

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	33806.1.1 (B-4632)	1	1

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

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# STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 33806.1.1 (B-4632) F.A. PROJ. BRSTP-1576(1)  
 COUNTY RUTHERFORD  
 PROJECT DESCRIPTION BRIDGE NO. 69 ON SR-1576  
OVER CSX RAILROAD

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

**CAUTION NOTICE**

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

GENERAL SOIL AND ROCK STRATA DESCRIPTIONS AND INDICATED BOUNDARIES ARE BASED ON A GEOTECHNICAL INTERPRETATION OF ALL AVAILABLE SUBSURFACE DATA AND MAY NOT NECESSARILY REFLECT THE ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS OR BETWEEN SAMPLED STRATA WITHIN THE BOREHOLE. THE LABORATORY SAMPLE DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD TEST METHOD. THE OBSERVED WATER LEVELS OR SOIL MOISTURE CONDITIONS INDICATED IN THE SUBSURFACE INVESTIGATIONS ARE AS RECORDED AT THE TIME OF THE INVESTIGATION. THESE WATER LEVELS OR SOIL MOISTURE CONDITIONS MAY VARY CONSIDERABLY WITH TIME ACCORDING TO CLIMATIC CONDITIONS INCLUDING TEMPERATURES, PRECIPITATION, AND WIND, AS WELL AS OTHER NON-CLIMATIC FACTORS.

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

**PROJECT: 33806.1.1 ID: B-4632**

PERSONNEL  
**M M HAGER**

**D C ELLIOT**

**D O CHEEK**

**G K ROSE**

**C J COFFEY**

**R D CHILDERS**

**L E RIDDLE**

**M E HART**

INVESTIGATED BY C A DUNNAGAN

CHECKED BY W D FRYE, Jr

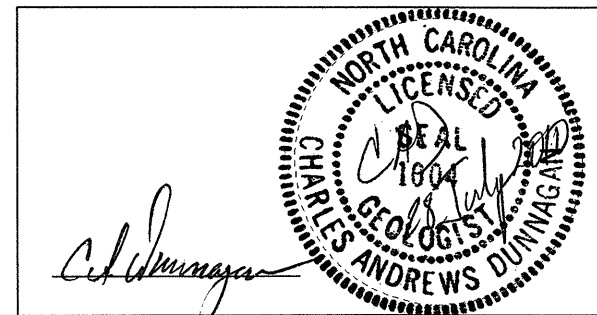
SUBMITTED BY W D FRYE, Jr

DATE JULY 2010

DRAWN BY: C A DUNNAGAN

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

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



NORTH CAROLINA DEPARTMENT OF TRANSPORTATION





DIVISION OF HIGHWAYS

GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

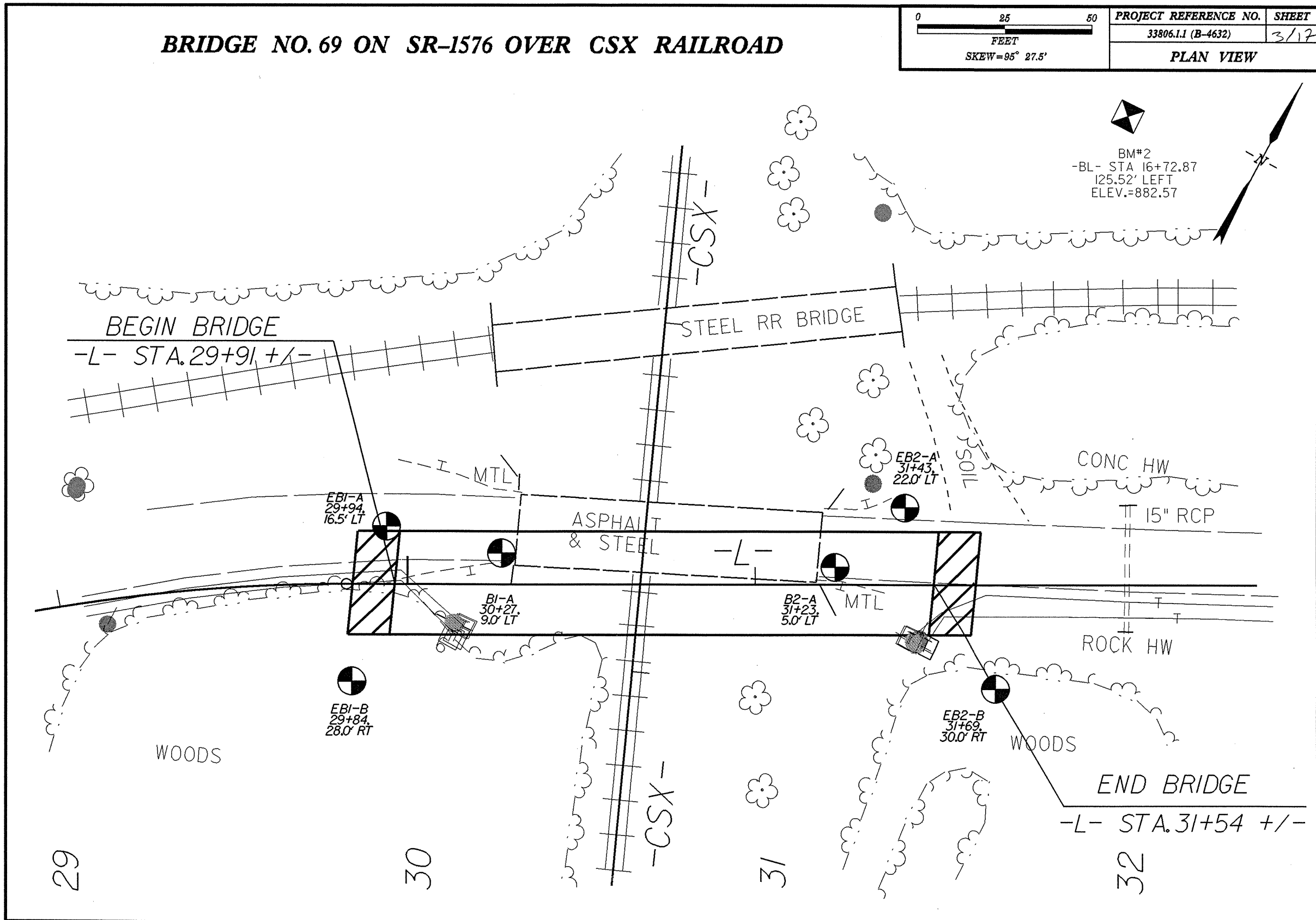
PROJECT REFERENCE NO. 33806.LI(B-4632)	SHEET NO. 2/12
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SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS					
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T208, 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: <i>VERY STIFF, GRA. SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i>		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. <b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u> , <u>SUBANGULAR</u> , <u>SUBROUNDED</u> , OR <u>ROUNDED</u> .		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:  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.  FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.  COASTAL PLAIN SEDIMENTARY CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.		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 DISLOGGED 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.					
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING							
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS		MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.		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. <u>IF TESTED, WOULD YIELD SPT REFUSAL</u> 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. <u>IF TESTED, YIELDS SPT N VALUES &gt; 100 BPF</u> 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. <u>IF TESTED, YIELDS SPT N VALUES &lt; 100 BPF</u> 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.		COMPRESSIONIBILITY 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 SILT - CLAY SOILS SOILS TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE		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. <u>IF TESTED, WOULD YIELD SPT REFUSAL</u> 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. <u>IF TESTED, YIELDS SPT N VALUES &gt; 100 BPF</u> 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. <u>IF TESTED, YIELDS SPT N VALUES &lt; 100 BPF</u> 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.			
CONSISTENCY OR DENSENESS		GROUND WATER		MISCELLANEOUS SYMBOLS							
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )		WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD		SPT DMT DPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL					
TEXTURE OR GRAIN SIZE		MISCELLANEOUS SYMBOLS		ABBREVIATIONS							
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270 4.76 2.00 0.42 0.25 0.075 0.053		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 % - UNIT WEIGHT % <sub>d</sub> - DRY UNIT WEIGHT FIAD - FILLED IMMEDIATELY AFTER DRILLING WH - WEIGHT OF HAMMER					
SOIL MOISTURE - CORRELATION OF TERMS		EQUIPMENT USED ON SUBJECT PROJECT		FRACTURE SPACING		BEDDING					
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION		DRILL UNITS: MOBILE B-____ BK-51 CME-45C CME-650 PORTABLE HOIST		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		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					
PLASTICITY		ADVANCING TOOLS:		INDURATION							
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY		CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE *STEEL TEETH TRICONE *TUNG-CARB. CORE BIT		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.							
COLOR		HAMMER TYPE:									
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.		AUTOMATIC <input checked="" type="checkbox"/> MANUAL <input type="checkbox"/> CORE SIZE: B-____ N-____ H-____ HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST									

# BRIDGE NO. 69 ON SR-1576 OVER CSX RAILROAD

<p>0 25 50 FEET SKEW=95° 27.5'</p>	PROJECT REFERENCE NO.	SHEET
	33806.1.1 (B-4632)	3/17
PLAN VIEW		

BM#2  
 -BL- STA 16+72.87  
 125.52' LEFT  
 ELEV.=882.57

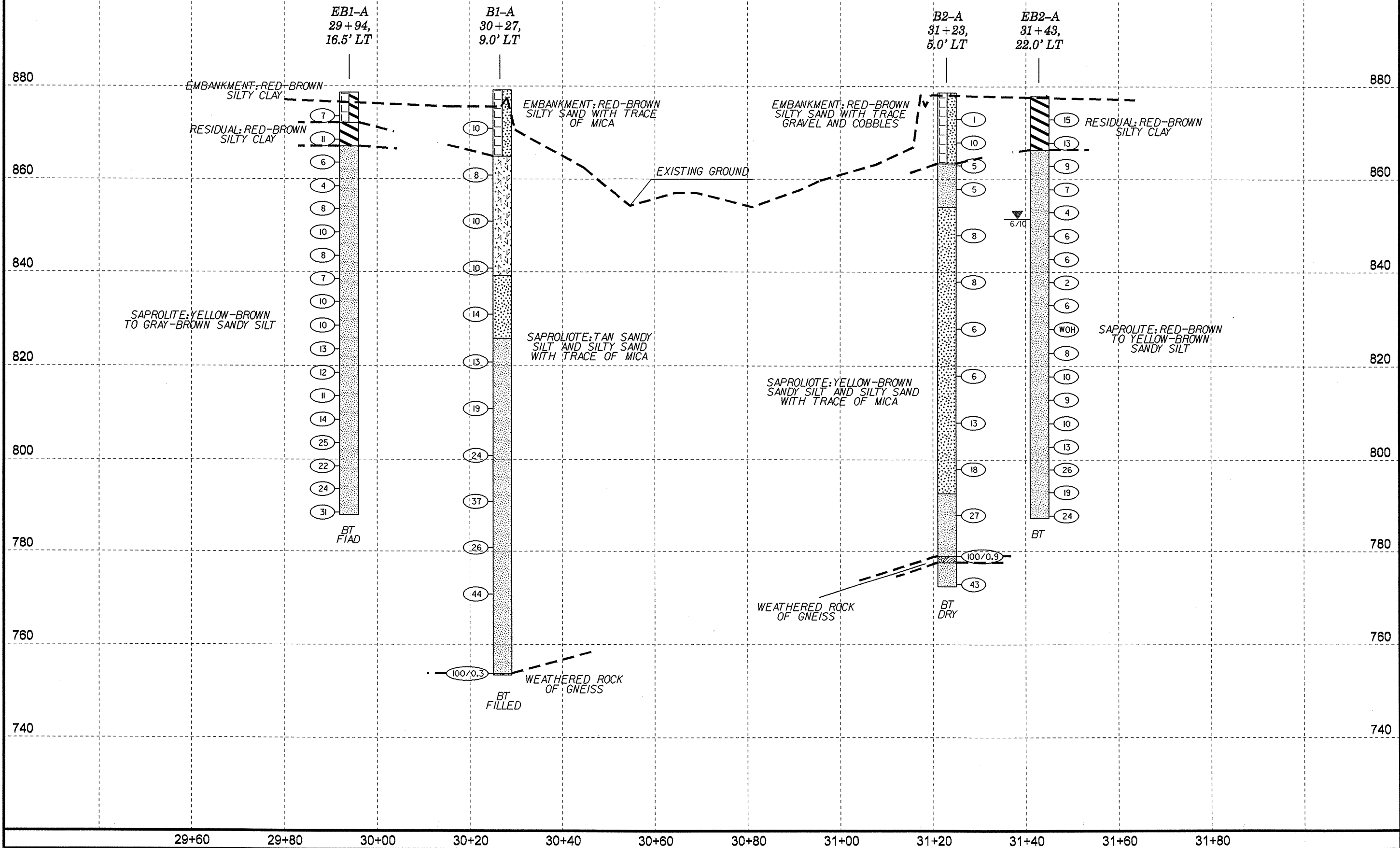


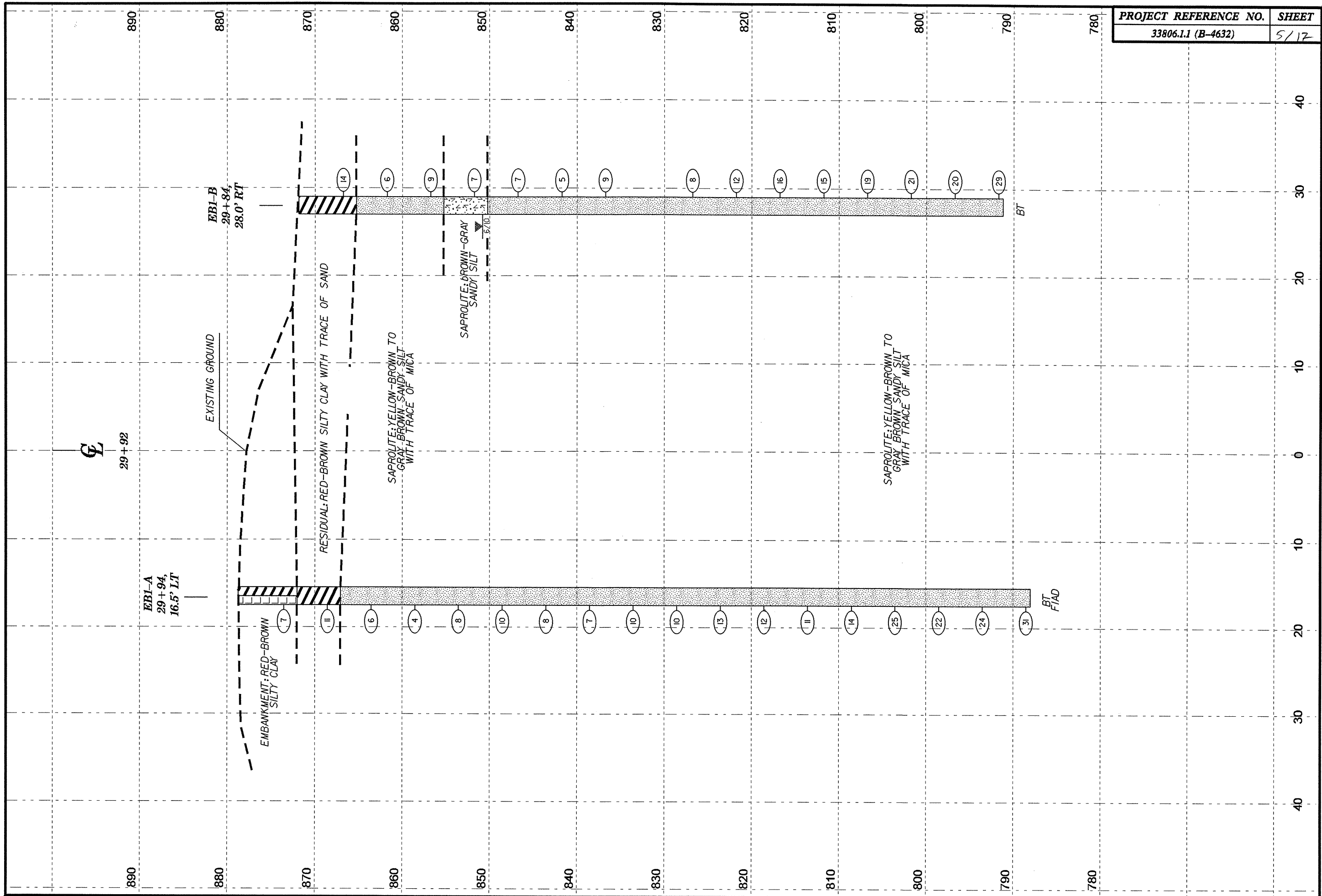
29

30

31

32





CL  
29+92

EBI-A  
29+94,  
16.5' LT

EXISTING GROUND

EBI-B  
29+84,  
28.0' RT

EMBANKMENT: RED-BROWN SILTY CLAY

RESIDUAL: RED-BROWN SILTY CLAY WITH TRACE OF SAND

SAPROLITE: YELLOW-BROWN TO GRAY BROWN SANDY SILT WITH TRACE OF MICA

SAPROLITE: BROWN-GRAY SANDY SILT

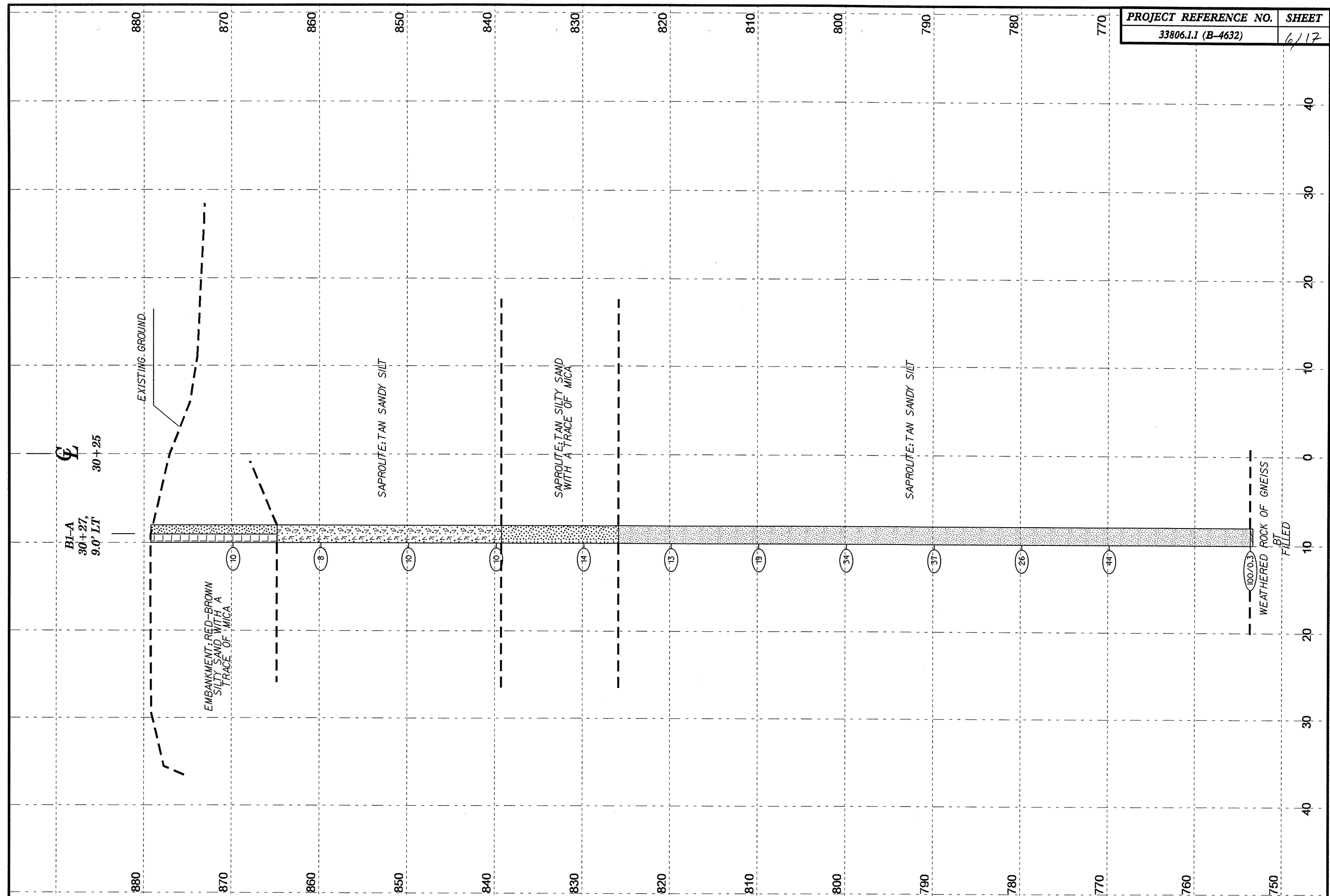
SAPROLITE: YELLOW-BROWN TO GRAY BROWN SANDY SILT WITH TRACE OF MICA

HORIZ. SCALE 0 10 20 (FEET)

VE = 1

SKEW = 95° 27.5'

END BENT ONE



BI-A  
30+27,  
9.0' LT  
30+25

EXISTING GROUND

EMBANKMENT: RED-BROWN  
SILTY SAND WITH A  
TRACE OF MICA

SAPROLITE: TAN SANDY SILT

SAPROLITE: TAN SILTY SAND  
WITH A TRACE OF MICA

SAPROLITE: TAN SANDY SILT

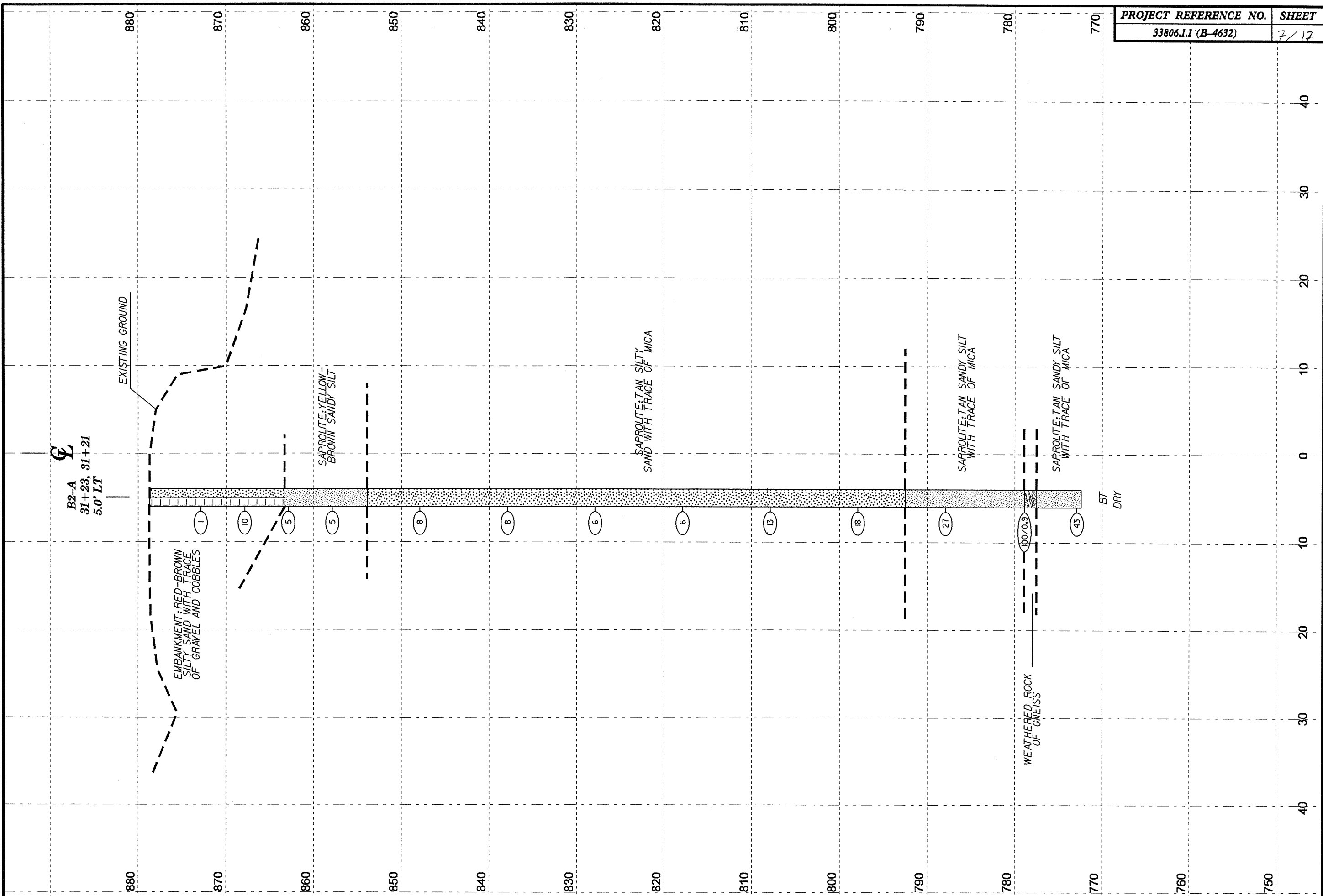
100/0.3  
WEATHERED ROCK OF GNEISS  
BT  
FILLED

HORIZ. SCALE 0 10 20  
(FEET)

VE = 1

SKEW = 95° 27.5'

INTERIOR BENT ONE

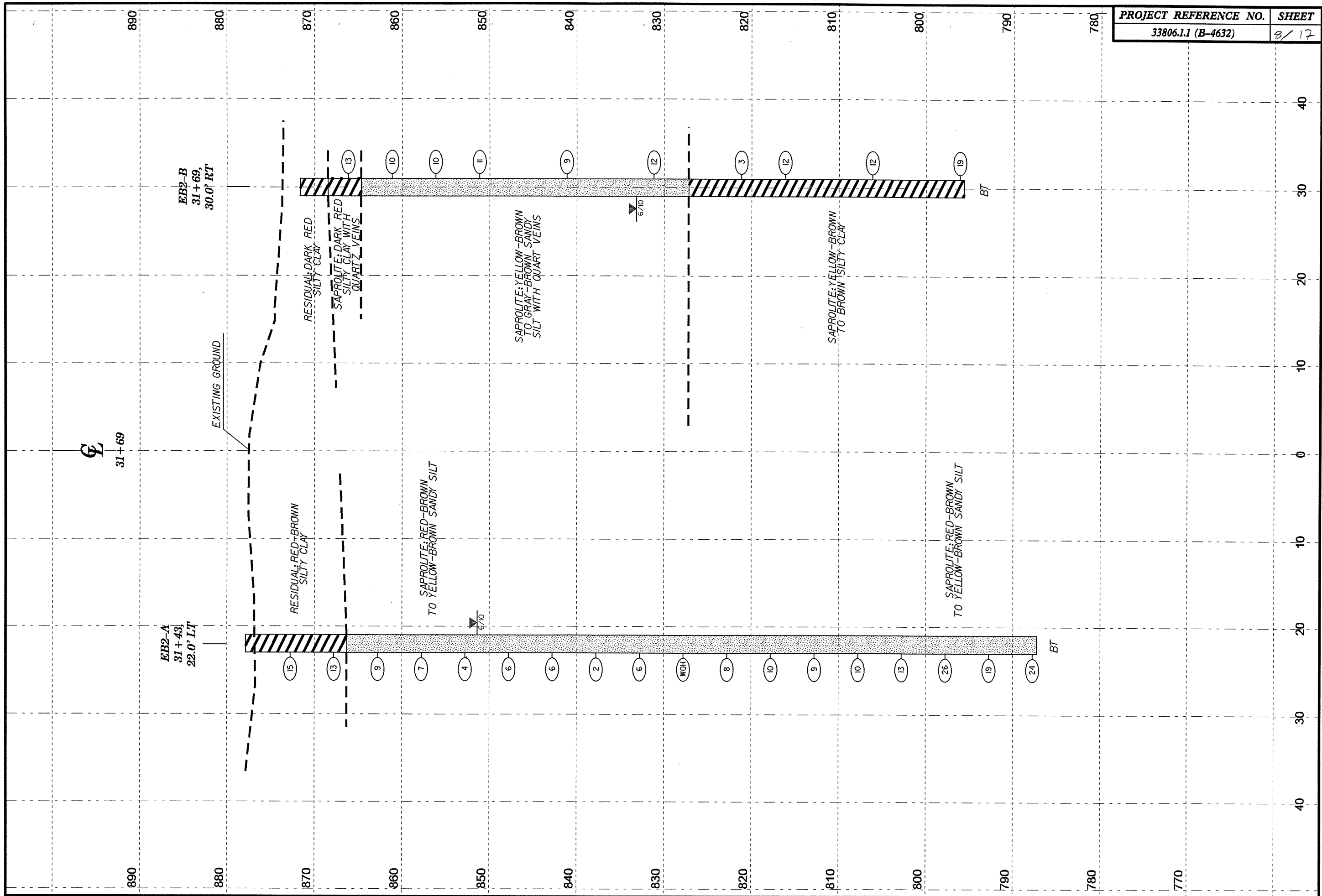


HORIZ. SCALE 0 10 20 (FEET)

VE = 1

SKEW = 95° 27.5'

INTERIOR BENT TWO



31+69

EB2-A  
31+43  
22.0' LT

EB2-B  
31+69  
30.0' RT

EXISTING GROUND

RESIDUAL: RED-BROWN  
SILTY CLAY

RESIDUAL: DARK RED  
SILTY CLAY

SAPROLITE: DARK RED  
SILTY CLAY WITH  
QUARTZ VEINS

SAPROLITE: RED-BROWN  
TO  
YELLOW-BROWN SANDY SILT

SAPROLITE: YELLOW-BROWN  
TO GRAY-BROWN SANDY  
SILT WITH QUARTZ VEINS

SAPROLITE: YELLOW-BROWN  
TO BROWN SILTY CLAY

SAPROLITE: RED-BROWN  
TO  
YELLOW-BROWN SANDY SILT

HORIZ. SCALE 0 10 20  
(FEET)

VE = 1

SKEW = 95° 27.5'

END BENT TWO



PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. EB1-A	STATION 29+94	OFFSET 17 ft LT	ALIGNMENT -L-
COLLAR ELEV. 878.7 ft	TOTAL DEPTH 90.7 ft	NORTHING 598,171	EASTING 1,151,279
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Rose, G. K.	START DATE 06/11/10	COMP. DATE 06/11/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
880														878.7	0.0	GROUND SURFACE ROADWAY EMBANKMENT Red-brown silty clay.
875	874.5	4.2	4	3	4						SS-6	D		872.0	6.7	RESIDUAL Red-brown silty clay with trace of sand.
870	869.5	9.2	4	4	7						SS-7	D		867.0	11.7	SAPROLITE Yellow-brown to gray-brown sandy silt.
865	864.5	14.2	4	3	3						SS-8					
860	859.5	19.2	1	1	3											
855	854.5	24.2	1	3	5						SS-9					
850	849.5	29.2	2	4	6											
845	844.5	34.2	1	4	4											
840	839.5	39.2	2	3	4						SS-10					
835	834.5	44.2	2	4	6											
830	829.5	49.2	2	4	6											
825	824.5	54.2	4	5	8											
820	819.5	59.2	2	4	8											
815	814.5	64.2	WOH	3	8						SS-11					
810	809.5	69.2	4	6	8											
805	804.5	74.2	7	13	12											
800																

PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. EB1-A	STATION 29+94	OFFSET 17 ft LT	ALIGNMENT -L-
COLLAR ELEV. 878.7 ft	TOTAL DEPTH 90.7 ft	NORTHING 598,171	EASTING 1,151,279
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Rose, G. K.	START DATE 06/11/10	COMP. DATE 06/11/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
800	799.5	79.2	3	7	15											
795	794.5	84.2	7	10	14											
790	789.5	89.2	7	14	17											
785																
780																
775																
770																
765																
760																
755																
750																
745																
740																
735																
730																
725																
720																

NCDOT BORE SINGLE BORELOGS.GPJ NC DOT.GDT 07/08/10

NCDOT BORE SINGLE BORELOGS.GPJ NC DOT.GDT 07/08/10

PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. EB1-B	STATION 29+84	OFFSET 28 ft RT	ALIGNMENT -L-
COLLAR ELEV. 871.9 ft	TOTAL DEPTH 80.6 ft	NORTHING 598,127	EASTING 1,151,290
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Childers, R.	START DATE 06/08/10	COMP. DATE 06/09/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
875															
870														GROUND SURFACE	0.0
865	867.8	4.1	3	6	8						SS-1	D		RESIDUAL Red-brown silty clay.	
860	862.8	9.1	1	3	3						SS-2	M		SAPROLITE Yellow-brown sandy silt.	6.6
855	857.8	14.1	2	4	5							M			
850	852.8	19.1	1	3	4						SS-3	W		SAPROLITE Brown-gray sandy silt.	16.6
845	847.8	24.1	2	3	4						SS-4	W		SAPROLITE Brown-gray to yellow-brown sandy silt with trace of mica.	21.6
840	842.8	29.1	1	2	3							M			
835	837.8	34.1	1	4	5										
830															
825	827.8	44.1	1	3	5										
820	822.8	49.1	3	5	7										
815	817.8	54.1	3	8	8										
810	812.8	59.1	3	6	9										
805	807.8	64.1	5	7	12										
800	802.8	69.1	3	8	13						SS-5				
795	797.8	74.1	4	9	11										

NCDOT BORE SINGLE BORELOGS.GPJ NC\_DOT.GDT 07/08/10

PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. EB1-B	STATION 29+84	OFFSET 28 ft RT	ALIGNMENT -L-
COLLAR ELEV. 871.9 ft	TOTAL DEPTH 80.6 ft	NORTHING 598,127	EASTING 1,151,290
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Childers, R.	START DATE 06/08/10	COMP. DATE 06/09/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
795															
790	792.8	79.1	10	12	17									SAPROLITE Brown-gray to yellow-brown sandy silt with trace of mica. (continued)	80.6
785														Boring Terminated at Elevation 791.3 ft in very stiff saprolite.	
780															
775															
770															
765															
760															
755															
750															
745															
740															
735															
730															
725															
720															
715															

NCDOT BORE SINGLE BORELOGS.GPJ NC\_DOT.GDT 07/08/10

PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Elliott, D. C.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. B1-A	STATION 30+27	OFFSET 9 ft LT	ALIGNMENT -L-
COLLAR ELEV. 879.2 ft	TOTAL DEPTH 125.9 ft	NORTHING 598,179	EASTING 1,151,312
DRILL MACHINE CME-550	DRILL METHOD Wash Boring	HAMMER TYPE Automatic	
DRILLER Cheek, D. O.	START DATE 07/01/10	COMP. DATE 07/01/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)					
			0.5ft	0.5ft	0.5ft	0	25	50	75	100									
880														879.2	GROUND SURFACE	0.0			
															ROADWAY EMBANKMENT				
															Red-brown silty sand with trace of mica.				
870	870.8	8.4	2	5	5								M						
865																			
860	860.8	18.4	2	2	6								SS-21	M	864.8	SAPROLITE	14.4		
															Tan sandy silt.				
855																			
850	850.8	28.4	2	4	6									M					
845																			
840	840.8	38.4	3	4	6									SS-22	M	839.2	SAPROLITE	40.0	
																Tan silty sand with trace of mica.			
835																			
830	830.8	48.4	3	5	9										M				
825																			
820	820.8	58.4	3	4	9									SS-23	M	825.8	SAPROLITE	53.4	
																Tan sandy silt.			
815																			
810	810.8	68.4	6	8	11										M				
805																			
800	800.8	78.4																	

NCDOT BORE SINGLE BORELOGS.GPJ NC\_DOT\_GDT\_07/27/10

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PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Elliott, D. C.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. B1-A	STATION 30+27	OFFSET 9 ft LT	ALIGNMENT -L-
COLLAR ELEV. 879.2 ft	TOTAL DEPTH 125.9 ft	NORTHING 598,179	EASTING 1,151,312
DRILL MACHINE CME-550	DRILL METHOD Wash Boring	HAMMER TYPE Automatic	
DRILLER Cheek, D. O.	START DATE 07/01/10	COMP. DATE 07/01/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)					
			0.5ft	0.5ft	0.5ft	0	25	50	75	100									
800																			
795																			
790	790.8	88.4	14	17	20														
785																			
780	780.8	98.4	8	11	15									SS-25	M				
775																			
770	770.8	108.4	6	15	29										SS-26	M			
765																			
760																			
755																			
750	753.6	125.6																	
745																			
740																			
735																			
730																			
725																			
720																			

NCDOT BORE SINGLE BORELOGS.GPJ NC\_DOT\_GDT\_07/27/10

PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Elliott, D. C.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. B2-A	STATION 31+23	OFFSET 5 ft LT	ALIGNMENT -L-
COLLAR ELEV. 878.7 ft	TOTAL DEPTH 106.3 ft	NORTHING 598,219	EASTING 1,151,399
DRILL MACHINE CME-550		DRILL METHOD Wash Boring	HAMMER TYPE Automatic
DRILLER Rose, G. K.	START DATE 06/29/10	COMP. DATE 06/30/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
880													GROUND SURFACE	0.0
875	873.9	4.8	1	WOH	1							M	ROADWAY EMBANKMENT Red-brown silty sand with trace of gravel and cobbles.	
870	868.9	9.8	24		5	5						M		
865	863.9	14.8	1		2	3						M	SAPROLITE Yellow-brown sandy silt.	15.4
860	858.9	19.8	1		2	3						M		
855														
850	848.9	29.8	1		4	4						M		
845														
840	838.9	39.8	1		2	6						M		
835														
830	828.9	49.8	1		2	4						M		
825														
820	818.9	59.8	2		3	3						M		
815														
810	808.9	69.8	3		5	8						M		
805														
800														

NCDOT BORE SINGLE BORELOGS.GPJ NC DOT.GDT 07/27/10

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PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Elliott, D. C.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. B2-A	STATION 31+23	OFFSET 5 ft LT	ALIGNMENT -L-
COLLAR ELEV. 878.7 ft	TOTAL DEPTH 106.3 ft	NORTHING 598,219	EASTING 1,151,399
DRILL MACHINE CME-550		DRILL METHOD Wash Boring	HAMMER TYPE Automatic
DRILLER Rose, G. K.	START DATE 06/29/10	COMP. DATE 06/30/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
800														
795	798.9	79.8	6		8	10						M	SAPROLITE Tan silty sand with trace of mica. (continued)	
790														
785	788.8	89.9	9		9	18						M	SAPROLITE Tan sandy silt with trace of mica.	86.2
780														
775	778.9	99.8	18		38	62/0.4						M	WEATHERED ROCK Weathered rock of gneiss.	99.8
770	773.9	104.8	14		19	24						M	SAPROLITE Tan sandy silt with trace of mica.	101.2
765														
760														
755														
750														
745														
740														
735														
730														
725														
720														

NCDOT BORE SINGLE BORELOGS.GPJ NC DOT.GDT 07/27/10

PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. EB2-A	STATION 31+43	OFFSET 22 ft LT	ALIGNMENT -L-
COLLAR ELEV. 877.9 ft	TOTAL DEPTH 90.6 ft	NORTHING 598,243	EASTING 1,151,409
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Rose, G. K.	START DATE 06/21/10	COMP. DATE 06/22/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)		
			0.5ft	0.5ft	0.5ft	0	25	50	75	100							
880															877.9	GROUND SURFACE	0.0
875	873.8	4.1	4	6	9											RESIDUAL Red-brown silty clay.	
870	868.8	9.1	3	5	8												
865	863.8	14.1	2	4	5										866.3	SAPROLITE Red-brown to yellow-brown sandy silt.	11.6
860	858.8	19.1	2	3	4												
855	853.8	24.1	1	1	3												
850	848.8	29.1	1	2	4												
845	843.8	34.1	1	2	4												
840	838.8	39.1	WOH	1	1												
835	833.8	44.1	1	2	4												
830	828.8	49.1	WOH	WOH	WOH												
825	823.8	54.1	2	3	5												
820	818.8	59.1	6	5	5												
815	813.8	64.1	1	4	5												
810	808.8	69.1	1	4	6												
805	803.8	74.1	2	5	8												
800																	

NCDOT BORE SINGLE BORELOGS.GPJ NC\_DOT\_GDT 07/08/10

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PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. EB2-A	STATION 31+43	OFFSET 22 ft LT	ALIGNMENT -L-
COLLAR ELEV. 877.9 ft	TOTAL DEPTH 90.6 ft	NORTHING 598,243	EASTING 1,151,409
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Rose, G. K.	START DATE 06/21/10	COMP. DATE 06/22/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100						
800																
795	798.8	79.1	5	10	16											
790	793.8	84.1	5	7	12											
785	788.8	89.1	4	9	15											
780																
775																
770																
765																
760																
755																
750																
745																
740																
735																
730																
725																
720																

NCDOT BORE SINGLE BORELOGS.GPJ NC\_DOT\_GDT 07/08/10



PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. EB2-B	STATION 31+69	OFFSET 30 ft RT	ALIGNMENT -L-
COLLAR ELEV. 871.7 ft	TOTAL DEPTH 76.0 ft	NORTHING 598,208	EASTING 1,151,456
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Rose, G. K.	START DATE 06/15/10	COMP. DATE 06/15/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
875														
870													871.7 GROUND SURFACE 0.0	
865	867.2	4.5	3	5	8							D	868.5 RESIDUAL Dark red silty clay. 3.2	
860	862.2	9.5	3	4	6							D	864.7 SAPROLITE Dark red silty clay with quartz veins. 7.0	
855	857.2	14.5	2	4	6									
850	852.2	19.5	2	4	7									
845														
840	842.2	29.5	1	4	5							M		
835														
830	832.2	39.5	2	5	7									
825														
820	822.2	49.5	WOH	WOH	3						SS-12	W	827.2 SAPROLITE Yellow-brown to brown silty clay. 44.5	
815	817.2	54.5	3	5	7							W		
810														
805	807.2	64.5	5	6	6									
800														
795	797.2	74.5	5	9	10						SS-13		795.7 76.0	

NCDOT BORE SINGLE BORELOGS.GPJ NC\_DOT\_GDT 07/09/10

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PROJECT NO. 33806.1.1	ID. B-4632	COUNTY RUTHERFORD	GEOLOGIST Hager, M. M.
SITE DESCRIPTION Bridge No. 69 on SR-1576 over CSX Railroad.			GROUND WTR (ft)
BORING NO. EB2-B	STATION 31+69	OFFSET 30 ft RT	ALIGNMENT -L-
COLLAR ELEV. 871.7 ft	TOTAL DEPTH 76.0 ft	NORTHING 598,208	EASTING 1,151,456
DRILL MACHINE CME-550	DRILL METHOD H.S. Augers	HAMMER TYPE Automatic	
DRILLER Rose, G. K.	START DATE 06/15/10	COMP. DATE 06/15/10	SURFACE WATER DEPTH N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. NO.	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)
			0.5ft	0.5ft	0.5ft	0	25	50	75	100				
795													Match Line	
790													Boring Terminated at Elevation 795.7 ft in very stiff saprolite.	
785														
780														
775														
770														
765														
760														
755														
750														
745														
740														
735														
730														
725														
720														
715														

NCDOT BORE SINGLE BORELOGS.GPJ NC\_DOT\_GDT 07/09/10

JCS  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT  
 SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #: B-4632

REPORT ON SAMPLES OF: Soils for Quality

PROJECT:	33806.1.1	COUNTY:	Rutherford	Owner:	NCDOT
DATE SAMPLED:	6.8 - 6.22.10	DATE RECEIVED:	6.24.10	DATE REPORTED:	7.7.10
SAMPLED FROM:	Bridge	SAMPLED BY:	C. A. Dunnagan		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8
Lab Sample No. A	163976	163977	163978	163979	163980	163981	163982	163983
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passing #10 Sieve %	97	100	100	100	97	97	100	100
Passing #40 Sieve %	88	95	85	88	76	91	88	87
Passing #200 Sieve %	68	53	40	42	41	58	60	49

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	18	14	25	22	32	20	20	23
Fine Sand - Ret. #270	16	44	45	48	35	23	27	37
Silt 0.05-0.005 mm %	28	28	22	22	25	15	23	30
Clay < 0.005 mm %	38	14	8	8	8	42	30	10
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	53	38	42	40	40	50	45	40
Plastic Index	21	NP	NP	NP	NP	18	13	NP
AASHTO Classification	A-7-5 (13)	A-4 (3)	A-5 (1)	A-4 (1)	A-4 (1)	A-7-5 (9)	A-7-5 (7)	A-4 (3)
Quantity								
Texture								
Station	29+84	29+84	29+84	29+84	29+84	29+94	29+94	29+94
Hole No.								
Depth (ft) From:	4.6	9.6	19.6	24.6	69.6	4.7	9.7	14.7
To:	5.6	10.6	20.6	25.6	70.6	5.7	10.7	15.7
	OK	OK	OK	OK	OK	OK	OK	OK

Remarks:

A-163976 - 163983

CC:

C. A. Dunnagan	
File	

SOILS ENGINEER:

JCS  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT  
 SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #: B-4632

REPORT ON SAMPLES OF: Soils for Quality

PROJECT:	33806.1.1 (cont.)	COUNTY:	Rutherford	Owner:	NCDOT
DATE SAMPLED:	6.8 - 6.22.10	DATE RECEIVED:	6.24.10	DATE REPORTED:	7.7.10
SAMPLED FROM:	Bridge	SAMPLED BY:	C. A. Dunnagan		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-9	SS-10	SS-11	SS-12	SS-13	SS-14	SS-15	SS-16
Lab Sample No. A	163984	163985	163986	163987	163988	163989	163990	163991
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passing #10 Sieve %	100	100	100	100	100	99	100	99
Passing #40 Sieve %	82	86	92	100	95	91	94	84
Passing #200 Sieve %	41	47	47	83	78	76	51	48

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	30	24	17	3	10	13	15	24
Fine Sand - Ret. #270	38	40	48	22	17	14	44	38
Silt 0.05-0.005 mm %	24	30	25	39	31	23	27	28
Clay < 0.005 mm %	8	6	10	36	42	50	14	10
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	37	37	39	58	49	60	36	37
Plastic Index	NP	NP	NP	21	19	25	NP	NP
AASHTO Classification	A-4 (1)	A-4 (2)	A-4 (2)	A-7-5 (16)	A-7-5 (13)	A-7-5 (18)	A-4 (3)	A-4 (3)
Quantity								
Texture								
Station	29+94	29+94	29+94	31+69	31+69	31+43	31+43	31+43
Hole No.								
Depth (ft) From:	24.7	39.7	64.7	50.4	75.0	4.6	14.6	29.6
To:	25.7	40.7	65.7	51.4	76.0	5.6	15.6	30.6
	OK	OK	OK	OK	OK	OK	OK	OK

Remarks:

A-163984 - 163991

CC:

C. A. Dunnagan	
File	

SOILS ENGINEER:

JCS

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT  
SOILS TEST REPORT-SOILS LABORATORY**

T.I.P. ID #:	B-4632
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REPORT ON SAMPLES OF:	Soils for Quality
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PROJECT:	33806.1.1 (cont.)	COUNTY:	Rutherford	Owner:	NCDOT
DATE SAMPLED:	6.21 & 6.22.10	DATE RECEIVED:	6.24 & 6.28.10	DATE REPORTED:	7.7.10
SAMPLED FROM:	Bridge	SAMPLED BY:	C. A. Dunnagan		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

**TEST RESULTS**

Project Sample No.	SS-17	SS-18	SS-19	SS-20				
Lab Sample No. A	163992	163993	164012	164013				
HiCAMS Sample #	--	--	--	--				
Retained #4 Sieve %	0.0	0.0	0.0	0.0				
Passing #10 Sieve %	97	92	100	93				
Passing #40 Sieve %	83	83	92	79				
Passing #200 Sieve %	60	56	43	42				

**MINUS #10 FRACTION**

Soil Mortar - 100%								
Coarse Sand -Ret. #60	19	18	17	25				
Fine Sand - Ret. #270	28	33	52	40				
Silt 0.05-0.005 mm %	39	35	21	27				
Clay < 0.005 mm %	14	14	10	8				
Passing # 40 Sieve %	--	--	--	--				
Passing # 200 Sieve %	--	--	--	--				

Liquid Limit	38	40	38	40				
Plastic Index	NP	NP	NP	NP				
AASHTO Classification	A-4 (5)	A-4 (4)	A-4 (2)	A-4 (1)				
Quantity								
Texture								
Station	31+43	31+43	31+43	31+43				
Hole No.								
Depth (ft) From:	39.6	59.6	69.6	79.6				
To:	40.6	60.6	70.6	80.6				
	OK	OK	OK	OK				

**Remarks:**

A-163992 & 163993; A-164012 & 164013
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**CC:**

C. A. Dunnagan	
File	

SOILS ENGINEER:	
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JCS  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
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T.I.P. ID #: B-4632

REPORT ON SAMPLES OF: Soils for Quality

PROJECT:	33806.1.1	COUNTY:	Rutherford	Owner:	NCDOT
DATE SAMPLED:	6.30 & 7.1.10	DATE RECEIVED:	7.6.10	DATE REPORTED:	7.27.10
SAMPLED FROM:	Bridge	SAMPLED BY:	C. A. Dunnagan		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-21	SS-22	SS-23	SS-24	SS-25	SS-26	SS-27	SS-28
Lab Sample No. A	164343	164344	164345	164346	164347	164348	164349	164350
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	0.0	0.0	2.2	0.0	0.0
Passing #10 Sieve %	100	95	100	96	98	89	94	93
Passing #40 Sieve %	93	74	89	82	85	83	77	74
Passing #200 Sieve %	63	47	41	45	38	37	48	35

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	16	30	22	23	26	24	27	32
Fine Sand - Ret. #270	33	29	49	43	47	44	33	40
Silt 0.05-0.005 mm %	35	31	25	28	23	26	30	24
Clay < 0.005 mm %	16	10	4	6	4	6	10	4
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	43	43	40	36	34	34	38	32
Plastic Index	NP	NP	NP	NP	NP	NP	NP	NP
AASHTO Classification	A-5 (6)	A-5 (3)	A-4 (1)	A-4 (2)	A-4 (1)	A-4 (0)	A-4 (3)	A-2-4 (0)
Quantity								
Texture								
Station	30+27	30+27	30+27	30+27	30+27	30+27	31+23	31+23
Hole No.								
Depth (ft) From:	18.9	38.9	58.9	78.9	98.9	108.9	90.3	100.3
To:	19.9	39.9	59.9	79.9	99.9	109.9	91.3	101.2
	OK	OK	OK	OK	OK	OK	OK	OK

Remarks:  
 A-164343 - 164350

CC:  
 C. A. Dunnagan  
 File

SOILS ENGINEER:

JCS  
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T.I.P. ID #: B-4632

REPORT ON SAMPLES OF: Soils for Quality

PROJECT:	33806.1.1 (cont.)	COUNTY:	Rutherford	Owner:	NCDOT
DATE SAMPLED:	6.30.10	DATE RECEIVED:	7.6.10	DATE REPORTED:	7.27.10
SAMPLED FROM:	Bridge	SAMPLED BY:	C. A. Dunnagan		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-29							
Lab Sample No. A	164351							
HiCAMS Sample #	--							
Retained #4 Sieve %	0.0							
Passing #10 Sieve %	95							
Passing #40 Sieve %	84							
Passing #200 Sieve %	36							

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	33							
Fine Sand - Ret. #270	39							
Silt 0.05-0.005 mm %	20							
Clay < 0.005 mm %	8							
Passing # 40 Sieve %	--							
Passing # 200 Sieve %	--							

Liquid Limit	35							
Plastic Index	NP							
AASHTO Classification	A-4 (0)							
Quantity								
Texture								
Station	31+23							
Hole No.								
Depth (ft) From:	105.3							
To:	106.3							
	OK							

Remarks:  
 A-164351

CC:  
 C. A. Dunnagan  
 File

SOILS ENGINEER: