STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	38532.1.1(B-4760)	1	14

NOTE: SEE SHEET 1A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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LINE	STATION	PLAN	XSECT
-L-	14+50 to 35+00	4 - 5	6 - 13
SOIL TEST RESULTS		14	

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

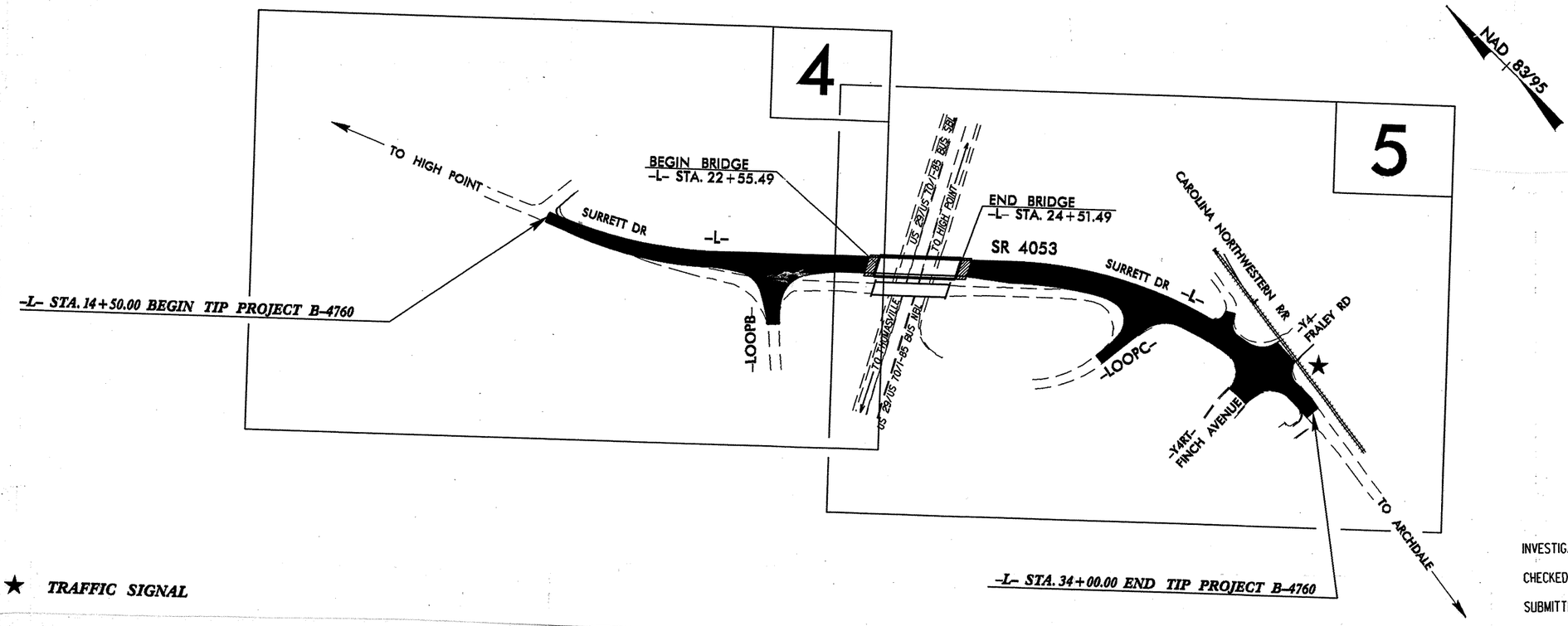
ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 38532.1.1(B-4760) F.A. PROJ. BRZ-4053(1)

COUNTY GUILFORD

PROJECT DESCRIPTION BRIDGE NO. 77 ON SR 4053 (SURRETT DR.) OVER US 29/US 70/I-85 BUSINESS

INVENTORY



★ TRAFFIC SIGNAL

CAUTION NOTICE

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

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

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

PERSONNEL

D.C. ELLIOT

C.J. COFFEY

L. RIDDLE

M. WHALEN

INVESTIGATED BY B.D. WORLEY

CHECKED BY K.B. MILLER

SUBMITTED BY K.B. MILLER

DATE OCTOBER 2010

NORTH CAROLINA LICENSED 10-11-10 SEAL 1926 GEOLOGIST BRADLEY D. WORLEY

Bradley D Worley

DRAWN BY: T. WALKER, C. YOUNGBLOOD, B. WORLEY

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

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

ID: B-4760

CONTRACT: C202846

PROJECT REFERENCE NO.	SHEET NO.
38532.1.1(B-4760)	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-7-5, A-7-6)	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							
SYMBOL														
% PASSING # 10	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
# 40	30 MX	50 MX	51 MN											
# 200	15 MX	25 MX	10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN			
LIQUID LIMIT / PLASTIC INDEX	6 MX		NP	40 MX / 10 MX	41 MN / 10 MX	40 MX / 11 MN	41 MN / 11 MN	40 MX / 10 MX	41 MN / 10 MX	40 MX / 11 MN	41 MN / 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
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	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	HIGHLY	35% AND ABOVE

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

ABBREVIATIONS

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

SAMPLE ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- ☐ MOBILE B-___
- ☐ BK-51
- ☐ CME-45C
- ■ CME-550
- ☐ PORTABLE HOIST
- ☐ _____
- ☐ _____

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

HAMMER TYPE:
- ■ AUTOMATIC ☐ MANUAL

CORE SIZE:
- ☐ -B_____
- ■ -N WD4
- ☐ -H_____

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

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

BENCH MARK: BL-4 = BL Sta 14+92.23
N 795019.6551 E 1703469.2409
ELEVATION: 860.26 FT.

