

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

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4047	1	35

CONTENTS

LINE	STATION	PLAN	XSECT
-L-	36+50 - 44+50	5 - 6	7 - 15
-RPB-	15+50 - 22+00	4 - 5	16 - 27
-Y2L-	19+50 - 20+00	4	28
-Y3-	11+16 - 13+50	5	29 - 32
-Y5-	12+00	6	33

ROADWAY  
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34599.1.1 F.A. PROJ. STP-209 (2)  
COUNTY HAYWOOD  
PROJECT DESCRIPTION NC 209 FROM US 23 BUS. TO NORTH OF SR 1523 (OLD CLYDE RD.)

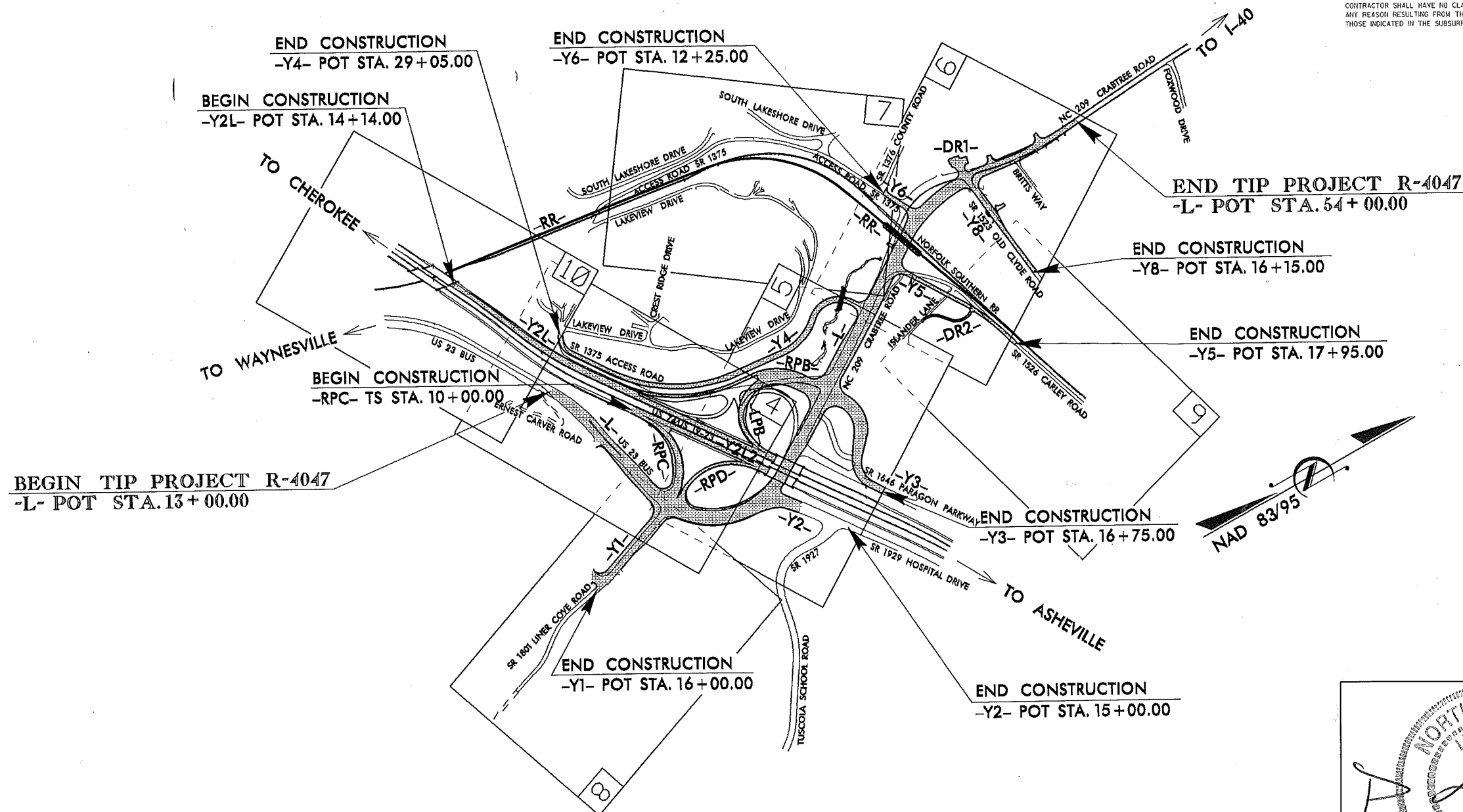
CAUTION NOTICE

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 1919 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 RELED 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.

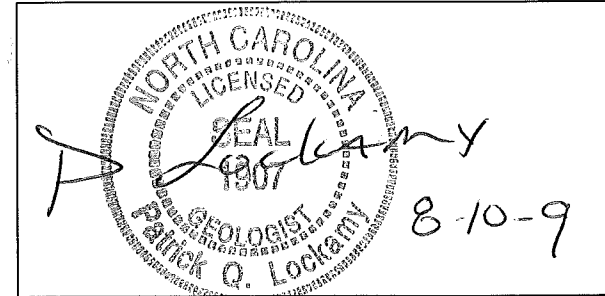
THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT 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.

INVENTORY



- PERSONNEL
- P.Q. LOCKAMY
  - M.M. HAGER
  - R.D. CHILDERS
  - G.K. ROSE

INVESTIGATED BY P.Q. LOCKAMY  
CHECKED BY W.D. FRYE  
SUBMITTED BY W.D. FRYE  
DATE 08.10.09



TIP: R-4047

WBS: 34599

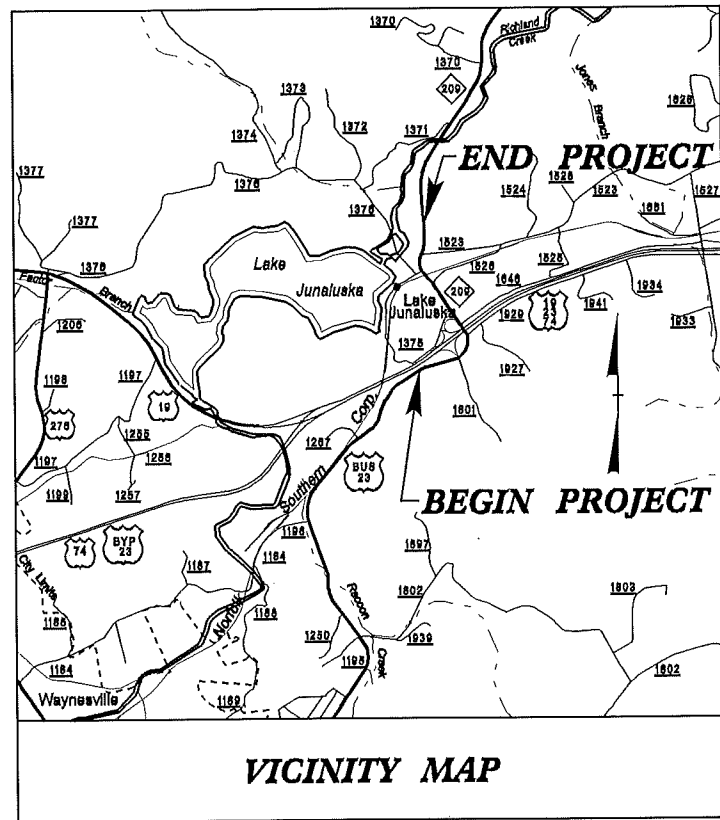
DRAWN BY: J.T. WILLIAMS

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N.C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IS IT 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.

**TIP PROJECT: R-4047**

See Sheet 1-A For Index of Sheets  
See Sheet 1-B For Conventional Symbols



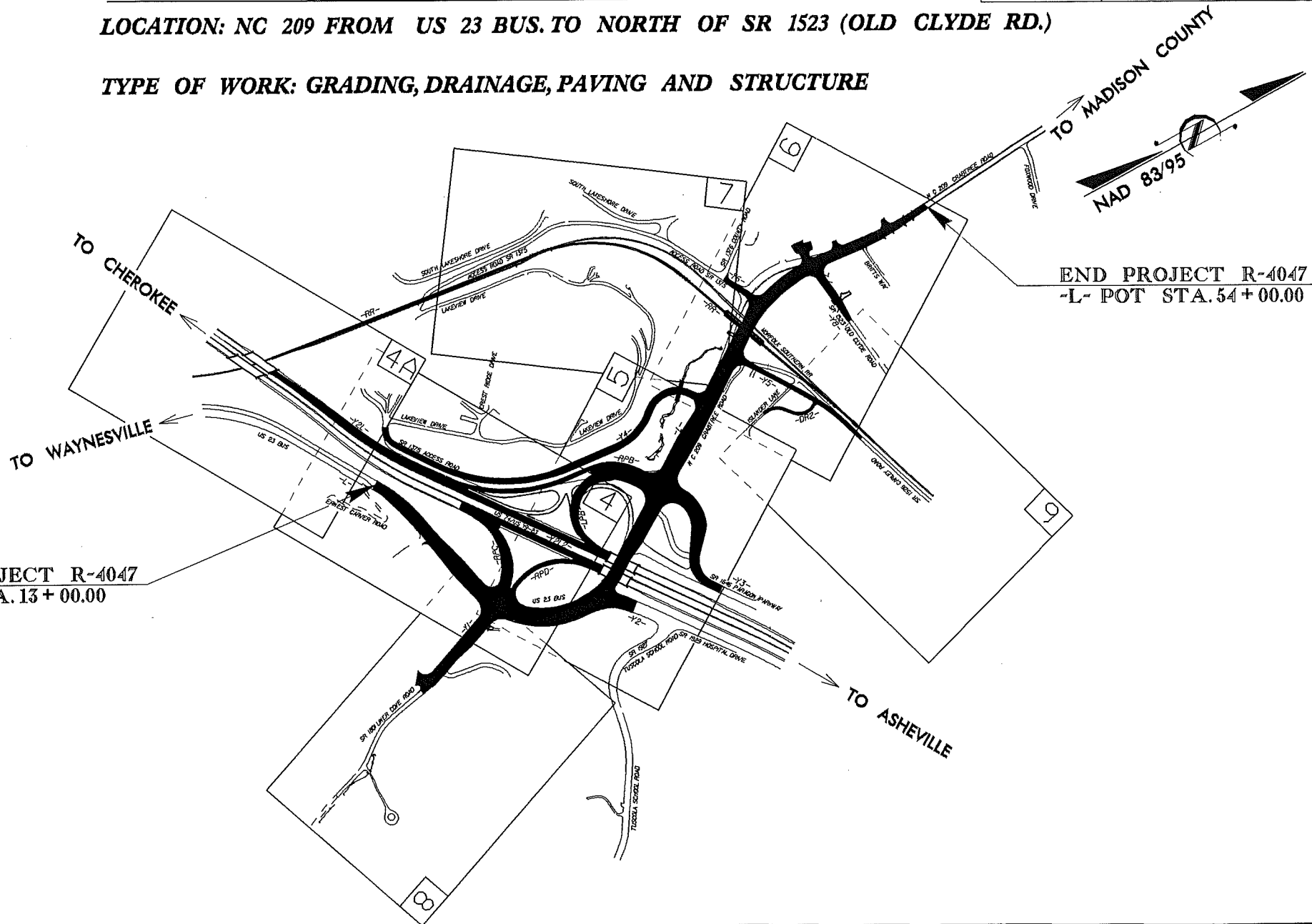
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# HAYWOOD COUNTY

**LOCATION: NC 209 FROM US 23 BUS. TO NORTH OF SR 1523 (OLD CLYDE RD.)**

**TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE**

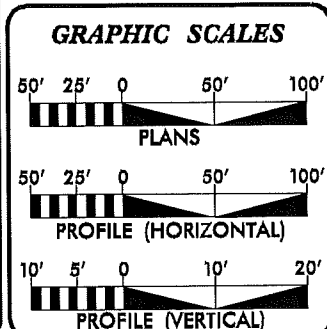
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-4047	1A	35
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34599.1.1	STP-209(2)	PE	



**BEGIN PROJECT R-4047**  
**-L- POT STA. 13 + 00.00**

**END PROJECT R-4047**  
**-L- POT STA. 54 + 00.00**

**CONTRACT:**



**DESIGN DATA**

ADT 2011 =	24,300
ADT 2030 =	31,900
DHV =	10 %
D =	60 %
T =	5 % *
V =	35 MPH
FUNC. CLASS. =	COLLECTOR
* TTST 2 %	DUAL 3 %

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT R-4047 =	0.777 MI.
TOTAL LENGTH OF TIP PROJECT R-4047 =	0.777 MI.

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

<p>2006 STANDARD SPECIFICATIONS</p> <p><b>RIGHT OF WAY DATE:</b> MARCH 2010</p> <p><b>LETTING DATE:</b> OCTOBER 15, 2013</p>	<p><b>ROGER D. THOMAS, P.E.</b> PROJECT ENGINEER</p> <p><b>MICHAEL W. LITTLE, P.E.</b> PROJECT DESIGN ENGINEER</p>
--	--

**HYDRAULICS ENGINEER**

P.E.

---

**ROADWAY DESIGN ENGINEER**

P.E.

PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS  
DO NOT USE FOR R/W ACQUISITION

P.E.

DIVISION OF HIGHWAYS  
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS





GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

PROJECT REFERENCE NO.  
R-4047

SHEET NO.  
2/35

SOIL DESCRIPTION		GRADATION		ROCK DESCRIPTION		TERMS AND DEFINITIONS					
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 (ASTM 1206, ASTM 0-1586). 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: <i>VERY STIFF, GRAY SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGH PLASTIC, A-7-6</i>		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. <b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.		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:  NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.  FINE TO COARSE GRAIN IGNEOUS AND METAMORPHIC ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.  FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.  COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.		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 DISLOOGED 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 (SCREC) - 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.					
SOIL LEGEND AND AASHTO CLASSIFICATION		MINERALOGICAL COMPOSITION		WEATHERING							
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS		MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.		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.		COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50		PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA			
PERCENTAGE OF MATERIAL		GROUND WATER		MISCELLANEOUS SYMBOLS							
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		WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP		ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD TEST BORING AUGER BORING CORE BORING MONITORING WELL PIEZOMETER INSTALLATION SLOPE INDICATOR INSTALLATION SPT N-VALUE SPT REFUSAL							
CONSISTENCY OR DENSENESS		ABBREVIATIONS		EQUIPMENT USED ON SUBJECT PROJECT		FRACTURE SPACING					
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> )		AR - AUGER REFUSAL HI. - HIGHLY BT - BORING TERMINATED MED. - MEDIUM CL - CLAY MICA - MICACEOUS CPT - CONE PENETRATION TEST MOD. - MODERATELY CSE. - COARSE NP - NON PLASTIC DMT - DILATOMETER TEST ORG. - ORGANIC DPT - DYNAMIC PENETRATION TEST PMT - PRESSUREMETER TEST e - VOID RATIO SAP. - SAPROLITIC f - FINE SD. - SAND, SANDY FOSS. - FOSSILIFEROUS SL. - SILT, SILTY FRAC. - FRACTURED, FRACTURES SLI. - SLIGHTLY FRAGS. - FRAGMENTS TCR - TRICONE REFUSAL		MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST		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					
TEXTURE OR GRAIN SIZE		U.S. STD. SIEVE SIZE OPENING (MM)		HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B N H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST		BEDDING 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					
SOIL MOISTURE - CORRELATION OF TERMS		EQUIPMENT USED ON SUBJECT PROJECT		INDURATION		BENCH MARK: ELEVATION: FT.					
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION		DRILL UNITS: ADVANCING TOOLS: HAMMER TYPE: CORE SIZE: HAND TOOLS:		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.		NOTES: BLAST ROCK					
LIQUID LIMIT - SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE PLASTIC LIMIT - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE OPTIMUM MOISTURE SHRINKAGE LIMIT - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE		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		INDURATION							
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.											

## EARTHWORK BALANCE SHEET - FINAL ESTIMATE

Volumes in Cubic Yards

PROJECT: R-4047

COUNTY: Haywood

DATE: 12/30/2013

ROCK SWELL:

SHEET \_\_\_ OF \_\_\_ SHEETS

3

LINE	STATION	STATION	EXCAVATION				EMBANKMENT				BORROW	WASTE					
			TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH		EMBANK. 15%	ROCK	SUITABLE	UNSUIT.	TOTAL	
-L- LT	16+50.00	29+00.00	39				39	928		928	1,067	1,028					
-RPC-	10+00.00	16+00.74	645				645	319		319	367			278			278
-RPD-	14+25.00	15+79.47	44				44	66		66	76	32					
<b>SUBTOTAL 1</b>			728				728	1,313		1,313	1,510	1,060		278			278
-L- RT	16+50.00	29+00.00	411				411	643		643	739	328					
-Y1-	10+52.66	15+50.00	1,016				1,016	880		880	1,012			4			4
<b>SUBTOTAL 2</b>			1,427				1,427	1,523		1,523	1,751	328		4			4
-L- LT	29+00.00	42+50.00	380				380	2,136		2,136	2,456	2,076					
-LPB-	10+35.96	15+00.00	1,426				1,426	1,317		1,317	1,515	89					
-RPB-	10+00.00	22+34.27	31,193				31,193	747		747	859			30,334			30,334
-Y4-	10+24.00	16+16.64	14,438				14,438	5,463		5,463	6,282			8,156			8,156
-Y4-	28+21.80	29+05.00	82				82	55		55	63			19			19
-Y2L-	15+00.00	23+24.32	1,168				1,168	2,309		2,309	2,655	1,487					
-Y2L2-	13+50.00	18+50.00	738				738							738			738
-RR-	20+66.00	29+00.00	12,235				12,235	9,575		9,575	11,011			1,224			1,224
<b>SUBTOTAL 3</b>			61,660				61,660	21,602		21,602	24,841	3,652		40,471			40,471
-L- RT	29+00.00	42+50.00	49,411				49,411	106		106	122			49,289			49,289
-Y3-	10+57.04	16+75.00	68,540	3,910			64,630	56	47		47		3,863	64,630			68,493
-Y5-	10+47.62	17+95.00	37,242				37,242	5		5	6			37,236			37,236
-DR2-	10+09.00	13+10.00	4,143				4,143							4,143			4,143
-RR-	11+00.00	17+86.75	17,827				17,827	31		31	36			17,791			17,791
<b>SUBTOTAL 4</b>			177,163	3,910			173,253	198	47	142	211		3,863	173,089			176,952
-L- LT	42+50.00	54+00.00	1,927				1,927	1,747		1,747	2,009	82					
-Y6-	10+24.20	12+25.00	6				6	330		330	380	374					
-DR1-	10+24.30	11+00.00	4				4	279		279	321	317					
<b>SUBTOTAL 5</b>			1,937				1,937	2,356		2,356	2,710	773					
-L- RT	42+50.00	54+00.00	13,036				13,036	2,342		2,342	2,693			10,343			10,343
-Y8-	10+40.54	13+45.00	808				808	17		17	20			788			788
<b>SUBTOTAL 6</b>			13,844				13,844	2,359		2,359	2,713			11,131			11,131
<b>PROJECT SUBTOTAL</b>			256,759	3,910	0	0	252,849	29,351	47	29,295	33,736	5,813	3,863	224,973	0		228,836
LOSS DUE TO CLEARING & GRUBBING (TRACKWORK PLANS)			-435				-435							-435			-435
LOSS DUE TO CLEARING & GRUBBING			-700				-700							-700			-700
ROCK WASTE TO REPLACE BORROW								3,863	-3,863			-3,863	-3,863				-3,863
ADJUST FOR ROCK SWELL									-773			-773					
ELIMINATE EARTH SHRINKAGE												-695					
WASTE IN LIEU OF BORROW												-482		-482			-482
<b>PROJECT TOTAL</b>			255,624	3,910	0	0	251,714	29,351	3,910	24,659	32,268	0	0	223,356	0		223,356
<b>GRAND TOTAL</b>			255,624			0						0					
<b>SAY</b>			260,000														
-L-, -Y3-, -Y4- & -RPB- PAVEMENT STRUCTURE VOLUME = 6650 CY																	
EST. DDE = 1000 CY																	
EST. SHOULDER BORROW = 900 CY																	

\* 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.

