STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-5527	1	93

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
17BP.14.R.84	N/A	P.E.
		R/W & UTIL.

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

CONTENTS

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

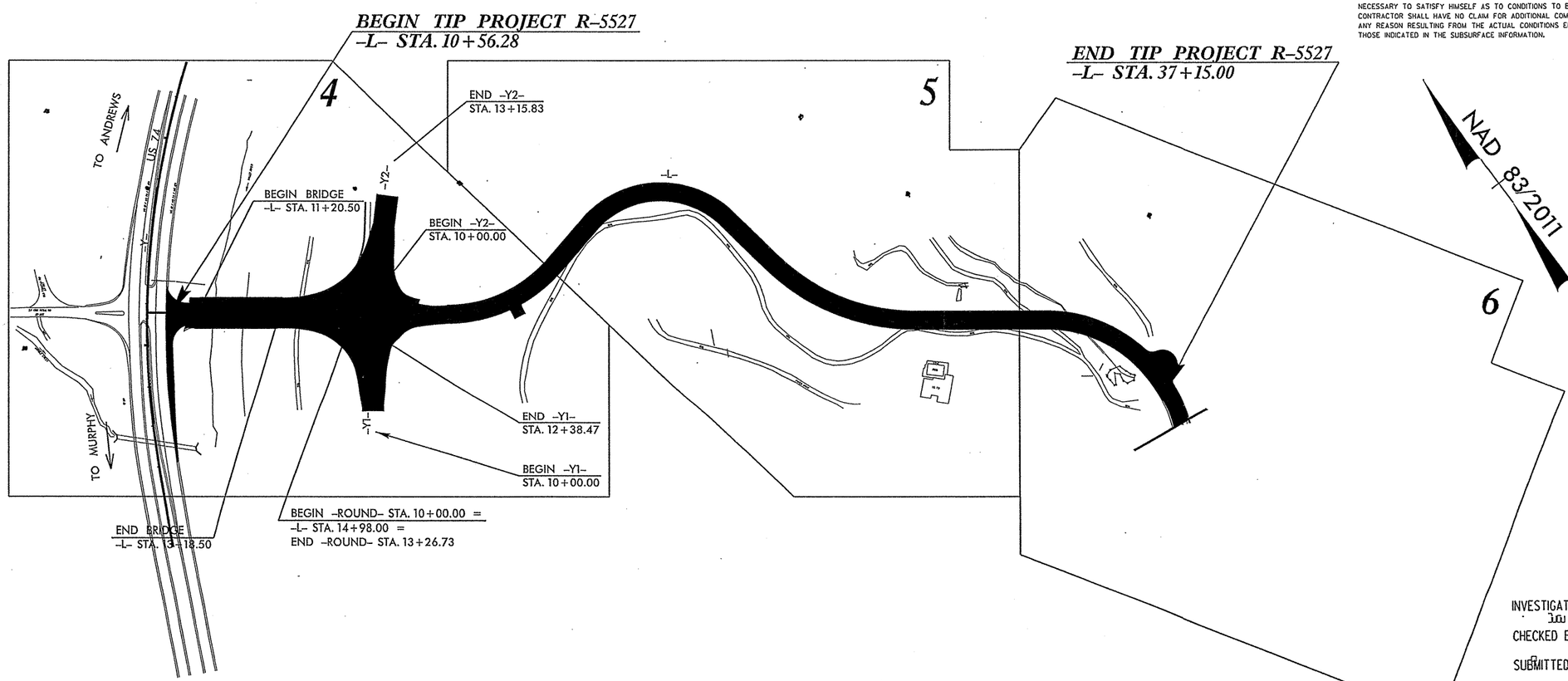
ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *17BP.14.R.84* F.A. PROJ. *N/A*

COUNTY *Cherokee*

PROJECT DESCRIPTION *NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY*

INVENTORY



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) 707-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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PERSONNEL

R. Kral, E.I.T.

M. Brewer, E.I.T.

C. Boyce

S. Joyner

M. Walko, P.E.

M. Grabski

INVESTIGATED BY *F&R, Inc.*

CHECKED BY *M. Walko, P.E.*

SUBMITTED BY *F&R, Inc.*

DATE *August 2013*

NORTH CAROLINA PROFESSIONAL SEAL 026917 ENGINEER MICHAEL J. WALKO 8/5/13

DRAWN BY: *M. Brewer, E.I.T.*

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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.

ID: R-5527

CONTRACT: 17BP.14.R.84

PROJECT REFERENCE NO.	SHEET NO.
R-5527	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% 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	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX		50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT	6 MX		NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - 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)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SPT, CPT, DMT, VST, PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

SAMPLE ABBREVIATIONS
S - BULK
SS - SPLIT SPOON
ST - SHELBY TUBE
RS - ROCK
RT - RECOMPACTED TRIAXIAL
CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B- ___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550X
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [ ] TRICONE ___" STEEL TEETH
- [ ] TRICONE ___" TUNG.-CARB.
- [X] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B ___
- [X] -N 02
- [ ] -H ___

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF 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:

WEATHERED ROCK (WR)	NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.
CRYSTALLINE ROCK (CR)	FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.
NON-CRYSTALLINE ROCK (NCR)	FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YEILD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.
COASTAL PLAIN SEDIMENTARY ROCK (CP)	COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	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.
SLIGHT (SLI.)	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.
MODERATE (MOD.)	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.
MODERATELY SEVERE (MOD. SEV.)	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. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK 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. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	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. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	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.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

FRIABLE	RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.
MODERATELY INDURATED	GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.
INDURATED	GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.
EXTREMELY INDURATED	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - 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.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) 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 PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

STRATA ROCK QUALITY DESIGNATION (SRQD) - 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.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: Survey information provided by Vaughn & Melton, Inc.

ELEVATION: N/A FT.

NOTES:
ALLUV. = ALLUVIAL
CLY. = CLAYEY
DK. = DARK
FIAD = FILLED IMMEDIATELY AFTER DRILLING
GSRF = GRAVEL-SIZED ROCK FRAGMENTS
RDWY. EMB. = ROADWAY EMBANKMENT
SOS = SURFICIAL ORGANIC SOILS
TR. = TRACE
WR = WEATHERED ROCK
W/ = WITH
O-XXX = SURFICIAL ORGANIC SOIL SAMPLE

REVISED 09/23/09

SINCE 1881

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Charlotte, North Carolina 28269 I USA
T 704.596.2889 I F 704.596.3784
NC Engineering License # F-0266

FROEHLING & ROBERTSON, INC.

August 5, 2013

WBS No.:	17BP.14.R.84
TIP No.:	R-5527
F.A. Number:	N/A
County:	Cherokee
Description:	New Route from US 74/19/129 to EBCI Tribal Boundary
SUBJECT:	**Geotechnical Report – Inventory**

Project Description

The project will consist of the construction of a new single span bridge and approximately ½-mile long two lane entrance road to the Eastern Bank of the Cherokee Indians' second casino near the existing intersection of US Highway 74/19/129 and Regal Road in Murphy, North Carolina. Based on the cross sections and profiles provided to us by Vaughn & Melton, the project will begin at approximate Station 10+00 (-L-) and end at approximate Station 38+16 (-L-) for a total length of approximately 2,816 feet. A roundabout will be constructed at approximate Station 15+50 to provide access to future routes, -Y1- & -Y2-. The proposed roadway generally extends through rolling terrain that is mostly wooded.

In the relatively flat areas of the site between approximate Station 13+50 to Station 17+00, proposed cut and fill depths are generally less than 10 feet. This relatively flat area is composed of existing artificial fill at the ground surface ranging in depths from approximately 40 feet at Station 13+50 to 5 feet at Station 17+00. From approximate Station 17+00 to 38+00, proposed embankment heights are on the order of 10 to 35 feet in height while proposed cut depths are on the order of 20 to 60 feet in height. A soldier pile retaining wall is planned approximately 25 feet right of the proposed center line to be used to retain the toe of the proposed cut slope from Station 29+87 to Station 32+97. Mechanically stabilized earth (MSE) walls will be used to retain fill soils from approximate Station 31+00 to Station 33+27 and from Station 35+00 to Station 37+00 and are located approximately 55 to 93 feet left and 40 to 74 feet right of the centerline, respectively. Soldier pile walls will generally be less than 12 feet high, while MSE wall heights will be on the order of 12 to 25 feet high.

A geotechnical field investigation was performed by F&R between June 20 and July 24, 2013. During this time period, a total of thirty-eight (38) standard penetration test (SPT) borings were advanced with an ATV-mounted CME 550X drill rig with an automatic hammer. In addition, eleven (11) rock sounding borings were completed in order to delineate areas of shallow rock or potentially unsuitable soils. Representative soil samples were collected for visual classification in the field and for laboratory analysis by F&R's testing laboratory.

The following alignments were investigated:

Line	Station (±)
-L-	10+00 to 38+16
-Y1-	10+00 to 12+38
-Y2-	10+00 to 13+16

Areas of Special Geotechnical Interest

1) Crystalline Rock: Multiple borings performed on this project encountered rock above or within six feet of the proposed grade. At other borings, crystalline rock was not encountered above or within six feet of the proposed grade, but dependent upon the trend of the rock-line, crystalline rock could be encountered above or within six feet of the proposed grade in adjacent slope areas. The following area was found to contain or may contain crystalline rock above or within six feet of the proposed grade and will likely require ripping or blasting for removal:

Line	Station (±)
-L-	19+25 to 24+75

2) Weathered Rock: Multiple borings performed on this project encountered weathered rock above or within six feet of the proposed grade. At other borings, weathered rock was not encountered above or within six feet of the proposed grade, but dependent upon the trend of the rock-line, weathered rock could be encountered above or within six feet of the proposed grade in adjacent slope areas. The following areas were found to contain or may contain weathered rock above or within six feet of the proposed grade and have a potential to require ripping or blasting for removal:

Line	Station (±)
-L-	18+75 to 26+00
-L-	33+50 to 35+75, left

3) Soft and Loose Soils: The following areas contain relatively soft and/or loose soils that have the potential to cause subgrade problems and embankment stability problems during construction:

Line	Station (±)
-L-	27+00 to 29+50
-L-	29+50 to 33+50, left
-L-	33+50 to 38+16

4) Groundwater: Several borings performed on this project encountered groundwater within six feet of the proposed grade. At other borings, groundwater was not encountered within six feet of the proposed grade, but dependent upon the actual groundwater level, groundwater could be encountered within six feet of the proposed grade in adjacent slope areas. The following areas exhibited or may exhibit groundwater within six feet of the proposed grade, or within 6 feet of the bottom of the anticipated undercut locations:

Line	Station (±)
-L-	35+00 to 37+00

The following areas exhibited groundwater within three feet of existing grade, which has the potential to cause subgrade problems during construction:

Line	Station (±)
-L-	37+00, right

5) Organic Soils: The following locations were found to contain organic-laden soils, which have the potential to cause subgrade problems during construction, embankment instability or long-term settlement problems:

Line	Station (±)
-L-	21+00 to 25+00
-L-	27+00
-L-	33+00 to 36+50

6) Artificial Fill: The following areas encountered artificial fill. It is possible that unsuitable soils within the artificial fill may be encountered that could require undercutting or remedial repairs:

Line	Station (±)
-L-	13+50 to 18+00
-L-	21+00
-L-	25+00 to 27+00
-L-	30+00 to 33+00
-L-	35+00 to 37+00

Physiography and Geology

The project site is located within the Murphy Belt of the Blue Ridge physiographic province of North Carolina. More specifically, it is located near the boundary of the Murphy Marble/Andrews Formation (Zman) and the Mineral Bluff Formation (Zmb). Predominant rock types in these areas are mapped as calcareous to dolomitic biotite schist, quartz schist, and phyllite. Weathered and crystalline rock samples recovered from our borings exhibited the characteristics of all these units. The virgin soils are the residual product of in-place chemical weathering of rock that was similar to the rock presently underlying the site.

The proposed route for the alignment typically runs northwest to southeast. The existing ground surface along the alignment generally slopes upward from an elevation of +/- 1575 feet at the intersection with US HWY 74 to maximum elevation of +/- 1750 feet at proposed Station 21+00. The alignment then generally begins to slope downward from proposed Station 26+50, at an elevation of +/- 1749 to Station 34+00 at an elevation of +/- 1640 feet. The ground surface then generally slopes upward to an elevation of +/- 1675 near the end of the project.

Based on a review of the cross sections provided, cut and fill depths are relatively shallow from approximate Station 13+50 to Station 17+00 where the existing topography is relatively flat. Beyond approximate Station 17+00, the terrain becomes rolling with maximum cut and fill depths on the order of approximately 60 feet and 35 feet, respectively. In general, proposed fill slopes are on the order of 2:1 (H:V) or flatter and cut slopes are typically 2:1 (H:V) at most locations.

The proposed route crosses the Valley River from approximate Station 11+00 to 13+50. The river then diverges away from the site until approximate Station 21+00 where the river runs adjacent to the left side of the alignment until diverging away near the end of the project. In addition, a small stream starts in a wetland area at approximate Station 36+50 right of the alignment and feeds into the Valley River. An additional wetland area is noted at approximate Station 34+50. The stream runs through the middle of the alignment and ends left of the alignment at Station 31+00.

Soils Properties

The subsurface conditions discussed below and those shown on the attached drawings, represent an estimate of the subsurface conditions based on interpretation of the boring data using normally-accepted geotechnical engineering judgments. The transitions between different soil strata are usually less distinct than those shown on the plan views and cross sections. Sometimes the relatively small sample obtained in the field is insufficient to definitively describe the origin of the subsurface material. Although individual soil test borings are representative of the subsurface conditions at the boring locations on the dates shown, they are not necessarily indicative of subsurface conditions at other locations or at other times.

Soils within the area of this project have been divided into four categories: surficial materials (topsoil), artificial fill, alluvial, and residual soils.

Surficial Materials: Organic laden soils (topsoil/rootmat) were encountered at the surface of all the borings and ranged in thickness from approximately 0.1 to 1.0 feet. Note that a majority of our borings were performed on existing trails along the proposed alignment; therefore, some of the surficial organic laden soils may have been previously removed. Surficial organic laden soil depths in the wooded areas are expected to be greater than the above reported range.

Artificial Fill: Artificial fill (A. F.) soils were encountered below the surficial organic laden soil at borings EB1-A, EB1-B, EB2-A, EB2-B, L_1500, L_1550L, L_1550R, L_1700, L_1800, L-2100R, L_2100R3, L_2500, L_2700R, L_3000R, L_3050R, L_3100R, L_3150R, L_3200R, L_3250R, L_3300R, L_3500R2, L_3600R, L_3660R, and L-3700R. The artificial fill soils generally consisted of sandy or clayey SILT (AASHTO classification A-4, A-5), and silty SAND (A-2-4) with varying amounts of gravel, mica and clay throughout. The SPT N-values in the artificial fill ranged from 2 to 33 blows per foot (bpf) with a majority of the N-values ranging from 3 to 8 bpf. A majority of the lower blow counts were located within the upper 5 feet of the boring. The artificial fill extended to depths ranging from approximately 2 to 37 feet below existing grades.

Alluvial: Alluvial soils were not encountered in the roadway borings performed during this investigation. However, alluvial soils were encountered in the bridge Borings EB2-A and EB2-B. The alluvial soils consisted of sandy SILT (A-4) and silty sandy GRAVEL (A-1-a) with SPT N-values ranging from 5 to 33 bpf. These alluvial soils were encountered at approximate elevations +/- 1533 feet and +/- 1548 feet at depths ranging from 37 to 52 feet below the existing ground surface.

Residual Soils: A majority of the soils encountered on the project were residual soils, and generally consisted of sandy SILT (A-4) and silty SAND (A-2-4) with SPT N-values ranging from 1 to 94 bpf. The N-values generally increased with depth and a majority of the N-values ranged from 10 to 40 bpf. Residual soils with N-values less than 10 bpf were typically encountered within the upper 10 feet of the boring.

Rock Properties

Weathered rock (WR) and/or Crystalline Rock (CR) was encountered at more than half of the boring locations. The weathered rock and crystalline rock was generally sampled as BIOTITE SCHIST. The depth to top of weathered rock/weathered rock lenses varied across the site ranging from approximately 3.5 to 53.5 feet below existing grades. Weathered rock is defined as residual material exhibiting an SPT N-value of at least 100 blows per foot. The SPT N-values in the weathered rock ranged from 100/1.0' to 100/0.2'.

Crystalline Rock (CR) was encountered in 21 borings (L_1965R, L_2100R, L_2300R, L_2500R2, L_3200R, L_3223L, L_3250L, L_3250R, L_3327L, L_3600R, and L_3700) at elevations from approximately 3.5 to 68.5 feet below existing grades. Crystalline rock is defined by SPT refusal (i.e., 60/0.1' or 60/0.0'). In addition to the Crystalline Rock, auger refusal was also encountered at 10 borings L_1800, L_2900, L_3150L, L_3150R, L_3200L, L_3300L, L_3500R2, L_3550R, L_3660R, and L_3700R. Auger refusal is a designation applied to any material that cannot be penetrated by the soil auger, and is typically caused by encountering boulders, hard rock lenses/ledges or bedrock. The nature of the materials causing auger refusal was not explored in these borings, but is anticipated to represent the bedrock surface.

An additional 11 rock soundings were performed to further delineate rock in areas where crystalline rock was encountered within 6 feet of proposed grade. Eight of the rock sounding borings encountered auger refusal (L_2000L, L_2100L, L_2200L, L_2300, L_2400L, L_2400R, L_2200R and L-2250R). The rock soundings that auger refused on Crystalline Rock above or within six feet of the proposed grade were L_2000L, L_2200L, L_2200R, L_2250R, and L_2300.

Rock coring was performed at borings EB1-A and EB1-B after encountering auger refusal. The coring extended from 6.2 to 25.2 feet and 4.4 to 25.4 feet below the existing ground surface after SPT refusal was achieved. The rock consisted of moderately hard to hard, moderately to slightly weathered, Dolomitic Marble with interlayered Quartzite. Isolated zones of lost core recovery were noted within the upper several feet, which may be indicative of the presence of relatively thin soil seams or weathered rock. The Recovery of each core run and the Rock Quality Designation (RQD) of each core run were measured by F&R staff. The strata recovery and RQD are indicated on the cross section. For Boring EB1-A from 6.2 to 25.2 feet, the recovery and RQD were measured to be 95% and 37%, respectively. For Boring EB1-B from 4.4 to 25.4, the recovery and RQD were measured to be 99% and 18%, respectively.

Groundwater Properties

Groundwater levels were measured in the borings both immediately after drilling and after a stabilization period of approximately 24 hours. Stabilized groundwater was encountered in 9 borings (L_1500, L_1700, L_1800, L_3500R2, L_3550R, L_3600R, L_3660R, L_3700, L_3700R) at depths ranging from approximately 1.0 to 12.3 feet below existing grades. The recovered soil samples were generally described as dry or moist above the groundwater level and moist to wet below the groundwater level.

Geotechnical Descriptive Analysis of the Project

Section 1: Section 10+00 to 13+50 (+/-):

Section 1 of the project will consist of a new single-span bridge crossing the Valley River. A separate report titled "Subsurface Investigation and Bridge Foundation Design Recommendations" was issued by F&R on July 22, 2013. Foundation design recommendations were provided in that report.

Section 2: Section 13+50 to 18+50 (+/-):

Section 2 of the project will extend through an area that is relatively flat. Cut depths in this section are anticipated to be 5 feet or less and fill depths are generally on the order of 15 feet or less. The proposed embankments will be designed at a 4:1 (H:V) side slope. The subgrade within the areas of proposed fills is anticipated to consist mainly of firm to stiff sandy silts.

Section 3: Section 18+50 to 27+00 (+/-):

Section 3 of the project will extend through an area that will require deep cuts, on the order of 20 to 60 feet, to reach proposed elevations. The cut slopes on the right side of the alignment are proposed to be a 2:1 (H:V). Cut slopes along the left side of the alignment are generally proposed to be a 6:1 (H:V). However, from approximate Station 26+50 to 27+00, the cut slope steepens to either a 3:1 (H:V) or a 4:1 (H:V), depending on the location. A sliver fill will be required to tie into the existing slope on the left side of the alignment at approximate Station 26+00.

A majority of the excavated soil in the cuts is anticipated to consist mainly of residual sandy silts and silty sands. Very loose and/or very soft near-surface sands/silts are anticipated to be encountered at isolated locations along this section. However; please note that some areas along this section of the alignment encountered weathered rock and crystalline rock within 6 feet of proposed grades. Additional effort to excavate, rip, or blast may be required to reach design elevations.

Section 4: Section 27+00 to 29+50 (+/-):

Section 4 of the project will consist of embankment fill up to approximately 35 feet in height. Embankment slopes will be designed at a 2:1, 3:1, or 4:1. The subgrade within the areas of the proposed fills is anticipated to mainly consist of sandy silts and silty sands. Very soft near-surface sandy silts are anticipated to be encountered in the vicinity of approximate Station 29+00.

Section 5: Section 29+50 to 33+50 (+/-):

Section 5 of this project will consist of cuts on the order of approximately 15 feet and fills up to approximately 25 feet. A soldier pile wall to retain the cut soils will be constructed on the right side of the alignment from Station 29+87 to Station 32+97. The maximum height of the wall will be approximately 12.5 feet. Excavation in the cuts is anticipated to consist mainly of artificial fill and residual soils consisting of sandy silts and silty sands. In this section, very loose/soft near-surface sands/silts were encountered along the right side of the alignment. Shallow weathered rock or crystalline rock within six feet of the proposed grade is not anticipated to be encountered in this section.

Along the left side of the alignment, a mechanically stabilized earth (MSE) wall is proposed to retain fill soils from approximate Station 31+00 to Station 33+27. Wall heights in this section will be approximately 20 feet or less. The slopes above the wall are proposed at a 2:1 (H:V). The subgrade within the areas of the proposed MSE walls is anticipated to mainly consist of very soft/soft sandy silts and very loose/loose silty sands.

Section 6: Section 33+50 to 38+16 (+/-):

Section 6 of this project will consist of fills up to approximately 35 feet in height. The embankments slopes will be designed at a 2:1 (H:V) or flatter. A mechanically stabilized earth (MSE) wall will be used to retain fill soils from approximate Station 35+00 to Station 37+00. Wall heights in this section will be approximately 25 feet or less. The embankments from the top of the wall to subgrade elevations will be designed at a 2:1 (H:V). Shallow cuts on the order of 3 to 6 feet in depth are proposed along the left side of the alignment in this section. The embankments for the cut portions of this section are typically designed at a 2:1 (H:V). The subgrade within the areas of proposed fills is anticipated to consist mainly of very soft to soft sandy silts and very loose to loose silty sands.

Please do not hesitate to contact us if you have any questions regarding this report or if you need additional services.

Sincerely,
FROEHLING & ROBERTSON, INC.

D. Matthew Brewer, E.I.
Transportation Staff Professional

Michael J. Walko, P.E.
Senior Geotechnical Engineer
NC License No. 26917

NORTH CAROLINA PROFESSIONAL SEAL 026917 9/5/13 ENGINEER MICHAEL J. WALKO

Appendix A

Bulk Samples

The following bulk samples were obtained and transported to our laboratory for potential testing to determine the engineering properties of the soil:

Sample No.	Boring No.	Line	Station	Offset	Depth (ft)	Test(s) Performed
CBR-1	L_1500	-L-	15+00	CL	1.0 – 4.0	California Bearing Ratio
CBR-2	L_2100R	-L-	21+00	7' Rt	2.0 – 5.0	California Bearing Ratio
CBR-3	L_2500	-L-	25+00	CL	2.0 – 5.0	California Bearing Ratio
RT-1	L_2500	-L-	25+00	CL	2.0 – 5.0	Remolded Triaxial Shear Testing

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT: R-5527A COUNTY: Cherokee DATE: 8/27/2013 COMPILED BY: WCC SHEET OF SHEETS

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL
-L- 10+88.39	-L- 11+20.50(Beg. Bridge)						136		136	157	157				
-L- 13+18.50 (End Bridge)	-L- 13+99.78	324				324							324		324
TOTAL		324				324	136		136	157	157		324		324
MATERIAL FOR SHOULDER CONSTRUCTION															
LOSS DUE TO CLEARING & GRUBBING															
ADDITIONAL UNDERCUT															
ROCK WASTE TO REPLACE BORROW															
ADJUST FOR ROCK WASTE															
PROJECT TOTAL		324				324	136		136	157			167		167
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT															
GRAND TOTAL		324				324	136		136	157			167		167
SAY		325													

NOTE: 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.

SINCE
F&R
1881

V&M
Vaughn & Melton
Consulting Engineers
Asheville, North Carolina 828-253-2796
Charlotte, North Carolina 704-357-0488
Tri-Cities, Tennessee 423-467-8401
Knoxville, Tennessee 865-546-5800
Middlesboro, Kentucky 606-248-6600
Spartanburg, South Carolina 864-574-4775

PROJECT REFERENCE NO.	SHEET NO.
R-5527	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

35
30
15
WOODS
EXISTING R/W
CMF R/W
5' WM
PAVED DITCH
18" CMP
42" CMP
24" CMP
15" CMP
POT Sta. 13+00.00
US 19 / US 74 / US 129
LANDSCAPE AREA
VALLEY RIVER
N 536618.5134
E 505412.8731
SR 1366 OLD MARBLE SPRINGS RD
SR 1366 REGAL RD
27' BST
MARBLE CREEK
BEGIN PROJECT
-L- Sta. 10+00.00
-L- Sta. 13+00
-Y2-
-Y1-
PC Sta. 17+22.92
SOIL
-ARTIFICIAL FILL-
-RESIDUAL-
NEW ROUTE, S 63° 15' 48" E
LOW WIRE ELEV=1588.66'
LOW WIRE ELEV=1678.38'
LOW WIRE ELEV=1686.56'
LOW WIRE ELEV=1687.91'
SC Sta. 28+11.61
CONC H/W
EXISTING R/W & CENTERLINE OF RIVER
MATCHLINE -L- STA. 29+00 - SEE SHEET 5
NC GRID
NAD 83 NA 2011
100.00'
T.V.A. EXISTING R/W 100' 263 PG 99

SINCE 1881

V&M Vaughn & Melton
Consulting Engineers
Asheville, North Carolina
828-253-2796

Charlotte, North Carolina 704-357-0488
Tri-Cities, Tennessee 423-467-8401
Knoxville, Tennessee 865 546-6800
Middlesboro, Kentucky 606-248-6600
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PROJECT REFERENCE NO.	SHEET NO.
R-5527	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

HUBERT WELLS, JONATHAN WELLS & BRIAN WELLS
DB 720 PG 199

HUBERT WELLS, JONATHAN WELLS & BRIAN WELLS
DB 720 PG 199

WOODS

-RESIDUAL-

-ARTIFICIAL FILL-

-RESIDUAL-

-ARTIFICIAL FILL-

-RESIDUAL-

-ARTIFICIAL FILL-

-RESIDUAL-

S 15°28'01" E
371.94'

S 27°35'01" E
103.93'

S 52°23'01" E
168.44'

S 67°34'01" E
191.13'

S 73°28'27" E

N 77°14'59" E
40.18'

PC Sta. 26+57.92

PT Sta. 30+50.36

MATCHLINE -L- STA. 29+00 - SEE SHEET 4

MATCHLINE -L- STA. 33+00 - SEE SHEET 6

PC Sta. 27+41.82

69.91'

SPRING

WETLAND AREA

RETAINING WALL
Sta. 31+00 to 33+27

RETAINING WALL
Sta. 29+87 to 32+97

S 53°18'07" E

SOIL

PRIVATE R/W

N 73°03'43" E
11.11'

S 17°28'29" E
10.06'

EIP

WELL

N 7°18'43" E
20.25'

S 72°07'06" W
5.78'

N 33°13'05" W
5.16'

S 83°01'17" E
105.62'

S 82°35'17" E
137.61'

S 71°19'43" W
100.38'

S 81°47'35" W
74.10'

PAVED DRIVE

45.00'

TIMOTHY L. & LORI NICHOLSON
DB 819 PG 202

CONC

POOL

IS FD

N 48°32'45" E
19.90'

S 27°30'45" E
86.23'

N 57°09'45" E
122.44'

N 57°09'45" E
12.53'

WALTER LEON TATHAM
DB 1109 PG 145

ROBERT F. & JOYCE P. BARTON
DB 1047 PG 778

DAVID A. & KRISTINA N RITZ
DB 822 PG 100

NC GRID
NAD 83 NA 2011

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1881

V&M
Vaughn & Melton
Consulting Engineers

Asheville, North Carolina 828-253-2796
Charlotte, North Carolina 704-357-0488
Tri-Cities, Tennessee 423-467-8401
Knoxville, Tennessee 865-546-5800
Middlesboro, Kentucky 606-248-6600
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PROJECT REFERENCE NO.	SHEET NO.
R-5527	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

35

S 70°54'01" E 26.06'
S 09°51'01" E 63.19'
S 22°09'01" E 55.66'
S 43°29'01" E 127.04'
S 40°39'01" E 162.54'
S 39°08'01" E 89.78'
S 43°50'01" E 30.66'
S 33°32'01" E 47.14'
S 29°49'01" E 87.82'
S 22°11'01" E 63.62'
S 11°06'01" E 59.76'
S 56°01" E 60.19'

