

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	32919.1.1 B-3187	1	9

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

STRUCTURE
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 32919.1.1 B-3187 F.A. PROJ. BRZ-1112(2)
COUNTY HAYWOOD
PROJECT DESCRIPTION BRIDGE NO. 79 ON SR 1112
OVER WEST FORK PIGEON RIVER

SITE DESCRIPTION _____

For Letting

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.

PERSONNEL

M.M. HAGER

D.O. CHEEK

C.J. COFFEY

R.D. CHILDERS

INVESTIGATED BY J.W. MANN

CHECKED BY W.D. FRYE

SUBMITTED BY W.D. FRYE

DATE 12/16/08



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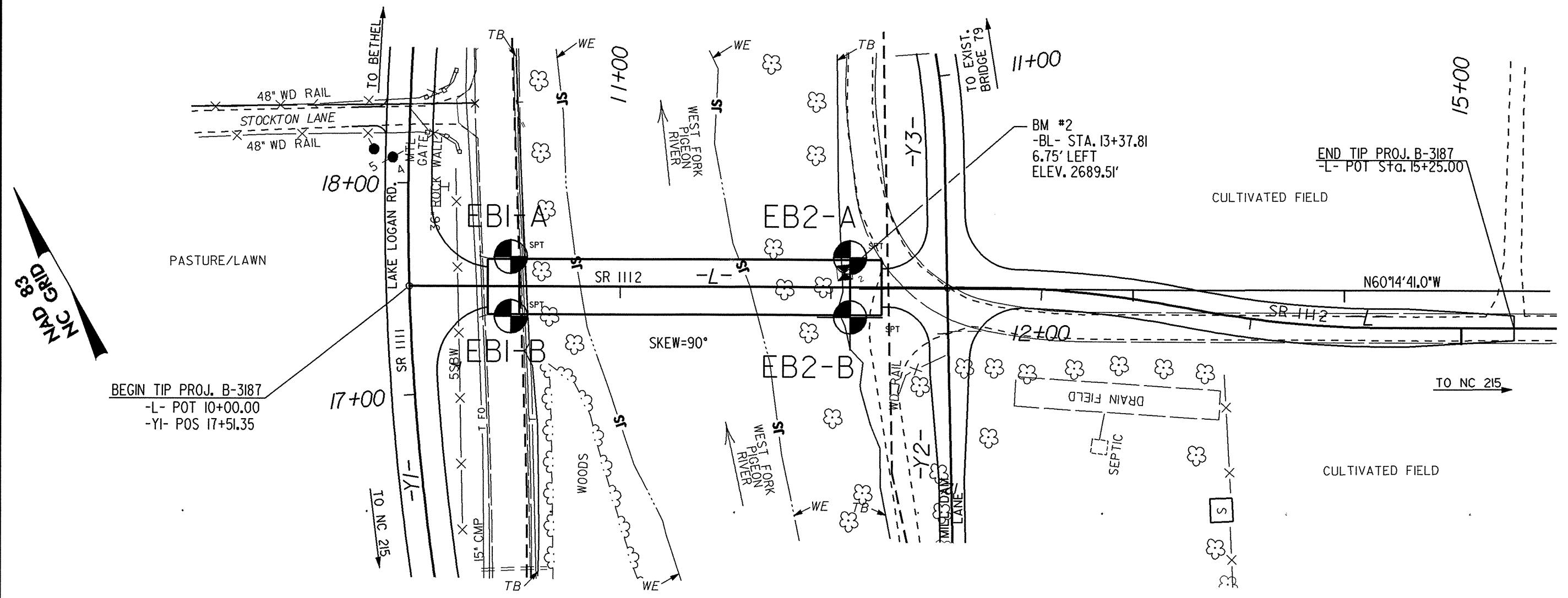
<u>SHEET</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4	CROSS SECTIONS
5-7	BORE LOG & CORE REPORTS
8	SCOUR REPORT
9	CORE PHOTOGRAPH

PROJECT: 32919.1.1 ID: B-3187

DRAWN BY: J.W. Mann

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.



