STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

August 20, 2012

ADDENDUM #2

To: Plan Holders

From: Wanda H. Austin, PE
Proposals Engineer

RE:
Contract ID: DN00074
County: Clay
Letting Date: August 28, 2012

Attached are the Geotechnical Reports for the above contract.

Please insert this letter into the proposal and sign the verification below. Thank you for your attention to this matter.

I, _____ representing _____
(SIGNATURE)

Acknowledge receipt of Addendum #2.

Fourteenth Division Office
Phone: (828)586-2141 *253 Webster Road, Sylva, North Carolina 28779* *Fax: (828)586-4043*

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BD-5114F _ 45360.1.6	1	9

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. BD-5114F 45360.1.6 F.A. PROJ. _____

COUNTY CLAY

PROJECT DESCRIPTION BRIDGE NO. 2 ON SR 1112 OVER CRAWFORD CREEK

SITE DESCRIPTION _____

PROJECT: 45360.1.6

ID: BD-5114F

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CAUTION NOTICE

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

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

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

PERSONNEL
- MM HAGER
- DO CHEEK
- C COFFEY

INVESTIGATED BY JC KUHNE

CHECKED BY D FRYE

SUBMITTED BY JC KUHNE

DATE 3/5/2012

NORTH CAROLINA LICENSED SEAL 1878 GEOLOGIST JODY KUHNE

DRAWN BY: JC KUHNE JT WILLIAMS

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

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

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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

SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. EXAMPLE:

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		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	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	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
# 40	30 MX	50 MX	51 MN											
# 200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT	6 MX		NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 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 A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

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 RESISTENCE (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 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	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 MM: 305 | 75 | 2.0 | 0.25 | 0.05 | 0.005
GRAIN SIZE IN.: 12 | 3

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	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.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

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 WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 31
MODERATELY COMPRESSIBLE	LIQUID LIMIT EQUAL TO 31-50
HIGHLY COMPRESSIBLE	LIQUID LIMIT GREATER THAN 50

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	>10%	>20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
HIGHLY	35% AND ABOVE

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW 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
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT TEST BORING
- AUGER BORING
- CORE BORING
- MW MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF SPT REFUSAL

SAMPLE DESIGNATIONS
S - BULK SAMPLE
SS - SPLIT SPOON SAMPLE
ST - SHELBY TUBE SAMPLE
RS - ROCK SAMPLE
RT - RECOMPACTED TRIAXIAL SAMPLE
CBR - CALIFORNIA BEARING RATIO SAMPLE

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. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
w - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-__
- [ ] BK-51
- [ ] CME-45C
- [ ] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [X] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [X] W/ ADVANCER
- [ ] TRICONE __" STEEL TEETH
- [ ] TRICONE __" TUNG.-CARB.
- [ ] CORE BIT
- [ ] _____

HAMMER TYPE:
- [X] AUTOMATIC
- [ ] MANUAL

CORE SIZE:
- [ ] -B _____
- [ ] -N _____
- [ ] -H _____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL. AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.
ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:

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 YEILD 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. SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *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, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS 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 PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
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 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
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

TERM	THICKNESS
VERY THICKLY BEDDED	> 4 FEET
THICKLY BEDDED	1.5 - 4 FEET
THINLY BEDDED	0.16 - 1.5 FEET
VERY THINLY BEDDED	0.03 - 0.16 FEET
THICKLY LAMINATED	0.008 - 0.03 FEET
THINLY LAMINATED	< 0.008 FEET

INDURATION

FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.

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

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, 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 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 (SRQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE.

TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BM #1 AT BASELINE STA. 5+00

ELEVATION: 1717.00 FT.

NOTES:

REVISED 02/23/06

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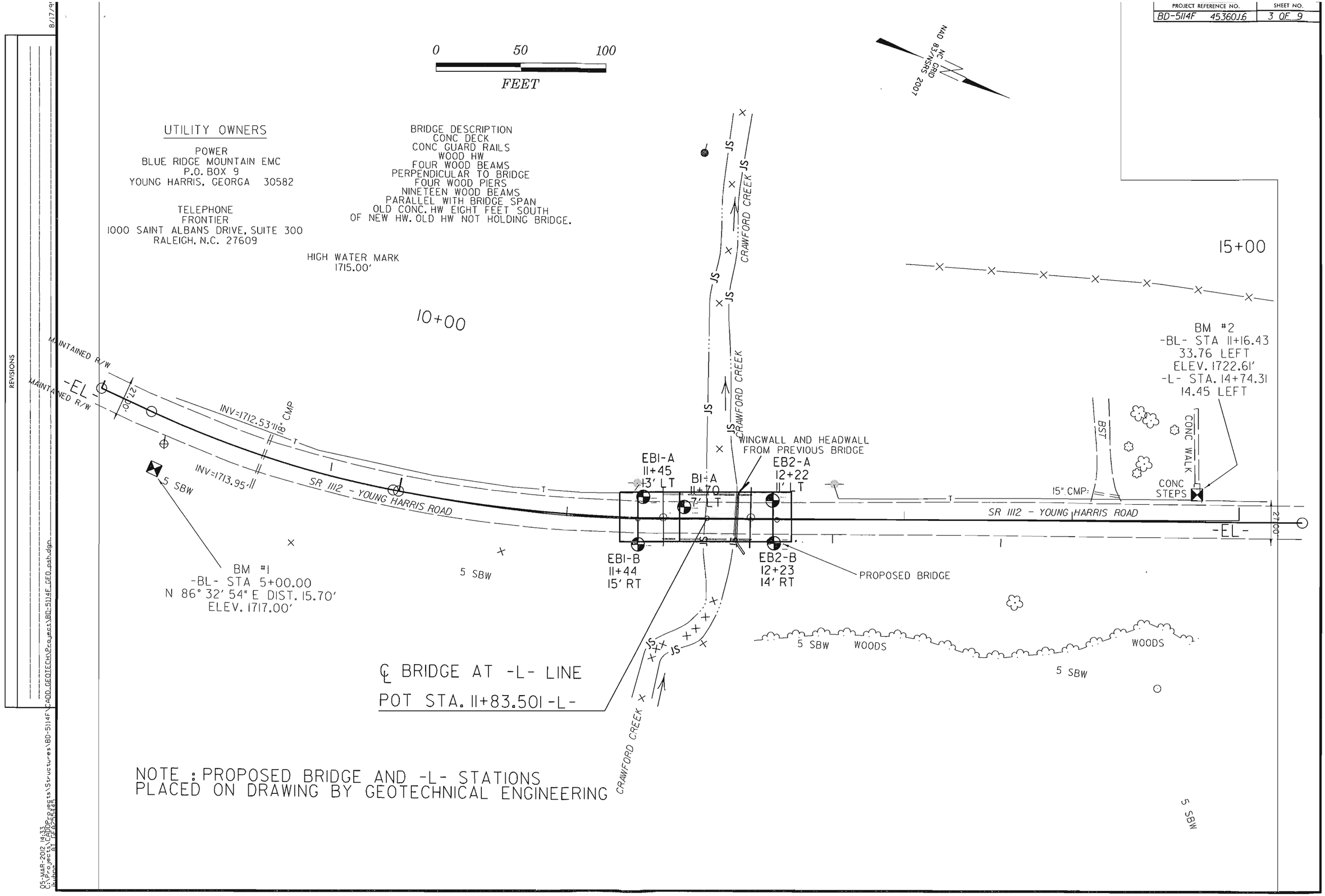
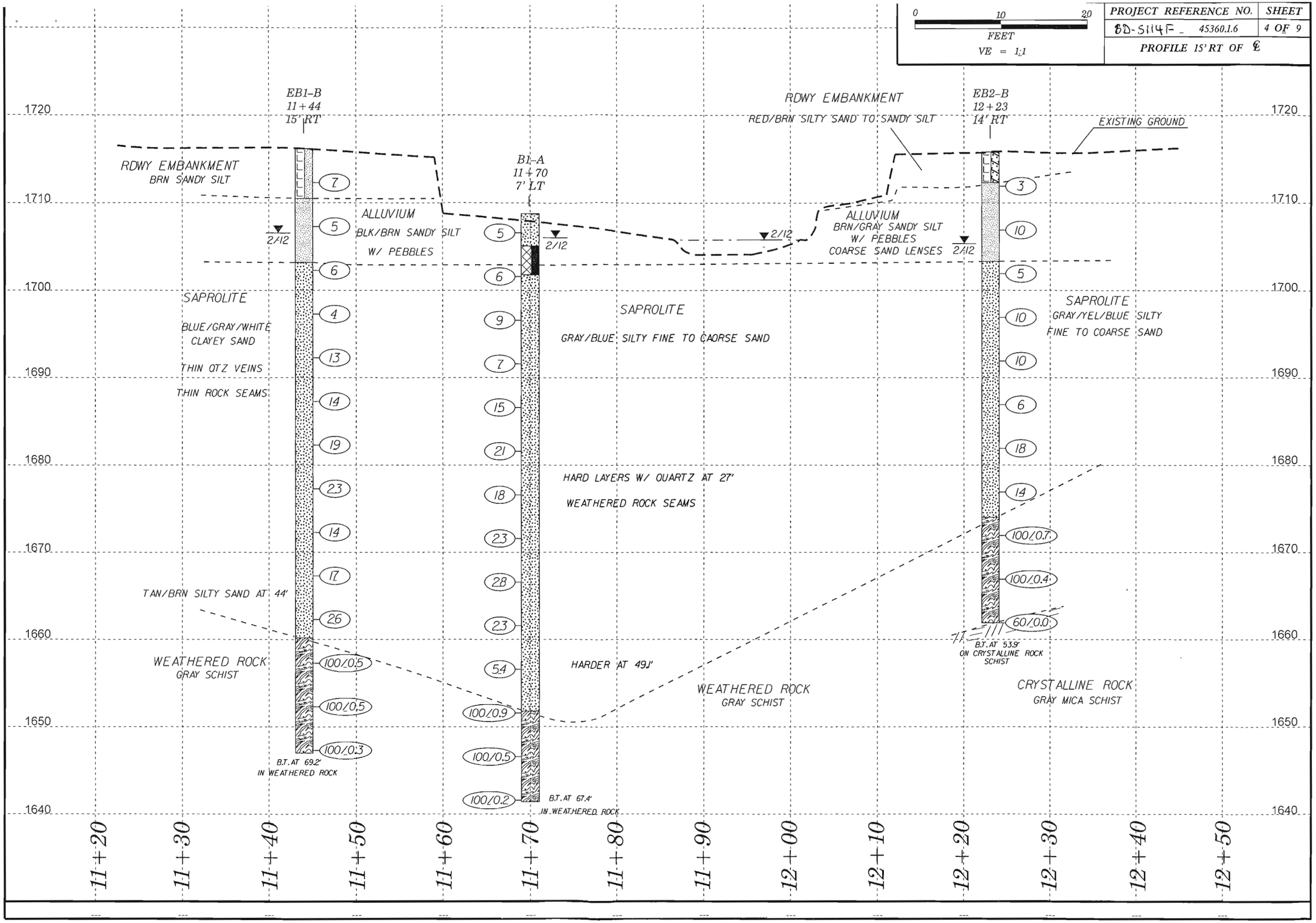
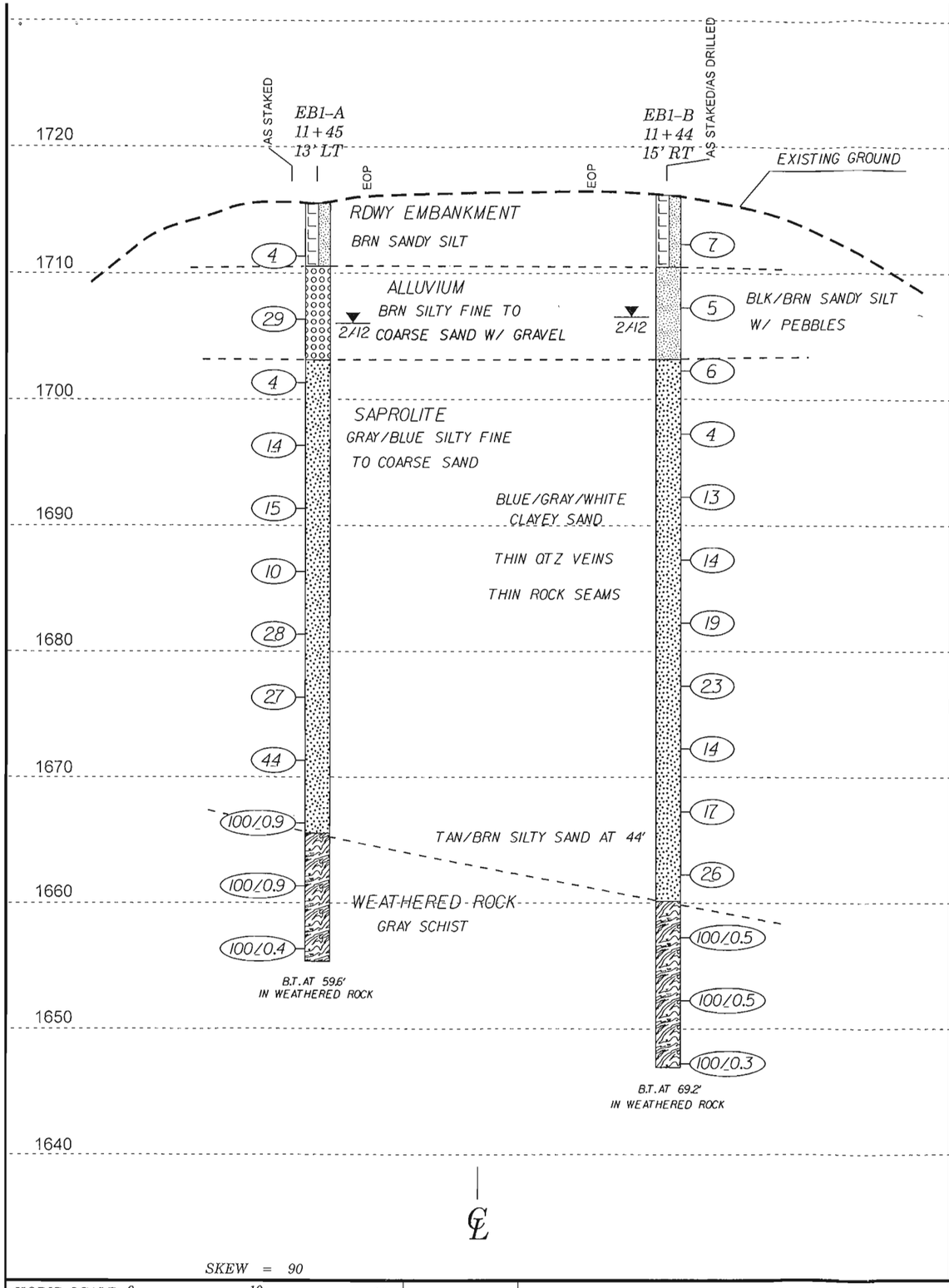


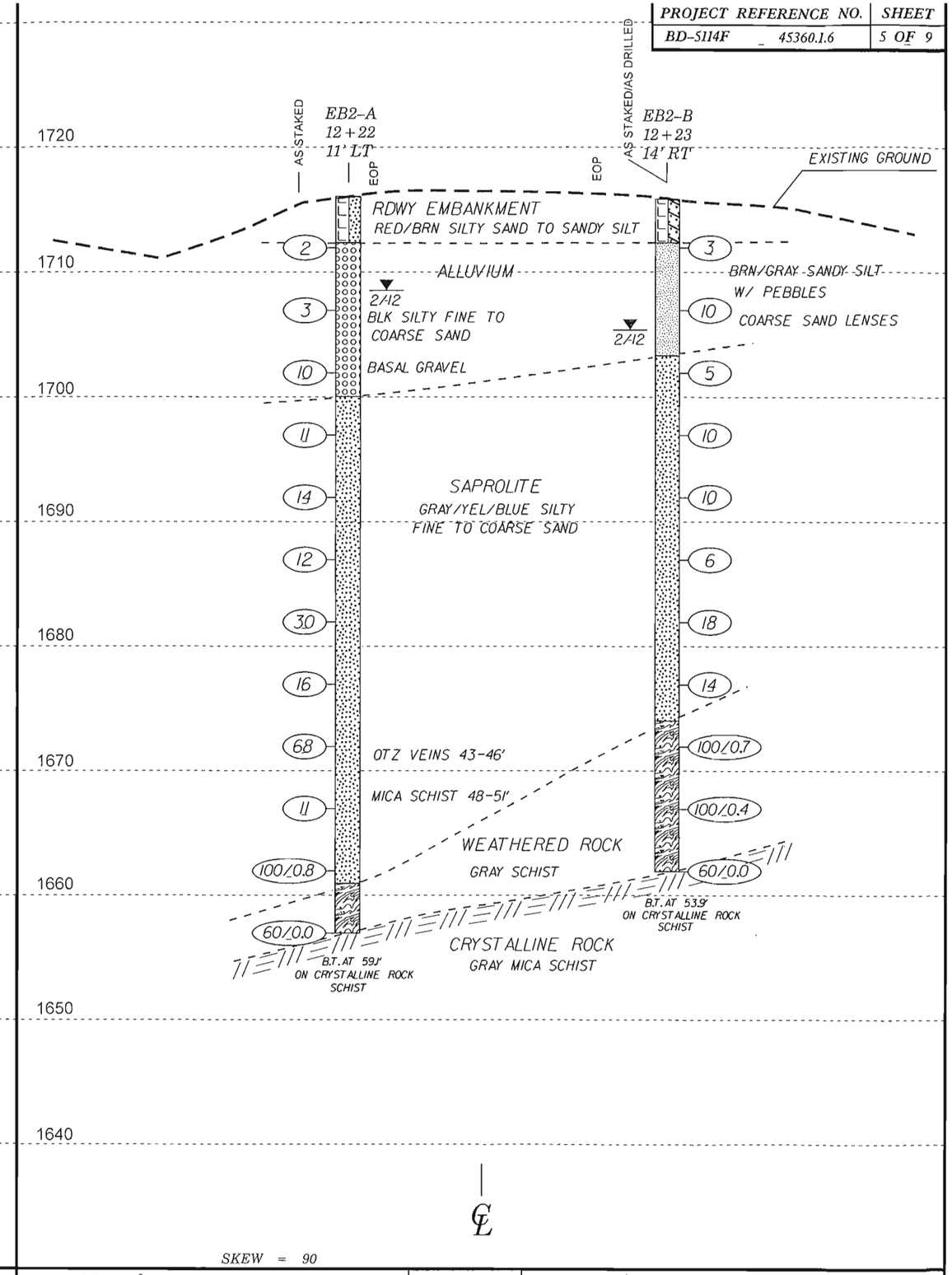
PROJECT REFERENCE NO.	SHEET
BD-5114F - 45360.1.6	4 OF 9
PROFILE 15' RT OF ℄	



PROJECT REFERENCE NO.	SHEET
BD-5114F 45360.1.6	5 OF 9

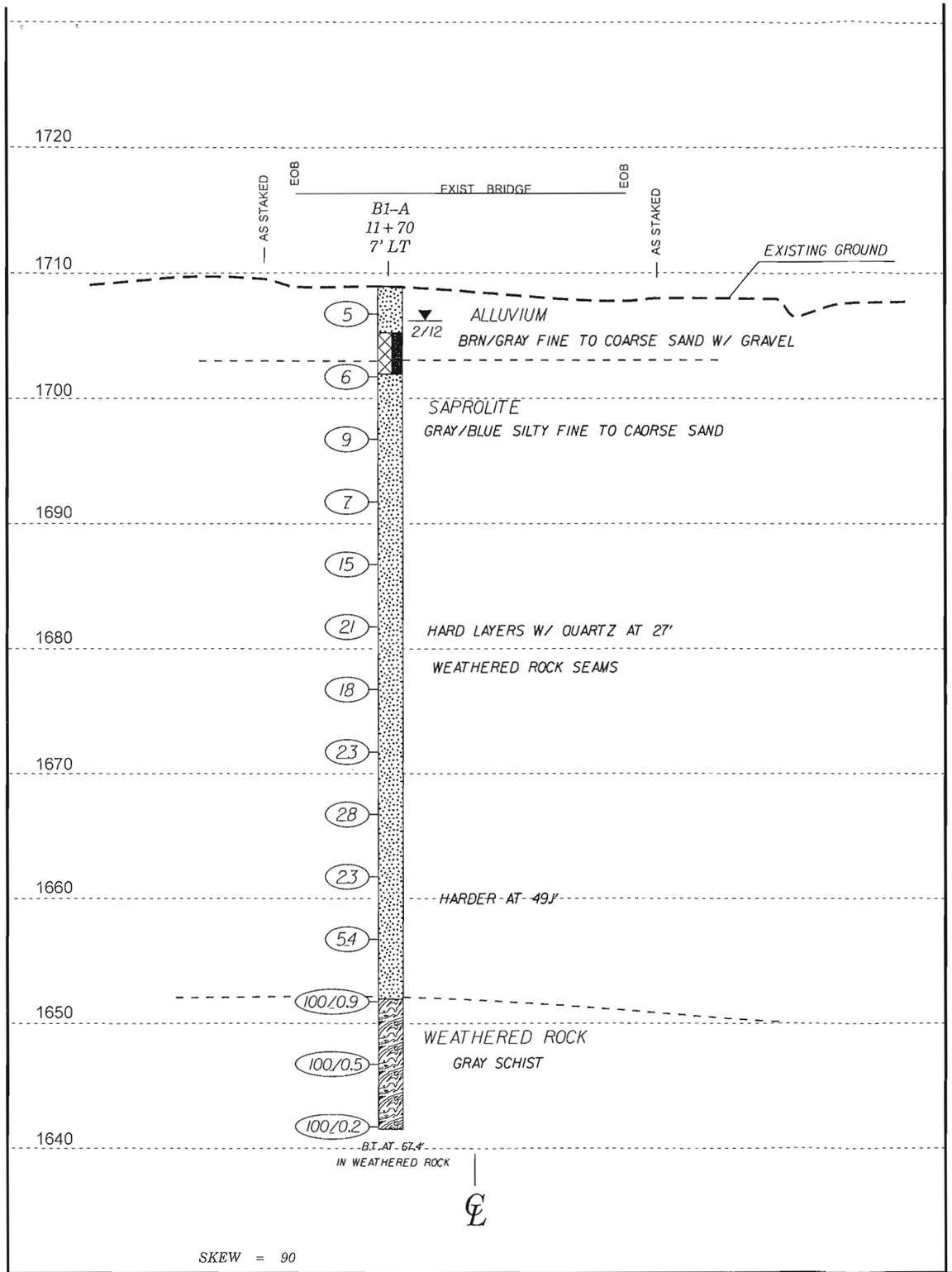


HORIZ. SCALE (FEET) 0 10 20 | VE = 1:1 | SECTION THROUGH EB1



HORIZ. SCALE (FEET) 0 10 20 | VE = 1:1 | SECTION THROUGH EB2

PROJECT REFERENCE NO.	SHEET
BD-5114F 45360.1.6	6 OF 9



HORIZ. SCALE (FEET) 0 10 20 | VE = 1:1 | SECTION THROUGH B1

HORIZ. SCALE (FEET) 0 | VE = -

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45360.1.1	TIP BD-5114F	COUNTY CLAY	GEOLOGIST Hager, M. M.
SITE DESCRIPTION BRIDGE NO. 2 ON SR 1112 OVER CRAWFORD CREEK			GROUND WTR (ft)
BORING NO. EB1-A	STATION 11+45	OFFSET 13 ft LT	ALIGNMENT -L-
COLLAR ELEV. 1,715.6 ft	TOTAL DEPTH 59.6 ft	NORTHING 488,513	EASTING 535,550
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Coffey, Jr., C.	START DATE 02/28/12	COMP. DATE 02/28/12	SURFACE WATER DEPTH N/A

GROUND WTR (ft): 0 HR. N/A; 24 HR. 9.5

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT (0 25 50 75 100)	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
										1,715.6 GROUND SURFACE 0.0
										1,710.6 ROADWAY EMBANKMENT BROWN SANDY SILT 5.0
	1,711.4	4.2	0	2	2	4				
	1,706.4	9.2	8	17	12	29				1,703.2 ALLUVIAL BRN SILTY FINE TO COARSE SAND W/ ROUNDED GRAVEL 12.4
	1,701.4	14.2	1	2	2	4		Sat.		
	1,696.4	19.2	7	7	7	14		M		1,665.6 SAPROLITE GRAY/BLUE SILTY FINE TO COARSE SAND 50.0
	1,691.4	24.2	4	7	8	15		M		
	1,686.4	29.2	2	4	6	10		M		
	1,681.4	34.2	5	12	16	28		M		
	1,676.4	39.2	8	10	17	27		M		
	1,671.4	44.2	10	17	27	44				
	1,666.4	49.2	15	37	63/.4	100+				1,655.4 WEATHERED ROCK BRN/BLK/YEL/GRAY SILTY FINE TO COARSE SAND, SCHISTOSE 60.2
	1,661.4	54.2	28	39	69/.4	100+				
	1,656.4	59.2	100/.4			100+				Boring Terminated at Elevation 1,656.0 ft IN WEATHERED ROCK, SCHIST