S 83°17'38" E 465.87'

SOIL

WOODS

-RESIDUAL-

-RESIDUAL-

MATCHLINE -L- STA. 33+00

SEE SHEET 5

WETLAND AREA

Sta. 35+00 to 31+00 / WETLAND AREA

RETAINING WALL

-ARTIFICIAL FILL-

-ARTIFICIAL FILL-

-RESIDUAL-

WOODS

WALTER LEON TATHAM
DB 1109 PG 145

PC: Sta. 33+62.43

PT Sta. 38+16.63

WOODS

EIP

PRIVATE R/W

45.00'

N 81°05'55" W 150.28'

CMF
NW CORNER OF INDIAN TRACT NO. 59

EASTERN BAND OF CHEROKEE INDIANS
DB 88 PG 399

N 534904.6954
E 507248.7592

-L- STA. 38+45.63
END OF PROJECT

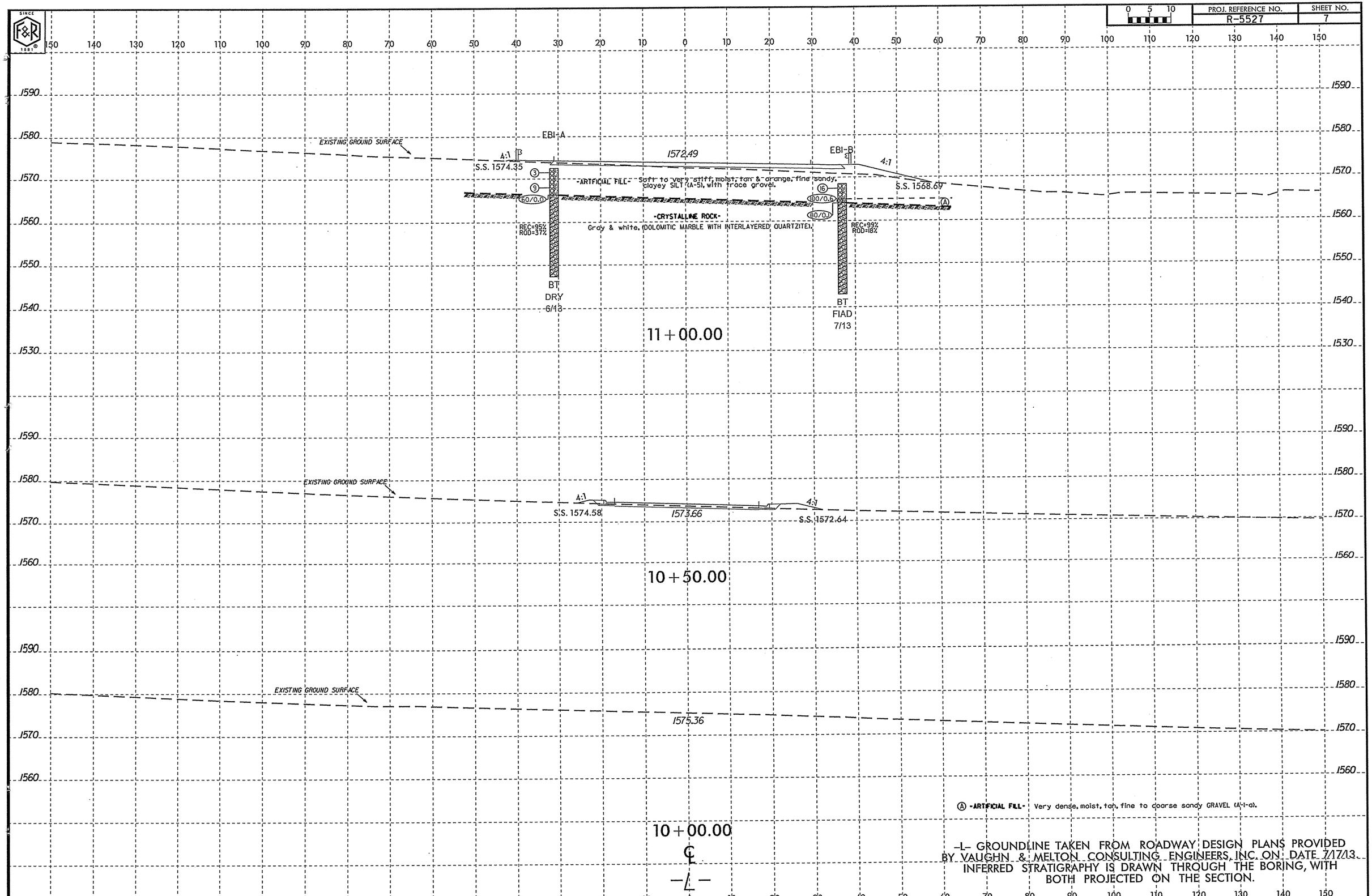
EIP

N 52°41'10" E 115.25'

N 37°18'50" W

NC GRID
NAD 83 NA 2011

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5527	7



EB2-A

EB2-B

SS-10
SS-11
SS-12
SS-29
SS-30

S.S. 1584.41

1585.47

S.S. 1586.26

4:1

EXISTING GROUND SURFACE

-ARTIFICIAL FILL- Medium stiff to very stiff, moist, red-brown-tan & gray-black, fine sandy SILT (A-4), with trace gravel and mica.

-ALLUVIAL- Medium stiff to hard, wet, brown & gray, mottled, coarse to fine sandy SILT (A-4), with little clay, trace roots, wood fragments & mica.

-RESIDUAL- Very stiff to hard, moist, gray-black & orange-white-brown, fine sandy SILT (A-4), with trace gravel-sized rock fragments, clay & mica, saprolitic.

-WEATHERED ROCK- Brown & orange, (BIOTITE SCHIST)

Hard, moist, dark gray & white, highly fine, sandy, clayey SILT (A-5), saprolitic.

-WEATHERED ROCK- Dark gray & white, (BIOTITE SCHIST)

-CRYSTALLINE ROCK- (BIOTITE SCHIST)

BT

BT

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-10	36' LT.	13+53	38.5'-40.0'	A-4(4)	36	10	11.0	40.7	28.0	20.3	100.0	96.7	56.3	32.7	NT
SS-11	36' LT.	13+53	43.5'-45.0'	A-4(6)	35	8	1.4	32.7	43.7	22.2	100.0	99.6	76.2	28.0	NT
SS-12	36' LT.	13+53	48.5'-50.0'	A-1-a(0)	25	3	57.8	22.4	16.3	3.5	48.9	24.5	12.8	14.7	NT
SS-29	37' RT.	13+39	43.5'-45.0'	A-4(0)	25	1	4.8	56.1	30.9	8.2	100.0	99.7	52.0	25.5	NT
SS-30	37' RT.	13+39	48.5'-50.0'	A-4(0)	18	1	17.4	39.5	32.6	10.5	75.2	67.0	42.5	13.4	NT

13+50.00
℄
-L-

Ⓐ -ALLUVIAL- Dense, wet, gray, silty, fine to highly coarse sandy GRAVEL (A-1-a), with trace clay.

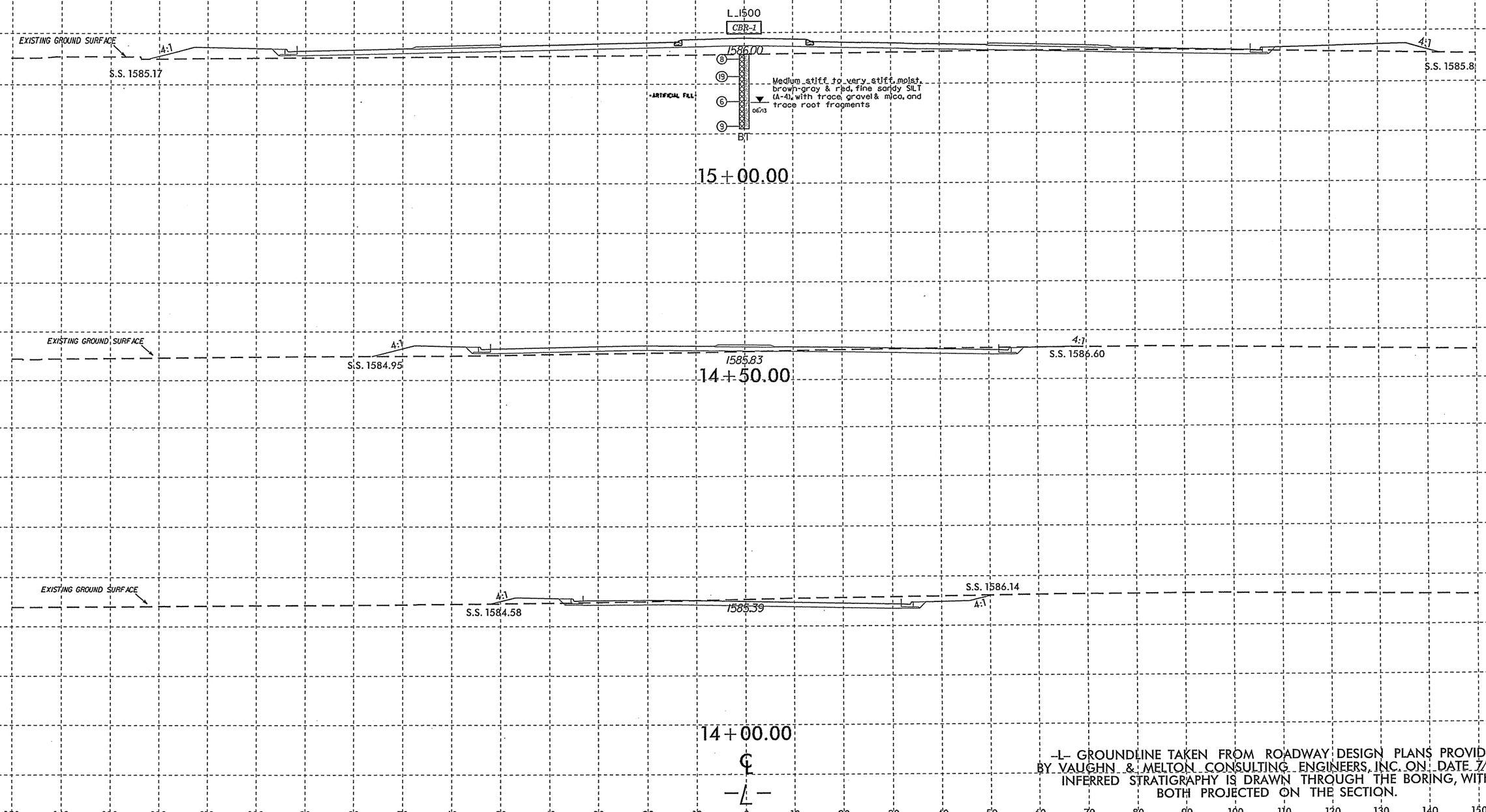
Ⓑ -RESIDUAL- Hard, moist, brown & orange, fine sandy SILT (A-4), with trace mica, saprolitic

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	9

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	#10	#40	#200		
CBR-1	CL	15+00	1.0'-4.0'	A-4(0)	32	7	19.9	41.4	27.0	11.7	86.5	76.8	48.6	18.3	NT



–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	10

0 5 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

1610
1600
1590
1580
1570

EXISTING GROUND SURFACE

4:1

S.S. 1588.48

1588.18

16+50.00

4:1

S.S. 1587.60

EXISTING GROUND SURFACE

4:1

S.S. 1587.63

1586.81

16+00.00

4:1

S.S. 1586.42

L_1550L

-ARTIFICIAL FILL-

-RESIDUAL-

11
6
34
BT
DRY
6/13

Medium stiff to very stiff, moist, brown-gray & red, fine sandy SILT (A-4), with trace mica & gravel, clay from 8.5-10.0'.

Hard, moist, orange-tan-red, fine to coarse sandy SILT (A-4), with trace gravel-sized rock fragments & mica.

1586.22

15+50.00

℄

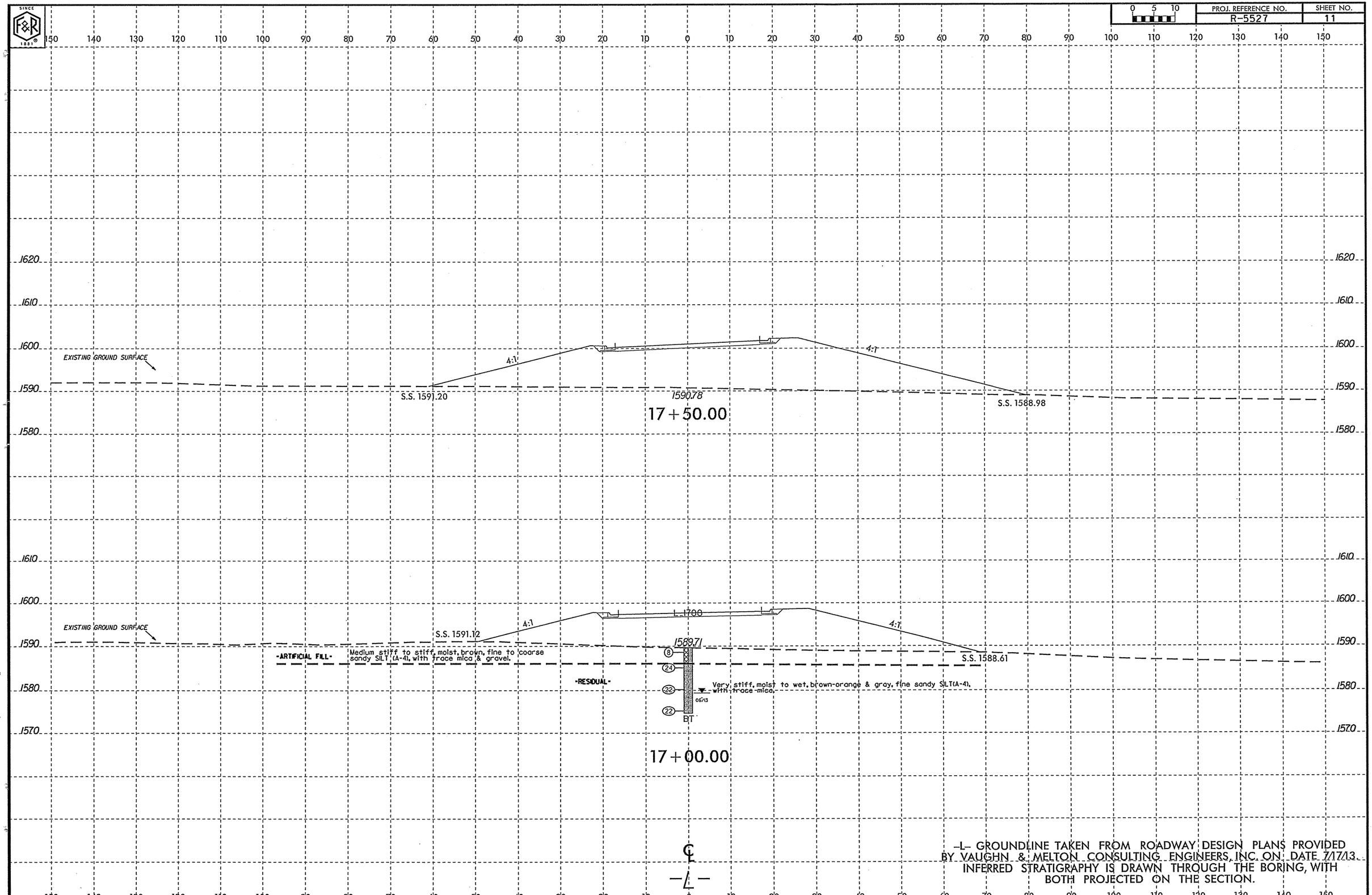
L_1550R

9
6
16
BT
DRY
6/13

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	11

0 5 10



–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	12

0 5 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

1640 1630 1620 1610 1600 1590 1580 1570

EXISTING GROUND SURFACE

S.S. 1590.23

4:1

1606.15

S.S. 1616.89

2:1

1609.61

18+50.00

EXISTING GROUND SURFACE

S.S. 1591.06

4:1

L 1800

4:1

S.S. 1595.16

1591.36

-RESIDUAL- Very stiff, moist, brown, orange & black, fine to coarse sandy SILT (A-4), with trace gravel-sized rock fragments & mica.

-WEATHERED ROCK- Brown, orange & gray, (BIOTITE SCHIST).

-CRYSTALLINE ROCK- (BIOTITE SCHIST)

(5) (28) (100/0.8) (100/0.1) (50/0.0) 06"/13 BT (A)

Ⓐ -ARTIFICIAL FILL- Medium stiff, moist, brown & orange, fine sandy SILT (A-4), with trace gravel & mica.

18+00.00

℄

-L-

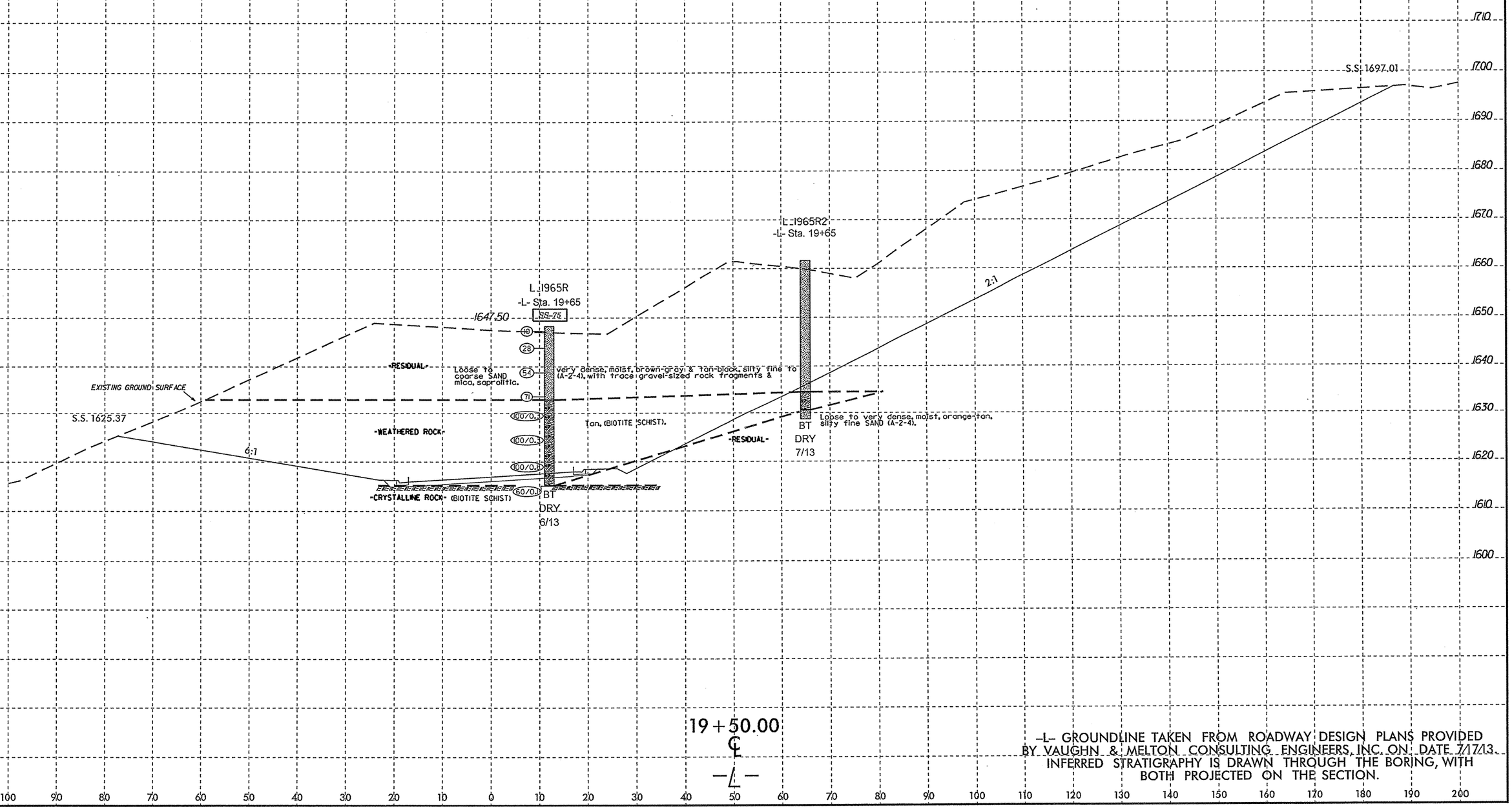
-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SINCE F&R 1881

PROJ. REFERENCE NO.	SHEET NO.
R-5527	13

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-75	12' RT.	19+65	3.5'-5.0'	A-2-4(0)	30	2	18.0	50.0	23.1	8.9	71.1	62.4	32.4	16.0	NT



19+50.00
℄
—L—

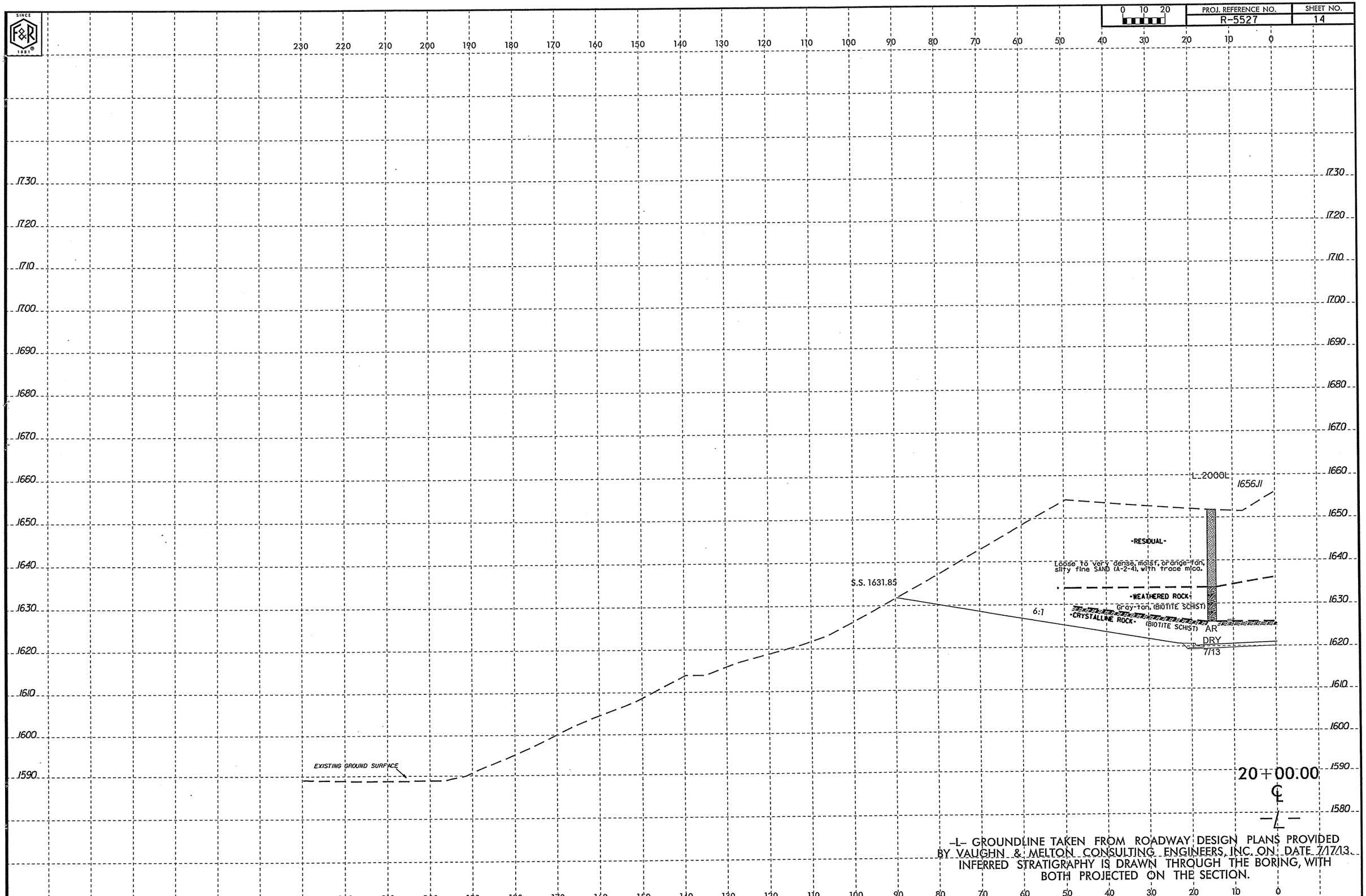
-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SINCE F&R 1881

0 10 20

PROJ. REFERENCE NO. R-5527

SHEET NO. 14



–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	15

0 5 10

EXISTING GROUND SURFACE

S.S. 1734.01

L_2000R

2:1

1656.11

-RESIDUAL- Loose to very dense, silty fine SAND (A-2-4), moist, orange-tan, with trace mica.

-WEATHERED ROCK- Gray-tan, (BIOTITE SCHIST)

-RESIDUAL- Medium dense to very dense, moist, gray-tan, silty fine SAND (A-2-4), with trace mica.