BEGIN TIP PROJ. B-3187
 -L- POT 10+00.00
 -Y1- POS 17+51.35

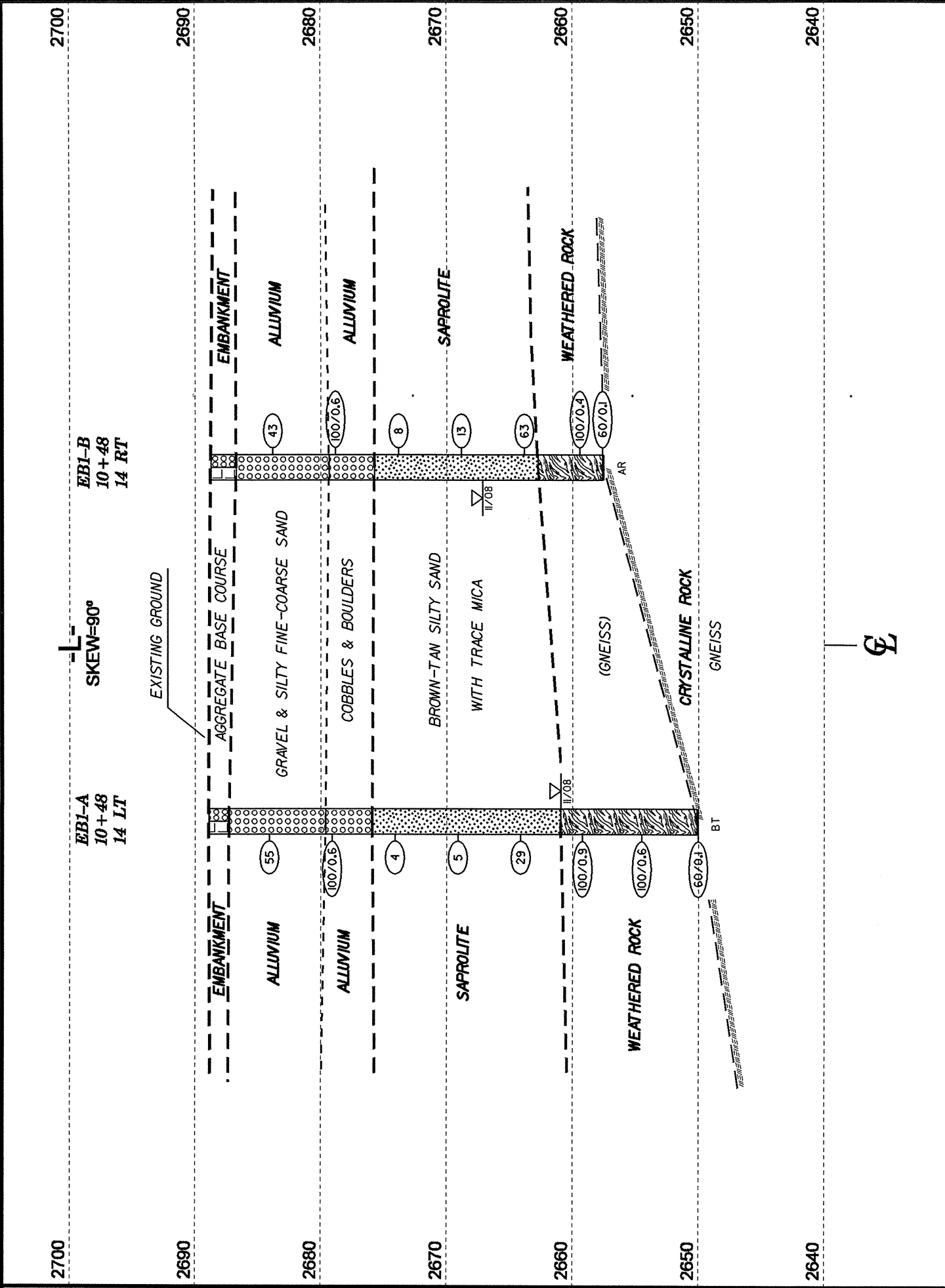
BM #2
 -BL- STA. 13+37.81
 6.75' LEFT
 ELEV. 2689.51'

