NORTH CAROLINA DIVISION OF HIGHWAYS

GEOTECHNICAL UNIT

SOIL AND ROCK CLASSIFICATION, LEGEND, AND ABBREVIATIONS

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #270)							SILT-CLAY MATERIALS (> 35% PASSING #270)				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											
#270	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
(PASSING #40) LL	6 MX		N.P.	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
PI				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 & SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				

• PI OF A-7-5 ≤ (LL-30); PI OF A-7-6 > (LL-30)

TEXTURE OR GRAIN SIZE

BOULDER	COBBLE	GRAVEL	COARSE SAND	MED. SAND	FINE SAND	SILT	CLAY

GRAIN SIZE (mm)	305	75	2	0.6	0.425	0.2	0.075	0.002
(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		
OM OPTIMUM MOISTURE	-MOIST- (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL SHRINKAGE LIMIT		
	-DRY- (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

ROCK DESCRIPTION

IN THE BROADEST MEANING, HARD ROCK IS CONSIDERED TO BE THAT INDURATED EARTH MATERIAL WHICH CANNOT BE SAMPLED BY CONVENTIONAL SOIL SAMPLING TOOLS OR TECHNIQUES. THE BOUNDARY BETWEEN SOIL AND ROCK IS ARBITRARY. TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF 'WEATHERED ROCK'. FOR THE PURPOSE OF THIS INVESTIGATION, THESE MATERIALS ARE DIVIDED AS FOLLOWS:

TERM	SYMBOLS		DESCRIPTION
HARD ROCK (HR)	CORED ROCK	INFERRED ROCK LINE [2]	MATERIAL THAT CANNOT BE PENETRATED BY POWER AUGERS, EXCEPT IN THIN LEDGES, AND REQUIRES ROCK CORING TOOLS FOR OBTAINING A SAMPLE
WEATHERED ROCK (WR)		HARD WEATHERED ROCK (HWR)	MATERIAL THAT CAN BE PENETRATED WITH GREAT DIFFICULTY USING POWER AUGERS AND YIELDS SPT REFUSAL [1]
		SOFT WEATHERED ROCK (SWR)	MATERIAL THAT CAN BE PENETRATED WITH SOME DIFFICULTY USING POWER AUGERS AND YIELDS SPT VALUES > 100 BLOWS BUT < SPT REFUSAL

[1] SPT REFUSAL ≤ 25 mm OF PENETRATION PER 50 BLOWS IN SPT.

[2] AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH AUGERS COULD NO LONGER PENETRATE. THE HARD ROCK SYMBOL IS SHOWN WHEN ROCK IS CORED AND ONLY TO THAT DEPTH CORED. A DESCRIPTION OF ROCK IS GIVEN, INCLUDING:

CORE RECOVERY (REC.) - TOTAL LENGTH OF ROCK RECOVERED IN THE CORE BARREL DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%.

ROCK QUALITY DESIGNATION (ROD) - TOTAL LENGTH OF SOUND ROCK SEGMENTS RECOVERED THAT ARE LONGER THAN OR EQUAL TO 100 mm DIVIDED BY THE TOTAL LENGTH OF THE CORE RUN TIMES 100%.

NORTH CAROLINA PROFESSIONAL SEAL 025257 12-28-00 ENGINEER NYLE L. HOTHEM

SEAL

Signature

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTANCE (N - VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH (q_u) (kN / m²)
GENERALLY GRANULAR MATERIAL	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	VERY SOFT	< 2	< 25
	SOFT	2 TO 4	25 TO 50
	MEDIUM STIFF	4 TO 8	50 TO 100
	STIFF	8 TO 15	100 TO 200
	VERY STIFF	15 TO 30	200 TO 400
	HARD	> 30	> 400

GROUND WATER

- WATER LEVEL IN BORE HOLE { IMMEDIATELY AFTER DRILLING (I.A.D.) / SOON AFTER DRILLING (▽ 0 HRS.)
- STATIC WATER LEVEL (AFTER 24 - 48 HRS.)
- PERCHED WATER (PW), SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEPAGE

MISCELLANEOUS SYMBOLS AND ABBREVIATIONS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- 25° STRIKE AND DIP
- APPARENT DIP (NORMAL TO_____)
- ROD SOUNDING
- SPT DCP VST TEST BORING
- AUGER BORING
- CORE BORING
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- MW MONITORING WELL
- PAVEMENT STRUCTURE

SAMPLE DESIGNATIONS: S-BULK SAMPLE; SS-SPLIT SPOON SAMPLE; ST-SHELBY TUBE SAMPLE

ABBREVIATIONS

ALLUV.	ALLUVIUM	MIC.	MICACEOUS
A.R.	AUGER REFUSAL	MOT.	MOTTLED
B.T.	BORING TERMINATED	N	BLOWS / 300 mm
BLDR.	BOULDER	NS	NO SAMPLE TAKEN
CALC.	CALCAREOUS	ORG.	ORGANIC
CL.	CLAY	R.C.R.	ROLLER CONE REFUSAL
CLY.	CLAYEY	REF.	REFER TO
COB.	COBBLE	RES.	RESIDUAL
CSE.	COARSE	S.	SOFT
D.C.P.	DYNAMIC CONE PENETRATION	SAT.	SATURATED
EST.	ESTIMATED	SD.	SAND
F.	FINE	SDY.	SANDY
FOSS.	FOSSILIFEROUS	SED(S).	SEDIMENT(S)
FRAC.	FRACTURED	SL.	SILT, SILTY
FRAG(S).	FRAGMENT(S)	SLI.	SLIGHTLY
GR.	GRAVEL	SPT	STANDARD PENETRATION TEST
GS	SPECIFIC GRAVITY	TS.	TOPSOIL
GW	GROUND WATER	VST	VANE SHEAR TEST
MED.	MEDIUM	V.	VERY
N.M.	NOT MEASURED	W/	WITH
N.R.	NO RECOVERY	T.C.R.	TRI-CONE REFUSAL
C.T.	CORING TERMINATED	A.R.	AUGER REFUSAL

BENCH MARK: BM 4- CHISELED SQUARE IN STEP OF LOADING DOCK. -BL- STA 12+59.304, 28.983 M LT. (EL. 354.751)

STATE PROJECT NO. 8.2791701

T.I.P. NO. U-2306A F.A. NO. MASTP-1216(8)

SITE DESCRIPTION BRIDGE ON NSRR OVER SR 1007

PROJECT ENGINEER C.V.NORVILLE SUBMITTED BY N.L. HOTHEM

PERSONNEL D.L. TEAGUE
T.J. ROBERSON
D.R. KITCHEN

DATE SUBMITTED 12/00

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WAS 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 UNIT @ (919) 250-4088. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA IS 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.

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.

LEGEND SUPPLEMENT

In addition to the terms and abbreviations listed on the Legend Sheet, the following will be used to further describe rock quality on this project. Because of limited space on the logs, abbreviations are in parenthesis.

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 0.025 meters. 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 show 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 & can be excavated with geologist's pick. Rock gives "clunk" sound when struck. **Comparable to hard weathered rock.**
Severe (SEV.)	All rocks 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. **Comparable to soft weathered rock.**
Very Sever (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. **Comparable to soil**
Complete	Rock reduced to soil. Rock fabric not discernible only in small and scattered concentrations. Quartz may be present as dikes or stringers. Saprolite is also an example. **Comparable to soil.**

ROCK CONTINUITY

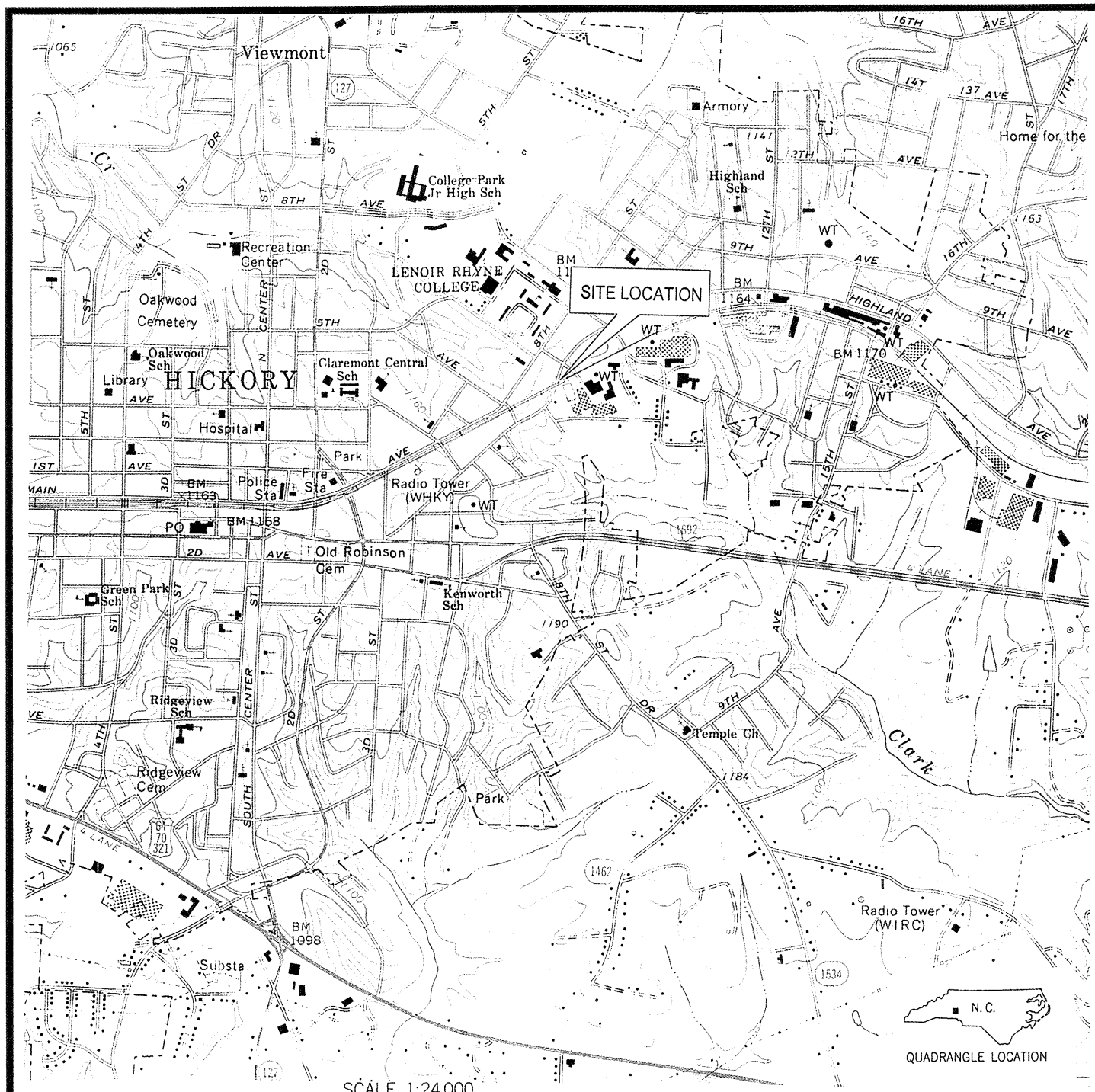
Sound -	Core Pieces Larger Than .2 meters
Slightly Fractured (SLI.FRAC.) -	Core Pieces Between .1 meters and .2 meters
Moderately Fractured (MOD.FRAC.) -	Core pieces between .025 meters and .1 meters
Extremely Fractured (EXT.FRAC.) -	Core pieces less than .025

JOINT SPACING

Average Discontinuity Spacing (ADS)
The average measured distance (in meters) between joints in the same set. Will not apply to individual joints.

JOINT THICKNESS

Average Discontinuity Thickness (ADS)
The average thickness or width of gap in the joint (in meters).



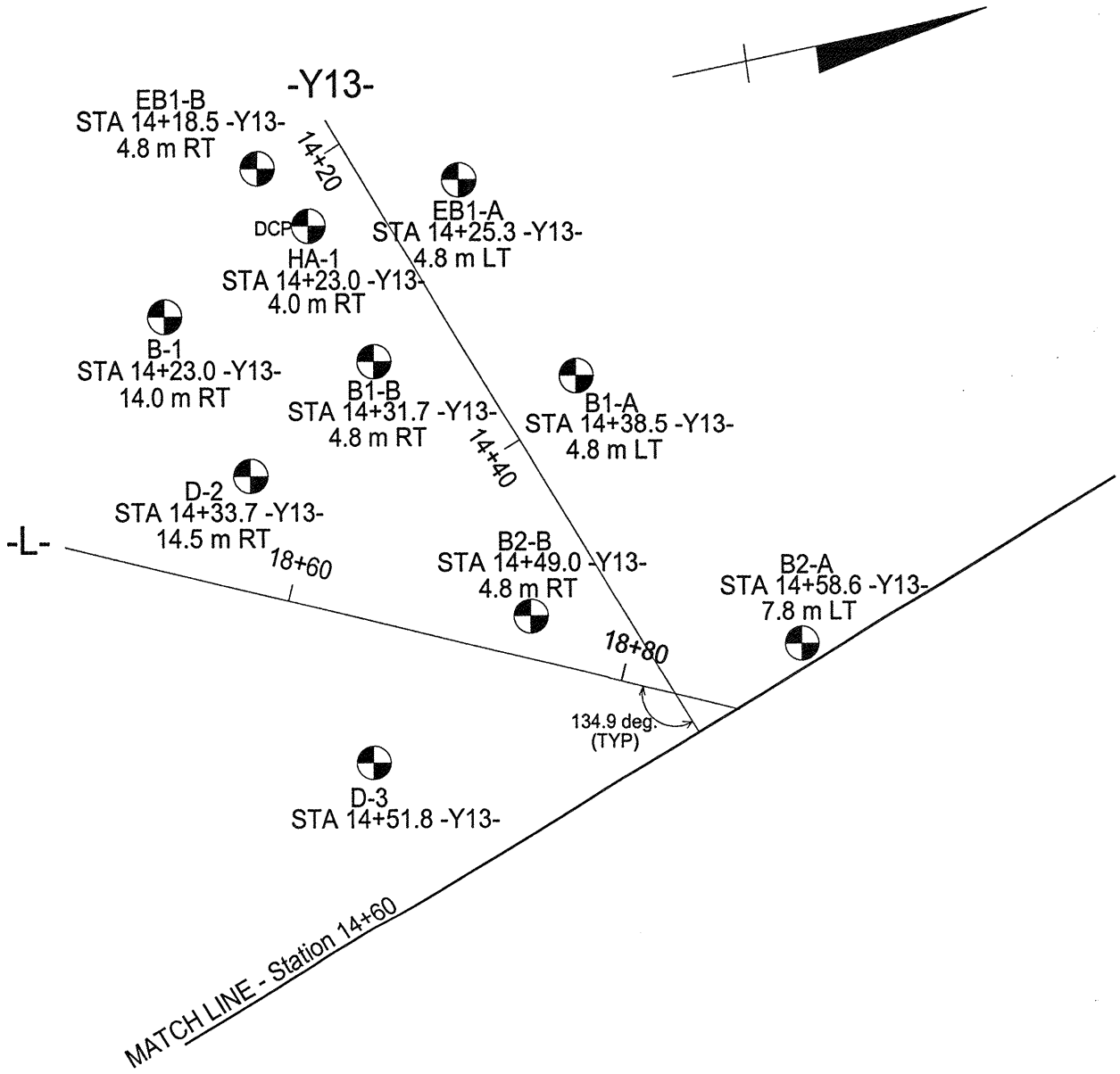
TRIGON
ENGINEERING CONSULTANTS, INC.

