

**This electronic collection of documents is provided
for the convenience of the user
and is Not a Certified Document –**

**The documents contained herein were originally issued
and sealed by the individuals whose names and license
numbers appear on each page, on the dates appearing
with their signature on that page.**

**This file or an individual page
shall not be considered a certified document.**

REFERENCE: B-5123

PROJECT: 42265

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-5123	1	20

CONTENTS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	LEGEND
3	SITE PLAN
4-5	PROFILE(S)
6-8	CROSS SECTION(S)
9-15	BORE LOG(S) & CORE REPORT(S)
16	SOIL TEST RESULTS
17-19	CORE PHOTOGRAPH(S)
20	SITE PHOTOGRAPH(S) (AERIAL PHOTO)

STRUCTURE
SUBSURFACE INVESTIGATION

COUNTY CABARRUS
PROJECT DESCRIPTION REPLACE BRIDGE NO. 014 & 019
ON US 29 OVER ROCKY RIVER AND ACCESS ROAD

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

J.K. STICKNEY
C.L. SMITH
R.Q. CALLAWAY
R.S. HINSON
C.E. BURRIS

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



Done and signed by: Clinton B. Little
930443D5AC8E3610/2015

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

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)						SILT-CLAY MATERIALS (> 35% PASSING #200)						ORGANIC MATERIALS				
	A-1	A-3	A-2		A-2		A-4	A-5	A-6	A-7	A-1, A-2	A-4, A-5	A-6, A-7				
GROUP CLASS.	A-1-a	A-1-b	A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6							
SYMBOL																	
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX 10 MX	51 MN 35 MX 35 MX	35 MX 35 MX	35 MX 35 MX	35 MX 35 MX	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN	36 MN 36 MN							
MATERIAL PASSING #40 LL PI	-	-	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN							
GROUP INDEX	0	0	0	4 MX	8 MX	12 MX	16 MX	NO MX									
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND	FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND			SILTY SOILS		CLAYEY SOILS									
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD						FAIR TO POOR			FAIR TO POOR	POOR	UNSATURABLE					
	PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30																

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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
BOULDER (BLDR.)						
COBBLE (COB.)						
GRAVEL (GR.)						
COARSE SAND (CSE, SD.)						
FINE SAND (F SD.)						
SILT (SL.)						
CLAY (CL.)						
GRAIN SIZE	305	75	2.0	0.25	0.05	0.005
MM						
IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	26 OR MORE	HIGH

COLOR

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

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
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.

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE LL < 31
MODERATELY COMPRESSIBLE LL = 31 - 50
HIGHLY COMPRESSIBLE LL > 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL
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

GROUND WATER

- 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

MISCELLANEOUS SYMBOLS

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

RECOMMENDATION SYMBOLS

- UNDERCUT EXCAVATION
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADED ROCK
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - ACCEPTABLE

ABBREVIATIONS

- AR - AUGER REFUSAL
- BT - BORING TERMINATED
- CL - CLAY
- CPT - CONE PENETRATION TEST
- CSE - COARSE
- DMT - DILATOMETER TEST
- DPT - DYNAMIC PENETRATION TEST
- e - VOID RATIO
- F - FINE
- FOSS. - FOSSILIFEROUS
- FRAC. - FRACTURED, FRACTURES
- FRAGS. - FRAGMENTS
- HI. - HIGHLY
- MED. - MEDIUM
- MICA - MICACEOUS
- MOD. - MODERATELY
- NP - NON PLASTIC
- ORG. - ORGANIC
- PMT - PRESSUREMETER TEST
- SAP. - SAPROLITIC
- SD. - SAND, SANDY
- SL. - SILTY, SILTY
- SLI. - SLIGHTLY
- TCR - TRICONE REFUSAL
- w - MOISTURE CONTENT
- V - VERY
- VST - VANE SHEAR TEST
- WEA. - WEATHERED
- γ_u - UNIT WEIGHT
- γ_d - DRY UNIT WEIGHT
- SAMPLE ABBREVIATIONS
- S - BULK
- SS - SPLIT SPOON
- ST - SHELBY TUBE
- RS - ROCK
- RT - RECOMPACTED TRIAXIAL
- CBR - CALIFORNIA BEARING RATIO

EQUIPMENT USED ON SUBJECT PROJECT

- DRILL UNITS:
 - CME-45C
 - CME-55
 - CME-550
 - VANE SHEAR TEST
 - PORTABLE HOIST
- ADVANCING TOOLS:
 - CLAY BITS
 - 6" CONTINUOUS FLIGHT AUGER
 - 8" HOLLOW AUGERS
 - HARD FACED FINGER BITS
 - TUNG-CARBIDE INSERTS
 - CASING w/ ADVANCER
 - TRICONE _____ *STEEL TEETH
 - TRICONE 2 1/4" TUNG-CARB.
 - CORE BIT
- HAMMER TYPE:
 - AUTOMATIC MANUAL
- CORE SIZE:
 - B _____ -H _____
 - N Q/NO & NXWL
- HAND TOOLS:
 - POST HOLE DIGGER
 - HAND AUGER
 - SOUNDING ROD
 - VANE SHEAR TEST

ROCK DESCRIPTION

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:

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

WEATHERING

- FRESH** ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
- VERY SLIGHT (V SL.)** 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 (SL.)** ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
- MODERATE (MOD.)** SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
- MODERATELY SEVERE (MOD. SEV.)** ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
- SEVERE (SEV.)** ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF*
- VERY SEVERE (V SEV.)** 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*
- COMPLETE** ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

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

FRACTURE SPACING

TERM	SPACING	TERM	THICKNESS
VERY WIDE	MORE THAN 10 FEET	VERY THICKLY BEDDED	4 FEET
WIDE	3 TO 10 FEET	THICKLY BEDDED	1.5 - 4 FEET
MODERATELY CLOSE	1 TO 3 FEET	THINLY BEDDED	0.16 - 1.5 FEET
CLOSE	0.16 TO 1 FOOT	VERY THINLY BEDDED	0.03 - 0.16 FEET
VERY CLOSE	LESS THAN 0.16 FEET	THICKLY LAMINATED	0.008 - 0.03 FEET
		THINLY LAMINATED	< 0.008 FEET

INDURATION

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

TERMS AND DEFINITIONS

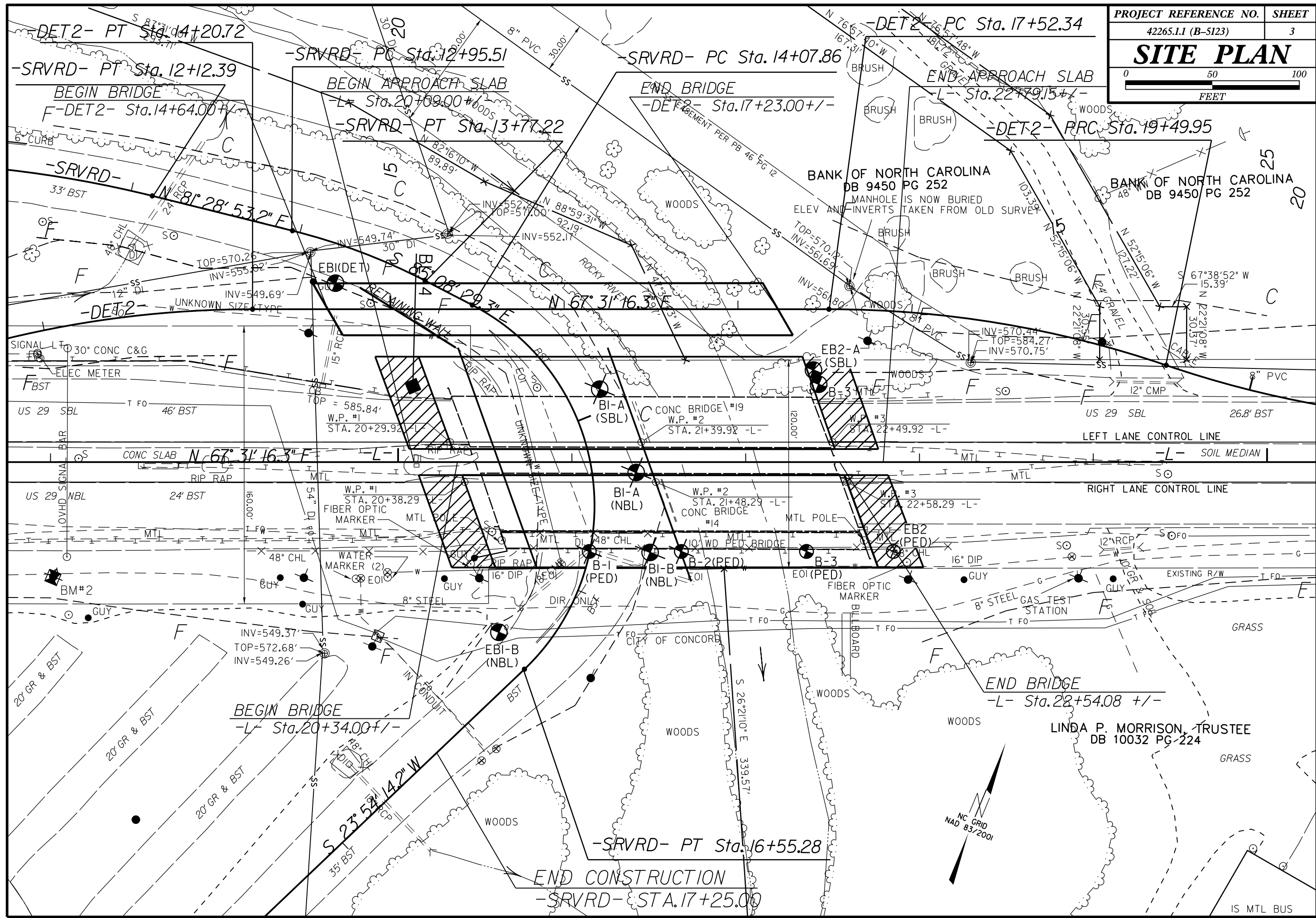
- ALLUVIUM (ALLUV.)** - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
- AQUIFER** - A WATER BEARING FORMATION OR STRATA.
- ARENACEOUS** - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
- ARGILLACEOUS** - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, 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 EMBLACED 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.

BENCH MARK: BL-4

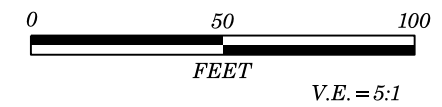
STA. 24+09.39 -BL-
N 589930,5520 E 1500384,4430 ELEVATION: 585.73 FEET

NOTES:

SOIL STRATIGRAPHY IS THROUGH THE BORINGS FOR PROFILES & CROSS-SECTIONS.