NOTES:

REVISED 09/23/09

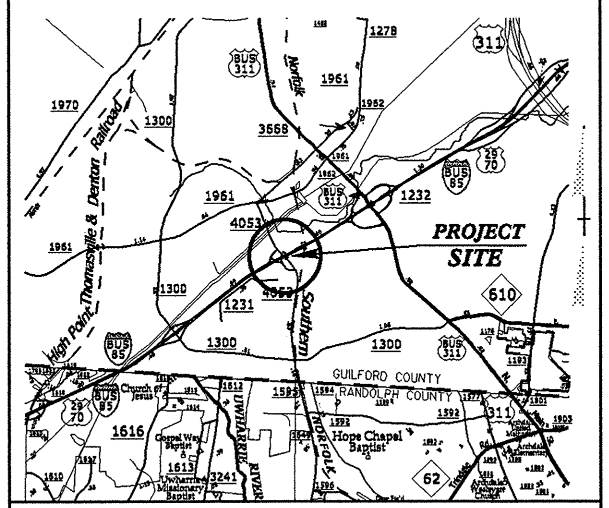
09/08/99

TIP PROJECT: B-4760

CONTRACT:

05-OCT-2010 12:41
S:\Contracts\Investigations\TIP\B4760_GEO_RDWY\CADD_GEOTECH\PlanProf\B4760_geo_tsh.dgn
bdworley AT GEC24823I

See Sheet 1-A For Index of Sheets



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

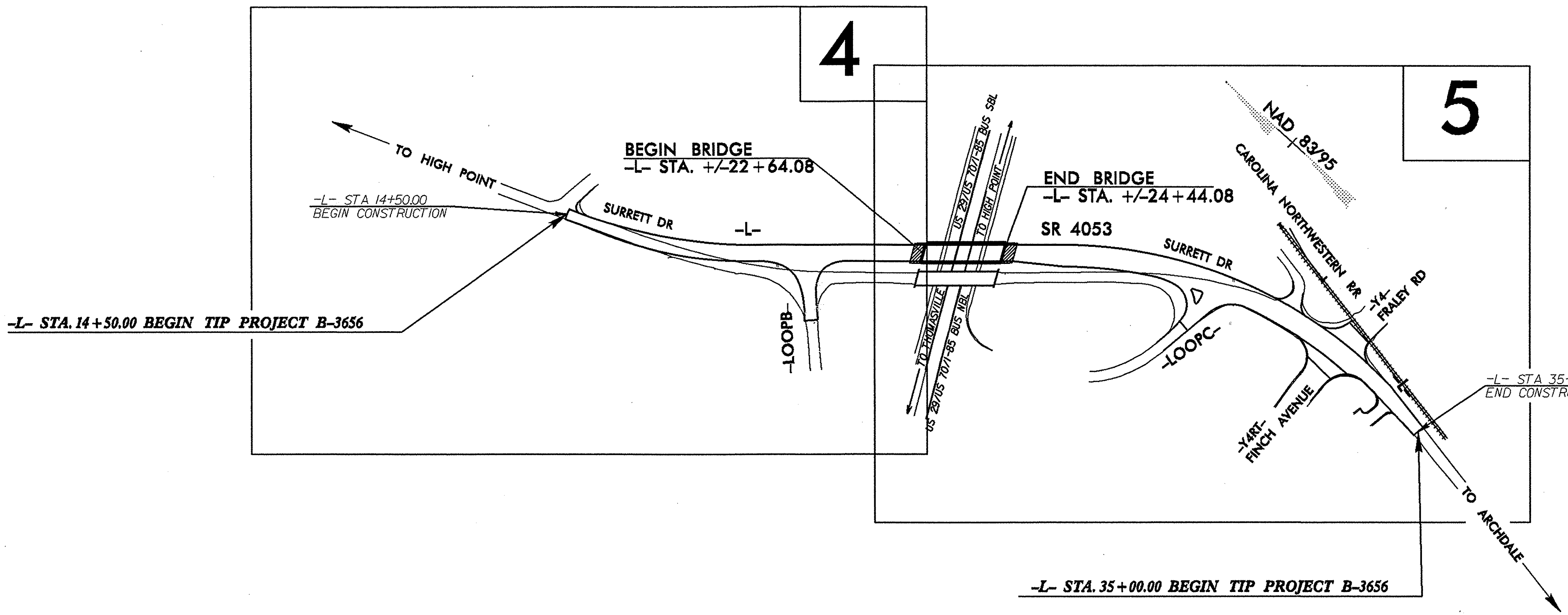
GUILFORD COUNTY

LOCATION: REPLACEMENT OF BRIDGE NO. 77 ON SR 4053 OVER US 29 /US 70 I-85 BUS

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-4760	2A	14

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
38532.1.1	BRZ-4053(1)	PE



INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARY OF HIGH POINT

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 2012 = 12,500
ADT 2035 = 17,600
DHV = 12 %
D = 55 %
T = % *
V = 40 MPH
* TTST = 3% DUAL 5%
FUNC CLASS = COLLECTOR
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-4760 =	0.354 MILES
LENGTH STRUCTURE TIP PROJECT B-4760 =	0.034 MILES
TOTAL LENGTH TIP PROJECT B-4760 =	0.388 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JULY 15, 2011

LETTING DATE: JULY 17, 2012

G.E. BREW, P.E.
PROJECT ENGINEER

I.T. YOUNIS
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

STATE HIGHWAY DESIGN ENGINEER *P.E.*

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

October 11, 2010

STATE PROJECT: 38532.1.1 (B-4760)
F.A. PROJECT: BRZ-4053(1)
COUNTY: Guilford
DESCRIPTION: Bridge No. 77 on SR 4053 (Surrett Rd.) over US 29/US 70/I-85 Business

SUBJECT: Geotechnical Report - Inventory

Project Description

The project consists of constructing 0.388 miles of widening and realignment of SR 4053 (Surrett Dr.) between Timber St. and Surrett Court. The new alignment will accommodate the construction of a proposed new bridge over US 29/US 70/I-85 Business.

The geotechnical investigation was conducted August 2010 utilizing NCDOT Geotechnical Engineering Unit personnel. Borings were advanced using a CME-550X drill machine (equipment #AFO0071) equipped with automatic hammer (efficiency rating 72%, 9/3/09). Standard Penetration Test borings were performed at specific locations to provide subsurface information for roadway design and construction. Four preliminary bridge borings were drilled at the time of the roadway investigation to aid in structure foundation design. Rock coring was performed in two of those borings using NW casing and NWD-4 coring equipment. Representative soil samples were collected and submitted to the Materials and Tests Unit for laboratory analysis.

The following alignments were investigated for this project:

Line	Station(±)
-L-	14+50 to 35+00

Physiography, Geology and Surface Water

The project is located in the central portion of the Piedmont Physiographic Province near the city of High Point, N.C. Topography in the area is generally gently rolling. The project area is well-developed urban landscape.

The geology of the project area is dominated by residual saprolitic soils, predominantly sandy silts and silty sands, overlying Paleozoic to Late Proterozoic-age metamorphosed diorite. No in-situ crystalline rock outcrops were located in the project area.

MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

TELEPHONE: 919-250-4088
Fax: 919-250-4237
www.ncdot.gov/doh/preconstruct/highway/geotech

LOCATION:
CENTURY CENTER COMPLEX
ENTRANCE B-2
1020 BIRCH RIDGE DRIVE
RALEIGH NC 27610

Surface water is drained from the project area by ditches that feed into a small creek that flows north under the project area through a series of culverts.

Soils Properties

Soils encountered at the project site include roadway embankment, alluvial, and residual.

Roadway Embankment soils are present along the proposed alignment and are related to the original alignment of Surrett Drive and US 29/US 70/I-85 Business. These soils consist of red-brown, soft to medium stiff, silty clay (A-7-6).

Recent alluvial deposits, less than 0.5 ft. in depth, were observed in the bed of the creek that drains to the north/northeast across the project area. These deposits consist of a very thin layer of loose, silty sand (A-2-4) and coarse sand (A-1-b). Alluvial soils were not encountered in any of the geotechnical borings performed during the roadway investigation.

Residual soils encountered along the project corridor are derived from weathering of the underlying metamorphosed diorite. Typically, these soils are saprolitic and consist of tan-gray to brown, stiff to very stiff, sandy silt (A-4) and brown, dense to very dense, silty sand (A-2-4). Also encountered in minor amounts was tan-brown, medium stiff, silty clay (A-7-5), tan to red-brown, stiff, saprolitic sandy clay (A-6), and tan-brown, medium stiff, saprolitic clayey silt (A-5).

Rock Properties

Weathered rock was encountered during the roadway investigation. It originates from the underlying metamorphosed diorite. Weathered rock thickness ranges from less than approximately 2 ft. to greater than 15 ft. across the project. The top of weathered rock was encountered below residual soils in borings ranging from elevation 801.3 ft to 837.8 ft.

Crystalline rock was encountered during the roadway investigation and consists of brown to gray, very slightly weathered to fresh, close to wide fractured, moderately hard to very hard, foliated, metamorphosed diorite. The top of crystalline rock was encountered in borings ranging from 797.2 ft. to 837.5 ft.

Ground Water

Ground water data was collected during below average rainfall conditions. Water levels across the project vary due to topographic relief and soil permeability. In the borings performed for this investigation, 24-hour groundwater readings ranged in elevation from 820.9 ft. to 838.0 ft. Groundwater may fluctuate with seasonal precipitation.

Prepared by,

Bradley D. Worley, PG
Project Geological Engineer

EARTHWORK BALANCE SHEET

PROJECT: B-4760 COUNTY: Guilford DATE: 2/8/2012 COMPILED BY: CJT / JBT/iy SHEET 1 OF 1 SHEET

STATION	STATION	EXCAVATION (Cubic Yard)					EMBANKMENT (Cubic Yard)				BORROW (Cu. Yd.)	WASTE (Cubic Yard)			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +20%		ROCK	SUITABLE	UNSUIT.	TOTAL
SUMMARY 1 LT SIDE															
-L- 14+50.00 LT	22+55.49	1,206				1,206	7,336		7,336	8,803	7,597				
-L- 24+51.49 LT	34+00.00	213				213	26,329		26,329	31,595	31,382				
SUMMARY 1	**SUBTOTAL**	1,419				1,419	33,665		33,665	40,398	38,979				
SUMMARY 2 RT SIDE															
-L- 14+50.00	22+55.49	273				273	1,341		1,341	1,609	1,336				
-L- 24+51.49	34+00.00	45				45	1,567		1,567	1,880	1,835				
-LOOPB- 10+50.00	11+50.00	54				54	120		120	144	90				
-LOOPC- 11+00.00	11+50.00	30				30	4		4	5			25		25
SUMMARY 2	**SUBTOTAL**	402				402	3,032		3,032	3,638	3,262		25		25
TOTAL		1,821				1,821	36,697		36,697	44,036	42,241		25		25
SHOULDER MATERIAL							436		436	523	523				
LOSS DUE TO CLEARING & GRUBBING		-100				-100					100				
PROJECT TOTAL		1,721				1,721	37,133		37,133	44,560	42,864		25		25
EST. 5% TO REPLACE TOP SOIL ON BORROW PIT											2,143				
GRAND TOTAL		1,721				1,721	37,133		37,133	44,560	45,007		25		25
SAY		1,800									45,500				