RAILROAD EARTHWORK QUANTITIES TAKEN FROM TRACKWORK PLANS



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE  
GOVERNOR

EUGENE A. CONTI, JR.  
SECRETARY

August 10, 2009

STATE PROJECT: 34599.1.1 (R-4047)  
F. A. PROJECT: STP-209(2)  
COUNTY: Haywood  
  
DESCRIPTION: NC 209 From US 23 BUS. To North of SR 1523 (Old Clyde Road)  
  
SUBJECT: Geotechnical Report – Inventory

**Project Description**

The project consists of improvements to NC 209 and its interchange with US-74-19-23. The interchange configuration has been altered slightly with some relocation of Paragon Parkway (-Y3-), -RPB-, Access Road (-Y4-), Carley Road (-Y5-), and Islander Lane (-DR2-). Relocation of a stretch of railroad, a section of NC 209 (-L-), and a new railroad bridge over NC 209 are also included. The focus of this investigation is on the deeper cuts and along proposed retaining walls. Access was limited by topography, existing structures and utilities. Most of the 31 borings made for this investigation are offset so centerline profiles were not made.

**Areas of Special Geotechnical Interest**

Crystalline Rock

Crystalline rock was encountered above grade in a proposed cut on -Y3- from Stations 10+80 to 12+25. Crystalline rock was encountered within six feet of proposed grade right of -L- Station 40+00 and left of -Y2L- Station 20+00. Crystalline Rock is exposed in the bed of Liner Creek left of -L- Station 39+00, in a cut outside of construction limits right of -L- between Stations 26+00 and 27+50 and between -RPD- and -L- in a small area also outside of construction limits.

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

TELEPHONE: 919-250-4088  
FAX: 919-250-4237

WEBSITE: [WWW.DOH.DOT.STATE.NC.US](http://WWW.DOH.DOT.STATE.NC.US)

LOCATION:  
CENTURY CENTER COMPLEX  
BUILDING B  
1020 BIRCH RIDGE DRIVE  
RALEIGH NC 27610

3A

Structures

Several structures associated with the project are not part of the roadway subsurface investigation. Among them are the proposed relocated railroad bridge and a proposed culvert on -Y4- along Liner Creek. A deep SPT boring was made near the south end of the Proposed Railroad bridge. Crystalline rock is exposed in the bed of Liner Creek along most of the proposed culvert on -Y4-.

**Physiography and Geology**

The project lays within the lower reaches of an unnamed creek draining Liner Cove which will be referred to here as Liner Creek. The valley of Richland Creek along with some hillsides are present. Most of the project area has been altered with cuts and fills. The floodplain of Liner Creek around the interchange is completely obscured by deep embankment, some of which is blast rock. Where not covered by fill or embankment there is thin alluvium over shallow crystalline rock in the floodplain of Liner Creek left of -L- Stations 34+50 to 41+00. The floodplain of Richland Creek is also highly altered and has slightly elevated alluvial terraces. At higher elevations around Carley Road (-Y5-) and Old Clyde Road (-Y8-) are thick clayey alluvial terraces with subangular quartz gravel beds. The hillsides have rather deep residual and saprolitic soils. The boundary between soil, weathered rock and crystalline rock can undulate due to changes in lithology.

Basement age polymetamorphic gneissic rock of the Richard Russell Formation underlies the project area. In places the gneiss has a distinct look featuring thin parallel foliations, in others it is partially melted, folded and filled with small intrusions and leucosomes giving it a migmatitic look. The gneiss is mostly light colored with some dark layers of amphibolite. Quartz veins and light colored intrusions are common. The quartz has a waxy luster that is indicative of the parent basement rock.

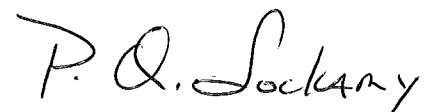
Groundwater

Groundwater was encountered in the cuts above grade right of -L- Station 38+00 and along -Y3- from Stations 11+00 to 12+00. This water is believed to be caused by a fairly wet spring and is not believed to be permanent. The water table there is expected to lower itself to below grade as it is exposed by excavation. Groundwater was also encountered near grade in a boring right of -L- Station 45+00.

Wells

Private water wells within the project area were not observed during this investigation.

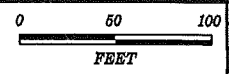
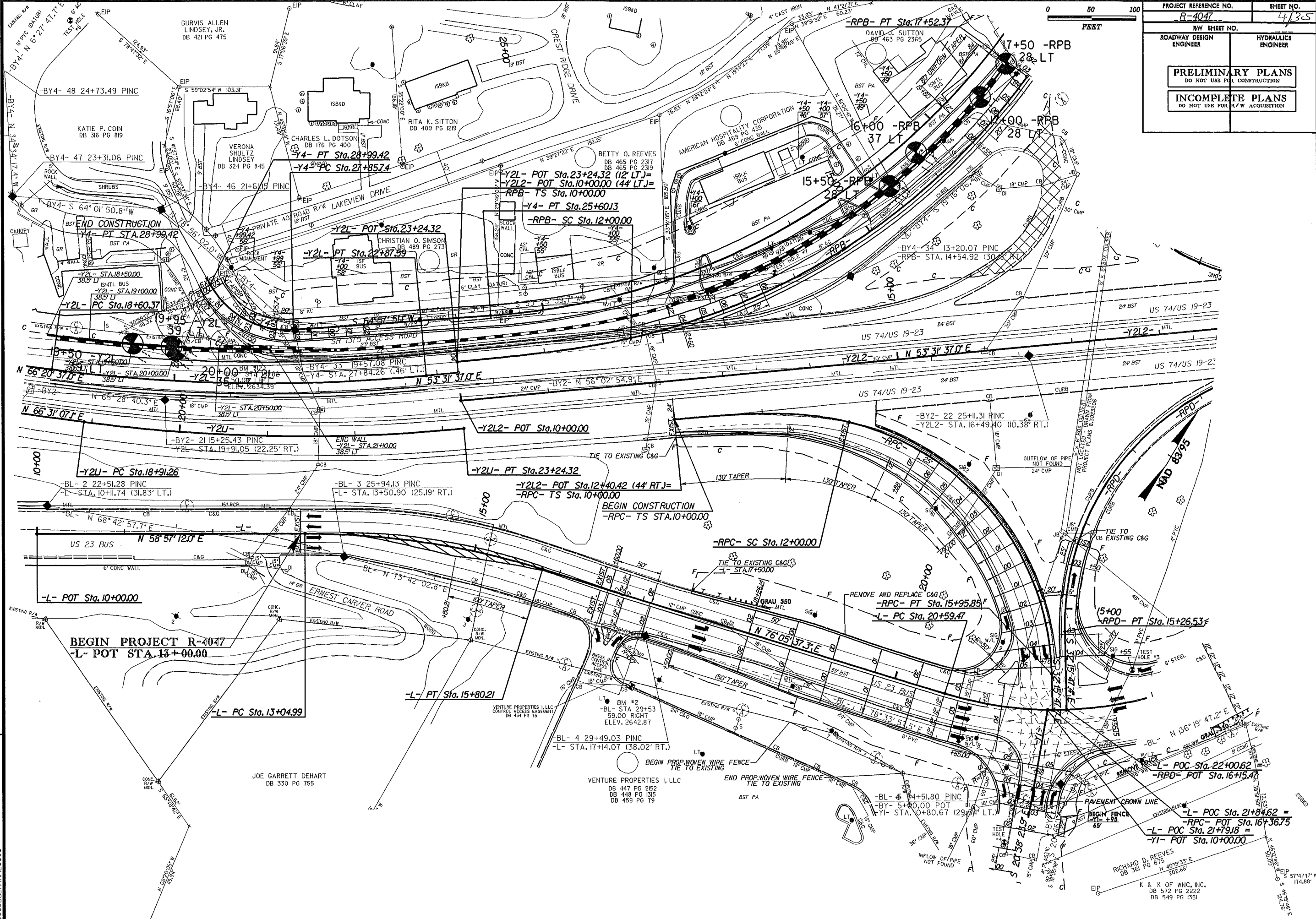
Respectfully Submitted,



P. Q. Lockamy, P.G.

PROJECT REFERENCE NO. R-4047	SHEET NO. 4/35
RDY SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

REVISIONS  
 1. 11/15/17  
 2. 11/15/17  
 3. 11/15/17  
 4. 11/15/17  
 5. 11/15/17  
 6. 11/15/17  
 7. 11/15/17  
 8. 11/15/17  
 9. 11/15/17  
 10. 11/15/17  
 11. 11/15/17  
 12. 11/15/17  
 13. 11/15/17  
 14. 11/15/17  
 15. 11/15/17  
 16. 11/15/17  
 17. 11/15/17  
 18. 11/15/17  
 19. 11/15/17  
 20. 11/15/17  
 21. 11/15/17  
 22. 11/15/17  
 23. 11/15/17  
 24. 11/15/17  
 25. 11/15/17  
 26. 11/15/17  
 27. 11/15/17  
 28. 11/15/17  
 29. 11/15/17  
 30. 11/15/17  
 31. 11/15/17  
 32. 11/15/17  
 33. 11/15/17  
 34. 11/15/17  
 35. 11/15/17  
 36. 11/15/17  
 37. 11/15/17  
 38. 11/15/17  
 39. 11/15/17  
 40. 11/15/17  
 41. 11/15/17  
 42. 11/15/17  
 43. 11/15/17  
 44. 11/15/17  
 45. 11/15/17  
 46. 11/15/17  
 47. 11/15/17  
 48. 11/15/17  
 49. 11/15/17  
 50. 11/15/17  
 51. 11/15/17  
 52. 11/15/17  
 53. 11/15/17  
 54. 11/15/17  
 55. 11/15/17  
 56. 11/15/17  
 57. 11/15/17  
 58. 11/15/17  
 59. 11/15/17  
 60. 11/15/17  
 61. 11/15/17  
 62. 11/15/17  
 63. 11/15/17  
 64. 11/15/17  
 65. 11/15/17  
 66. 11/15/17  
 67. 11/15/17  
 68. 11/15/17  
 69. 11/15/17  
 70. 11/15/17  
 71. 11/15/17  
 72. 11/15/17  
 73. 11/15/17  
 74. 11/15/17  
 75. 11/15/17  
 76. 11/15/17  
 77. 11/15/17  
 78. 11/15/17  
 79. 11/15/17  
 80. 11/15/17  
 81. 11/15/17  
 82. 11/15/17  
 83. 11/15/17  
 84. 11/15/17  
 85. 11/15/17  
 86. 11/15/17  
 87. 11/15/17  
 88. 11/15/17  
 89. 11/15/17  
 90. 11/15/17  
 91. 11/15/17  
 92. 11/15/17  
 93. 11/15/17  
 94. 11/15/17  
 95. 11/15/17  
 96. 11/15/17  
 97. 11/15/17  
 98. 11/15/17  
 99. 11/15/17  
 100. 11/15/17

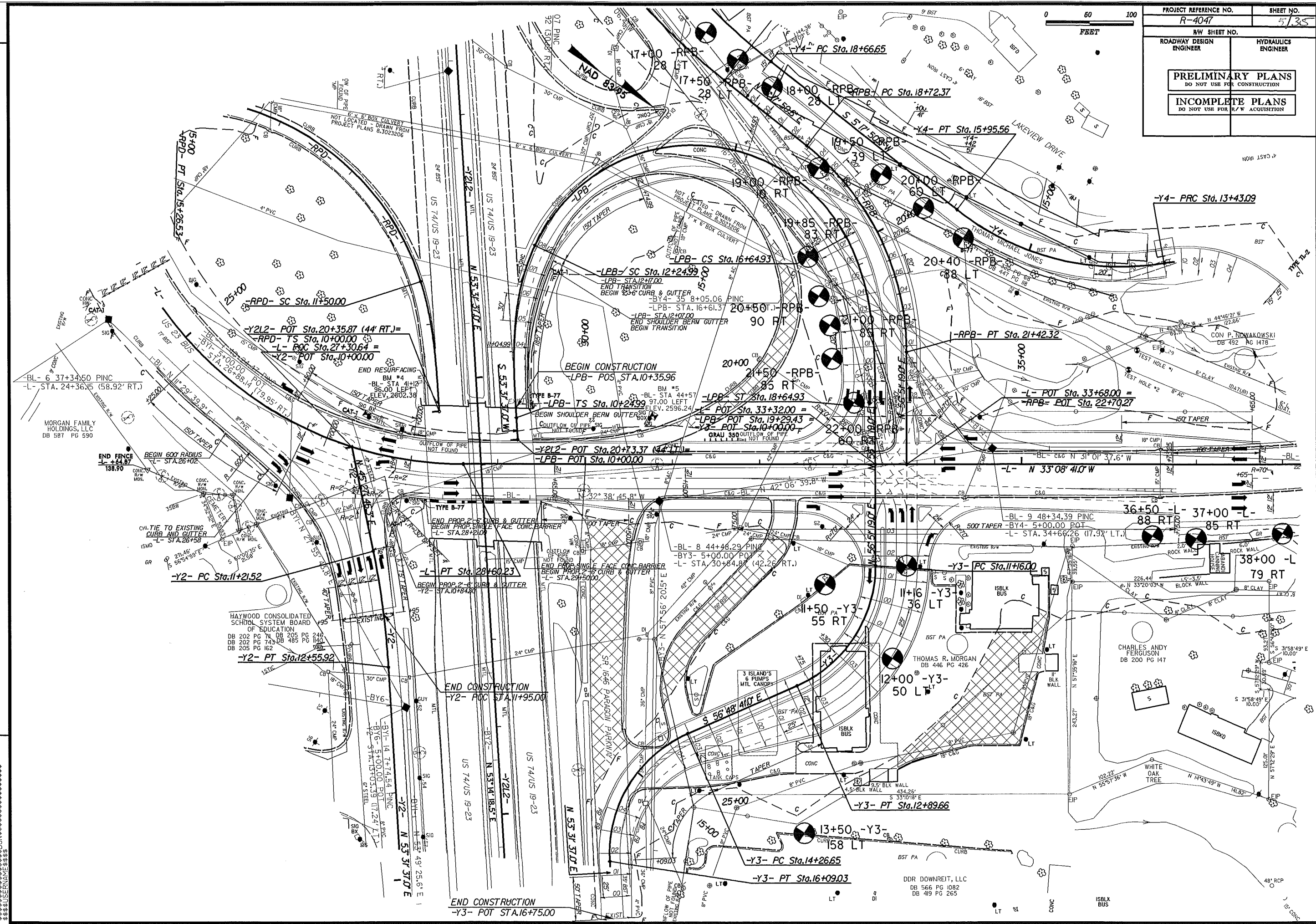


**BEGIN PROJECT R-4047**  
-L- POT STA. 13+00.00

VENTURE PROPERTIES I, LLC  
DB 454 PG 75  
BM #2  
-BL- STA 29+53  
59.00 RIGHT  
ELEV. 2642.87  
-BL- 4 29+49.03 PINC  
-L- STA. 17+14.07 (38.02' RT.)

RICHARD D. REEVES  
DB 361 PG 875  
N 40°19'33" E  
202.68'  
K & K OF WNC, INC.  
DB 572 PG 2222  
DB 549 PG 1351

PROJECT REFERENCE NO.	SHEET NO.
R-4047	5/35
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	



REVISIONS

\*\*\*\*\*SYSTEMS TIME\*\*\*\*\*  
\*\*\*\*\*DESIGN\*\*\*\*\*  
\*\*\*\*\*USER\*\*\*\*\*

HAYWOOD CONSOLIDATED SCHOOL SYSTEM BOARD OF EDUCATION  
DB 202 PG 74 DB 205 PG 246  
DB 202 PG 743 DB 485 PG 146  
DB 205 PG 162

MORGAN FAMILY HOLDINGS, LLC  
DB 587 PG 590

CHARLES ANDY FERGUSON  
DB 200 PG 147

DDR DOWNREIT, LLC  
DB 566 PG 1082  
DB 419 PG 265

END CONSTRUCTION  
-Y3- POT STA. 16+75.00

END CONSTRUCTION  
-Y2- POT STA. 11+95.00

BEGIN CONSTRUCTION  
-LPB- POS STA. 10+35.96

BEGIN CONSTRUCTION  
-LPB- POS STA. 10+35.96

BEGIN CONSTRUCTION  
-LPB- POS STA. 10+35.96

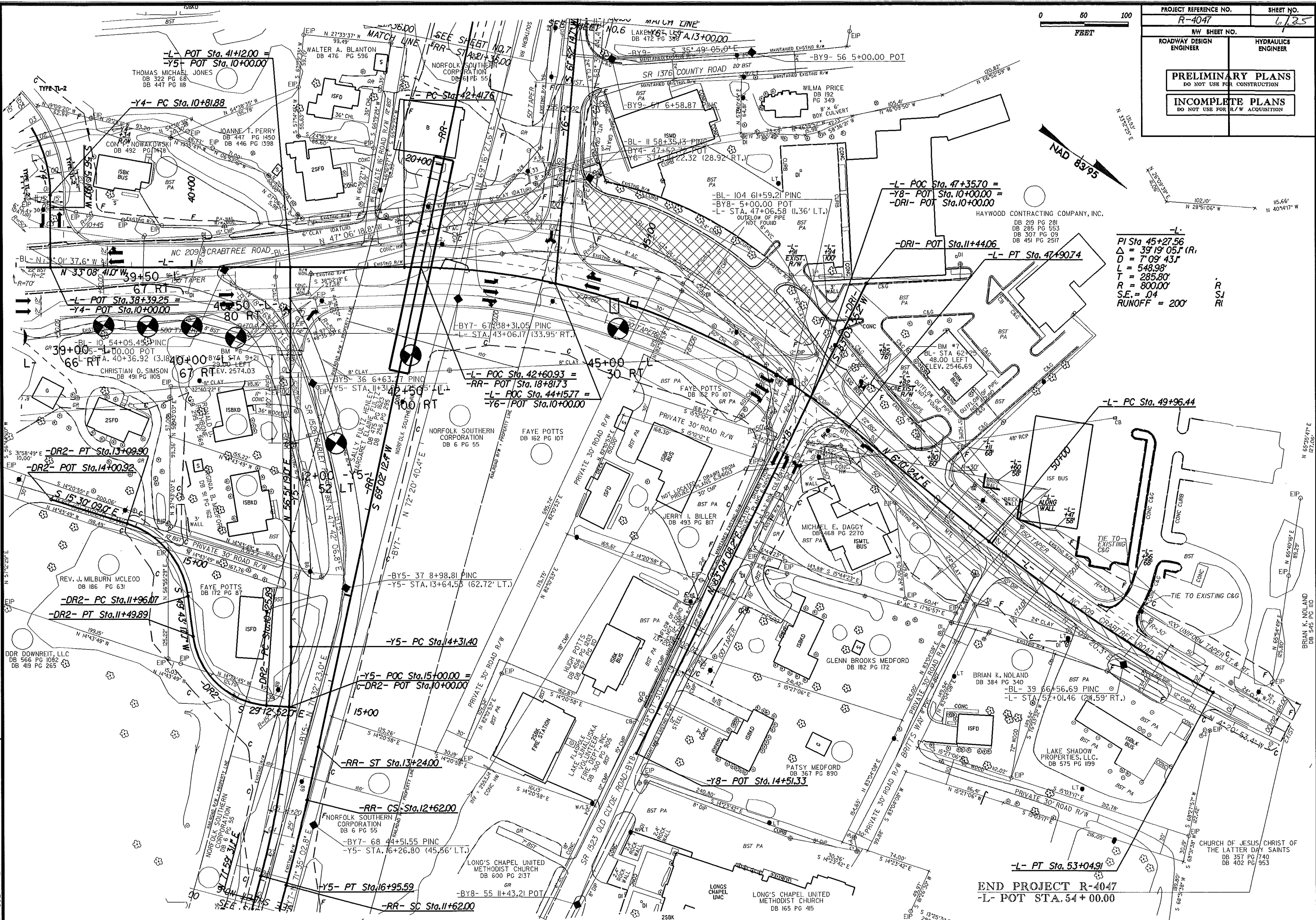
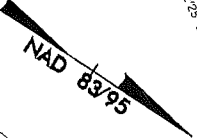
BEGIN CONSTRUCTION  
-LPB- POS STA. 10+35.96

DDR DOWNREIT, LLC  
DB 566 PG 1082  
DB 419 PG 265





PROJECT REFERENCE NO.	SHEET NO.
R-4047	6/25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	



PI Sta 45+27.56  
 $\Delta = 39' 19" 05"$  (R)  
 $D = 7' 09" 43"$   
 $L = 548.98'$   
 $T = 285.80'$   
 $R = 800.00'$   
 $S.E. = .04$   
 $RUNOFF = 200'$

