

CONTRACT: ID: B-3624

NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

**CONTENTS:**

LINE	STATION	PLAN	PROFILE	XSECTS
-L-	10+00.00 - 21+00.00	4	5	6 - 13

**SUBJECT**

LEGEND	2
ROADWAY TITLE SHEET	2A
INVENTORY REPORT	3A - 3B
EARTHWORK BALANCE SHEET	3C

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

**ROADWAY**  
**SUBSURFACE INVESTIGATION**

STATE PROJECT NO. 33172.1.1 I.D. NO. B-3624  
 F.A. PROJECT BRZ-1328(4)  
 COUNTY CALDWELL  
 PROJECT DESCRIPTION APPROACHES TO  
BRIDGE No. 190 ON SR 1328 (PLAYMORE BEACH ROAD)  
OVER JOHNS RIVER

**INVENTORY REPORT**

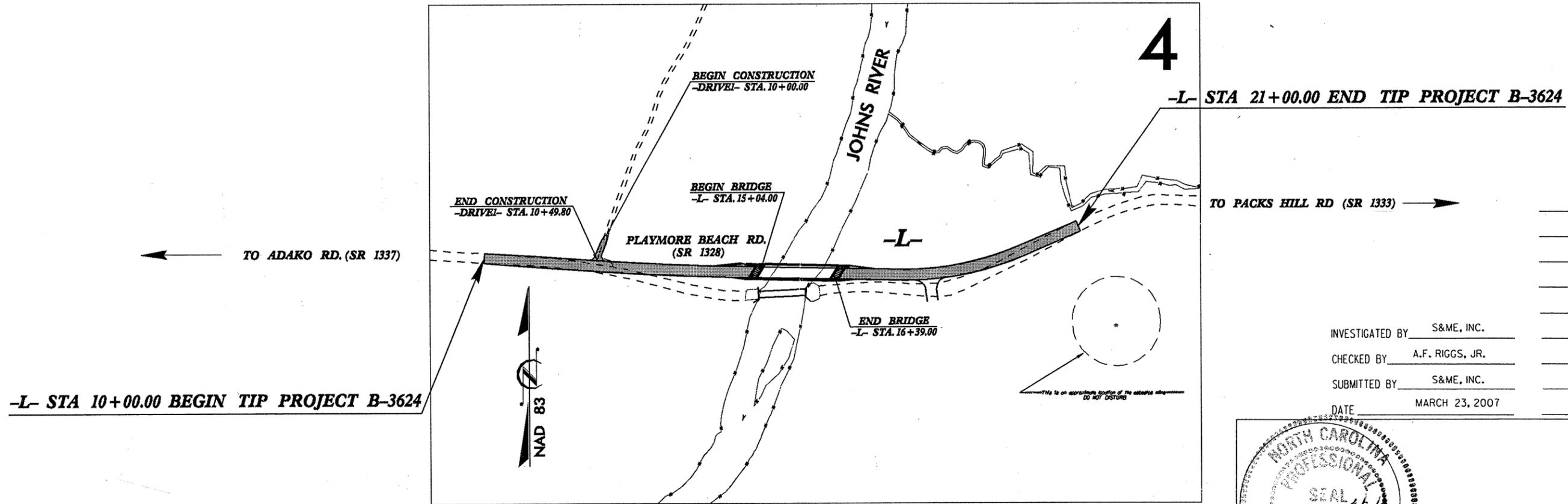
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3624	1	13
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
33172.1.1	BRZ-1328(4)	P.E.	
33172.2.1	BRZ-1328(4)	RW, UTIL	
33172.3.1	BRZ-1328(4)	CONST.	

**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

- J. S. JOHNSON
- A. BROWNING
- N. BRADLEY
- J. WHITE
- J. WHITE
- R. NORWOOD
- S. LOWE
- P. PHELPS
- T. PEREZ

INVESTIGATED BY S&ME, INC.  
 CHECKED BY A.F. RIGGS, JR.  
 SUBMITTED BY S&ME, INC.  
 DATE MARCH 23, 2007



*Alfred Riggs Jr.*  
 SIGNATURE

DRAWN BY: T. PEREZ

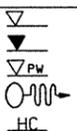
NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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 ENGINEERING UNIT**

**SUBSURFACE INVESTIGATION**

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

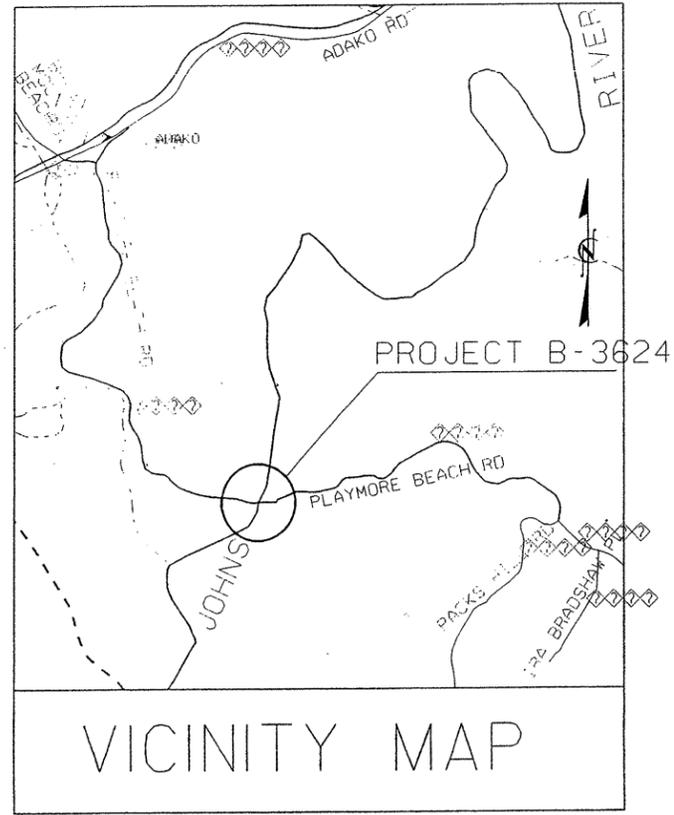
SOIL DESCRIPTION				GRADATION				ROCK DESCRIPTION				TERMS AND DEFINITIONS																																																																																																			
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED OR WEATHERED EARTH MATERIALS WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T296, 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: <i>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i>				<b>WELL GRADED:</b> INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE UNIFORM. 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. <b>ANGULARITY OF GRAINS</b> 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> .				<b>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.</b> 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: <b>WEATHERED ROCK (WR)</b>  NON-COASTAL PLAIN MATERIAL THAT YIELDS SPT N VALUES > 100 BLOWS PER FOOT. <b>CRYSTALLINE ROCK (CR)</b>  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC. <b>NON-CRYSTALLINE ROCK (NCR)</b>  FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC. <b>COASTAL PLAIN SEDIMENTARY ROCK (CPS)</b>  COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.				<b>ALLUVIUM (ALLUV.)</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 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 DISLODGED 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 INTRUDED 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 (N OR B.P.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 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. <b>TOPSOIL (T.S.)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.																																																																																																			
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> <table border="1"> <tr> <th>GENERAL CLASS.</th> <th colspan="2">GRANULAR MATERIALS (&lt; 5% PASSING #200)</th> <th colspan="4">SILT-CLAY MATERIALS (&gt; 5% PASSING #200)</th> <th colspan="2">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <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-3</th> <th>A-4, A-5</th> <th>A-6, A-7</th> </tr> <tr> <th>SYMBOL</th> <td></td> </tr> <tr> <th>% PASSING</th> <td>50 MX</td> <td>30 MX</td> <td>35 MX</td> </tr> <tr> <th>LIQUID LIMIT PLASTIC INDEX</th> <td>6 MX</td> <td>N.P.</td> <td>40 MX</td> <td>41 MN</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>16 MX</td> <td>16 MX</td> <td>16 MX</td> <td>16 MX</td> <td>16 MX</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>SILTY SOILS</td> <td>CLAYEY SOILS</td> <td colspan="2">SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER</td> <td colspan="2">HIGHLY ORGANIC SOILS</td> <td colspan="2">MUCK, PEAT</td> </tr> <tr> <th>GEN. RATING AS A SUBGRADE</th> <td colspan="2">EXCELLENT TO GOOD</td> <td colspan="2">FAIR TO POOR</td> <td>FAIR TO POOR</td> <td>POOR</td> <td colspan="2">UNSUITABLE</td> <td colspan="4"></td> </tr> </table>				GENERAL CLASS.	GRANULAR MATERIALS (< 5% PASSING #200)		SILT-CLAY MATERIALS (> 5% PASSING #200)				ORGANIC MATERIALS		GROUP CLASS.	A-1	A-3	A-2		A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7	SYMBOL													% PASSING	50 MX	30 MX	35 MX	35 MX	35 MX	35 MX	35 MX	35 MX	35 MX	35 MX	35 MX	35 MX	LIQUID LIMIT PLASTIC INDEX	6 MX	N.P.	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 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		MUCK, PEAT		GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD		FAIR TO POOR		FAIR TO POOR	POOR	UNSUITABLE						<b>MINERALOGICAL COMPOSITION</b> MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.				<b>WEATHERING</b> <b>FRESH</b> - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE. <b>VERY SLIGHT (V. SL.)</b> - ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN. CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE. <b>SLIGHT (SL.)</b> - ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS. <b>MODERATE (MOD.)</b> - SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. <b>MODERATELY SEVERE (MOD. SEV.)</b> - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i> <b>SEVERE (SEV.)</b> - ALL ROCKS EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. <i>IF TESTED, YIELDS SPT N VALUES &gt; 100 BPF</i> <b>VERY SEVERE (V. SEV.)</b> - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. <i>IF TESTED, YIELDS SPT N VALUES &lt; 100 BPF</i> <b>COMPLETE</b> - ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.								
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09/08/09

