STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	42295.1.1 (B-5136)	1	16

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

STRUCTURE SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *42295.1.1 (B-5136)* F.A. PROJ. *BRSTP-0029(43)*

COUNTY *CABARRUS*

PROJECT DESCRIPTION *BRIDGE NO. 66 & 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601*

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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) 707-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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CHECKED BY *CVN*

SUBMITTED BY *FALCON ENG.*

DATE *AUGUST 2013*

NORTH CAROLINA PROFESSIONAL SEAL 039779 8/23/13 ENGINEER JEREMY R. HAMM

PROJECT: 42295.1.1

ID: B-5136

DRAWN BY: *EVANS, T. E.*

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.

PROJECT REFERENCE NO.	SHEET NO.
42295.1.1 (B-5136)	2

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	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>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
	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)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
OM — OPTIMUM MOISTURE		
SL — SHRINKAGE LIMIT		
	- 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, FELOSPAR, 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	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
- 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
- SPT / DPT DMT VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- CONE PENETROMETER TEST
- SOUNDING ROD
- TEST BORING W/ CORE
- SPT N-VALUE
- REF — SPT REFUSAL

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

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:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550X
- [ ] PORTABLE HOIST
- [X] CME-55 TRUCK
- [ ] _____

ADVANCING TOOLS:
- [X] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 6" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [X] TRICONE 2 1/5" 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 FELOSPAR 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 FELOSPARS 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 FELOSPARS 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 FELOSPARS 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:
BL-3 (24" REBAR WITH CAP)
-BL- STA 14+60.99 N:615656.0830 E:1521495.3620 ELEVATION: 701.01 FT.

NOTES:
FIAD - "FILLED-IN IMMEDIATELY AFTER DRILLING"

REVISED 09/23/09

25"x67"x66" BLK COL
BLK WALL HEIGHT VARIES
1'x11'x65" BLK SIGN
DIR ONLY
15" RCP
INV=672.66'
12" RCP
DI
GR
BLK PATIO
INV=671.74'
20" BLK WALL
MON WELL
GRAVEL
BY2-8
WOODS
R/R ELEC CABINET
R/R ELEC CONTROL BOX
VHD R/R SIGNAL
SWITCH MACHINE
MILE POST 354
COMM WITNESS POST
MTL LT
CONC PAD
2SBK BUS
POWER METER
18" RCP
NAD 83/NSRS 2007
BST PARKING LOT
18" CONC C&G
CONC SW
BLOW OFF ASSEMBLY
DET-1
DET-2
EY3-(SB)
EY3-(NB)
24" DIP
CEDAR
BM #2
42" BLK RET WALL
EOI
EB2-A
CONCORD PARKWAY HWY 29 / HWY 601
BL-4
EBI-A
BI-A
B2-A
BRIDGE #69
GRASS MEDIAN
N 58° 27' 48.1" E
BRIDGE #66
B2-B
EB2-B
INV=682.03' WOODS
8x8"x30" MTL SIGN
CONC CABINET
EBI-B
BI-B
BM #3
72" CHL W/3SBW
12" BLK RET WALL
N 2° 31' 40.0" W
N 2° 29' 43.8" W
BST
FLAGPOLE
3.0' GRAVEL WALK
CONC CURB
CONC RAMP
8' CONC SW
30.0' BST
BOLLARD POST
ANTENNA
SWITCH MACHINE
DONED SOLES
EC TRANS
CONC
BOLLARDS
48" STEPS
ISFBUS
BL-3
2SFBUS
BOLLARD
CONC 48" MTL STEPS
CONC RAMP
STEPS
IS BLK BUS
IS MTL BUS
BST PARKING LOT

0 50 100
FEET

NOTES:

PLANS ADOPTED FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED JUNE 2013.

BRIDGE SKEW: 60 DEGREES

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PHONE: 919.871.0800
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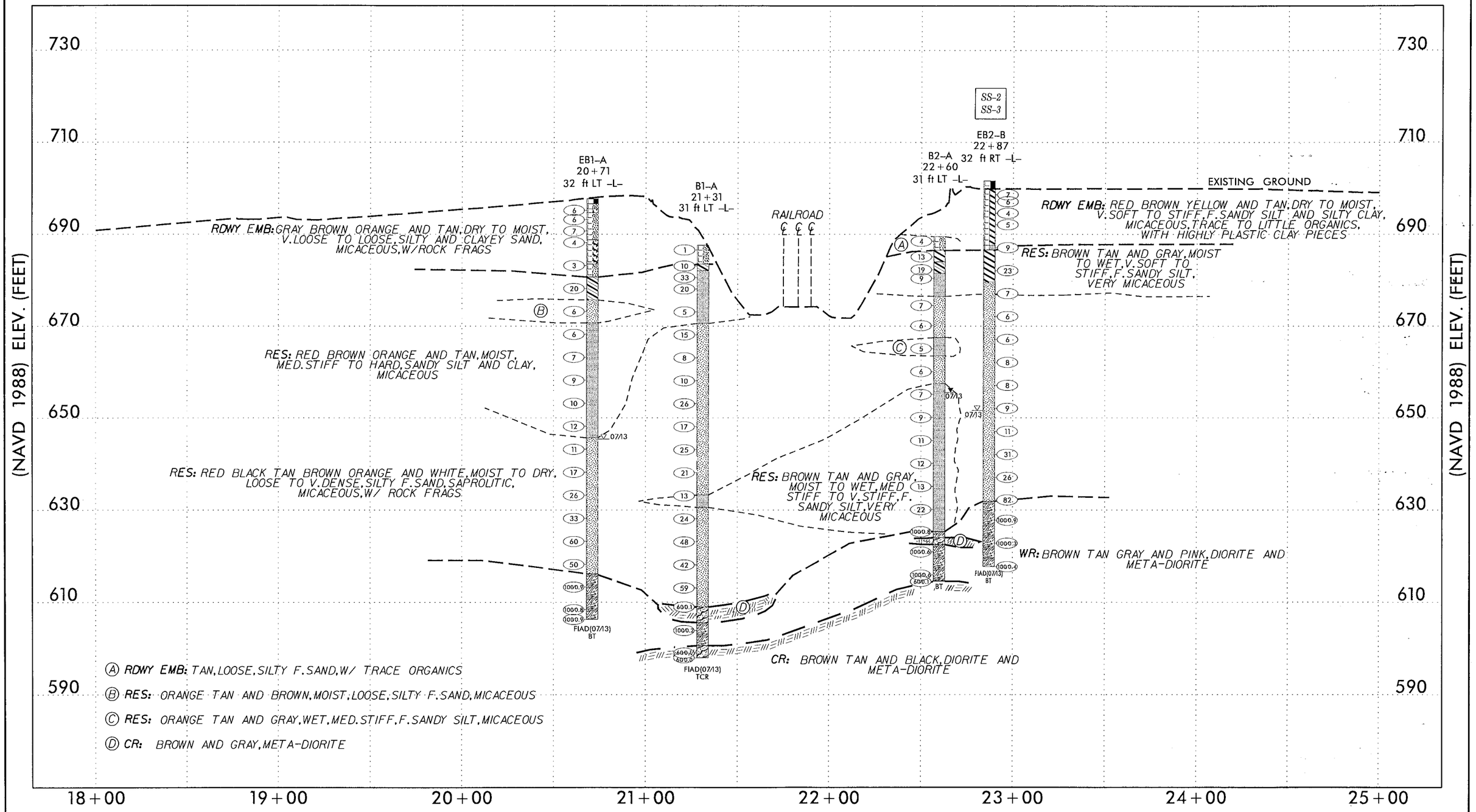
SITE PLAN

REPLACE BRIDGES NO. 66 AND 69 OVER NORFOLK SOUTHERN RR ON US 29/601
CABARRUS COUNTY, NORTH CAROLINA
WBS: 42295.1.1 TIP:B-5136
FALCON PROJECT NO.: G13055.00