END TIP PROJ. B-3187
 -L- POT Sta. 15+25.00

CULTIVATED FIELD

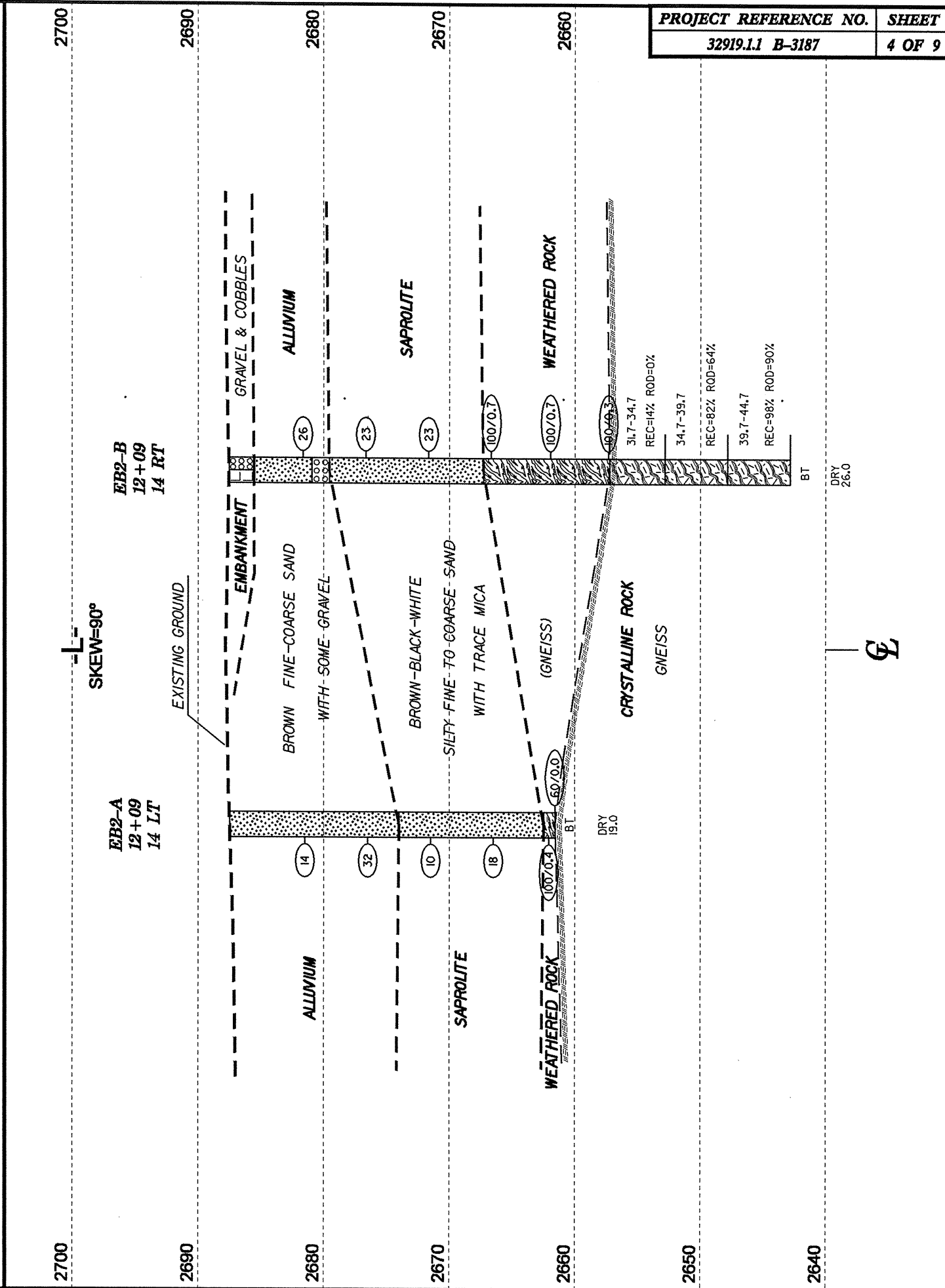
CULTIVATED FIELD

NAD 83
GRID



HORIZ. SCALE 0 10 20 (FEET) VE = 1

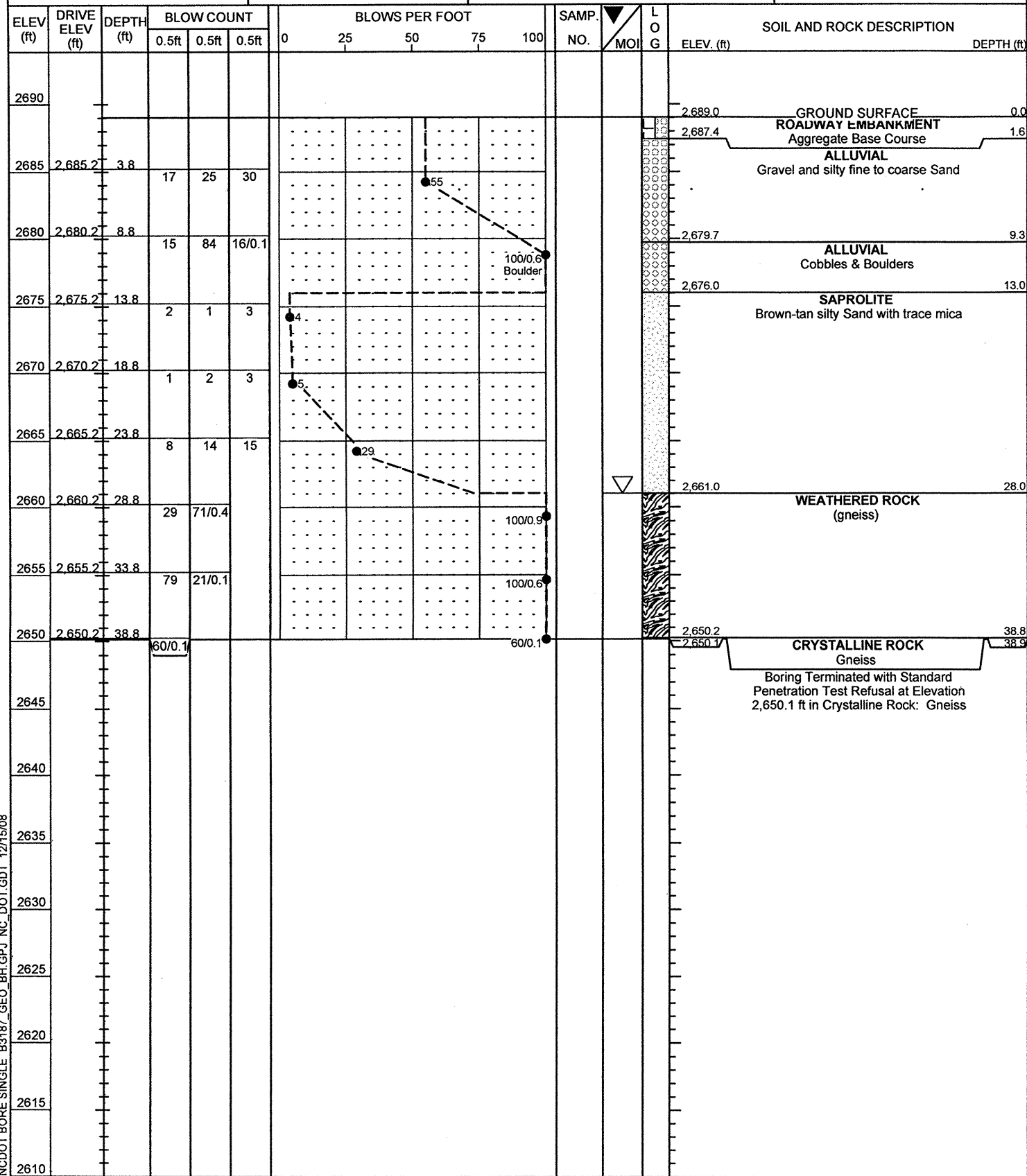
SECTION THRU END BENT ONE



HORIZ. SCALE 0 10 20 (FEET) VE = 1

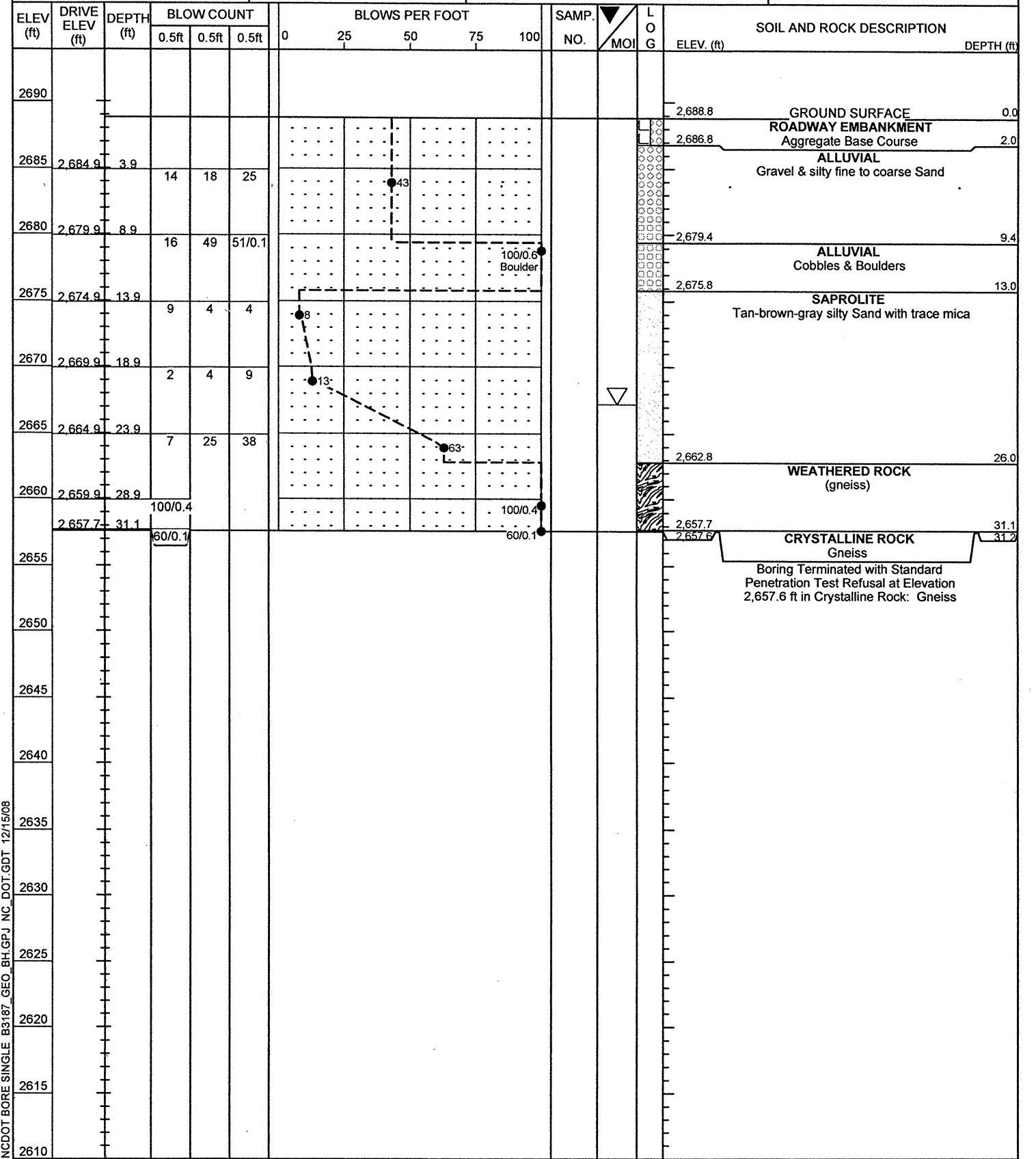
SECTION THRU END BENT TWO

PROJECT NO. 32919.1.1	ID. B-3187	COUNTY Haywood	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 79 on SR 1112 over West Fork Pigeon River			GROUND WTR (ft)
BORING NO. EB1-A	STATION 10+48	OFFSET 14ft LT	ALIGNMENT -L-
COLLAR ELEV. 2,689.0 ft	TOTAL DEPTH 38.9 ft	NORTHING 645,936	EASTING 838,576
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 11/18/08	COMP. DATE 11/18/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 38.8 ft



NCDOT BORE SINGLE B3187_GEO_BH.GPJ NC_DOT.GDT 12/15/08