-WEATHERED ROCK- Gray-tan, (BIOTITE SCHIST)

-CRYSTALLINE ROCK- (BIOTITE SCHIST)

1621.25

BT
DRY
7/13

20+00.00
℄
-L-

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SINCE F&R 1881

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5527	16

230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

1730 1720 1710 1700 1690 1680 1670 1660 1650 1640 1630 1620 1610 1600 1590

1676.76

"RESIDUAL"

"WEATHERED ROCK"

S.S. 1638.51

61

"CRYSTALLINE ROCK"

EXISTING GROUND SURFACE

20+50.00 ℄

–L–

–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

–L–

230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

PROJ. REFERENCE NO.	SHEET NO.
R-5527	17

0 5 10

EXISTING GROUND SURFACE

S.S. 1748.75

2:1

1676.76

"RESIDUAL"

"WEATHERED ROCK"

"CRYSTALLINE ROCK"

1624.80

20+50.00 ℄

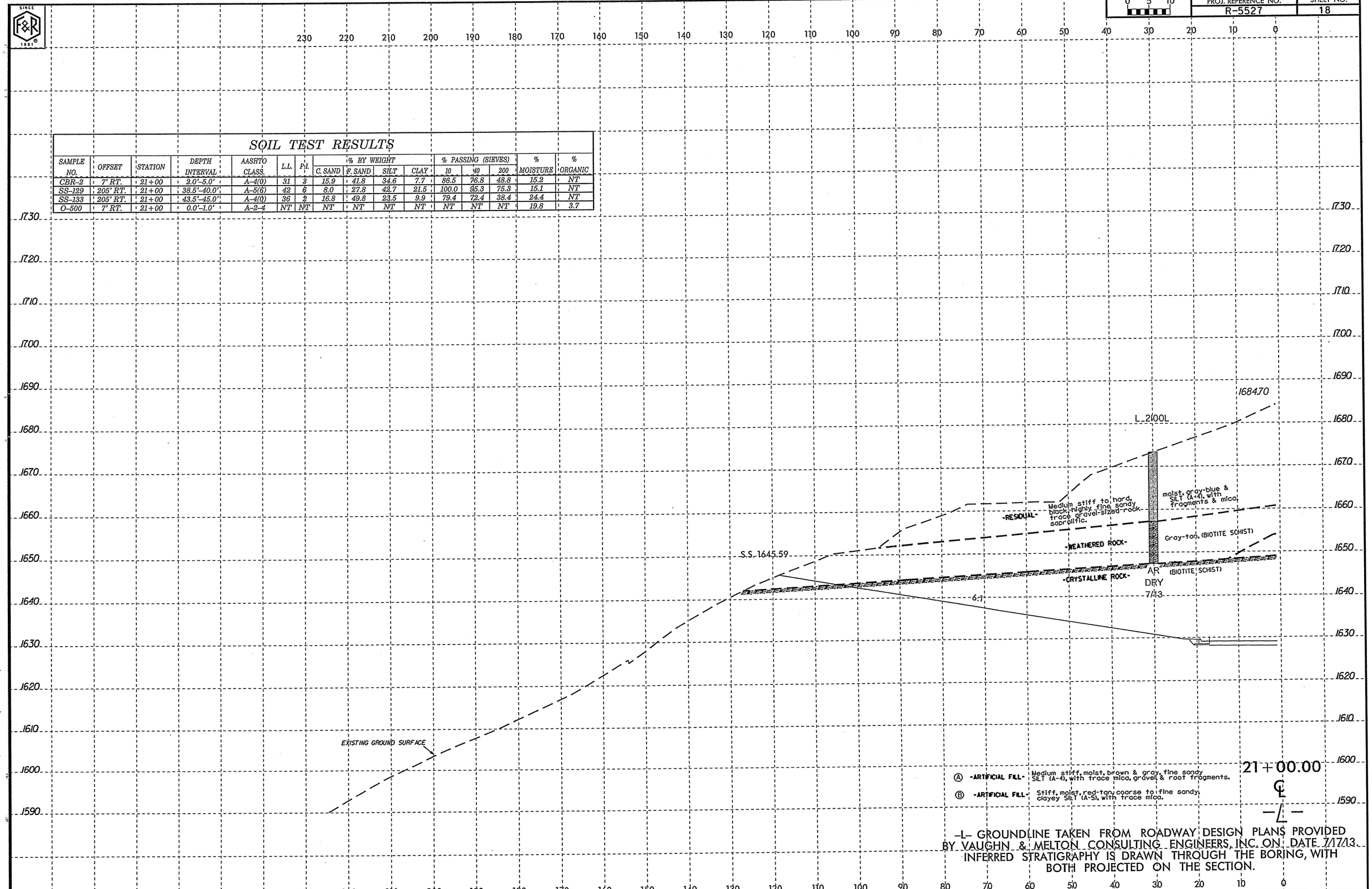
–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SINCE F&R 1881

PROJ. REFERENCE NO.	SHEET NO.
R-5527	18

SOIL TEST RESULTS

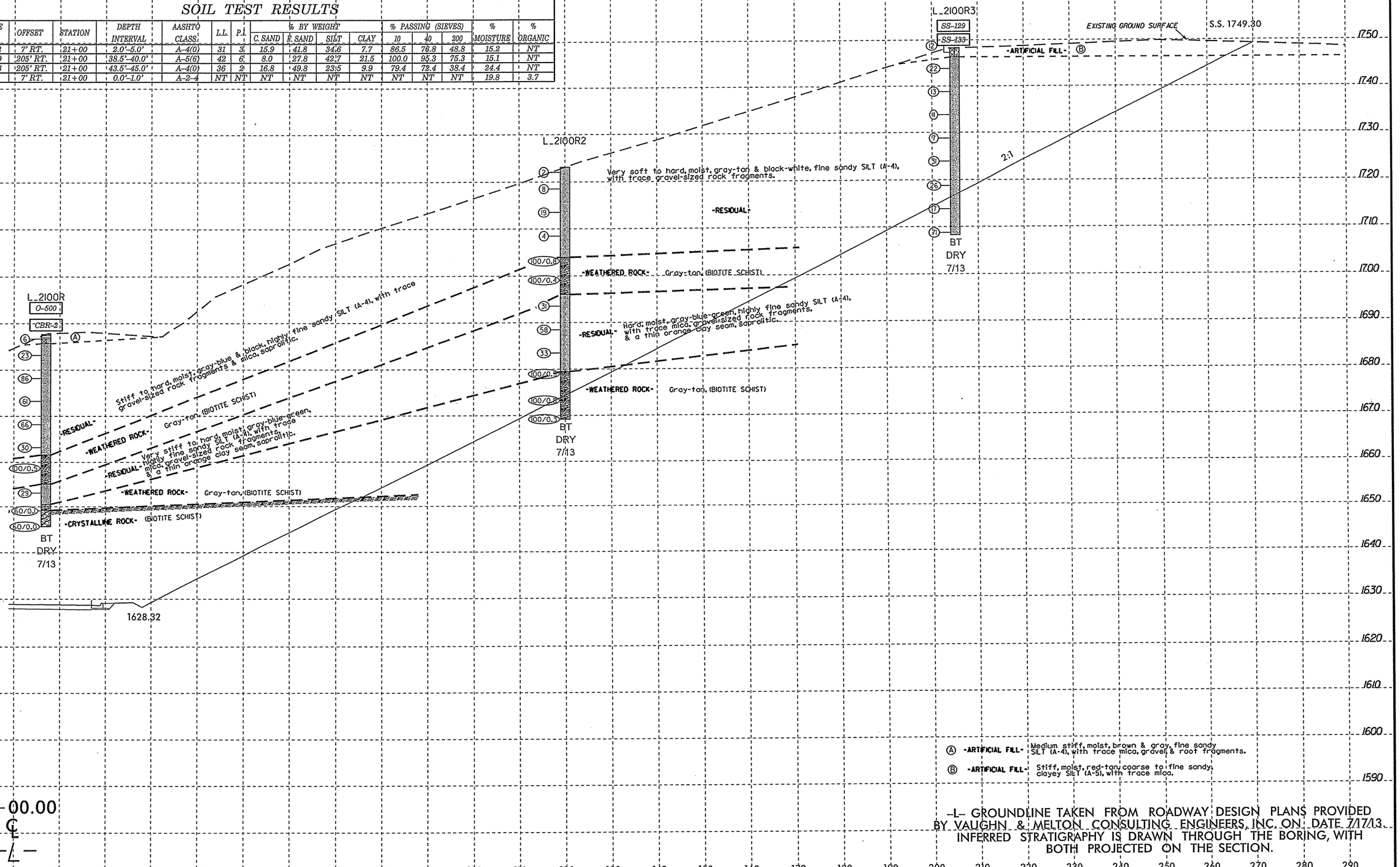
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
CBR-2	7' RT.	21+00	2.0'-5.0'	A-4(0)	31	3	15.9	41.8	34.6	7.7	86.5	76.8	48.8	15.2	NT
SS-129	205' RT.	21+00	38.5'-40.0'	A-5(6)	42	6	8.0	27.8	42.7	21.5	100.0	95.3	75.3	15.1	NT
SS-133	205' RT.	21+00	43.5'-45.0'	A-4(0)	36	2	16.8	49.8	23.5	9.9	79.4	72.4	38.4	24.4	NT
O-500	7' RT.	21+00	0.0'-1.0'	A-2-4	NT	NT	NT	NT	NT	NT	NT	NT	NT	19.8	3.7



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
CBR-2	7' RT.	21+00	2.0'-5.0'	A-4(0)	31	3	15.9	41.8	34.6	7.7	86.5	76.8	48.8	15.2	NT
SS-129	205' RT.	21+00	38.5'-40.0'	A-5(6)	42	6	8.0	27.8	42.7	21.5	100.0	95.3	75.3	15.1	NT
SS-133	205' RT.	21+00	43.5'-45.0'	A-4(0)	36	2	16.8	49.8	23.5	9.9	79.4	72.4	38.4	24.4	NT
O-500	7' RT.	21+00	0.0'-1.0'	A-2-4	NT	NT	NT	NT	NT	NT	NT	NT	NT	19.8	3.7



Ⓐ -ARTIFICIAL FILL- Medium stiff, moist, brown & gray, fine sandy SILT (A-4), with trace mica, gravel & root fragments.

Ⓑ -ARTIFICIAL FILL- Stiff, moist, red-tan, coarse to fine sandy, clayey SILT (A-5), with trace mica.

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	20

0 5 10

230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

1730 1720 1710 1700 1690 1680 1670 1660 1650 1640 1630 1620 1610 1600 1580

1686.58

S.S. 1648.35

-RESIDUAL-

-WEATHERED ROCK-

6:1

-CRYSTALLINE ROCK-

EXISTING GROUND SURFACE

21+50.00 ℄

-L-

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

1730 1720 1710 1700 1690 1680 1670 1660 1650 1640 1630 1620 1610 1600 1590

SINCE F&R 1881

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-5527	21

S.S. 1749.93

1686.58

2:1

"RESIDUAL"

"WEATHERED ROCK"

"CRYSTALLINE ROCK"

1631.85

21+50.00

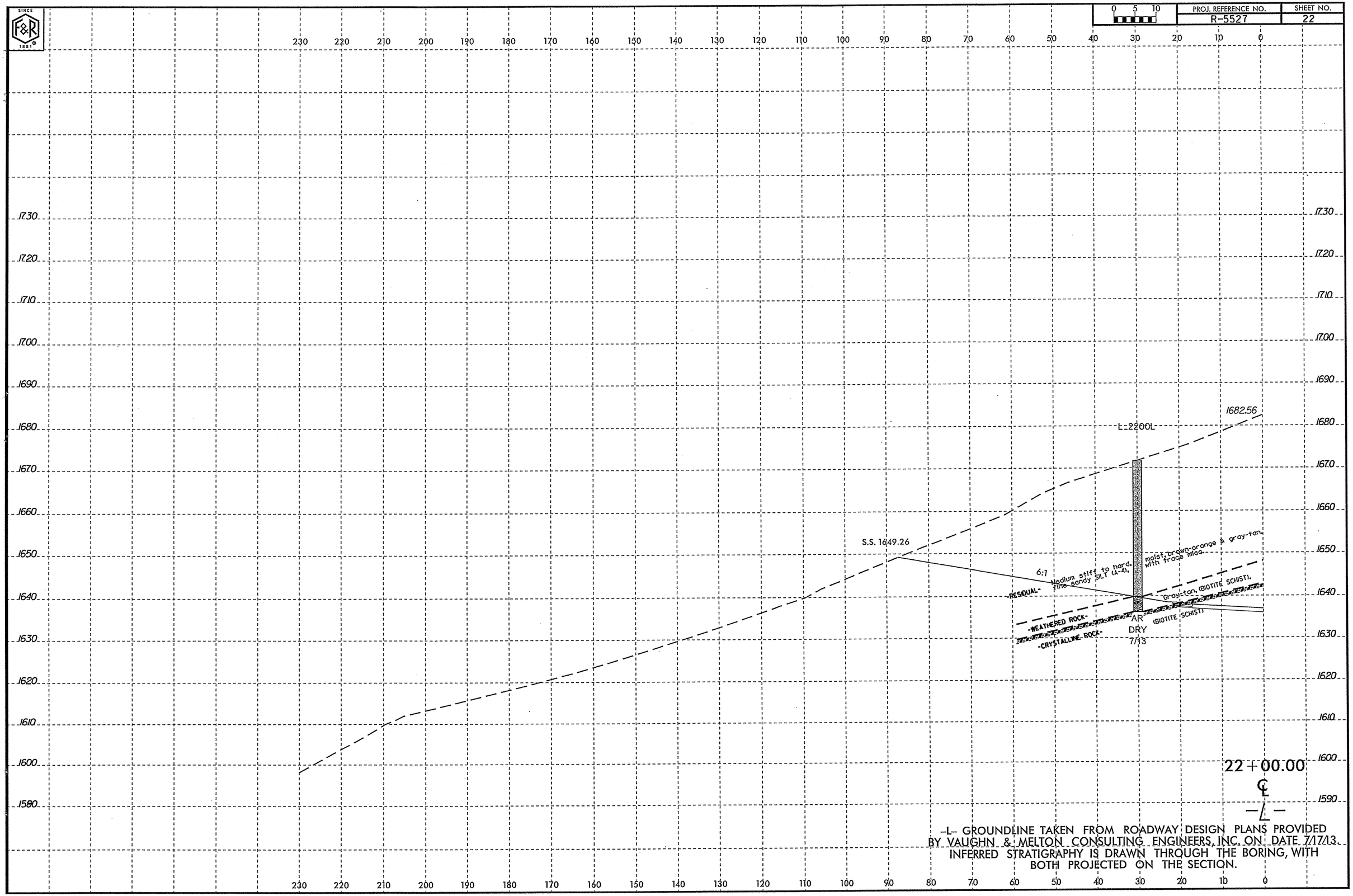
℄

–L–

–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	22

0 5 10



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	23

0 5 10

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

1750 1740 1730 1720 1710 1700 1690 1680 1670 1660 1650 1640 1630 1620 1610 1600 1590 1580

S.S. 1750.06

L_2200R

1682.56

2:1

"RESIDUAL" - Medium stiff to hard, fine sandy SILT (A-4), moist, brown-orange & gray-tan, with frags mica.

"WEATHERED ROCK" - Gray-tan, (BIOTITE SCHIST).

"CRYSTALLINE ROCK" - (BIOTITE SCHIST)

AR
DRY
7/13

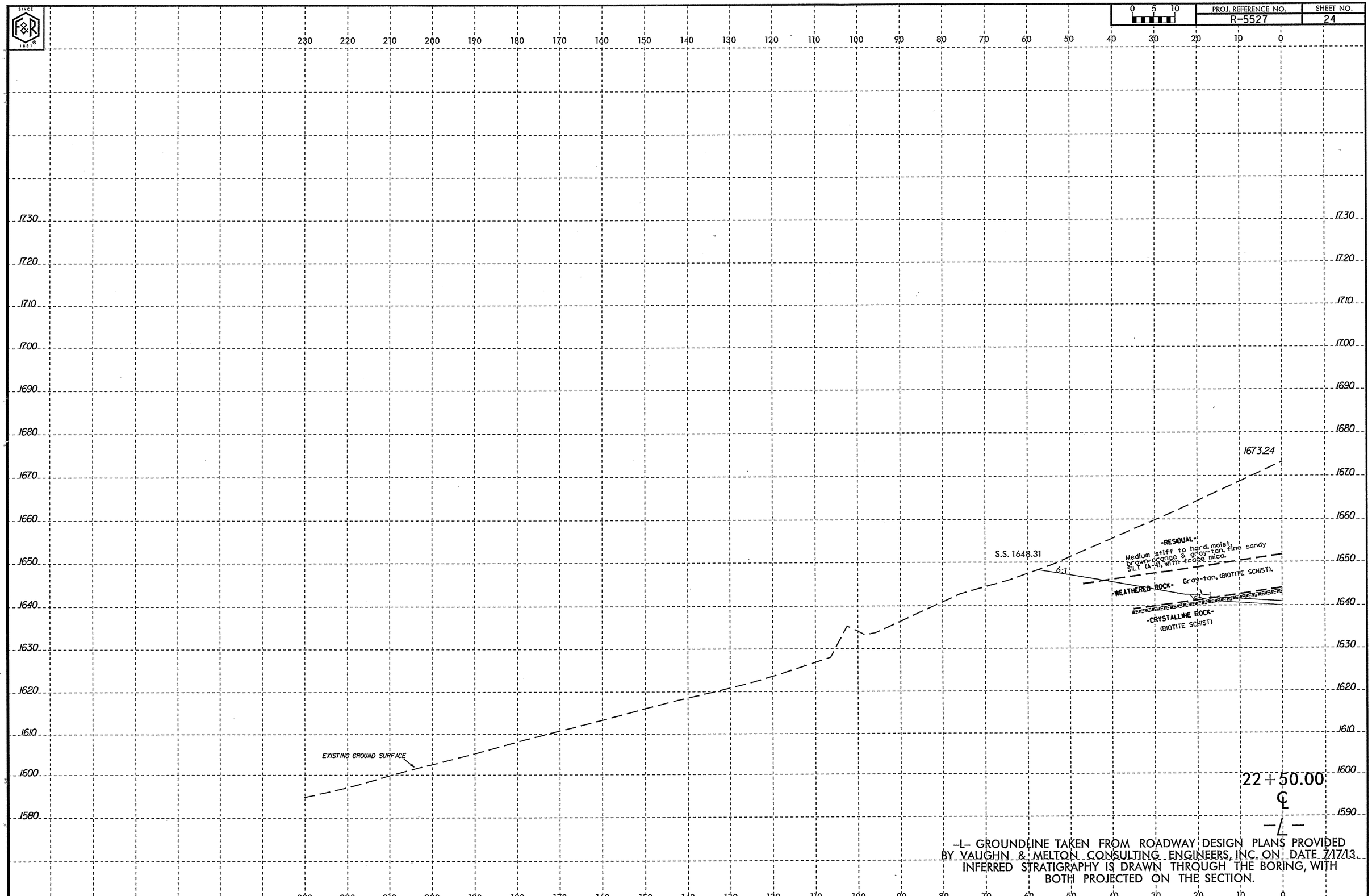
1635.39

22+00.00
℄
—L—

–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SINCE F&R 1881

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5527	24



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON: DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	25

EXISTING GROUND SURFACE

S.S. 1750.24

L_2250R2

L_2250R

1673.24

-RESIDUAL- Medium stiff brown-orange fine sandy SILT trace mica.

to hard, moist, & gray-tan. (A-4), with

2:1

BT
DRY
7/13

moist, brown-orange, & gray-tan.

-RESIDUAL- Medium stiff to hard, fine sandy SILT (A-4).

-WEATHERED ROCK- gray-tan, (BIOTITE SCHIST)

-CRYSTALLINE ROCK- (BIOTITE SCHIST)

AR
DRY
7/13

1639.39

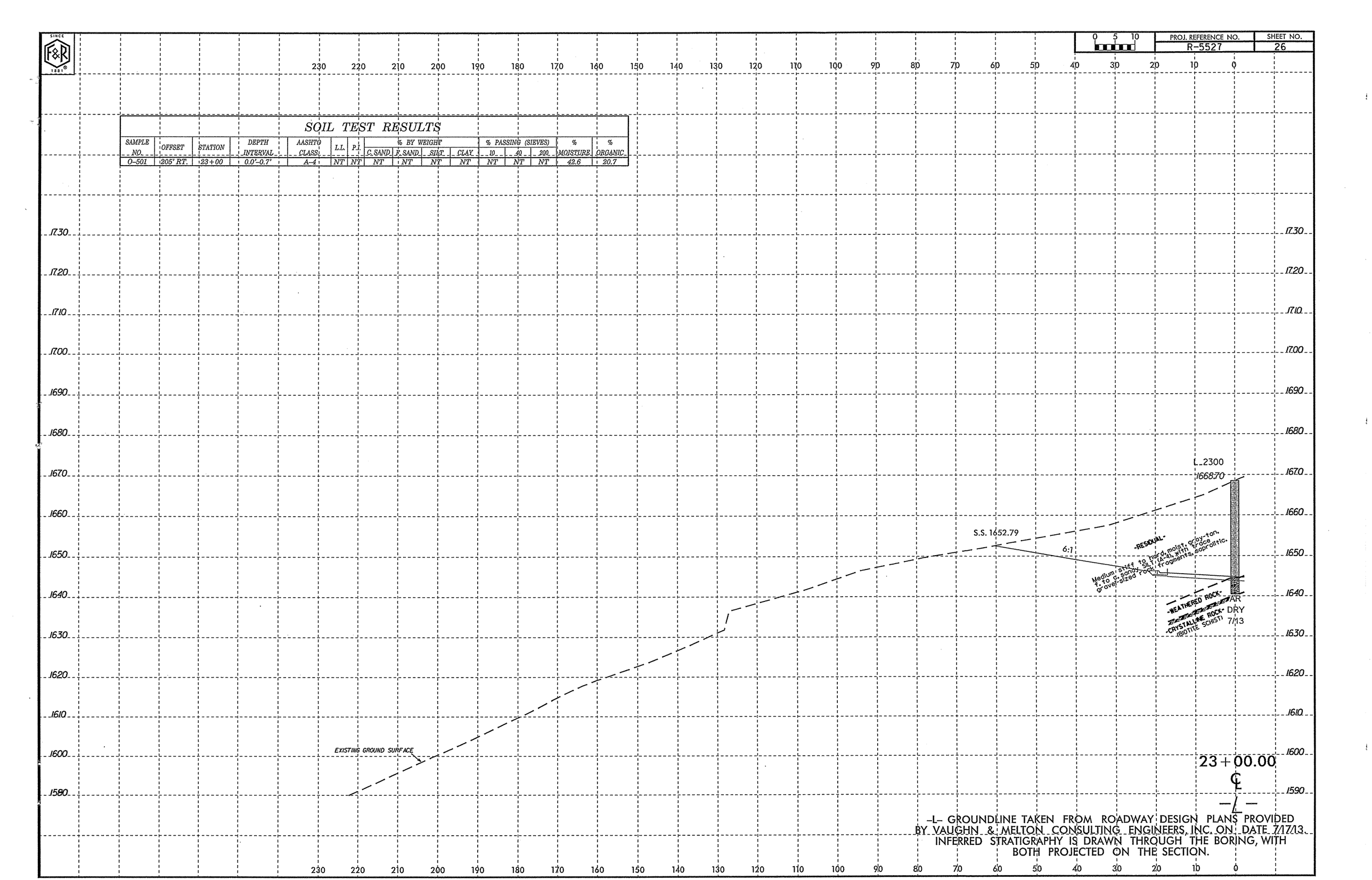
22+50.00
℄
—L—

–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	26

SOIL TEST RESULTS

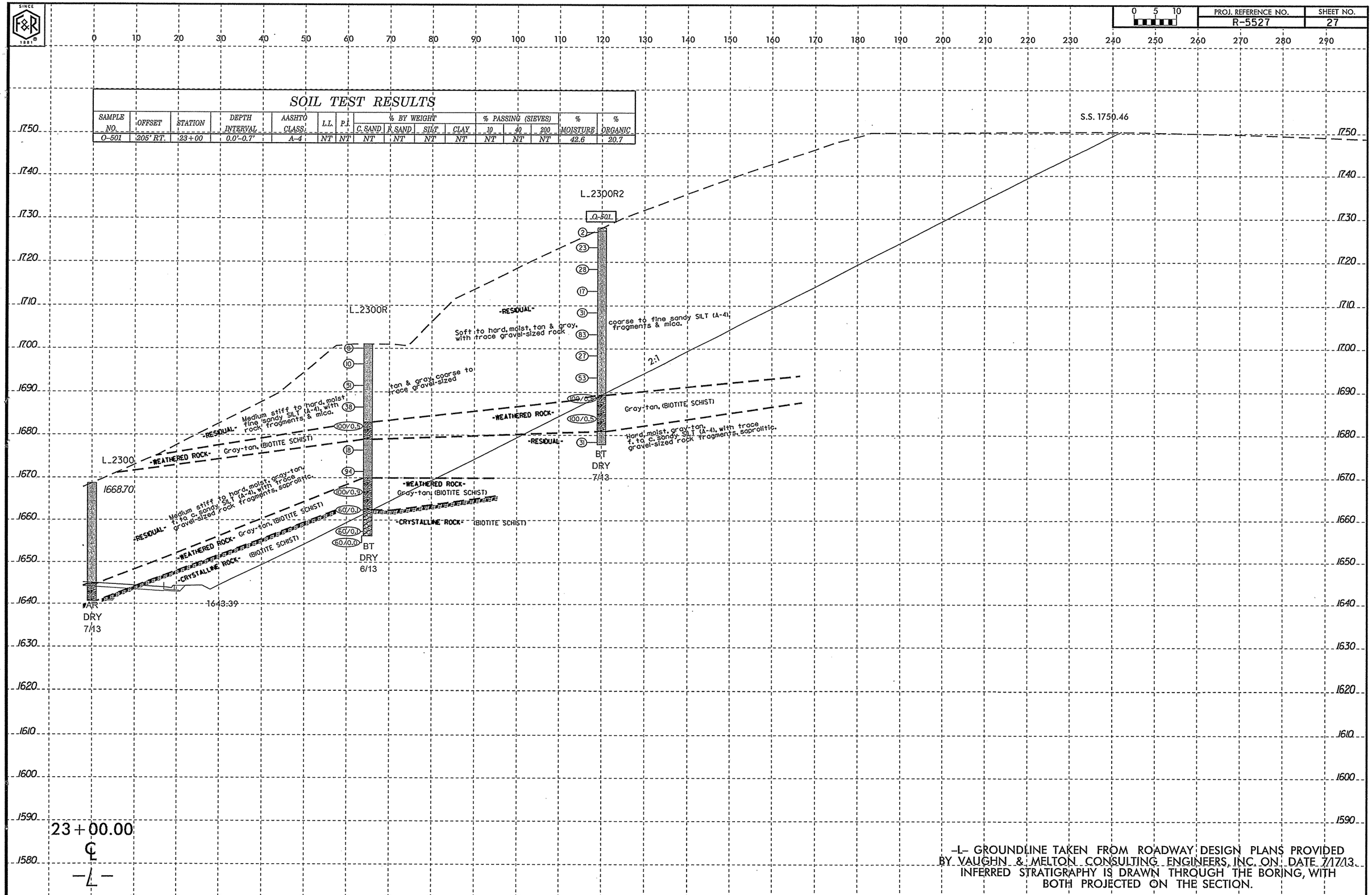
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
O-501	205' RT.	23+00	0.0'-0.7'	A-4	NT	NT	NT	NT	NT	NT	NT	NT	NT	42.6	20.7



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
O-501	205' RT.	23+00	0.0'-0.7'	A-4	NT	NT	NT	NT	NT	NT	NT	NT	NT	42.6	20.7



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	28

0 5 10

230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

1730
1720
1710
1700
1690
1680
1670
1660
1650
1640
1630
1620
1610
1600
1580

1682.75

S.S. 1661.61

-RESIDUAL-

6:1

-WEATHERED ROCK-

-CRYSTALLINE ROCK-

EXISTING GROUND SURFACE

23+50.00
℄
—L—

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

PROJ. REFERENCE NO.	SHEET NO.
R-5527	29

0 5 10

S.S. 1750.41

2:1

1682.75

-RESIDUAL-

-WEATHERED ROCK-

1647.39

-CRYSTALLINE ROCK-

23+50.00
℄
—L—

23+50.00
—L—

–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	30

0 5 10

230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

1730 1720 1710 1700 1690 1680 1670 1660 1650 1640 1630 1620 1610 1600 1580

L- 2400L

1701.96

S.S. 1670.18

-RESIDUAL- Medium stiff to hard, moist, fine sandy SILT (A-4), with brown-orange & gray-tan, trace mica.

