

PROJECT: 33497.1.1 ID: B-4148

# STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

## STRUCTURE SUBSURFACE INVESTIGATION

STATE PROJECT 33497.1.1 I.D. NO. B-4148

F.A. PROJECT \_\_\_\_\_

COUNTY HENDERSON

PROJECT DESCRIPTION BRIDGE NO. 12 ON  
SR-1329 OVER BOYLSTON CREEK

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

**CONTENTS:**

SHEET	DESCRIPTION
1	TITLE SHEET
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DRAWN BY: J.T. WILLIAMS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33497.1.1 (B-4148)	1	9
STATE PROJ. NO.		DESCRIPTION	
		P.E.	
		CONST.	

**CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS 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 UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS 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 T.B. DANIEL

C.J. COFFEY

G.K. ROSE

L.E. LANKFORD

INVESTIGATED BY P.Q. LOCKAMY

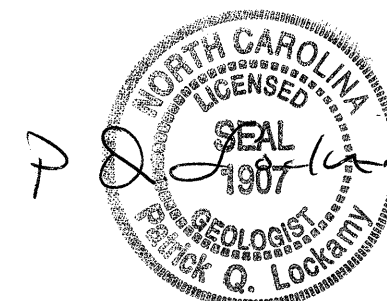
CHECKED BY W.D. FRYE

SUBMITTED BY W.D. FRYE

DATE 11/07 (REV)

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.



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

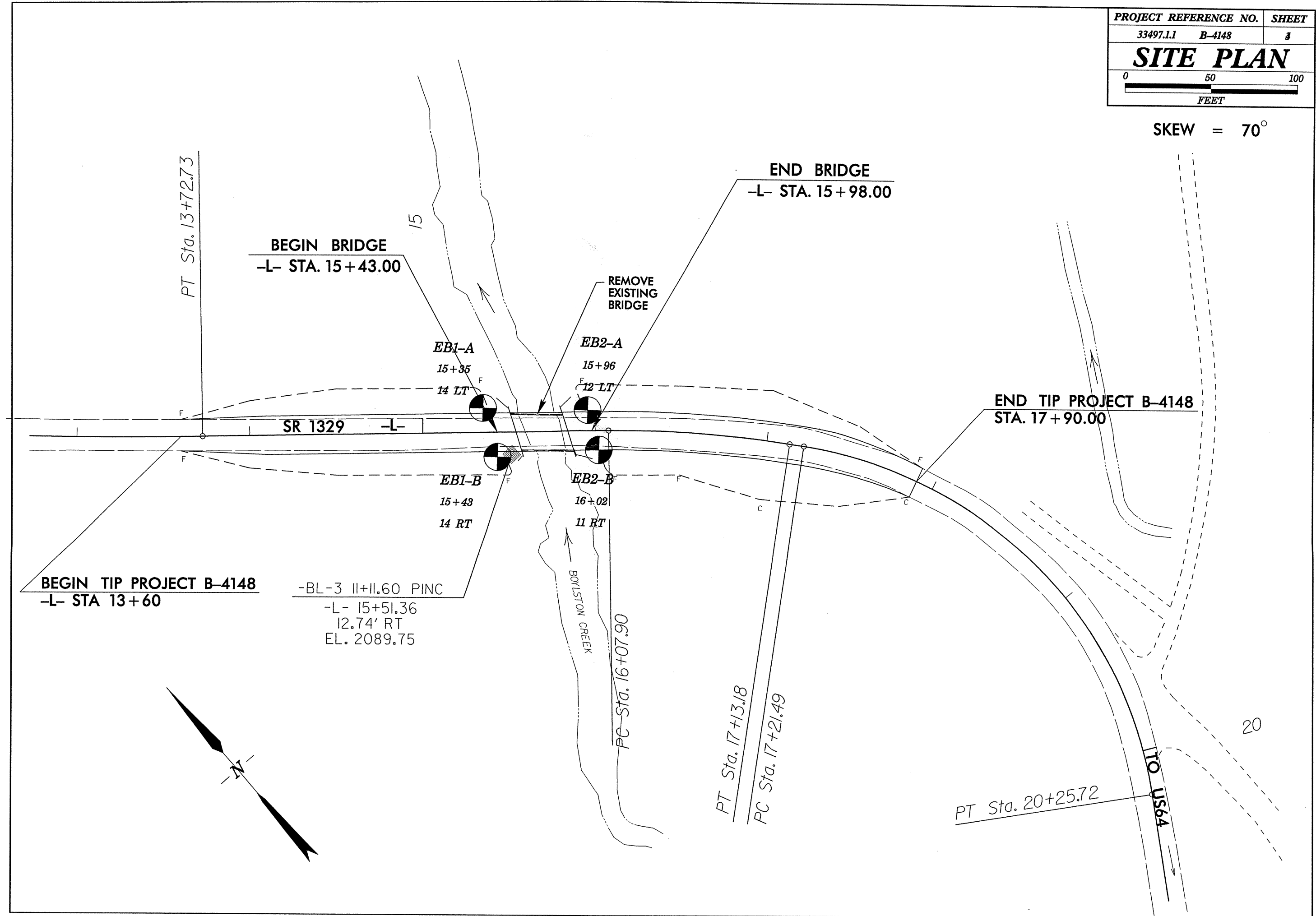
ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
B-4148	33497.1.1	2	

**SUBSURFACE INVESTIGATION**

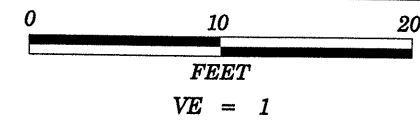
**SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS**

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS																																																																																																																																																																																						
<p>SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:</p> <p style="text-align: center;"><i>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>		<p><b>WELL GRADED</b>- INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE  <b>UNIFORM</b>- INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)  <b>GAP-GRADED</b>- INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p style="text-align: center;"><b>ANGULARITY OF GRAINS</b></p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS ARE DESIGNATED BY THE TERMS: <u>ANGULAR</u>, <u>SUBANGULAR</u>, <u>SUBROUNDED</u>, OR <u>ROUNDED</u>.</p>		<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN 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><b>ALLOUVIUM (ALLOV.)</b> - SOILS WHICH HAVE BEEN TRANSPORTED BY WATER.  <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA.  <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.  <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.  <b>ARTESIAN</b> - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.  <b>CALCAREOUS (CALC.)</b> - SOILS WHICH CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.  <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.  <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.  <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.  <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.  <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.  <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.  <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.  <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.  <b>FLOOD PLAIN (F.P.)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.  <b>FORMATION (FM.)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.  <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.  <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.  <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.  <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.  <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.  <b>RESIDUAL SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.  <b>ROCK QUALITY DESIGNATION (R.Q.D.)</b> - 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.  <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL WHICH RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.  <b>SILL</b> - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, WHICH HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRODUCED ROCKS.  <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.  <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - NUMBER OF BLOWS IN OR B.P.F.F. 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 LESS THAN 0.1 FOOT PENETRATION WITH 60 BLOWS.  <b>STRATA CORE RECOVERY (SREC.)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.  <b>STRATA ROCK QUALITY DESIGNATION (S.R.Q.D.)</b> - A MEASURE OF ROCK QUALITY DESCRIBED BY: TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 10 CENTIMETERS DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.  <b>TOPSOIL (T.S.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																																						
<p style="text-align: center;"><b>SOIL LEGEND AND AASHTO CLASSIFICATION</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th rowspan="2">GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (&lt; 35% PASSING #200)</th> <th colspan="7">SILT-CLAY MATERIALS (&gt; 35% PASSING #200)</th> <th colspan="3">ORGANIC MATERIALS</th> </tr> <tr> <th>A-1</th> <th>A-3</th> <th colspan="2">A-2</th> <th>A-4</th> <th>A-5</th> <th>A-6</th> <th>A-7</th> <th>A-1, A-2</th> <th>A-4, A-5</th> <th>A-6, A-7</th> <th>A-7.5</th> <th>A-7.6</th> <th>A-7.7</th> <th>A-7.8</th> <th>A-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> </tr> <tr> <th>GROUP CLASS.</th> <td>A-1-a</td> <td>A-1-b</td> <td>A-2-4</td> <td>A-2-5</td> <td>A-2-6</td> <td>A-2-7</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>SYMBOL</th> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>% PASSING</th> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> <td>10</td> </tr> <tr> <th>LIQUID LIMIT PLASTIC INDEX</th> <td>6 MX</td> <td></td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> <td>41 MN</td> <td>40 MX</td> </tr> <tr> <th>GROUP INDEX</th> <td>0</td> <td>0</td> <td>0</td> <td>4 MX</td> <td>8 MX</td> <td>12 MX</td> <td>16 MX</td> <td>20 MX</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td>STONE FRAGS. GRAVEL AND SAND</td> <td>FINE SAND</td> <td colspan="2">SILTY OR CLAYEY GRAVEL AND SAND</td> <td colspan="2">SILTY SOILS</td> <td colspan="2">CLAYEY SOILS</td> <td colspan="3">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td colspan="2">HIGHLY ORGANIC SOILS</td> <td colspan="3"></td> </tr> <tr> <th>GEN. RATING AS A SUBGRADE</th> <td colspan="7">EXCELLENT TO GOOD</td> <td colspan="3">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td colspan="3">UNSUITABLE</td> </tr> </table>		GENERAL CLASS.	GRANULAR MATERIALS (< 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)							ORGANIC MATERIALS			A-1	A-3	A-2		A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6, A-7	A-7.5	A-7.6	A-7.7	A-7.8	A-3	A-4, A-5	A-6, A-7	GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7												SYMBOL																		% PASSING	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	LIQUID LIMIT PLASTIC INDEX	6 MX		40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	20 MX										USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND		SILTY SOILS		CLAYEY SOILS		SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER			HIGHLY ORGANIC SOILS					GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR			FAIR TO POOR	POOR	UNSUITABLE			<p style="text-align: center;"><b>MINERALOGICAL COMPOSITION</b></p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p>		<p style="text-align: center;"><b>COMPRESSIBILITY</b></p> <p>SLIGHTLY COMPRESSIBLE      LIQUID LIMIT LESS THAN 30                      MODERATELY COMPRESSIBLE      LIQUID LIMIT 31-50                      HIGHLY COMPRESSIBLE      LIQUID LIMIT GREATER THAN 50</p>		<p style="text-align: center;"><b>PERCENTAGE OF MATERIAL</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th></th> <th>GRANULAR SOILS</th> <th>SILT-CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE 1 - 10%</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE 10 - 20%</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME 20 - 35%</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>&gt;10%</td> <td>&gt;20%</td> <td>HIGHLY 35% AND ABOVE</td> </tr> </table>			GRANULAR SOILS	SILT-CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE 1 - 10%	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE 10 - 20%	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME 20 - 35%	HIGHLY ORGANIC	>10%	>20%	HIGHLY 35% AND ABOVE	<p style="text-align: center;"><b>GROUND WATER</b></p> <p> WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING.   STATIC WATER LEVEL AFTER 24 HOURS.   PERCHED WATER, SATURATED ZONE OR WATER BEARING STRATA   SPRING OR SEEPAGE</p>	
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GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	< 0.25 0.25 TO 0.5 0.5 TO 1 1 TO 2 2 TO 4 > 4																																																																																																																																																																																									
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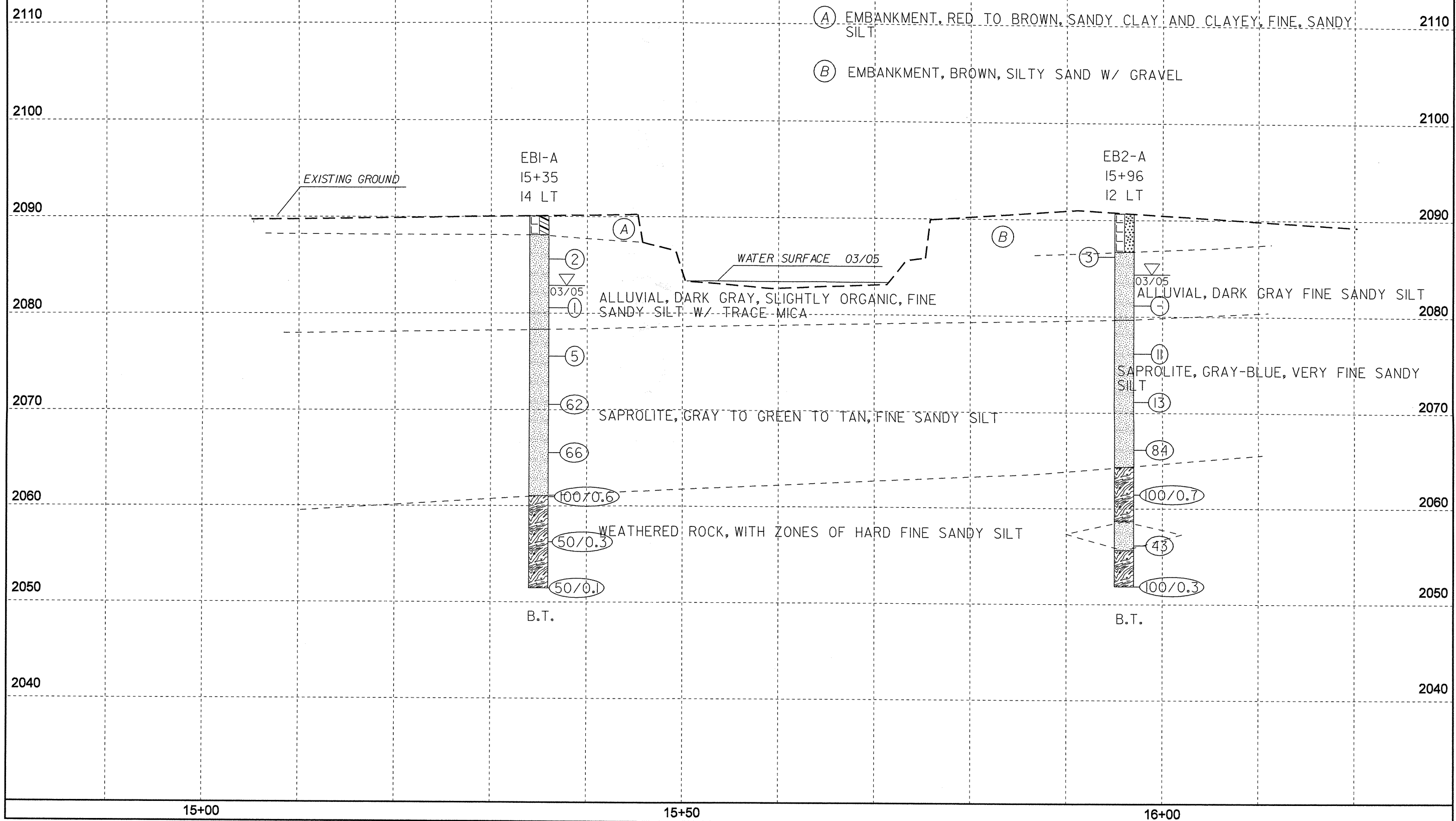
SKEW = 70°

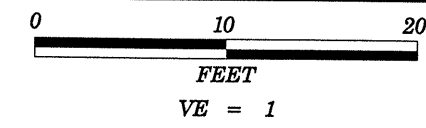


# PROFILE 14' LT OF -L-



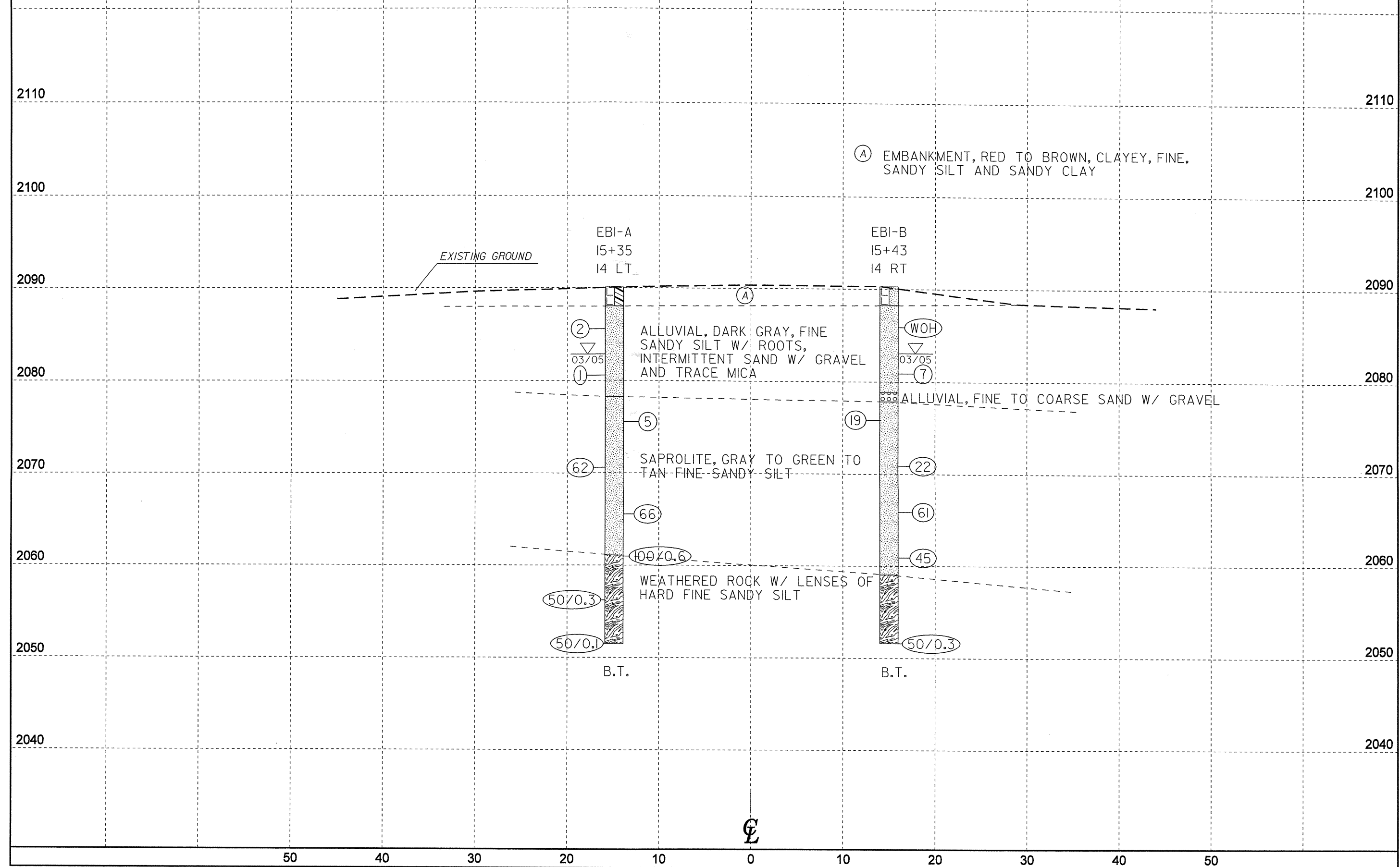
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<b>BRIDGE NO. 12 ON SR 1329 OVER BOYLSTON CREEK</b>	

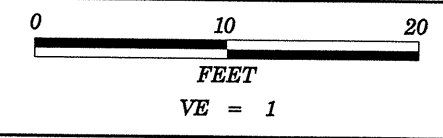




PROJECT REFERENCE NO.	SHEET
33497.1.1 B-4148	5
BRIDGE NO. 12 ON SR 1329 OVER BOYLSTON CREEK	

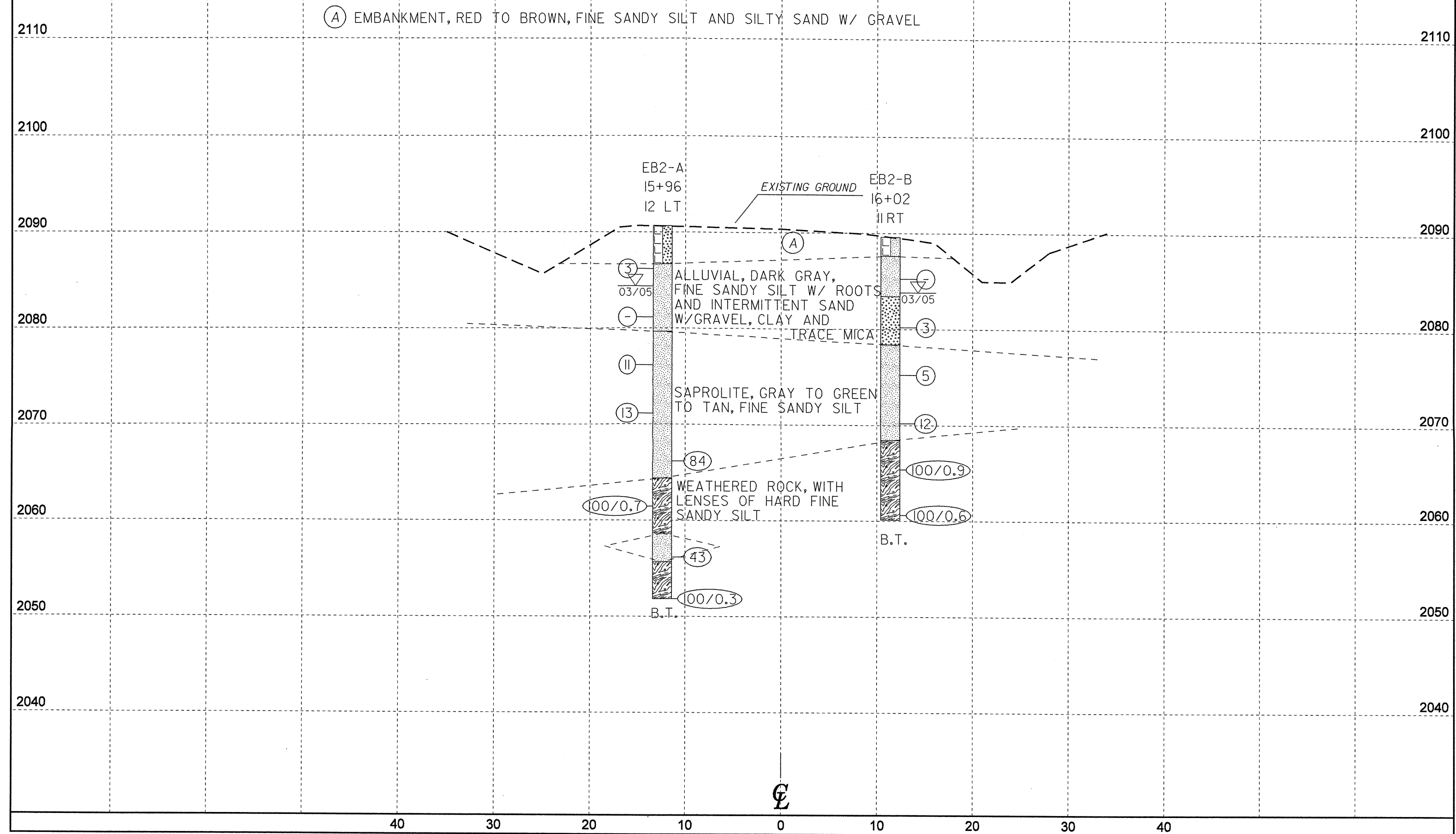
### SECTION THRU EBI





PROJECT REFERENCE NO.	SHEET
33497.1.1 B-4148	6
<b>BRIDGE NO. 12 ON SR 1329 OVER BOYLSTON CREEK</b>	

### SECTION THRU EB2

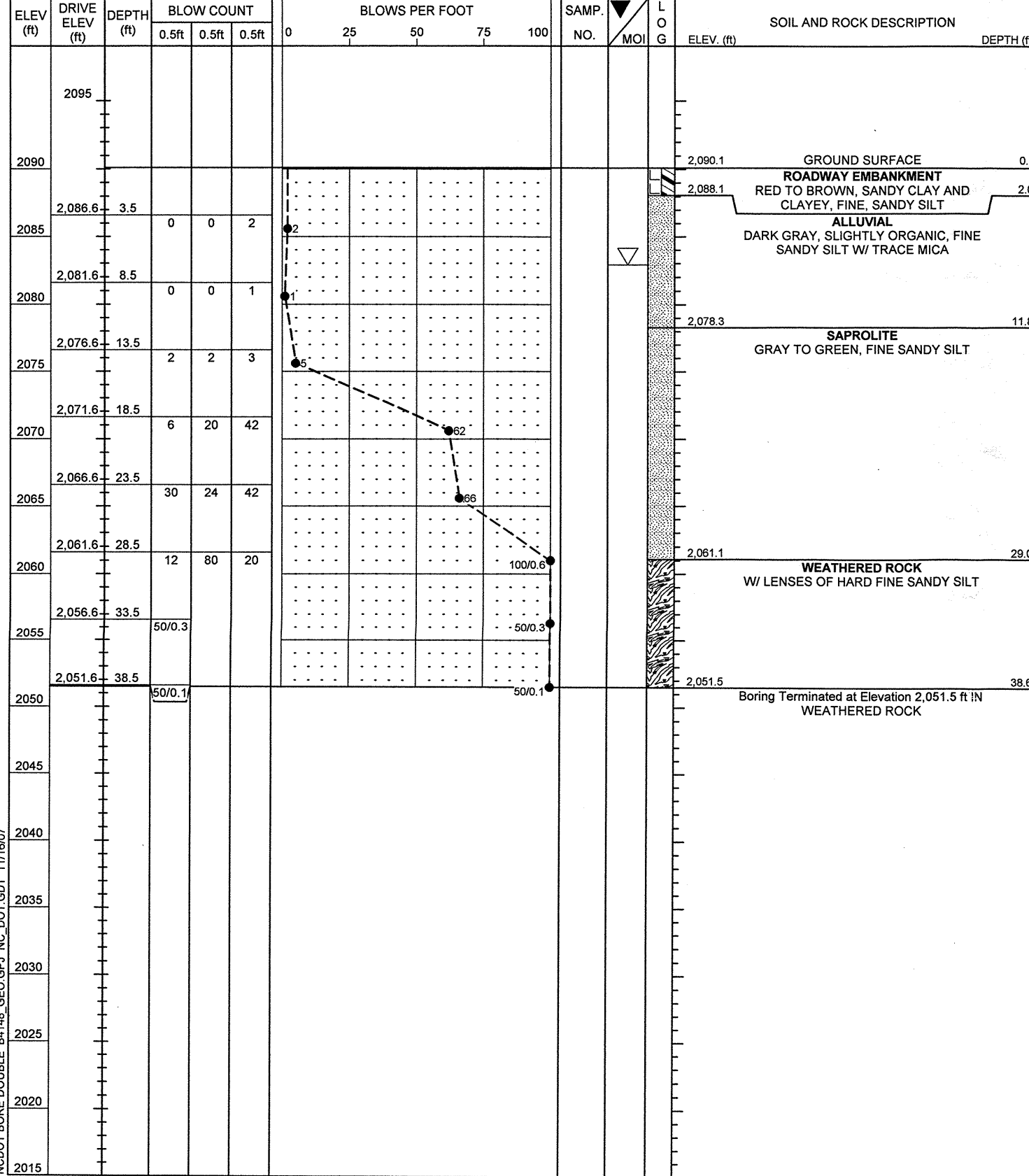




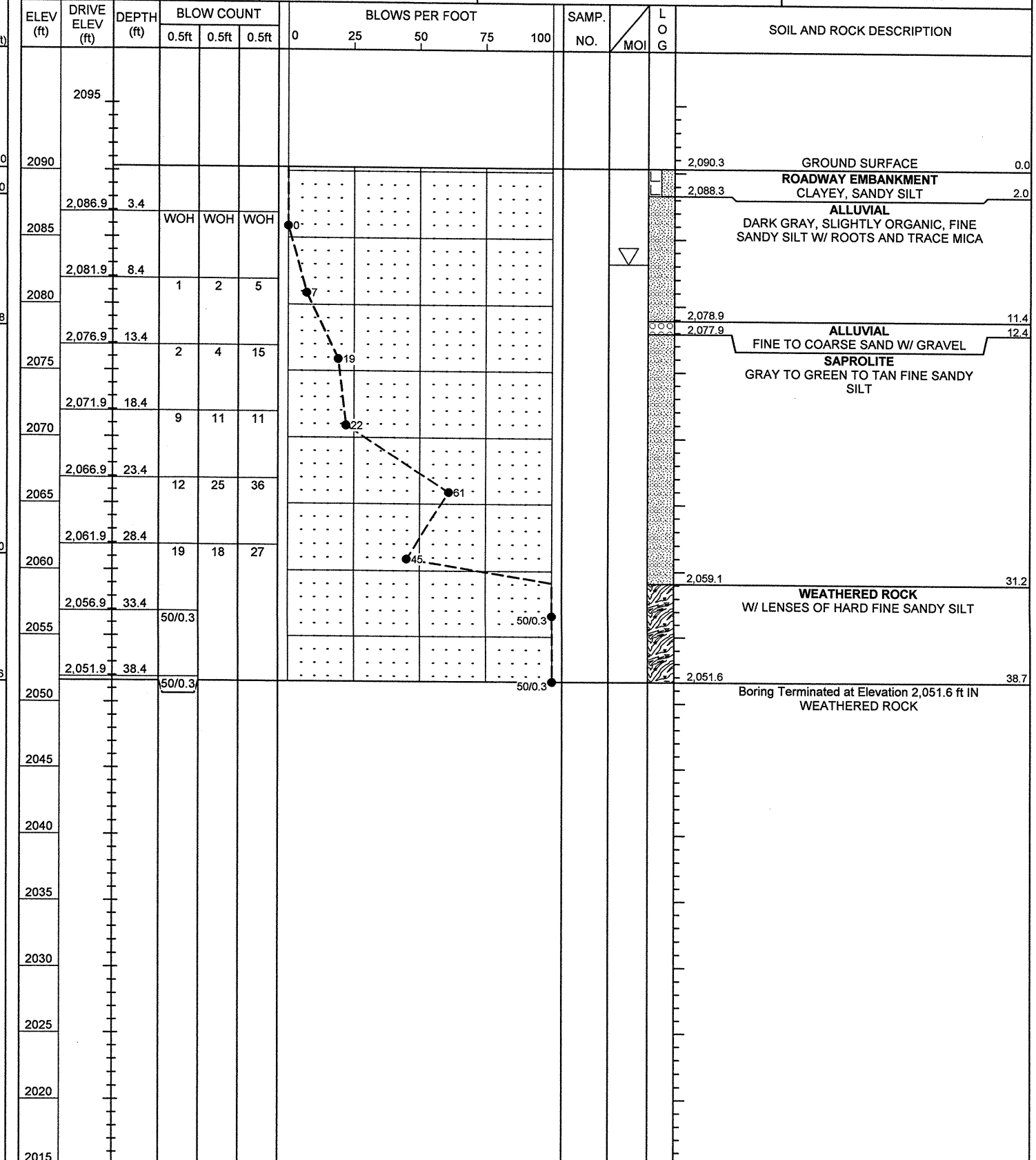
# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

PROJECT NO. 33497.1.1	ID. B-4148	COUNTY HENDERSON	GEOLOGIST Daniel, T. B.
SITE DESCRIPTION BRIDGE NO. 12 ON SR 1329 OVER BOYLSTON CREEK			GROUND WTR (ft)
BORING NO. EB1-A	STATION 15+35	OFFSET 14ft LT	ALIGNMENT -L-
COLLAR ELEV. 2,090.1 ft	TOTAL DEPTH 38.6 ft	NORTHING 607,166	EASTING 932,792
DRILL MACHINE CME-45C	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 03/10/05	COMP. DATE 03/10/05	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



PROJECT NO. 33497.1.1	ID. B-4148	COUNTY HENDERSON	GEOLOGIST Daniel, T. B.
SITE DESCRIPTION BRIDGE NO. 12 ON SR 1329 OVER BOYLSTON CREEK			GROUND WTR (ft)
BORING NO. EB1-B	STATION 15+43	OFFSET 14ft RT	ALIGNMENT -L-
COLLAR ELEV. 2,090.3 ft	TOTAL DEPTH 38.7 ft	NORTHING 607,140	EASTING 932,779
DRILL MACHINE CME-45C	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
START DATE 03/10/05	COMP. DATE 03/10/05	SURFACE WATER DEPTH N/A	DEPTH TO ROCK N/A



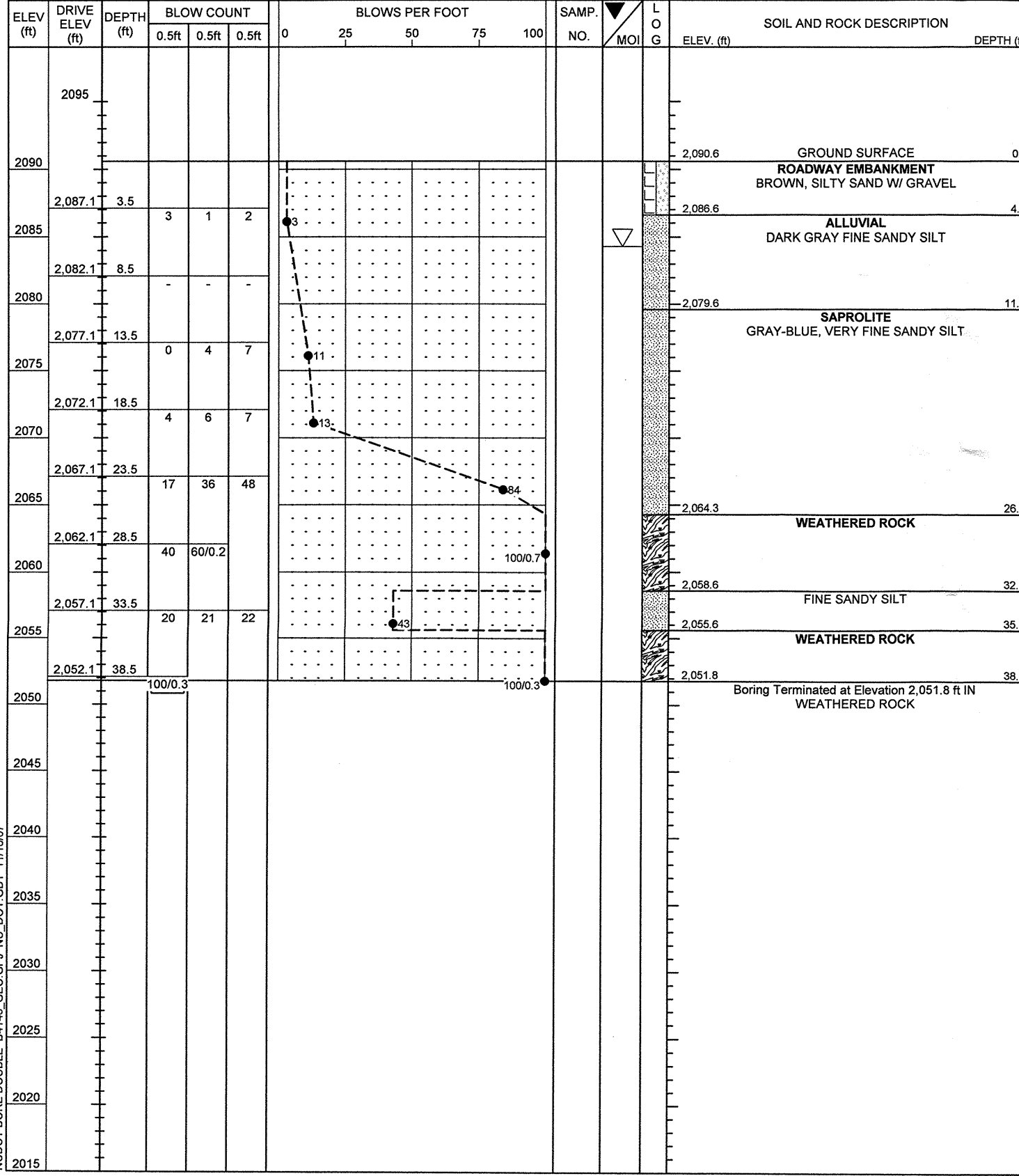
NCDOT BORE DOUBLE B4148\_GEO.GPJ NC\_DOT\_GDT 11/16/07



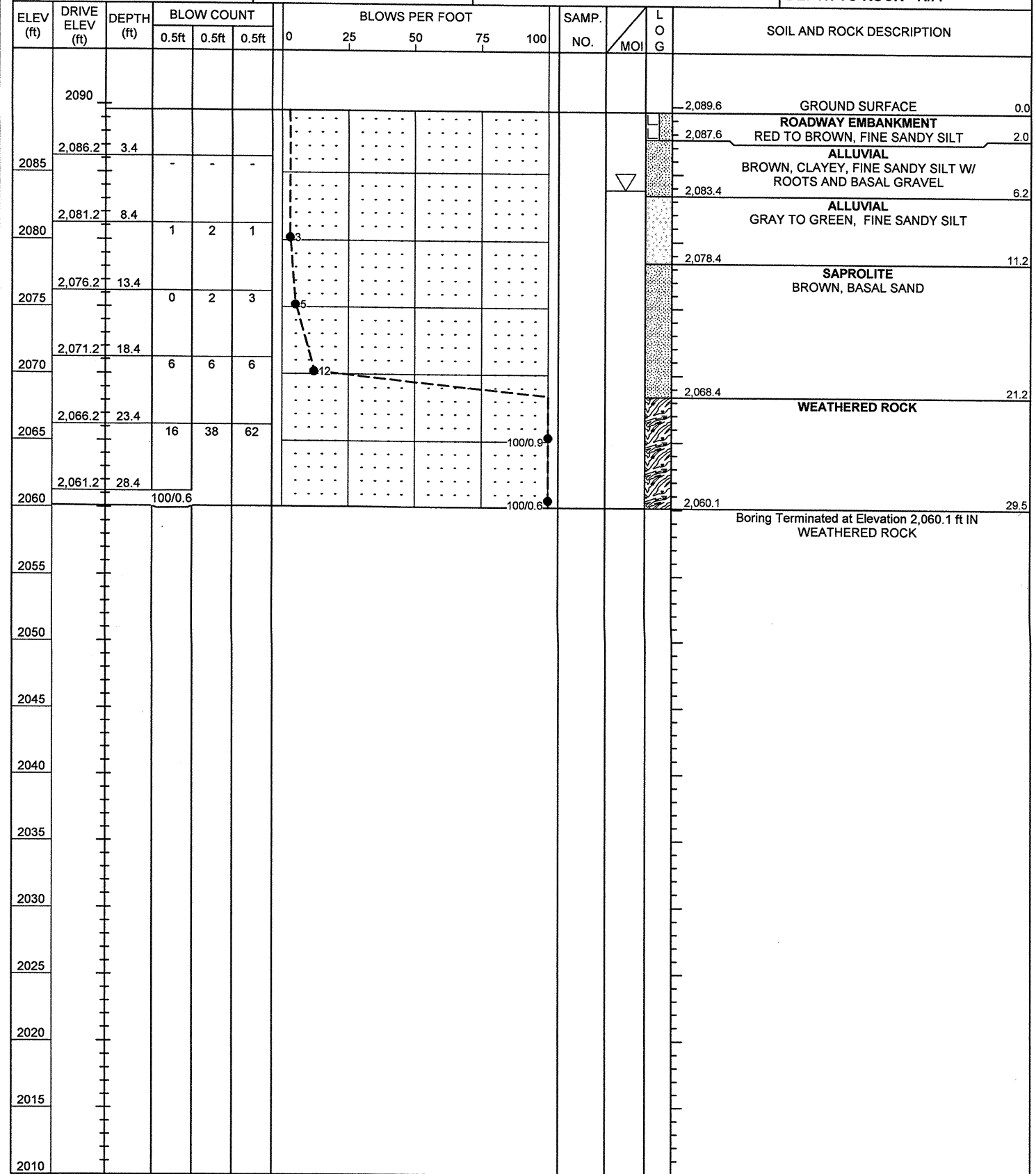
# NCDOT GEOTECHNICAL ENGINEERING UNIT

## BORELOG REPORT

PROJECT NO. 33497.1.1		ID. B-4148		COUNTY HENDERSON		GEOLOGIST Daniel, T. B.	
SITE DESCRIPTION BRIDGE NO. 12 ON SR 1329 OVER BOYLSTON CREEK							GROUND WTR (ft)
BORING NO. EB2-A		STATION 15+96		OFFSET 12ft LT		ALIGNMENT -L-	
COLLAR ELEV. 2,090.6 ft		TOTAL DEPTH 38.8 ft		NORTHING 607,123		EASTING 932,835	
DRILL MACHINE CME-45C		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic			
START DATE 03/11/05		COMP. DATE 03/11/05		SURFACE WATER DEPTH N/A		DEPTH TO ROCK N/A	



PROJECT NO. 33497.1.1		ID. B-4148		COUNTY HENDERSON		GEOLOGIST Daniel, T. B.	
SITE DESCRIPTION BRIDGE NO. 12 ON SR 1329 OVER BOYLSTON CREEK							GROUND WTR (ft)
BORING NO. EB2-B		STATION 16+02		OFFSET 11ft RT		ALIGNMENT -L-	
COLLAR ELEV. 2,089.6 ft		TOTAL DEPTH 29.5 ft		NORTHING 607,102		EASTING 932,824	
DRILL MACHINE CME-45C		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic			
START DATE 03/11/05		COMP. DATE 03/11/05		SURFACE WATER DEPTH N/A		DEPTH TO ROCK N/A	



NCDOT BORE DOUBLE B4148\_GEO.GPJ NC\_DOT\_GDT 11/16/07





**FIELD  
 SCOUR REPORT**

WBS: 33497.1.1 TIP: B-4148 COUNTY: HENDERSON

DESCRIPTION(1): BRIDGE NO. 12 ON SR 1329 OVER BOYLSTON CREEK

**EXISTING BRIDGE**

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

Bridge No.: 12 Length: 30.5 Total Bents: 2 Bents in Channel: 0 Bents in Floodplain: 2  
 Foundation Type: TIMBER PILES

**EVIDENCE OF SCOUR(2)**

Abutments or End Bent Slopes: NONE

Interior Bents: N/A

Channel Bed: SANDY BED LOAD HAS ALL SCOUR HOLES FILLED.

Channel Bank: MINOR - INTERMITTENT EXPOSED SOIL ON VERTICAL BANKS.

**EXISTING SCOUR PROTECTION**

Type(3): TIMBER ABUTMENT AND WINGS

Extent(4): CREEK BED TO ROADWAY

Effectiveness(5): VERY GOOD

Obstructions(6): LARGE LOG ACROSS CK. UPSTREAM HAS 2 FEET OF RECENT SEDS. ACCUMULATED

**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): SILTY SAND W/ PEA GRAVEL (ABOUT 1/4 TO 3/8 INCH ROUNDED QUARTZ)

Channel Bank Material(8): CLAYEY AND SANDY SILT

Channel Bank Cover(9): WEEDS - BRUSH - BARE SOIL

Floodplain Width(10): ESTIMATE 800 FEET

Floodplain Cover(11): ROW CROPS

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

Channel Migration Tendency(13): LONG TERM MIGRATION TO EAST CONTROLLED BY BEDROCK STRUCTURE.

Observations and Other Comments: STREAM TERRACES TO WEST AND STEEP VALLEY WALLS TO THE EAST.

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

**ELEVATION**

CHANNEL	2081.5																		
EB1	2085.2																		
EB2	2084.7																		

Comparison of DSE to Hydraulics Unit theoretical scour:  
 GEOTECHNICAL ENGINEERING UNIT AGREES WITH HYDRAULICS UNIT THEORETICAL SCOUR DATED 5/15/07. THIS IS BASED ON A FIVE YEAR SCOUR.

**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: PQ Lockamy

Date: 11/16/2007