

REFERENCE: B-5985

PROJECT: 47749

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

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY ROBESON
PROJECT DESCRIPTION BRIDGE NO. 770125 ON -LI-
(NC 41/NC 72) OVER LUMBER RIVER AT -LI- STA.
23 + 56.00

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
1	TITLE SHEET
2	LEGEND (SOIL & ROCK)
3	SITE PLAN
4	PROFILE
5 - 8	BORE LOGS
9	SOIL TEST RESULTS
10	SITE PHOTOS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5985	1	10

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. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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 THE 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.

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

PERSONNEL

Lindsay Pugh, LG

Thomas Park

Jordan Edmondson

Corey Futral

Patrick McCain

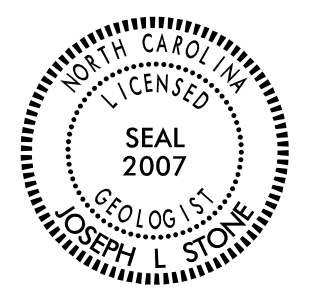
INVESTIGATED BY _____

DRAWN BY L. G. PUGH, LG

CHECKED BY J. LEE STONE, PG

SUBMITTED BY J. Lee Stone, PG

DATE March 2022



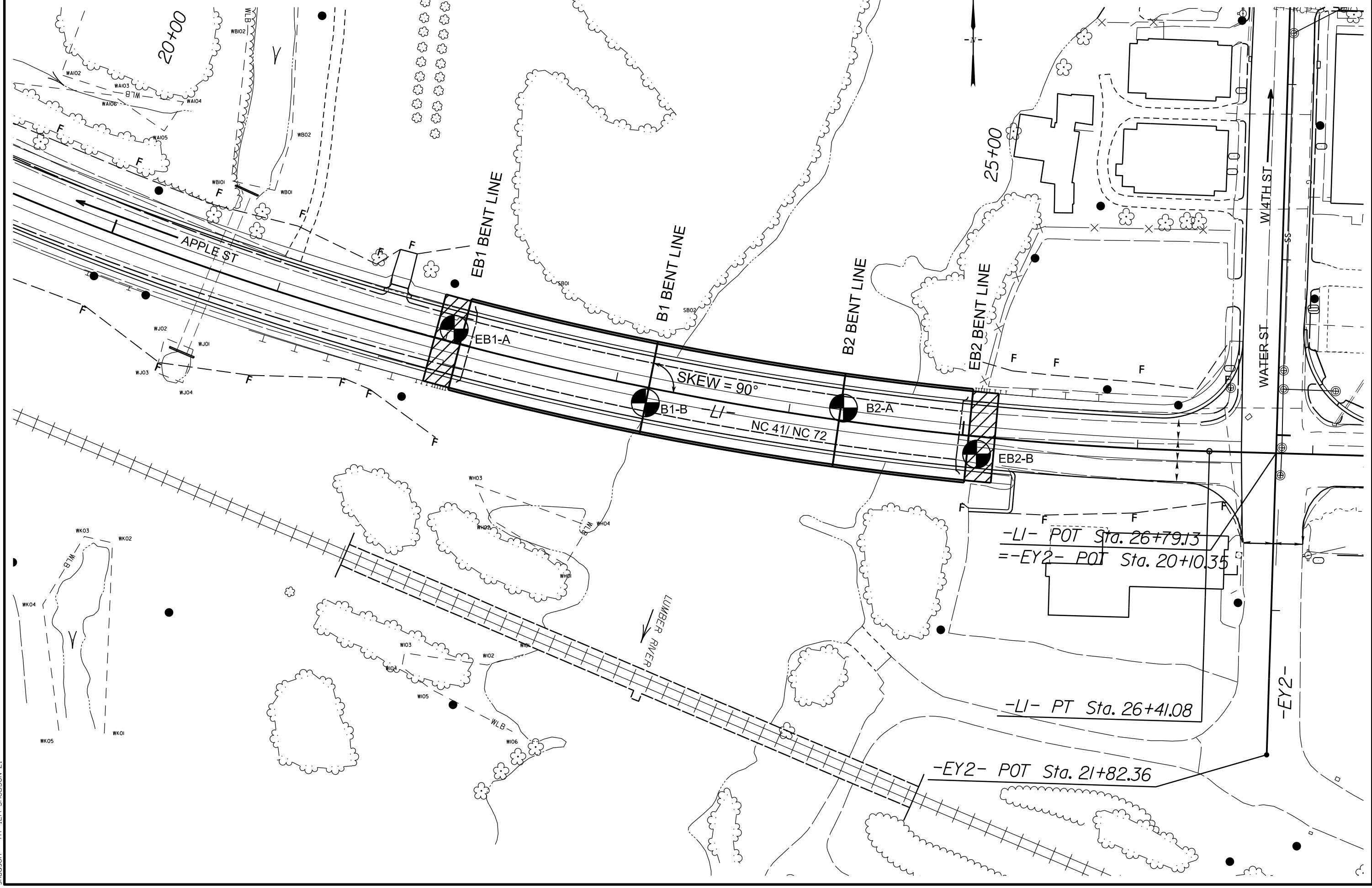
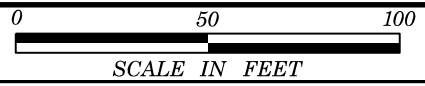
DocuSigned by:
Joseph L. Stone 03/25/2022

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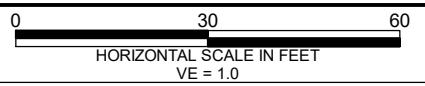
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UNLESS ALL SIGNATURES COMPLETED**

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

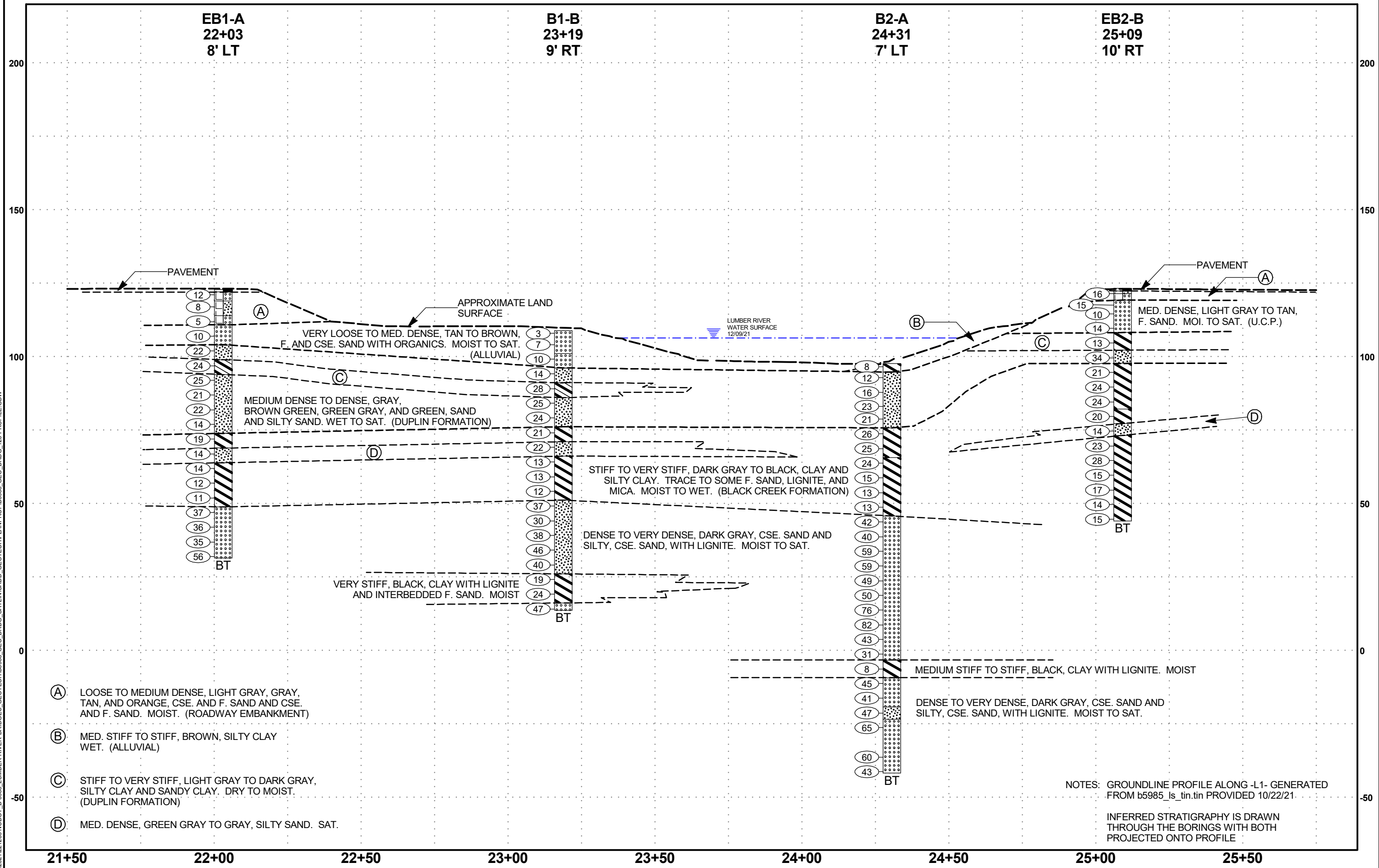
SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																									
<p>SOIL IS CONSIDERED UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 208, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>										<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>										<p>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, SUCH 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 (ROD) - 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 (SROD) - 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.</p>																																																																																																																																									
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MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME																																																																																																																																																																				
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<p>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.</p>										<p>COMPRESSION</p> <p>DMT - DILATOMETER TEST</p> <p>DPT - DYNAMIC PENETRATION TEST</p> <p>e - VOID RATIO</p> <p>F - FINE</p> <p>FOSS. - FOSSILIFEROUS</p> <p>FRAC. - FRACTURED, FRACTURES</p> <p>FRAGS. - FRAGMENTS</p> <p>HI. - HIGHLY</p>										<p>PERCENTAGE OF MATERIAL</p> <p>ORGANIC MATERIAL</p> <p>GRANULAR SOILS</p> <p>SILT - CLAY SOILS</p> <p>OTHER MATERIAL</p>										<p>GROUND WATER</p> <p>WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p>STATIC WATER LEVEL AFTER 24 HOURS</p> <p>PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p>SPRING OR SEEP</p>																																																																																																																																									
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 AT ILM-SHEDSON-21
 shudson