PROJECT NO. 32919.1.1	ID. B-3187	COUNTY Haywood	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 79 on SR 1112 over West Fork Pigeon River			GROUND WTR (ft)
BORING NO. EB1-B	STATION 10+48	OFFSET 14ft RT	ALIGNMENT -L-
COLLAR ELEV. 2,688.8 ft	TOTAL DEPTH 31.2 ft	NORTHING 645,812	EASTING 838,562
DRILL MACHINE CME-550X	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 11/18/08	COMP. DATE 11/18/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 31.1 ft



NCDOT BORE SINGLE B3187_GEO_BH.GPJ NC_DOT.GDT 12/15/08

PROJECT NO. 32919.1.1	ID. B-3187	COUNTY Haywood	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 79 on SR 1112 over West Fork Pigeon River			GROUND WTR (ft)
BORING NO. EB2-A	STATION 12+09	OFFSET 14ft LT	ALIGNMENT -L-
COLLAR ELEV. 2,687.5 ft	TOTAL DEPTH 25.9 ft	NORTHING 645,856	EASTING 838,716
DRILL MACHINE CME-550X	DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic	
START DATE 11/14/08	COMP. DATE 11/14/08	SURFACE WATER DEPTH N/A	DEPTH TO ROCK 25.9 ft

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						
2690																
														2,687.5	GROUND SURFACE	0.0
2685															ALLUVIAL Brown fine to coarse Sand	
	2,682.5	5.0	2	4	10											
2680																
	2,677.5	10.0	4	12	20											
2675																
	2,672.5	15.0	2	4	6									2,674.0	SAPROLITE Brown silty fine to coarse Sand	13.5
2670																
	2,667.5	20.0	4	6	12											
2665																
	2,662.5	25.0												2,662.5		25.0
	2,661.6	25.9	100/0.4							100/0.4				2,661.6	WEATHERED ROCK (gneiss)	25.9
2660			60/0.0							60/0.0					CRYSTALLINE ROCK Gneiss	
															Boring Terminated with Standard Penetration Test Refusal at Elevation 2,661.6 ft on Crystalline Rock: Gneiss	
2655																
2650																
2645																
2640																
2635																
2630																
2625																
2620																
2615																
2610																

NC DOT BORE SINGLE B3187_GEO_BH.GPJ NC_DOT.GDT 12/15/08

PROJECT NO. 32919.1.1	ID. B-3187	COUNTY Haywood	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 79 on SR 1112 over West Fork Pigeon River			GROUND WTR (ft)
BORING NO. EB2-B	STATION 12+09	OFFSET 14ft RT	ALIGNMENT -L-
COLLAR ELEV. 2,687.5 ft	TOTAL DEPTH 44.7 ft	NORTHING 645,832	EASTING 838,702
DRILL MACHINE CME-550X		DRILL METHOD NW Casing w/ SPT Core	
START DATE 11/13/08		COMP. DATE 11/13/08	
SURFACE WATER DEPTH N/A		DEPTH TO ROCK 30.3 ft	