TIP PROJECT: B-3624

CONTRACT:

See Sheet 1-A For Index of Sheets



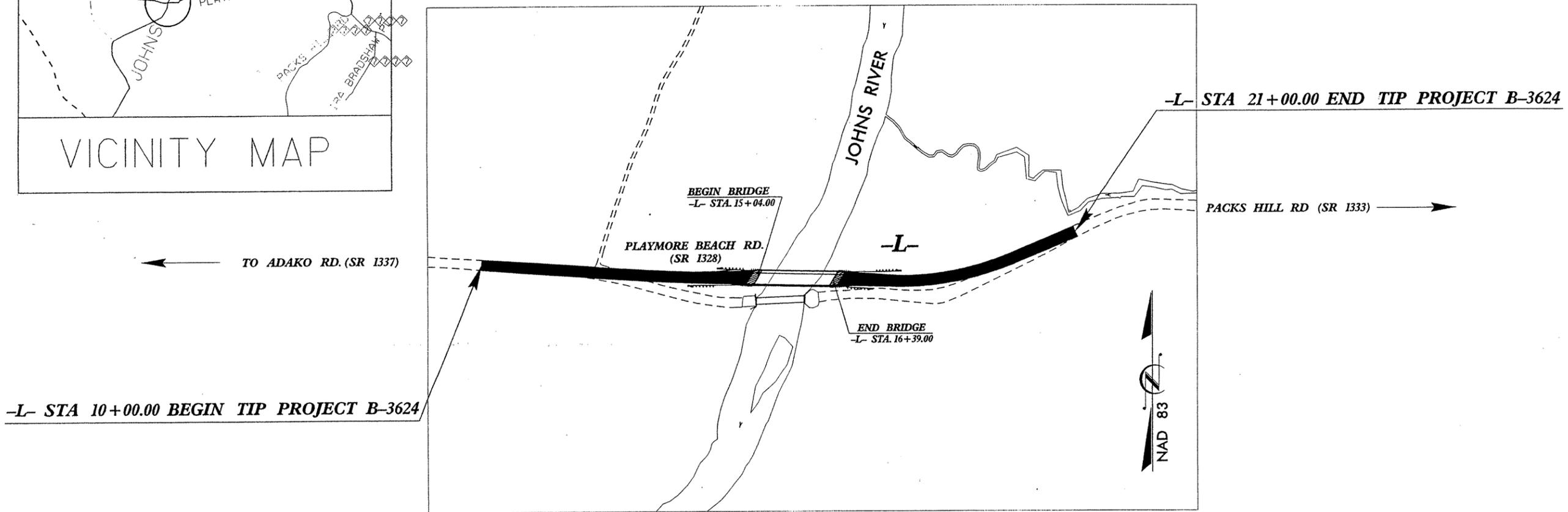
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**CALDWELL COUNTY**

LOCATION: BRIDGE NO. 190 OVER JOHNS RIVER ON SR 1328

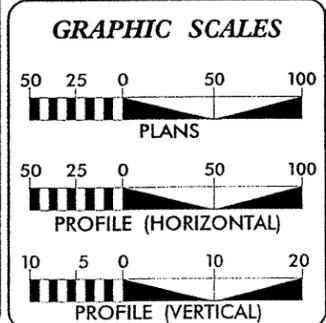
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-3624	2A	13
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
33172.1.1	BRZ-1328(4)	P.E.	



THERE IS NO CONTROL OF ACCESS ON THIS PROJECT.  
THIS PROJECT IS NOT WITHIN MUNICIPAL BOUNDARIES.  
CLEARING ON THIS PROJECT SHOULD BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD \_\_\_\_.

INCOMPLETE PLANS  
DO NOT USE FOR R/W ACQUISITION  
PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION



DESIGN DATA

ADT 2007 = 120	LENGTH OF ROADWAY TIP PROJECT B-3624 = 0.182 MILES
ADT 2030 = 700	LENGTH OF STRUCTURE TIP PROJECT B-3624 = 0.026 MILES
DHV = 12 %	TOTAL LENGTH OF TIP PROJECT B-3624 = 0.208 MILES
D = 60 %	
T = 3 % *	
** V = 30 MPH	
* TTST 1	DUAL 2

PROJECT LENGTH

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
SEPTEMBER 21, 2007

LETTING DATE:  
SEPTEMBER 16, 2008

TONY HOUSER, PE  
PROJECT ENGINEER

JASON TALLEY, PE  
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

ROADWAY DESIGN ENGINEER

SIGNATURE:

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

STATE PROJECT: 33172.1.1  
 FEDERAL PROJECT: BRZ-1328(4)  
 TIP NUMBER: B-3624  
 COUNTY: Caldwell

DESCRIPTION: Approaches to Bridge No. 190 on SR 1328 (Playmore Beach Road) over the Johns River

SUBJECT: Roadway Subsurface Investigation – Inventory Report

**Project Description**

This project is located in southwestern Caldwell County on Playmore Beach Road at its intersection with the Johns River southwest of Lenior, North Carolina. The project will include the replacement of Bridge No. 190 over the Johns River on Playmore Beach Road and the realignment of the west and east approaches. The proposed west approach will begin on Playmore Beach Road at station 10+00 –L- and extend east to the bridge at station 15+04 –L- north of existing Playmore Beach Road. The east approach will extend from the proposed bridge over the Johns River and merge back with Playmore Beach Road at station 21+00 –L-. The realignment of the approaches of proposed Bridge No. 190 will consist of 965 linear feet of a two lane road. The proposed bridge structure is located from station 15+04 to 16+39 –L-.

A geotechnical investigation was conducted between February 12, 2007 and February 23, 2007 by performing soil test borings. Drilling consisted of advancing 3-1/4 inch diameter hollow stem augers and wash boring techniques with standard penetration tests at nine (9) locations including borings EB1-A and EB2-A and performing an auger probe at one (1) location with a CME-550x drill rig and a BK-51 drill rig mounted on all terrain carriers.

The following survey lines were investigated.

<u>Line</u>	<u>Station</u>
-L-	10+00 to 21+00

**Areas of Special Geotechnical Interest**

1) Alluvial Soils: The following area contains relatively soft, loose or wet soils. In addition, these soils may contain cohesive soils.

<u>Line</u>	<u>Station</u>
-L-	12+00 to 15+04
-L-	16+39 to 21+00

2) Crystalline and Weathered Rock: No crystalline rock was encountered at or above proposed roadway grades. Weathered rock was encountered near or above proposed grades left of the –L- alignment in the following area.

<u>Line</u>	<u>Station</u>
-L-	10+50 to 11+50

3) Soils Containing Asbestos Minerals: Soil containing trace amounts of anthophyllite was encountered in the following area.

<u>Line</u>	<u>Station</u>
-L-	19+00 to 21+00

**Physiography and Geology**

The proposed roadway project is located within the Piedmont Physiographic and Geologic Province of North Carolina. The Piedmont Province is characterized by gently to steeply sloping topography with well-rounded hills and along rolling ridges with a northeast-southwest trend dissected by a moderate to well developed (mature) detritic-type drainage system consisting of drainage swales, hollows, tributaries, streams and rivers. More specifically, the site is located within the Inner Piedmont Belt. The Inner Piedmont is described as a fault bounded stack of thrust sheets containing metamorphic and intrusive rock types. The metamorphic rocks found in this region include schist, gneiss, metagraywacke and amphibolite. Based on previous mapping and our knowledge of the local geology, the parent rock is interpreted to be (NC Geologic Map) gneiss. This unit is competent and relatively resistant to weathering. In addition, southeast of the existing bridge, meta-ultramafic rocks are present. This unit consists of metamorphosed dunite, local peridotite, serpentinite, soapstone, anthophyllite and other ultramafic rocks (NC Geologic Map).

The borings were advanced to depths ranging from 10.0 to 54.5 feet (elevations 1045.4 to 994.6 feet) at collar elevations ranging from 1075.5 to 1048.3 feet.

Artificial fill material was encountered in Auger Probe AP-1 to a depth of about 0.2 feet (elevation 1064.4 feet) below the collar elevation. The fill material encountered was crushed aggregate base course stone used for the roadbed material. No standard penetration test (SPT) was performed in the fill material.

Alluvial deposits were encountered at the ground surface within the flood plain in borings B-3, B-4, EB1-A, EB2-A, B-5, B-6 and B-7 to depths ranging from about 17.0 to 19.6 feet (elevations 1034.7 to 1031.6 feet) beneath collar elevations in borings B-3, EB1-A, EB2-A and B-5 and to boring termination depths in borings B-4, B-6 and B-7. Typically, alluvial deposits encountered in the flood plain consist of very loose to loose brown and gray silty coarse to fine sand (A-2-4), very soft to medium stiff gray and brown fine sandy and clayey silt (A-4, A-5) and soft to stiff red-brown, brown and gray coarse to fine sandy silty clay (A-7-5) overlying a layer of loose to medium dense brown and gray fine to coarse sand (A-1-a) with gravel, silt, clay

and cobbles (0.25 to 0.5 feet in diameter). The standard penetration test (SPT) N-values for the alluvial soils encountered in floodplain ranged from 1 to 17 blows per foot (bpf).