PROFILE THROUGH BORINGS PROJECTED ALONG -L1-



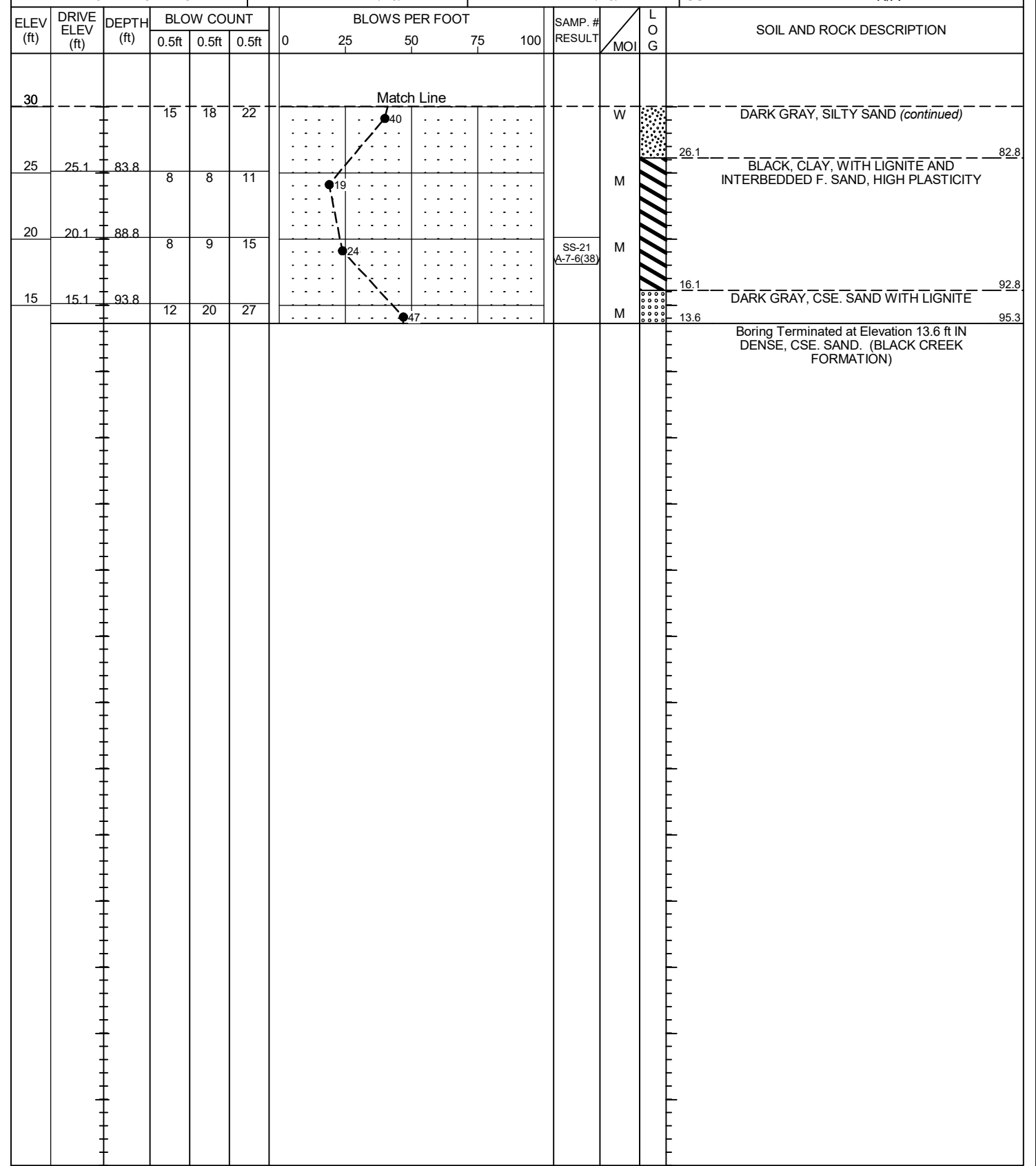
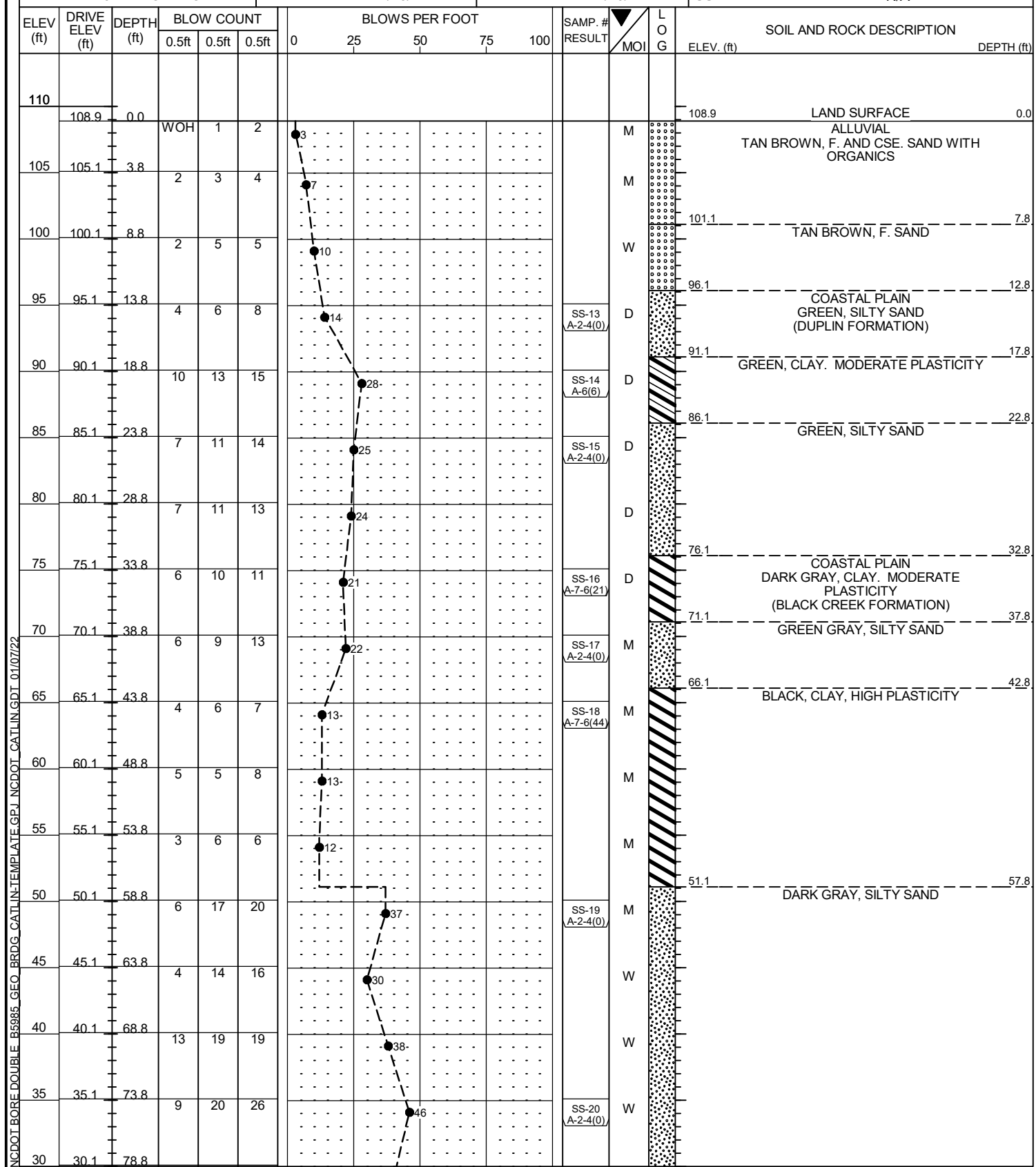
P:\2021\221289 NCDOT - B-5985 LUMBER-RIVER-BRIDGES - GEOTECH\PLAN\PROF\B5985 GEO_BRDG_CATLIN\CADD - GEO_BRDG_CATLIN\CADD - GEOTECH\PLAN\PROF\B5985 GEO_BRDG_125-PROFILE.GDW

GEOTECHNICAL BORING REPORT BORE LOG



WBS: 47749.1.1	TIP: B-5985	COUNTY: ROBESON	GEOLOGIST: THOMAS PARK
SITE DESCRIPTION: BRIDGE NO. 770125 ON -L1- (NC 41/NC 72) over LUMBER RIVER AT -L1- 23+56.00			GROUND WTR (ft)
BORING NO.: B1-B	STATION: 23+19	OFFSET: 9 ft RT	ALIGNMENT: -L1-
COLLAR ELEV.: 108.9 ft	TOTAL DEPTH: 95.3 ft	NORTHING: 315,917	EASTING: 1,996,547
DRILL RIG/HAMMER EFF./DATE: CAT4425 CME-55 83.7% 03/10/2021		DRILL METHOD: NW Casing w/ Advancer	HAMMER TYPE: AUTOMATIC
DRILLER: J. EDMONDSON	START DATE: 12/15/21	COMP. DATE: 12/15/21	SURFACE WATER DEPTH: N/A

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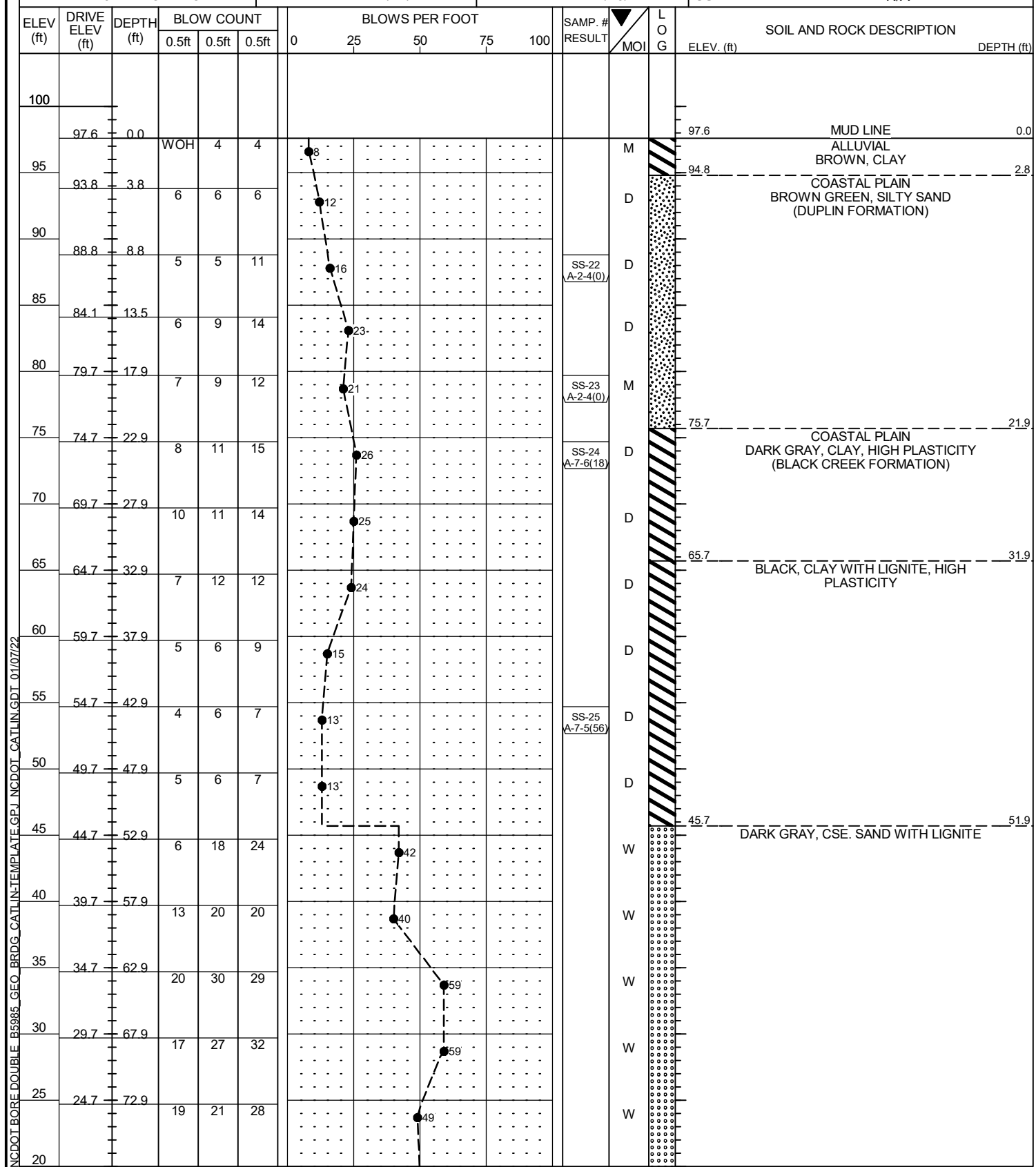


NCDOT BORE DOUBLE B5985_GEO_BRDG_CATLIN_TEMPLATE.GPJ NCDOT_CATLIN_GDT_01/07/22

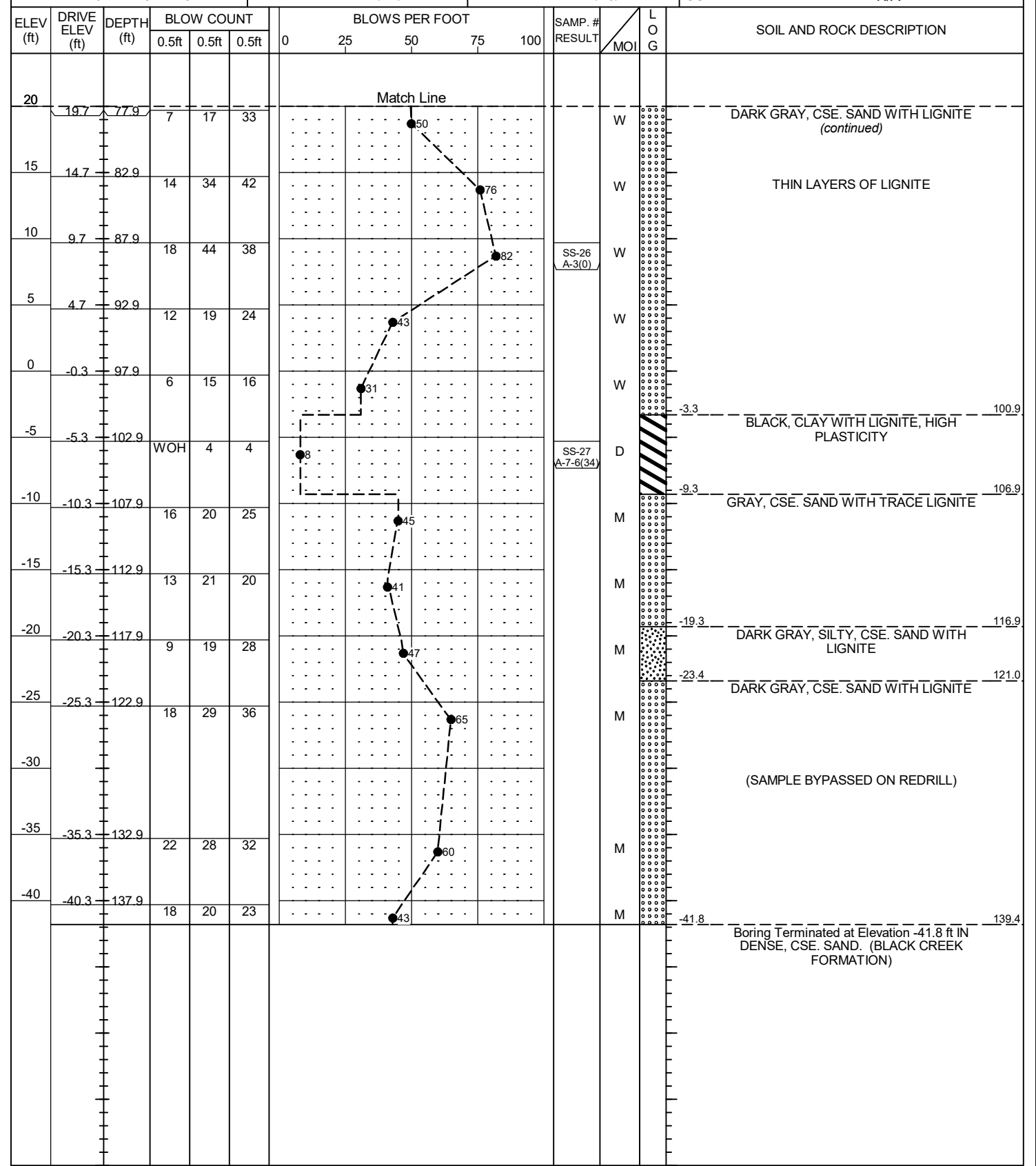
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SITE DESCRIPTION: BRIDGE NO. 770125 ON -L1- (NC 41/NC 72) over LUMBER RIVER AT -L1- 23+56.00			GROUND WTR (ft)
BORING NO.: B2-A	STATION: 24+31	OFFSET: 7 ft LT	ALIGNMENT: -L1-
COLLAR ELEV.: 97.6 ft	TOTAL DEPTH: 139.4 ft	NORTHING: 315,914	EASTING: 1,996,660
DRILL RIG/HAMMER EFF./DATE: CAT4425 CME-55 83.7% 03/10/2021		DRILL METHOD: NW Casing w/ Advancer	HAMMER TYPE: AUTOMATIC
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NCDOT BORE DOUBLE B5985 GEO BRDG CATLIN TEMPLATE GFL NCDOT CATLIN GDT 01/07/22

LABORATORY SUMMARY SHEET

AASHTO Standard Specifications

(As modified by NCDOT, Material and Tests Unit, 2000.)

TEST RESULTS

Proj. Sample Number	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21	SS-22	SS-23	SS-24	SS-25	SS-26	SS-27
Lab Sample Number	SS-13	SS-14	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21	SS-22	SS-23	SS-24	SS-25	SS-26	SS-27
Retained #4 Sieve %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Passing #10 Sieve %	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Passing #40 Sieve %	64	89	59	99	99	99	96	83	97	81	73	98	100	72	97
Passing #200 Sieve %	22	52	16	91	26	94	27	15	91	16	18	87	99	9	93
MINUS NUMBER 10 FRACTION															
SOIL MORTAR - 100%															
Coarse Sand Ret.-#60 %	51.6	20.1	62.4	2.4	3.8	1.8	25.7	46.6	4.3	49.0	57.5	3.2	0.4	76.4	4.9
Fine Sand Ret.-#270 %	30.7	33.8	24.9	8.1	79.1	4.6	48.5	40.6	7.5	38.5	27.6	13.0	0.7	16.0	3.0
Silt 0.05 - 0.005mm %	13.9	38.2	9.8	75.1	13.2	40.0	6.7	7.2	29.0	11.7	12.9	67.2	21.7	5.6	27.6
Clay <0.005mm %	3.7	7.9	2.9	14.4	3.9	53.6	19.1	5.6	59.2	0.8	2.0	16.6	77.2	2.0	64.6
Liquid Limit (LL)	NP	35	NP	48	NP	67	NP	NP	62	NP	NP	44	79	NP	56
Plasticity Index (PI)	NP	17	NP	19	NP	41	NP	NP	37	NP	NP	19	47	NP	33
AASHTO Classification /Group Index	A-2-4(0)	A-6(6)	A-2-4(0)	A-7-6(21)	A-2-4(0)	A-7-6(44)	A-2-4(0)	A-2-4(0)	A-7-6(38)	A-2-4(0)	A-2-4(0)	A-7-6(18)	A-7-5(56)	A-3(0)	A-7-6(34)
Organic Content %	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Station	23+19	23+19	23+19	23+19	23+19	23+19	23+19	23+19	23+19	24+31	24+31	24+31	24+31	24+31	24+31
Offset	9ft RT	9ft RT	9ft RT	9ft RT	9ft RT	9ft RT	9ft RT	9ft RT	9ft RT	7ft LT	7ft LT	7ft LT	7ft LT	7ft LT	7ft LT
Alignment	-L1-	-L1-	-L1-	-L1-	-L1-	-L1-	-L1-	-L1-	-L1-	-L1-	-L1-	-L1-	-L1-	-L1-	-L1-
Boring Identification	B1-B	B1-B	B1-B	B1-B	B1-B	B1-B	B1-B	B1-B	B1-B	B2-A	B2-A	B2-A	B2-A	B2-A	B2-A
Depth (FT)	13.8	18.8	23.8	33.8	38.8	43.8	58.8	73.8	88.8	8.8	17.9	22.9	42.9	87.9	102.9
to	15.3	20.3	25.3	35.2	40.3	45.3	60.3	75.3	90.3	10.3	19.4	24.4	44.4	89.4	104.4
Field Moist. Content %															
Tested By	MDMASON	MDMASON	MDMASON	MDMASON	MDMASON	MDMASON	MDMASON	MDMASON	MDMASON	MDMASON	MDMASON	MDMASON	MDMASON	MDMASON	MDMASON
Submitted By	L.PUGH	L.PUGH	L.PUGH	L.PUGH	L.PUGH	L.PUGH	L.PUGH	L.PUGH	L.PUGH	L.PUGH	L.PUGH	L.PUGH	L.PUGH	L.PUGH	L.PUGH
Date Submitted	12/22/21	12/22/21	12/22/21	12/22/21	12/22/21	12/22/21	12/22/21	12/22/21	12/22/21	12/22/21	12/22/21	12/22/21	12/22/21	12/22/21	12/22/21

NP = Non-Plastic

NEM = Not Enough Material for Analysis

N/A = Not Applicable / Not Analyzed

Michael D. Mason
Laboratory Manager

Report Date: 1/6/2022

Laboratory Report Page 1 of 1



LEFT OF -L1- NEAR END BENT 1
FACING EAST



LEFT OF -L1- NEAR BENT 2
FACING WEST TOWARDS END BENT 1



RIGHT OF -L1- NEAR BENT 2
FACING EAST TOWARDS END BENT 2

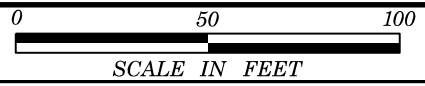


DOWNSTREAM (RIGHT) OF -L1-
FACING NORTH

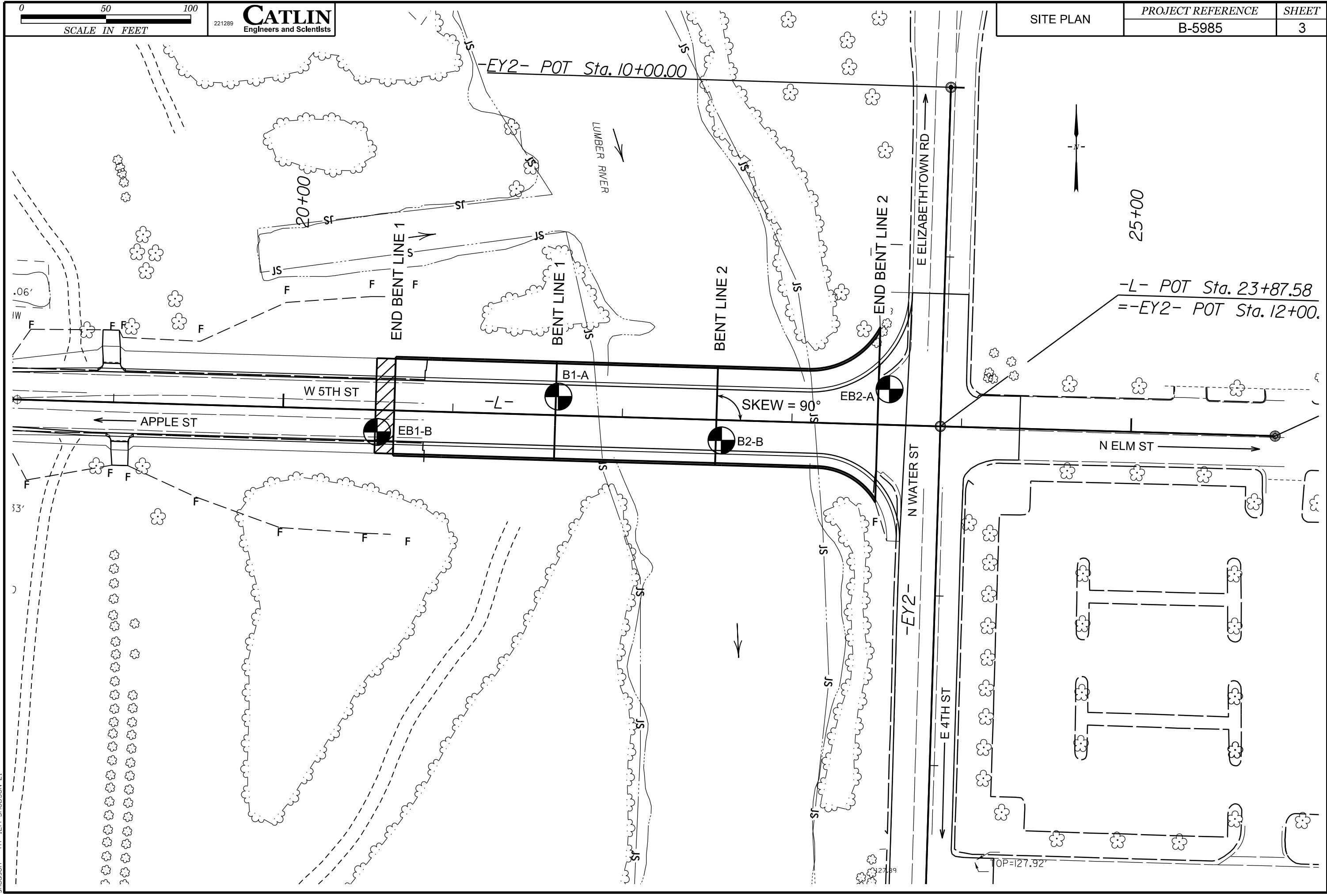
10-MAN-2022 1146
2021/221289
shudson
NCDOT-B-5985-LUMBER-RIVER-BRIDGES-GEOTECH-B5985-GEODRG-125\CADD-GEOTECH\Site&Sub\B5985-GEODRG-PHOTOS.125.dgn

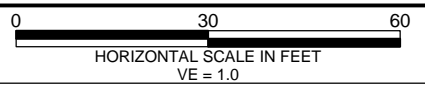
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION										GRADATION										ROCK DESCRIPTION										TERMS AND DEFINITIONS																																																																																																																																																					
<p>SOIL IS CONSIDERED 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 THE STANDARD PENETRATION TEST (AASHTO T 208, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE, VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</p>										<p>WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.</p>										<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>										<p>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, SUCH 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 (ROD) - 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 (SROD) - 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.</p>																																																																																																																																																					
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<p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>										<p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>										<p>ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p>										<p>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.</p>																																																																																																																																																					
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<p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY</p>										<p>DIP & DIP DIRECTION OF ROCK STRUCTURES SPT TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION</p>										<p>SLOPE INDICATOR INSTALLATION CONE PENETROMETER TEST SOUNDING ROD TEST BORING WITH CORE SPT N-VALUE</p>										<p>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 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, WOULD YIELD SPT N VALUES > 100 BPF ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF 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.</p>																																																																																																																																																					
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<p>DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-BROWN). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.</p>										<p>FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE MODERATELY INDURATED INDURATED EXTREMELY INDURATED</p>										<p>FRAGILE MODERATELY INDURATED INDURATED EXTREMELY INDURATED</p>										<p>FRAGILE MODERATELY INDURATED INDURATED EXTREMELY INDURATED</p>																																																																																																																																																					

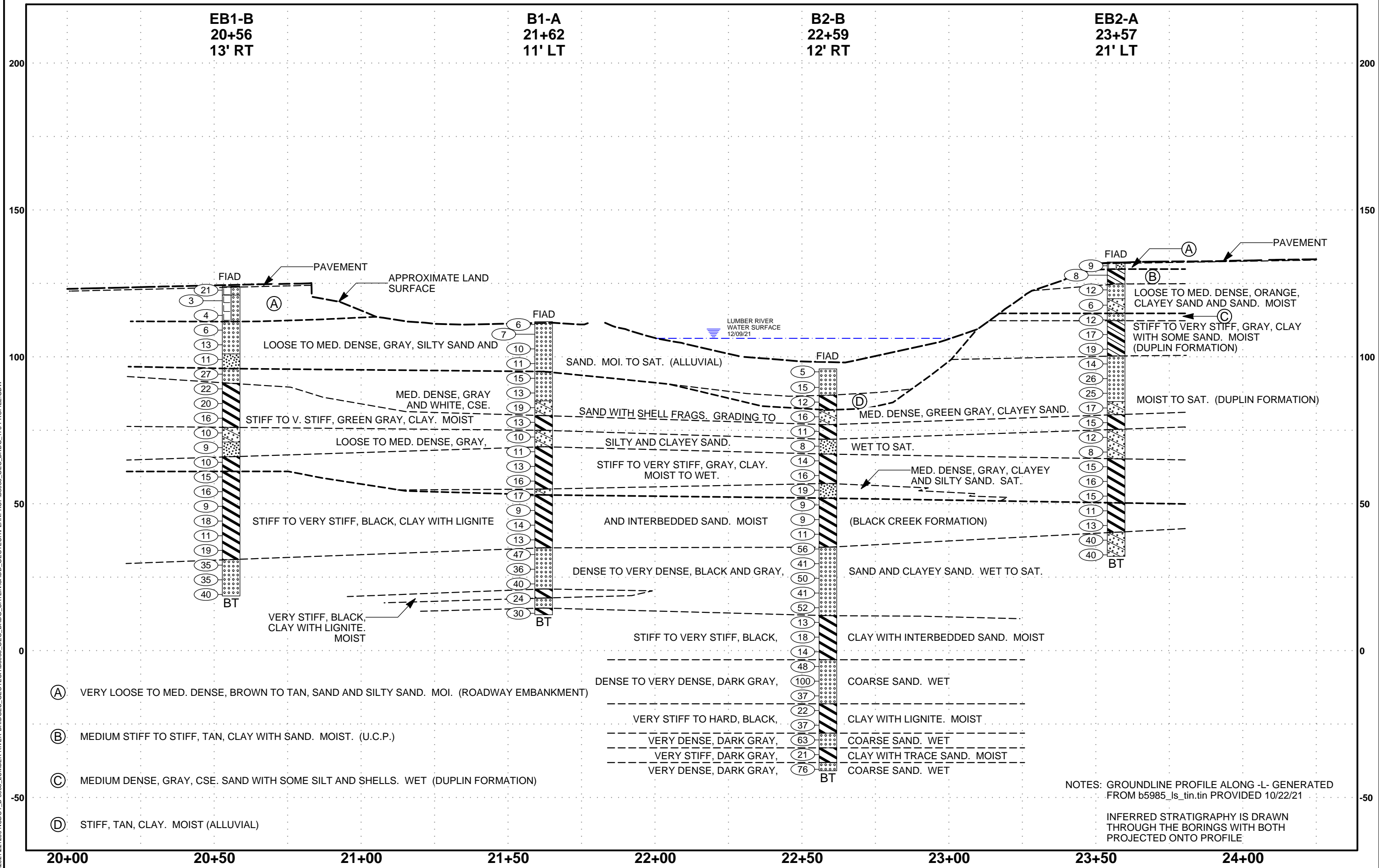


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 AT ILM:SHUDSON-21
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PROFILE THROUGH BORINGS PROJECTED ALONG -L-



GEOTECHNICAL BORING REPORT BORE LOG



WBS: 47749.1.1	TIP: B-5985	COUNTY: ROBESON	GEOLOGIST: THOMAS PARK
SITE DESCRIPTION: BRIDGE NO. 770175 ON -L- (W. 5TH ST) OVER LUMBER RIVER AT -L- STA. 22+08.00			GROUND WTR (ft)
BORING NO.: B1-A	STATION: 21+62	OFFSET: 11 ft LT	ALIGNMENT: -L-
COLLAR ELEV.: 112.0 ft	TOTAL DEPTH: 99.8 ft	NORTHING: 316,716	EASTING: 1,996,707
DRILL RIG/HAMMER EFF./DATE: CAT4425 CME-55 83.7% 03/10/2021		DRILL METHOD: NW Casing w/ Advancer	HAMMER TYPE: AUTOMATIC
DRILLER: J. EDMONDSON	START DATE: 12/07/21	COMP. DATE: 12/07/21	SURFACE WATER DEPTH: N/A

WBS: 47749.1.1	TIP: B-5985	COUNTY: ROBESON	GEOLOGIST: THOMAS PARK
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ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT			BLOWS PER FOOT					SAMP. # RESULT	LOG	SOIL AND ROCK DESCRIPTION	DEPTH (ft)	
			0.5ft	0.5ft	0.5ft	0	25	50	75	100					
115															
	112.0	0.0													
	108.7	3.3	2	2	4										
	103.7	8.3	4	2	5										
	103.7	8.3	4	3	7										
	98.7	13.3	4	3	7										
	98.7	13.3	4	5	6										
	93.7	18.3	4	6	9										
	88.7	23.3	4	6	7										
	83.7	28.3	5	8	11										
	78.7	33.3	3	6	7										
	73.7	38.3	4	4	6										
	68.7	43.3	5	5	6										
	63.7	48.3	4	5	8										
	58.7	53.3	6	7	9										
	53.7	58.3	5	8	9										
	48.7	63.3	4	4	5										
	43.7	68.3	4	6	8										
	38.7	73.3	3	6	7										
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	23.7	88.3	11	16	24										
	18.7	93.3	3	9	15										
	13.7	98.3	8	12	18										

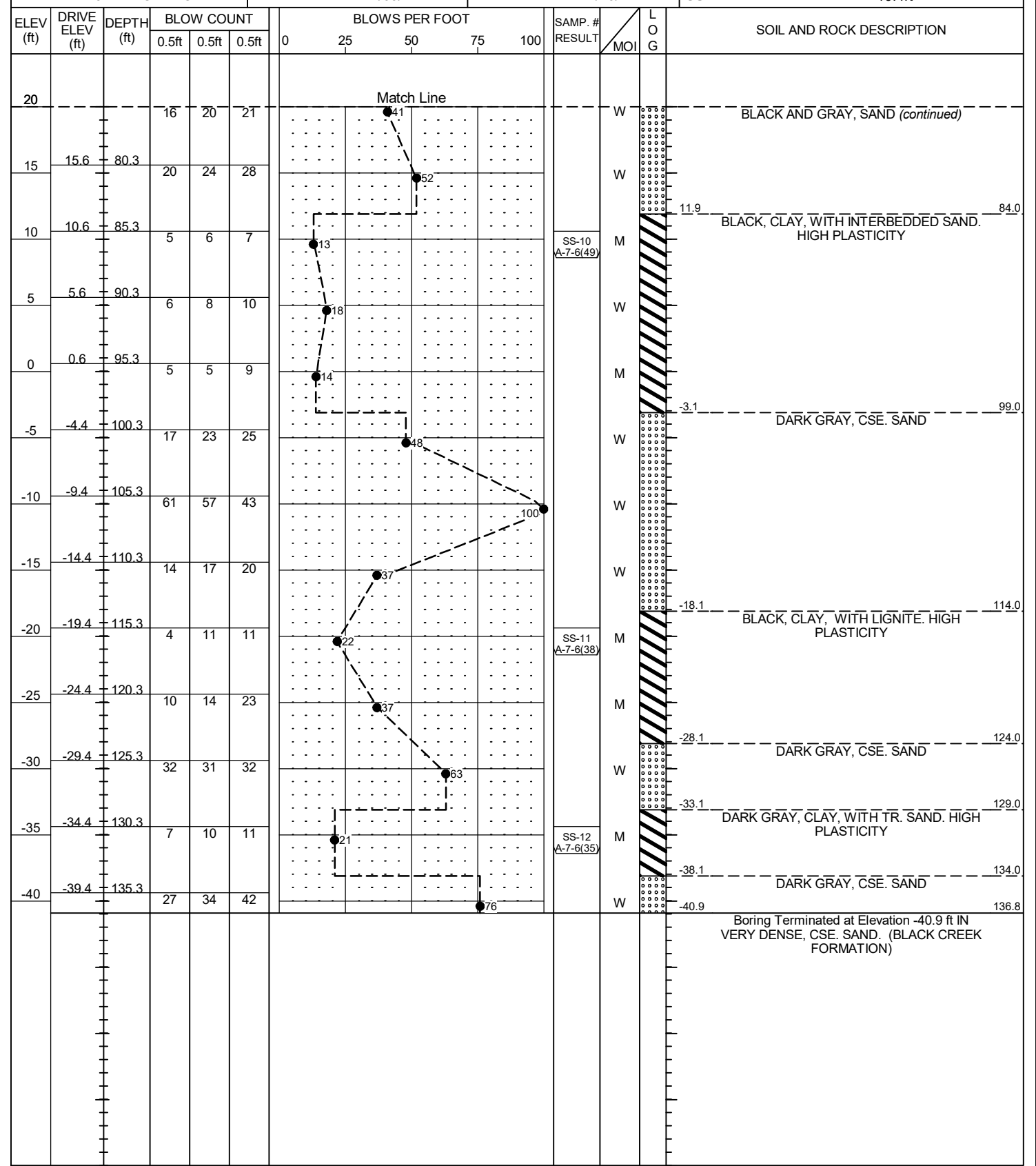
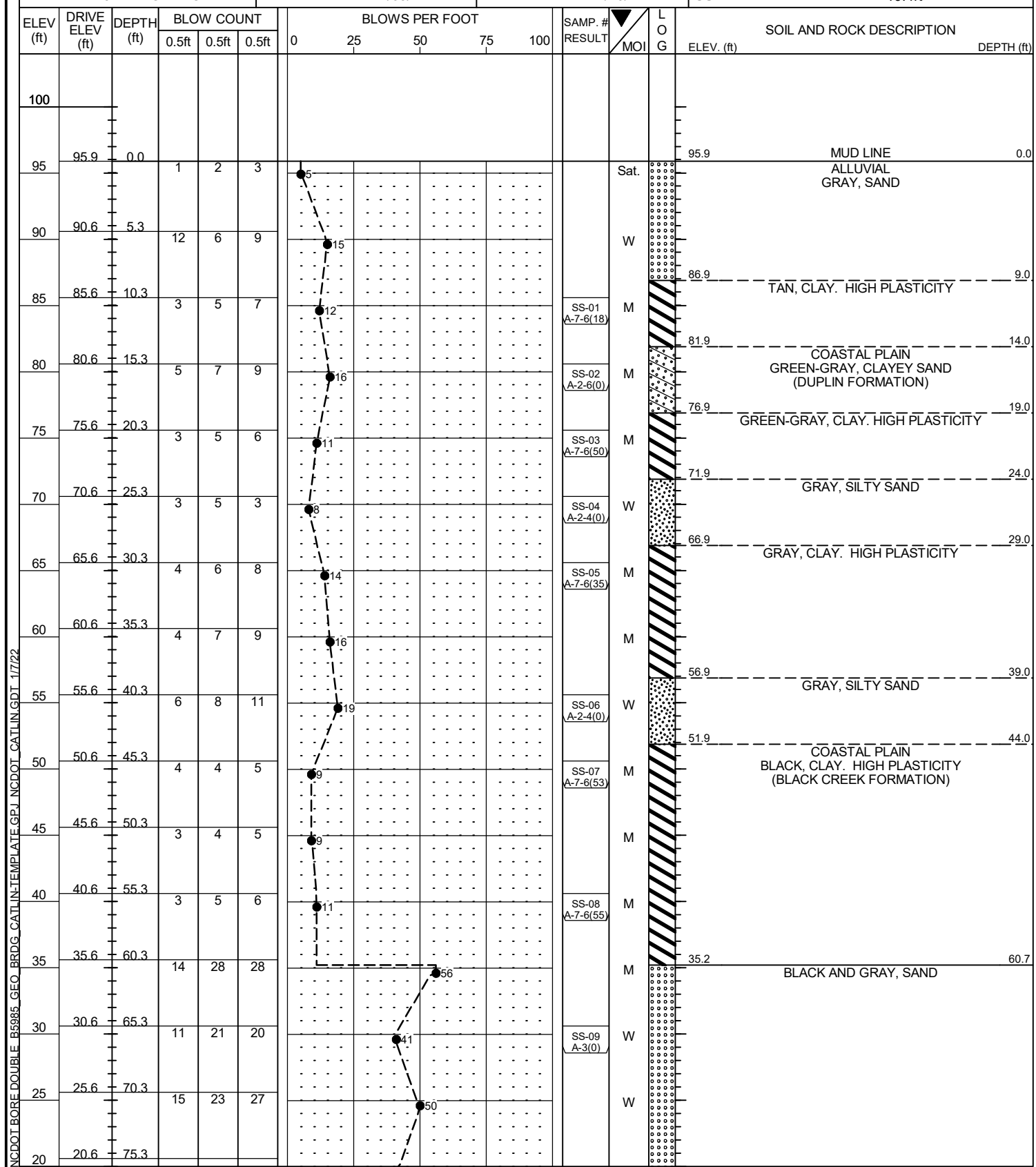
NCDOT BORE DOUBLE B5985_GEO_BRDG_CATLIN_TEMPLATE.GPJ NCDOT_CATLIN_GDT_1/17/22

GEOTECHNICAL BORING REPORT BORE LOG



WBS: 47749.1.1	TIP: B-5985	COUNTY: ROBESON	GEOLOGIST: THOMAS PARK
SITE DESCRIPTION: BRIDGE NO. 770175 ON -L- (W. 5TH ST) OVER LUMBER RIVER AT -L- STA. 22+08.00			GROUND WTR (ft)
BORING NO.: B2-B	STATION: 22+59	OFFSET: 12 ft RT	ALIGNMENT: -L-
COLLAR ELEV.: 95.9 ft	TOTAL DEPTH: 136.8 ft	NORTHING: 316,690	EASTING: 1,996,803
DRILL RIG/HAMMER EFF./DATE: CAT4425 CME-55 83.7% 03/10/2021		DRILL METHOD: NW Casing w/ Advancer	
DRILLER: J. EDMONDSON		START DATE: 12/09/21	
COMP. DATE: 12/10/21		SURFACE WATER DEPTH: 10.4ft	

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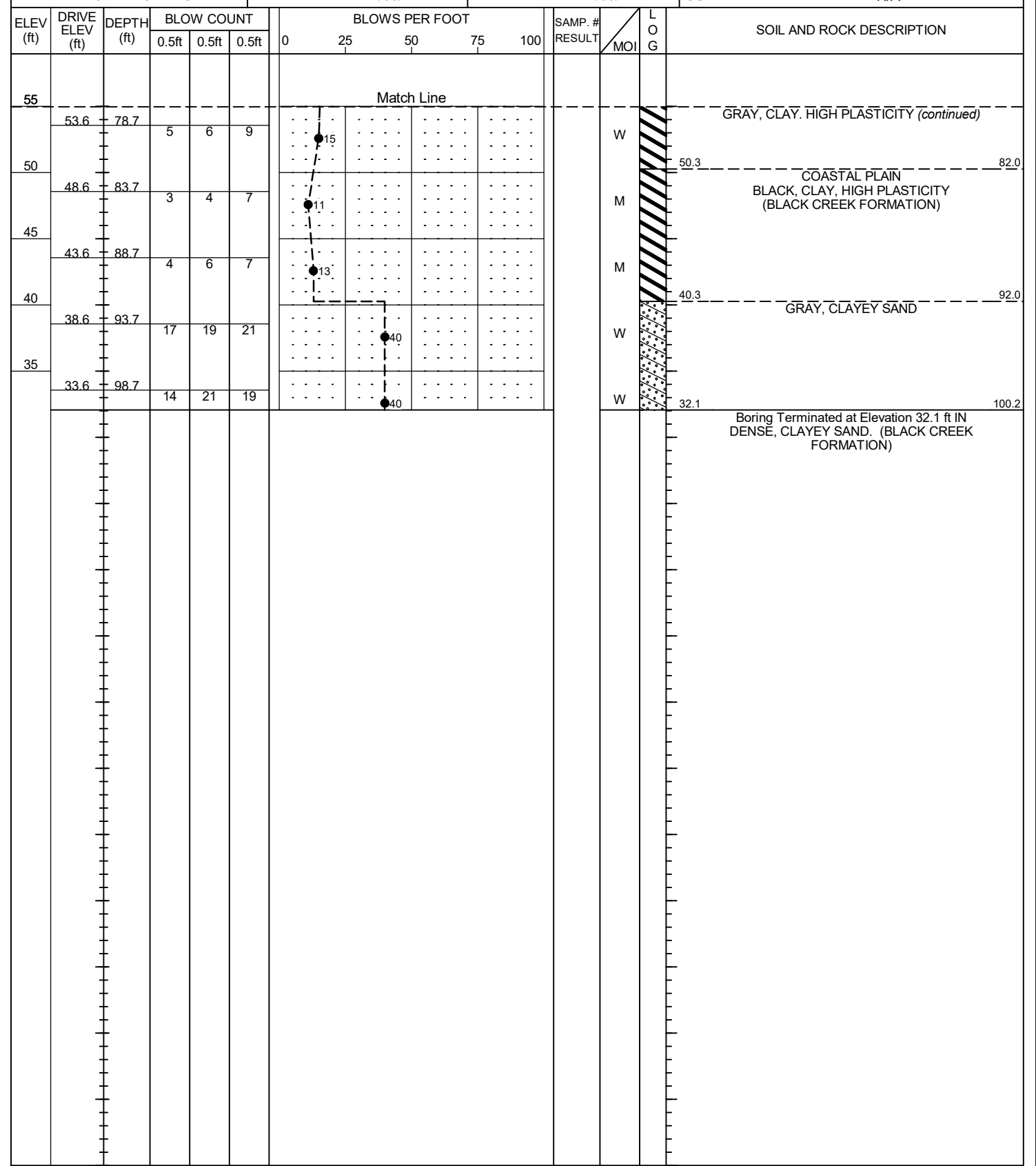
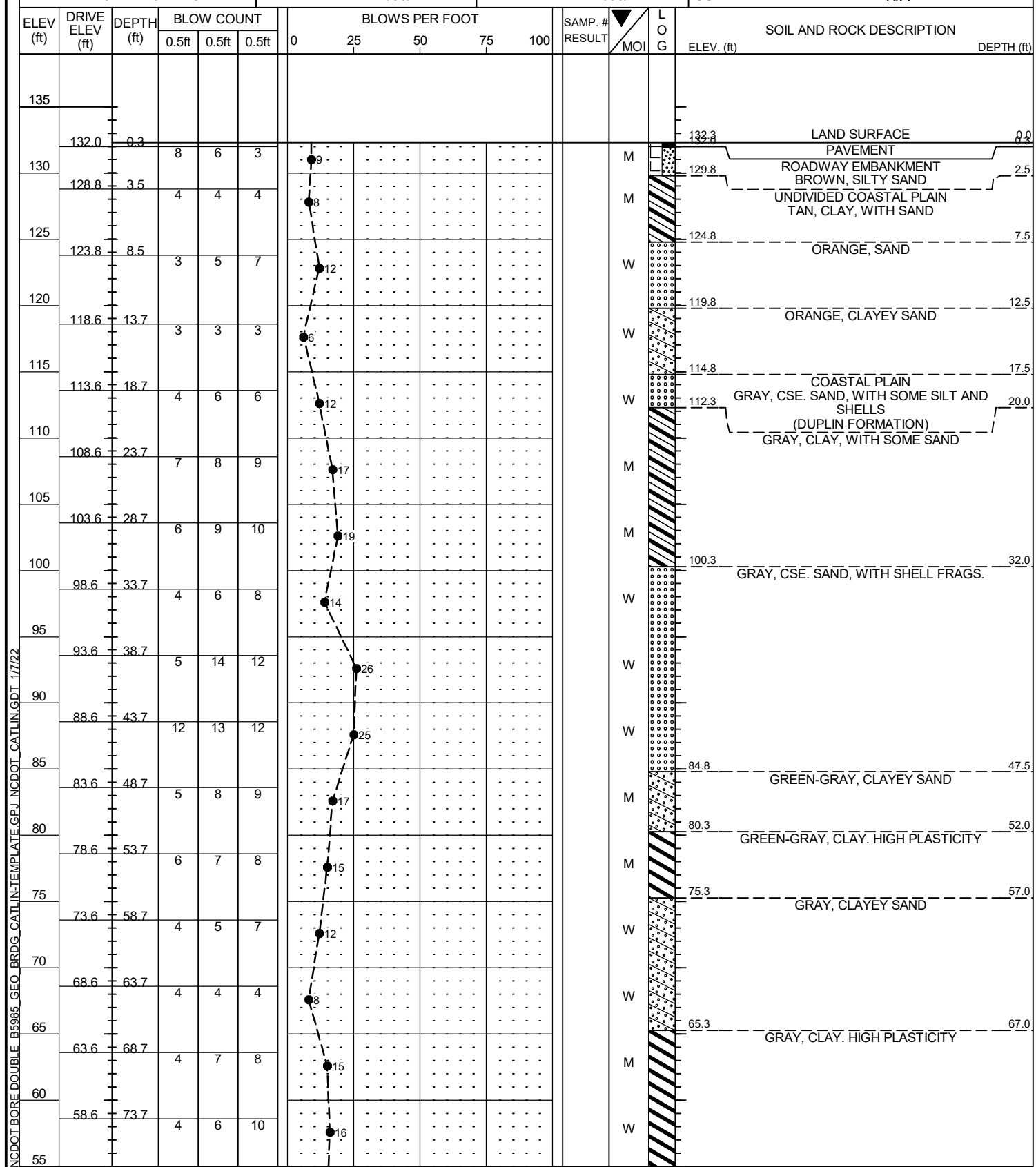
NCDOT BORE DOUBLE B5985_GEO_BRDG_CATLINTEMPLATE.GPJ NCDOT CATLIN.GDT 1/17/22

GEOTECHNICAL BORING REPORT BORE LOG



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SITE DESCRIPTION: BRIDGE NO. 770175 ON -L- (W. 5TH ST) OVER LUMBER RIVER AT -L- STA. 22+08.00			GROUND WTR (ft)
BORING NO.: EB2-A	STATION: 23+57	OFFSET: 21 ft LT	ALIGNMENT: -L-
COLLAR ELEV.: 132.3 ft	TOTAL DEPTH: 100.2 ft	NORTHING: 316,720	EASTING: 1,996,902
DRILL RIG/HAMMER EFF./DATE: CAT4425 CME-55 83.7% 03/10/2021		DRILL METHOD: MUD ROTARY	HAMMER TYPE: AUTOMATIC
DRILLER: J. EDMONDSON	START DATE: 12/06/21	COMP. DATE: 12/06/21	SURFACE WATER DEPTH: N/A

WBS: 47749.1.1	TIP: B-5985	COUNTY: ROBESON	GEOLOGIST: THOMAS PARK
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COLLAR ELEV.: 132.3 ft	TOTAL DEPTH: 100.2 ft	NORTHING: 316,720	EASTING: 1,996,902
DRILL RIG/HAMMER EFF./DATE: CAT4425 CME-55 83.7% 03/10/2021		DRILL METHOD: MUD ROTARY	HAMMER TYPE: AUTOMATIC
DRILLER: J. EDMONDSON	START DATE: 12/06/21	COMP. DATE: 12/06/21	SURFACE WATER DEPTH: N/A



NCDOT BORE DOUBLE B-5985 GEO BRDG CATLIN TEMPLATE.GPJ NCDOT CATLIN GDT-1/17/22

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

STRUCTURE
SUBSURFACE INVESTIGATION

LABORATORY RESULTS

REFERENCE: B-5985

PROJECT: 47749

B2-B SOIL TEST RESULTS															
SAMPLE NUMBER	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-01	12 ft RT	22+59	10.3 - 11.8	A-7-6(18)	54	39	29.3	18.2	28.0	24.5	91.2	78	57	-	-
SS-02	12 ft RT	22+59	15.3 - 16.8	A-2-6(0)	27	11	51.6	29.2	12.1	7.1	97.8	69	21	-	-
SS-03	12 ft RT	22+59	20.3 - 21.8	A-7-6(50)	74	52	3.0	15.3	25.8	55.9	100	98	88	-	-
SS-04	12 ft RT	22+59	25.8 - 26.8	A-2-4(0)	NP	NP	72.9	15.1	2.6	9.4	99.3	57	13	-	-
SS-05	12 ft RT	22+59	30.3 - 31.8	A-7-6(35)	55	40	1.3	20.1	29.0	49.6	100	100	84	-	-
SS-06	12 ft RT	22+59	40.3 - 41.8	A-2-4(0)	26	6	1.8	73.9	11.8	12.5	100	99	33	-	-
SS-07	12 ft RT	22+59	45.3 - 46.8	A-7-6(53)	73	45	0.6	0.8	84.2	14.4	99.9	100	99	-	-
SS-08	12 ft RT	22+59	55.3 - 56.8	A-7-6(55)	73	49	2.4	1.7	38.2	57.7	100	99	97	-	-
SS-09	12 ft RT	22+59	65.3 - 66.8	A-3(0)	NP	NP	74.8	17.7	3.0	4.6	99.1	51	9	-	-
SS-10	12 ft RT	22+59	85.3 - 86.8	A-7-6(49)	69	44	2.7	1.9	38.2	57.2	100	98	96	-	-
SS-11	12 ft RT	22+59	115.3 - 116.8	A-7-6(38)	59	37	3.1	6.5	33.9	56.6	99.3	98	93	-	-
SS-12	12 ft RT	22+59	130.3 - 131.8	A-7-6(35)	56	35	3.0	7.5	33.0	56.5	99.2	98	92	-	-



NEAR BENT 1 FACING WEST
TO END BENT 1



NEAR BENT 1 FACING EAST
TO END BENT 2



NEAR END BENT 1
LEFT OF -L- FACING EAST
TO END BENT 2



DOWNSTREAM (RIGHT) OF -L-
FACING NORTH

10-MAN-2022-10-44
2021-221289
shudson
NCDOT-B-5985-LUMBER-RIVER-BRIDGES-GEOTECH\B5985-GEO.BRDG.175\CADD.GEOTECH\Site&Sub\B5985-GEO.BRDG.PHOTOS.175.dgn