NOTES:

- GROUNDLINE PROFILE OF -L- TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED JUNE 2013.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.
- BRIDGE SKEW: 60 DEGREES

VERTICAL SCALE
0 20 40
FEET

HORIZONTAL SCALE
0 50 100
FEET

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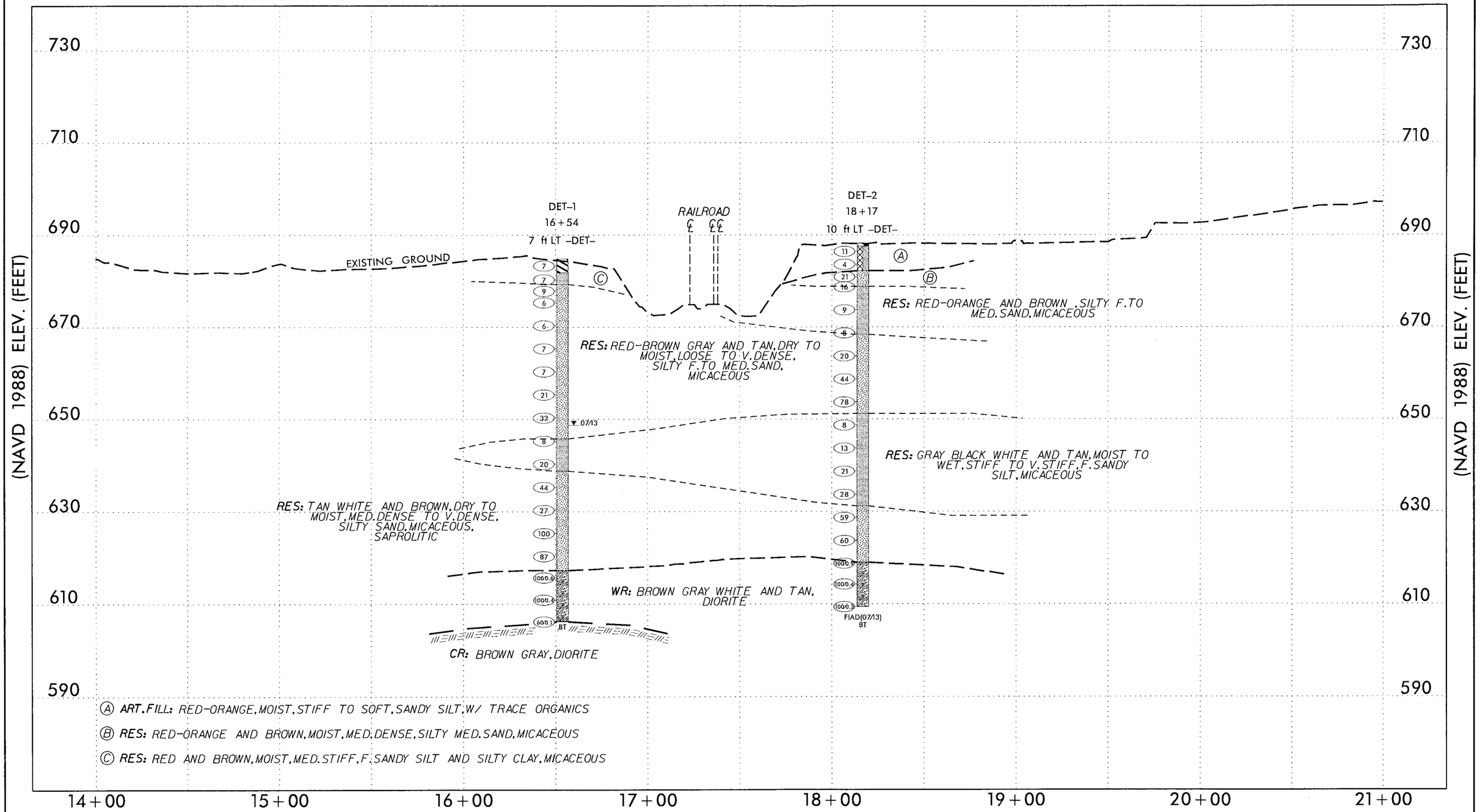
SUBSURFACE PROFILE ALONG -L-

REPLACE BRIDGES NO. 66 AND 69 OVER NORFOLK SOUTHERN RR ON US 29/601
CABARRUS COUNTY, NORTH CAROLINA
WBS: 42295.1.1 TIP:B-5136
FALCON PROJECT NO.: G13055.00



NOTES:

- GROUNDLINE PROFILE OF –DET– TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED JUNE 2013.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.
- BRIDGE SKEW: 60 DEGREES

VERTICAL SCALE
0 20 40
FEET

HORIZONTAL SCALE
0 50 100
FEET

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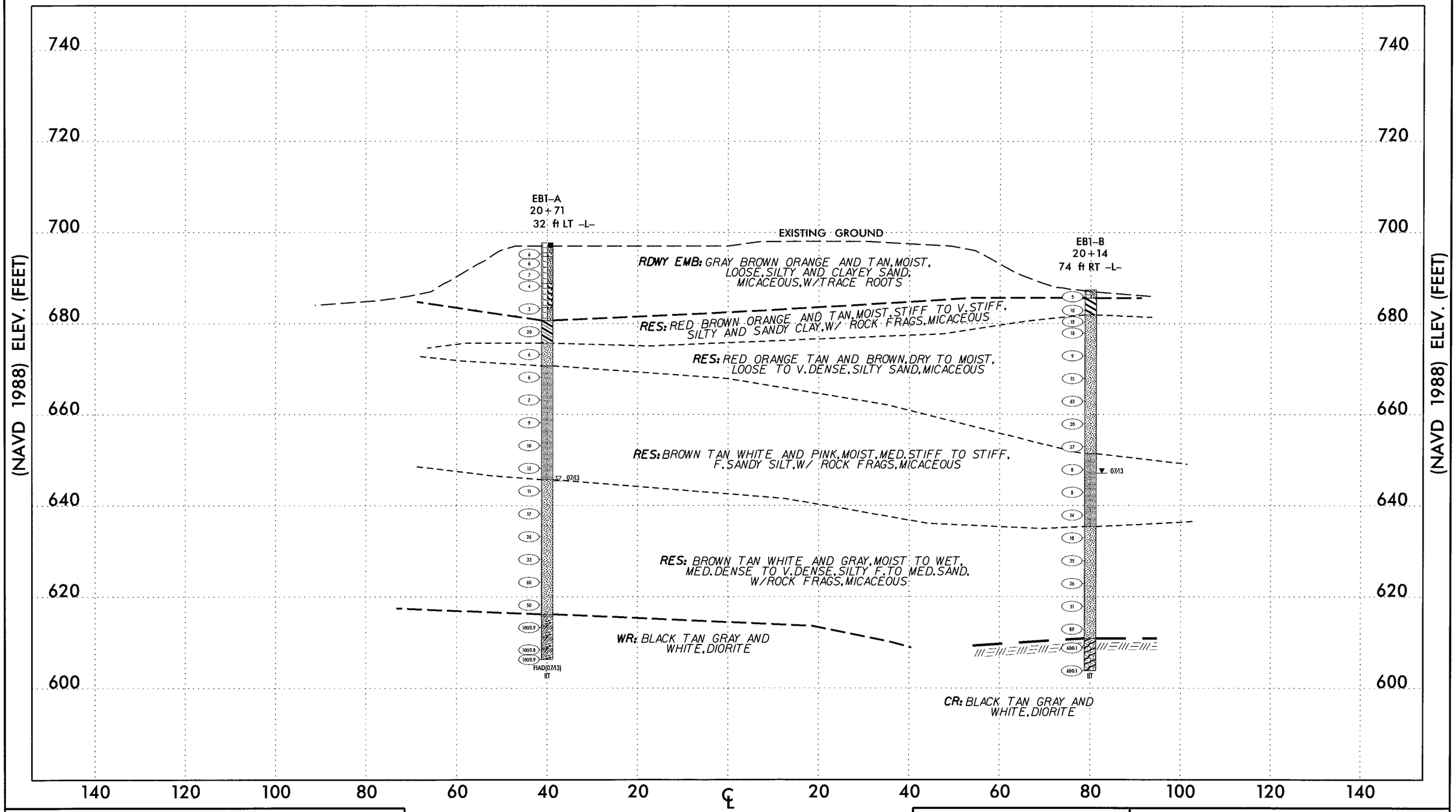
SUBSURFACE PROFILE ALONG –DET–

