

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

**STRUCTURE**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 33542.1.1 F.A. PROJ. BRZ-1163(3)  
 COUNTY McDowell  
 PROJECT DESCRIPTION BRIDGE No. 42 ON SR 1163 OVER  
SECOND BROAD RIVER

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

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**CAUTION NOTICE**

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PERSONNEL

MM HAGER

JT WILLIAMS

INVESTIGATED BY PQ LOCKAMY

CHECKED BY WD FRYE

SUBMITTED BY WD FRYE

DATE 9-29-06



**PROJECT: 33542.1.1 ID: B-4195**

DRAWN BY: PQ LOCKAMY

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

NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO. 33542.I.I SHEET NO. 2

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table with 4 main columns: SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, and TERMS AND DEFINITIONS. Includes sub-sections like SOIL LEGEND AND AASHTO CLASSIFICATION, CONSISTENCY OR DENSENESS, TEXTURE OR GRAIN SIZE, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, MISCELLANEOUS SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, and ROCK HARDNESS.



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY  
GOVERNOR

LYNDO TIPPETT  
SECRETARY

29 September, 2006

STATE PROJECT: 33542.1.1 (B-4195)  
F. A. PROJECT: BRZ-1163(3)  
COUNTY: McDowell  
  
DESCRIPTION: Bridge No. 42 on SR 1163 over Second Broad River  
  
SUBJECT: Geotechnical Report – Foundation Investigation

**Introduction**

This project is located in the Sugar Hill area of McDowell County. The existing double span bridge is proposed to be replaced by a bottomless structure with a skew of 125°.

The surface investigation was conducted by shooting elevations along the proposed culvert foundations where crystalline rock of Henderson Gneiss is continuously exposed. No borings were made; soil samples and rock samples were not taken. A scour report was not made.

**Geology and Rock Characteristics**

Underlying rock type is Henderson Gneiss, a metamorphosed granite typified by myrmekitic rimmed feldspar augens. Myrmekite is oligoclase feldspar with numerous small worm like inclusions of quartz around the surface. It may be seen under handlens magnification. Henderson Gneiss is symbolized on geologic maps as Ch or Chg. The gneiss has an IUGS classification of monzogranite to granodiorite. It is composed chiefly of microcline, oligoclase, and quartz, with biotite and some muscovite. Henderson Gneiss commonly has allanite and sphene as accessory minerals.

The northwest - southeast trending valley of the Second Broad River expresses a prominent regional structure. It is apparent on topo maps and boldly displayed on aerial photographs. Valleys with similar orientations that echo this noticeably straight feature are found to the northeast and southwest on approximately 1.4 to 1.6 mile intervals. This lineation is repeated on a more localized scale by a joint set parallel to the river trending at north 42° west with 1 to 4

foot spacings and a nearly vertical plunge. This joint set was utilized in excavation of crystalline rock of Henderson Gneiss for the existing north endbent. Another joint set (oblique to perpendicular to the first joint set) is exposed in the riverbed and trends north 40° to 60° east also with a nearly vertical plunge.

Typical of massive rock is exfoliation or shallow cracking parallel to the surface. Exfoliation makes the smooth surface of exposed crystalline rock of Henderson Gneiss in the riverbed and also may also be utilized in excavation.

**Foundation Materials**

Both proposed culvert footings have continuous exposures of crystalline rock of Henderson Gneiss. A thin skimming of alluvia from .5 to 1.4 feet deep is present behind existing interior bent one. Continuity of gneissic bedrock was confirmed by hand excavation through the patches of alluvium. All surface elevations shown on cross sections are of crystalline rock of Henderson Gneiss. The alluvium is not shown.

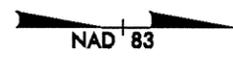
Respectfully Submitted,

PQ Lockamy, PG

# PLAN VIEW

**INCOMPLETE PLANS**  
DO NOT USE FOR E/W ACQUISITION

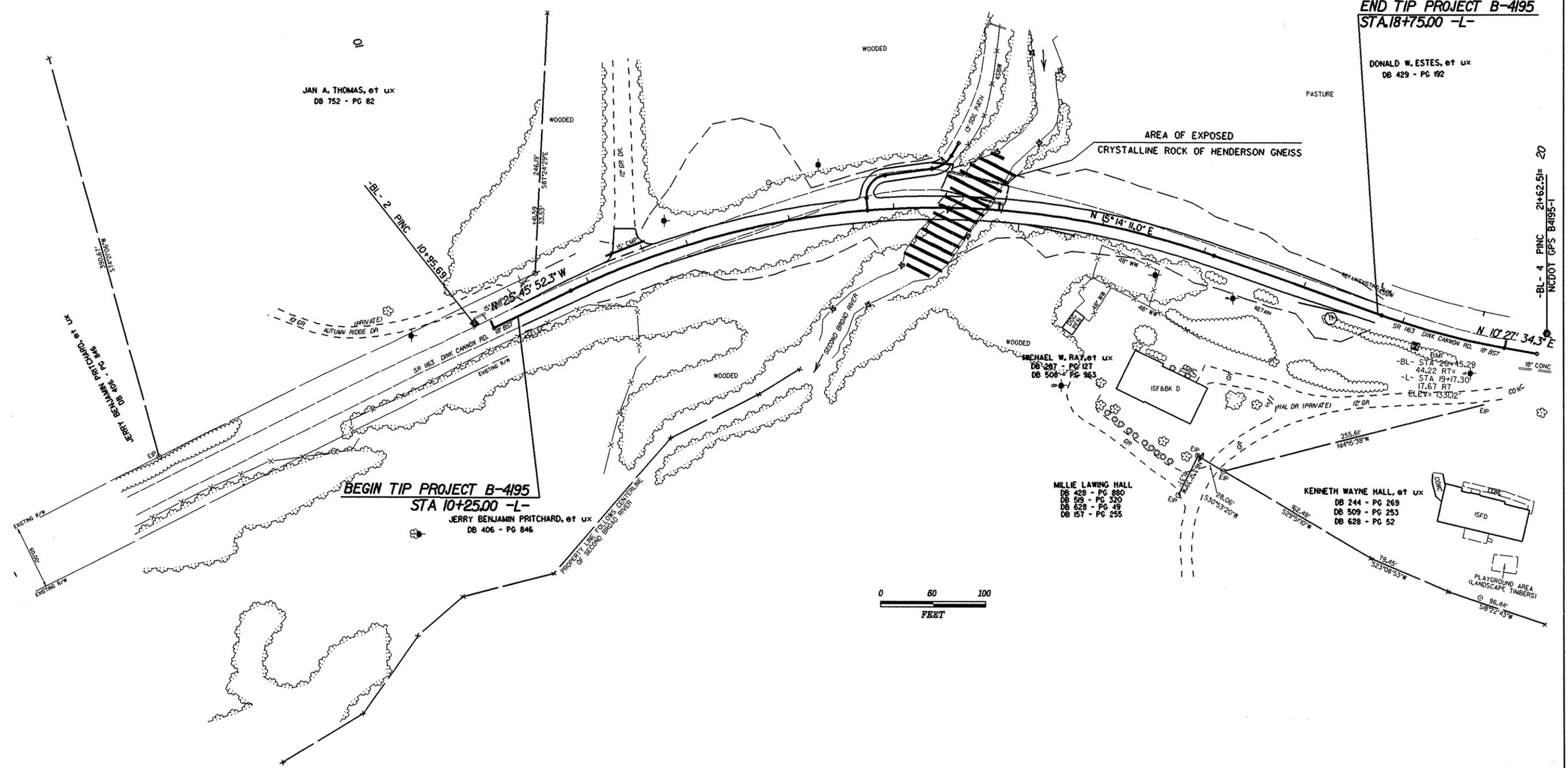
**PRELIMINARY PLANS**  
DO NOT USE FOR CONSTRUCTION



AUBREY WYLIE, et ux  
DB 289 - PG 443  
DB 315 - PG 128

**END TIP PROJECT B-4195**  
**STA. 18+75.00 -L-**

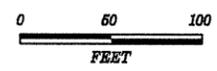
DONALD W. ESTES, et ux  
DB 429 - PG 192



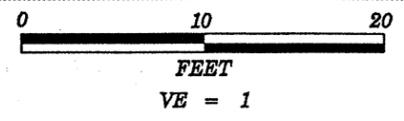
**BEGIN TIP PROJECT B-4195**  
**STA 10+25.00 -L-**  
JERRY BENJAMIN PRITCHARD, et ux  
DB 406 - PG 846

MILLIE LAWING HALL  
DB 428 - PG 880  
DB 519 - PG 320  
DB 528 - PG 49  
DB 57 - PG 255

KENNETH WAYNE HALL, et ux  
DB 244 - PG 269  
DB 509 - PG 253  
DB 628 - PG 52

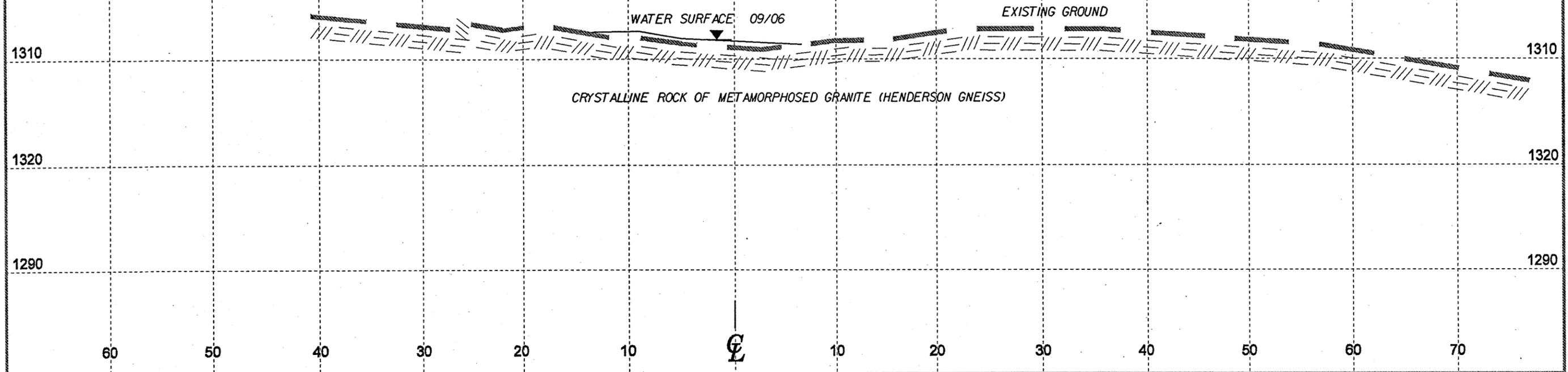


-BL-4 PINC 21+62.51= 20  
NCDOT GPS B4195-1

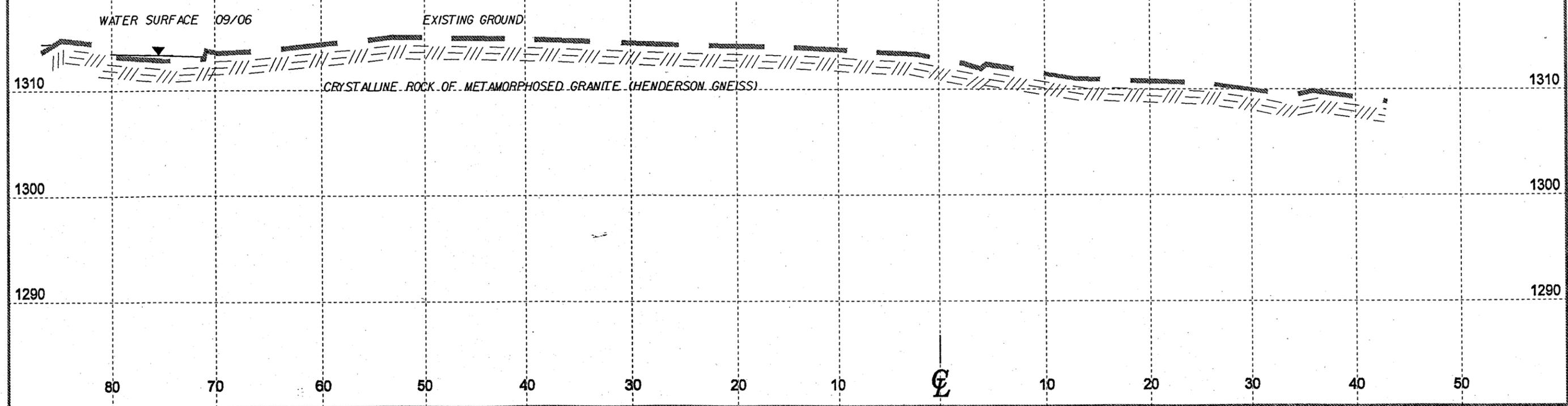


PROJECT REFERENCE NO.	SHEET
33542.1.1	5 of 7
SKEW = 125°	

**SECTION ALONG NORTH SIDE FOOTING**  
**CL = -L- STA. 14+88**



**SECTION ALONG SOUTH SIDE FOOTING**  
**CL = -L- STA. 14+47**



33542.1.1  
B-4195

McDowell County Bridge 42 on SR 1163  
Over Second Broad River



Downstream Looking up  
Exposed crystalline rock of Henderson Gneiss

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McDowell County Bridge 42 on SR 1163  
Over Second Broad River



Upstream Side of Existing Bridge  
Exposed crystalline rock of Henderson Gneiss

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McDowell County Bridge 42 on SR 1163  
Over Second Broad River



North Bank Under Bridge  
Exposed crystalline rock of Henderson Gneiss  
Looking Upstream

33542.1.1  
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McDowell County Bridge 42 on SR 1163  
Over Second Broad River



South Bank Under Bridge  
Exposed crystalline rock of Henderson Gneiss  
Looking Downstream