**END PROJECT R-4047**  
**L- POT STA. 54 + 00.00**

REVISIONS

SYSTEMS TIME \*\*\*\*\*  
\*\*\*\*\* DGN \*\*\*\*\*  
\*\*\*\*\* PLAN \*\*\*\*\*

DDR DOWNREIT, LLC  
 DB 566 PG 1082  
 DB 419 PG 265

**-DR2- PC Sta. 11+96.07**  
**-DR2- PT Sta. 11+49.89**

**-Y5- PC Sta. 14+31.40**  
**-Y5- POT Sta. 10+00.00**

**-RR- ST Sta. 13+24.00**

**-RR- CS Sta. 12+62.00**

**-Y5- PT Sta. 16+95.59**

**-RR- SC Sta. 11+62.00**

**-L- POC Sta. 42+60.93 =**  
**-RR- POT Sta. 18+81.73**  
**-L- POC Sta. 44+15.77 =**  
**-Y6- POT Sta. 10+00.00**

**-L- POC Sta. 47+35.70 =**  
**-Y8- POT Sta. 10+00.00 =**  
**-DRI- POT Sta. 10+00.00**

**-DRI- POT Sta. 11+44.06**  
**-L- PT Sta. 47+90.74**

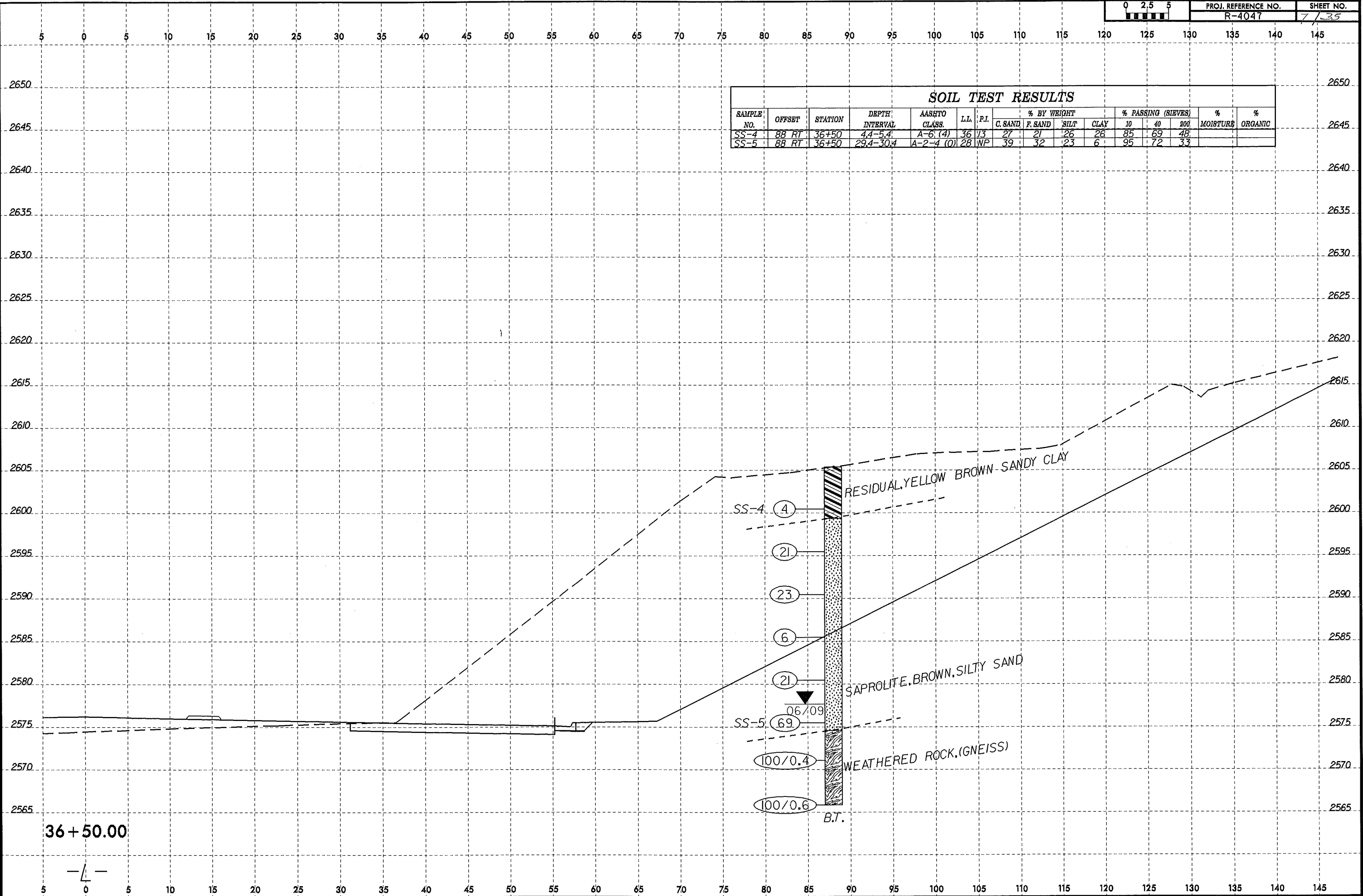
**-L- PC Sta. 49+96.44**

**-Y8- POT Sta. 14+51.33**

**-L- PT Sta. 53+04.91**

BRIAN K. NOLAND  
 DB 384 PG 340  
 DB 545 PG 110

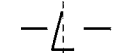
8/23/99



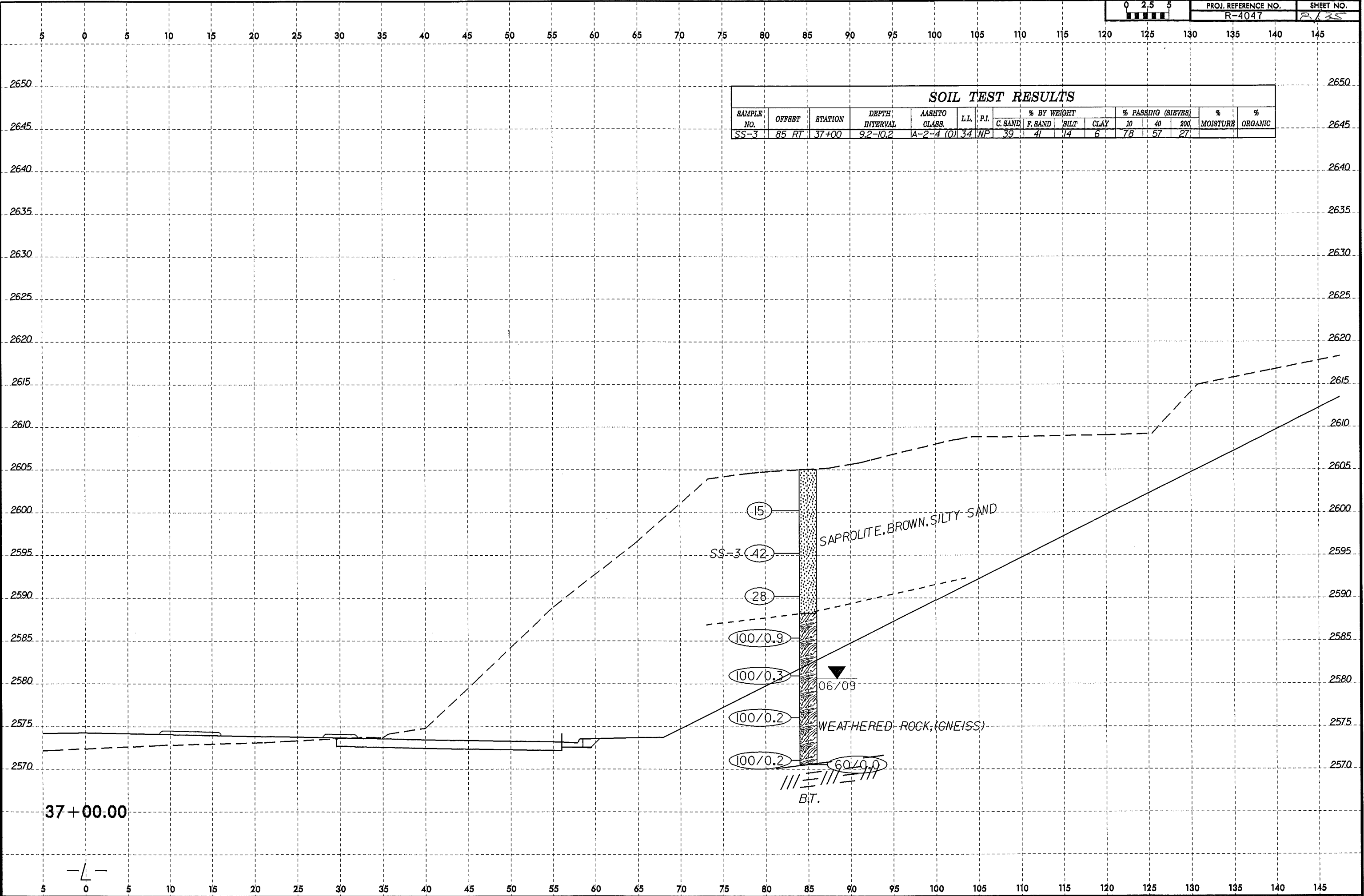
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-4	88 RT	36+50	4.4-5.4	A-6 (4)	36	13	27	21	26	28	85	69	48		
SS-5	88 RT	36+50	29.4-30.4	A-2-4 (0)	28	NP	39	32	23	6	95	72	33		

30-JUL-2009 07:37  
 D:\PROJECTS\R4047\_GEO\RDWY\_209\CADD\GEO\TECH\XSC\NR4047\_GEO\_XSC\_1\_RT.dgn  
 \$\$\$USERNAME\$\$\$

36 + 50.00



8/23/99  
 30-JUL-2009 07:37  
 D:\P\0\9835\AR4047\_GEO\_ROWY\_209\CADD\_GEO\TECH\XSC\AR4047\_GEO\_XSL1.RT.dgn  
 \$\$\$USERNAME\$\$\$



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-3	85 RT	37+00	9.2-10.2	A-2-A (0)	34	NP	39	41	14	6	78	57	27		

37+00.00

BT.

06/09

15

SS-3 42

28

100/0.9

100/0.3

100/0.2

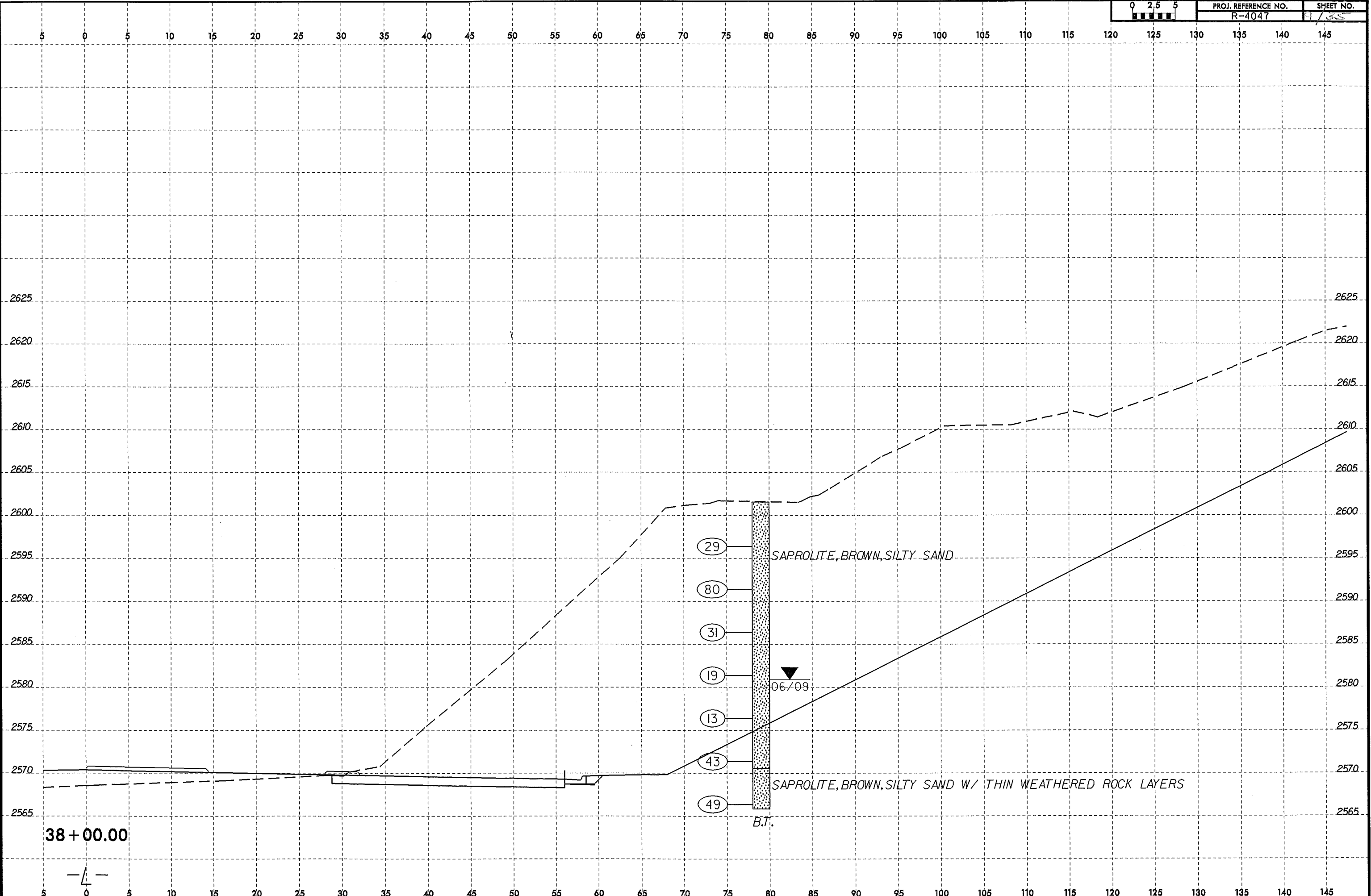
100/0.2

60/0.0

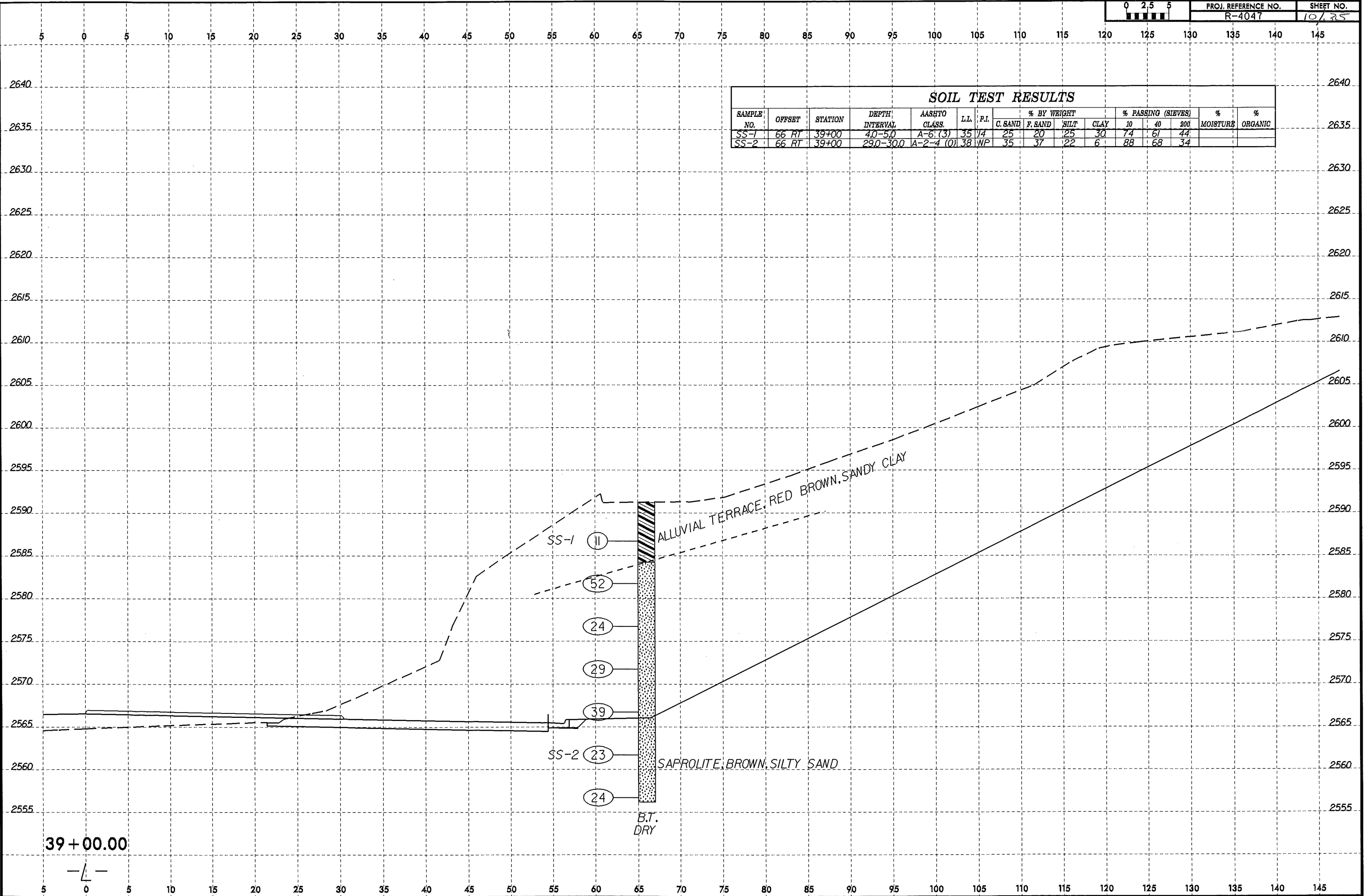
WEATHERED ROCK (GNEISS)

SAPROLITE, BROWN, SILTY SAND

30-JUL-2009 07:37  
D:\PROJECTS\AR4047\_GEO\RDWY\_209\CADD\_GEO\TECH\XSC\AR4047\_GEO\_XSL\_1\_RT.dgn  
\$\$\$USERNAME\$\$\$

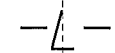


30-JUL-2009 07:37  
 D:\PROJECTS\4047\_GEO\_ROWY\_209\CADD\_GEO\GEO\XSEC\NR4047\_GEO\_xsl\_1\_RT.dgn  
 \$\$\$USERNAME\$\$\$



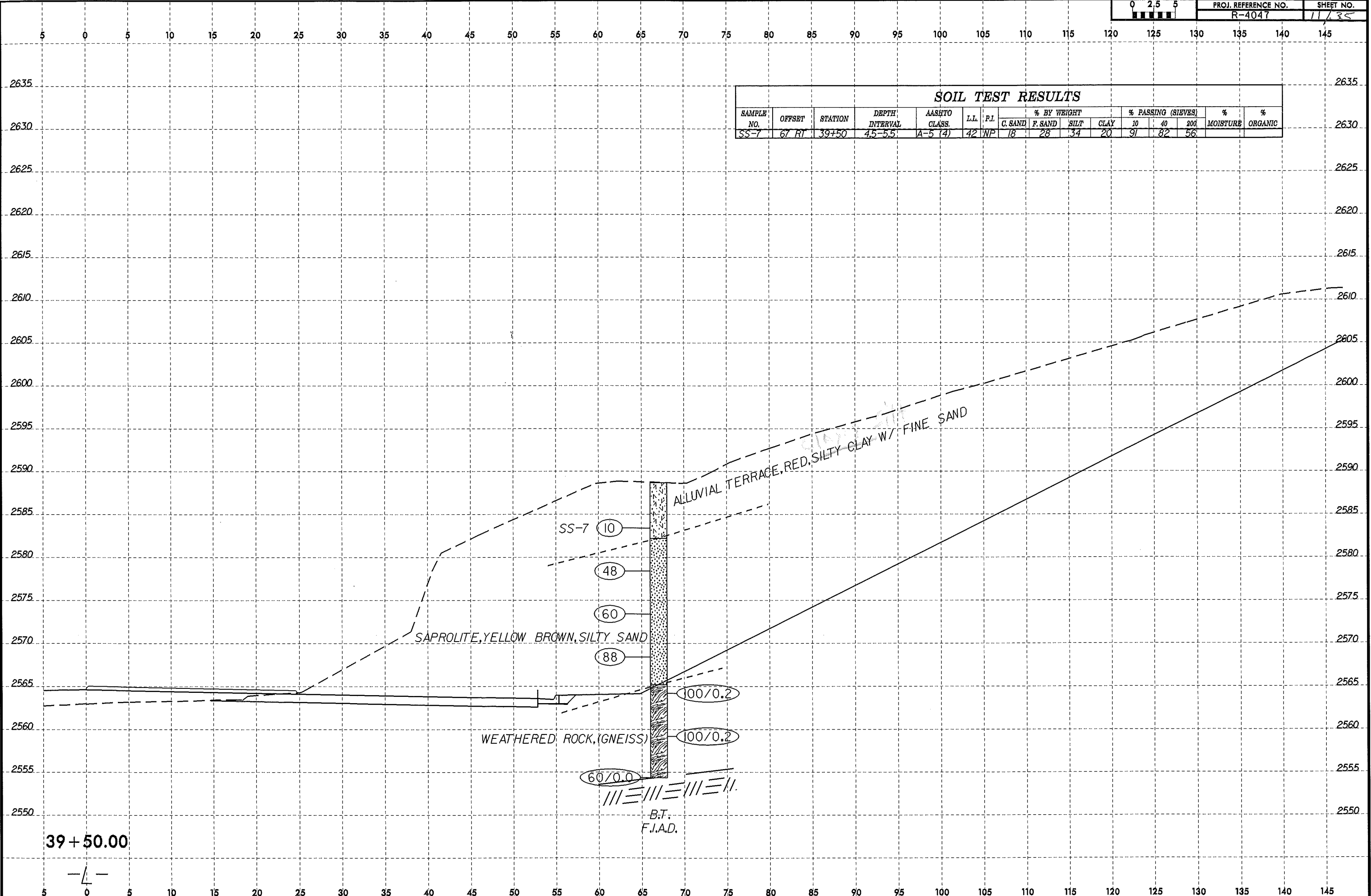
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	66 RT	39+00	4.0-5.0	A-6: (3)	35	14	25	20	25	30	74	61	44		
SS-2	66 RT	39+00	29.0-30.0	A-2-4 (0)	38	NP	35	37	22	6	88	68	34		