6:1

Gray-tan & black, (BIOTITE SCHIST)

-WEATHERED ROCK- (BIOTITE SCHIST)

-CRYSTALLINE ROCK-

AR
DRY
7/13

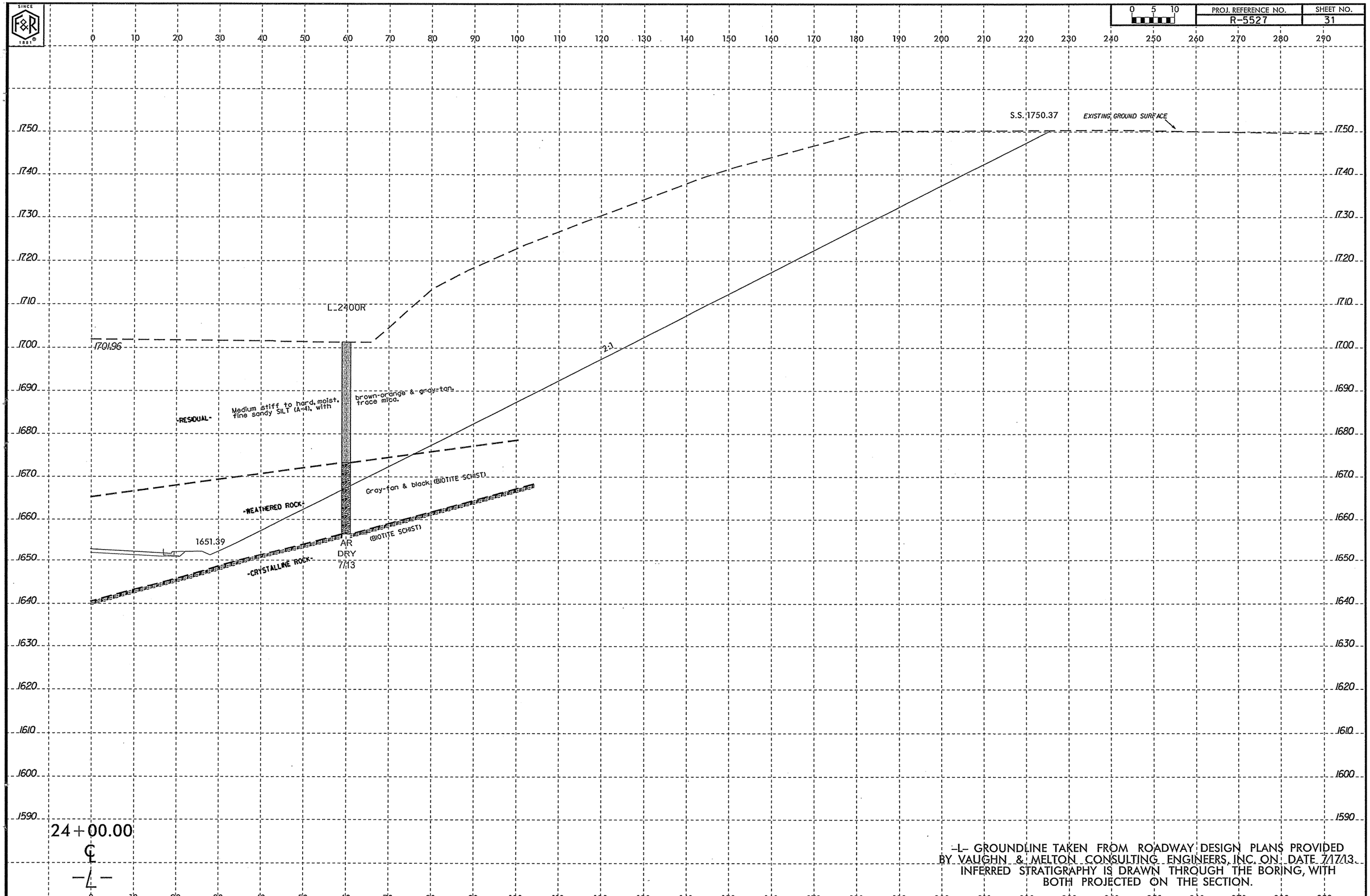
EXISTING GROUND SURFACE

24+00.00
℄
—L—

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	31

0 5 10



—L— GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	32

0 5 10

230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

1730 1720 1710 1700 1690 1680 1670 1660 1650 1640 1630 1620 1610 1600 1590 1580

1702.22

S.S. 1667.00

6:1

"RESIDUAL"

"WEATHERED ROCK"

"CRYSTALLINE ROCK"

EXISTING GROUND SURFACE

24+50.00
℄
—/—

–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SINCE F&R 1881

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5527	33

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

1750 1740 1730 1720 1710 1700 1690 1680 1670 1660 1650 1640 1630 1620 1610 1600 1590 1580

S.S. 1750.35

EXISTING GROUND SURFACE

1702.22

2:1

"RESIDUAL"

"WEATHERED ROCK"

1655.39

"CRYSTALLINE ROCK"

24+50.00

℄

–L–

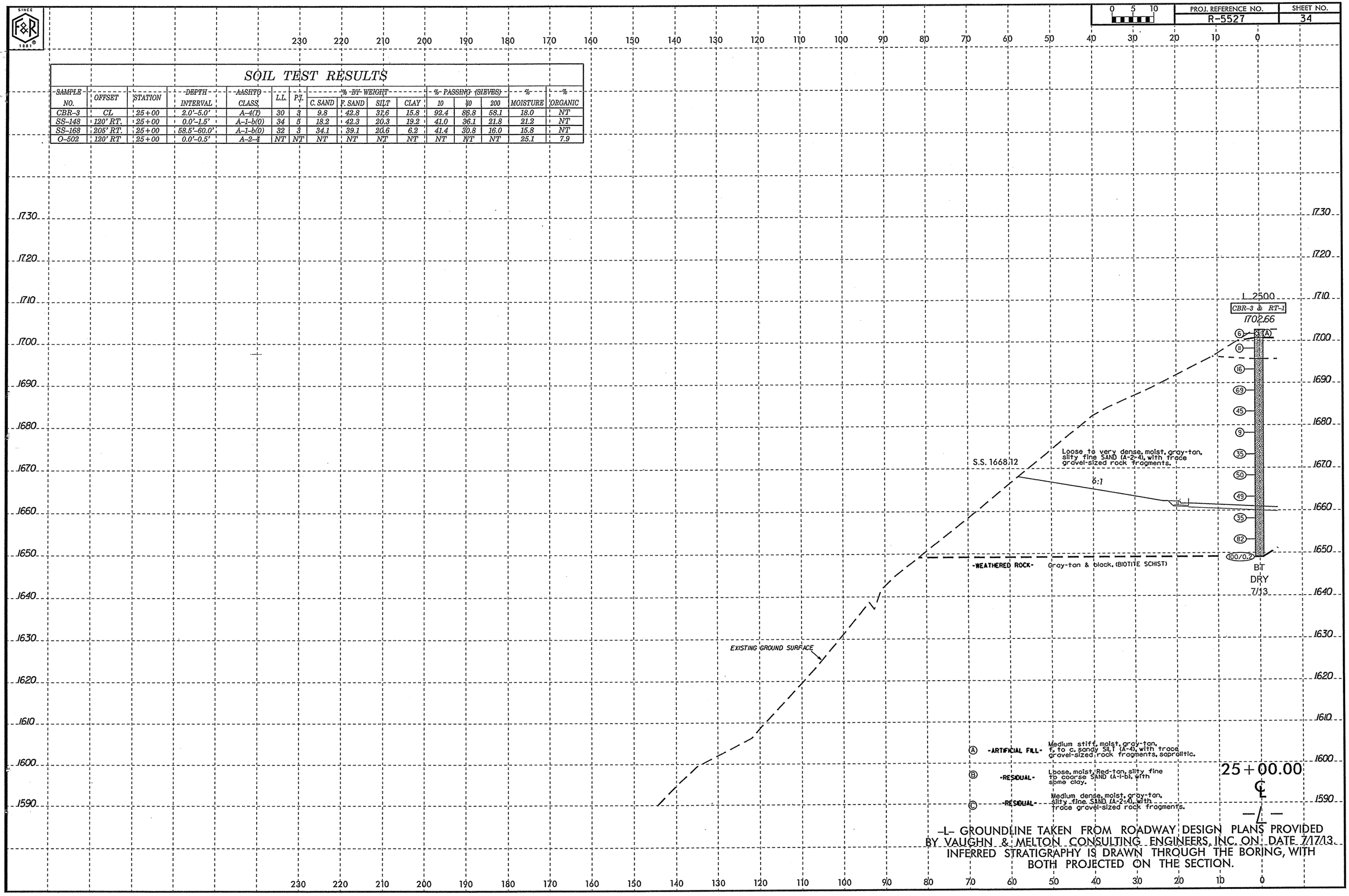
–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

PROJ. REFERENCE NO.	SHEET NO.
R-5527	34

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
CBR-3	CL	25+00	2.0'-5.0'	A-4(7)	30	3	9.8	42.8	31.6	15.8	92.4	86.8	58.1	18.0	NT
SS-148	120' RT.	25+00	0.0'-1.5'	A-1-b(0)	34	5	18.2	42.3	20.3	19.2	41.0	36.1	21.8	21.2	NT
SS-168	205' RT.	25+00	58.5'-60.0'	A-1-b(0)	32	3	34.1	39.1	20.6	6.2	41.4	30.8	16.0	15.8	NT
O-502	120' RT	25+00	0.0'-0.5'	A-2-4	NT	NT	NT	NT	NT	NT	NT	NT	NT	25.1	7.9



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
CBR-3	CL	25+00	2.0'-5.0'	A-4(1)	30	3	9.8	42.8	31.6	15.8	92.4	86.8	58.1	18.0	NT
SS-148	120' RT.	25+00	0.0'-1.5'	A-1-b(0)	34	5	18.2	42.3	20.3	19.2	41.0	36.1	21.8	21.2	NT
SS-168	205' RT.	25+00	58.5'-60.0'	A-1-b(0)	32	3	34.1	39.1	20.6	6.2	41.4	30.8	16.0	15.8	NT
O-502	120' RT	25+00	0.0'-0.5'	A-1-b	NT	NT	NT	NT	NT	NT	NT	NT	NT	25.1	7.9

L-2500

1702.66

(6) (A)
(11)
-RESIDUAL- Stiff, moist, tan-red & gray-blue, fine to coarse sandy SILT (A-4), with trace mica & gravel-sized rock fragments.

(16)
(69)
(45)
Loose to very dense, moist, gray-tan, silty fine SAND (A-2-4), with trace gravel-sized rock fragments.

(9)
(35)
(50)
(49)
(35)
(82)
(100/0.2)
BT
DRY
7/13

-WEATHERED ROCK-
Gray-tan & black, (BIOTITE SCHIST)

1659.66

-RESIDUAL-
Dense, moist, gray-tan-black, silty fine SAND (A-2-4)

25+00.00
℄
—L—

L-2500R

SS-148
O-501
(5) (B)
(34)
(20)
(28)
-RESIDUAL-
(33)
(100/0.3)
-RESIDUAL- (23) ©
(100/0.8)
(30)
BT
DRY
7/13

Gray-tan & black, (BIOTITE SCHIST)
-WEATHERED ROCK-

L-2500R2

SS-168
S.S. 1750.33
EXISTING GROUND SURFACE
(8)
(15)
(15)
(19)
(49)
(34)
(61)
(11)
(22)
(72)
(100/0.7)
(42)
(41)
(60/0.1)
(60/0.0)
BT
DRY
7/13

2:1

Loose to very dense, moist, gray-tan, silty fine SAND (A-2-4), with trace gravel-sized rock fragments.

-RESIDUAL-

Dense, moist, tan-gray & white, silty fine to coarse SAND (A-1-b), with trace gravel-sized rock fragments & clay.

-CRYSTALLINE ROCK- (BIOTITE SCHIST)

Ⓐ -ARTIFICIAL FILL- Medium stiff, moist, gray-tan, f. to c. sandy SILT (A-4), with trace gravel-sized rock fragments, saprolitic.

Ⓑ -RESIDUAL- Loose, moist, Red-tan, silty fine to coarse SAND (A-1-b), with some clay.

© -RESIDUAL- Medium dense, moist, gray-tan, silty fine SAND (A-2-4), with trace gravel-sized rock fragments.

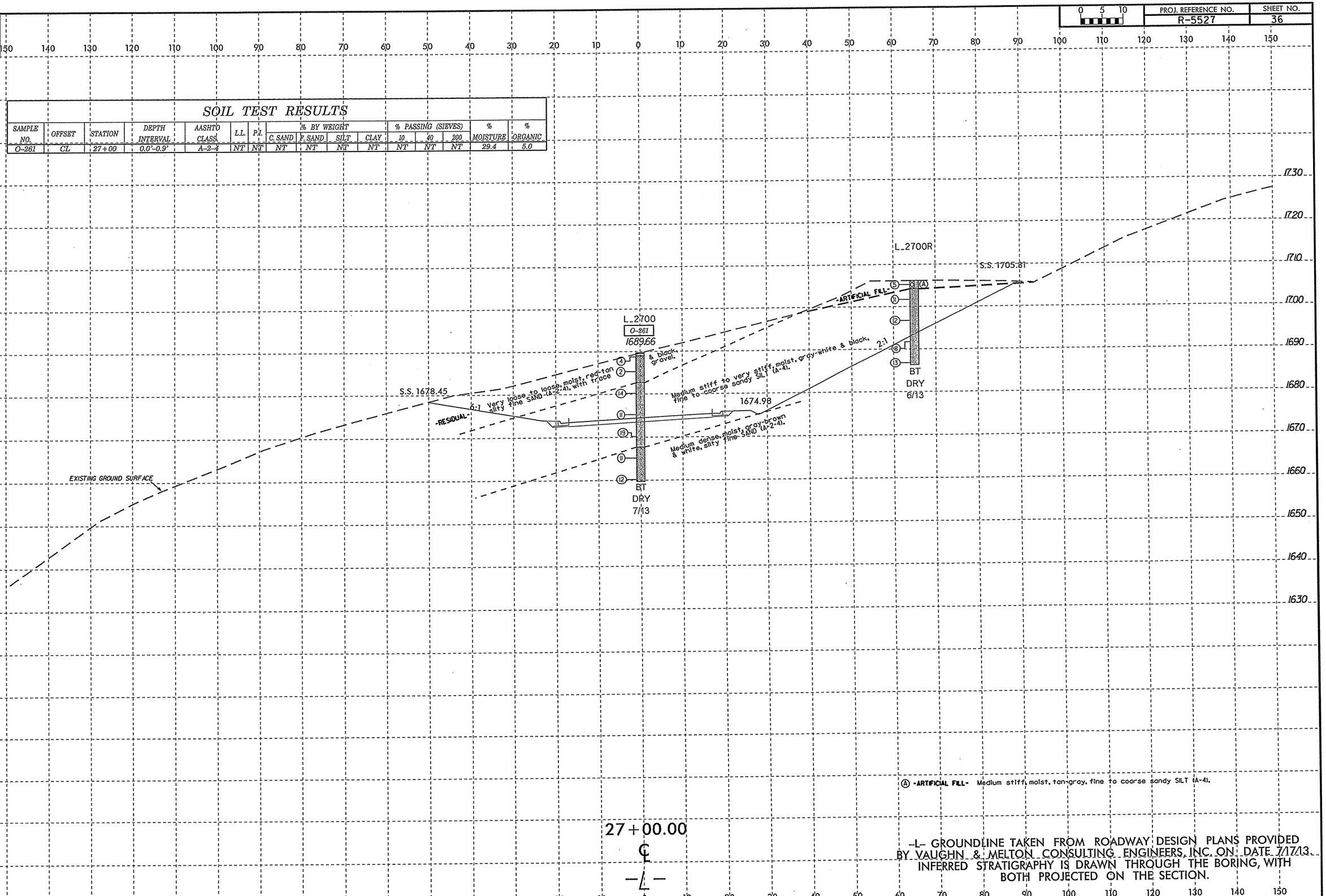
-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SINCE F&R 1881

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5527	36

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
O-261	CL	27+00	0.0'-0.9'	A-2-4	NT	NT	NT	NT	NT	NT	NT	NT	NT	29.4	5.0



Ⓐ **-ARTIFICIAL FILL-** Medium stiff, moist, tan-gray, fine to coarse sandy SILT (A-4).

27+00.00
℄
—L—

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SINCE F&R 1891

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-5527	37

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

1730 1720 1710 1700 1690 1680 1670 1660 1650 1640 1630

EXISTING GROUND SURFACE

S.S. 1664.65

3:1

-RESIDUAL- very loose to loose, moist, red-tan & black, silty fine SAND (A-2-4), with trace gravel.

1671.60

4:1

S.S. 1676.52

-ARTIFICIAL FILL-

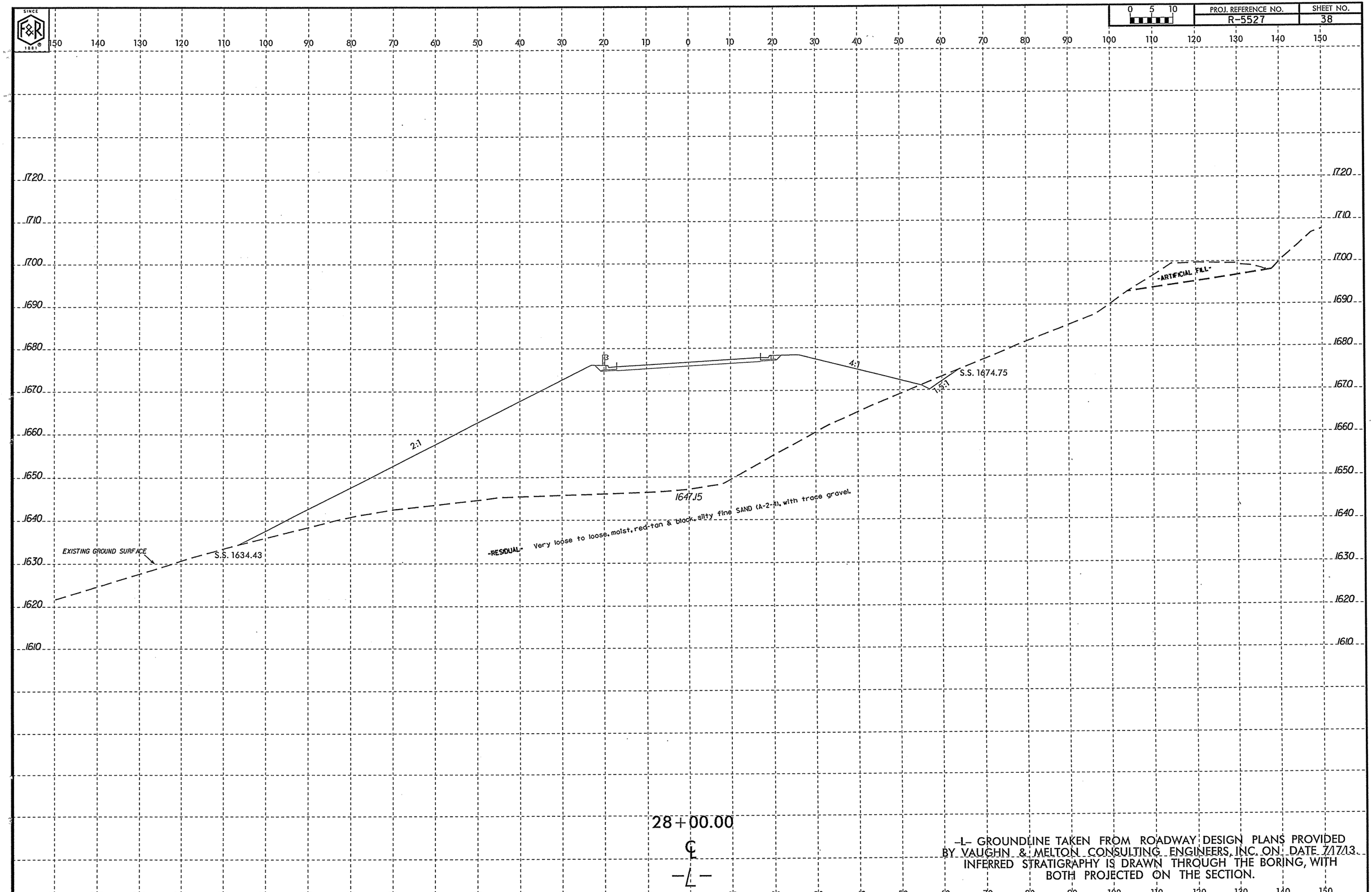
27+50.00

℄

—L—

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

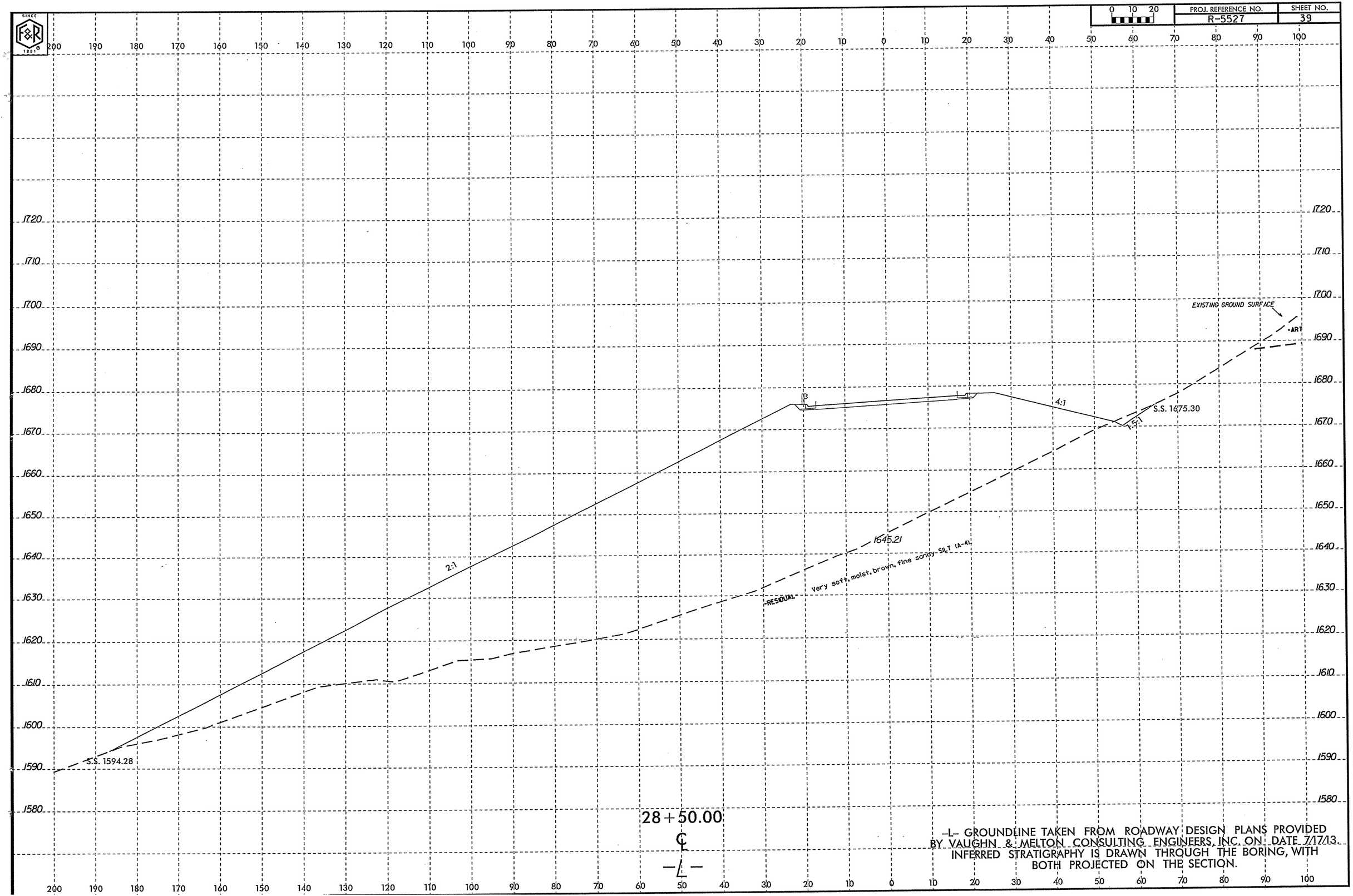
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5527	38



—L— GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

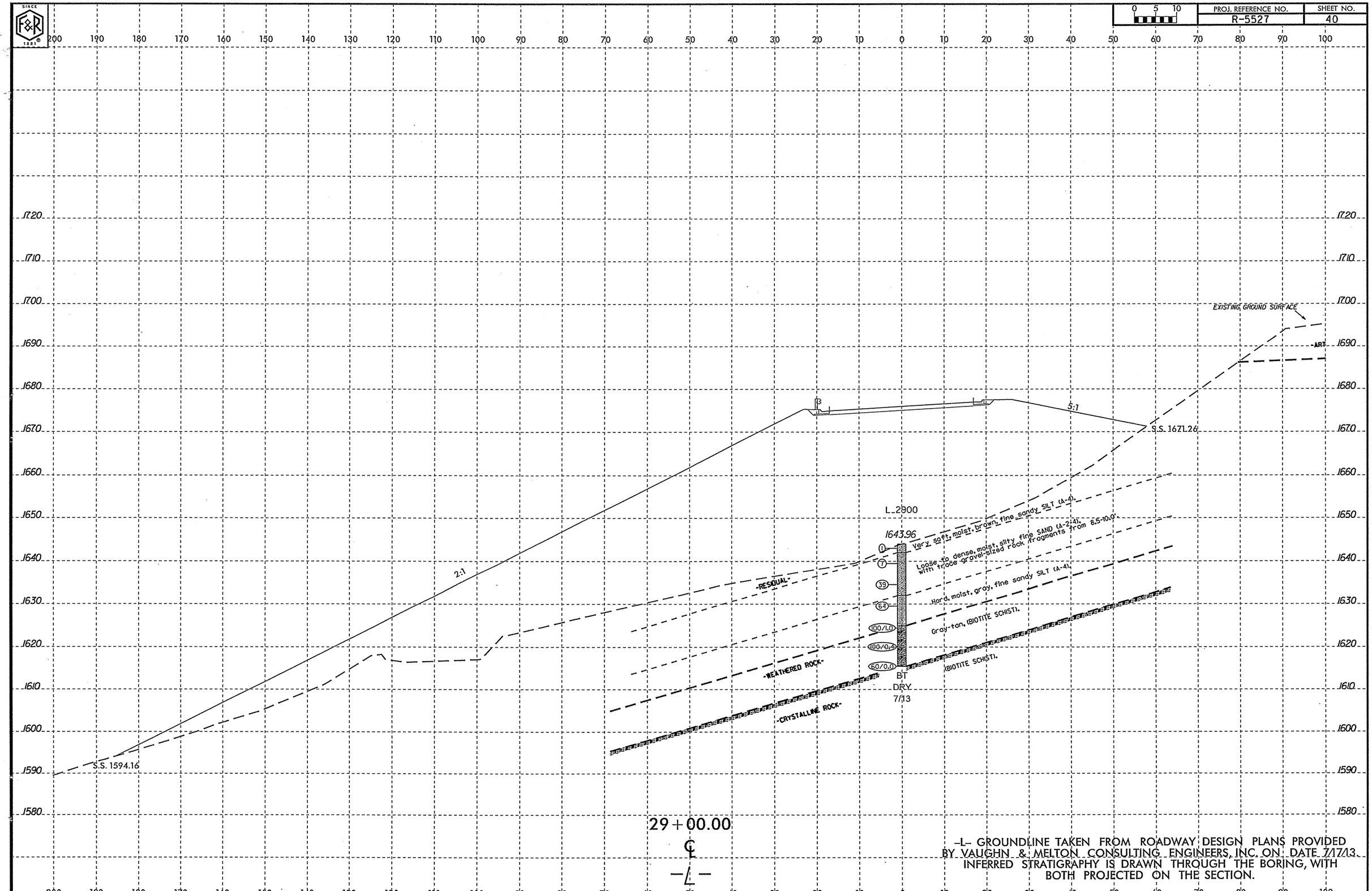
SINCE F&R 1881

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	R-5527	39



PROJ. REFERENCE NO.	SHEET NO.
R-5527	40

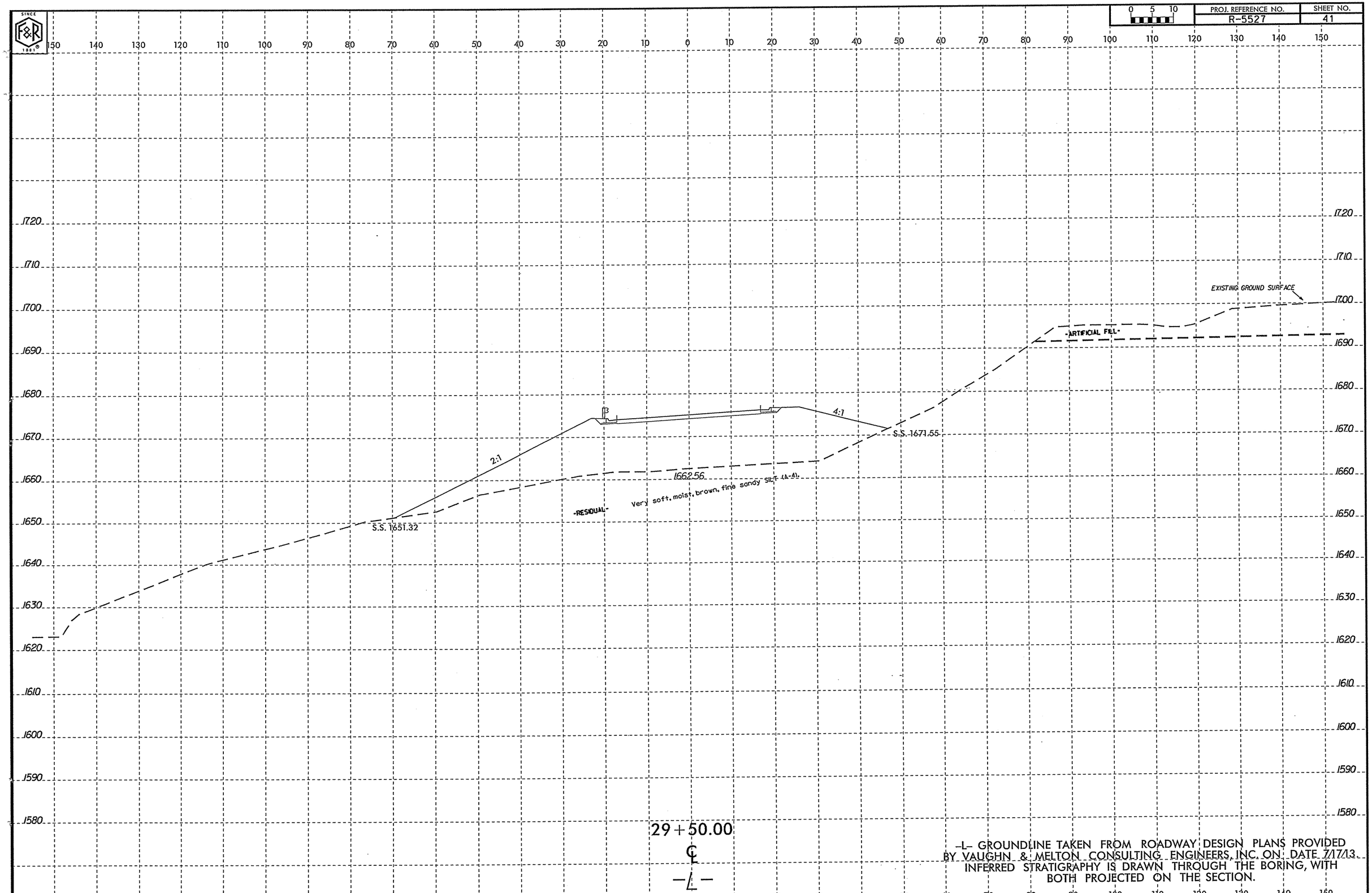
0 5 10



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	41

0 5 10



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SINCE F&R 1881

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5527	42

EXISTING GROUND SURFACE

L_3000R

S.S. 1691.45

ARTIFICIAL FILL (A)

RESIDUAL

Very loose to loose, moist, tan-brown, silty fine SAND (A-2-4).

2:1

1682.72

S.S. 1675.27

4:1

Very stiff to hard, moist, gray-orange & black, fine sandy SILT (A-4).

BT
DRY
7/13

30+00.00

℄

—L—

(A)-ARTIFICIAL FILL- Medium stiff, moist, red-brown, fine sandy SILT (A-4).

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	43

0 5 10

EXISTING GROUND SURFACE

L_3050R

1688.12

-ARTIFICIAL FILL- Very loose, moist, red-brown, silty fine SAND (A-2-4).

S.S. 1687.62

S.S. 1674.16

4:1

-RESIDUAL- Stiff to hard, moist, tan-brown & black-white, fine sandy SILT (A-4), with trace gravel-sized rock fragments from 28.5-35.0'.

3
15
11
21 Ⓐ
34
37
36
30
29 Ⓐ
61
52
100/0.9
100/0.4
100/0.6
59
100/0.7
100/1.0
78

-WEATHERED ROCK- Tan-brown & black, (BIOTITE SCHIST).