IS MTL BUS



STA. 20+29.92
GP EL. 589.78

SBL STA. 21+40
GP EL. 589.5
TWO SPANS
2 @ 110', 72' MBT.
70° SKEW, 4' END BENT CAPS

US 29 SBL

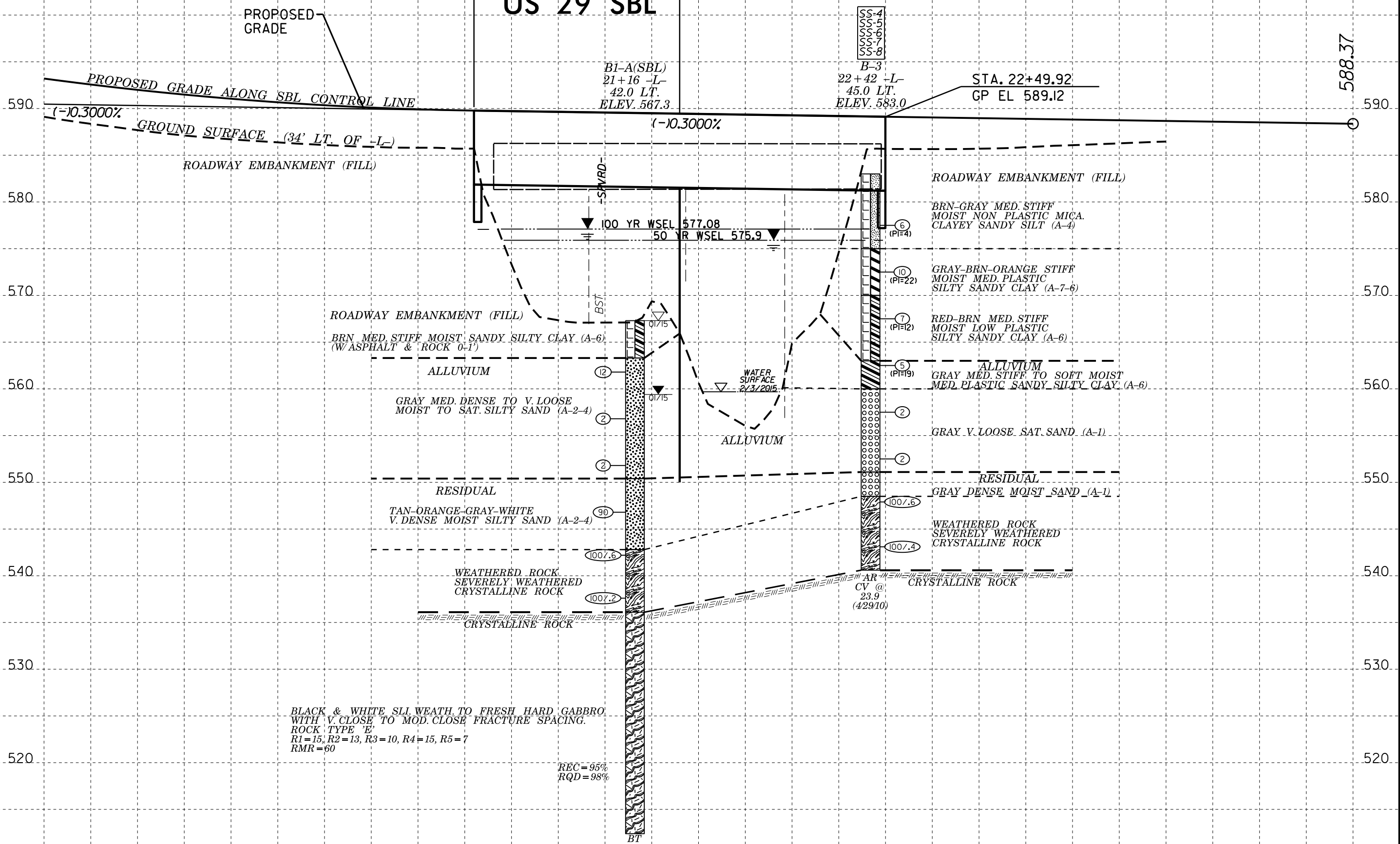
SS-4
SS-5
SS-6
SS-7
SS-8

B1-A(SBL)
21+16 -L-
42.0 LT.
ELEV. 567.3

B-3
22+42 -L-
45.0 LT.
ELEV. 583.0

STA. 22+49.92
GP EL. 589.12

588.37



ROADWAY EMBANKMENT (FILL)
BRN. MED. STIFF MOIST. SANDY SILTY CLAY (A-6)
(W ASPHALT & ROCK 0-1)

ALLUVIUM
GRAY MED. DENSE TO V. LOOSE
MOIST TO SAT. SILTY SAND (A-2-4)

RESIDUAL
TAN-ORANGE-GRAY-WHITE
V. DENSE MOIST SILTY SAND (A-2-4)

WEATHERED ROCK
SEVERELY WEATHERED
CRYSTALLINE ROCK

ROADWAY EMBANKMENT (FILL)
BRN-GRAY MED. STIFF
MOIST NON PLASTIC MICA
CLAYEY SANDY SILT (A-4)

GRAY-BRN-ORANGE STIFF
MOIST MED. PLASTIC
SILTY SANDY CLAY (A-7-6)

RED-BRN MED. STIFF
MOIST LOW PLASTIC
SILTY SANDY CLAY (A-6)

ALLUVIUM
GRAY MED. STIFF TO SOFT MOIST
MED. PLASTIC SANDY SILTY CLAY (A-6)

GRAY V. LOOSE SAT. SAND (A-1)

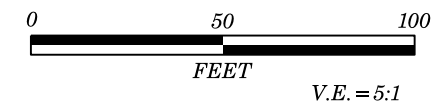
RESIDUAL
GRAY DENSE MOIST SAND (A-1)

WEATHERED ROCK
SEVERELY WEATHERED
CRYSTALLINE ROCK

BLACK & WHITE SLI WEATH. TO FRESH HARD GABBRO
WITH V. CLOSE TO MOD. CLOSE FRACTURE SPACING.
ROCK TYPE 'E'
R1=15, R2=13, R3=10, R4=15, R5=7
RMR=60

REC=95%
RQD=98%

BT

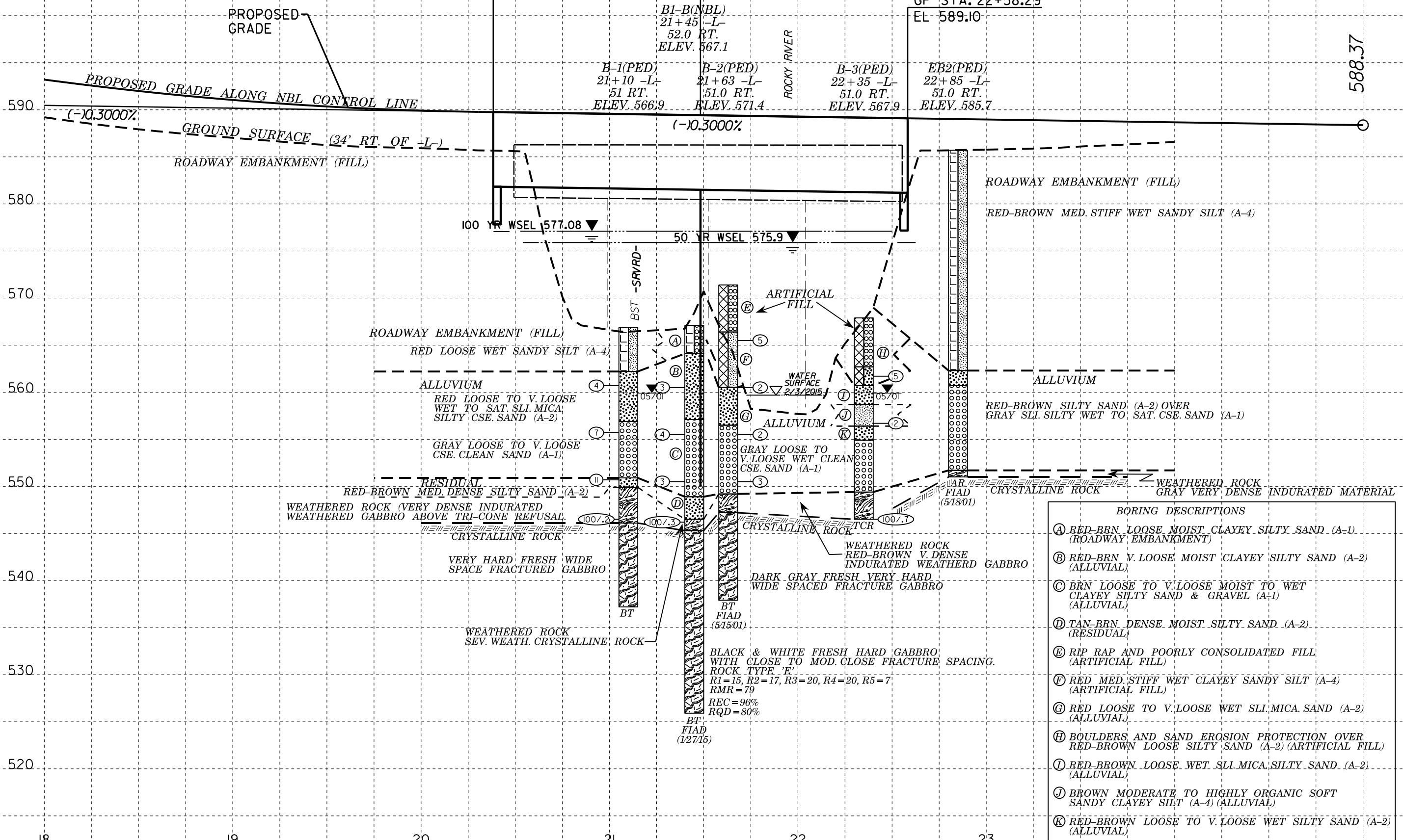


NBL STA 21+48
GP EL. 589.4
TWO SPANS
2 @ 110', 72° MBT
70° SKEW, 4' END BENT CAPS

US 29 NBL
GP STA. 20+38.29
EL. 589.75

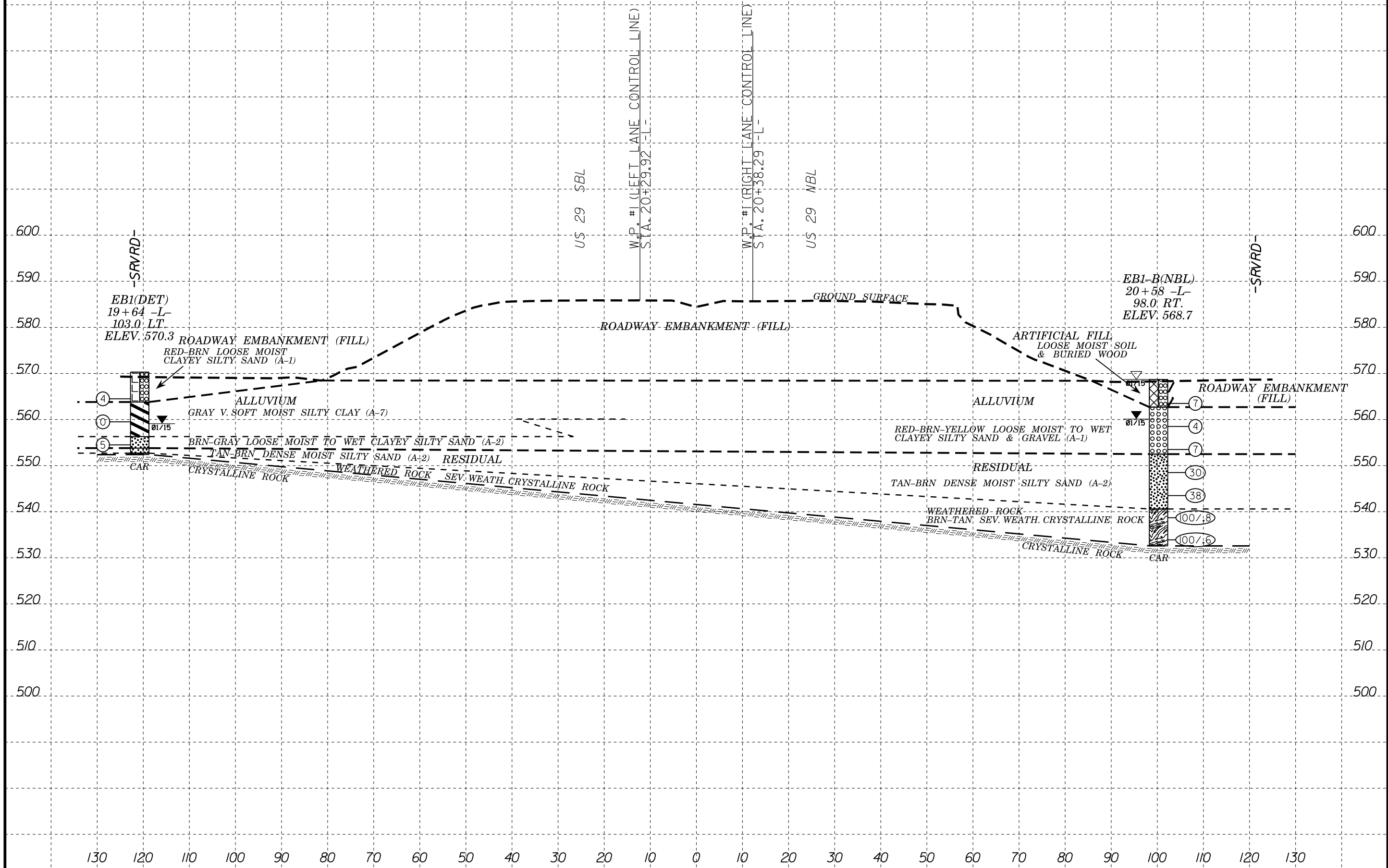
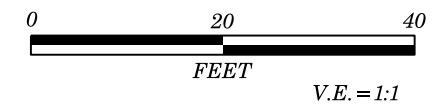
GP STA. 22+58.29
EL. 589.10

588.37



BORING DESCRIPTIONS

- (A) RED-BRN. LOOSE MOIST CLAYEY SILTY SAND (A-1) (ROADWAY EMBANKMENT)
- (B) RED-BRN V. LOOSE MOIST CLAYEY SILTY SAND (A-2) (ALLUVIAL)
- (C) BRN LOOSE TO V. LOOSE MOIST TO WET CLAYEY SILTY SAND & GRAVEL (A-1) (ALLUVIAL)
- (D) TAN-BRN DENSE MOIST SILTY SAND (A-2) (RESIDUAL)
- (E) RIP RAP AND POORLY CONSOLIDATED FILL (ARTIFICIAL FILL)
- (F) RED MED. STIFF WET CLAYEY SANDY SILT (A-4) (ARTIFICIAL FILL)
- (G) RED LOOSE TO V. LOOSE WET SLI. MICA SAND (A-2) (ALLUVIAL)
- (H) BOULDERS AND SAND EROSION PROTECTION OVER RED-BROWN LOOSE SILTY SAND (A-2) (ARTIFICIAL FILL)
- (I) RED-BROWN LOOSE WET SLI. MICA SILTY SAND (A-2) (ALLUVIAL)
- (J) BROWN MODERATE TO HIGHLY ORGANIC SOFT SANDY CLAYEY SILT (A-4) (ALLUVIAL)
- (K) RED-BROWN LOOSE TO V. LOOSE WET SILTY SAND (A-2) (ALLUVIAL)



EB1(DET)
19+64 -L-
103.0' LT.
ELEV. 570.3

EB1-B(NBL)
20+58 -L-
98.0' RT.
ELEV. 568.7

US 29 SBL

W.P. #1 (LEFT LANE CONTROL LINE)
STA. 20+29.92 -L-

W.P. #1 (RIGHT LANE CONTROL LINE)
STA. 20+38.29 -L-

US 29 MBL

- ④
- ①
- ⑤

- ⑦
- ④
- ⑦
- ③①
- ③⑧
- ①①①/⑧
- ①①①/⑥

ROADWAY EMBANKMENT (FILL)
RED-BRN LOOSE MOIST
CLAYEY SILTY SAND (A-1)

ROADWAY EMBANKMENT (FILL)

ARTIFICIAL FILL
LOOSE MOIST SOIL
& BURIED WOOD

ROADWAY EMBANKMENT (FILL)

ALLUVIUM
GRAY V. SOFT MOIST SILTY CLAY (A-7)

ALLUVIUM

BRN-GRAY LOOSE MOIST TO WET CLAYEY SILTY SAND (A-2)

RED-BRN-YELLOW LOOSE MOIST TO WET
CLAYEY SILTY SAND & GRAVEL (A-1)

TAN-BRN DENSE MOIST SILTY SAND (A-2) RESIDUAL

RESIDUAL

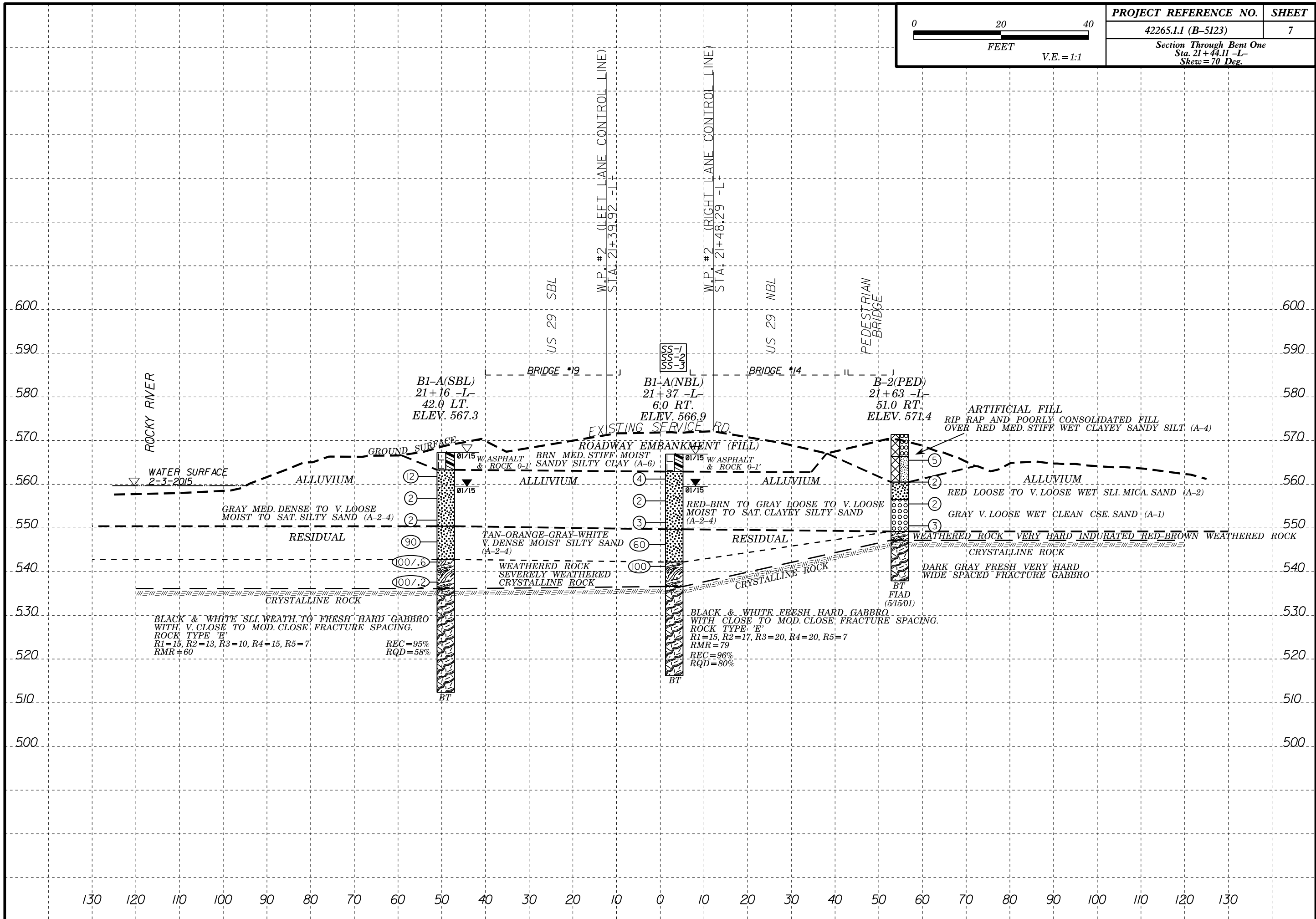
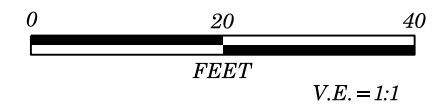
WEATHERED ROCK
SEV. WEATH. CRYSTALLINE ROCK

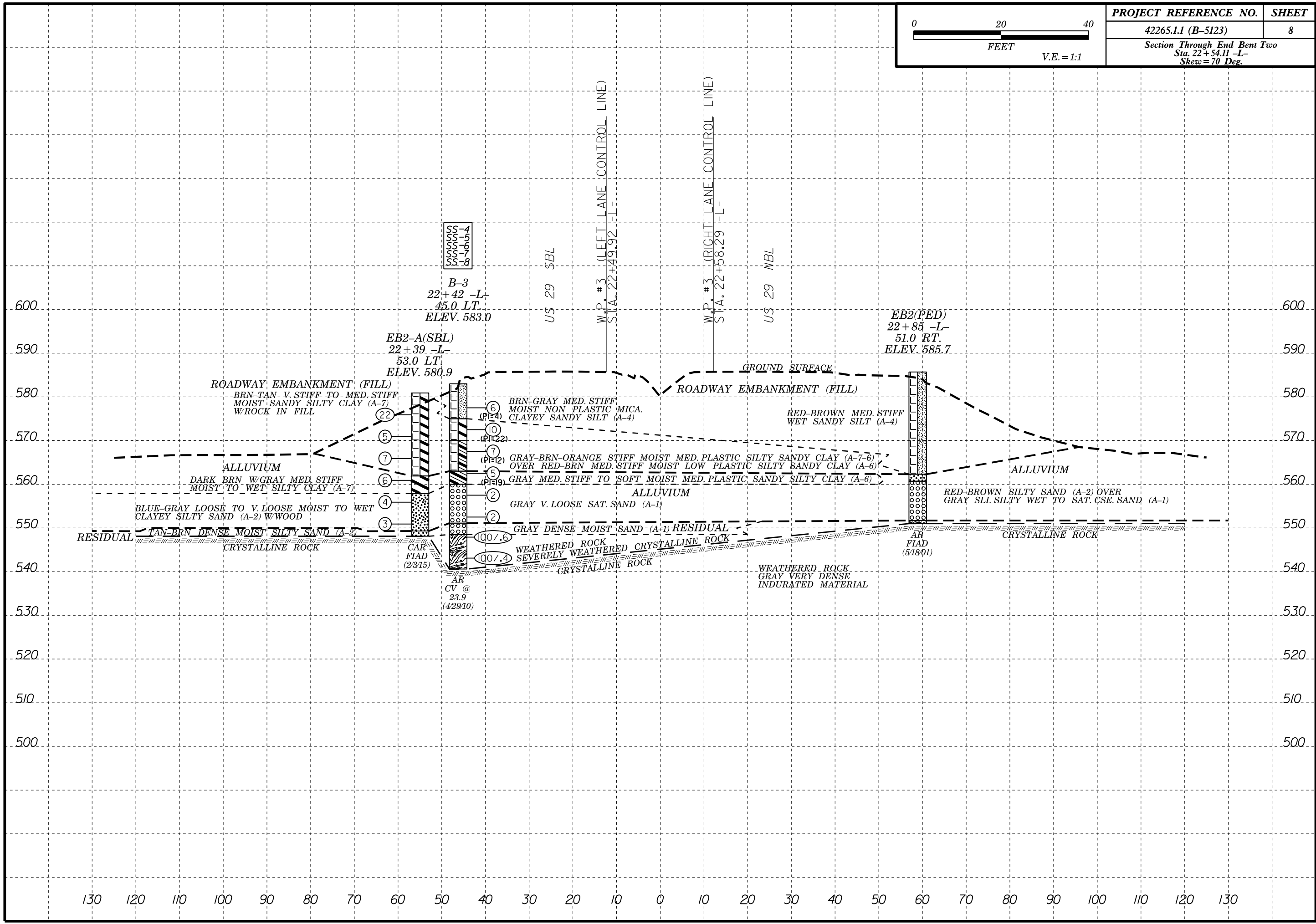
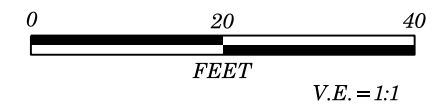
WEATHERED ROCK
BRN-TAN, SEV. WEATH. CRYSTALLINE, ROCK

CRYSTALLINE ROCK

CRYSTALLINE ROCK

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





SS-4
SS-5
SS-6
SS-7
SS-8

B-3
22+42 -L-
45.0 LT.
ELEV. 583.0

US 29 SBL

W.P. #3 (LEFT LANE CONTROL LINE)
STA. 22+49.92 -L-

W.P. #3 (RIGHT LANE CONTROL LINE)
STA. 22+58.29 -L-

US 29 MBL

EB2(PED)
22+85 -L-
51.0 RT.
ELEV. 585.7

EB2-A(SBL)
22+39 -L-
53.0 LT.
ELEV. 580.9

ROADWAY EMBANKMENT (FILL)
BRN-TAN V. STIFF TO MED. STIFF
MOIST SANDY SILTY CLAY (A-7)
W/ROCK IN FILL

ROADWAY EMBANKMENT (FILL)
RED-BROWN MED. STIFF
WET SANDY SILT (A-4)

ALLUVIUM
DARK BRN W/GRAY MED. STIFF
MOIST TO WET SILTY CLAY (A-7)

ALLUVIUM

BLUE-GRAY LOOSE TO V. LOOSE MOIST TO WET
CLAYEY SILTY SAND (A-2) W/WOOD

ALLUVIUM
GRAY V. LOOSE SAT. SAND (A-1)

RED-BROWN SILTY SAND (A-2) OVER
GRAY SLI. SILTY WET TO SAT. CSE. SAND (A-1)

RESIDUAL TAN-BRN DENSE MOIST SILTY SAND (A-2)
CRYSTALLINE ROCK

RESIDUAL
GRAY DENSE MOIST SAND (A-1)
CRYSTALLINE ROCK

CRYSTALLINE ROCK

CAR
FIAD
(2/315)
AR
CV @
23.9
(42910)

WEATHERED ROCK
SEVERELY WEATHERED
CRYSTALLINE ROCK

WEATHERED ROCK
GRAY VERY DENSE
INDURATED MATERIAL

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

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 42265.1	TIP B-5123	COUNTY CABARRUS	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION REPLACE BRIDGE NO. 014 & 019 ON US 29 OVER ROCKY RIVER & ACCESS RD.			GROUND WTR (ft)
BORING NO. EB1(DET)	STATION 19+64	OFFSET 103 ft LT	ALIGNMENT -L-
COLLAR ELEV. 570.3 ft	TOTAL DEPTH 17.9 ft	NORTHING 589,968	EASTING 1,500,321
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 88% 03/19/2014		DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 01/29/15	COMP. DATE 01/29/15	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				
575														
570													GROUND SURFACE	0.0
565	565.5	4.8	1	2	2								ROADWAY EMBANKMENT RED-BRN LOOSE MOIST CLAYEY SILTY SAND (A-1)	
560	560.5	9.8	0	0	0								ALLUVIAL GRAY V. SOFT MOIST SILTY CLAY (A-7)	6.5
555	555.5	14.8	1	2	3								ALLUVIAL BRN-GRAY LOOSE MOIST TO WET CLAYEY SILTY SAND (A-2)	14.0
													RESIDUAL TAN-BRN DENSE MOIST SILTY SAND (A-2)	16.5
													WEATHERED ROCK SEV. WEATH. CRYSTALLINE ROCK	17.8
													Boring Terminated WITH CASING ADVANCER REFUSAL at Elevation 552.4 ft ON CRYSTALLINE ROCK	17.9

WBS 42265.1	TIP B-5123	COUNTY CABARRUS	GEOLOGIST Stickney, J. K.
SITE DESCRIPTION REPLACE BRIDGE NO. 014 & 019 ON US 29 OVER ROCKY RIVER & ACCESS RD.			GROUND WTR (ft)
BORING NO. EB1-B(NBL)	STATION 20+58	OFFSET 98 ft RT	ALIGNMENT -L-
COLLAR ELEV. 568.7 ft	TOTAL DEPTH 36.1 ft	NORTHING 589,819	EASTING 1,500,484
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 88% 03/19/2014		DRILL METHOD NW Casing w/ SPT	HAMMER TYPE Automatic
DRILLER Smith, C. L.	START DATE 01/30/15	COMP. DATE 01/30/15	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				
570													GROUND SURFACE	0.0
565	564.5	4.2	0	7	0								ARTIFICIAL FILL LOOSE MOIST SOIL & BURIED WOOD	6.0
560	559.5	9.2	1	1	3								ALLUVIAL RED-BRN-YELLOW LOOSE MOIST TO WET CLAYEY SILTY SAND & GRAVEL (A-1)	16.2
555	554.5	14.2	2	3	4								RESIDUAL TAN-BRN DENSE MOIST SILTY SAND (A-2)	16.2
550	549.5	19.2	11	13	17									
545	544.5	24.2	6	14	24									
540	539.5	29.2	53	47/0.3									WEATHERED ROCK BRN-TAN SEV. WEATH. CRYSTALLINE ROCK	28.1
535	534.5	34.2	77	23/0.1										
													Boring Terminated WITH CASING ADVANCER REFUSAL at Elevation 532.6 ft ON CRYSTALLINE ROCK	36.1

NCDOT BORE DOUBLE B5123_GEO_BH_BRDG0014&0019.GPJ NC_DOT.GDT 2/20/15



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 42265.1		TIP B-5123		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION REPLACE BRIDGE NO. 014 & 019 ON US 29 OVER ROCKY RIVER & ACCESS RD.							GROUND WTR (ft)								
BORING NO. EB2-A(SBL)		STATION 22+39		OFFSET 53 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 580.9 ft		TOTAL DEPTH 32.8 ft		NORTHING 590,027		EASTING 1,500,594									
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 88% 03/19/2014		DRILL METHOD NW Casing w/ SPT		HAMMER TYPE Automatic											
DRILLER Smith, C. L.		START DATE 02/03/15		COMP. DATE 02/03/15		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					
585															
580														580.9	GROUND SURFACE
															ROADWAY EMBANKMENT BRN-TAN V. STIFF TO MED. STIFF MOIST SANDY SILTY CLAY (A-7) W/ ROCK IN FILL
575	576.9	4.0	0	5	17										
570	571.9	9.0	2	2	3										
565	566.9	14.0	1	3	4										
560	561.9	19.0	1	2	4									561.9	19.0
															ALLUVIAL DARK BRN W/ GRAY MED. STIFF MOIST TO WET SILTY CLAY (A-7)
555	556.9	24.0	1	1	3									557.9	23.0
															ALLUVIAL BLUE-GRAY LOOSE TO V. LOOSE MOIST TO WET CLAYEY SILTY SAND (A-2) W/ WOOD
550	551.9	29.0	0	1	2									549.3	31.6
														548.1	32.8
															RESIDUAL TAN-BRN DENSE MOIST SILTY SAND (A-2) Boring Terminated WITH CASING ADVANCER REFUSAL at Elevation 548.1 ft ON CRYSTALLINE ROCK

WBS 42265.1		TIP B-5123		COUNTY CABARRUS		GEOLOGIST Stickney, J. K.									
SITE DESCRIPTION REPLACE BRIDGE NO. 014 & 019 ON US 29 OVER ROCKY RIVER & ACCESS RD.							GROUND WTR (ft)								
BORING NO. B-3		STATION 22+42		OFFSET 45 ft LT		ALIGNMENT -L-									
COLLAR ELEV. 583.0 ft		TOTAL DEPTH 42.4 ft		NORTHING 590,021		EASTING 1,500,600									
DRILL RIG/HAMMER EFF./DATE HFO0072 CME-550 89% 09/02/2009		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic											
DRILLER Smith, C. L.		START DATE 04/29/10		COMP. DATE 04/29/10		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					
585															
580														583.0	GROUND SURFACE
															ROADWAY EMBANKMENT BRN-GRAY MED. STIFF MOIST NON (PI=4) PLASTIC MICA. CLAYEY SANDY SILT (A-4)
575	578.5	4.5	3	3	3										
570	573.5	9.5	1	3	7										
565	568.5	14.5	2	3	4										
560	563.5	19.5	1	2	3										
															ROADWAY EMBANKMENT GRAY-BRN-ORANGE STIFF MOIST MED. (PI=22) PLASTIC SILTY SANDY CLAY (A-7-6)
555	558.5	24.5	0	1	1										
															ROADWAY EMBANKMENT RED-BRN MED. STIFF MOIST LOW (PI=12) PLASTIC SILTY SANDY CLAY (A-6)
550	553.5	29.5	0	1	1										
															ALLUVIAL GRAY MED. STIFF TO SOFT MOIST MED. (PI=19) PLASTIC SANDY SILTY CLAY (A-6)
545	548.5	34.5	35	65/1											
															ALLUVIAL GRAY V. LOOSE SAT. SAND (A-1)
	543.5	39.5	100/4												
															RESIDUAL GRAY DENSE MOIST SAND (A-1)
															WEATHERED ROCK SEVERELY WEATHERED CRYSTALLINE ROCK
															Boring Terminated BY AUGER REFUSAL at Elevation 540.6 ft ON CRYSTALLINE ROCK

NCDOT BORE DOUBLE B5123_GEO_BH_BRDG0014&0019.GPJ NC_DOT_GDT 2/20/15



NCDOT GEOTECHNICAL ENGINEERING UNIT

BORELOG REPORT

WBS 42265.1	TIP B-5123	COUNTY CABARRUS	GEOLOGIST Callaway, R. Q.
SITE DESCRIPTION REPLACE BRIDGE NO. 014 & 019 ON US 29 OVER ROCKY RIVER & ACCESS RD.			GROUND WTR (ft)
BORING NO. B-3(PED)	STATION 22+35	OFFSET 51 ft RT	ALIGNMENT -L-
COLLAR ELEV. 567.9 ft	TOTAL DEPTH 21.4 ft	NORTHING 589,929	EASTING 1,500,630
DRILL RIG/HAMMER EFF./DATE CME-550		DRILL METHOD NW Casing w/ SPT & Tri-Cone	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 05/18/01	COMP. DATE 05/18/01	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				
570													GROUND SURFACE	0.0
565													ARTIFICIAL FILL BOULDERS AND SAND EROSION PROTECTION	
	562.7	5.2	2	3	2								ARTIFICIAL FILL	5.2
560													RED-BROWN LOOSE SILTY SAND (A-2)	7.2
	557.7	10.2	0	1	1								ALLUVIAL RED-BROWN LOOSE WET SLI. MICA SILTY SAND (A-2)	9.2
555													ALLUVIAL BROWN MODERATE TO HIGHLY ORGANIC SOFT SANDY CLAYEY SILT (A-4)	11.5
	554.9												ALLUVIAL RED-BROWN LOOSE TO V. LOOSE WET SILTY SAND (A-2)	13.0
550													ALLUVIAL GRAY LOOSE TO V. LOOSE WET CLEAN CSE. SAND (A-1)	18.5
	547.7	20.2	8	13	50/0.2								WEATHERED ROCK RED-BROWN V. DENSE INDURATED WEATHERD GABBRO	21.4
													Boring Terminated BY TRI-CONE REFUSAL at Elevation 546.5 ft ON CRYSTALLINE ROCK	
													NOTE: THIS BORING WAS ORIGINALLY BORING 'B-3' FROM PROJECT 9.8100492 U-3827.	
													NOTE: DRIVE AT 15.2 WAS NOT TAKEN DUE TO SAND BLOW BACK, PROCEEDED TO NEXT DRIVE.	
														100/7

WBS 42265.1	TIP B-5123	COUNTY CABARRUS	GEOLOGIST Callaway, R. Q.
SITE DESCRIPTION REPLACE BRIDGE NO. 014 & 019 ON US 29 OVER ROCKY RIVER & ACCESS RD.			GROUND WTR (ft)
BORING NO. EB2(PED)	STATION 22+85	OFFSET 51 ft RT	ALIGNMENT -L-
COLLAR ELEV. 585.7 ft	TOTAL DEPTH 34.7 ft	NORTHING 589,948	EASTING 1,500,676
DRILL RIG/HAMMER EFF./DATE CME-550		DRILL METHOD Solid Augers	HAMMER TYPE Automatic
DRILLER Estep, J. E.	START DATE 05/18/01	COMP. DATE 05/18/01	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				
590													GROUND SURFACE	0.0
585													ROADWAY EMBANKMENT RED-BROWN MED. STIFF WET SANDY SILT (A-4)	
580														
575														
570														
565														
560													ALLUVIAL RED-BROWN SILTY SAND (A-2)	25.0
													ALLUVIAL GRAY SLI. SILTY WET TO SAT. CSE. SAND (A-1)	23.4
555													WEATHERED ROCK GRAY VERY DENSE INDURATED MATERIAL - AUGER REFUSAL AT BASE.	34.0
													Boring Terminated BY AUGER REFUSAL at Elevation 551.0 ft ON CRYSTALLINE ROCK	34.7
													NOTE: THIS BORING WAS ORIGINALLY BORING 'EB2' FROM PROJECT 9.8100492 U-3827.	

NCDOT BORE DOUBLE B5123_GEO_BH_BRD0014&0019.GPJ NC_DOT.GDT 2/20/15

42265.1.1 (B-5123)
CABARRUS COUNTY
REPLACE BRIDGE NO. 014 & 019 ON US 29 OVER ROCKY RIVER AND ACCESS ROAD

CORE PHOTOS

B1-A(SBL)



42265.1.1 (B-5123)
CABARRUS COUNTY
REPLACE BRIDGE NO. 014 & 019 ON US 29 OVER ROCKY RIVER AND ACCESS ROAD

CORE PHOTOS

B1-A(NBL)



42265.1.1 (B-5123)
CABARRUS COUNTY
REPLACE BRIDGE NO. 014 & 019 ON US 29 OVER ROCKY RIVER AND ACCESS ROAD

CORE PHOTOS

B1-B(NBL)