SITE LOCATION PLAN

BRIDGE ON NSRR OVER SR 1007

CATAWBA COUNTY

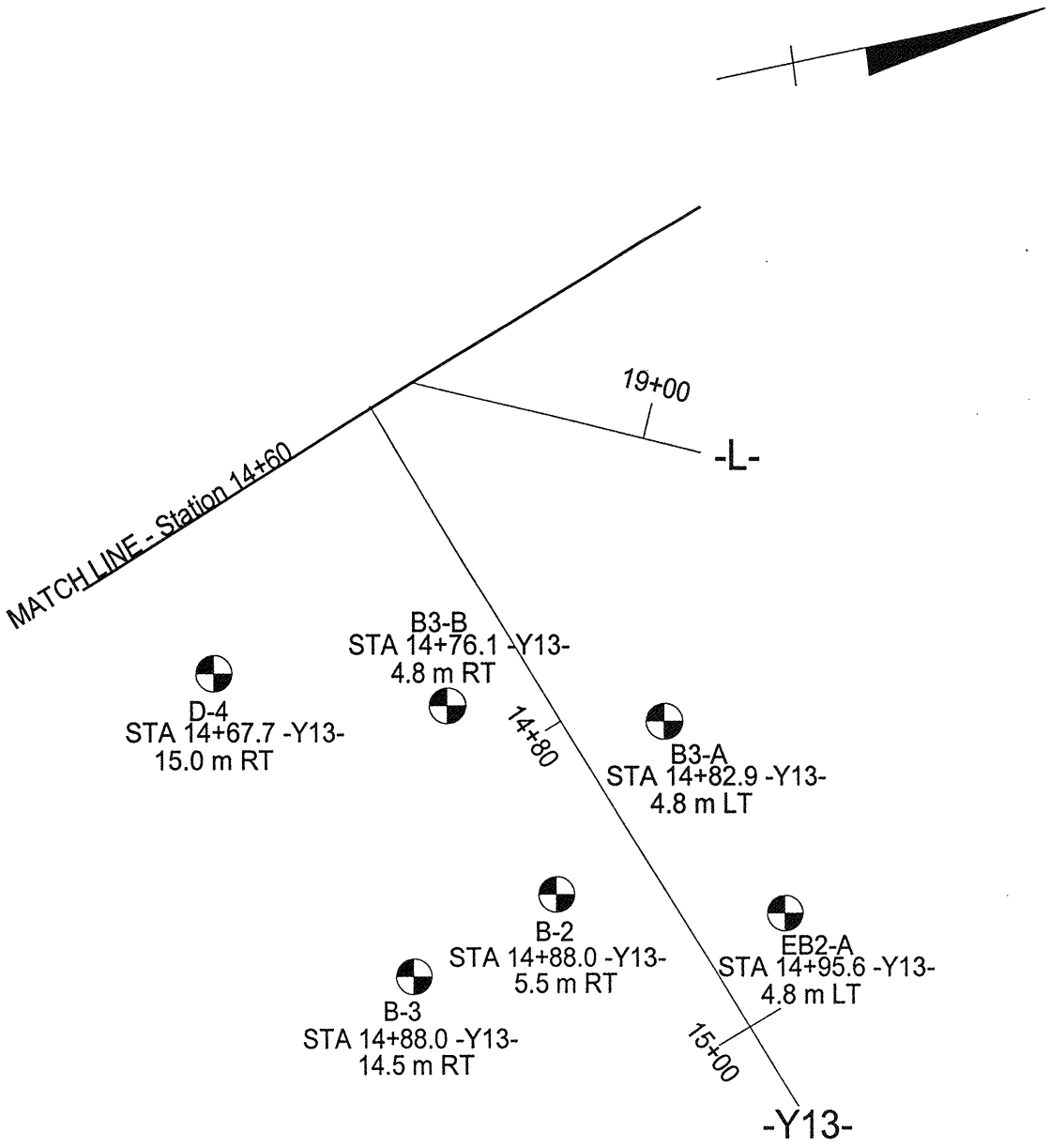
Project No.	8.2791701	Tip No.	U-2306A
Federal No.	MASTP-1216(8)	Vert. Scale	N/A
Date	12/00	Horiz. Scale	N/A
Drawn By	DLT	Drawing No.	1



BM 4 - CHISELED SQUARE IN STEP OF LOADING DOCK
-BL- STA 12+59.304, 28.983 m LT (EL. 354.751)

TRIGON

BORING IDENTIFICATION DIAGRAM	
BRIDGE ON NSRR OVER SR 1007	
CATAWBA COUNTY	
Project No. 8.2791701	Tip No. U-2306A
Federal No. MASTP-1216(8)	Vert. Scale N/A
Date 12/00	Horiz. Scale 1:400
Drawn By DLT	Drawing No. 2A

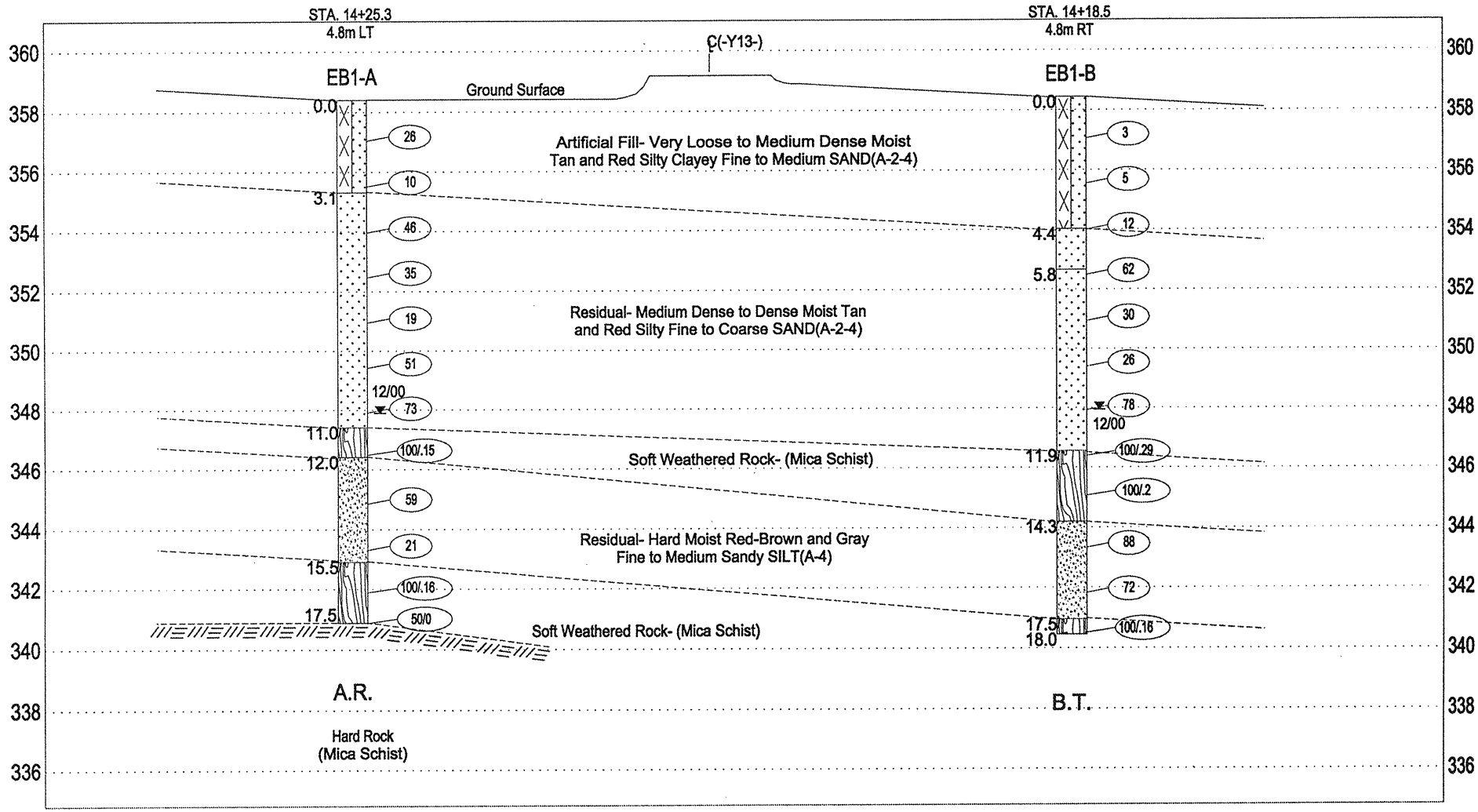


0 m 10 m 20 m

BM 4 - CHISELED SQUARE IN STEP OF LOADING DOCK
-BL- STA 12+59.304, 28.983 m LT (EL. 354.751)

TRIGON

BORING IDENTIFICATION DIAGRAM	
BRIDGE ON NSRR OVER SR 1007	
CATAWBA COUNTY	
Project No. 8.2791701	Tip No. U-2306A
Federal No. MASTP-1216(8)	Vert. Scale N/A
Date 12/00	Horiz. Scale 1:400
Drawn By DLT	Drawing No. 2B



0 2 4
VERT. METERS

0 1 2
HORZ. METERS

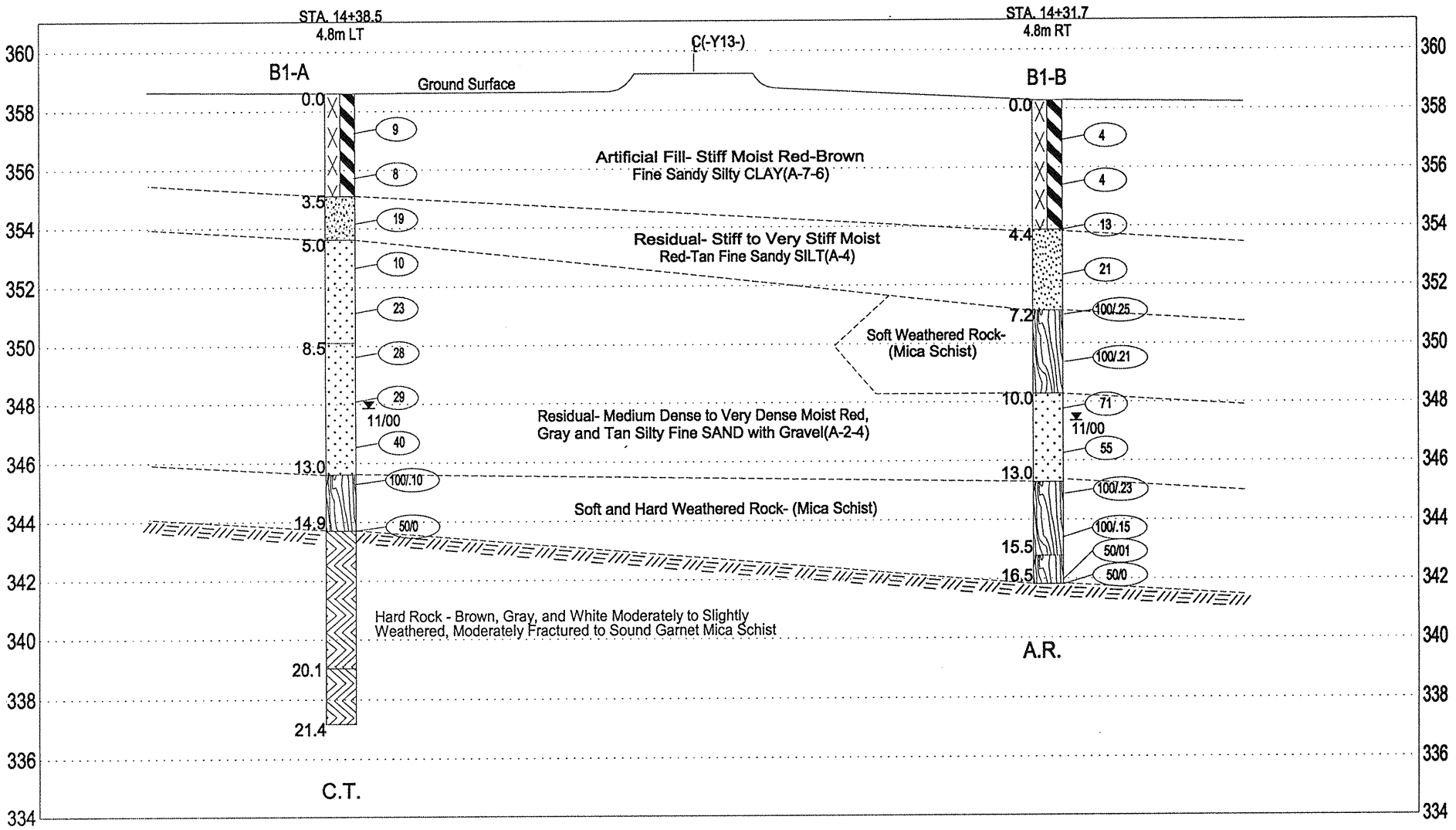
TRIGON
ENGINEERING CONSULTANTS, INC.

CROSS SECTION THROUGH BORINGS AT END BENT-1

BRIDGE ON NSRR OVER SR 1007

CATAWBA COUNTY, NORTH CAROLINA

Project No. 8.2791701	TIP No. U-2306A
Federal No. MASTP-1216(8)	Vert. Scale 1 = 200
Date 12/12/00	Horiz. Scale 1 = 100
Drawn by DRK	Drawing No. 3



0 2 4
VERT. METERS

0 1 2
HORZ. METERS

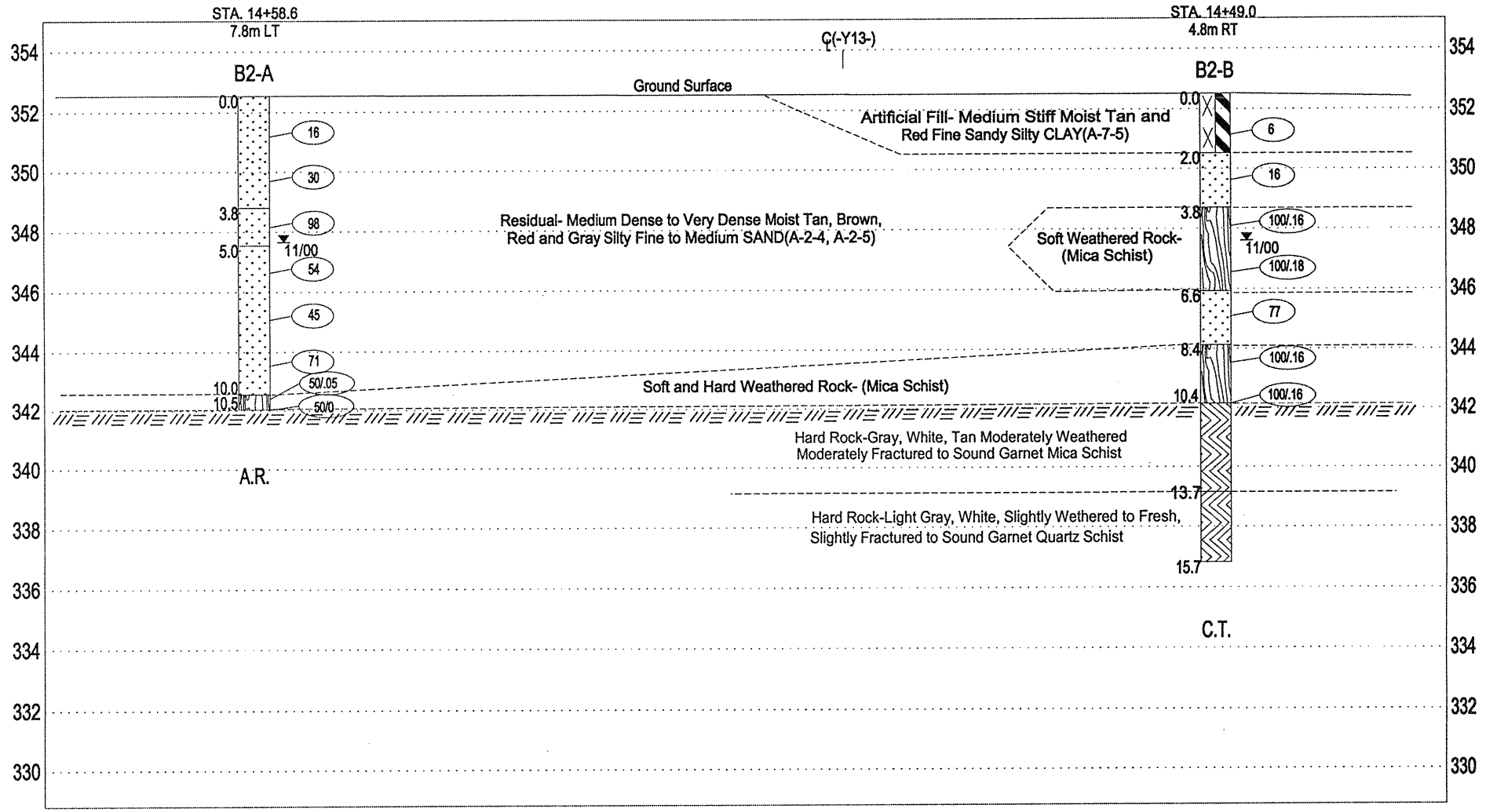
TRIGON
ENGINEERING CONSULTANTS, INC.

CROSS SECTION THROUGH BORINGS AT BENT-1

BRIDGE ON NSRR OVER SR 1007

CATAWBA COUNTY, NORTH CAROLINA

Project No. 8.2791701	TIP No. U-2306A
Federal No. MASTP-1216(8)	Vert. Scale 1 = 200
Date 12/12/00	Horiz. Scale 1 = 100
Drawn by DRK	Drawing No. 4



0 2 4
VERT. METERS

0 1 2
HORZ. METERS

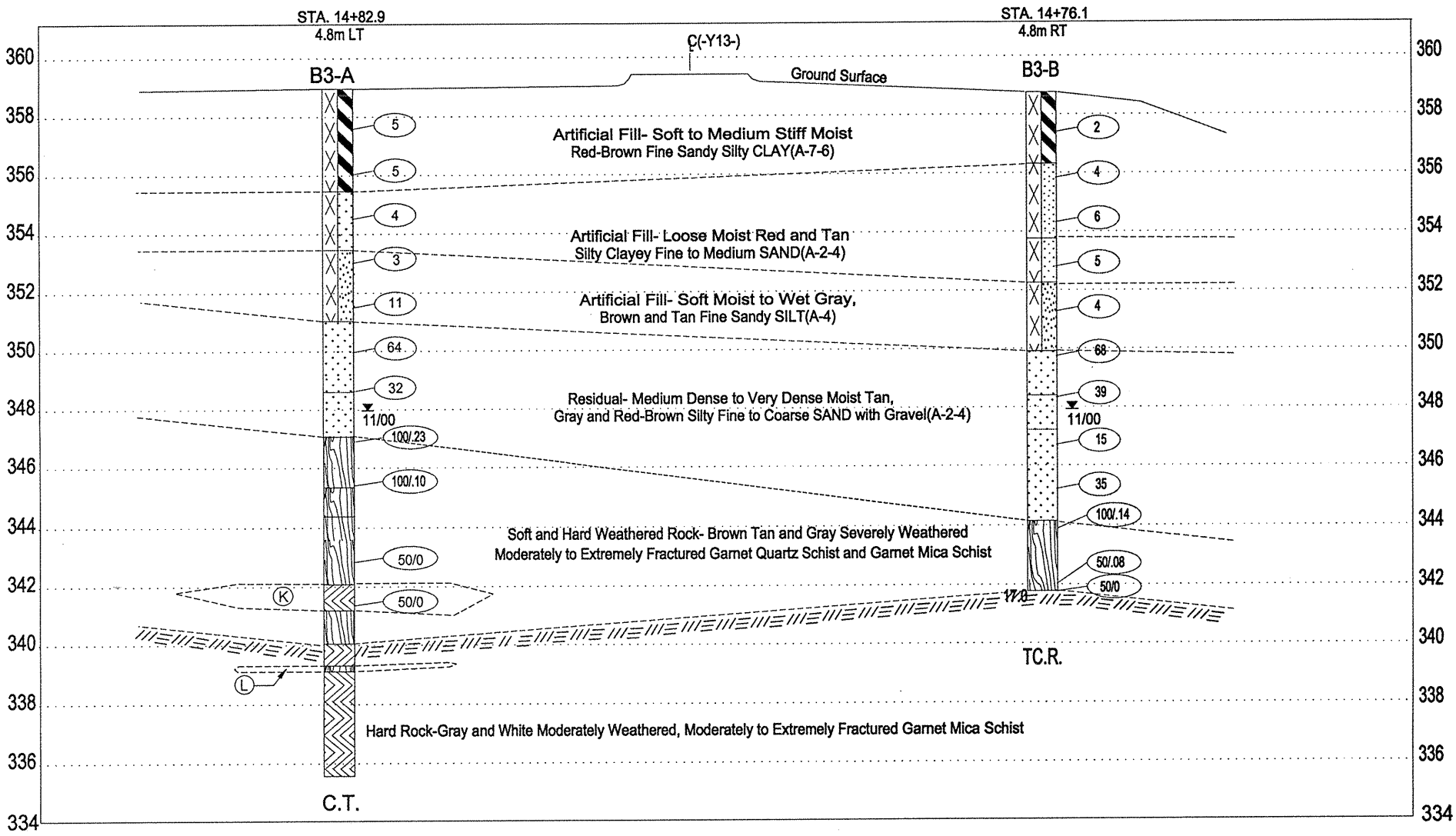
TRIGON
ENGINEERING CONSULTANTS, INC.

CROSS SECTION THROUGH BORINGS AT BENT-2

BRIDGE ON NSRR OVER SR 1007

CATAWBA COUNTY, NORTH CAROLINA

Project No. 8.2791701	TIP No. U-2306A
Federal No. MASTP-1216(8)	Vert. Scale 1 = 200
Date 12/12/00	Horiz. Scale 1 = 100
Drawn by DRK	Drawing No. 5



(K) Hard Rock-Tan and Gray Moderately Weathered
Moderately to Extremely Fractured Garnet Quartz Schist

(L) Soft Weathered Rock-Tan Severely Weathered Extrememly Fractured
Garnet Mica Schist

0 1 2
HORZ. METERS

0 2 4
VERT. METERS

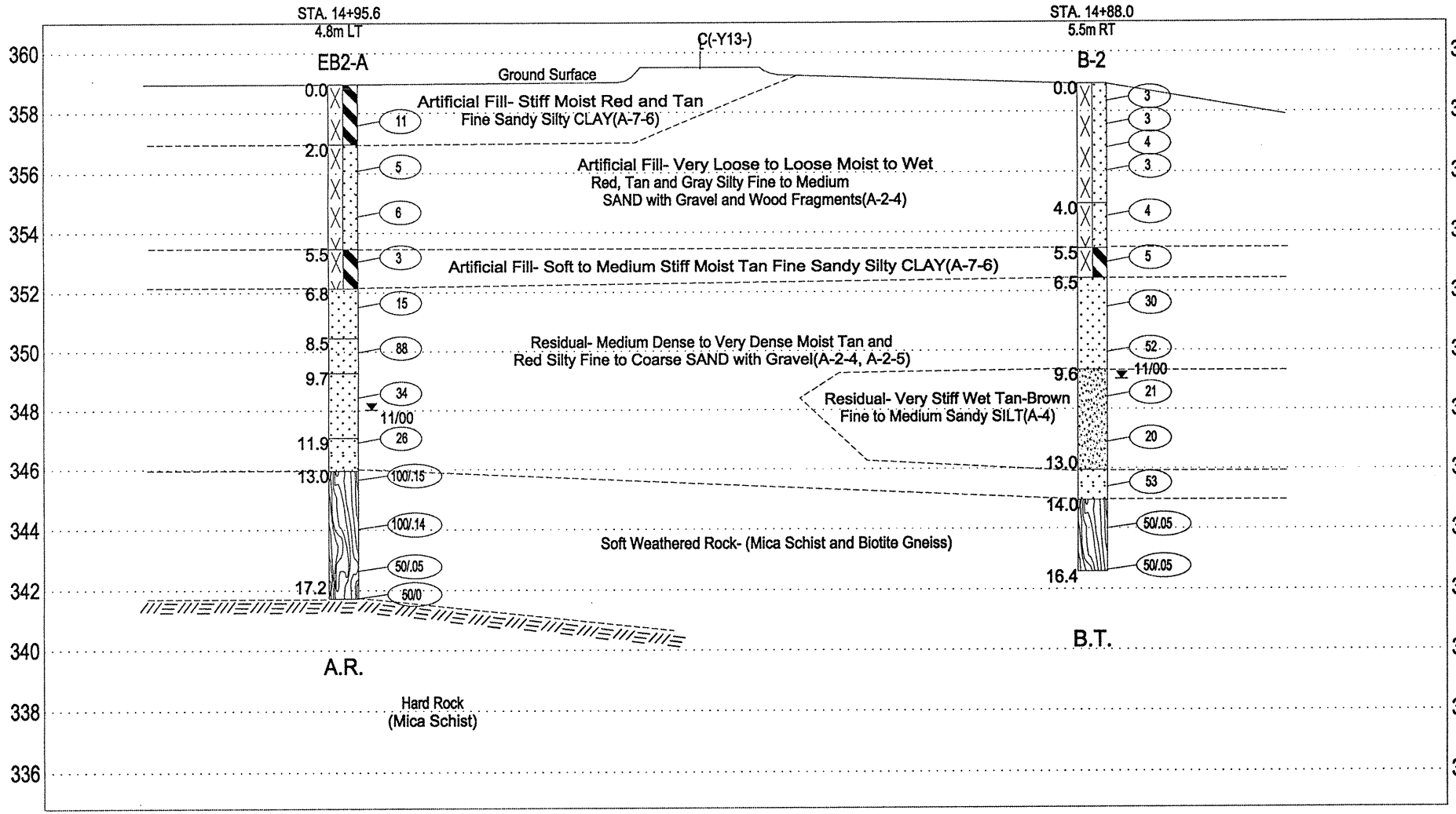
TRIGON
ENGINEERING CONSULTANTS, INC.

CROSS SECTION THROUGH BORINGS AT BENT-3

BRIDGE ON NSRR OVER SR 1007

CATAWBA COUNTY, NORTH CAROLINA

Project No. 8.2791701	TIP No. U-2306A
Federal No. MASTP-1216(8)	Vert. Scale 1 = 200
Date 12/12/00	Horiz. Scale 1 = 100
Drawn by DRK	Drawing No. 6



0 2 4

VERT. METERS

0 1 2

HORZ. METERS

TRIGON

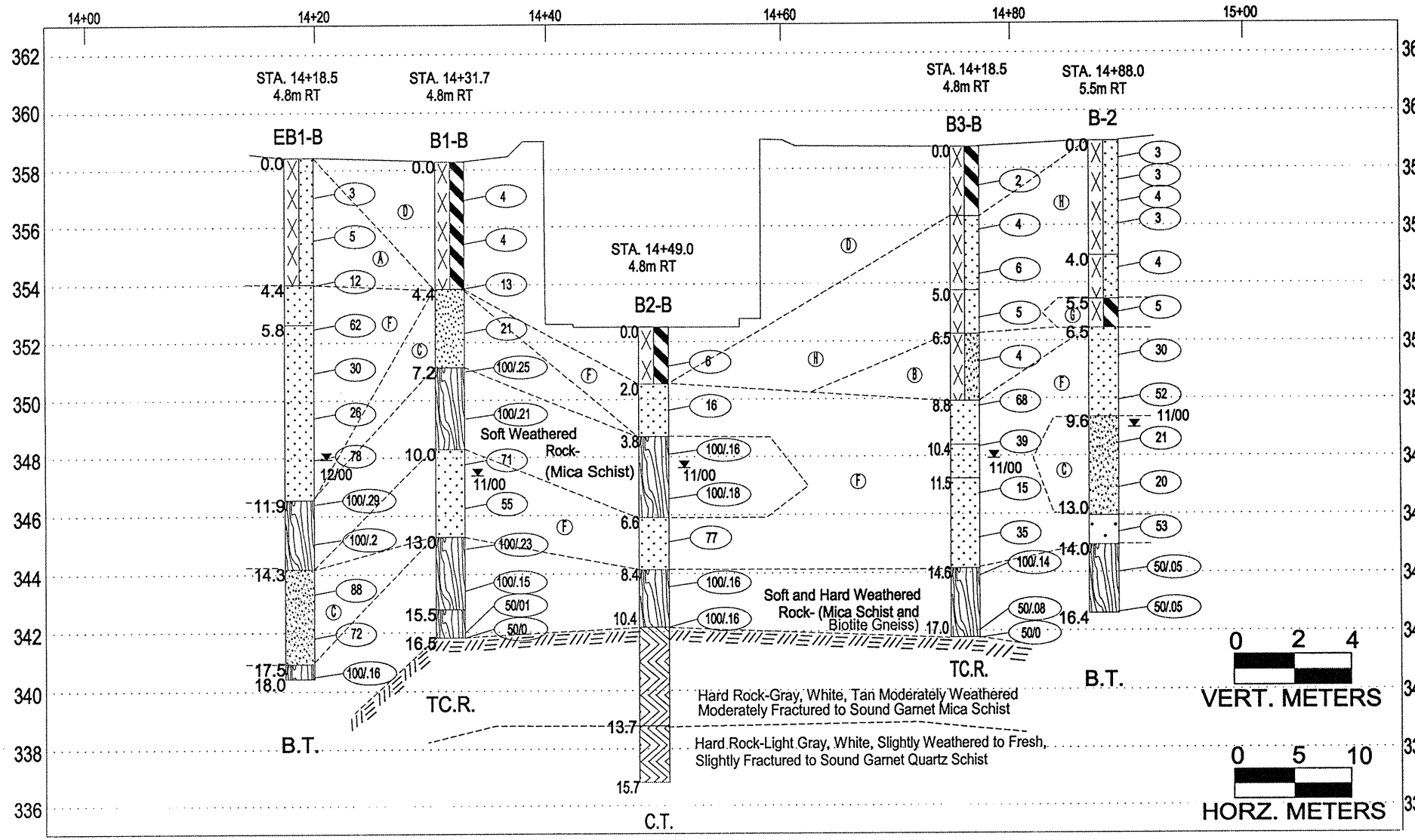
ENGINEERING CONSULTANTS, INC.