REPLACE BRIDGES NO. 66 AND 69 OVER NORFOLK SOUTHERN RR ON US 29/601
CABARRUS COUNTY, NORTH CAROLINA
WBS: 42295.1.1 TIP:B-5136
FALCON PROJECT NO.: G13055.00



NOTES:

- GROUNDLINE CROSS SECTION TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED JUNE 2013.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.
- BRIDGE SKEW: 60 DEGREES

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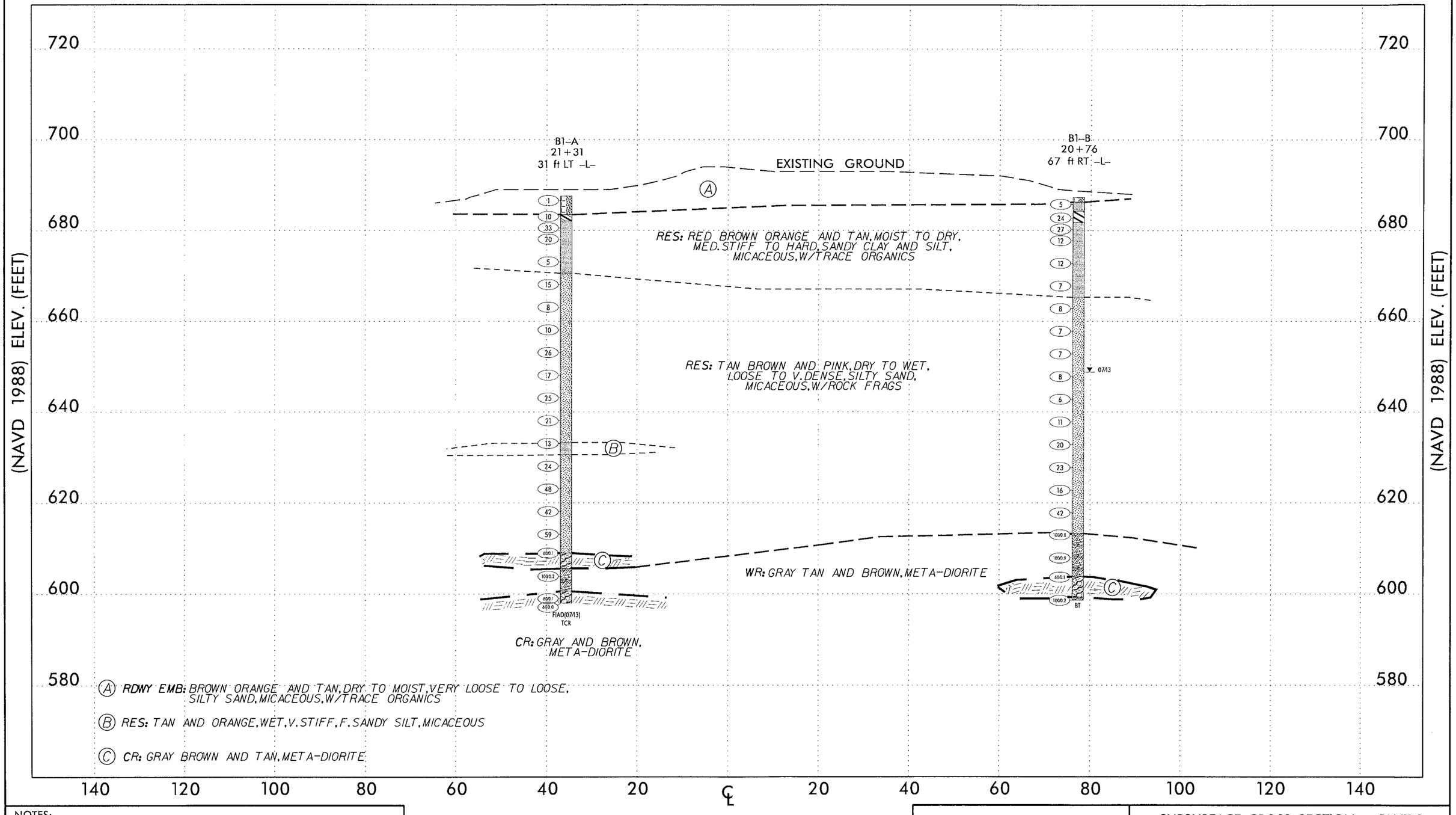
SUBSURFACE CROSS SECTION – END BENT 1

REPLACE BRIDGES NO. 66 AND 69 OVER NORFOLK SOUTHERN RR ON US 29/601
CABARRUS COUNTY, NORTH CAROLINA
WBS: 42295.1.1 TIP:B-5136
FALCON PROJECT NO.: G13055.00



NOTES:

- GROUNDLINE CROSS SECTION ALONG PROPOSED BENT TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED JUNE 2013.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROPOSED CROSS SECTION.
- BRIDGE SKEW: 60 DEGREES

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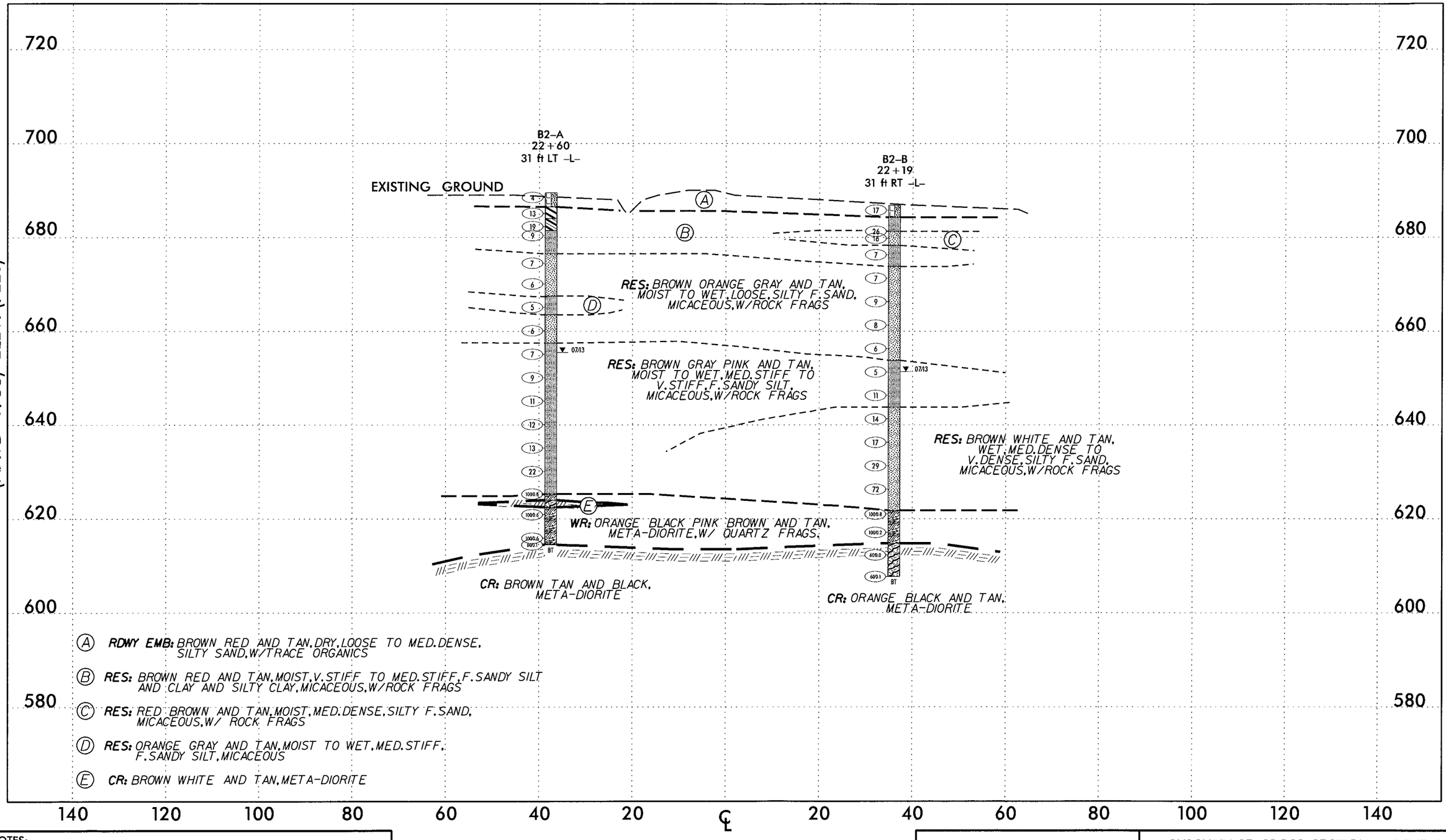
SUBSURFACE CROSS SECTION – BENT 1