39 + 00.00

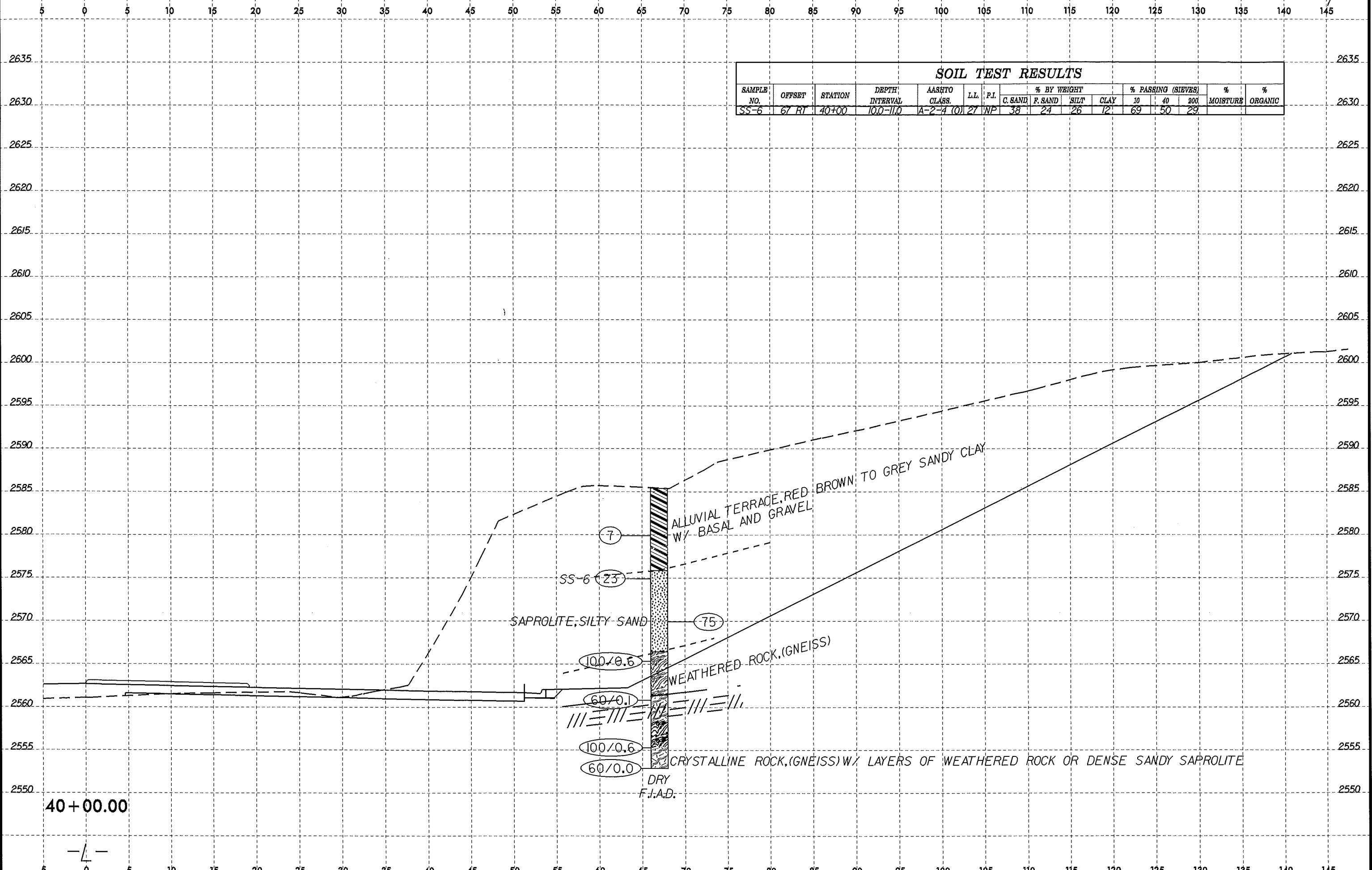


8/23/99  
 30-JUL-2009 07:37  
 D:\P\PROJECTS\4047\_GEO\_RDWY\_2009\CADD\_GEO\TECH\SSC\AR4047\_GEO\_xss\_1\_1\_RT.dgn  
 \$\$\$USERNAME\$\$\$

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-7	67 RT	39+50	4.5-5.5'	A-5 (4)	42	NP	18	28	34	20	91	82	56		

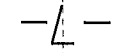


8/23/99  
 30-JUL-2009 09:23  
 D:\P\03\35\4047\_GED\_RDWY\_209\CADD\GEO\TECH\XSEC\R4047\_GED\_xsi\_1.RT.dgn  
 \$\$\$USERNAME\$\$\$

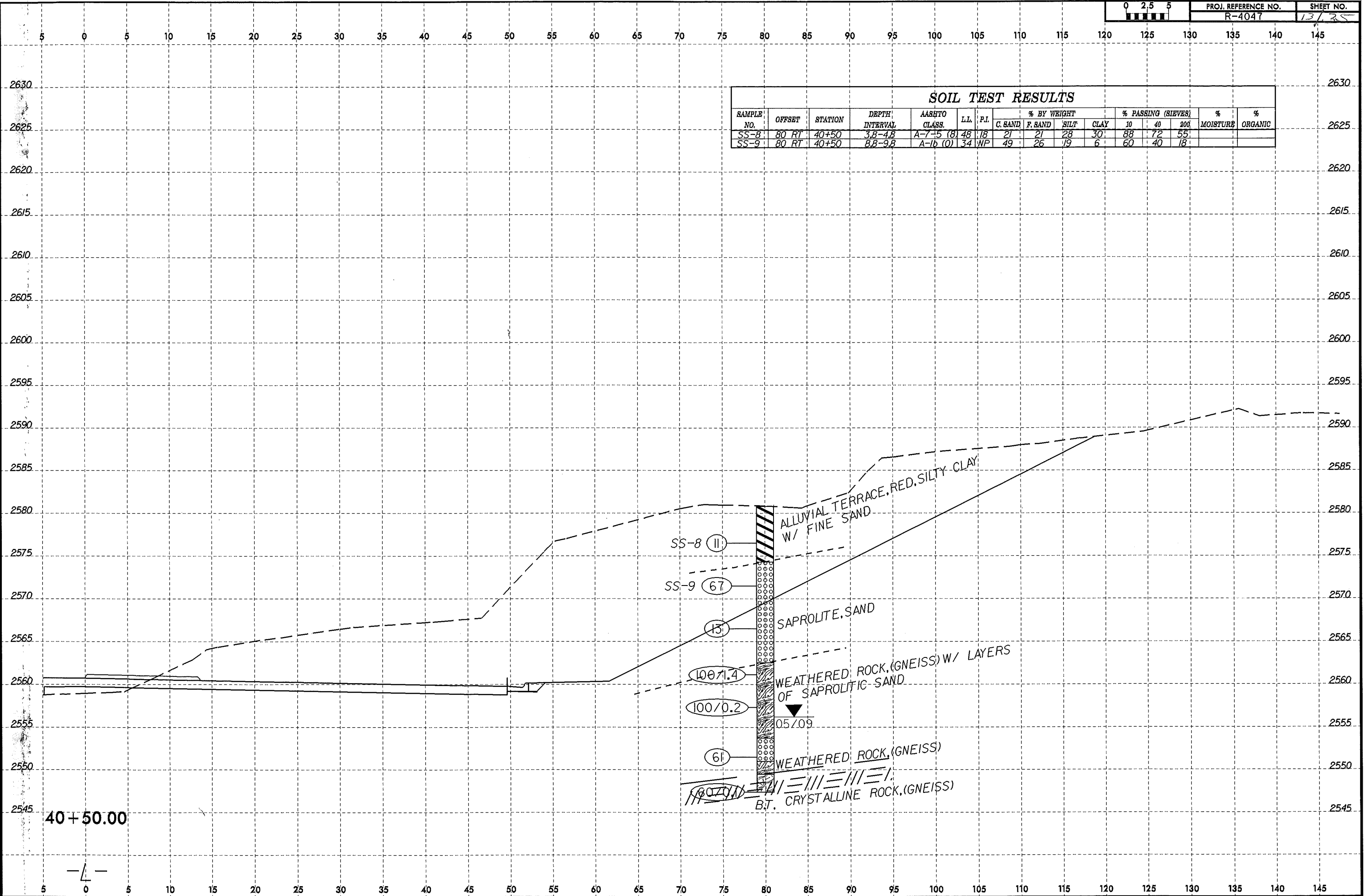


SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-6	67 RT	40+00	10.0-11.0	A-2-4 (0)	27	NP	38	24	26	12	69	50	29		

40 + 00.00

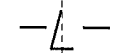


30-JUL-2009 07:37  
 D:\PROJECTS\RDWY\_2009\CADD\_GEDTECH\XSC\NR4047\_GEO.XST\_1.RT.dgn  
 \$\$\$USERNAME\$\$\$



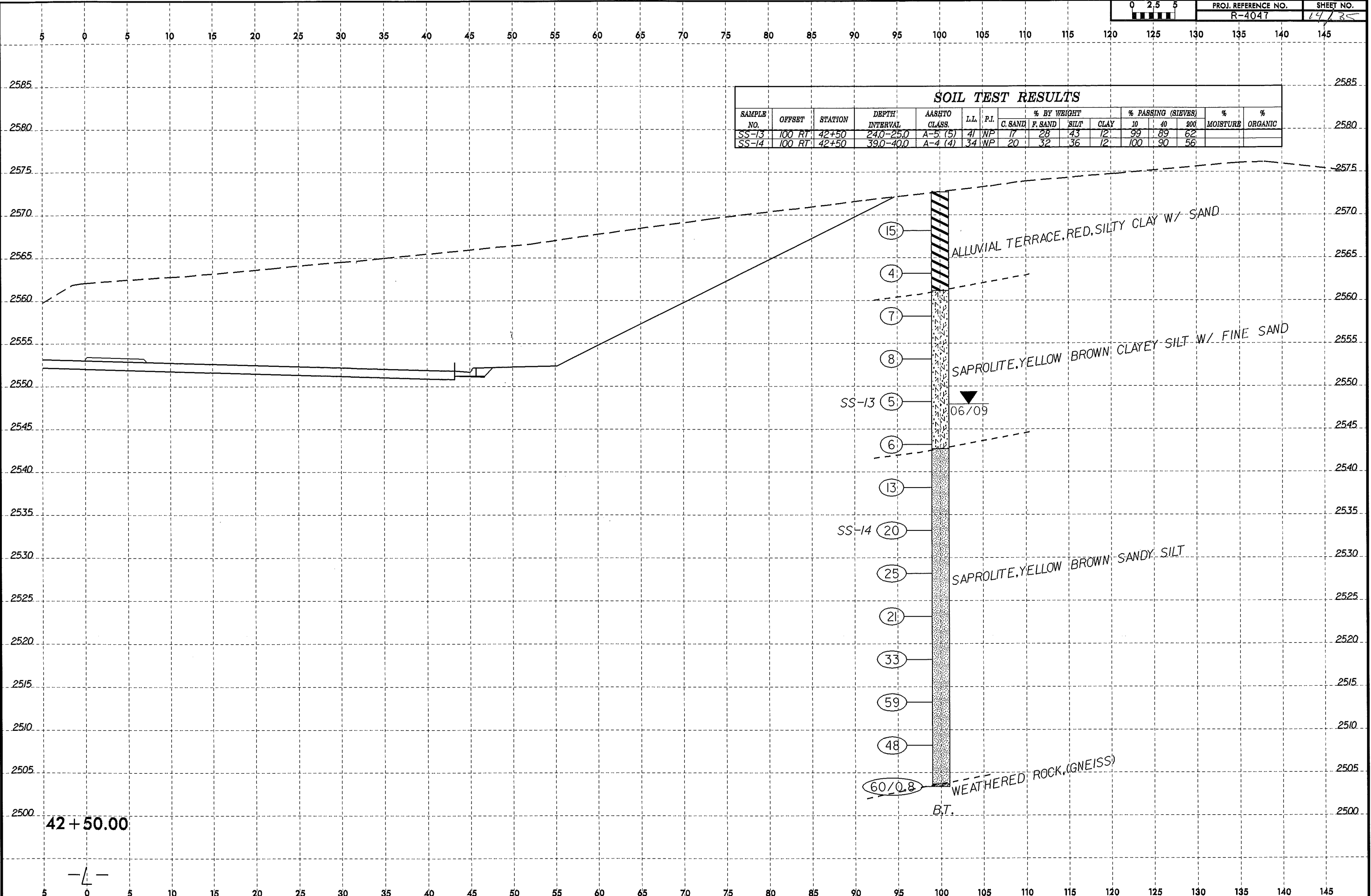
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-8	80 RT	40+50	3.8-4.8	A-7-5 (8)	48	18	21	21	28	30	88	72	55		
SS-9	80 RT	40+50	8.8-9.8	A-1b (0)	34	NP	49	26	19	6	60	40	18		

40+50.00





8/23/99



SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-13	100 RT	42+50	24.0-25.0	A-5 (5)	41	NP	17	28	43	12	99	89	62		
SS-14	100 RT	42+50	39.0-40.0	A-4 (4)	34	NP	20	32	36	12	100	90	56		

42 + 50.00

B.T.

WEATHERED ROCK (GNEISS)

SAPROLITE, YELLOW BROWN SANDY SILT

SAPROLITE, YELLOW BROWN CLAYEY SILT W/ FINE SAND

ALLUVIAL TERRACE, RED, SILTY CLAY W/ SAND

SS-13 (5)

SS-14 (20)

(15)

(4)

(7)

(8)

(6)

(13)

(25)

(21)

(33)

(59)

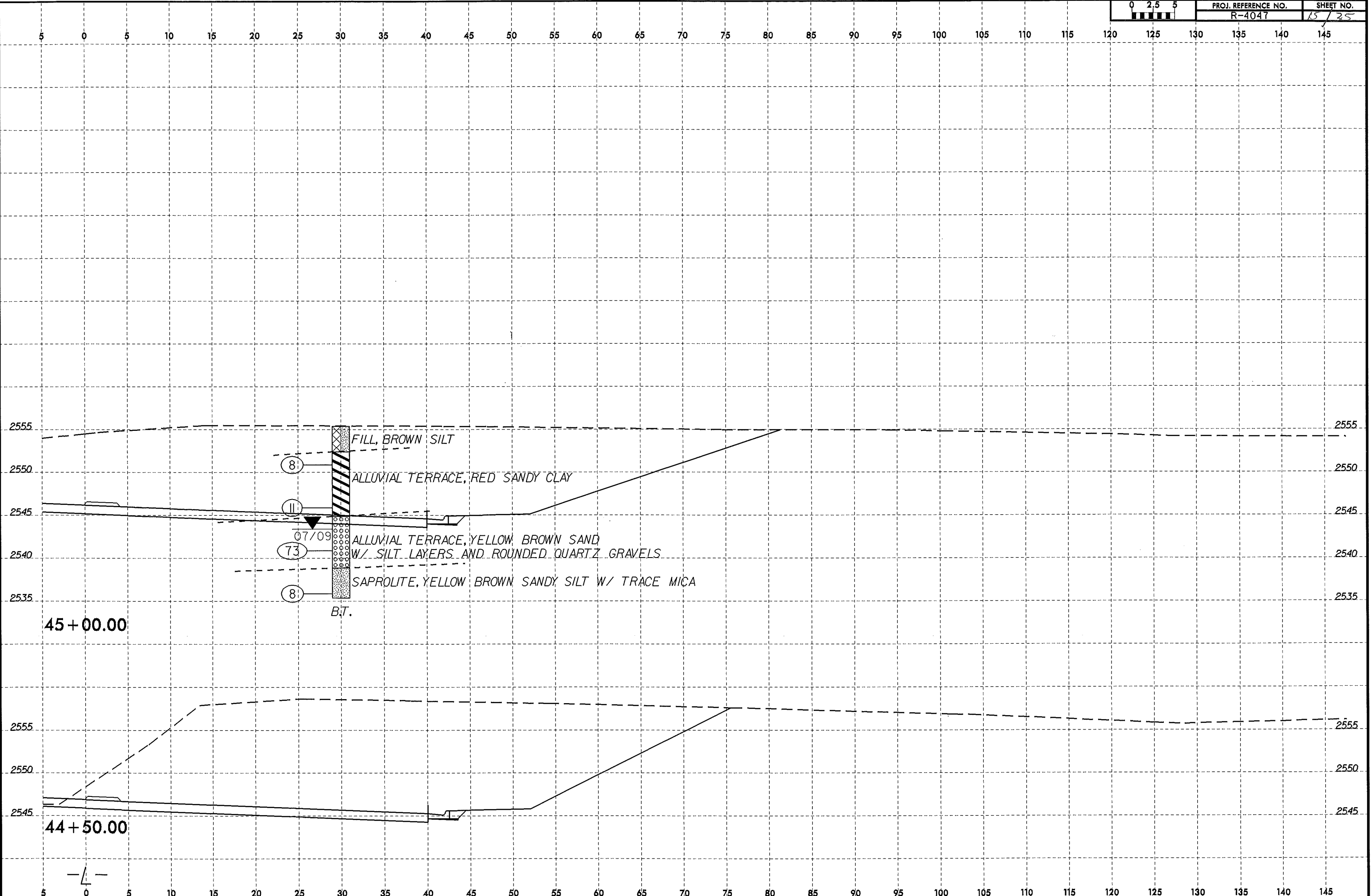
(48)

(60/0.8)

