

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 33262.1.1 (B-3806) F.A. PROJ. BRSTP-1573(2)  
COUNTY ASHE  
PROJECT DESCRIPTION BRIDGE NO. 456 ON SR-1573  
OVER ASHEWORTH CREEK

SITE DESCRIPTION \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**CONTENTS**

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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) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN 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.

**PROJECT: 33262.1.1 ID: B-3806**

**PERSONNEL**

T B DANIEL

C J COFFEY

R D CHILDERS

M M HAGER

D O CHEEK

G K ROSE

INVESTIGATED BY C A DUNNAGAN

CHECKED BY W D FRYE, Jr

SUBMITTED BY W D FRYE, Jr

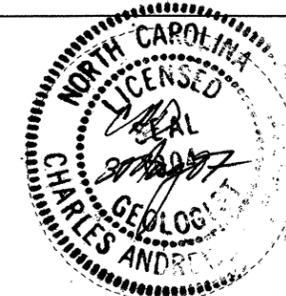
DATE AUGUST 2007

DRAWN BY: C A DUNNAGAN

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.

*C A Dunnagan*



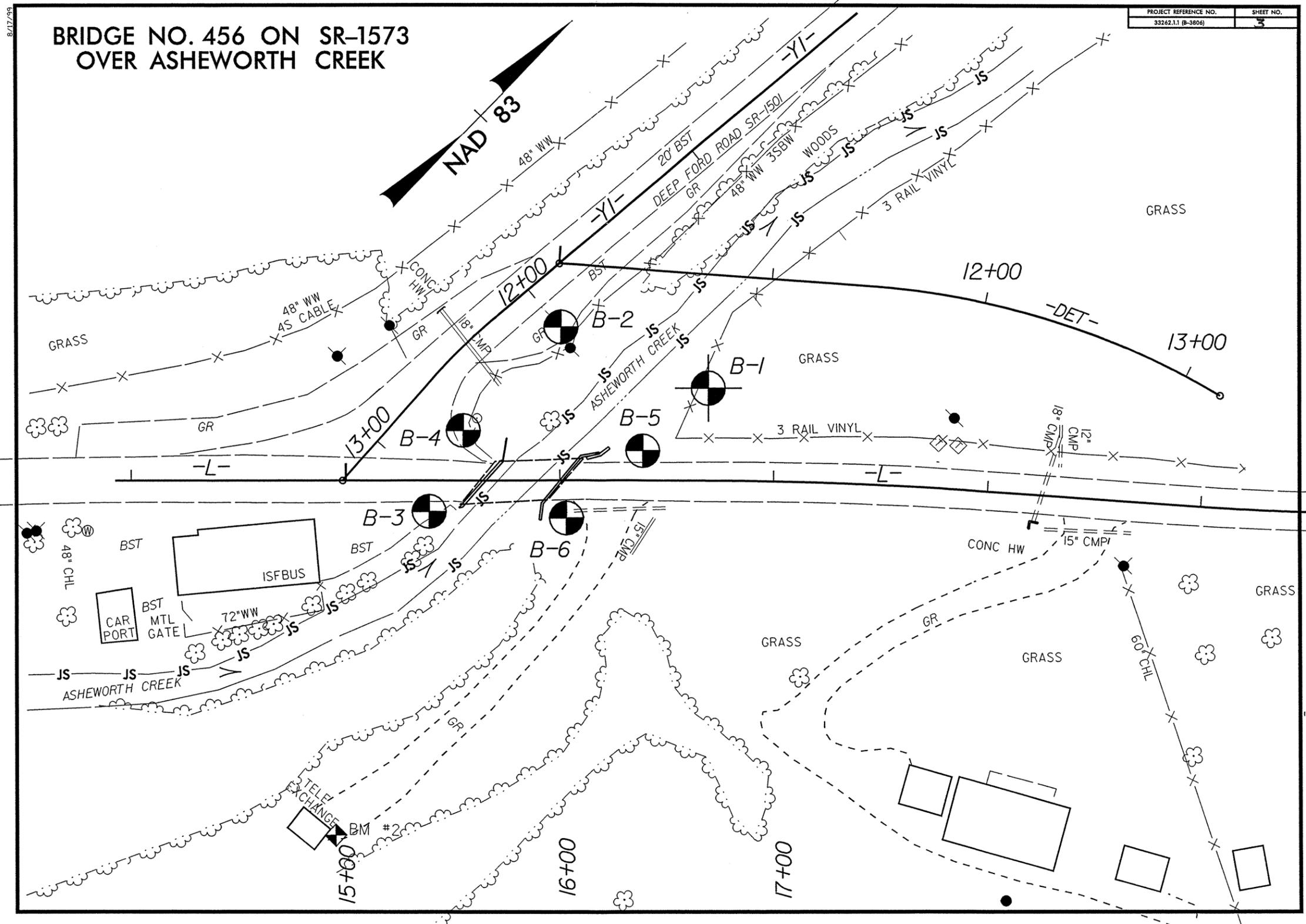
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO. 33262.IJ (B-3806) SHEET NO. 2

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

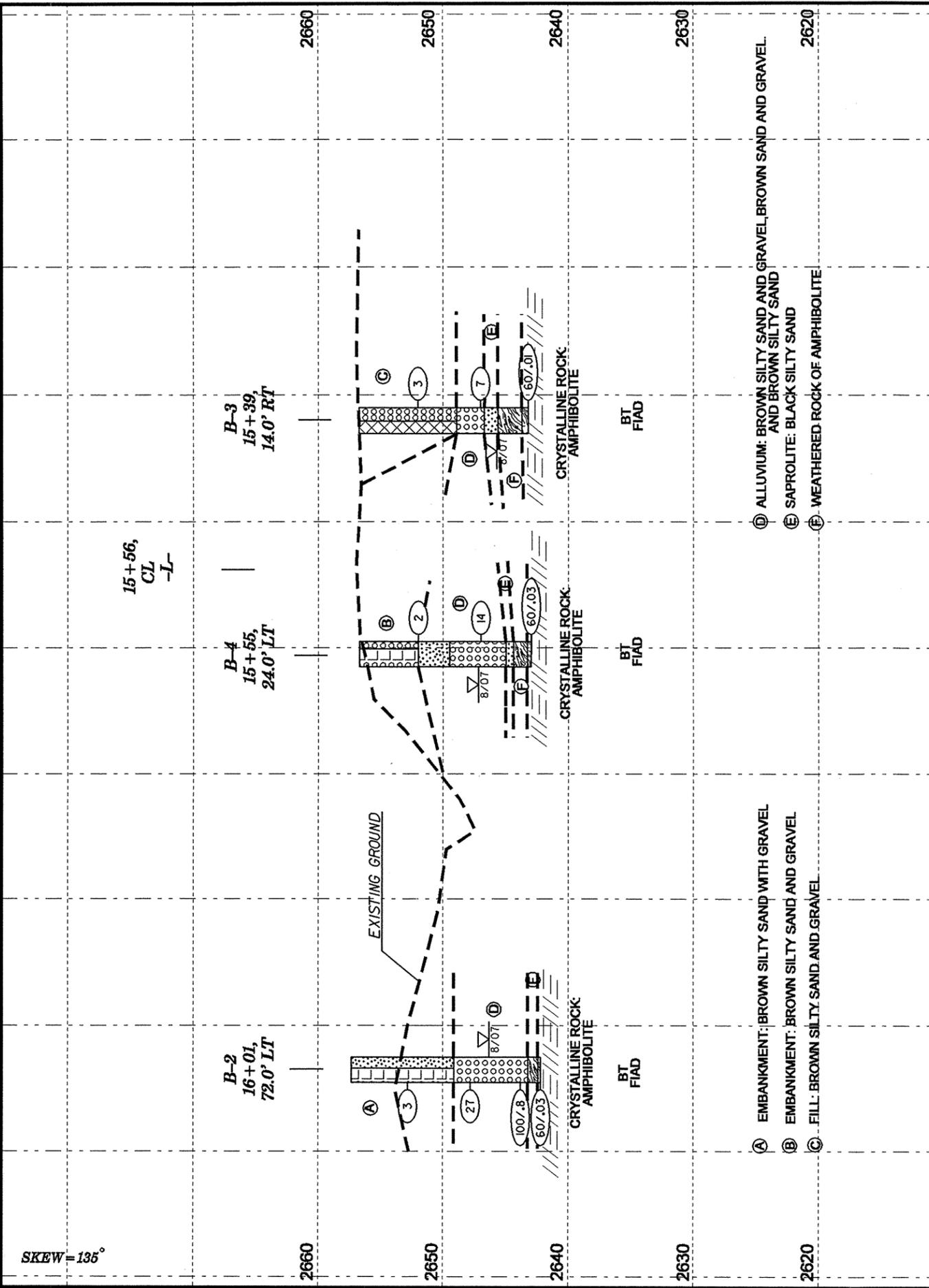
Table with multiple columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, MINERALOGICAL COMPOSITION, COMPRESSION, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, INDURATION, PLASTICITY, COLOR.



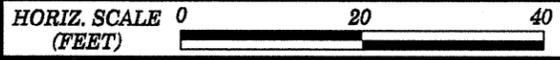
**BRIDGE NO. 456 ON SR-1573  
OVER ASHEWORTH CREEK**

PROJECT REFERENCE NO. 33262.1.1 (B-3806)	SHEET NO. 3
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8/17/99

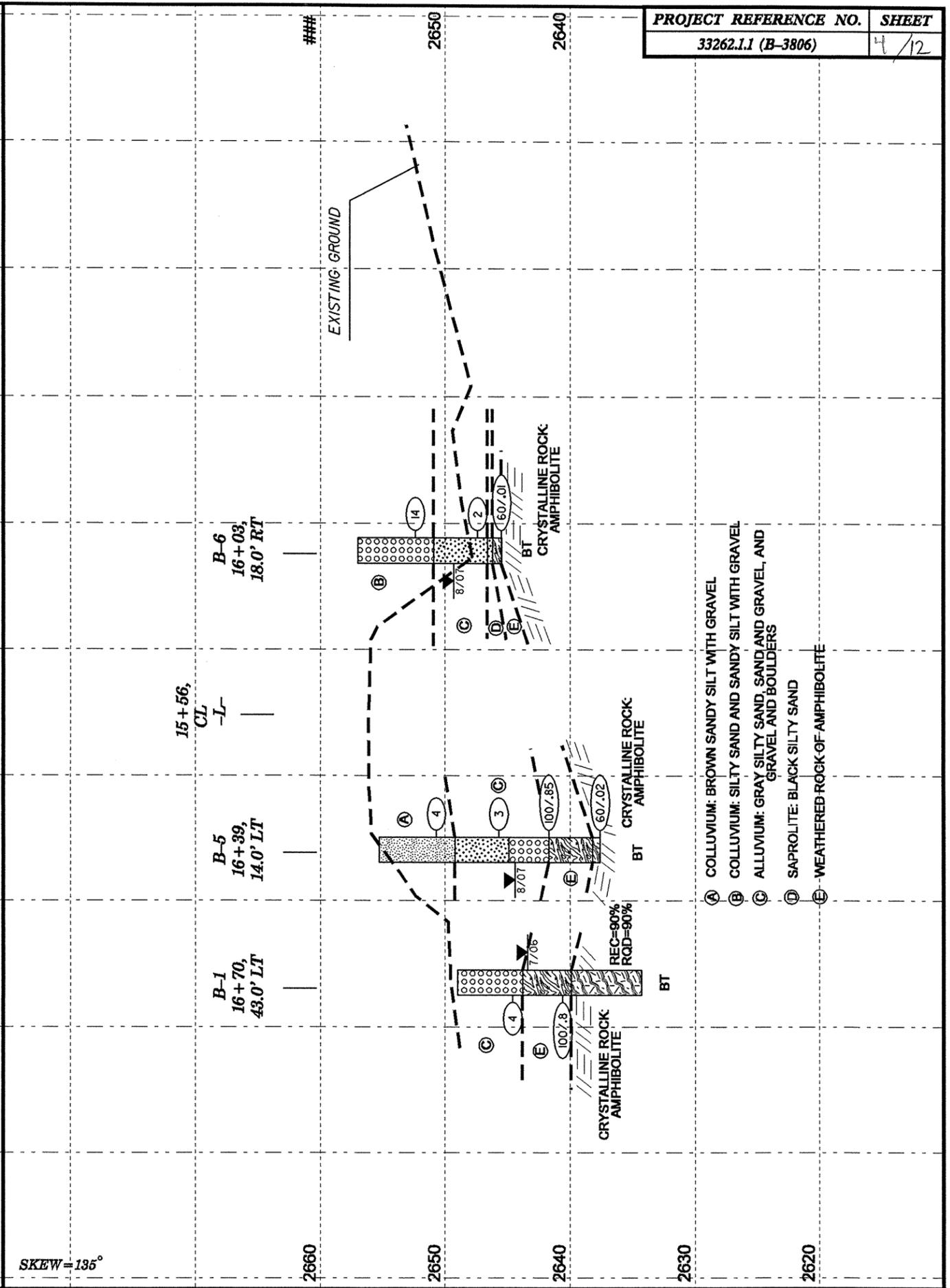


SKEW=135°

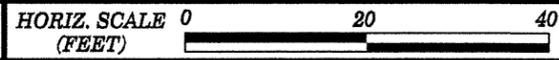


VE = 2

PROFILE ALONG WESTERN FOOTING



SKEW=135°



VE = 2

PROFILE ALONG EASTERN FOOTING

PROJECT NO. 33262.1.1		ID. B-3806		COUNTY Ashe		GEOLOGIST Hager, M. M.									
SITE DESCRIPTION BRIDGE NO. 456 ON SR-1573 OVER ASHEWORTH CREEK						GROUND WTR (ft)									
BORING NO. B-1		STATION 16+70		OFFSET 43ft LT		ALIGNMENT -L-									
COLLAR ELEV. 2,649.0 ft		TOTAL DEPTH 14.7 ft		NORTHING 998,977		EASTING 1,282,855									
DRILL MACHINE CME-550		DRILL METHOD NW Casing w/ SPT Core				HAMMER TYPE Automatic									
START DATE 07/31/06		COMP. DATE 07/31/06		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 9.1 ft									
ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
		0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2650														2,649.0	0.0
	3.4													2,643.8	5.2
	8.4													2,639.9	9.1
														2,634.3	14.7
Boring Terminated at Elevation 2,634.3 ft IN CRYSTALLINE ROCK (AMPHIBOLITE)															

NCDOT BORE SINGLE BORLOGS.GPJ NC\_DOT\_GDT\_08/21/07

5/12

PROJECT NO. 33262.1.1		ID. B-3806		COUNTY Ashe		GEOLOGIST Daniel, T. B.									
SITE DESCRIPTION BRIDGE NO. 456 ON SR-1573 OVER ASHEWORTH CREEK						GROUND WTR (ft)									
BORING NO. B-2		STATION 16+01		OFFSET 72ft LT		ALIGNMENT -L-									
COLLAR ELEV. 2,657.3 ft		TOTAL DEPTH 15.1 ft		NORTHING 998,949		EASTING 1,282,786									
DRILL MACHINE CME-550		DRILL METHOD H.S. Augers				HAMMER TYPE Automatic									
START DATE 08/16/07		COMP. DATE 08/17/07		SURFACE WATER DEPTH N/A		DEPTH TO ROCK 14.9 ft									
ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	LOG G	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
		0.5ft	0.5ft	0.5ft	0	25	50	75	100						
2660														2,657.3	0.0
	3.5													2,649.1	8.2
	8.5													2,643.2	14.1
	13.5													2,642.4	14.9
	15.1													2,642.2	15.1
Boring Terminated with Standard Penetration Test Refusal at Elevation 2,642.2 ft IN CRYSTALLINE ROCK (AMPHIBOLITE)															

NCDOT BORE SINGLE BORLOGS.GPJ NC\_DOT\_GDT\_08/21/07







**FIELD  
 SCOUR REPORT**

WBS: 33262.1.1 TIP: B-3806 COUNTY: Ashe

DESCRIPTION(1): Bridge No.456 on SR-1573 over Asheworth Creek

**EXISTING BRIDGE**

Information from: Field Inspection  Microfilm \_\_\_\_\_ (reel \_\_\_\_\_ pos: \_\_\_\_\_)  
 Other (explain) \_\_\_\_\_

Bridge No.: 456 Length: 35ft Total Bents: 2 Bents in Channel: 0 Bents in Floodplain: 2  
 Foundation Type: \_\_\_\_\_

**EVIDENCE OF SCOUR(2)**

Abutments or End Bent Slopes: None noted.

Interior Bents: N/A

Channel Bed: None noted.

Channel Bank: None noted. There is a prominent erosional feature at EB1-B. Probably from run-off from parking lot above. Repaired with concrete sacks and backfill.

**EXISTING SCOUR PROTECTION**

Type(3): Concrete end bent walls with wingwalls of wood.

Extent(4): Wingwalls extend +/- 10 feet beyond end bent walls.

Effectiveness(5): OK

Obstructions(6): Boulders 2-3 feet diameter, downstream of bridge.

**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 theoretical 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): Rock with sand, gravel and boulder alluvium.

Channel Bank Material(8): Silty sand with gravel.

Channel Bank Cover(9): Shrubs and trees.

Floodplain Width(10): EB2-A > 100 feet. All others = 0 feet.

Floodplain Cover(11): Grass.

Stream is(12): Aggrading \_\_\_\_\_ Degrading \_\_\_\_\_ Static

Channel Migration Tendency(13): Southwest

Observations and Other Comments: Deposition of sand is occurring under existing bridge with erosion immediately downstream from bridge.

DESIGN SCOUR ELEVATIONS(14) Feet  Meters \_\_\_\_\_

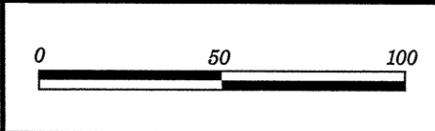
	BENTS											
	B1	B2	B3	B4								
SB Lanes, Lt												
SB Lanes, Rt												
NB Lanes, Lt												
NB Lanes, Rt												

Comparison of DSE to Hydraulics Unit theoretical scour:  
 No Hydraulics Unit report was supplied.

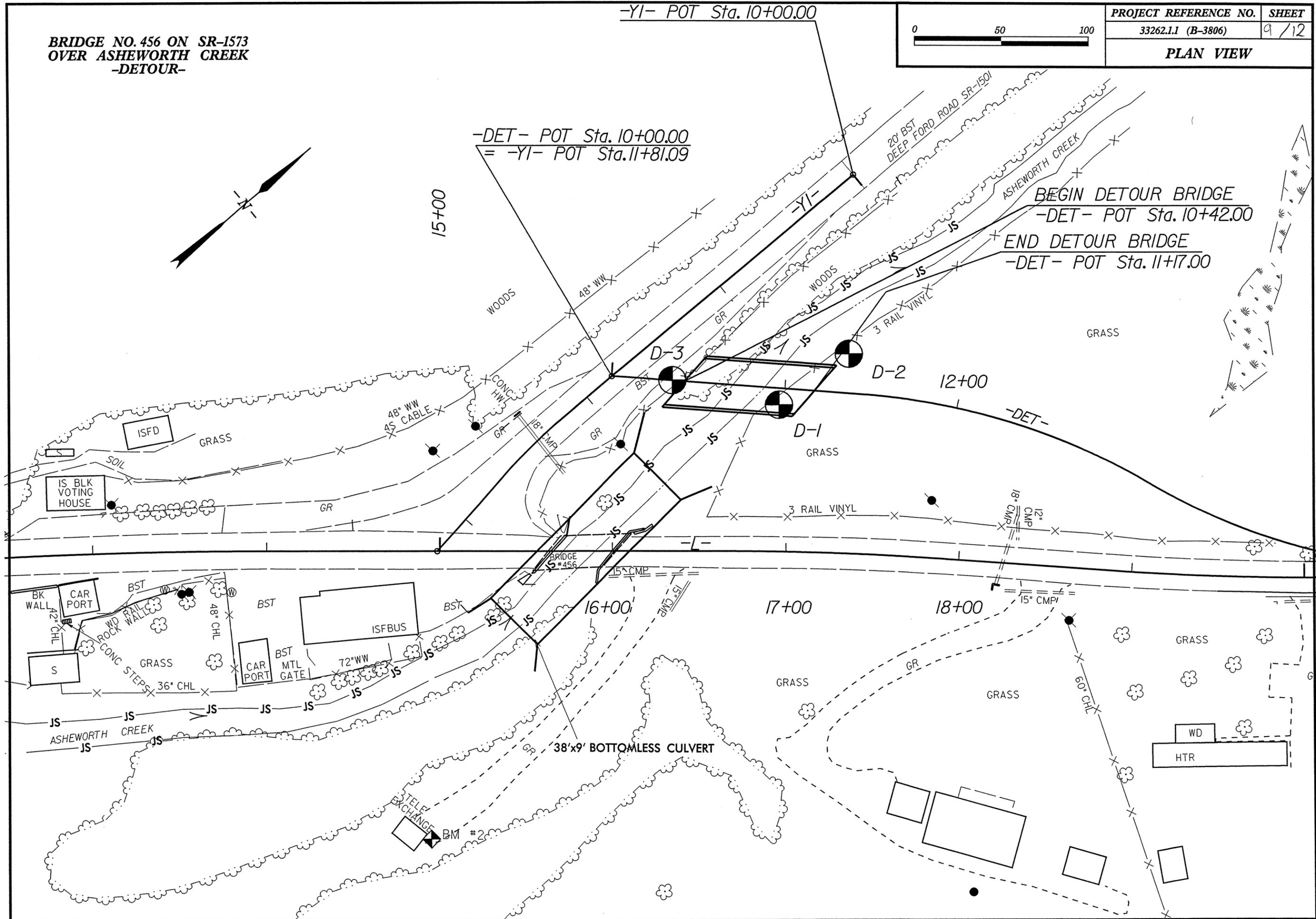
**SOIL ANALYSIS RESULTS FROM CHANNEL BED AND BANK MATERIAL**

Bed or Bank													
Sample No.													
Retained #4													
Passed #10													
Passed #40													
Passed #200													
Coarse Sand													
Fine Sand													
Silt													
Clay													
LL													
PI													
AASHTO													
Station													
Offset													
Depth													

**BRIDGE NO. 456 ON SR-1573  
OVER ASHEWORTH CREEK  
-DETOUR-**



PROJECT REFERENCE NO.	SHEET
33262.1.1 (B-3806)	9 / 12
PLAN VIEW	



-YI- POT Sta. 10+00.00

-DET- POT Sta. 10+00.00  
= -YI- POT Sta. 11+81.09

BEGIN DETOUR BRIDGE  
-DET- POT Sta. 10+42.00  
END DETOUR BRIDGE  
-DET- POT Sta. 11+17.00

BRIDGE NO. 456

38'x9' BOTTOMLESS CULVERT

15+00

12+00

16+00

17+00

18+00

BK WALL  
CAR PORT

CONC STEPS  
36\"/>

CAR PORT  
MTL GATE

ISFBUS

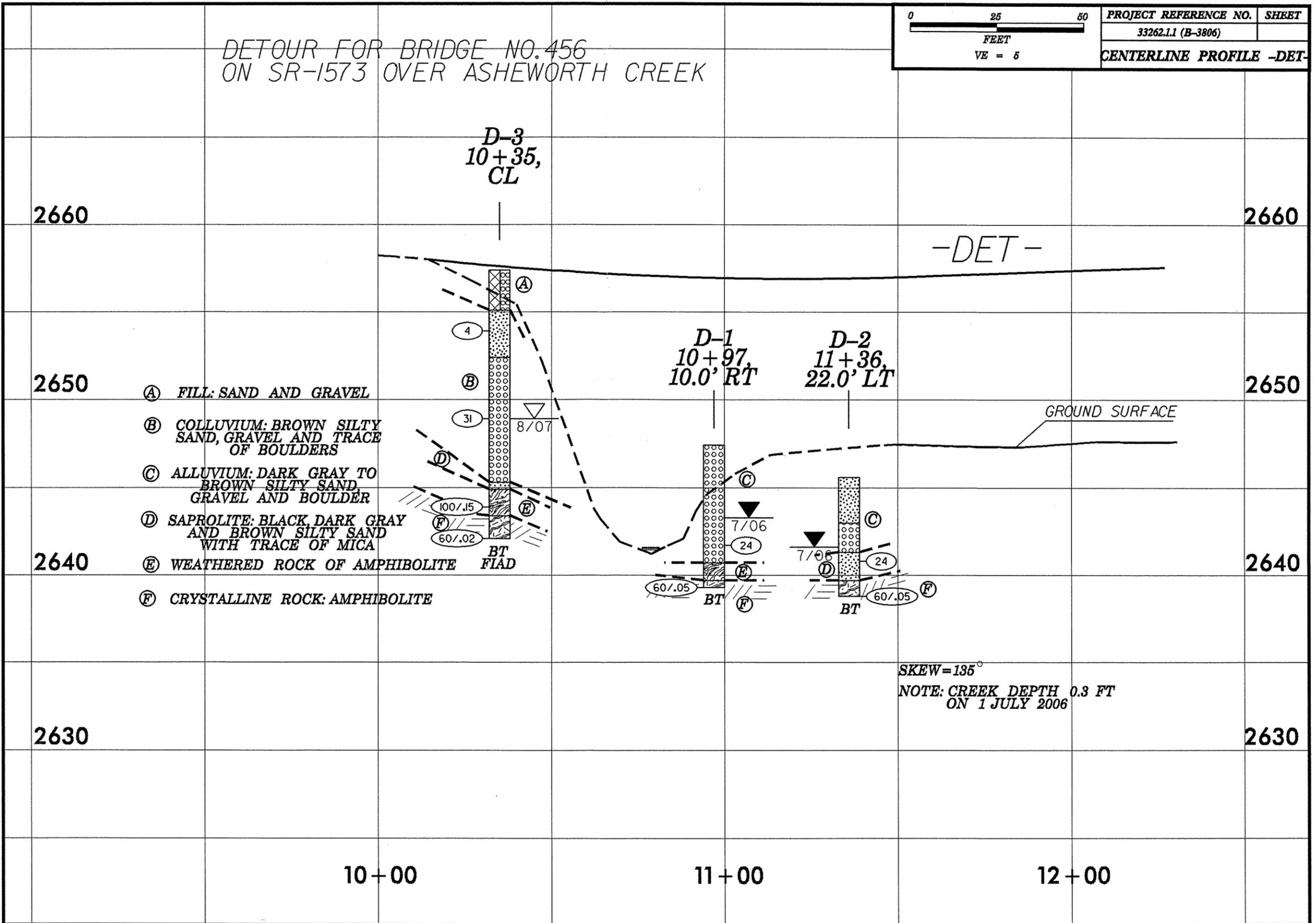
TELE EXCHANGE  
BM #2

WD  
HTR

DETOUR FOR BRIDGE NO. 456  
ON SR-1573 OVER ASHEWORTH CREEK

<p>0 25 50 FEET VE = 5</p>	PROJECT REFERENCE NO.	SHEET
	33262.1.1 (B-3806)	

CENTERLINE PROFILE -DET-



- Ⓐ FILL: SAND AND GRAVEL
- Ⓑ COLLUVIUM: BROWN SILTY SAND, GRAVEL AND TRACE OF BOULDERS
- Ⓒ ALLUVIUM: DARK GRAY TO BROWN SILTY SAND GRAVEL AND BOULDER
- Ⓓ SAPROLITE: BLACK DARK GRAY AND BROWN SILTY SAND WITH TRACE OF MICA
- Ⓔ WEATHERED ROCK OF AMPHIBOLITE
- Ⓕ CRYSTALLINE ROCK: AMPHIBOLITE

SKEW = 135°  
NOTE: CREEK DEPTH 0.3 FT  
ON 1 JULY 2006

PROJECT NO. 33262.1.1	ID. B-3806	COUNTY Ashe	GEOLOGIST Hager, M. M.
SITE DESCRIPTION BRIDGE NO. 456 ON SR-1573 OVER ASHEWORTH CREEK			GROUND WTR (ft)
BORING NO. D-1	STATION 10+97	OFFSET 10ft RT	ALIGNMENT -DET-
COLLAR ELEV. 2,647.4 ft	TOTAL DEPTH 8.1 ft	NORTHING 999,022	EASTING 1,282,846
DRILL MACHINE CME-550	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
START DATE 07/31/06	COMP. DATE 07/31/06	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 7.7 ft

ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
		0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2650												2,647.4 GROUND SURFACE	0.0
												ALLUVIAL DARK GRAY TO BROWN SILTY SAND AND GRAVEL.	
2,642.7	4.7											2,640.7 WEATHERED ROCK OF AMPHIBOLITE.	6.7
2,639.3	8.1											2,639.7 CRYSTALLINE ROCK (AMPHIBOLITE).	7.7
												2,639.3	8.1
												Boring Terminated with Standard Penetration Test Refusal at Elevation 2,639.3 ft IN CRYSTALLINE ROCK (AMPHIBOLITE)	

PROJECT NO. 33262.1.1	ID. B-3806	COUNTY Ashe	GEOLOGIST Hager, M. M.
SITE DESCRIPTION BRIDGE NO. 456 ON SR-1573 OVER ASHEWORTH CREEK			GROUND WTR (ft)
BORING NO. D-2	STATION 11+36	OFFSET 22ft LT	ALIGNMENT -DET-
COLLAR ELEV. 2,645.6 ft	TOTAL DEPTH 6.8 ft	NORTHING 999,071	EASTING 1,282,853
DRILL MACHINE CME-550	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
START DATE 07/31/06	COMP. DATE 07/31/06	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 5.9 ft

ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG MOI	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
		0.5ft	0.5ft	0.5ft	0	25	50	75	100				
2650												2,645.6 GROUND SURFACE	0.0
												ALLUVIAL BROWN SILTY SAND.	2.6
2,640.8	4.8											2,641.3 ALLUVIAL GRAVEL AND BOULDER.	4.3
2,638.8	6.8											2,639.7 SAPROLITE	5.9
												2,638.8	6.8
												Boring Terminated with Standard Penetration Test Refusal at Elevation 2,638.8 ft IN CRYSTALLINE ROCK (AMPHIBOLITE)	



# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

12/12

PROJECT NO. 33262.1.1	ID. B-3806	COUNTY Ashe	GEOLOGIST Daniel, T. B.
SITE DESCRIPTION BRIDGE NO. 456 ON SR-1573 OVER ASHEWORTH CREEK			GROUND WTR (ft)
BORING NO. D-3	STATION 10+35	OFFSET CL	ALIGNMENT -DET-
COLLAR ELEV. 2,657.4 ft	TOTAL DEPTH 15.3 ft	NORTHING 998,992	EASTING 1,282,792
DRILL MACHINE CME-550	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
START DATE 08/16/07	COMP. DATE 08/16/07	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 14.0 ft

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					
2660														
												2,657.4	GROUND SURFACE	0.0
												2,655.1	ARTIFICIAL FILL SAND AND GRAVEL.	2.3
2,653.9	3.5	5	2	2							M	2,652.4	COLLUVIUM BROWN SILTY SAND WITH GRAVEL.	5.0
2,648.9	8.5	10	16	15							M		COLLUVIUM BROWN SILTY SAND AND GRAVEL WITH TRACE OF BOULDER.	
2,643.9	13.5											2,645.3	SAPROLITE	12.1
												2,644.9	BLACK SILTY SAND.	12.5
2,642.1	15.3	100/15							100/15		M	2,643.4	WEATHERED ROCK OF AMPHIBOLITE.	14.0
		60/02							60/02			2,642.1	CRYSTALLINE ROCK (AMPHIBOLITE).	15.3
													Boring Terminated with Standard Penetration Test Refusal at Elevation 2,642.1 ft IN CRYSTALLINE ROCK (AMPHIBOLITE)	

NCDOT BORE SINGLE BORLOGS.GPJ NC\_DOT.GDT 08/22/07