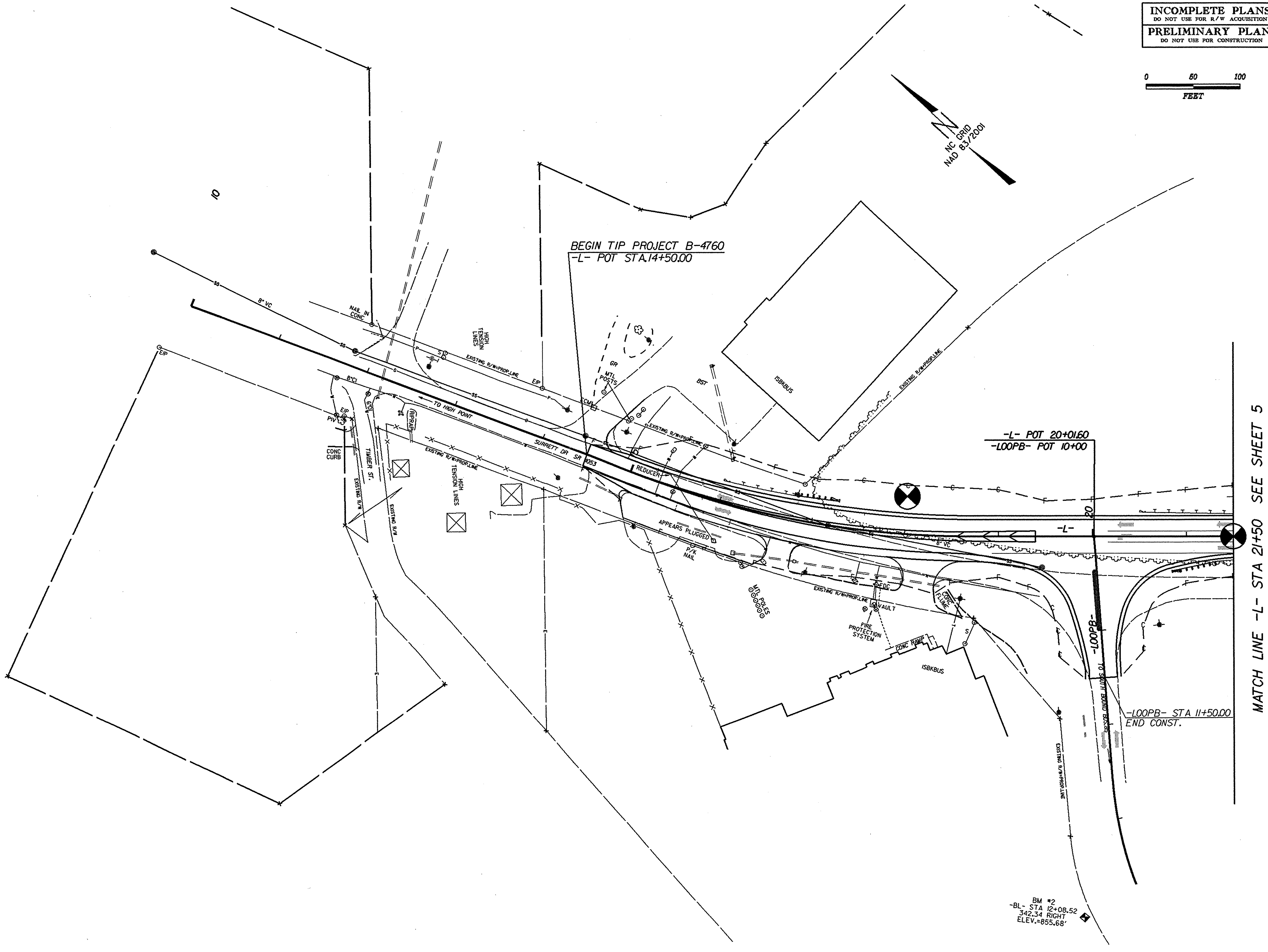
ESTIMATED UNDERCUT = 550 C.Y.
EST. SELECT GRANULAR MATERIAL = 250 C.Y.
EST. DRAINAGE DITCH EXCAVATION = 489 C.Y.

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.
NOTE: APPROXIMATE QUANTITIES ONLY. UNCLASSIFIED EXCAVATION, FINE GRADING, CLEARING AND GRUBBING, AND REMOVEL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE LUMP SUM PRICE FOR "GRADING".

PROJECT REFERENCE NO.	SHEET NO.
B-4760	4

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

8/17/99

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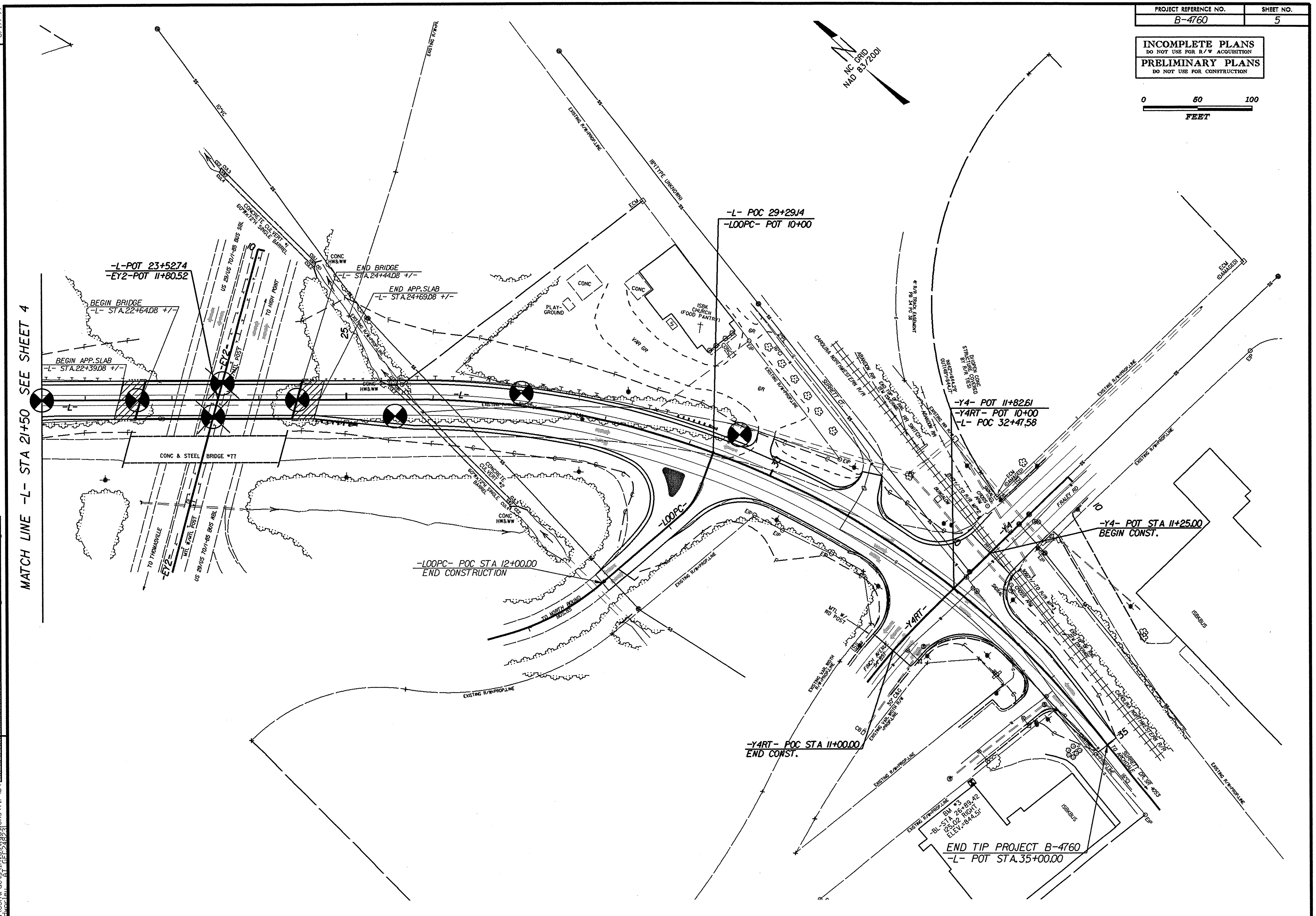
PROJECT REFERENCE NO.	SHEET NO.
B-4760	5

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



REVISIONS

8/17/99

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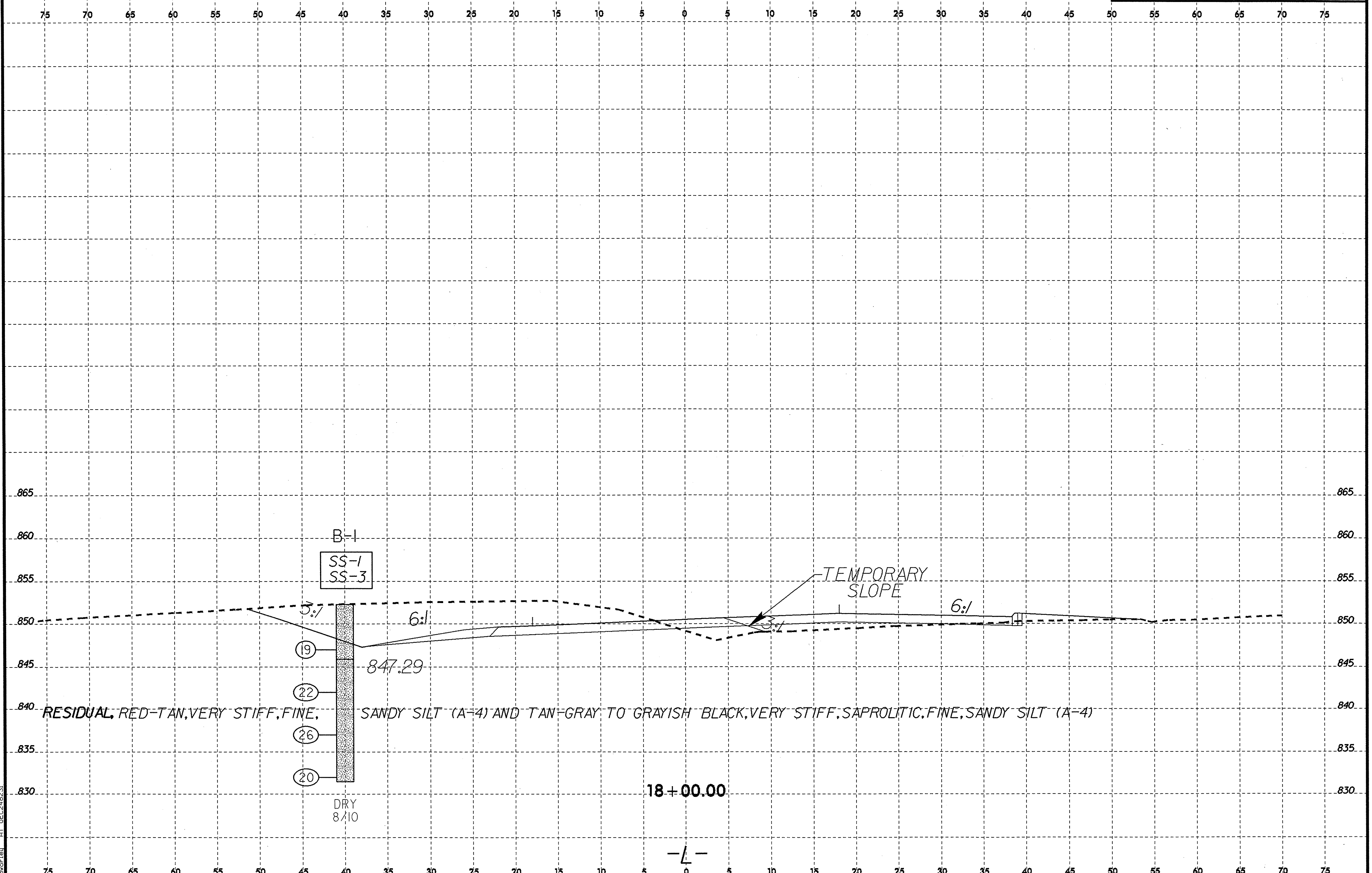
bdworley AT GEC248231

PROJ. REFERENCE NO.	SHEET NO.
B-4760	6



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8/23/99

0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4760	7

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

870
865
860
855
850
845
840
835
830

2:1

4:1

B-2

SS-6

RESIDUAL, RED-BROWN, STIFF, SANDY SILT (A-4)

15

TAN-BROWN TO RED, VERY STIFF, SAPROLITIC, SANDY CLAY (A-6)

8

15

TAN-BROWN, STIFF, SAPROLITIC, SANDY SILT (A-4)

17

DRY
8/10

21+50.00
-L-

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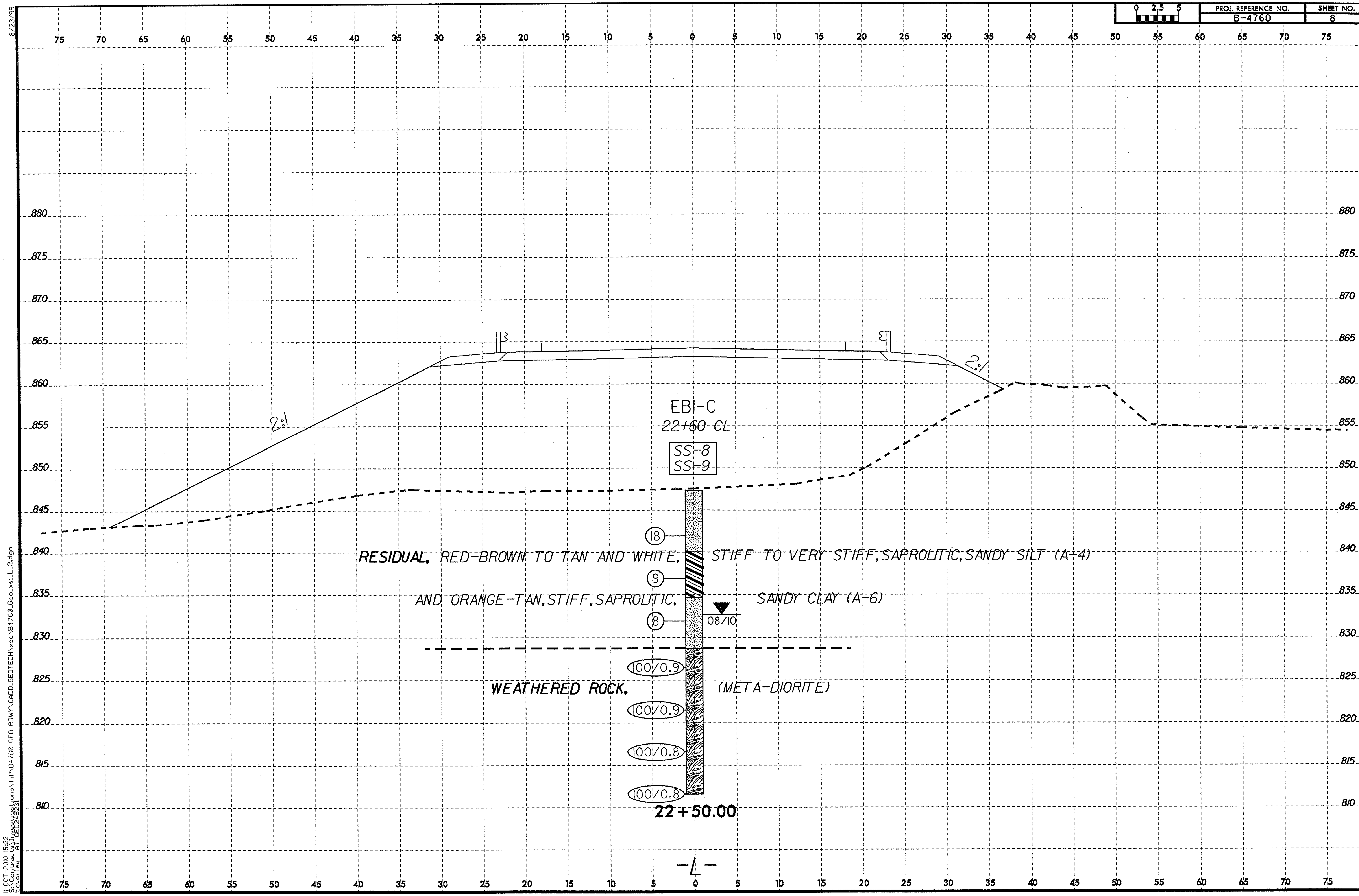
AT GEO24823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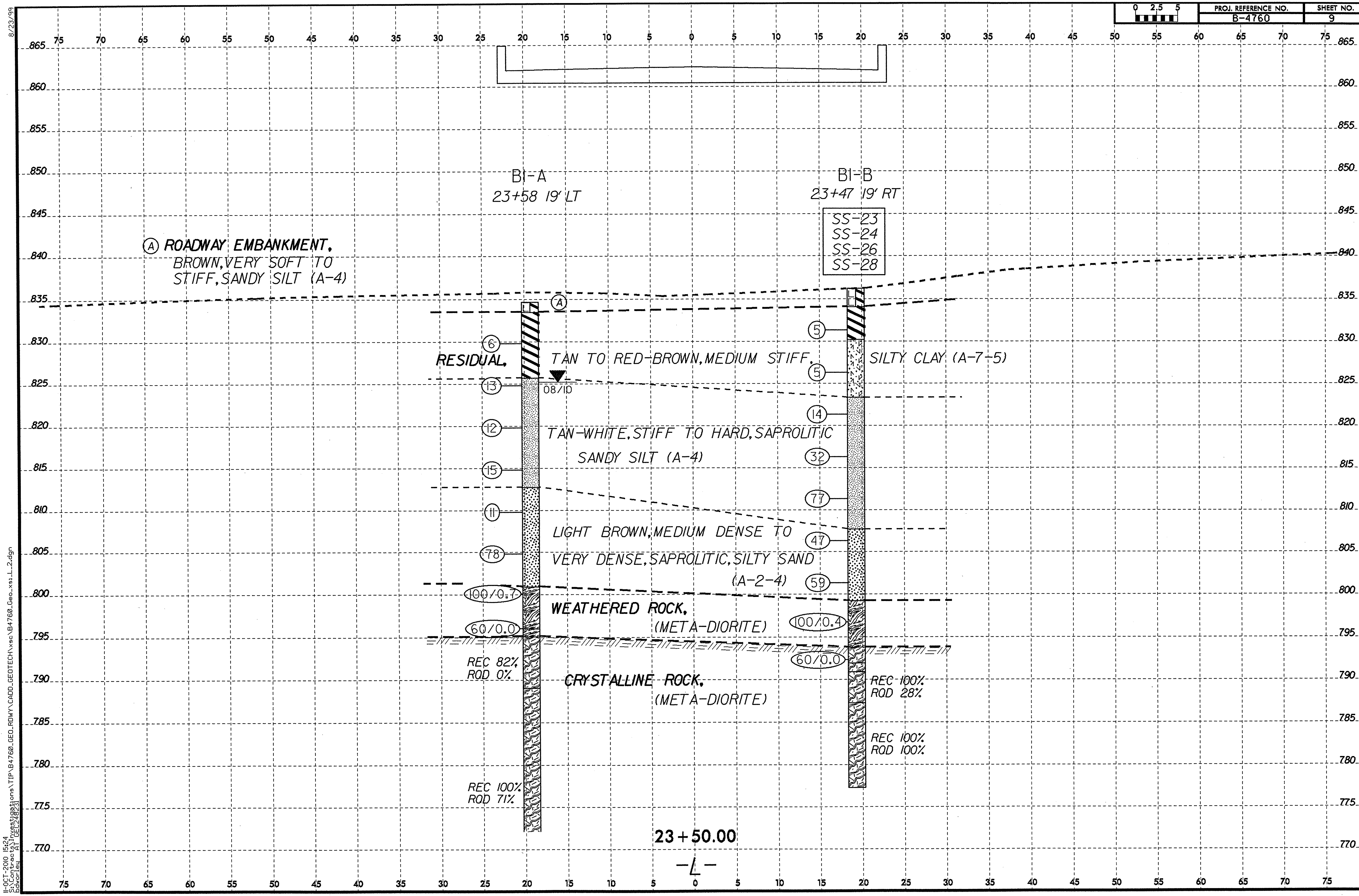
B-4760
SHEET NO.
8
EBI-C
22+60 CL
SS-8
SS-9
RESIDUAL, RED-BROWN TO TAN AND WHITE, STIFF TO VERY STIFF, SAPROLITIC, SANDY SILT (A-4)
AND ORANGE-TAN, STIFF, SAPROLITIC, SANDY CLAY (A-6)
WEATHERED ROCK, (META-DIORITE)
18
9
8
08/10
100/0.9
100/0.9
100/0.8
100/0.8
2:1
2:1
22+50.00
-L-
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
B-4760	9



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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4760	10

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

870
865
860
855
850
845
840
835
830
825
820
815

2:1

2:1

EB2-C

24+44 CL

SS-16
SS-17

ROADWAY EMBANKMENT, STIFF, SILTY CLAY (13) — RED-BROWN, (A-7-6)

RESIDUAL, RED-TAN, AND TAN, HARD, (65) — VERY STIFF, SANDY CLAY (A-6) SAPROLITIC, SANDY SILT (A-4)

WEATHERED ROCK, (100/0.8) — (META-DIORITE)

08/10

(60/0.1)

24+50.00

—L—

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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bdworley
AT GEC24823

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4760	11

Ⓐ **RESIDUAL.** *DARK BROWN, VERY DENSE, SAPROLITIC, SILTY SAND (A-2-4)*

B-3
25+56 19' RT

SS-19
SS-22

TEMPORARY SLOPE

4:1

3:1

2:1

ROADWAY EMBANKMENT;
RED-BROWN, MEDIUM STIFF TO VERY STIFF, SILTY CLAY (A-7-6)

7
13
20
6
60/0.0

08/10

Ⓐ

CRYSTALLINE ROCK,
(META-DIORITE)

25+50.00
-L-

865 860 855 850 845 840 835 830 825 820 815

75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

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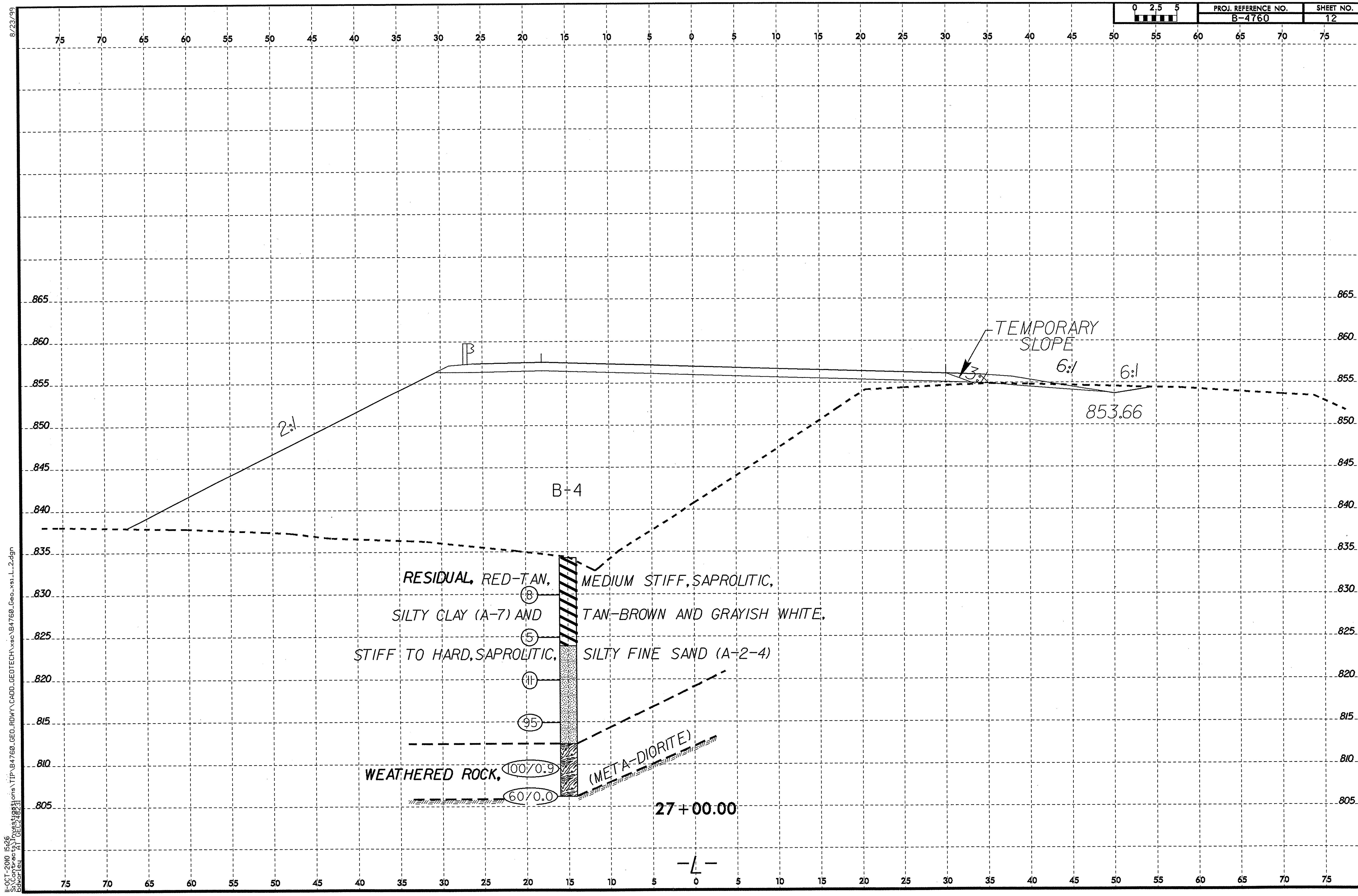
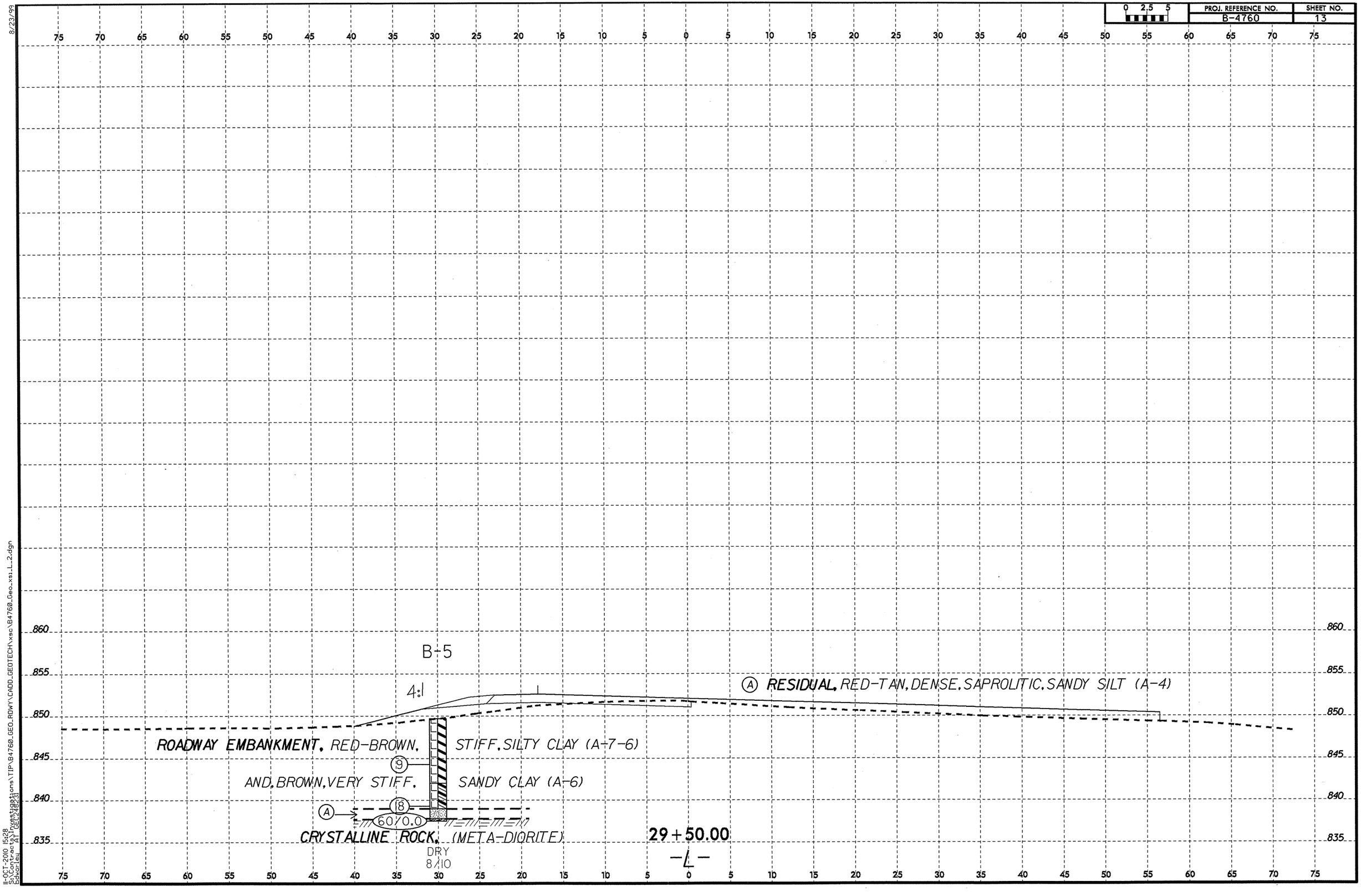


PROJ. REFERENCE NO.
B-4760
SHEET NO.
12
0 2.5 5
TEMPORARY SLOPE
6:1
6:1
853.66
2:1
B-4
RESIDUAL, RED-TAN, MEDIUM STIFF, SAPROLITIC,
SILTY CLAY (A-7) AND TAN-BROWN AND GRAYISH WHITE,
STIFF TO HARD, SAPROLITIC, SILTY FINE SAND (A-2-4)
8
5
11
95
WEATHERED ROCK, 100/0.9
60/0.0
(META-DIORITE)
27+00.00
-L-
865
860
855
850
845
840
835
830
825
820
815
810
805
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75
8/23/99

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	B-4760	13



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bdoorley AT GEO24823

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		
SS-1	40.0 LT	18+00	4.3-5.8	A-4(6)	39	9	10.8	29.8	41.0	18.4	100	96	70	-	-
SS-3	40.0 LT	18+00	9.3-10.8	A-4(0)	29	4	16.5	42.4	16.5	24.5	95	89	51	-	-
SS-6	CL	21+50	9.4-10.9	A-6(8)	38	11	8.0	28.0	45.7	18.4	100	97	74	-	-
SS-8	CL	22+60	9.4-10.9	A-6(5)	35	15	21.4	27.3	26.7	24.5	88	77	51	-	-
SS-9	CL	22+60	14.4-15.9	A-4(0)	24	NP	33.4	33.4	27.1	6.1	100	83	40	-	-
SS-14	30.0 LT	29+50	4.4-5.9	A-7-6(17)	49	22	9.2	22.7	25.3	42.9	100	96	75	-	-
SS-15	30.0 LT	29+50	9.4-10.9	A-6(8)	40	14	11.0	31.6	36.9	20.4	98	94	66	-	-
SS-16	CL	24+44	4.6-6.1	A-7-6(21)	52	27	9.8	16.5	24.7	49.0	99	94	77	-	-
SS-17	CL	24+44	9.6-11.1	A-6(5)	40	12	21.4	32.0	28.2	18.4	99	85	56	-	-
SS-19	19.0 RT	25+56	3.6-5.1	A-7-6(18)	51	22	9.8	19.2	32.2	38.8	100	95	76	-	-
SS-22	19.0 RT	25+56	18.6-20.1	A-2-4(0)	27	3	40.0	30.4	25.5	4.1	90	63	34	-	-
SS-23	19.3 RT	23+47	4.0-5.5	A-7-5(9)	44	11	9.0	29.2	41.4	20.4	100	97	72	-	-
SS-24	19.3 RT	23+47	9.0-10.5	A-5(3)	43	5	13.3	37.6	41.0	8.2	100	95	61	-	-
SS-26	19.3 RT	23+47	19.0-20.5	A-4(0)	27	2	29.4	39.8	26.7	4.1	100	86	41	-	-
SS-28	19.3 RT	23+47	29.0-30.5	A-2-4(0)	28	4	48.6	24.3	19.0	8.2	93	59	31	-	-