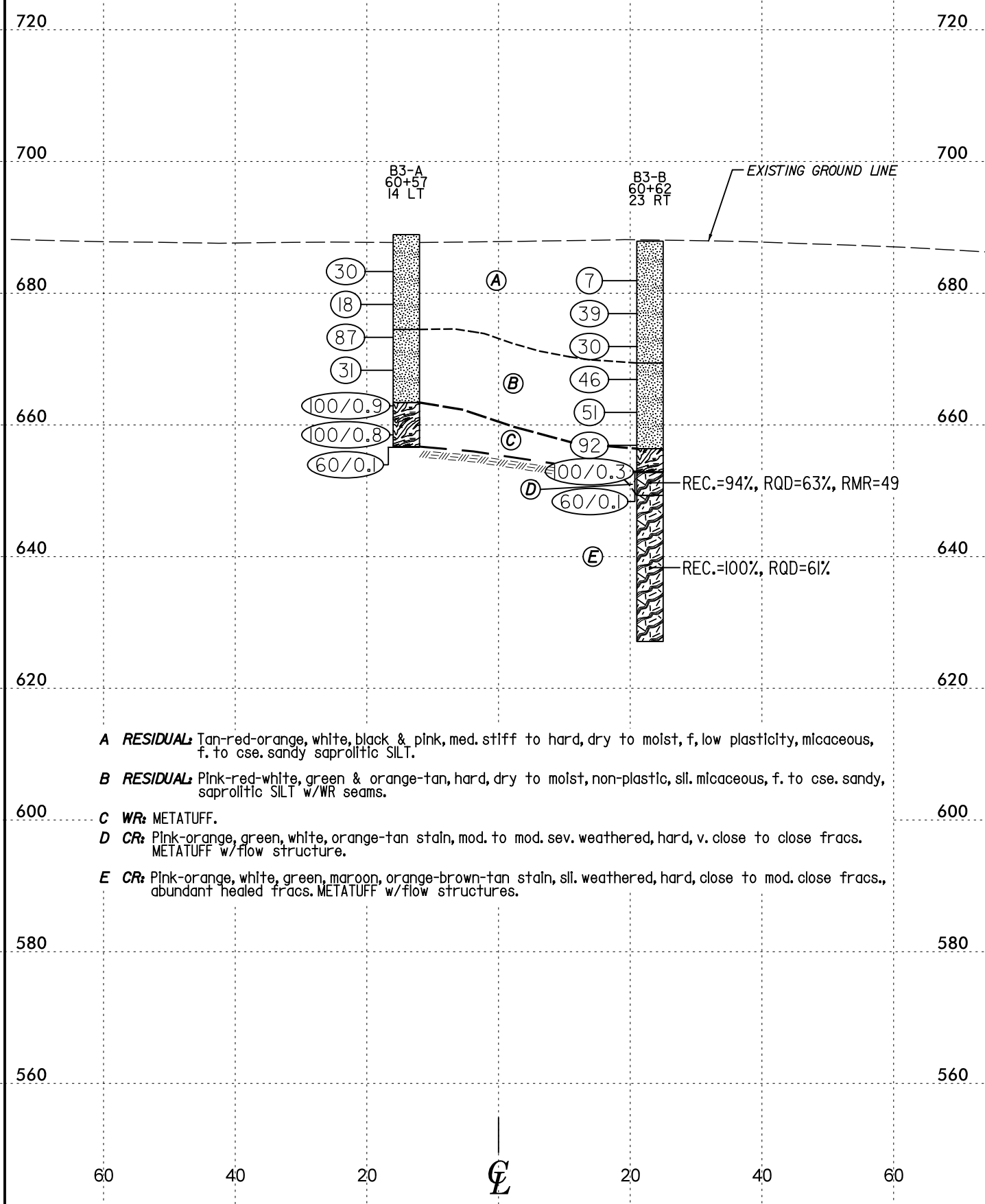


A ALLUVIAL: Brown, tan-orange, soft, saturated, f. sandy, silty CLAY.
B RESIDUAL: Green-black, white, tan, v.dense, moist, silty, saprolitic, f. SAND.
C WR: METATUFF.
D CR: METATUFF.

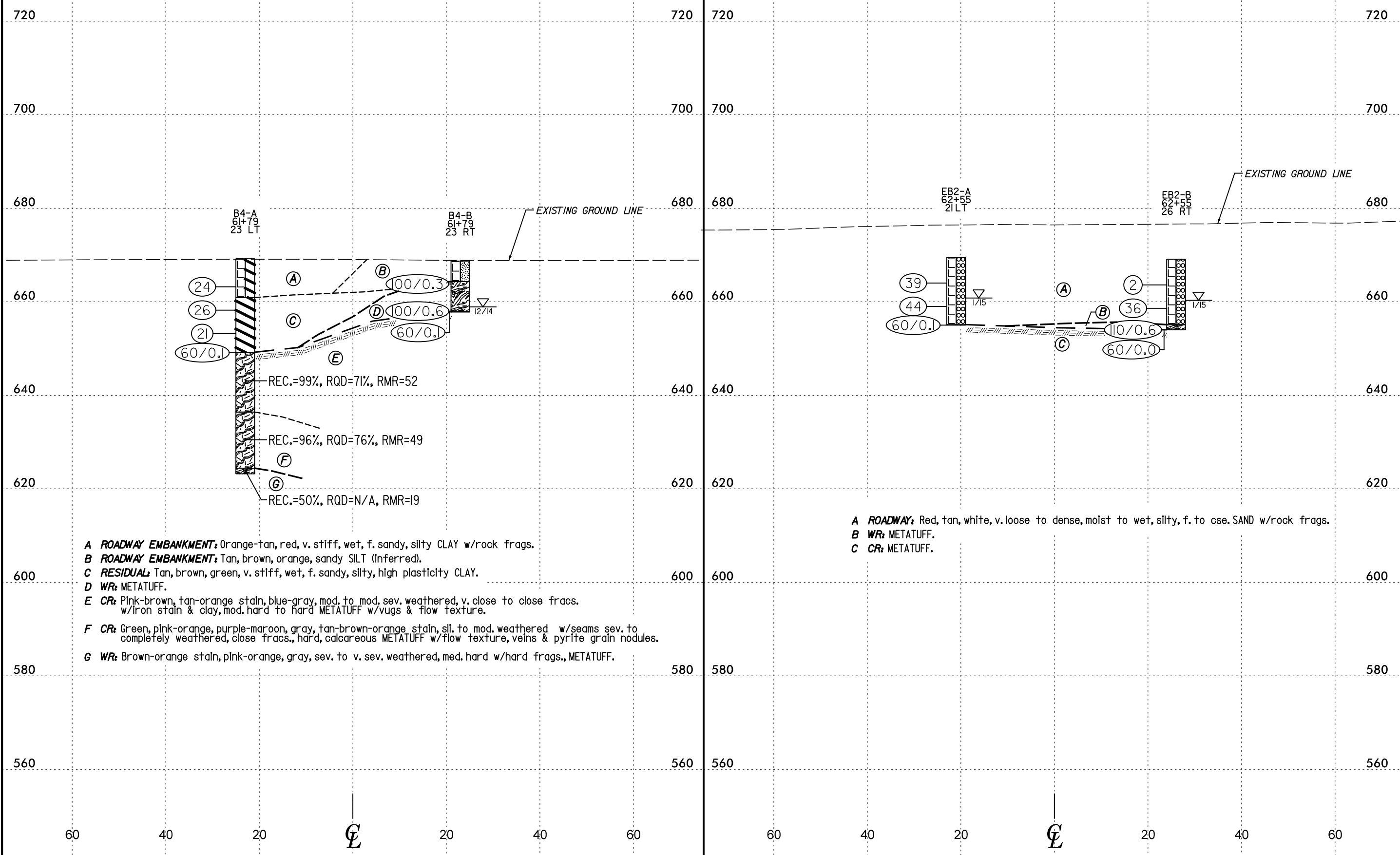
A ALLUVIAL: Tan, brown, black, med. stiff, moist, f. sandy SILT.
B RESIDUAL: Tan, gray-green, brown, med. dense, moist, silty, f. SAND w/rock frags.
C WR: METATUFF.
D CR: Gray-white, green, pink-red, sl. weathered w/mod. to sev. weathered seams, hard, v. close to closely spaced frags., med. grain w/frags. cse. grain, veined METATUFF w/inclusive frags. METAGABBRO, flow structures & trcs. pyrite grains as part of vein infill.
E CR: Dark gray-white, black, green, pink, v. sil. to sil. weathered, hard, close to mod. close frags., f. to med. grain METATUFF w/calcite-gypsum veining, scattered inclusive METAGABBRO, flow structures & trcs. pyrite grains as part of vein infill.
F CR: Gray-white, green, scattered brown-orange stain, sil. to mod. sev. weathered, hard, v. close to close frags., f. to med. grain METATUFF w/seams of completely weathered rock.
G WR: Gray, white, pale pink, sev. to completely weathered w/frags. sil. weathered, hard frags., v. close frags., med. grain METATUFF & cse. grain METAGABBRO.
H CR: Black-green, pink, white, trcs. lt. gray & maroon, v. sil. weathered, hard, mod. close to wide frags., cse. grain hornblende-feldspar METATUFF w/abundant calcite-gypsum veining.



HORIZ. SCALE 0 20 40 (FEET) VE = NONE **BENT 2 - CROSS SECTION**



HORIZ. SCALE 0 20 40 (FEET) VE = NONE **BENT 3 - CROSS SECTION**



- A ROADWAY EMBANKMENT:** Orange-tan, red, v. stiff, wet, f. sandy, silty CLAY w/rock frags.
- B ROADWAY EMBANKMENT:** Tan, brown, orange, sandy SILT (Inferred).
- C RESIDUAL:** Tan, brown, green, v. stiff, wet, f. sandy, silty, high plasticity CLAY.
- D WR:** METATUFF.
- E CR:** Pink-brown, tan-orange stain, blue-gray, mod. to mod. sev. weathered, v. close to close frags. w/Iron stain & clay, mod. hard to hard METATUFF w/vugs & flow texture.
- F CR:** Green, pink-orange, purple-maroon, gray, tan-brown-orange stain, sl. to mod. weathered w/seams sev. to completely weathered, close frags., hard, calcareous METATUFF w/flow texture, veins & pyrite grain nodules.
- G WR:** Brown-orange stain, pink-orange, gray, sev. to v. sev. weathered, med. hard w/hard frags., METATUFF.

- A ROADWAY:** Red, tan, white, v. loose to dense, moist to wet, silty, f. to cse. SAND w/rock frags.
- B WR:** METATUFF.
- C CR:** METATUFF.

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 44105.1.FD1	TIP W-5516	COUNTY ROWAN	GEOLOGIST DeLost, R.
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek			GROUND WTR (ft)
BORING NO. B1-A	STATION 58+28	OFFSET 23 ft LT	ALIGNMENT -L-
COLLAR ELEV. 663.1 ft	TOTAL DEPTH 31.3 ft	NORTHING 653,404	EASTING 1,531,440
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014		DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic
DRILLER Morgan, M.	START DATE 12/10/14	COMP. DATE 12/10/14	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)
665														663.1 GROUND SURFACE 0.0
660														ALLUVIAL Tan, brown, black, med. stiff, f. sandy SILT (A-4).
655	657.9	5.2	2	2	4						SS-29	M		655.6 RESIDUAL 7.5
650	652.9	10.2	6	8	13						SS-32	M		RESIDUAL Tan, gray-green, brown, med. dense, silty, f. SAND w/rock frags. (A-1-b).
645	647.9	15.2	60/0.1											647.9 CRYSTALLINE ROCK 15.2 647.8 Metatuff 15.3
640											RS-8			CRYSTALLINE ROCK Metatuff
635											RS-11			637.5 Metatuff 25.6
														631.8 Boring Terminated at Elevation 631.8 ft in Crystalline Rock (Metatuff). 31.3 Driller did not obtain immediate water table reading.

NCDOT BORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

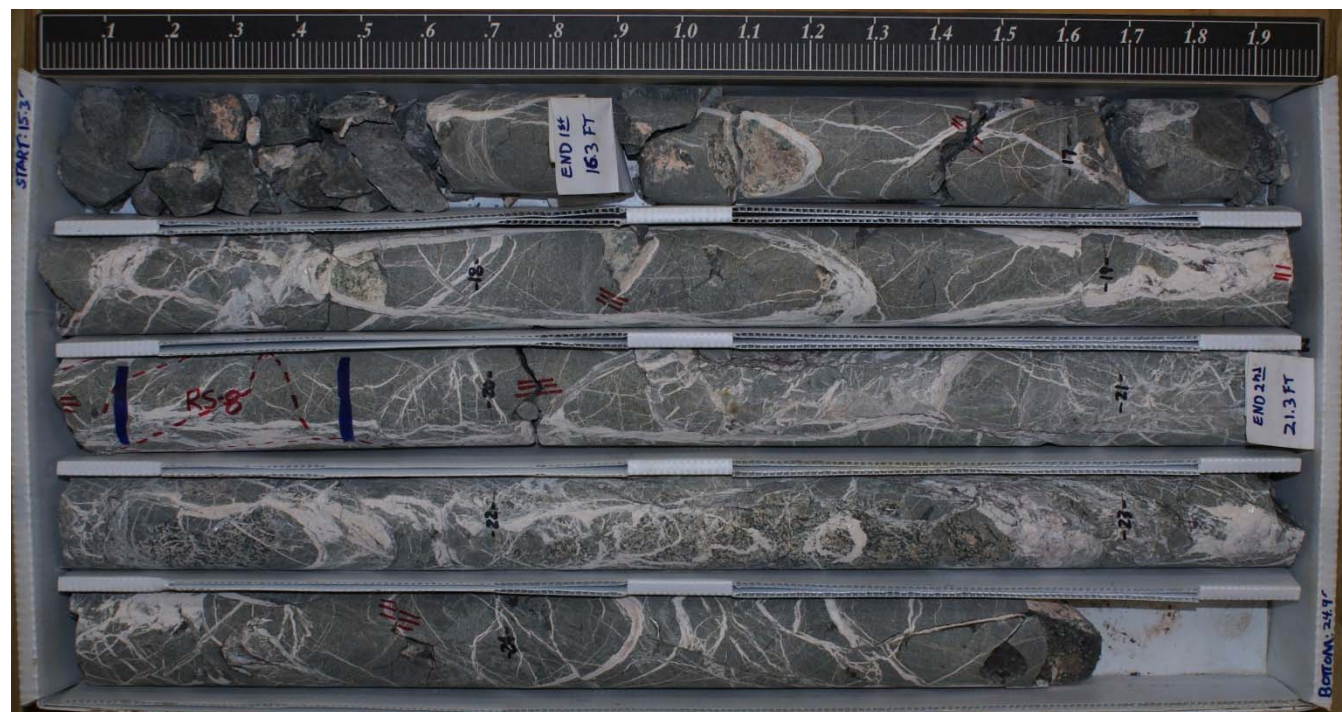
WBS 44105.1.FD1		TIP W-5516		COUNTY ROWAN		GEOLOGIST DeLost, R.						
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek							GROUND WTR (ft)					
BORING NO. B1-A		STATION 58+28		OFFSET 23 ft LT		ALIGNMENT -L-						
COLLAR ELEV. 663.1 ft		TOTAL DEPTH 31.3 ft		NORTHING 653,404		EASTING 1,531,440						
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic						
DRILLER Morgan, M.		START DATE 12/10/14		COMP. DATE 12/10/14		SURFACE WATER DEPTH N/A						
CORE SIZE NQ2		TOTAL RUN 16.0 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)	
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %				
647.8	646.8	15.3	1.0	2:54	(0.9)	(0.0)	(10.2)	(7.9)		<p>Begin Coring @ 15.3 ft CRYSTALLINE ROCK</p> <p>Black, green, gray, white & pink, v. slight to slightly weathered, hard, close to mod. close frac. spacing, fine grain metatuff w/abundant calcite, vein infill to 10 mm, med. to cse. grain inclusions & some flow structures, trace pyrite.</p> <p>3 60° jts. w/calcite infill to 5 mm; 3 30° jts. w/calcite & gypsum infill to 3 mm; 1 0° jt. w/rough walls. R1=2, R2=17, R3=20, R4=20, R5=7, RMR=66 Rock Type D</p> <p>Black-green, pink, white, trcs. lt. gray, maroon, v. slightly weathered, hard, mod. close to wide frac. spacing, cse. grain hornblende, feldspar, metatuff w/abundant calcite veining infill to 5 mm.</p> <p>3 50°-60° jts. rough w/trcs. clay; 2 25°-30° jts. w/trcs. clay or calcite infill to 2 mm. R1=1, R2=20, R3=20, R4=20, R5=4, RMR=65 Rock Type D</p> <p>Boring Terminated at Elevation 631.8 ft in Crystalline Rock (Metatuff).</p> <p>Driller did not obtain immediate water table reading.</p>	15.3	
645	641.8	21.3	5.0	2:29 2:58 2:48 3:03 3:33	90% (5.0) 100%	0% (4.0) 80%	99% (10.2)	77% (7.9)			RS-8	647.8
640	636.8	26.3	5.0	3:15 3:43 3:42 3:19 3:18	(5.0) 100%	(4.4) 88%	(5.7)	(5.3)			RS-11	637.5
635	631.8	31.3	5.0	3:00 3:45 3:20 3:13 2:29	(5.0) 100%	(4.8) 96%	(5.7)	(5.3)			RS-11	631.8

NCDOT CORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

CORE PHOTOGRAPHIC RECORD

Bridge #339 on Old Beatty Ford Road over Cold Water Creek

WBS 44105.1.FD1 TIP W-6615



B1-A, 58+28.40 @ 23' LT. Box 1 of 2



B1-A, 58+28.40 @ 23' LT. Box 2 of 2

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 44105.1.FD1	TIP W-5516	COUNTY ROWAN	GEOLOGIST DeLost, R.
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek			GROUND WTR (ft)
BORING NO. B1-B	STATION 58+28	OFFSET 23 ft RT	ALIGNMENT -L-
COLLAR ELEV. 662.9 ft	TOTAL DEPTH 41.3 ft	NORTHING 653,358	EASTING 1,531,440
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014		DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic
DRILLER Morgan, M.	START DATE 12/10/14	COMP. DATE 12/11/14	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)
665														
													662.9	GROUND SURFACE
660														ALLUVIAL Tan, brown, med. stiff, f. sandy SILT (A-4).
	657.7	5.2	2	3	3								655.9	7.0
655														WEATHERED ROCK Metatuff
	652.7	10.2											651.7	11.2
	651.7	11.2	67	33/0.1						100/0.6			651.6	11.3
650			60/0.1											CRYSTALLINE ROCK Metatuff
														CRYSTALLINE ROCK Metatuff
645														RS-4
640													641.6	21.3
														Metatuff
635														
630													630.9	32.0
														Metatuff
625													628.1	34.8
														WEATHERED ROCK Metatuff & Metagabbro
													621.6	41.3
														Boring Terminated at Elevation 621.6 ft in Weathered Rock (Metatuff & Metagabbro). Driller did not obtain immediate water table reading.

NCDOT BORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 44105.1.FD1		TIP W-5516		COUNTY ROWAN		GEOLOGIST DeLost, R.					
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek							GROUND WTR (ft)				
BORING NO. B1-B		STATION 58+28		OFFSET 23 ft RT		ALIGNMENT -L-	0 HR. N/A				
COLLAR ELEV. 662.9 ft		TOTAL DEPTH 41.3 ft		NORTHING 653,358		EASTING 1,531,440	24 HR. 6.4				
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic					
DRILLER Morgan, M.		START DATE 12/10/14		COMP. DATE 12/11/14		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 30.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	SAMP. NO.	REC. (ft) %			
651.6	651.6	11.3	5.0	2:28	(3.8)	(0.0)				Begin Coring @ 11.3 ft	11.3
650	646.6	16.3	5.0	2:29 3:28 3:36 2:27	76%	0%		(7.9) (0.7)	79% 7%	CRYSTALLINE ROCK Gray-white, green, pink-red, slightly weathered w/mod. weathered to sev. weathered seams, hard, v. close to closely spaced fracs., med. grain w/frags. cse. grain, veining, metatuff w/inclusive frags. metagabbro, trcs. pyrite grains lining jts. 4 70°-90° jts. trcs. clay; 11 50°-60° jts. some w/clay <1 mm; 20+ 0°-20° jts. clay & iron stain. R1=4, R2=3, R3=10, R4=12, R5=7, RMR=36 Rock Type D	11.3
645	641.6	21.3	5.0	2:49 2:08 2:11 4:27 2:23	(4.1) 82%	(0.7) 14%	RS-4				641.6
640	636.6	26.3	5.0	2:10 2:51 2:11 2:16 4:28	(5.0) 100%	(3.8) 76%	RS-5	(10.3) 96%	(7.3) 68%	Dk. gray-white, green, v. slight to slight weathered, hard, close to mod. close fracs. f. to med. grain, metatuff w/veining & scattered inclusive metagabbro, trcs. pyrite grains as part of vein infill. 9 40°-65° jts. w/trac. clay; 14 10°-30° jts. w/iron stain. R1=4, R2=13, R3=10, R4=20, R5=4, RMR=51 Rock Type D	21.3
635	631.6	31.3	5.0	2:29 1:23 1:31 1:31 1:18	(4.6) 92%	(3.5) 70%					630.9
630	626.6	36.3	5.0	1:38 2:34 1:57 2:37 2:30	(3.7) 74%	(0.0) 0%		(2.8) 100%	(0.0) 0%	Gray-white, green, scat. brown-orange stain, sli. to mod. sev. weathered, hard, v. close to closely spaced fracs., f. to med. grain, metatuff w/seams of completely weathered rock. 2+ 80°-90° jts. w/scat. pyrite & clay; 7+ 40°-50° jts. w/clay & iron stain; 10+ 20°-30° jts. w/iron stain & infill to 3 mm. R1=4, R2=3, R3=10, R4=12, R5=7, RMR=36 Rock Type D	32.0
625	621.6	41.3	5.0	1:12 2:20 2:13 3:06 2:32	(1.2) 24%	N/A		(1.4) 22%	N/A		628.1
										WEATHERED ROCK Gray, white, pale pink, sev. to completely weathered w/frags. sli. weathered, hard frags., v. close frac. spacing, med. grain metatuff & cse grain metagabbro. Boring Terminated at Elevation 621.6 ft in Weathered Rock (Metatuff & Metagabbro). Driller did not obtain immediate water table reading.	41.3

NCDOT CORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

CORE PHOTOGRAPHIC RECORD

Bridge #399 on Old Beatty Ford Road over Cold Water Creek

WBS 44105.1.FD1 TIPW-5516



B1-B, 58 + 28.40 @ 23' RT. Box 1 of 3



B1-B, 58 + 28.40 @ 23' RT. Box 2 of 3



B1-B, 58 + 28.40 @ 23' RT. Box 3 of 3

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 44105.1.FD1	TIP W-5516	COUNTY ROWAN	GEOLOGIST DeLost, R.
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek			GROUND WTR (ft)
BORING NO. B2-A	STATION 59+45	OFFSET 23 ft LT	ALIGNMENT -L-
COLLAR ELEV. 660.8 ft	TOTAL DEPTH 35.8 ft	NORTHING 653,404	EASTING 1,531,567
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014		DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic
DRILLER Morgan, M.	START DATE 11/22/14	COMP. DATE 11/24/14	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)
665														
660													660.8	GROUND SURFACE
655	656.1	4.7	11	17	52									ROADWAY EMBANKMENT Tan, gray, black, v. dense, silty SAND w/black frags. (A-2-4).
650	651.1	9.7	60/0.1										651.1	CRYSTALLINE ROCK Metatuff
645													651.0	CRYSTALLINE ROCK Metatuff
640													643.8	Metatuff
635														
630													629.0	Metatuff
625													625.0	Metatuff
Boring Terminated at Elevation 625.0 ft in Crystalline Rock (Metatuff). Driller did not obtain immediate water table reading.														

NCDOT BORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 44105.1.FD1		TIP W-5516		COUNTY ROWAN		GEOLOGIST DeLost, R.					
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek							GROUND WTR (ft)				
BORING NO. B2-A		STATION 59+45		OFFSET 23 ft LT		ALIGNMENT -L-	0 HR. N/A				
COLLAR ELEV. 660.8 ft		TOTAL DEPTH 35.8 ft		NORTHING 653,404		EASTING 1,531,567	24 HR. FIAD				
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic					
DRILLER Morgan, M.		START DATE 11/22/14		COMP. DATE 11/24/14		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 26.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
651										Begin Coring @ 9.8 ft	
650	651.0 650.0	9.8 10.8	1.0 5.0	3:11 2:10 4:06 2:16 1:38 3:38	(0.7) 70% (4.5) 90%	(0.6) 60% (2.0) 40%	(6.4) 89%	(3.1) 43%		651.0 Red-maroon, orange-tan stain, mod. to mod. sev. weathered w/sev. weathering along frac. faces, mod. hard to hard, v. close to closely spaced fracs., v. fine grain matrix w/f. to pebble size fragments, some calcareous, feldspar metatuff w/scattered vugs.	9.8
645	645.0	15.8	5.0	1:49 2:36 1:43 3:13 4:23	(3.7) 74%	(0.9) 18%	(10.9) 74%	(1.1) 7%		643.8 3 60°-70° jts. w/rough walls; 5 30°-50° jts. w/smooth to stepped walls; 14 0°-20° jts. w/trcs. clay < 1 mm. R1=4, R2=8, R3=10, R4=12, R5=7, RMR=41 Rock Type D	17.0
640	640.0	20.8	5.0	1:57 1:43 2:13 2:59 2:23	(4.0) 80%	(0.7) 14%				Pink-red, gray, green, brown-orange stain, mod. sev. weathered w/seams sev. to completely weathered, v. close to close frac. spacing, med. grain w/seams v. fine grain, metatuff.	
635	635.0	25.8	5.0	2:18 1:55 2:42 4:25 2:14	(4.1) 82%	(0.0) 0%				2 85°-90° jts. w/iron precipitate; 4+ 60° jts. w/heavy iron stain; 19+ 20°-30° jts. w/iron stain.	
630	630.0	30.8	5.0	1:56 2:29 3:49 4:23 2:51	(4.2) 84%	(2.8) 56%	(3.9) 98%	(2.2) 55%		629.0 White, pale maroon, lt. green-gray, tan-orange stain, sli. to mod. weathered, hard, close to mod. close frac. spacing, feldspar, quartz, metatuff w/trace pyrite & vugs.	31.8
625	625.0	35.8								625.0 1 90° jt. healed w/iron stain; 1 50° jt. w/iron stain; 5 10°-20° jts. w/iron stain. R1=4, R2=13, R3=10, R4=20, R5=4, RMR=51 Rock Type D Boring Terminated at Elevation 625.0 ft in Crystalline Rock (Metatuff). Driller did not obtain immediate water table reading.	35.8

NCDOT CORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

CORE PHOTOGRAPHIC RECORD

Bridge #399 on Old Beatty Ford Road over Cold Water Creek

WBS 44105.1.FD1 TIP W-5516



B2-A, 59 + 45.40 @ 23' LT. Box 1 of 3



B2-A, 59 + 45.40 @ 23' LT. Box 2 of 3



B2-A, 59 + 45.40 @ 23' LT. Box 3 of 3

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 44105.1.FD1	TIP W-5516	COUNTY ROWAN	GEOLOGIST DeLost, R.
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek			GROUND WTR (ft)
BORING NO. B2-B	STATION 59+45	OFFSET 23 ft RT	ALIGNMENT -L-
COLLAR ELEV. 660.7 ft	TOTAL DEPTH 36.1 ft	NORTHING 653,358	EASTING 1,531,567
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014		DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic
DRILLER Morgan, M.	START DATE 11/21/14	COMP. DATE 11/22/14	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)
665														
660													660.7	0.0
655	655.4	5.3	5	7	7									
650	650.4 649.6	10.3 11.1	41	59/0.3	60/0.0					100/0.8 60/0.0			651.0	9.7
645													649.6	11.1
640														
635														
630													633.4	27.3
625													627.7	33.0
													624.6	36.1
Boring Terminated at Elevation 624.6 ft in Crystalline Rock (Metatuff).														

NCDOT BORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 44105.1.FD1		TIP W-5516		COUNTY ROWAN		GEOLOGIST DeLost, R.					
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek							GROUND WTR (ft)				
BORING NO. B2-B		STATION 59+45		OFFSET 23 ft RT		ALIGNMENT -L-					
COLLAR ELEV. 660.7 ft		TOTAL DEPTH 36.1 ft		NORTHING 653,358		EASTING 1,531,567					
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic					
DRILLER Morgan, M.		START DATE 11/21/14		COMP. DATE 11/22/14		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 25.0 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %			
649.6	649.6	11.1	5.0	N=60/0.0 2:50 1:32 3:53 2:20 3:02	(4.0) 80%	(2.2) 44%	(14.4) 89%	(10.1) 62%		Begin Coring @ 11.1 ft	11.1
645	644.6	16.1	5.0	1:34 3:49 4:31 5:11 5:06	(4.2) 84%	(3.3) 66%			RS-9	Dk. gray, lt. gray, faint purple, white, red-tan-orange stain, green, slight to mod. weathered w/seams v. sev. to completely weathered, hard, closely spaced frags., calcareous in parts, metatuff w/trace pyrite & calcite veining. 3 85°-90° jts. w/iron precipitate & stain, <1mm; 2 80° jts. healed w/calcite crystals to 1 mm; 5 60°-70° jts. w/iron precipitate & clay to 1 mm; 23 0°-20° jts. w/iron precipitate, stain & clay. R1=4, R2=13, R3=10, R4=12, R5=7, RMR=46 Rock Type D	
640	639.6	21.1	5.0	3:28 6:54 6:24 6:44 6:12	(5.0) 100%	(3.9) 78%					
635	634.6	26.1	5.0	6:05 4:17 2:02 3:08 3:35	(2.6) 52%	(0.7) 14%	(2.3) 40%	N/A		WEATHERED ROCK Brown-red-orange stain, dk. gray, sev. to v. sev. weathered w/seams completely weathered, med. to mod. hard, v. close to close frac. spacing, metatuff, contains scat. vugs. R1=1, R2=3, R3=5, R4=6, R5=4, RMR=19 Rock Type D	27.3
630	629.6	31.1	5.0	2:31 4:47 5:58 4:17 4:28	(4.0) 80%	(2.4) 48%	(3.1) 100%	(2.4) 77%			33.0
625	624.6	36.1								CRYSTALLINE ROCK Dk. gray, gray, brown-orange stain, scat. white, sli. to mod. weathered, mod. hard to hard, close frac. spacing, metatuff. 1 50° jt. w/clay to 1mm; 6 0° jts. w/clay 1-2mm. R1=4, R2=13, R3=10, R4=12, R5=7, RMR=46 Rock Type D Boring Terminated at Elevation 624.6 ft in Crystalline Rock (Metatuff).	36.1

NCDOT CORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

CORE PHOTOGRAPHIC RECORD

Bridge #399 on Old Beatty Ford Road over Cold Water Creek

WBS 44105.1.FD1 TIP W-5516



B2-B, 59 + 45.40 @ 23 RT. Box 1 of 3



B2-B, 59 + 45.40 @ 23 RT. Box 2 of 3



B2-B, 59 + 45.40 @ 23 RT. Box 3 of 3

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 44105.1.FD1	TIP W-5516	COUNTY ROWAN	GEOLOGIST DeLost, R.
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek			GROUND WTR (ft)
BORING NO. B3-A	STATION 60+57	OFFSET 14 ft LT	ALIGNMENT -L-
COLLAR ELEV. 688.9 ft	TOTAL DEPTH 32.3 ft	NORTHING 653,395	EASTING 1,531,668
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 79% 08/22/2013		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Morgan, M.	START DATE 11/19/13	COMP. DATE 11/20/13	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					
690														688.9	0.0
685	684.3	4.6	9	15	15										
680	679.3	9.6	4	7	11										
675	674.3	14.6	33	50	37									674.5	14.4
670	669.3	19.6	9	15	16										
665	664.3	24.6	10	21	79/0.4									663.4	25.5
660	659.3	29.6	31	69/0.3										656.7	32.2
	656.7	32.2	60/0.1											656.6	32.3

NCDOT BORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15



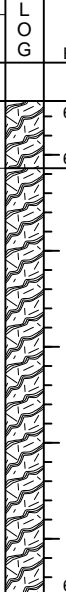
NCDOT GEOTECHNICAL ENGINEERING UNIT BORELOG REPORT

WBS 44105.1.FD1		TIP W-5516		COUNTY ROWAN		GEOLOGIST DeLost, R.	
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek						GROUND WTR (ft)	
BORING NO. B3-B		STATION 60+62		OFFSET 23 ft RT		ALIGNMENT -L-	
COLLAR ELEV. 687.9 ft		TOTAL DEPTH 60.8 ft		NORTHING 653,359		EASTING 1,531,674	
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic	
DRILLER Morgan, M.		START DATE 12/08/14		COMP. DATE 12/09/14		SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
690																
														687.9	0.0	GROUND SURFACE
685																RESIDUAL Tan-red-orange, white, black & pink, med. stiff to hard, low plasticity, micaceous, f. to cse. sandy, saprolitic SILT (A-4).
	682.9	5.0		2	3	4						SS-34	D			
680																
	677.9	10.0		7	9	30										
675																Tan-pink, red, green, white, hard, saprolitic, f. to cse. sandy SILT (A-4).
	672.9	15.0		9	13	17						SS-35	D			
670																
	667.9	20.0		8	20	26									669.4	18.5
665																WEATHERED ROCK Metatuff
	662.9	25.0		14	22	29						SS-36	M			
660																
	657.9	30.0		21	39	53										
655																CRYSTALLINE ROCK Metatuff
	653.2	34.7														
	652.9	35.0		100/0.3								RS-10	M			
650																CRYSTALLINE ROCK Metatuff
	652.9	35.0		60/0.1												
645																
640																
635																
630																
														627.1	60.8	Boring Terminated at Elevation 627.1 ft in Crystalline Rock (Metatuff). Driller did not obtain immediate water table reading.

NCDOT BORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 44105.1.FD1		TIP W-5516		COUNTY ROWAN		GEOLOGIST DeLost, R.						
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek							GROUND WTR (ft)					
BORING NO. B3-B		STATION 60+62		OFFSET 23 ft RT		ALIGNMENT -L-	0 HR. N/A					
COLLAR ELEV. 687.9 ft		TOTAL DEPTH 60.8 ft		NORTHING 653,359		EASTING 1,531,674	24 HR. FIAD					
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic						
DRILLER Morgan, M.		START DATE 12/08/14		COMP. DATE 12/09/14		SURFACE WATER DEPTH N/A						
CORE SIZE NQ2		TOTAL RUN 25.7 ft										
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)	
					REC. (ft) %	RQD (ft) %	REC. (ft) %	RQD (ft) %				
652.8	652.1	35.1	0.7	3:35	(0.7)	(0.6)	(3.3)	(2.2)		35.1		
650	647.1	40.8	5.0	2:53 2:54 4:03 3:17 3:38	100% (4.8)	86% (2.8)	94% (22.2)	63% (13.5)		649.3	38.6	
645	642.1	45.8	5.0	2:56 3:47 3:05 4:32 6:20	(5.0) 100%	(1.8) 36%						
640	637.1	50.8	5.0	3:50 2:46 3:23 2:57 3:17	(5.0) 100%	(2.0) 40%						
635	632.1	55.8	5.0	3:16 3:12 4:00 3:40 3:22	(5.0) 100%	(3.7) 74%						
630	627.1	60.8	5.0	3:22 2:40 3:10 3:10 3:01	(5.0) 100%	(4.8) 96%						
												627.1
Boring Terminated at Elevation 627.1 ft in Crystalline Rock (Metatuff).												
Driller did not obtain immediate water table reading.												

NCDOT CORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

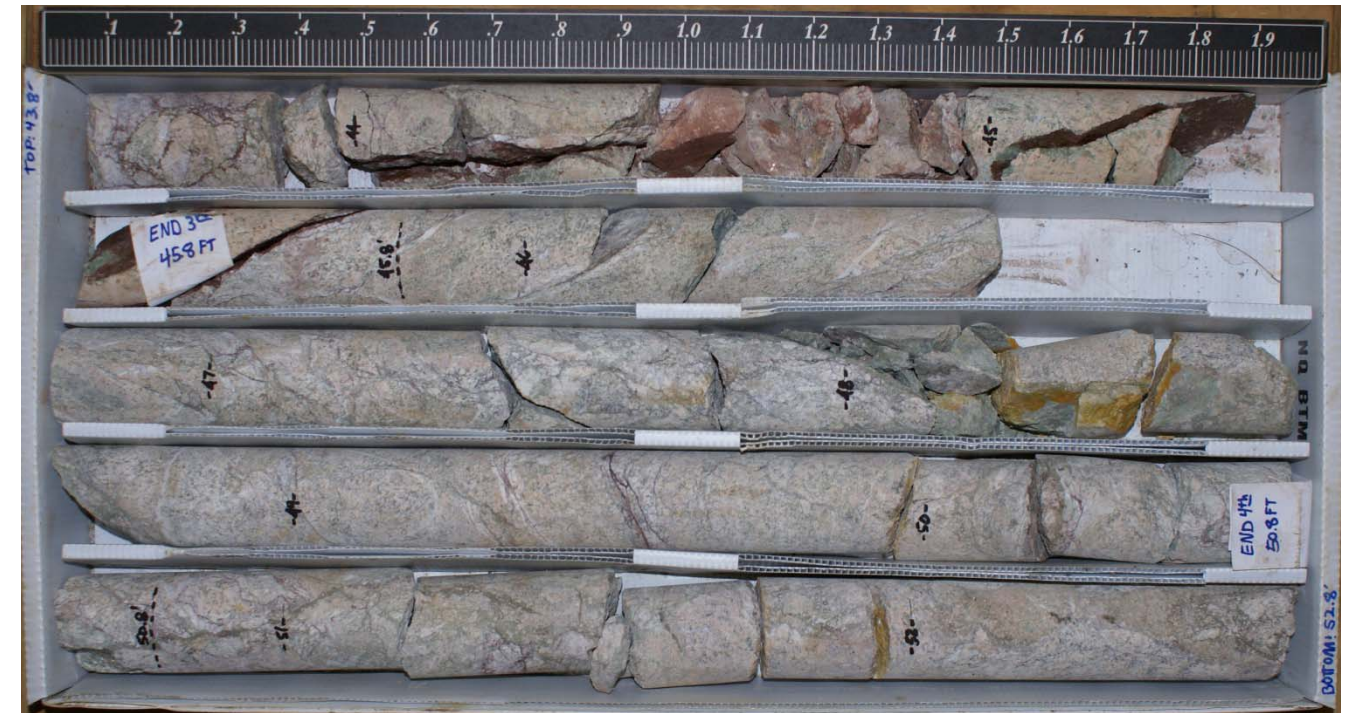
CORE PHOTOGRAPHIC RECORD

Bridge #399 on Old Beatty Ford Road over Cold Water Creek

WBS 44105.1.FD1 TIP W-5516



B3-B, 60 + 62.40 @ 23'RT. Box 1 of 3



B3-B, 60 + 62.40 @ 23'RT. Box 2 of 3



B3-B, 60 + 62.40 @ 23'RT. Box 3 of 3

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 44105.1.FD1	TIP W-5516	COUNTY ROWAN	GEOLOGIST DeLost, R.
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek			GROUND WTR (ft)
BORING NO. B4-A	STATION 61+79	OFFSET 23 ft LT	ALIGNMENT -L-
COLLAR ELEV. 669.2 ft	TOTAL DEPTH 46.0 ft	NORTHING 653,405	EASTING 1,531,791
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014		DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic
DRILLER Morgan, M.	START DATE 12/14/14	COMP. DATE 12/14/14	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)
670													669.2	0.0	GROUND SURFACE
665	664.2	5.0	10	11	13							W	660.9	8.3	ROADWAY EMBANKMENT Orange-tan, red, v. stiff, f. sandy, silty, CLAY w/rock frags. (A-7-5).
660	659.2	10.0	5	12	14							W			RESIDUAL Tan, brown, green, v. stiff, f. sandy, silty, high plasticity CLAY (A-7-5).
655	654.2	15.0	5	9	12							W			
650	649.2	20.0	60/0.1									SS-37	649.2	20.0	CRYSTALLINE ROCK Metatuff
645												RS-6	649.1	20.1	CRYSTALLINE ROCK Metatuff
640												RS-7			
635													636.4	32.8	Metatuff
630															
625													624.4	44.8	WEATHERED ROCK Metatuff
													623.2	46.0	Metatuff Boring Terminated at Elevation 623.2 ft in Weathered Rock (Metatuff). Driller did not obtain immediate water table reading.

NCDOT BORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 44105.1.FD1		TIP W-5516		COUNTY ROWAN		GEOLOGIST DeLost, R.					
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek							GROUND WTR (ft)				
BORING NO. B4-A		STATION 61+79		OFFSET 23 ft LT		ALIGNMENT -L-					
COLLAR ELEV. 669.2 ft		TOTAL DEPTH 46.0 ft		NORTHING 653,405		EASTING 1,531,791					
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014				DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic					
DRILLER Morgan, M.		START DATE 12/14/14		COMP. DATE 12/14/14		SURFACE WATER DEPTH N/A					
CORE SIZE NQ2		TOTAL RUN 25.9 ft									
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)	REC. (%)	RQD (%)			
649.1	649.1	20.1	0.9	1:37	(0.9)	(0.7)				Begin Coring @ 20.1 ft	20.1
	648.2	21.0	5.0	1:25	100%	78%	RS-6	(12.6)	(9.0)	<p>CRYSTALLINE ROCK</p> <p>Pink-brown, tan-orange stain, blue-gray, mod. to mod. sev. weathered, v. close to mod. close frac. spacing w/iron stain & clay, hard to mod. hard, metatuff w/vugs & flow texture.</p> <p>1 70° jt. w/clay <1 mm; 7 40°-60° jts. w/iron stain & clay to 1 mm; 19 20° jts. w/heavy iron stain & clay to 1 mm; numerous healed jts. w/infill <1 mm.</p> <p>R1=2, R2=13, R3=10, R4=20, R5=7, RMR=52</p> <p>Rock Type D</p>	
645				2:10	(5.0)	(2.8)					
	643.2	26.0		1:58	100%	56%					
			5.0	1:54			RS-7				
640				1:38	(4.9)	(3.8)					
			5.0	1:58	98%	76%					
	638.2	31.0		1:52							
			5.0	1:51							
				2:38							
635				2:20	(4.5)	(3.4)					
			5.0	1:54	90%	68%		(11.5)	(9.1)	<p>Green, pink-orange, purple-maroon, gray, tan-brown-orange stain, slight to mod. weathered w/seams sev. to completely weathered (32.8'-34.3' & 38.4'-38.7'), hard, closely spaced frags., calcareous, metatuff w/flow texture & vein infill to 5 mm, nodules w/pyrite grains.</p> <p>1 75° jt. w/calcite crystal growth to 2 mm; 11 0°-30° jts. w/iron stain.</p> <p>R1=2, R2=13, R3=10, R4=20, R5=4, RMR=49</p> <p>Rock Type D</p>	
	633.2	36.0		3:59							
			5.0	3:37	(5.0)	(4.0)					
630				3:19							
			5.0	3:10	100%	80%					
	628.2	41.0		2:20							
			5.0	6:28							
				3:37							
625				3:51	(4.4)	(3.4)					
			5.0	3:50	88%	68%					
	624.4	44.8		3:11							
				3:05							
	623.2	46.0		3:15							
				1:44	(0.6)	NA				<p>WEATHERED ROCK</p> <p>Brown-orange stain, pink-orange, gray, sev. to v. sev. weathered, med. hard w/hard frags., metatuff.</p> <p>R1=1, R2=3, R3=5, R4=6, R5=4, RMR=19</p> <p>Rock Type D</p> <p>Boring Terminated at Elevation 623.2 ft in Weathered Rock (Metatuff).</p> <p>Driller did not obtain immediate water table reading.</p>	46.0

NCDOT CORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

CORE PHOTOGRAPHIC RECORD

Bridge #399 on Old Beatty Ford Road over Cold Water Creek

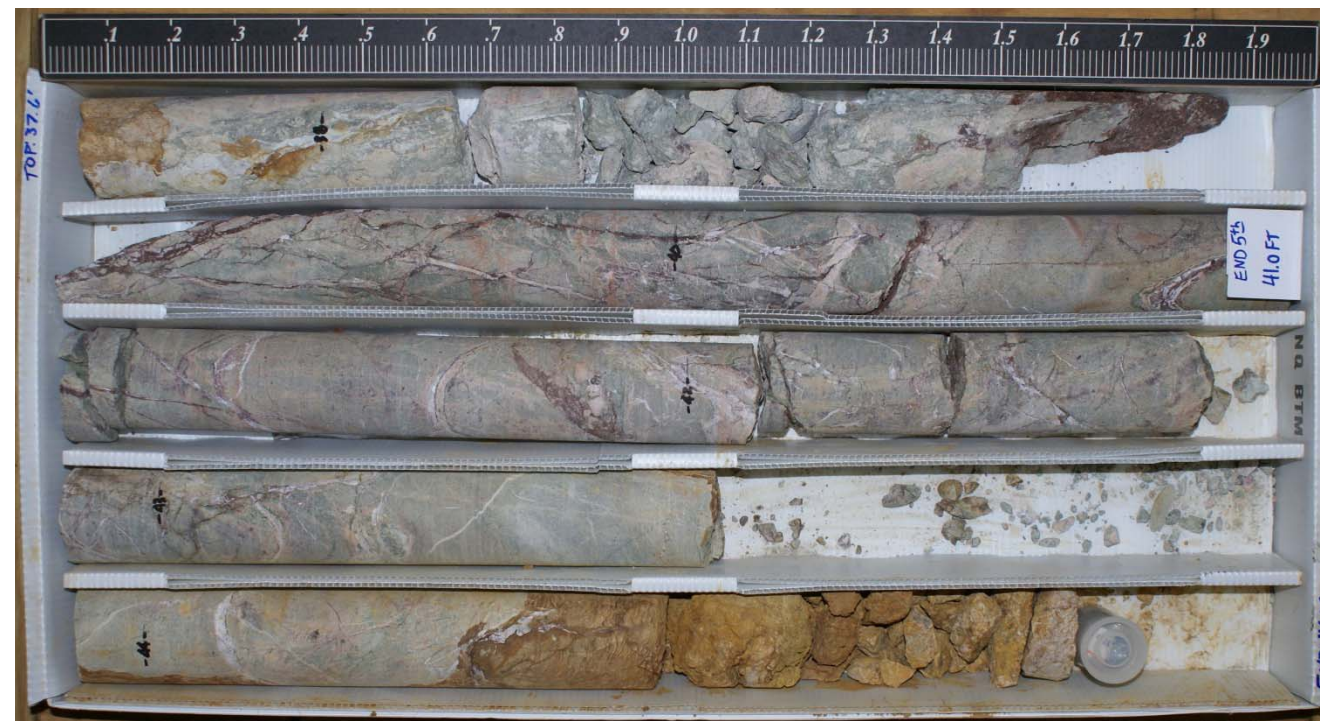
WBS 44105.1.FD1 TIP W-5516



B4-A, 61 + 79.40 @ 23 LT. Box 1 of 3



B4-A, 61 + 79.40 @ 23 LT. Box 2 of 3



B4-A, 61 + 79.40 @ 23 LT. Box 3 of 3

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 44105.1.FD1		TIP W-5516		COUNTY ROWAN		GEOLOGIST DeLost, R.										
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek							GROUND WTR (ft)									
BORING NO. B4-B		STATION 61+79		OFFSET 23 ft RT		ALIGNMENT -L-	0 HR. 9.8									
COLLAR ELEV. 668.7 ft		TOTAL DEPTH 10.9 ft		NORTHING 653,359		EASTING 1,531,791	24 HR. FIAD									
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014				DRILL METHOD H.S. Augers		HAMMER TYPE Automatic										
DRILLER Morgan, M.		START DATE 12/14/14		COMP. DATE 12/14/14		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)		
670														668.7	0.0	GROUND SURFACE
665	664.1	4.6												664.3	4.4	ROADWAY EMBANKMENT Inferred from cuttings, tan, brown, orange, sandy SILT (A-4).
			100/0.3							100/0.3						WEATHERED ROCK Metatuff
660	659.1	9.6	20	45	55/0.1									657.9	10.8	CRYSTALLINE ROCK Metatuff Boring Terminated with Standard Penetration Test Refusal at Elevation 657.8 ft in Crystalline Rock (Metatuff).
	657.9	10.8	60/0.1							100/0.6 60/0.1				657.8	10.9	

NCDOT BORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 44105.1.FD1		TIP W-5516		COUNTY ROWAN		GEOLOGIST DeLost, R.										
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek							GROUND WTR (ft)									
BORING NO. EB2-A		STATION 62+55		OFFSET 21 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 669.5 ft		TOTAL DEPTH 14.5 ft		NORTHING 653,404		EASTING 1,531,866										
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Morgan, M.		START DATE 01/20/15		COMP. DATE 01/20/15		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
670															669.5	0.0
665	665.0	4.5	14	20	19											
660	660.0	9.5	9	20	24											
655	655.1	14.4													655.1	14.4
			60/0.1												655.0	14.5
<p>GROUND SURFACE 0.0</p> <p>ROADWAY EMBANKMENT Red, tan, dense, silty, fine to cse. SAND w/rock frags. (A-1-b).</p> <p>CRYSTALLINE ROCK Metatuff Boring Terminated with Standard Penetration Test Refusal at Elevation 655.0 ft in Crystalline Rock (Metatuff).</p>																

WBS 44105.1.FD1		TIP W-5516		COUNTY ROWAN		GEOLOGIST DeLost, R.										
SITE DESCRIPTION Bridge #399 on Old Beatty Ford Road over Cold Water Creek							GROUND WTR (ft)									
BORING NO. EB2-B		STATION 62+55		OFFSET 26 ft RT		ALIGNMENT -L-										
COLLAR ELEV. 669.1 ft		TOTAL DEPTH 15.1 ft		NORTHING 653,357		EASTING 1,531,867										
DRILL RIG/HAMMER EFF./DATE ICA0404 CME-45C 90% 08/25/2014		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic												
DRILLER Morgan, M.		START DATE 01/20/15		COMP. DATE 01/20/15		SURFACE WATER DEPTH N/A										
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
670															669.1	0.0
665	664.6	4.5	1	1	1											
660	659.6	9.5	WOH	3	33											
655	654.6	14.5													655.1	14.4
	654.0	15.1	76	34/0.1											654.0	15.1
			60/0.0													
<p>GROUND SURFACE 0.0</p> <p>ROADWAY EMBANKMENT Red, tan, white, v. loose to dense, silty, cse. grain SAND w/rock frags. (A-1-b).</p> <p>WEATHERED ROCK Metatuff Boring Terminated with Standard Penetration Test Refusal at Elevation 654.0 ft on Crystalline Rock (Metatuff).</p>																

NCDOT BORE DOUBLE W5516_GEO_BRDG_BORE.GPJ NC_DOT.GDT 5/29/15

SUMMARY OF SOIL CLASSIFICATION

SHEET 30

SAMPLE	OFFSET	STATION	DEPTH	AASHTO	LL	PI	C. SAND	F. SAND	SILT	CLAY	10	40	200	MOIST	ORGAN
B1-A															
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-29	23 LT	58+28	5.2-6.7	A-4(0)	25	4	6.9	44.2	33.3	15.7	99.0	97.0	57.5	22.4	-
EB1-B															
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-30	28 RT	57+45	4.5-6.0	A-2-4(0)	NP	NP	40.8	35.5	18.4	5.3	86.7	62.3	26.2	9.2	-
EB2-B															
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-31	26 RT	62+55	4.5-7.0	A-1-b(0)	NP	NP	84.1	12.9	1.5	1.5	95.6	35.2	3.6	6.8	-
B1-A															
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-32	23 LT	58+28	10.2-11.7	A-1-b(0)	30	5	42.4	27	21.7	9	62.0	42.3	22.3	16.1	-
B2-B															
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-33	23 RT	59+45	5.3-6.8	A-7-6(21)	50	23	6	9.6	30.5	53.9	95.3	91.8	83.1	27.6	-

SUMMARY OF SOIL CLASSIFICATIONS

SHEET 31

SAMPLE	OFFSET	STATION	DEPTH	AASHTO	LL	PI	C. SAND	F. SAND	SILT	CLAY	10	40	200	MOIST	ORGAN
B3-B															
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-34	23 RT	60+62	5.0-6.5	A-4(0)	34	2	31.4	24.2	26.6	17.8	97.7	76.8	48.6	18.5	-

B3-B															
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-35	23 RT	60+62	15.0-16.5	A-4(3)	40	5	18.6	29.3	38.3	13.8	97.7	85.6	58.9	28	-

B3-B															
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-36	23 RT	60+62	25.0-26.5	A-4(1)	32	7	33.5	22.7	27.1	16.7	97.1	73.7	47.7	19.1	-

B4-A															
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-37	23 LT	61+79	15.0-16.5	A-7-5(27)	67	26	7.9	12.8	41.2	38.1	99.8	95.1	83.2	42.1	-