REPLACE BRIDGES NO. 66 AND 69 OVER NORFOLK SOUTHERN RR ON US 29/601
CABARRUS COUNTY, NORTH CAROLINA
WBS: 42295.1.1 TIP:B-5136
FALCON PROJECT NO.: G13055.00



Ⓐ **RDWY EMB:** BROWN RED AND TAN, DRY, LOOSE TO MED. DENSE, SILTY SAND, W/TRACE ORGANICS

Ⓑ **RES:** BROWN RED AND TAN, MOIST, V. STIFF TO MED. STIFF, F. SANDY SILT AND CLAY AND SILTY CLAY, MICACEOUS, W/ROCK FRAGS

Ⓒ **RES:** RED BROWN AND TAN, MOIST, MED. DENSE, SILTY F. SAND, MICACEOUS, W/ ROCK FRAGS

Ⓓ **RES:** ORANGE GRAY AND TAN, MOIST TO WET, MED. STIFF, F. SANDY SILT, MICACEOUS

Ⓔ **CR:** BROWN WHITE AND TAN, META-DIORITE

NOTES:
- GROUNDLINE CROSS SECTION TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED JUNE 2013.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE.
- BRIDGE SKEW: 60 DEGREES

0 20 40
FEET

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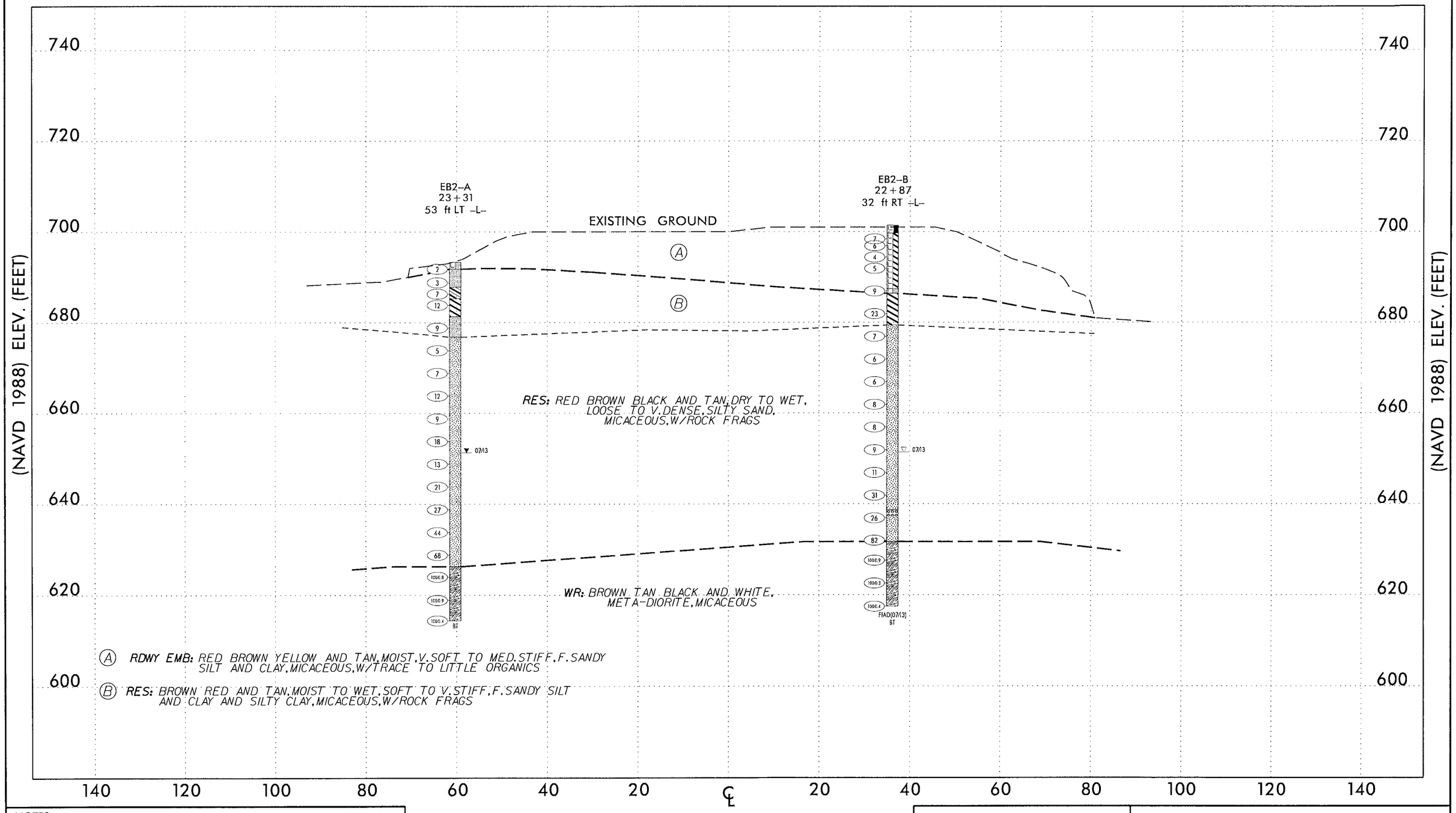
SUBSURFACE CROSS SECTION – BENT 2

REPLACE BRIDGES NO. 66 AND 69 OVER NORFOLK SOUTHERN RR ON US 29/601
CABARRUS COUNTY, NORTH CAROLINA
WBS: 42295.1.1 TIP: B-5136
FALCON PROJECT NO.: G13055.00



NOTES:

- GROUNDLINE CROSS SECTION ALONG PROPOSED BENT TAKEN FROM ELECTRONIC FILES RECEIVED FROM NCDOT GEU, DATED JUNE 2013.
- INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROPOSED CROSS SECTION.
- BRIDGE SKEW: 60 DEGREES

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SUBSURFACE CROSS SECTION – END BENT 2

REPLACE BRIDGES NO. 66 AND 69 OVER NORFOLK SOUTHERN RR ON US 29/601
CABARRUS COUNTY, NORTH CAROLINA
WBS: 42295.1.1 TIP:B-5136
FALCON PROJECT NO.: G13055.00

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 42295.1.1	**TIP** B-5136	**COUNTY** CABARRUS	**GEOLOGIST** Hunsberger, W. S.	
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601				**GROUND WTR (ft)**
BORING NO. EB1-A	**STATION** 20+71	**OFFSET** 32 ft LT	**ALIGNMENT** -L-	**0 HR.** 52.3
COLLAR ELEV. 697.7 ft	**TOTAL DEPTH** 91.4 ft	**NORTHING** 615,582	**EASTING** 1,521,308	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 93% 12/08/2011		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Whichard, W.	**START DATE** 07/09/13	**COMP. DATE** 07/09/13	**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)
										697.7 EXISTING PAVEMENT	0.0
	696.2	1.5	3	3	3	6		M		696.6 0.3' BITUMINOUS CONCRETE	1.1
	694.2	3.5	2	3	3	6		M		695.5 0.8' PORTLAND CEMENT CONCRETE	2.2
	691.7	6.0	1	4	3	7		M		694.7 **ROADWAY EMBANKMENT** GRAY AND TAN, SILTY SAND (A-2-4) W/ ROCK FRAGS	3.0
	689.2	8.5	2	2	2	4		M		688.8 RED-ORANGE TAN AND BLACK, CLAYEY SAND (A-2-6)	8.9
	684.2	13.5	1	2	1	3		M		ORANGE BLACK AND TAN, F. TO MED. SILTY SAND (A-2-4) MICACEOUS	
	679.2	18.5	5	9	11	20		M		683.5 RED-ORANGE AND BROWN, CLAYEY SAND (A-2-6) MICACEOUS	14.2
	674.2	23.5	2	3	3	6		M		680.7 RED AND BROWN, SILTY MED. SAND (A-2-4)	17.0
	669.2	28.5	2	2	4	6		M		**RESIDUAL** 675.7 RED-ORANGE, SANDY CLAY (A-6) MICACEOUS	22.0
	664.2	33.5	2	3	4	7		M		ORANGE TAN AND BROWN, SILTY F. SAND (A-2-4) MICACEOUS	27.0
	659.2	38.5	2	4	5	9		M		BROWN TAN AND WHITE, F. SANDY SILT (A-4) MICACEOUS	
	654.2	43.5	4	4	6	10		M			
	649.2	48.5	4	5	7	12		M			
	644.2	53.5	3	4	7	11		M		645.7 BROWN TAN AND WHITE, SILTY F. TO MED. SAND (A-2-4) MICACEOUS, SAPROLITIC	52.0
	639.2	58.5	4	6	11	17		M			
	634.2	63.5	3	11	15	26		M			
	629.2	68.5	12	14	19	33		M			
	624.2	73.5	24	28	32	60		M			
	619.2	78.5	11	19	31	50		M		616.2 **WEATHERED ROCK** TAN GRAY AND WHITE, DIORITE	81.5
	614.2	83.5	50	50/0.4		100/0.9					
	609.2	88.5	44	56/0.3		100/0.8					
	607.2	90.5	43	57/0.4		100/0.9				606.3 Boring Terminated at Elevation 606.3 ft in WR: DIORITE	91.4

WBS 42295.1.1	**TIP** B-5136	**COUNTY** CABARRUS	**GEOLOGIST** Evans, T. E.	
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601				**GROUND WTR (ft)**
BORING NO. EB1-B	**STATION** 20+14	**OFFSET** 74 ft RT	**ALIGNMENT** -L-	**0 HR.** 43.5
COLLAR ELEV. 687.4 ft	**TOTAL DEPTH** 83.6 ft	**NORTHING** 615,462	**EASTING** 1,521,314	**24 HR.** 40.3
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER White, J. D.	**START DATE** 07/03/13	**COMP. DATE** 07/03/13	**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	
										687.4 GROUND SURFACE: 0.3' TOPSOIL	0.0
	686.9	0.5	2	2	3	5		M		685.6 **ROADWAY EMBANKMENT** BROWN AND TAN, SILTY SAND (A-2-4) W/ TRACE ROOTS	1.8
	683.9	3.5	2	4	6	10		M		681.9 **RESIDUAL** RED-BROWN AND TAN, SILTY CLAY (A-7) MICACEOUS, W/ ROCK FRAGS.	5.5
	681.4	6.0	9	9	10	19		M		RED-BROWN AND TAN, SILTY SAND (A-2-4) SAPROLITIC, MICACEOUS TO SLI. MICACEOUS, W/ ROCK FRAGS.	
	678.9	8.5	7	9	9	18		D			
	673.9	13.5	3	3	6	9		D			
	668.9	18.5	8	8	7	15		D			
	663.9	23.5	14	28	34	62		D		V. DENSE LAYER @ 24.0-27.0 FT	
	658.9	28.5	10	14	16	30		D			
	653.9	33.5	14	15	12	27		D			
	648.9	38.5	3	3	5	8		M			
	643.9	43.5	3	3	5	8		M			
	638.9	48.5	4	6	8	14		M			
	633.9	53.5	6	7	11	18		M			
	628.9	58.5	8	16	19	35		M			
	623.9	63.5	10	15	21	36		M			
	618.9	68.5	16	23	28	51		M			
	613.9	73.5	28	39	50	89		M			
	608.9	78.5	60/0.1			60/0.1				610.9 **CRYSTALLINE ROCK** BLACK GRAY AND TAN, DIORITE	76.5
	603.9	83.5	60/0.1			60/0.1				603.8 Boring Terminated with Standard Penetration Test Refusal at Elevation 603.8 ft in CR: DIORITE	83.6

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 42295.1.1	**TIP** B-5136	**COUNTY** CABARRUS	**GEOLOGIST** Hunsberger, W. S.	
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601				**GROUND WTR (ft)**
BORING NO. B1-A	**STATION** 21+31	**OFFSET** 31 ft LT	**ALIGNMENT** -L-	**0 HR.** Caved
COLLAR ELEV. 687.6 ft	**TOTAL DEPTH** 89.6 ft	**NORTHING** 615,613	**EASTING** 1,521,359	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 93% 12/08/2011		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Whichard, W.	**START DATE** 07/10/13	**COMP. DATE** 07/16/13	**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)
690										
	687.6	0.0								687.6 0.0 GROUND SURFACE
			WOH	1	WOH	1		D		**ROADWAY EMBANKMENT**
685	684.1	3.5								ORANGE BROWN AND TAN, SILTY SAND (A-2-4) MICACEOUS
			2	5	5	10 33		D		683.5 4.1
	681.6	6.0								**RESIDUAL**
680			17	16	17			M		682.1 5.5 RED AND BLACK, SANDY CLAY (A-6) MICACEOUS
	679.1	8.5				20				RED-ORANGE WHITE AND TAN, SANDY SILT (A-4) MICACEOUS
			10	11	9			M		
675										
	674.1	13.5								
			2	2	3	5		M		
670										670.6 17.0
	669.1	18.5								TAN BROWN ORANGE AND WHITE, SILTY F. TO CSE. SAND (A-2-4) MICACEOUS W/ ROCK FRAGS. @ 34 FT
			4	6	9	15		D		
665										
	664.1	23.5								
			3	4	4	8		D		
660										
	659.1	28.5								
			3	4	6	10		D		
655										
	654.1	33.5								
			3	7	19	26		D		
650										
	649.1	38.5								
			4	4	13	17		D		
645										
	644.1	43.5								
			7	12	13	25		M		
640										
	639.1	48.5								
			6	9	12	21		M		
635										
	634.1	53.5								
			4	5	8	13		M		633.3 54.3 TAN AND ORANGE, F. SANDY SILT (A-4) MICACEOUS
630										630.6 57.0 TAN AND WHITE, SILTY SAND (A-2-4) MICACEOUS
	629.1	58.5								
			10	10	14	24		W		
625										
	624.1	63.5								
			18	20	28	48		M		
620										
	619.1	68.5								
			16	19	23	42		M		
615										
	614.1	73.5								
			22	27	32	59		M		
610										
	609.1	78.5	60/0.1			60/0.1				609.1 78.5 GRAY AND WHITE, META-DIORITE
605	604.1	83.5	100/0.2			100/0.2				605.6 82.0 GRAY AND TAN, META-DIORITE
										600.6 87.0 GRAY AND WHITE, META-DIORITE
600	599.1	88.5								
	598.0	89.6	60/0.1			60/0.1				598.0 89.6 Boring Terminated with Tricone Refusal at Elevation 598.0 ft in CR: META-DIORITE
			60/0.0			60/0.0				

NOTE: GROUNDWATER NOT ENCOUNTERED DUE TO SHALLOW CAVING OF BOREHOLE. BOREHOLE CAVED AT 12.0 FT

WBS 42295.1.1	**TIP** B-5136	**COUNTY** CABARRUS	**GEOLOGIST** Evans, T. E.	
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601				**GROUND WTR (ft)**
BORING NO. B1-B	**STATION** 20+76	**OFFSET** 67 ft RT	**ALIGNMENT** -L-	**0 HR.** 43.2
COLLAR ELEV. 687.3 ft	**TOTAL DEPTH** 88.7 ft	**NORTHING** 615,500	**EASTING** 1,521,364	**24 HR.** 38.5
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER White, J. D.	**START DATE** 07/03/12	**COMP. DATE** 07/03/12	**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
690										
	686.8	0.5								687.3 0.0 GROUND SURFACE: 0.4' TOPSOIL
			2	2	3	5		M		686.3 1.0 **ROADWAY EMBANKMENT**
685	683.8	3.5								684.3 3.0 BROWN, SILTY SAND (A-2-4) W/ TRACE ORGANICS, ROOTS
			6	9	15	24		M		681.8 5.5 **RESIDUAL**
	681.3	6.0								RED-BROWN, F. SANDY SILT (A-4) W/ TRACE ORGANICS, MICACEOUS
680			8	13	14	27		M		RED-BROWN, SILTY CLAY (A-7) MICACEOUS
	678.8	8.5								RED-BROWN BLACK AND TAN, F. SANDY SILT (A-4) MICACEOUS
			6	5	7	12		M		
675										
	673.8	13.5								
			4	5	7	12		D		
670										
	668.8	18.5								
			3	3	4	7		D		
665										665.3 22.0
	663.8	23.5								TAN PINK BROWN GRAY AND BLACK, SILTY F. SAND (A-2-4) MICACEOUS, SAPROLITIC, W/ CSE. SAND LAYERS, MICACEOUS, W/ ROCK FRAGS.
			3	3	5	8		M		
660										
	658.8	28.5								
			3	3	4	7		M		
655										
	653.8	33.5								
			3	3	4	7		M		
650										
	648.8	38.5								
			3	4	4	8		W		
645										
	643.8	43.5								
			3	2	4	6		W		
640										
	638.8	48.5								
			3	4	7	11		W		
635										
	633.8	53.5								
			5	9	11	20		M		
630										
	628.8	58.5								
			6	13	10	23		M		
625										
	623.8	63.5								
			6	6	10	16		M		
620										
	618.8	68.5								
			9	18	24	42		M		
615										
	613.8	73.5								613.3 74.0
			21	44	56/0.3	100/0.8				**WEATHERED ROCK**
610										GRAY BROWN AND TAN, META-DIORITE
	608.8	78.5	69	31/0.4		100/0.9				
										603.8 83.5
605	603.8	83.5	60/0.1			60/0.1				**CRYSTALLINE ROCK**
										GRAY BROWN AND TAN, META-DIORITE
600	598.8	88.5								599.3 88.0
			100/0.2			100/0.2				598.6 88.7 **WEATHERED ROCK**
										GRAY BROWN AND TAN, META-DIORITE
										Boring Terminated at Elevation 598.6 ft in WR: META-DIORITE

NCDOT GEOTECHNICAL ENGINEERING UNIT
BOREHOLE REPORT

WBS 42295.1.1	**TIP** B-5136	**COUNTY** CABARRUS	**GEOLOGIST** Evans, T. E.	
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601				**GROUND WTR (ft)**
BORING NO. B2-A	**STATION** 22+60	**OFFSET** 31 ft LT	**ALIGNMENT** -L-	**0 HR.** N/A
COLLAR ELEV. 689.5 ft	**TOTAL DEPTH** 75.0 ft	**NORTHING** 615,680	**EASTING** 1,521,469	**24 HR.** 34.0
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012		**DRILL METHOD** H.S. Augers / Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER White, J. D.	**START DATE** 07/09/13	**COMP. DATE** 07/10/13	**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)
690										
	689.5	0.0	2	1	3	4 13 19 9		D		689.5 / 0.0 GROUND SURFACE
685	686.1	3.4	4	6	7			M		**ROADWAY EMBANKMENT** TAN, SILTY F. SAND (A-2-4) W/ TRACE ORGANICS — 686.5 / 3.0
	683.3	6.2	6	9	10			M		**RESIDUAL** RED, SILTY CLAY (A-7) MICACEOUS, W/ ROCK FRAGS. — 684.0 / 5.5
680	681.4	8.1	3	4	5			D		RED, F. SANDY CLAY (A-6) MICACEOUS, W/ ROCK FRAGS. — 681.5 / 8.0
	675.5	14.0	2	3	4	7		W		RED, F. SANDY SILT(A-4) MICACEOUS — 676.5 / 13.0
675	671.1	18.4	3	3	3	6		W		BROWN AND TAN, SILTY F. SAND (A-2-4) SLI. MICACEOUS, SAPROLITIC, W/ ROCK FRAGS.
670	666.1	23.4	2	2	3	5		W		667.5 / 22.0 ORANGE GRAY AND TAN, F. SANDY SILT (A-4) MICACEOUS, SAPROLITIC
665	661.1	28.4	2	3	3	6		W		663.5 / 26.0 ORANGE TAN AND GRAY, SILTY F. SAND (A-2-4) MICACEOUS, SAPROLITIC
660	656.1	33.4	3	3	4	7		W		657.5 / 32.0 BROWN TAN AND GRAY, F. SANDY SILT (A-4) V. MICACEOUS, SAPROLITIC
655	651.1	38.4	3	3	6	9		M		
650	646.1	43.4	3	4	7	11		M		
645	641.1	48.4	5	5	7	12		M		
640	636.1	53.4	5	5	8	13		M		
635	631.1	58.4	6	10	12	22		M		
630	626.1	63.4	14	63	37/0.3	100/0.8		M		625.3 / 64.2 WEATHERED ROCK 624.0 / 65.5 BROWN WHITE AND TAN, META-DIORITE 622.5 / 67.0
625	621.5	68.0	73	27/0.1		100/0.6				CRYSTALLINE ROCK BROWN WHITE AND TAN, META-DIORITE
620	616.5	73.0	59	41/0.1		100/0.6				WEATHERED ROCK PINK TAN AND BROWN, META-DIORITE, W/ QUARTZ FRAGS. 614.6 / 74.9
615	614.6	74.9	60/0.1			60/0.1				CRYSTALLINE ROCK 614.5 / 75.0 BROWN TAN AND BLACK, META-DIORITE

Boring Terminated with Standard Penetration Test Refusal at Elevation 614.5 ft in CR: META-DIORITE

NOTE: HSA DRILLING METHOD USED BEYOND 63.4 FT BELOW GROUND SURFACE DUE TO CASING FILLING WITH FLOWING SANDS.

WBS 42295.1.1	**TIP** B-5136	**COUNTY** CABARRUS	**GEOLOGIST** Evans, T. E.	
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601				**GROUND WTR (ft)**
BORING NO. B2-B	**STATION** 22+19	**OFFSET** 31 ft RT	**ALIGNMENT** -L-	**0 HR.** 38.5
COLLAR ELEV. 686.8 ft	**TOTAL DEPTH** 79.1 ft	**NORTHING** 615,606	**EASTING** 1,521,467	**24 HR.** 35.4
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER White, J. D.	**START DATE** 07/15/13	**COMP. DATE** 07/15/13	**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)
690										
	686.8	0.0	9	11	6	17		D		686.8 / 0.0 GROUND SURFACE
685	682.3	4.5						M		**ROADWAY EMBANKMENT** RED-BROWN, SILTY SAND (A-2-4) — 684.3 / 2.5
	680.8	6.0	9	12	14	26		M		**RESIDUAL** RED-BROWN AND TAN, F. SANDY SILT (A-4) MICACEOUS, W/ ROCK FRAGS. — 681.3 / 5.5
680	677.3	9.5	6	8	8	16		M		RED-BROWN AND TAN, SILTY F. SAND (A-2-4) MICACEOUS, W/ ROCK FRAGS. — 678.3 / 8.5
	672.3	14.5	3	3	4	7		M		ORANGE AND TAN, F. SANDY SILT (A-4) MICACEOUS, W/ ROCK FRAGS. — 673.8 / 13.0
675	667.3	19.5	3	3	4	7		M		BROWN TAN AND PINK, SILTY F. SAND (A-2-4) MICACEOUS, SAPROLITIC, W/ QUARTZ FRAGS.
670	662.3	24.5	4	4	5	9		M		
665	657.3	29.5	3	3	5	8		M		
660	652.3	34.5	3	2	4	6		M		
655	647.3	39.5	2	2	3	5		M		653.8 / 33.0 BROWN TAN AND PINK, F. SANDY SILT (A-4) SAPROLITIC, MICACEOUS
650	642.3	44.5	3	5	6	11		W		
645	637.3	49.5	5	5	9	14		W		643.8 / 43.0 BROWN WHITE AND TAN, SILTY F. SAND (A-2-4) SAPROLITIC, MICACEOUS, W/ QUARTZ FRAGS.
640	632.3	54.5	5	6	11	17		W		
635	627.3	59.5	8	12	17	29		W		
630	622.3	64.5	18	30	42	72		W		
625	617.3	69.5	24	62	38/0.3	100/0.8				621.8 / 65.0 WEATHERED ROCK ORANGE AND BLACK, META-DIORITE
620	612.3	74.5	100/0.2			100/0.2				614.8 / 72.0 CRYSTALLINE ROCK ORANGE BLACK AND TAN, META-DIORITE
615	607.8	79.0	60/0.0			60/0.0				607.7 / 79.1
610			60/0.1			60/0.1				

Boring Terminated with Standard Penetration Test Refusal at Elevation 607.7 ft in CR: META-DIORITE

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 42295.1.1	**TIP** B-5136	**COUNTY** CABARRUS	**GEOLOGIST** Evans, T. E.
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601			**GROUND WTR (ft)**
BORING NO. EB2-A	**STATION** 23+31	**OFFSET** 53 ft LT	**ALIGNMENT** -L- — **0 HR.** 43.0
COLLAR ELEV. 693.3 ft	**TOTAL DEPTH** 78.9 ft	**NORTHING** 615,736	**EASTING** 1,521,518 — **24 HR.** 42.0
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER White, J. D.	**START DATE** 07/02/13	**COMP. DATE** 07/02/13	**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)
										693.3 GROUND SURFACE: 0.4' TOPSOIL	0.0
	692.8	0.5	2	1	1	2		M		691.8 **ROADWAY EMBANKMENT** BLACK AND RED-BROWN, F. SANDY SILT (A-4) W/ TRACE TO LITTLE ORGANICS, MICACEOUS	1.5
	689.8	3.5	2	1	2	3		M		687.8 **RESIDUAL** RED-BROWN AND TAN, F. SANDY SILT (A-4) MICACEOUS	5.5
	687.3	6.0	WOH	3	4	7		W		685.3 RED-BROWN, F. SANDY CLAY (A-6) W/ ROCK FRAGS.	8.0
	684.8	8.5	3	5	7	12	SS-1	28%		681.3 RED-BROWN, SILTY CLAY (A-7-5) SLI. MICACEOUS	12.0
	679.8	13.5	3	4	5	9		M		676.8 RED-BROWN AND TAN, F. SANDY SILT (A-4) MICACEOUS, W/ ROCK FRAGS.	16.5
	674.8	18.5	2	3	2	5		D		TAN GRAY AND BROWN, SILTY F.TO MED. SAND (A-2-4) SAPROLITIC, MICACEOUS, W/ ROCK FRAGS.	
	669.8	23.5	3	4	3	7		D			
	664.8	28.5	5	5	7	12		M			
	659.8	33.5	4	4	5	9		M			
	654.8	38.5	5	7	11	18		M			
	649.8	43.5	4	6	7	13		M			
	644.8	48.5	8	10	11	21		M			
	639.8	53.5	7	12	15	27		W			
	634.8	58.5	9	18	26	44		W			
	629.8	63.5	22	31	37	68		W			
	624.8	68.5	21	46	54/0.3	100/0.8				626.3 **WEATHERED ROCK** BROWN TAN AND GRAY, META-DIORITE	67.0
	619.8	73.5	34	66/0.4		100/0.9					
	614.8	78.5	100/0.4			100/0.4				614.4 Boring Terminated at Elevation 614.4 ft in WR: DIORITE	78.9

WBS 42295.1.1	**TIP** B-5136	**COUNTY** CABARRUS	**GEOLOGIST** Evans, T. E.
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601			**GROUND WTR (ft)**
BORING NO. EB2-B	**STATION** 22+87	**OFFSET** 32 ft RT	**ALIGNMENT** -L- — **0 HR.** 50.0
COLLAR ELEV. 701.4 ft	**TOTAL DEPTH** 83.9 ft	**NORTHING** 615,641	**EASTING** 1,521,525 — **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER White, J. D.	**START DATE** 07/12/13	**COMP. DATE** 07/12/13	**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)
										701.4 EXISTING PAVEMENT	0.0
	699.4	2.0								699.6 0.6' BITUMINOUS CONCRETE 1.2' AGGREGATE BASE COURSE	1.8
	697.9	3.5	4	3	4	7		M		**ROADWAY EMBANKMENT** TAN BROWN RED AND YELLOW, MOTTLED, SILTY CLAY (A-7-6) W/ HIGH PLASTIC CLAY PIECES, GRAVEL, MICACEOUS	
	695.4	6.0	3	3	3	6	SS-2	23%			
	692.9	8.5	2	2	2	4		M		GRAVEL LAYER 6.0-7.0 FT	
	687.9	13.5	2	2	3	5		W		687.4	14.0
	682.9	18.5	3	4	5	9		M		686.4 TAN RED AND BROWN, F. SANDY SILT (A-4) MICACEOUS **RESIDUAL** RED AND TAN, F. SANDY SILTY CLAY (A-7-5) MICACEOUS, W/ ROCK FRAGS.	15.0
	677.9	23.5	6	10	13	23	SS-3	24%		679.4 RED BLACK BROWN AND TAN, SILTY F. SAND (A-2-4) SAPROLTIC, MICACEOUS, W/ ROCK FRAGS.	22.0
	672.9	28.5	3	3	4	7		D			
	667.9	33.5	3	3	3	6		D			
	662.9	38.5	3	3	3	6		M			
	657.9	43.5	3	4	4	8		M			
	652.9	48.5	3	3	5	8		M			
	647.9	53.5	3	5	4	9		M			
	642.9	58.5	4	5	6	11		W			
	637.9	63.5	4	14	17	31		W			
	632.9	68.5	12	12	14	26		M			
	627.9	73.5	10	16	66	82		M		638.7	62.7
	622.9	78.5	53	47/0.4		100/0.9				637.4 WHITE TAN AND BROWN, SLI. SILTY SAND (A-1-b) V. HIGH ROCK FRAGS. CONTENT, SAPROLITIC, MICACEOUS	64.0
	617.9	83.5	100/0.3			100/0.3				BLACK TAN GRAY AND BROWN, SILTY F. SAND (A-2-4) SAPROLITIC, MICACEOUS	
			100/0.4			100/0.4				631.4 **WEATHERED ROCK** BLUE-GRAY BROWN TAN WHITE AND BLACK, META-DIORITE	70.0
										617.5 Boring Terminated at Elevation 617.5 ft in WR: META-DIORITE	83.9