06/09

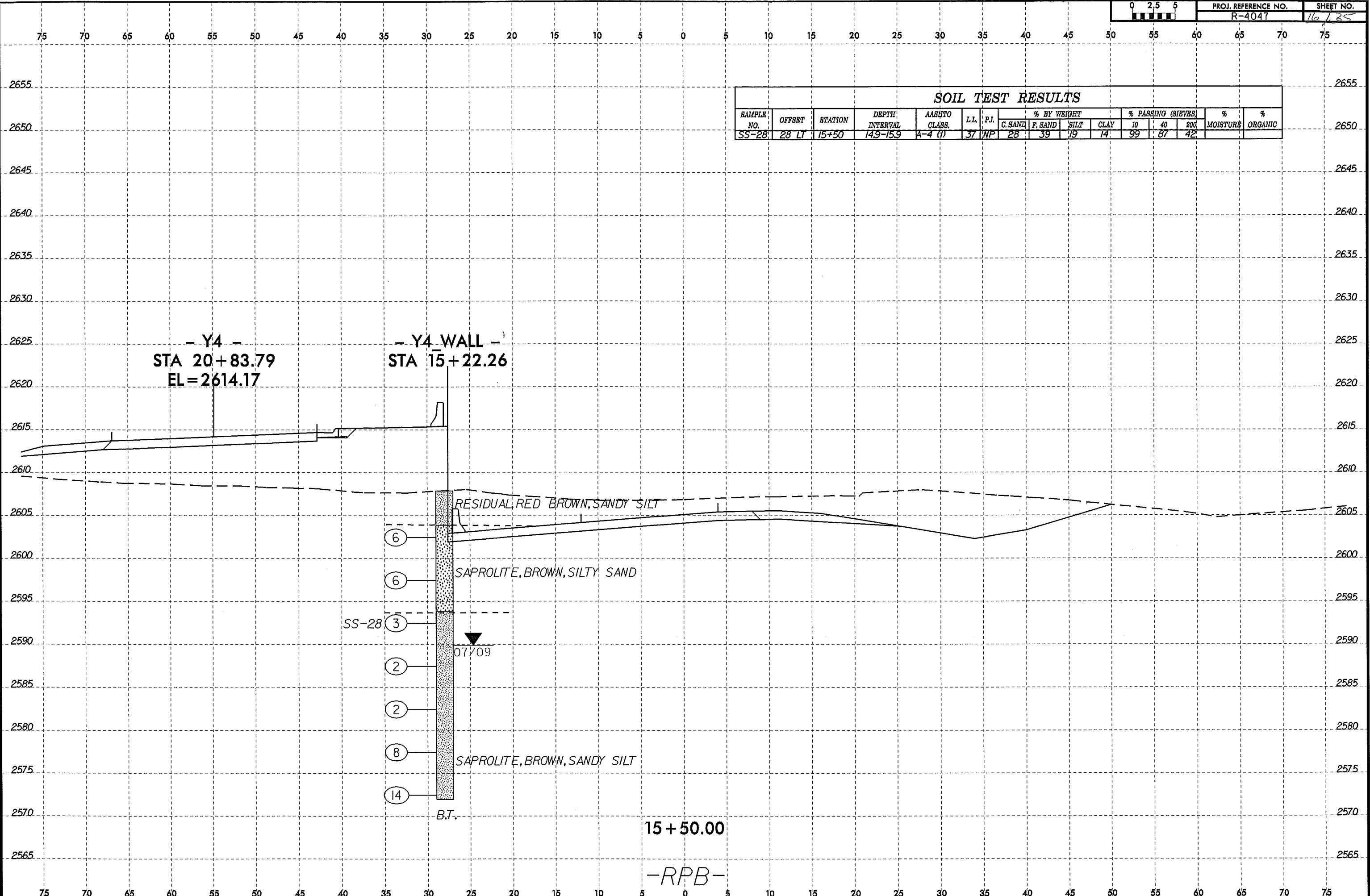
30-JUL-2009 07:38  
D:\P\proj\4047\_GEO\_ROWY\_209\CADD\GEO\TECH\XSC\NR4047\_GEO\_XS1\_1\_RT.dgn  
\$\$\$\$\$USER\$NAME\$\$\$\$\$

8/23/99  
30-JUL-2009 07:38  
D:\PROJECTS\NR4047\_GEO\ROWY\_2009\CADD\_GEDTECH\XSC\NR4047\_GEO\_XS\_1\_RT.dgn  
\$\$\$USERNAME\$\$\$



8/23/99

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-28	28 LT	15+50	14.9-15.9	A-4 (U)	37	NP	28	39	19	14	99	87	42		



- Y4 -  
STA 20+83.79  
EL=2614.17

- Y4 WALL -  
STA 15+22.26

RESIDUAL RED BROWN SANDY SILT

SAPROLITE, BROWN, SILTY SAND

SAPROLITE, BROWN, SANDY SILT

SS-28

07Y09

B.T.

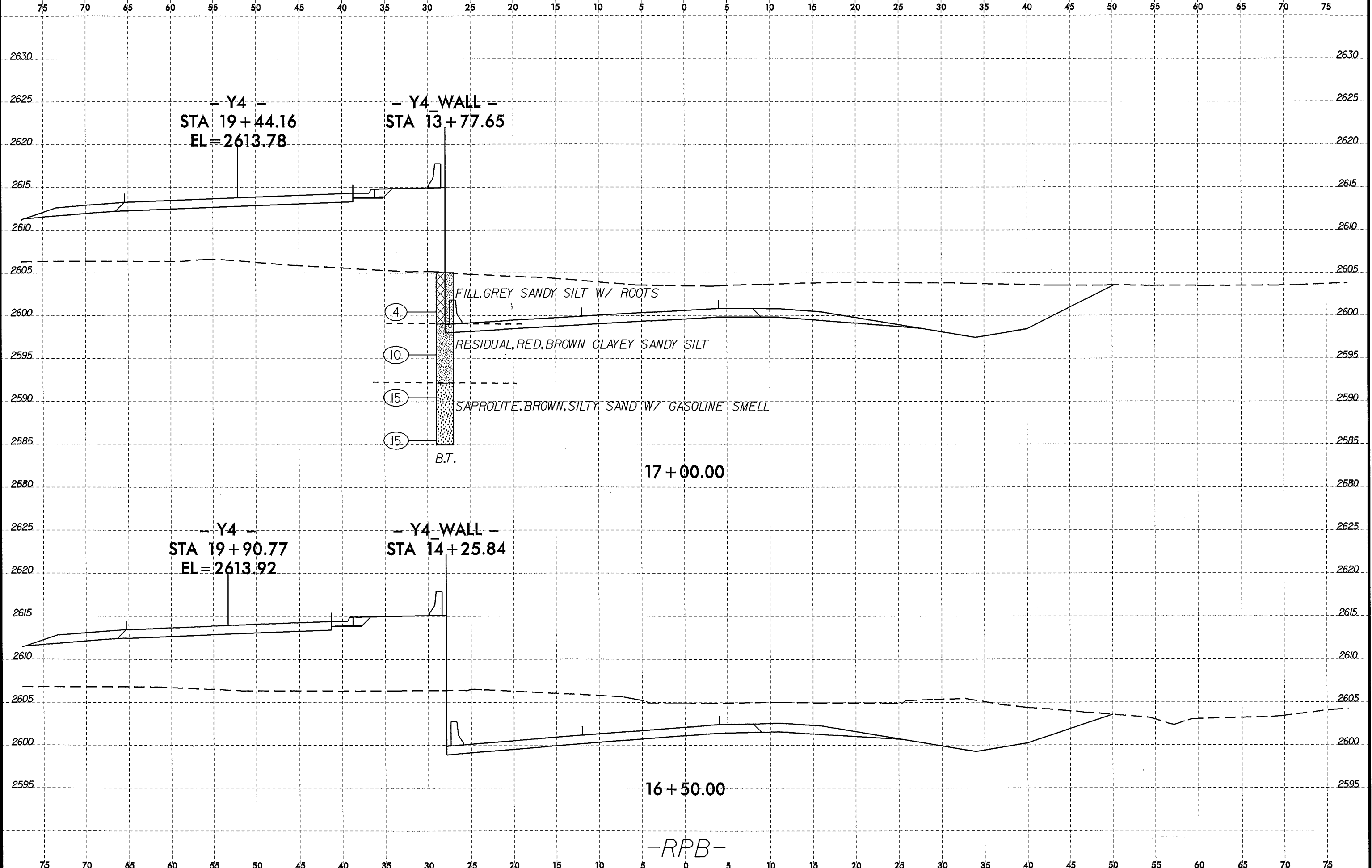
15 + 50.00

-RPB-

30-JUL-2009 07:50  
D:\P\9\985\164047\_GEO.RDWY\_209\CADD\_GEDTECH\XSC\164047\_GEO.XSL.rpb.dgn  
\$\$\$\$\$USERNAME\$\$\$\$\$



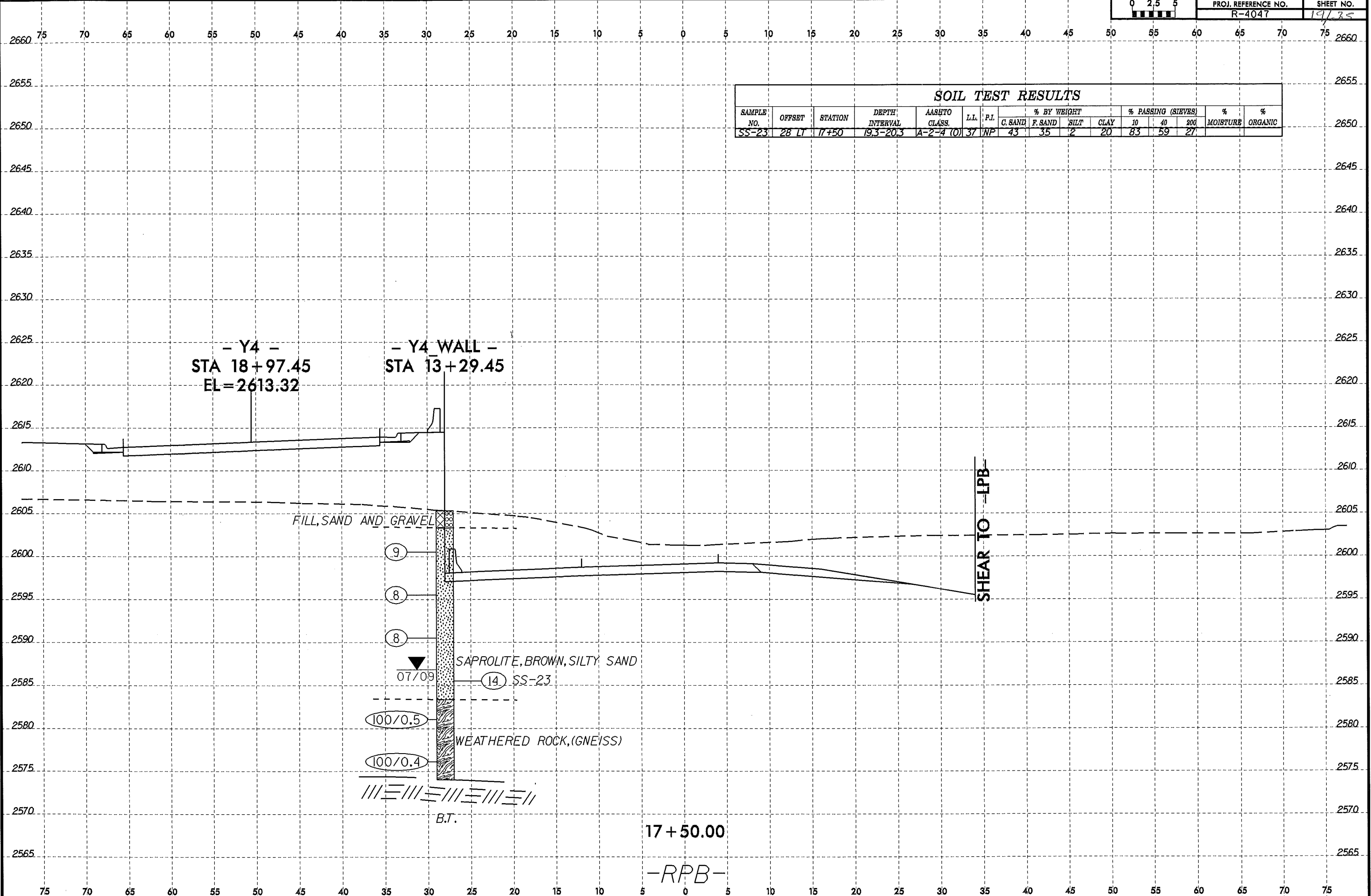
8/23/99



30-JUL-2009 07:50  
D:\PROJECTS\R4047\_GEO\_RDWY\_209\CADD\_GEO\TECH\XSC\NR4047\_GEO\_XSL\RPB.dgn  
\$\$\$\$USERNAM\$\$\$\$

8/23/99

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-23	28 LT	17+50	19.3-20.3	A-2-4 (0)	37	NP	43	35	2	20	83	59	27		



- Y4 -  
STA 18+97.45  
EL = 2613.32

- Y4 WALL -  
STA 13+29.45

FILL, SAND AND GRAVEL

(9)

(8)

(8)

07/09

SAPROLITE, BROWN, SILTY SAND

(14) SS-23

(100/0.5)

WEATHERED ROCK, (GNEISS)

(100/0.4)

B.T.

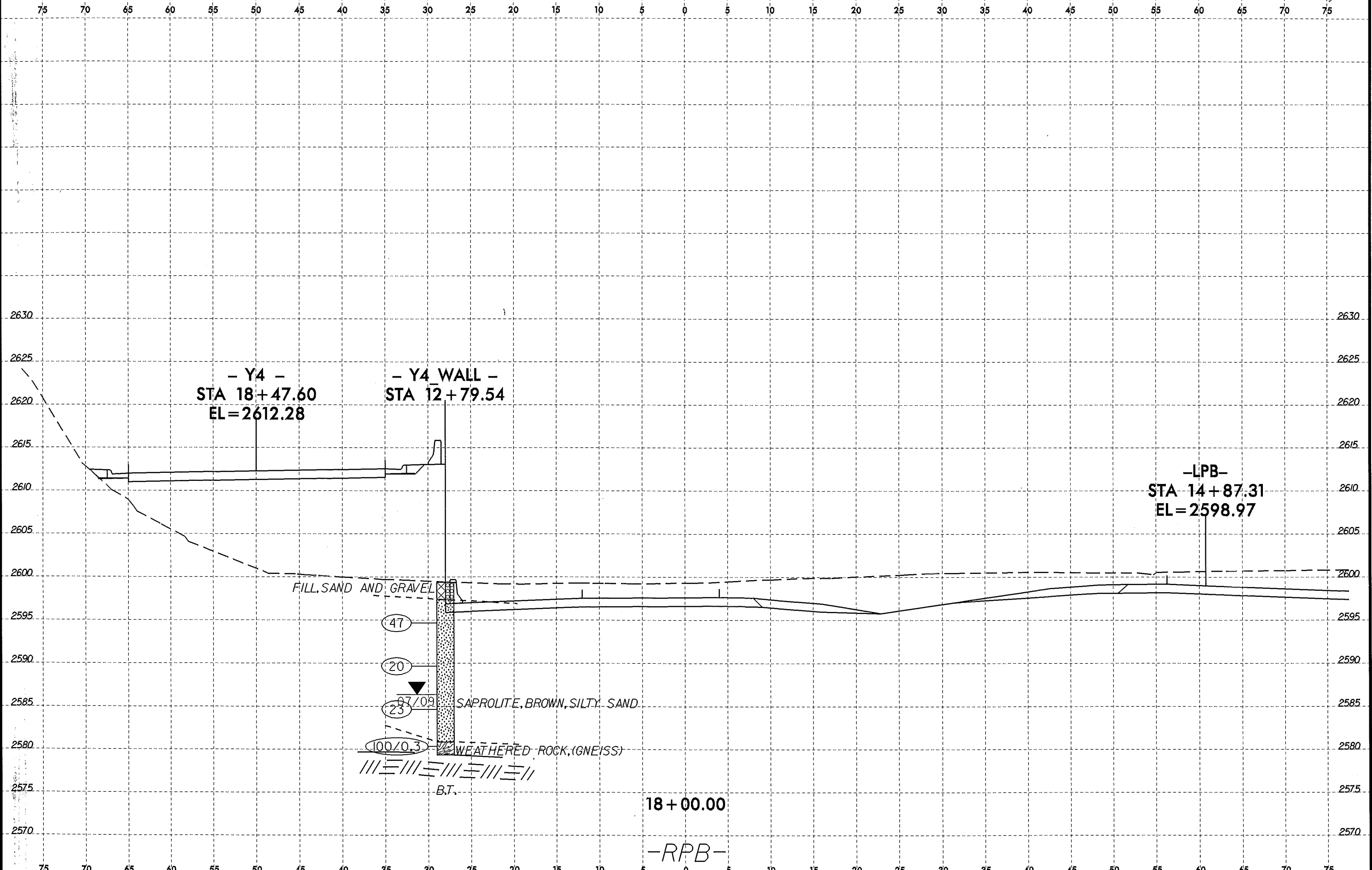
17+50.00

-RPB-

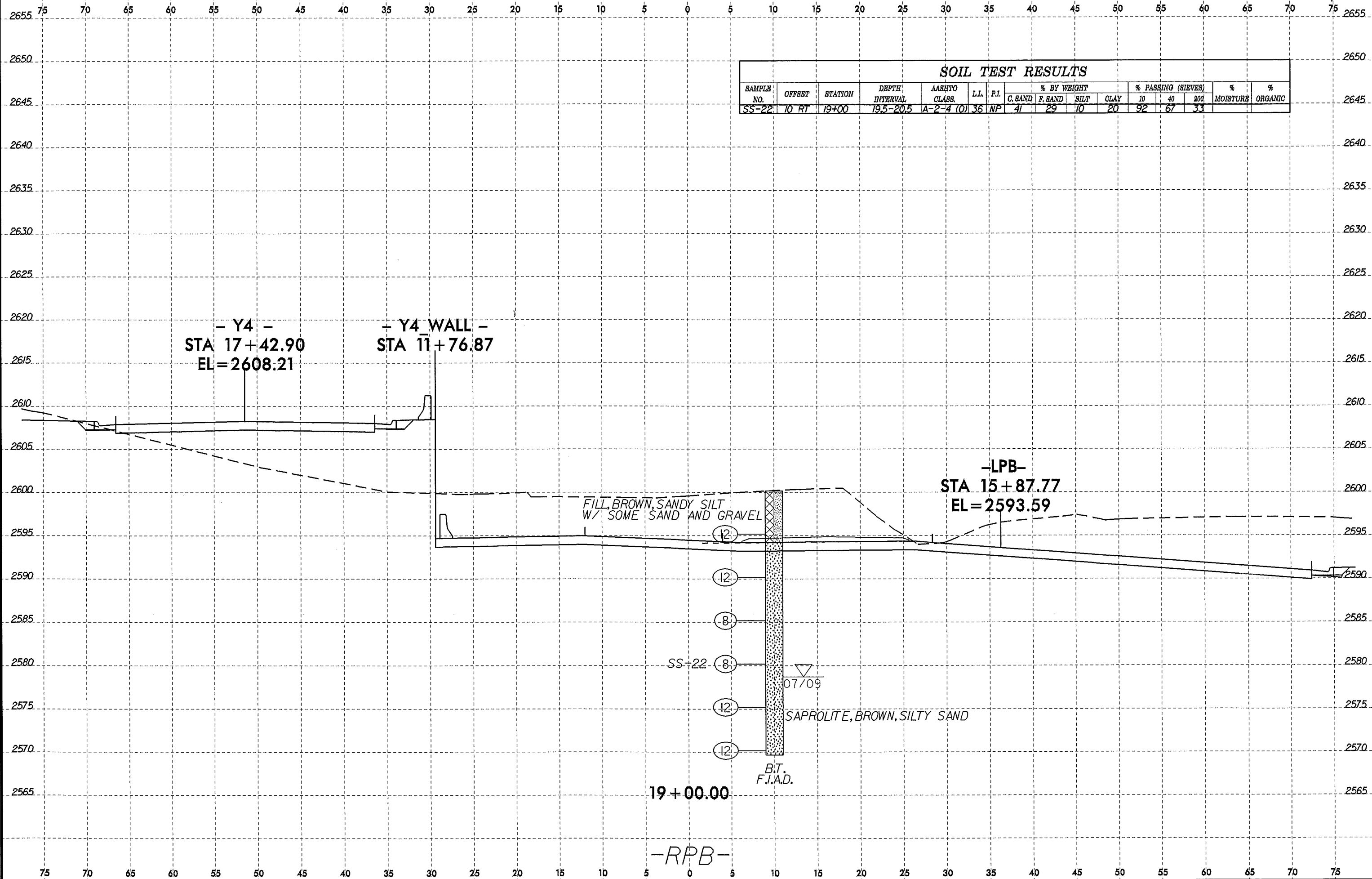
SHEAR TO -LPB-

30-JUL-2009 07:50  
D:\PROJ\PCS\4047\_GEO\_RDWY\_20\9\GADD\_GEOTECH\XSC\4047\_GEO\_XSI\_RPB.dgn  
\$\$\$USERNAME\$\$\$

8/23/99  
30-JUL-2009 09:54  
D:\PROJECTS\18047\_GEO\RDWY\_209\CADD\GEO\TECH\XSEC\R4047\_GEO\_xs\_rpb.dgn  
\$\$\$USE PENSIVE\$\$\$



8/23/99



**SOIL TEST RESULTS**

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-22	10 RT	19+00	19.5-20.5	A-2-4 (10)	36	NP	41	29	10	20	92	67	33		

- Y4 -  
STA 17+42.90  
EL = 2608.21

- Y4 WALL -  
STA 17+76.87

- LPB -  
STA 15+87.77  
EL = 2593.59

FILL, BROWN, SANDY SILT  
W/ SOME SAND AND GRAVEL

SAPROLITE, BROWN, SILTY SAND

B.T.  
F.I.A.D.

