PROJECT: C202379

ID: U-4703

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

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	10+00 to 56+50	4-7	12-13	
-L-	56+50 to 59+50	7-8	13	16-18
-L-	59+50 to 84+14	8-9	13-14	
-Y3-	10+00 to 18+83	10	15	

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 35871.1.1 (U-4703) F.A. PROJ. STP-0508 (2)

COUNTY WAKE

PROJECT DESCRIPTION TIMBER DRIVE EXTENSION (SR 2812)
FROM NC 50 TO WHITE OAK ROAD (SR 2547) IN GARNER

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4703	1	17

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
35871.1.1	STP-0508(2)	PE
35871.2.1	STP-0508(2)	R/W & UTILITIES
35871.3.1	STPDA-0508(3)	CONST.

CAUTION NOTICE

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

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

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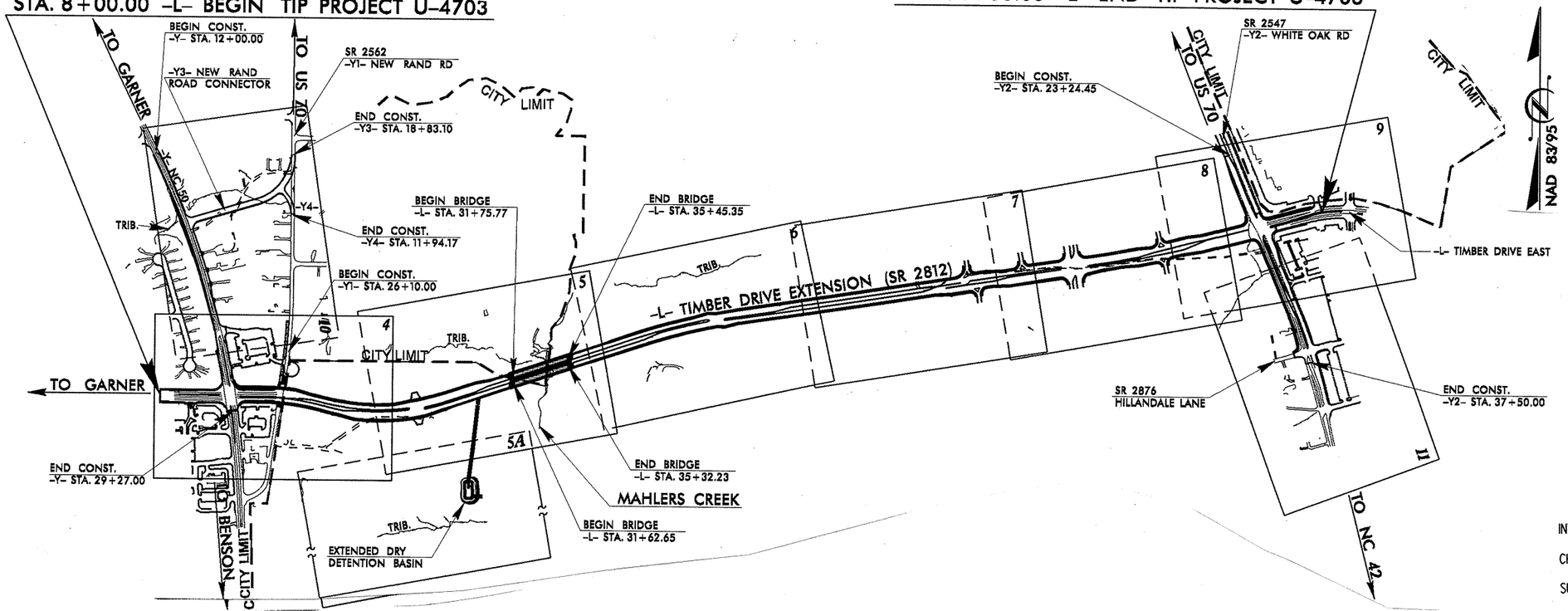
STA. 8+00.00 -L- BEGIN TIP PROJECT U-4703

STA. 84+50.00 -L- END TIP PROJECT U-4703



PERSONNEL
Y. KUNTUKOVA
D.S. TIGNOR

INVESTIGATED BY N.T. ROBERSON
CHECKED BY N.T. ROBERSON
SUBMITTED BY N.T. ROBERSON
DATE OCTOBER 2007

NORTH CAROLINA LICENSED SEAL 1912 GEOLOGIST NEIL T. ROBERSON
10/12/07

DRAWN BY: N.T. ROBERSON, T.T. WALKER

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PROJECT REFERENCE NO.	SHEET NO.
U-4703	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5, A-7-6			
SYMBOL														
% PASSING #10 #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		NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	0.42	0.25	0.075	0.053

BOULDER (BLDR.)	COBBLE (COB.)	GRAVEL (GR.)	COARSE SAND (CSE. SD.)	FINE SAND (F SD.)	SILT (SL.)	CLAY (CL.)

GRAIN SIZE	MM	305	75	2.0	0.25	0.05	0.005
	IN.	12	3				

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
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, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE.
UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED)
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.

ANGULARITY OF GRAINS

THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

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

GROUND WATER

- WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING
- STATIC WATER LEVEL AFTER 24 HOURS
- PW — PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA
- SPRING OR SEEP

MISCELLANEOUS SYMBOLS

- ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION
- SOIL SYMBOL
- ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT
- INFERRED SOIL BOUNDARY
- INFERRED ROCK LINE
- ALLUVIAL SOIL BOUNDARY
- 25/025 — DIP & DIP DIRECTION OF ROCK STRUCTURES
- SOUNDING ROD
- SPT CPT DPT DMT VST PMT — TEST BORING
- AUGER BORING
- CORE BORING
- MW — MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- REF — SPT REFUSAL

SAMPLE DESIGNATIONS

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

ABBREVIATIONS

AR - AUGER REFUSAL
BT - BORING TERMINATED
CL. - CLAY
CPT - CONE PENETRATION TEST
CSE. - COARSE
DMT - DILATOMETER TEST
DPT - DYNAMIC PENETRATION TEST
e - VOID RATIO
F - FINE
FOSS. - FOSSILIFEROUS
FRAC. - FRACTURED, FRACTURES
FRAGS. - FRAGMENTS
HI. - HIGHLY
MED. - MEDIUM
MICA. - MICACEOUS
MOD. - MODERATELY
NP - NON PLASTIC
ORG. - ORGANIC
PMT - PRESSUREMETER TEST
SAP. - SAPROLITIC
SD. - SAND, SANDY
SL. - SILT, SILTY
SLI. - SLIGHTLY
TCR - TRICONE REFUSAL
#P - MOISTURE CONTENT
V - VERY
VST - VANE SHEAR TEST
WEA. - WEATHERED
γ - UNIT WEIGHT
γ_d - DRY UNIT WEIGHT

EQUIPMENT USED ON SUBJECT PROJECT

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

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

HAMMER TYPE:
- [X] AUTOMATIC [ ] MANUAL

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

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

ROCK DESCRIPTION

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

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

WEATHERING

FRESH	ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.
VERY SLIGHT (V SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY. ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.
SLIGHT (SLI.)	ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH. OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED. CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.
MODERATE (MOD.)	SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.
MODERATELY SEVERE (MOD. SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. *IF TESTED, WOULD YIELD SPT REFUSAL*
SEVERE (SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. *IF TESTED, YIELDS SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, YIELDS SPT N VALUES < 100 BPF*
COMPLETE	ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.

ROCK HARDNESS

VERY HARD	CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.
HARD	CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.
MODERATELY HARD	CAN BE SCRATCHED BY KNIFE OR PICK. GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS.
MEDIUM HARD	CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.
SOFT	CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.
VERY SOFT	CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.

FRACTURE SPACING

TERM	SPACING
VERY WIDE	MORE THAN 10 FEET
WIDE	3 TO 10 FEET
MODERATELY CLOSE	1 TO 3 FEET
CLOSE	0.16 TO 1 FEET
VERY CLOSE	LESS THAN 0.16 FEET

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.

AQUIFER - A WATER BEARING FORMATION OR STRATA.

ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.

ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC.

ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE.

CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.

COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.

CORE RECOVERY (REC.) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.

DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.

DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.

FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.

FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.

FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL.

FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.

FORMATION (FM.) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.

JOINT - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.

LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.

LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.

MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.

PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.

RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.

ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE.

SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.

SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS.

SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.

STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (N OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.

STRATA CORE RECOVERY (SREC.) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.

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

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

BENCH MARK:

ELEVATION: FT.

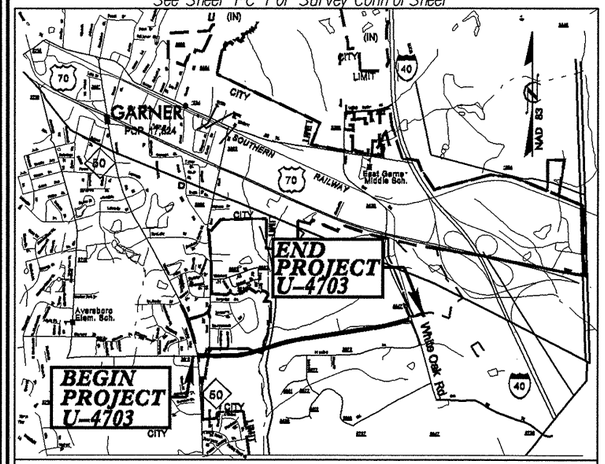
NOTES:

REVISED 02/23/06

09/08/99

TIP PROJECT: U-4703

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-4703	2A	17
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
35871.1.1	STP-0508(2)	PE	

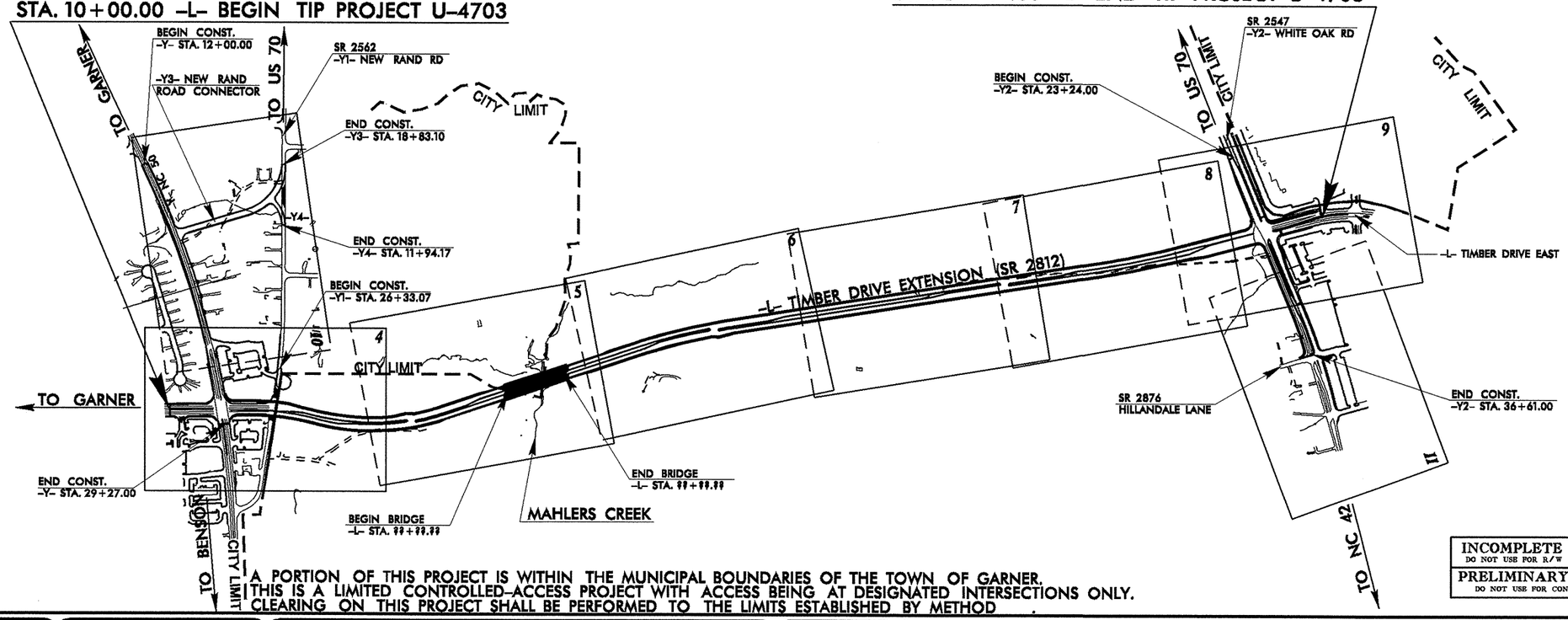
LOCATION: TIMBER DRIVE EAST EXTENSION (SR 2812) FROM NC 50 TO WHITE OAK ROAD (SR 2547) IN GARNER

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

NAD 83

STA. 10+00.00 -L- BEGIN TIP PROJECT U-4703

STA. 84+14.00 -L- END TIP PROJECT U-4703



A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF GARNER.
THIS IS A LIMITED CONTROLLED-ACCESS PROJECT WITH ACCESS BEING AT DESIGNATED INTERSECTIONS ONLY.
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

CONTRACT:

GRAPHIC SCALES

PLANS 50 25 0 50 100
PROFILE (HORIZONTAL) 50 25 0 50 100
PROFILE (VERTICAL) 10 5 0 10 20

DESIGN DATA

ADT 2007 = 14,620
ADT 2030 = 24,000
DHV = 10 %
D = 55 %
T = 6 % *
V = 50 MPH
* TTST 2% DUAL 4%
FUNC. CLASS = URBAN MINOR ARTERIAL

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-4703 = 0.000 mi.
LENGTH STRUCTURE OF TIP PROJECT U-4703 = 0.000 mi.
TOTAL LENGTH OF TIP PROJECT U-4703 = 1.404 mi.

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: APRIL 18, 2008

LETTING DATE: SEPTEMBER 15, 2009

JAMES A. SPEER, PE
PROJECT ENGINEER

DANNY GARDNER
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS STATE OF NORTH CAROLINA

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

P.E.
STATE HIGHWAY DESIGN ENGINEER

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

P.O. BOX 25201, RALEIGH, N.C. 27611-5201

Lyndo Tippett
SECRETARY

October 5, 2007

STATE PROJECT: 35871.1.1 (U-4703)
FEDERAL PROJECT: STP-0508(2)
COUNTY: Wake

DESCRIPTION: Timber Drive Extension (SR 2812) from NC 50 to White Oak Road (SR 2547) in Garner

SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of a proposed 1.404 mile, two-lane roadway (-L-) on new location to extend Timber Drive (SR 2812) from White Oak Road to NC 50. Also proposed is a connector (-Y3-) between NC 50 and New Rand Road (SR 2562). A bridge is proposed to carry -L- over Mahlers Creek (see Plan Sheet No. 5).

The geotechnical field investigation was conducted during June of 2007. F&R was contracted to drill the project. A CME-550 with automatic hammer was during the investigation. Standard Penetration Tests were performed in selected borings and additional borings were advanced using continuous flight augers. Representative soil samples were collected for visual classification in the field and for laboratory analysis by the Materials and Tests Unit.

The following alignments, totaling 1.404 miles, were investigated. Subsurface soil profiles, or cross-sections, of these alignments are included in this report.

Line	Station		
-L-	10+00	to	84+14
-Y3-	10+00	to	18+83

Areas of Special Geotechnical Interest

1) Highly Plastic Clay Soils: Highly plastic clays (PI > 25) were encountered on the project at the following locations:

Alignment	Station	Offset
-L-	15+50	60 LT
-L-	57+00	CL

2) Crystalline Rock: Crystalline rock was encountered in the following borings:

Alignment	Station	Offset
-L-	31+70	10 RT
-L-	35+40	10 LT
-L-	39+00	CL
-L-	45+00	50 LT
-L-	57+00	CL
-L-	71+00	10 RT
-Y3-	10+50	35 LT

Physiography and Geology

The project is located in the eastern Piedmont of North Carolina and is underlain by bedrock typical of the Raleigh Belt. Soils are derived from the weathering of the underlying granite is characterized by gently rolling hills. Mahlers Creek flows across the project from north to south. Fallow fields, wooded areas and abandoned homes comprise the eastern two-thirds of the project and a mixture of single-family homes and businesses is located near the intersections of Timber drive with NC 50 and White Oak road.

Soil Properties

Soils encountered at the project site include residual soils and alluvial sediments.

The residual soils are derived from the in-situ weathering of the underlying granite. Clayey soils are most common throughout the project and generally consist of medium stiff to very stiff, sandy clay and silty clay (A-6, A-7-5, and A-7-6). Medium stiff to stiff, sandy and clayey silt (A-4, A-5) and medium dense, silty sand (A-2-4) are also present.

Alluvial soils are present in the floodplain of Mahlers Creek and consist of shallow, wet, loose sands.

Rock Properties

Weathered rock and crystalline rock occur in several areas on the project. The weathered rock is derived from the underlying Raleigh Belt bedrock and ranges from 3 to 6 feet in thickness. The crystalline bedrock consists mostly of granite.

Groundwater

Groundwater was encountered in several borings. When present in residual soil, groundwater was determined to be 6 to 16 feet below the ground surface. Based on this investigation, groundwater is not anticipated to cause problems during construction.

Prepared by,

Yekaterina Kuntukova
Engineering Geologist

5/9/06

COMPUTED BY: DWG DATE: 11/29/07
CHECKED BY: _____ DATE: _____

PROJECT REFERENCE NO.	SHEET NO.
U-4703	3A OF 17

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

SUMMARY OF EARTHWORK

IN CUBIC YARDS

LOCATION	TOTAL UNCLASSIFIED EXCAVATION	ROCK EXCAVATION	UNDERCUT	UNSUITABLE EXCAVATION	SUITABLE EXCAVATION	TOTAL EMBANKMENT	ROCK EMBANKMENT	EARTH EMBANKMENT	EMBANKMENT (+20%)	BORROW	SUITABLE WASTE	UNSUITABLE WASTE	TOTAL WASTE
SUMMARY NO. 1													
–L– 8+00.00 TO 12+92.77													
TOTAL SUMMARY NO. 1													
SUMMARY NO. 2													
–L– 13+61.48 TO 31+69.16 (BB)	5517				5517	38298		38298	45958	40441			
–Y– 12+00.00 TO 29+27.00	874				874	3916		3916	4699	3825			
–Y1– 26+33.07 TO 27+55.94	71				71	138		138	166	95			
–Y3– 10+85.09 TO 18+83.10	1398				1398	7281		7281	8737	7339			
–Y4– 10+94.36 TO 11+94.17	231				231	350		350	420	189			
TOTAL SUMMARY NO. 2	8091				8091	49983		49983	59980	51889			
SUMMARY NO. 3													
–L– 35+38.79 (EB) TO 57+00.00	29477				29477	24955		24955	29946	469			
TOTAL SUMMARY NO. 3	29477				29477	24955		24955	29946	469			
SUMMARY NO. 4													
–L– 57+00.00 TO 80+21.10	24225				24225	32669		32669	39203	14978			
–Y2– 23+24.45 TO 27+50.00	1085				1085						1085		1085
–Y2– 29+00.00 TO 37+50.00	789				789	668		668	802	13			
TOTAL SUMMARY NO. 4	26099				26099	33337		33337	40005	14991	1085		1085
SUMMARY NO. 5													
–L– 80+65.61 TO 84+50.00	360				360	11		11	13		347		347
TOTAL SUMMARY NO. 5	360				360	11		11	13		347		347
SUMMARY TOTALS	64027				64027	108286		108286	129944	67349	1432		1432
LOSS DUE TO C & G	–5900				–5900					5900			
WASTE IN LIEU OF BORROW										–1432	–1432		–1432
EST. SHOULDER MATERIAL						320		320	384	384			
PROJECT SUBTOTALS	58127				58127	108606		108606	130328	72201			
EST. 5% FOR REPLACING TOPSOIL ON BORROW PIT										3611			
PROJECT TOTALS	58127				58127	108606		108606	130328	75812			
SAY	58200									75900			

DIVISION UNDERCUT QUANTITY (PLFI) =2500 CY
FABRIC FOR SOIL STABILIZATION=800 SY
FABRIC FOR SOIL STABILIZATION IN UNDERCUT OF SUBGRADE=850 SY
SELECT GRANULAR MATERIAL=1650 CY
UNDERDRAINS=1000 LF (SEE "SUBSURFACE DRAINAGE–UNDERDRAIN" PROJECT SPECIAL PROVISION)
PAVEMENT STRUCTURE VOLUME = 9500 CY

NOTE: 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.

06-APR-2010 08:12
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PROJECT REFERENCE NO.	SHEET NO.
U-4703	4

8/17/99

MATCHLINE -Y1- STA 24+00.00 (SEE SHEET 10)

MATCHLINE -Y- STA 23+50.00 (SEE SHEET 10)

NAD 83

BEGIN PROJECT U-4703
-L- STA. 10+00.00

-L- POT Sta. 10+00.00

-L- PC Sta. 15+01.03

-Y1- PT Sta. 26+92.92

BEGIN CONSTRUCTION
-Y1- STA. 26+33.07

-L- PRC Sta. 19+21.92

-Y1- POT Sta. 28+93.56

-L- POC Sta. 16+49.79=
-Y1- POT Sta. 29+00.41

-Y1- POT Sta. 32+33.56

END CONSTRUCTION
-Y- STA. 29+27.00

-L- POT Sta. 13+28.71=
-Y- POC Sta. 28+27.25

CITY LIMIT

MEL-VIN COLEY
DB 10996 PG 290

MICHAEL BRUMSEY
DB 9196 PG 760

ROBERT WILLIAMS
DB 7820 PG 280

STEVEN TANNER
DB 5594 PG 34

KATHY LIVERMAN
DB 8610 PG 602

TED MASSENGILL
DB 4702 PG 186

BARBARA SCHOR
DB 8447 PG 533

STATE EMPLOYEES CREDIT UNION
DB 1015 PG 2790

TOWN OF GARNER
DB 3947 PG 2266
DB 3997 PG 642

MICHAEL BARSKILE
DB 3245 PG 662

GEORGE MOORE
DB 6497 PG 515

ANDREW JACKSON
DB 3245 PG 483

SANDRA MITCHELL
DB 6599 PG 873

BRENDA W. FOWLER, et al
DB 6408 PG 164

JACQUES EL CHAYEB
ERA IN HOUSE REALTY
ISBKBUS
DB 8824 PG 2613

MCDONALDS CORPORATION
DB 6093 PG 887

HARDEES FOOD SYSTEMS INCC/O RASH
DB 4213 PG 116

TIMBER CROSSINGS TV
PROP LLC &CROSSINGS
GA PROPERTIES LLC
DB 8932 PG 1640

TIMBER PROPERTIES LLC
DB 8969 PG 385

RIDGELAND, LLC
DB 1464 PG 447

330' FULL LANE

100' TAPER

36' INC. TYP.

137.5' MEDIAN TRANSITION

-Y-
NC 50

	21,680 / 31,800		
-L- SR 2812 TIMBER DR.	7,168 / 11,400	1,032 / 1,400	-Y- SR 2812 TIMBER DR.
28,920 / 51,000	10,048 / 19,800	1,880 / 2,800	14,616 / 24,000
		25,408 / 41,600	2007 ADT / 2030 ADT

-Y-	-Y1-	-L-	
PI Sta 27+67.21	PI Sta 24+86.97	PI Sta 17+12.64	PI Sta 23+43.31
Δ = 14° 43' 36.0" (RT)	Δ = 8° 39' 41.3" (RT)	Δ = 14° 42' 16.5" (RT)	Δ = 32° 41' 40.6" (LT)
D = 1° 03' 06.6"	D = 2° 05' 55.5"	D = 3° 29' 37.1"	D = 4° 00' 04.0"
L = 1,400.08'	L = 412.70'	L = 420.90'	L = 819.64'
T = 703.92'	T = 206.74'	T = 211.61'	T = 421.39'
R = 5,447.19'	R = 2,730.00'	R = 1,640.00'	R = 1,432.00'
SE = .02	SE = SEE PLANS	SE = .04	SE = .04
RO = SEE PLANS		RO = SEE PLANS	RO = SEE PLANS

SEE SHEET 12 FOR -L- PROFILE
SEE SHEET 15 FOR -Y- PROFILE
SEE SHEET 16 FOR -Y1- PROFILE

MATCHLINE -L- STA 23+00.00 (SEE SHEET 5)

30-JUL-2007 14:01
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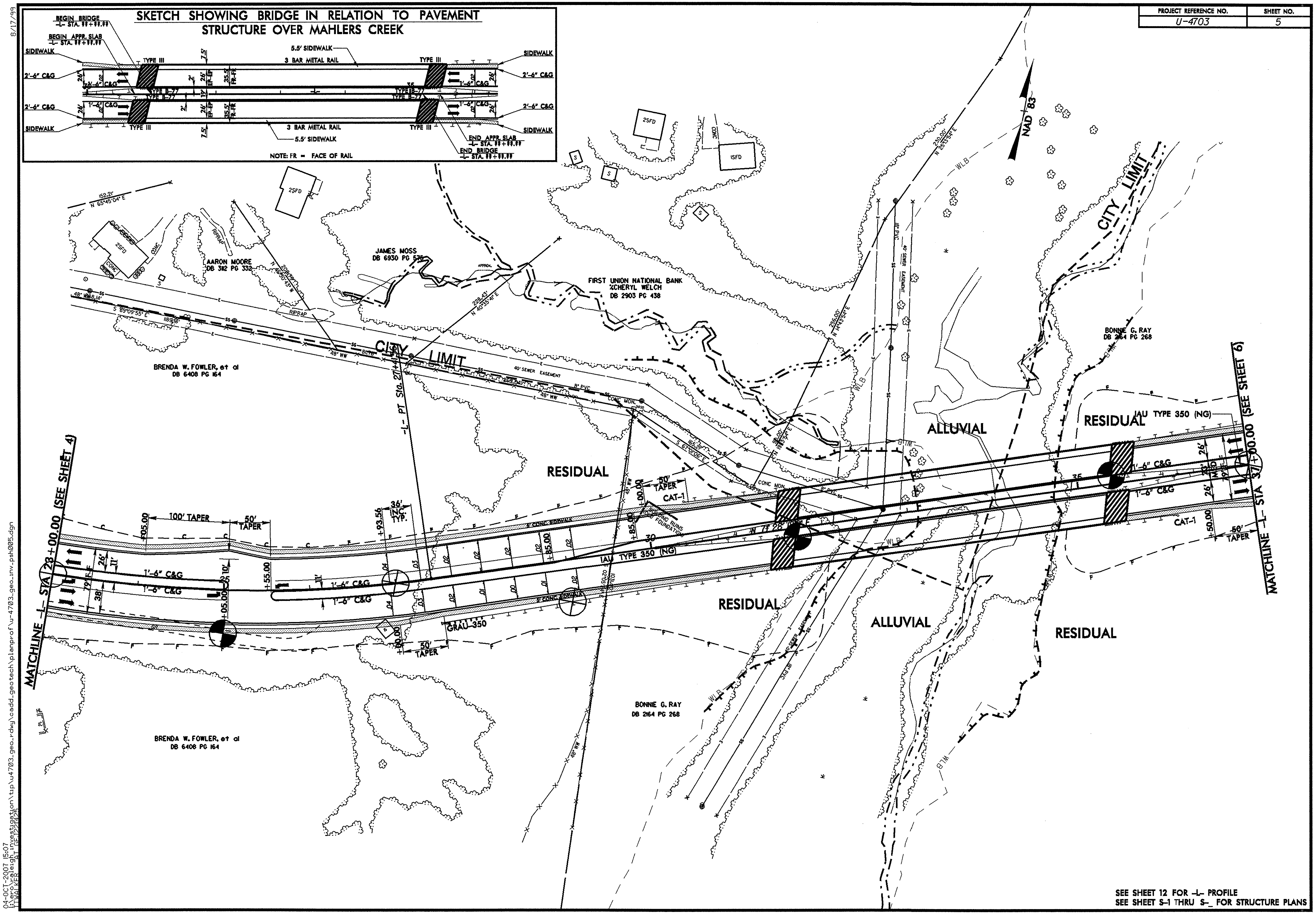
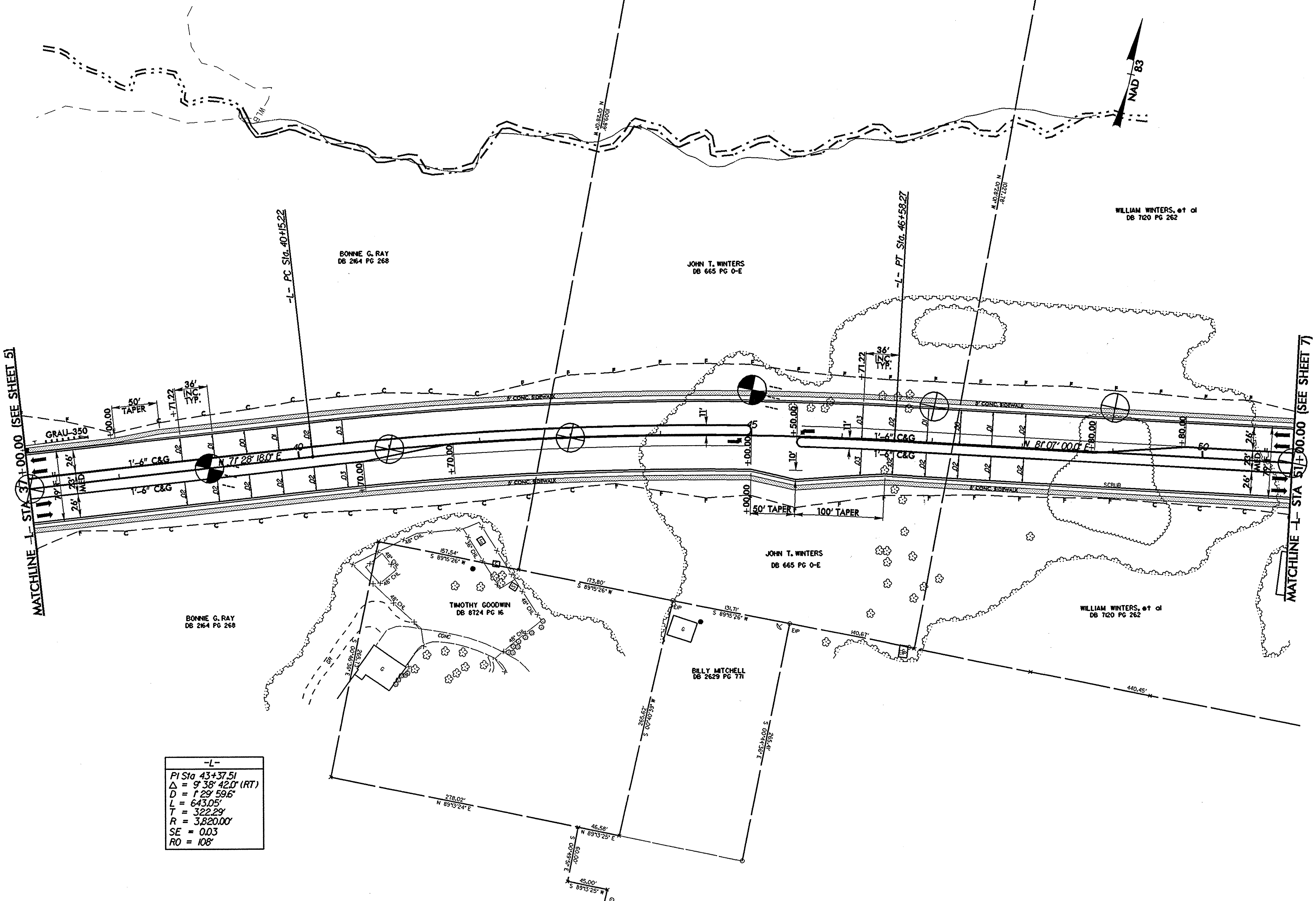
tmiller



PROJECT REFERENCE NO.
U-4703
SHEET NO.
5
SKETCH SHOWING BRIDGE IN RELATION TO PAVEMENT
STRUCTURE OVER MAHLERS CREEK
BEGIN BRIDGE
BEGIN APPR. SLAB
SIDEWALK
2'-6" C&G
1'-6" C&G
TYPE III
3 BAR METAL RAIL
5.5' SIDEWALK
END APPR. SLAB
END BRIDGE
NOTE: FR = FACE OF RAIL
NAD 83
CITY LIMIT
JAMES MOSS
DB 6930 PG 535
AARON MOORE
DB 312 PG 332
FIRST UNION NATIONAL BANK
%CHERYL WELCH
DB 2903 PG 438
BONNIE G. RAY
DB 2164 PG 268
BRENDA W. FOWLER, et al
DB 6408 PG 164
RESIDUAL
ALLUVIAL
IAU TYPE 350 (NG)
GRAU-350
CAT-1
100' TAPER
50' TAPER
8' CONC. SIDEWALK
40' SEWER EASEMENT
CONC. MON.
2SFD
1SFD
MATCHLINE -L- STA 23+00.00 (SEE SHEET 4)
MATCHLINE -L- STA 37+00.00 (SEE SHEET 6)
SEE SHEET 12 FOR -L- PROFILE
SEE SHEET S-1 THRU S-_ FOR STRUCTURE PLANS
8/17/99
04-OCT-2007 15:07

PROJECT REFERENCE NO.	SHEET NO.
U-4703	6



SEE SHEET 13 FOR -L- PROFILE

8/17/99

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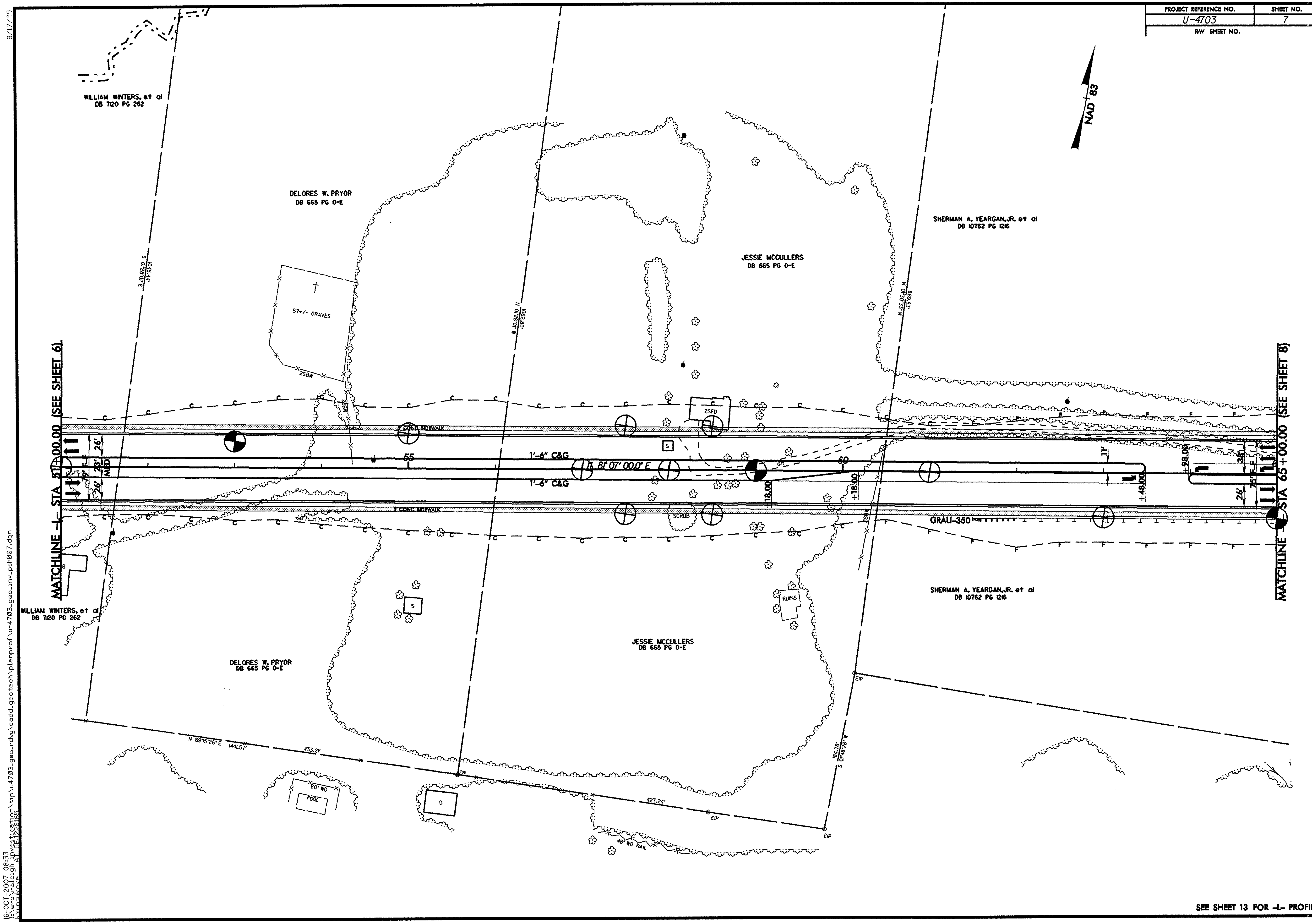
PROJECT REFERENCE NO.	SHEET NO.
U-4703	7
R/W SHEET NO.	



SEE SHEET 13 FOR -L- PROFILE

16-OCT-2007 08:33

PROJECT REFERENCE NO.	SHEET NO.
U-4703	8

8/17/99

NAD 83

SHERMAN A. YEARGAN, JR. et al
DB 10762 PG 1216

-L- PC Sta. 69+59.26

-L- PT Sta. 75+84.34

SCRUB

36' INC TR.

+39.25

+28.00

162.5' MEDIAN TRANSITION

+67.50

+96.34

MATCHLINE -L- STA 65+00.00 (SEE SHEET 7)

MATCHLINE -L- STA 76+00.00 (SEE SHEET 9)

8" CONC. SIDEWALK

CAT-1

N 81° 07' 00.0" E

1'-6" C&G

65.5' F-F

49.00

100' TAPER

+30.88

ISFD

SHERMAN A. YEARGAN, JR. et al
DB 10762 PG 1216

-L-
PI Sta 72+72.10
Δ = 6° 10' 29.9" (LT)
D = 0° 59' 16.3"
L = 625.09'
T = 312.85'
R = 5,800.00'
SE = 0.02
RO = 72'

36" CMP

1966.71'
N 89° 59' 51" W

SEE SHEET 14 FOR -L- PROFILE

30-JUL-2007 14:27
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PROJECT REFERENCE NO.	SHEET NO.
U-4703	9

8/17/99

BEGIN CONSTRUCTION
-Y2- STA. 23+24.00

+24.45

RUINS
RUINS
RUINS
RUINS
SCRUB

150' TAPER

CITY LIMIT

SUBBASE

CONC

30' BR. WALL

84" BR. WALL

GARNER RETAIL SPE LLC
DB 10584 PG 1323
BM 2002 PG 1828-32

24" C&G

BST

250' FULL LANE

-L- PC Sta. 83+16.61

NAD 83

GARNER RETAIL SPE LLC
DB 10584 PG 1323
BM 2002 PG 1828-32

BST

END PROJECT U-4703
-L- STA. 84+14.00

SHERMAN A. YEARGAN, JR. et al
DB 10762 PG 1216

BEGIN RESURFACING
-Y2- STA. 27+34.00 LT.

TIE TO EXISTING SIDEWALK

BST

24" C&G

CB

70.00'

10' PROGRESS ENERGY POWERLINE EASEMENT
DB 5240 PG 830, 837 & 846

CITY LIMIT

SCRUB

70' CP&L EASEMENT

50'

+24.45

+72.00

36" RCP

30' C&G

5' CONC.

PVC

4" PVC

6" PVC

8" PVC

8" CONC.

MATCHLINE -L- STA. 76+00.00 (SEE SHEET 8)

36" RCP TYP.

8' CONC. SIDEWALK

N 74°56'30"E

38.89'

TIMBER DRIVE EAST

30' C&G

CONC. ISL.

BST (WIDTH VARIES)

CITY OF RALEIGH SANITARY SEWER EASEMENT
BM 2002 PG 839-39

-L- PT Sta. 88+41.08

60" CONC.

60" PVC

EXIST. R/W

100.00'

END RESURFACING
-L- STA. 81+44.00 RT.

GARNER RETAIL LLC
DB 9597 PG 1383
BM 2002 PG 1576-8

24" C&G

P/A BST

ISBRUS

CONC

CONC. RET. WALL

SHERMAN A. YEARGAN, JR. et al
DB 10762 PG 1216

330' FULL LANE

100' TAPER

SCRUB

SCRUB

6R

24" RCP

SR 2547 WHITE OAK

12 BST

25 BST

18" C&G

-L- POT Sta. 80+42.76=
-Y2- POC Sta. 28+29.12

CH. BEARING=S 64°17'35"E
CH. DIS.=26.53'

12" RCP

S 74°10'34" W
136.00'

S57°49'26"E
301.89'

WLB

MATCHLINE -Y2- STA 32+50.00 (SEE SHEET 11)

SEE SHEET 14 FOR -L- PROFILE
SEE SHEET 17 FOR -Y2- PROFILE

16-OCT-2007 08:34
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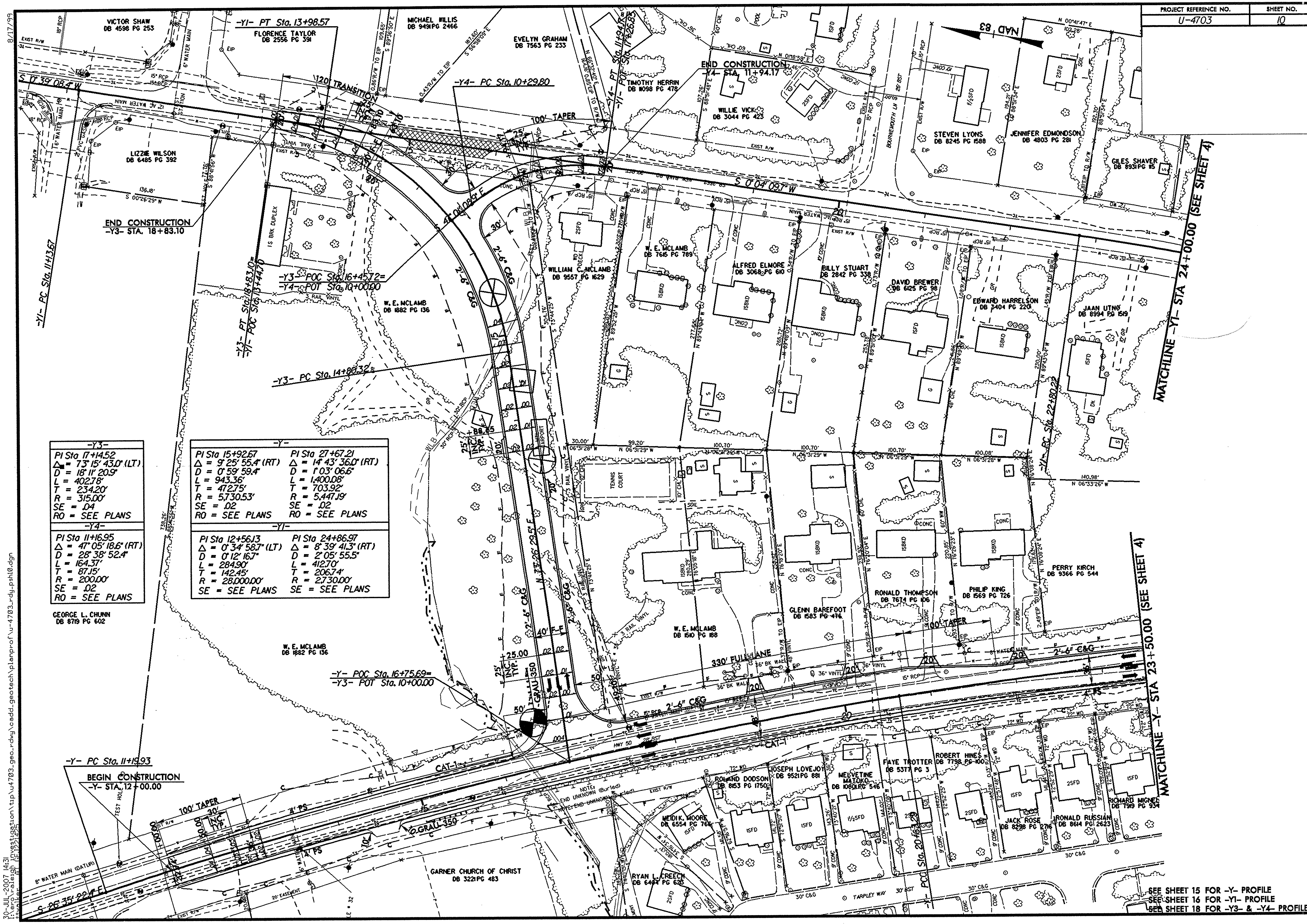
kkuntz

PROJECT REFERENCE NO.	SHEET NO.
U-4703	10



-Y3-
PI Sta 17+14.52
Δ = 73° 15' 43.0" (LT)
D = 18° 11' 20.9"
L = 402.78'
T = 234.20'
R = 315.00'
SE = .04
RO = SEE PLANS

-Y4-
PI Sta 11+16.95
Δ = 47° 05' 18.6" (RT)
D = 28° 38' 52.4"
L = 164.37'
T = 87.15'
R = 200.00'
SE = .02
RO = SEE PLANS

-Y-	
PI Sta 15+92.67	PI Sta 27+67.21
Δ = 9° 25' 55.4" (RT)	Δ = 14° 43' 36.0" (RT)
D = 0° 59' 59.4"	D = 1° 03' 06.6"
L = 943.36'	L = 1,400.08'
T = 472.75'	T = 703.92'
R = 5,730.53'	R = 5,447.19'
SE = .02	SE = .02
RO = SEE PLANS	RO = SEE PLANS

-Y1-	
PI Sta 12+56.13	PI Sta 24+86.97
Δ = 0° 34' 58.7" (LT)	Δ = 8° 39' 41.3" (RT)
D = 0° 12' 16.7"	D = 2° 05' 55.5"
L = 284.90'	L = 412.70'
T = 142.45'	T = 206.74'
R = 28,000.00'	R = 2,730.00'
SE = SEE PLANS	SE = SEE PLANS

SEE SHEET 15 FOR -Y- PROFILE
SEE SHEET 16 FOR -Y1- PROFILE
SEE SHEET 18 FOR -Y3- & -Y4- PROFILES

PROJECT REFERENCE NO.	SHEET NO.
U-4703	11

8/17/99

NAD 83

TARGET CORPORATION
DB 9597 PG 1388
BM 2002 PG 1576-8

MATCHLINE -Y2- STA 32+50.00 (SEE SHEET 9)

-Y2- PC Sta. 34+09.59

-Y2- PRC Sta. 35+79.59

-Y2- PT Sta. 40+01.84

-Y2- POT Sta. 43+00.59

END RESURFACING
-Y2- STA. 33+30.00 LT.

END CONSTRUCTION
-Y2- STA. 36+61.00

ISBKBUS

24" C&G

P/A BST

2" PVC GAS 28' BST

GARNER LAND COMPANY LLC
DB 8841 PG 198

730.20'
N 74°08'47" E

SR 2541 WHITE OAK 73' BST

S 13° 41' 55" E

30" C&G

18" C&G

EXIST R/W

6" DIP WATER

EIP

15" RCP

18" RCP

12" DIP WATER

4' CONC SIDEWALK

TEST HOLE # 21

TEST HOLE # 17

TEST HOLE # 13

TEST HOLE # 5

JIMMY ALLEN
DB 2244 PG 553

ISRD

CONC

SHERMAN A. YEARGAN, JR. et al
DB 10762 PG 1216

173.27'
N 85°59'30" W

204.31'
S 13°57'47" E

SR 2876 HILLANDALE LN

JAMES M. EUBANKS, III
DB 8806 PG 1584

JAMES M. EUBANKS, III
DB 6686 PG 255

ISFD

DK

265.70'
S 2°00'36" W

36.24'
N 85°59'50" W

140.28'
S 15°50'31" E

131.85'
S 15°40'38" E

DAVID M. KING
DB 2449 PG 600

W/SFD

EXIST R/W VARIABLE WIDTH

50'

L WLB

-Y2-	
PI Sta 34+94.62	PI Sta 37+90.87
Δ = 3° 40' 32.1" (RT)	Δ = 5° 22' 34.4" (RT)
D = 2° 09' 43.6"	D = 1° 16' 23.7"
L = 170.00'	L = 422.25'
T = 85.03'	T = 211.28'
R = 2650.00'	R = 4,500.00'
SE = SEE PLANS	SE = SEE PLANS

SEE SHEET 17 FOR -Y2- PROFILE

30-JUL-2007 14:33
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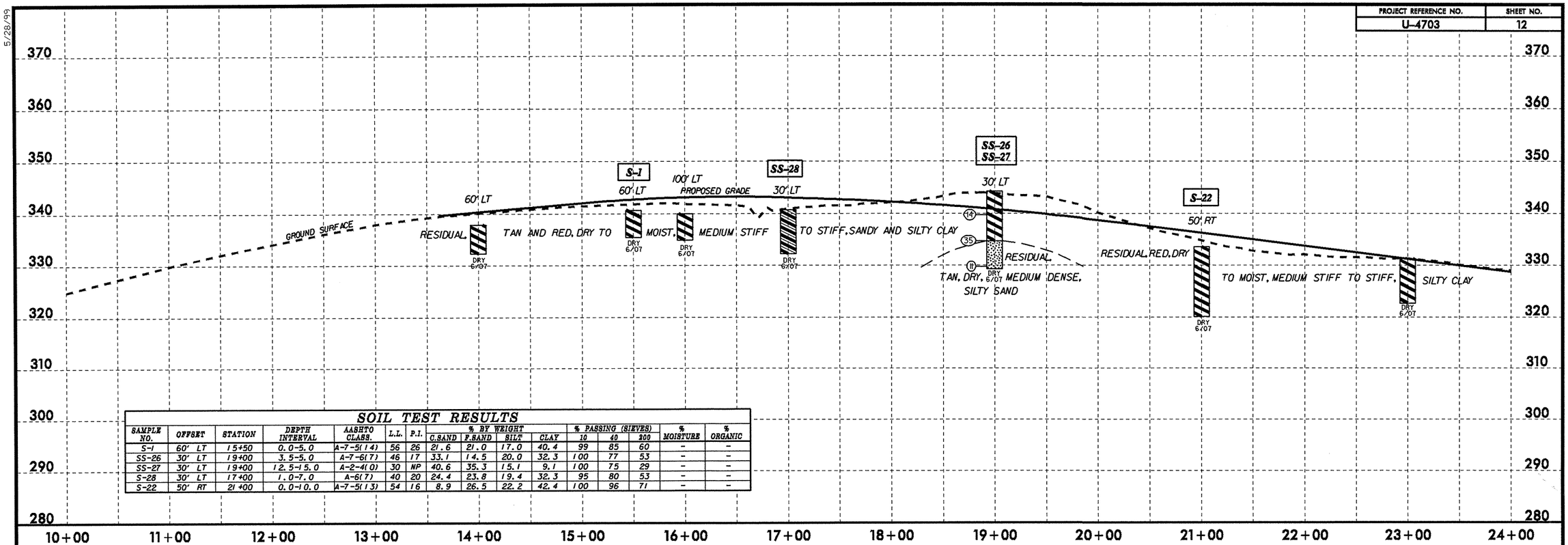
jwalker

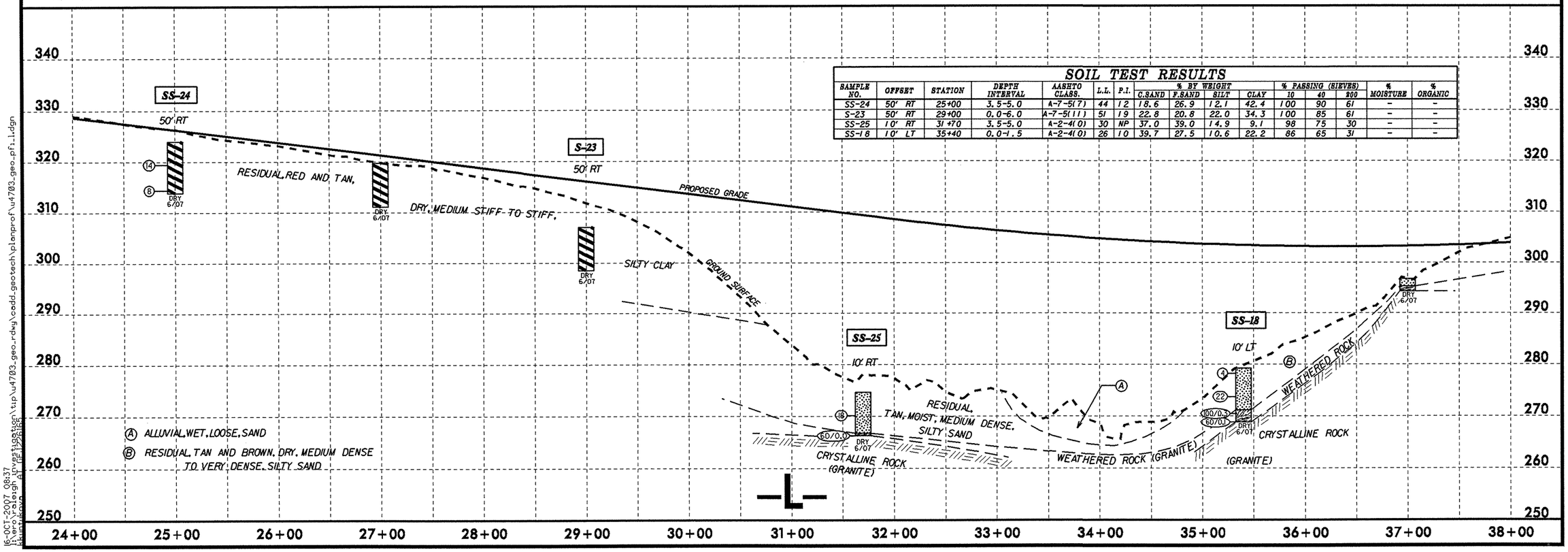
PROJECT REFERENCE NO.	SHEET NO.
U-4703	12

5/28/99



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
S-1	60' LT	15+50	0.0-5.0	A-7-5(14)	56	26	21.6	21.0	17.0	40.4	99	85	60	-	-
SS-26	30' LT	19+00	3.5-5.0	A-7-6(17)	46	17	33.1	14.5	20.0	32.3	100	77	53	-	-
SS-27	30' LT	19+00	12.5-15.0	A-2-4(0)	30	NP	40.6	35.3	15.1	9.1	100	75	29	-	-
S-28	30' LT	17+00	1.0-7.0	A-6(7)	40	20	24.4	23.8	19.4	32.3	95	80	53	-	-
S-22	50' RT	21+00	0.0-10.0	A-7-5(13)	54	16	8.9	26.5	22.2	42.4	100	96	71	-	-



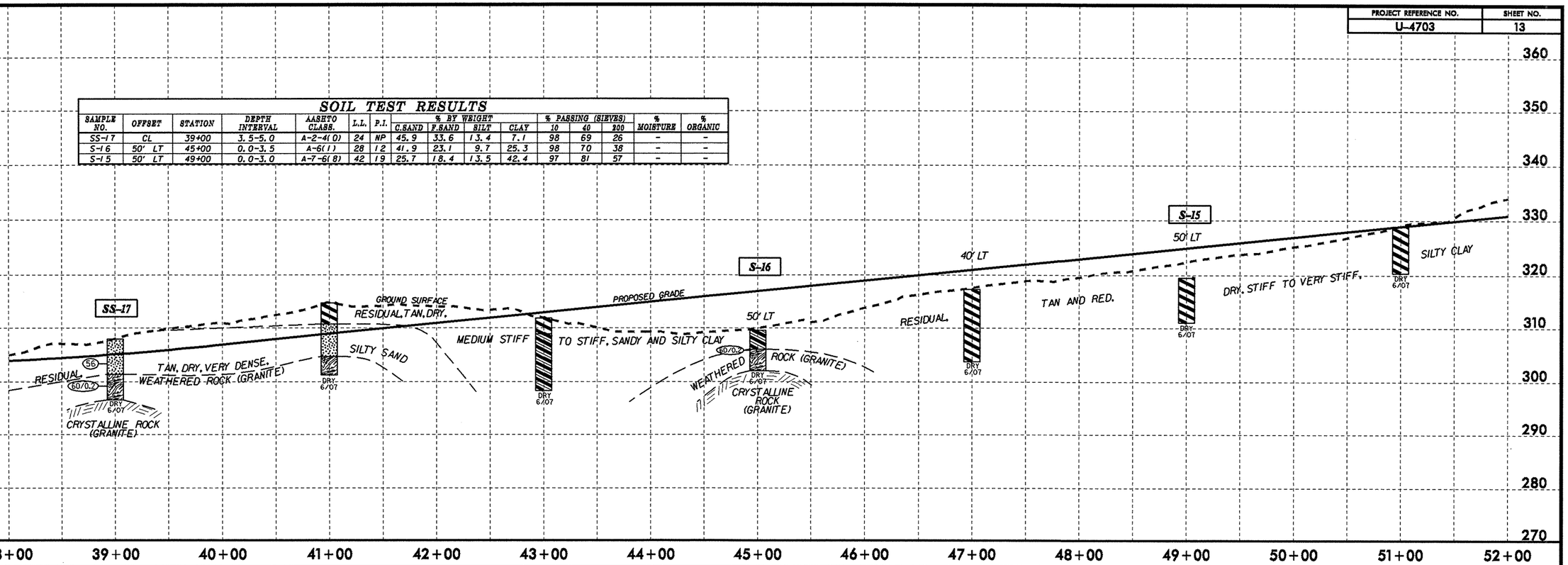
SOIL TEST RESULTS

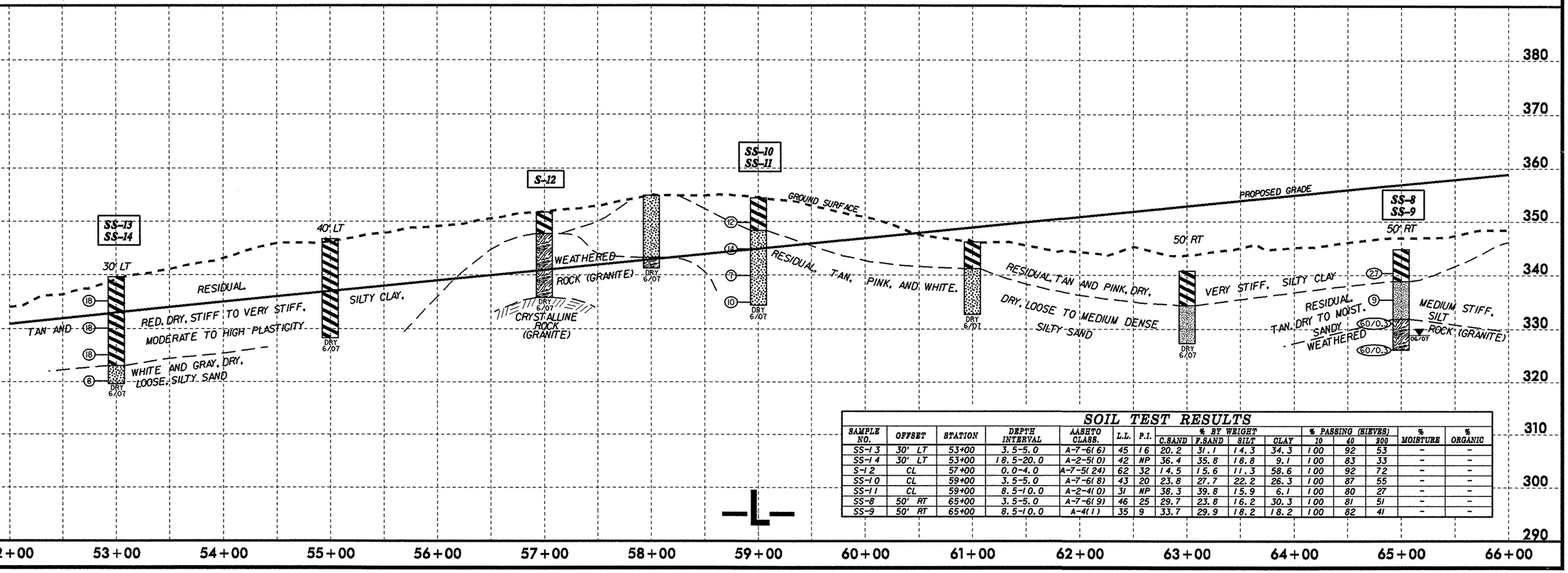
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-24	50' RT	25+00	3.5-5.0	A-7-5(7)	44	12	18.6	26.9	12.1	42.4	100	90	61	-	-
S-23	50' RT	29+00	0.0-6.0	A-7-5(11)	51	19	22.8	20.8	22.0	34.3	100	85	61	-	-
SS-25	10' RT	31+70	3.5-5.0	A-2-4(0)	30	NP	37.0	39.0	14.9	9.1	98	75	30	-	-
SS-18	10' LT	35+40	0.0-1.5	A-2-4(0)	26	10	39.7	27.5	10.6	22.2	86	65	31	-	-

PROJECT REFERENCE NO.	SHEET NO.
U-4703	13

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-17	CL	39+00	3.5-5.0	A-2-4(0)	24	NP	45.9	33.6	13.4	7.1	98	69	26	-	-
S-16	50' LT	45+00	0.0-3.5	A-6(1)	28	12	41.9	23.1	9.7	25.3	98	70	38	-	-
S-15	50' LT	49+00	0.0-3.0	A-7-6(8)	42	19	25.7	18.4	13.5	42.4	97	81	57	-	-





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-13	30' LT	53+00	3.5-5.0	A-7-6(6)	45	16	20.2	31.1	14.3	34.3	100	92	53	-	-
SS-14	30' LT	53+00	18.5-20.0	A-2-5(0)	42	NP	36.4	35.8	18.8	9.1	100	83	33	-	-
S-12	CL	57+00	0.0-4.0	A-7-5(24)	62	32	14.5	15.6	11.3	58.6	100	92	72	-	-
SS-10	CL	59+00	3.5-5.0	A-7-6(8)	43	20	23.8	27.7	22.2	26.3	100	87	55	-	-
SS-11	CL	59+00	8.5-10.0	A-2-4(0)	31	NP	38.3	39.8	15.9	6.1	100	80	27	-	-
SS-8	50' RT	65+00	3.5-5.0	A-7-6(9)	46	25	29.7	23.8	16.2	30.3	100	81	51	-	-
SS-9	50' RT	65+00	8.5-10.0	A-4(1)	35	9	33.7	29.9	18.2	18.2	100	82	41	-	-

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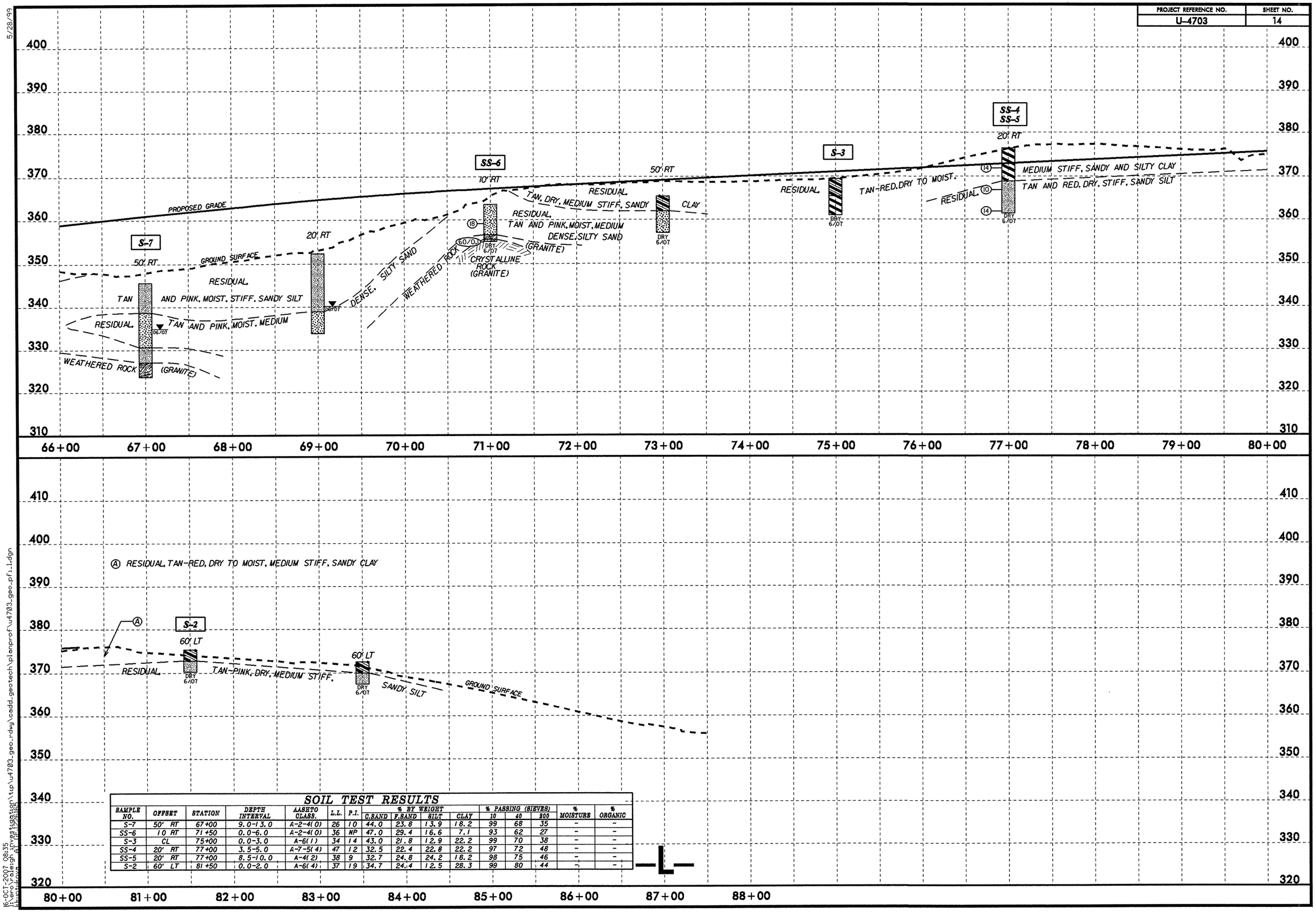
PROJECT REFERENCE NO.	SHEET NO.
U-4703	14



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
S-7	50' RT	67+00	9.0-13.0	A-2-4(0)	26	10	44.0	23.8	13.9	18.2	99	68	35	-	-
SS-6	10 RT	71+50	0.0-6.0	A-2-4(0)	36	NP	47.0	29.4	16.6	7.1	93	62	27	-	-
S-3	CL	75+00	0.0-3.0	A-6(11)	34	14	43.0	21.8	12.9	22.2	99	70	38	-	-
SS-4	20' RT	77+00	3.5-5.0	A-7-5(4)	47	12	32.5	22.4	22.8	22.2	97	72	48	-	-
SS-5	20' RT	77+00	8.5-10.0	A-4(2)	38	9	32.7	24.8	24.2	18.2	98	75	46	-	-
S-2	60' LT	81+50	0.0-2.0	A-6(4)	37	19	34.7	24.4	12.5	28.3	99	80	44	-	-

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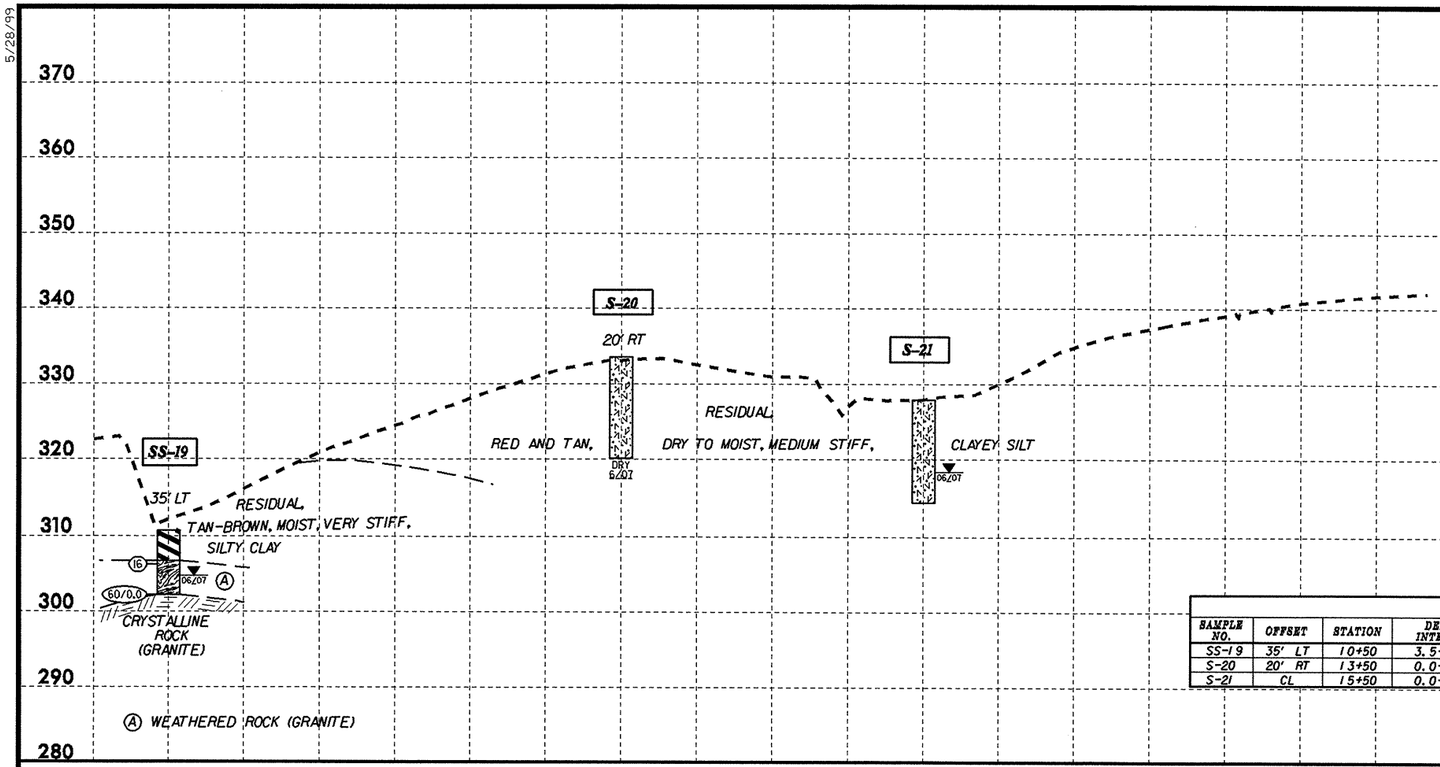
PROJECT REFERENCE NO.	SHEET NO.
U-4703	15



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-19	35' LT	10+50	3.5-5.0	A-7-5(12)	54	20	21.6	20.8	19.2	38.4	100	86	61	-	-
S-20	20' RT	13+50	0.0-10.0	A-5(5)	47	10	4.2	49.3	20.2	26.3	100	98	56	-	-
S-21	CL	15+50	0.0-10.0	A-5(2)	49	8	17.4	44.2	16.2	22.2	100	93	46	-	-

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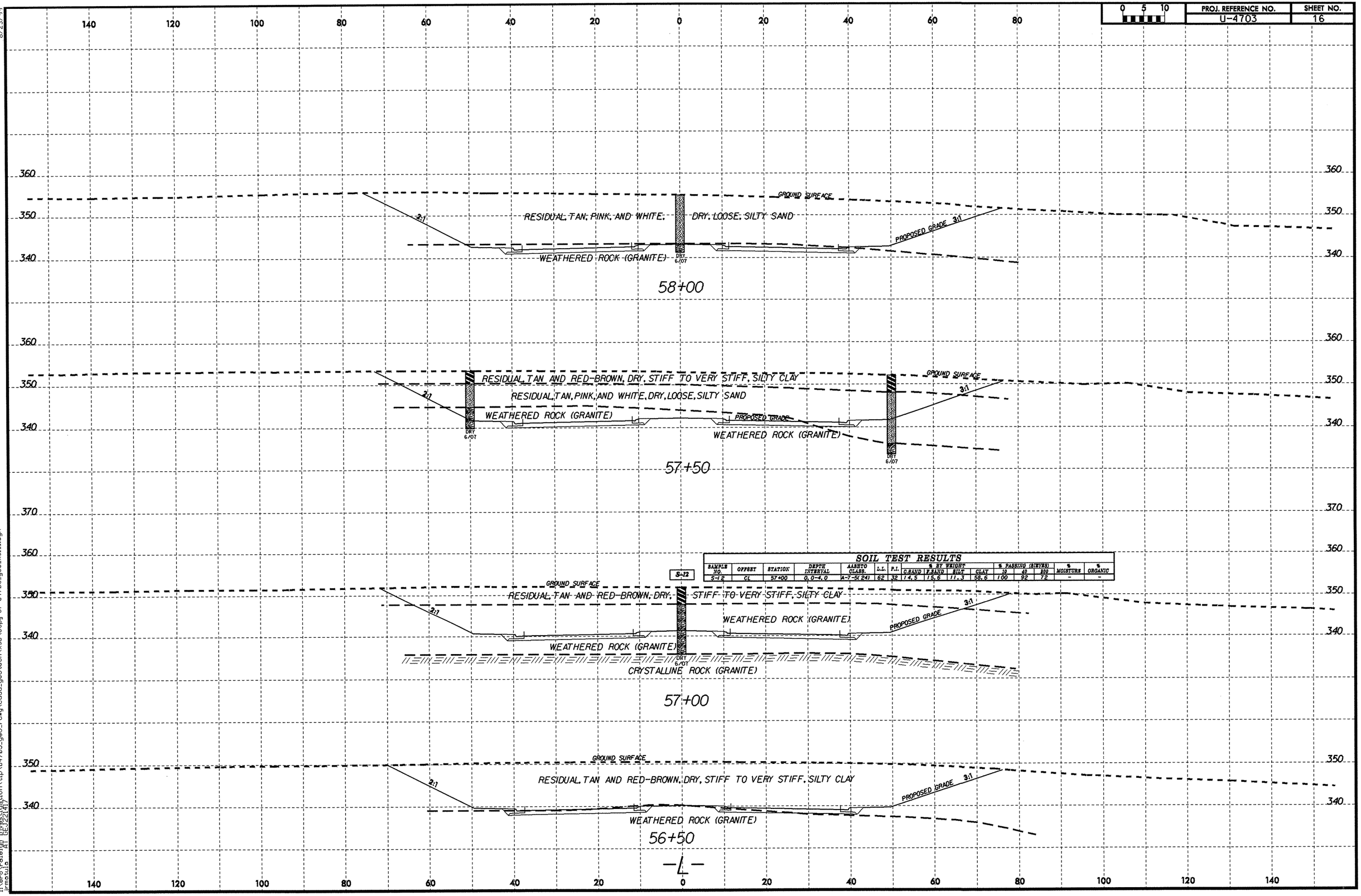
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4703	16



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
S-12	CL	57+00	0.0-4.0	A-7-5(24)	62	32	14.5	15.6	11.3	58.6	100	92	72	-	-

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0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	U-4703	17

140 120 100 80 60 40 20 0 20 40 60 80

350

GROUND SURFACE

3:1

RESIDUAL, TAN AND RED-BROWN, DRY, STIFF TO VERY STIFF, SILTY CLAY

4:1 PROPOSED GRADE

TAN, PINK, AND WHITE, DRY, LOOSE TO MEDIUM DENSE, SILTY SAND

350

59+50

370

360

350

340

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT GRAVEL	SAND	SILT	CLAY	% PASSING (SIEVE) #10	#40	#200	% MOISTURE	% ORGANIC
SS-10	CL	59+00	3.5-5.0	A-7-6(0)	43	20	23.8	29.7	22.2	26.3	100	87	55	-	-
SS-11	CL	59+00	8.5-10.0	A-2-4(0)	NV	NP	36.3	39.8	15.9	6.1	100	80	27	-	-

SS-10
SS-11

GROUND SURFACE

2:1

RESIDUAL, TAN AND RED-BROWN, DRY, STIFF TO VERY STIFF, SILTY CLAY

3:1

PROPOSED GRADE

TAN, PINK, AND WHITE, DRY, LOOSE TO MEDIUM DENSE, SILTY SAND

12
14
7
10

DRY 6/07

59+00

360

350

340

RESIDUAL, TAN AND RED-BROWN, DRY, STIFF TO VERY STIFF, SILTY CLAY

2:1

GROUND SURFACE

RESIDUAL, TAN, PINK AND WHITE, DRY, LOOSE TO MEDIUM DENSE, SILTY SAND

3:1

PROPOSED GRADE

WEATHERED ROCK (GRANITE)

WEATHERED ROCK (GRANITE)

DRY 6/07

DRY 6/07

58+50

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