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					
2690														2,687.5	0.0
														2,685.5	2.0
2685														2,680.9	6.6
	2,682.6	4.9	3	11	15									2,679.5	8.0
2680														2,677.6	9.9
														2,672.6	14.9
2675														2,667.6	19.9
														2,662.6	24.9
2670														2,657.6	29.9
														100/0.3	100/0.3
2665															
2660															
2655															
2650															
2645															
2640															
2635															
2630															
2625															
2620															
2615															
2610															

NCDOT BORE SINGLE B3187_GEO_BH.GPJ NC_DOT.GDT 12/15/08

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DRILL MACHINE CME-550X		DRILL METHOD NW Casing w/ SPT Core	
START DATE 11/13/08		COMP. DATE 11/13/08	
SURFACE WATER DEPTH N/A		DEPTH TO ROCK 30.3 ft	

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN		SAMP. NO.	STRATA		LOG	DESCRIPTION AND REMARKS	DEPTH (ft)
					REC. (%)	RQD (%)		REC. (%)	RQD (%)			
2656.44											Begin Coring @ 31.1 ft	
2655	2,656.4	31.1	3.6	0:57	(0.5)	(0.0)					CRYSTALLINE ROCK Gray-White very severely weathered to fresh, soft to hard Gneiss. Foliation is well developed and highly variable. Fracture spacing is very to moderately close. Joints vary from 0-35°. (continued)	
	2,652.8	34.7	5.0	0:54								
2650				0:31/0.6	(4.1)	(3.2)						
				1:04								
				1:20								
				1:15								
				1:26								
				1:04								
2645				1:35	(4.9)	(4.5)						
				1:04								
				1:35								
				1:55								
				1:53								
2640											Boring Terminated at Elevation 2,642.8 ft in Crystalline Rock: Gneiss	44.7
2635												
2630												
2625												
2620												
2615												
2610												
2605												
2600												
2595												
2590												
2585												
2580												

NCDOT CORE SINGLE B3187_GEO_BH.GPJ NC_DOT.GDT 12/15/08



**FIELD
 SCOUR REPORT**

WBS: 32919.1.1 TIP: B-3187 COUNTY: Haywood

DESCRIPTION(1): Bridge No. 79 on SR 1112 over West Fork Pigeon River

EXISTING BRIDGE

Information from: Field Inspection Microfilm (reel pos:)
 Other (explain) BSR dated 05/05/08

Bridge No.: 79 Length: 91 Total Bents: 3 Bents in Channel: 1 Bents in Floodplain: 2
 Foundation Type: Timber post & sill; reinforced concrete

EVIDENCE OF SCOUR(2)

Abutments or End Bent Slopes: None noted

Interior Bents: None noted

Channel Bed: None noted

Channel Bank: Negligible

EXISTING SCOUR PROTECTION

Type(3): None

Extent(4): n/a

Effectiveness(5): n/a

Obstructions(6): None

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): Sand, gravel, cobbles, boulders

Channel Bank Material(8): Sand, cobbles, some boulders

Channel Bank Cover(9): Trees, shrubs

Floodplain Width(10): ~3000'

Floodplain Cover(11): Trees, grass

Stream is(12): Aggrading _____ Degrading _____ Static

Channel Migration Tendency(13): Toward End Bent One

Observations and Other Comments:

DESIGN SCOUR ELEVATIONS(14)

Feet Meters _____

BENTS

	B1	B2	B3	B4									
N/A: Single Span													
Scour does not affect													
End Bents:													

Comparison of DSE to Hydraulics Unit theoretical scour:
 In agreement with Elev. 2669.5

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													

Reported by: J.W. Mann

Date: 12/9/2008

32919.1.1 B-3187
HAYWOOD COUNTY
BRIDGE # 79 ON SR 1112 OVER WEST FORK PIGEON RIVER

CORE PHOTO

EB2-B