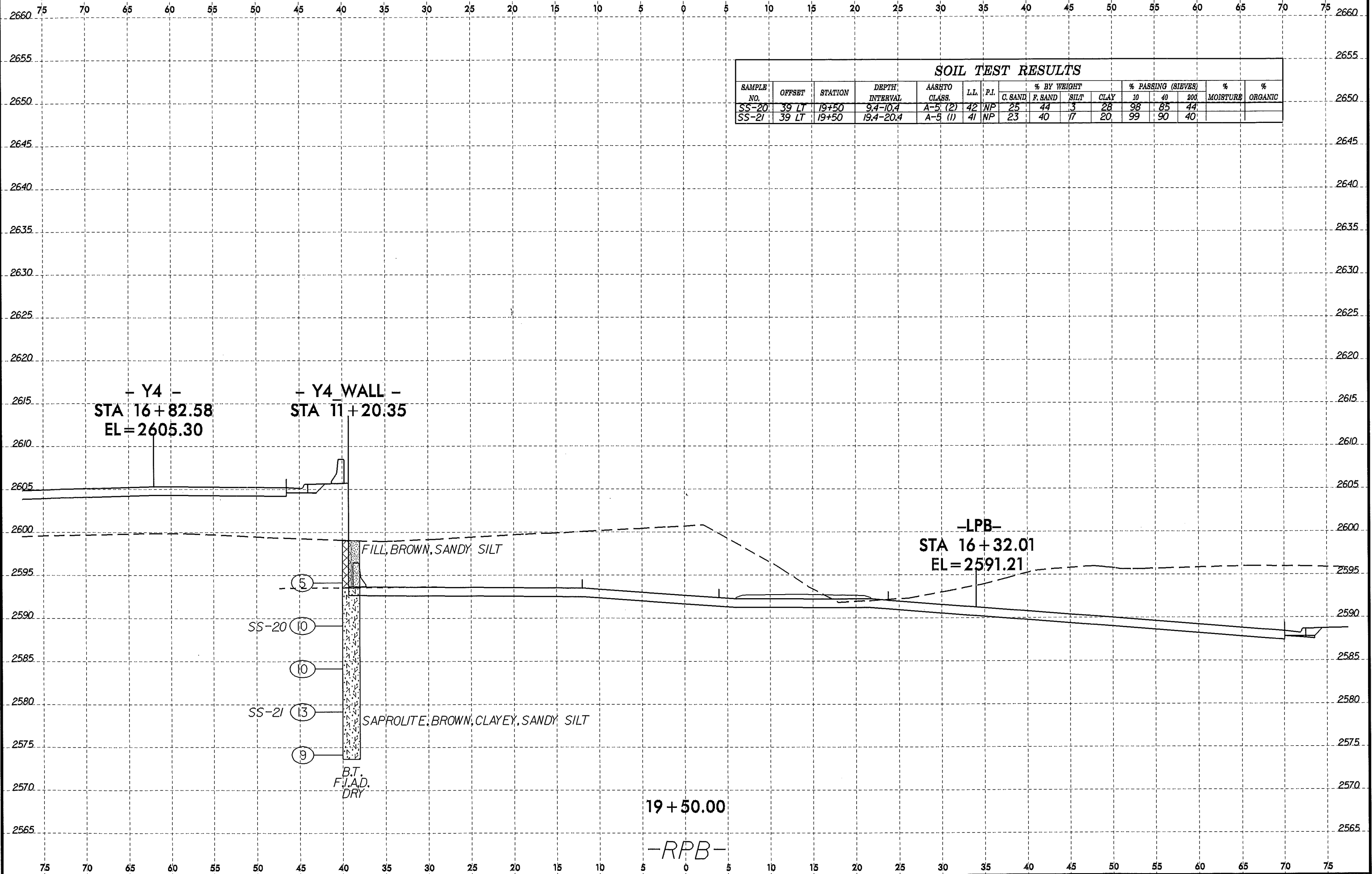
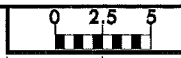
19 + 00.00

- RPB -

30-JUL-2009 07:50 D:\P\Projects\1047\_GEO\_RDWY\_209\CADD\GEO\TECH\SSC\R4047\_GEO\_xsl\_rpb.dgn



8/23/99



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-20	39 LT	19+50	9.4-10.4	A-5 (2)	42	NP	25	44	3	28	98	85	44		
SS-21	39 LT	19+50	19.4-20.4	A-5 (1)	41	NP	23	40	17	20	99	90	40		

- Y4 -  
STA 16+82.58  
EL = 2605.30

- Y4 WALL -  
STA 11+20.35

-LPB-  
STA 16+32.01  
EL = 2591.21

FILL, BROWN, SANDY SILT

SS-20 (10)

(10)

SS-21 (13)

SAPROLITE, BROWN, CLAYEY, SANDY SILT

(9)

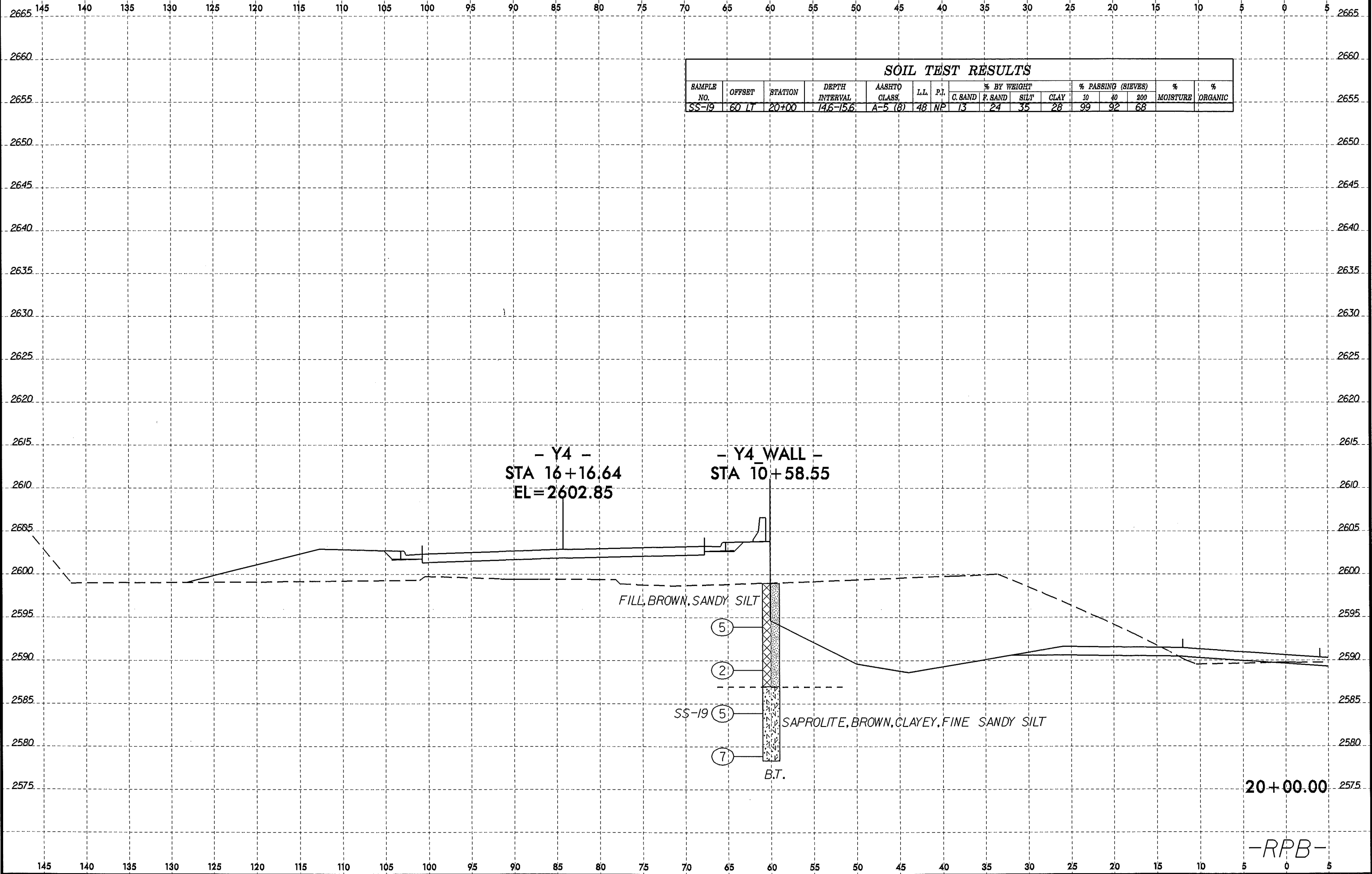
B.T. F.I.A.D. DRY

19 + 50.00

-RPB-

30-JUL-2009 07:50 D:\Projects\194047\_GEO\RDWY\_20\CADD\GEO\TECH\XSEC\R4047\_GEO\_xs1\_rpb.dgn

8/23/99



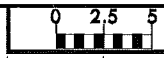
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-19	60 LT	20+00	14.6-15.6	A-5 (8)	48	NP	13	24	35	28	99	92	68		

30-JUL-2009 08:24  
 D:\PROJECTS\R4047\_GEO\RDWY\_2009\CADD\_GEOTECH\XSEC\VR4047\_GEO\_XSL\RPB.LT.dgn  
 \$\$\$USERNAME\$\$\$

20+00.00

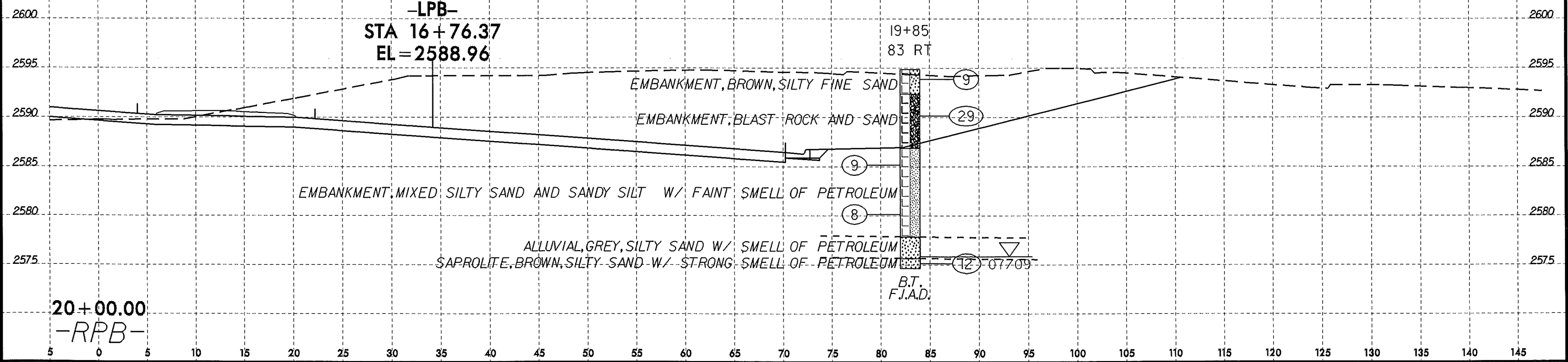
-RPB-

8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-4047	24/35

5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145



-LPB-  
 STA 16+76.37  
 EL = 2588.96

19+85  
 83 RT

EMBANKMENT, BROWN, SILTY FINE SAND

EMBANKMENT, BLAST ROCK AND SAND

EMBANKMENT, MIXED SILTY SAND AND SANDY SILT W/ FAINT SMELL OF PETROLEUM

ALLUVIAL, GREY, SILTY SAND W/ SMELL OF PETROLEUM  
 SAPROLITE, BROWN, SILTY SAND W/ STRONG SMELL OF PETROLEUM

B.T.  
 F.I.A.D.

(9)

(29)

(9)

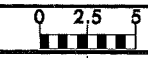
(8)

(12) 07709

20+00.00  
 -RPB-

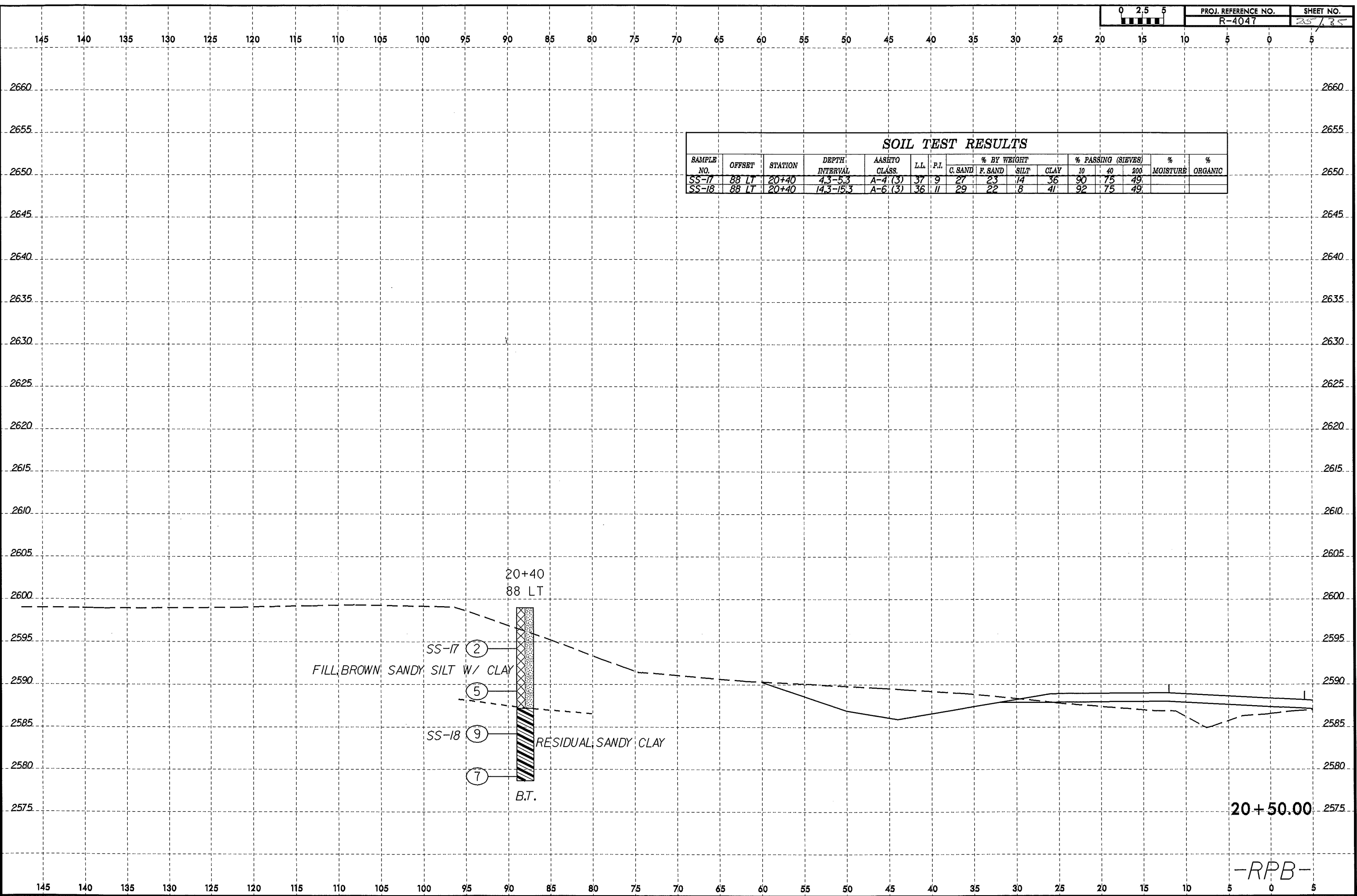
30-JUL-2009 08:17  
 D:\PROJECTS\R4047\_GEO\_RDWY\_209\CADD\_GEDITECH\XSEC\VR4047\_GEO\_XSL\RPB\_RT.dgn  
 \$\$\$USERNAME\$\$\$

8/23/99



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-17	88 LT	20+40	4.3-5.3	A-4 (3)	37	9	27	23	14	36	90	75	49		
SS-18	88 LT	20+40	14.3-15.3	A-6 (3)	36	11	29	22	8	41	92	75	49		

30-JUL-2009 08:24 D:\PROJECTS\4047\_GEO\_RDMY\_2009\CADD\_GEDITECH\XSEC\4047\_GEO.XSEC\RPB.LT.dgn \$\$\$USERNAME\$\$\$

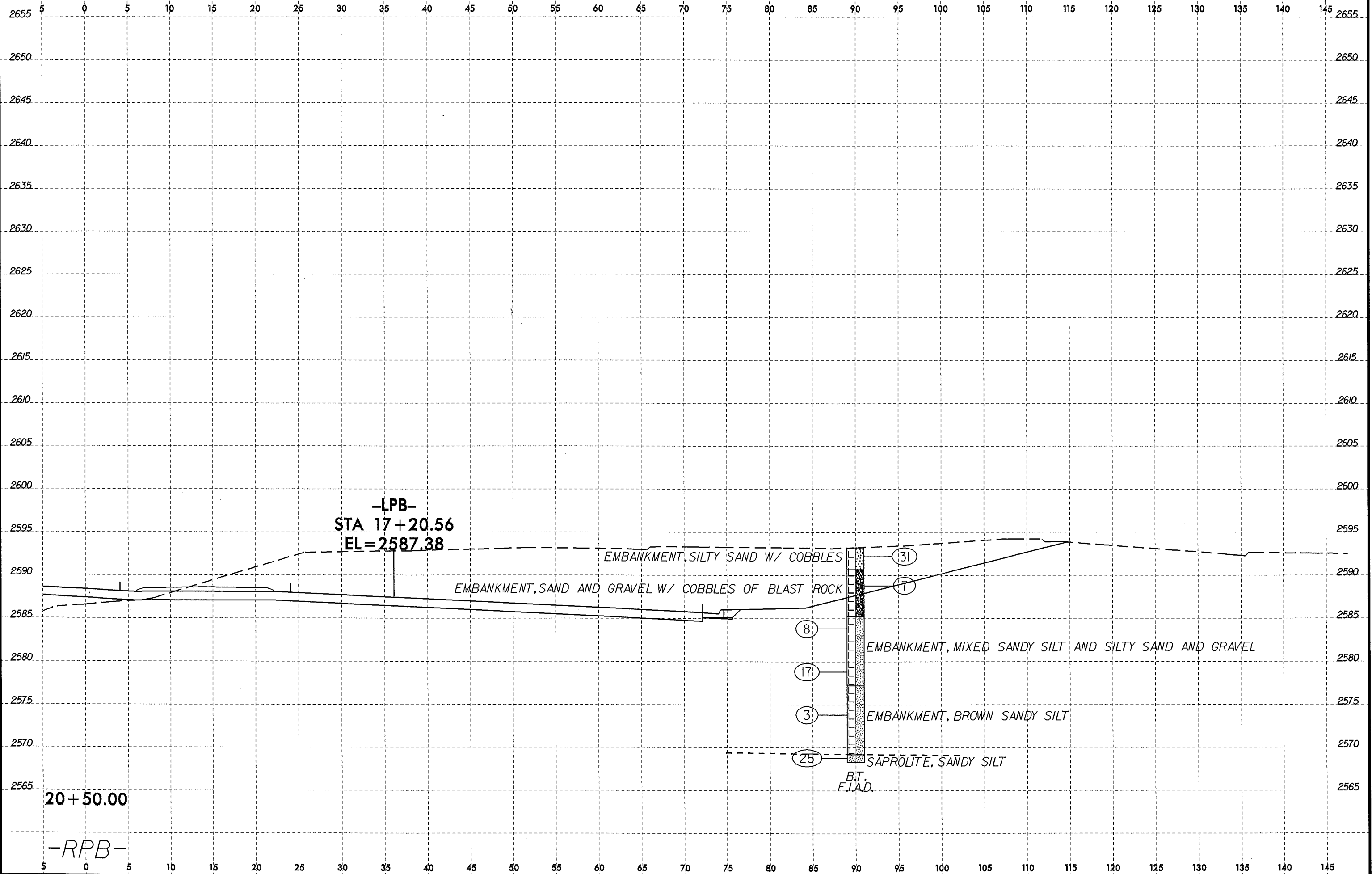


20+50.00

-RPB-

8/23/99  
30-JUL-2009 08:17  
D:\PROJECTS\2009\ROAD\GEO\RDWY\_209\GADD\GEO\TECH\XSEC\VR4047\_GEO\_XS\_LPB\_RT.dgn  
\$\$\$\$SUBSERIALNAME\$\$\$\$

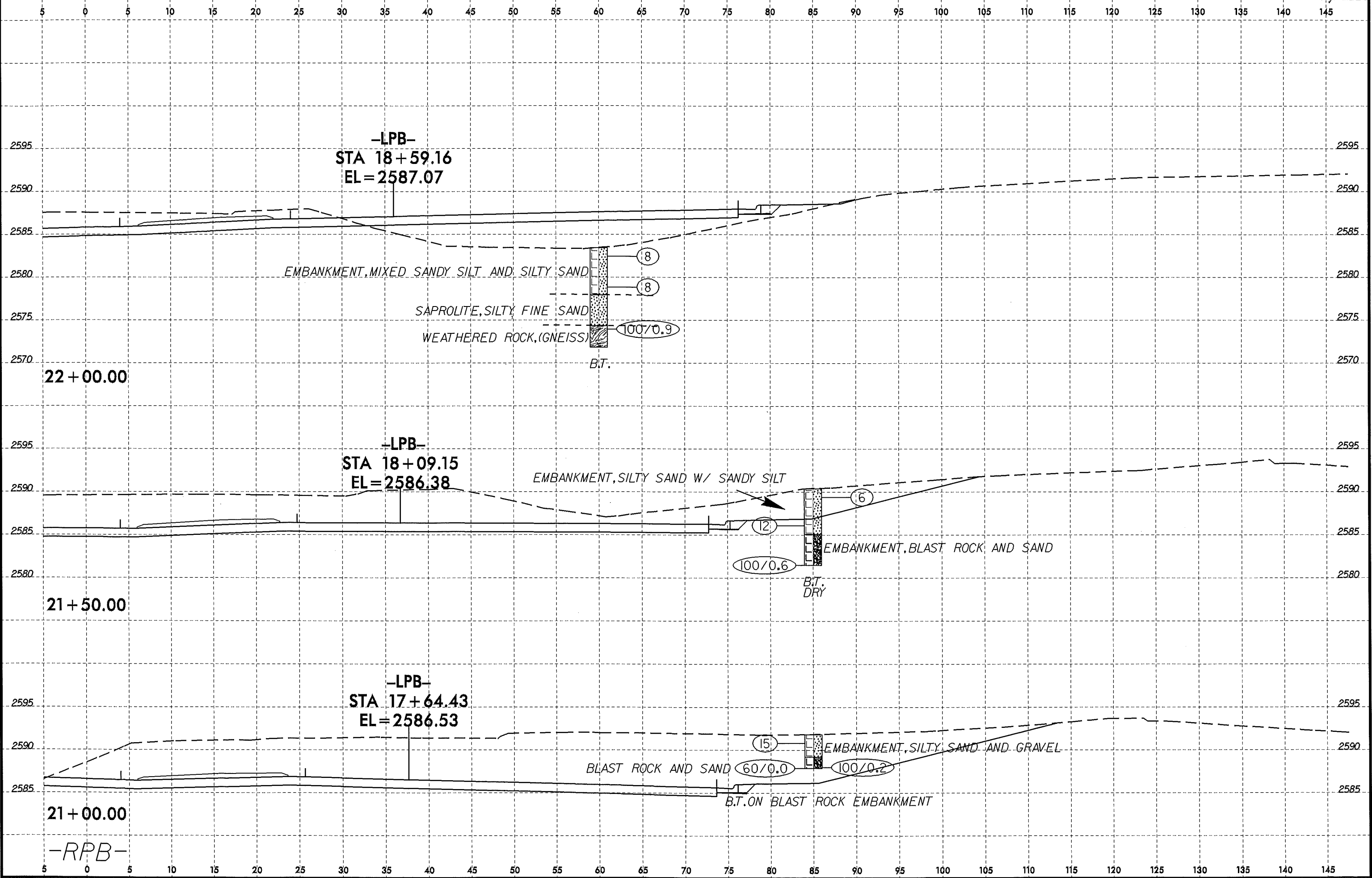
0 2.5 5	PROJ. REFERENCE NO. R-4047	SHEET NO. 26/35
---------	-------------------------------	--------------------



8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-4047	27/35



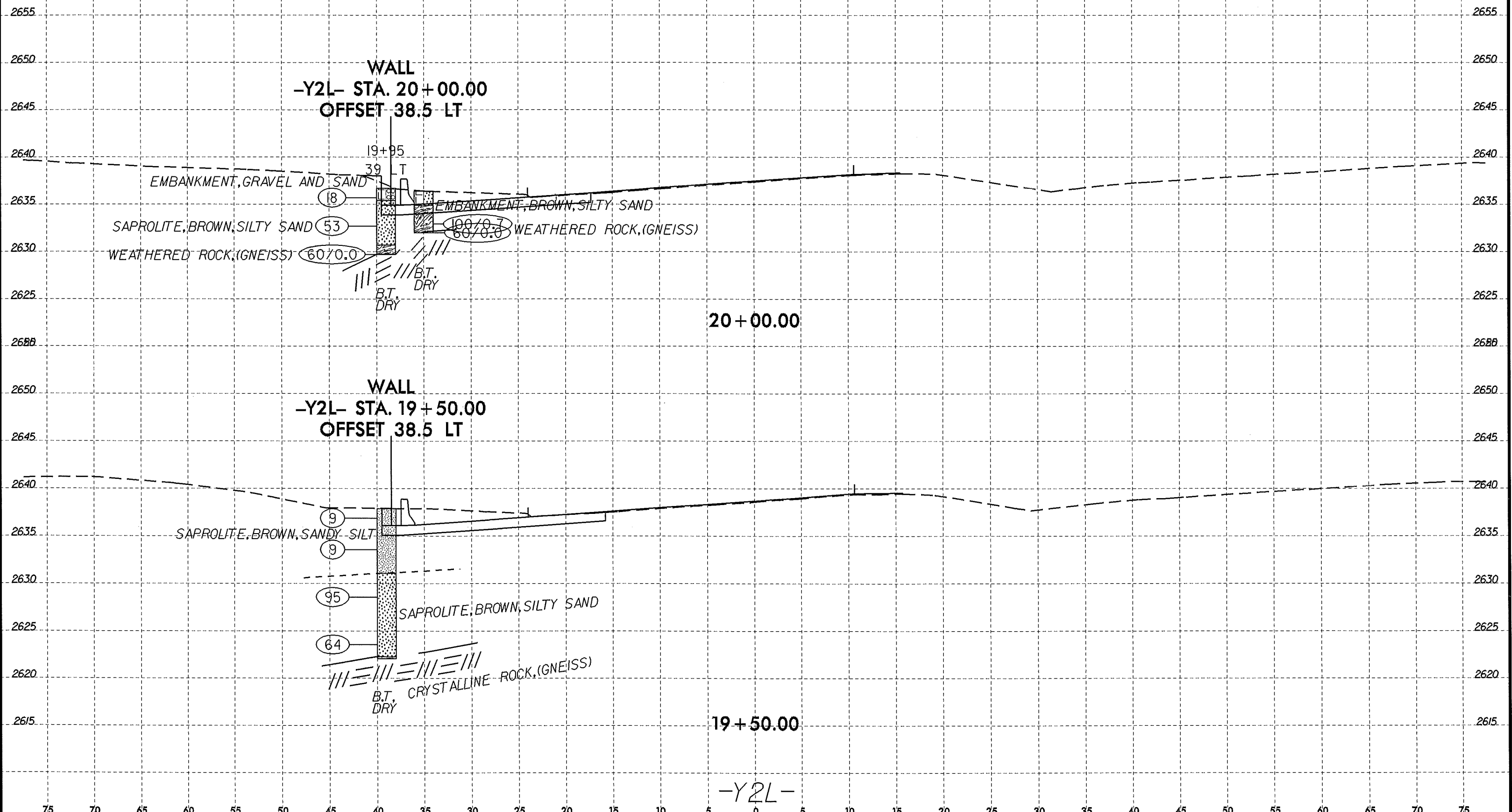
30-JUL-2009 08:05  
 D:\PROJECTS\R4047\_GEO\RDWY\_2009\CADD\_GEO\TECH\XSO\R4047\_GEO\_XSL-RP5-RT.dgn  
 \$\$\$USERNAME\$\$\$

8/23/99

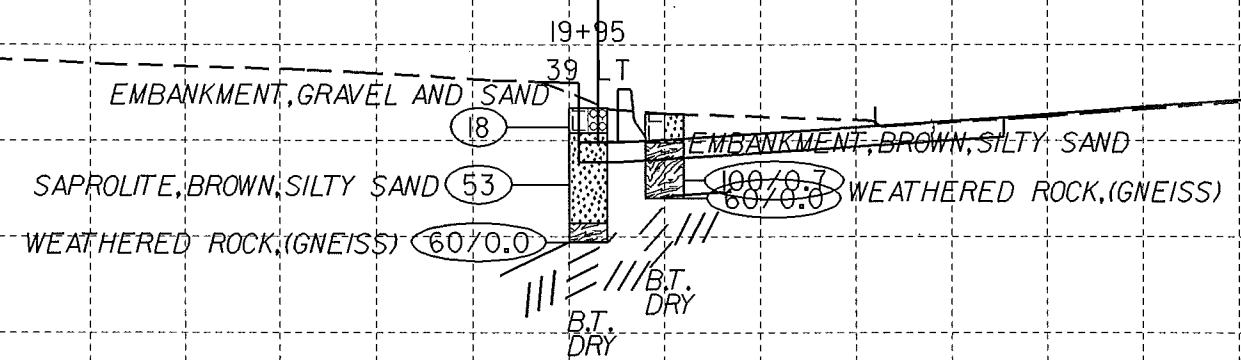


PROJ. REFERENCE NO. R-4047 SHEET NO. 28/35

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

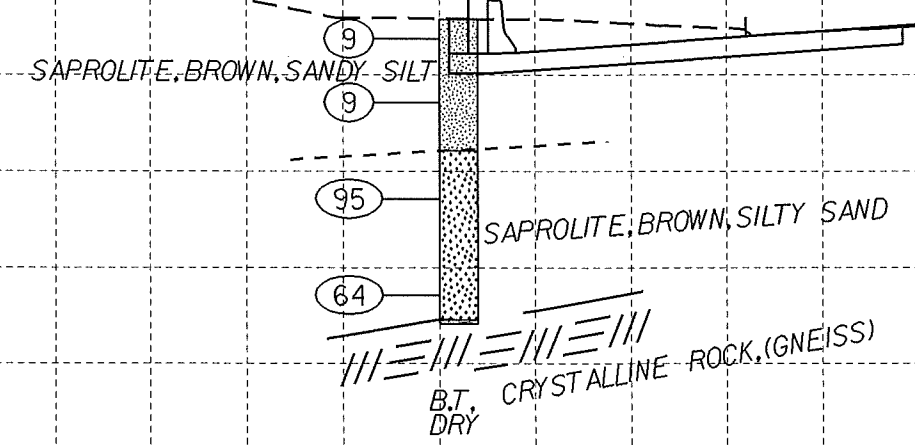


WALL  
-Y2L- STA. 20+00.00  
OFFSET 38.5 LT



20+00.00

WALL  
-Y2L- STA. 19+50.00  
OFFSET 38.5 LT



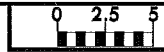
19+50.00

-Y2L-

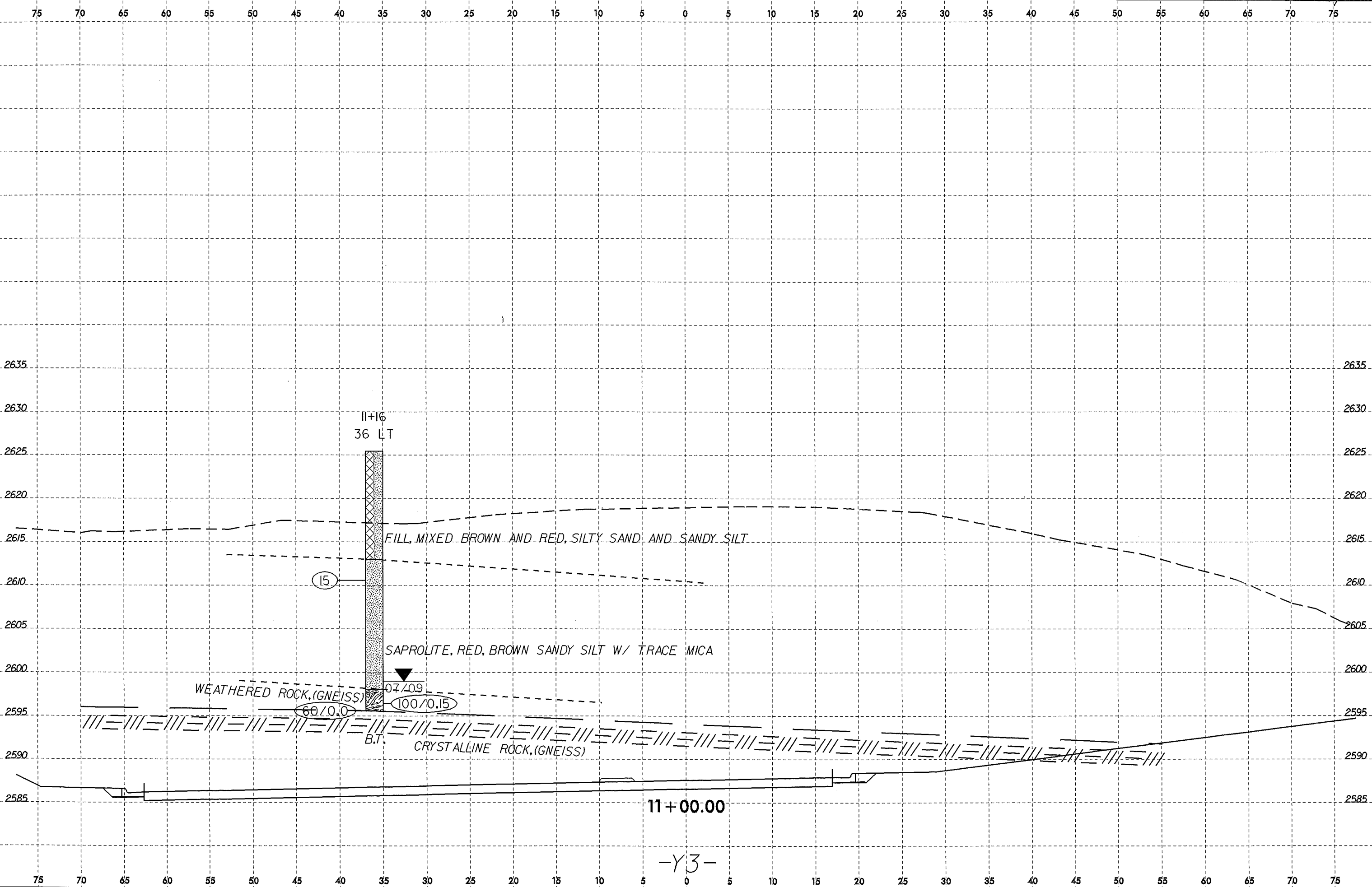
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75

30-JUL-2009 08:30 D:\PROJECTS\194047\_GEO\RDWY\_2009\CADD\GEO\TECH\XSC\194047\_GEO\_xs.j21.dgn \$\$\$USERNAME\$\$\$

8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-4047	29/35

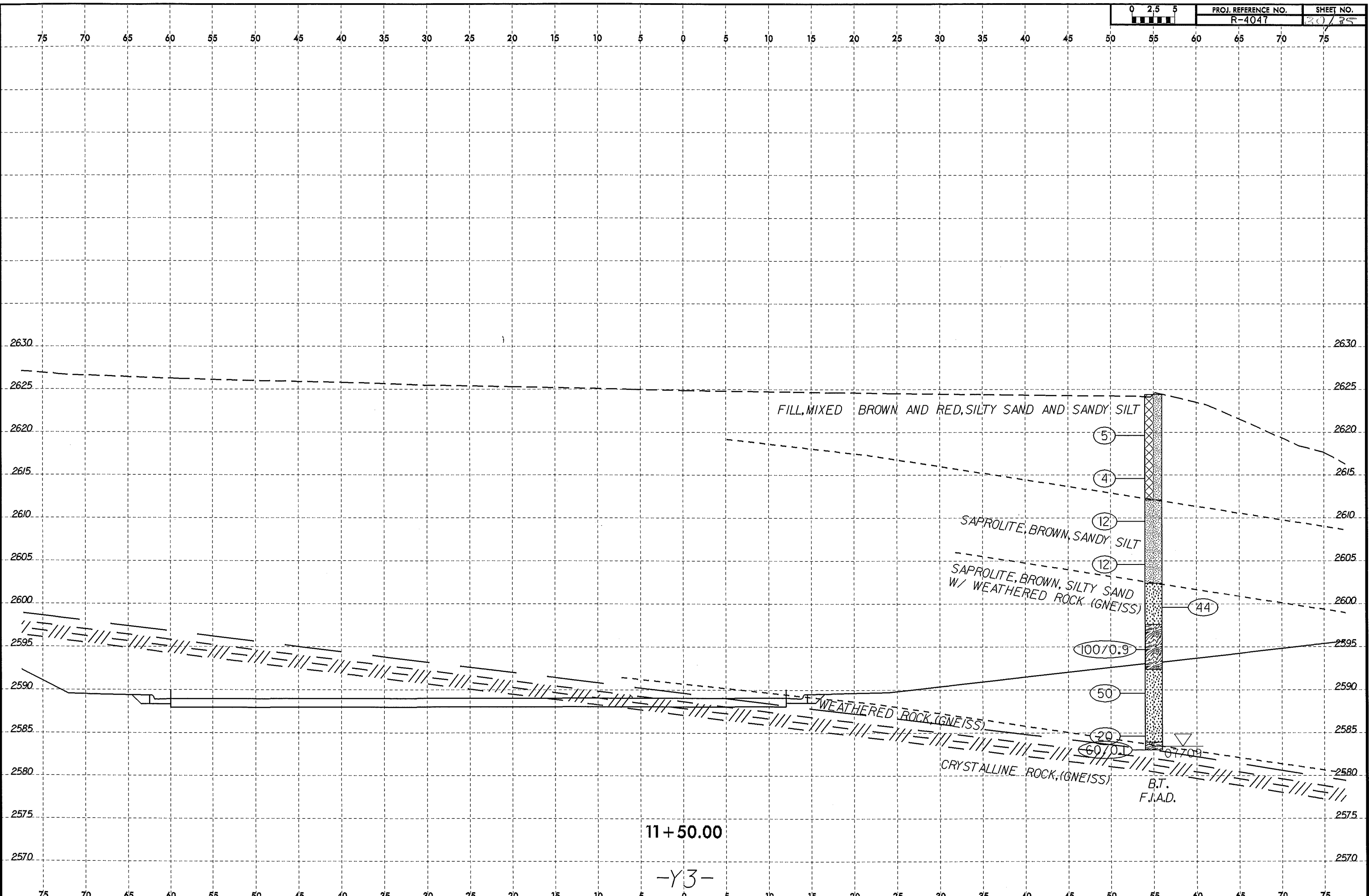


31-JUL-2009 09:43  
 D:\PROJECTS\NR4047\_GEOLOGY\209\CADD\_GEO\TECH\XSEC\NR4047\_GEO\_XSEC\_3.dgn  
 \*\*\*USER NAME\*\*\*

