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REFERENCE: B-4751

PROJECT: 38523

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4751	1	14

STRUCTURE
SUBSURFACE INVESTIGATION

CONTENTS

<u>SHEET NO.</u>	<u>DESCRIPTION</u>
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COUNTY GASTON
PROJECT DESCRIPTION BRIDGE NO. 203 ON SR 1935
(WILLOWSIDE DR.) OVER STANLEY CREEK

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) 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.

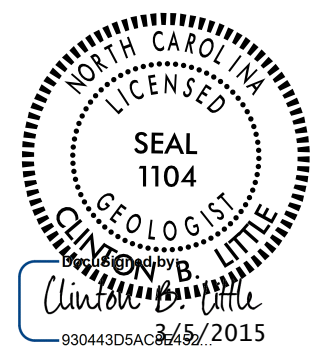
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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:
1. 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.
 2. 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

- C.C. MURRAY
M.R. MOORE
J.E. ESTEP
R.S. HINSON
C.L. SMITH
R.W. TODD
C.E. BURRIS
J.A. NEWBERRY

INVESTIGATED BY J.E. BEVERLY
DRAWN BY J.K. McCLURE
CHECKED BY C.B. LITTLE
SUBMITTED BY C.B. LITTLE
DATE FEBRUARY 2015



SIGNATURE _____ DATE _____

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 206, 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. FLOTT - 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 (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>	
<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p>				<p style="text-align: center;">ANGULARITY OF GRAINS</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>			<p style="text-align: center;">WEATHERED ROCK (WR)</p> <p>NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.</p>					
<p style="text-align: center;">MINERALOGICAL COMPOSITION</p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.</p>				<p style="text-align: center;">CRYSTALLINE ROCK (CR)</p> <p>FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.</p>			<p style="text-align: center;">NON-CRYSTALLINE ROCK (NCR)</p> <p>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.</p>					
<p style="text-align: center;">COMPRESSION</p> <p>SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50 HIGHLY COMPRESSIBLE LL > 50</p>				<p style="text-align: center;">PERCENTAGE OF MATERIAL</p>			<p style="text-align: center;">COASTAL PLAIN SEDIMENTARY ROCK (CP)</p> <p>COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.</p>					
<p style="text-align: center;">GROUND WATER</p>				<p style="text-align: center;">MISCELLANEOUS SYMBOLS</p>			<p style="text-align: center;">WEATHERING</p>					
<p style="text-align: center;">RECOMMENDATION SYMBOLS</p>				<p style="text-align: center;">ABBREVIATIONS</p>			<p style="text-align: center;">FRACTURE SPACING</p>				<p style="text-align: center;">BEDDING</p>	
<p style="text-align: center;">TEXTURE OR GRAIN SIZE</p>				<p style="text-align: center;">EQUIPMENT USED ON SUBJECT PROJECT</p>			<p style="text-align: center;">INDURATION</p>					
<p style="text-align: center;">SOIL MOISTURE - CORRELATION OF TERMS</p>				<p style="text-align: center;">PLASTICITY</p>			<p style="text-align: center;">COLOR</p>					
<p style="text-align: center;">CONSISTENCY OR DENSENESS</p>				<p style="text-align: center;">RECOMMENDATION SYMBOLS</p>			<p style="text-align: center;">ABBREVIATIONS</p>					
<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p>				<p style="text-align: center;">COMPRESSION</p>			<p style="text-align: center;">PERCENTAGE OF MATERIAL</p>					
<p style="text-align: center;">GROUND WATER</p>				<p style="text-align: center;">MISCELLANEOUS SYMBOLS</p>			<p style="text-align: center;">WEATHERING</p>					
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<p style="text-align: center;">SOIL LEGEND AND AASHTO CLASSIFICATION</p>				<p style="text-align: center;">COMPRESSION</p>			<p style="text-align: center;">PERCENTAGE OF MATERIAL</p>					
<p style="text-align: center;">GROUND WATER</p>				<p style="text-align: center;">MISCELLANEOUS SYMBOLS</p>			<p style="text-align: center;">WEATHERING</p>					
<p style="text-align: center;">RECOMMENDATION SYMBOLS</p>				<p style="text-align: center;">ABBREVIATIONS</p>			<p style="text-align: center;">FRACTURE SPACING</p>				<p style="text-align: center;">BEDDING</p>	
<p style="text-align: center;">TEXTURE OR GRAIN SIZE</p>				<p style="text-align: center;">EQUIPMENT USED ON SUBJECT PROJECT</p>			<p style="text-align: center;">INDURATION</p>					
<p style="text-align: center;">SOIL MOISTURE - CORRELATION OF TERMS</p>				<p style="text-align: center;">PLASTICITY</p>			<p style="text-align: center;">COLOR</p>					

BEGIN T.I.P. PROJECT B-4751

-L- STA. 13+50.00

DONNA K. LYMAN
DB 1936 PG 944

REMOVE EXISTING BRIDGE

BRIDGE #203
WOODEN BRIDGE
W/BST. DECK, TIMBER END
WALLS, AND 12" ROUND
WOODEN PILINGS

BRIDGE IDENTITY
15+53.00 -L-
SKEW=120° 00' 00"
(TO LONG CORD)

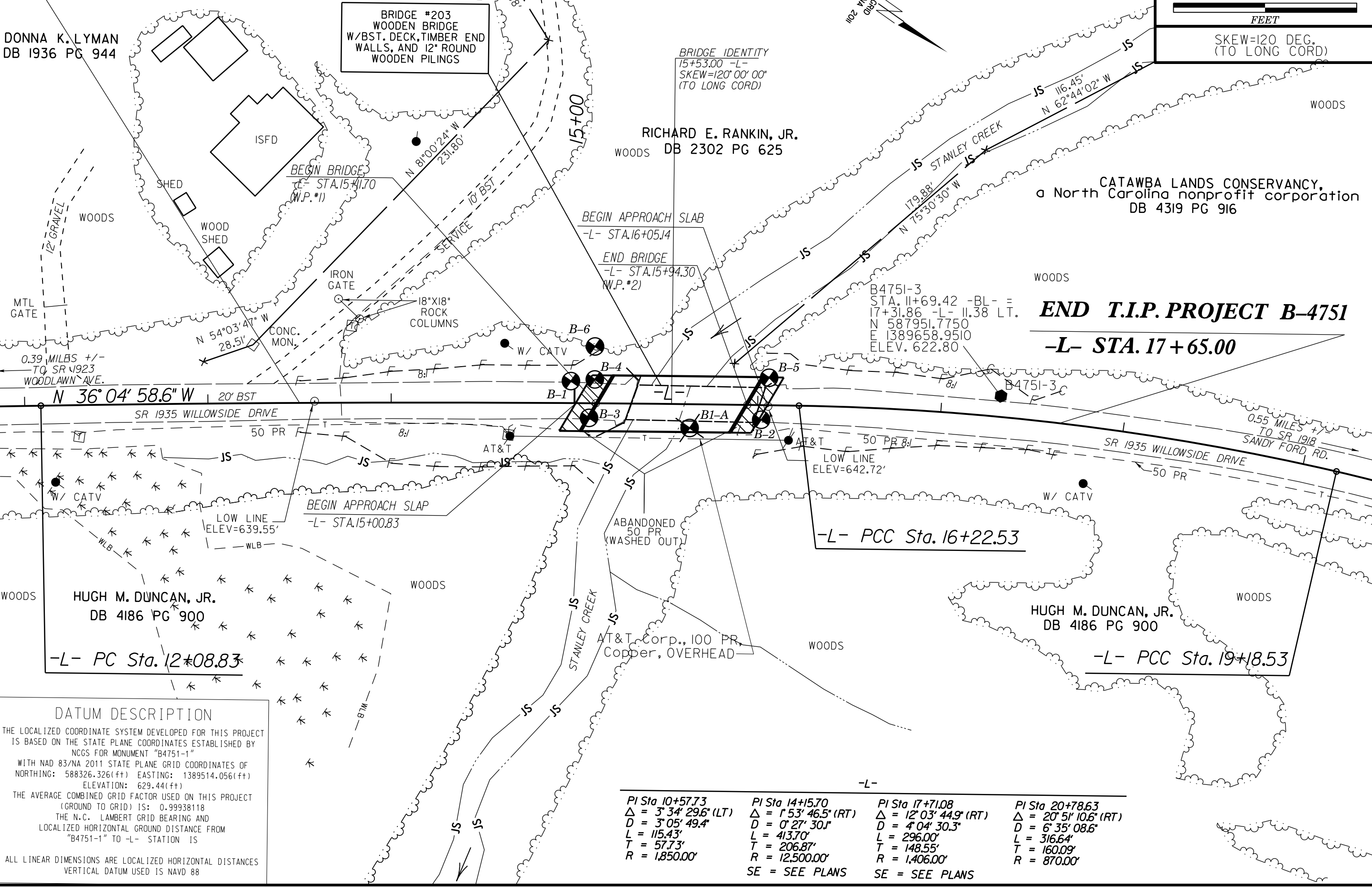
RICHARD E. RANKIN, JR.
WOODS DB 2302 PG 625

CATAWBA LANDS CONSERVANCY,
a North Carolina nonprofit corporation
DB 4319 PG 916

END T.I.P. PROJECT B-4751

-L- STA. 17+65.00

B4751-3
STA. 11+69.42 -BL- =
17+31.86 -L- 11.38 LT.
N 58° 51' 77.50"
E 138° 9658.9510
ELEV. 622.80



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B4751-1"

WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 588326.326(ft) EASTING: 1389514.056(ft)
ELEVATION: 629.44(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99938118

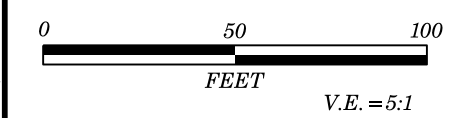
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4751-1" TO -L- STATION IS

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

PI Sta 10+57.73 Δ = 3° 34' 29.6" (LT) D = 3° 05' 49.4" L = 115.43' T = 57.73' R = 1,850.00'	PI Sta 14+15.70 Δ = 1° 53' 46.5" (RT) D = 0° 27' 30.1" L = 413.70' T = 206.87' R = 12,500.00'	PI Sta 17+71.08 Δ = 12° 03' 44.9" (RT) D = 4° 04' 30.3" L = 296.00' T = 148.55' R = 1,406.00'	PI Sta 20+78.63 Δ = 20° 51' 10.6" (RT) D = 6° 35' 08.6" L = 316.64' T = 160.09' R = 870.00'
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SE = SEE PLANS

-L- SR 1935
WILLOWSIDE DR.

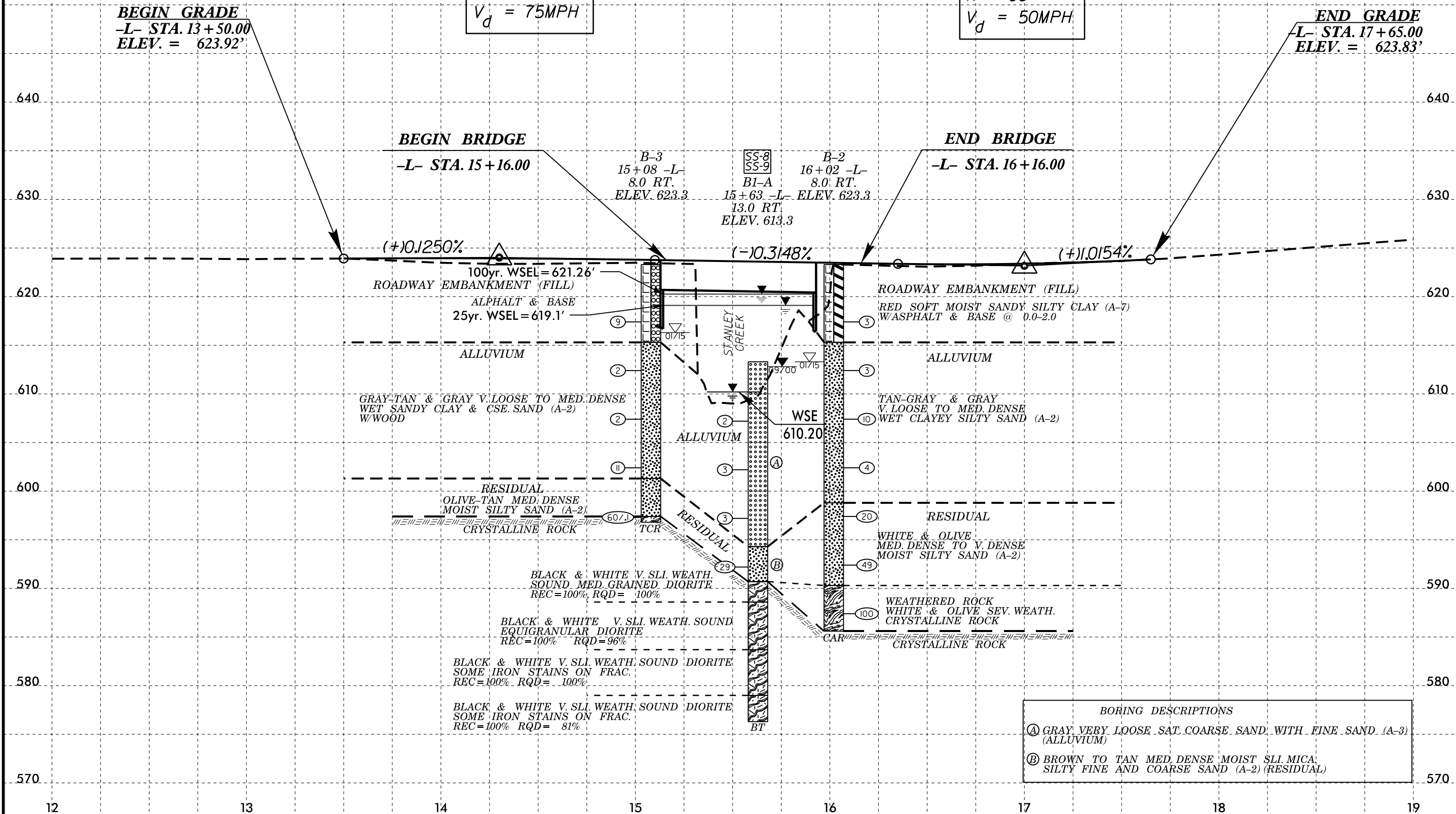


PROJECT REFERENCE NO.	SHEET
38523.1.2 (B-4751)	4
Profile -L- Bridge No. 203 on SR 1935 (Willowside Dr.) over Stanley Creek	

BM#1 ELEV. = 626.53'
-L- STA. 11+22.13
33.12' LEFT
RR SPIKE IN 30" BEECH

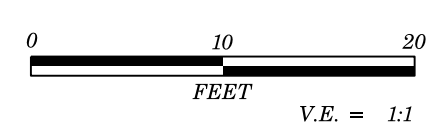
PI = 14+30.00
EL = 624.02'
VC = 160'
K = 364
V_d = 75MPH

PI = 17+00.00
EL = 623.17'
VC = 130'
K = 98
V_d = 50MPH

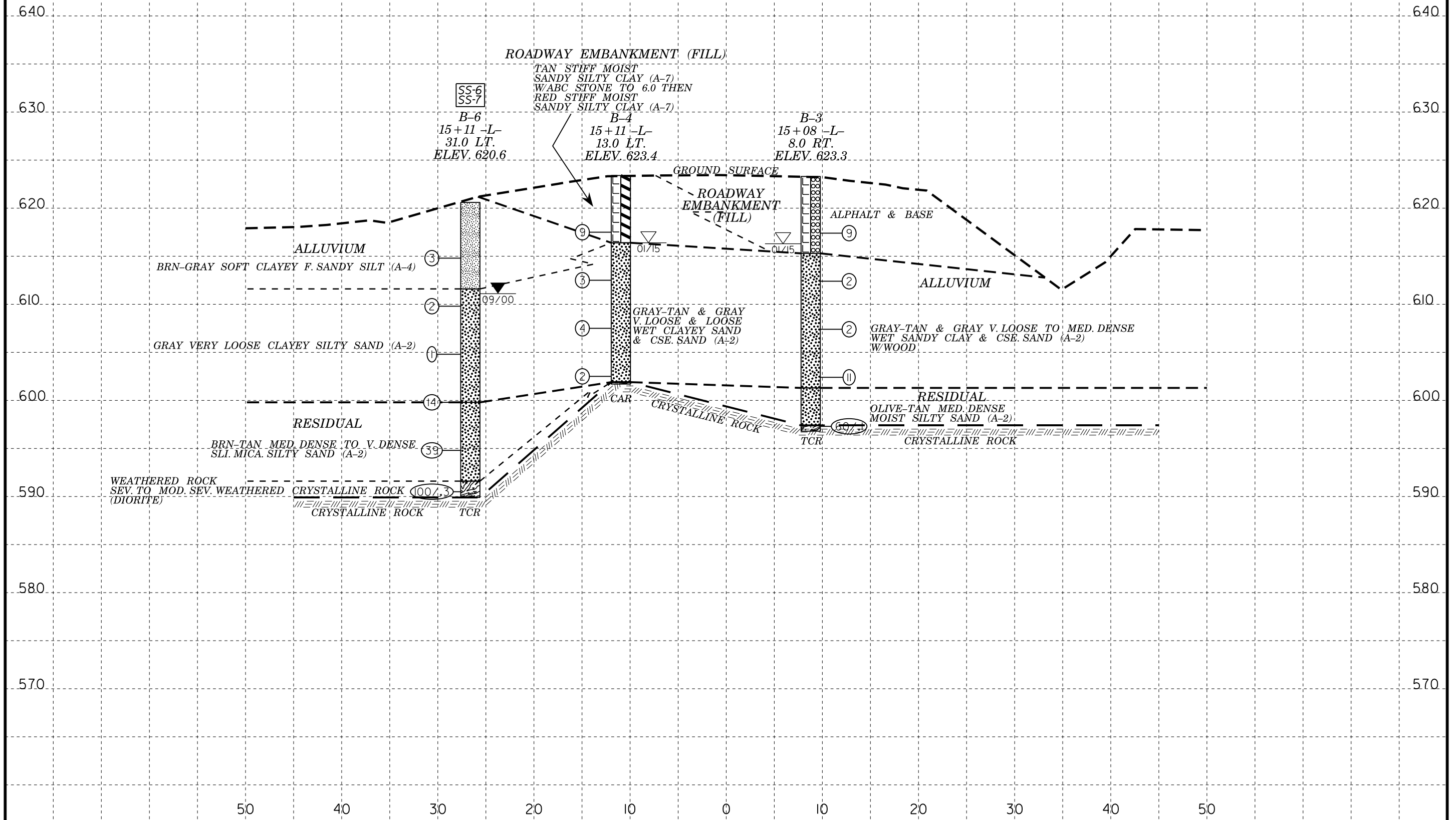


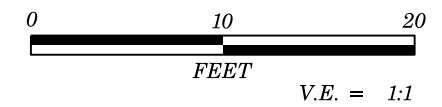
BORING DESCRIPTIONS

(A)	GRAY VERY LOOSE SAT. COARSE SAND WITH FINE SAND (A-3) (ALLUVIUM)
(B)	BROWN TO TAN MED. DENSE MOIST SLI. MICA SILTY FINE AND COARSE SAND (A-2) (RESIDUAL)

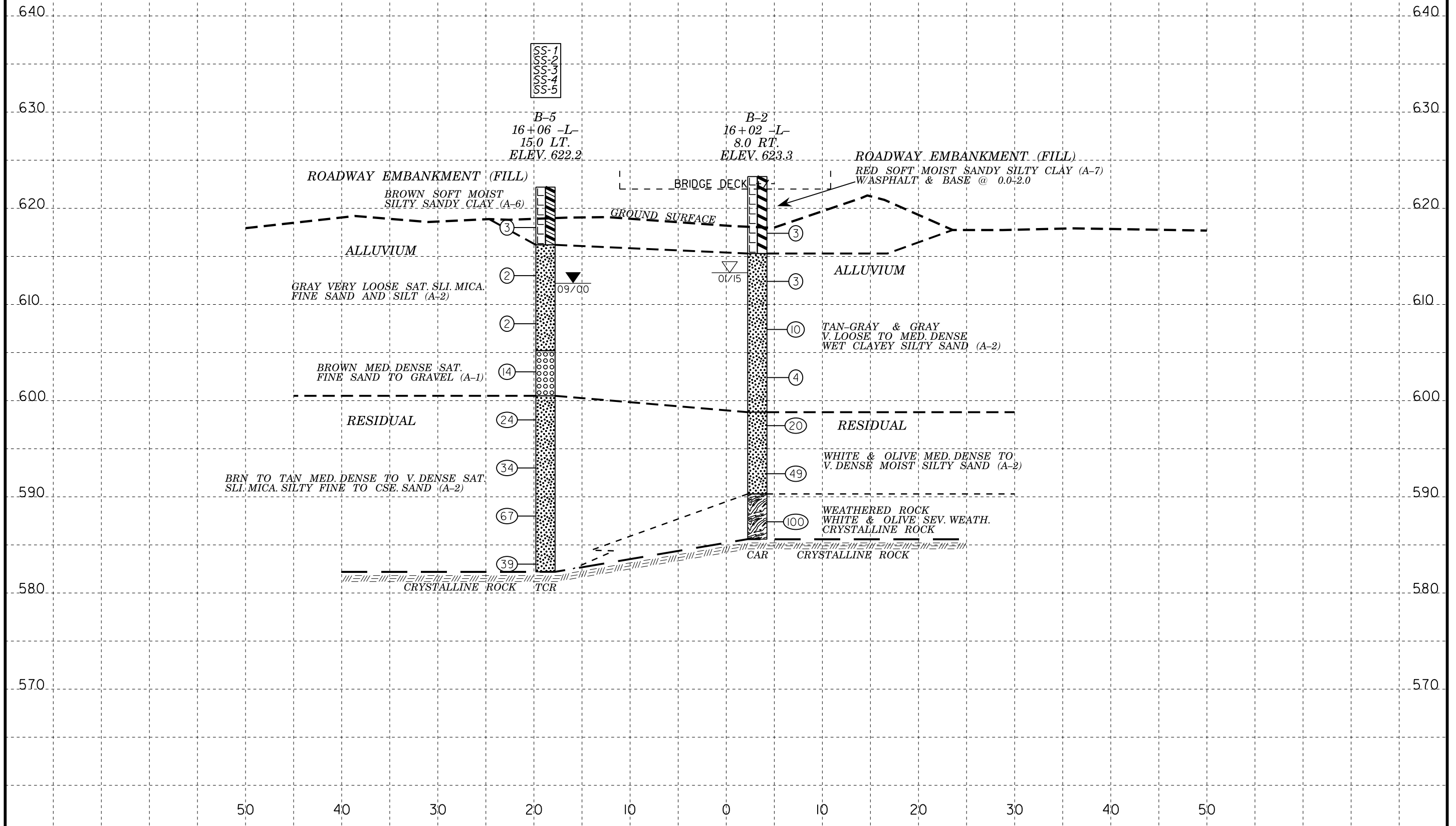


PROJECT REFERENCE NO.	SHEET
38523.1.1 (B-4751)	5
Section Through End Bent One 15+11.70 -L- (W.P. #1) Skew=120 Deg. (To Long Cord)	





PROJECT REFERENCE NO.	SHEET
38523.1.1 (B-4751)	6
Section Through End Bent Two 15+94.30 -L- (W.P. #2) Skew=120 Deg. (To Long Cord)	



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38523.1.2	TIP B-4751	COUNTY GASTON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE 203 ON SR 1935 (WILLOWSIDE DR.) OVER STANLEY CREEK			GROUND WTR (ft)
BORING NO. B-6	STATION 15+11	OFFSET 31 ft LT	ALIGNMENT -L-
COLLAR ELEV. 620.6 ft	TOTAL DEPTH 30.7 ft	NORTHING 587,755	EASTING 1,389,764
DRILL RIG/HAMMER EFF./DATE CME-550		DRILL METHOD NW Casing W/SPT & Tri-cone	HAMMER TYPE Automatic
DRILLER Hinson, R. S.	START DATE 09/05/00	COMP. DATE 09/05/00	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					
625															
620														620.6	GROUND SURFACE
615	615.8	4.8	1	2	1										ALLUVIAL BRN-GRAY SOFT CLAYEY F. SANDY SILT (A-4)
610	610.8	9.8	1	1	1										ALLUVIAL GRAY VERY LOOSE CLAYEY SILTY SAND (A-2)
605	605.8	14.8	1	0	1										
600	600.8	19.8	4	4	10										RESIDUAL BRN-TAN MED. DENSE TO V. DENSE SLI. MICA. SILTY SAND (A-2)
595	595.8	24.8	10	16	23										
590	590.8	29.8	100/0.3												WEATHERED ROCK SEV. TO MOD. SEV. WEATHERED CRYSTALLINE ROCK (DIORITE)

Boring Terminated BY Tri-Cone Refusal at Elevation 589.9 ft ON CRYSTALLINE ROCK

NOTE: THIS BORING WAS ORIGINALLY EB2-B STA. 10+90 -L- 31.0 RT. FROM PROJECT 5.8152 (MAINT.)

WBS 38523.1.2	TIP B-4751	COUNTY GASTON	GEOLOGIST Murray, C. C.
SITE DESCRIPTION BRIDGE 203 ON SR 1935 (WILLOWSIDE DR.) OVER STANLEY CREEK			GROUND WTR (ft)
BORING NO. B-3	STATION 15+08	OFFSET 8 ft RT	ALIGNMENT -L-
COLLAR ELEV. 623.3 ft	TOTAL DEPTH 26.5 ft	NORTHING 587,775	EASTING 1,389,798
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/2014		DRILL METHOD NW Casing w/ Advancer & Tri-cone	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 01/15/15	COMP. DATE 01/15/15	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					
625															
620														623.3	GROUND SURFACE
615	618.4	4.9	5	6	3										ROADWAY EMBANKMENT ALPHALT & BASE
610	613.4	9.9	0	2	0										ALLUVIAL GRAY-TAN & GRAY V. LOOSE TO MED. DENSE WET SANDY CLAY & CSE. SAND (A-2) W/ WOOD
605	608.4	14.9	1	1	1										
600	603.4	19.9	3	6	5										RESIDUAL OLIVE-TAN MED. DENSE MOIST SILTY SAND (A-2)
595	598.4	24.9	11	18	60/0.1										CRYSTALLINE ROCK

Boring Terminated BY Tri-Cone Refusal at Elevation 596.8 ft IN CRYSTALLINE ROCK

NCDOT BORE DOUBLE B4751_GEO_BH_BRDG0203.GPJ NC_DOT.GDT 3/4/15



NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38523.1.2		TIP B-4751		COUNTY GASTON		GEOLOGIST Murray, C. C.										
SITE DESCRIPTION BRIDGE 203 ON SR 1935 (WILLOWSIDE DR.) OVER STANLEY CREEK							GROUND WTR (ft)									
BORING NO. B-1		STATION 14+98		OFFSET 12 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 623.3 ft		TOTAL DEPTH 7.2 ft		NORTHING 587,755		EASTING 1,389,787										
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/2014		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic												
DRILLER Estep, J. E.		START DATE 01/14/15		COMP. DATE 01/14/15		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						
625														623.3	GROUND SURFACE	0.0
620	618.3	5.0	6	8	60/0.1								M	616.1	ROADWAY EMBANKMENT ASPHALT & BASE (ABC STONE) W/ BOULDERS	7.2
															Boring Terminated WITH CASING ADVANCER REFUSAL at Elevation 616.1 ft IN ROADWAY EMBANKMENT (BOULDER)	
															NOTE: HOLE ABANDONED	

WBS 38523.1.2		TIP B-4751		COUNTY GASTON		GEOLOGIST Murray, C. C.										
SITE DESCRIPTION BRIDGE 203 ON SR 1935 (WILLOWSIDE DR.) OVER STANLEY CREEK							GROUND WTR (ft)									
BORING NO. B-4		STATION 15+11		OFFSET 13 ft LT		ALIGNMENT -L-										
COLLAR ELEV. 623.4 ft		TOTAL DEPTH 21.7 ft		NORTHING 587,765		EASTING 1,389,779										
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/2014		DRILL METHOD NW Casing w/ Advancer		HAMMER TYPE Automatic												
DRILLER Estep, J. E.		START DATE 01/16/15		COMP. DATE 01/16/15		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						
625														623.4	GROUND SURFACE	0.0
620	618.5	4.9	6	7	2									616.4	ROADWAY EMBANKMENT TAN STIFF MOIST SANDY SILTY CLAY (A-7) W/ ABC STONE TO 6.0 THEN RED STIFF MOIST SANDY SILTY CLAY (A-7)	7.0
615	613.5	9.9	2	1	2										ALLUVIAL GRAY-TAN & GRAY V. LOOSE & LOOSE WET CLAYEY SAND & CSE. SAND (A-2)	
610	608.5	14.9	0	2	2											
605	603.5	19.9	1	1	1											
														601.9	CRYSTALLINE ROCK	21.5
														601.7	Boring Terminated WITH CASING ADVANCER REFUSAL at Elevation 601.7 ft IN CRYSTALLINE ROCK	21.7

NCDOT BORE DOUBLE B4751_GEO_BH_BRDG0203.GPJ NC_DOT.GDT 3/4/15



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 38523.1.2	TIP B-4751	COUNTY GASTON	GEOLOGIST Todd, R. W.	
SITE DESCRIPTION BRIDGE 203 ON SR 1935 (WILLOWSIDE DR.) OVER STANLEY CREEK				GROUND WTR (ft)
BORING NO. B1-A	STATION 15+63	OFFSET 13 ft RT	ALIGNMENT -L-	0 HR. N/M
COLLAR ELEV. 613.3 ft	TOTAL DEPTH 37.0 ft	NORTHING 587,823	EASTING 1,389,771	24 HR. 0.5
DRILL RIG/HAMMER EFF./DATE CME-550		DRILL METHOD NW Casing W/SPT & Core	HAMMER TYPE Automatic	
DRILLER Hinson, R. S.	START DATE 09/05/00	COMP. DATE 09/05/00	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						
615														613.3	GROUND SURFACE	0.0
610	608.2	5.1	1	1	1							SS-8	Sat.		ALLUVIAL GRAY VERY LOOSE SAT. COARSE SAND WITH FINE SAND (A-3)	
605																
600	603.2	10.1	1	2	1											
595	598.2	15.1	1	2	1											
590	593.2	20.1	7	12	17							SS-9	M	594.3	RESIDUAL BROWN TO TAN MEDIUM DENSE MOIST SLIGHTLY MICA SILTY FINE AND COARSE SAND (A-2)	19.0
585														590.7	CRYSTALLINE ROCK (RUN 1) BLACK & WHITE V. SLI. WEATH. SOUND MED. GRAINED DIORITE REC=100%, RQD=100%	22.6
														588.6	CRYSTALLINE ROCK (RUN 2) BLACK & WHITE V. SLI. WEATH. SOUND EQUIGRANULAR DIORITE REC=100% RQD=96%	24.7
														583.7	CRYSTALLINE ROCK (RUN 3) BLACK & WHITE V. SLI. WEATH. SOUND DIORITE, SOME IRON STAINS ON FRAC. REC=100% RQD=100%	29.8
														579.0	CRYSTALLINE ROCK (RUN 4) BLACK & WHITE V. SLI. WEATH. SOUND DIORITE, SOME IRON STAINS ON FRAC. REC=100% RQD=81%	34.3
580														576.3	CRYSTALLINE ROCK (RUN 4) BLACK & WHITE V. SLI. WEATH. SOUND DIORITE, SOME IRON STAINS ON FRAC. REC=100% RQD=81%	37.0
															Boring Terminated at Elevation 576.3 ft IN CRYSTALLINE ROCK (DIORITE)	
															NOTE: THIS BORING WAS ORIGINALLY B1-A STA. 10+38 -L- 13.0 LT. FROM PROJECT 5.8152 (MAINT.)	

NCDOT BORE DOUBLE B4751_GEO_BH_BRD0203.GPJ NC_DOT.GDT 3/4/15

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 38523.1.2	TIP B-4751	COUNTY GASTON	GEOLOGIST Todd, R. W.
SITE DESCRIPTION BRIDGE 203 ON SR 1935 (WILLOWSIDE DR.) OVER STANLEY CREEK			GROUND WTR (ft)
BORING NO. B-5	STATION 16+06	OFFSET 15 ft LT	ALIGNMENT -L-
COLLAR ELEV. 622.2 ft	TOTAL DEPTH 40.0 ft	NORTHING 587,843	EASTING 1,389,724
DRILL RIG/HAMMER EFF./DATE CME-550		DRILL METHOD NW Casing W/SPT & Tri-cone	HAMMER TYPE Automatic
DRILLER Hinson, R. S.	START DATE 09/05/00	COMP. DATE 09/05/00	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				
625													GROUND SURFACE	0.0
620	619.0	3.2	1	2	1						SS-1	M	ROADWAY EMBANKMENT BROWN SOFT MOIST SILTY SANDY CLAY (A-6)	6.0
615	614.0	8.2	1	1	1						SS-2		ALLUVIAL GRAY VERY LOOSE SAT. SLI. MICA. FINE SAND AND SILT (A-2)	17.0
610	609.0	13.2	1	1	1						SS-3	Sat.		
605	604.0	18.2	5	6	8						SS-4	Sat.	ALLUVIAL BROWN MED. DENSE SAT. FINE SAND TO GRAVEL (A-1)	21.7
600	599.0	23.2	10	12	12						SS-5	Sat.	RESIDUAL BRN TO TAN MED. DENSE TO V. DENSE SAT. SLI. MICA. SILTY FINE TO CSE. SAND (A-2)	40.0
595	594.0	28.2	6	15	19									
590	589.0	33.2	16	29	38									
585	584.0	38.2	17	17	22									

Boring Terminated BY Tri-Cone Refusal at Elevation 582.2 ft ON CRYSTALLINE ROCK

NOTE: THIS BORING WAS ORIGINALLY EB1-B STA. 9+95 -L- 15.0 RT. FROM PROJECT 5.8152 (MAINT.)

WBS 38523.1.2	TIP B-4751	COUNTY GASTON	GEOLOGIST Murray, C. C.
SITE DESCRIPTION BRIDGE 203 ON SR 1935 (WILLOWSIDE DR.) OVER STANLEY CREEK			GROUND WTR (ft)
BORING NO. B-2	STATION 16+02	OFFSET 8 ft RT	ALIGNMENT -L-
COLLAR ELEV. 623.3 ft	TOTAL DEPTH 37.7 ft	NORTHING 587,852	EASTING 1,389,745
DRILL RIG/HAMMER EFF./DATE HFO0066 CME-550 81% 03/19/2014		DRILL METHOD NW Casing w/ Advancer	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 01/14/15	COMP. DATE 01/14/15	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				
625													GROUND SURFACE	0.0
620	618.4	4.9	0	1	2								ROADWAY EMBANKMENT RED SOFT MOIST SANDY SILTY CLAY (A-7) W/ ASPHALT & BASE @ 0.0-2.0	6.0
615	613.4	9.9	1	2	1								ALLUVIAL TAN-GRAY & GRAY V. LOOSE TO MED. DENSE WET CLAYEY SILTY SAND (A-2)	8.0
610	608.4	14.9	5	7	3									
605	603.4	19.9	2	2	2									
600	598.4	24.9	9	10	10								RESIDUAL WHITE & OLIVE MED. DENSE TO V. DENSE MOIST SILTY SAND (A-2)	24.5
595	593.4	29.9	11	11	38									
590	588.4	34.9	15	43	57								WEATHERED ROCK WHITE & OLIVE SEV. WEATH. CRYSTALLINE ROCK	33.0

Boring Terminated WITH CASING ADVANCER REFUSAL at Elevation 585.6 ft ON CRYSTALLINE ROCK

NCDOT BORE DOUBLE B4751_GEO_BH_BRD0203.GPJ NC_DOT.GDT 3/4/15

TEST RESULTS

PROJECT: 38523.1.2 (B-4751)

COUNTY: GASTON

SITE DESCRIPTION: BRIDGE 203 ON SR 1935 (WILLOWSIDE DR.) OVER STANLEY CREEK

SHEET

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SOIL SAMPLE RESULTS

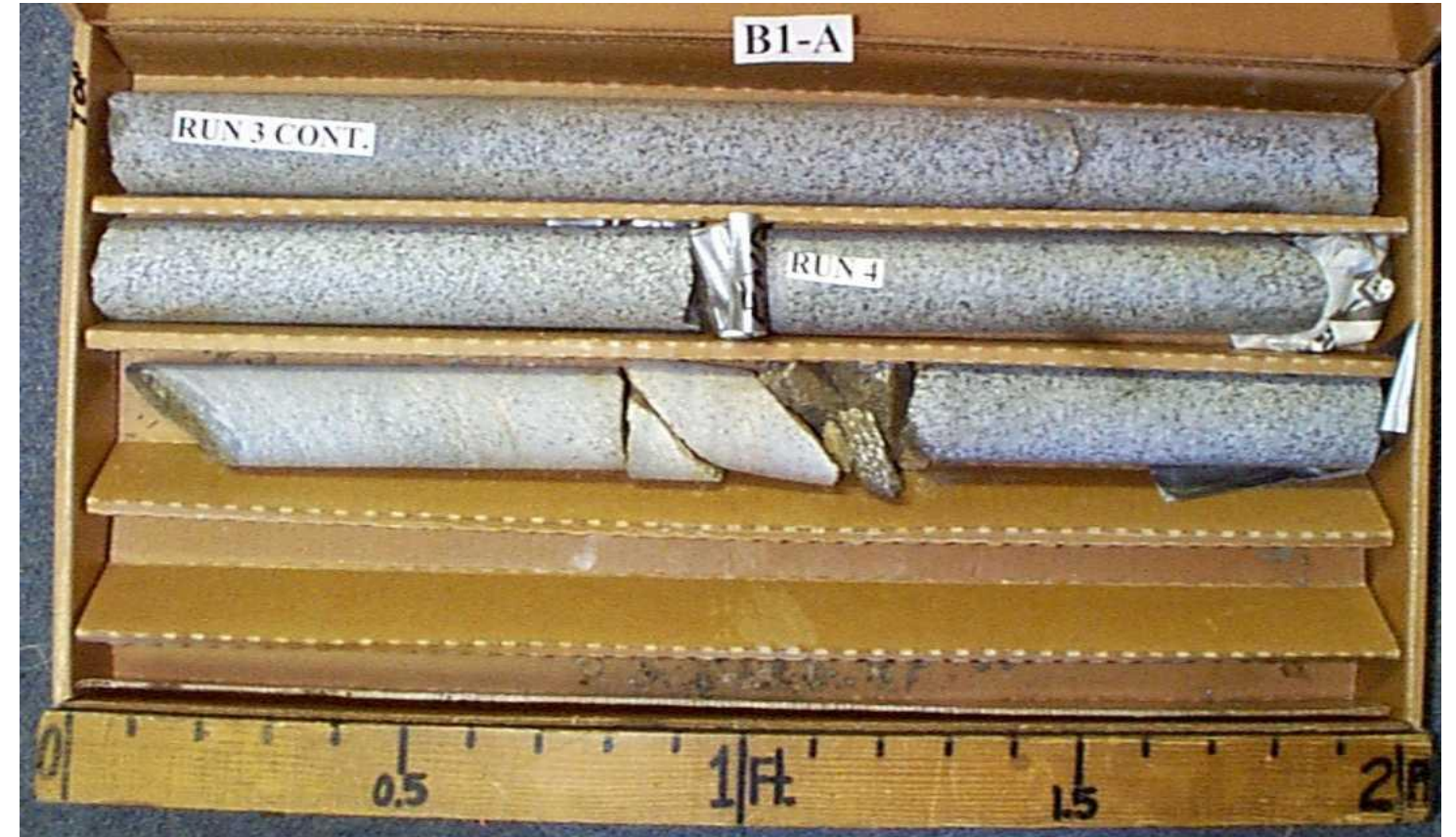
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	N	L.L.	P.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC	UNIT WT. (d)	VOID RATIO
								C. SAND	F. SAND	SILT	CLAY	10	40	200				
		B-5																
SS-1	15.0' LT.	16+06 -L-	3.20-4.70	A-6(3)	3	35	15	29.7	26.2	17.9	26.2	90	72	43				
SS-2	15.0' LT.	16+06 -L-	8.20-9.70	A-2-4(0)	2	22	NP	31.9	37.9	18.1	12.1	100	79	35				
SS-3	15.0' LT.	16+06 -L-	13.20-14.70	A-2-4(0)	2	23	NP	18.4	53.1	20.5	8.1	100	93	35				
SS-4	15.0' LT.	16+06 -L-	18.20-19.70	A-1-b(0)	14	22	NP	66.7	22.9	7.4	3	67	33	7				
SS-5	15.0' LT.	16+06 -L-	23.20-24.70	A-2-4(0)	24	27	NP	49.4	32.5	16	2	89	57	20				
		B1-A																
SS-8	13.0' RT.	15+63 -L-	5.10-6.60	A-3(0)	2	22	NP	66.9	28.8	3.3	1	96	63	6				
SS-9	13.0' RT.	15+63 -L-	20.10-21.60	A-2-4(0)	29	25	NP	43.4	37.3	17.3	2	98	70	24				
		B-6																
SS-6	31.0' LT.	15+11 -L-	4.80-6.30	A-4(4)	3	32	10	17	26.8	34	22.2	99	89	62				
SS-7	31.0' LT.	15+11 -L-	24.80-26.30	A-2-4(0)	39	28	NP	45.6	35.7	16.6	2	87	59	21				

ROCK SAMPLE RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	RQD	UNIT WT (pcf)	Q(ksf)	E(MPsi)
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38523.1.2 (B-4751)
GASTON COUNTY
BRIDGE 203 ON SR 1935 (WILLOWSIDE DR.) OVER STANLEY CREEK

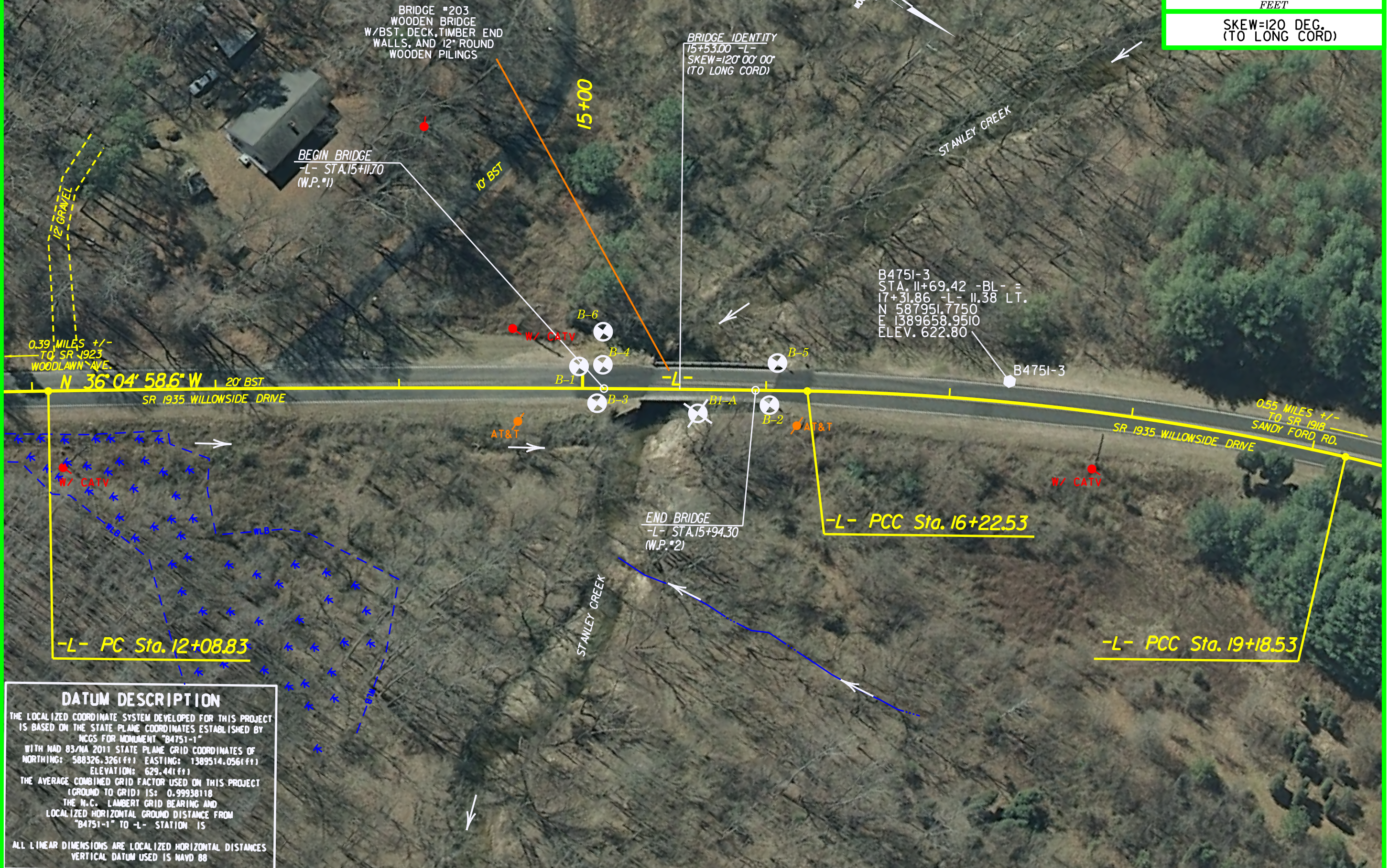
CORE PHOTOS



38523.1.2 (B-4751)
GASTON COUNTY
BRIDGE 203 ON SR 1935 (WILLOWSIDE DR.) OVER STANLEY CREEK

SITE PHOTOS





DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B4751-1"

WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF
NORTHING: 588326.326 (ft) EASTING: 1389514.056 (ft)
ELEVATION: 629.44 (ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99938118

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B4751-1" TO -L- STATION IS

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88