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TITLE SHEET

SITE PLAN BRIDGE PROFILE

SHEET NO.

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STATE OF NORTH CAROLINA

DEPARTMENT OF TRANSPORTATION **DIVISION OF HIGHWAYS** GEOTECHNICAL ENGINEERING UNIT

STRUCTURE SUBSURFACE INVESTIGATION

COUNTY CASWELL PROJECT DESCRIPTION BRIDGE 160001 ON US 158 OVER COUNTRY LINE CREEK SITE DESCRIPTION BRIDGE STRUCTURE AT -L-STA. 20 + 18.00

STATE PROJECT REFERENCE NO. BR-0069

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF PREPARING THE SCOPE OF WORK TO BE INCLUDED IN THE REQUEST FOR PROPOSAL. 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 (1991) 707-8050. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT PART OF THE CONTRACT.

SOIL AND ROCK BOUNDARIES WITHIN A BOREHOLE ARE BASED ON GEOTECHNICAL INTERPRETATION UNLESS ENCOUNTERED IN A SAMPLE. INTERPRETED BOUNDARIES MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN SAMPLED STRATA AND BOREHOLE INFORMATION MAY NOT NECESSARILY REFLECT ACTUAL SUBSURFACE CONDITIONS BETWEEN BORINGS, THE LABORATORY SAMPLED DATA AND THE IN SITU (IN-PLACE) TEST DATA CAN BE RELIED ON ONLY TO THE DEGREE OF RELIABILITY INHERENT IN THE STANDARD 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 INCLIDING 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 INTERRETATIONS 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.

P.M. WEAVER P.B. GONZALEZ SubTerra Exploration INVESTIGATED BY ESP Associates, Inc. DRAWN BY __P.B. GONZALEZ CHECKED BY P.M. WEAVER

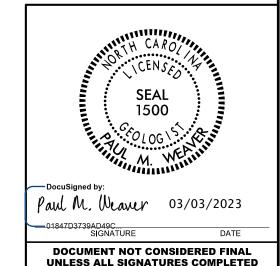
PERSONNEL

SUBMITTED BY ESP Associates, Inc.

DATE October 2022



ESP ASSOCIATES, INC. 7011 ALBERT PICK RD SUITE E GREENSBORO, NC 27409 FIRM # C-0587 WWW.ESPASSOCIATES.COM



PROJECT REPERENCE NO. SHEET NO.

BR-0069
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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
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	WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.	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.	ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.
ACCORDING TO THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION	<u>UNIFORMLY GRADED</u> - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. <u>GAP-GRADED</u> - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES OF TWO OR MORE SIZES.	SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60	AQUIFER - A WATER BEARING FORMATION OR STRATA.
IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH	ANGULARITY OF GRAINS	BLOWS IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.	ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.
AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR EXAMPLE,	THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS:	ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:	ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING
VERY STIFF.GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6 SOIL LEGEND AND AASHTO CLASSIFICATION	ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.	WEATHERED NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.	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
CENERAL CRANIII AR MATERIALS SILT-CLAY MATERIALS	MINERALOGICAL COMPOSITION	FINE TO COARSE CRAIN IGNEOUS AND METAMORPHIC ROCK THAT	WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND
CLASS. (≤ 35% PASSING *200) (> 35% PASSING *200) ORGANIC MATERIALS	MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC.	WOULD YIELD SPT REFUSAL IF TESTED, ROCK TYPE INCLUDES GRANITE,	SURFACE.
GROUP A-1 A-3 A-2 A-4 A-5 A-6 A-7 A-1, A-2 A-4, A-5	ARE USED IN DESCRIPTIONS WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.	UNELSS, OHBERU, SCHIST, ETC.	CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.
CLASS. A-1-0 A-1-b A-2-4 A-2-5 A-2-6 A-2-7 A-7-6 A-3 A-6, A-7	COMPRESSIBILITY	NON-CRYSTALLINE ROCK (NCR) SEDIMENTARY ROCK THAT WOULD YELLD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.	COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.
SYMBOL 0000 d00000 00000 00000 00000 00000 00000 0000	SLIGHTLY COMPRESSIBLE LL < 31 MODERATELY COMPRESSIBLE LL = 31 - 50	COASTAL PLAIN COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD	CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED
% PASSING SUIT-	HIGHLY COMPRESSIBLE LL > 50	SEDIMENTARY ROCK SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED (CP) SHELL BEDS, ETC.	BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
*10 50 MX GRANULAR CLAY MUCK, *40 30 MX 50 MX 51 MN SOILS SOILS SOILS PEAT	PERCENTAGE OF MATERIAL	WEATHERING	DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT
*200 15 MX 25 MX 10 MX 35 MX 35 MX 35 MX 35 MX 36 MN 36 MN 36 MN 36 MN 36 MN 36 MN	GRANULAR SILT - CLAY ORGANIC MATERIAL SOILS SOILS OTHER MATERIAL	FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER	ROCKS OR CUTS MASSIVE ROCK.
MATERIAL	TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20%	HAMMER IF CRYSTALLINE.	DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.
PASSING *40 48 MX 41 MN	MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35%	VERY SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, (V SLI.) CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF	DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE
PI 6 MX NP 10 MX 10 MX 11 MN 11 MN 10 MX 10 MX 11 MN 11 MN 11 MN 11 MN HIGHLY	HIGHLY ORGANIC > 10% > 20% HIGHLY 35% AND ABOVE	OF A CRYSTALLINE NATURE.	LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.
GROUP INDEX 0 0 0 4 MX 8 MX 12 MX 16 MX NO MX AMOUNTS OF SOUS	GROUND WATER	SLIGHT ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO	FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.
USUAL TYPES STONE FRAGS. FINE SILTY OR CLAYEY SILTY CLAYEY MATTER	✓ WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING	(SLI.) 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.	FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.
OF MAJOR GRAYEL, AND MATERIALS SAND GRAYEL AND SAND SOILS SOILS	STATIC WATER LEVEL AFTER 24 HOURS	MODERATE SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN	FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM
CEN BATING FAIR TO		(MOD.) GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS	PARENT MATERIAL.
AS SUBGRADE EXCELLENT TO GOOD FAIR TO POOR POOR UNSUITABLE	SPRING OR SEEP	DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.	FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.
PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ;PI OF A-7-6 SUBGROUP IS > LL - 30		MODERATELY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL	FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE
CONSISTENCY OR DENSENESS	MISCELLANEOUS SYMBOLS	SEVERE AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH (MOD. SEV.) AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK, ROCK GIVES "CLUNK" SOUND WHEN STRUCK.	FIELD. JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.
PRIMARY SOIL TYPE COMPACTNESS OR PENETRATION RESISTENCE COMPRESSIVE STRENGTH	ROADWAY EMBANKMENT (RE) 25/025 DIP & DIP DIRECTION	IF TESTED, WOULD YIELD SPT REFUSAL	LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO
CONSISTENCY CONSISTENCY (N-VALUE) (TONS/FT ²)	WITH SOIL DESCRIPTION → OF ROCK STRUCTURES	SEVERE ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT	ITS LATERAL EXTENT.
GENERALLY VERY LOOSE < 4	SOIL SYMBOL SOIL SYMBOL SPE OPT ONT TEST BORING INSTALLATION	(SEV.) REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.	LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.
GRANULAR LOOSE 4 TO 10 GRANULAR MEDIUM DENSE 10 TO 30 N/A	NT - STATE	IF TESTED, WOULD YIELD SPT N VALUES > 100 BPF	MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS
MATERIAL DENSE 30 TO 50 (NON-COHESIVE)	ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT AUGER BORING CONE PENETROMETER TEST	VERY ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE	USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.
VERT DENSE 2 2	INFERRED SOIL BOUNDARY - CORE BORING SOUNDING ROD	SEVERE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK (V SEV.) REMAINING, SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR	PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.
VERY SOFT < 2 < 0.25 GENERALLY SOFT 2 TO 4 0.25 TO 0.5	Y	VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. IF TESTED, WOULD YIELD SPT N VALUES < 100 BPF	RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.
SILT-CLAY MEDIUM STIFF 4 TO 8 0.5 TO 1.0 MATERIAL STIFF 8 TO 15 1 TO 2	INFERRED ROCK LINE MONITORING WELL TEST BORING WITH CORE	COMPLETE ROCK REDUCED TO SOIL, ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND	ROCK QUALITY DESIGNATION (ROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF
MATERIAL STIFF 8 TO 15 1 TO 2	→ → → → → → ALLUVIAL SOIL BOUNDARY \(\triangle \) PIEZOMETER INSTALLATION \(\triangle \) SPT N-VALUE	SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.	ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.
HARD > 30 > 4	INSTRUCTION	ROCK HARDNESS	SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT
TEXTURE OR GRAIN SIZE	RECOMMENDATION SYMBOLS	VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK, BREAKING OF HAND SPECIMENS REQUIRES	ROCK,
U.S. STD. SIEVE SIZE 4 10 40 60 200 270	UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE	SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.	SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND
DPENING (MM) 4.76 2.00 0.42 0.25 0.075 0.053	USED IN THE TOP 2 FEET OF	HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.	RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.
BOULDER COBBLE GRAVEL COARSE FINE SILT CLAY	SHALLOW UNDERCUT UNCLASSIFIED EXCAVATION - EMBANKMENT OR BACKFILL	MODERATELY CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE	SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT
(BLDR.) (COB.) (GR.) (CSE. SD.) (F SD.) (SL.) (CL.)	ABBREVIATIONS	HARD EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK, HAND SPECIMENS CAN BE DETACHED	OR SLIP PLANE.
GRAIN MM 305 75 2.0 0.25 0.05 0.005	AR - AUGER REFUSAL MED MEDIUM YST - VANE SHEAR TEST	BY MODERATE BLOWS.	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
SIZE IN. 12 3	BT - BORING TERMINATED MICA MICACEOUS WEA WEATHERED CL CLAY MOD MODERATELY 7 - UNIT WEIGHT	MEDIUM CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. HARD CAN BE EXCAVATED IN SMALL CHIPS TO PEICES I INCH MAXIMUM SIZE BY HARD BLOWS OF THE	WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL
SOIL MOISTURE - CORRELATION OF TERMS	CPT - CONE PENETRATION TEST NP - NON PLASTIC $\gamma_{ m d}$ - DRY UNIT WEIGHT	POINT OF A GEOLOGIST'S PICK.	TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.
SOIL MOISTURE SCALE FIELD MOISTURE GUIDE FOR FIELD MOISTURE DESCRIPTION	CSE COARSE ORG ORGANIC DMT - DILATOMETER TEST PMT - PRESSUREMETER TEST SAMPLE ABBREVIATIONS	SOFT CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK, CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN	STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.
	DPT - DYNAMIC PENETRATION TEST SAP SAPROLITIC S - BULK	PIECES CAN BE BROKEN BY FINGER PRESSURE.	STRATA ROCK QUALITY DESIGNATION (SROD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL
- SATURATED - USUALLY LIQUID; VERY WET, USUALLY (SAT.) FROM BELOW THE GROUND WATER TABLE	e - VOID RATIO SD SAND, SANDY SS - SPLIT SPOON F - FINE SL SILT, SILTY ST - SHELBY TUBE	VERY CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH	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.
	FOSS FOSSILIFEROUS SLI SLIGHTLY RS - ROCK	SOFT OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE, CAN BE SCRATCHED READILY BY FINGERNAIL.	TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
PLASTIC SEMISOLID: REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE	FRAC FRACTURED, FRACTURES TCR - TRICONE REFUSAL RT - RECOMPACTED TRIAXIAL FRAGS FRAGMENTS W - MOISTURE CONTENT CBR - CALIFORNIA BEARING	FRACTURE SPACING BEDDING	
(PI) PLASTIC LIMITATTAIN OPTIMUM MOISTURE	HI HIGHLY V - VERY RATIO	TERM SPACING TERM THICKNESS	BENCH MARK: NGS Marker Designation CAS 2, PID FY2340
- MOIST - (M) COLID. AT OR NEAR ORTIMUM MOISTURE	EQUIPMENT USED ON SUBJECT PROJECT	VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED 4 FEET	ELEVATION: 440.98 FEET
OM OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL SHRINKAGE LIMIT	DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE:	WIDE	
SE SHRINKHUE LIMIT	CME-45C CLAY BITS X AUTOMATIC MANUAL	CLOSE 0.16 TO 1 FOOT VERY THINLY BEDDED 0.03 - 0.16 FEET	NOTES:
- DRY - (D) ATTAIN OPTIMUM MOISTURE	6' CONTINUOUS FLIGHT AUGER CORE SIZE:	VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	F.I.A.D = FILLED IMMEDIATELY AFTER DRILLING
PLASTICITY	CME-55	INDURATION	
PLASTICITY INDEX (PI) DRY STRENGTH	CME-550 HARD FACED FINGER BITS X-N Q	FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.	
NON PLASTIC 0-5 VERY LOW	TUNGCARBIDE INSERTS	RUBBING WITH FINGER FREES NUMEROUS GRAINS;	
SLIGHTLY PLASTIC 6-15 SLIGHT	VANE SHEAR TEST X CASING X WY ADVANCER HAND TOOLS:	GENILE BLUW BY HAMMER DISTRIEGRATES SAMPLE.	
MODERATELY PLASTIC 16-25 MEDIUM HIGHLY PLASTIC 26 OR MORE HIGH	BORTARIE HOICT TRICONE STEEL TEETH POST HOLE DIGGER	MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.	
COLOR	TOYOUT TOYOUT AUGUST	CDAING ADE DIEEICH I TO CEDADATE WITH CTEEL DDODE.	
	X DIEDRICH D-50 TRICONE TUNGCARB. SOUNDING ROD	INDURATED DIFFICULT TO BREAK WITH HAMMER.	
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.	X CORE BIT VANE SHEAR TEST	SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE;	
HOSTITENS SOUTHS ETOIT, DANK, STILENED, ETG. HEE USED TO DESCRIBE HEREARANCE.	<u> </u>	EXTREMELY INDURATED SAMPLE BREAKS ACROSS GRAINS.	DATE: 8-15-1-

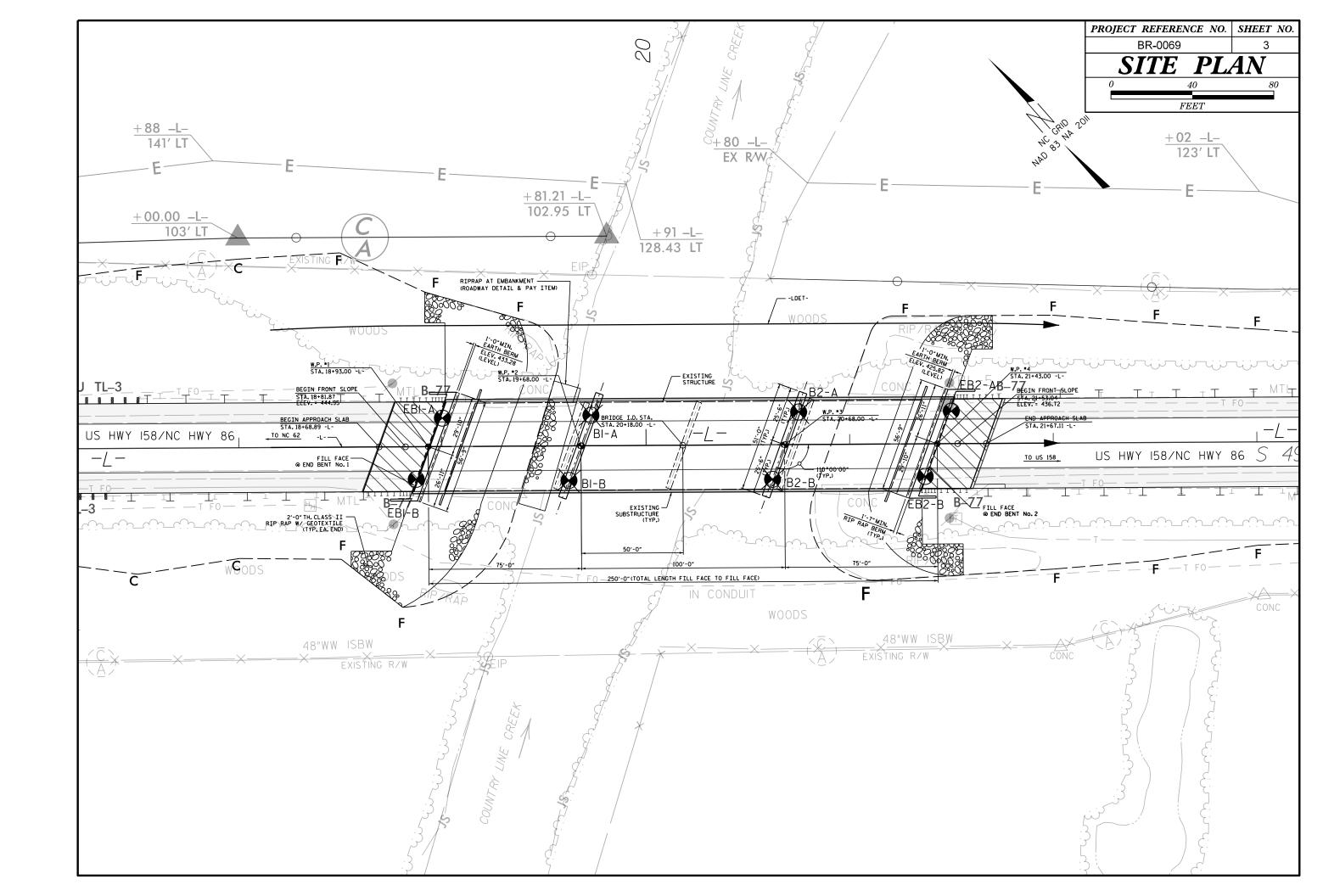
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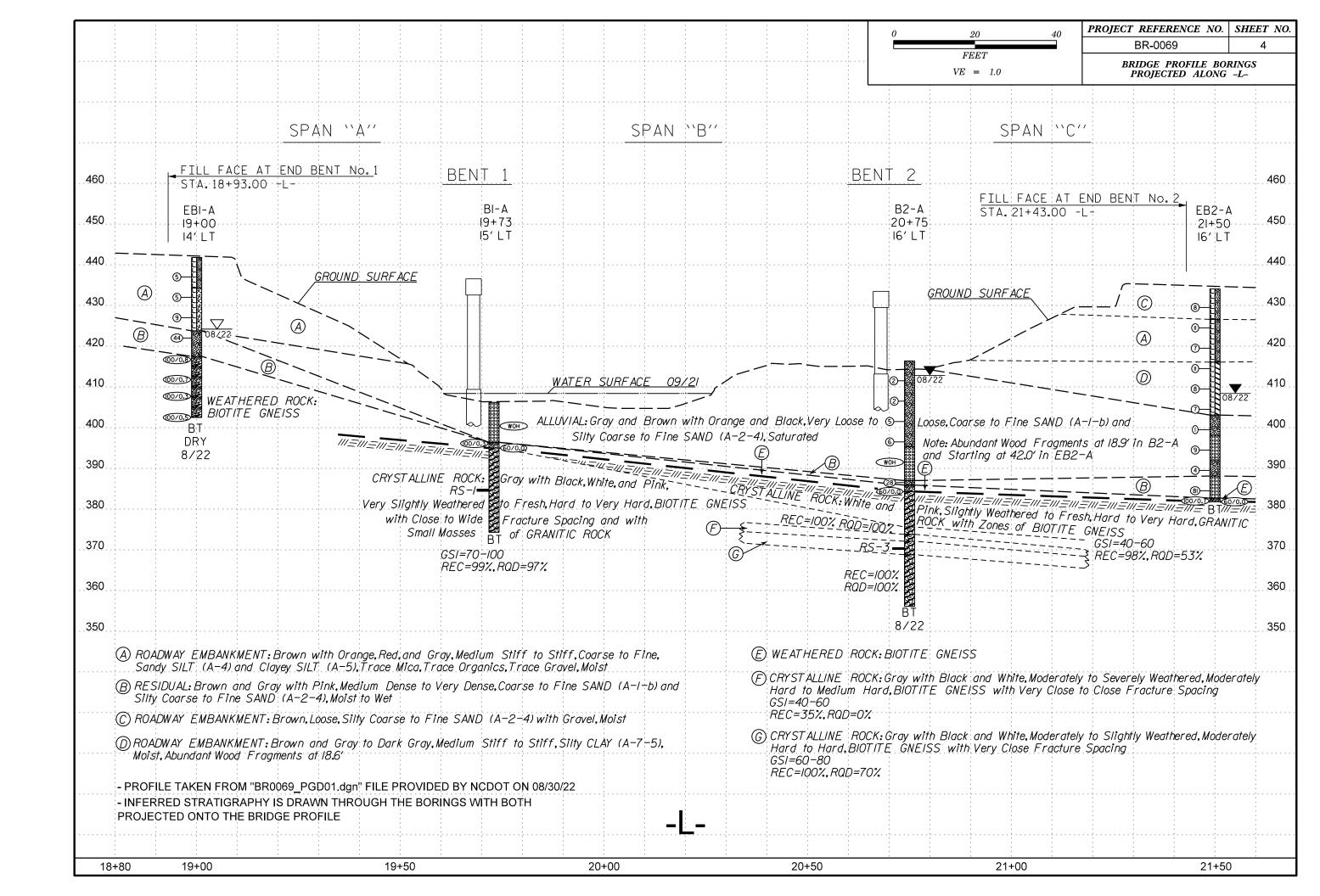
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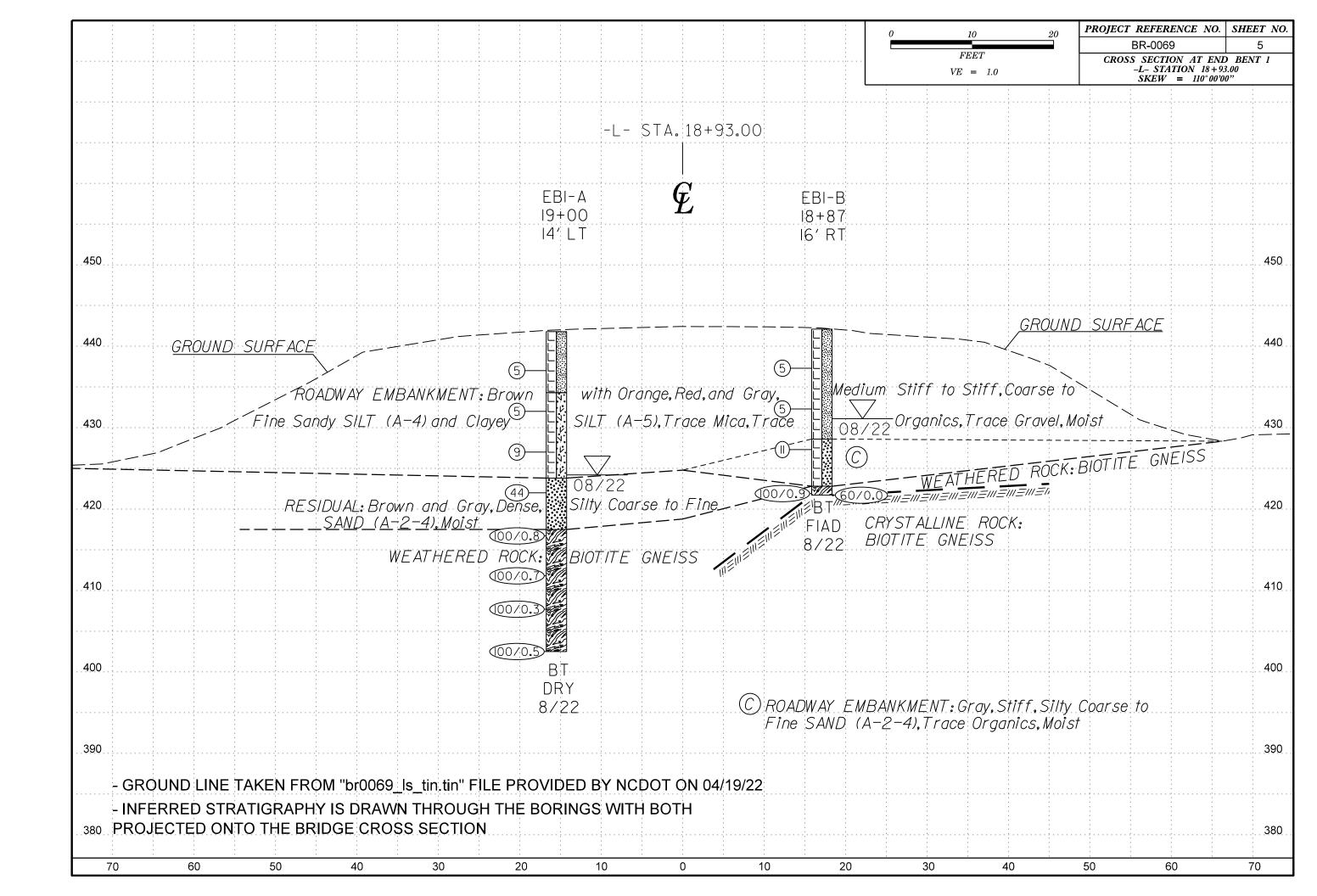
SUBSURFACE INVESTIGATION

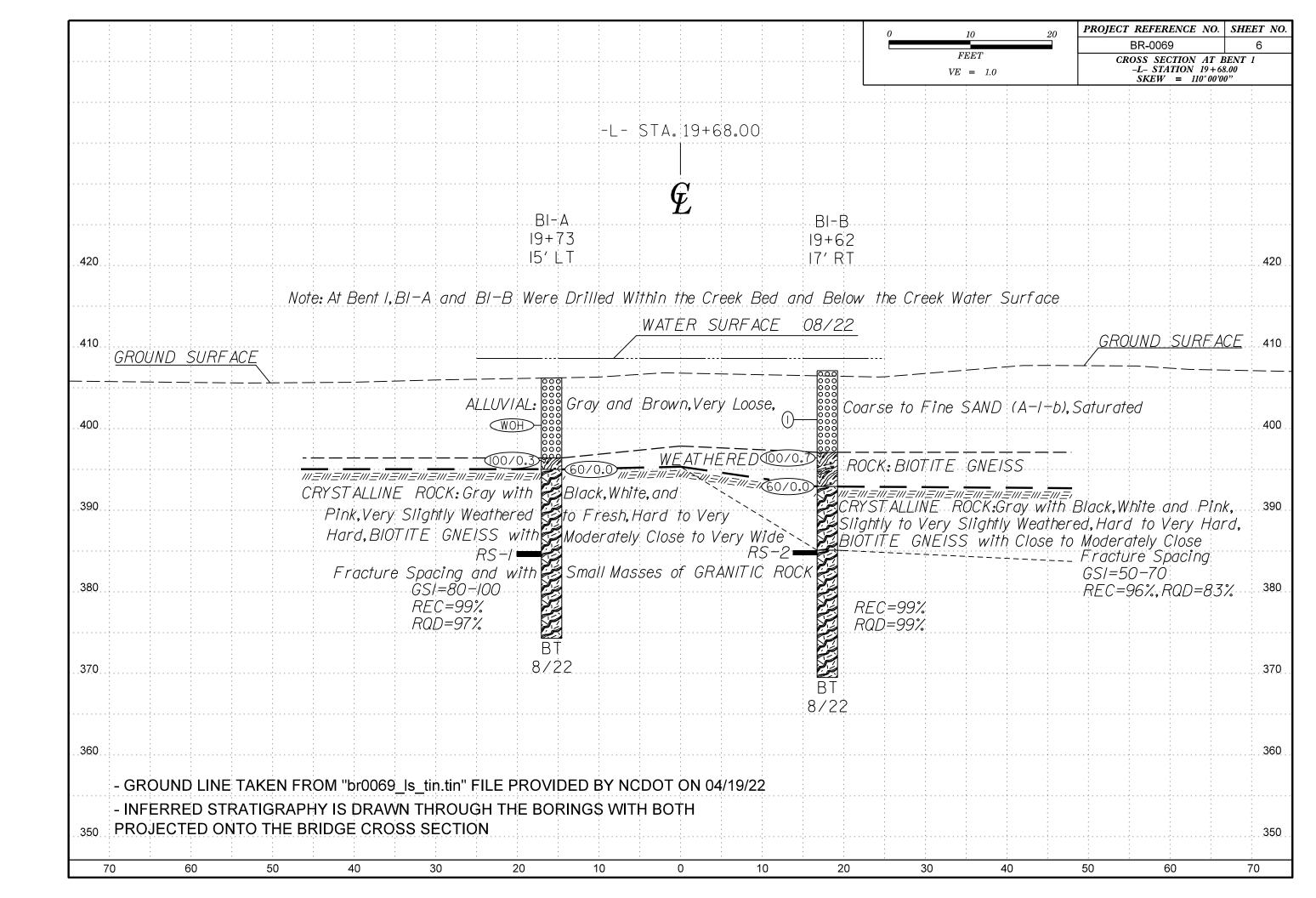
SUPPLEMENTAL LEGEND, GEOLOGICAL STRENGTH INDEX (GSI) TABLES

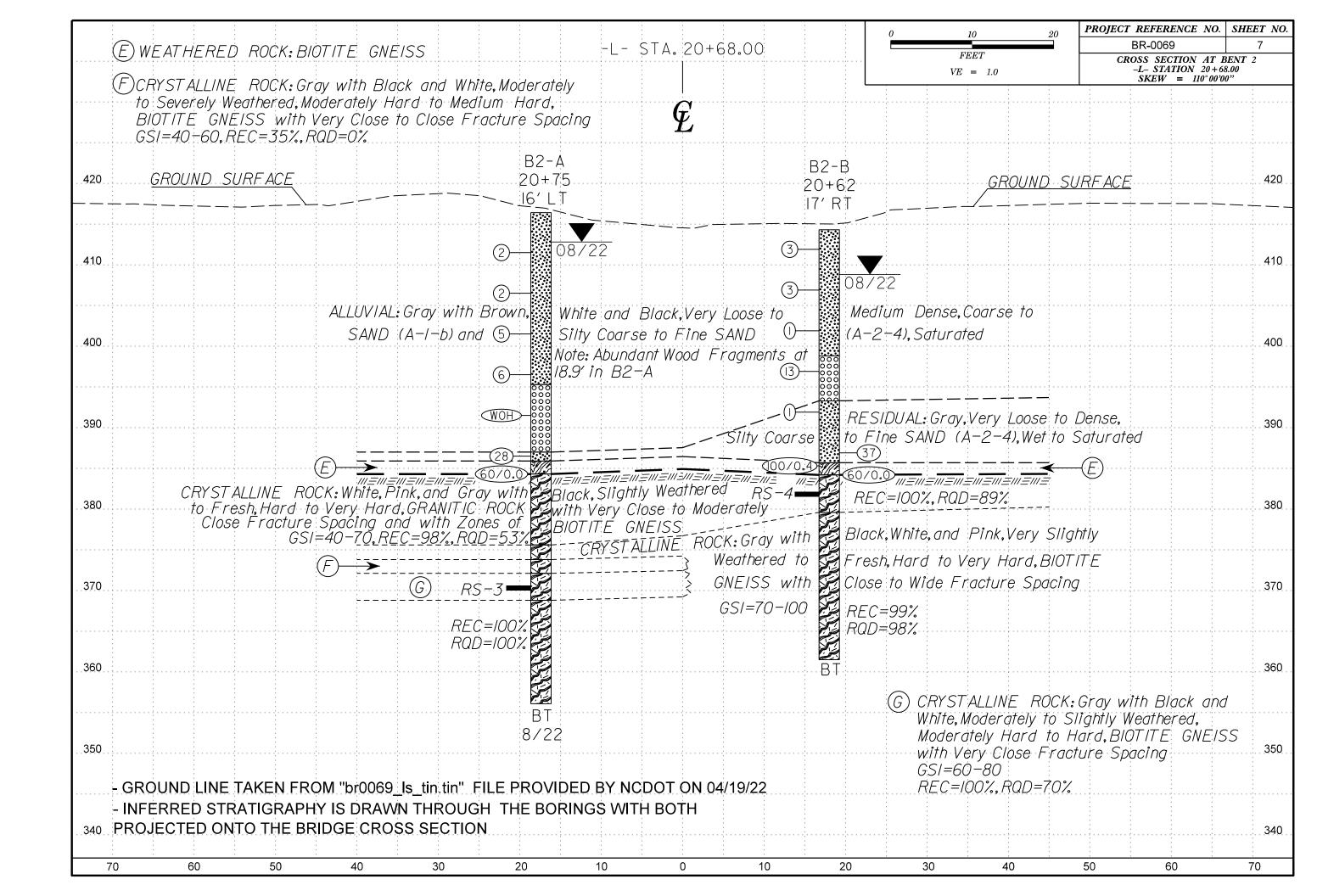
		FROM AAS	SHTO LRFD BI	BRIDG	AL STRENGTH INDEX (GSI) TABLES GE DESIGN SPECIFICATIONS		D 1			2000
GEOLOGICAL STRENGTH INDEX (GSI) FOR JOINTED ROCKS (Hoek and Marinos, 2000) From the lithology, structure and surface conditions of the discontinuities, estimate the average value of GSI. Do not try to be too precise. Quoting a range from 33 to 37 is more realistic than stating that GSI = 35. Note that the table does not apply to structurally controlled failures. Where weak planar structural planes are present in an unfavorable orientation with respect to the excavation face, these will dominate the rock mass behaviour. The shear strength of surfaces in rocks that are prone to deterioration as a result of changes in moisture content will be reduced if water is present. When working with rocks in the fair to very poor categories, a shift to the right may be made for wet conditions. Water pressure is dealt with by effective stress analysis. STRUCTURE	VERY GOOD Very rough, fresh unweathered surfaces	Scoop, Slightly weathered, iron stained surfaces Surfaces Surfaces Social Scooth, moderately weathered and altered surfaces	POOR Slickensided, highly weathered surface with compact coatings or fillings or angular fragments VERY POOR Slickensided, highly weathered surface	Slickensided, highly weathered surfaces with soft clay coatings or fillings	GSI FOR HETEROGENEOUS ROCK MASSES SUCH AS FLYSCH (Marinos. P and Hoek E., 2000) From a description of the lithology, structure and surface conditions (particularly of the bedding planes), choose a box in the chart. Locate the position in the box that corresponds to the condition of the discontinuities and estimate the average value of GSI from the contours. Do not attempt to be too precise. Quoting a range from 33 to 37 is more realistic than giving GSI = 35. Note that the Hoek-Brown criterion does not apply to structurally controlled failures. Where unfavourably oriented continuous weak planar discontinuities are present, these will dominate the behaviour of the rock mass. The strength of some rock masses is reduced by the presence of groundwater and this can be allowed for by a slight shift to the right in the columns for fair, poor and very poor conditions. Water pressure does not change the value of GSI and it is dealt with by using effective stress analysis. COMPOSITION AND STRUCTURE	VERY GOOD - Very Rough, fresh unweathered surfaces	GOOD - Rough, slightly weathered	FAIR - Smooth, moderately weathered and altered surfaces	POOR - Very smooth, occasionally slickensided surfaces with compact coatings or fillings with angular fragments	VERY POOR - Very smooth, slicken- sided or highly weathered surfaces with soft clay coatings or fillings
INTACT OR MASSIVE - intact rock specimens or massive in situ rock with few widely spaced discontinuities	90 80	SINO SON ACE ON	N/A N/A		A. Thick bedded, very blocky sandstone The effect of pelitic coatings on the bedding planes is minimized by the confinement of the rock mass. In shallow tunnels or slopes these bedding planes may cause structurally controlled instability.	70 60	A			
BLOCKY - well interlocked undisturbed rock mass consisting of cubical blocks formed by three intersecting discontinuity sets VERY BLOCKY - interlocked, partially disturbed mass with multi-faceted angular blocks formed by 4 or more joint sets	70 CKING OF HOUSE	60 50			B. Sand- stone with stone and stitstone thin inter- layers of siltstone amounts C. Sand- stone and siltstone or silty shale with sand- stone layers shale with sandstone layers		50 B 40	c l	D/E	
BLOCKY/DISTURBED/SEAMY - folded with angular blocks formed by many intersecting discontinuity sets. Persistence of bedding planes or schistosity	TSINO INIEK	40	30		C.D.E. and G - may be more or less folded than illustrated but this does not change the strength. Tectonic deformation, faulting and loss of continuity moves these categories to F and H.			30	F 20	
DISINTEGRATED - poorly inter- locked, heavily broken rock mass with mixture of angular and rounded rock pieces	DECKEASING		20		G. Undisturbed silty or clayey shale with or without a few very thin sandstone layers thin sandstone layers H. Tectonically deformed silty or clayey shale forming a chaotic structure with pockets of clay. Thin layers of sandstone are transformed into small rock pieces.	/				10
LAMINATED/SHEARED - Lack of blockiness due to close spacing of weak schistosity or shear planes	V N/A	N/A	10	$/ \dagger$	─────────────────────────────────────			/		DATE: 8-19-1

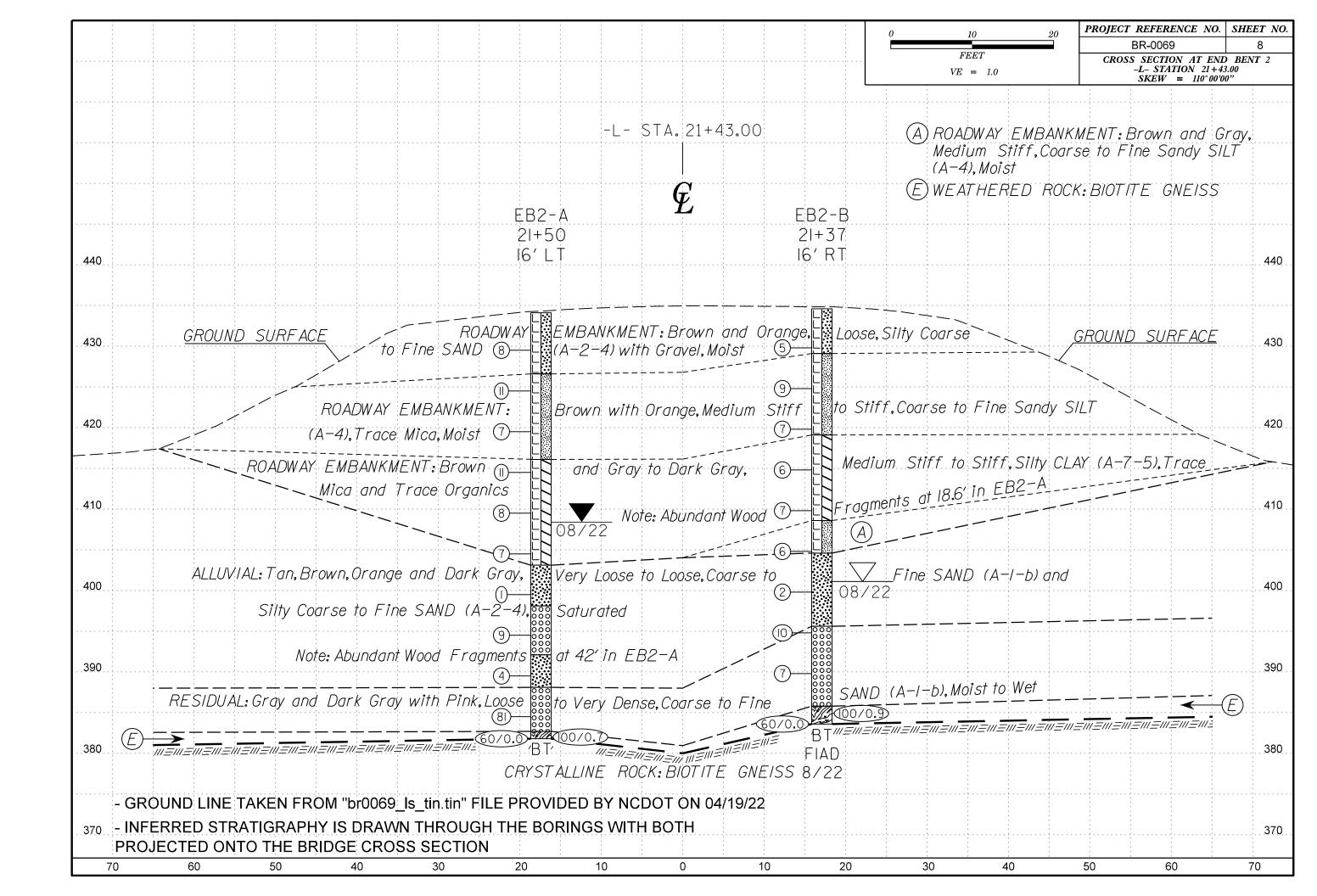


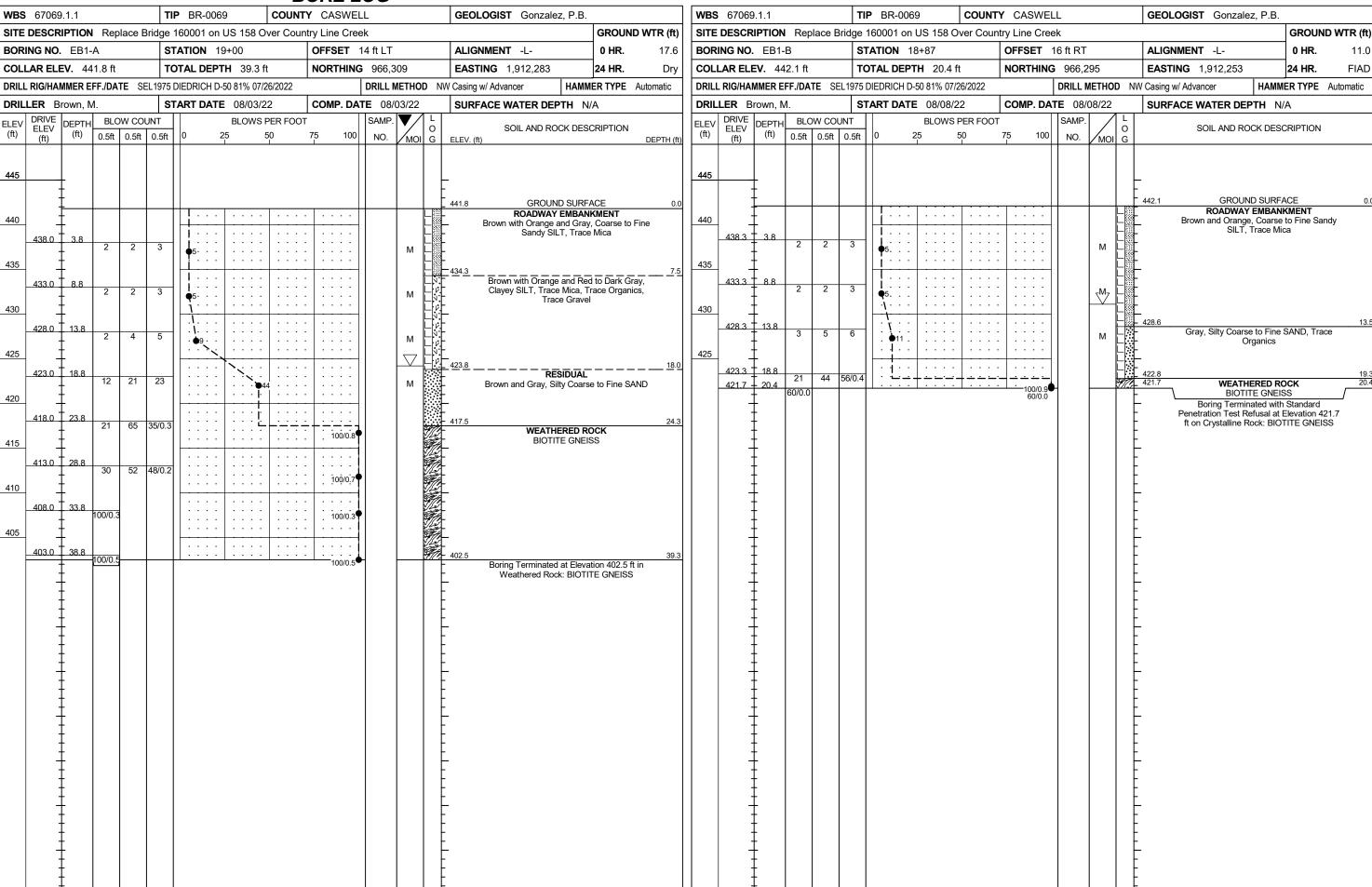












SHEET 10

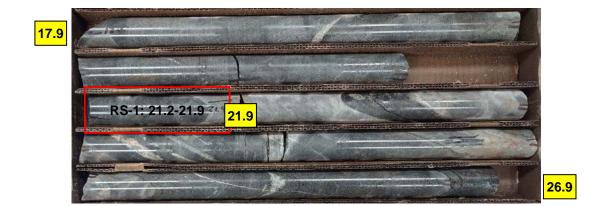
									B	UKE I	<u> </u>					
WBS	67069	9.1.1				ΊP	BR-0069	9	COUNT	Y CASWE	LL			GEOLOGIST Gonzalez, P.B.		
SITE	DESCR	RIPTIO	N Rep	olace E	3ridge	16	60001 on	US 158 O	ver Coun	try Line Cre	eek				GROUND WT	'R (1
BORI	NG NO	. B1-	4		S	STA	ATION 19	9+73		OFFSET	15 ft LT			ALIGNMENT -L-	0 HR.	N/
COLL	AR EL	EV . 4	06.2 ft		Т	ОТ	TAL DEPT	H 31.9 ft	t	NORTHIN	G 966,2	262		EASTING 1,912,338	24 HR.	N/
DRILL	RIG/HA	MMER I	FF./DA	TE S	<u>_</u> EL1975	DII	IEDRICH D-	50 81% 07/2	26/2022		DRILL I	METHO	D N	W Casing W/SPT & Core HAMM	ER TYPE Autom	natic
	LER B						ART DATE			COMP. DA				SURFACE WATER DEPTH 2.	3ft	
ELEV	DRIVE	DEPTH	1	ow co		П			PER FOOT		SAMP.	V /	1-1			
(ft)	ELEV (ft)	(ft)	0.5ft	0.5ft	0.5ft		0 2	5 5	50	75 100	NO.	МОІ	I G	SOIL AND ROCK DESC ELEV. (ft)		<u>PTH</u>
410	-	 												<u>-</u>		
405		<u> </u>				\mathbb{H}			· · · · ·	1			000	- 406.2 GROUND SURF	ACE	
	-	‡									1		000	Brown, Coarse to Fin	e SAND	
	401.4	† + _{4.8}				╽							000	• •		
400	-	‡	WOH	WOH	0		0				-	Sat.	000	<u>-</u>		
		‡							: : : :				0000	- -		
395	396.4	9.8	100/0.:	3		╂	-:-:-:-	:	 	100/0.3	\downarrow			- 396.4 - 395.0 WEATHERED RO	OCK	
393	395.0	11.2	60/0.0	1		lŀ			1 : : : :	60/0.0				395.0 WEATHERED RO	SS /	1
		‡												Gray with Black and White	Very Slightly	
390		‡								1	<u> </u>			Weathered to Fresh, Hard BIOTITE GNEISS with Mode	erately Close to	
		İ												Wide Fracture Spacing ar Masses of Granitic	nd with Small Rock	
		+												•		
385	-	Ŧ				╁			ļ	+	RS-1	-		-		
		Ŧ								::::		1		. •		
380		‡												•		
300	-	‡				lt				1				- -		
		‡									i			<u>.</u>		
375	-	‡									1			- 374.3		2
ŀ		! 				Н					1			Boring Terminated at Eleva	tion 374.3 ft in	3
		+												Crystalline Rock: BIOTI	I E GNEISS	
	_	Ŧ												-		
		‡												- -		
		‡												- -		
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		<u>†</u>												-		

GEOTECHNICAL BORING REPORT CORE LOG

											RE LOG
	67069.1.					BR-00					CASWELL GEOLOGIST Gonzalez, P.B.
SITE	DESCRIPT	TION	Rep	lace Brid	Ť			3 Over	Coun	-	
	ING NO. E						19+73			-	FSET 15 ft LT ALIGNMENT -L- 0 HR. N/A
COLI	AR ELEV.	406	5.2 ft		TOT	AL DE	PTH 31	.9 ft		NO	DRTHING 966,262 EASTING 1,912,338 24 HR. N/A
DRILL	. RIG/HAMM	ER EF	F./DA	TE SEL1	975 DIE	DRICH	D-50 81%	07/26/2	022		DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automatic
DRIL	LER Brov	vn, M			STAI	RT DA	TE 08/0	2/22		co	MP. DATE 08/02/22 SURFACE WATER DEPTH 2.3ft
COR	E SIZE NO	Q					N 20.7 f				
ELEV (ft)		EPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft) %	JN RQD (ft)%	SAMP. NO.	REC. (ft)	RQD (ft) %	10G	DESCRIPTION AND REMARKS ELEV. (ft) DEPTH (ft)
395	205 0 - 4	4.0									Begin Coring @ 11.2 ft
390	389.3 1 389.3 2 384.3 2 379.3 2	21.9	5.0	5:16/0.7 3:21/1.0 5:58/1.0 6:56/1.0 6:56/1.0 2:33/1.0 2:21/1.0 2:20/1.0 2:20/1.0 2:06/1.0 2:14/1.0 2:39/1.0 1:46/1.0	(0.7) 100% (4.8) 96% (5.0) 100% (5.0) 100%	(4.4) 88% (5.0) 100%	RS-1	(20.5) 99%	(20.1) 97%		GRYSTALLINE ROCK Gray with Black and White, Very Slightly Weathered to Fresh, Hard to Very Hard BIOTITE GNEISS with Moderately Close to Wide Fracture Spacing and with Small Masses of Granitic Rock Variably foliated with foliation angles of 50 degrees to 80 degrees 4 fractures in upper 3.5' at 50 degrees to 80 degrees parallel to foliation GSI=80 to 100
	‡		5.0	1:45/1.0 2:25/1.0	100%	100%					-
375	374.3 - 3	31.9		1:57/1.0 2:00/1.0							7374.3 Boring Terminated at Elevation 374.3 ft in Crystalline Rock: BIOTITE

B1-ABOXES 1 & 2: 11.2 - 26.9 FEET







B1-ABOX 3: 26.9 - 31.9 FEET





SHEET 12

							<u>ORE L</u>	<u>UG</u>				
VBS 6706	9.1.1			TI	IP BR-0069	COUNT	Y CASWEL	L			GEOLOGIST Gonzalez, P.B.	
SITE DESCR	RIPTION	I Rep	olace B	ridge	160001 on US 158 C	ver Count	try Line Cree	ek				GROUND WTR (ft
ORING NO) . B1-E	3		S	TATION 19+62		OFFSET	17 ft RT			ALIGNMENT -L-	0 HR. N/A
OLLAR EL	.EV . 40	07.1 ft		Т	OTAL DEPTH 37.6 f	t	NORTHING	966,2	45		EASTING 1,912,309	24 HR. N/A
RILL RIG/HA	AMMER E	FF./DA	TE SE	L1975	DIEDRICH D-50 81% 07/2	26/2022		DRILL N	METHOD	NV	V Casing W/SPT & Core HAMM	ER TYPE Automatic
RILLER E					TART DATE 08/04/2		COMP. DA				SURFACE WATER DEPTH 1.	 6ft
LEV DRIVE ELEV (ft)	DEDTL	1	0.5ft		BLOWS	PER FOOT		SAMP. NO.	V /	L O G	SOIL AND ROCK DESC	
05	<u> </u>									00000	407.1 GROUND SURF/ ALLUVIAL Gray with Brown, Coarse t	
402.1	I I		WOH	1	1				Sat.	000-	- 397.1	10
392.9	Ŧ	69/0.0	31/0.2				- 100/0.7		SY > A IDY > A IM IN . Se		WEATHERED RO BIOTITE GNES 392.9 CRYSTALLINE R Gray with Black, White, and	SS The state of t
35	† - - -							RS-2			Verý Slightly Weathered, Ha BIOTITE GNEISS with Close Close Fracture Sp. 385.1 Gray with Black, White, ar	e to Moderately acing 22
30	‡ ‡ ‡							113-2			Slightly Weathered to Fresh Hard BIOTITE GNEISS wi Fracture Spacing and with S Granitic Rock	n, Hard to Very th Very Wide small Masses of
75	† †										-	
370	<u>+</u> +										-369.5 Boring Terminated at Eleva Crystalline Rock: BIOTI	31 tion 369.5 ft in TE GNEISS
											-	

GEOTECHNICAL BORING REPORT CORE LOG

									<u> </u>	U	E LOG						
WBS	67069	.1.1			TIP	BR-0	ე69	C	OUNT	Υ	SWELL		GEOLOGI	ST Gonza	lez, P.B.	ı	
SITE	DESCR	IPTION	l Rep	lace Brid	ge 16	0001 c	on US 158	3 Over	· Cour	ntry I	e Creek		1			GROUN	D WTR (ft)
3OR	ING NO.	B1-B	1		STA	TION	19+62			OF	SET 17 ft RT		ALIGNME	NT -L-		0 HR.	N/A
COLI	LAR ELE	V . 40	7.1 ft		TOT	AL DE	PTH 37.	.6 ft		NC	THING 966,245		EASTING	1,912,309		24 HR.	N/A
DRILL	. RIG/HAI	/MER E	FF./DA	TE SEL1	975 DIE	DRICH	D-50 81%	07/26/2	.022		DRILL METH	D N	N Casing W/SP	T & Core	HAMM	IER TYPE	Automatic
DRIL	LER B	rown, N	Λ.		STA	RT DA	TE 08/0	4/22		CC	P. DATE 08/05/22		SURFACE	WATER DI	EPTH 1.	6ft	
COR	E SIZE	NQ					N 23.4 f			<u> </u>							
ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	REC. (ft)	UN RQD (ft) %	SAMP. NO.	REC. (ft)	RATA RQD (ft) %	O G	ELEV. (ft)	ļ	DESCRIPTION	AND REMAF	RKS		DEPTH (ft)
392.9	392.9	14.2	3.4	2:38/1.0 2:31/1.0	(3.2) 94%	(2.9) 85%		(7.5) 96%	(6.5) 83%		392.9 Gray with Bla	ck \M/h		ng @ 14.21 LLINE ROCK		/eathered H	14.2 Hard
390	389.5	- 17.6 -	5.0	2:43/1.0	(4.9) 98%	(4.2) 84%			55,5		to Very Har	d BIOT	ITE GNEISS wi	ith Close to M pacing	oderately C	Close Fractu	
385	- - 384.5	- - 22.6		1:28/1.0 1:46/1.0 1:56/1.0 1:55/1.0 2:17/1.0	9070	0470	RS-2	(15.4)	(15.4)			ctures a	at 70 degrees to ractures at 10 d	o 80 degrees	parallel to fo degrees		22.0
	-	- - -	5.0	2:22/1.0 2:18/1.0 2:30/1.0	(5.0) 100%	(5.0) 100%	110-2	99%	99%				ite, and Pink, V E GNEISS with	Very Wide Fr	acture Spa		
380	379.5	- 27 <u>.</u> 6	5.0	2:19/1.0 2:42/1.0 2:17/1.0 2:29/1.0	(4.9) 98%	(4.9) 98%					Variably	foliated		angles of 50 d Iral fractures		'0 degrees	
375	374.5 –	- - - 32.6		3:23/1.0 2:49/1.0 3:01/1.0									GSI	=80-100			
270	-		5.0	2:42/1.0 3:17/1.0 1:53/1.0 3:01/1.0	(4.9) 98%	(4.9) 98%		!									
370	369.5	- 37.6 -		2:42/1.0				<u> </u>			Borina Te	minate	d at Elevation 3	369.5 ft in Crv	stalline Roo	ck: BIOTIT	37.6 =
	-	_									Doming 10			NEISS		SK. B. ST. T.	_
	-	_															
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B1-BBOXES 1 & 2: 14.2 - 31.0 FEET

B1-BBOX 3: 31.0 - 37.6 FEET











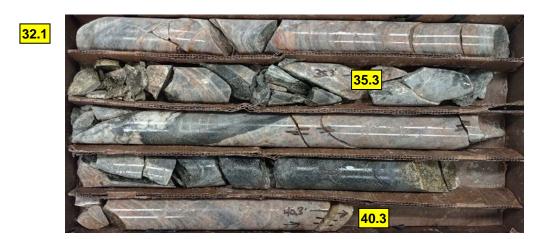
SHEET 14

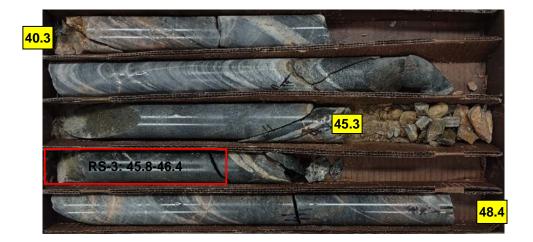
		1.1			''	I P BR-00	JOS	l	COUNT	Y CASWE	_L			GEOLOGIST Gonzalez, P.B.	
SITE	DESCR	IPTION	Rep	lace B	ridge	160001 o	n U	S 158 O	ver Coun	try Line Cre	ek			GF	ROUND WTR (ft)
BORI	NG NO.	B2-A			S	TATION	20+	75		OFFSET	16 ft LT			ALIGNMENT -L- 0	HR. N/A
OLL	AR ELE	V . 41	6.4 ft		T	OTAL DE	PTH	60.3 ft		NORTHING	966,1	96		EASTING 1,912,416 24	HR. 3.6
RILL	RIG/HAI	MMER E	FF./DA	TE SE	L1975	DIEDRICH	D-50	81% 07/2	6/2022		DRILL I	METHO	D NV	V Casing W/SPT & Core HAMMER 1	TYPE Automatic
RILI	ER B	rown, N	1.		S	TART DA	TE	08/01/2	2	COMP. DA	TE 08/	01/22		SURFACE WATER DEPTH N/A	
LEV	DRIVE ELEV	DEPTH	BLC	W COL	JNT			BLOWS F	PER FOOT		SAMP.	lacksquare	L	SOIL AND ROCK DESCRIP	TION
(ft)	(ft)	(ft)	0.5ft	0.5ft	0.5ft	0	25		50	75 100	NO.	MOI		ELEV. (ft)	DEPTH (
20		-												-	
	-						. 1		· · · ·	1				416.4 GROUND SURFACE ALLUVIAL	С
15	-	_				 	_					_		Gray with Brown and Black, Silty Fine SAND, Abundant Wood Fra	
-	412.5	- 3.9 -	WOH	WOH	2		:					Sat.		Sample at 18.9 feet	igiticitis III
10	_	_			-	 	:					Jal.		-	
	407.5 ⁻	- - 8.9				::::	:								
05		-	1	WOH	2	Q 2 : :	:					Sat.			
05	-	-												-	
-	402.5	13.9	2	2	3	1	:					Sat.			
00	-	_					:					Joan		_	
	397.5 -	- - 18.9] ¦∷:	:								
95	-	-	1	2	4	6	:					Sat.		395.3	21
33	-	-				 /				1			000	Gray, Coarse to Fine SAI	
-	392.5	- 23.9 -	WOH	WOH	0	 	:					Sat.	000 000 000		
90	_	-						· · · ·					000-	-	
	387.5 ⁻	- - 28.9] ::^s	:							387.0	29
85	-		2	6	22		`\•	28				W		385.9 RESIDUAL	30
-	384.3	32.1	60/0.0							60/0.0	•			Gray, Silty Coarse to Fine S WEATHERED ROCK	
	-	-				:::	:							BIOTITE GNEISS CRYSTALLINE ROCK	
80	_	_					_							White and Pink, Very Slightly We Fresh, Hard to Very Hard GRANI	athered to
	-	-					:							with Zones of Black and Gray, Mo Slighly Weathered, Moderately Ha	derately to
75	-	-					:							BIOTITE GNEISS; Close to Model	rately Close
7.5	-	-								1				373.8 Close Fracture Spacing	42
	-	-				:::	- 1							Gray with White and Black, Ver Weathered to Fresh, Hard to V	ery Hard - 44
70	_						-			 	RS-3			BIOTITE GNEISS with Close to N Close Fracture Spacing	ı '
	-	-				:::	:							Gray with Black and White, Mod Severely Weathered, Moderatel	
65	-	-				:::	:							Medium Hard BIOTITE GNEISS Close to Close Fracture Spa	with Very
00	-	-												Gray with Black and White, Mod	lerately to
	-	-					:							Slightly Weathered, Moderately H BIOTITE GNEISS with Very Clos	
60	-	<u> </u>					_							Fracture Spacing Gray with Black, White, and Pi	
	-	<u> </u>												Slightly Weathered to Fresh, Ha Hard BIOTITE GNEISS with Mo	oderately
-	-						•	• • • •			1			356.1 Close to Wide Fracture Spa Boring Terminated at Elevation 3	acing ₆₀
	-	<u> </u>												Crystalline Rock: BIOTITE G	
	-	<u>-</u>													
	-	-												-	
	-	_													
- 1	-	+	Ì	1		i									

GEOTECHNICAL BORING REPORT CORE LOG

WBS	67069	0.1.1			TIP	BR-00	069	С	OUNT	Υ (ASWELL GEOLOGIST Gonzalez, P.B.	
SITE	DESCR	IPTION	Rep	lace Brid	ge 160	0001 o	n US 15	3 Over	Coun	itry L	ine Creek GROUND WTF	R (ft)
BOR	NG NO.	B2-A			STAT	TION	20+75			OF	FSET 16 ft LT ALIGNMENT -L- 0 HR.	N/A
COLI	AR ELE	E V . 41	6.4 ft		TOTA	AL DE	PTH 60	.3 ft		NO	RTHING 966,196 EASTING 1,912,416 24 HR.	3.6
DRILL	. RIG/HAI	MMER E	FF./DA	TE SEL19	975 DIE	DRICH	D-50 81%	07/26/20	022		DRILL METHOD NW Casing W/SPT & Core HAMMER TYPE Automates	atic
DRIL	LER B	rown, N	1.		STAF	RT DA	TE 08/0	1/22		СО	MP. DATE 08/01/22 SURFACE WATER DEPTH N/A	
COR	E SIZE	NQ					N 28.2 f			L,		
ELEV (ft)	RUN ELEV	DEPTH (ft)	RUN (ft)	DRILL RATE	REC.	ROD	SAMP NO	STR REC.	RQD	P	DESCRIPTION AND REMARKS	
	(ft)	(11)	(11)	(Min/ft)	(ft) %	(ft) %	110.	(ft) %	(ft) %	G		PTH (ft)
384.3	384.3 -	- 32.1	3.2	2:20/1.0	(3.0)	(0.6)		(8.5)	(4.6)		Begin Coring @ 32.1 ft 384.3 CRYSTALLINE ROCK	32.1
	381.1 ⁻	35.3		2:39/1.0 3:19/1.0	94%	19%		98%	53%		White and Pink, Very Slightly Weathered to Fresh, Hard to Very Hard GRANITIC ROCK with Zones of Black and Gray, Moderately to Slighly	
380	_	[5.0	\ 1:13/0.2 / 2:24/1.0	(5.0) 100%	(3.5) 70%					Weathered, Moderately Hard to Hard BIOTITE GNEISS; Close to Moderately Close Fracture Spacing with Small Sections of Very Close Fracture Spacing	
	-			2:24/1 0 3:59/1 0 4:51/1 0 5:16/1 0 6:08/1 0							Fracture angles at 0 degrees to 70 degrees GSI=40-60	
375	376.1	40.3	5.0	6:08/1.0 5:57/1.0	(3.9)	(3.0)		(1.8)	(1.8)		- 375,6 - 375,6 - 375,6 - Gray with White and Black, Very Slighlty Weathered to Fresh, Hard to Very	40.8
	-	F		4:10/1.0 2:28/1.0	78%	60%		100%	100%		Hard BIOTITE GNEISS with Close to Moderately Close Fracture Spacing	42.6
	371.1	45.3		2:02/1.0 2:35/1.0				(0.6) \ 35% /	(0.0)		2 fractures at 10 degrees GSI=70-90	44.3
370	_		5.0	1:28/1.0 2:24/1.0	(5.0) 100%	(4.3) 86%	RS-3	(3.3)	(2.3) 70%		Gray with Black and White, Moderately to Severely Weathered, Moderately Hard to Medium Hard BIOTITE GNEISS with Very Close to Close Fracture	47.6
	-	F		2:15/1.0 3:43/1.0				(12.7)	(12.7)		Spacing Fractures at 70 degrees	
365	366.1	50.3	5.0	5:58/1.0 4:41/1.0	(5.0)	(5.0)		100%	100 76		GSI=40-60 Gray with Black and White, Moderately to Slightly Weathered, Moderately	
	-	[5:12/1.0 5:43/1.0	100%	100%					Hard to Hard BIOTITE GNEISS with Very Close to Close Fracture Spacing 1 fracture at 20 degrees and 2 fractures at 70 degrees	
	361.1	55.3		5:04/1.0 6:05/1.0							- GSI=60-80	
360	-	[5.0	8:18/1.0 6:05/1.0	(5.0) 100%	(5.0) 100%					Gray with Black, White, and Pink, Very Slightly Weathered to Fresh, Hard to Very Hard BIOTITE GNEISS with Moderately Close to Wide Fracture	
	-			8:18/1.0 7:51/1.0							Spacing 3 fractures at 10 degrees	
	356.1	60.3		7:06/1.0							SI=80-100 Boring Terminated at Elevation 356.1 ft in Crystalline Rock: BIOTITE	60.3
	- -	-									- - - -	

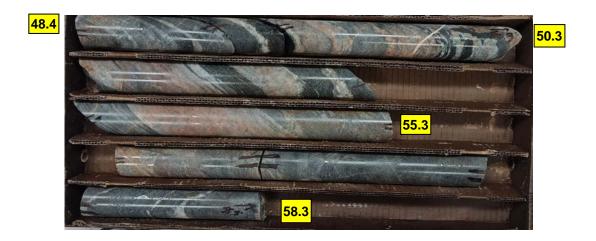
B2-ABOXES 1 & 2: 32.1 - 48.4 FEET







B2-ABOXES 3 & 4: 48.4 - 60.3 FEET







SHEET 16

WBS	67069	9.1.1				TII	P BR-0069	COUNT	Y CASWE	LL			GEOLOGIST Gonzalez, P.B.	
SITE	DESCR	RIPTION	Rep	olace E	Bridg	je 1	160001 on US 158 O	ver Coun	try Line Cre	ek			GROUN	D WTR (ff
BORI	NG NO	. B2-B				ST	FATION 20+62		OFFSET	17 ft RT			ALIGNMENT -L- 0 HR.	N/A
COLL	AR EL	EV . 41	4.3 ft			TC	OTAL DEPTH 52.8 f	i	NORTHING	3 966,1	79		EASTING 1,912,385 24 HR.	5.
DRILL	RIG/HA	MMER E	FF./DA	TE SE	EL19	75 E	DIEDRICH D-50 81% 07/2	:6/2022		DRILL N	METHO	D N	W Casing W/SPT & Core HAMMER TYPE	Automatic
DRIL		Brown, N				ST	TART DATE 08/03/2		COMP. DA		_		SURFACE WATER DEPTH N/A	
ELEV (ft)	DRIVE ELEV	DEPTH (ft)		W COL	_			PER FOOT 50	75 100	SAMP.	'/		SOIL AND ROCK DESCRIPTION	
(11)	(ft)	(11)	0.5ft	0.5ft	0.5	π	0 25	<u></u>	75 100	NO.	/MOI	G	ELEV. (ft)	DEPTH (
415		<u> </u>				4	1	 	1			*****	—414.3 GROUND SURFACE — ALLUVIAL	(
	412.9	1.4	WOH	1	2	\dashv	i · · · · · · · · ·				w		Gray and Brown, Silty Coarse to Fine SA	AND
410	-	‡						· · · ·					<u>-</u>	
	407.9	6.4	1	1	2	_		: : : :			_		- -	
405		‡	'	'			9 3 · · · · · · · · · · · · · · · · · · ·				Sat.		-	
	402.9	† 1 11.4					<u> </u>		1					
	402.5	† '''*	1	1	0						Sat.			
400	_	Ŧ					\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	 	+				398.8	15
-	397.9	16.4	5	7	6	\dashv	:\frac{7}{2}: ::::	: : : :			Sat.	000	Gray with White, Coarse to Fine SANI	D 19
395		Ī					13.				Jai.	000		
	392.9	I 21.4					/					000		21
			2	WOH	1						Sat.		RESIDUAL Gray, Silty Coarse to Fine SAND, Trac	ce
390	-	‡							 				Rock Fragments	
	387.9	26.4	3	5	32	2	37.				l w		_	
385	385.7 384.2	28.6 30.1	100/0.4						100/0.4			M	_ 385.7 — _{384.2} WEATHERED ROCK	28 30
	304.2	+ 30.1	60/0.0	1					- 60/0.0	?			BIOTITE GNEISS CRYSTALLINE ROCK	
380		‡								RS-4	1		Pink and Gray with White and Black, Slig	erv
000	-	‡											Hard GRANITIC ROCK with Very Close Close Fracture Spacing and with Sma	e to
		‡											Zones of Biotite Gneiss Gray with Black and White, Very Slight	- 1
375	-	Ŧ						ļ · · · ·					Weathered to Fresh, Hard to Very Har BIOTITE GNEISS with Moderately Close	rd e to
		Ŧ											- Wide Fracture Spacing	5 10
370		Ŧ												
		Ī											_	
		ŧ												
365	-	‡						 					<u>-</u>	
		<u> </u>				_		· · · ·	<u> : : : : : </u>		L		_ - 361.5	52
		‡				1							 Boring Terminated at Elevation 361.5 ft Crystalline Rock: BIOTITE GNEISS 	t in
		‡											- -	
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GEOTECHNICAL BORING REPORT CORE LOG

10,000	67000	1 1			TIP	DD 64	260	٦.			TE L		CEOLOGICE CO. 1			
	67069		L Da-	laca Dri-	<u> </u>	BR-00					CASWEL		GEOLOGIST Gonzale	∠, ۲.B.	CBOLIN	ID MITD (#1)
				lace Brid	Ť			8 Over	Cour	–			ALIONBACNIT			ID WTR (ft)
	ING NO.				<u> </u>		20+62			+	FSET		ALIGNMENT -L-		0 HR.	N/A
	LAR ELE				<u> </u>		PTH 52			NO	RTHING	966,179	EASTING 1,912,385	T	24 HR.	5.5
				TE SEL1					022				/ Casing W/SPT & Core	HAMMI	ER TYPE	Automatic
	LER B	-	Л.		 		TE 08/0			co	MP. DA	TE 08/04/22	SURFACE WATER DEF	PTH N/	Α	
COR	E SIZE	NQ					N 22.7 f			<u> </u>						
ELEV (ft)	RUN ELEV	DEPTH (ft)	RUN (ft)	DRILL RATE	REC.	JN RQD	SAMP NO	REC.	RQD				ESCRIPTION AND REMARK	S		
(11)	(ft)	(11)	(11)	(Min/ft)	%	(ft) %	NO.	(ft) %	(ft) %	G	ELEV. (f	t)				DEPTH (ft)
384.2	384.2 -	30.1	2.7	3:14/1.0	(2.7)	(2.7)		(4.6)	(4.1)		384.2		Begin Coring @ 30.1 ft CRYSTALLINE ROCK			30.1
	381.5 -	- - 32.8		3:21/1.0 2:28/0.7	100%	100%	RS-4	100%	(4.1) 89%				White and Black, Slightly to Vo GRANITIC ROCK with Very C			red,
380	_	- -	5.0	2:16/1.0 2:25/1.0 2:36/1.0	(5.0) 100%	(4.5) 90%	110-4				- 379.6	Spacing	and with Small Zones of Biol	ite Gneis		34.7
	-	-		2:36/1.0 2:19/1.0				(18.0)	(17.8) 98%		_	4 fr	otite Gneiss foliation at 60 dec actures at 20 degrees to 30 de	egrees		
075	376.5 -	- 37.8 -	5.0	2:06/1.0 2:21/1.0	(5.0)	(5.0)					_	Open ar	nd partially healed 1' long verti GSI=50-70	cal fractui	re	
375	-	- -		2:30/1.0 2:58/1.0	100%						_		White, Very Slightly Weathere ISS with Moderately Close to			
	371.5 -	- - 42.8		2:30/1.0 2:21/1.0							_	Variably foliated	with foliation angles of 50 deg	rees to 8	0 degrees	٠
370	-	-	5.0	2:20/1.0 2:27/1.0	(4.9) 98%	(4.9) 98%					_	i raciules genera	GSI=80-100	s paranci	to ioliatioi	'
	-	-		2:51/1.0 2:50/1.0	30 /6	30 70										
	366.5 -	- 47.8	5.0	4:01/1.0 4:18/1.0	(5.0)	(4.8)					_					
365	_	-	3.0	2:24/1.0 2:42/1.0	100%						_					
	- 361.5 -	- - 52.8		2:44/1.0 2:45/1.0							- - 361.5					52.8
	-	<u> </u>		3.45/1.0							- 301.3	Boring Terminated	at Elevation 361.5 ft in Cryst	alline Roc	k: BIOTIT	
	-	•											GNEISS			
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B2-BBOXES 1 & 2: 30.1 - 44.1 FEET