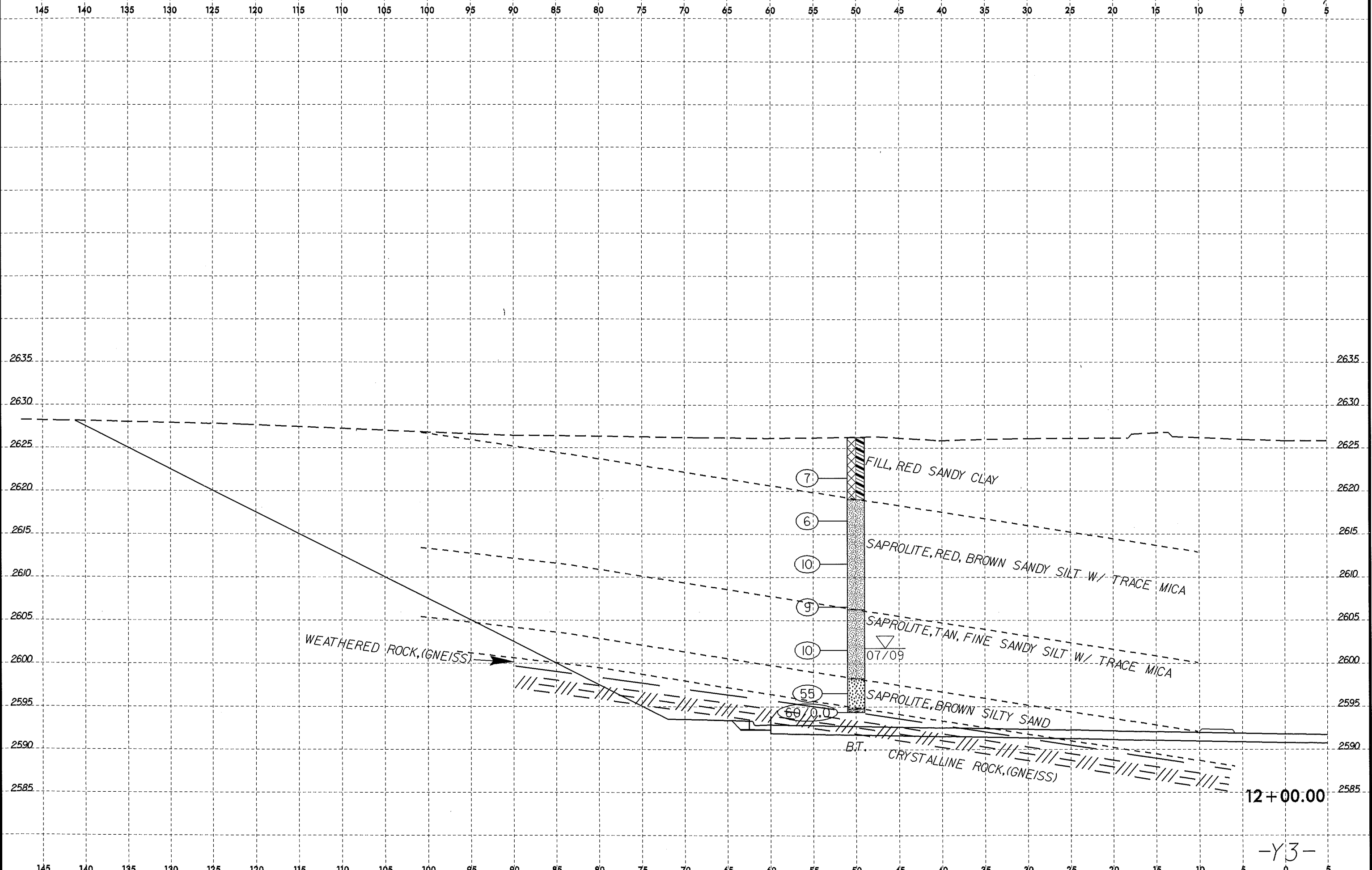
-Y3-



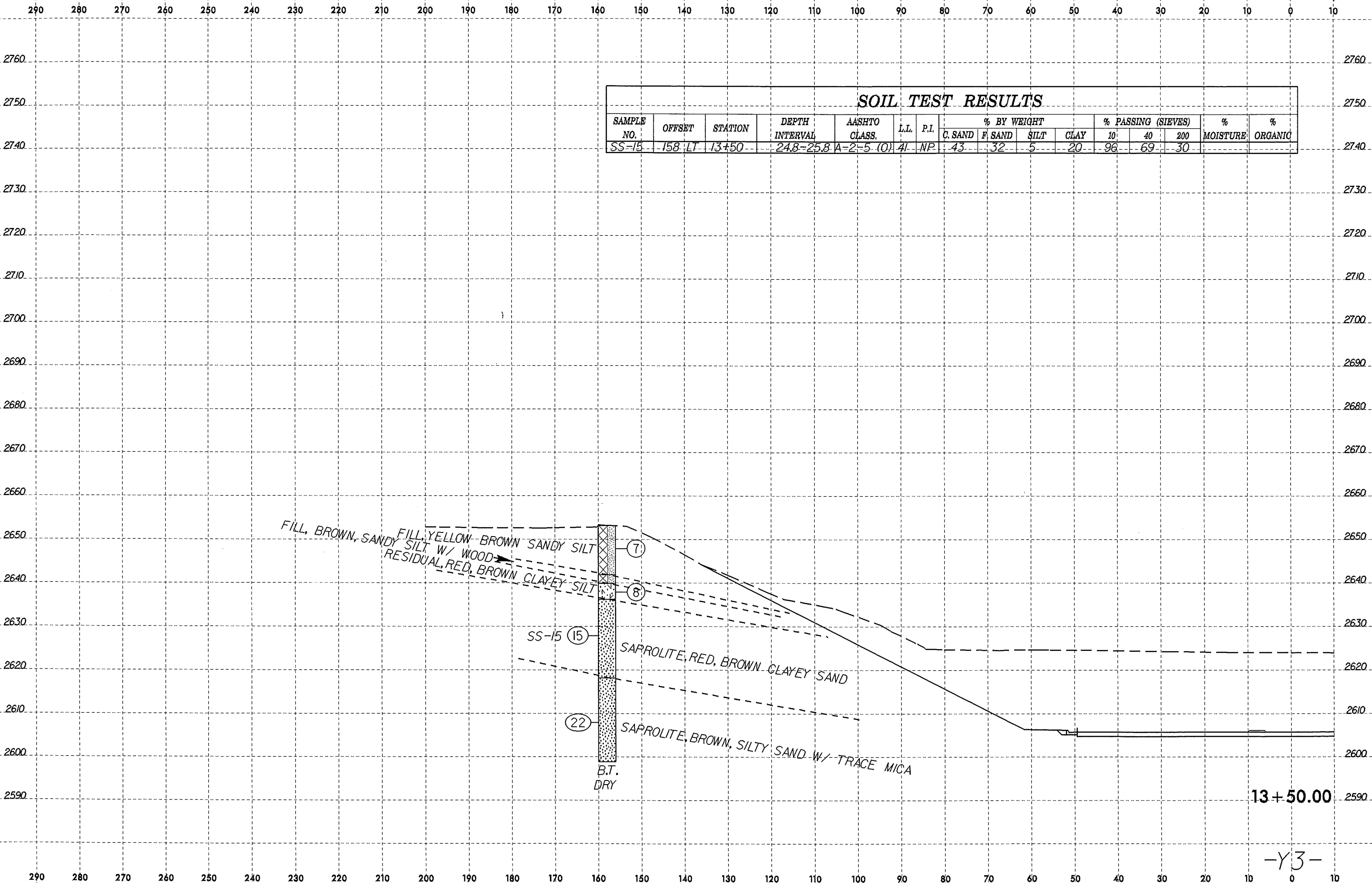
30-JUL-2009 09:28  
D:\PROJECTS\1047\_GEO\_RDWY\_209\CADD\_GEO\TECH\XSEC\R4047\_GEO\_xs.j3.dgn  
\$\$\$\$\$USERNAME\$\$\$\$\$



8/23/99  
30-JUL-2009 08:40  
D:\PROJECTS\1047\_GEO\_RDWY\_209\CADD\_GEO\TECH\XSEC\X4047\_GEO\_xs.j3.5.10.LT.dgn  
\$\$\$\$\$USERNAME\$\$\$\$\$



8/23/99



### 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-15	158 LT	13+50	24.8-25.8	A-2-5 (O)	41	NP	43	32	5	20	96	69	30		

(7) FILL, BROWN, SANDY SILT  
 FILL, YELLOW BROWN SANDY SILT  
 SILT W/ WOOD  
 (8) RESIDUAL, RED, BROWN CLAYEY SILT  
 SS-15 (15)  
 (22) SAPROLITE, RED, BROWN CLAYEY SAND  
 SAPROLITE, BROWN, SILTY SAND W/ TRACE MICA  
 B.T.  
 DRY

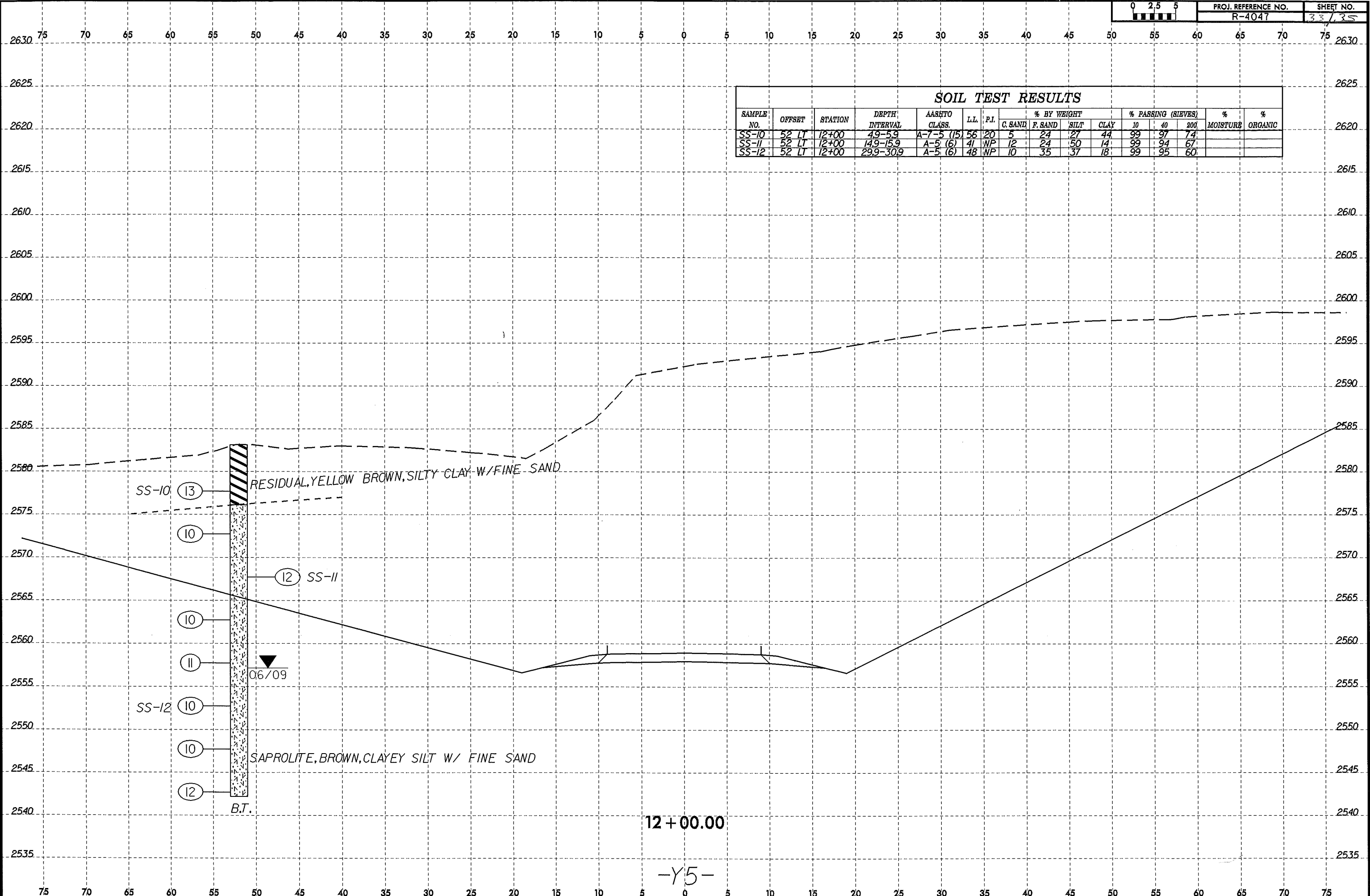
13+50.00

-Y3-

30-JUL-2009 10:15  
 D:\PROJECTS\1047\_GEO\_RDWY\_2009\CADD\GEO\TECH\SSC\1047\_GEO\_XS\_10\_20\_LT.dgn  
 \$\$\$USERNAME\$\$\$

8/23/99

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-10	52 LT	12+00	4.9-5.9	A-7-5 (15)	56	20	5	24	27	44	99	97	74		
SS-11	52 LT	12+00	14.9-15.9	A-5 (6)	41	NP	12	24	50	14	99	94	67		
SS-12	52 LT	12+00	29.9-30.9	A-5 (6)	48	NP	10	35	37	18	99	95	60		



12 + 00.00

-Y5-

30-JUL-2009 09:07  
D:\PROJ\SS\4047\_GEO\_RDWY\_209\CADD\_GEO\TECH\SS\4047\_GEO\_xst.y5.dgn  
\*\*\*USERNAME\*\*\*

JCS  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT  
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #: R-4047

REPORT ON SAMPLES OF: Soils for Quality

PROJECT:	34599.1.1	COUNTY:	Haywood	Owner:	NCDOT
DATE SAMPLED:	6.09	DATE RECEIVED:	6.25.09	DATE REPORTED:	7.13.09
SAMPLED FROM:	n/a	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-1	SS-2	SS-3	SS-4	SS-5	SS-6	SS-7	SS-8
Lab Sample No. A	161044	161045	161046	161047	161048	161049	161050	161051
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Passing #10 Sieve %	74	88	78	85	95	69	91	88
Passing #40 Sieve %	61	68	57	69	72	50	82	72
Passing #200 Sieve %	44	34	27	48	33	29	56	55

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	25	35	39	27	39	38	18	21
Fine Sand - Ret. #270	20	37	41	21	32	24	28	21
Silt 0.05-0.005 mm %	25	22	14	26	23	26	34	28
Clay < 0.005 mm %	30	6	6	26	6	12	20	30
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	35	38	34	36	28	27	42	48
Plastic Index	14	NP	NP	13	NP	NP	NP	18
AASHTO Classification	A-6 (3)	A-2-4 (0)	A-2-4 (0)	A-6 (4)	A-2-4 (0)	A-2-4 (0)	A-5 (4)	A-7-5 (8)
Quantity								
Texture								
Station	39+00	39+00	37+00	36+50	36+50	40+00	39+50	40+50
Hole No.								
Depth (ft) From:	4.0	29.0	9.2	4.4	29.4	10.0	4.5	3.8
To:	5.0	30	10.2	5.4	30.4	11.0	5.8	4.8
	OK	OK	OK	OK	OK	OK	OK	OK

Remarks:

A-161044 - 161051

CC:

P. Q. Lockamy	
File	

SOILS ENGINEER:

JCS  
NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT  
SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #: R-4047

REPORT ON SAMPLES OF: Soils for Quality

PROJECT:	34599.1.1 ( cont. )	COUNTY:	Haywood	Owner:	NCDOT
DATE SAMPLED:	6.09	DATE RECEIVED:	6.25.09	DATE REPORTED:	7.13.09
SAMPLED FROM:	n/a	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-9	SS-10	SS-11	SS-12	SS-13	SS-14		
Lab Sample No. A	161052	161053	161054	161055	161056	161057		
HiCAMS Sample #	--	--	--	--	--	--		
Retained #4 Sieve %	7.6	0.0	0.0	0.0	0.0	0.0		
Passing #10 Sieve %	60	99	99	99	99	100		
Passing #40 Sieve %	40	97	94	95	89	90		
Passing #200 Sieve %	18	74	67	60	62	56		

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	49	5	12	10	17	20		
Fine Sand - Ret. #270	26	24	24	35	28	32		
Silt 0.05-0.005 mm %	19	27	50	37	43	36		
Clay < 0.005 mm %	6	44	14	18	12	12		
Passing # 40 Sieve %	--	--	--	--	--	--		
Passing # 200 Sieve %	--	--	--	--	--	--		

Liquid Limit	34	56	41	48	41	34		
Plastic Index	NP	20	NP	NP	NP	NP		
AASHTO Classification	A-1-b (0)	A-7-5 (15)	A-5 (6)	A-5 (6)	A-5 (5)	A-4 (4)		
Quantity								
Texture								
Station	40+50	12+00	12+00	12+00	42+50	42+50		
Hole No.								
Depth (ft) From:	8.8	4.9	14.9	29.9	24.0	39.0		
To:	9.8	5.9	15.9	30.9	25.0	40.0		
	OK	OK	OK	OK	OK	OK		

Remarks:

A-161052 - 161057

CC:

P. Q. Lockamy	
File	

SOILS ENGINEER:

JCS  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT  
 SOILS TEST REPORT-SOILS LABORATORY

JCS  
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT  
 SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #: R-4047

T.I.P. ID #: R-4047

REPORT ON SAMPLES OF: Soils for Quality

REPORT ON SAMPLES OF: Soils for Quality

PROJECT:	34599.1.1	COUNTY:	n/a	Owner:	NCDOT
DATE SAMPLED:	6.09	DATE RECEIVED:	7.7.09	DATE REPORTED:	7.20.09
SAMPLED FROM:	n/a	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

PROJECT:	34599.1.1	COUNTY:	n/a	Owner:	NCDOT
DATE SAMPLED:	6.09	DATE RECEIVED:	7.7.09	DATE REPORTED:	7.20.09
SAMPLED FROM:	n/a	SAMPLED BY:	P. Q. Lockamy		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-15	SS-16	SS-17	SS-18	SS-19	SS-20	SS-21	SS-22
Lab Sample No. A	161170	161171	161172	161173	161174	161175	161176	161177
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	1.2	0.0	0.0	0.0	0.0
Passing #10 Sieve %	96	99	90	92	99	98	99	92
Passing #40 Sieve %	69	80	75	75	92	85	90	67
Passing #200 Sieve %	30	43	49	49	68	44	40	33

TEST RESULTS

Project Sample No.	SS-23	SS-24	SS-25	SS-26	SS-27	SS-28
Lab Sample No. A	161178	161179	161180	161181	161182	161183
HiCAMS Sample #	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	6.9	0.0	0.0	0.0
Passing #10 Sieve %	83	96	80	97	99	99
Passing #40 Sieve %	59	77	60	90	85	87
Passing #200 Sieve %	27	50	33	66	47	42

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	43	31	27	29	13	25	23	41
Fine Sand - Ret. #270	32	35	23	22	24	44	40	29
Silt 0.05-0.005 mm %	5	16	14	8	35	3	17	10
Clay < 0.005 mm %	20	18	36	41	28	28	20	20
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	43	28	37	14	26	28		
Fine Sand - Ret. #270	35	26	27	25	37	39		
Silt 0.05-0.005 mm %	2	16	20	41	23	19		
Clay < 0.005 mm %	20	30	16	20	14	14		
Passing # 40 Sieve %	--	--	--	--	--	--		
Passing # 200 Sieve %	--	--	--	--	--	--		

Liquid Limit	41	36	37	36	48	42	41	36
Plastic Index	NP	NP	9	11	NP	NP	NP	NP
AASHTO Classification	A-2-5 (0)	A-4 (1)	A-4 (3)	A-6 (3)	A-5 (8)	A-5 (2)	A-5 (1)	A-2-4 (0)
Quantity								
Texture								
Station	13+50	19+50	20+12	20+12	20+00	19+50	19+50	19+00
Hole No.								
Depth (ft) From:	24.8	3.8	4.3	14.3	14.6	9.4	n/a	19.5
To:	25.8	4.8	5.3	15.3	15.6	10.4	n/a	20.5
	OK	OK	OK	OK	OK	OK	OK	OK

Liquid Limit	37	34	28	41	38	37		
Plastic Index	NP	NP	NP	9	NP	NP		
AASHTO Classification	A-2-4 (0)	A-4 (3)	A-2-4 (0)	A-5 (6)	A-4 (2)	A-4 (1)		
Quantity								
Texture								
Station	17+50	16+00	16+00	16+00	16+00	15+50		
Hole No.								
Depth (ft) From:	19.3	4.3	9.3	19.3	29.3	14.9		
To:	20.3	5.3	10.3	20.3	30.3	15.9		
	OK	OK	OK	OK	OK	OK		

Remarks:

A-161170 - 161177

CC:

P. Q. Lockamy	
File	

Remarks:

A-161178 - 161183

CC:

P. Q. Lockamy	
File	

SOILS ENGINEER:

SOILS ENGINEER: