09/08/99

ID: U-0624

CONTRACT: C203175

NOTES: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION	SHEET NUMBERS PLAN	PLOFILE	XSECT
-L-	11+50 TO 51+80	4-7		3-19
-Y3-	10+50 TO 11+88	5		24
-Y4-	12+75 TO 14+06	6		25-26
-Y6-	10+75 TO 12+10	6		28
-Y7-	11+50 TO 14+25	6		31
-Y8-	10+65 TO 12+10	7		34

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-0624	1	46

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34762.1.1	STP-86(2)	PE
34762.2.2	STP-0086(2)	R/W & UTIL
34762.3.4	STP-0086(5)	CONST

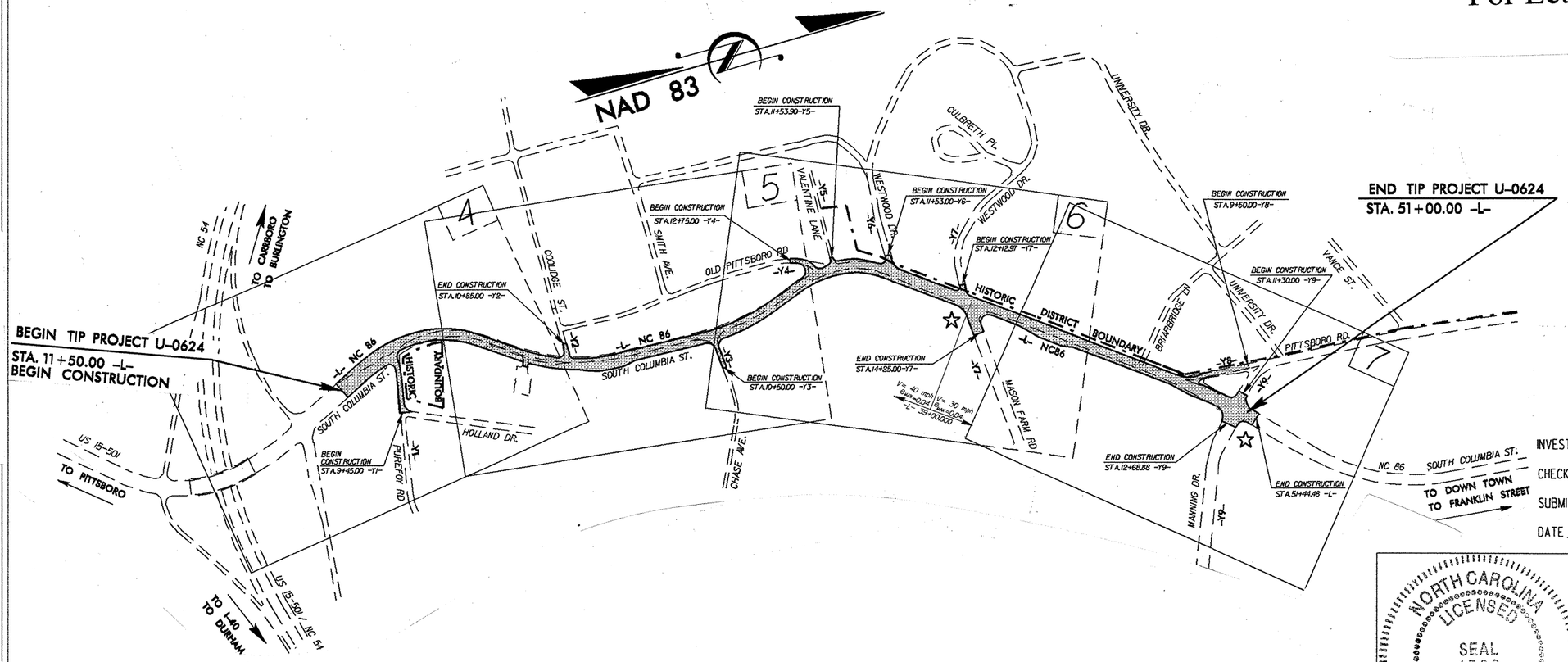
ROADWAY SUBSURFACE INVESTIGATION

STATE PROJECT 34762.1.1 F.A. PROJECT STP-86(2)

COUNTY Orange

PROJECT DESCRIPTION NC 86 (S Columbia St.) From SR 1906 (Purefoy Rd.) to SR 1902 (Manning Dr.)

INVENTORY



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

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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.

For Letting

PERSONNEL

P WEAVER
D GOODNIGHT
J STEPHENSON
K HICKS
C HEUN
A HAYES
D KITCHEN
_
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INVESTIGATED BY P WEAVER

CHECKED BY J VINSON

SUBMITTED BY P WEAVER

DATE MARCH 21, 2007

NORTH CAROLINA LICENSED SEAL 1560 GEOLOGIST PAUL M. WEAVER 3/22/07

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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.

$$$$SYSTIME$$$$
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$$$$DGN$$$$

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

ID	STATE PROJECT NO.	SHEET NO.	TOTAL SHEETS
U-0624	34762.1.1	2	46

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 WHICH CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND WHICH YIELDS LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM AND 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 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT	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
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

P.I. OF A-7-5 ≤ L.L. - 30 ; P.I. OF A-7-6 > L.L. - 30

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.0	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		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
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, YEL-BRN, 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 ARE DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LIQUID LIMIT LESS THAN 30
MODERATELY COMPRESSIBLE	LIQUID LIMIT 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 SEEPAGE

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL OTHER THAN ROADWAY EMBANKMENTS
- INFERRED SOIL BOUNDARIES
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/825 — DIP/DIP DIRECTION OF ROCK STRUCTURES
- ● - SOUNDING ROD
- SPT / DPT / DMT / VST / PMT — TEST BORING
- HAND AUGER BORING
- CORE BORING
- MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

SAMPLE DESIGNATIONS

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

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CI. - CAVE IN
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
C.T. - CORING TERMINATED
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F. - FINE
FRAC. - FRACTURED
GW - GROUNDWATER
H.A.R. - HAND AUGER REFUSAL
H.A.T. - HAND AUGER TERMINATED
FRAGS. - FRAGMENTS
MED. - MEDIUM
NGWE - NO GOUNDWATER ENCOUNTERED
NM - NOT MEASURED
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
T.O.B. - TIME OF BORING
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT
W - MOISTURE CONTENT
V. - VERY
VST - VANE SHEAR TEST

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [X] MOBILE B- 57
- [ ] BK-51
- [ ] CME-45
- [ ] CME-55
- [ ] PORTABLE HOIST
- [ ] OTHER CME 850
- [ ] OTHER ACKER MARK II

ADVANCING TOOLS:
- [ ] CLAY BITS
- [X] 6" CONTINUOUS FLIGHT AUGER
- [ ] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [ ] TUNG.-CARBIDE INSERTS
- [ ] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE 3⅞" TUNG.-CARB.
- [ ] CORE BIT
- [ ] OTHER _____

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

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

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [X] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [X] OTHER DCP

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WHEN 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 FOLOWS:

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

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V. SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL 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. *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 GEOLOGISTS 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 GEOLOGISTS 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 GEOLOGISTS 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 WHICH 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 IS IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS WHICH 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 (F.P.) - 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 SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (R.Q.D.) - 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 WHICH 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, WHICH 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 B.P.F.) 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 LESS THAN 0.1 FOOT PENETRATION WITH 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 (S.R.Q.D.) - 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 (T.S.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK: BM #2: -BL- STA. 25+85.00, 150.92' LT;

ELEVATION: 452.84'

NOTES:

TIP PROJECT: U-0624

CONTRACT: ______

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols
See Sheet 1-C For Survey Control Data

VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ORANGE COUNTY

LOCATION: NC 86 (SOUTH COLUMBIA STREET) FROM SR 1906 (PUREFOY ROAD) TO SR 1904 (MASON FARM ROAD) IN CHAPEL HILL

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CURB & GUTTER, AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-0624	2A	46

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34762.1.1	STP-86(2)	PE

NAD 83

THIS IS NOT A CONTROLLED ACCESS PROJECT.
THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF CHAPEL HILL.
CLEARING ON THIS PROJECT SHALL BE PERFORMED
TO THE LIMITS ESTABLISHED BY METHOD ___.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2005 = 19,200
ADT 2030 = 31,000
DHV = 10 %
D = 75 %
T = 5 % *
V = 40 /30 MPH
* TTST 1% DUAL 4%

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-0624 = 0.763 MI
TOTAL LENGTH TIP PROJECT U-0624 = 0.763 MI

Prepared in the Office of:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JULY 19, 2007
LETTING DATE: JULY 21, 2009

JASON MOORE, PE
PROJECT ENGINEER

KEVIN E. MOORE, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

______ P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

$$$$SYSTIME$$$$
$$$$$$$$$DGN$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$

ENGINEERING CONSULTANTS, INC.

www.trigoneng.com

P.O. Box 18846 • Zip 27419-8846 • 313 Gallimore Dairy Road • Greensboro, NC 27409 • *p* 336.668.0093 • *f* 336.668.3868

STATE PROJECT: 34762.1.1 (U-0624)

FEDERAL PROJECT: STP-86(2)

COUNTY: Orange

DESCRIPTION: NC 86 (South Columbia St.) from SR 1906 (Purefoy Rd.) to SR 1902 (Manning Dr.)

SUBJECT: Geotechnical Report - Inventory

Trigon Engineering Consultants, Inc. (Trigon) has completed the authorized subsurface investigation for the above referenced project in Orange County, North Carolina. The purpose of this exploration was to investigate the subsurface conditions along the proposed roadway widening project and to provide general construction considerations based on the subsurface conditions.

Project Description

The project site is located on the south side of the town of Chapel Hill, North Carolina, along the existing alignment of South Columbia Street (-L-). The project will consist of improvements to the existing South Columbia Street beginning on the south side of SR 1906 (Purefoy Road) and continuing to the north side of SR 1902 (Manning Drive). These improvements will primarily consist of the addition of a center turn lane, the addition of two bus turnouts, and improvements to -Y3-, -Y4-, -Y6-, -Y7-, and -Y8- in the vicinity of their intersections with -L-. The proposed widening along South Columbia Street will predominantly take place on the eastern (right) side of the existing roadway. At the time of this investigation, the area of roadway widening generally consisted of grassed relatively gentle slopes, and paved and gravel entrances for homes and isolated business. The maximum depth of cut for the project will be approximately 5 feet, while the maximum amount of fill will be approximately 14 feet.

The field exploration for this project was conducted between December, 2006 and February, 2007, and consisted of drilling nine soil test borings and performing 26 hand auger/Dynamic Cone Penetrometer (DCP) borings. An ATV-mounted Mobile B-57 drill machine equipped with a manual hammer was used to perform the soil test borings. Standard Penetration Tests (SPT's) were performed in the soil test borings at regular intervals. In conjunction with this testing, split-barrel soil samples were recovered for visual soil classification in the field. The split-barrel samples were transported to our laboratory for testing and final classification.

A three-inch hand auger was used to advance the hand auger borings. Representative soil samples were obtained by sampling the auger cuttings. At selected depths, Dynamic Cone Penetrometer (DCP) tests were performed to evaluate relative consistency or denseness of the subgrade materials. This type of Dynamic Cone Penetrometer utilizes a 15-lb steel mass falling 20-inches to strike an anvil to penetrate a 1.5-inch diameter 45° cone into the soil in 1¾ inch increments, and generally yields blow counts comparable with those obtained in Standard Penetration Tests (SPT's). Grab samples of representative soils encountered during hand augering were transported to our laboratory for testing and final classification. A "Hand Auger/DCP Observation Summary" sheet for each hand auger/DCP boring is attached to this report.

Continuous Dual-Mass Dynamic Cone Penetrometer (DCP) testing to a minimum of 3 feet into the subgrade soil was performed at 26 selected locations where proposed cut and/or fill heights are to be less than 2 feet. The Dual-Mass DCP used in this testing consists of a 0.625-inch diameter steel bottom rod with anvil, a hardened point, and a 17.6 lb hammer that is dropped 22.6 inches. This DCP was developed and patented by the U.S. Army Corps of Engineers, and is used to assess the in-situ strength of undisturbed soil and/or compacted materials and to estimate the in-situ California Bearing Ratio (CBR) of subgrade materials. Raw DCP Test Data sheets were submitted to the NCDOT Geotechnical Engineering Unit for analysis.

The following base lines were investigated as part of this investigation:

Line	Station
-L-	11+50 to 51+80
-Y3-	10+50 to 11+88
-Y4-	12+75 to 14+06
-Y6-	10+75 to 12+16
-Y7-	11+50 to 14+25
-Y8-	10+65 to 12+10

Areas of Special Geotechnical Interest

1) Clays: Clays (A-6, A-7-5, and A-7-6) were encountered on the project at the following locations. No high plasticity clays (P.I. > 25) were encountered within the project corridor.

Line	Station
-L-	14+00 to 15+50
-L-	22+50 to 23+00
-L-	27+00 to 31+00
-L-	33+00 to 46+00
-Y4-	13+75
-Y6-	11+75
-Y7-	13+75
-Y8-	11+65

2) Loose Sands: Loose sands were encountered near-surface on the project at the following locations:

Line	Station
-L-	27+00, 25' Rt.
-L-	29+00
-L-	31+00

3) Organics: Soils with more than a trace of organic material (>3% in granular soils and >5% in silt-clay soils) were encountered on the project at the following locations:

Line	Station
-L-	14+00
-L-	22+50
-L-	23+00
-L-	27+00
-L-	46+00

4) Near-Surface Wet Soils: Wet soils within the upper 5 feet of the soil column were encountered on the project at the following locations.

Line	Station
-L-	19+00
-L-	22+50 to 23+00
-L-	27+00 to 32+90
-L-	40+00 to 46+00
-Y4-	13+75
-Y6-	11+75

5) Groundwater: The following areas exhibited a high water table, seasonal high groundwater, or the potential for groundwater related construction problems.

Line	Station
-L-	26+00 to 27+00 Rt. of L-
-L-	27+70 to 30+50 Rt. of -L-
-Y3-	10+50 to 11+50 Rt. of -Y3-

6) Large Gravel/Large Rock Fragments/Boulders: Large gravel, large rock fragments, and/or boulders were encountered within the depths explored at the following locations:

Line	Station
-L-	15+50
-L-	22+50
-L-	27+00, 37' Rt.
-L-	29+00, 12' Rt.
-L-	40+00
-L-	44+00

7) Weathered Rock: Weathered rock was encountered within the depths explored at the following locations:

Line	Station
-L-	17+50
-L-	19+00

Physiography and Geology

The project site is located in the Piedmont Physiographic Province of North Carolina. The project corridor is primarily composed of single family homes, isolated businesses, and wooded lots. The general topography of the site vicinity is rolling with relatively gentle slopes. Geologically, the site is located within the Carolina Slate Belt and, according to the 1985 Geologic Map of North Carolina, the rocks underlying the project corridor generally consists of metamorphosed granitic rock. The overlying

Mr. Njoroge W. Wainaina, P.E., NCDOT *March 21, 2007*
NC 86 (South Columbia St.) from SR 1906 to SR 1902, Orange County, North Carolina *Trigon Project No. 071-06-047*

residual soils at the site are the product of the physical and chemical weathering of the underlying crystalline rock.

Soil Properties

Artificial fill was encountered beginning at the existing ground surface e or underlying the existing pavement structure at the following locations:

Line	Station
-L-	22+50 to 24+00
-L-	44+00 to 47+50
-Y6-	11+75

The artificial fill embankments on the project are generally approximately six feet or less in height, and generally consist of soft to stiff, tan to red to orange to brown, clayey, coarse to fine sandy silt (A-4) and silty, coarse to fine sandy clay (A-6). Plasticity indices of the artificial fill soils tested as part of this investigation ranged from 3 to 11. Little organic content in the form of plant debris was present within the artificial fill at -L- Station 22+50, and high organic contents were present to a depth of approximately 2 feet at -L- Stations 23+00 and 46+00. Refusal to our hand auger equipment occurred on large gravel/boulders within the artificial fill at -L- Station 22+50.

Roadway embankment fill was encountered beginning at the existing ground surface or underlying the existing pavement structure at the following locations:

Line	Station
-L-	13+50 to 15+00
-L-	26+50 to 31+60
-Y3-	11+00 to 11+50
-Y7-	13+75
-Y8-	11+65

The existing roadway embankments on the project generally appear to be less that ten feet in height with the exception of the area around -L- Station 14+00. The roadway embankment fill material encountered at the site generally consists of loose to medium dense, tan to red to brown, variably clayey, silty, fine to coarse sand (A-1-b and A-2-4), and soft to very stiff, grey and tan to red to brown, clayey, coarse to fine sandy silt (A-4) and coarse to fine sandy, silty clay (A-6 and A-7-5). Moderate to high organic contents were present within portions of the roadway embankment fill at -L- Stations 14+00 and 27+00 (37' Rt.), and refusal to our hand auger equipment occurred in wood and/or gravel at -L- Station 27+00 (37' Rt.). Large gravel and/or boulders were present within the roadway embankment fill at -L- Stations 14+00, 27+00 (37' Rt.), 29+00, and 31+00. The plasticity indices of the roadway embankment fill soils tested as part of this investigation range from 6 to 14.

Alluvial soils were encountered right of the existing roadway embankment at -L- Station 29+00. The alluvium extends to a depth of 3.0 feet below the existing ground surface and generally consist of loose, red to brown, silty, coarse to fine sand (A-2-4), and very soft to soft, brown, clayey, fine sandy silty (A-4) and coarse to fine sandy, silty clay (A-6).

The residual soils encountered as part of this investigation generally consist of medium dense to dense, red to tan to brown, clayey, silty, coarse to fine sand (A-2-4), and soft to hard, tan to orange to red to brown, variably clayey, coarse to fine sandy silt (A-4) and silty, coarse to fine sandy clay (A-6 and A-7). Rock fragments are common within the residual soil. The plasticity indices of the residual soils tested as part of this investigation range from 6 to 22.

Rock Properties

Weathered rock is derived from the underlying metamorphosed granitic rock. Weathered rock was encountered within the depth explored at two locations on the -L- alignment: Station 17+50 and Station 19+00. The top of the weathered rock was encountered at a depth of 3.0 feet (Elev. 383.0 feet) at Station 17+50, and at a depth of 8.0 feet (Elev. 383.7 feet) at Station19+00). The weathered rock consists of metamorphosed granitic rock.

Groundwater

Groundwater was only encountered at the hand auger performed 36 feet right of -L- Station 29+00. The groundwater at this boring was present at a depth of 1.5 feet below the existing ground surface (Elevation 427.8 feet). It should be noted that fluctuations in groundwater levels can occur due to seasonal changes in precipitation and surface water runoff. Seasonally high groundwater levels usually occur during or just after the typically wetter months of the year (November through April). Areas that, based on the preliminary cross sections and on visual observations, are likely to exhibit a high water table, seasonal high groundwater, or the potential for groundwater related construction problems are outlined in the section of this report entitled "Areas of Special Geotechnical Interest".

Closure

Trigon Engineering Consultants, Inc. appreciates the opportunity to work with you during this phase of the project. Should you have any questions concerning this report, please do not hesitate to contact our office.

Respectfully submitted,
TRIGON ENGINEERING CONSULTANTS, INC.

Paul M. Weaver, P.G.
Registered North Carolina No. 1500

Jeffrey R. Vinson, P.G.
Executive Vice President

NORTH CAROLINA LICENSED SEAL 1500 GEOLOGIST PAUL M. WEAVER

8/22/07

PMW/JRV:pmw
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BULK SAMPLES

The following bulk samples were taken for tests to evaluate the engineering properties of the soil:

Sample No.	Location	Depth (ft.)	Test
CBR-1	-L- 19+00, 25' RT	0.0-1.5	California Bearing Ratio
CBR-2	-L- 33+00, 50' LT	0.0-1.5	California Bearing Ratio
CBR-3	-Y4- 13+75, 9' RT	0.0-1.5	California Bearing Ratio

COMPUTED BY: HLE	DATE 7/30/2012	PROJECT NO.	SHEET NO.
CHECKED BY: CSM	DATE 7/30/2012	U-624	3D / 46

EARTHWORK BALANCE SHEET

IN CUBIC YARDS

LOCATION	UNCLASSIFIED EXCAVATION	ROCK EXCAVATION	UNDERCUT EXCAVATION	UNSUITABLE EARTH EXCAVATION	SUITABLE EARTH EXCAVATION	TOTAL EMB'T	EARTH EMBANKMENT	ROCK EMB'T	EMB'T + % 20	BORROW	SELECT BORROW	ROCK WASTE	SUITABLE WASTE	UNSUITABLE WASTE	TOTAL WASTE
-L- LT 12+00.00 TO 38+50.00	852				852	397	397		476				376		376
-L- RT 12+00.00 TO 38+50.00	1640				1640	8944	8944		10733	9093					
-Y1- 9+50.00 TO 12+00.00	28				28	24	24		29	1					
-Y2- 10+00.00 TO 11+00.00	6				6	15	15		18	12					
-Y3- 10+25.00 TO 11+75.00	6				6	685	685		822	816					
-Y4- 12+75.00 TO 13+75.00	268				268	8	8		10				258		258
-Y6- 11+53.00 TO 11+83.00	13				13	2	2		2				11		11
-L- RT 19+45.00 (FILL IN REVINE)						245	245		294	294					
SUBTOTALS NO 1	2813				2813	10320	10320		12384	10216			645		645
-L- LT 38+50.00 TO 50+50.00	238				238	65	65		78				160		160
-L- RT 38+50.00 TO 50+50.00	515				515	281	281		337				178		178
-Y7- 12+12.97 TO 12+50.00	8				8								8		8
-Y7- 13+25.00 TO 14+25.00	24				24	5	5		6				18		18
-Y8- 10+50.00 TO 11+82.08	69				69	14	14		17				52		52
SUBTOTALS NO 2	854				854	365	365		438				416		416
SUBTOTAL NO 3															
PROJECT SUBTOTALS	3667				3667	10685	10685		12822	10216			1061		1061
LOSS DUE TO CLEAR. & GRUB	-200				-200					200					
ADDITIONAL UNDERCUT EXCAV.															
WASTE IN LIEU OF BORROW										-1061			-1061		-1061
PROJECT TOTALS	3467				3467	10685	10685		12822	9355					
REPLACE TOP SOIL BOR. PITS										468					
GRAND TOTALS	3467									9823					
SAY	3500									9900					

PAVEMENT STRUCTURE VOLUME :	**N/A**	**CUBIC YARDS**	
DRAINAGE DITCH EXCAVATION :	**1,720**	**CUBIC YARDS**	
UNDERCUT EXCAVATION	**350**	**CUBIC YARDS**	(Contingency Item)
SHALLOW UNDERCUT EXCAVATION	**2000**	**CUBIC YARDS**	(Contingency Item)
CLASS IV SUBGADE STABILIZATION	**4000**	**TONS**	(Contingency Item - Backfill Material To Replace Shallow Undercut Excavation)
SELECT GRANULAR MATERIAL	**250**	**CUBIC YARDS**	(Contingency item, Class II or III)

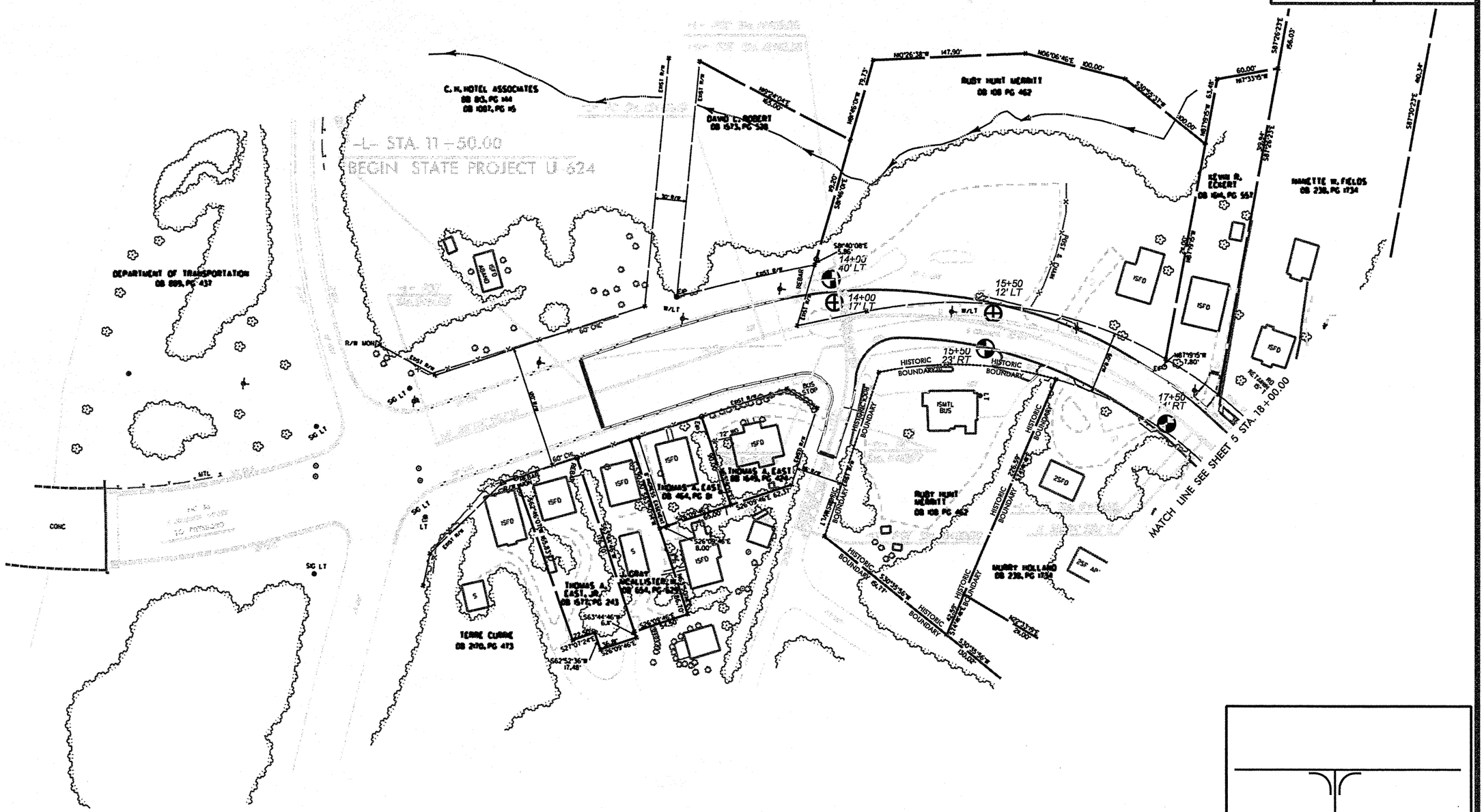
EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

Sheet 4

U-0624 | 4

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



FOR -L- PROFILE, SEE SHEET 8
FOR -Y1- PROFILE, SEE SHEET 10

REVISIONS

8/17/99

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$$$$USERNAME$$$$

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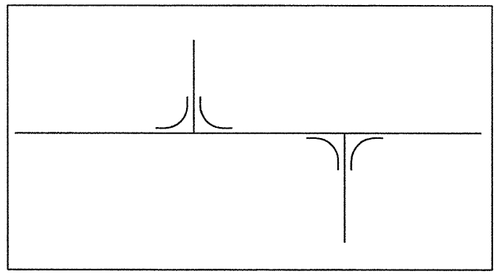
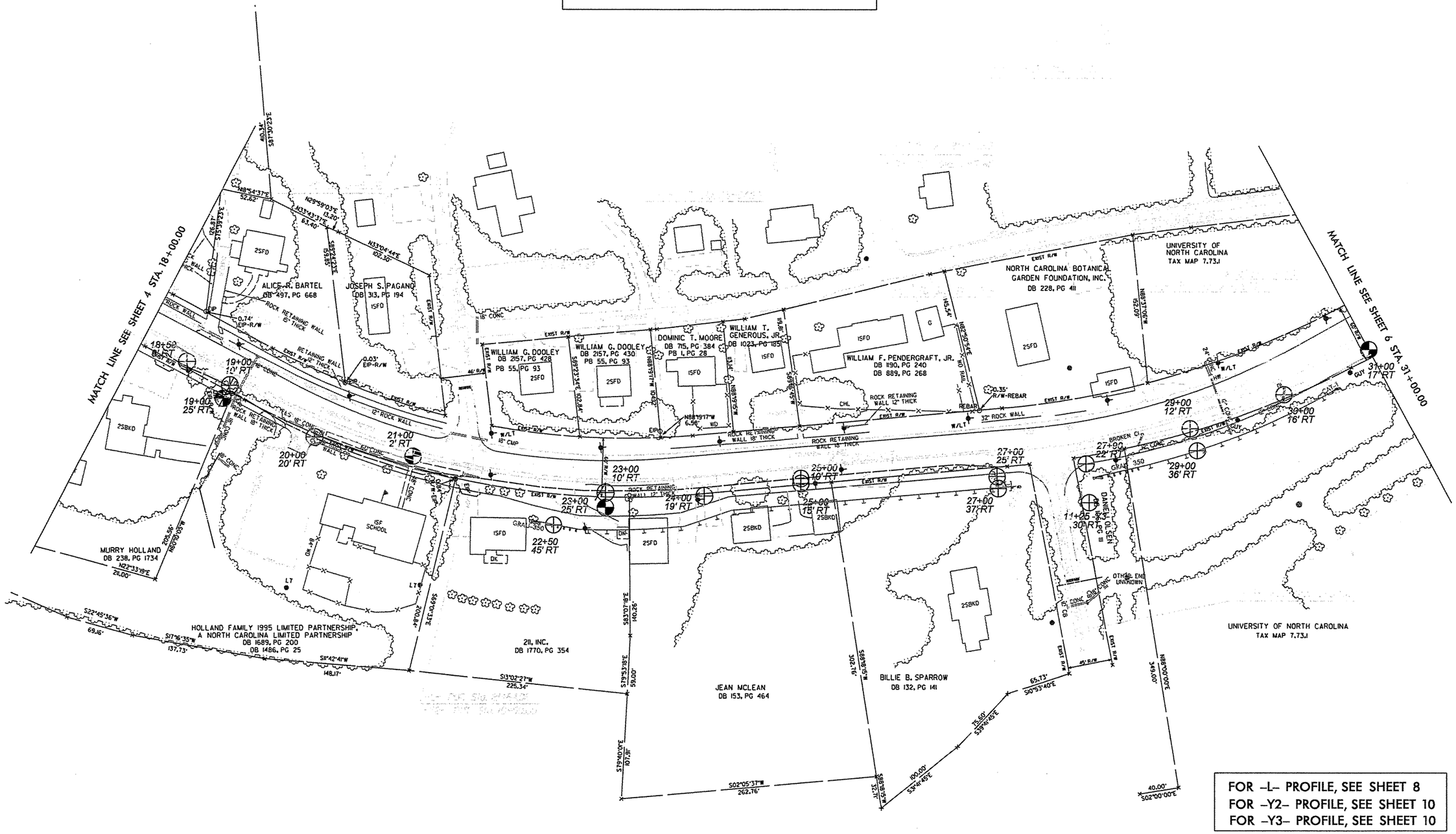
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS





U-0624 6

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS

PAMELA M. SHUPING & WILLIAM E. SHUPING DB 1621, PG 3 PB 1, PG 77

JOHN BILLING DB 1976, PG 34 PB 1, PG 77

DON W. MILLEN DB 767, PG 322 PB 1, PG 107

CHARLES MURPHY, JR. DB 275, PG 969 PB 1, PG 107

ANNE PACKARD DB 2062, PG 328 PB 1, PG 107

JONATHAN F. FOSTER DB 514, PG 412 PB 1, PG 107

WILLIAM H. PEARLMAN DB 222, PG 205 PB 1, PG 107

JOHN P. SHERROD & SYDNEY S. SHERROD DB 1367, PG 509 PB 1, PG 107

JOHN I. MCKOWAN DB 1273 PG 384

UNIVERSITY OF NORTH CAROLINA TAX MAP 7.73J

UNIVERSITY OF NORTH CAROLINA TAX MAP 7.73J

ISBK HOSPITAL

MATCH LINE SEE SHEET 5 STA. 31+00.00

MATCH LINE SEE SHEET 7 STA. 42+00.00

2005 AADT / 2030 AADT	OLD PITTSBORO RD.	VALENTINE LN.	WESTWOOD DR.	WESTWOOD DR.
	600/700	–100/NA	600/700	400/500
	200/300	400/400	–100/NA	–100/NA	400/400	200/300	100/100	100/100
S. COLUMBIA ST. NC 86	19,000/30,900	19,200/31,000	19,200/31,000	19,000/30,900	6000/9300	3000/4700	16,000/26,300	S. COLUMBIA ST. NC 86
					9200/14300			
					MASON FARM RD.			

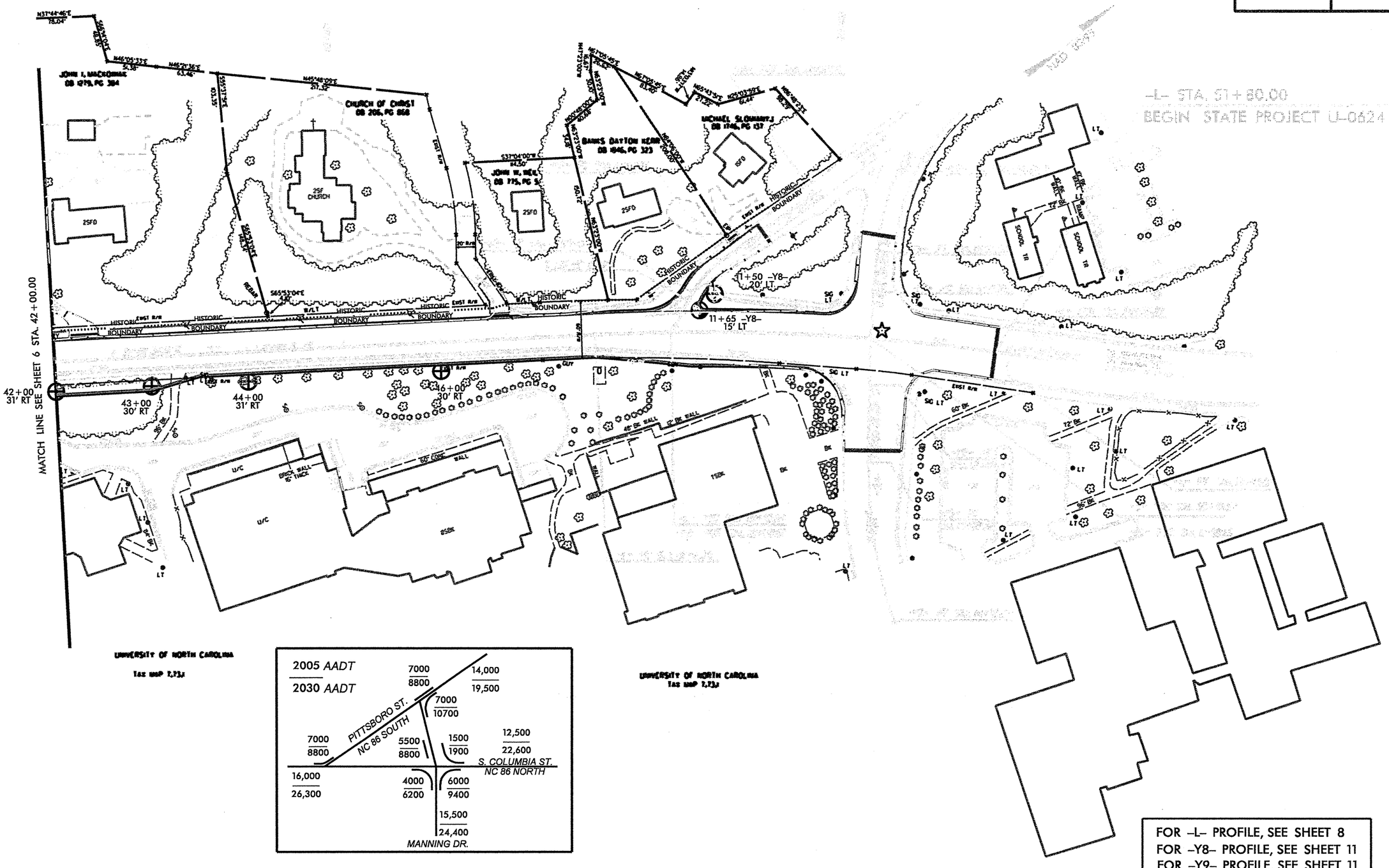
FOR –L– PROFILE, SEE SHEET 8
FOR –Y4– PROFILE, SEE SHEET 10
FOR –Y5– PROFILE, SEE SHEET 10
FOR –Y6– PROFILE, SEE SHEET 10
FOR –Y7– PROFILE, SEE SHEET 11

U-0624	7

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

REVISIONS 8/17/99



FOR –L– PROFILE, SEE SHEET 8
FOR –Y8– PROFILE, SEE SHEET 11
FOR –Y9– PROFILE, SEE SHEET 11

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Sheet 8

U-0624 | X-3

8/23/99

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.L. I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	23' RT	15+50	3.5-5.0	A-7-6 (17)	50	22	11	18	19	52	100	93	76	27.6	

Sheet 9
U-0624
X-4
8/23/99
0.0023
0.0126
391.280
RESIDUAL - SANDY SILT(A-4)
18+50.00
0.0169
0.0200
388.090
RESIDUAL - SANDY SILT(A-4)
18+00.00
0.0361
0.0361
RESIDUAL - DRY, HARD, TAN-ORANGE, COARSE TO FINE SANDY SILT(A-4) WITH LITTLE ROCK FRAGMENTS
385.669
WEATHERED ROCK - TAN, METAMORPHOSED GRANITIC ROCK
3.0
9.2
(86)
100/0.8
100/0.8
100/0.7
B.T.
NGWE
17+50.00
0.0400
0.0400
382.997
RESIDUAL - SANDY SILT(A-4)
17+00.00
0.0400
0.0400
380.827
RESIDUAL - SANDY SILT(A-4)
16+50.00
0.0400
0.0400
378.610
16+00.00
RESIDUAL - SANDY SILT(A-4)
-L-
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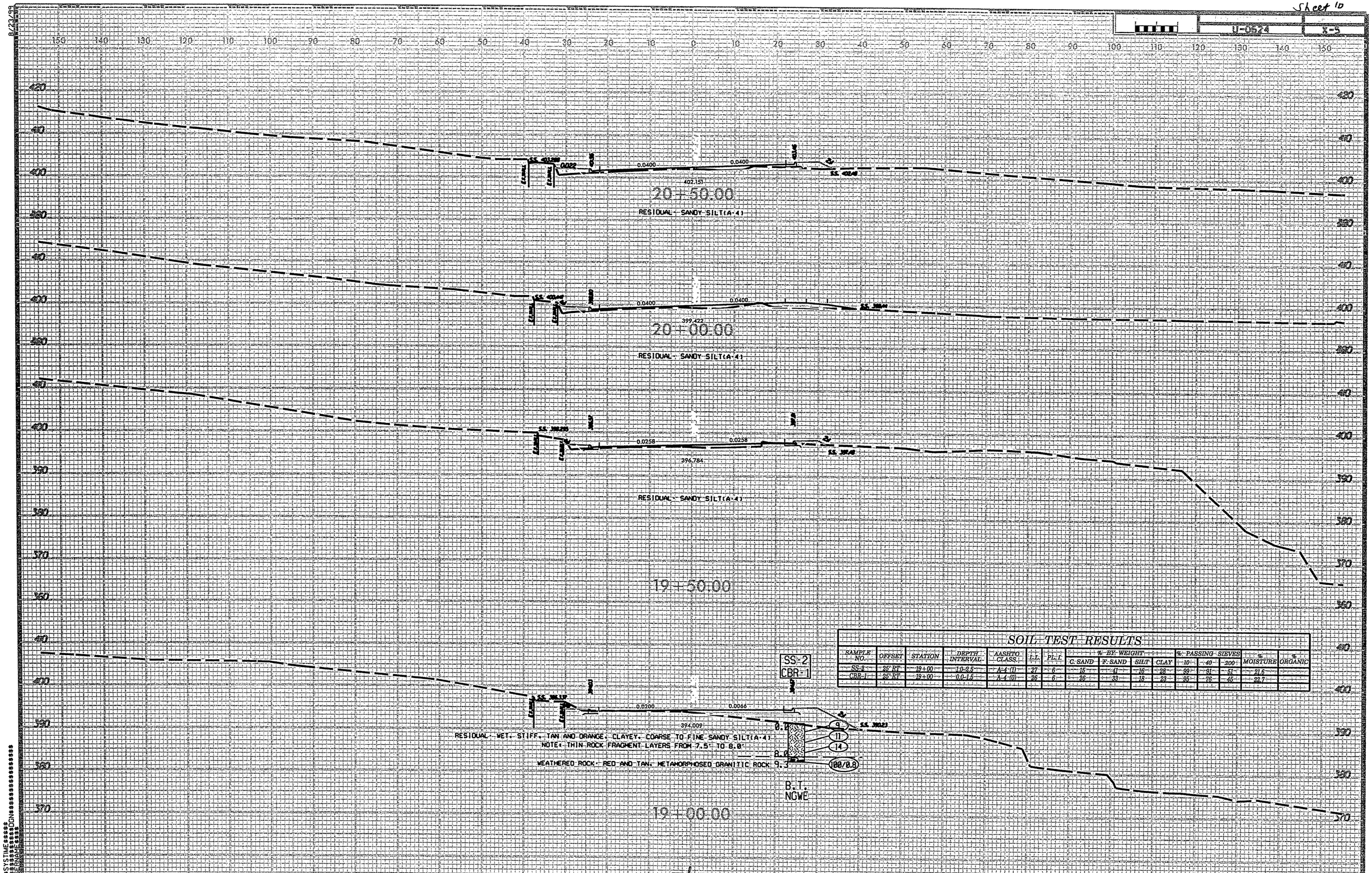
$$$USERNAME$$$$

Sheet 10

U-0524 X-5



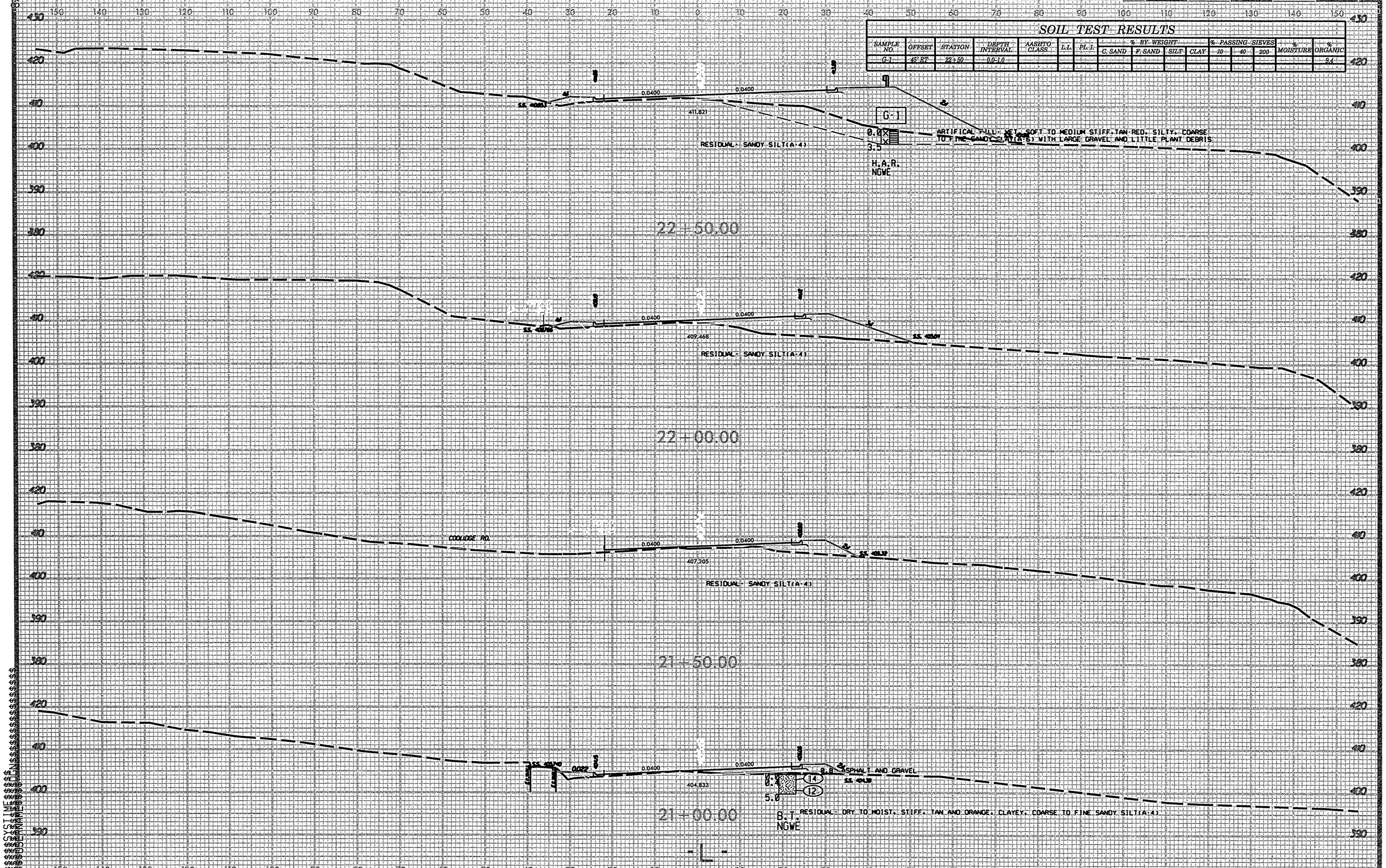
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
SS-2	25' RT	19+00	1.0-2.5	A-4 (1)	27	6	15	41	16	28	99	91	51	21.6	
CBR-1	25' RT	19+00	0.0-1.5	A-4 (0)	26	6	26	33	18	23	95	76	45	22.7	

U-0524 | X-6

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	PL.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES #10	#40	#200	% MOISTURE	% ORGANIC
G-1	45' RT	22+50	0.0-1.0												9.4



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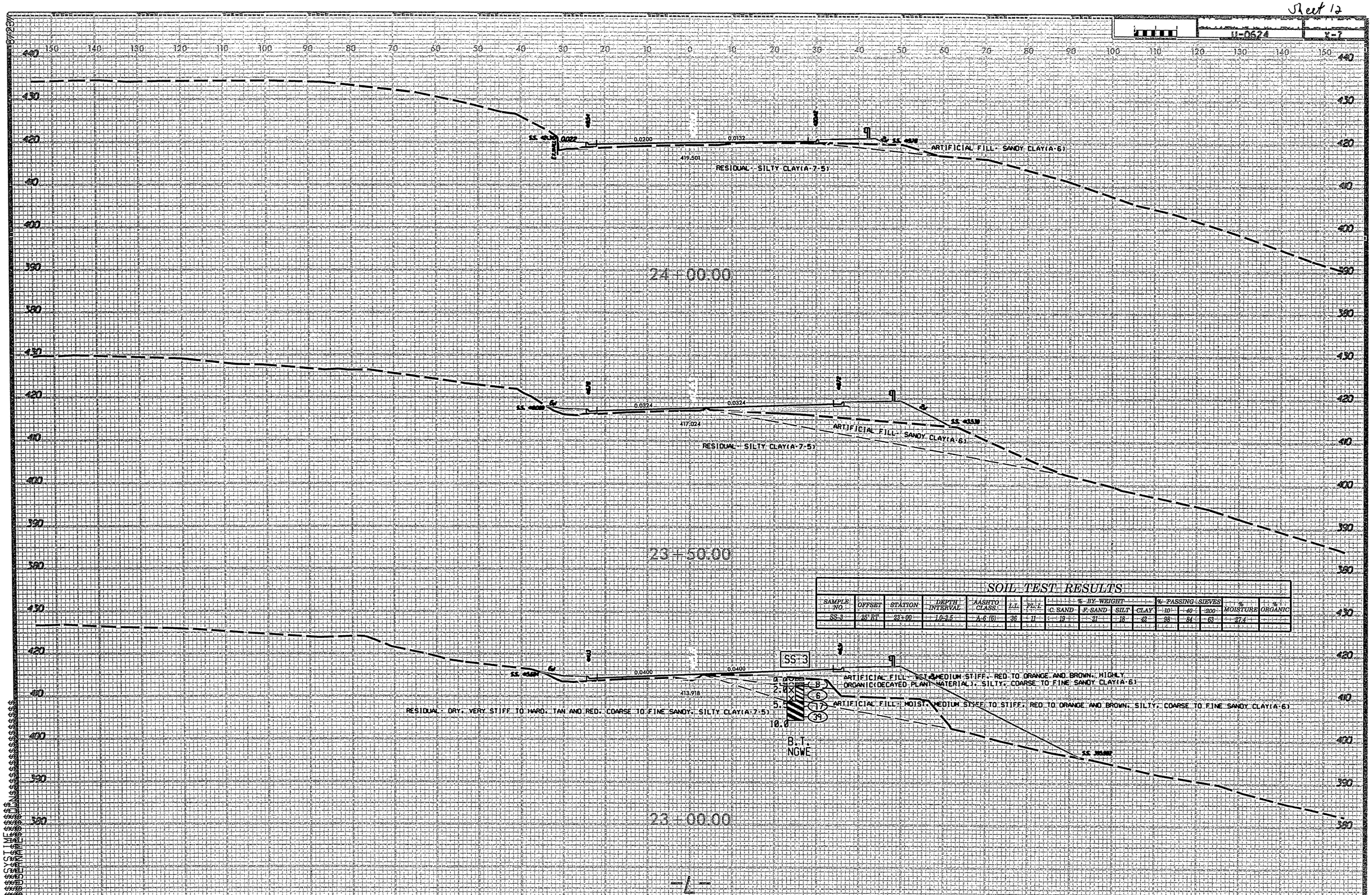
Sheet 12



SOIL TEST RESULTS

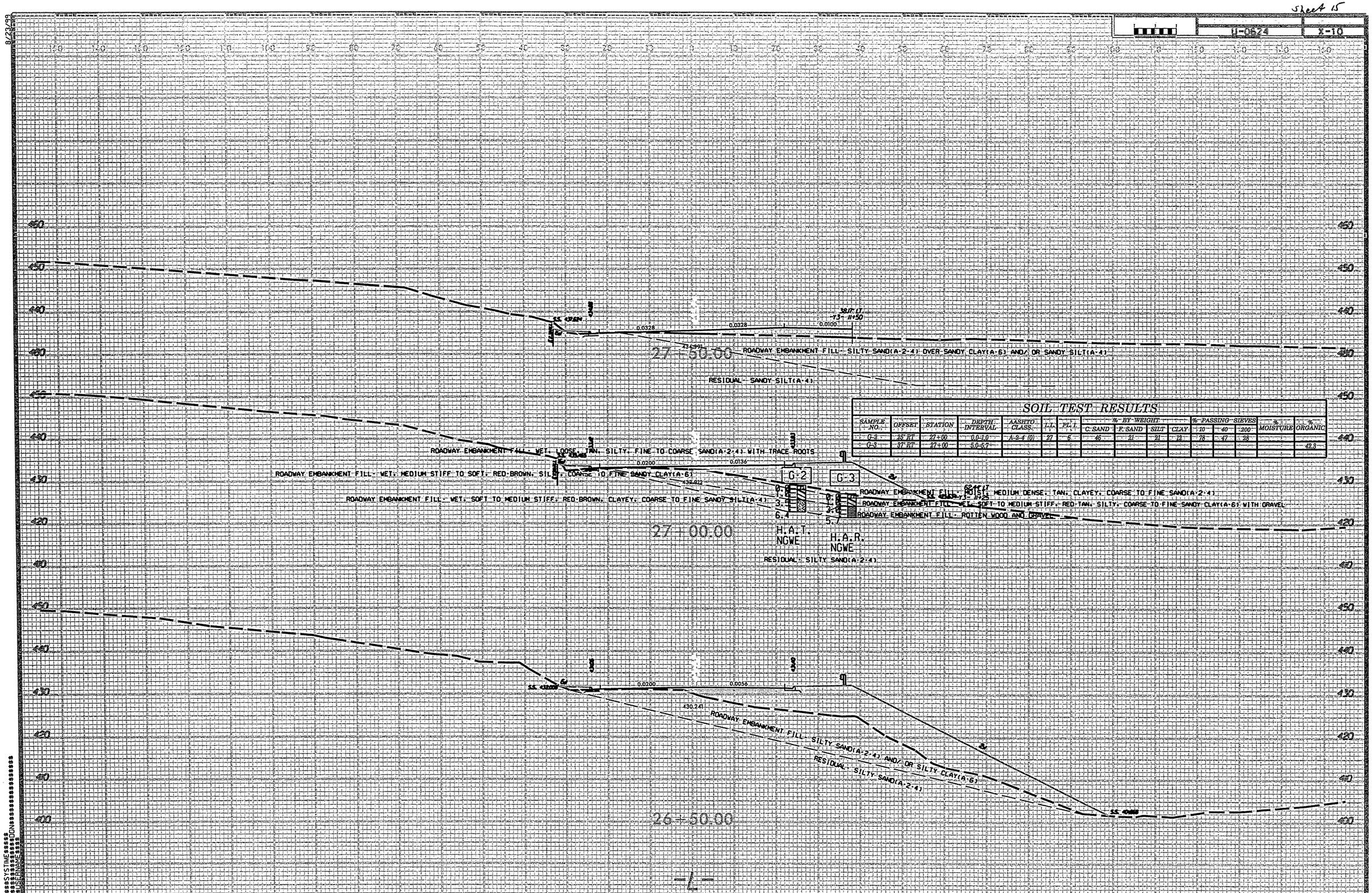
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
SS-3	25' RT	23+00	1.0-2.5	A-6 (6)	36	11	19	21	18	42	98	84	63	27.4	

Sheet 13
U-0524
X-8
8/23/99
RESIDUAL- MOIST, MEDIUM DENSE TO DENSE, TAN-BROWN TO RED-TAN, CLAYEY, SILTY, COARSE TO FINE SAND(A-2-4)
423.990
0.022
0.0200
0.0200
6.0
H.A.T.
NGWE
25+00.00
0.022
0.0200
0.0060
421.575
RESIDUAL- SILTY SAND(A-2-4)
24+50.00
-L-
450
440
430
420
410
400
390

Sheet 14
U-0624
X-9
8/23/99
0.0200
0.0200
428.571
RESIDUAL - SILTY SAND(A-2-4)
26+00.00
0.0200
0.0200
426.537
RESIDUAL - SILTY SAND(A-2-4)
25+50.00
-L-
450
440
430
420
410
400
390
380
370

Sheet 15

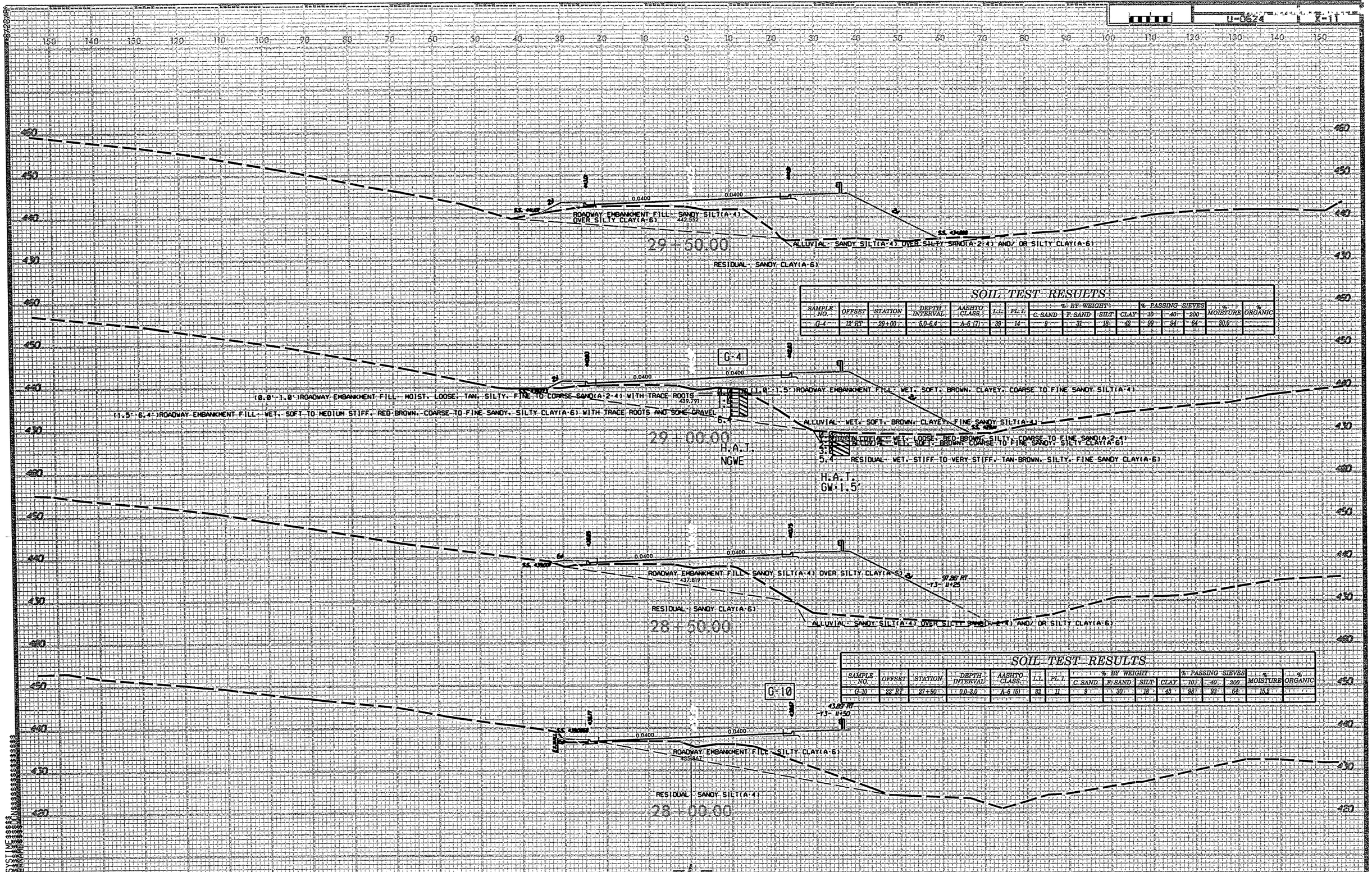
U-0624 X-10

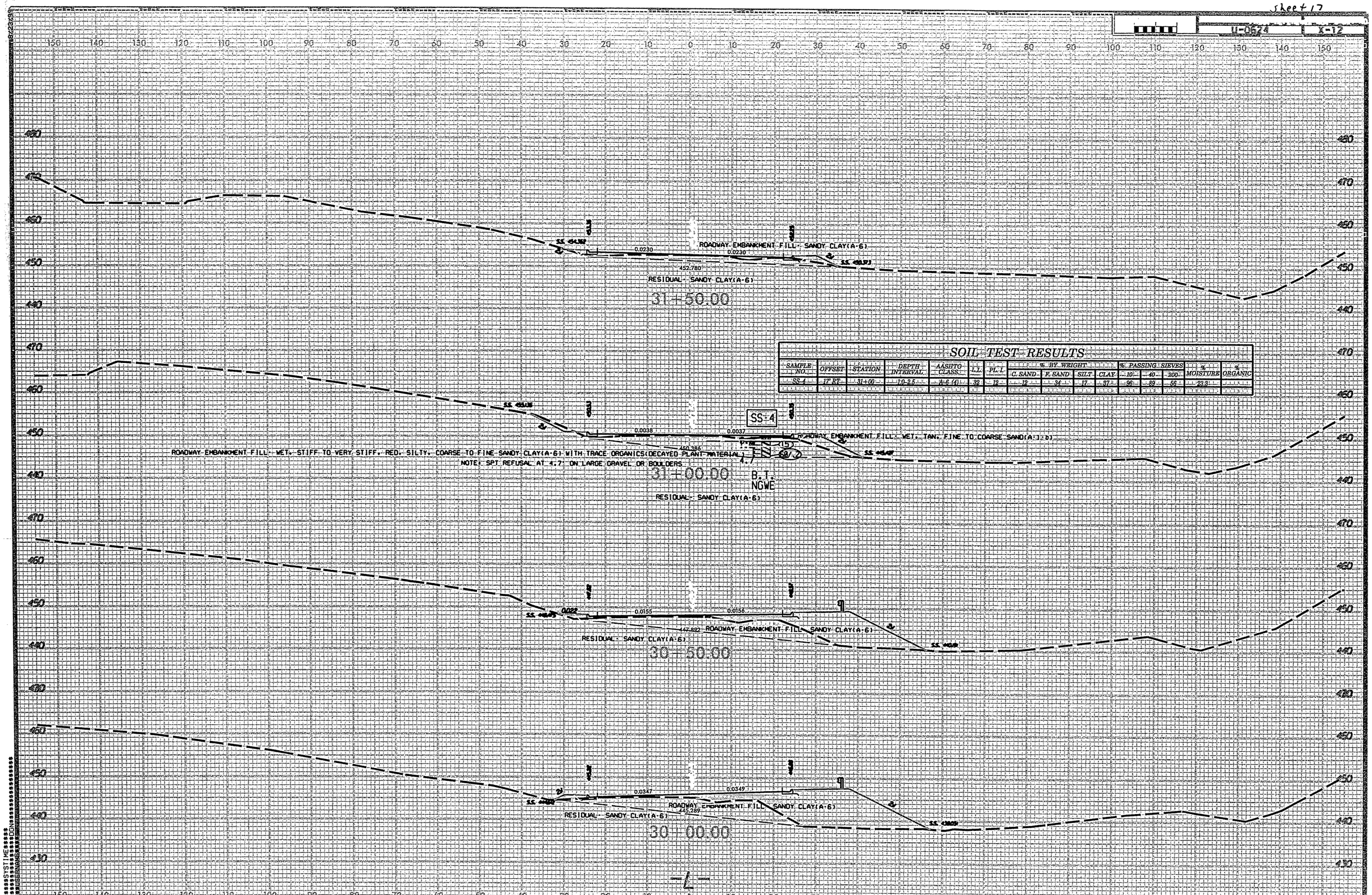


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
G-2	25' RT	27+00	0.0-1.0	A-2-4 (0)	27	6	46	21	21	12	78	47	28		
G-3	37' RT	27+00	5.0-5.7												42.3

-L-


150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
460
450
440
430
420
ROADWAY EMBANKMENT FILL- SANDY SILT(A-4) OVER SILTY CLAY(A-6)
442.552
29+50.00
RESIDUAL- SANDY CLAY(A-6)
ALLUVIAL- SANDY SILT(A-4) OVER SILTY SAND(A-2-4) AND/ OR SILTY CLAY(A-6)
0.0400
G-4
(0.0'-1.0') ROADWAY EMBANKMENT FILL- MOIST, LOOSE, TAN, SILTY, FINE TO COARSE SAND(A-2-4) WITH TRACE ROOTS
439.791
(1.5'-6.4') ROADWAY EMBANKMENT FILL- WET, SOFT TO MEDIUM STIFF, RED-BROWN, COARSE TO FINE SANDY, SILTY CLAY(A-6) WITH TRACE ROOTS AND SOME GRAVEL
29+00.00
H.A.T.
NGWE
(0.0'-1.5') ROADWAY EMBANKMENT FILL- WET, SOFT, BROWN, CLAYEY, COARSE TO FINE SANDY SILT(A-4)
ALLUVIAL- WET, SOFT, BROWN, CLAYEY, FINE SANDY SILT(A-4)
ALLUVIAL- WET, LOOSE, RED-BROWN, SILTY, COARSE TO FINE SAND(A-2-4)
ALLUVIAL- WET, SOFT, BROWN, COARSE TO FINE SANDY, SILTY CLAY(A-6)
RESIDUAL- WET, STIFF TO VERY STIFF, TAN-BROWN, SILTY, FINE SANDY CLAY(A-6)
H.A.T.
GW-1.5
SOIL TEST RESULTS
SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | PL.I. | % BY WEIGHT: C-SAND | F-SAND | SILT | CLAY | % PASSING SIEVES: 10 | 40 | 200 | % MOISTURE | % ORGANIC
G-4 | 12' RT | 29+00 | 5.0-6.4 | A-6 (7) | 39 | 14 | 9 | 31 | 18 | 42 | 99 | 94 | 64 | 30.0 |
G-10
ROADWAY EMBANKMENT FILL- SANDY SILT(A-4) OVER SILTY CLAY(A-6)
437.819
28+50.00
RESIDUAL- SANDY CLAY(A-6)
97.85' RT
-Y3- 11+25
ALLUVIAL- SANDY SILT(A-4) OVER SILTY SAND(A-2-4) AND/ OR SILTY CLAY(A-6)
43.89' RT
-Y3- 11+50
ROADWAY EMBANKMENT FILL- SILTY CLAY(A-6)
435.847
RESIDUAL- SANDY SILT(A-4)
28+00.00
SOIL TEST RESULTS
SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | PL.I. | % BY WEIGHT: C. SAND | F. SAND | SILT | CLAY | % PASSING SIEVES: 10 | 40 | 200 | % MOISTURE | % ORGANIC
G-10 | 22' RT | 27+90 | 0.0-3.0 | A-6 (5) | 32 | 11 | 9 | 30 | 18 | 43 | 98 | 93 | 64 | 15.2 |



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
SS-4	17' RT	31+00	1.0-2.5	A-6 (4)	32	12	12	34	17	37	96	89	56	23.3	

U-0624 X-13

8/28/99

RESIDUAL - SILTY CLAY(A-7-5)

RESIDUAL - SANDY SILT(A-4)

RESIDUAL - MOIST, SOFT TO VERY STIFF, RED-BROWN TO TAN-RED, FINE SANDY, SILTY CLAY(A-7-5)

RESIDUAL - WET, MEDIUM STIFF TO VERY STIFF, RED-BROWN, CLAYEY, COARSE TO FINE SANDY SILT(A-4) WITH TRACE TO SOME ROCK FRAGMENTS AND ROOTLETS

RESIDUAL - MOIST, DENSE, TAN-BROWN, SILTY, COARSE TO FINE SAND(A-2-4)

RESIDUAL - SILTY CLAY(A-7-5)

RESIDUAL - SANDY SILT(A-4)

RESIDUAL - SANDY CLAY(A-6)

33+50.00

33+00.00

32+50.00

32+00.00

-L-

G-5
CBR-2

SS-5

H.A.T.
NGWE

B.T.
NGWE

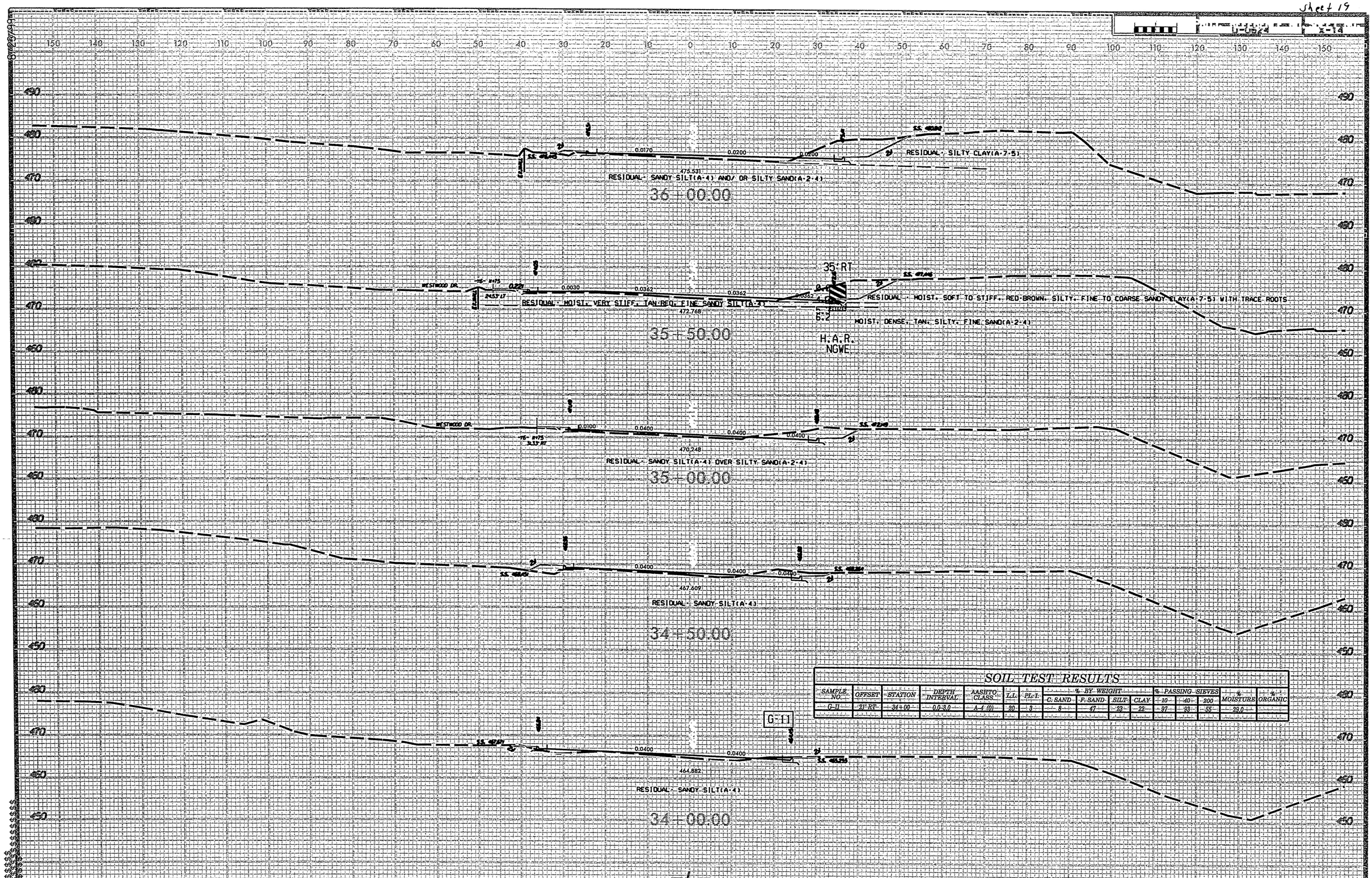
OLD PITTSBORO RD.

1852' LT
-Y4- 13+75

35.18' RT
-Y4- 13+75

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES #10	#40	#200	% MOISTURE	% ORGANIC
SS-5	28' RT	32+90	1.0-2.5	A-4 (1)	26	6	14	40	18	28	99	91	65	21.2	
G-5	60' LT	33+00	3.0-4.0	A-7-5 (9)	43	12	4	30	16	50	100	99	70	28.4	
CBR-2	60' LT	33+00	0.0-1.5	A-4 (1)	24	7	10	41	18	30	99	95	55	20.6	



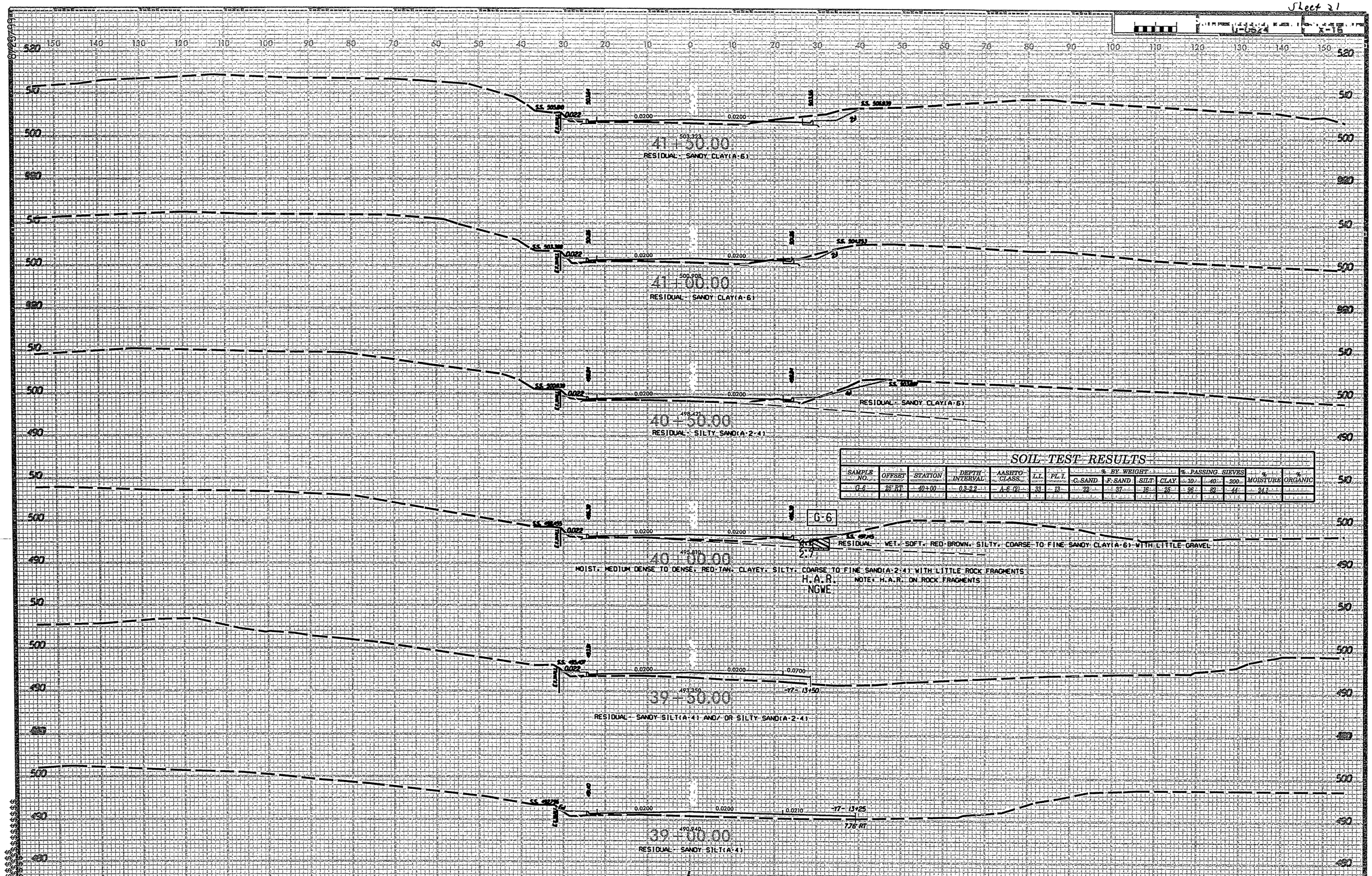
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
G-11	21' RT	34+00	0.0-3.0	A-4 (0)	20	3	8	47	23	22	97	93	55	29.0	

Sheet 20

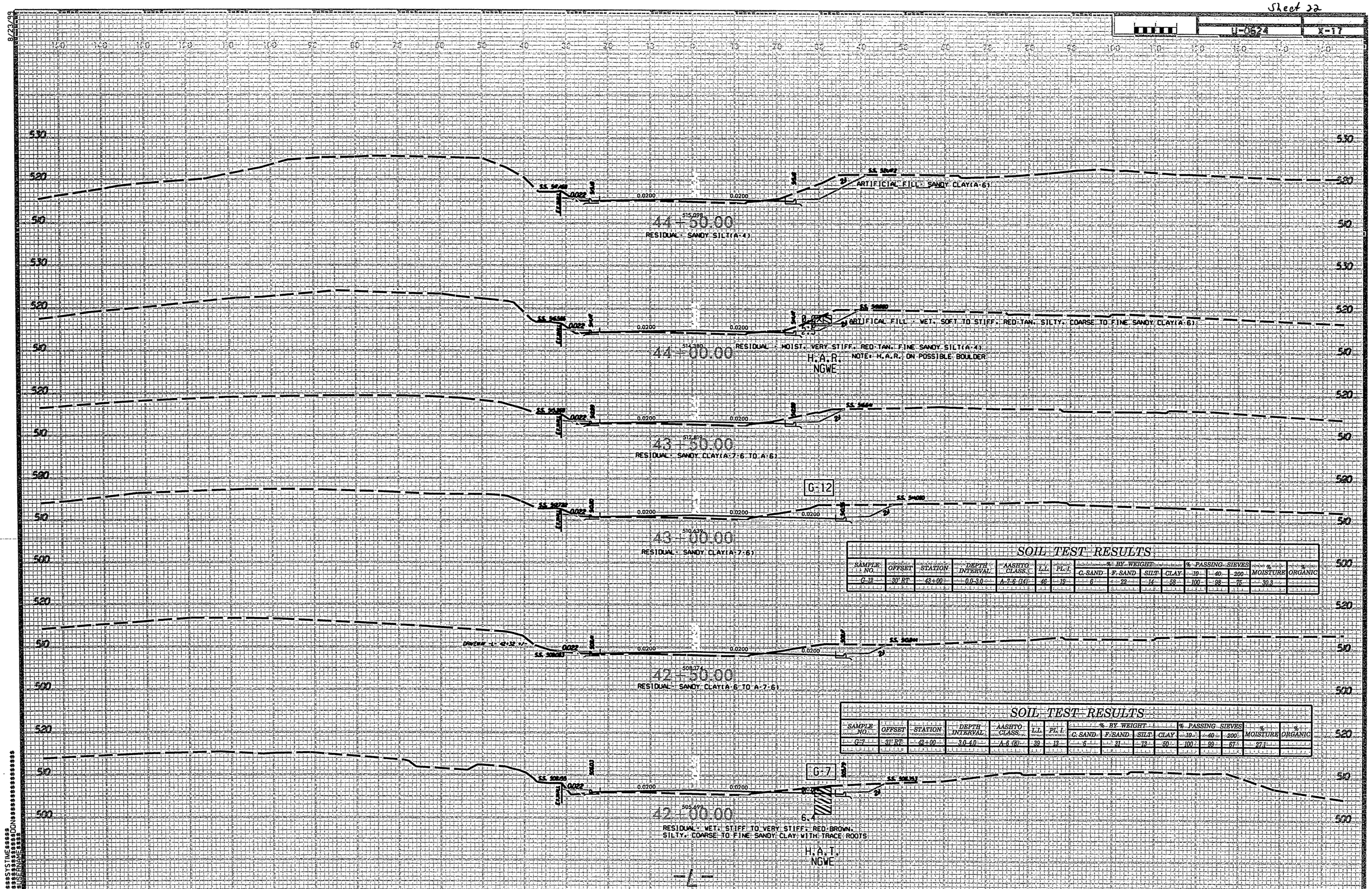
8/23/99

$$$$SYSTIME$$$$$
$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL. I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES #10	% PASSING SIEVES #40	% PASSING SIEVES #200	% MOISTURE	% ORGANIC
G-6	25' RT	40+00	0.3-2.2	A-6 (2)	33	13	22	37	16	25	95	82	44	24.1	

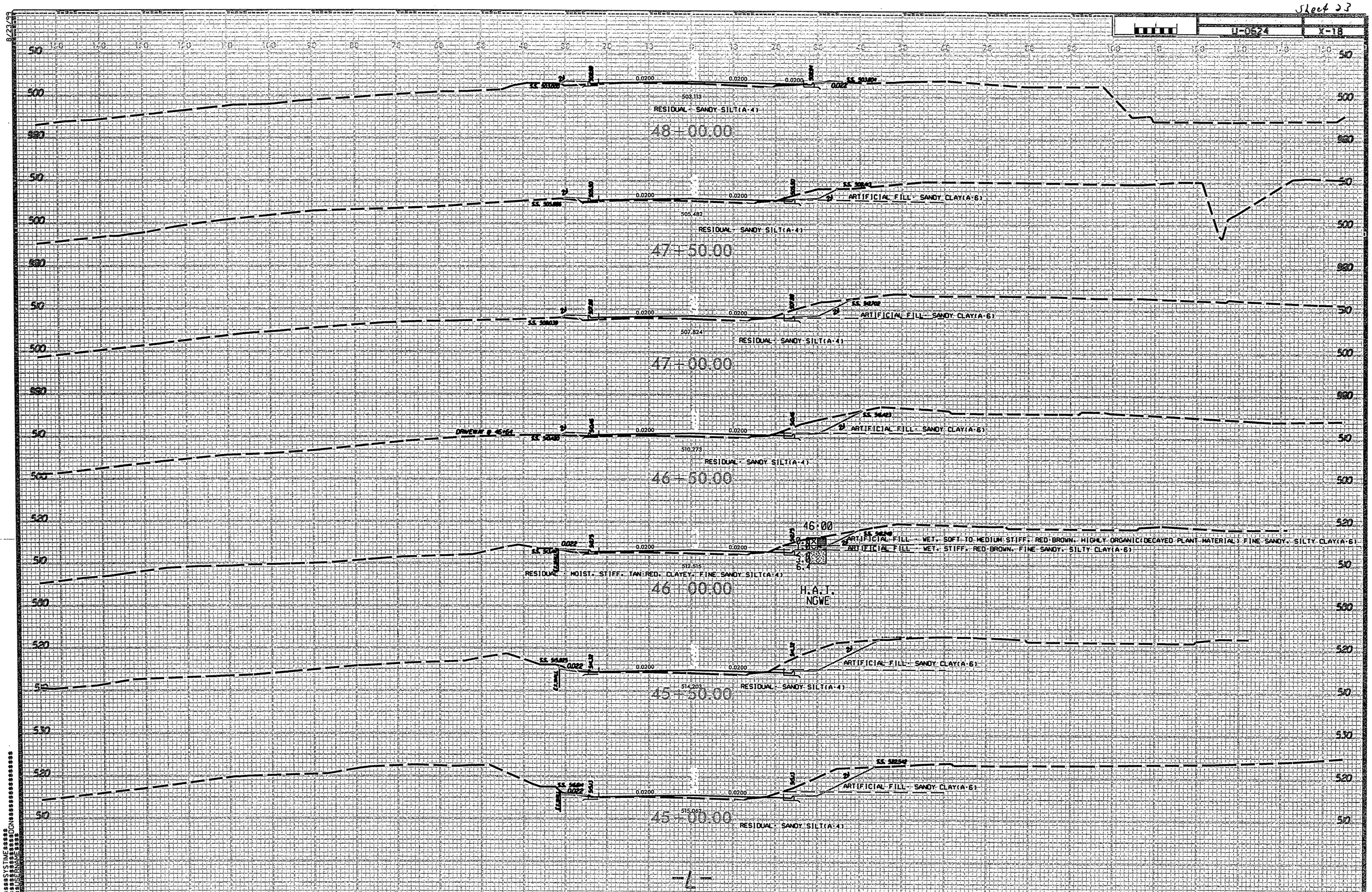


SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
G-12	30' RT	43+00	0.0-3.0	A-7-6 (14)	46	19	6	22	14	58	100	98	75	30.3	

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL.I.	% BY WEIGHT C. SAND	% BY WEIGHT F. SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING SIEVES 10	% PASSING SIEVES 40	% PASSING SIEVES 200	% MOISTURE	% ORGANIC
G-7	31' RT	42+00	3.0-4.0	A-6 (8)	39	13	6	31	13	50	100	99	67	27.1	

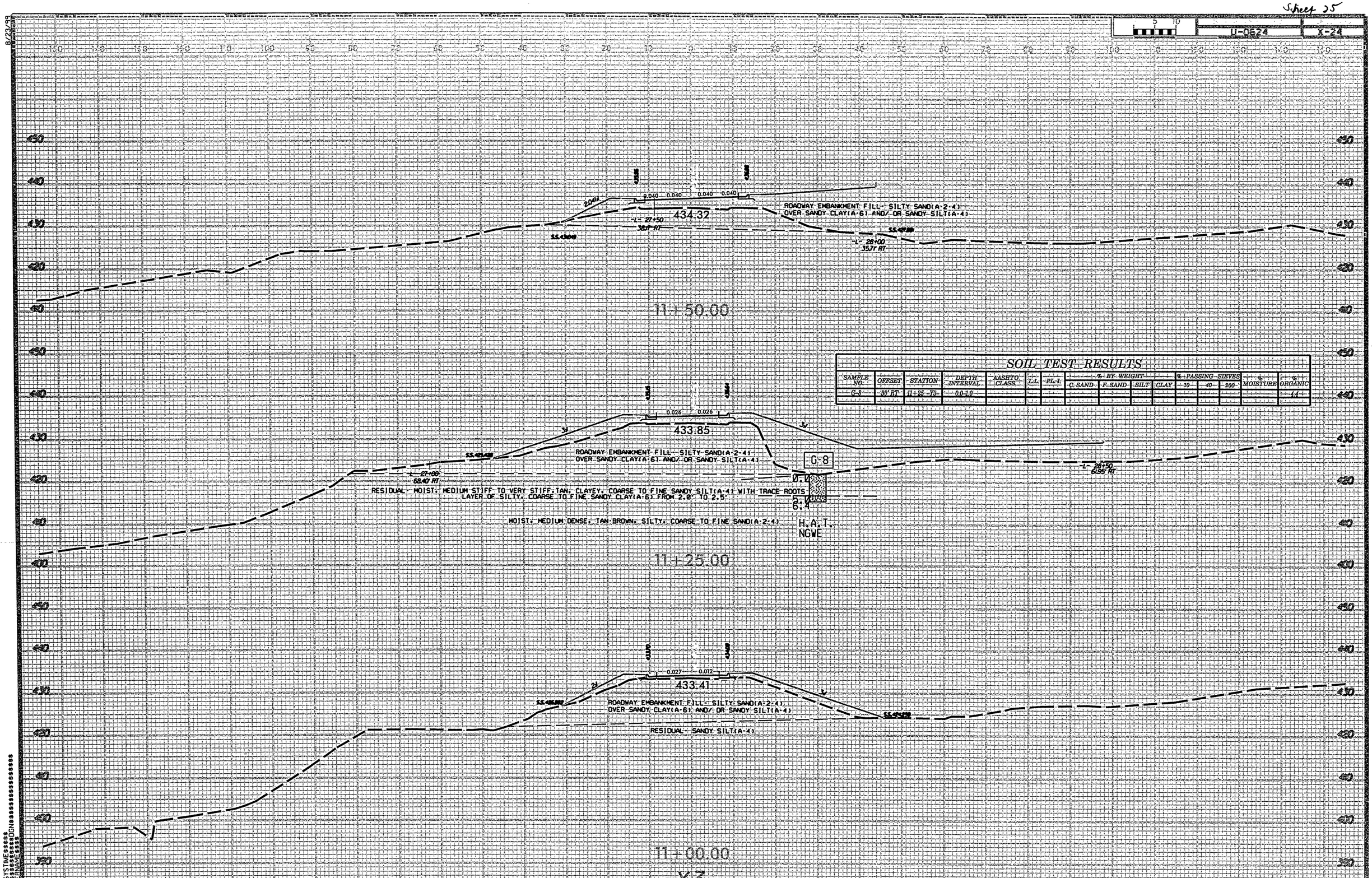

Sheet 23
U-0624
X-18
8/23/99
503.113
RESIDUAL - SANDY SILT(A-4)
48+00.00
505.482
ARTIFICIAL FILL - SANDY CLAY(A-6)
RESIDUAL - SANDY SILT(A-4)
47+50.00
507.824
ARTIFICIAL FILL - SANDY CLAY(A-6)
RESIDUAL - SANDY SILT(A-4)
47+00.00
DRIVEWAY @ 46+64
510.273
ARTIFICIAL FILL - SANDY CLAY(A-6)
RESIDUAL - SANDY SILT(A-4)
46+50.00
46+00
ARTIFICIAL FILL - WET, SOFT TO MEDIUM STIFF, RED-BROWN, HIGHLY ORGANIC(DECAYED PLANT MATERIAL) FINE SANDY, SILTY CLAY(A-6)
ARTIFICIAL FILL - WET, STIFF, RED-BROWN, FINE SANDY, SILTY CLAY(A-6)
512.515
RESIDUAL - MOIST, STIFF, TAN-RED, CLAYEY, FINE SANDY SILT(A-4)
46+00.00
H.A.T.
NGWE
514.203
ARTIFICIAL FILL - SANDY CLAY(A-6)
RESIDUAL - SANDY SILT(A-4)
45+50.00
515.062
ARTIFICIAL FILL - SANDY CLAY(A-6)
RESIDUAL - SANDY SILT(A-4)
45+00.00
-L-

Sheet 24

8/23/99

$$$$SYSTIME$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$

Sheet 25



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING SIEVES 10	40	200	% MOISTURE	% ORGANIC
G-8	30' RT	11+25 -Y3-	0.0-1.0												4.4

Sheet 26

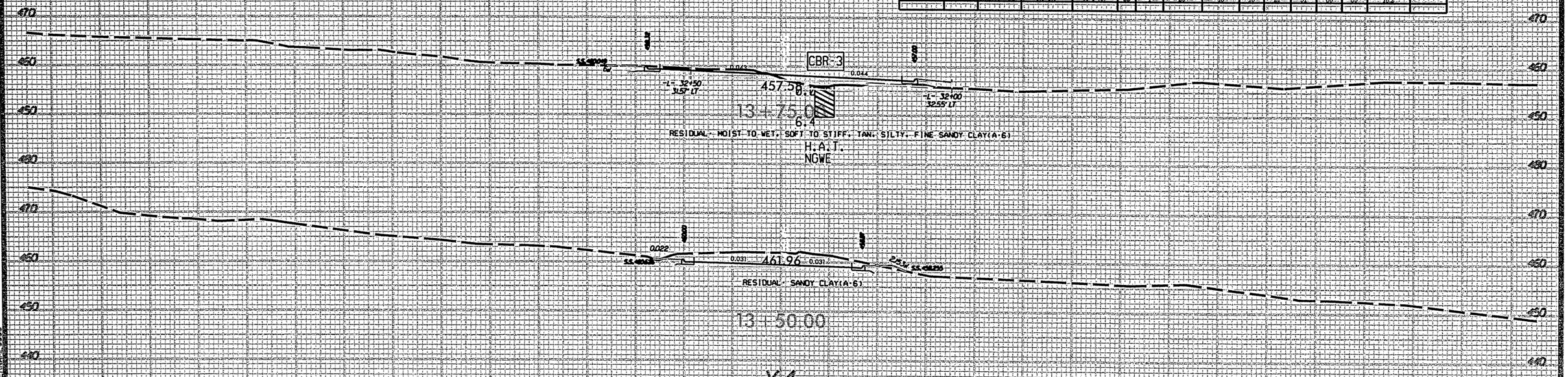
U-0624
X-25
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
480
470
460
450
440
0.019
462.81
0.019
RESIDUAL - SANDY CLAY (A-6)
13+25.00
0.006
0.006
0.022
462.65
RESIDUAL - SANDY CLAY (A-6)
13+00.00
0.000
0.000
463.62
BEG. RESURF. BEG. GRADE
RESIDUAL - SANDY CLAY (A-6)
12+75.00
464.46
RESIDUAL - SANDY CLAY (A-6)
12+50.00
-Y4-

Sheet 27

	U-0624	X-26

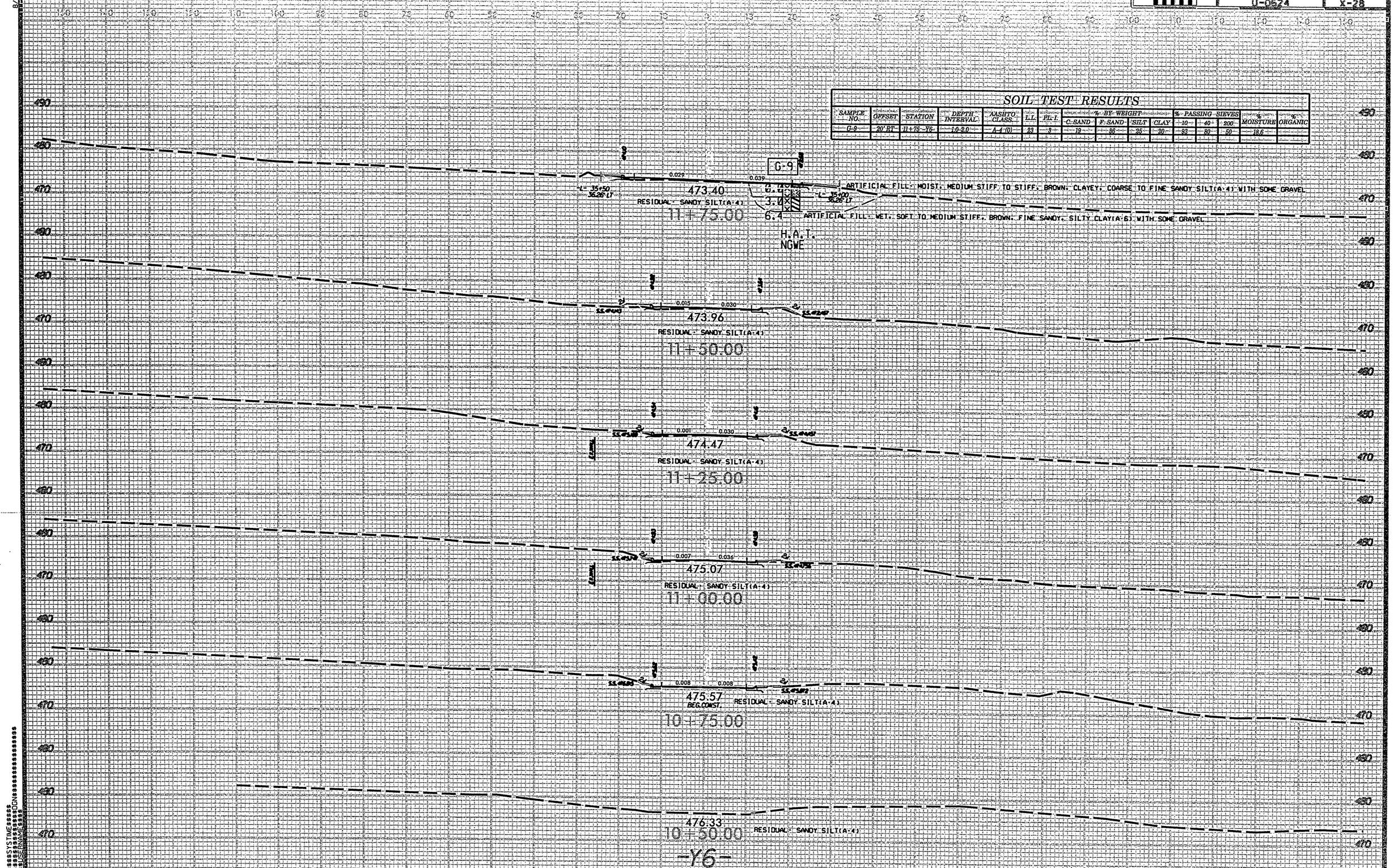
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING SIEVES #10	#40	#200	% MOISTURE	% ORGANIC
CBR-3	9' RT.	13+75 -Y4-	3.5-5.0	A-4 (0)	22	4	20	43	16	21	91	80	39	18.2	

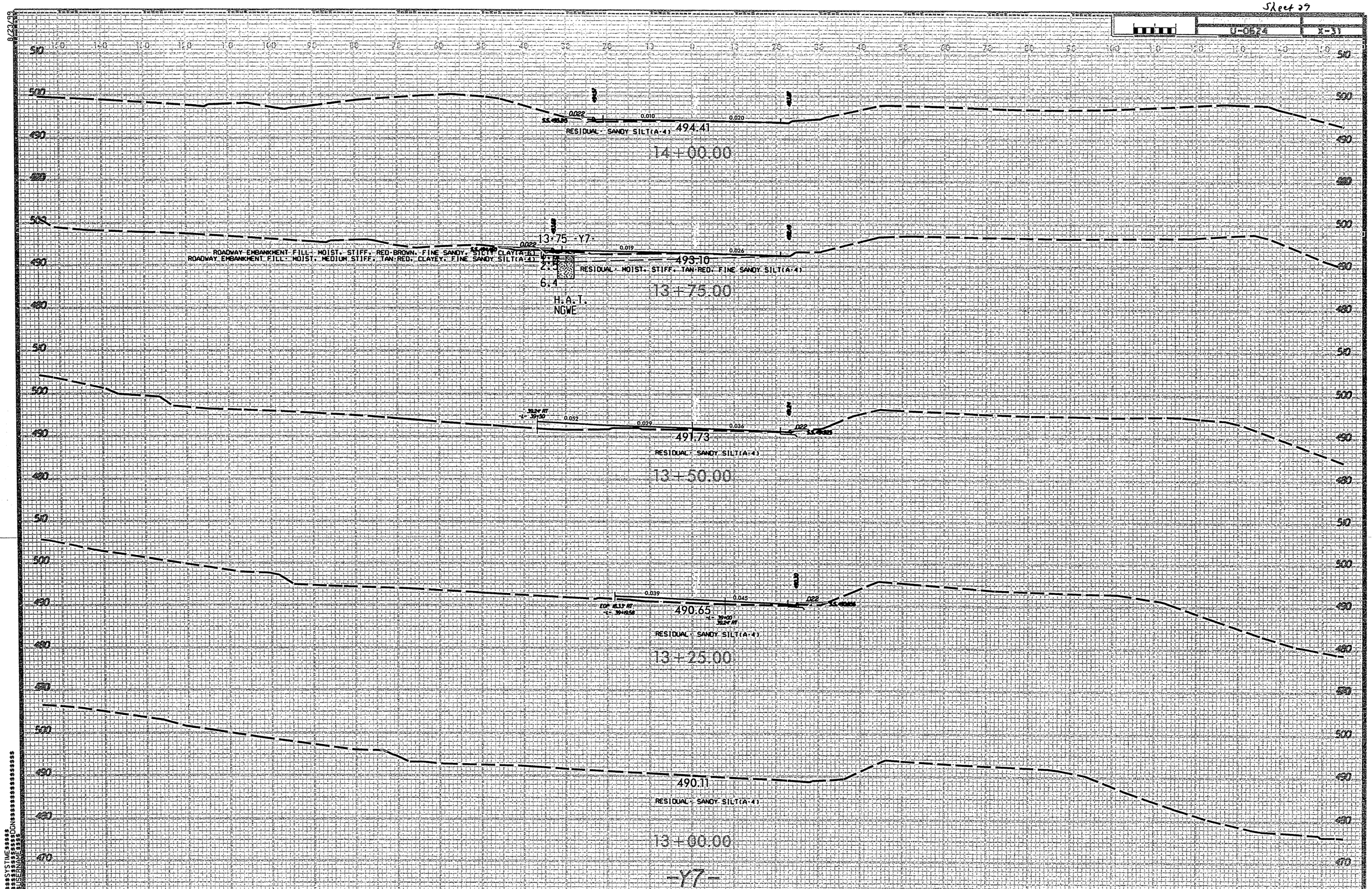


Sheet 28

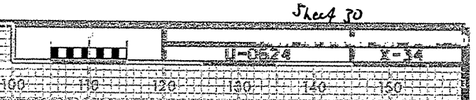
U-0624 X-28



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	PL.I.	% BY WEIGHT				% PASSING SIEVES			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
G-9	20' RT	11+75 -Y6	1.0-2.0	A-4 (0)	23	3	19	36	25	20	93	80	50	18.6	



Sheet 29
U-0624
X-31
494.41
RESIDUAL - SANDY SILT(A-4)
14+00.00
13+75 -Y7-
ROADWAY EMBANKMENT FILL - MOIST, STIFF, RED-BROWN, FINE SANDY, SILTY CLAY(A-6)
ROADWAY EMBANKMENT FILL - MOIST, MEDIUM STIFF, TAN-RED, CLAYEY, FINE SANDY SILT(A-4)
493.10
RESIDUAL - MOIST, STIFF, TAN-RED, FINE SANDY SILT(A-4)
6.4
H.A.T.
NGWE
13+75.00
491.73
RESIDUAL - SANDY SILT(A-4)
13+50.00
490.65
RESIDUAL - SANDY SILT(A-4)
13+25.00
490.11
RESIDUAL - SANDY SILT(A-4)
13+00.00
-Y7-



150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

50
500
450

500.97
12+00.00

RESIDUAL- SANDY SILT(A-4)

0.017 0.017 0.017

500.33
11+84.00

RESIDUAL- SANDY SILT(A-4)

0.012 0.012 0.012 0.012

499.73
11+75.00

RESIDUAL- SANDY CLAY(A-6) OVER SANDY SILT(A-4)

0.007 0.007 0.007

11+65

0.5' ASPHALT AND 0.5' ABC STONE

ROADWAY EMBANKMENT FILL- STIFF, BROWN, FINE SANDY SILT(A-4) WITH LITTLE GRAVEL 3.0
ROADWAY EMBANKMENT FILL- MEDIUM DENSE, TAN-BROWN, SILTY, FINE SAND(A-2-4) WITH TRACE GRAVEL 5.0
RESIDUAL- VERY STIFF, RED-BROWN, SILTY, COARSE TO FINE SANDY CLAY(A-6) 8.0
VERY STIFF, TAN AND RED, FINE SANDY SILT(A-4) 10.0

14 15 24 20

499.09
11+65.00

B.T.

-Y8-

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: December 29, 2006

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 22+50 Elevation: 404.8' Surface Water Elev.: NA
Station: 22+50 Offset: 45' Rt. Ground Water @ T.O.B.: Dry
Northing: 1982989 Easting: 781702
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet) From	Depth (Feet) To	Elev. (Feet) From	Elev. (Feet) To	Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
0.0		404.8		ARTIFICIAL FILL: Wet, soft to med.	0	25+			25+
				stiff, tan-red, silty,cse. to f. sandy	1	5	5	5	5
				CLAY (A-6) w/ large gravel and little	2	4	4	4	4
				plant debris *Sample G-1 (0.0'-1.0')*	3	4	3	5	4
	3.5		401.3	*organic content=9.4%*	3.5	4	3	25+	25+
				Hand Auger Refusal at 3.5' (Elev. 401.3')					
				in Artificial Fill: large gravel/boulder					
				*Note: High blow count at					
				0.0' due to rock fragment					
				*Note: Two attempts made to advance					
				hand auger boring. Hand auger refusal					
				encountered at 3.5' in both attempts.					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: December 29, 2006

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 25+00 Elevation: 423.5' Surface Water Elev.: NA
Station: 25+00 Offset: 15' Rt. Ground Water @ T.O.B.: Dry
Northing: 1982979 Easting: 781959
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet) From	Depth (Feet) To	Elev. (Feet) From	Elev. (Feet) To	Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
0.0		423.5		RESIDUAL: Moist, med. dense to	0	5	8	17	12
				dense, tan-brown, clayey, silty, cse. to	1	25+			25+
				f. SAND (A-2-4)	2	13	25+		25+
				*Note: more clayey from 1.5' to 2.0'	3	19	25+		25+
				*Note: color change to red-tan @ 4.5'	4	25+			25+
					5	25+			25+
	6.0		417.5		6	25+			25+
				Hand Auger/DCP Terminated at 6.0'					
				(Elev. 417.5') in Residual Soil					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: December 29, 2006

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 27+00, 25' Rt Elevation: 429.0' Surface Water Elev.: NA
Station: 27+00 Offset: 25' Rt. Ground Water @ T.O.B.: Dry
Northing: 1982997 Easting: 782160
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet) From	Depth (Feet) To	Elev. (Feet) From	Elev. (Feet) To	Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
0.0		429.0		RDWY. EMBK. FILL: Wet, loose, tan,	0	3	3	7	5
				silty, f. to cse. SAND (A-2-4) w/trace	1	8	4	5	4
	1.0		428.0	roots *Sample G-2 (0.0'-1.0')*	2	3	4	4	4
1.0		428.0		RDWY. EMBK. FILL: Wet, med. stiff to	3	2	2	2	2
				soft, red-brown,silty, cse. to f. sdy.	4	3	2	1	1
	3.5		425.5	CLAY (A-6)	5	3	5	5	5
3.5		425.5		RDWY. EMBK. FILL: Wet, soft to med.	6	5	4	4	4
				stiff, red-brown,clayey, cse. to f. sdy.					
	6.4		422.6	SILT (A-4)					
				Hand Auger/DCP Terminated at 6.4'					
				(Elev. 422.6') in Roadway Embankment					
				Fill					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: December 29, 2006

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 27+00, 37' Rt. Elevation: 427.2' Surface Water Elev.: NA
Station: 27+00 Offset: 37' Rt. Ground Water @ T.O.B.: Dry
Northing: 1983009 Easting: 782159
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet) From	Depth (Feet) To	Elev. (Feet) From	Elev. (Feet) To	Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
0.0		427.2		RDWY. EMBK. FILL: Moist, med.	0	16	15	13	14
				dense, tan, clayey, cse. to f. SAND	1	25+			25+
	1.0		426.2	(A-2-4)	2	4	4	3	3
1.0		426.2		RDWY. EMBK. FILL: Wet, soft to med.	3	4	3	4	3
				stiff, red-tan, silty, cse. to f. sandy CLAY	4	3	4	4	4
				(A-6) w/gravel, highly organic 3.0-5.0'	5	6	4	6	5
	5.0		422.2	(wood debris)	5.7	25+			25+
5.0		422.2		RDWY. EMBK. FILL: Rotten wood and					
	5.7		421.5	gravel					
				Sample G-3 (5.0'-5.7')					
				organic content=42.3%					
				Hand Auger/DCP Refusal at 5.7'					
				(Elev. 421.5') on wood and gravel in					
				Roadway Embankment Fill					
				*Note: High blow counts @					
				1.0' due to gravel					
				*Note: High blow counts @					
				5.7' due to gravel					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: December 29, 2006

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 29+00, 12' Rt Elevation: 439.8' Surface Water Elev.: NA
Station: 29+00 Offset: 12' Rt Ground Water @ T.O.B.: Dry
Northing: 1982972 Easting: 782361
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet)		Elev. (Feet)		Soil Description	Depth	Blows/	Blows/	Blows/	Avg.
From	To	From	To		B.S.G.	1.75"	1.75"	1.75"	Blows
0.0		439.8		RDWY. EMBK. FILL: Moist, loose, tan,	0	3	2	4	3
	1.0		438.8	silty, f. to cse. SAND (A-2-4) w/trace root	1	2	3	2	2
1.0		438.8		RDWY. EMBK. FILL: Wet, soft, brown,	2	5	4	4	4
	1.5		438.3	clayey, cse. to f. sandy SILT (A-4)	3	2	3	3	3
1.5		438.3		RDWY. EMBK. FILL: Wet, soft to med.	4	3	3	22	12
				stiff, red-brown,cse. to f. sandy, silty	5	3	2	2	2
	6.4		433.4	CLAY (A-6) w/trace roots from 3.0'-5.5'	6	2	3	2	2
				and w/some gravel at 4.0'					
				Sample G-4 (5.0'-6.4'), moisture=30.0%					
				Hand Auger/DCP terminated at 6.4'					
				(Elev. 433.4') in Roadway Embankment					
				Fill					
				*Note: High blow counts 4.0'					
				due to gravel					
				*Note: Obstruction (gravel?) encountered					
				at 4.5' in first attempt to advance boring.					
				Boring offset 1' and continued to 6.4'					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: December 29, 2006

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 29+00, 36' Rt. Elevation: 429.3' Surface Water Elev.: NA
Station: 29+00 Offset: 36' Rt. Ground Water @ T.O.B.: 1.5'
Northing: 1982996 Easting: 782365
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet)		Elev. (Feet)		Soil Description	Depth	Blows/	Blows/	Blows/	Avg.
From	To	From	To		B.S.G.	1.75"	1.75"	1.75"	Blows
0.0	0.5	429.3	428.8	Topsoil	0	2	2	2	2
0.5		428.8		ALLUVIAL: Wet, soft, brown, clayey, f.	1	4	4	4	4
	1.0		428.3	sandy SILT (A-4)	2	2	1	1	1
1.0		428.3		ALLUVIAL: Wet, loose, red-brown, silty,	3	6	8	10	9
	2.0		427.3	cse. to f. SAND (A-2-4)	4	20	25+		25+
2.0		427.3		ALLUVIAL: Wet, soft, brown, cse. to f.	5	12	18	25+	25+
				sandy, silty CLAY (A-6)					
3.0		426.3		RESIDUAL: Wet, stiff to v. stiff, tan-					
	5.4		423.9	brown, silty, f. sandy CLAY (A-6)					
				Hand Auger/DCP terminated at 5.4'					
				(Elev. 423.9') in Residual Soil					
				*Note: Groundwater at 1.5'					
				at time of boring					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: December 29, 2006

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 33+00, Lt Elevation: 462.8' Surface Water Elev.: NA
Station: 33+00 Offset: 50' Lt Ground Water @ T.O.B.: Dry
Northing: 1982802 Easting: 782742
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet) From	Depth (Feet) To	Elev. (Feet) From	Elev. (Feet) To	Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
0.0	0.8	462.8	462.0	Topsoil	0	2	3	3	3
0.8		462.0		RESIDUAL: Moist, soft to v. stiff,	1	4	4	6	5
				red-brown to tan-red, f. sandy, silty	2	7	7	9	8
				CLAY (A-7-5)	3	6	10	15	12
				Sample G-5 (3.0'-4.0'), moisture=29.4%	4	9	13	16	14
					5	11	19	23	21
					6	8	17	19	18
	6.4		456.4						
				Hand Auger/DCP terminated at 6.4'					
				(Elev. 456.4') in Residual Soil					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: December 29, 2006

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 35+50 Elevation: 476.0' Surface Water Elev.: NA
Station: 35+50 Offset: 35' Rt. Ground Water @ T.O.B.: Dry
Northing: 1982952 Easting: 782959
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet) From	Depth (Feet) To	Elev. (Feet) From	Elev. (Feet) To	Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
0.0	0.3	476.0	475.7	Topsoil	0	2	3	2	2
0.3		475.7		RESIDUAL: Moist, soft to stiff, red-	1	2	3	3	3
				brown, silty, f. to cse. sandy CLAY	2	4	5	6	5
				(A-7-5) w/trace roots	3	7	12	14	13
	4.3		471.7		4	10	11	10	10
4.3		471.7		Moist, v. stiff, tan-red, f. sandy SILT (A-4)	5	13	25+		25+
	5.3		470.7		6	25+			25+
5.3		471		Moist, dense, tan, silty, f. SAND (A-2-4)					
	6.2		469.8						
				Hand Auger/DCP Terminated at 6.2'					
				(Elev. 469.8') in Residual Soil					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: December 29, 2006

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 37+00 Elevation: 483.5' Surface Water Elev.: NA
Station: 37+00 Offset: 39' Rt. Ground Water @ T.O.B.: Dry
Northing: 1983043 Easting: 783075
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet)		Elev. (Feet)		Soil Description	Depth	Blows/	Blows/	Blows/	Avg.
From	To	From	To		B.S.G.	1.75"	1.75"	1.75"	Blows
0.0		483.5		Topsoil	0	3	2	6	4
	1.0		482.5		1	5	4	6	5
1.0		482.5		RESIDUAL: Moist, med. stiff to stiff,	2	7	10	12	11
				tan-red, f. sandy, silty CLAY (A-6)	3	9	13	13	13
	4.0		479.5		4	9	11	15	13
4.0		479.5		Moist, stiff, tan-red, clayey, f. sandy SILT	5	10	13	13	13
	6.4		477.1	(A-4)	6	10	12	17	14
				Hand Auger/DCP terminated at 6.4'					
				(Elev. 477.1') in Residual Soil					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: January 2, 2007

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 40+00 Elevation: 496.0' Surface Water Elev.: NA
Station: 40+00 Offset: 31' Rt. Ground Water @ T.O.B.: Dry
Northing: 1983217 Easting: 783319
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet)		Elev. (Feet)		Soil Description	Depth	Blows/	Blows/	Blows/	Avg.
From	To	From	To		B.S.G.	1.75"	1.75"	1.75"	Blows
0.0	0.3	496.0	495.7	Topsoil	0	4	3	4	3
0.3		495.7		RESIDUAL: Wet, soft, red-brown, silty,	1	4	4	3	3
	2.2		493.8	cse. to f. sandy CLAY (A-6) w/little gravel	2	5	22	25+	25+
				Sample G-6 (0.3'-2.2'), moisture=24.1%	2.7	25+			25+
2.2		493.8		Moist, med. dense to dense, red-tan,					
				clayey, silty, cse. to f. SAND (A-2-4)					
	2.7		493.3	w/little rock fragments					
				Hand Auger/DCP Refusal @ 2.7'					
				(Elev. 493.3') on rock fragments w/in					
				Residual Soil					
				*Note: 2 attempts made to advance					
				borehole with refusal at 2.7' in both					
				attempts					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: January 2, 2007

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 42+00 Elevation: 507.8' Surface Water Elev.: NA
Station: 42+00 Offset: 31' Rt. Ground Water @ T.O.B.: Dry
Northing: 1983338 Easting: 783479
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet) From	Depth (Feet) To	Elev. (Feet) From	Elev. (Feet) To	Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
0.0	0.5	507.8	507.3	Topsoil w/large roots	0	3	6	7	6
0.5		507.3		RESIDUAL: Wet, stiff to v. stiff, red-	1	8	9	12	10
				brown, silty, cse. to f. sandy CLAY (A-6)	2	16	17	17	17
				w/trace roots	3	15	14	15	14
				Sample G-7 (3.0'-4.0'), moisture=27.1%	4	17	18	18	18
					5	10	14	15	14
	6.4		501.4		6	16	15	15	15
				Hand Auger/DCP Terminated at 6.4' (Elev. 501.4') in Residual Soil					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: January 2, 2007

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 44+00 Elevation: 518.5' Surface Water Elev.: NA
Station: 44+00 Offset: 31' Rt. Ground Water @ T.O.B.: Dry
Northing: 1983458 Easting: 783638
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet) From	Depth (Feet) To	Elev. (Feet) From	Elev. (Feet) To	Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
0.0		518.5		ARTIFICIAL FILL: Wet, soft to stiff, red-	0	1	1	1	1
				tan, silty, cse. to f. sandy CLAY (A-6)	1	9	12	10	11
	2.0		516.5		2	10	14	18	16
2.0		516.5		RESIDUAL: Moist, v. stiff, red-tan, f.	2.5	25+			25+
	2.5		516.0	sdy. SILT (A-4)					
				Hand Auger Refusal @ 2.5' (Elev. 516.0') on possible boulder w/in Residual Soil					
				*Note: 2 attempts made to advance borehole with refusal at 2.5' in both attempts					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: January 2, 2007

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 46+00 Elevation: 506.8' Surface Water Elev.: NA
Station: 46+00 Offset: 30' Rt. Ground Water @ T.O.B.: Dry
Northing: 1983578 Easting: 783799
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet) From	Depth (Feet) To	Elev. (Feet) From	Elev. (Feet) To	Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
0.0	0.2	506.8	506.6	Topsoil	0	2	3	3	3
0.2		506.6		ARTIFICIAL FILL: Wet, soft to stiff, red-	1	6	7	9	8
				brown, f. sandy, silty CLAY (A-6), highly	2	10	12	16	14
	3.0		503.8	organic (decayed wood) from 1.0' to 2.0'	3	9	12	14	13
3.0		503.8		RESIDUAL: Moist,stiff, tan-red, clayey,	4	13	13	14	13
				f. sandy SILT (A-4)	5	13	15	16	15
	6.4		500.4		6	12	11	14	12
				Hand Auger/DCP terminated at 6.4'					
				(Elev. 500.4') in Residual Soil					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: January 2, 2007

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 11+25 -Y3- Elevation: 421.8' Surface Water Elev.: NA
Station: 11+25 -Y3- Offset: 30' Rt. Ground Water @ T.O.B.: Dry
Northing: 1983034 Easting: 782250
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet) From	Depth (Feet) To	Elev. (Feet) From	Elev. (Feet) To	Soil Description	Depth B.S.G.	Blows/ 1.75"	Blows/ 1.75"	Blows/ 1.75"	Avg. Blows
0.0	0.5	421.8	421.3	Topsoil	0	2	2	4	3
0.5		421.3		RESIDUAL: Moist, med. stiff, tan,	1	5	6	6	6
				clayey, cse. to f. sandy SILT (A-4) w/	2	4	4	6	5
				trace roots *Sample G-8 (0.0'-1.0')*	3	25+			25+
	2.0		419.8	*organic content=4.4%*	4	6	6	10	8
2.0		419.8		Moist, med. stiff, tan, silty, cse. to f.	5	8	8	17	12
	2.5		419.3	sandy CLAY (A-6) w/trace rootlets	6	16	21	12	16
2.5		419.3		Moist, v. stiff to stiff, tan, clayey, cse. to					
	5.0		416.8	f. sandy SILT (A-4)					
5.0		416.8		Moist, med. dense, tan-brown, silty, cse.					
	6.4		415.4	to f. SAND (A-2-4)					
				Hand Auger/DCP terminated at 6.4'					
				(Elev. 415.4') in Residual Soil					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: January 2, 2007

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 13+75 -Y4- Elevation: 456.0' Surface Water Elev.: NA
Station: 13+75 -Y4- Offset: 9' Rt. Ground Water @ T.O.B.: Dry
Northing: 1982829 Easting: 782661
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet)		Elev. (Feet)		Soil Description	Depth	Blows/	Blows/	Blows/	Avg.
From	To	From	To		B.S.G.	1.75"	1.75"	1.75"	Blows
0.0	0.3	456.0	455.7	Topsoil	0	2	1	3	2
0.3		455.7		RESIDUAL: Moist to wet, soft to stiff,	1	3	3	4	3
				tan, silty, f. sandy CLAY (A-6)	2	4	5	6	5
					3	11	14	19	16
					4	10	11	13	12
					5	9	9	9	9
	6.4		449.6		6	11	12	16	14
				Hand Auger/DCP terminated at 6.4'					
				(Elev. 449.6') in Residual Soil					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: December 29, 2006

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 11+75 -Y6- Elevation: 473.0' Surface Water Elev.: NA
Station: 11+75 -Y6- Offset: 20' Rt. Ground Water @ T.O.B.: Dry
Northing: 1982869 Easting: 782962
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet)		Elev. (Feet)		Soil Description	Depth	Blows/	Blows/	Blows/	Avg.
From	To	From	To		B.S.G.	1.75"	1.75"	1.75"	Blows
0.0	0.3	473.0	472.7	Topsoil	0	3	6	8	7
0.3		472.7		ARTIFICIAL FILL: Moist, med. stiff to	1	5	5	6	5
				stiff, brown, clayey, cse. to f. sandy SILT	2	7	9	11	10
				(A-4) w/some gravel	3	4	2	1	1
	3.0		470.0	*Sample G-9 (1.0'-2.0'), moisture=18.6%*	4	4	4	4	4
3.0		470.0		ARTIFICIAL FILL: Wet, soft to med.	5	3	5	6	5
				stiff, brown, f.sandy, silty CLAY (A-6)	6	6	5	8	6
	6.4		466.6	w/some gravel 5'-6'					
				Hand Auger/DCP terminated at 6.4'					
				(Elev. 466.6') in Artificial Fill					
				*Note: Artificial Fill is backfill for					
				nearby storm drain					

TRIGON ENGINEERING CONSULTANTS, INC.
HAND AUGER/DCP OBSERVATION SUMMARY

Job Name: NC 86 (S. Columbia St.) in Chapel Hill Location: Orange County, North Carolina
Trigon Project No.: 071-06-047 Present at Site: D. Goodnight, W. Duggins, K. Hicks
NCDOT Project No.: 34762.1.1 TIP No.: U-0624
Date: December 29, 2006

WEATHER: [X] Clear [ ] Cloudy [ ] Light Rain [ ] Showers

Boring No.: 13+75 -Y7- Elevation: 493.5' Surface Water Elev.: NA
Station: 13+75 -Y7- Offset: 30' Lt. Ground Water @ T.O.B.: Dry
Northing: 1983211 Easting: 783276
Equipment: Dynamic Cone Penetrometer (DCP) with 15 lb. hammer, 1.375-inch rod, and 1.5" diameter 45° cone
Hand Auger used to excavate soil to DCP sample depths

Depth (Feet)		Elev. (Feet)		Soil Description	Depth	Blows/	Blows/	Blows/	Avg.
From	To	From	To		B.S.G.	1.75"	1.75"	1.75"	Blows
0.0	0.3	493.5	493.2	Topsoil	0	6	9	11	10
0.3		493.2		RDWY. EMBK. FILL: Moist, stiff, red-	1	4	6	6	6
	1.0		492.5	brown, f. sandy, silty CLAY (A-6)	2	5	4	7	5
1.0		492.5		RDWY. EMBK. FILL: Moist, med stiff,	3	6	7	10	8
				tan-red, clayey, f. sandy SILT (A-4)	4	6	9	11	10
	2.5		491.0	w/gravel	5	9	9	12	10
2.5		491.0		RESIDUAL: Moist, stiff, tan-red, f. sandy	6	10	14	14	14
	6.4		487.1	SILT (A-4)					
				Hand Auger/DCP Terminated at 6.4'					
				(Elev. 487.1') in Residual Soil					

CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

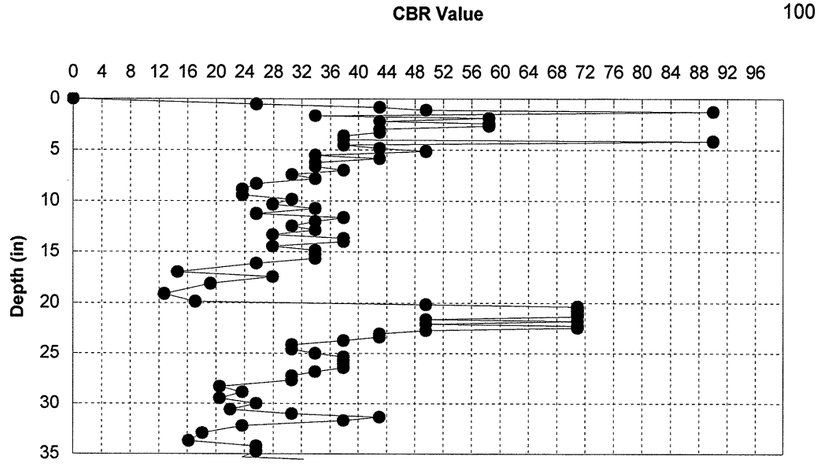
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp

-L- 14+00, 17' Lt — Raw — 1
0 — Fill
Datum = 371.0' — 12/28/06

Interval 0.0 to 10.3	
# of Values	29
Avg CBR	42.1
Wghtd Avg.	37.8
Max CBR	90.0
Min CBR	23.7

Interval 10.3 to 37.3	
# of Values	63
Avg CBR	36.8
Wghtd Avg.	31.0
Max CBR	70.9
Min CBR	12.8



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

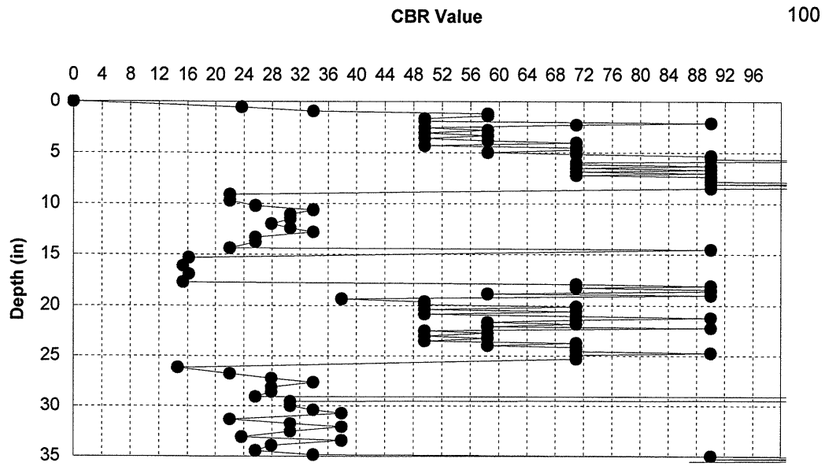
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp

-L- 17+50, 10' Rt. — Raw — 3
0 — Grade
Datum = 386.0' — 12/28/06

Interval 0.0 to 10.2	
# of Values	44
Avg CBR	71.4
Wghtd Avg.	59.6
Max CBR	100+
Min CBR	22.0

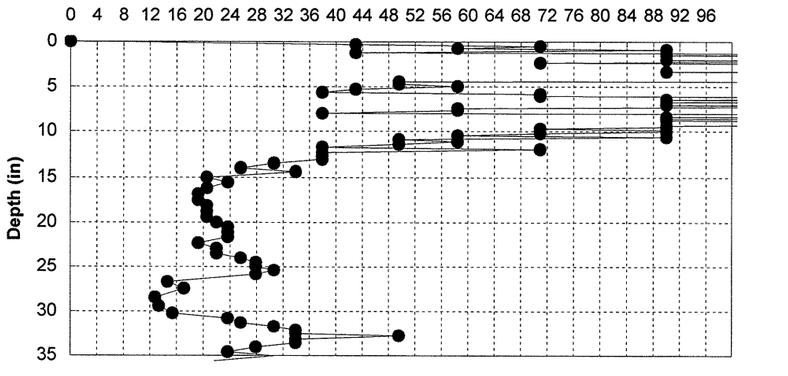
Interval 10.2 to 37.5	
# of Values	85
Avg CBR	58.9
Wghtd Avg.	42.1
Max CBR	100+
Min CBR	14.6



-L- 15+50, 12' Lt. — Raw — 2
0 — Fill
Datum = 376.0' — 12/28/06

Interval 0.0 to 10.0	
# of Values	68
Avg CBR	100+
Wghtd Avg.	96.4
Max CBR	100+
Min CBR	37.9

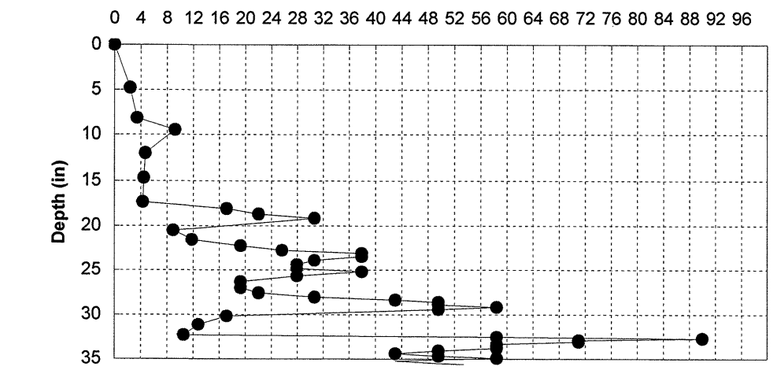
Interval 10.0 to 36.9	
# of Values	53
Avg CBR	30.8
Wghtd Avg.	25.9
Max CBR	90.0
Min CBR	12.8



-L- 18+50, 9' Rt. — Raw — 4
0.0 — Grade
Datum = 391.0' — 02/14/07

Interval 0.0 to 9.5	
# of Values	3
Avg CBR	5.0
Wghtd Avg	3.7
Max CBR	9.2
Min CBR	2.4

Interval 9.5 to 36.0	
# of Values	44
Avg CBR	36.9
Wghtd Avg.	21.5
Max CBR	90.0
Min CBR	4.3



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

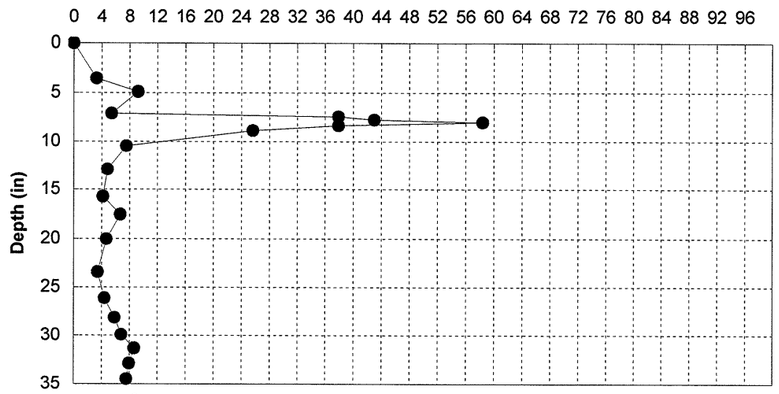
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp

-L- 19+00, 10' Rt. | Raw | 5
0 | Grade
Datum = 393.0' | 12/28/06

Interval 0.0 to 10.5	
# of Values	9
Avg CBR	25.4
Wghtd Avg.	10.7
Max CBR	58.4
Min CBR	3.3

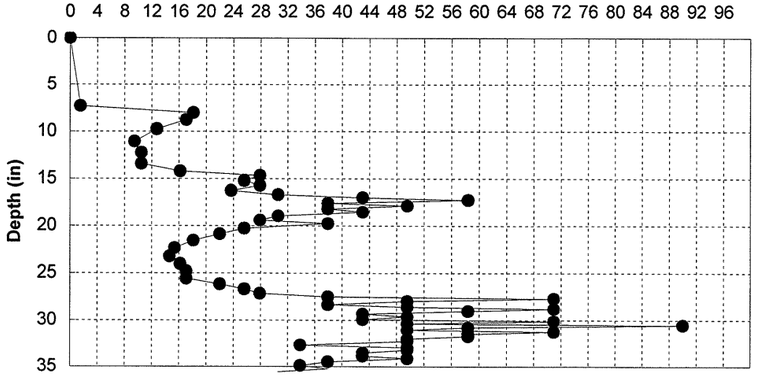
Interval 10.5 to 34.5	
# of Values	11
Avg CBR	5.9
Wghtd Avg.	5.5
Max CBR	8.6
Min CBR	3.4



-L- 20+00, 20' Rt. | Raw | 6
0 | Grade
Datum = 399.4' | 02/14/07

Interval 0.0 to 9.8	
# of Values	4
Avg CBR	12.4
Wghtd Avg.	4.8
Max CBR	18.1
Min CBR	1.5

Interval 9.8 to 36.1	
# of Values	60
Avg CBR	38.8
Wghtd Avg.	30.2
Max CBR	90.0
Min CBR	9.5



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

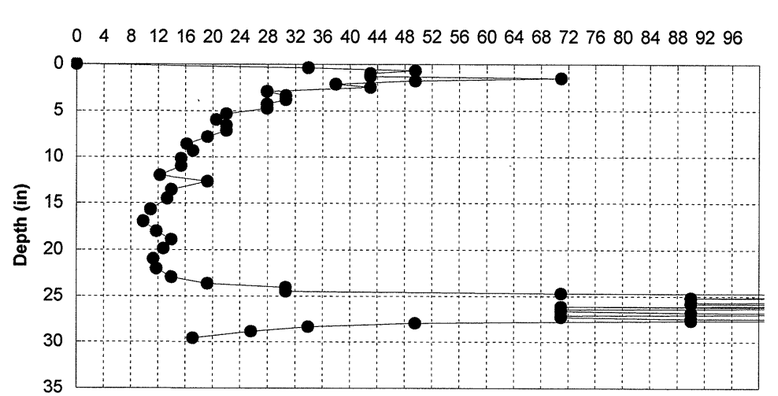
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp

-L- 21+00, 2' Rt. | Raw | 7
0 | Grade
Datum = 404.6' | 12/28/06

Interval 0.0 to 10.2	
# of Values	21
Avg CBR	31.9
Wghtd Avg.	27.2
Max CBR	70.9
Min CBR	15.4

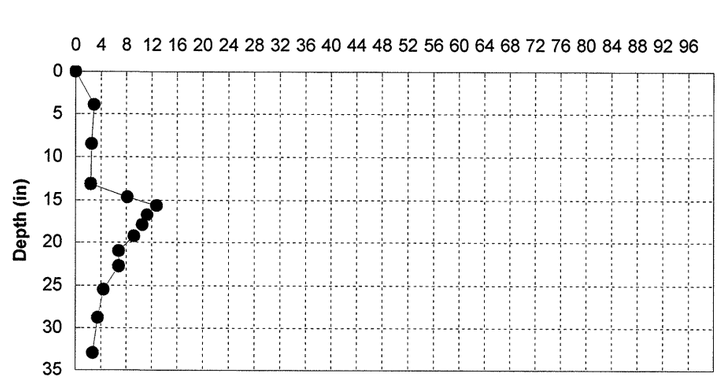
Interval 10.2 to 29.6	
# of Values	43
Avg CBR	71.7
Wghtd Avg.	29.2
Max CBR	100+
Min CBR	9.8



-L- 23+00, 10' Rt. | Raw | 8
0 | Fill
Datum = 415.0' | 12/28/06

Interval 0.0 to 8.5	
# of Values	2
Avg CBR	2.7
Wghtd Avg.	2.7
Max CBR	2.9
Min CBR	2.5

Interval 8.5 to 33.0	
# of Values	11
Avg CBR	7.1
Wghtd Avg.	5.3
Max CBR	12.8
Min CBR	2.4



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

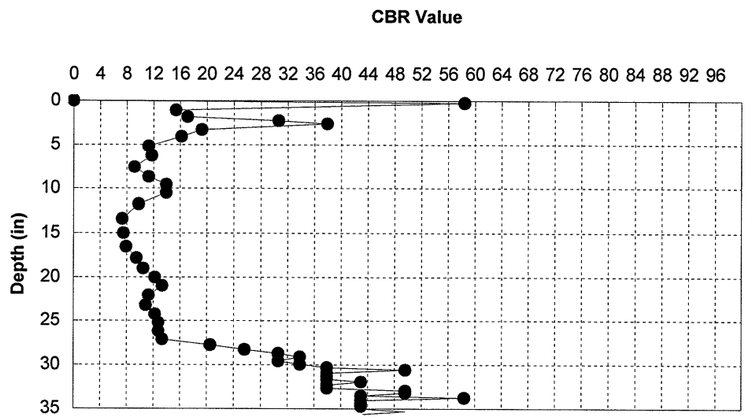
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp

-L- 24+00, 19' Rt.. Raw 9
0 Grade
Datum = 420.3' 02/14/07

Interval 0.0 to 10.5	
# of Values	13
Avg CBR	20.5
Wghtd Avg.	15.8
Max CBR	58.4
Min CBR	9.2

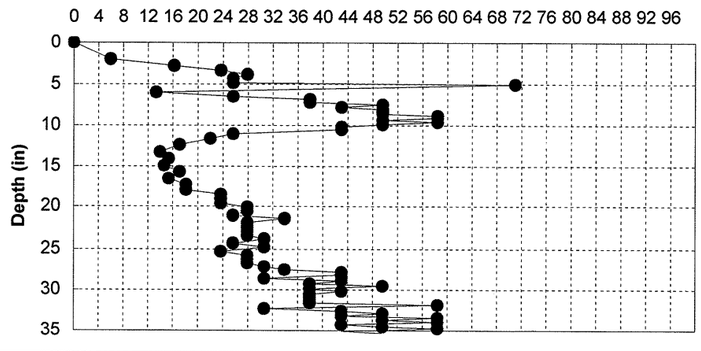
Interval 10.5 to 37.0	
# of Values	42
Avg CBR	30.3
Wghtd Avg.	20.5
Max CBR	58.4
Min CBR	7.3



-L- 25+00, 10' Rt. Raw 10
0 Grade
Datum = 423.8' 12/28/06

Interval 0.0 to 10.2	
# of Values	22
Avg CBR	39.5
Wghtd Avg.	28.5
Max CBR	70.9
Min CBR	6.0

Interval 10.2 to 35.4	
# of Values	56
Avg CBR	33.8
Wghtd Avg.	29.4
Max CBR	58.4
Min CBR	13.9



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

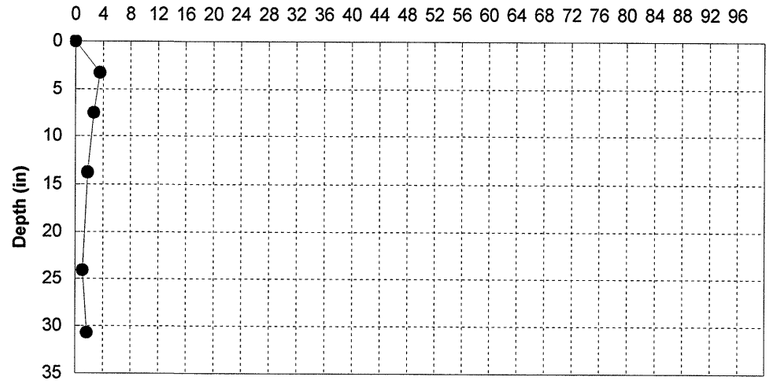
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp

-L- 27+90, 22' Rt.. Raw 11
0 Fill
Datum = 429.0' 02/14/07

Interval 0.0 to 7.5	
# of Values	2
Avg CBR	3.1
Wghtd Avg.	3.1
Max CBR	3.6
Min CBR	2.7

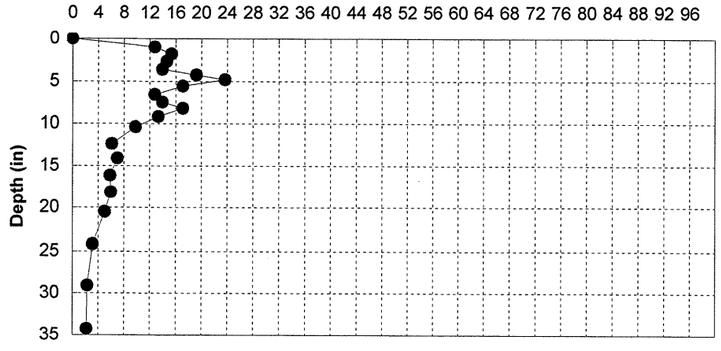
Interval 7.5 to 30.7	
# of Values	3
Avg CBR	1.5
Wghtd Avg.	1.4
Max CBR	1.8
Min CBR	1.0



-L- 30+00, 16' Rt. Raw 12
0 Fill
Datum = 444.5' 02/14/07

Interval 0.0 to 10.4	
# of Values	12
Avg CBR	15.3
Wghtd Avg.	14.6
Max CBR	23.7
Min CBR	9.8

Interval 10.4 to 34.3	
# of Values	8
Avg CBR	4.7
Wghtd Avg.	3.9
Max CBR	7.0
Min CBR	2.2



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

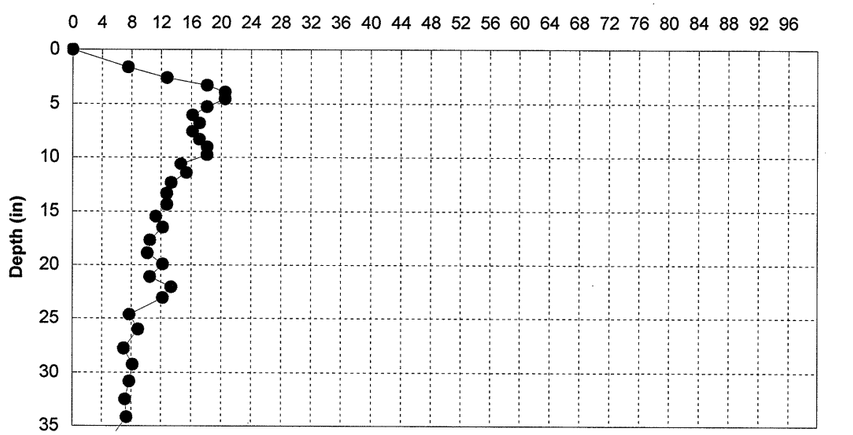
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE U0624_GEO_RDWY_dcp

-L- 31+00, 16' Rt. | Raw | 13
0 | Fill
Datum = 450.0' | 12/28/06

Interval 0.0 to 9.8	
# of Values	12
Avg CBR	16.7
Wghtd Avg.	15.6
Max CBR	20.5
Min CBR	7.5

Interval 9.8 to 36.7	
# of Values	21
Avg CBR	10.5
Wghtd Avg.	9.6
Max CBR	15.4
Min CBR	4.7



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

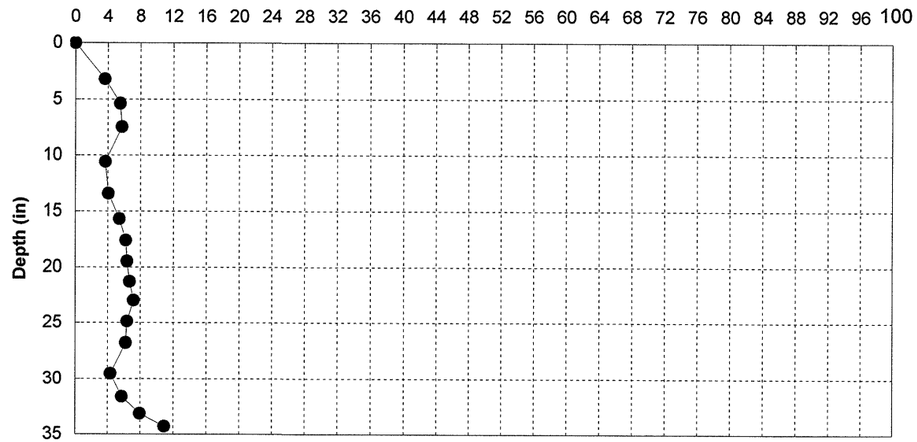
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE U0624_GEO_RDWY_dcp

-L- 33+00, 50' Lt. | Raw | 15
0 | Grade
Datum = 462.8' | 12/28/06

Interval 0.0 to 10.6	
# of Values	4
Avg CBR	4.6
Wghtd Avg.	4.4
Max CBR	5.7
Min CBR	3.6

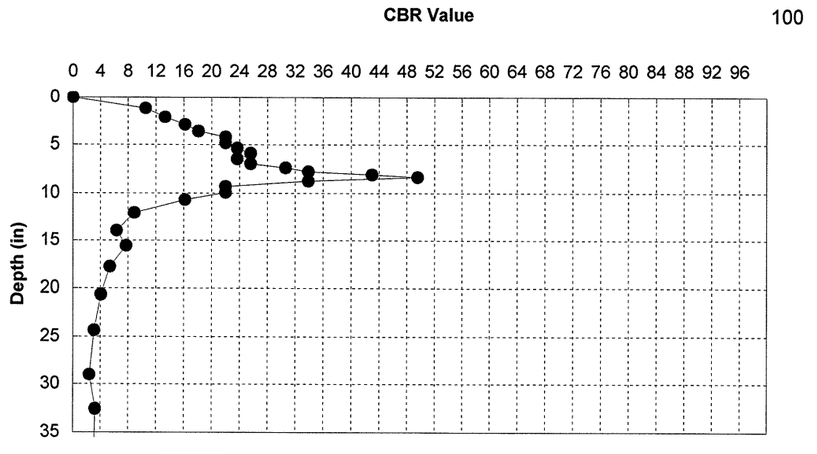
Interval 10.6 to 34.3	
# of Values	12
Avg CBR	6.4
Wghtd Avg.	6.1
Max CBR	10.9
Min CBR	4.1



-L- 32+00, 22' Rt. | Raw | 14
0 | Grade
Datum = 454.2' | 02/14/07

Interval 0.0 to 9.9	
# of Values	17
Avg CBR	25.6
Wghtd Avg.	22.3
Max CBR	49.6
Min CBR	10.5

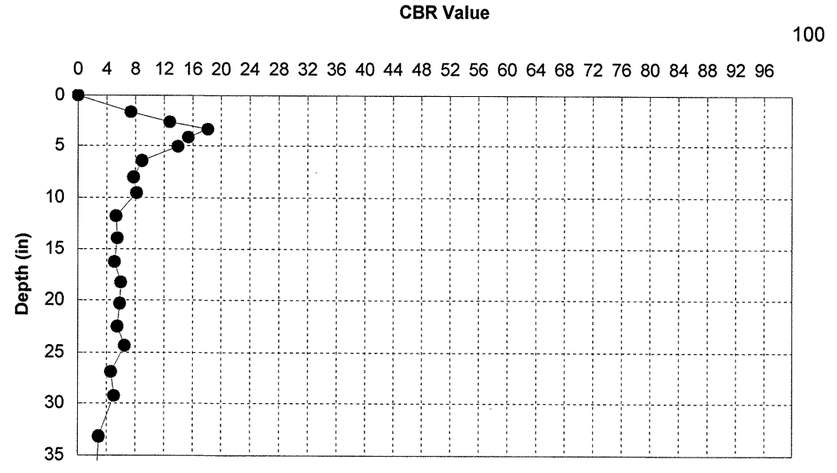
Interval 9.9 to 36.3	
# of Values	10
Avg CBR	6.0
Wghtd Avg.	4.5
Max CBR	16.2
Min CBR	2.4



-L- 33+00, 22' Rt. | Raw | 16
0 | Grade
Datum = 459.5' | 12/28/06

Interval 0.0 to 9.5	
# of Values	8
Avg CBR	11.5
Wghtd Avg.	10.4
Max CBR	18.1
Min CBR	7.3

Interval 9.5 to 37.6	
# of Values	11
Avg CBR	5.0
Wghtd Avg.	4.6
Max CBR	6.5
Min CBR	2.6



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp

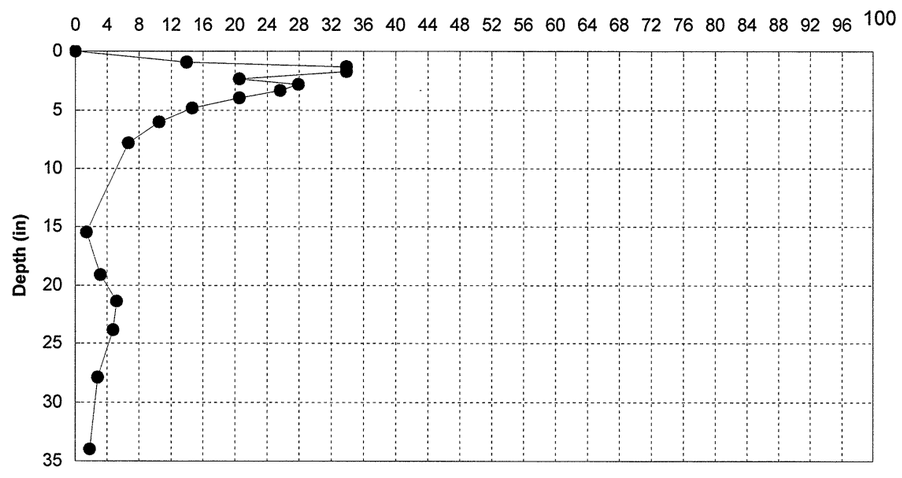
-L- 34+00, 21' Rt..
0
Datum = 465.0'

Raw
Grade
02/14/07

17

Interval 0.0 to 7.8	
# of Values	10
Avg CBR	20.8
Wghtd Avg.	16.4
Max CBR	33.9
Min CBR	6.7

Interval 7.8 to 34.0	
# of Values	6
Avg CBR	3.2
Wghtd Avg.	2.6
Max CBR	5.2
Min CBR	1.4



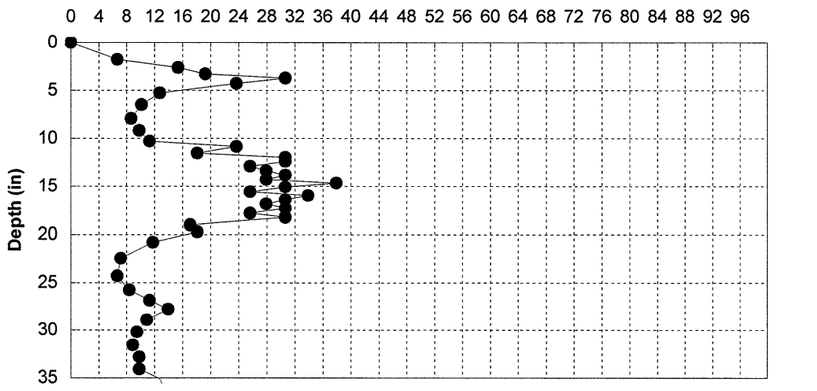
-L- 35+50, 25' Rt.
0
Datum = 472.8'

Raw
Cut
12/28/06

18

Interval 0.0 to 10.3	
# of Values	10
Avg CBR	14.8
Wghtd Avg.	12.2
Max CBR	30.6
Min CBR	6.7

Interval 10.3 to 36.9	
# of Values	33
Avg CBR	20.4
Wghtd Avg.	15.8
Max CBR	37.9
Min CBR	6.7



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp

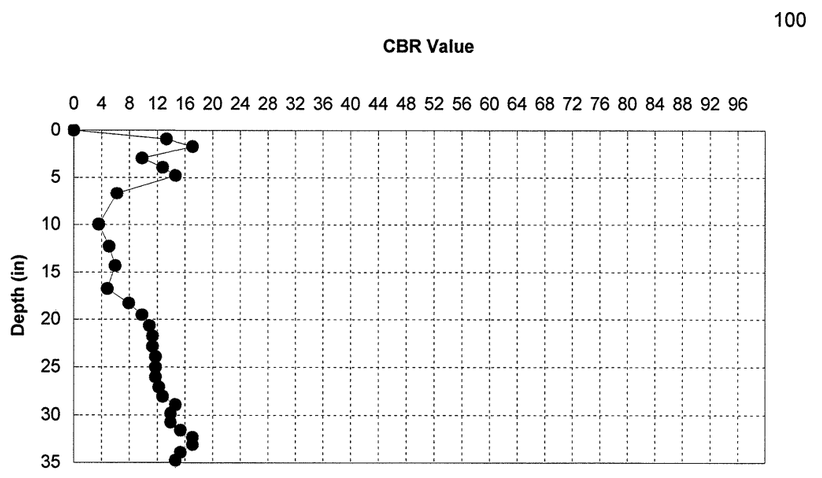
-L- 37+00, 30' Rt.
0
Datum = 481.1'

Raw
Cut
12/28/06

19

Interval 0.0 to 10.0	
# of Values	7
Avg CBR	11.1
Wghtd Avg.	8.6
Max CBR	17.1
Min CBR	3.6

Interval 10.0 to 35.6	
# of Values	22
Avg CBR	12.0
Wghtd Avg.	10.6
Max CBR	17.1
Min CBR	4.8



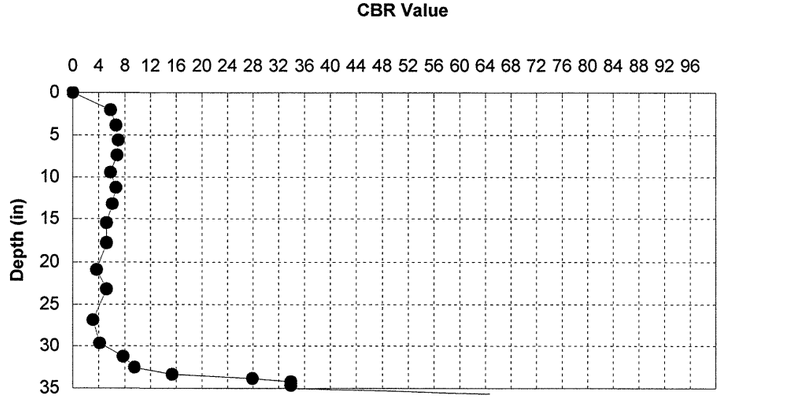
-L- 40+00, 25' Rt.
0
Datum = 495.8'

Raw
Cut
12/28/06

20

Interval 0.0 to 9.4	
# of Values	5
Avg CBR	6.4
Wghtd Avg.	6.4
Max CBR	7.0
Min CBR	5.8

Interval 9.4 to 37.0	
# of Values	27
Avg CBR	51.1
Wghtd Avg.	12.3
Max CBR	100+
Min CBR	3.1



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

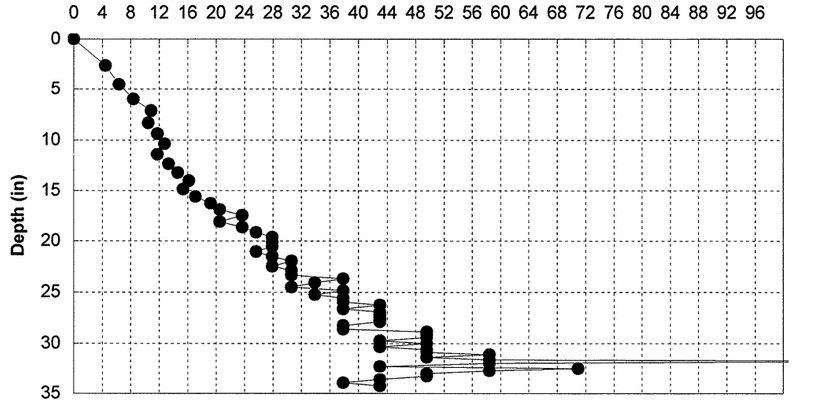
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp2

-L- 41+00, 30' Rt. | Raw | 1
0 | Cut
Datum = 503.0' | 02/14/07

Interval 0.0 to 10.4	
# of Values	7
Avg CBR	9.3
Wghtd Avg.	8.3
Max CBR	12.8
Min CBR	4.5

Interval 10.4 to 34.3	
# of Values	57
Avg CBR	38.3
Wghtd Avg.	31.7
Max CBR	100+
Min CBR	11.8



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

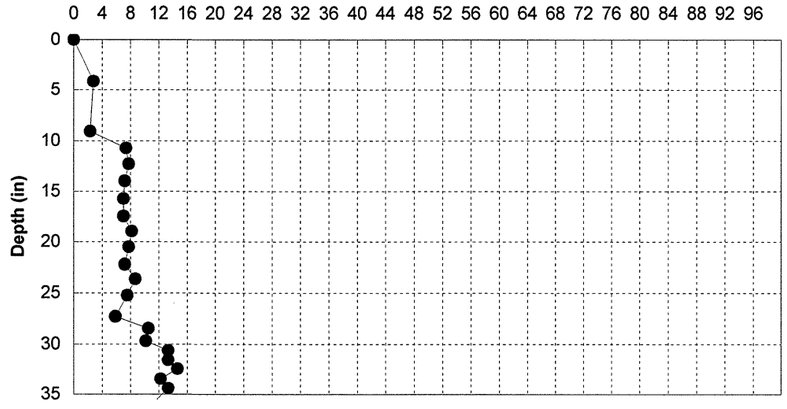
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp2

-L- 43+00, 30' Rt. | Raw | 3
0 | Grade
Datum = 513.0' | 12/28/06

Interval 0.0 to 10.7	
# of Values	3
Avg CBR	4.1
Wghtd Avg.	3.2
Max CBR	7.3
Min CBR	2.3

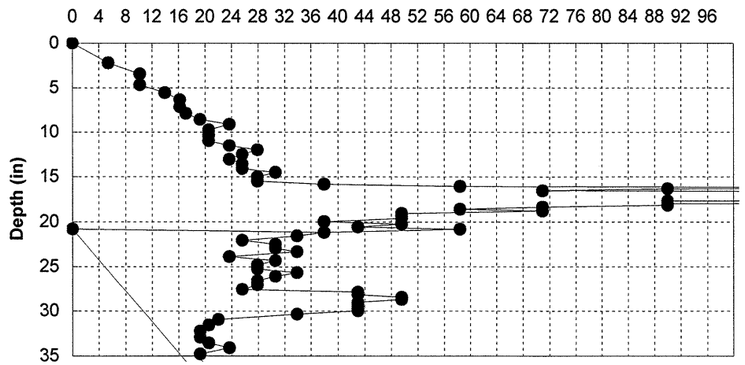
Interval 10.7 to 36.5	
# of Values	19
Avg CBR	9.8
Wghtd Avg.	9.1
Max CBR	14.6
Min CBR	5.8



-L- 42+00, 27' Rt. | Raw | 2
0 | Grade
Datum = 507.2' | 12/28/06

Interval 0.0 to 10.4	
# of Values	11
Avg CBR	15.7
Wghtd Avg.	13.4
Max CBR	23.7
Min CBR	5.4

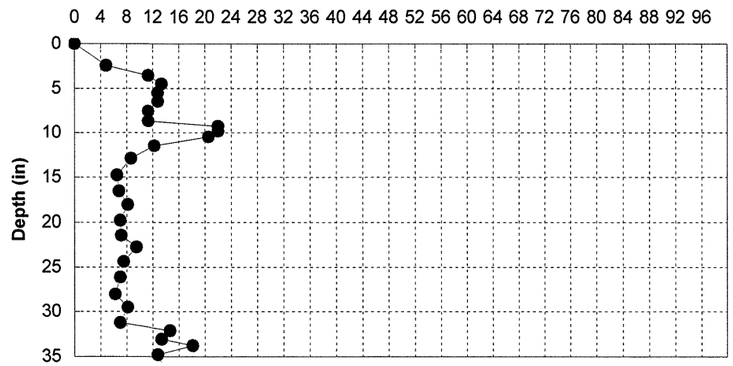
Interval 10.4 to 37.5	
# of Values	111
Avg CBR	#NUM!
Wghtd Avg.	56.9
Max CBR	#NUM!
Min CBR	#NUM!



-Y6- 11+75, 20' Rt. | Raw | 4
0.0 | Fill
Datum = 473.0' | 12/28/06

Interval 0.0 to 10.5	
# of Values	10
Avg CBR	14.2
Wghtd Avg	11.9
Max CBR	22.0
Min CBR	4.8

Interval 10.5 to 35.7	
# of Values	18
Avg CBR	9.7
Wghtd Avg.	8.8
Max CBR	18.1
Min CBR	6.2



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

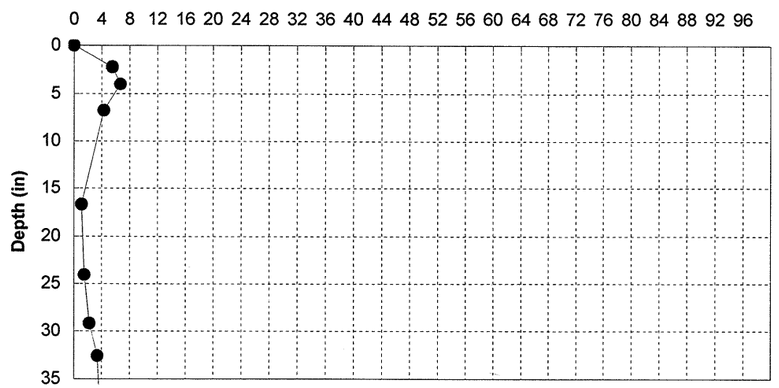
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp2

-Y7- 13+75, 28' Lt. | Raw | 5
0 | Fill
Datum = 493.6' | 12/28/06

Interval 0.0 to 6.7	
# of Values	3
Avg CBR	5.5
Wghtd Avg.	5.3
Max CBR	6.7
Min CBR	4.3

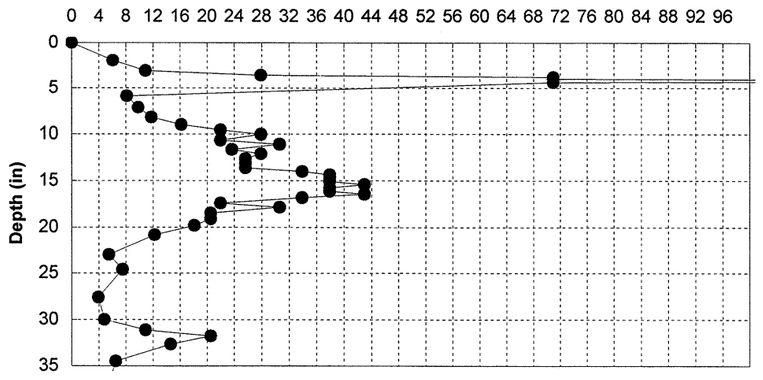
Interval 6.7 to 35.8	
# of Values	5
Avg CBR	2.3
Wghtd Avg.	1.9
Max CBR	3.6
Min CBR	1.1



-Y8- 11+50, 20' Lt. | Raw | 6
0 | Grade
Datum = 497.8' | 12/28/06

Interval 0.0 to 10.0	
# of Values	14
Avg CBR	47.4
Wghtd Avg.	17.9
Max CBR	100+
Min CBR	6.1

Interval 10.0 to 36.6	
# of Values	31
Avg CBR	23.5
Wghtd Avg.	14.8
Max CBR	43.0
Min CBR	4.0



CONE PENETROMETER RESULTS
NC - DOT, GEOTECHNICAL ENGINEERING UNIT

PROJECT NO.	34762.1.1
PROJECT ID	U-0624
ROUTE	NC 86
COUNTY	Orange

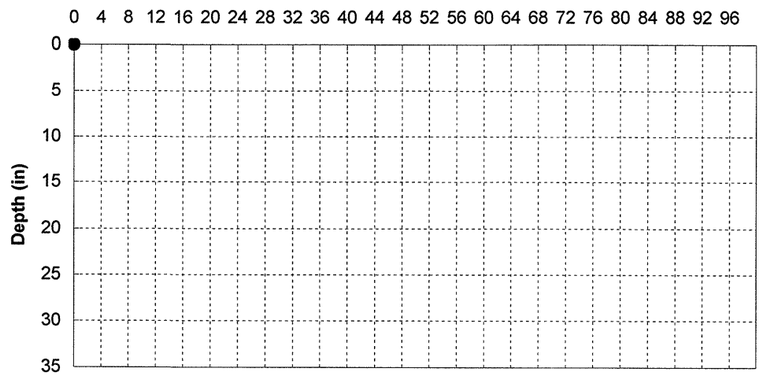
GEOLOGIST	Goodnight
GEOTECHS	Trigon

FILE	U0624_GEO_RDWY_dcp2

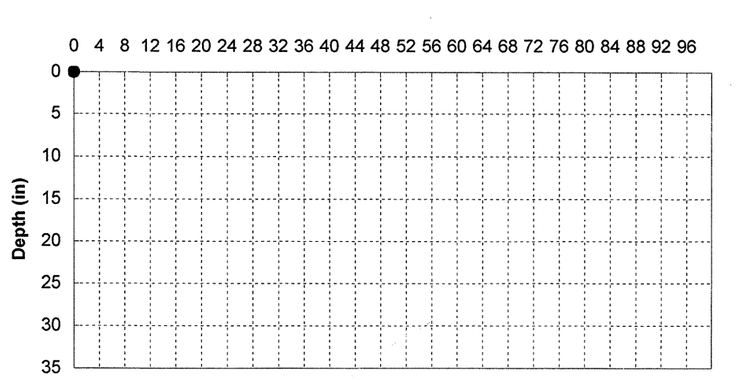
0 | 0 | 7
0 | 0
Datum = 0 | 01/00/00

Interval 0.0 to 0.0	
# of Values	0
Avg CBR	#DIV/0!
Wghtd Avg.	#DIV/0!
Max CBR	0.0
Min CBR	0.0

Interval 0.0 to 0.0	
# of Values	0
Avg CBR	#DIV/0!
Wghtd Avg.	#DIV/0!
Max CBR	0.0
Min CBR	0.0



0 | 0 | 8
0 | 0
Datum = 0 | 01/00/00

Interval 0.0 to 0.0	
# of Values	0
Avg CBR	#DIV/0!
Wghtd Avg.	#DIV/0!
Max CBR	0.0
Min CBR	0.0

Interval 0.0 to 0.0	
# of Values	0
Avg CBR	#DIV/0!
Wghtd Avg.	#DIV/0!
Max CBR	0.0
Min CBR	0.0