-WEATHERED ROCK- Tan-gray & black, (BIOTITE SCHIST).

BT
DRY
7/13

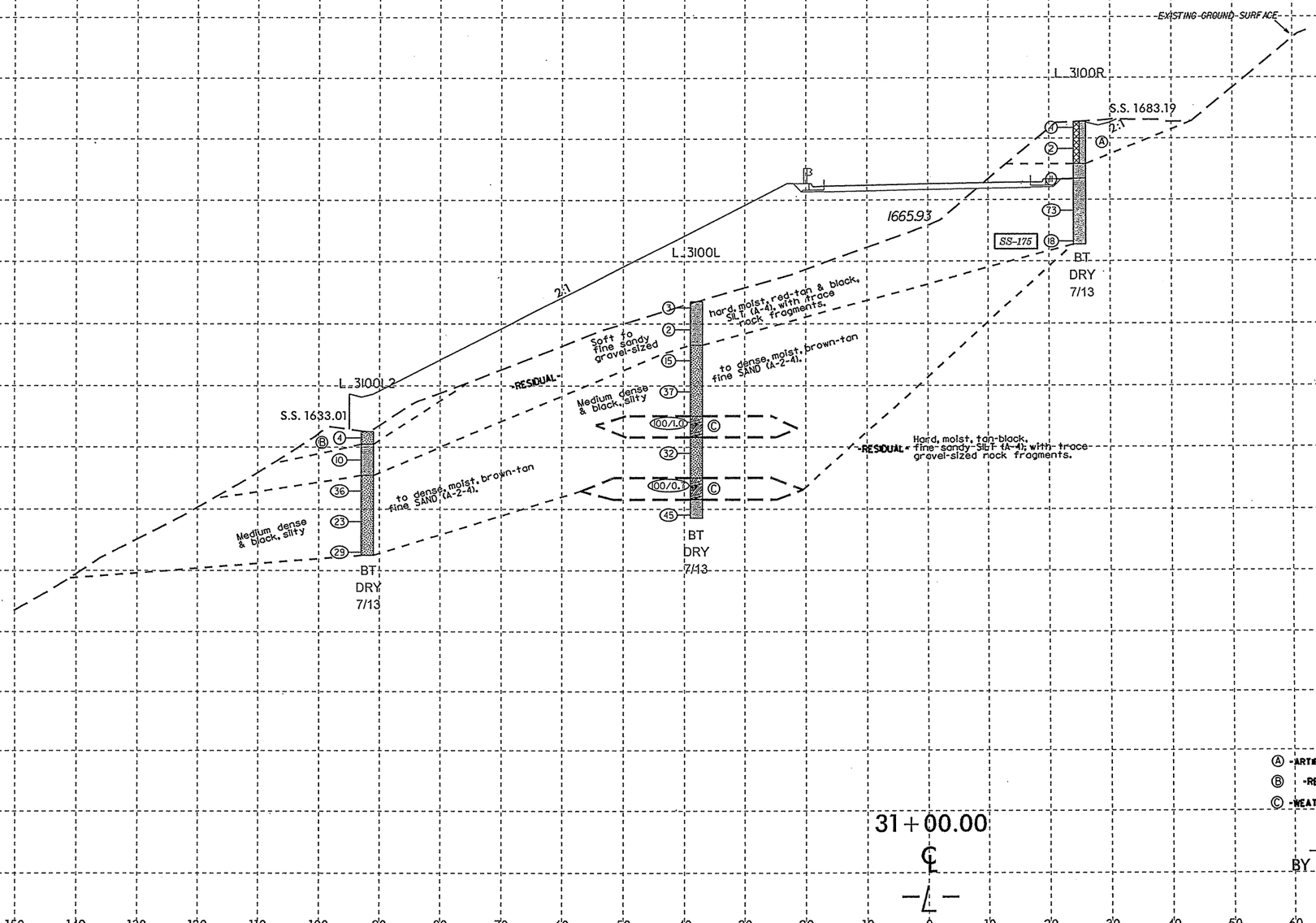
Ⓐ -RESIDUAL- Medium dense, moist, black-tan-white & brown, silty fine SAND (A-2-4).

30+50.00
℄
—L—

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-175	25' RT.	31+00	18.5'-20.0'	A-4(0)	32	1	19.9	41.9	28.0	10.2	100.0	90.3	49.4	30.6	NT



Ⓐ -ARTIFICIAL FILL- Very loose to loose, moist, red-brown & tan, silty fine SAND (A-2-4), with trace gravel.

Ⓑ -RESIDUAL- Very loose to loose, moist, red-brown, silty fine SAND (A-2-4).

Ⓒ -WEATHERED ROCK- Red-tan-gray, (BIOTITE SCHIST).

31+00.00
℄
—L—

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	45

0 5 10

EXISTING GROUND SURFACE

L_3150R

S.S. 1679.72

2:1

-RESIDUAL- Very dense to medium dense, moist, red-brown & tan, silty fine SAND (A-2-4), with trace gravel-sized rock fragments.

Stiff, moist, brown-tan sandy SILT (A-4).

1657.73

Hard to very & gray, fine

moist, black-gray, SAND (A-2-4).

Medium dense, silty fine

Tan & gray, (BIOTITE SCHIST)

-WEATHERED ROCK-

BT
DRY
7/13

L_3150L

S.S. 1626.05

-CRYSTALLINE ROCK- (BIOTITE SCHIST)

-RESIDUAL- Very stiff, moist, fine sandy SILT

tan-gray, (A-4).

BT
DRY
7/13

Ⓐ -ARTIFICIAL FILL- Loose, moist, red-brown & tan, silty fine SAND (A-2-4), with trace gravel.

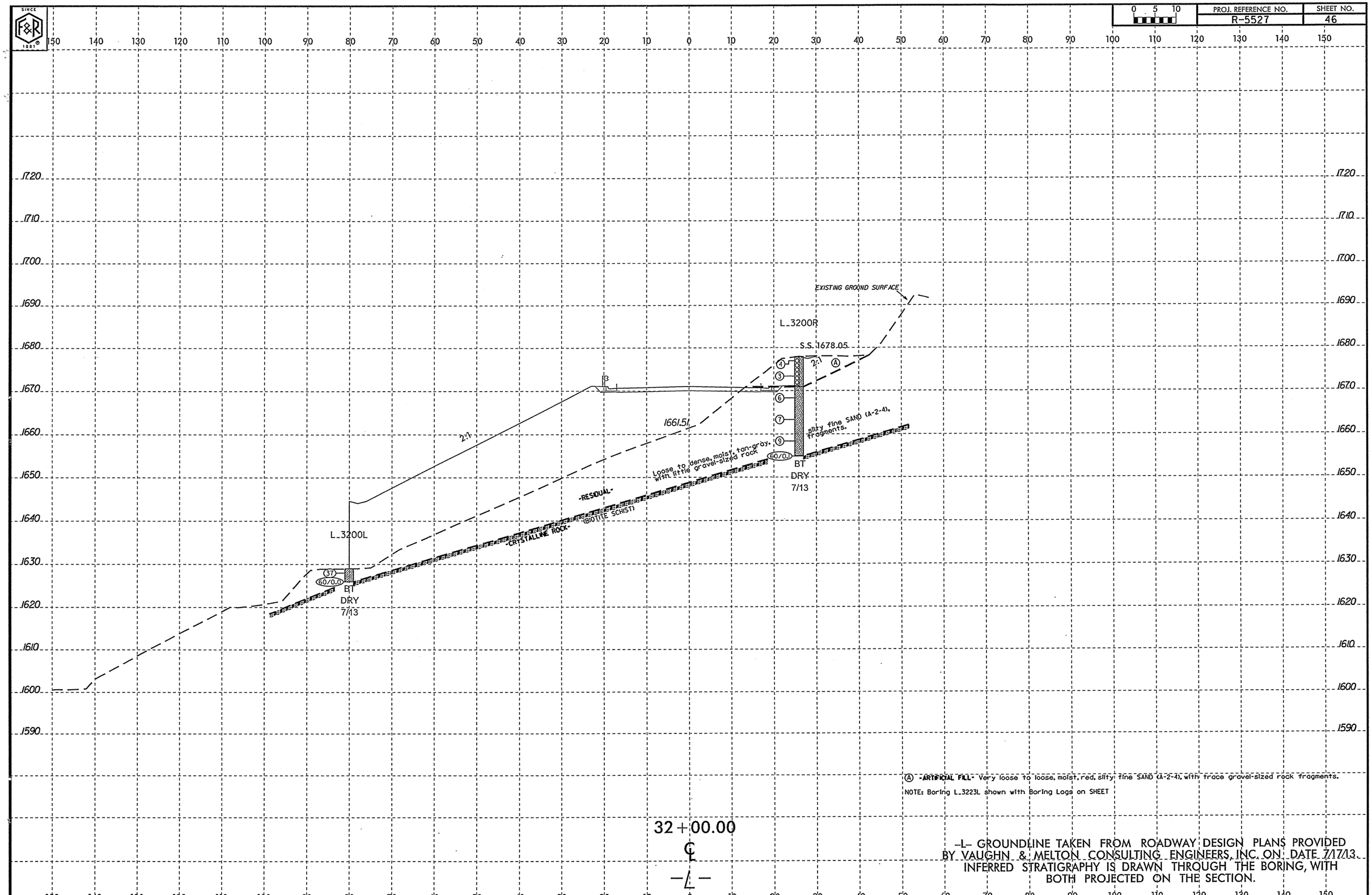
Ⓑ -RESIDUAL- Medium stiff, moist, red, fine sandy SILT (A-4).

31+50.00
℄
–L–

–L– GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

SINCE F&R 1881

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-5527	46



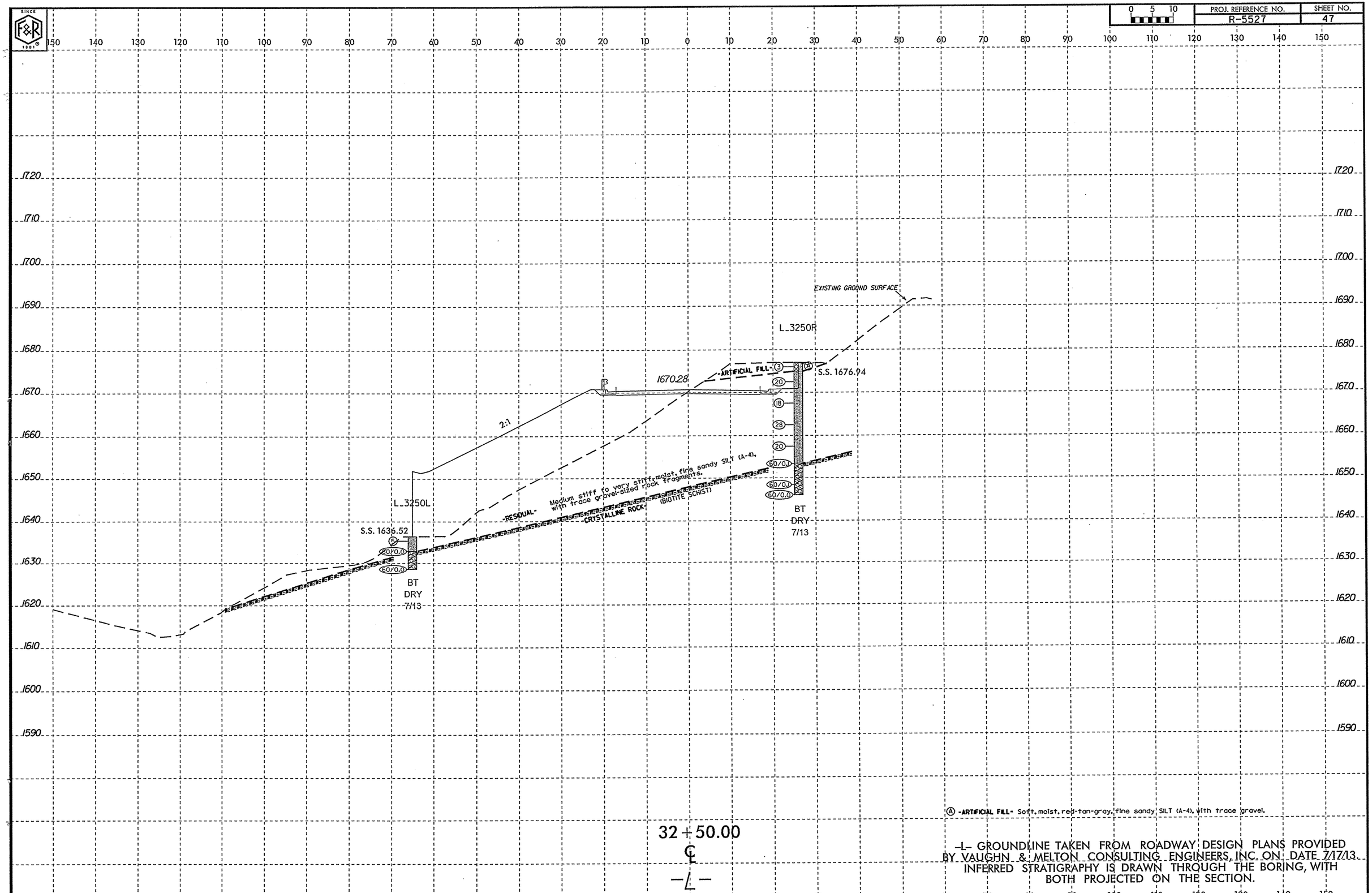
Ⓐ **-ARTIFICAL FILL-** Very loose to loose, moist, red, silty fine SAND (A-2-4), with trace gravel-sized rock fragments.

NOTE: Boring L_3223L shown with Boring Logs on SHEET

32+00.00
℄
—L—

—L— GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	47



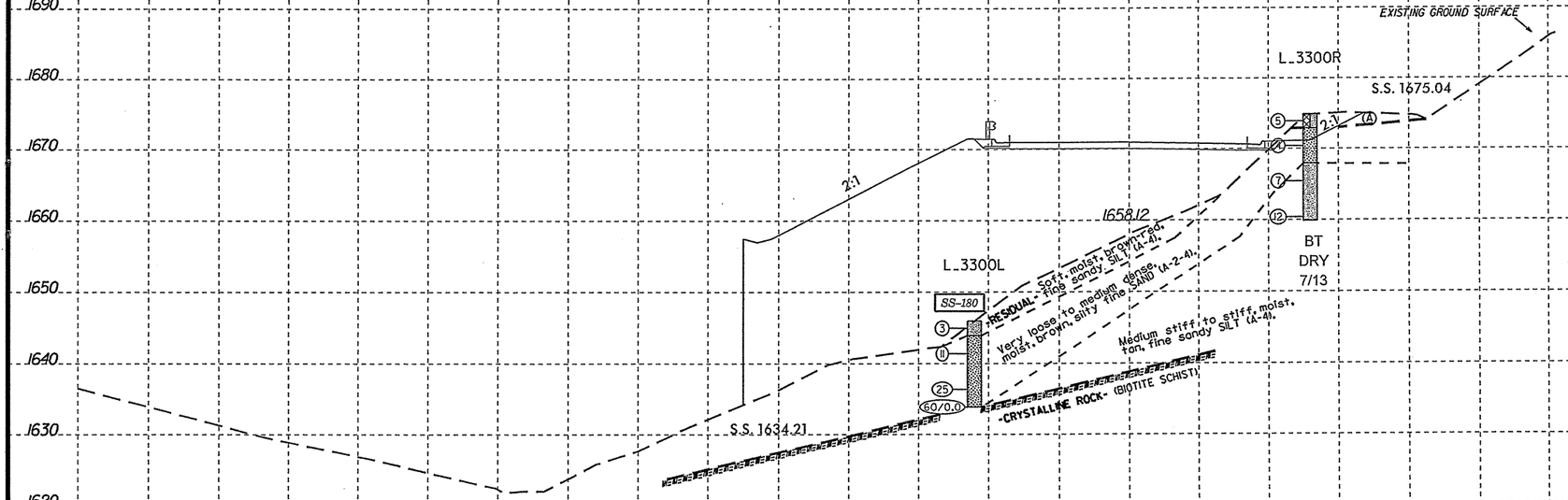
Ⓐ -ARTIFICIAL FILL- Soft, moist, red-tan-gray, fine sandy SILT (A-4), with trace gravel.

—L— GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	48

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-180	22' LT.	33+00	3.5'-5.0'	A-2-4(0)	36	5	19.2	40.2	27.1	13.5	47.0	40.5	26.2	22.2	NT



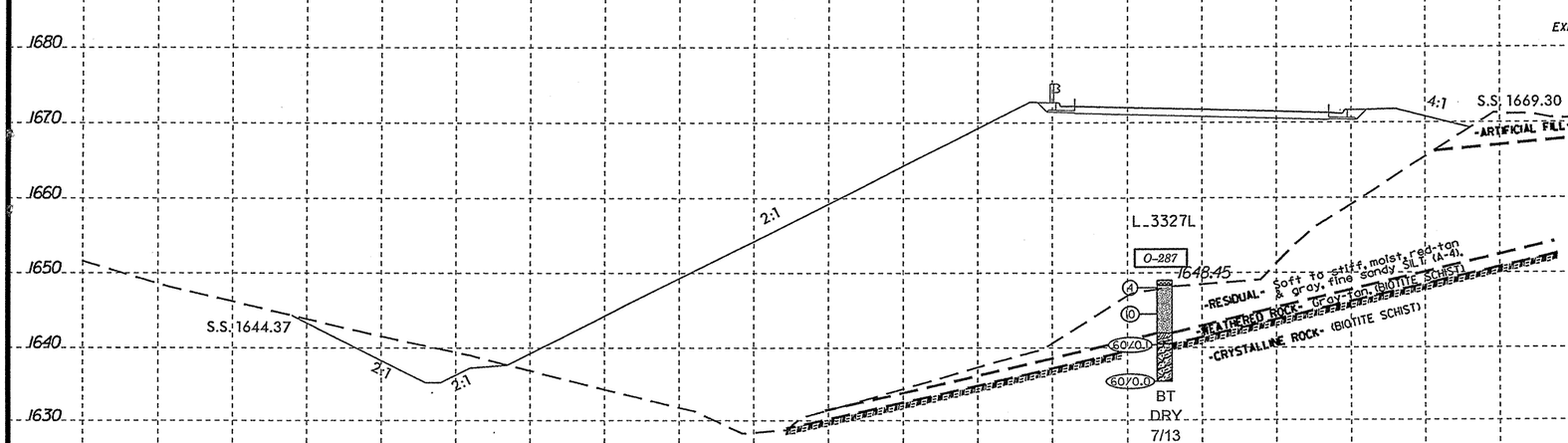
33+00.00
℄
—L—

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	49

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTUBE	% ORGANIC
O-287	5' LT.	33+27	0.0'-0.7	A-4	NT	NT	NT	NT	NT	NT	NT	NT	NT	127.8	24.0



33+50.00

℄

—L—

—L— GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	50

0 5 10

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

1690 1680 1670 1660 1650 1640 1630

S.S. 1669.87

2:1 2:1 2:1 2:1

EXISTING GROUND SURFACE

-ARTIFICIAL FILL-

S.S. 1656.66

1643.69

...ft to stiff, moist, red-tan fine sandy SILT (A-4).

34+50.00

S.S. 1658.02

2:1 2:1 2:1 2:1

EXISTING GROUND SURFACE

-ARTIFICIAL FILL-

S.S. 1661.91

1640.93 stiff, moist, red-tan & gray, fine, sandy SILT (A-4).

-RESIDUAL-

34+00.00

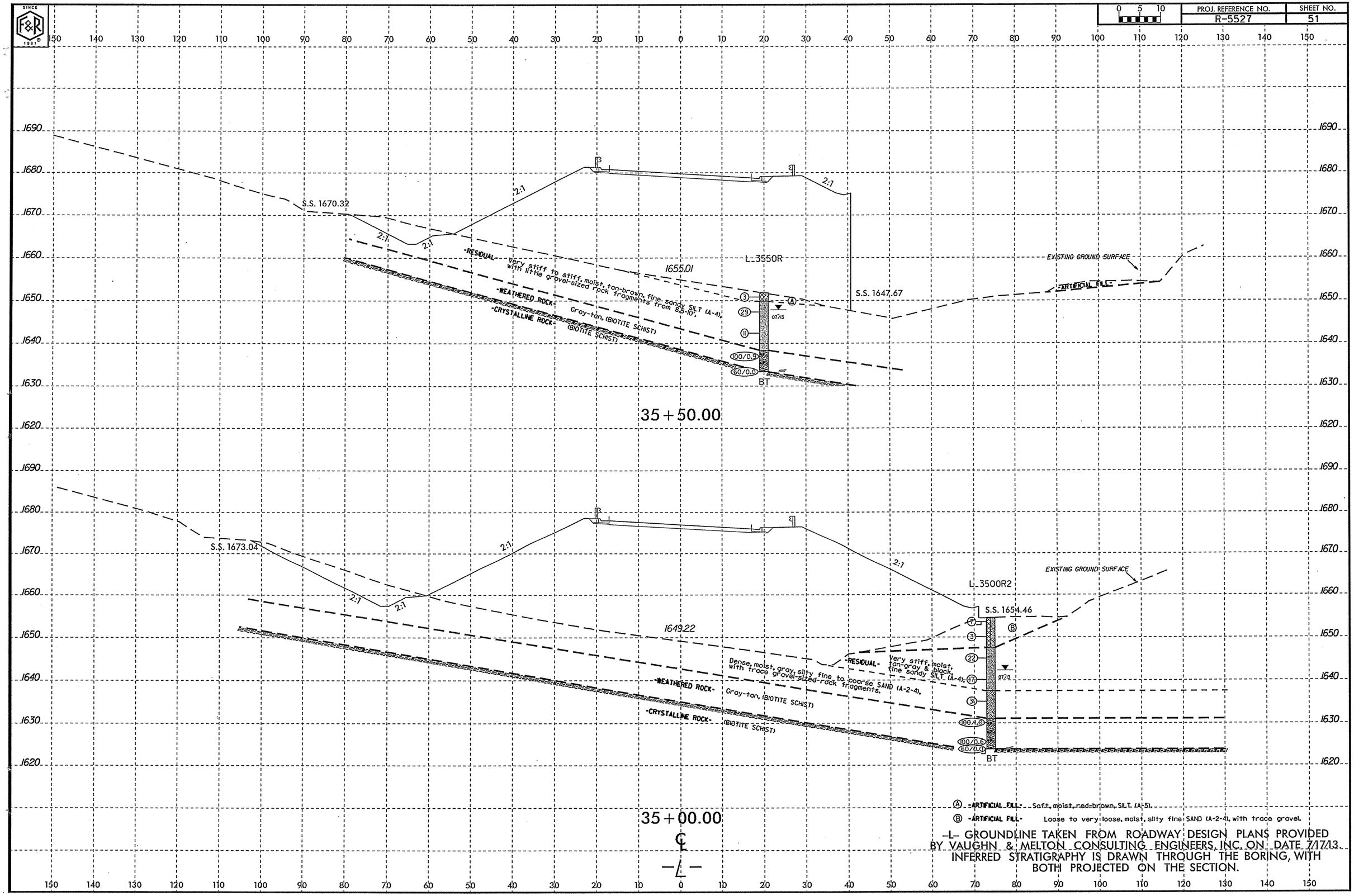
℄

-L-

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	51

0 5 10



Ⓐ -ARTIFICIAL FILL- Soft, moist, red-brown, SILT (A-5).

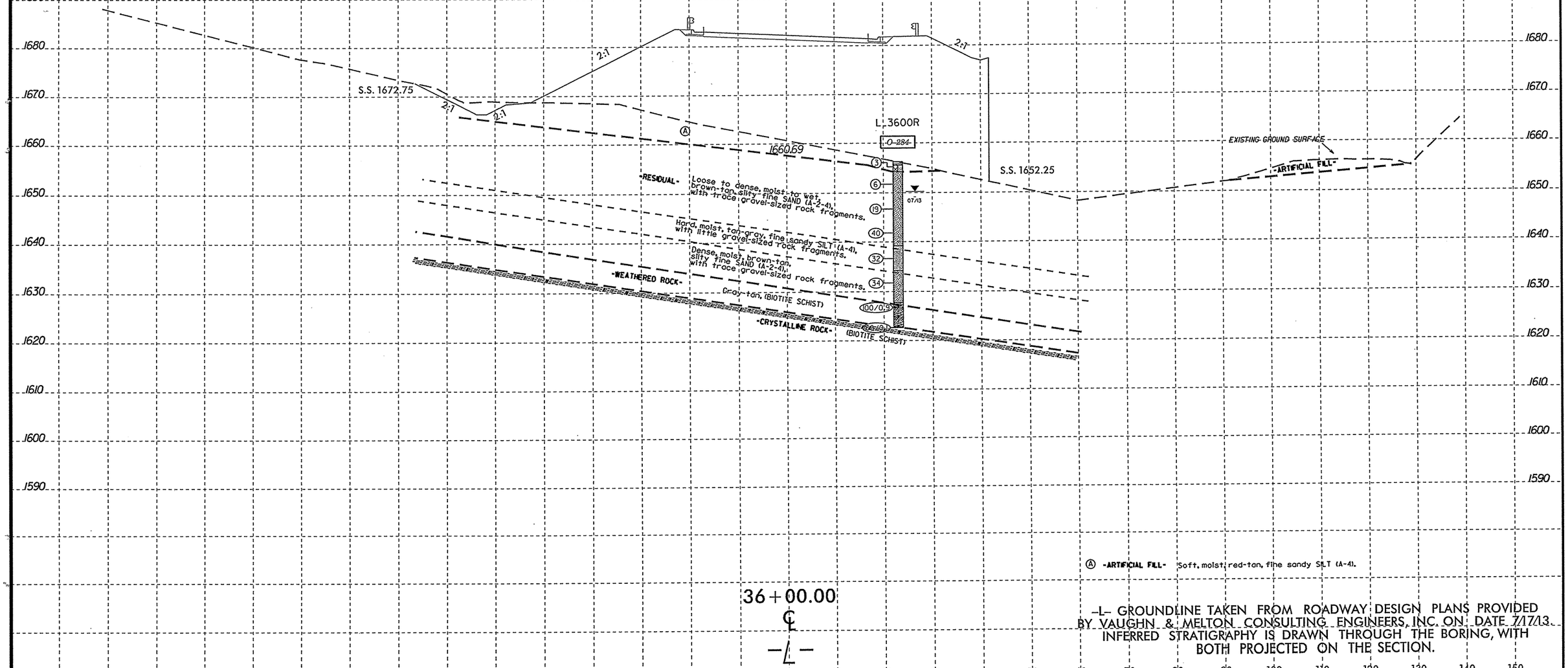
Ⓑ -ARTIFICIAL FILL- Loose to very loose, moist, silty fine SAND (A-2-4), with trace gravel.

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	52

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
O-284	23' LT.	36+00	0.0'-0.7	A-4	NT	NT	NT	NT	NT	NT	NT	NT	NT	49.6	10.4



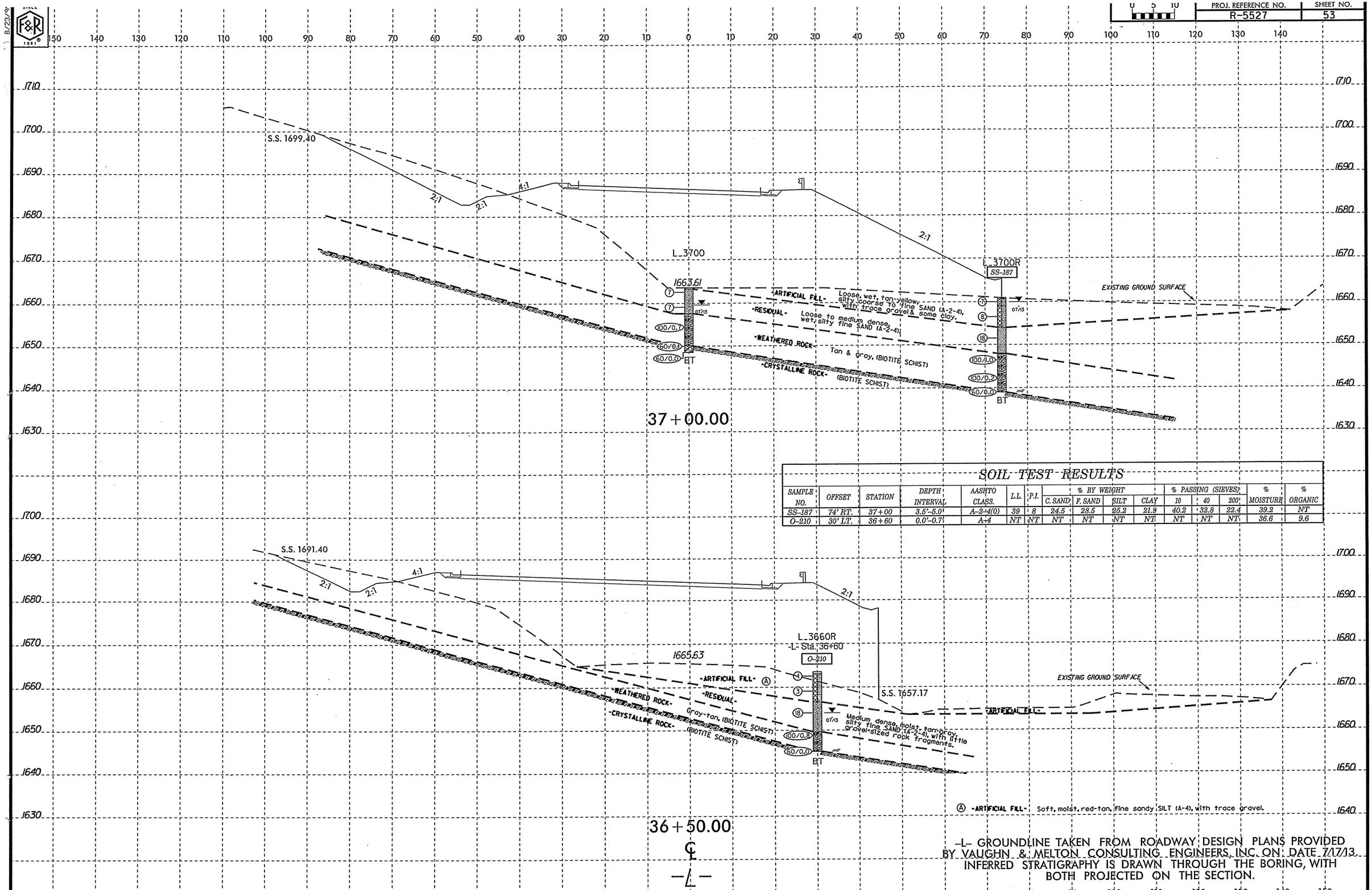
Ⓐ -ARTIFICIAL FILL- Soft, moist, red-tan, fine sandy SILT (A-4).