CROSS SECTION THROUGH BORINGS AT END BENT-2

BRIDGE ON NSRR OVER SR 1007

CATAWBA COUNTY, NORTH CAROLINA

Project No. 8.2791701	TIP No. U-2306A
Federal No. MASTP-1216(8)	Vert. Scale 1 = 200
Date 12/12/00	Horiz. Scale 1 = 100
Drawn by DRK	Drawing No. 7



Ⓐ Artificial Fill- Loose Dry Red and Dark Gray Silty Fine to Medium SAND with Gravel(A-2-4)

Ⓑ Residual- Loose Moist Stiff Tan and Red Clayey Silty Fine to Medium SAND(A-2-4)

Ⓒ Residual- Stiff to Hard Moist to Wet Tan, Red and Brown Fine to Coarse Sandy SILT(A-5, A-4)

Ⓓ Artificial Fill- Soft Moist Tan-Brown Silty Fine Sandy CLAYI(A-7-6)

Ⓕ Residual- Medium Dense to Very Dense Moist Tan, Red, Gray and Brown Silty Fine to Coarse SAND with Gravel (A-2-4)

Ⓖ Artificial Fill- Medium Stiff Wet Tan Fine Sandy Silty CLAYI(A-7-6)

Ⓗ Residual- Very Loose to Loose Wet Tan, Red and Dark Gray Silty Fine to Medium SAND with Gravel and Wood Fragments (A-2-4)

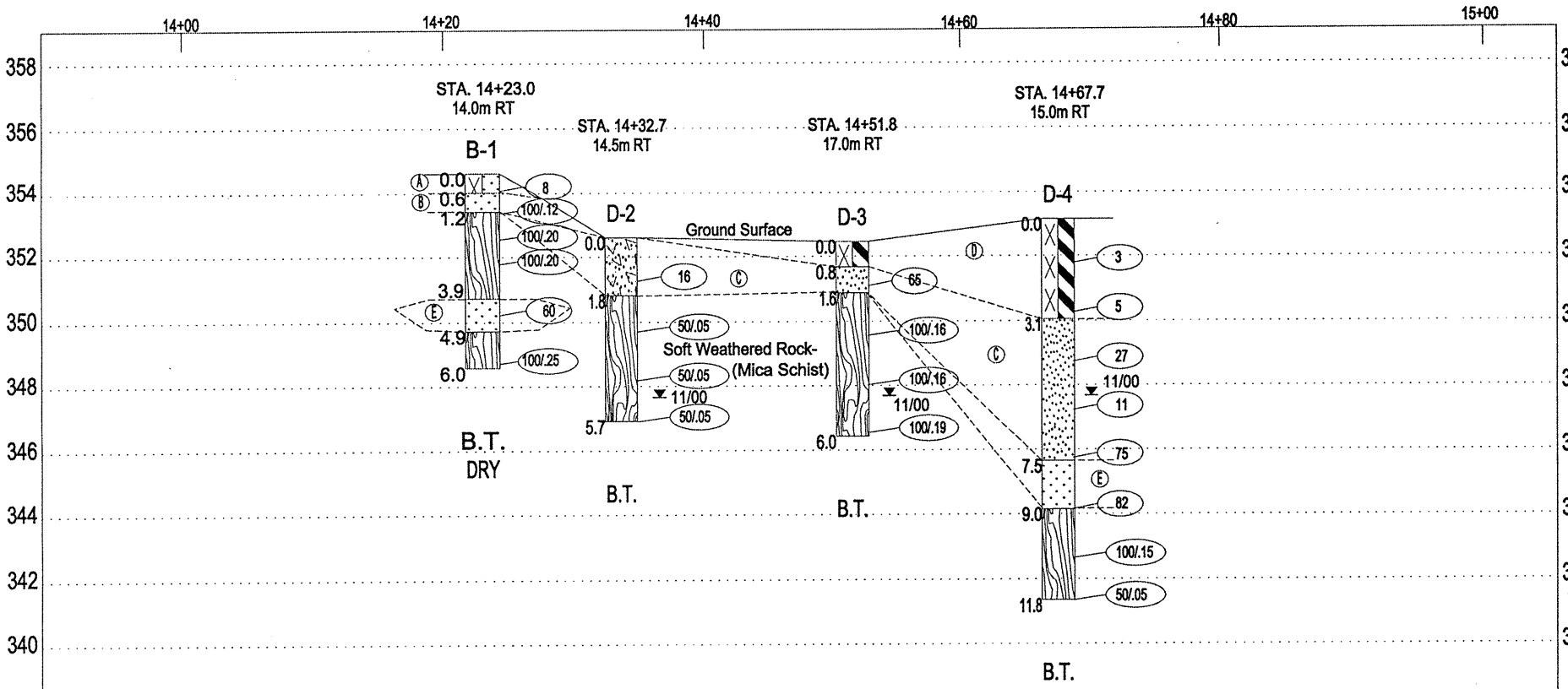
TRIGON
ENGINEERING CONSULTANTS, INC.

PROFILE 4.8m RIGHT OF -Y13-

BRIDGE ON NSRR OVER SR 1007

CATAWBA COUNTY, NORTH CAROLINA

Project No. 8.2791701	TIP No. U-2306A
Federal No. MASTP-1216(8)	Vert. Scale 1 = 200
Date 12/12/00	Horiz. Scale 1 = 500
Drawn by DRK	Drawing No. 8



0 2 4
VERT. METERS

0 5 10
HORZ. METERS

TRIGON
ENGINEERING CONSULTANTS, INC.

PROFILE 14.5m RIGHT OF -Y13-(DETOUR STRUCTURE)

BRIDGE ON NSRR OVER SR 1007

CATAWBA COUNTY, NORTH CAROLINA

Project No. 8.2791701	TIP No. U-2306A
Federal No. MASTP-1216(8)	Vert. Scale 1 = 200
Date 12/12/00	Horiz. Scale 1 = 500
Drawn by DRK	Drawing No. 9

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** C. Norville
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. EB1-A	**BORING LOCATION** 14+25.3	**OFFSET** 4.8 LT	**ALIGNMENT** -Y13-	**0 HR.** 10.56
COLLAR ELEV. 358.41 m	**NORTHING**	**EASTING**	**24 HR.** 10.56
TOTAL DEPTH 17.54 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 82.6 mm ID HSA	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/21/00	**COMPLETED** 11/21/00	**SURFACE WATER DEPTH**	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
358.41					Ground Surface Elev. 358.41				358.41 0.00
358	1.07	8	13	13	26		M		Artificial Fill: Medium Dense, Moist, Tan and Red, Silty Fine to Medium SAND (A-2-4)
356	2.59	4	5	5	10		M		355.31 3.10
354	4.12	17	23	23	46		M		Residual: Medium Dense to Very Dense, Moist, Tan and Red, Silty Fine to Coarse SAND (A-2-4)
352	5.64	13	19	16	35	SS-4	17.7		
350	7.16	6	8	11	19		M		
348	8.69	25	30	21	51		M		
346	10.21	25	29	44	73		M		347.41 11.00
	11.74	29	100/.15		100/.15		D		Soft Weathered Rock - Mica Schist
344	13.26	16	26	33	59		M		346.41 12.00
342	14.79	7	7	14	21		M		Residual: Very Stiff to Hard, Moist, Brown and Gray, Fine Sandy SILT (A-4)
	16.31	13	85	15/.01	100/.16		D		342.91 15.50
	17.54	50/0			50/0		D		Soft Weathered Rock - Mica Schist
									340.87 17.54
									Auger Refusal at 17.54m (EL 340.87) on Hard Rock - Mica Schist

TEC-NCDOT_BORE_NEW 01100112.GPJ NCDOT2.GDT 12/21/00

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** D. Teague
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. EB1-B	**BORING LOCATION** 14+18.5	**OFFSET** 4.8 RT	**ALIGNMENT** -Y13-	**0 HR.** 10.56
COLLAR ELEV. 358.44 m	**NORTHING**	**EASTING**	**24 HR.** 10.56
TOTAL DEPTH 18.00 m	**DRILL MACHINE** CME 45 Mud Bug	**DRILL METHOD** 82.6 mm ID HSA	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/30/00	**COMPLETED** 12/1/00	**SURFACE WATER DEPTH**	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
358.44					Ground Surface Elev. 358.44				358.44 0.00
358	1.07	2	2	1	3		M		Artificial Fill: Very Loose to Loose, Moist, Red and Brown, Clayey Fine Sand (A-2-4)
356	2.59	3	2	3	5		M		
	4.12	5	4	8	12		M		354.02 4.42
354	5.64	14	25	37	62		M		Residual: Medium Dense, Moist, Tan, Silty Fine SAND (A-2-4)
352	7.16	12	15	15	30		M		352.65 5.79
350	8.69	10	11	15	26		M		Medium Dense to Very Dense, Moist, Tan and Gray, Silty Fine SAND (A-2-4)
	10.21	31	45	33	78	SS-7	2 3		
348	11.74	15	33	67/.14	100/.29		D		346.55 11.89
346	13.26	65	35/.05		100/.2		D		Soft Weathered Rock - Mica Schist
344	14.79	18	38	50	88		M		344.19 14.25
	16.31	23	30	42	72		M		Residual: Hard, Moist, Red and Gray, Fine to Medium Sandy SILT (A-4)
342	17.84	35	65/.01		100/.16		D		340.94 17.50
									Soft Weathered Rock - Mica Schist
									340.44 18.00
									Boring Terminated at 18.00m (EL 340.44) in Hard Weathered Rock - Mica Schist.

TEC-NCDOT_BORE_NEW 01100112.GPJ NCDOT2.GDT 12/21/00

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** C. Norville
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. B1-A	**BORING LOCATION** 14+38.5	**OFFSET** 4.8 LT	**ALIGNMENT** -Y13-	**0 HR.** NM
COLLAR ELEV. 358.61 m	**NORTHING**	**EASTING**	**24 HR.** 10.74
TOTAL DEPTH 21.44 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 98 mm Tricone	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/20/00	**COMPLETED** 11/21/00	**SURFACE WATER DEPTH**	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
358.61					Ground Surface Elev. 358.61				358.61 0.00
358	1.07	6	5	4	9		M		Artificial Fill: Stiff, Moist, Red, Fine to Medium Sandy Silty CLAY (A-7-6)
356	2.59	2	4	4	8		M		355.11 3.50
	4.12	6	7	12	19	SS-3	47.9		Residual: Very Stiff, Moist, Red, Fine Sandy SILT (A-4)
354	5.64	4	5	5	10		M		353.61 5.00
352	7.16	6	10	13	23		M		Medium Dense, Moist, Tan and Red, Silty Fine SAND (A-2-4)
350	8.69	9	12	16	28		M		350.11 8.50
	10.21	10	13	16	29		M		Medium Dense to Dense, Moist, Tan and Brown, Silty Fine SAND (A-2-4)
348	11.74	6	12	28	40		M		345.61 13.00
346	13.26	100/.10			100/.10		D		Soft Weathered Rock - Mica Schist
344	14.90	50/0			50/0	RS-1	D		343.71 14.90
342									Hard Rock - Brown White Mod. Weathered, Mod. Fractured to Sound Garnet Mica Schist with Extremely Fractured Zones from 15.16 m to 15.22 m, 16.80 m to 16.92 m, 18.50 m to 18.60 m, 19.10 m to 19.30 m, and 19.94 m to 20.07 m.
340									

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** C. Norville
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. B1-A	**BORING LOCATION** 14+38.5	**OFFSET** 4.8 LT	**ALIGNMENT** -Y13-	**0 HR.** NM
COLLAR ELEV. 358.61 m	**NORTHING**	**EASTING**	**24 HR.** 10.74
TOTAL DEPTH 21.44 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 98 mm Tricone	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/20/00	**COMPLETED** 11/21/00	**SURFACE WATER DEPTH**	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
339.61					Continued from previous page				
						RS-2			338.54 — 20.07 Hard Rock - Grey White, Slightly Weathered Slightly Fractured to Sound Garnet Mica Schist With Extremely Fractured Zone from 20.77 m to 20.78 m.
338									337.17 — 21.44 Coring Terminated at 21.44m (EL 337.17) in Hard Rock - Mica Schist

TRIGON ENGINEERING CONSULTANTS, INC.
CORE BORING REPORT

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** C. Norville
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. B1-A	**BORING LOCATION** 14+38.5	**OFFSET** 4.8 LT	**ALIGNMENT** -Y13-	**0 HR.** NM
COLLAR ELEV. 358.610 m	**NORTHING**	**EASTING**	**24 HR.** 10.74
TOTAL DEPTH 21.44 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 98 mm Tricone	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/20/00	**COMPLETED** 11/21/00	**SURFACE WATER DEPTH**	
CORE SIZE NQ2	**TOTAL RUN** 6.84 m	**DRILLER** B.S.	

ELEV. (m)	DEPTH (m)	RUN (m)	DRILL RATE (Min./0.3m)	RUN REC. (m) %	RUN RQD (m) %	SAMP. NO.	STRATA REC. %	STRATA RQD %	DESCRIPTION AND REMARKS
343.71	14.90								Begin Coring @ 343.71 m
		0.6	4:30	(0.61)	(0.52)		99%	57%	Hard Rock - Brown White Mod. Weathered, Mod. Fractured to Sound Garnet Mica Schist with Extremely Fractured Zones from 15.16 m to 15.22 m, 16.80 m to 16.92 m, 18.50 m to 18.60 m, 19.10 m to 19.30 m, and 19.94 m to 20.07 m.
				100%	85%				
343.10	15.51		3:45/.31						
		1.5	5:20	(1.49)	(0.96)				3 jts @ 10°-15° ADS=0.01m ADT=0.00m 3 jts @ 5° - 10° ADS=0.01m ADT=0.00m 5 jts @ 10° - 15° ADS=0.01m ADT=0.00m 1 jt @ 68° ADT=0.00m 2 jts @ 15° ADS=0.04m ADT=0.00m 1 jt @ 40° ADT=0.00m 9 jts @ 10° - 20° ADS=0.02m ADT=0.00m 3 jts @ 5° ADS=0.01m ADT=0.00m 11 jts @ 10° - 20° ADS=0.02m ADT=0.00m 1 jt @ 65° ADT=0.00m
				98%	63%				
			6:15						
			3:00						
			4:00						
341.58	17.03		3:00/.32						
		1.5	3:25	(1.52)	(0.79)				
				100%	52%				
			4:00						
			3:45						
			4:10						
340.06	18.55		4:00/.32						
		1.5	3:40	(1.52)	(0.68)				
				100%	45%				
			3:45						
			4:00						
			3:50						
338.54	20.07		3:10/.32						338.54 20.07
		1.4	4:40	(1.34)	(1.19)		98%	87%	Hard Rock - Grey White, Slightly Weathered Slightly Fractured to Sound Garnet Mica Schist With Extremely Fractured Zone from 20.77 m to 20.78 m.
				98%	87%				
			5:00						2 jts @ 5° ADS=0.10m ADT=0.00m 2 jts @ 5° ADS=0.01m ADT=0.00m
			5:00						