WBS 45360.1.1	TIP BD-5114F	COUNTY CLAY	GEOLOGIST Hager, M. M.
SITE DESCRIPTION BRIDGE NO. 2 ON SR 1112 OVER CRAWFORD CREEK			GROUND WTR (ft)
BORING NO. EB1-B	STATION 11+44	OFFSET 15 ft RT	ALIGNMENT -L-
COLLAR ELEV. 1,716.2 ft	TOTAL DEPTH 69.2 ft	NORTHING 488,522	EASTING 535,576
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Coffey, Jr., C.	START DATE 02/27/12	COMP. DATE 02/27/12	SURFACE WATER DEPTH N/A

GROUND WTR (ft): 0 HR. N/A; 24 HR. 9.6

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT (0 25 50 75 100)	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										1,716.2 GROUND SURFACE 0.0
										1,710.5 ROADWAY EMBANKMENT BRN SANDY SILT 5.7
	1,712.3	3.9	2	4	3	7		D		
	1,707.3	8.9	3	2	3	5		W		1,703.2 ALLUVIAL BRN/BLK FINE SANDY SILT W/ PEBBLES 13.0
	1,702.3	13.9	2	2	4	6		M		
	1,697.3	18.9	4	2	2	4		M		1,660.2 SAPROLITE BLUE/GRAY/WHITE CLAYEY SAND WITH THIN QUARTZ VEINS AND GRAVEL. BECOMES TAN/BRN SILTY SAND AT 44'. 56.0
	1,692.3	23.9	5	7	6	13		M		
	1,687.3	28.9	2	5	9	14		M		
	1,682.3	33.9	4	7	12	19		M		
	1,677.3	38.9	5	10	13	23		M		
	1,672.3	43.9	2	5	9	14		M		
	1,667.3	48.9	4	7	10	17		M		
	1,662.3	53.9	5	11	15	26		M		1,647.0 WEATHERED ROCK TAN/BRN/GRAY SCHISTOSE WEATHERED ROCK 69.2
	1,657.3	58.9	82	18/0.0		100+				
	1,652.3	63.9	74	26/0.0		100+				
	1,647.3	68.9	100/.3			100+				Boring Terminated at Elevation 1,647.0 ft IN WEATHERED ROCK

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45360.1.1	TIP BD-5114F	COUNTY CLAY	GEOLOGIST Hager, M. M.	
SITE DESCRIPTION BRIDGE NO. 2 ON SR 1112 OVER CRAWFORD CREEK				GROUND WTR (ft)
BORING NO. EB2-A	STATION 12+22	OFFSET 11 ft LT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 1,716.0 ft	TOTAL DEPTH 59.1 ft	NORTHING 488,583	EASTING 535,519	24 HR. 7.5 Caved
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic
DRILLER Coffey, Jr., C.	START DATE 02/28/12	COMP. DATE 02/28/12	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
										1,716.0 GROUND SURFACE	0.0
										ROADWAY EMBANKMENT RED/BRN SILTY SAND	
										1,712.3	3.7
	1,711.9	4.1	0	0	2	2		M		ALLUVIAL BLACK SILTY FINE TO COARSE SAND, LAYERS OF SILT W/ BASAL GRAVEL	
	1,706.9	9.1	0	1	2	3		M			
	1,701.9	14.1	3	4	6	10		W		1,700.0	16.0
	1,696.9	19.1	6	7	4	11		W		SAPROLITE GRAY/YEL/BLUE SILTY FINE TO COARSE SAND. THIN QUARTZ VEINS 43-46' GRAY/BRN SILTY FINE TO COARSE SAND, SOME MICA SCHIST 48-51'	
	1,691.9	24.1	2	6	8	14		M			
	1,686.9	29.1	2	5	7	12					
	1,681.9	34.1	8	14	16	30					
	1,676.9	39.1	4	8	8	16					
	1,671.9	44.1	42	34	34	68					
	1,666.9	49.1	10	1	10	11		W			
	1,661.9	54.1	12	33	100/.3	100+				1,660.9	55.1
										WEATHERED ROCK GRAY/BRN FINE TO COARSE SAND, SCHIST	
	1,656.9	59.1	60/0.0			60/0.0				1,656.9	59.1
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,656.9 ft ON CRYSTALLINE ROCK, SCHIST	

WBS 45360.1.1	TIP BD-5114F	COUNTY CLAY	GEOLOGIST Hager, M. M.	
SITE DESCRIPTION BRIDGE NO. 2 ON SR 1112 OVER CRAWFORD CREEK				GROUND WTR (ft)
BORING NO. EB2-B	STATION 12+23	OFFSET 14 ft RT	ALIGNMENT -L-	0 HR. N/A
COLLAR ELEV. 1,715.9 ft	TOTAL DEPTH 53.9 ft	NORTHING 488,595	EASTING 535,542	24 HR. 10.4
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009		DRILL METHOD H.S. Augers		HAMMER TYPE Automatic
DRILLER Coffey, Jr., C.	START DATE 02/27/12	COMP. DATE 02/27/12	SURFACE WATER DEPTH N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										1,715.9 GROUND SURFACE 0.0
										ROADWAY EMBANKMENT RED/BRN/ORANGE SANDY SILT
										1,712.4 3.5
	1,712.0	3.9	2	2	1	3		W		ALLUVIAL DK. BRN/GRAY SANDY SILT W/ PEBBLES AND COARSE SAND LENSES
	1,707.0	8.9	0	1	9	10				
	1,702.0	13.9	1	2	3	5		D		1,703.4 12.5
	1,697.0	18.9	1	4	6	10		M		SAPROLITE BLUE/GRAY/BRN SILTY FINE TO COARSE SAND, SCHISTOSE W/ SOME MICA
	1,692.0	23.9	3	4	6	10		M		
	1,687.0	28.9	0	2	4	6		M		
	1,682.0	33.9	4	7	11	18		M		
	1,677.0	38.9	5	6	8	14				1,674.1 41.8
	1,672.0	43.9	13	46	54/0.2					WEATHERED ROCK GRAY COARSE GRAINED SCHIST
	1,667.0	48.9	100/.4							
	1,662.0	53.9	60/0.0							1,662.0 53.9
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,662.0 ft ON CRYSTALLINE ROCK

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 45360.1.1	**TIP** BD-5114F	**COUNTY** CLAY	**GEOLOGIST** Hager, M. M.
SITE DESCRIPTION BRIDGE NO. 2 ON SR 1112 OVER CRAWFORD CREEK			**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 11+70	**OFFSET** 7 ft LT	**ALIGNMENT** -L- — 0 HR. N/A
COLLAR ELEV. 1,708.9 ft	**TOTAL DEPTH** 67.4 ft	**NORTHING** 488,538	**EASTING** 535,545 — 24 HR. 2.7
DRILL RIG/HAMMER EFF./DATE AFO0071 CME-550X 72% 09/03/2009		**DRILL METHOD** NW Casing w/ SPT	**HAMMER TYPE** Automatic
DRILLER Coffey, Jr., C.	**START DATE** 02/28/12	**COMP. DATE** 02/28/12	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT (0 25 50 75 100)	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
1710										1,708.9 GROUND SURFACE	0.0
1705	1,706.7	2.2	5	4	1	5		D		**ALLUVIAL** BRN/GRAY SILTY FINE TO COARSE SAND W/ GRAVEL — 1,705.2	3.7
	1,701.7	7.2								**ARTIFICIAL FILL** OLD BR. FOUNDATION, WEATHERED CONCRETE OR ROCK — 1,701.9	7.0
1700			1	2	4	6		Sat.		**SAPROLITE** BLUE/GRAY CLAYEY SILTY FINE TO COARSE SAND. THIN QUARTZ VEINS STARTING AT 27'. MINOR WEATHERED ROCK SEAMS, 27-57'. INCREASING HARDNESS STARTING AT 49'	
	1,696.7	12.2									
1695			2	3	6	9		M			
	1,691.7	17.2									
1690			2	3	4	7					
	1,686.7	22.2									
1685			4	6	9	15					
	1,681.7	27.2									
1680			6	8	13	21					
	1,676.7	32.2									
1675			5	9	9	18					
	1,671.7	37.2									
1670			7	11	12	23					
	1,666.7	42.2									
1665			12	16	12	28					
	1,661.7	47.2									
1660			7	9	14	23					
	1,656.7	52.2									
1655			18	21	33	54					
	1,651.7	57.2								1,651.9	57.0
1650			30	70/.4		100+				**WEATHERED ROCK** GRAY WEATHERED SCHIST	
	1,646.7	62.2									
1645			100/.5			100+					
	1,641.7	67.2	100/.2			100+				1,641.5	67.4
										Boring Terminated at Elevation 1,641.5 ft IN WEATHERED ROCK, SCHIST	

NCDOT BORE DOUBLE BD5114F_BORELOGS.GPJ NC_DOT.GDT 3/5/12

FOUNDATION RECOMMENDATIONS

WBS 45360.1.6

T.I.P. NO. BD-5114F

COUNTY Clay

STATION 11+83.5010-L-

DESCRIPTION Bridge No 002 on SR 1112 over Crawford Creek

	INITIALS	DATE
DESIGN	MRB	3/28/12
CHECK	SCC	3/30/12
APPROVAL	SCC	3/30/12

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 029869 ENGINEER SHANE C. CLARK

SIGNATURE 3/30/12

BENT	STATION	FOUNDATION TYPE	FACTORED RESISTANCE	MISCELLANEOUS & DETAILS
END BENT 1	STA. 11+42.313 -L-	Cap on HP 12x53 Steel Piles	55 tons/pile	Bottom of Cap El. = 1,711.2 ft ± Estimated Length of Pile = 50 ft (LT), 55 ft (RT) Number of Piles =5
BENT 1	STA. 11+68.502 -L-	Cap on HP 14x73 Steel Piles	105 tons/pile	Bottom of Cap Elev. =1,710.8 ft ± Point of Fixity Elev. = 1,681.5 ft Tip No Higher Than Elev. = 1,652.0 ft Estimated Length of Piles = 60 ft Number of Piles =7
END BENT 2	STA. 12+24.689-L-	Cap on HP 12x53 Steel Piles	85 tons/pile	Bottom of Cap El. = 1,711.5 ft ± Estimated Length of Pile = 55 ft)LT), 40 ft (RT) Number of Piles = 5

NOTES ON PLANS & COMMENTS

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS HIGHWAY BUILDING PO BOX 25201 RALEIGH, NORTH CAROLINA 27611	SUBJECT: Bridge No 002 on SR 1112 over Crawford Creek	
	PREPARED BY: MRB	PROJECT: 45360.1.6
	DATE: 3/28/12	TIP: BD-5114F
	CHECKED BY: SCC	COUNTY: Clay
	DATE: 3/30/12	

FOUNDATION RECOMMENDATION NOTES ON PLANS

1) For Piles, See Section 450 of the Standard Specifications.

2) Piles at End Bent No. 1 are designed for a Factored Resistance of 55.0 Tons per Pile.

3) Drive piles at End Bent No. 1 to a required driving resistance of 92.0 tons per pile.

4) Piles at Bent No. 1 are designed for a Factored Resistance of 105 Tons per Pile.

5) Drive piles at Bent No. 1 to a required driving resistance of 190 tons per pile. This required driving resistance includes additional resistance for downdrag or scour.

6) Install Piles at Bent No. 1 to a Tip Elevation no higher than 1652.0 ft.

7) The Scour Critical Elevation for Bent No. 1 is Elevation 1681.5 ft . Scour Critical Elevations are used to monitor possible scour problems during the life of the structure.

8) Drive piles at End Bent No. 2 to a required driving resistance of 85.0 tons per pile.

9) Drive piles at End Bent No. 2 to a required driving resistance of 142.0 tons per pile.

SPECIAL NOTES ON PLANS

1) **PZ-27 sheet piles are to be placed in front of 12x53 HP piles at End Bent No. 1.**

2) **Sheet piles are installed to an elevation of 1707.5 ft at End Bent No. 1 to account for the scour impact at End Bent No 1.**

3) **PZ-27 sheet piles are to be placed in front of 12x53 HP piles at End Bent No. 2.**

4) **Sheet piles are installed to an elevation of 1698.0 ft at End Bent No. 2 to account for the scour impact at End Bent No 2.**

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS HIGHWAY BUILDING PO BOX 25201 RALEIGH, NORTH CAROLINA 27611	SUBJECT: Bridge No 002 on SR 1112 over Crawford Creek	
	PREPARED BY: MRB	PROJECT: 45360.1.6
	DATE: 3/28/12	TIP: BD-5114F
	CHECKED BY: SCC	COUNTY: Clay
	DATE: 3/30/12	[redacted]

FOUNDATION RECOMMENDATION COMMENTS

1) Please advise Western Regional Office, if factored resistance is less than max. factored structure load.

2) PDA will be used to monitor driving stresses.

3) Re-strikes are required.

4) End bent slopes of 1½:1 are ok with slope protection to berm and to 1¾: 1.

5) Bridge approach Fill - Sub Regional Tier is required at End Bent No. 1.

6) Bridge approach Fill - Sub Regional Tier is required at End Bent No. 2.

7) The Design Scour Elevation for Bent No. 1 is 1694.5 ft.

8) The Point of Fixity Elevation for Bent No. 1 is 1681.5 ft.

9) Please send Western Regional Design Engineer a half size copy of the final general drawing sheets, including the location sketch, plan notes and quantities, at the time they are submitted to the plan checking & review squad.

PILE PAY ITEMS

(For 2012 Lettings and Later - Revised 4/18/11)

WBS ELEMENT 45360.1.6 DATE 3/28/2012

TIP NO. BD-5114F DESIGNED BY MRB

COUNTY Clay CHECKED BY SCC

STATION +83.5010-L-

DESCRIPTION Bridge No 002 on SR 1112 over Crawford Creek

NUMBER OF BENTS WITH PILES
NUMBER OF PILES PER BENT
NUMBER OF END BENTS WITH PILES
NUMBER OF PILES PER END BENT

Only required for "Pile Excavation" Pay Items.

Bent # or End Bent #	PILE PAY ITEM QUANTITIES						
	Steel Pile Points (yes/no)	Pipe Pile Plates (yes/no/maybe)	Predrilling For Piles (per linear ft)	Pile Redrives (per each)	Pile Excavation (per linear ft)		PDA Testing (per each)
					In Soil	Not In Soil	
TOTALS			0	0	0	0	1

Notes:
Blanks or "no" represent quantity of zero.

If steel pile points are required, calculate quantity of "Steel Pile Points" as equal to the number of steel piles.

If pipe pile plates are or may be required, calculate the quantity of "Pipe Pile Plates" as equal to the number of pipe piles.

If PDA testing may be required, show quantities of "PDA Testing" on the substructure plans as totals only. If PDA testing is required, show quantities of "PDA Testing" on the substructure plans for each bent or end bent.