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 42295.1.1	**TIP** B-5136	**COUNTY** CABARRUS	**GEOLOGIST** Evans, T. E.	
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601				**GROUND WTR (ft)**
BORING NO. DET-1	**STATION** 16+54	**OFFSET** 7 ft LT	**ALIGNMENT** -DET-	**0 HR.** 38.5
COLLAR ELEV. 684.8 ft	**TOTAL DEPTH** 78.6 ft	**NORTHING** 615,670	**EASTING** 1,521,346	**24 HR.** 36.1
DRILL RIG/HAMMER EFF./DATE SOI8513 CME-550X 97% 08/08/2012		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER White, J. D.	**START DATE** 07/01/13	**COMP. DATE** 07/01/13	**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)
685										684.8 GROUND SURFACE: 0.3' TOPSOIL 0.0
	684.3	0.5	2	3	4	7		M		**RESIDUAL**
680	681.3	3.5	3	3	4	7		M		681.8 RED, SILTY CLAY (A-7) MICACEOUS 3.0
	678.8	6.0	4	4	5	9		M		RED-BROWN, F. SANDY SILT (A-4) MICACEOUS
675	676.3	8.5	3	3	3	6		M		679.3 RED-BROWN GRAY AND TAN, SILTY F. TO MED. SAND (A-2-4) SAPROLITIC, MICACEOUS 5.5
670	671.3	13.5	3	3	3	6		D		
665	666.3	18.5	3	3	4	7		M		
660	661.3	23.5	3	3	4	7		D		
655	656.3	28.5	6	9	12	21		D		
650	651.3	33.5	13	13	19	32		D		
645	646.3	38.5	5	3	5	8		W		645.8 GRAY BLACK TAN AND BROWN, F. SANDY SILT (A-4) MICACEOUS 39.0
640	641.3	43.5	5	10	10	20		W		
635	636.3	48.5	10	14	30	44		M		638.8 BROWN TAN WHITE AND BLUE, SILTY F. TO MED. SAND (A-2-4) SAPROLITIC, MICACEOUS TO SLI. MICACEOUS 46.0
630	631.3	53.5	10	10	17	27		W		
625	626.3	58.5	14	39	61	100		D		
620	621.3	63.5	16	35	52	87		D		
615	616.3	68.5	70	30/0.1		100/0.6				617.3 WEATHERED ROCK BROWN GRAY AND TAN, DIORITE 67.5
610	611.3	73.5	100/0.4			100/0.4				
	606.3	78.5	60/0.1			60/0.1				606.3 CRYSTALLINE ROCK BROWN GRAY AND TAN, DIORITE 78.5 / 606.2 78.6
										Boring Terminated with Standard Penetration Test Refusal at Elevation 606.2 ft in CR: DIORITE

WBS 42295.1.1	**TIP** B-5136	**COUNTY** CABARRUS	**GEOLOGIST** Hunsberger, W. S.	
SITE DESCRIPTION REPLACE BRIDGE NO. 66 AND 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29/601				**GROUND WTR (ft)**
BORING NO. DET-2	**STATION** 18+17	**OFFSET** 10 ft LT	**ALIGNMENT** -DET-	**0 HR.** N/A
COLLAR ELEV. 688.2 ft	**TOTAL DEPTH** 78.8 ft	**NORTHING** 615,786	**EASTING** 1,521,484	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI9435 CME-55 93% 12/08/2011		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic	
DRILLER Whichard, W.	**START DATE** 07/03/13	**COMP. DATE** 07/03/13	**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
690										688.2 EXISTING PAVEMENT 0.0 / 687.5 0.7
	687.4	0.8	4	6	5	11		M		0.2' BITUMINOUS CONCRETE 0.5' AGGREGATE BASE COURSE
685	684.6	3.6	1	2	2	4		M		**ARTIFICIAL FILL**
	681.9	6.3	6	9	12	21		M		682.2 RED-ORANGE, SANDY SILT (A-4) W/ TRACE ORGANICS 6.0
680	679.7	8.5	4	7	9	16		M		**RESIDUAL**
675	674.7	13.5	4	4	5	9		D		678.8 RED-ORANGE AND BROWN, SILTY MED. SAND (A-2-4) MICACEOUS 9.4
670	669.7	18.5	3	3	5	8		D		RED-ORANGE TAN AND BROWN, SANDY SILT (A-4) MICACEOUS
665	664.7	23.5	6	11	9	20		D		668.4 WHITE ORANGE BROWN AND TAN, SILTY F. TO MED. SAND (A-2-4) 19.8
660	659.7	28.5	12	20	24	44		D		
655	654.7	33.5	24	40	38	78		D		
650	649.7	38.5	3	3	5	8		M		651.2 WHITE BROWN AND TAN, F. SANDY SILT (A-4) 37.0
645	644.7	43.5	2	5	8	13		M		
640	639.7	48.5	7	9	12	21		M		
635	634.7	53.5	7	12	16	28		M		
630	629.7	58.5	16	25	34	59		M		631.2 TAN WHITE AND BROWN, SILTY MED. TO CSE. SAND (A-2-4) MICACEOUS 57.0
625	624.7	63.5	14	29	31	60		M		
620	619.7	68.5	38	62/0.4		100/0.9				619.0 WEATHERED ROCK WHITE GRAY AND BROWN, DIORITE 69.2
615	614.7	73.5	100/0.4			100/0.4				
610	609.7	78.5	100/0.3			100/0.3				609.4 Boring Terminated at Elevation 609.4 ft in WR: DIORITE 78.8
										NOTE: GROUNDWATER NOT ENCOUNTERED DUE TO INTRODUCTION OF BENTONITE SLURRY

FALCON 1210 TRINITY ROAD, SUITE 110, RALEIGH, NORTH CAROLINA 27607

AASHTO SOIL CLASSIFICATION AND GRADATION SHEET

REPLACE BRIDGES NO. 66 & 69 OVER NORFOLK SOUTHERN RR ON US 29/601

WBS NO.: 42295.1.1 , TIP NO.: B-5136

CABARRUS COUNTY, NORTH CAROLINA

FALCON ENGINEERING, INC. PROJECT NO: G13055.00

BORING		SAMPLE	TOTAL SAMPLE			Atterberg Limit Test Results			Natural Moisture Content
AASHTO Classification			PERCENT PASSING						
STATION	OFFSET (FEET)	DEPTH (FEET)	#10	#40	#200	LL	PL	PI	%
EB2-A		SS-1	100	86	79	81	33	48	27.9
A-7-5									
23+31	53 ' LT	8.5-10.0							
EB2-B		SS-2	99	80	56	54	26	28	22.6
A-7-6									
22+87	32' RT	3.5-5.0							
EB2-B		SS-3	97	75	60	69	52	17	23.7
A-7-5									
22+87	32' RT	18.5-20.0							

SIGNATURE 105-03-0803

Notes:
LL = Liquid limit
PL = Plastic limit
PI = Plasticity index = LL - PL

LOOKING SOUTH TOWARDS EXISTING BRIDGE FROM NEAR BORING DET–1

LOOKING UPSTATION ALONG –L– FROM NEAR EXISTING END BENT 1

FALCON ENGINEERING

FALCON ENGINEERING, INC.
1210 TRINITY ROAD, SUITE 110
RALEIGH, NC 27607

PHONE: 919.871.0800
FAX: 919.871.0803

SITE PHOTOGRAPHS

REPLACE BRIDGE NO. 66 & 69 OVER NORFOLK SOUTHERN RAILROAD ON US 29 /601
CABARRUS COUNTY, NORTH CAROLINA
WBS NO.: 42295.1.1 , TIP NO.: B–5136
FALCON PROJECT NO.: G13055.00