30.1

RS-4: 32.2-32.8

32.8

37.4

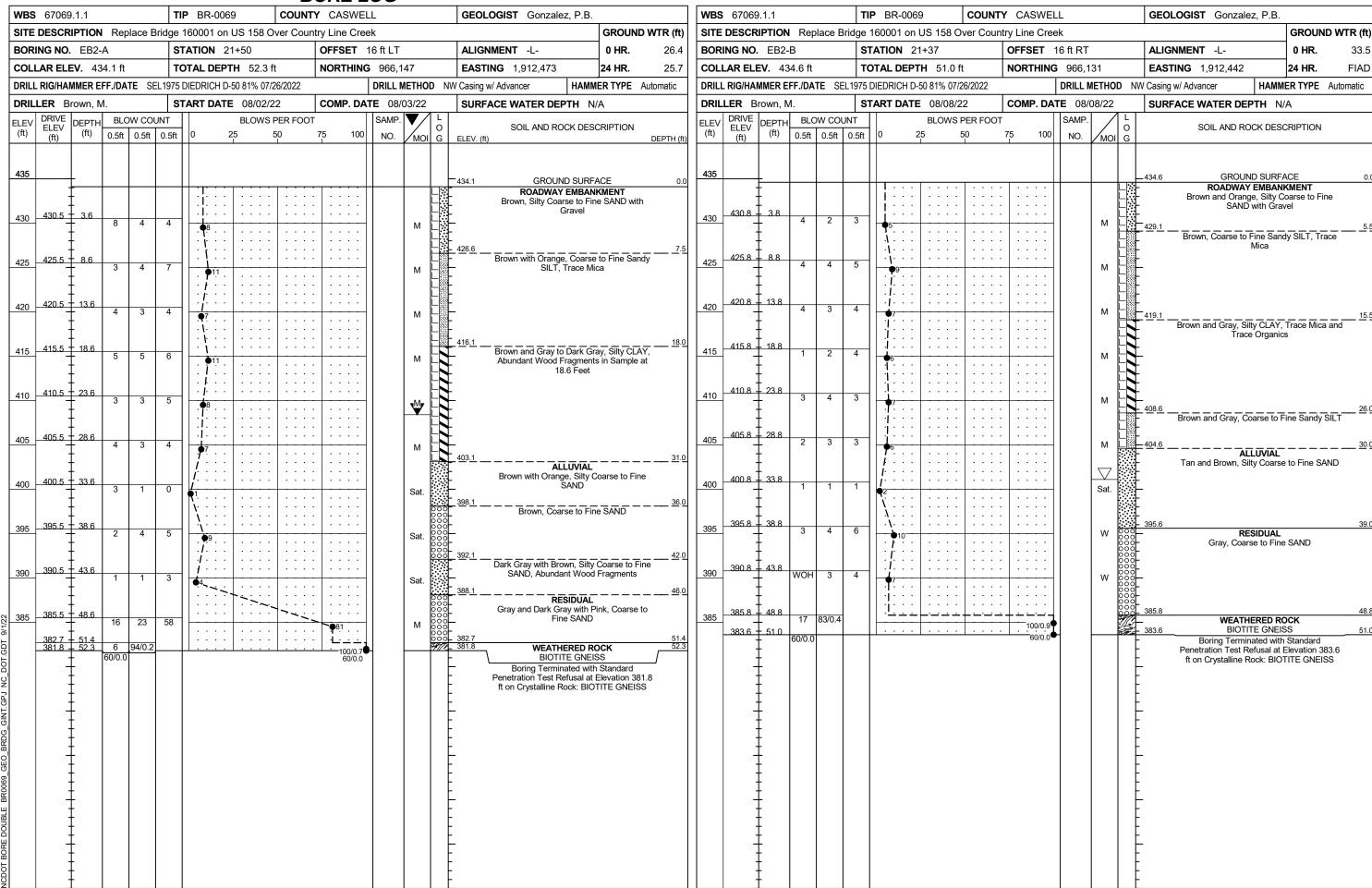
37.4 37.8 42.8



B2-BBOX 3: 44.1 - 52.8 FEET









UNCONFINED COMPRESSIVE STRENGTH of INTACT ROCK CORE SPECIMENS

ASTM D 7012-14 Method C

This method does not report strain rate or deformation

 Client:
 ESP Associates
 Boring No.:
 B1-A

 Client Project:
 IS14.321
 Depth (ft):
 21.2-21.9

 Project No.:
 R-2022-191-001
 Sample ID:
 RS-1

 Lab ID No.:
 R-2022-191-001-001
 Moisture Condition: As received

Specimen Weight (g): 604.11

SPECIMEN LENGTH (in)		SPECIMEN DIAMETER (in):	
Reading 1:	4.40	Reading 1: 1.99	
Reading 2:	4.40	Reading 2: 1.99	
Reading 3:	4.40	Average: 1.99	
Average:	4.40	Area (in ²): 3.11	
		L/D: 2.21	
MOISTURE CONTENT			
Tare Number:	441	Total Load (lb): 80,140	
Wt. of Tare & Wet Sample (g):	184.37	Uniaxial Compressive Strength (psi): 25,770	
Wt. of Tare & Dry Sample (g):	184.32		
Weight of Tare (g):	98.17	Fracture Type: Shear	
Weight of Wet Sample (g):	86.20		
Sample Volume (cm ³):	224.28	Rate of Loading (lb/sec): 219	
Moisture Content (%):	0.06	Time to Break (min:sec): 6:05.90	
Unit Wet Weight (g/cm ³):	2.694	Deviation From Straightness ² : Pass	
Unit Wet Weight (pcf):	168.1		
Unit Dry Weight (g/cm³):	2.692	AXIAL: Pass TOP: Pass BOTTOM: Pass	
Unit Dry Weight (pcf):	168.0		

Physical Description: Gray Rock Core

Notes:

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used:

R176 Compression Machine,

R525 Digital Calipers,

R148 Feeler Gauge, R419 Scale

R512 Rock Saw

R148 Straight Edge

R582 V-Block, R585 Dial Gauge

Tested By:	NS	Date: 8/29/22	Checked By:	GEM	Date: 8/30/22

age 1 of 1 DCN: CT45A; Revision No.: 1e3 Revision Date: 4/5/17

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UNCONFINED COMPRESSIVE STRENGTH of INTACT ROCK CORE SPECIMENS

ASTM D 7012-14 Method C

This method does not report strain rate or deformation

 Client:
 ESP Associates
 Boring No.:
 B1-B

 Client Project:
 IS14.321
 Depth (ft):
 22.0-22.6

 Project No.:
 R-2022-191-001
 Sample ID:
 RS-2

 Lab ID No.:
 R-2022-191-001-002
 Moisture Condition: As received

Specimen Weight (g): 582.30

SPECIMEN LENGTH (in)		SPECIMEN DIAMETER (in):
Reading 1:	4.38	Reading 1: 1.99
Reading 2:	4.38	Reading 2: 1.99
Reading 3:	4.38	Average: 1.99
Average:	4.38	Area (in ²): 3.12
		L/D: 2.20
MOISTURE CONTENT		
Tare Number:	427	Total Load (lb): 38,250
Wt. of Tare & Wet Sample (g):	325.80	Uniaxial Compressive Strength (psi): 12,270
Wt. of Tare & Dry Sample (g):	325.36	
Weight of Tare (g):	99.27	Fracture Type: Shear
Weight of Wet Sample (g):	226.53	
Sample Volume (cm ³):	223.60	Rate of Loading (lb/sec): 240
Moisture Content (%):	0.19	Time to Break (min:sec): 2:39.64
Unit Wet Weight (g/cm ³):	2.604	Deviation From Straightness ² : Pass
Unit Wet Weight (pcf):	162.5	
Unit Dry Weight (g/cm³):	2.599	AXIAL: Pass TOP: Pass BOTTOM: Pass
Unit Dry Weight (pcf):	162.2	

Physical Description: Gray Rock Core

Notes

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used:

R176 Compression Machine,

R525 Digital Calipers,

R148 Feeler Gauge, R419 Scale

R512 Rock Saw

R148 Straight Edge

R582 V-Block, R585 Dial Gauge

page 1 of 1 DCN: CT45A; Revision No.: 1e3 Revision Date: 4/5/17
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Checked By:

GEM

Date: 8/30/22

Date: 8/29/22



UNCONFINED COMPRESSIVE STRENGTH of INTACT ROCK CORE SPECIMENS

ASTM D 7012-14 Method C

This method does not report strain rate or deformation

 Client:
 ESP Associates
 Boring No.:
 B2-A

 Client Project:
 IS14.321
 Depth (ft):
 45.8-46.4

 Project No.:
 R-2022-191-001
 Sample ID:
 RS-3

 Lab ID No.:
 R-2022-191-001-003
 Moisture Condition: As received

Specimen Weight (g): 637.30

SPECIMEN LENGTH (in)		SPECIMEN DIAMETER (in):
Reading 1:	4.35	Reading 1: 1.99
Reading 2:	4.35	Reading 2: 1.99
Reading 3:	4.35	Average: 1.99
Average:	4.35	Area (in ²): 3.11
		L/D: 2.18
MOISTURE CONTENT		
Tare Number:	488	Total Load (lb): 2,310
Wt. of Tare & Wet Sample (g):	531.79	Uniaxial Compressive Strength (psi): 740
Wt. of Tare & Dry Sample (g):	531.38	
Weight of Tare (g):	99.12	Fracture Type: Shear
Weight of Wet Sample (g):	432.67	
Sample Volume (cm ³):	221.81	Rate of Loading (lb/sec): 100
Moisture Content (%):	0.09	Time to Break (min:sec): 0:23
Unit Wet Weight (g/cm ³):	2.873	Deviation From Straightness ² : Pass
Unit Wet Weight (pcf):	179.3	
Unit Dry Weight (g/cm³):	2.870	AXIAL: Pass TOP: Pass BOTTOM: Pass
Unit Dry Weight (pcf):	179.1	

Physical Description: Gray Rock Core

Notes:

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used:

R176 Compression Machine,

R525 Digital Calipers,

R148 Feeler Gauge, R419 Scale

R512 Rock Saw

R148 Straight Edge

R582 V-Block, R585 Dial Gauge

Tested By:	NS	Date: 8/29/22	Checked By:	GEM	Date: 8/30/22
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age 1 of 1 DCN: CT45A; Revision No.: 1e3 Revision Date: 4/5/17

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SHEET 20

UNCONFINED COMPRESSIVE STRENGTH of INTACT ROCK CORE SPECIMENS

ASTM D 7012-14 Method C

This method does not report strain rate or deformation

 Client:
 ESP Associates
 Boring No.:
 B2-B

 Client Project:
 IS14.321
 Depth (ft):
 32.2-32.8

 Project No.:
 R-2022-191-001
 Sample ID:
 RS-4

 Lab ID No.:
 R-2022-191-001-004
 Moisture Condition: As received

Specimen Weight (g): 580.85

SPECIMEN LENGTH (in)		SPECIMEN DIAMETER (in):	
Reading 1:	4.40	Reading 1:	1.99
Reading 2:	4.40	Reading 2:	1.99
Reading 3:	4.40	Average:	1.99
Average:	4.40	Area (in ²):	3.11
		L/D:	2.21
MOISTURE CONTENT			
Tare Number:	475	Total Load (lb):	6,630
Wt. of Tare & Wet Sample (g):	328.09	Uniaxial Compressive Strength (psi):	2,130
Wt. of Tare & Dry Sample (g):	324.16		
Weight of Tare (g):	98.30	Fracture Type:	Shear
Weight of Wet Sample (g):	229.79		
Sample Volume (cm ³):	224.43	Rate of Loading (lb/sec):	80
Moisture Content (%):	1.74	Time to Break (min:sec):	1:23.20
Unit Wet Weight (g/cm ³):	2.588	Deviation From Straightness ² :	Pass
Unit Wet Weight (pcf):	161.5		
Unit Dry Weight (g/cm³):	2.544	AXIAL: Pass TOP: Pass	BOTTOM: Pass
Unit Dry Weight (pcf):	158.7		
Wt. of Tare & Dry Sample (g): Weight of Tare (g): Weight of Wet Sample (g): Sample Volume (cm³): Moisture Content (%): Unit Wet Weight (g/cm³): Unit Wet Weight (pcf): Unit Dry Weight (g/cm³):	324.16 98.30 229.79 224.43 1.74 2.588 161.5 2.544	Fracture Type: Rate of Loading (lb/sec): Time to Break (min:sec): Deviation From Straightness ² :	80 1:23.20 Pass

Physical Description: Gray Rock Core

Notes

- 1) Moisture conditions at time of the test are: As received
- 2) Sample prep conforms to ASTM D4543-08 "best effort" if applicable
- 3) Deviation from straightness, Procedure A of ASTM D 4543-08 Pass/Fail criteria: gap < 0.02 = Pass, gap > 0.02 = Fail
- 4) Temperature is laboratory room temperature.
- 5) D4543 Prep and D7012 Testing Equipment Used:

R176 Compression Machine,

R525 Digital Calipers,

R148 Feeler Gauge, R419 Scale

R512 Rock Saw

R148 Straight Edge

R582 V-Block, R585 Dial Gauge

page 1 of 1 DCN: CT45A; Revision No.: 1e3 Revision Date: 4/5/17
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Checked By:

GEM

Date: 8/29/22

SITE PHOTOGRAPHS

Bridge No.160001 on US 158 over Country Line Creek

View Along Bridge 0001 Looking Upstation



View of Along Bridge 0001 Looking Downstation



View Looking Upstream from Bridge 0001



View Looking Downstream from Bridge 0001