Residual soils were encountered at the ground surface or beneath artificial fill in borings AP-1, B-1 and B-2 and beneath the alluvium in borings B-3, B-5, EB1-A, EB2-A to depths ranging from about 14.7 to 44.3 feet (elevations 1047.0 to 1006.7 feet) below collar elevations. The residual soils consist of stiff to hard tan, brown and gray coarse to fine sandy silt (A-4) with trace of clay, stiff to hard coarse to fine sandy silty clay (A-7-5) and very dense gray silty fine sand (A-2-4). The SPT N-values for the residual soils ranged from 8 to 84 bpf. Three thin layers of weathered rock exists within the residual soils in boring B-2 between the depths of 7.1 and 7.5 feet (elevation 1068.4 and 1068.0 feet), 15.5 and 16.5 feet (elevations 1060.0 and 1059.0 feet) and the depths of 25.5 and 27.0 feet (elevations 1050.0 and 1048.5 feet) beneath the collar elevations. A layer of weathered rock exists within the residual soils between the depths of 9.7 and 11.5 feet (elevations 1052.0 to 1050.2 feet) beneath the collar elevation in boring B-2. The residual soils transition to weathered rock (gneiss) in borings B-2, EB1-A and EB2-A at depths ranging from about 14.7 to 44.3 feet (elevations 1047.0 to 1006.7 feet) and extend to the depth of boring termination. Standard penetration test (SPT) N-values in the weathered rock ranged from 100 blows with 0.9 feet of penetration to 100 blows with 0.5 feet of penetration. The weathered rock contains layers of very severely weathered hard brown and gray clayey fine sandy silt (A-4) and very dense gray silty fine sand (A-2-4) in boring EB1-A. Standard penetration test (SPT) N-values in these soil layers ranged from 67 to 84 bpf.

**Groundwater**

Groundwater was not encountered in any of the boreholes at the time of drilling or after a period of 24 hours. Groundwater was not measured in boring EB1-A at the time of drilling operations due to wash boring techniques being used which induces drilling fluid into the borehole. However, the borehole caved at depths ranging from approximately 4.5 to 17.0 feet (elevation 1047.8 to 1036.0 feet) beneath collar elevations. The river level at the time of our exploration was at elevation 1037.5 feet.

**Geotechnical Descriptive Analysis**

For descriptive purposes, the project has been divided into two segments. The division of the alignments into two segments is based on the near surface and subsurface materials.

**Segment I**

-L- 10+00 to 12+00

Segment I consists of areas near grade on the right side of the alignment and cut sections on the left side of the alignment which will require excavations of about 1 to 15 feet of residual soils to reach design grades. The majority of this section consists of stiff to hard residual soils as described in the Soil Properties section of this report. These sections consist of widening existing roadways and new alignments with typical construction methods. Segment I makes up approximately 21 percent of the investigated alignment.

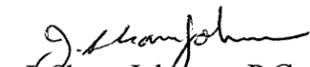
**Segment II**

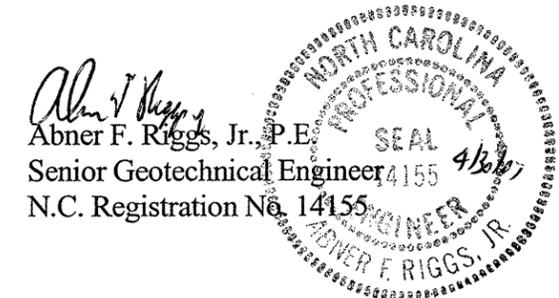
-L- 12+00.00 to 15+04.00  
 -L- 16+39.00 to 21+00.00

Segment II consists of soft/loose alluvial soils. A portion of these soils contains the asbestos mineral anthophyllite which may be an occupational health hazard. Approximately 79 percent of the investigation falls within Section II.

S&ME appreciates the opportunity to be your geotechnical consultant on this project. If you have any questions or need additional information in regard to this report, please contact us.

Very truly yours,  
**S&ME, Inc.**

  
 J. Shane Johnson, P.G.  
 Project Geologist  
 N.C. Registration No. 1753



Attachments

Appendix A

The following bulk samples were taken for tests to determine the Standard Proctor and CBR values of the soil:

<u>Line</u>	<u>Station</u>	<u>Depth (ft)</u>	<u>Test Performed</u>
-L-	10+83	0-3	Standard Proctor and CBR
-L-	17+50	0-3	Standard Proctor and CBR

Embankment column does not include backfill for undercut.  
 Per Geotech Recommendations, Class IV Subgrade Stabilization  
 is to be used as backfill for undercut.

EARTHWORK BALANCE SHEET

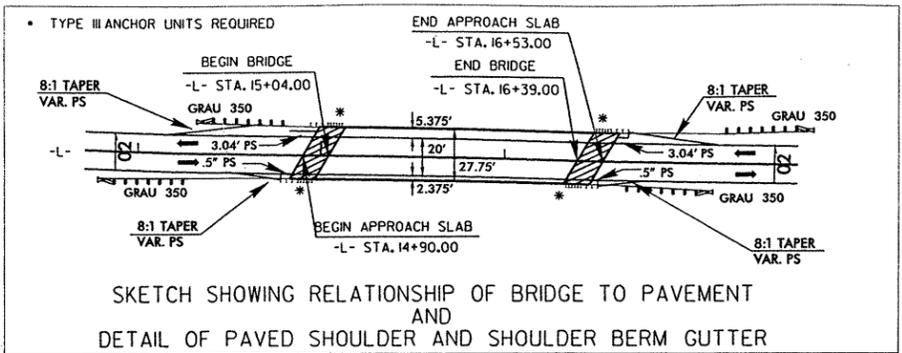
CALCULATED BY: FOSTER

CHECKED BY: \_\_\_\_\_

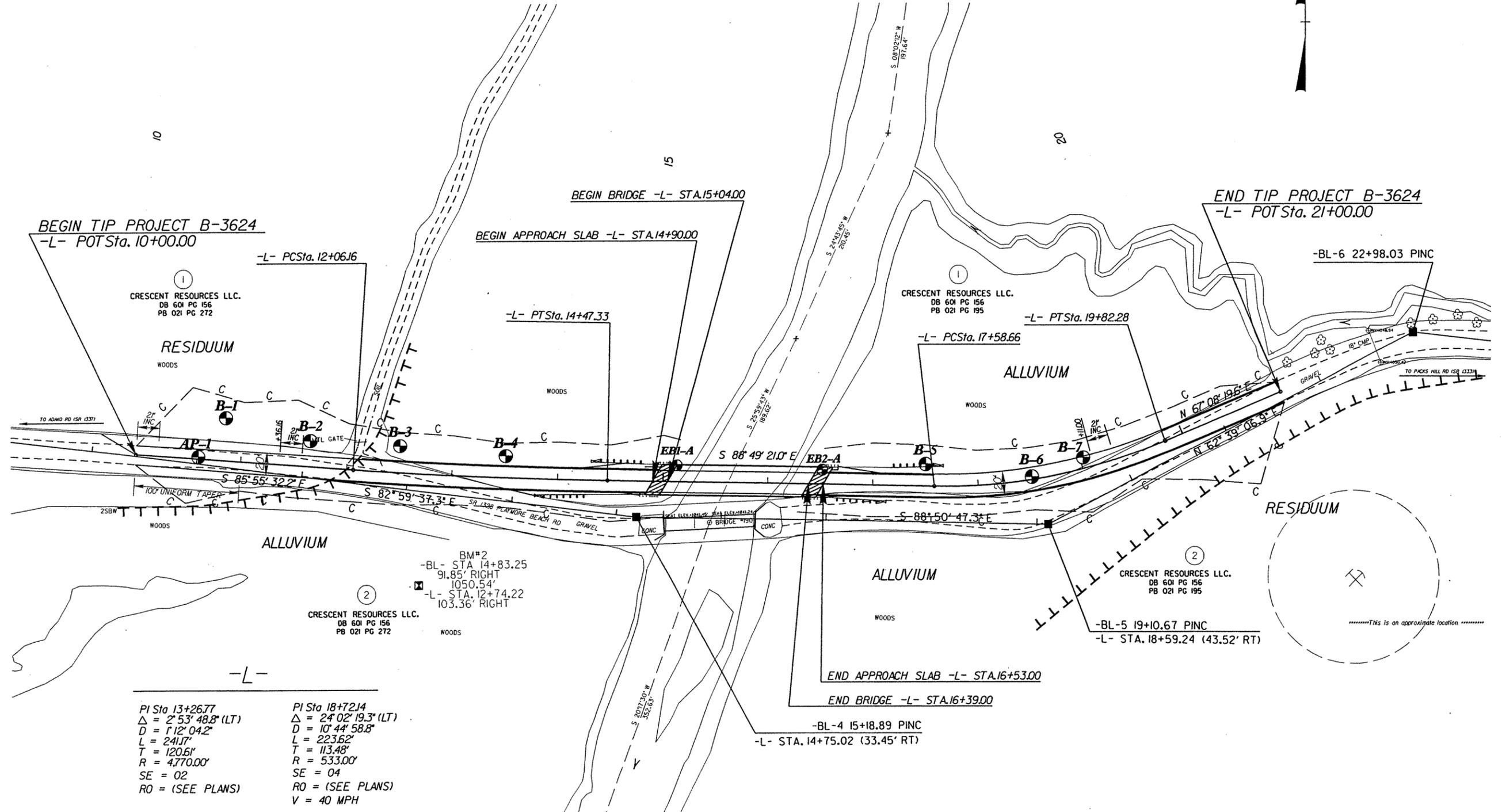
PROJECT: <u>B-3624</u>		COUNTY: <u>CALDWELL</u>		SHEET 3C OF 13										
SUMMARIES / STATION RANGES	TOTAL EXCAV. (UNCL)	ROCK EXCAV.	UNDERCUT EXCAV.	UNSUIT. EXCAV.	SUITABLE EXCAV.	TOTAL EMB.	ROCK EMB.	EARTH EMB.	EMB. + 20%	BORROW	ROCK WASTE	SUITABLE WASTE	UNSUIT. WASTE	TOTAL WASTE
SUMMARY #1														
10+00.00 to 15+04.00 (Beg Bridge)	3,618		380	470	3,148	62	0	62	74	0	0	3,074	850	3,924
DRIVE1- sta 10+00 to sta 10+49.80	112				112		0	0	0	0	0	112	0	112
<b>SUBTOTAL</b>	<b>3,730</b>	<b>0</b>	<b>380</b>	<b>470</b>	<b>3,260</b>	<b>62</b>	<b>0</b>	<b>62</b>	<b>74</b>	<b>0</b>	<b>0</b>	<b>3,186</b>	<b>850</b>	<b>4,036</b>
SUMMARY #2														
16+39.00 (End Bridge) to 21+00.00	1,318		396	447	871	207		207	248	0	0	623	843	1,466
<b>SUBTOTAL</b>	<b>1,318</b>	<b>0</b>	<b>396</b>	<b>447</b>	<b>871</b>	<b>207</b>	<b>0</b>	<b>207</b>	<b>248</b>	<b>0</b>	<b>0</b>	<b>623</b>	<b>843</b>	<b>1,466</b>
<b>TOTAL</b>	<b>5,048</b>	<b>0</b>	<b>776</b>	<b>917</b>	<b>4,131</b>	<b>269</b>	<b>0</b>	<b>269</b>	<b>322</b>	<b>0</b>	<b>0</b>	<b>3,809</b>	<b>1,693</b>	<b>5,502</b>
Loss due to clearing and grubbing	-300				-300							-300		-300
Additional Undercut	0		50			50	0	50	60	60	0	0	50	50
Waste To Replace Borrow										-60	0	-60	0	-60
<b>PROJECT TOTAL</b>	<b>4,748</b>	<b>0</b>	<b>826</b>	<b>917</b>	<b>3,831</b>	<b>319</b>	<b>0</b>	<b>319</b>	<b>382</b>	<b>0</b>	<b>0</b>	<b>3,449</b>	<b>1,743</b>	<b>5,192</b>
<b>GRAND TOTAL</b>	<b>4,748</b>		<b>826</b>							<b>0</b>				
<b>SAY</b>	<b>4,775</b>		<b>840</b>											

Earthwork quantities are calculated by the Roadway Design Unit.  
 These earthwork quantities are based in part on subsurface data  
 provided by the Geotechnical Engineering Unit.

PROJECT REFERENCE NO. B-3624	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



SKETCH SHOWING RELATIONSHIP OF BRIDGE TO PAVEMENT AND  
DETAIL OF PAVED SHOULDER AND SHOULDER BERM GUTTER

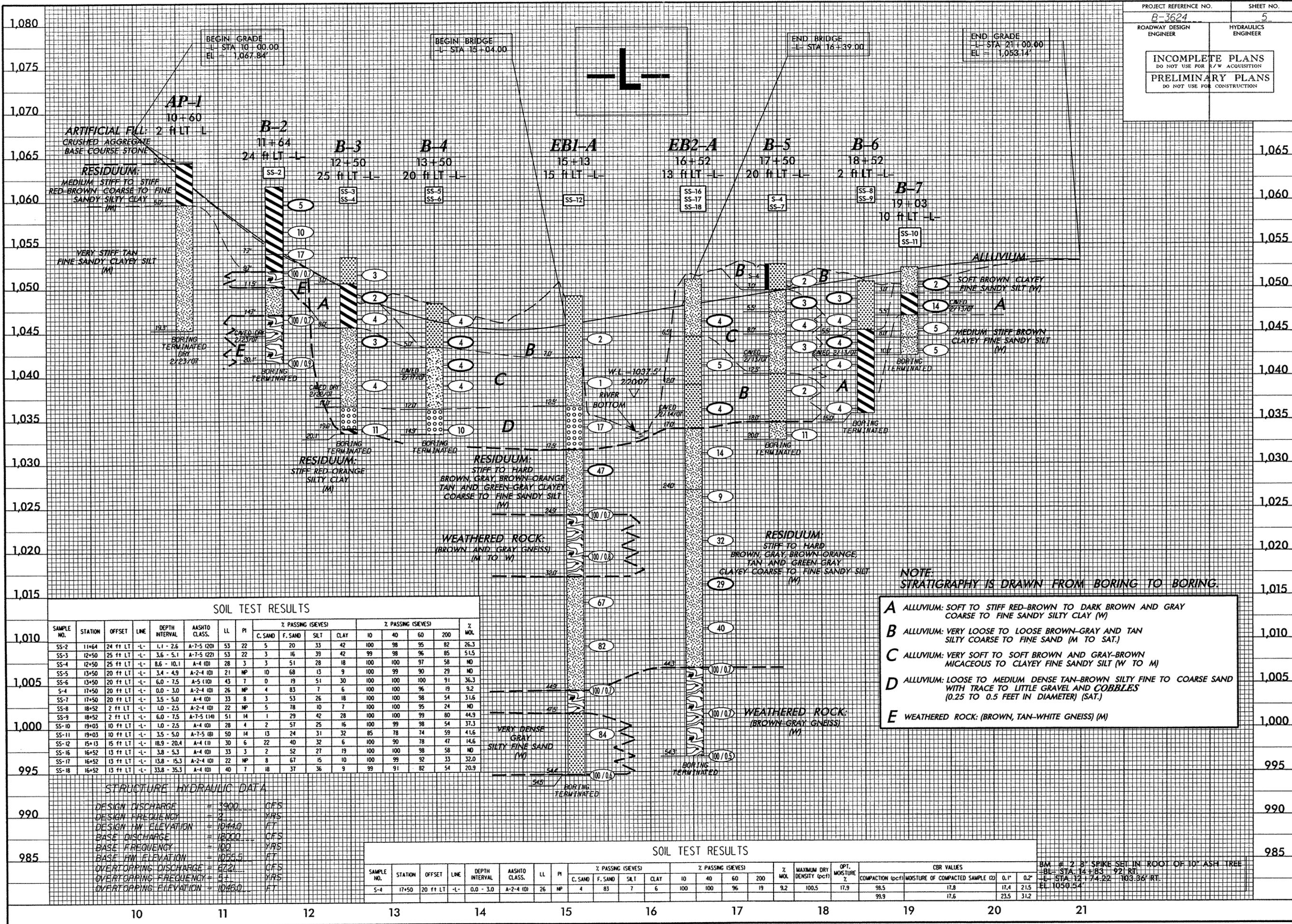


PI Sta 13+26.77	PI Sta 18+72.14
$\Delta = 2^{\circ}53'48.8"$ (LT)	$\Delta = 24^{\circ}02'19.3"$ (LT)
D = 112'04.2'	D = 10'44'58.8"
L = 241.7'	L = 223.62'
T = 120.61'	T = 113.48'
R = 4.770.00'	R = 533.00'
SE = 02	SE = 04
RO = (SEE PLANS)	RO = (SEE PLANS)
	V = 40 MPH

BM#2  
-BL- STA 14+83.25  
91.85' RIGHT  
1050.54'  
-L- STA. 12+74.22  
103.36' RIGHT

CRESCENT RESOURCES LLC.  
DB 601 PG 156  
PB 021 PG 195

-BL-5 19+10.67 PINC  
-L- STA. 18+59.24 (43.52' RT)



**SOIL TEST RESULTS**

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOL.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-2	11+64	24 FT LT	-L-	1.1 - 2.6	A-7-5 (20)	53	22	5	20	33	42	100	98	95	82	26.3
SS-3	12+50	25 FT LT	-L-	3.6 - 5.1	A-7-5 (22)	53	22	3	16	39	42	99	98	96	85	51.5
SS-4	12+50	25 FT LT	-L-	8.6 - 10.1	A-4 (0)	28	3	3	51	28	18	100	100	97	58	ND
SS-5	13+50	20 FT LT	-L-	3.4 - 4.9	A-2-4 (0)	21	NP	10	68	13	9	100	99	90	29	ND
SS-6	13+50	20 FT LT	-L-	6.0 - 7.5	A-5 (10)	43	7	0	19	51	30	100	100	91	36.3	
S-4	17+50	20 FT LT	-L-	0.0 - 3.0	A-2-4 (0)	26	NP	4	83	7	6	100	100	96	19	9.2
SS-7	17+50	20 FT LT	-L-	3.5 - 5.0	A-4 (0)	33	8	3	53	26	18	100	100	98	54	31.6
SS-8	18+52	2 FT LT	-L-	1.0 - 2.5	A-2-4 (0)	22	NP	5	78	10	7	100	100	95	24	ND
SS-9	18+52	2 FT LT	-L-	6.0 - 7.5	A-7-5 (14)	51	14	1	29	42	28	100	100	99	80	44.9
SS-10	19+03	10 FT LT	-L-	1.0 - 2.5	A-4 (0)	28	4	2	57	25	16	100	99	98	54	37.3
SS-11	19+03	10 FT LT	-L-	3.5 - 5.0	A-7-5 (0)	50	14	13	24	31	32	85	78	74	59	41.6
SS-12	15+13	15 FT LT	-L-	18.9 - 20.4	A-4 (0)	30	6	22	40	32	6	100	90	78	47	14.6
SS-16	16+52	13 FT LT	-L-	3.8 - 5.3	A-4 (0)	33	3	2	52	27	19	100	100	98	58	ND
SS-17	16+52	13 FT LT	-L-	13.8 - 15.3	A-2-4 (0)	22	NP	8	67	15	10	100	99	92	33	32.0
SS-18	16+52	13 FT LT	-L-	33.8 - 35.3	A-4 (0)	40	7	18	37	36	9	99	91	82	54	20.9

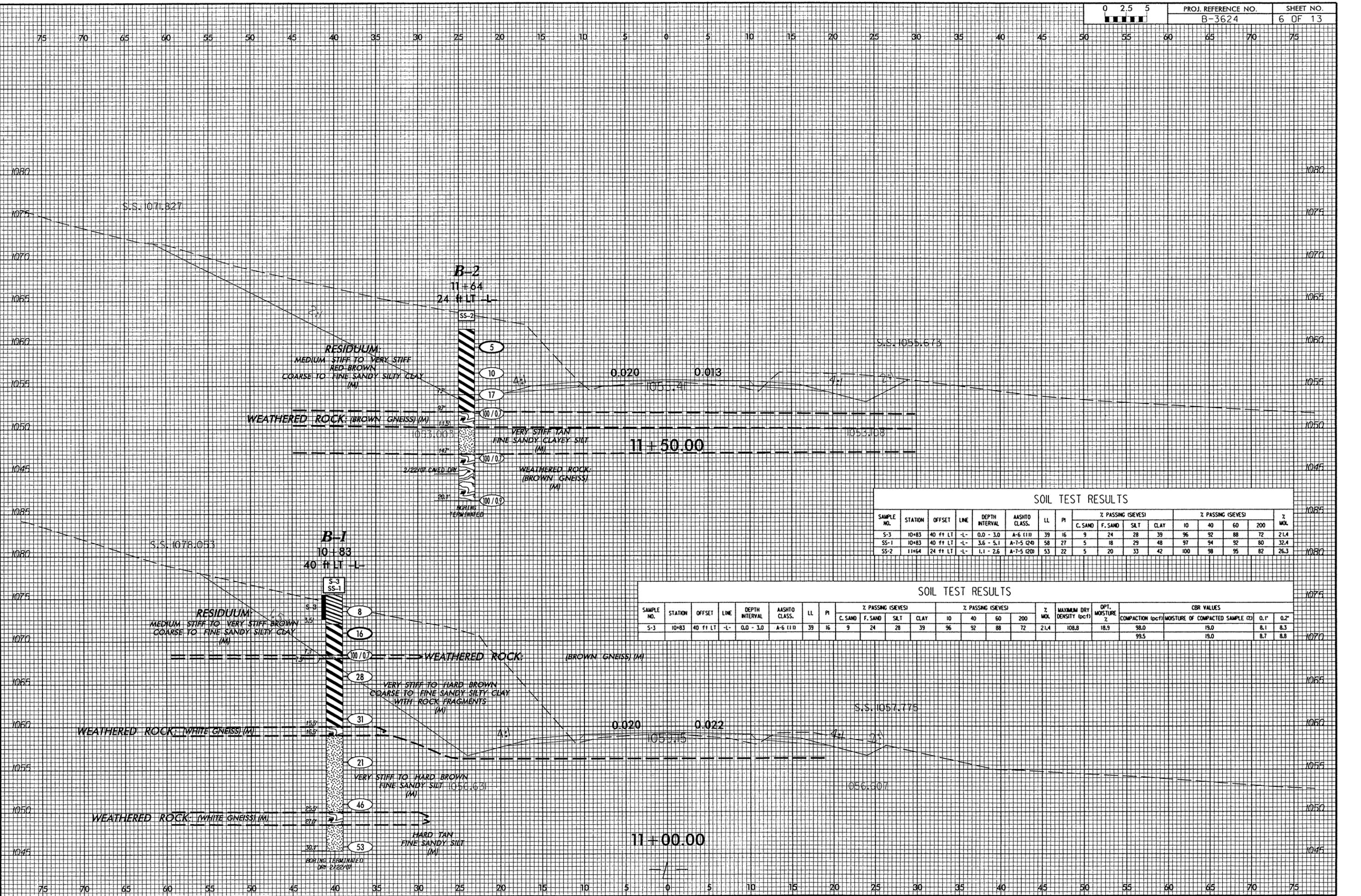
**STRUCTURE HYDRAULIC DATA**

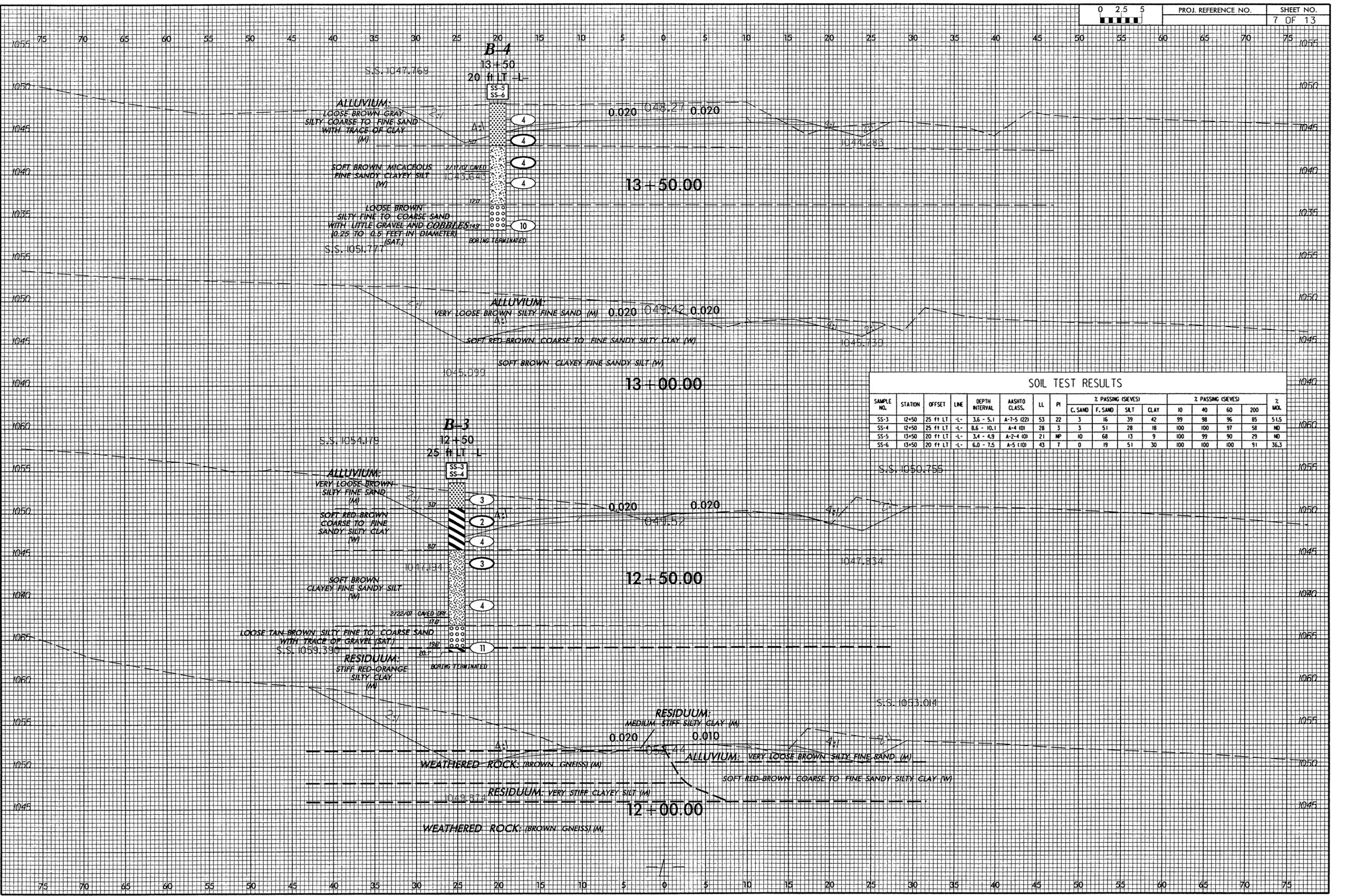
DESIGN DISCHARGE	= 3900	CFS
DESIGN FREQUENCY	= 2	YRS
DESIGN HW ELEVATION	= 1044.0	FT
BASE DISCHARGE	= 18000	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1055.5	FT
OVERTOPPING DISCHARGE	= 6721	CFS
OVERTOPPING FREQUENCY	= 5+	YRS
OVERTOPPING ELEVATION	= 1065.0	FT

**SOIL TEST RESULTS**

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOL.	MAXIMUM DRY DENSITY (pcf)	OPT. MOISTURE %	CBR VALUES			
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200				COMPACTION (pcf)	MOISTURE OF COMPACTED SAMPLE (%)	0.1"	0.2"
S-4	17+50	20 FT LT	-L-	0.0 - 3.0	A-2-4 (0)	26	NP	4	83	7	6	100	100	96	19	9.2	100.5	17.9	98.5	17.8	17.4	21.5
																		99.9	17.6	23.5	31.2	

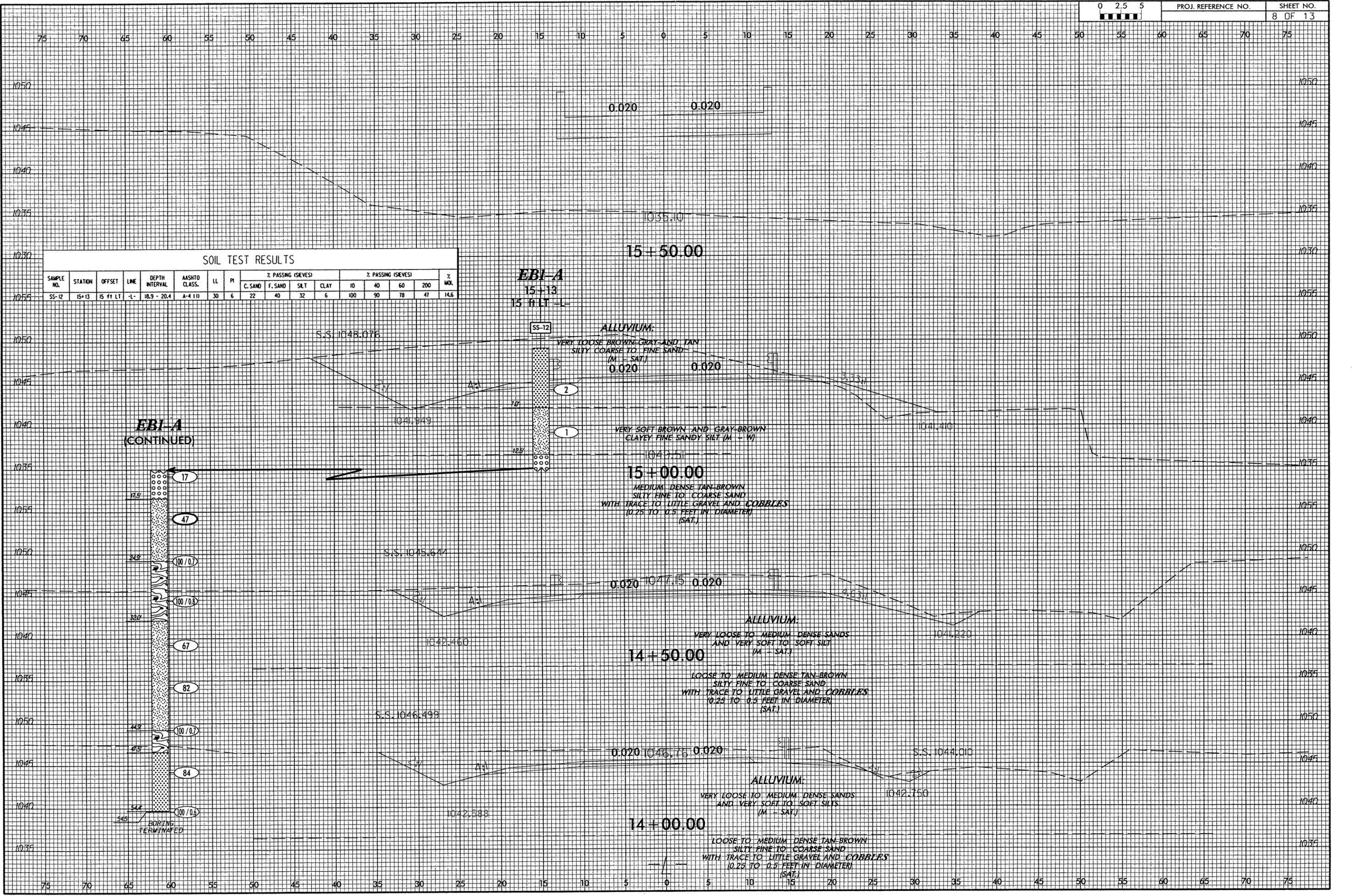
BM # 2 8" SPIKE SET IN ROOT OF 10" ASH TREE  
-BI- STA. 14+83 92' RT.  
-L- STA. 12+74.22 103.86' RT.  
EL. 1050.54'





**SOIL TEST RESULTS**

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOL.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-3	12+50	25 ft LT	-L-	3.6 - 5.1	A-7-5 (22)	53	22	3	16	39	42	99	98	96	85	51.5
SS-4	12+50	25 ft LT	-L-	8.6 - 10.1	A-4 (0)	28	3	3	51	28	18	100	100	97	58	ND
SS-5	13+50	20 ft LT	-L-	3.4 - 4.9	A-2-4 (0)	21	NP	10	68	13	9	100	99	90	29	ND
SS-6	13+50	20 ft LT	-L-	6.0 - 7.5	A-5 (10)	43	7	0	19	51	30	100	100	100	91	36.3



**SOIL TEST RESULTS**

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOL.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-12	15+13	15 FT LT	-L-	18.9 - 20.4	A-4 (1)	30	6	22	40	32	6	100	90	78	47	14.6

**EBI-A**  
(CONTINUED)

**EBI-A**  
15+13  
15 FT LT -L-

**ALLUVIUM:**  
 VERY LOOSE BROWN GRAY AND TAN SILTY COARSE TO FINE SAND (M - SAT.)  
 0.020 0.020

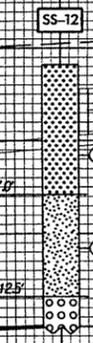
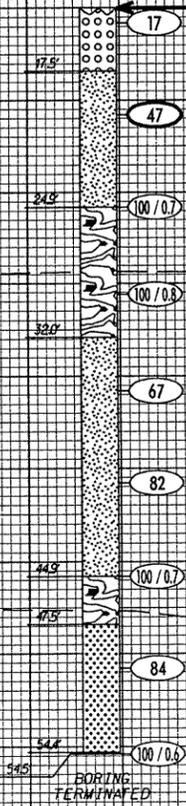
**ALLUVIUM:**  
 VERY SOFT BROWN AND GRAY-BROWN CLAYEY FINE SANDY SILT (M - W)  
 1049.51  
**15+00.00**  
 MEDIUM DENSE TAN-BROWN SILTY FINE TO COARSE SAND WITH TRACE TO LITTLE GRAVEL AND COBBLES (0.25 TO 0.5 FEET IN DIAMETER) (SAT.)

**ALLUVIUM:**  
 VERY LOOSE TO MEDIUM DENSE SANDS AND VERY SOFT TO SOFT SILT (M - SAT.)  
 0.020 1047.15 0.020

**ALLUVIUM:**  
 LOOSE TO MEDIUM DENSE TAN-BROWN SILTY FINE TO COARSE SAND WITH TRACE TO LITTLE GRAVEL AND COBBLES (0.25 TO 0.5 FEET IN DIAMETER) (SAT.)

**ALLUVIUM:**  
 VERY LOOSE TO MEDIUM DENSE SANDS AND VERY SOFT TO SOFT SILTS (M - SAT.)  
 0.020 1046.76 0.020

**ALLUVIUM:**  
 LOOSE TO MEDIUM DENSE TAN-BROWN SILTY FINE TO COARSE SAND WITH TRACE TO LITTLE GRAVEL AND COBBLES (0.25 TO 0.5 FEET IN DIAMETER) (SAT.)



S.S. 1048.076

S.S. 1045.644

S.S. 1046.499

S.S. 1044.010

15+50.00

15+00.00

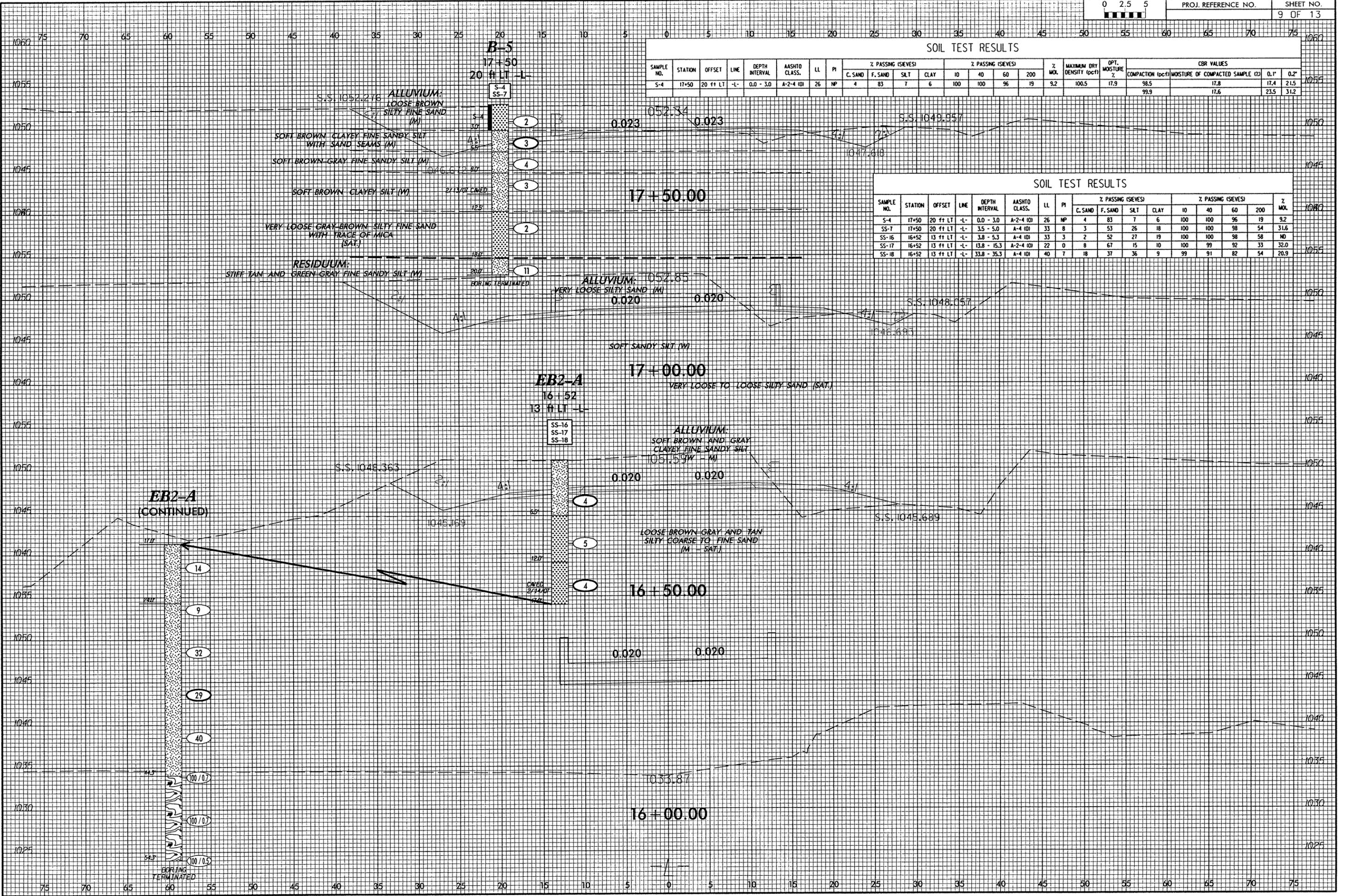
14+50.00

14+00.00

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

1050 1045 1040 1035 1030 1025 1020 1015 1010 1005 1000 995 990 985 980 975 970 965 960 955 950 945 940 935 930 925 920 915 910 905 900 895 890 885 880 875 870 865 860 855 850 845 840 835 830 825 820 815 810 805 800 795 790 785 780 775 770 765 760 755 750 745 740 735 730 725 720 715 710 705 700 695 690 685 680 675 670 665 660 655 650 645 640 635 630 625 620 615 610 605 600 595 590 585 580 575 570 565 560 555 550 545 540 535 530 525 520 515 510 505 500 495 490 485 480 475 470 465 460 455 450 445 440 435 430 425 420 415 410 405 400 395 390 385 380 375 370 365 360 355 350 345 340 335 330 325 320 315 310 305 300 295 290 285 280 275 270 265 260 255 250 245 240 235 230 225 220 215 210 205 200 195 190 185 180 175 170 165 160 155 150 145 140 135 130 125 120 115 110 105 100 95 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



**SOIL TEST RESULTS**

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% MOL.	MAXIMUM DRY DENSITY (pcf)	OPT. MOISTURE %	CBR VALUES							
								C. SAND	F. SAND	SILT	CLAY				10	40	200	COMPACTION (pcf)	MOISTURE OF COMPACTED SAMPLE (%)	0.1'	0.2'	
S-4	17+50	20 ft LT	-L-	0.0 - 3.0	A-2-4 (M)	26	NP	4	83	7	6	100	100	96	19	9.2	100.5	17.9	98.5	17.8	17.4	21.5
																		99.9	17.6	23.5	31.2	

**SOIL TEST RESULTS**

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% MOL.				
								C. SAND	F. SAND	SILT	CLAY					
S-4	17+50	20 ft LT	-L-	0.0 - 3.0	A-2-4 (M)	26	NP	4	83	7	6	100	96	19	9.2	
SS-7	17+50	20 ft LT	-L-	3.5 - 5.0	A-4 (M)	33	8	3	53	26	18	100	100	98	54	31.6
SS-16	16+52	13 ft LT	-L-	3.8 - 5.3	A-4 (M)	33	3	2	52	27	19	100	100	98	58	ND
SS-17	16+52	13 ft LT	-L-	13.8 - 15.3	A-2-4 (M)	22	0	8	67	15	10	100	99	92	33	32.0
SS-18	16+52	13 ft LT	-L-	33.8 - 35.3	A-4 (M)	40	7	18	37	36	9	99	91	82	54	20.9

**B-5**  
 17+50  
 20 ft LT -L-

**EB2-A**  
 16+52  
 13 ft LT -L-

**EB2-A**  
 (CONTINUED)

BORING TERMINATED

17+50.00

17+00.00

16+50.00

16+00.00

S.S. 1052.216  
 ALLUVIUM:  
 LOOSE BROWN  
 SILTY FINE SAND  
 (M)

SOFT BROWN CLAYEY FINE SANDY SILT  
 WITH SAND SEAMS (M)

SOFT BROWN GRAY FINE SANDY SILT (M)

SOFT BROWN CLAYEY SILT (M)

VERY LOOSE GRAY-BROWN SILTY FINE SAND  
 WITH TRACE OF MICA  
 (SAT.)

RESIDUUM:  
 STIFF TAN AND GREEN-GRAY FINE SANDY SILT (M)

ALLUVIUM:  
 VERY LOOSE SILTY SAND (M)

SOFT SANDY SILT (M)

VERY LOOSE TO LOOSE SILTY SAND (SAT.)

ALLUVIUM:  
 SOFT BROWN AND GRAY  
 CLAYEY FINE SANDY SILT  
 (M)

LOOSE BROWN GRAY AND TAN  
 SILTY COARSE TO FINE SAND  
 (M - SAT.)

117'

291'

14.5'

54.3'

S-4  
 SS-7

30'

30'

22.8'

12.5'

18.0'

20.0'

BORING TERMINATED

(2)

(3)

(4)

(3)

(2)

(11)

(4)

(5)

(4)

(14)

(9)

(32)

(29)

(40)

(100 / 0.7)

(100 / 0.7)

(100 / 0.5)

0.023

0.023

0.020

0.020

0.020

0.020

0.020

0.020

0.52.34

0.52.85

1051.59W

0.33.87

S.S. 1049.957

S.S. 1048.057

S.S. 1045.689

1047.618

1046.693

1046.628

1045.169

S.S. 1048.363

117'

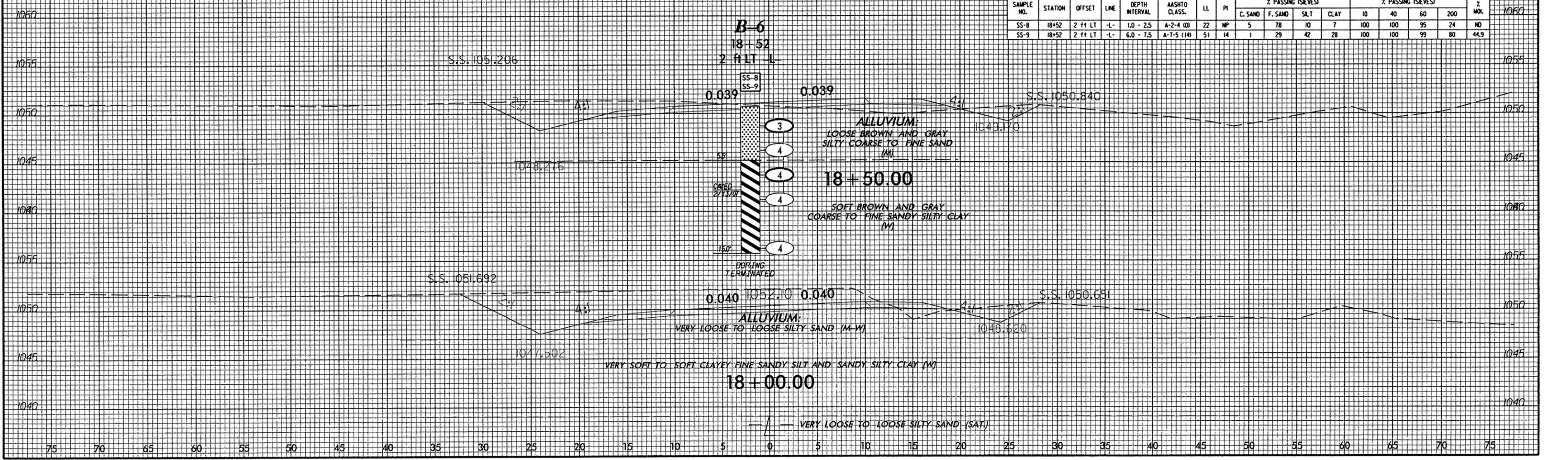
291'

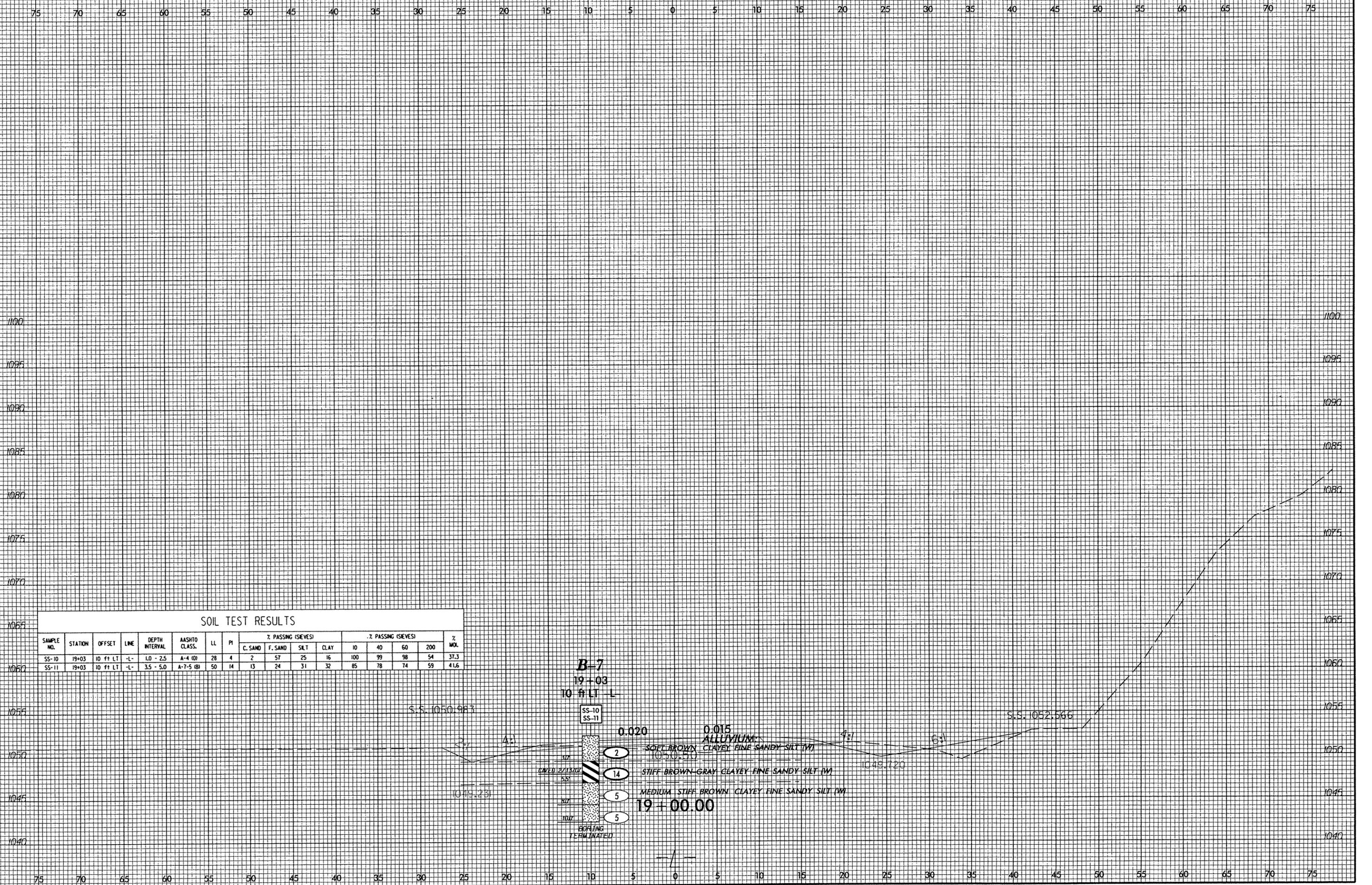
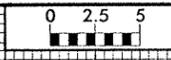
14.5'

54.3'

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

SOIL TEST RESULTS																
SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOL.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-8	18+52	2 FT LT	-L-	1.0 - 2.5	A-2-4 (0)	22	NP	5	78	10	7	100	100	95	24	ND
SS-9	18+52	2 FT LT	-L-	6.0 - 7.5	A-7-5 (14)	51	14	1	29	42	28	100	100	99	80	44.9





SOIL TEST RESULTS

SAMPLE NO.	STATION	OFFSET	LINE	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% PASSING (SIEVES)				% PASSING (SIEVES)				% MOL.
								C. SAND	F. SAND	SILT	CLAY	10	40	60	200	
SS-10	19+03	10 FT LT	-L-	1.0 - 2.5	A-4 (M)	28	4	2	57	25	16	100	99	98	54	37.3
SS-11	19+03	10 FT LT	-L-	3.5 - 5.0	A-7-5 (M)	50	14	13	24	31	32	85	78	74	59	41.6

**B-7**  
19+03  
10 FT LT -L-

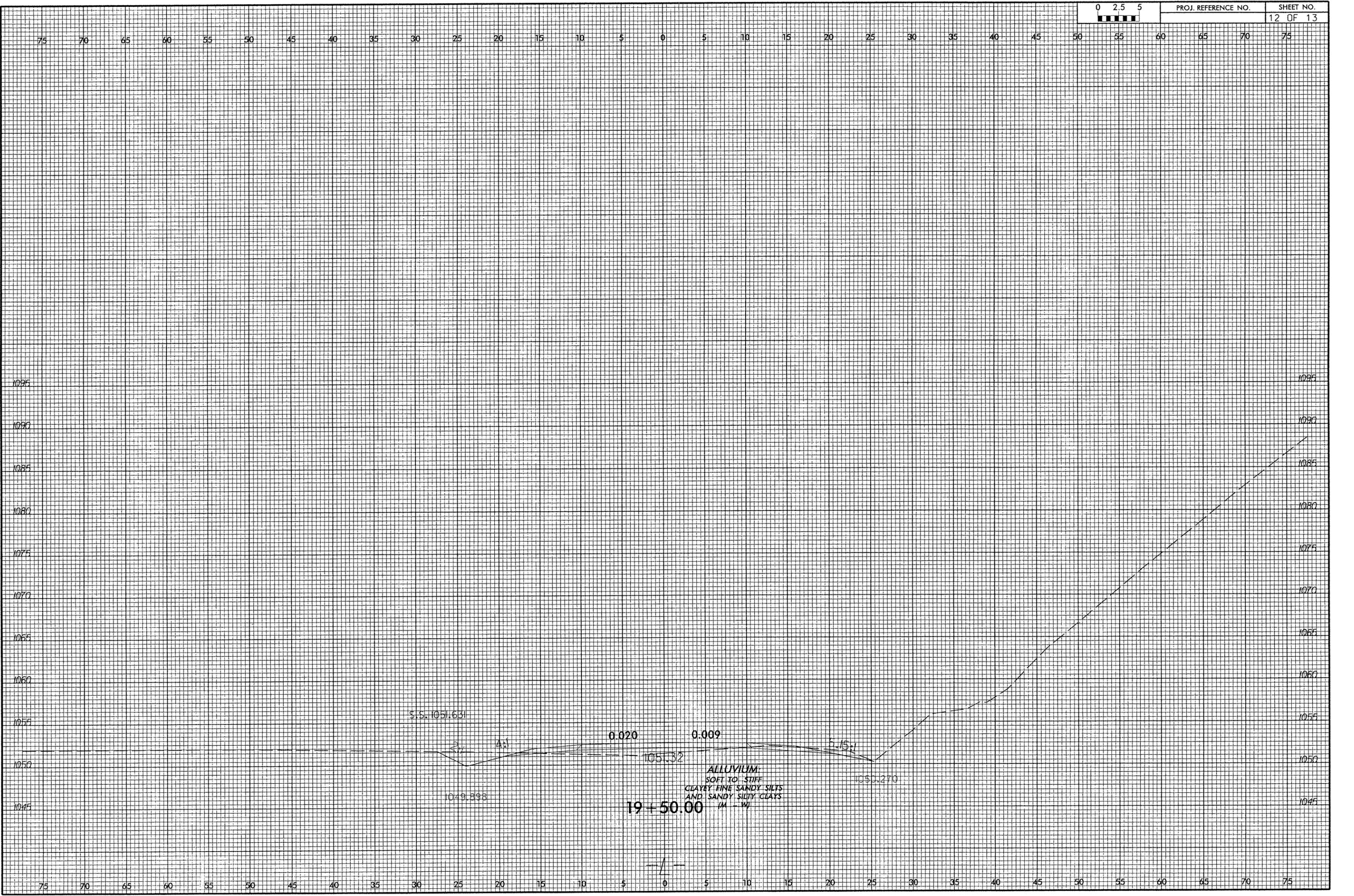
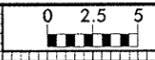
SS-10  
SS-11

S.S. 1050.983

S.S. 1052.566

- 0.020
- 0.015
- ALLUVIUM
- SOFT BROWN CLAYEY FINE SANDY SILT (M)
- STIFF BROWN GRAY CLAYEY FINE SANDY SILT (M)
- MEDIUM STIFF BROWN CLAYEY FINE SANDY SILT (M)
- 19+00.00





S.S. 1051.631

1049.898

0.020

0.009

5.15:1

1051.32

1050.270

19+50.00

ALLUVIUM:  
SOFT TO STIFF  
CLAYEY FINE SANDY SILTS  
AND SANDY SILTY CLAYS  
(M - W)