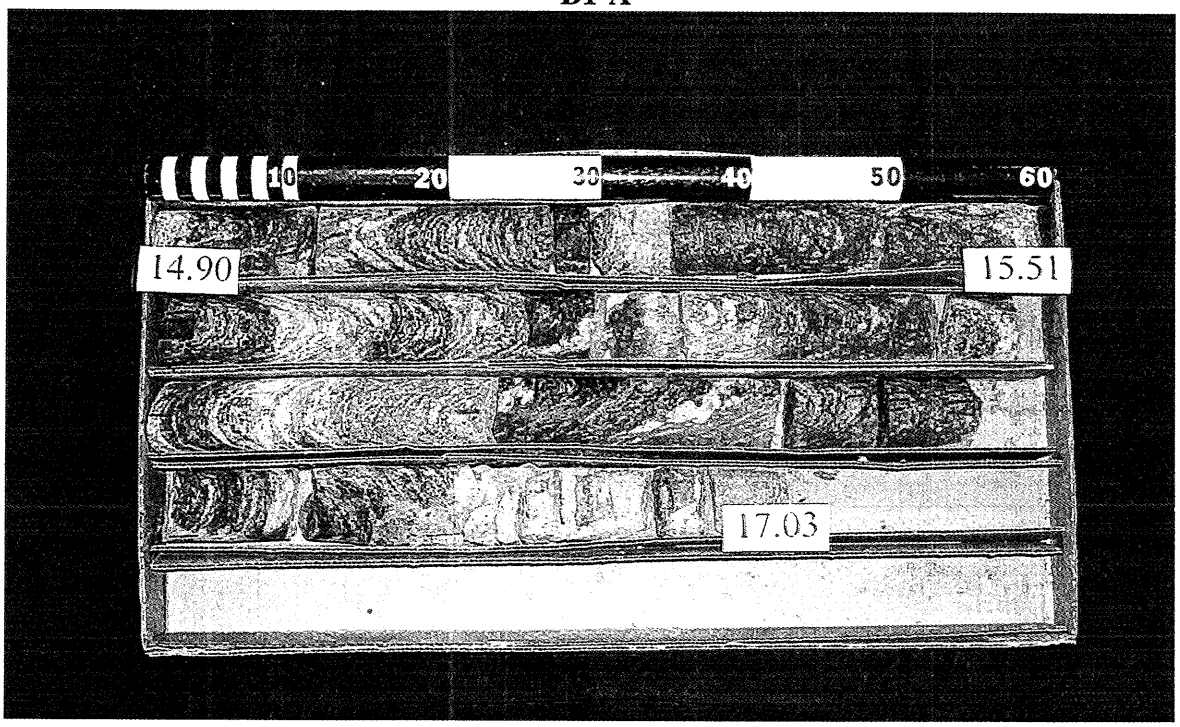
TRIGON ENGINEERING CONSULTANTS, INC.
CORE BORING REPORT

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** C. Norville	
SITE DESCRIPTION Bridge on NSRR over SR 1007				**GROUND WATER (m)**
BORING NO. B1-A	**BORING LOCATION** 14+38.5	**OFFSET** 4.8 LT	**ALIGNMENT** -Y13-	**0 HR.** NM
COLLAR ELEV. 358.610 m	**NORTHING**	**EASTING**		**24 HR.** 10.74
TOTAL DEPTH 21.44 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 98 mm Tricone		**HAMMER TYPE** 63.5 kg. manua
DATE STARTED 11/20/00	**COMPLETED** 11/21/00	**SURFACE WATER DEPTH**		
CORE SIZE NQ2	**TOTAL RUN** 6.84 m	**DRILLER** B.S.		

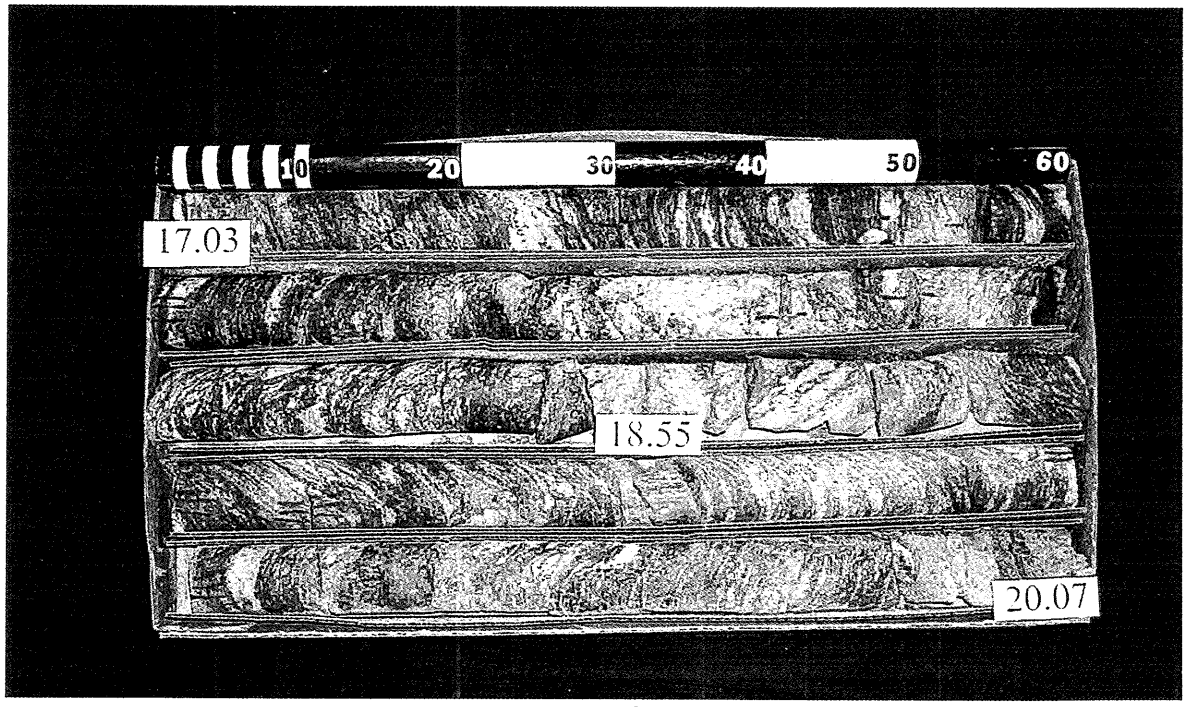
ELEV. (m)	DEPTH (m)	RUN (m)	DRILL RATE Min./0.3m	RUN REC. (m) %	RUN RQD (m) %	SAMP. NO.	STRATA REC. %	STRATA RQD %	DESCRIPTION AND REMARKS
337.63	20.98								Continued from previous page
			6:00						
337.17	21.44		3:20/0.17						337.17 — 21.44 Coring Terminated at 21.44m (EL 337.17) in Hard Rock - Mica Schist

CORE PHOTOGRAPHS

Bridge on NSRR Over SR 1007 and Detour Bridge
NCDOT Project 8.2791701 (U-2306 A)
B1-A



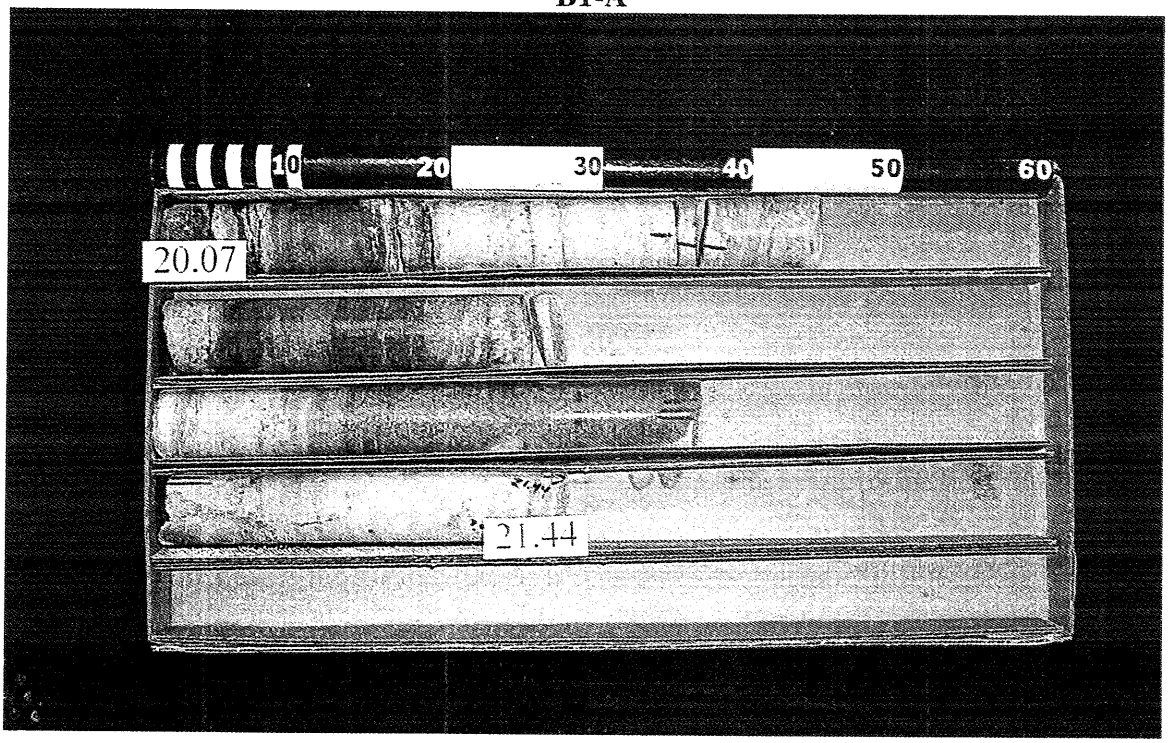
Box 1 of 3



Box 2 of 3

CORE PHOTOGRAPHS

Bridge on NSRR Over SR 1007 and Detour Bridge
NCDOT Project 8.2791701 (U-2306 A)
B1-A



Box 3of 3

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** D. Teague
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. B1-B	**BORING LOCATION** 14+31.7	**OFFSET** 4.8 RT	**ALIGNMENT** -Y13-	**0 HR.** 10.97
COLLAR ELEV. 358.28 m	**NORTHING**	**EASTING**	**24 HR.** 10.97
TOTAL DEPTH 16.47 m	**DRILL MACHINE** CME 45 Mud Bug	**DRILL METHOD** 82.6 mm ID HSA	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/30/00	**COMPLETED** 11/30/00	**SURFACE WATER DEPTH**	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
358.28					Ground Surface Elev. 358.28				358.28 0.00
358	1.07						M		Artificial Fill: Soft, Moist, Red and Brown, Fine Sandy Silty CLAY (A-7-6)
		1	2	2	4				
356	2.59	3	2	2	4		M		
	4.12	2	4	9	13		M		353.86 4.42
354	5.64								Residual: Stiff to Very Stiff, Moist, Red and Tan, Fine Sandy SILT (A-4)
		8	8	13	21		M		
352	7.16	30	70/.10		100/.25		D		351.12 7.16
350	8.69								Soft Weathered Rock - Mica Schist
		16	43	57/.06	100/.21		D		
348	10.21	28	51	20	71		M		348.28 10.00
	11.74								Residual: Very Dense, Moist, Red and Gray, Silty Fine to Medium SAND with Gravel (A-2-4)
346		12	23	32	55	SS-8	19.0		
	13.26	45	55/.08		100/.23		D		345.28 13.00
344	14.79								Soft Weathered Rock - Mica Schist
		100/.15			100/.15		D		
342	16.31								342.78 15.50
	16.47	50/.01			50/.01		D		Hard Weathered Rock - Mica Schist
		50/0			50/0		D		341.81 16.47
									Auger Refusal at 16.47m (EL 341.81) on Hard Rock - Mica Schist

TEC-NCDOT_BORE_NEW 01100112.GPJ NCDOT2.GDT 12/21/00

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	ID. U-2306A	COUNTY Catawba	GEOLOGIST D. Teague
SITE DESCRIPTION Bridge on NSRR over SR 1007			GROUND WATER (m)
BORING NO. B2-A	BORING LOCATION 14+58.6	OFFSET 7.8 LT	ALIGNMENT -Y13-	0 HR. 4.88
COLLAR ELEV. 352.55 m	NORTHING	EASTING	24 HR. 4.88
TOTAL DEPTH 10.51 m	DRILL MACHINE Mobile B-57	DRILL METHOD 82.6 mm ID HSA	HAMMER TYPE 63.5 kg. manual
DATE STARTED 11/28/00	COMPLETED 11/28/00	SURFACE WATER DEPTH	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
352.55					Ground Surface Elev. 352.55				352.55 0.00
352	1.07	4	7	9	16	SS-1	28.8		Residual: Medium Dense to Dense, Moist, Tan, Silty Fine SAND (A-2-5)
350	2.59	12	17	13	30		M		348.80 3.75
348	4.12	19	78	20	98		M		Very Dense, Moist, Tan and Gray, Silty Fine to Medium SAND with Gravel (A-2-4)
346	5.64	7	21	33	54		M		347.55 5.00
344	7.16	14	24	21	45		M		Dense to Very Dense, Moist, Tan and Brown, Silty Fine to Medium SAND (A-2-4)
	8.69	11	11	60	71		M		
	10.21								342.55 10.00
	10.51	50/.05			50/.05		D		Hard Weathered Rock - Mica Schist
		50/0			50/0		D		342.04 10.51 Auger Refusal at 10.51m (EL 342.04) on Hard Rock - Mica Schist

TEC-NCDOT_BORE_NEW 01100112.GPJ NCDOT2.GDT 12/21/00

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** D. Teague
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. B2-B	**BORING LOCATION** 14+49.0	**OFFSET** 4.8 RT	**ALIGNMENT** -Y13-	**0 HR.** NM
COLLAR ELEV. 352.52 m	**NORTHING**	**EASTING**	**24 HR.** 4.88
TOTAL DEPTH 15.69 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 98 mm Tricone	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/29/00	**COMPLETED** 11/29/00	**SURFACE WATER DEPTH**	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
352.52					Ground Surface Elev. 352.52				352.52 0.00
352	1.07	2	3	3	6		M		Artificial Fill: Medium Stiff, Moist, Tan and Red, Fine Sandy Silty CLAY (A-7-5)
									350.52 2.00
350	2.59	4	6	10	16		M		Residual: Medium Dense, Moist, Red and Gray, Silty Fine to Medium SAND (A-2-4)
	4.12								348.70 3.82
348		95	5/.01		100/.16		D		Soft Weathered Rock - Mica Schist
	5.64								
		48	52/.03		100/.18		D		
346	7.16								345.92 6.60
		23	38	39	77		M		Residual: Very Dense, Moist, Tan and Brown, Silty Fine to Medium SAND (A-2-4)
344	8.69								344.13 8.39
		75	25/.01		100/.16		D		Hard Weathered Rock - Mica Schist
	10.21								342.15 10.37
342		62	38/.01		100/.16		D		Hard Rock - Gray White and Tan, Moderately Weathered, Moderately Fractured to Sound, Garnet Mica Schist with Extremely Fractured Zones from 10.64 m to 10.67 m, 13.38 m to 13.50 m and 13.66 m to 13.69 m.
						RS-3			
340									
									338.80 13.72
338						RS-4			Hard Rock - Light Gray and White, Slightly Weathered to Fresh, Slightly Fractured to Sound Garnet Quartz Schist with Extremely Fractured Zone from 15.17 m to 15.19 m.
									336.83 15.69
									Coring Terminated at 15.69m (EL 336.83) in Hard Rock - Quartz Schist

TRIGON ENGINEERING CONSULTANTS, INC.
CORE BORING REPORT

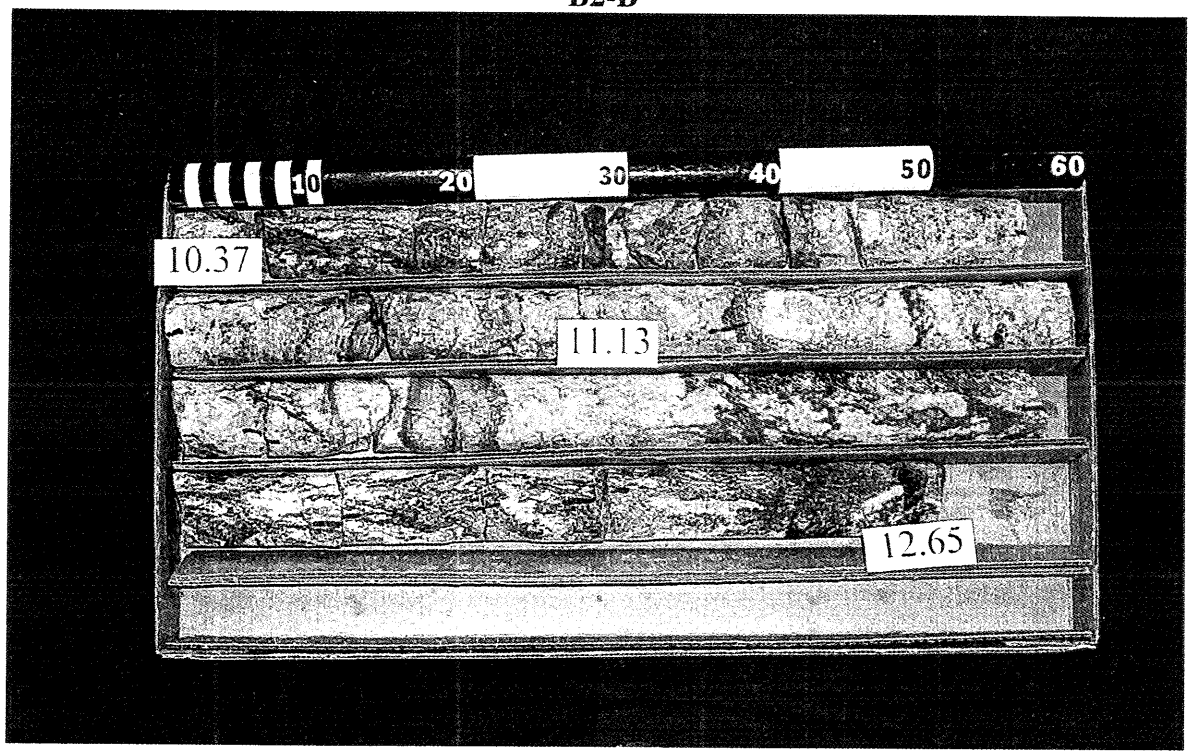
SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** D. Teague
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. B2-B	**BORING LOCATION** 14+49.0	**OFFSET** 4.8 RT	**ALIGNMENT** -Y13-	**0 HR.** NM
COLLAR ELEV. 352.520 m	**NORTHING**	**EASTING**	**24 HR.** 4.88
TOTAL DEPTH 15.69 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 98 mm Tricone	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/29/00	**COMPLETED** 11/29/00	**SURFACE WATER DEPTH**	
CORE SIZE NQ2	**TOTAL RUN** 5.32 m	**DRILLER** B.S.	

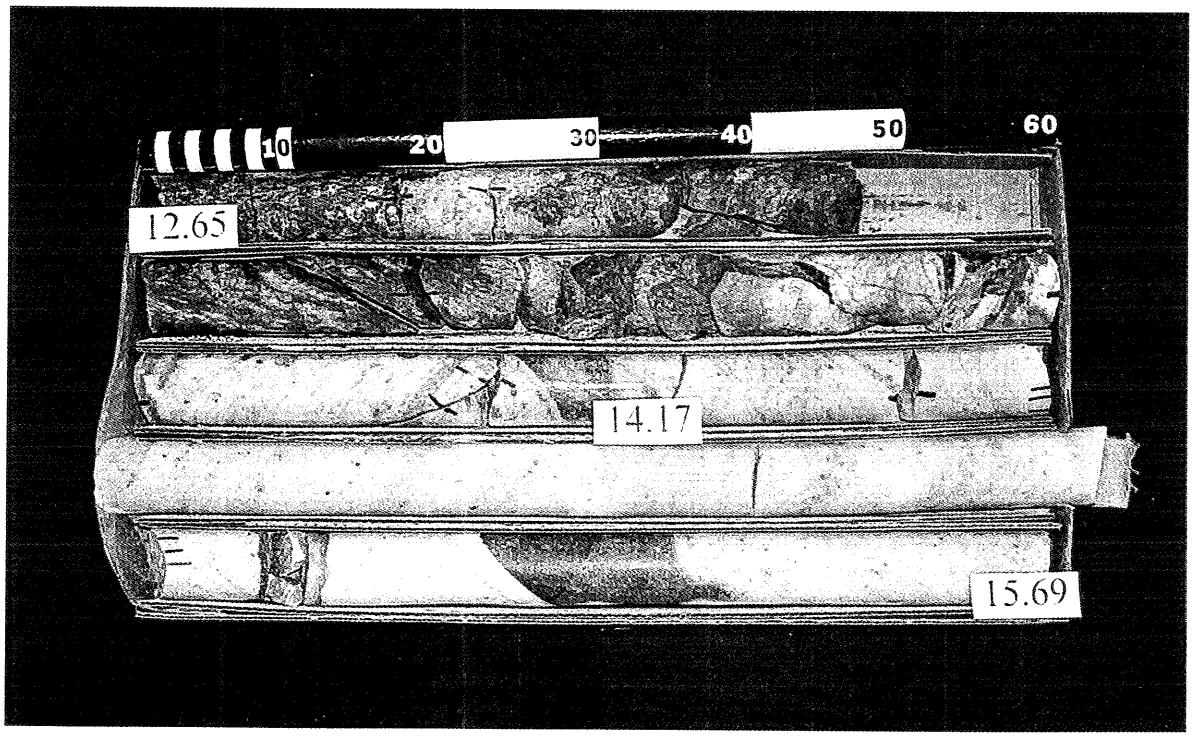
ELEV. (m)	DEPTH (m)	RUN (m)	DRILL RATE (Min./0.3m)	RUN REC. (m) %	RUN RQD (m) %	SAMP. NO.	STRATA REC. %	STRATA RQD %	DESCRIPTION AND REMARKS
342.15	10.37								Begin Coring @ 342.15 m
		0.8	4:25 3:58 1:45/0.16	(0.76) 100%	(0.46) 61%		100%	56%	Hard Rock - Gray White and Tan, Moderately Weathered, Moderately Fractured to Sound, Garnet Mica Schist with Extremely Fractured Zones from 10.64 m to 10.67 m, 13.38 m to 13.50 m and 13.66 m to 13.69 m. 7 jts @ 5° - 10° ADS=0.03m ADT=0.00m 2 jts @ 5° ADS=0.01m ADT=0.00m 2 jts @ 20° - 25° ADS=0.02m ADT=0.00m 2 jts @ 10° ADS=0.10m ADT=0.00m with Fe Stains 1 jt @ 77° ADT=0.00m 4 jts @ 10° - 20° ADS=0.03m ADT=0.00m
341.39	11.13								
		1.5	2:29 2:28 3:20 2:44 3:29/.32	(1.52) 100%	(1.20) 79%				
339.87	12.65								
		1.5	4:11 3:16 1:34 3:18 3:57/.32	(1.52) 100%	(0.57) 38%				
338.80	13.72								
							100%	89%	Hard Rock - Light Gray and White, Slightly Weathered to Fresh, Slightly Fractured to Sound Garnet Quartz Schist with Extremely Fractured Zone from 15.17 m to 15.19 m. 4 jts @ 15° - 20° ADS=0.04m ADT=0.00m with Fe Stains 1 jt @ 30° ADT=0.00m 2 jts @ 10° ADS=0.01m ADT=0.00m with Fe Stains
338.35	14.17								
		1.5	4:03 4:14 4:35 4:04 4:26/.32	(1.52) 100%	(1.40) 92%				
336.83	15.69								
336.83	15.69								Coring Terminated at 15.69m (EL 336.83) in Hard Rock - Quartz Schist

CORE PHOTOGRAPHS

Bridge on NSRR Over SR 1007 and Detour Bridge
NCDOT Project 8.2791701 (U-2306 A)
B2-B



Box 1 of 2



Box 2 of 2

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** D. Teague
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. B3-A	**BORING LOCATION** 14+82.9	**OFFSET** 4.8 LT	**ALIGNMENT** -Y13-	**0 HR.** NM
COLLAR ELEV. 358.96 m	**NORTHING**	**EASTING**	**24 HR.** 11.00
TOTAL DEPTH 23.39 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 98 mm Tricone	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/17/00	**COMPLETED** 11/20/00	**SURFACE WATER DEPTH**	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
358.96					Ground Surface Elev. 358.96				358.96 0.00
358	1.07	2	2	3	5		M		Artificial Fill: Medium Stiff, Moist, Red and Brown, Fine Sandy Silty CLAY (A-7-6)
	2.59	3	2	3	5		M		355.46 3.50
356	4.12	3	2	2	4		M		Artificial Fill: Loose, Moist, Red and Tan, Silty Fine to Medium SAND (A-2-4)
354	5.64	2	1	2	3	SS-4	30.7		353.46 5.50
352	7.16	5	5	6	11		M		Artificial Fill: Soft to Stiff, Moist, Gray and Brown, Fine Sandy SILT (A-4)
	8.69	9	20	44	64		M		351.04 7.92
350	10.21	30	19	13	32		M		Residual: Very Dense, Moist, Tan and Red, Silty Fine to Medium SAND (A-2-4)
348	11.74	13	50	50/.08	100/.23		D		348.60 10.36
346	13.26	100/.10			100/.10		D		Dense, Moist, Gray and Brown, Silty Fine to Coarse SAND with Gravel (A-2-4)
344	15.79	50/0			50/0	RS-5	D		347.07 11.89
342	17.31	50/0			50/0		D		Soft Weathered Rock - Quartz Schist
	18.83				50/0				344.99 13.97
									Soft Weathered Rock - Brown, Severely Weathered Extremely Fractured Garnet Quartz Schist.
									344.00 14.96
									Hard Weathered Rock - Tan and Gray, Moderately Severly Weathered, Moderately to Extremely Fractured Garnet Quartz Schist.
									341.65 17.31
									Hard Rock - Tan and Gray, Moderately Weathered, Moderately to Extremely Fractured Garnet Quartz Schist.
									340.73 18.23
									Soft Weathered Rock - Gray and Tan, Severely Weathered, Extremely Fractured Garnet Mica

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** D. Teague
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. B3-A	**BORING LOCATION** 14+82.9	**OFFSET** 4.8 LT	**ALIGNMENT** -Y13-	**0 HR.** NM
COLLAR ELEV. 358.96 m	**NORTHING**	**EASTING**	**24 HR.** 11.00
TOTAL DEPTH 23.39 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 98 mm Tricone	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/17/00	**COMPLETED** 11/20/00	**SURFACE WATER DEPTH**	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
339.96					Continued from previous page				
		50/0					D		339.56 Schist. 19.40
	20.35								Hard Rock - Gray and Tan, Moderately Weathered, Moderately to Extremely Fractured Garnet Mica Schist. 338.81 20.15
		50/0			50/0		D		338.61 Soft Weathered Rock - Tan, Severely Weathered, Extremely Fractured Garnet Mica Schist. 20.35
338	21.87								Hard Rock - Gray and White, Moderately Weathered, Moderately to Extremely Fractured Garnet Mica Schist.
		50/0			50/0		D		
						RS-6			
336									335.57 23.39
									Coring Terminated at 23.39m (EL 335.57) in Hard Rock - Garnet Mica Schist

TRIGON ENGINEERING CONSULTANTS, INC.
CORE BORING REPORT

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** D. Teague
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. B3-A	**BORING LOCATION** 14+82.9	**OFFSET** 4.8 LT	**ALIGNMENT** -Y13-	**0 HR.** NM
COLLAR ELEV. 358.960 m	**NORTHING**	**EASTING**	**24 HR.** 11.00
TOTAL DEPTH 23.39 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 98 mm Tricone	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/17/00	**COMPLETED** 11/20/00	**SURFACE WATER DEPTH**	
CORE SIZE NQ2	**TOTAL RUN** 9.42 m	**DRILLER** B.S.	

ELEV. (m)	DEPTH (m)	RUN (m)	DRILL RATE (Min./0.3m)	RUN REC. (m) %	RUN RQD (m) %	SAMP. NO.	STRATA REC. %	STRATA RQD %	DESCRIPTION AND REMARKS
344.99	13.97								Begin Coring @ 344.99 m
		1.8	0:45 1:00 0:55 1:31 2:30 2:00/.32	(0.83) 46%	(0.12) 7%		0%	0%	Soft Weathered Rock - Brown, Severely Weathered Extremely Fractured Garnet Quartz Schist.
343.17	15.79								344.00 14.96
		1.5	2:06 1:49 2:21 2:12 2:11/.32	(1.52) 100%	(0.62) 41%		100%	31%	Hard Weathered Rock - Tan and Gray, Moderately Severly Weathered, Moderately to Extremely Fractured Garnet Quartz Schist. 5 jts @ 15° - 20° ADS=0.03m ADT=0.00m with Fe Stains 9 jts @ 10° - 15° ADS=0.04m ADT=0.001m 2 jts @ 5° ADS=0.02m ADT=0.00m with Fe Stains 7 jts @ 10° - 15° ADS=0.08m ADT=0.001m with Fe Stains 5 jts @ 15° - 20° ADS=0.04m ADT=0.001m
341.65	17.31								341.65 17.31
		1.5	2:39 2:06 3:02 2:57 6:26/.32	(1.18) 78%	(0.00) 0%		67%	0%	Hard Rock - Tan and Gray, Moderately Weathered, Moderately to Extremely Fractured Garnet Quartz Schist. 8 jts @ 10° - 15° ADS=0.05m ADT=0.00m with Fe Stains
340.13	18.83								340.73 18.23
		1.5	2:40 2:54 2:53 3:02	(0.82) 54%	(0.00) 0%		48%	0%	Soft Weathered Rock - Gray and Tan, Severely Weathered, Extremely Fractured Garnet Mica Schist.
									339.56 19.40
							95%	0%	Hard Rock - Gray and Tan, Moderately Weathered, Moderately to Extremely Fractured Garnet Mica Schist. 8 jts @ 30° - 40° ADS=0.07m ADT=0.00m with Fe Stains

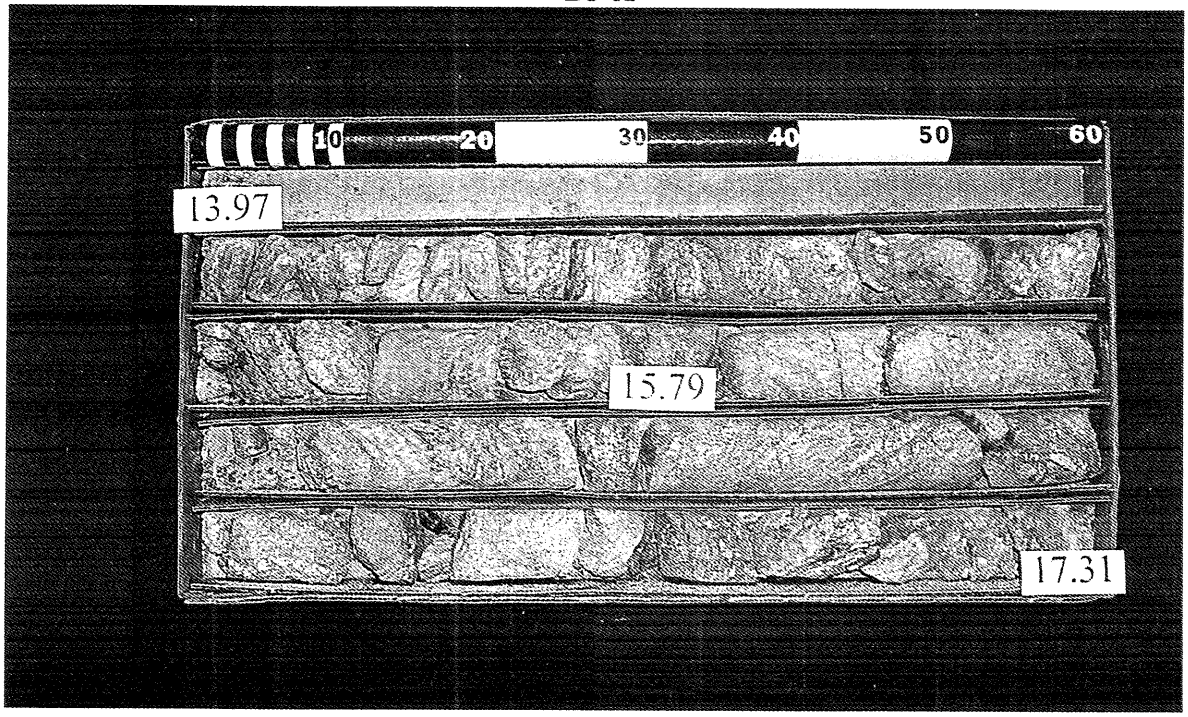
TRIGON ENGINEERING CONSULTANTS, INC.
CORE BORING REPORT

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** D. Teague
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. B3-A	**BORING LOCATION** 14+82.9	**OFFSET** 4.8 LT	**ALIGNMENT** -Y13-	**0 HR.** NM
COLLAR ELEV. 358.960 m	**NORTHING**	**EASTING**	**24 HR.** 11.00
TOTAL DEPTH 23.39 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 98 mm Tricone	**HAMMER TYPE** 63.5 kg. manua
DATE STARTED 11/17/00	**COMPLETED** 11/20/00	**SURFACE WATER DEPTH**	
CORE SIZE NQ2	**TOTAL RUN** 9.42 m	**DRILLER** B.S.	

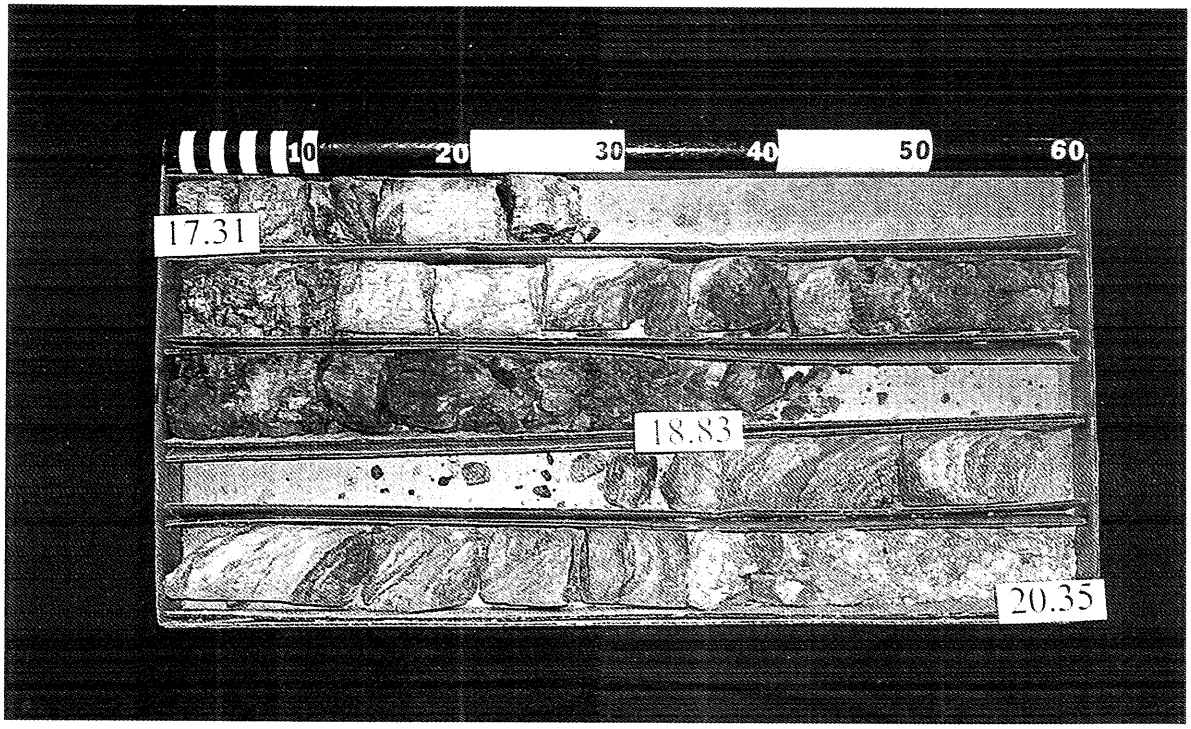
ELEV. (m)	DEPTH (m)	RUN (m)	DRILL RATE (Min./0.3m)	RUN REC. (m) %	RUN RQD (m) %	SAMP. NO.	STRATA REC. %	STRATA RQD %	DESCRIPTION AND REMARKS
338.91	20.05								Continued from previous page
									338.81 20.15
338.61	20.35		4:14/.32				95%	0%	Soft Weathered Rock - Tan, Severely Weathered, Extremely Fractured Garnet Mica Schist. 338.61 20.35
		1.5	2:40	(1.34)	(0.00)		92%	20%	Hard Rock - Gray and White, Moderately Weathered, Moderately to Extremely Fractured Garnet Mica Schist.
				88%	0%				
			3:45						25 jts @ 15° - 20° ADS=0.03m ADT=0.00m
			6:25						1 jt @ 85° ADT=0.00m with Fe Stains
			13:20						6 jts @ 15° - 20° ADS=0.04m ADT=0.00m
337.09	21.87		19:20/.32						1 jt @ 45° ADT=0.00m
		1.5	2:25	(1.52)	(0.56)				
				100%	37%				
			3:40						
			5:20						
			4:30						
335.57	23.39		3:55/.32						335.57 23.39
									Coring Terminated at 23.39m (EL 335.57) in Hard Rock - Garnet Mica Schist

CORE PHOTOGRAPHS

Bridge on NSRR Over SR 1007 and Detour Bridge
NCDOT Project 8.2791701 (U-2306 A)
B3-A



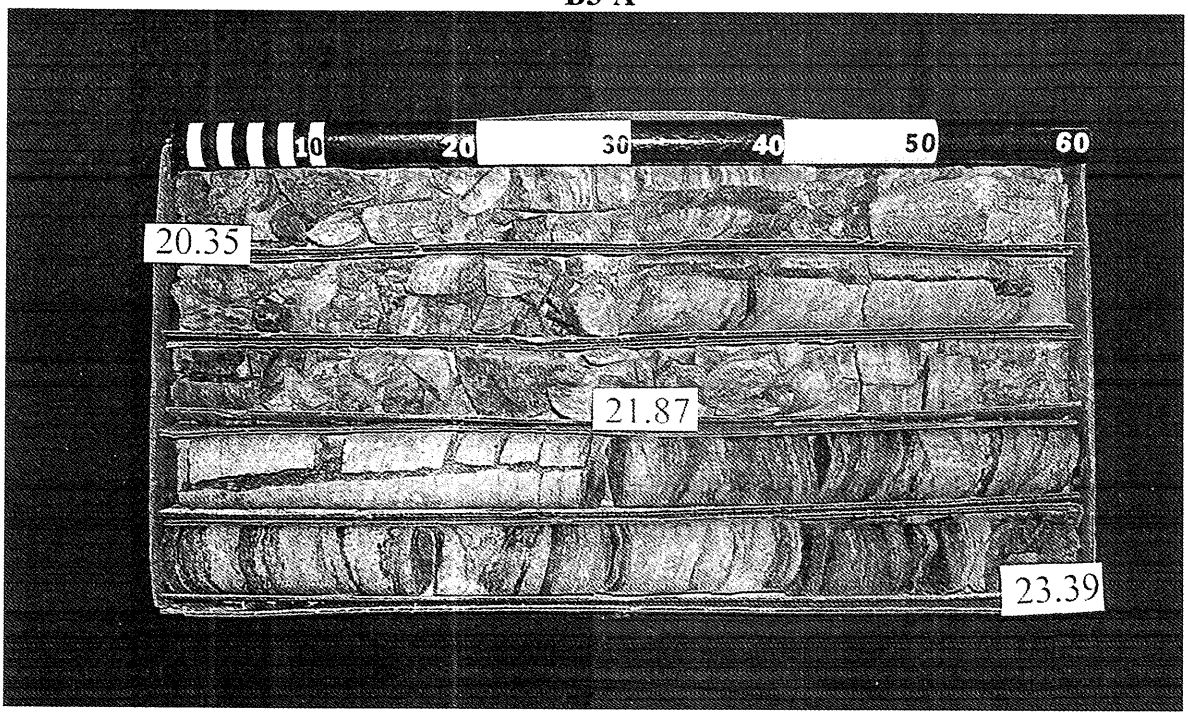
Box 1 of 3



Box 2 of 3

CORE PHOTOGRAPHS

Bridge on NSRR Over SR 1007 and Detour Bridge
NCDOT Project 8.2791701 (U-2306 A)
B3-A



Box 3of 3

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** D. Teague
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. B3-B	**BORING LOCATION** 14+76.1	**OFFSET** 4.8 RT	**ALIGNMENT** -Y13-	**0 HR.** 10.86
COLLAR ELEV. 358.75 m	**NORTHING**	**EASTING**	**24 HR.** 10.86
TOTAL DEPTH 16.98 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 98 mm Tricone	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/15/00	**COMPLETED** 11/16/00	**SURFACE WATER DEPTH**	

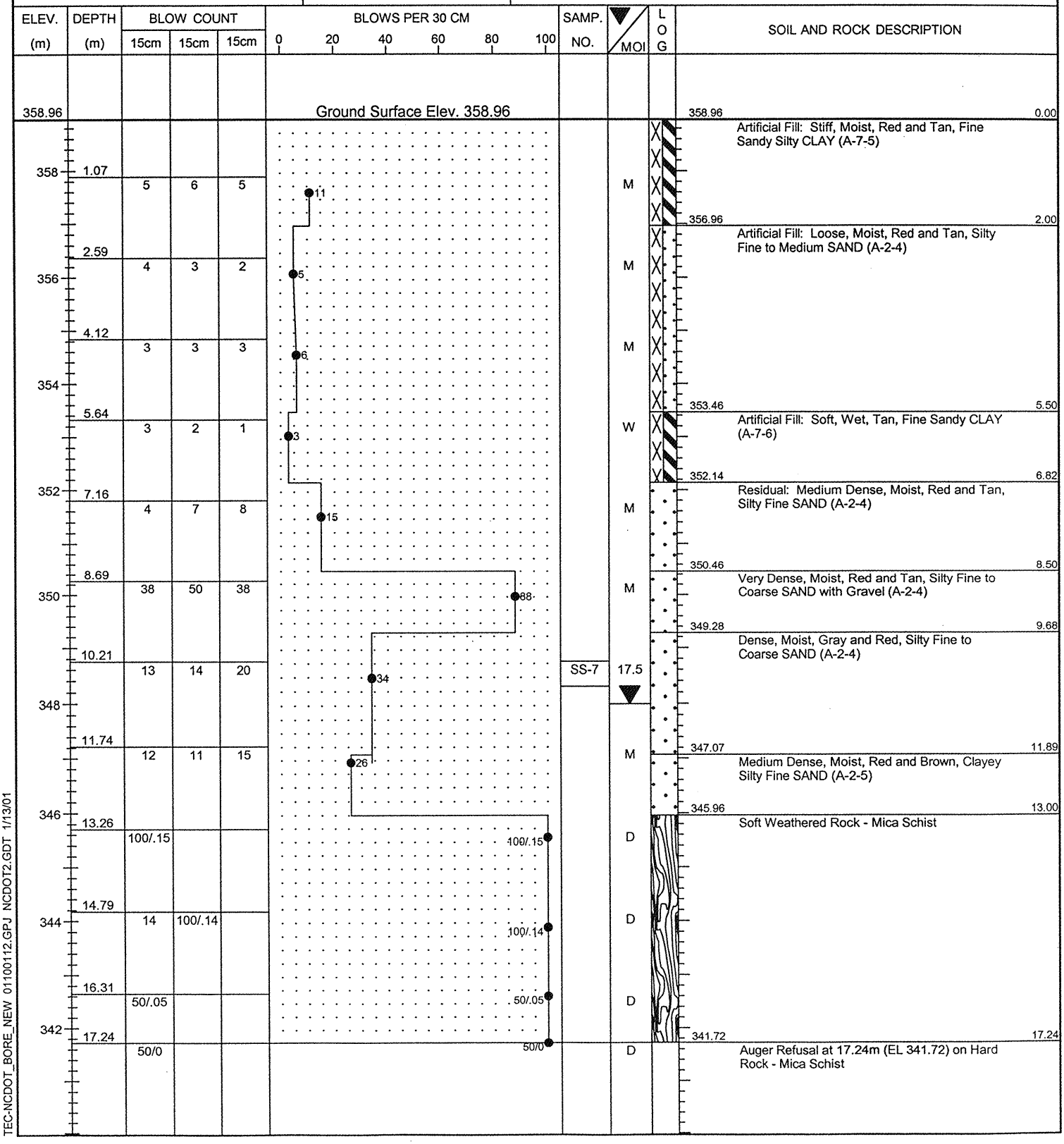
ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
358.75					Ground Surface Elev. 358.75				358.75 0.00
358	1.07	1	1	1	2		M		Artificial Fill: Soft, Moist, Red and Brown, Fine Sandy Silty CLAY (A-7-6)
	2.59								356.25 2.50
356		2	2	2	4	SS-2	20.8		Artificial Fill: Loose, Moist, Red and Tan, Silty Clayey Fine SAND (A-2-4)
	4.12	2	3	3	6		M		
354	5.64	2	2	3	5		M		
									352.25 6.50
352	7.16	1	2	2	4		W		Artificial Fill: Soft, Wet, Tan, Fine Sandy SILT (A-4)
	8.69								349.91 8.84
350	10.21	6	21	47	68		M		Residual: Very Dense, Moist, Tan, Silty Fine SAND (A-2-4)
									348.39 10.36
348	11.74	50	28	11	39		M		Dense, Moist, Gray, Silty Fine to Coarse SAND with Gravel (A-2-4)
									347.21 11.54
346	13.26	5	7	8	15		M		Medium Dense to Dense, Moist, Gray, Silty Fine SAND (A-2-4)
	14.79	8	20	15	35		M		
344		100/.14			100/.14		D		344.15 14.60 Soft Weathered Rock - Mica Schist
	16.31								
342	16.98	50/.08			50/.08		D		341.77 16.98
		50/0			50/0		D		Tricone Refusal at 16.98m (EL341.77) on Hard Rock - Mica Schist

TEC-NCDOT_BORE_NEW 01100112.GPJ NCDOT2.GDT 1/13/01

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** D. Teague
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. EB2-A	**BORING LOCATION** 14+95.6	**OFFSET** 4.8 LT	**ALIGNMENT** -Y13-	**0 HR.** 10.97
COLLAR ELEV. 358.96 m	**NORTHING**	**EASTING**	**24 HR.** 10.97
TOTAL DEPTH 17.24 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 82.6 mm ID HSA	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/16/00	**COMPLETED** 11/16/00	**SURFACE WATER DEPTH**	



TEC-NCDOT_BORE_NEW 01100112.GPJ NCDOT2.GDT 1/13/01

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** C. Norville
SITE DESCRIPTION NSRR over Lenoir Rhyne Boulevard Extension			**GROUND WATER (m)**
BORING NO. B-2	**BORING LOCATION** 14+88.0	**OFFSET** 5.5m RT	**ALIGNMENT** -Y13-	**0 HR.** 9.94
COLLAR ELEV. 358.94 m	**NORTHING**	**EASTING**	**24 HR.** 10.00
TOTAL DEPTH 16.36 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 82.6mm ID HSA	**HAMMER TYPE** 63.5kg Manual
DATE STARTED 03/09/99	**COMPLETED** 03/09/99	**SURFACE WATER DEPTH** N/A	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
358.94					Ground Surface Elev. 358.94				358.94 0.00
	0.30								
358	1.07	1	2	1	3		M		Artificial Fill: Very Loose Moist to Wet Tan, Red, and Dark Gray Silty Fine to Medium SAND with Gravel and Wood Fragments (A-2-4)
	1.83	2	1	2	3		W		
	2.59	2	2	2	4		W		
356	4.12	1	2	1	3		W		354.94 4.00
	5.64	2	2	2	4		M		Artificial Fill: Loose Moist Tan Silty Fine to Medium SAND (A-2-4)
354	7.16	1	2	3	5		W		353.44 5.50 Artificial Fill: Medium Stiff Wet Fine Sandy Silty CLAY (A-7-6)
	8.69	18	15	15	30		M		352.44 6.50 Residual: Dense to Very Dense Moist Tan and Red Silty Fine to Medium SAND with Rock Fragments (A-2-4)
352	10.21	8	20	32	52		M		
	11.74	5	12	9	21		W		349.34 9.60 Residual: Very Stiff Wet Tan and Brown Fine to Medium Sandy SILT (A-4)
350	13.26	4	8	12	20	SS-10	W		
	14.79	10	25	28	53	SS-11	M		345.94 13.00 Residual: Very Dense Moist Tan and Brown Slightly Micaceous Silty Fine to Medium SAND (A-2-5)
348	16.31	70	50/.05		50/.05		D		344.94 14.00 SOFT WEATHERED ROCK - Biotite Gneiss
346		50/.05			50/.05		D		342.58 16.36 Boring Terminated at 16.36m (Elev. 342.58) in SOFT WEATHERED ROCK - Biotite Gneiss
344									

TEC-NCDOT_BORE_NEW 01199044.GPJ NCDOT2.GDT 12/29/00

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** C. Norville
SITE DESCRIPTION NSRR over Lenoir Rhyne Boulevard Extension			**GROUND WATER (m)**
BORING NO. B-1	**BORING LOCATION** 14+23.0	**OFFSET** 14.0m RT	**ALIGNMENT** -Y13-	**0 HR.** Dry
COLLAR ELEV. 354.86 m	**NORTHING**	**EASTING**		**24 HR.** Dry
TOTAL DEPTH 6.04 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 82.6mm ID HSA		**HAMMER TYPE** 63.5kg Manual
DATE STARTED 03/09/99	**COMPLETED** 03/09/99	**SURFACE WATER DEPTH** N/A		

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
354.86					Ground Surface Elev. 354.86				354.86	0.00
	0.30	3	3	5	8		D		Artificial Fill: Loose Dry Red and Dark Gray Silty Fine to Medium SAND with Gravel (A-2-4)	
354	1.07								354.26	0.60
		20	100/.12		100/.12		M		Residual: Loose Moist Tan and Red Clayey Silty Fine to Medium SAND (A-2-4)	
	1.83								353.66	1.20
		39	56	44/.05	100/.20		D		SOFT WEATHERED ROCK - Biotite Gneiss	
	2.59									
352		30	48	52/.05	100/.20		D			
	4.12								350.96	3.90
		18	20	40	60		D		Residual: Very Dense Dry Micaceous Tan Silty Fine to Medium SAND with Rock Fragments (A-2-4)	
350									349.96	4.90
	5.64								SOFT WEATHERED ROCK - Biotite Gneiss	
		21	60	40/.10	100/.25		D		348.82	6.04
									Boring Terminated at 6.04m (Elev. 348.82) in SOFT WEATHERED ROCK - Biotite Gneiss	

EC-NCDOT_BORE_NEW 01199044.GPJ NCDOT2.GDT 12/29/00

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** C. Norville
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. D-2	**BORING LOCATION** 14+32.7	**OFFSET** 14.5 RT	**ALIGNMENT** -Y13-	**0 HR.** 5.00
COLLAR ELEV. 352.84 m	**NORTHING**	**EASTING**		**24 HR.** 5.00
TOTAL DEPTH 5.69 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 82.6 mm ID HSA		**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/22/00	**COMPLETED** 11/22/00	**SURFACE WATER DEPTH**		

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
352.84					Ground Surface Elev. 352.84				352.84 0.00
352	1.07	7	7	9	16	SS-1	18.9		Residual: Very Stiff, Moist, Tan and Red, Fine to Medium Sandy SILT (A-5)
	2.59	34	50/.05		50/.05		D		351.04 1.80 Soft Weathered Rock - Mica Schist
350	4.12	39	50/.05		50/.05		D		
348	5.64	50/.05			50/.05		D		347.15 5.69 Boring Terminated at 5.69 m (EL 347.15) in Soft Weathered Rock - Mica Schist

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** C. Norville
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. D-3	**BORING LOCATION** 14+51.8	**OFFSET** 17.0 RT	**ALIGNMENT** -Y13-	**0 HR.** 4.80
COLLAR ELEV. 352.70 m	**NORTHING**	**EASTING**	**24 HR.** 4.80
TOTAL DEPTH 6.04 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 82.6 mm ID HSA	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/22/00	**COMPLETED** 11/22/00	**SURFACE WATER DEPTH**	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
352.70					Ground Surface Elev. 352.70				352.70 0.00
352	1.07	10	25	40	65		M		Artificial Fill: Soft Moist, Brown, Silty Fine to Medium Sandy CLAY (A-7-6) 351.90 0.80
									Residual: Hard, Dry, Tan and Brown, Fine to Coarse Sandy SILT (A-4) 351.10 1.60
350	2.59	90	10/.01		100/.16		D		Soft Weathered Rock - Mica Schist
	4.12	90	10/.01		100/.16		D		
348	5.64	25	67	33/.10	100/.25		D		346.66 6.04
									Boring Terminated at 6.04m (EL 346.66) in Soft Weathered Rock - Mica Schist

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** C. Norville
SITE DESCRIPTION Bridge on NSRR over SR 1007			**GROUND WATER (m)**
BORING NO. D-4	**BORING LOCATION** 14+67.7	**OFFSET** 15.0 RT	**ALIGNMENT** -Y13-	**0 HR.** 5.49
COLLAR ELEV. 353.38 m	**NORTHING**	**EASTING**	**24 HR.** 5.49
TOTAL DEPTH 11.79 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 82.6 mm ID HSA	**HAMMER TYPE** 63.5 kg. manual
DATE STARTED 11/22/00	**COMPLETED** 11/22/00	**SURFACE WATER DEPTH**	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
353.38					Ground Surface Elev. 353.38				353.38 0.00
	1.07								Artificial Fill: Soft to Medium Stiff, Moist, Tan and Brown, Fine Sandy CLAY (A-7-6)
352		1	2	1	3		M		
	2.59					SS-2	22.5		350.28 3.10
		1	2	3	5				Residual: Stiff to Very Stiff, Moist to Wet, Tan and Red, Fine Sandy SILT (A-4)
350	4.12						M		
		4	10	17	27				
348	5.64						W		
		2	3	8	11				
	7.16						M		345.88 7.50
346		5	10	65	75				Very Dense, Moist, Tan and Brown, Silty Fine to Coarse SAND (A-2-4)
	8.69						M		344.38 9.00
		13	29	53	82				Soft Weathered Rock - Mica Schist
344	10.21						D		
		100/.15			100/.15				
342	11.74								341.59 11.79
		50/.05			50/.05		D		Boring Terminated at 11.79m (EL 341.59) in Soft Weathered Rock - Mica Schist

TRIGON ENGINEERING CONSULTANTS, INC.
BORING LOG

SHEET 1 OF 1

PROJECT NO. 8.2791701	**ID.** U-2306A	**COUNTY** Catawba	**GEOLOGIST** C. Norville
SITE DESCRIPTION NSRR over Lenoir Rhyne Boulevard Extension			**GROUND WATER (m)**
BORING NO. B-3	**BORING LOCATION** 14+88.0	**OFFSET** 14.5m RT	**ALIGNMENT** -Y13-	**0 HR.** 6.55
COLLAR ELEV. 355.66 m	**NORTHING**	**EASTING**	**24 HR.** 6.71
TOTAL DEPTH 11.96 m	**DRILL MACHINE** Mobile B-57	**DRILL METHOD** 82.6mm ID HSA	**HAMMER TYPE** 63.5 kg Manual
DATE STARTED 03/08/99	**COMPLETED** 03/08/99	**SURFACE WATER DEPTH** N/A	

ELEV. (m)	DEPTH (m)	BLOW COUNT 15cm	15cm	15cm	BLOWS PER 30 CM 0 20 40 60 80 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
355.66					Ground Surface Elev. 355.66				355.66 0.00
	0.30	4	4	3	7		M		Artificial Fill: Loose to Medium Dense Moist Red, Gray, and Tan Silty Clayey Fine SAND with Gravel (A-2-6)
	1.07	3	2	2	4		M		
354	1.83	4	5	6	11		M		353.46 2.20
	2.59	10	11	30	41	SS-4	25		Residual: Hard Moist Fine to Medium Sandy Silty CLAY (A-7-6)
352	4.12	15	15	12	27		M		351.86 3.80 Residual: Medium Dense Moist Tan and Red Silty Fine to Medium SAND (A-2-4)
	5.64								349.86 5.80
350		10	56	44/.05	100/.20		D		SOFT WEATHERED ROCK - Biotite Gneiss
	7.16	12	14	21	35	SS-7	W		349.16 6.50 Residual: Dense Wet Tan Silty Fine to Medium SAND (A-2-4)
348	8.69	18	22	69	91		M		346.81 8.85
									346.36 9.30 Residual: Very Dense Moist Tan Micaceous Silty Fine to Coarse SAND with Rock Fragments (A-2-4)
346	10.21	100/.14			100/.14		M		SOFT WEATHERED ROCK - Biotite Gneiss
344	11.74	42	50/.07		50/.07		M		343.70 11.96 Boring Terminated at 11.96m (Elev. 343.7) in SOFT WEATHERED ROCK - Biotite Gneiss

DYNAMIC CONE PENETROMETER DATA SHEET

Trigon Engineering Consultants, Inc.
700 Blue Ridge Road
Raleigh, North Carolina 27606

Date: 03/10/99
Project: NSRR over Lenoir Rhyne Boulevard Extension
County: Catawba
Project No.: 8.2791701 (U-2306A)
Trigon Project No.: 01199044
Personnel: B. Whitaker, B. Foster

Test Location	Penetrometer Blow Count Per .044m Increments				Depth Below Grade (m)	Soil Description Ground Surface Elev. 358.47
	1st	2nd	3rd	Avg.		
HA-1	3	2	1	1	0.76	(0.00 - 2.59m) Artificial Fill: Very Loose to Loose Moist Red and Dark Gray Silty Fine to Coarse SAND with Gravel (A-2-4)
STA						
14+23.0	2	1	1	1	1.52	
-Y13 -						
4.0m RT						(Elev. 355.88)
	4	5	4	4	2.29	(2.59 - 3.35m) Artificial Fill: Loose Moist Slightly Micaceous Tan and Red Silty Fine Sandy CLAY with Gravel (A-6) (Elev. 355.12)
	6	9	2	5	3.05	
						(3.35 - 3.93m) Residual: Medium Dense Moist Slightly Micaceous Tan and Red Silty Fine to Medium SAND (A-2-4) (Elev. 354.54)
	15	13	18	15	3.81	
						Boring Terminated at 3.93m (Elev. 354.54) in Silty Fine to Medium SAND Dry at Time of Boring

State Project No. 8.2791701
TIP No. U-2306A
Bridge on NSRR over SR 1007
Hickory, North Carolina

SUMMARY OF LABORATORY TEST DATA

Boring No.	Sample Depth (m)	Sample No.*	Natural Moisture Content (%)	AASHTO Class (Group Index)	N-Value (bpf)**	Atterberg Limits			Gradation Results							
						L.L.	P.L.	P.I.	Pass #10 Sieve	Pass #40 Sieve	Pass #200 Sieve	Pass #270 Sieve	Coarse Sand (%)	Med. & Fine Sand (%)	Silt (%)	Clay (%)
EB1-A	5.64-6.10	SS-4	17.7	A-2-4 (0)	35	31	NP	NP	97	69	26	19	3	78	5	14
EB1-B	10.21-10.67	SS-7	21.3	A-2-4 (0)	78	36	NP	NP	91	65	30	22	9	69	12	10
B1-A	4.12-4.57	SS-3	47.9	A-4 (0)	19	26	NP	NP	96	81	45	39	4	57	18	21
B1-B	11.74-12.20	SS-8	19.0	A-2-4 (0)	55	39	NP	NP	100	76	29	22	0	78	15	7
B2-A	1.07-1.52	SS-1	28.8	A-2-5 (0)	16	56	NP	NP	92	71	31	22	8	70	4	18
B3-A	5.64-6.10	SS-4	30.7	A-4 (2)	3	24	16	8	100	86	57	54	0	46	20	34
B3-B	2.59-3.05	SS-2	20.8	A-2-4 (0)	4	25	NP	NP	91	70	28	24	9	67	6	18
EB2-A	10.21-10.67	SS-7	17.5	A-2-4 (0)	34	33	NP	NP	96	55	17	17	4	79	9	8
D-4	2.59-3.05	SS-2	22.5	A-7-6 (4)	5	43	20	23	100	79	40	35	0	65	25	10
D-2	1.07-1.52	SS-1	18.9	A-5 (0)	16	87	NP	NP	100	94	39	32	0	68	0	32

* SS = Split-Spoon Sample (ASTM-D-1586)
** bpf = blows per 30 cm.
*** S = Bulk Sample
NP -- Non Plastic

TRIGON ENGINEERING CONSULTANTS, INC.
RALEIGH, NORTH CAROLINA
Trigon Job Number: 011-00-112

State Project No. 8.2791701
Federal Project No. MASTP-1216(8)
NSRR over Lenoir Rhyne Boulevard Extension
Catawba County, North Carolina

SUMMARY OF LABORATORY TEST DATA

Boring No.	Sample Depth (m)	Sample No.*	Natural Moisture Content (%)	AASHTO Class (Group Index)	N-Value (bpi)**	Atterberg Limits			Gradation Results							
						L.L.	P.L.	P.I.	Pass #10 Sieve	Pass #40 Sieve	Pass #200 Sieve	Pass #270 Sieve	Coarse Sand (%)	Med. & Fine Sand (%)	Silt (%)	Clay (%)
HA-1	2.90-3.05	NA	-	A-6(1)	NA	32	17	15	83	67	37	32	17	51	18	14
B-2	11.74-12.20	SS-10	-	A-4 (0)	20	37	NP	NP	100	82	40	28	0	72	28	0
B-2	13.26-13.72	SS-11	-	A-2-5	53	45	NP	NP	99	76	34	20	1	79	20	0
B-3	2.59-3.05	SS-4	25	A-7-6(28)	41	59	23	36	83	68	51	47	17	36	10	37
B-3	7.16-7.62	SS-7	-	A-2-4	35	39	NP	NP	95	61	24	12	5	83	11	1

* SS = Split-Spoon Sample (ASTM-D-1586)
** bpi = Blows per increment of 30 cm
*** S = Bulk Sample
NP -- Non Plastic
NA -- Not Applicable
HA -- Hand Auger

TRIGON ENGINEERING CONSULTANTS, INC.
RALEIGH, NORTH CAROLINA
Trigon Job Number: 01199044