36+00.00
℄
-L-

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

8/23/9

PROJ. REFERENCE NO.	SHEET NO.
R-5527	53



SOIL TEST RESULTS

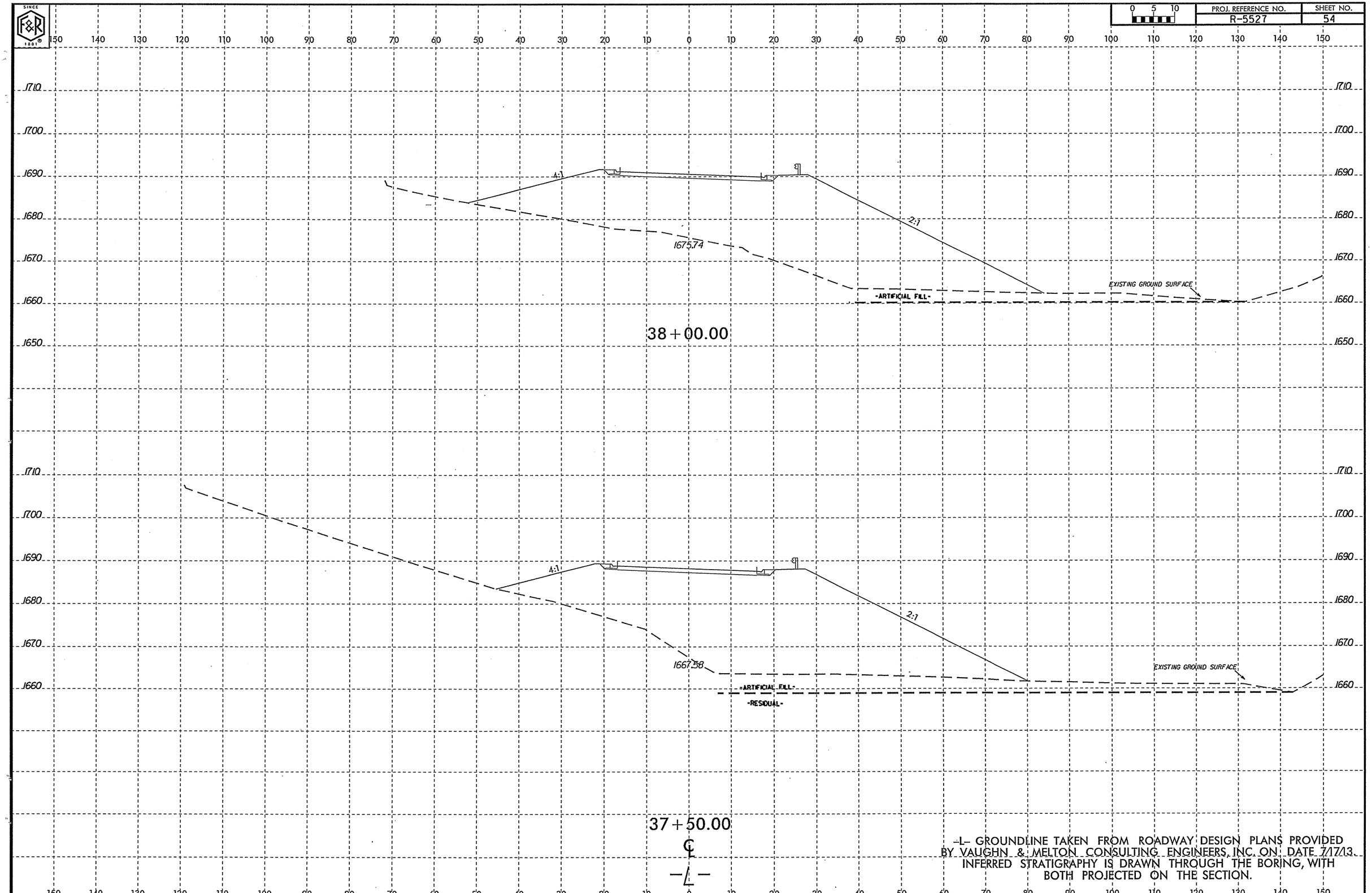
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-187	74' RT.	37+00	3.5'-5.0'	A-2-4(0)	39	8	24.5	28.5	25.2	21.9	40.2	32.8	22.4	39.2	NT
O-210	30' LT.	36+60	0.0'-0.7'	A-4	NT	NT	NT	NT	NT	NT	NT	NT	NT	36.6	9.6

Ⓐ -ARTIFICIAL FILL- Soft, moist, red-tan, fine sandy SILT (A-4), with trace gravel.

-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

PROJ. REFERENCE NO.	SHEET NO.
R-5527	54

0 5 10



-L- GROUNDLINE TAKEN FROM ROADWAY DESIGN PLANS PROVIDED BY VAUGHN & MELTON CONSULTING ENGINEERS, INC. ON DATE 7/17/13. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORING, WITH BOTH PROJECTED ON THE SECTION.

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34518.1.2	TIP R-5527	COUNTY CHEROKEE	GEOLOGIST M. Brewer	
SITE DESCRIPTION Bridge on New Route over Valley River				GROUND WTR (ft)
BORING NO. EB1-A	STATION 11+06	OFFSET 31 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 1,572.5 ft	TOTAL DEPTH 25.2 ft	NORTHING 536,580	EASTING 505,516	24 HR. Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER C. Boyce	START DATE 06/25/13	COMP. DATE 06/26/13	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
1575										
	1,572.5	0.0	1	1	2	3		W		1,572.5 GROUND SURFACE 0.0 **ARTIFICIAL FILL** Tan & orange, fine sandy, clayey SILT (A-5), with trace gravel.
1570	1,569.0	3.5	5	6	3	9		M		
	1,566.3	6.2	60/0.0			60/0.0				1,566.3 6.2 **CRYSTALLINE ROCK** White & gray, (DOLOMITIC MARBLE WITH INTERLAYERED QUARTZITE).
1565										
1560							RS-1			
1555							RS-3			
1550										1,547.3 25.2 Boring Terminated at Elevation 1,547.3 ft IN CRYSTALLINE ROCK (DOLOMITIC MARBLE WITH INTERLAYERED QUARTZITE) 1) Auger refusal at 6.2', began coring. 2) 0-hr water level not measured due to water introduced for coring.

NCDOT BORE SINGLE 63R0047_BORELOGS_SUB.GPJ NC_DOT.GDT 8/2/13

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34518.1.2	TIP R-5527	COUNTY CHEROKEE	GEOLOGIST M. Brewer	
SITE DESCRIPTION Bridge on New Route over Valley River				GROUND WTR (ft)
BORING NO. EB1-A	STATION 11+06	OFFSET 31 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 1,572.5 ft	TOTAL DEPTH 25.2 ft	NORTHING 536,580	EASTING 505,516	24 HR. Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER C. Boyce	START DATE 06/25/13	COMP. DATE 06/26/13	SURFACE WATER DEPTH N/A	
CORE SIZE NQ2	TOTAL RUN 19.0 ft			

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft) / DEPTH (ft)
1566.3											Begin Coring @ 6.2 ft
1565	1,566.3	6.2	5.0	*N=60/0.0* 3:22/1.0 7:11/1.0 6:38/1.0 10:15/1.0 23:15/1.0	(4.7) 94%	(2.3) 46%		(18.1) 95%	(7.0) 37%		1,566.3 **CRYSTALLINE ROCK** 6.2 Slightly to moderately weathered, hard to very hard, white & gray, (DOLOMITIC MARBLE WITH INTERLAYERED QUARTZITE), with close to very close fracture spacing. RS-1: 12.5'-12.9' q_u= 3,580 psi RMR_1= 2 + 8 + 10 + 6 + 7 = 33
	1,561.3	11.2									
1560			5.0	26:47/1.0 15:13/1.0 9:57/1.0 13:44/1.0 8:16/1.0	(4.7) 94%	(1.6) 32%	RS-1				
	1,556.3	16.2					RS-3				RS-3: 15.3'-15.7' q_u= 15,005 psi RMR_3= 12 + 8 + 10 + 6 + 7 = 43
1555			5.0	8:45/1.0 14:36/1.0 16:22/1.0 11:41/1.0 18:14/1.0	(4.8) 96%	(2.3) 46%					
	1,551.3	21.2									
1550			4.0	12:15/1.0 13:44/1.0 3:15/1.0 4:54/1.0	(3.9) 98%	(0.8) 20%					
	1,547.3	25.2									1,547.3 25.2 Boring Terminated at Elevation 1,547.3 ft IN CRYSTALLINE ROCK (DOLOMITIC MARBLE WITH INTERLAYERED QUARTZITE) 1) Auger refusal at 6.2', began coring. 2) 0-hr water level not measured due to water introduced for coring.

NCDOT CORE SINGLE 63R0047_BORELOGS_SUB.GPJ NC_DOT.GDT 8/2/13

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34518.1.2	TIP R-5527	COUNTY CHEROKEE	GEOLOGIST R. Kral
SITE DESCRIPTION Bridge on New Route over Valley River			GROUND WTR (ft)
BORING NO. EB1-B	STATION 11+06	OFFSET 37 ft RT	ALIGNMENT -L- / 0 HR. N/A
COLLAR ELEV. 1,568.5 ft	TOTAL DEPTH 25.4 ft	NORTHING 536,525	EASTING 505,476 / 24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER C. Boyce	START DATE 06/26/13	COMP. DATE 07/16/13	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1570										ELEV. (ft) DEPTH (ft)
	1,568.5	0.0	7	7	9	16		M		1,568.5 GROUND SURFACE 0.0 **ARTIFICIAL FILL** Brown, fine to coarse sandy SILT (A-4), with trace gravel.
1565	1,565.0	3.5								1,565.0 3.5
	1,564.1	4.4	38 60/0.1	62/0.1		100/0.6 60/0.1		M		1,564.1 Tan, fine to coarse sandy GRAVEL (A-1-a). 4.4 **CRYSTALLINE ROCK** Gray & white, (DOLOMITIC MARBLE WITH INTERLAYERED QUARTZITE)
1560										
1555							RS-2			
1550										
1545										1,543.1 25.4 Boring Terminated at Elevation 1,543.1 ft IN CRYSTALLINE ROCK (DOLOMITIC MARBLE WITH INTERLAYERED QUARTZITE) 1) Auger refusal at 4.4, began coring. 2) 0-hr water level not measured due to water introduced for coring.

NCDOT BORE SINGLE 63R0047_BORELOGS_SUB.GPJ NC_DOT.GDT 8/2/13

NCDOT GEOTECHNICAL ENGINEERING UNIT
CORE BORING REPORT

WBS 34518.1.2	TIP R-5527	COUNTY CHEROKEE	GEOLOGIST R. Kral
SITE DESCRIPTION Bridge on New Route over Valley River			GROUND WTR (ft)
BORING NO. EB1-B	STATION 11+06	OFFSET 37 ft RT	ALIGNMENT -L- / 0 HR. N/A
COLLAR ELEV. 1,568.5 ft	TOTAL DEPTH 25.4 ft	NORTHING 536,525	EASTING 505,476 / 24 HR. FIAD
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012	DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER C. Boyce	START DATE 06/26/13	COMP. DATE 07/16/13	SURFACE WATER DEPTH N/A
CORE SIZE N/A	TOTAL RUN 21.0 ft		

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS
1564.1											ELEV. (ft) DEPTH (ft)
	1,564.1	4.4	5.0	*N=60/0.1* 2:20/1.0 6:58/1.0 10:42/1.0 34:32/1.0 18:36/1.0	(4.8) 96%	(0.3) 6%		(20.7) 99%	(3.8) 18%		Begin Coring @ 4.4 ft 1,564.1 **CRYSTALLINE ROCK** 4.4 Gray & white, slightly to moderately weathered, hard to moderately hard, (DOLOMITIC MARBLE WITH INTERLAYERED QUARTZITE), with very close to close fracture spacing.
1560	1,559.1	9.4	5.0	4:08/1.0 6:36/1.0 4:30/1.0 3:51/1.0 15:08/1.0	(4.9) 98%	(1.3) 26%	RS-2				RS-2: 10.4'-10.8' q_u= 8,240 psi RMR_2= 7 + 3 + 5 + 6 + 7 = 28
1555	1,554.1	14.4	5.0	4:00/1.0 5:55/1.0 5:00/1.0 7:32/1.0 31:07/1.0	(5.0) 100%	(0.4) 8%					
1550	1,549.1	19.4	5.0	10:01/1.0 22:34/1.0 16:15/1.0 9:49/1.0 6:53/1.0	(5.0) 100%	(1.8) 36%					
1545	1,544.1	24.4									
	1,543.1	25.4	1.0	10:43/1.0	(1.0) 100%	(0.0) 0%					1,543.1 25.4 Boring Terminated at Elevation 1,543.1 ft IN CRYSTALLINE ROCK (DOLOMITIC MARBLE WITH INTERLAYERED QUARTZITE) 1) Auger refusal at 4.4, began coring. 2) 0-hr water level not measured due to water introduced for coring.

NCDOT CORE SINGLE 63R0047_BORELOGS_SUB.GPJ NC_DOT.GDT 8/2/13

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** M. Brewer
SITE DESCRIPTION Bridge on New Route over Valley River			**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 13+53	**OFFSET** 36 ft LT	**ALIGNMENT** -L — **0 HR.** 49.0
COLLAR ELEV. 1,584.9 ft	**TOTAL DEPTH** 109.5 ft	**NORTHING** 536,436	**EASTING** 505,717 — **24 HR.** 37.9
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 06/11/13	**COMP. DATE** 06/18/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
1585	1,584.9	0.0	2	3	4	7 13		M		1,584.9 GROUND SURFACE 0.0
	1,581.4	3.5								**ARTIFICIAL FILL** Red-brown-tan & gray black, fine sandy SILT (A-4), with trace gravel and mica.
1580			5	6	7			M		
	1,576.4	8.5								
1575			10	6	8	14		M		
	1,571.4	13.5								
1570			10	9	13	22		M		
	1,566.4	18.5								
1565			3	4	6	10		M		
	1,561.4	23.5								
1560			7	8	7	15		M		
	1,556.4	28.5								
1555			4	5	5	10		M		
	1,551.4	33.5								
1550			8	8	12	20		M		
	1,546.4	38.5						▼		1,547.9 37.0
1545			2	3	2	5	SS-10	33%		**ALLUVIAL** Brown & gray, mottled, coarse to fine sandy SILT (A-4(4)), with little clay, trace roots, wood fragments & mica.
	1,541.4	43.5								1,542.9 42.0
1540			4	5	7	12	SS-11	28%		Brown & gray, mottled, coarse to fine sandy SILT (A-4(6)), with little clay, trace roots, wood fragments & mica.
	1,536.4	48.5								1,537.9 47.0
1535			17	18	15	33	SS-12	15%		Gray, silty, fine to highly coarse sandy GRAVEL (A-1-a(0)), with trace clay.
	1,531.4	53.5								1,532.9 52.0
1530			9	12	14	26		M		**RESIDUAL** Gray-black & orange-white-brown, fine sandy SILT (A-4), with trace gravel-sized rock fragments, clay & mica, saprolitic.
	1,526.4	58.5								
1525			10	13	38	51		M		
	1,521.4	63.5								
1520			14	22	23	45		M		
	1,516.4	68.5								
1515			8	8	11	19		M		
	1,511.4	73.5								
1510			10	13	15	28		M		
	1,506.4	78.5								
1505			10	14	18	32		M		

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** M. Brewer
SITE DESCRIPTION Bridge on New Route over Valley River			**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 13+53	**OFFSET** 36 ft LT	**ALIGNMENT** -L — **0 HR.** 49.0
COLLAR ELEV. 1,584.9 ft	**TOTAL DEPTH** 109.5 ft	**NORTHING** 536,436	**EASTING** 505,717 — **24 HR.** 37.9
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 06/11/13	**COMP. DATE** 06/18/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1505						Match Line				
	1,501.4	83.5	8	10	22	32		M		**RESIDUAL** Gray-black & orange-white-brown, fine sandy SILT (A-4), with trace gravel-sized rock fragments, clay & mica, saprolitic. *(continued)*
1500										1,495.9 89.0
	1,496.4	88.5								**WEATHERED ROCK** Brown & orange, (BIOTITE SCHIST)
1495			19	71	29/0.3	100/0.8				
	1,491.4	93.5								1,487.9 97.0
1490			33	43	57/0.4	100/0.9				**RESIDUAL** Brown & orange, fine sandy SILT (A-4), with trace mica, saprolitic
	1,486.4	98.5								1,482.9 102.0
1485			16	30	50	80		M		Dark-gray & white, fine to coarse sandy, clayey SILT (A-5), saprolitic
	1,481.4	103.5								
1480			14	24	53	77		M		
	1,476.4	108.5	24	76/0.5		100/1.0				1,476.4 108.5
										1,475.4 **WEATHERED ROCK** 109.5
										Dark-gray & white, (BIOTITE SCHIST)
										Boring Terminated at Elevation 1,475.4 ft IN WEATHERED ROCK (BIOTITE SCHIST)
										Surficial Organic Soils from 0.0-0.1'.
										Bulk Sample obtained for CBR-1 from 1.0-4.0'.

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** M. Brewer	
SITE DESCRIPTION Bridge on New Route over Valley River				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 13+39	**OFFSET** 37 ft RT	**ALIGNMENT** -L	**0 HR.** 49.0
COLLAR ELEV. 1,586.5 ft	**TOTAL DEPTH** 130.1 ft	**NORTHING** 536,386	**EASTING** 505,662	**24 HR.** 43.0
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 06/11/13	**COMP. DATE** 06/11/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1590										
	1,586.5	0.0								1,586.5 GROUND SURFACE 0.0
1585			2	3	2	5		M		**ARTIFICIAL FILL** Gray-brown-red & black, fine sandy SILT (A-4), with trace gravel and mica, trace clay from 23.5-38.7'.
	1,583.0	3.5								
1580			1	3	2	5		M		
	1,578.0	8.5								
1575			7	5	7	12		M		
	1,573.0	13.5								
1570			7	9	11	20		M		
	1,568.0	18.5								
1565			4	4	4	8		M		
	1,563.0	23.5								
1560			6	5	14	19		M		
	1,558.0	28.5								
1555			5	5	6	11		M		
	1,553.0	33.5								
1550			8	5	9	14		M		
	1,548.0	38.5								
1545			4	4	7	11		M		
	1,543.0	43.5								
1540			3	3	3	6	SS-29	26%		
	1,538.0	48.5								
1535			18	19	12	31	SS-30	13%		
	1,533.0	53.5								
1530			6	9	14	23		M		
	1,528.0	58.5								
1525			11	15	26	41		M		
	1,523.0	63.5								
1520			10	12	17	29		M		
	1,518.0	68.5								
1515			15	12	29	41		M		
	1,513.0	73.5								
1510			12	19	29	48		M		
	1,547.8	38.7						W		**ALLUVIAL** Black-gray & brown & maroon-brown, mottled, fine to coarse sandy SILT (A-4(0)), with trace mica, gravel & organics.
	1,534.5	52.0								**RESIDUAL** Orange-white-brown, fine sandy SILT (A-4), with trace to little clay, trace mica, and trace gravel-sized rock fragments from 53.5-65.0', saprolitic.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** M. Brewer	
SITE DESCRIPTION Bridge on New Route over Valley River				**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 13+39	**OFFSET** 37 ft RT	**ALIGNMENT** -L	**0 HR.** 49.0
COLLAR ELEV. 1,586.5 ft	**TOTAL DEPTH** 130.1 ft	**NORTHING** 536,386	**EASTING** 505,662	**24 HR.** 43.0
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 06/11/13	**COMP. DATE** 06/11/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1510						Match Line				
	1,508.0	78.5	10	16	27	43		M		**RESIDUAL** Orange-white-brown, fine sandy SILT (A-4), with trace to little clay, trace mica, and trace gravel-sized rock fragments from 53.5-65.0', saprolitic. *(continued)*
1505										
	1,503.0	83.5	8	15	25	40		M		
1500										
	1,498.0	88.5	11	17	29	46		M		
1495										
	1,493.0	93.5	12	19	37	56		M		
1490										
	1,488.0	98.5	11	20	32	52		M		
1485										
	1,483.0	103.5	14	27	39	66		M		
1480										
	1,478.0	108.5	11	23	38	61		M		
1475										
	1,473.0	113.5	18	24	43	67		M		
1470										
	1,468.0	118.5	19	28	72/0.3	100/0.3		M		
1465										
	1,463.0	123.5	14	20	23	43		M		
1460										
	1,458.0	128.5								
	1,456.4	130.1	9	91/0.1		100/0.6				
			60/0.0			60/0.0				
	1,467.5	119.0								**WEATHERED ROCK** Orange & brown, (BIOTITE SCHIST)
	1,464.5	122.0								**RESIDUAL** Dark-gray & white, highly fine sandy, clayey SILT(A-5), saprolitic.
	1,458.0	128.5								**WEATHERED ROCK** Dark-gray, (BIOTITE SCHIST)
	1,456.4	130.1								Boring Terminated with Standard Penetration Test Refusal at Elevation 1,456.4 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)

Surficial Organic Soils from 0.0-0.1'.

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** M. Brewer	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_1500	**STATION** 15+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** 11.8
COLLAR ELEV. 1,586.0 ft	**TOTAL DEPTH** 15.0 ft	**NORTHING** 536,319	**EASTING** 505,814	**24 HR.** 9.7
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 06/20/13	**COMP. DATE** 06/20/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1590										ELEV. (ft) DEPTH (ft)
	1,586.0	0.0								1,586.0 GROUND SURFACE 0.0
1585			2	4	4	8		M		**ARTIFICIAL FILL**
	1,582.5	3.5					S-1	18%		Brown-gray & red, fine sandy SILT (A-4(0)), with trace gravel & mica, and trace root fragments from 13.5-15.0'.
			7	10	9	19		M		
1580										
	1,577.5	8.5						M		
			2	4	2	6				
1575										
	1,572.5	13.5								
			4	4	5	9		M		1,571.0 15.0
										Boring Terminated at Elevation 1,571.0 ft IN ARTIFICIAL FILL (SILT)
										Surficial Organic Soils from 0.0-0.1'.
										Other Samples: CBR-1 (1.0 - 4.0)

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** M. Brewer	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_1550L	**STATION** 15+50	**OFFSET** 100 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,585.8 ft	**TOTAL DEPTH** 10.0 ft	**NORTHING** 536,370	**EASTING** 505,914	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 06/20/13	**COMP. DATE** 06/20/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1590										
	1,585.8	0.0								1,585.8 GROUND SURFACE 0.0
1585			3	4	7	11		M		**ARTIFICIAL FILL**
	1,582.3	3.5								Brown & gray, fine sandy SILT (A-4), with trace gravel & mica.
			4	3	3	6		M		
1580										
	1,577.3	8.5								1,577.3 8.5
			7	9	25	34		M		1,575.8 **RESIDUAL** 10.0
										Orange-tan-red, fine to coarse sandy SILT (A-4), with trace gravel-sized rock fragments & mica.
										Boring Terminated at Elevation 1,575.8 ft IN RESIDUAL (SILT)
										Surficial Organic Soils from 0.0-0.1'.

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BORELOG REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** M. Brewer	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_1550R	**STATION** 15+50	**OFFSET** 100 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,586.3 ft	**TOTAL DEPTH** 10.0 ft	**NORTHING** 536,209	**EASTING** 505,794	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 06/20/13	**COMP. DATE** 06/20/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
1590										
	1,586.3	0.0								1,586.3 GROUND SURFACE 0.0
1585			4	5	4	9		M		**ARTIFICIAL FILL** Brown-gray & red, fine sandy SILT (A-4), with trace mica & gravel, clay from 8.5-10.0'.
	1,582.8	3.5	2	2	4	6		M		
1580										
	1,577.8	8.5	4	6	10	16		M		1,576.3 10.0
										Boring Terminated at Elevation 1,576.3 ft IN ARTIFICIAL FILL (SILT)
										Surficial Organic Soils from 0.0-0.1'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** M. Brewer	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_1700	**STATION** 17+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,589.7 ft	**TOTAL DEPTH** 15.0 ft	**NORTHING** 536,200	**EASTING** 505,974	**24 HR.** 10.3
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 06/20/13	**COMP. DATE** 06/20/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1590										
	1,589.7	0.0	3	4	4	8		M		1,589.7 GROUND SURFACE 0.0
	1,586.2	3.5								**ARTIFICIAL FILL** Brown, fine to coarse sandy SILT (A-4), with trace mica & gravel.
1585			8	11	13	24		M		1,586.2 3.5
	1,581.2	8.5								**RESIDUAL** Brown-orange & gray, fine sandy SILT(A-4), with trace mica.
1580			5	9	13	22		M		
	1,576.2	13.5								
1575			6	10	12	22		M		1,574.7 15.0
										Boring Terminated at Elevation 1,574.7 ft IN RESIDUAL (SILT)
										Surficial Organic Soils from 0.0-0.1'.

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BORELOG REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** M. Brewer	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_1800	**STATION** 18+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** 8.7
COLLAR ELEV. 1,591.4 ft	**TOTAL DEPTH** 14.2 ft	**NORTHING** 536,147	**EASTING** 506,059	**24 HR.** 6.0
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 06/20/13	**COMP. DATE** 06/20/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1595										
	1,591.4	0.0								1,591.4 GROUND SURFACE 0.0
1590			1	2	3	5		M		**ARTIFICIAL FILL**
	1,587.9	3.5								1,589.4 Brown & orange, fine sandy SILT (A-4), with trace gravel & mica. 2.0
			9	16	12	28		M		**RESIDUAL**
1585										1,586.2 Brown, orange & black, fine to coarse sandy SILT (A-4), with trace gravel-sized rock fragments & mica. 5.2
	1,582.9	8.5	68	32/0.3		100/0.8				**WEATHERED ROCK**
1580										Brown, orange & gray, (BIOTITE SCHIST).
	1,577.9	13.5								
	1,577.2	14.2	25/0.0	75/0.2		100/0.7 60/0.0				1,577.2 14.2
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,577.2 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)
										Surficial Organic Soils from 0.0-0.1'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** M. Brewer	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_1965R	**STATION** 19+65	**OFFSET** 12 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,648.3 ft	**TOTAL DEPTH** 33.2 ft	**NORTHING** 536,107	**EASTING** 506,220	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 06/20/13	**COMP. DATE** 06/20/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1650										
	1,648.3	0.0								1,648.3 GROUND SURFACE 0.0
			4	4	6	10		M		**RESIDUAL**
1645	1,644.8	3.5								Brown-gray & tan-black, silty fine to coarse SAND (A-2-4(0)), with trace gravel-sized rock fragments & mica, saprolitic.
			17	12	16	28	SS-75	16%		
1640	1,639.8	8.5								
			21	35	19	54		M		
1635	1,634.8	13.5								
			55	41	30	71		M		1,633.1 15.2
1630	1,629.8	18.5	100/0.3			100/0.3				**WEATHERED ROCK**
1625	1,624.8	23.5	100/0.3			100/0.3				Gray, (BIOTITE SCHIST).
1620	1,619.8	28.5	20	80/0.3		100/0.8				
	1,615.2	33.1	60/0.1			60/0.1				1,615.2 33.1
										1,615.1 CRYSTALLINE ROCK 33.2 (BIOTITE SCHIST).
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,615.1 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST)
										Surficial Organic Soils from 0.0-0.2'.

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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_1965R2	**STATION** 19+65	**OFFSET** 65 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,661.7 ft	**TOTAL DEPTH** 33.0 ft	**NORTHING** 536,055	**EASTING** 506,224	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/16/13	**COMP. DATE** 07/16/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
										1,661.7 GROUND SURFACE 0.0
										RESIDUAL Dense to very dense, moist, tan, silty fine SAND (A-2-4), with trace mica.
										1,634.7 — 27.0
										WEATHERED ROCK Tan, (BIOTITE SCHIST).
										1,630.7 — 31.0
										RESIDUAL 1,628.7 Dense to very dense, moist, orange-tan, silty fine SAND (A-2-4). 33.0
										Boring Terminated at Elevation 1,628.7 ft IN RESIDUAL (SILT)

Surficial Organic Soils from 0.0-0.2'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_2000L	**STATION** 20+00	**OFFSET** 15 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,651.8 ft	**TOTAL DEPTH** 26.0 ft	**NORTHING** 536,138	**EASTING** 506,252	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/24/13	**COMP. DATE** 07/24/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
										1,651.8 GROUND SURFACE 0.0
										RESIDUAL Loose to very dense, moist, orange-tan & gray-tan, silty fine to coarse SAND (A-2-4).
										1,633.8 — 18.0
										WEATHERED ROCK Gray-tan, (BIOTITE SCHIST).
										1,625.8 — 26.0
										Boring Terminated by Auger Refusal at Elevation 1,625.8 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)

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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_2000R	**STATION** 20+00	**OFFSET** 50 ft RT	**ALIGNMENT** -L- **0 HR.** Dry
COLLAR ELEV. 1,670.5 ft	**TOTAL DEPTH** 46.0 ft	**NORTHING** 536,084	**EASTING** 506,261 **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/16/13	**COMP. DATE** 07/16/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1675										
										1,670.5 GROUND SURFACE 0.0
1670										**RESIDUAL** Loose to very dense, moist, orange-tan, silty fine SAND (A-2-4), with trace mica.
1665										
1660										
1655										
1650										
1645										1,644.5 26.0
1640										**WEATHERED ROCK** Gray-tan, (BIOTITE SCHIST)
1635										1,640.5 30.0
1630										**RESIDUAL** Dense to very dense, moist, gray-tan, silty fine SAND (A-2-4), with trace mica.
1625										1,636.5 34.0
										WEATHERED ROCK Gray-tan, (BIOTITE SCHIST).
										1,624.5 46.0
										Boring Terminated at Elevation 1,624.5 ft IN WEATHERED ROCK (BIOTITE SCHIST)
										Surficial Organic Soils from 0.0-0.2'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_2100L	**STATION** 21+00	**OFFSET** 30 ft LT	**ALIGNMENT** -L- **0 HR.** Dry
COLLAR ELEV. 1,673.3 ft	**TOTAL DEPTH** 25.8 ft	**NORTHING** 536,174	**EASTING** 506,346 **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/24/13	**COMP. DATE** 07/24/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1675										
										1,673.3 GROUND SURFACE 0.0
1670										**RESIDUAL** Medium stiff to hard, moist, fine sandy SILT (A-4). with trace gravel-sized rock fragments.
1665										
1660										
1655										1,657.3 16.0
1650										**WEATHERED ROCK** Gray-tan, (BIOTITE SCHIST).
										1,647.5 25.8
										Boring Terminated by Auger Refusal at Elevation 1,647.5 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)

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BOREHOLE REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** M. Brewer
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_2100R	**STATION** 21+00	**OFFSET** 7 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,687.7 ft	**TOTAL DEPTH** 42.0 ft	**NORTHING** 536,138	**EASTING** 506,353	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 06/27/13	**COMP. DATE** 06/27/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
1690										
	1,687.7	0.0	2	3	3	6		20%		1,687.7 GROUND SURFACE 0.0
1685										1,686.7 Brown, silty fine SAND (A-2-4), with trace organics. 1.0
	1,684.2	3.5	6	9	14	23	S-2	15% M		1,685.7 ARTIFICIAL FILL 2.0
1680										Brown & black, fine sandy SILT (A-4).
	1,679.2	8.5	39	50	36	86		M		RESIDUAL
1675										Gray-blue & black, highly fine sandy SILT (A-4(0)), with trace gravel-sized rock fragments & mica, saprolitic.
	1,674.2	13.5	18	26	35	61		M		
1670										
	1,669.2	18.5	28	33	33	66		M		
1665										
	1,664.2	23.5	20	16	14	30		M		
1660										
	1,659.2	28.5	100/0.5			100/0.5		M		1,661.6 26.1
1655										WEATHERED ROCK
	1,654.2	33.5	5	9	20	29		M		Gray-blue, (BIOTITE SCHIST).
1650										1,655.2 32.5
	1,649.2	38.5	60/0.1			60/0.1		M		RESIDUAL
	1,645.7	42.0	60/0.0			60/0.0		M		Gray-blue-green, highly fine sandy SILT (A-4), with trace mica, gravel-sized rock fragments, & a thin orange clay seam, saprolitic.
										1,650.6 37.1
										1,649.2 WEATHERED ROCK 38.5
										(BIOTITE SCHIST).
										1,645.7 CRYSTALLINE ROCK 42.0
										(BIOTITE SCHIST).
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,645.7 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST)

Other Samples:
O-500 (0.0 - 1.0)
CBR-2 (2.0 - 5.0)

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_2100R2	**STATION** 21+00	**OFFSET** 120 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,723.0 ft	**TOTAL DEPTH** 53.8 ft	**NORTHING** 536,028	**EASTING** 506,377	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/01/13	**COMP. DATE** 07/01/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1725										
	1,723.0	0.0	2	1	1	2		M		1,723.0 GROUND SURFACE 0.0
1720										RESIDUAL
	1,719.5	3.5	2	3	5	8		M		Gray-tan & red, fine to coarse sandy SILT (A-4), with trace gravel-sized rock fragments & mica.
1715										
	1,714.5	8.5	6	11	8	19		M		
1710										
	1,709.5	13.5	5	2	2	4		M		
1705										
	1,704.5	18.5	31	65	35/0.3	100/0.8				1,704.0 19.0
1700										WEATHERED ROCK
	1,699.5	23.5	100/0.4			100/0.4				Gray-tan-red, (BIOTITE SCHIST).
1695										1,696.0 27.0
	1,694.5	28.5	9	12	19	31		M		RESIDUAL
1690										Gray-tan, fine to coarse sandy SILT (A-4), with trace gravel-sized rock fragments & mica.
	1,689.5	33.5	22	34	24	58		M		
1685										
	1,684.5	38.5	9	16	17	33		M		
1680										
	1,679.5	43.5	100/0.5			100/0.5				1,679.5 43.5
1675										WEATHERED ROCK
	1,674.5	48.5	35	60	40/0.3	100/0.8				Tan-gray & black, (BIOTITE SCHIST).
1670										
	1,669.5	53.5	100/0.3			100/0.3				1,669.2 53.8
										Boring Terminated at Elevation 1,669.2 ft IN WEATHERED ROCK (BIOTITE SCHIST)

Surficial Organic Soils from 0.0-0.2'.

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_2100R3	**STATION** 21+00	**OFFSET** 205 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,748.3 ft	**TOTAL DEPTH** 40.0 ft	**NORTHING** 535,945	**EASTING** 506,396	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/01/13	**COMP. DATE** 07/01/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1750										
	1,748.3	0.0								1,748.3 GROUND SURFACE 0.0
			3	5	7	12	SS-129	15%		**ARTIFICIAL FILL**
1745	1,744.8	3.5								1,746.3 Red-tan, coarse to fine sandy, clayey SILT (A-5(6), with trace mica. 2.0
			8	11	11	22		M		**RESIDUAL**
1740	1,739.8	8.5								Gray-tan & black-white, fine sandy SILT (A-4(0)), with trace gravel-sized rock fragments.
			10	8	5	13		M		
1735	1,734.8	13.5								
			4	5	6	11		M		
1730	1,729.8	18.5								
			2	3	4	7	SS-133	24%		
1725	1,724.8	23.5								
			12	15	16	31		M		
1720	1,719.8	28.5								
			14	15	11	26		M		
1715	1,714.8	33.5								
			6	7	10	17		M		
1710	1,709.8	38.5								
			22	33	38	71		M		1,708.3 40.0
										Boring Terminated at Elevation 1,708.3 ft IN RESIDUAL (SILT)
										Surficial Organic Soils from 0.0-0.2'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_2200L	**STATION** 22+00	**OFFSET** 30 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,671.8 ft	**TOTAL DEPTH** 35.6 ft	**NORTHING** 536,189	**EASTING** 506,452	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/24/13	**COMP. DATE** 07/24/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1675										
										1,671.8 GROUND SURFACE 0.0
1670										**RESIDUAL**
										Medium stiff to hard, moist, brown-orange & gray-tan, fine sandy SILT (A-4), with trace mica.
1665										
1660										
1655										
1650										
1645										
1640										1,639.8 32.0
										WEATHERED ROCK
										Gray-tan, (BIOTITE SCHIST).
										1,636.2 35.6
										Boring Terminated by Auger Refusal at Elevation 1,636.2 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_2250R2	**STATION** 22+50	**OFFSET** 120 ft RT	**ALIGNMENT** -L- — **0 HR.** Dry
COLLAR ELEV. 1,728.8 ft	**TOTAL DEPTH** 53.0 ft	**NORTHING** 536,036	**EASTING** 506,470 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/16/13	**COMP. DATE** 07/16/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
1730										
										1,728.8 GROUND SURFACE 0.0
										RESIDUAL Medium stiff to hard, moist, red-orange & gray-tan, fine sandy SILT (A-4), with trace mica.
1725										
1720										
1715										
1710										
1705										
1700										
1695										
1690										
1685										
1680										1,675.8 53.0
										Boring Terminated at Elevation 1,675.8 ft IN RESIDUAL (SILT)
										Surficial Organic Soils from 0.0-0.2'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_2300	**STATION** 23+00	**OFFSET** CL	**ALIGNMENT** -L- — **0 HR.** Dry
COLLAR ELEV. 1,668.7 ft	**TOTAL DEPTH** 28.0 ft	**NORTHING** 536,134	**EASTING** 506,547 — **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/24/13	**COMP. DATE** 07/24/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1670										1,668.7 GROUND SURFACE 0.0
										RESIDUAL Medium stiff to hard, moist, brown-orange & gray-tan, fine sandy SILT (A-4), with trace mica.
1665										
1660										
1655										
1650										
1645										1,644.7 24.0
										WEATHERED ROCK Gray-tan, (BIOTITE SCHIST).
										1,640.7 28.0
										Boring Terminated by Auger Refusal at Elevation 1,640.7 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_2300R	**STATION** 23+00	**OFFSET** 65 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,701.0 ft	**TOTAL DEPTH** 44.6 ft	**NORTHING** 536,076	**EASTING** 506,518	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 06/28/13	**COMP. DATE** 06/28/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
1705										
	1,701.0	0.0	4	4	4	8		M		1,701.0 0.0 GROUND SURFACE
1700	1,697.5	3.5	4	5	5	10		M		**RESIDUAL** Tan & gray, coarse to fine sandy SILT (A-4), with trace gravel-sized rock fragments & mica.
1695	1,692.5	8.5	8	14	17	31		M		
1690	1,687.5	13.5	8	19	19	38		M		
1685	1,682.5	18.5	100/0.5			100/0.5				1,683.0 18.0 **WEATHERED ROCK** Tan & gray, (BIOTITE SCHIST).
1680	1,679.0	22.0								1,679.0 22.0 **RESIDUAL** Gray-tan & black, fine to coarse sandy SILT (A-4), with trace gravel-sized rock fragments, saprolitic.
	1,677.5	23.5	5	7	11	18		M		
1675	1,672.5	28.5	12	14	80	94		M		
1670	1,670.0	31.0								1,670.0 31.0 **WEATHERED ROCK** Gray-tan & black, (BIOTITE SCHIST).
	1,667.5	33.5	18	82/0.4		100/0.9				
1665	1,662.5	38.5	60/0.1			60/0.1				1,662.5 38.5 **CRYSTALLINE ROCK** Gray, (BIOTITE SCHIST).
1660	1,657.5	43.5	60/0.1			60/0.1				
	1,656.4	44.6	60/0.0			60/0.0				1,656.4 44.6 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,656.4 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST)

Surficial Organic Soils from 0.0-0.2'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_2300R2	**STATION** 23+00	**OFFSET** 120 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,727.9 ft	**TOTAL DEPTH** 50.0 ft	**NORTHING** 536,028	**EASTING** 506,494	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/01/13	**COMP. DATE** 07/01/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1730										
	1,727.9	0.0	2	1	1	2		43% M		1,727.9 0.0 GROUND SURFACE
1725	1,724.4	3.5	5	9	14	23		M		1,727.2 0.7 Brown, fine sandy SILT (A-4), with some organics. **RESIDUAL** Red-tan & gray, fine sandy SILT (A-4), with trace gravel-sized rock fragments from 23.5-30.0'.
1720	1,719.4	8.5	13	16	12	28		M		
1715	1,714.4	13.5	7	7	10	17		M		
1710	1,709.4	18.5	22	16	15	31		M		
1705	1,704.4	23.5	18	50	33	83		M		
1700	1,699.4	28.5	19	17	10	27		M		
1695	1,694.4	33.5	50	28	25	53		D		
1690	1,689.4	38.5	57	43/0.3		100/0.8				1,689.4 38.5 **WEATHERED ROCK** Gray-tan, (BIOTITE SCHIST).
1685	1,684.4	43.5	100/0.5			100/0.5				1,680.9 47.0 **RESIDUAL** Gray-tan, fine sandy SILT (A-4).
1680	1,679.4	48.5	7	12	19	31		M		1,677.9 50.0 Boring Terminated at Elevation 1,677.9 ft IN RESIDUAL (SILT)

Other Samples:
O-501 (0.0 - 0.7)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_2400L	**STATION** 24+00	**OFFSET** 40 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,701.9 ft	**TOTAL DEPTH** 72.0 ft	**NORTHING** 536,096	**EASTING** 506,655	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/24/13	**COMP. DATE** 07/24/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT 0.5ft 0.5ft 0.5ft | BLOWS PER FOOT 0 25 50 75 100 | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION

1705 / 1700 / 1695 / 1690 / 1685 / 1680 / 1675 / 1670 / 1665 / 1660 / 1655 / 1650 / 1645 / 1640 / 1635 / 1630

ELEV (ft) 1,701.9 — DEPTH (ft) 0.0
GROUND SURFACE

RESIDUAL
Medium stiff to hard, moist, brown-orange & gray-tan, fine sandy SILT (A-4), with trace mica.

ELEV (ft) 1,659.9 — DEPTH (ft) 42.0
WEATHERED ROCK
Gray-tan, (BIOTITE SCHIST).

ELEV (ft) 1,629.9 — DEPTH (ft) 72.0
Boring Terminated by Auger Refusal at Elevation 1,629.9 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_2400R	**STATION** 24+00	**OFFSET** 60 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,701.3 ft	**TOTAL DEPTH** 44.7 ft	**NORTHING** 536,034	**EASTING** 506,577	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/24/13	**COMP. DATE** 07/24/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft) | DRIVE ELEV (ft) | DEPTH (ft) | BLOW COUNT 0.5ft 0.5ft 0.5ft | BLOWS PER FOOT 0 25 50 75 100 | SAMP. NO. | MOI | LOG | SOIL AND ROCK DESCRIPTION

1705 / 1700 / 1695 / 1690 / 1685 / 1680 / 1675 / 1670 / 1665 / 1660

ELEV (ft) 1,701.3 — DEPTH (ft) 0.0
GROUND SURFACE

RESIDUAL
Medium stiff to hard, moist, brown-orange & gray-tan, fine sandy SILT (A-4), with trace mica.

ELEV (ft) 1,673.3 — DEPTH (ft) 28.0
WEATHERED ROCK
Gray-tan, (BIOTITE SCHIST).

ELEV (ft) 1,656.6 — DEPTH (ft) 44.7
Boring Terminated by Auger Refusal at Elevation 1,656.6 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_2500	**STATION** 25+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,702.7 ft	**TOTAL DEPTH** 53.7 ft	**NORTHING** 535,982	**EASTING** 506,667	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/01/13	**COMP. DATE** 07/01/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1705	1,702.7	0.0	2	3	3	6		M		1,702.7 GROUND SURFACE 0.0
1700	1,699.2	3.5	8	6	5	11	S-3	18% M		**ARTIFICIAL FILL** Tan-red, fine sandy SILT (A-4), with trace gravel, roots & mica. 1,700.7 — 2.0
1695	1,694.2	8.5	2	4	12	16		M		**RESIDUAL** Tan-red & gray-blue, fine to coarse sandy SILT (A-4(1)), with trace mica & gravel-sized rock fragments. 1,695.7 — 7.0
1690	1,689.2	13.5	11	35	34	69		M		Gray-tan, silty fine SAND (A-2-4), with trace gravel-sized rock fragments.
1685	1,684.2	18.5	7	13	32	45		M		
1680	1,679.2	23.5	5	5	4	9		M		
1675	1,674.2	28.5	13	16	19	35		M		
1670	1,669.2	33.5	20	24	26	50		M		
1665	1,664.2	38.5	38	28	21	49		M		
1660	1,659.2	43.5	16	20	15	35		M		
1655	1,654.2	48.5	29	52	30	82		M		
1650	1,649.2	53.5	100/0.2			100/0.2		M		1,649.2 — 53.5; 1,649.0 — 53.7 **WEATHERED ROCK** Gray-blue, (BIOTITE SCHIST). Boring Terminated at Elevation 1,649.0 ft IN WEATHERED ROCK (BIOTITE SCHIST)

Other Samples:
CBR-3 (2.0 - 5.0)

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_2500R	**STATION** 25+00	**OFFSET** 120 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,735.4 ft	**TOTAL DEPTH** 40.0 ft	**NORTHING** 535,955	**EASTING** 506,551	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/01/13	**COMP. DATE** 07/01/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1740	1,735.4	0.0	2	2	3	5	SS-148	25% 21%		1,735.4 GROUND SURFACE 0.0; 1,734.9 — 0.5
1735	1,731.9	3.5	12	13	21	34		M		Brown, silty fine SAND (A-1-b), with little organics. 1,733.4 — 2.0
1730	1,726.9	8.5	10	11	9	20		M		**RESIDUAL** Red-tan, silty fine to coarse SAND (A-1-b(0)), with some clay. Red-tan, silty coarse to fine SAND (A-2-4).
1725	1,721.9	13.5	8	13	15	28		M		
1720	1,716.9	18.5	21	19	14	33		M		
1715	1,711.9	23.5	39	61/0.4		100/0.9		M		1,711.9 — 23.5 **WEATHERED ROCK** Gray-tan, (BIOTITE SCHIST). 1,708.4 — 27.0
1710	1,706.9	28.5	13	13	10	23		M		**RESIDUAL** Gray-tan, silty fine SAND (A-2-4), with trace gravel-sized rock fragments. 1,701.9 — 33.5
1705	1,701.9	33.5	32	68/0.3		100/0.8		M		**WEATHERED ROCK** Gray-tan-black, (BIOTITE SCHIST). 1,698.4 — 37.0
1700	1,696.9	38.5	21	16	14	30		M		**RESIDUAL** Gray-tan-black, silty fine SAND (A-2-4). 1,695.4 — 40.0

Boring Terminated at Elevation 1,695.4 ft IN RESIDUAL (SAND)

Other Samples:
O-502 (0.0 - 0.5)

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_2500R2	**STATION** 25+00	**OFFSET** 205 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,750.3 ft	**TOTAL DEPTH** 68.5 ft	**NORTHING** 535,937	**EASTING** 506,470	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/02/13	**COMP. DATE** 07/02/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1755											
1750	1,750.3	0.0	2	3	5	8		M		1,750.3 GROUND SURFACE	0.0
										RESIDUAL Gray-tan-red, silty fine SAND (A-2-4).	
	1,746.8	3.5	4	7	8	15		M			
1745											
	1,741.8	8.5	5	6	9	15		M			
1740											
	1,736.8	13.5	4	9	10	19		M			
1735											
	1,731.8	18.5	9	21	28	49		M			
1730											
	1,726.8	23.5	7	13	21	34		M			
1725											
	1,721.8	28.5	22	33	28	61		M			
1720											
	1,716.8	33.5	5	5	6	11		M			
1715											
	1,711.8	38.5	9	9	13	22		M			
1710											
	1,706.8	43.5	11	33	39	72		M			
1705											
	1,701.8	48.5	10	53	47/0.2	100/0.7				1,701.3 **WEATHERED ROCK** Gray-white & black, (BIOTITE SCHIST).	49.0
1700										1,698.3 **RESIDUAL** Tan-gray & white, silty fine to coarse SAND (A-1-b(0)), with trace gravel-sized rock fragments & clay.	52.0
	1,696.8	53.5	21	18	24	42		M			
1695											
	1,691.8	58.5	11	16	25	41	SS-168	16%			
1690											
	1,686.8	63.5	60/0.1			60/0.1				1,686.8 **CRYSTALLINE ROCK** Gray, (BIOTITE SCHIST).	63.5
1685											
	1,681.8	68.5	60/0.0			60/0.0				1,681.8 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,681.8 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST)	68.5
										Surficial Organic Soils from 0.0-0.2'.	

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_2700	**STATION** 27+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,689.7 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 535,785	**EASTING** 506,701	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/11/13	**COMP. DATE** 07/11/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
1690											
	1,689.7	0.0	3	2	2	4		29%		1,689.7 GROUND SURFACE	0.0
								M		1,688.8 Brown, silty fine SAND (A-2-4), with trace organics.	0.9
	1,686.2	3.5	1	1	1	2		M		**RESIDUAL** Red-tan & black, silty fine SAND (A-2-4), with trace gravel.	
1685											
	1,681.2	8.5	8	7	7	14		M		1,682.7 Gray-white & black, fine to coarse sandy SILT (A-4).	7.0
1680											
	1,676.2	13.5	5	6	5	11		M			
1675											
	1,671.2	18.5	7	9	10	19		M			
1670											
	1,666.2	23.5	10	6	5	11		M			
1665											
	1,661.2	28.5	7	6	6	12		M		1,667.7 Gray-brown & white, silty fine SAND (A-2-4).	22.0
1660											
								M		1,659.7 Boring Terminated at Elevation 1,659.7 ft IN RESIDUAL (SAND)	30.0
										Other Samples: O-261 (0.0 - 0.9)	

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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_2700R	**STATION** 27+00	**OFFSET** 65 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,706.2 ft	**TOTAL DEPTH** 20.0 ft	**NORTHING** 535,770	**EASTING** 506,638	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 06/28/13	**COMP. DATE** 06/28/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1710											
	1,706.2	0.0								1,706.2 GROUND SURFACE	0.0
1705			4	3	2	5		M		**ARTIFICIAL FILL**	
	1,702.7	3.5								1,704.2 Tan-gray, fine to coarse sandy SILT (A-4).	2.0
			4	4	7	11		M		**RESIDUAL** Tan-gray & black, fine to coarse sandy SILT (A-4), with trace mica & gravel-sized rock fragments.	
1700											
	1,697.7	8.5									
			3	5	7	12		M			
1695											
	1,692.7	13.5									
			4	4	4	8		M			
1690											
	1,687.7	18.5									
			5	6	7	13		M		1,686.2	20.0
										Boring Terminated at Elevation 1,686.2 ft IN RESIDUAL (SILT)	
										Surficial Organic Soils from 0.0-0.2'.	

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_2900	**STATION** 29+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,644.0 ft	**TOTAL DEPTH** 28.5 ft	**NORTHING** 535,604	**EASTING** 506,784	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/11/13	**COMP. DATE** 07/11/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
1645											
	1,644.0	0.0	1	WOH	1	1		M		1,644.0 GROUND SURFACE	0.0
1640										**RESIDUAL**	
	1,640.5	3.5	1	2	5	7		M		1,642.0 Brown, fine sandy SILT (A-4).	2.0
1635										Gray-tan, silty fine SAND (A-2-4), with trace gravel-sized rock fragments from 8.5-10.0'.	
	1,635.5	8.5	6	8	31	39		M			
1630										1,632.0 Gray, fine sandy SILT (A-4).	12.0
	1,630.5	13.5	26	28	36	64		M			
1625											
	1,625.5	18.5	6	9	91/0.5	100/1.0				1,625.0 **WEATHERED ROCK** Gray-tan, (BIOTITE SCHIST).	19.0
1620			100/0.4			100/0.4					
	1,620.5	23.5									
	1,615.5	28.5	60/0.0			60/0.0				1,615.5 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,615.5 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)	28.5
										Surficial Organic Soils from 0.0-0.2'.	

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3000R	**STATION** 30+00	**OFFSET** 26 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,689.3 ft	**TOTAL DEPTH** 30.0 ft	**NORTHING** 535,511	**EASTING** 506,833	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/11/13	**COMP. DATE** 07/11/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
										1,689.3 GROUND SURFACE	0.0
	1,689.3	0.0	3	3	3	6		M		ARTIFICIAL FILL	
1690										1,687.3 Red-brown, fine sandy SILT (A-4).	2.0
	1,685.8	3.5	2	2	2	4		M		RESIDUAL	
1685										Tan-brown, silty fine SAND (A-2-4).	
	1,680.8	8.5	11	5	11	16		M		1,682.3	7.0
1680										Gray-orange & black, fine sandy SILT (A-4).	
	1,675.8	13.5	3	6	14	20		M			
1675											
	1,670.8	18.5	15	17	14	31		M			
1670											
	1,665.8	23.5	4	6	12	18		M			
1665											
	1,660.8	28.5	6	18	28	46		M		1,659.3	30.0
1660										Boring Terminated at Elevation 1,659.3 ft IN RESIDUAL (SILT)	
										Surficial Organic Soils from 0.0-0.2'.	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3050R	**STATION** 30+50	**OFFSET** 26 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,688.1 ft	**TOTAL DEPTH** 85.0 ft	**NORTHING** 535,477	**EASTING** 506,873	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/09/13	**COMP. DATE** 07/09/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
1690											
	1,688.1	0.0								1,688.1 GROUND SURFACE	0.0
1685			2	1	2	3		M		1,686.1 **ARTIFICIAL FILL** Red-brown, silty fine SAND (A-2-4).	2.0
	1,684.6	3.5								**RESIDUAL** Tan-gray, fine sandy SILT (A-4).	
			5	7	8	15		M			
1680	1,679.6	8.5									
			3	3	8	11		M			
1675	1,674.6	13.5								1,676.1 Black-tan & white, silty fine to coarse SAND (A-2-4).	12.0
			4	10	11	21		M			
1670	1,669.6	18.5								1,671.1 Tan-brown & white, fine sandy SILT (A-4) with trace gravel-sized rock fragments from 28.5-35.0'.	17.0
			12	16	18	34		M			
1665	1,664.6	23.5									
			7	17	20	37		M			
1660	1,659.6	28.5									
			9	16	20	36		M			
1655	1,654.6	33.5									
			7	8	22	30		M			
1650	1,649.6	38.5									
			12	14	15	29		M			
1645	1,644.6	43.5									
			11	21	40	61		M			
1640	1,639.6	48.5									
			12	22	30	52		M			
1635	1,634.6	53.5								1,634.6 **WEATHERED ROCK** Tan-brown & black, (BIOTITE SCHIST).	53.5
			30	70/0.4		100/0.9					
1630	1,629.6	58.5									
			100/0.4			100/0.4					
1625	1,624.6	63.5									
			68	32/0.1		100/0.6					
1620	1,619.6	68.5									
			21	20	39	59		W		1,621.1 **RESIDUAL** Tan-gray, fine sandy SILT (A-4).	67.0
1615	1,614.6	73.5									
			26	44	56/0.2	100/0.7				1,614.1 **WEATHERED ROCK** Tan-gray & black, (BIOTITE SCHIST).	74.0
1610											

NCDOT BORE DOUBLE 63R0047_BORELOGS_SUB.GPJ NC_DOT.GDT 8/2/13

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3050R	**STATION** 30+50	**OFFSET** 26 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,688.1 ft	**TOTAL DEPTH** 85.0 ft	**NORTHING** 535,477	**EASTING** 506,873	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/09/13	**COMP. DATE** 07/09/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1610						Match Line				
	1,609.6	78.5	11	30	70/0.5	100/1.0				**WEATHERED ROCK** Tan-gray & black, (BIOTITE SCHIST). *(continued)*
1605										1,606.1 — 82.0
	1,604.6	83.5	14	24	54	78		W		**RESIDUAL** Tan-gray, fine sandy SILT (A-4).
										1,603.1 — 85.0
										Boring Terminated at Elevation 1,603.1 ft IN RESIDUAL (SILT)
										Surficial Organic Soils from 0.0-0.2'.

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_3100L	**STATION** 31+00	**OFFSET** 38 ft LT	**ALIGNMENT** -L- / **0 HR.** Dry
COLLAR ELEV. 1,653.6 ft	**TOTAL DEPTH** 35.0 ft	**NORTHING** 535,499	**EASTING** 506,952 / **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/08/13	**COMP. DATE** 07/08/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1655										
	1,653.6	0.0	WOH	1	2	3		M		1,653.6 GROUND SURFACE 0.0 **RESIDUAL** Brown-red, fine sandy SILT (A-4), with trace gravel.
1650	1,650.1	3.5	WOH	1	1	2		M		
1645	1,645.1	8.5	16	8	7	15		M		1,646.6 7.0 Brown-tan & black, silty fine SAND (A-2-4).
1640	1,640.1	13.5	8	14	23	37		M		
1635	1,635.1	18.5	23	77/0.5		100/1.0				1,635.1 18.5 **WEATHERED ROCK** Tan-orange-gray, (BIOTITE SCHIST).
1630	1,630.1	23.5	7	13	19	32		M		1,631.6 22.0 **RESIDUAL** Brown-tan & black, silty fine SAND (A-2-4).
1625	1,625.1	28.5	43	48	52/0.2	100/0.7				1,625.1 28.5 **WEATHERED ROCK** Red-tan-gray, (BIOTITE SCHIST).
1620	1,620.1	33.5	16	19	26	45		M		1,621.6 32.0 **RESIDUAL** Tan-black, fine sandy SILT (A-4) with trace gravel-sized rock fragments. 1,618.6 35.0 Boring Terminated at Elevation 1,618.6 ft IN RESIDUAL (SILT) Surficial Organic Soils from 0.0-0.2'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_3100L2	**STATION** 31+00	**OFFSET** 92 ft LT	**ALIGNMENT** -L- / **0 HR.** Dry
COLLAR ELEV. 1,632.5 ft	**TOTAL DEPTH** 20.0 ft	**NORTHING** 535,542	**EASTING** 506,984 / **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/11/13	**COMP. DATE** 07/11/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1635										
	1,632.5	0.0	1	2	2	4		M		1,632.5 GROUND SURFACE 0.0
1630	1,629.0	3.5	2	3	7	10		M		**RESIDUAL** 1,630.5 Red-brown, silty fine SAND (A-2-4). 2.0 Tan-brown, fine sandy SILT (A-4), with trace gravel-sized rock fragments.
1625	1,624.0	8.5	16	18	18	36		M		1,625.5 7.0 Tan-red & gray-white, silty fine SAND (A-2-4).
1620	1,619.0	13.5	11	10	13	23		M		
1615	1,614.0	18.5	8	7	22	29		M		1,612.5 20.0 Boring Terminated at Elevation 1,612.5 ft IN RESIDUAL (SAND) Surficial Organic Soils from 0.0-0.2'.

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3100R	**STATION** 31+00	**OFFSET** 25 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,682.8 ft	**TOTAL DEPTH** 20.0 ft	**NORTHING** 535,448	**EASTING** 506,914	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/02/13	**COMP. DATE** 07/02/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1685										
	1,682.8	0.0								1,682.8 GROUND SURFACE 0.0
			2	2	2	4		M		1,682.5 Surficial Organic Soils (0.3') 0.3
1680	1,679.3	3.5	WOH	1	1	2		M		ARTIFICIAL FILL Red-tan & black, fine sandy SILT (A-4), with trace gravel.
1675	1,674.3	8.5	3	3	8	11		M		1,675.8 7.0 RESIDUAL Red-tan & black, coarse to fine sandy SILT (A-4(0)), with little clay & trace gravel-sized rock fragments from 8.5-15.0'.
1670	1,669.3	13.5	17	38	35	73		M		
1665	1,664.3	18.5	11	8	10	18	SS-175	31%		1,662.8 20.0 Boring Terminated at Elevation 1,662.8 ft IN RESIDUAL (SILT)

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3150L	**STATION** 31+50	**OFFSET** 85 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,626.1 ft	**TOTAL DEPTH** 13.0 ft	**NORTHING** 535,507	**EASTING** 507,020	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/11/13	**COMP. DATE** 07/11/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1630										
	1,626.1	0.0								1,626.1 GROUND SURFACE 0.0
1625			WOH	1	3	4		M		RESIDUAL Red, fine sandy SILT (A-4).
	1,622.6	3.5	53	47/0.4		100/0.9				1,622.6 3.5 WEATHERED ROCK Tan-gray, (BIOTITE SCHIST).
1620										1,619.1 7.0
	1,617.6	8.5	13	11	9	20		M		RESIDUAL Tan-gray, fine sandy SILT (A-4).
1615	1,613.1	13.0	60/0.0			60/0.0				1,613.1 13.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,613.1 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST) Surficial Organic Soils from 0.0-0.2'.

NCDOT GEOTECHNICAL ENGINEERING UNIT
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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3150R	**STATION** 31+50	**OFFSET** 26 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,678.1 ft	**TOTAL DEPTH** 42.0 ft	**NORTHING** 535,418	**EASTING** 507,020	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/09/13	**COMP. DATE** 07/09/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
1680										
	1,678.1	0.0	2	3	2	5		M		1,678.1 GROUND SURFACE 0.0
1675										**ARTIFICIAL FILL**
	1,674.6	3.5								1,676.1 Red-brown & tan, silty fine SAND (A-2-4), with trace gravel. 2.0
			24	33	41	74		M		**RESIDUAL**
1670										Red-brown & tan, silty fine SAND (A-2-4), with trace gravel-sized rock fragments.
	1,669.6	8.5								
			7	11	13	24		M		
1665										
	1,664.6	13.5								1,666.1 12.0
			10	22	21	43		M		Brown-tan & gray, fine sandy SILT (A-4).
1660										
	1,659.6	18.5								
			8	8	9	17		M		
1655										
	1,654.6	23.5								1,656.1 22.0
			8	6	14	20		W		Black-gray, silty fine SAND (A-2-4).
1650										
	1,649.6	28.5								1,649.6 28.5
			38	62/0.1		100/0.6				**WEATHERED ROCK**
1645										Gray, (BIOTITE SCHIST).
	1,644.6	33.5								
			42	62	38/0.5	100/1.0				
1640										
	1,639.6	38.5								
			23	77/0.4		100/0.9				
	1,636.1	42.0								1,636.1 42.0
			60/0.0			60/0.0				Boring Terminated with Standard Penetration Test Refusal at Elevation 1,636.1 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)
										Surficial Organic Soils from 0.0-0.2'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3200L	**STATION** 32+00	**OFFSET** 80 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,629.0 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 535,473	**EASTING** 507,058	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/11/13	**COMP. DATE** 07/11/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1630										
	1,629.0	0.0								1,629.0 GROUND SURFACE 0.0
			7	18	19	37		M		**RESIDUAL**
	1,626.0	3.0								1,626.0 Tan-gray, silty fine SAND (A-2-4) with little gravel-sized rock fragments. 3.0
			60/0.0			60/0.0				Boring Terminated with Standard Penetration Test Refusal at Elevation 1,626.0 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)
										Surficial Organic Soils from 0.0-0.2'.

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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3200R	**STATION** 32+00	**OFFSET** 26 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,677.9 ft	**TOTAL DEPTH** 23.0 ft	**NORTHING** 535,388	**EASTING** 506,994	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/11/13	**COMP. DATE** 07/11/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1680										ELEV. (ft) DEPTH (ft)
	1,677.9	0.0								1,677.9 GROUND SURFACE 0.0
1675			2	2	2	4		M		**ARTIFICIAL FILL** Red, silty fine SAND (A-2-4), with trace gravel-sized rock fragments.
	1,674.4	3.5	2	1	2	3		M		
1670										1,670.9 7.0
	1,669.4	8.5	3	3	3	6		M		**RESIDUAL** Tan-brown & gray, silty fine SAND (A-2-4).
1665										
	1,664.4	13.5	4	3	4	7		M		
1660										
	1,659.4	18.5	9	6	3	9		M		
1655	1,655.0	22.9	60/0.1			60/0.1				1,655.0 22.9
	1,654.9	23.0								1,654.9 **CRYSTALLINE ROCK** (BIOTITE SCHIST) 23.0

Boring Terminated with Standard Penetration Test Refusal at Elevation 1,654.9 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST)

Surficial Organic Soils from 0.0-0.2'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3223L	**STATION** 32+23	**OFFSET** 73 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,633.6 ft	**TOTAL DEPTH** 4.0 ft	**NORTHING** 535,453	**EASTING** 507,071	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/10/13	**COMP. DATE** 07/10/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1635										
	1,633.6	0.0								1,633.6 GROUND SURFACE 0.0
1630			3	2	2	4		M		**RESIDUAL** Red-brown, silty fine SAND (A-2-4), with trace gravel-sized rock fragments.
	1,630.1	3.5	60/0.1			60/0.1				1,630.1 3.5
	1,629.6	4.0	60/0.0			60/0.0				1,629.6 **CRYSTALLINE ROCK** Gray, (BIOTITE SCHIST). 4.0

Boring Terminated with Standard Penetration Test Refusal at Elevation 1,629.6 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST)

Surficial Organic Soils from 0.0-0.2'.

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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3250L	**STATION** 32+50	**OFFSET** 65 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,636.5 ft	**TOTAL DEPTH** 8.0 ft	**NORTHING** 535,431	**EASTING** 507,088	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/11/13	**COMP. DATE** 07/11/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1640										ELEV. (ft) DEPTH (ft)
	1,636.5	0.0								1,636.5 GROUND SURFACE 0.0
1635			1	2	3	5		M		**RESIDUAL** Brown-tan & gray, fine sandy SILT (A-4).
	1,633.0	3.5	60/0.0			60/0.0				1,633.0 3.5 **CRYSTALLINE ROCK** Gray, (BIOTITE SCHIST).
1630	1,628.5	8.0	60/0.0			60/0.0				1,628.5 8.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,628.5 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST) Surficial Organic Soils from 0.0-0.2'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3250R	**STATION** 32+50	**OFFSET** 26 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,677.0 ft	**TOTAL DEPTH** 31.0 ft	**NORTHING** 535,358	**EASTING** 507,034	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/09/13	**COMP. DATE** 07/09/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1680										
	1,677.0	0.0								1,677.0 GROUND SURFACE 0.0
1675			2	2	1	3		M		1,675.0 **ARTIFICIAL FILL** Red-tan-gray, fine sandy SILT (A-4), with trace gravel. 2.0
	1,673.5	3.5	2	10	10	20		M		**RESIDUAL** Red-tan-gray, fine sandy SILT (A-4), with trace gravel-sized rock fragments.
1670	1,668.5	8.5	10	12	6	18		M		
1665	1,663.5	13.5	18	17	11	28		M		
1660	1,658.5	18.5	3	5	15	20		M		
1655	1,653.5	23.5	60/0.1			60/0.1				1,653.5 23.5 **CRYSTALLINE ROCK** Gray, (BIOTITE SCHIST).
1650	1,648.5	28.5	60/0.1			60/0.1				
	1,646.0	31.0	60/0.0			60/0.0				1,646.0 31.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,646.0 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST) Surficial Organic Soils from 0.0-0.2'.

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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_3300L	**STATION** 33+00	**OFFSET** 22 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,645.9 ft	**TOTAL DEPTH** 12.0 ft	**NORTHING** 535,366	**EASTING** 507,103	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/02/13	**COMP. DATE** 07/02/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1650										ELEV. (ft) DEPTH (ft)
	1,645.9	0.0								1,645.9 GROUND SURFACE 0.0
1645			2	1	2	3		M		**RESIDUAL**
	1,642.4	3.5								1,643.9 Red-brown, fine sandy SILT (A-4). 2.0
			4	5	6	11	SS-180	22%		Tan-black, silty fine to coarse SAND (A-2-4(0)), with little gravel-sized rock fragments & clay.
1640										
	1,637.4	8.5								
			46	11	14	25		D		
1635										
	1,633.9	12.0	60/0.0			60/0.0				1,633.9 12.0
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,633.9 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)
										Surficial Organic Soils from 0.0-0.2'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_3300R	**STATION** 33+00	**OFFSET** 26 ft RT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,674.9 ft	**TOTAL DEPTH** 15.0 ft	**NORTHING** 535,328	**EASTING** 507,074	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/02/13	**COMP. DATE** 07/02/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1675										
	1,674.9	0.0	5	2	3	5		M		1,674.9 GROUND SURFACE 0.0
	1,671.4	3.5								**ARTIFICIAL FILL**
1670			2	2	2	4		M		1,672.9 Brown-red, fine sandy SILT (A-4). 2.0
										RESIDUAL
										Brown, silty fine SAND (A-2-4).
	1,666.4	8.5								1,667.9 7.0
1665			3	3	4	7		M		Tan, fine sandy SILT (A-4).
	1,661.4	13.5								
1660			9	7	5	12		M		1,659.9 15.0
										Boring Terminated at Elevation 1,659.9 ft IN RESIDUAL (SILT)
										Surficial Organic Soils from 0.0-0.2'.

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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3327L	**STATION** 33+27	**OFFSET** 5 ft LT	**ALIGNMENT** -L-	**0 HR.** Dry
COLLAR ELEV. 1,649.0 ft	**TOTAL DEPTH** 13.5 ft	**NORTHING** 535,337	**EASTING** 507,114	**24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/11/13	**COMP. DATE** 07/11/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1650										
	1,649.0	0.0	2	2	2	4		128% M		1,649.0 / 0.0 GROUND SURFACE
										1,648.3 / 0.7 Brown, fine sandy SILT (A-4), with some organics.
1645	1,645.5	3.5	3	4	6	10		M		RESIDUAL Red-tan & gray, fine sandy SILT (A-4).
										1,642.0 / 7.0
1640	1,640.5	8.5	60/0.1			60/0.1				1,640.5 / 8.5 WEATHERED ROCK Gray-tan, (BIOTITE SCHIST). CRYSTALLINE ROCK (BIOTITE SCHIST)
	1,635.5	13.5	60/0.0			60/0.0				1,635.5 / 13.5 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,635.5 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST)

Surficial Organic Soils from 0.0-0.2'.

Other Samples:
O-287 (0.0 - 0.7)

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3500R2	**STATION** 35+00	**OFFSET** 74 ft RT	**ALIGNMENT** -L-	**0 HR.** 20.0
COLLAR ELEV. 1,654.6 ft	**TOTAL DEPTH** 30.8 ft	**NORTHING** 535,172	**EASTING** 507,166	**24 HR.** 12.3
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/09/13	**COMP. DATE** 07/09/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1655										
	1,654.6	0.0	4	4	3	7		M		1,654.6 / 0.0 GROUND SURFACE
										ARTIFICIAL FILL Red, silty fine SAND (A-2-4), with trace gravel.
1650	1,651.1	3.5	1	1	2	3		M		1,647.6 / 7.0 RESIDUAL Tan-gray & black, fine sandy SILT (A-4).
1645	1,646.1	8.5	6	10	12	22		M		
1640	1,641.1	13.5	6	7	10	17		M		1,637.6 / 17.0 Gray, silty fine to coarse SAND (A-2-4), with trace gravel-sized rock fragments.
1635	1,636.1	18.5	28	16	15	31		M		
1630	1,631.1	23.5	40	60/0.5		100/1.0				1,631.1 / 23.5 WEATHERED ROCK Gray, (BIOTITE SCHIST).
1625	1,626.1	28.5	80	20/0.1		100/0.6				
	1,623.8	30.8	60/0.0			60/0.0				1,623.8 / 30.8 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,623.8 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)

Surficial Organic Soils from 0.0-0.2'.

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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_3550R	**STATION** 35+50	**OFFSET** 20 ft RT	**ALIGNMENT** -L- — **0 HR.** 8.0
COLLAR ELEV. 1,651.9 ft	**TOTAL DEPTH** 18.5 ft	**NORTHING** 535,157	**EASTING** 507,234 — **24 HR.** 4.0
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/11/13	**COMP. DATE** 07/11/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1655										
	1,651.9	0.0	1	2	1	3		W		1,651.9 — GROUND SURFACE — 0.0
1650	1,649.9	2.0								1,649.9 — **ARTIFICIAL FILL** Red-brown, SILT (A-5). — 2.0
	1,648.4	3.5	8	15	14	29				**RESIDUAL** Tan-brown, fine sandy SILT (A-4), with little gravel-sized rock fragments from 8.5-10'.
1645								M		
	1,643.4	8.5	10	6	5	11				
1640	1,638.4	13.5						M		1,638.4 — 13.5
			8	35	65/0.4	100/0.9				**WEATHERED ROCK** Gray-tan, (BIOTITE SCHIST).
1635	1,633.4	18.5	60/0.0			60/0.0				1,633.4 — 18.5
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,633.4 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)
										Surficial Organic Soils from 0.0-0.2'.

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY			**GROUND WTR (ft)**
BORING NO. L_3600R	**STATION** 36+00	**OFFSET** 23 ft RT	**ALIGNMENT** -L- — **0 HR.** 13.0
COLLAR ELEV. 1,656.3 ft	**TOTAL DEPTH** 33.6 ft	**NORTHING** 535,112	**EASTING** 507,245 — **24 HR.** 6.0
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER C. Boyce	**START DATE** 07/09/13	**COMP. DATE** 07/09/13	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1660										
	1,656.3	0.0						37%		1,656.3 — GROUND SURFACE — 0.0
	1,655.6	0.7						W		1,655.6 — Brown, fine sandy SILT (A-4), with little organics.
1655	1,654.3	2.0	2	1	2	3				1,654.3 — 2.0
	1,652.8	3.5	3	3	3	6		M		**ARTIFICIAL FILL** Red-brown, fine sandy SILT (A-4).
1650										**RESIDUAL** Brown-tan, silty fine SAND (A-2-4), with trace gravel-sized rock fragments.
	1,647.8	8.5	6	7	12	19				
1645	1,642.8	13.5						M		
			6	16	24	40				
1640	1,637.8	18.5						M		1,639.3 — 17.0
			8	15	17	32				Tan-gray, fine sandy SILT (A-4), with little gravel-sized rock fragments.
1635	1,632.8	23.5								1,634.3 — 22.0
			28	21	13	34		M		Tan-gray, silty fine SAND (A-2-4), with little gravel-sized rock fragments.
1630	1,627.8	28.5								1,627.8 — 28.5
			34	66/0.4		100/0.9				**WEATHERED ROCK** Gray-tan, (BIOTITE SCHIST).
1625	1,622.8	33.5	60/0.1			60/0.1				1,622.8 — 33.5 — 1,622.7 — 33.6
										CRYSTALLINE ROCK (BIOTITE SCHIST).
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,622.7 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST)
										Other Samples: O-210 (0.0 - 0.0)

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WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3660R	**STATION** 36+60	**OFFSET** 30 ft RT	**ALIGNMENT** -L-	**0 HR.** 13.0
COLLAR ELEV. 1,663.6 ft	**TOTAL DEPTH** 18.5 ft	**NORTHING** 535,056	**EASTING** 507,246	**24 HR.** 9.5
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/11/13	**COMP. DATE** 07/11/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1665											
	1,663.6	0.0								1,663.6 GROUND SURFACE	0.0
			1	2	2	4		50% M		1,662.9 Brown, fine sandy SILT (A-4), with little organics.	0.7
1660	1,660.1	3.5								ARTIFICIAL FILL	
			1	1	2	3		M		Red-tan, fine sandy SILT (A-4), with trace gravel.	
										1,656.6	7.0
1655	1,655.1	8.5						M		RESIDUAL	
			6	7	11	18				Tan-gray, silty fine SAND (A-2-4), with little gravel-sized rock fragments.	
1650	1,650.1	13.5								1,649.6	14.0
			25	43	57/0.3	100/0.8				WEATHERED ROCK	
	1,645.1	18.5	60/0.0			60/0.0				Gray-tan, (BIOTITE SCHIST).	
										1,645.1	18.5
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,645.1 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)	
										Other Samples: O-284 (0.0 - 0.7)	

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3700	**STATION** 37+00	**OFFSET** CL	**ALIGNMENT** -L-	**0 HR.** 8.0
COLLAR ELEV. 1,663.6 ft	**TOTAL DEPTH** 15.0 ft	**NORTHING** 535,018	**EASTING** 507,276	**24 HR.** 4.0
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/02/13	**COMP. DATE** 07/02/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1665										
	1,663.6	0.0								1,663.6 GROUND SURFACE 0.0
			2	3	4	7		M		RESIDUAL
1660	1,660.1	3.5								Tan-gray, silty fine SAND (A-2-4).
			2	3	4	7		M		
										1,657.6 6.0
1655	1,655.1	8.5								WEATHERED ROCK
			38	62/0.2		100/0.7				Gray-tan, (BIOTITE SCHIST).
1650	1,650.1	13.5								1,650.1 13.5
			60/0.1			60/0.1				CRYSTALLINE ROCK
	1,648.6	15.0	60/0.0			60/0.0				Gray-tan, (BIOTITE SCHIST). 15.0
										Boring Terminated with Standard Penetration Test Refusal at Elevation 1,648.6 ft IN CRYSTALLINE ROCK (BIOTITE SCHIST)
										Surficial Organic Soils from 0.0-0.2'.

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34518.1.2	**TIP** R-5527	**COUNTY** CHEROKEE	**GEOLOGIST** R. Kral	
SITE DESCRIPTION NEW ROUTE FROM US 74/19/129 TO EBCI TRIBAL BOUNDARY IN CHEROKEE COUNTY				**GROUND WTR (ft)**
BORING NO. L_3700R	**STATION** 37+00	**OFFSET** 74 ft RT	**ALIGNMENT** -L-	**0 HR.** 8.5
COLLAR ELEV. 1,661.0 ft	**TOTAL DEPTH** 22.0 ft	**NORTHING** 535,023	**EASTING** 507,201	**24 HR.** 1.0
DRILL RIG/HAMMER EFF./DATE F&R3763 CME-550X 82% 10/5/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER C. Boyce	**START DATE** 07/02/13	**COMP. DATE** 07/02/13	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1665											
	1,661.0	0.0								1,661.0 GROUND SURFACE	0.0
1660			2	4	3	7		M		1,660.7 Surficial Organic Soils (0.3')	0.3
	1,657.5	3.5								1,659.0 ARTIFICIAL FILL	2.0
			4	3	5	8	SS-187	39%		Brown, fine sandy SILT (A-2-4), with trace gravel.	
1655										Tan-yellow, silty coarse to fine SAND (A-2-4(0)), with trace gravel & some clay.	
	1,652.5	8.5								1,654.0 RESIDUAL	7.0
			7	10	8	18		W		Brown-tan, silty fine SAND (A-2-4).	
1650											
	1,647.5	13.5								1,648.0 WEATHERED ROCK	13.0
			12	88/0.5		100/1.0				Tan-gray, (BIOTITE SCHIST).	
1645											
	1,642.5	18.5	100/0.2			100/0.2					
1640											
	1,639.0	22.0	60/0.0			60/0.0				1,639.0 Boring Terminated with Standard Penetration Test Refusal at Elevation 1,639.0 ft ON CRYSTALLINE ROCK (BIOTITE SCHIST)	22.0

NCDOT BORE SINGLE 69R0047_BORELOGS_SUB.GPJ NC_DOT.GDT 8/2/13

New Route from US 74/19/129 to EBCI Tribal Boundary

CORE PHOTOGRAPHS: EB1-A: Station 11+06

Begin Run 1
6.2 feet

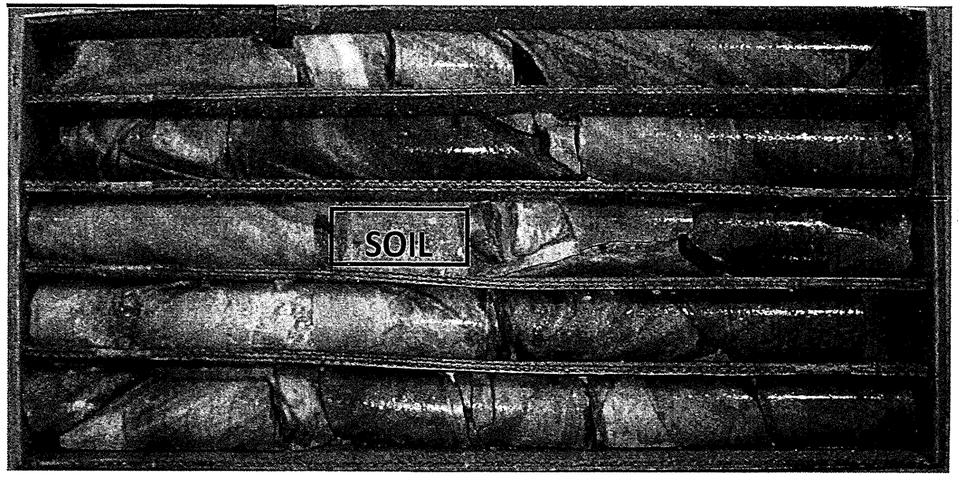
Begin Run 2
11.2 feet

15.7 feet

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE IN FEET

Begin Run 3
16.2 Feet



Begin Run 4
21.2 Feet

End Run 4
25.2

0.0 0.2 0.4 0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0

SCALE IN FEET

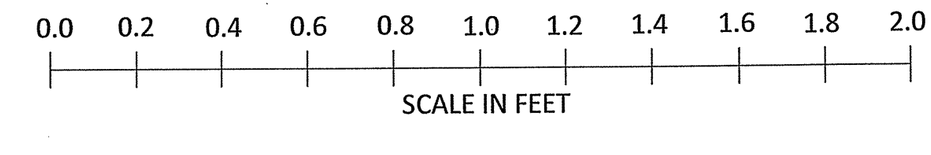
New Route from US 74/19/129 to EBCI Tribal Boundary

CORE PHOTOGRAPHS: EB1-B: Station 11+06

Begin Run 1
4.4 feet

Begin Run 2
9.4 feet

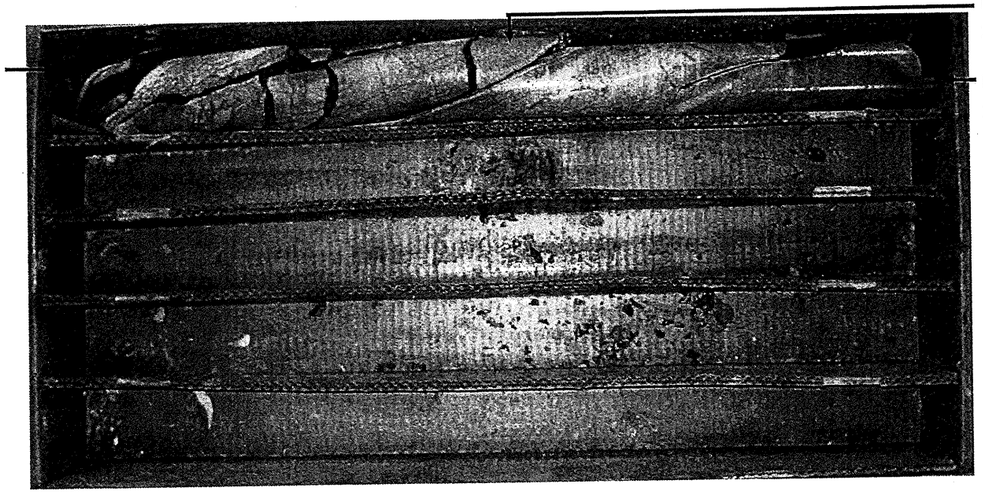
14.4 feet

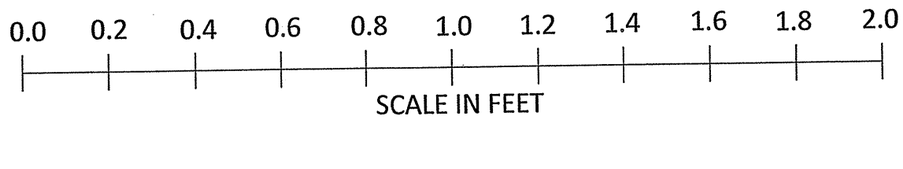


23.4 feet

Begin Run 5
24.4 Feet

End Run 5
25.4 Feet

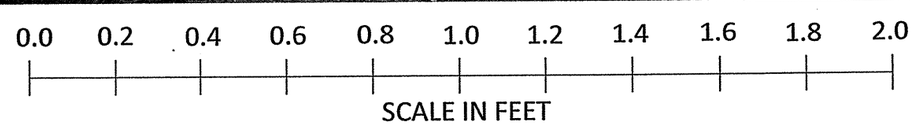




Begin Run 3
14.4 Feet

Begin Run 4
19.4 Feet

23.4 Feet



LABORATORY SUMMARY SHEET FOR ROCK CORE SAMPLES

WBS NO.: 17BP.14.R.84
TIP NO.: R-5527
COUNTY: Cherokee
DESCRIPTION: New Route from US 74/19/129 to EBCI Tribal Boundary

Sample ID	Boring No.	Depth (feet)	Rock Type	Run RQD (%)	Length (inches)	Diameter (inches)	Unit Weight (pcf)	Unconfined Compressive Strength (psi)	Young's Modulus, E (ksf)	RMR
RS-1	EB1-A	12.5-12.9	Quartzite	32	3.86	2.00	160.0	3,580	5.85×10^4	33
RS-2	EB1-B	10.4-10.8	Quartzite	26	4.48	2.00	159.1	8,240	8.94×10^4	28
RS-3	EB1-A	15.3-15.7	Quartzite	32	4.92	2.00	161.2	15,005	1.75×10^5	43