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STATE	STATE PROJECT REFERENCE NO.		SHEET NO.	TOTAL SHEETS
N.C.	34518.1.3	R-2915B	1	56

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
	STP-0221(40)	P.E.
		R/W & UTIL.

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

CONTENTS

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34518.1.3 R-2915B F.A. PROJ. STP-0221(40)

COUNTY ASHE

PROJECT DESCRIPTION US 221 FROM SR 1003 (IDLEWILD ROAD) TO NORTH OF THE SOUTH FORK OF THE NEW RIVER

INVENTORY

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) 707-6850. 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
DC ELLIOTT
DO CHEEK
C COFFEY

INVESTIGATED BY JW MANN
CHECKED BY JC KUHNE
SUBMITTED BY JW MANN
DATE SEPTEMBER 2013

NORTH CAROLINA LICENSED SEAL 1941 GEOLOGIST JOHN W. MANN 9/19/13

DRAWN BY: JW MANN

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: R-2915B

CONTRACT: 34518.1.3

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

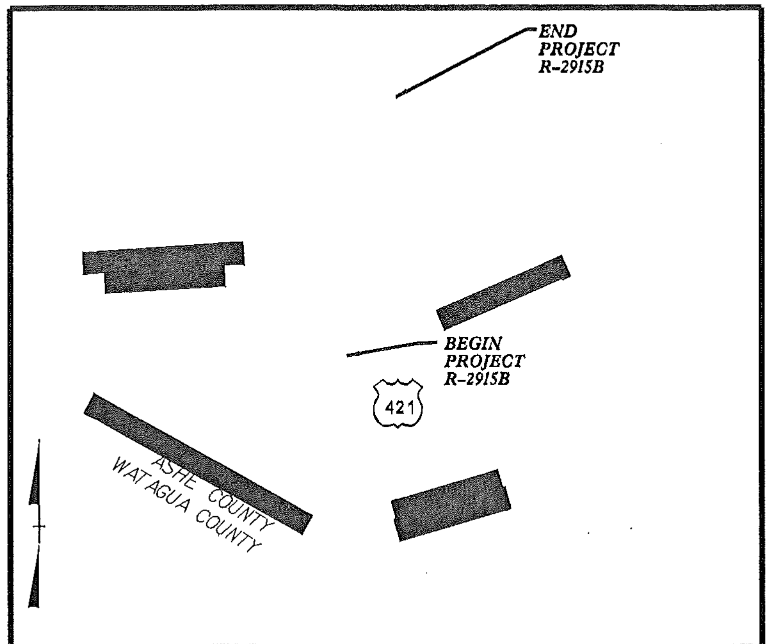
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2915B	1A	56
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34518.1.3	STP-0221(40)	P.E.	

ASHE COUNTY

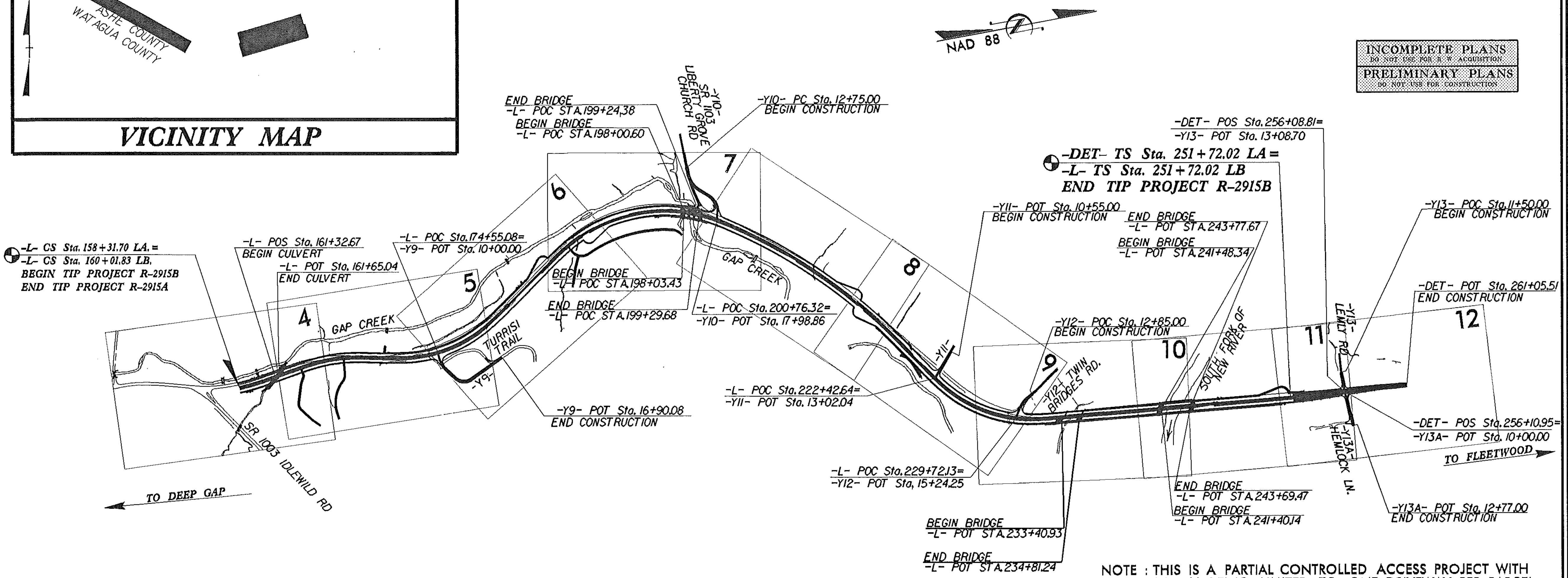
LOCATION: US 221 FROM SR 1003 (IDLEWILD ROAD) TO NORTH OF SOUTH FORK NEW RIVER

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURES



VICINITY MAP

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



NOTE : THIS IS A PARTIAL CONTROLLED ACCESS PROJECT WITH ACCESS BEING LIMITED TO ONE DRIVEWAY PER PARCEL.

THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ___

NCDOT CONTACT: BRENDA L. MOORE, P.E.

TIP PROJECT: R-2915B

CONTRACT:

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 2015	=	12,089
ADT 2035	=	20,204
DHV	=	10 %
D	=	65 %
T	=	9 % *
V	=	50 MPH

* TTST 2% DUAL 7%

FUNC CLASS = ARTERIAL STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2915B	=	1.675 MILES
LENGTH STRUCTURE TIP PROJECT R-2915B	=	0.094 MILES
TOTAL LENGTH TIP PROJECT R-2915B	=	1.769 MILES

Prepared in the Office of:

CDM Smith

5400 Glenwood Avenue, Suite 300, Raleigh, NC 27612

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 27, 2013

LETTING DATE: SEPTEMBER 15, 2015

DOUGLAS B. SAUNDERS, P.E.
PROJECT ENGINEER

RICKY E. STATON
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

09/08/99

J:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\PlanProf\R2915B_RDY_TSH_01.dgn
jwmann AT GEA266093

PROJECT REFERENCE NO.	SHEET NO.
R-2915B 34518.1.3	2 OF 56

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		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 LOOSE MEDIUM DENSE DENSE VERY DENSE	<4 4 TO 10 10 TO 30 30 TO 50 >50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	<2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 >30	<0.25 0.25 TO 0.50 0.5 TO 1.0 1 TO 2 2 TO 4 >4

TEXTURE OR GRAIN SIZE

U.S. STD. SIEVE SIZE	4	10	40	60	200	270
OPENING (MM)	4.76	2.00	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		
	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PLASTIC RANGE (PI)		
PL — PLASTIC LIMIT		
	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
OM — 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, DPT, 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
- [X] CME-550
- [ ] PORTABLE HOIST
- [ ] _____
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [X] 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
- [ ] 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: NA

ELEVATION: FT.

NOTES:

REVISED 09/23/09

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

PAT McCRORY
GOVERNOR

ANTHONY J. TATA
SECRETARY

September 23, 2013

STATE PROJECT: 34518.1.3 (R-2915B)
COUNTY: Ashe
DESCRIPTION: US 221 from SR 1003 (Idlewild Road) to North of the South Fork of the New River

SUBJECT: Geotechnical Report – Inventory

PROJECT DESCRIPTION

This project starts at the southern tip of Ashe County and just below the border of Watauga County. The "B" project section begins at SR 1003, continues 1.8 miles in a northerly trend and terminates north of the South Fork New River. Proposed construction consists of widening two-lanes to four-lanes with minor vertical and horizontal alignment changes along existing -L-. It is anticipated that existing culverts and pipes will be extended. The terrain is mountainous but does not include unusually large cuts and fills. The following alignments were investigated:

-L- Stations 158+32 – 251+72
-Y9- Stations 10+00 – 16+90

The total length of lines investigated is 1.9 miles. The field investigation was conducted in June/July 2013. All borings were conducted with a CME-550 drill machine with an automatic hammer. Standard Penetration Tests were performed utilizing Hollow Stem Augers with carbide insert teeth in the head stem.

AREAS OF SPECIAL GEOTECHNICAL INTEREST

Crystalline Rock: Weathered to crystalline rock should be expected within 6′ of grade in the following Station intervals:

162+50 – 170+00
176+00 – 180+00
184+00 – 187+00
191+00 – 195+00
213+00

SOIL PROPERTIES

Soils on the project are derived from amphibolite gneiss rock (Zabg) encountered within the project corridor. The dominant residual and saprolitic soil types encountered are silty sand and sandy silt with varying amounts of mica and manganese oxide. Weathered and crystalline rock may require blasting and is unlikely to produce durable stone for use on the project.

Respectfully submitted,

John Mann. PG
Project Geological Engineer

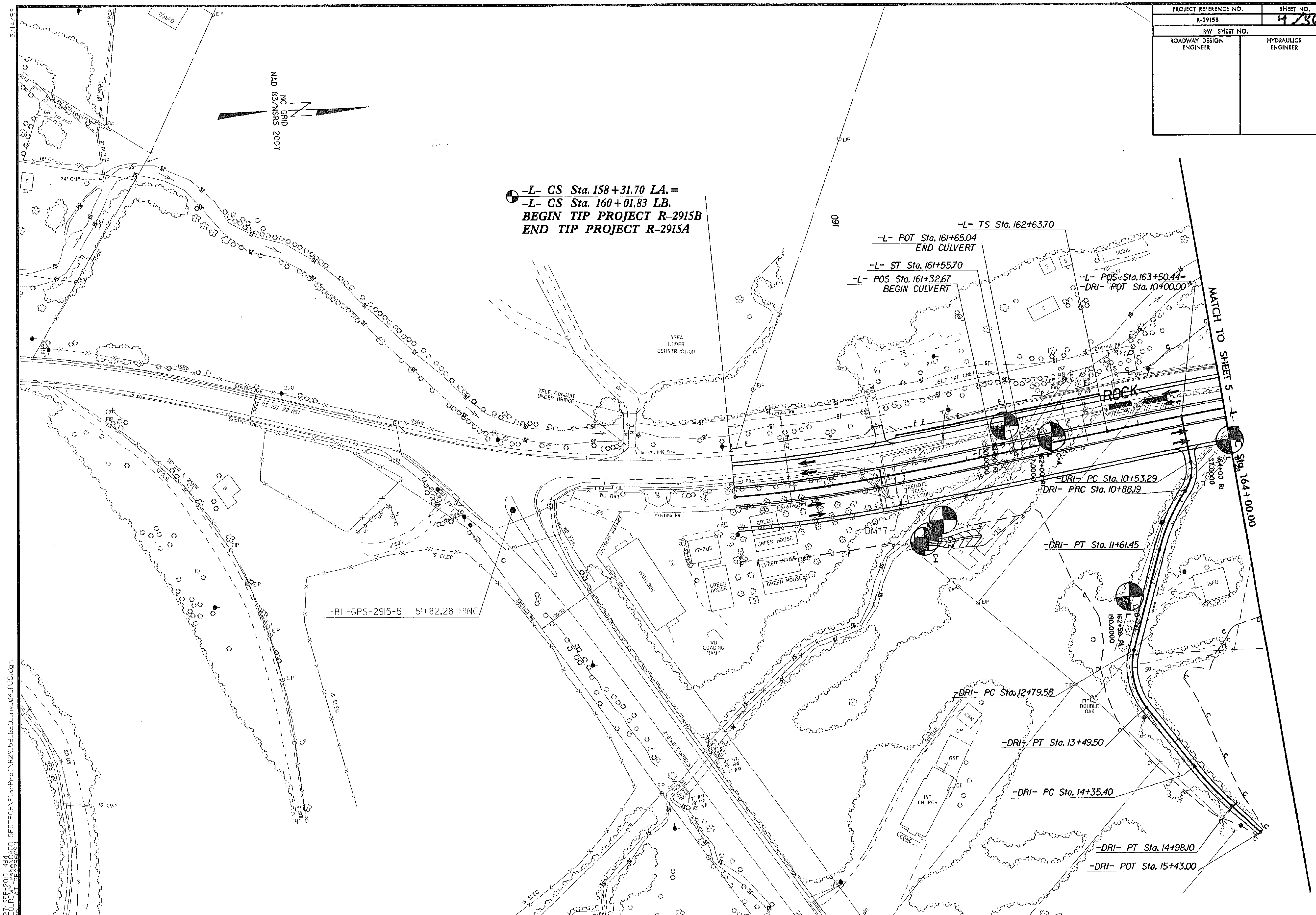
MAILING ADDRESS:
NC DEPARTMENT OF TRANSPORTATION
GEOTECHNICAL ENGINEERING UNIT
1589 MAIL SERVICE CENTER
RALEIGH NC 27699-1589

TELEPHONE: 919-707-6850
FAX: 919-250-4237

WEBSITE:
www.ncdot.gov/doh/preconstruct/highway/geotech

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

PROJECT REFERENCE NO.	SHEET NO.
R-2915B	4/56
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2915B	5 OF 6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83/NSRS 2007 NC GRID

-L- SC Sta. 165+69.70

-L- CS Sta. 166+59.74

-BL-46 160+64.01 PINC
-L- POS Sta. 164+57.70
- 59.72' LT

-L- POS Sta. 167+00.00
-DR2- POT Sta. 10+00.00
-L- SRS Sta. 169+65.74

-L- SC Sta. 172+71.74

-L- POC Sta. 174+55.08=
-Y9- POT Sta. 10+00.00

-BL- 47 169+98.73 PINC
-L- POC Sta. 173+86.62
- 21.84' LT

-L- POC Sta. 164+00.00

MATCH TO SHEET 4

MATCH TO SHEET 6

-L- POC SR. 177+00.00

-L- POT SR. 15+00.00

-Y9- POT SR. 15+00.00

B-28 L 164+00 RI 37.0000

B-29 L 165+00 RI 22.0000

B-30 L 167+00 RI 70.0000

B-31 L 168+50 RI 125.0000

B-32 L 169+92 RI 50.0000

B-33 L 176+00 RI 45.0000

Y9-1 Y9 12+00 RI 14.0000

Y9-2 Y9 15+00 RI 40.0000

Y9-3 Y9 17+00 RI 100.0000

Y9-4 Y9 14+00 RI 60.0000

Y9-5 Y9 14+50 RI 60.0000

-DR2- PC Sta. 11+21.48

-DR2- PRC Sta. 11+93.20

-DR2- PT Sta. 14+59.21

-DR2- POT Sta. 14+90.00
END CONSTRUCTION

-DR2- POT Sta. 15+06.93

-Y9- PC Sta. 10+55.24

-Y9- PT Sta. 11+49.53

-Y9- PC Sta. 12+55.49

-Y9- PT Sta. 13+92.44

US 221 2F BST

EXISTING RW

EXISTING RR

ISFBUS

ISFD

HTR

WO

W/LT

CAT-1

RIPRAP

WD RAIL

DEEP GAP CREEK

Possible Spring

SOIL

GR

JS

F

EIP

27-SEP-2013 13:52
3.GEO_ROW_Aerial\GEO_GEOTECH\PlanProf\R2915B_GEO_inv_05_PJS.DGN

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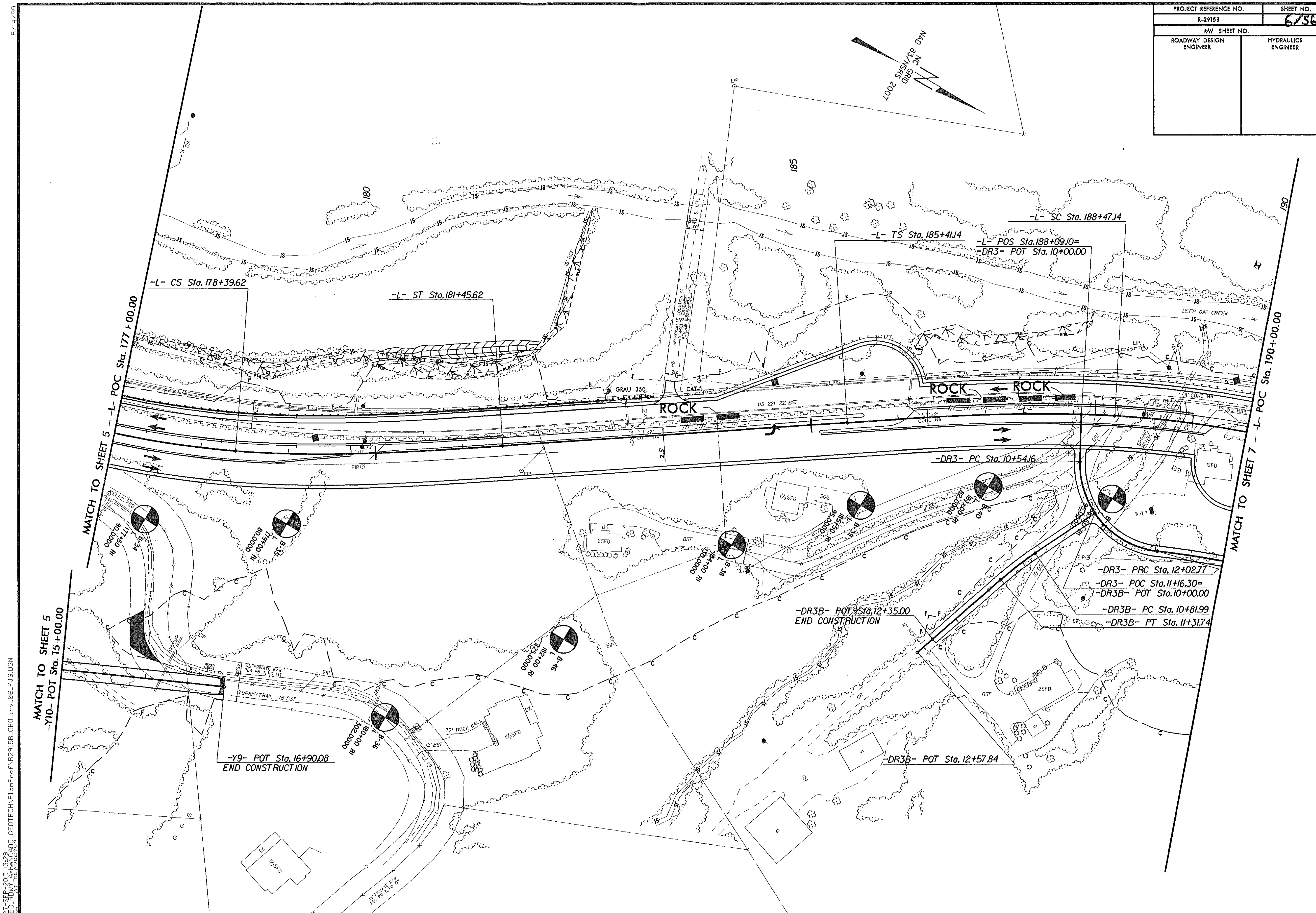

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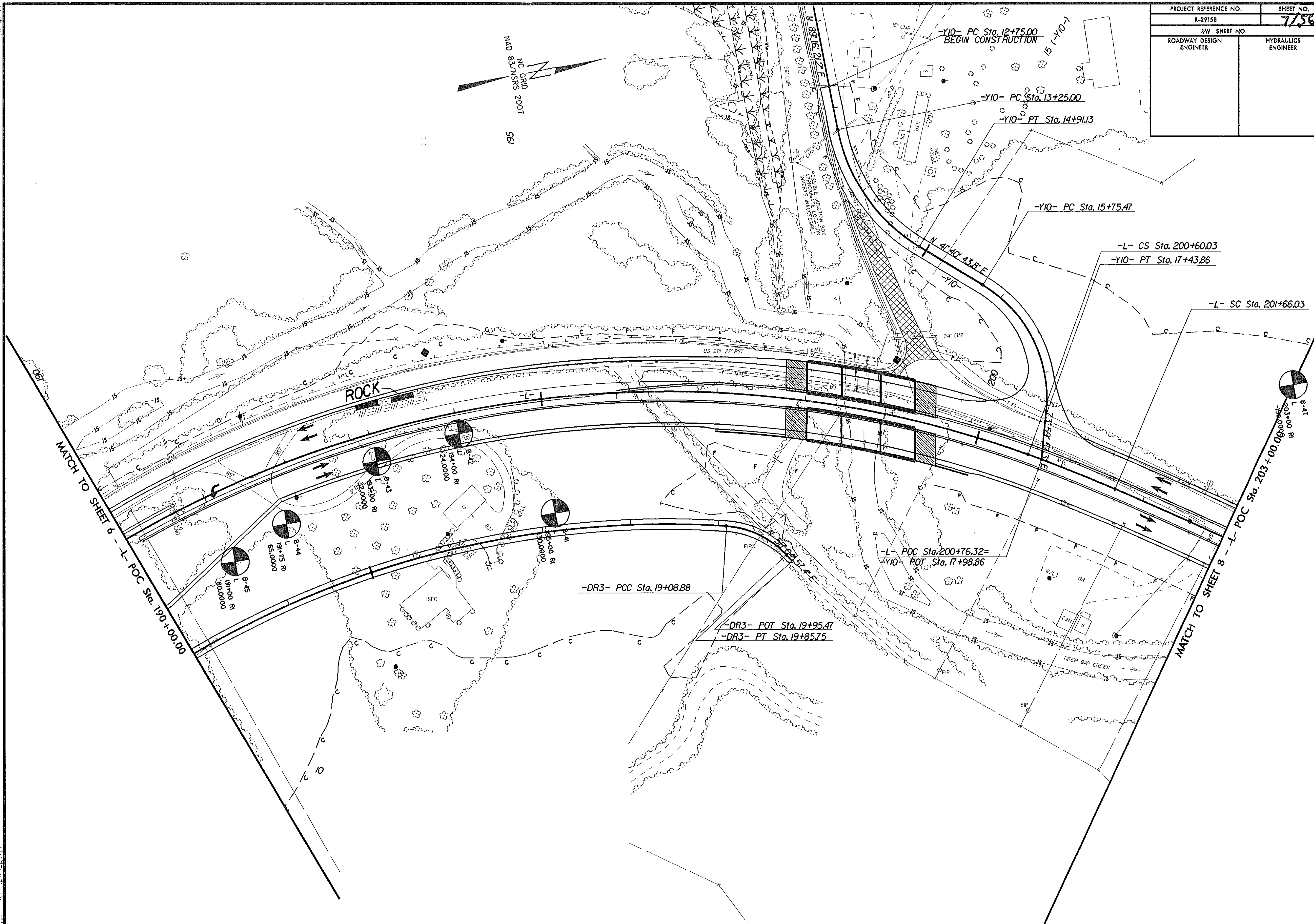

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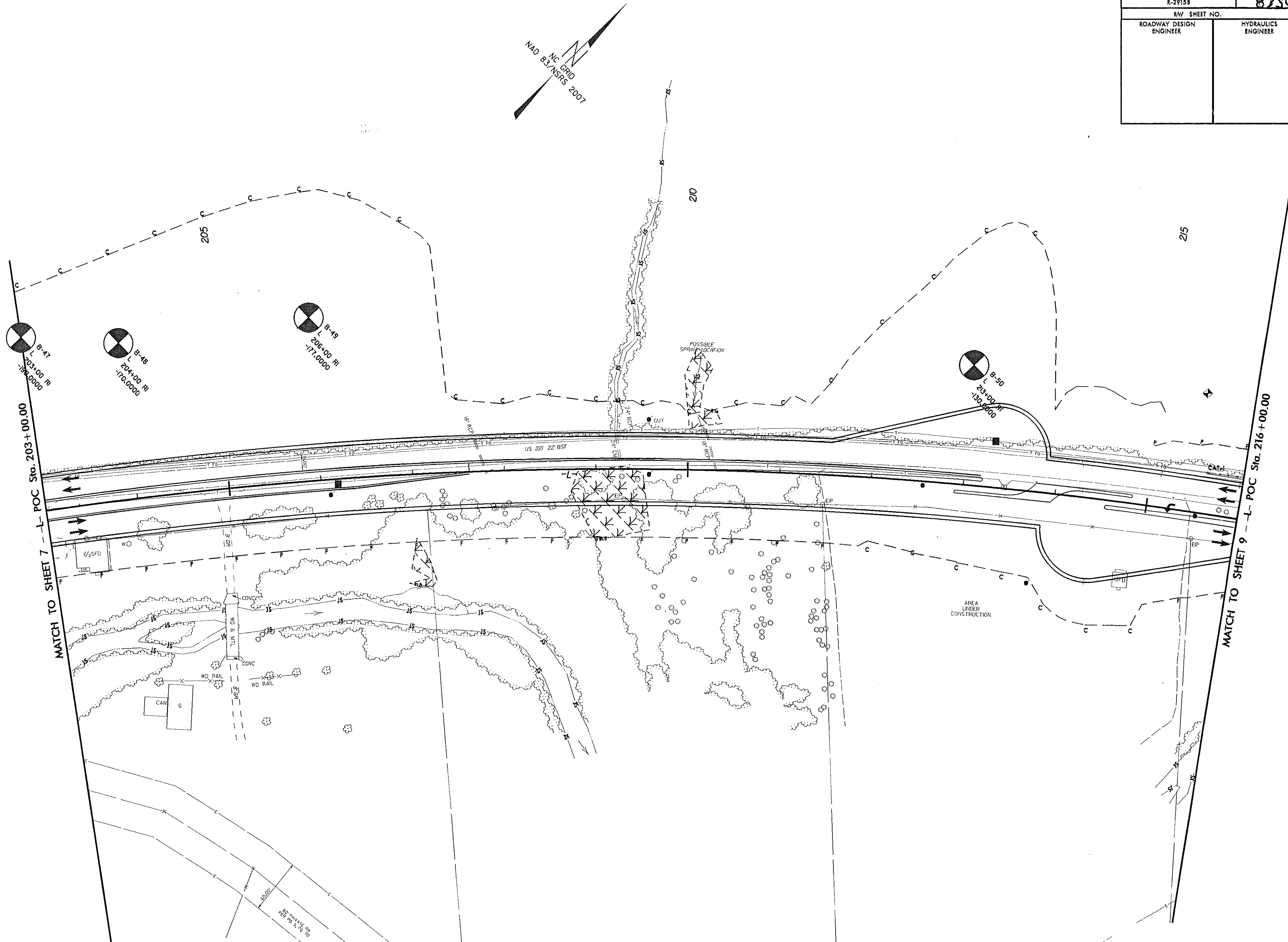

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8/23/99

0 5 10

PROJ. REFERENCE NO. R-2915B

SHEET NO. 9 TSC

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2905.52 ℄ G.E.2905.70

0.020

C-2 L 160+60 61

C-1 L 160+40 77

C-3 L 160-35 81

3:56:1

2:1

160+50.00
EX. EL. 2899.87

ARTIFICIAL FILL, SILT

ALLUVIAL, clayey sandy SILT with pebbles, organics

ALLUVIAL, COBBLES & GRAVEL

SAPROLITE, slightly micaceous silty SAND

WEATHERED ROCK, (amphibolite-gneiss with interlayered saprolite)

ALLUVIAL, Brown clayey sandy SILT with pebbles, organics

ALLUVIAL, GRAVEL & COBBLES

CRYSTALLINE ROCK, AMPHIBOLITE GNEISS

06/13 06/13 06/13

WOH 2 58 100/0.8 100/0.6 60/0.0 60/0.0

-4-

17-SEP-2013 17:22
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wmann
Default
GEH2650943

8/23/99

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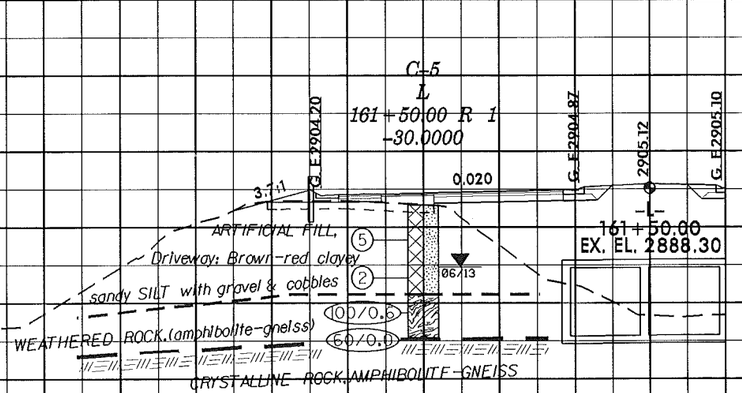

161+50.00

-L-

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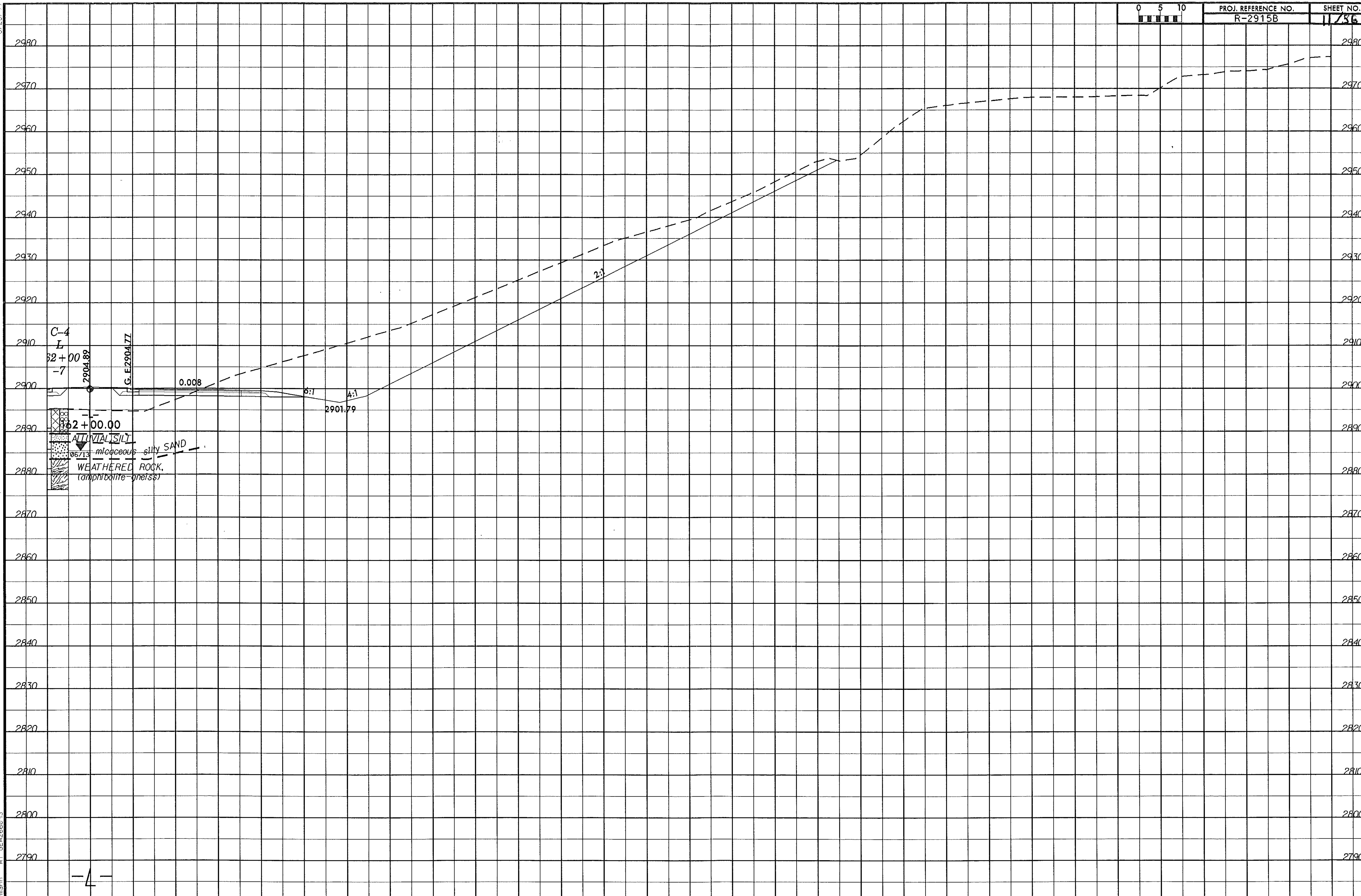
smason



0 5 10
C-4
L
62+00
-7
2904.89
G. E.2904.77
0.008
6:1
4:1
2901.79
2:1
162+00.00
ALLUVIAL SILT
06/13
micaceous silty SAND
WEATHERED ROCK,
(amphibolite-gneiss)
2980
2970
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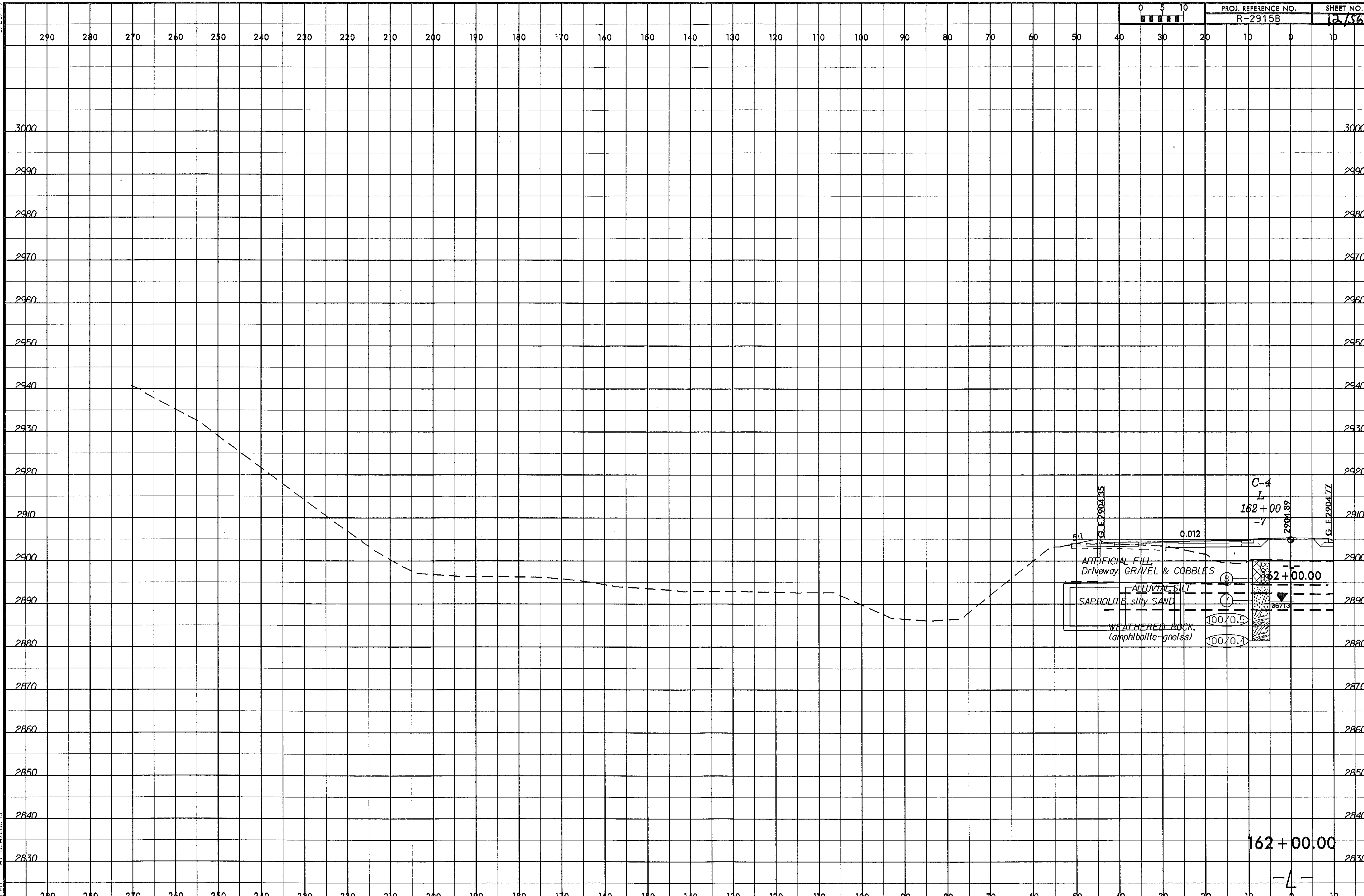
2800
2790
-L-



162 + 00.00

-L-

8/23/99

0 5 10

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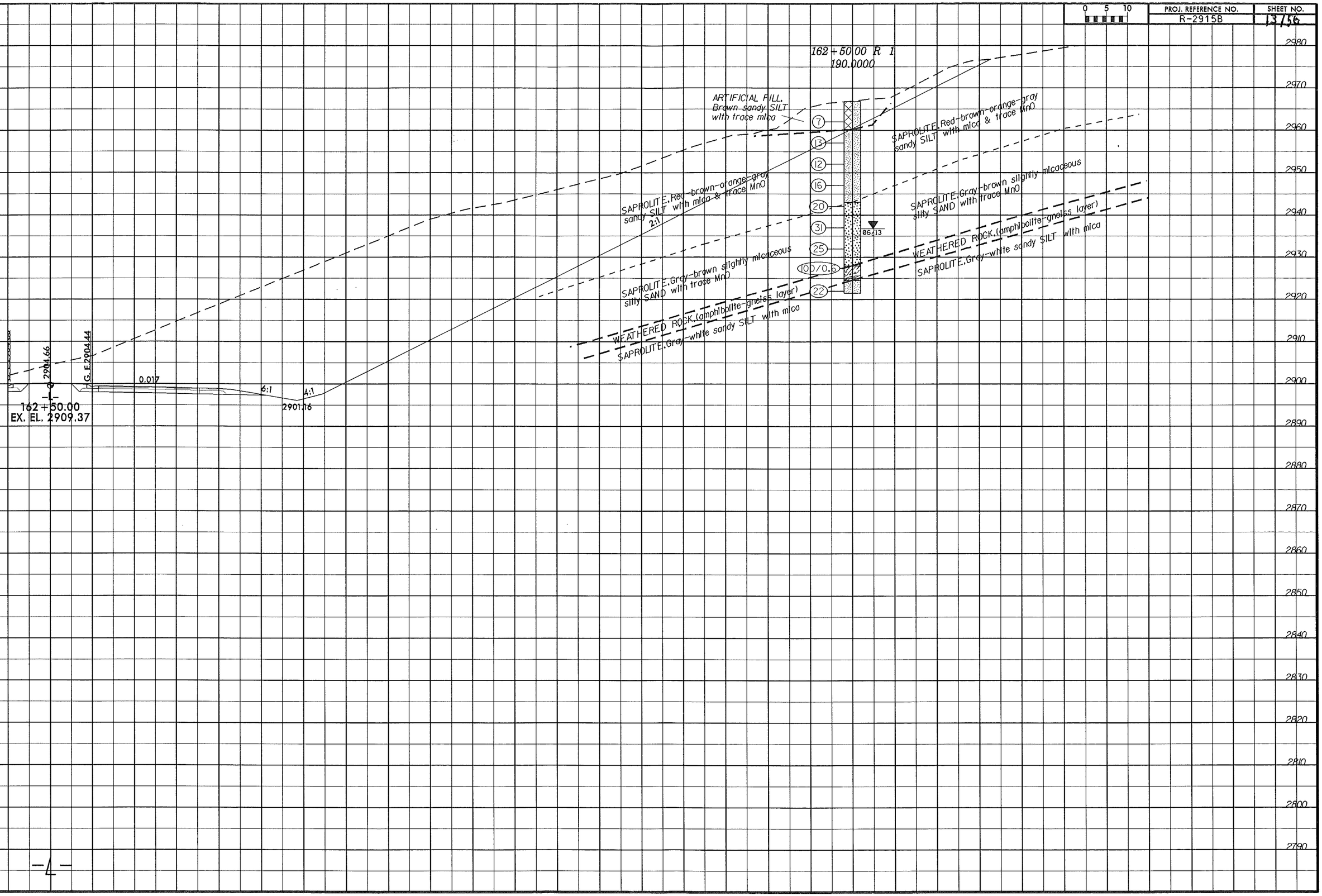

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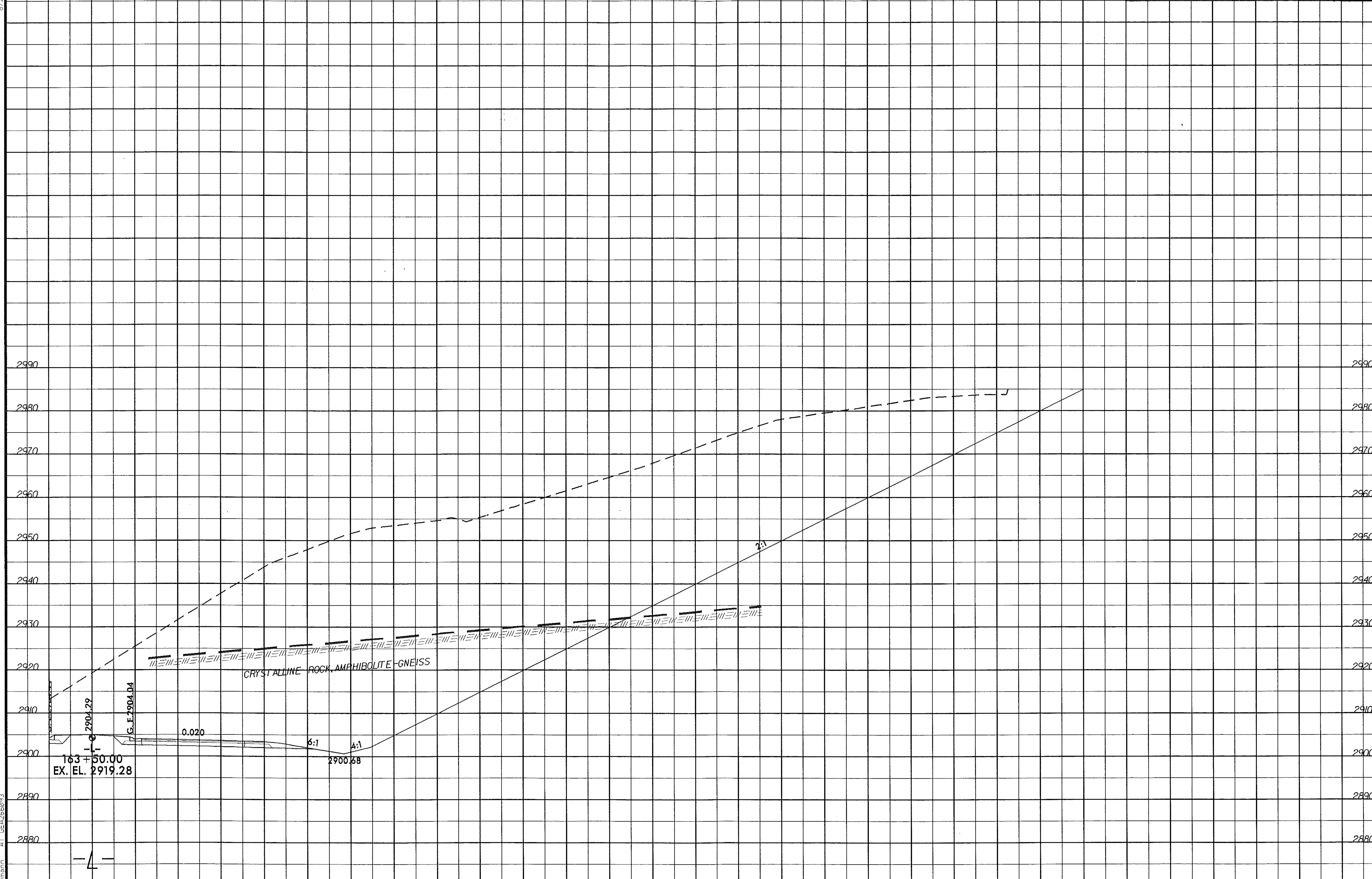

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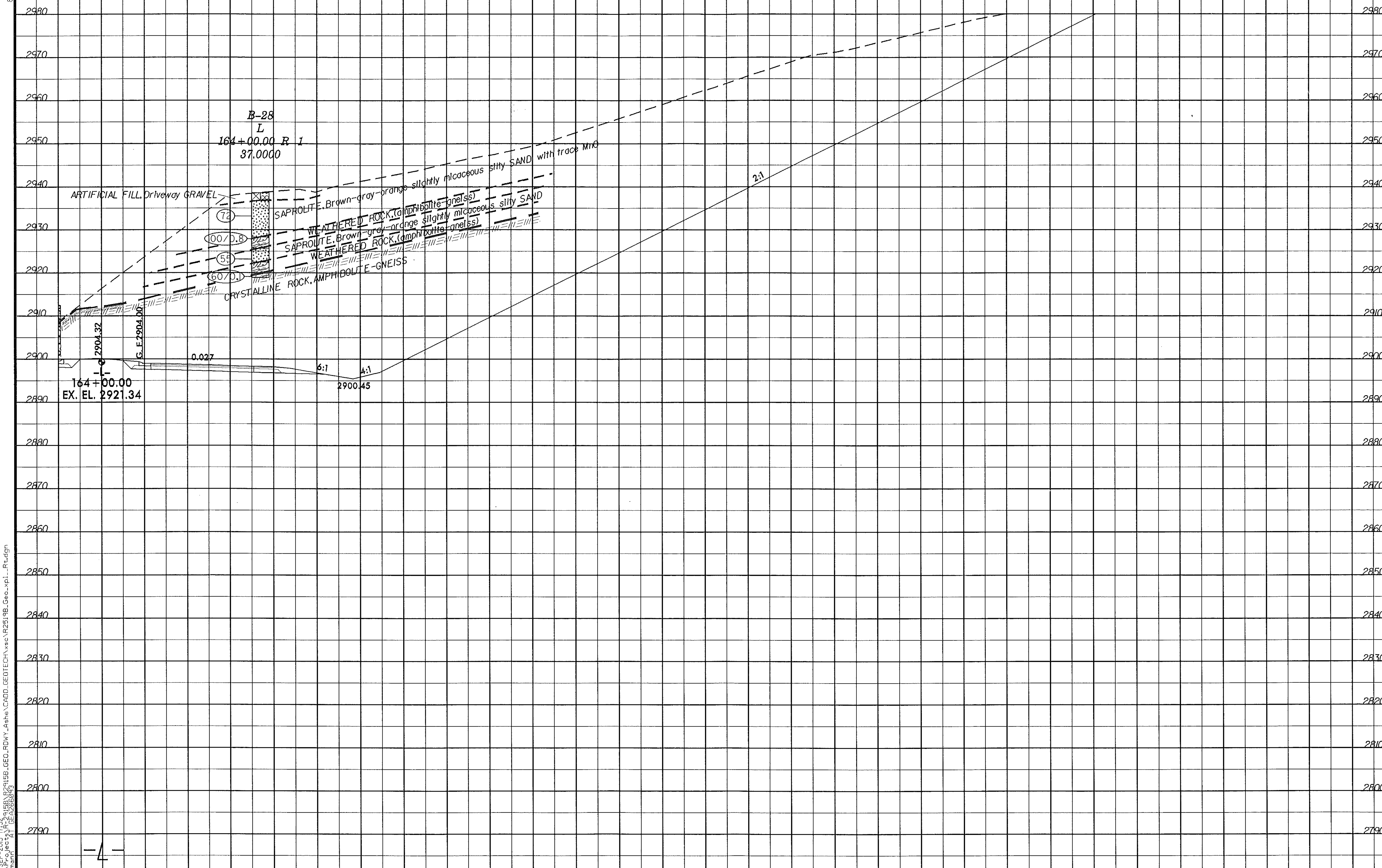

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lwmann AT GEA266093

8/23/99

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2990
2980
2970
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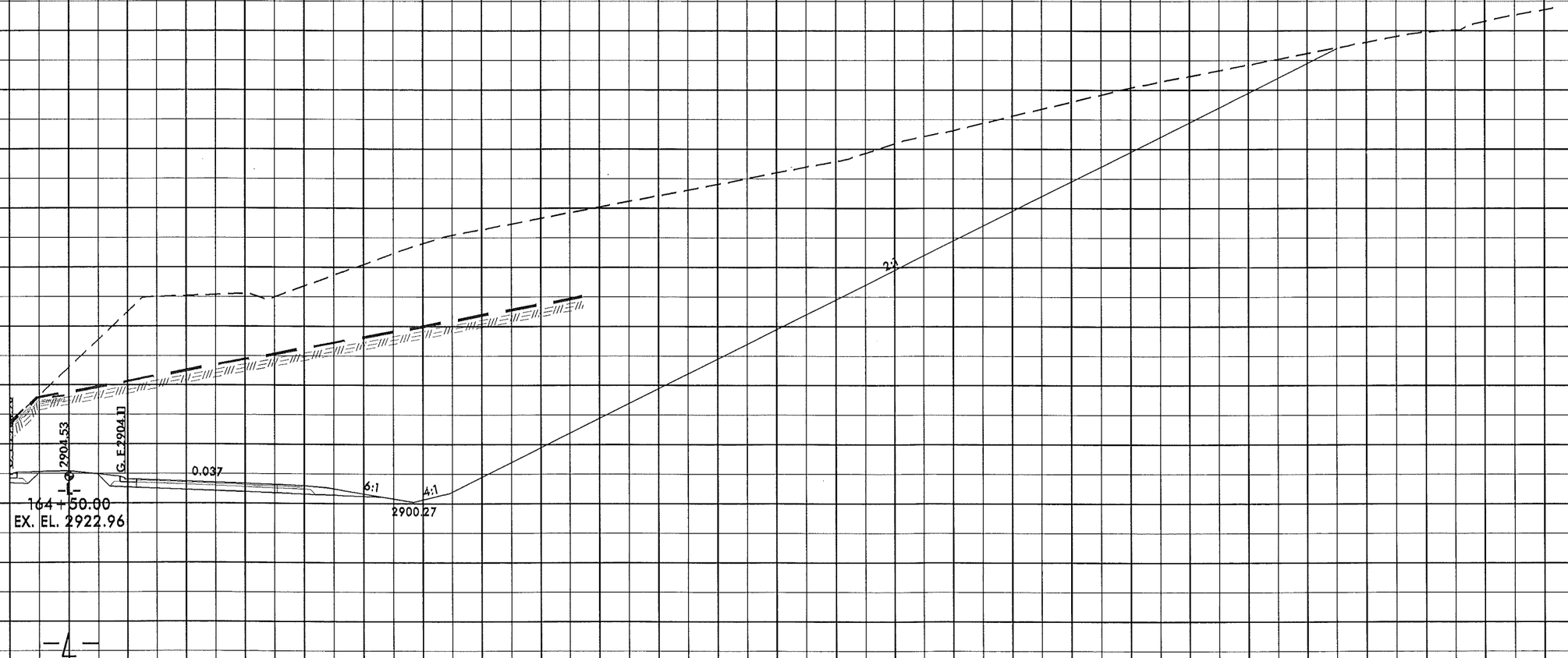
2890
2880



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bmann
A1 GEOTECH(23)

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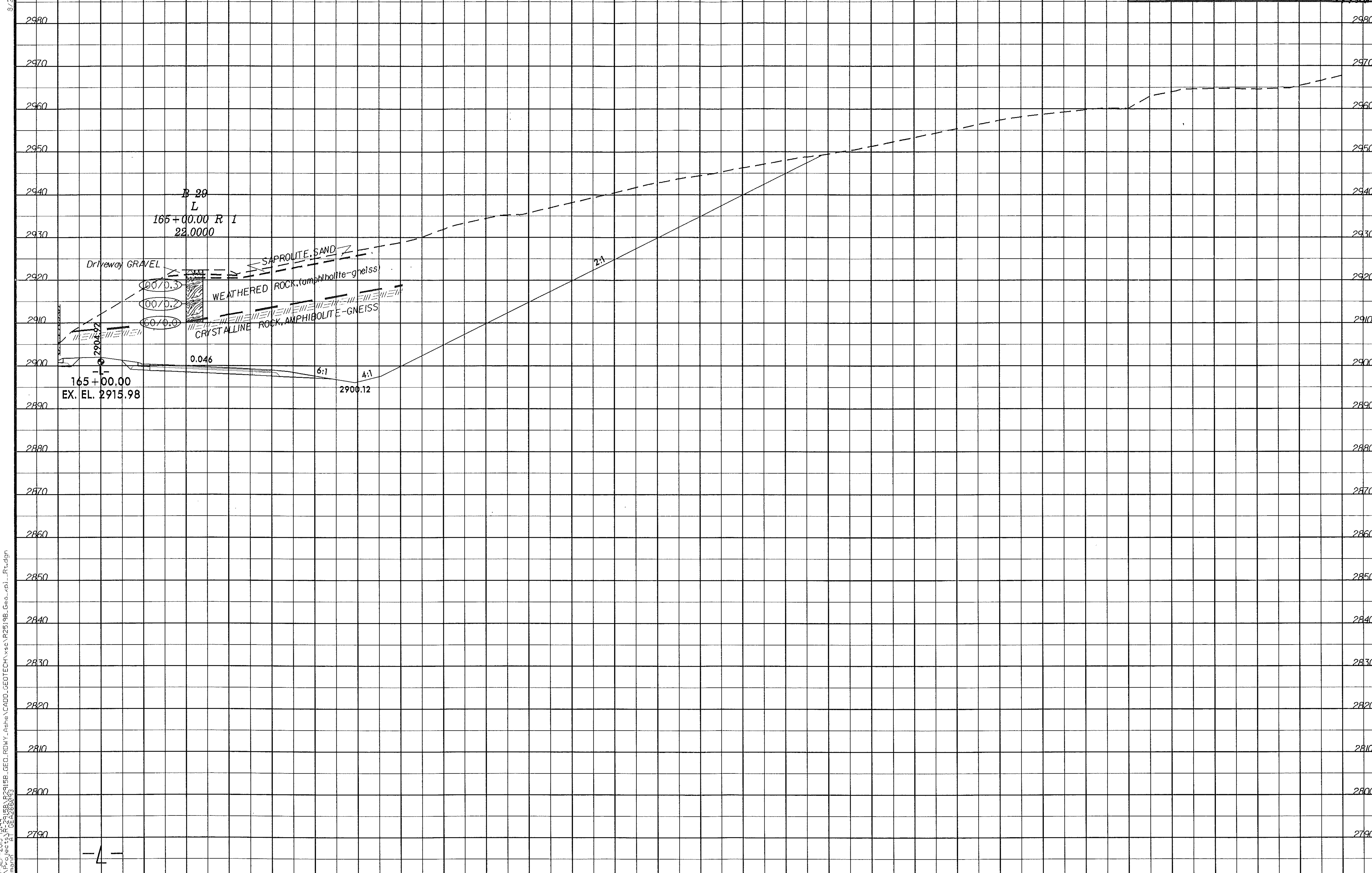

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8/23/99

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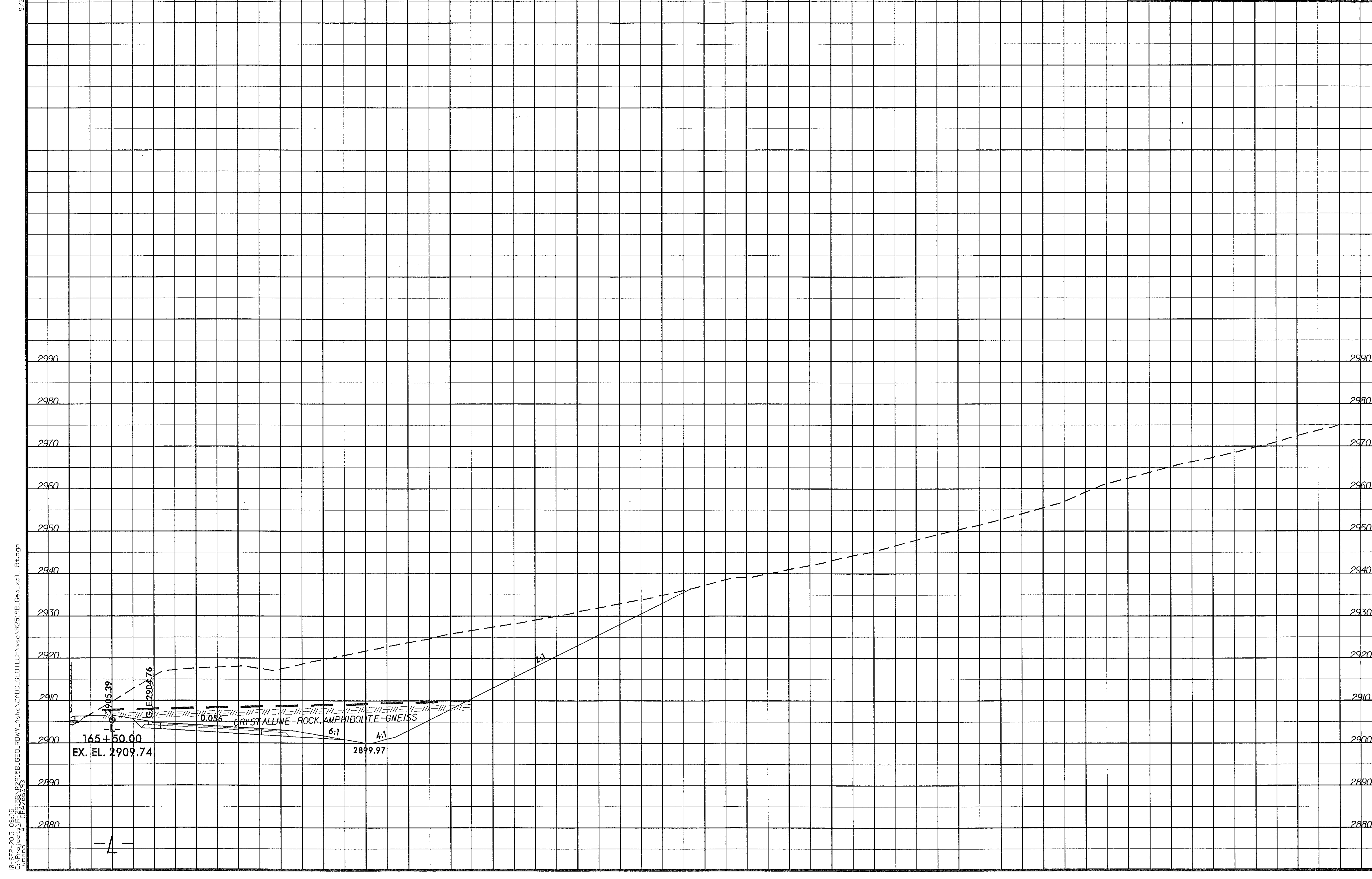

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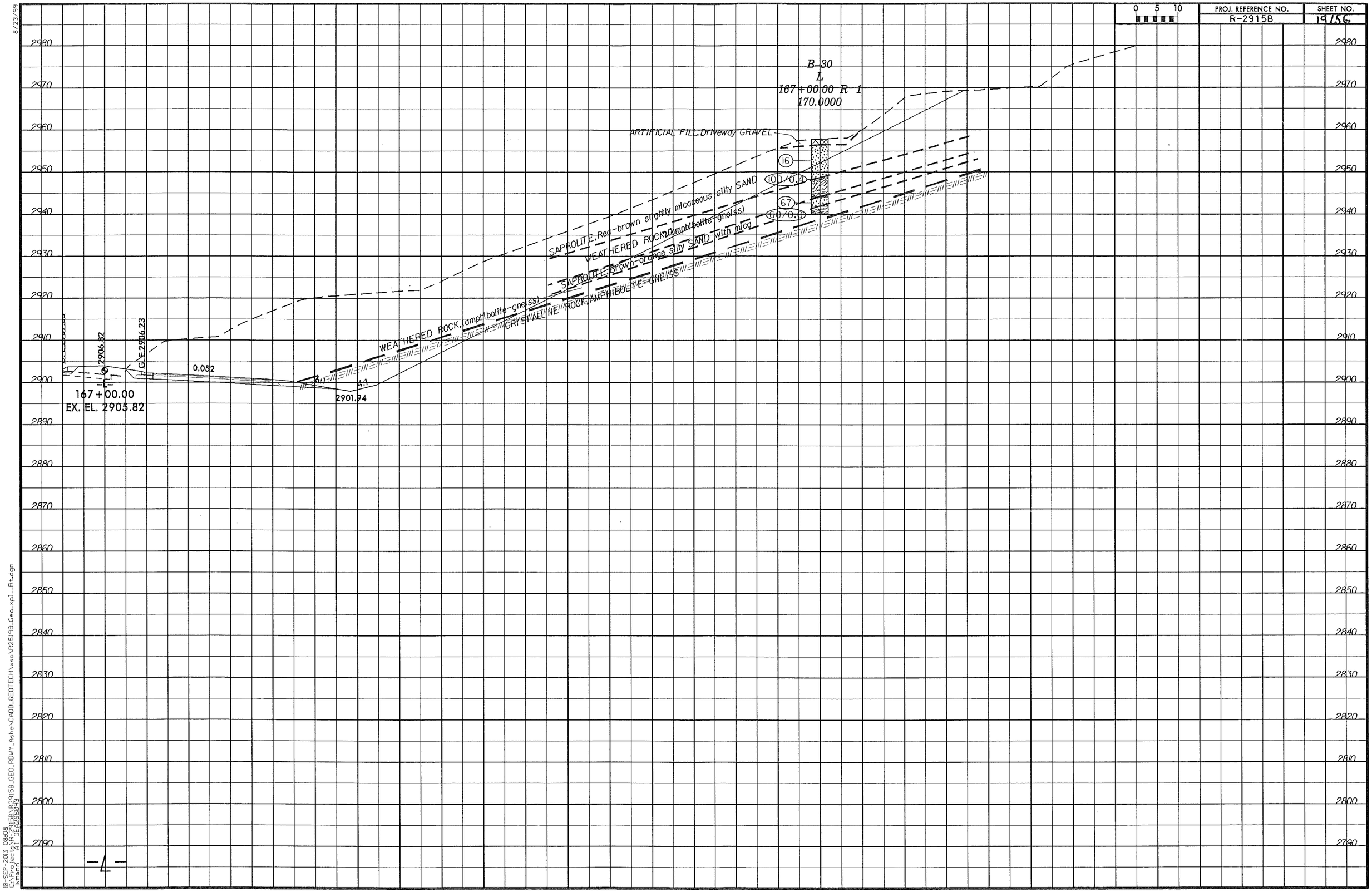

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lwilson

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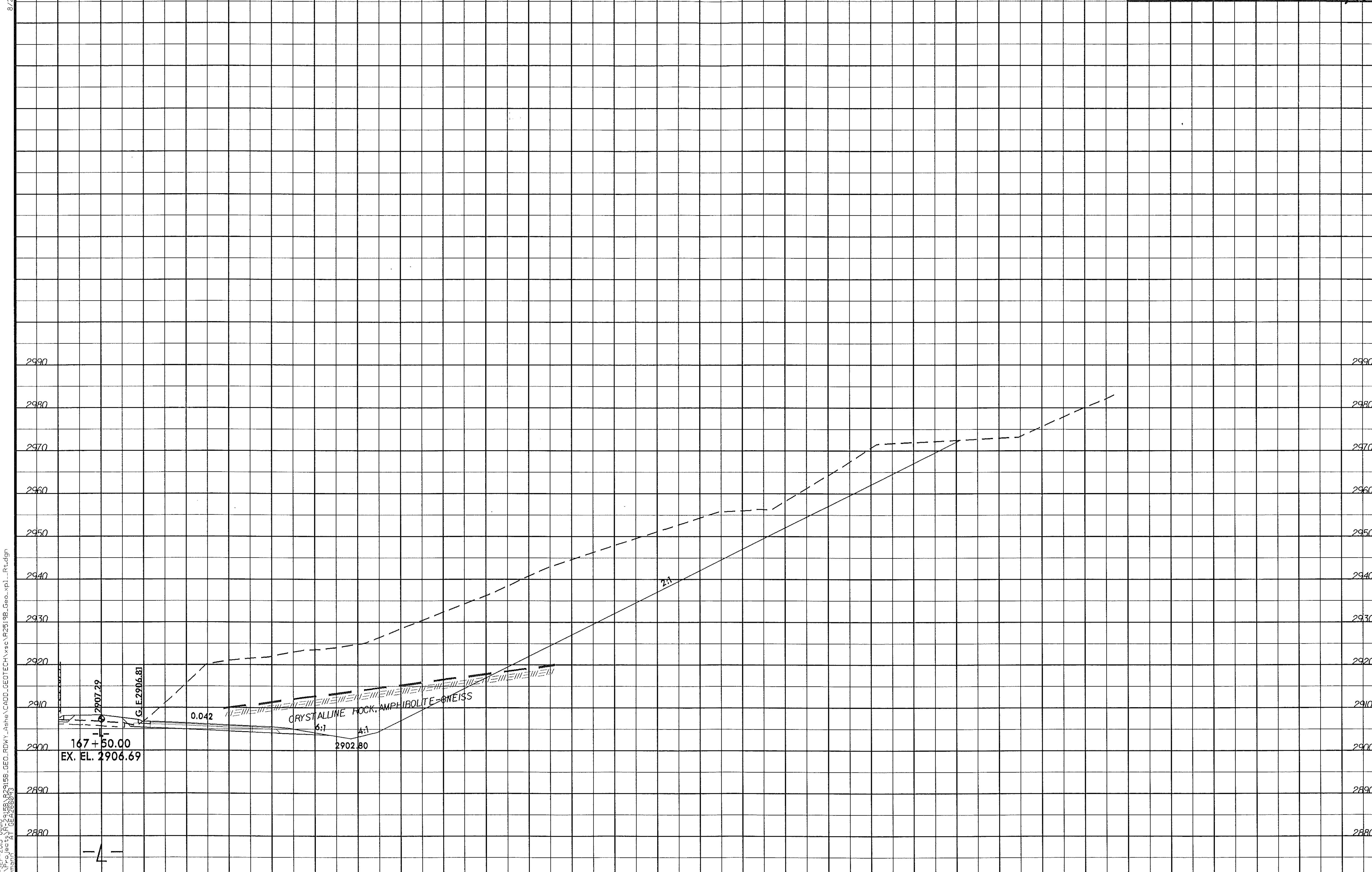

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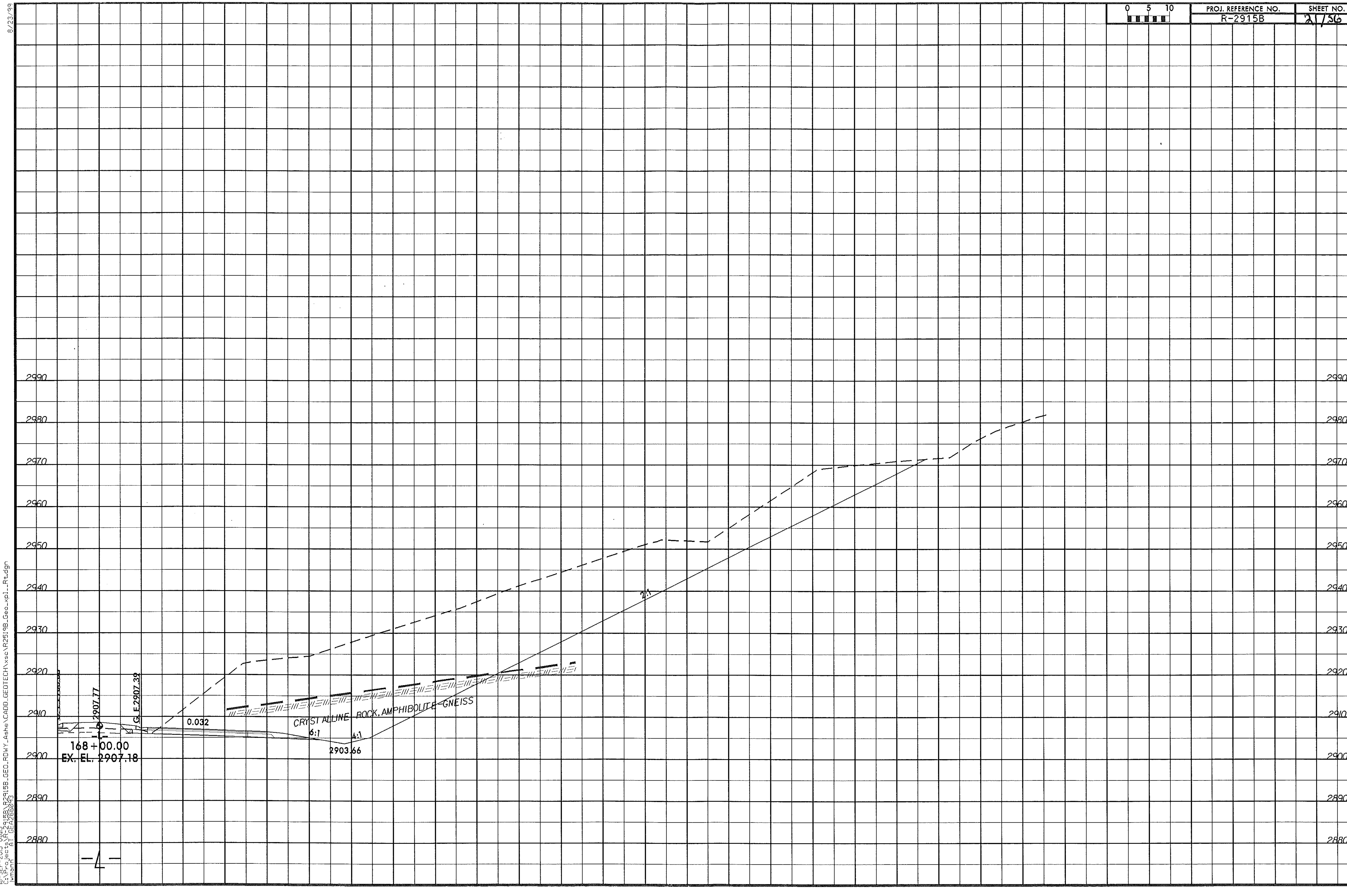
lwmann AT GEA266093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R-2915B
SHEET NO.
21/56
8/23/99
2990
2980
2970
2960
2950
2940
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2920
2910
2900
2890
2880
2:1
CRYSTALLINE ROCK, AMPHIBOLITE GNEISS
0.032
6:1
4:1
2903.66
2907.77
G.E.2907.39
168+00.00
EX. EL. 2907.18
-4-

8/23/99

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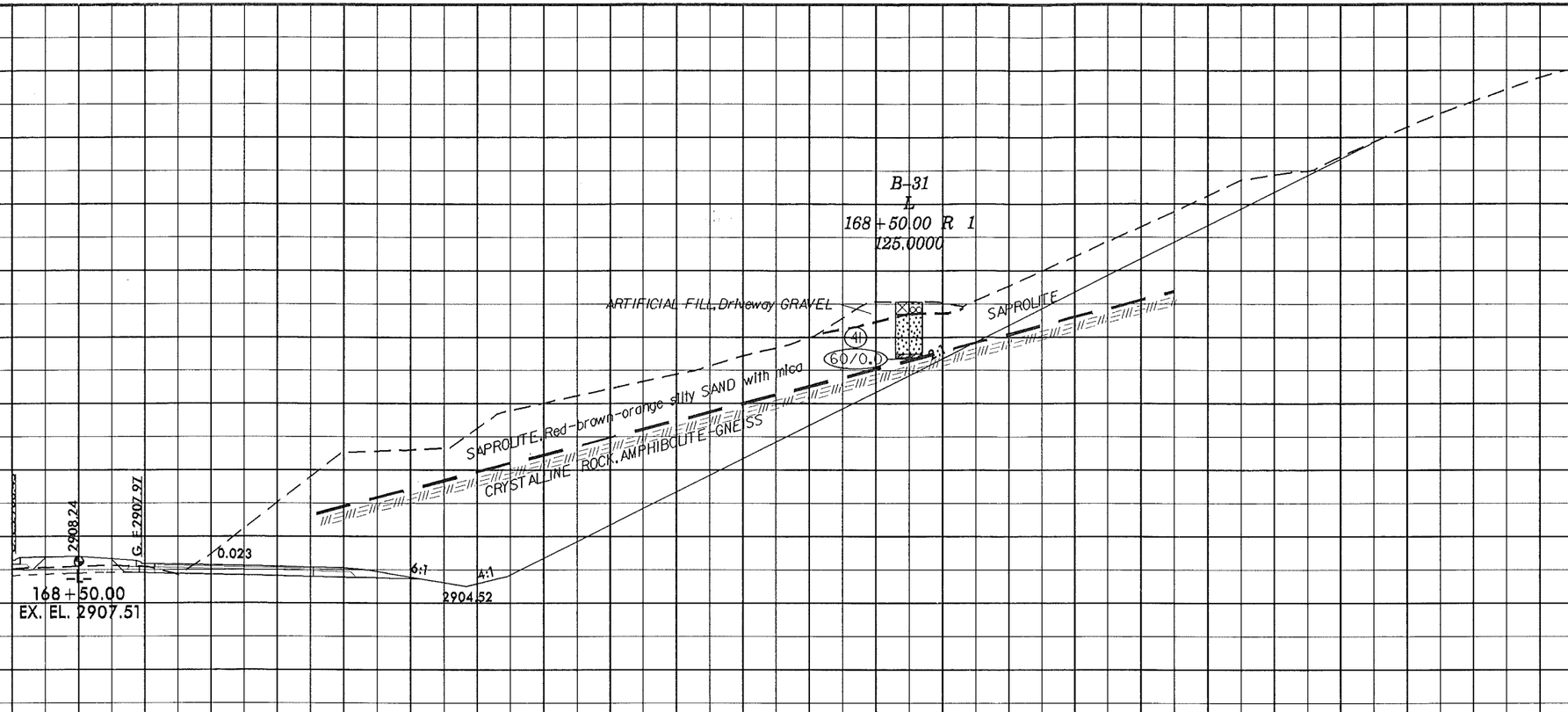

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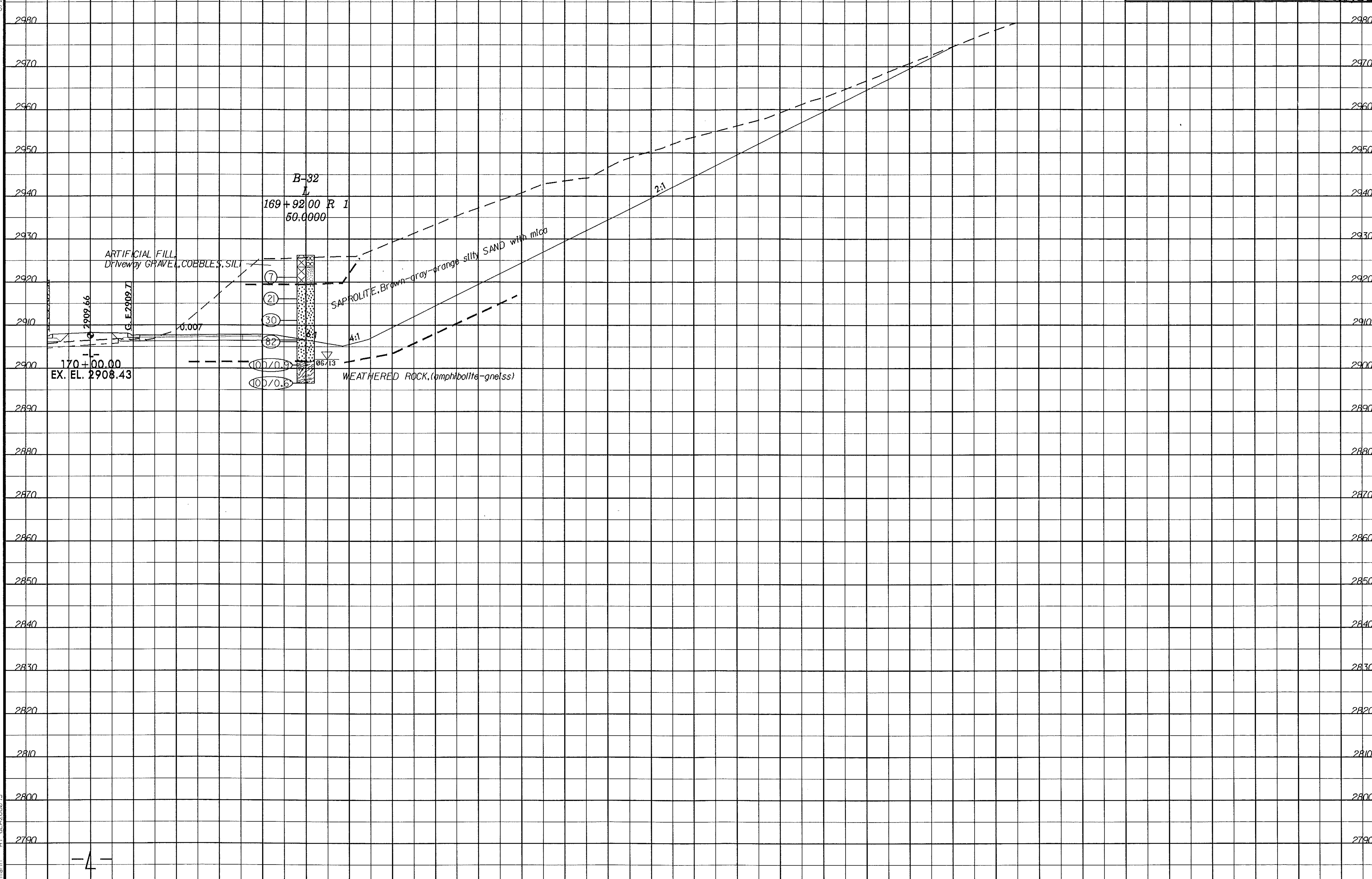

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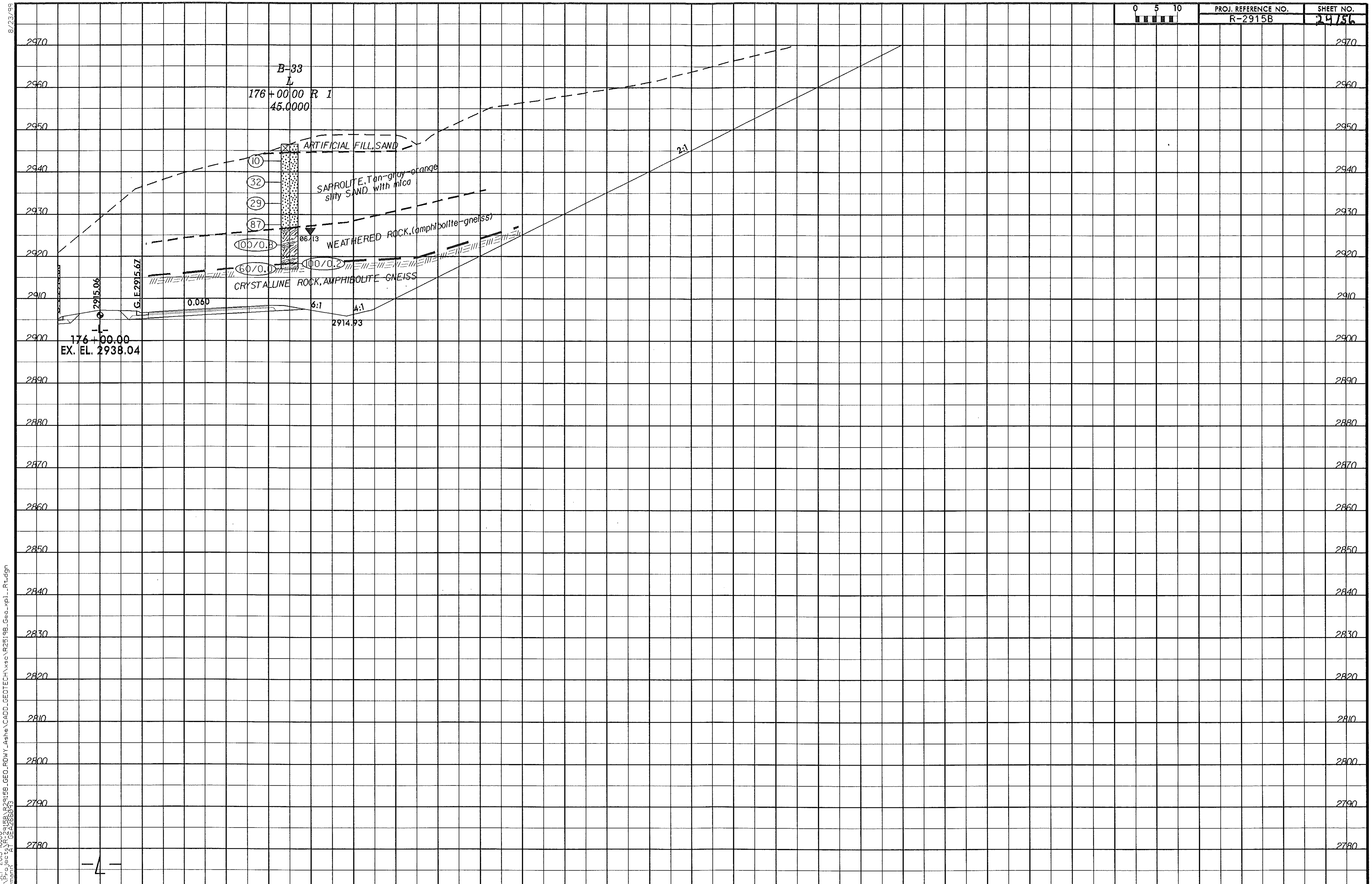

PROJ. REFERENCE NO.
R-2915B
SHEET NO.
29/56
0 5 10
B-33
L
176+00.00 R 1
45.0000
ARTIFICIAL FILL,SAND
SAPROLITE,Tan-gray-orange silty SAND with mica
WEATHERED ROCK,(amphibolite-gneiss)
CRYSTALLINE ROCK,AMPHIBOLITE GNEISS
10
32
29
87
100/0.8
60/0.0
100/0.2
06/13
2:1
6:1
4:1
0.060
2914.93
2915.06
G.E.2915.67
-L-
176+00.00
EX. EL. 2938.04
2970
2960
2950
2940
2930
2920
2910
2900
2890
2880
2870
2860
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2840
2830
2820
2810
2800
2790
2780
-L-
8/23/99

8/23/99

0 5 10

PROJ. REFERENCE NO. R-2915B

SHEET NO. 25/56

2980 2970 2960 2950 2940 2930 2920 2910 2900 2890 2880

2:1

2915.14

G.E. 2915.75

0.060

CRYSTALLINE ROCK, AMPHIBOLITE-GNEISS

6:1

4:1

2915.01

-L-

176+50.00

EX. EL. 2942.17

-L-

2980 2970 2960 2950 2940 2930 2920 2910 2900 2890 2880

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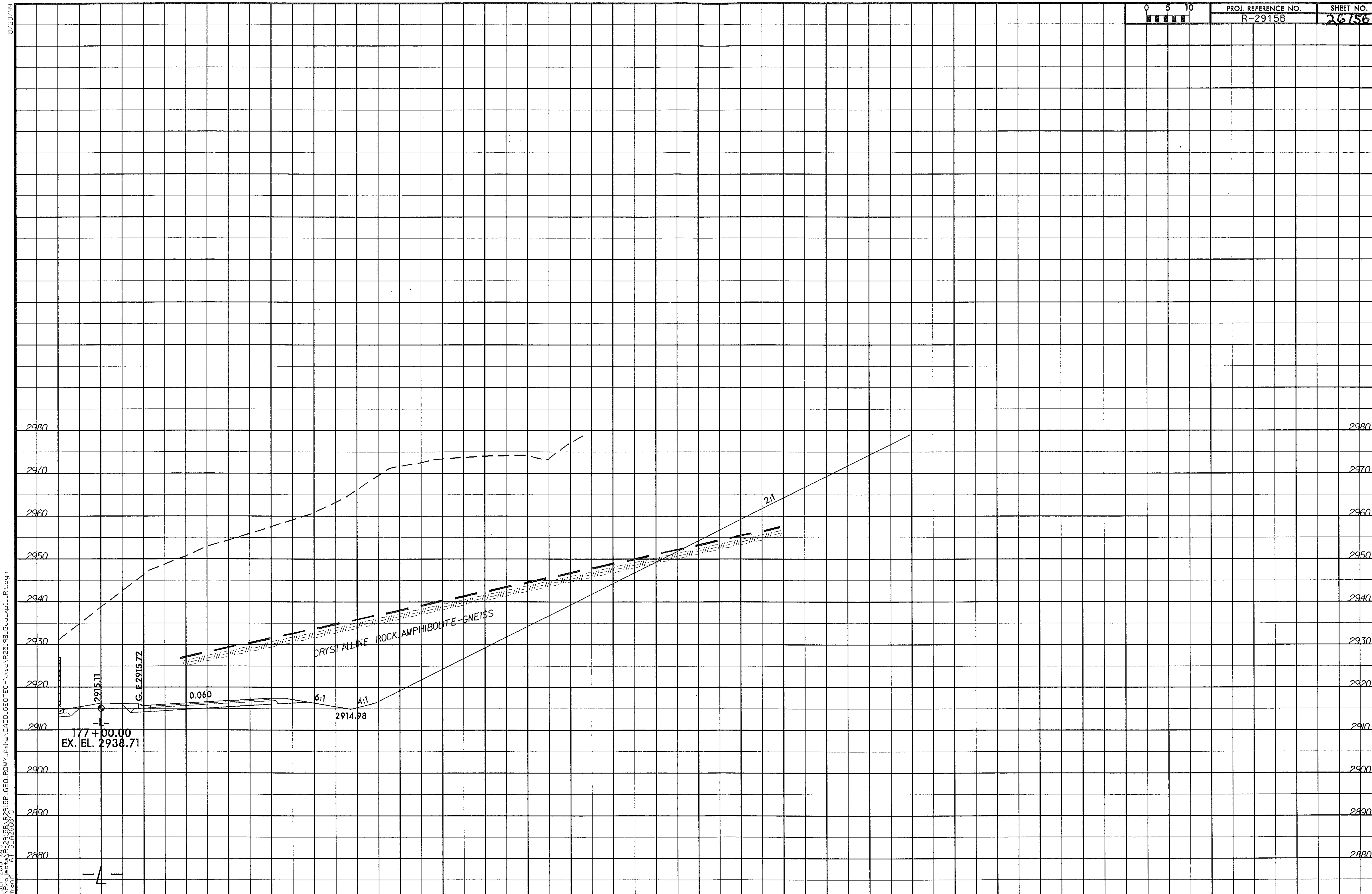
smsmith



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R-2915B
SHEET NO.
26/56
8/23/99
2980
2970
2960
2950
2940
2930
2920
2910
2900
2890
2880
2:1
CRYSTALLINE ROCK,AMPHIBOLITE-GNEISS
2915.11
G. E 2915.72
0.060
6:1
4:1
2914.98
177+00.00
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-4-

8/23/99

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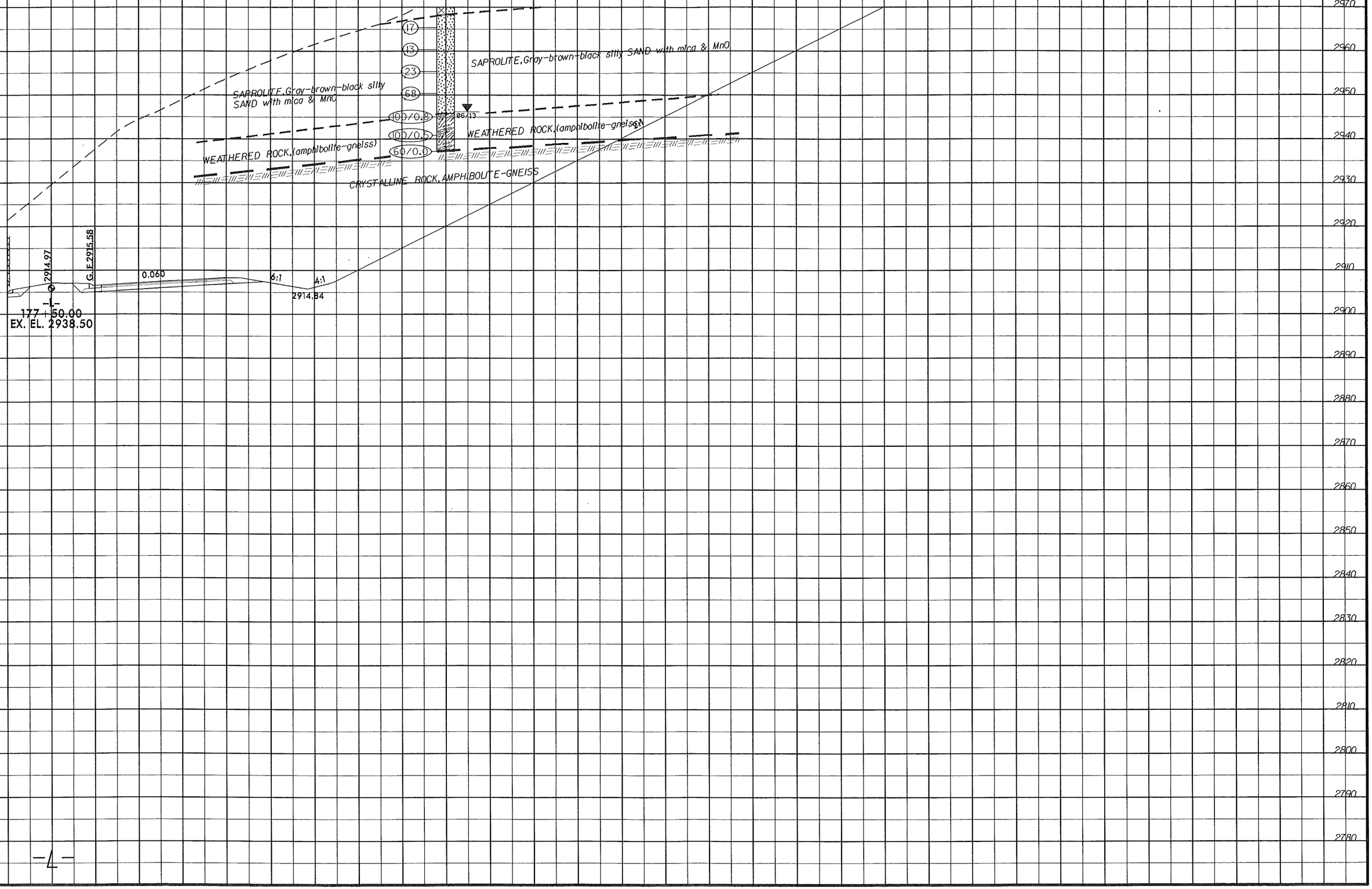

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wmath GEH26803

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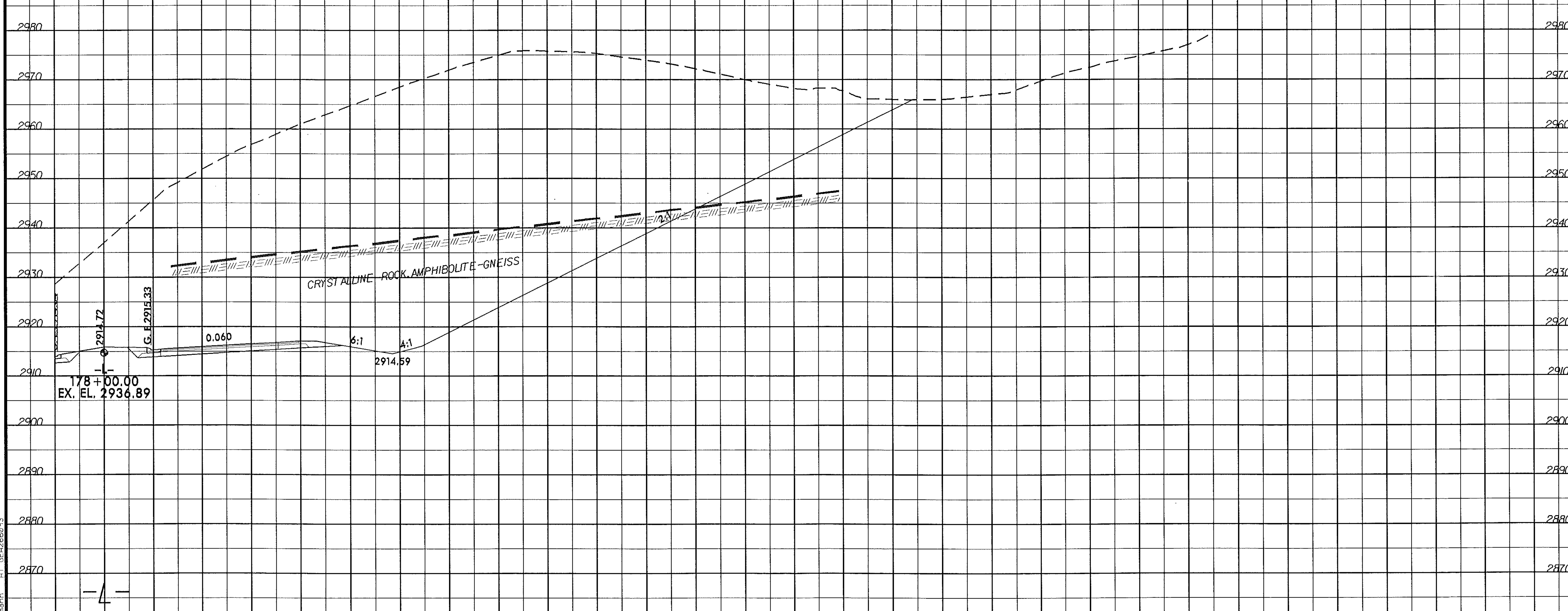

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iwmann AT GEA266093

8/23/99

0 5 10

PROJ. REFERENCE NO. R-2915B

SHEET NO. 29756

2980
2970
2960
2950
2940
2930
2920
2910
2900
2890
2880
2870

2914.36
G.E. 2914.95
0.058
CRYST ALLINE ROCK, AMPHIBOLITE-GNEISS
6:1
4:1
2:1
2914.14
-L-
178+50.00
EX. EL. 2932.68

-L-

18-SEP-2013 10:18
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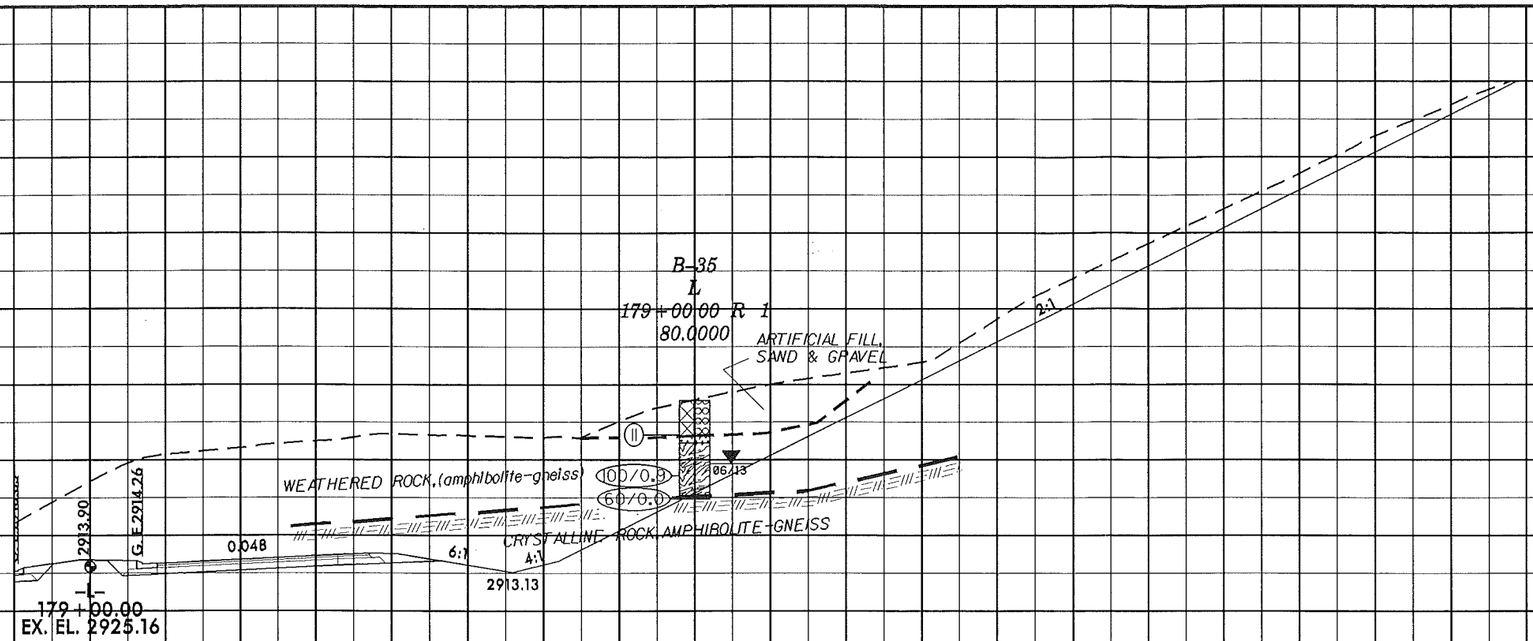
smoth

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915B	30/56



18-SEP-2013 10:23
C:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2519B_Geo_xpl_Rt.dgn
swiamni

8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	37/56

2980
2970
2960
2950
2940
2930
2920
2910
2900
2890
2880
2870

2:1

*SAPROLITE, Brown-gray-orange silty SAND with mica & MnO, loose to very dense

*WEATHERED ROCK, (amphibolite-gneiss)

*SAPROLITE, Gray-brown silty SAND wit mica & MnO, dense

*WEATHERED ROCK, (amphibolite-gneiss)

*Stratigraphy based on boring located 302' Right of -L-

0.029

6:1

4:1

2912.69

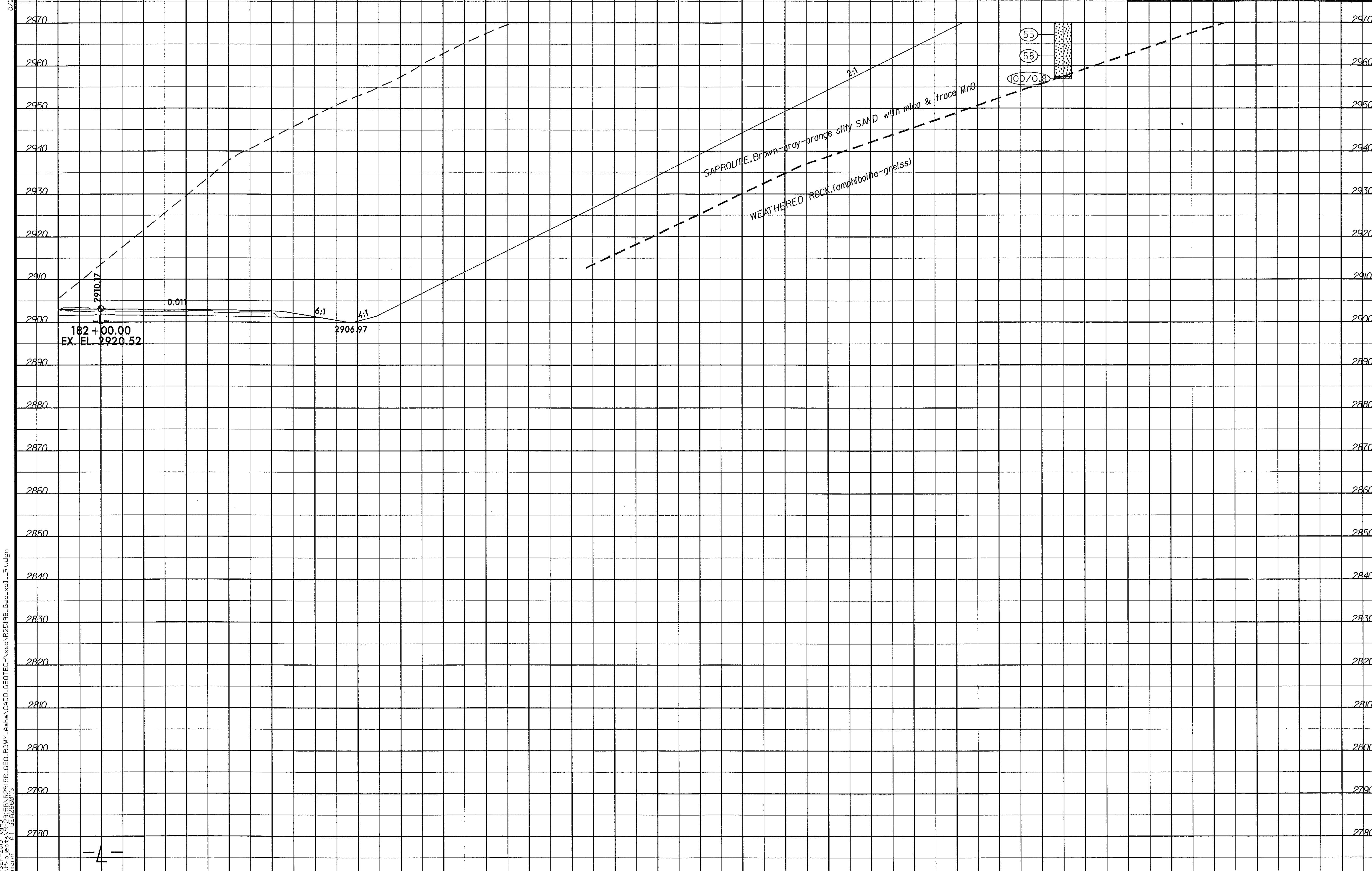
2911.19

-L-
180+00.00
EX. EL. 2921.26

-L-

08-SEP-2013 10:34
C:\Projects\TIP R-2915B\R2915B_GEO_ROWY_Ashe\CADD_GEOTECH\xsc\R2915B_Geo_xpl_Rt.dgn
lwasmi
ALT GEN2560B3

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	32/56

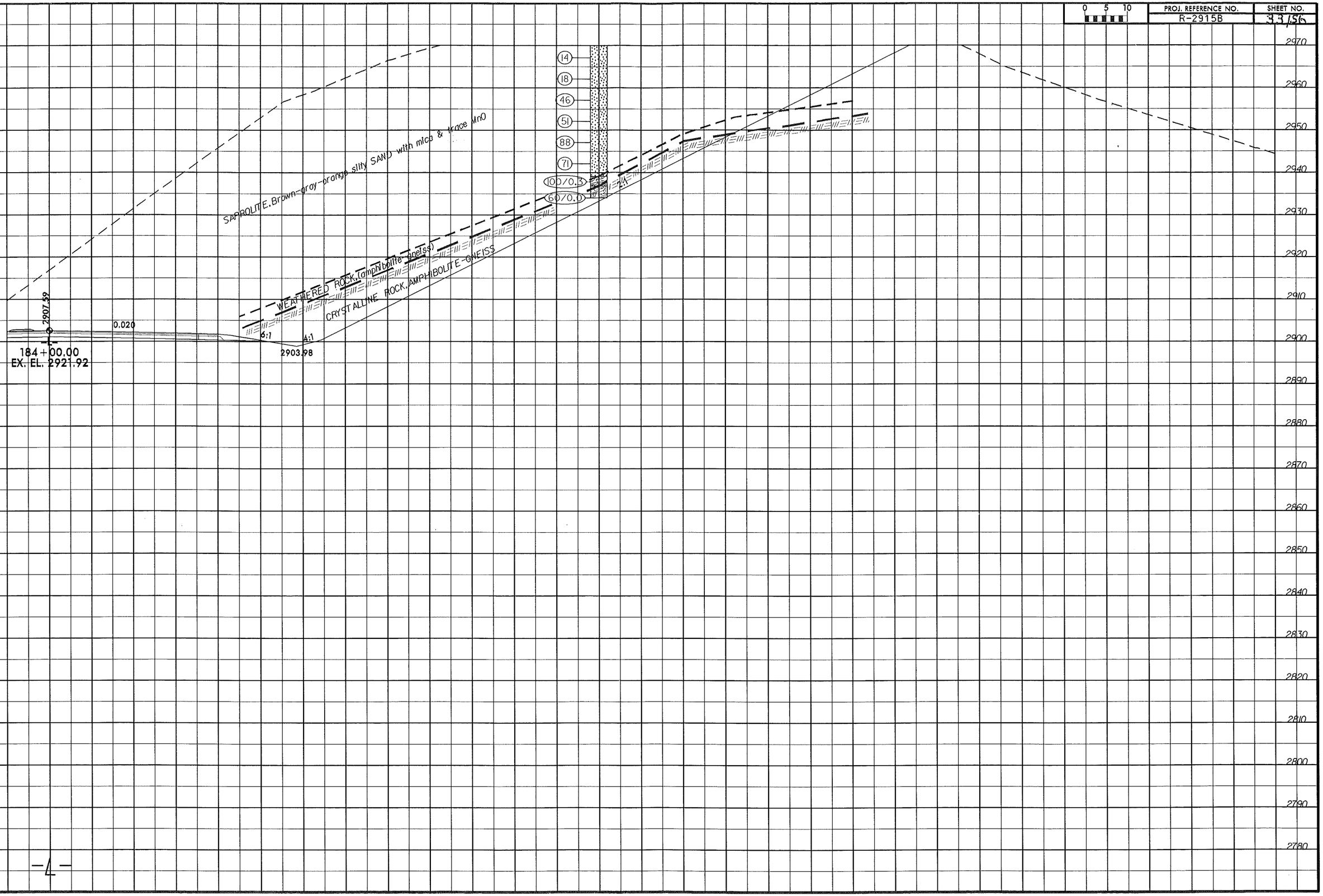


8/23/99

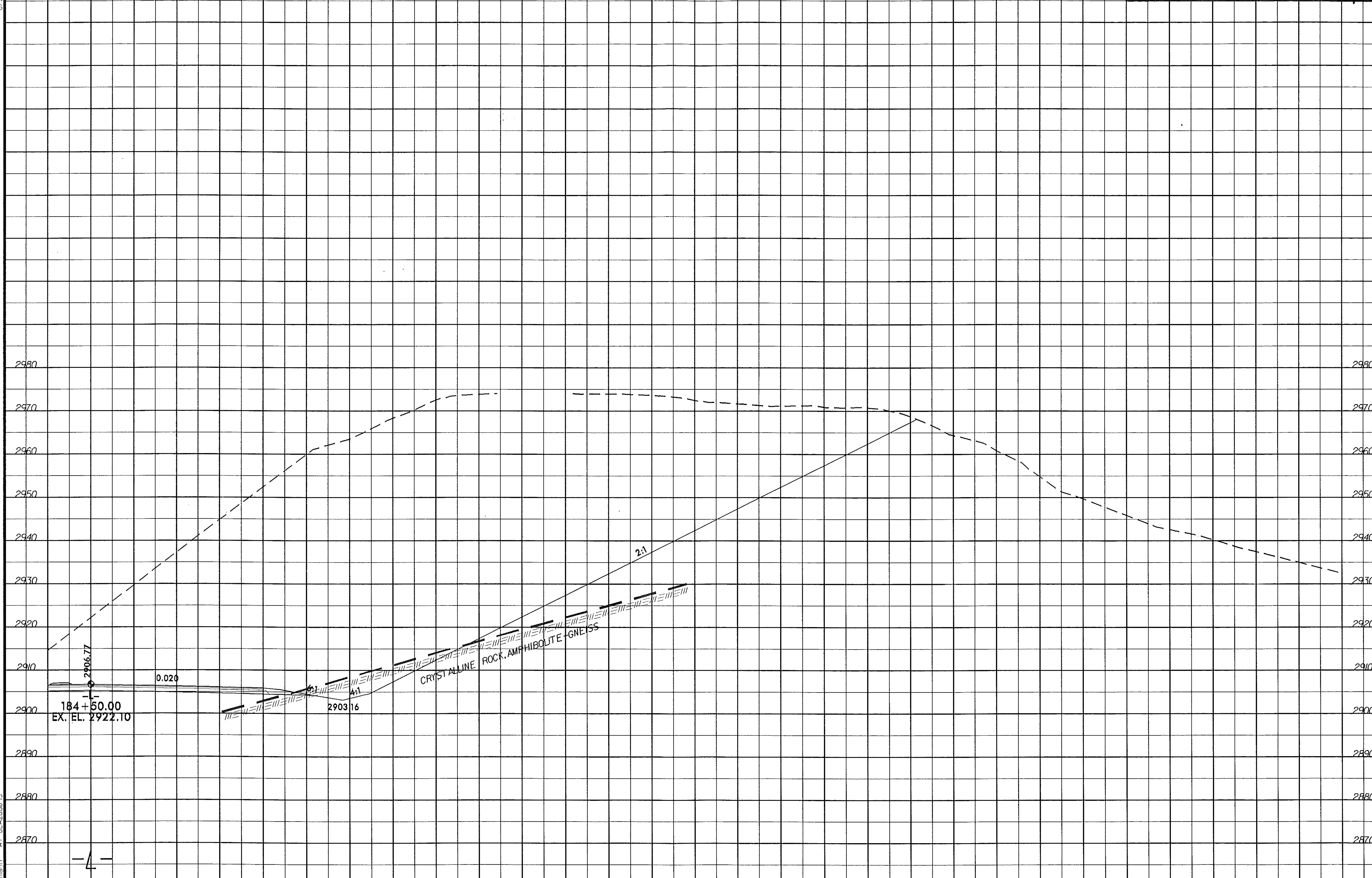
18-SEP-2013 10:45
C:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2915B_Geo_xpl_Rt.dgn
lwmann AT GEA26093

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	33/56



0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915B	3W/56



8/23/99

18-SEP-2013 10:51
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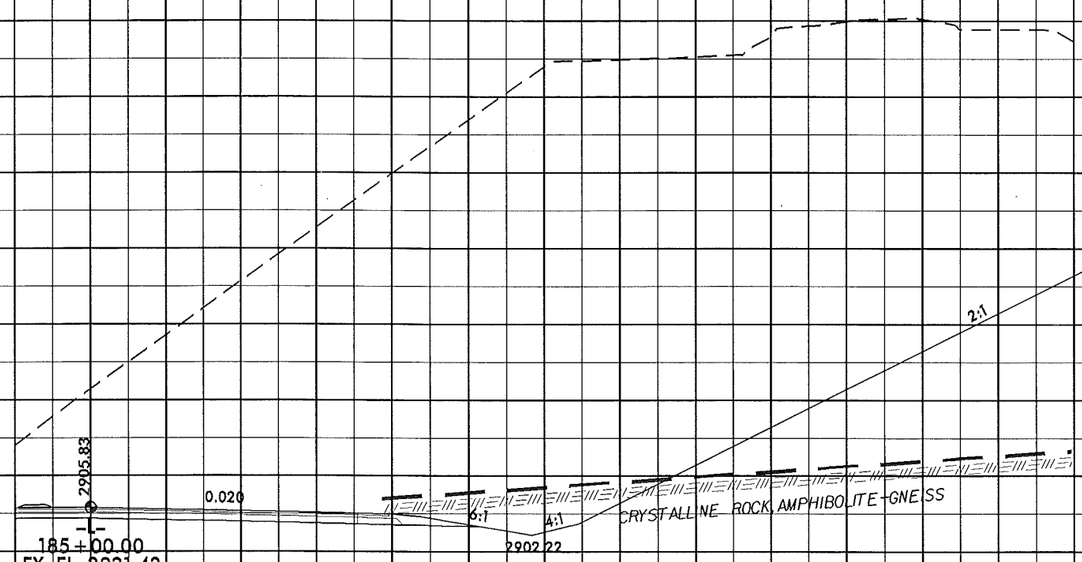
lwmann AT GEA266093

8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	3575

2980
2970
2960
2950
2940
2930
2920
2910
2900
2890
2880
2870



18-SEP-2013 10:53
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kmsmith
DEFAULT

8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	36/36

185+50.00 R 1
95.0000

ARTIFICIAL FILL, Driveway SILT

14
19
21
55
78
100/0.9
100/0.8
100/0.3
61
100/0.2
60/0.0
100/0.4

SAPROLITE, Gray-brown silty SAND with mica & trace MnO

SAPROLITE, Gray-brown silty SAND with mica & trace MnO

WEATHERED ROCK, (amphibolite-gneiss)

WEATHERED ROCK, (amphibolite-gneiss)

SAPROLITE, Seam of gray-brown-orange silty SAND with mica & trace MnO

SAPROLITE, Seam of gray-brown-orange silty SAND with mica & trace MnO

WEATHERED ROCK, (amphibolite-gneiss)

WEATHERED ROCK, (amphibolite-gneiss)

2904.76

0.020

6:1

4:1

CRYSTALLINE ROCK, AMPHIBOLITE-GNEISS 2901.15

CRYSTALLINE ROCK, AMPHIBOLITE-GNEISS

-L-
185+50.00
EX. EL. 2917.39

2970
2960
2950
2940
2930
2920
2910
2900
2890
2880
2870
2860
2850
2840
2830
2820
2810
2800
2790
2780

-4-

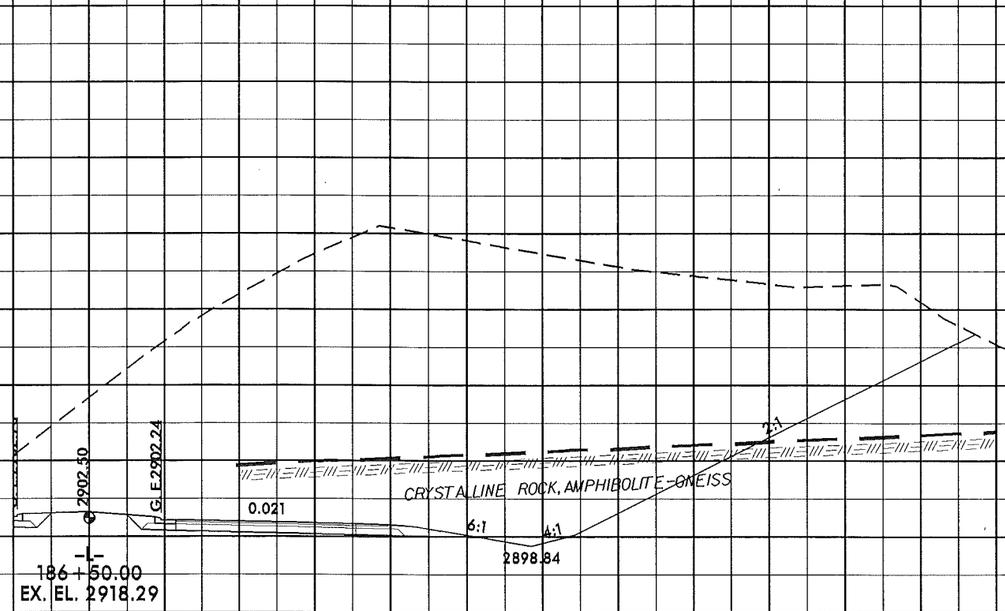
18-SEP-2013 11:07
C:\Projects\R-2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2915B_Geo_xpl_Rt.dgn
kmann
R-2915B GEOTECH

8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	37

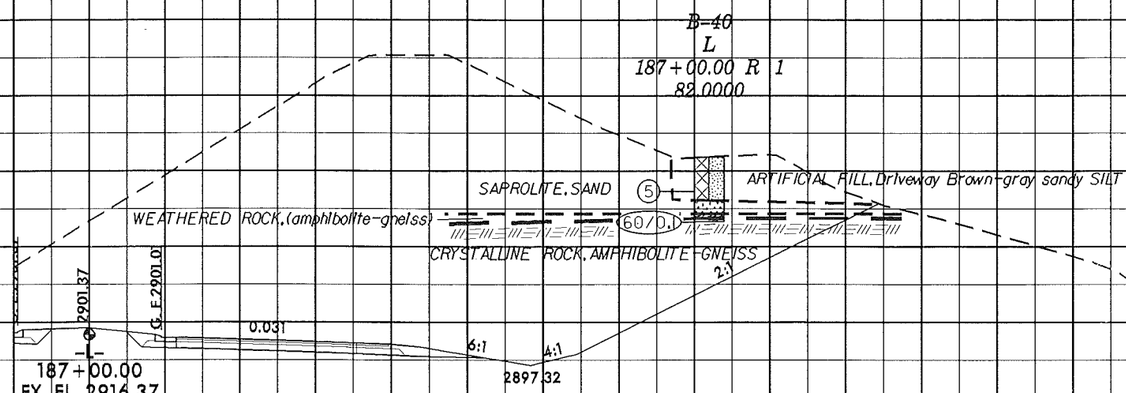
2980
2970
2960
2950
2940
2930
2920
2910
2900
2890
2880
2870



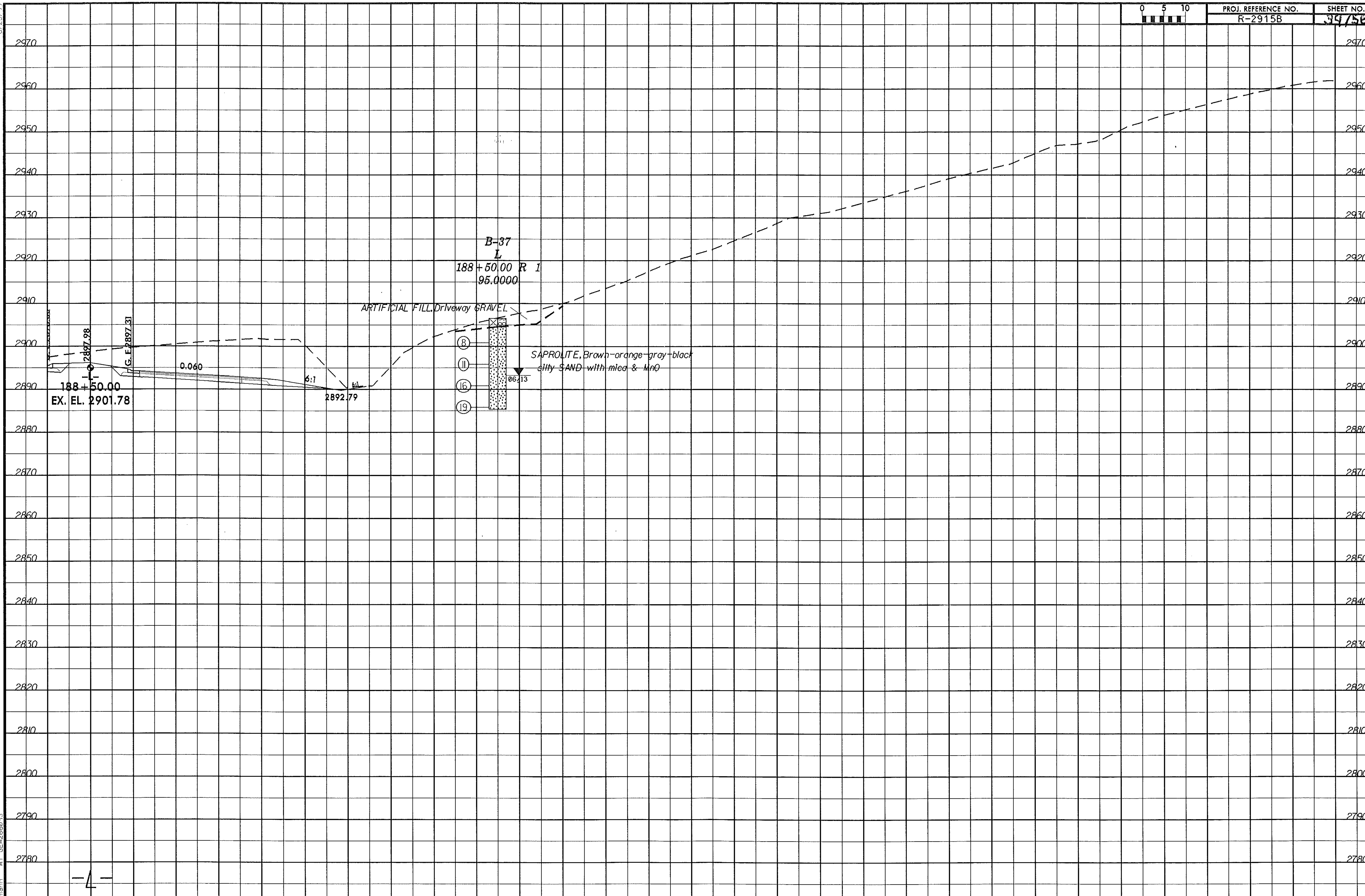
18-SEP-2013 lth09
C:\Projects\R-2915B_R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2915B_Geo_xpl_Rt.dgn
lwmann

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915B	38/56



20-SEP-2013 14:03
C:\PROJECTS\R-2915B\2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2519B_Geo_xpl_Rt.dgn
lmsom

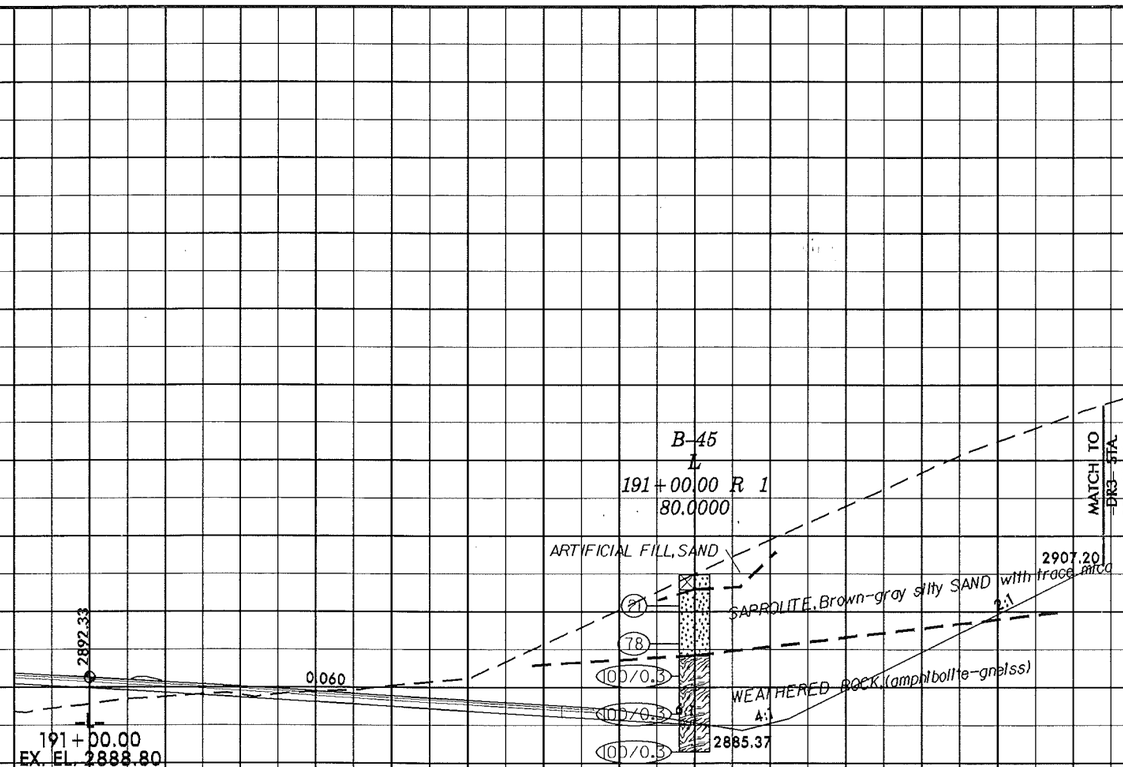


8/23/99

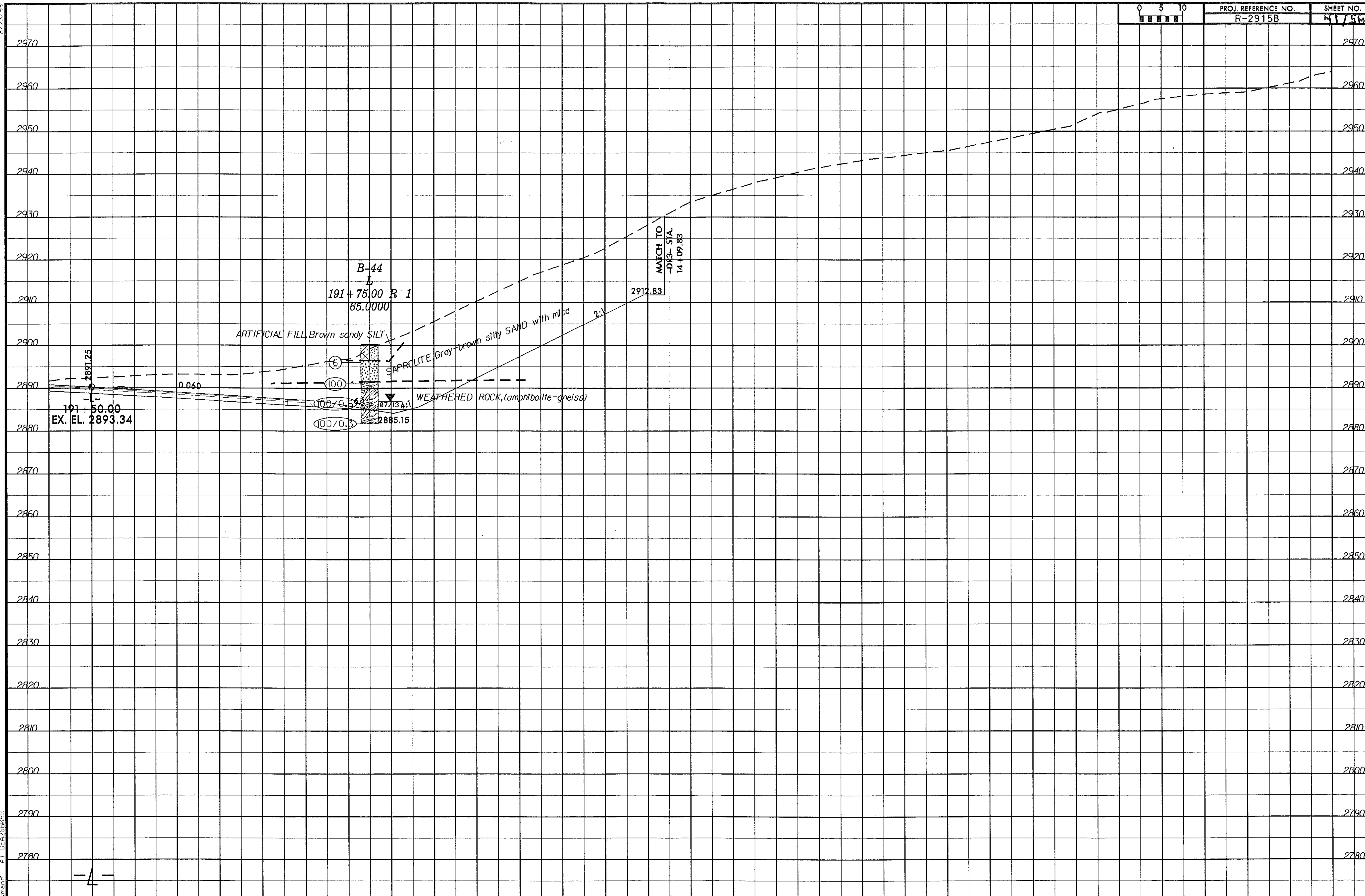
18-SEP-2013 11:13
C:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2519B_Geo_xpl_Rt.dgn
lwmann AT GEA266093

8/23/99

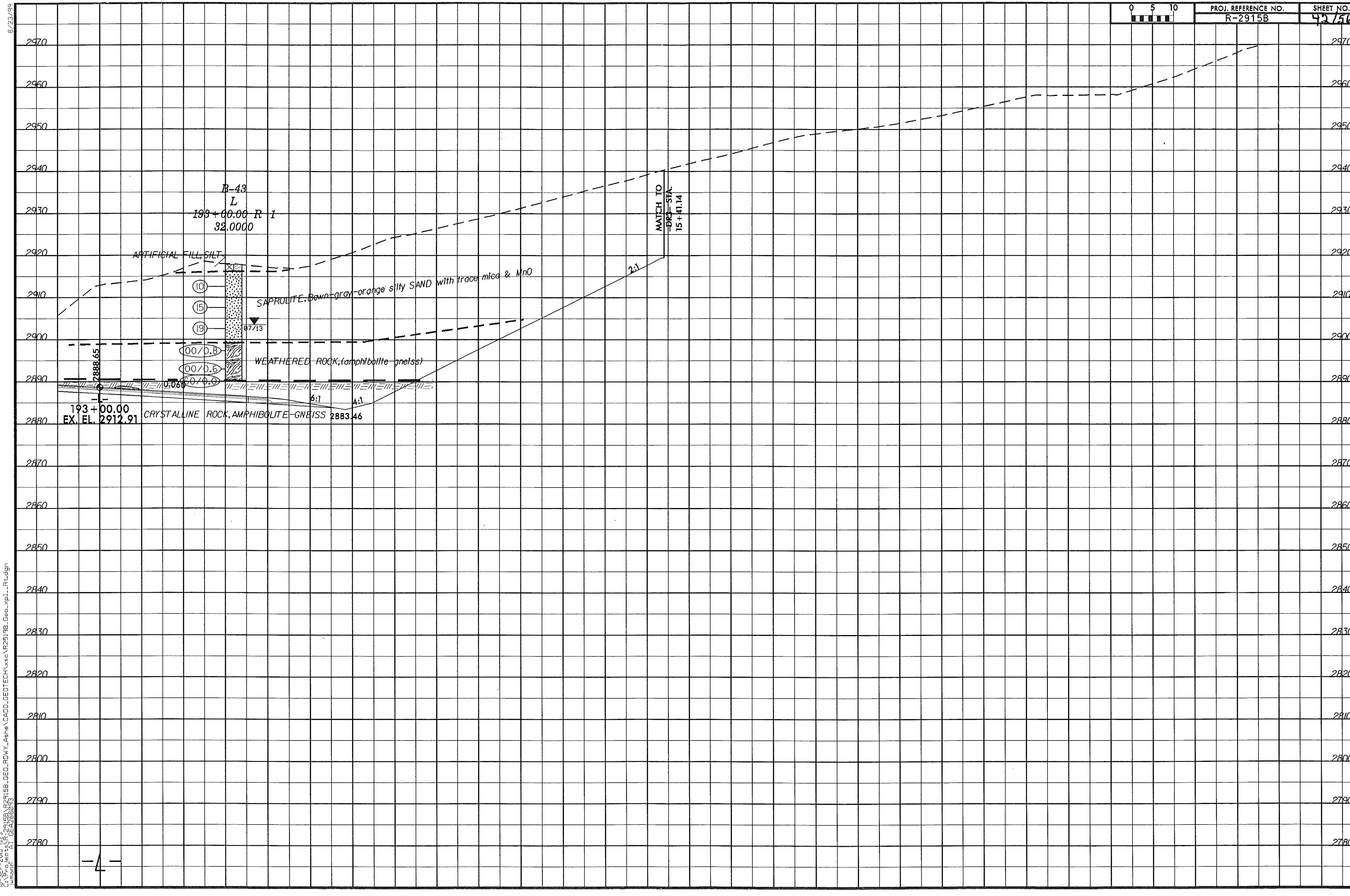
0 5 10	PROJ. REFERENCE NO. R-2915B	SHEET NO. 70156



PROJ. REFERENCE NO.	SHEET NO.
R-2915B	43/58



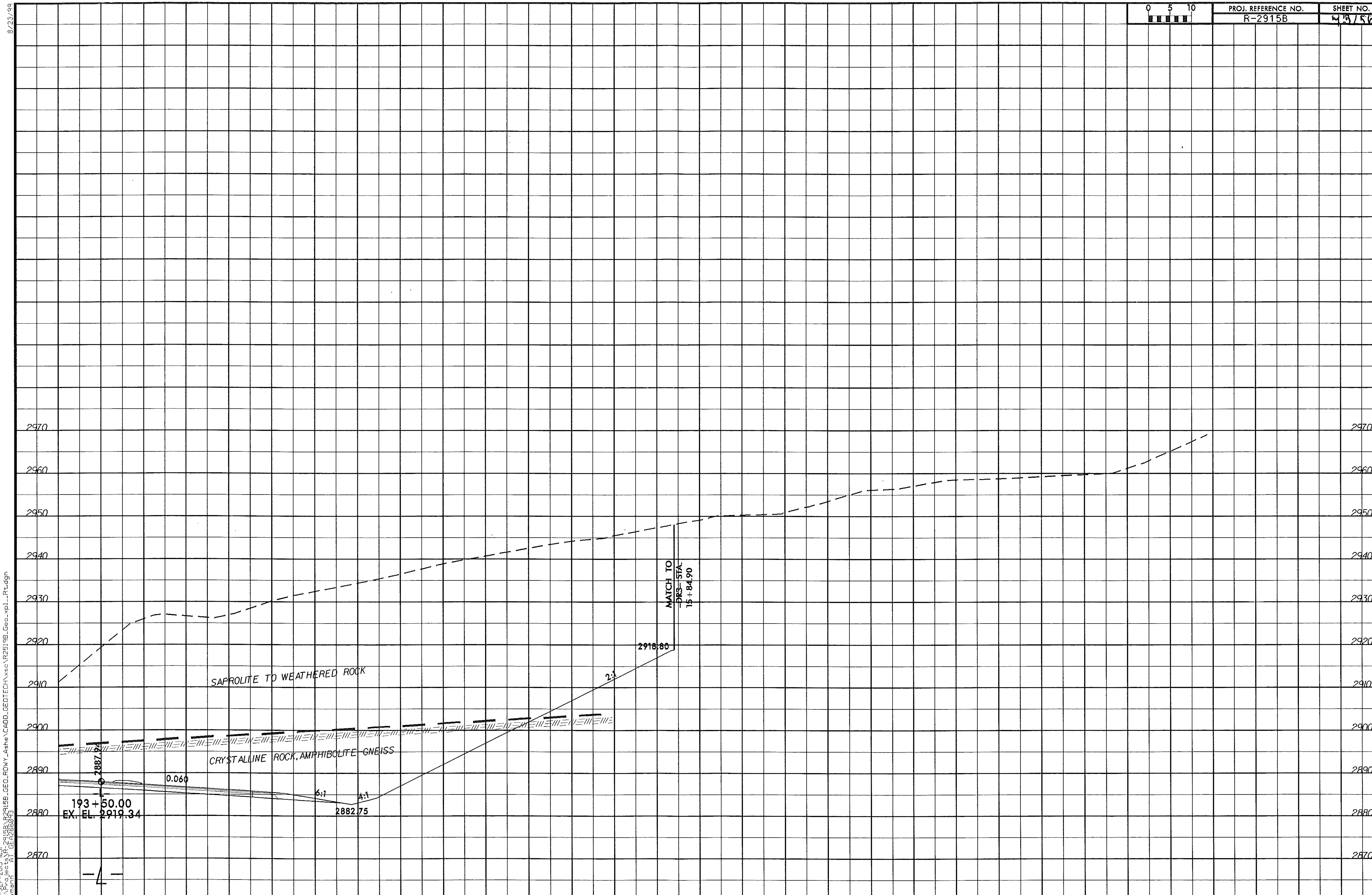
-4-



-4-

18-SEP-2013 11:29
C:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2519B_Geo_xpl__Rt.dgn
lwmann AT GEA266093

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	43/56



8/23/99

18-SEP-2013 16:31
C:\Projects\R-2915B\R2915B_GEO_ROWY_Ashe\CADD_GEOTECH\xsc\R2519B_Geo_xpl_Rt.dgn
iwmann AT GEA2E6093

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	49/56

0 5 10

B-42
L
194+00.00 R 1
24.0000

FILL, Driveway sandy silty GRAVEL

46
20
18
42

SAPROLITE, Brown-gray-orange silty SAND with mica

WEATHERED ROCK, (amphibolite-gneiss)

100/70.4 | 50/0.0

CRYSTALLINE ROCK, AMPHIBOLITE-GNEISS

MATCH TO DRS STA. 16+28.67

2918.10

2:1

2887.23

0.060

6:1

4:1

2882.04

194+00.00
EX. EL. 2916.46

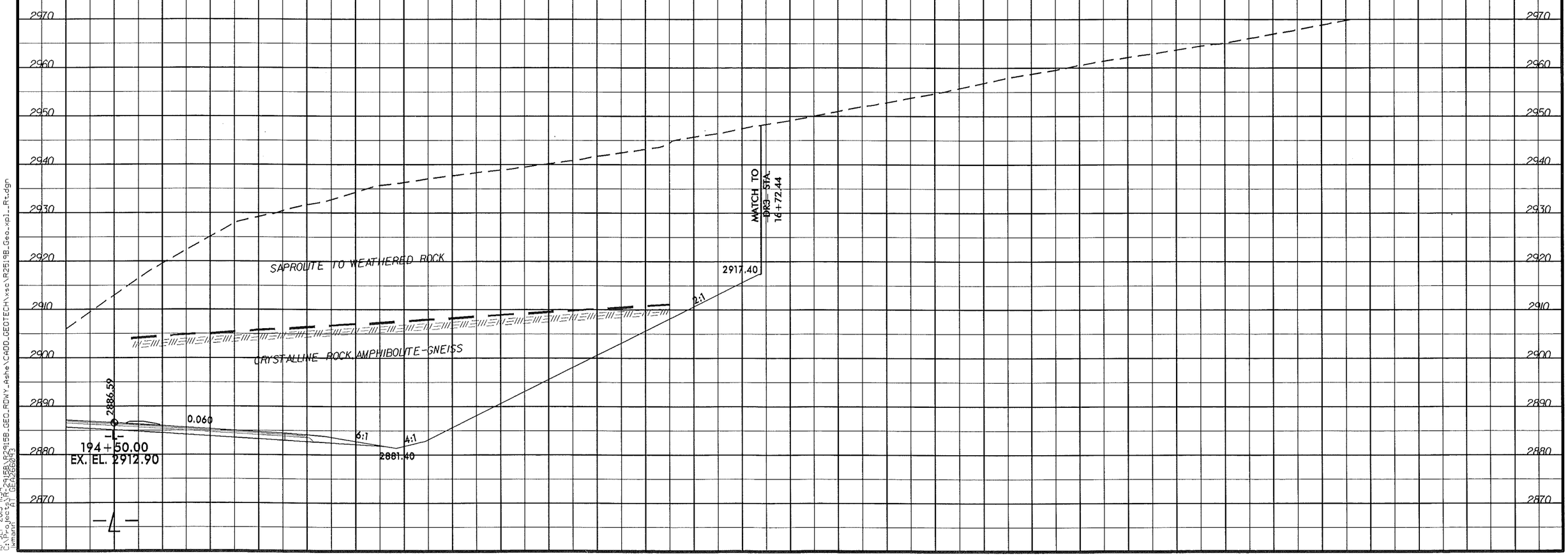
2960 2950 2940 2930 2920 2910 2900 2890 2880 2870 2860 2850 2840 2830 2820 2810 2800 2790 2780 2770

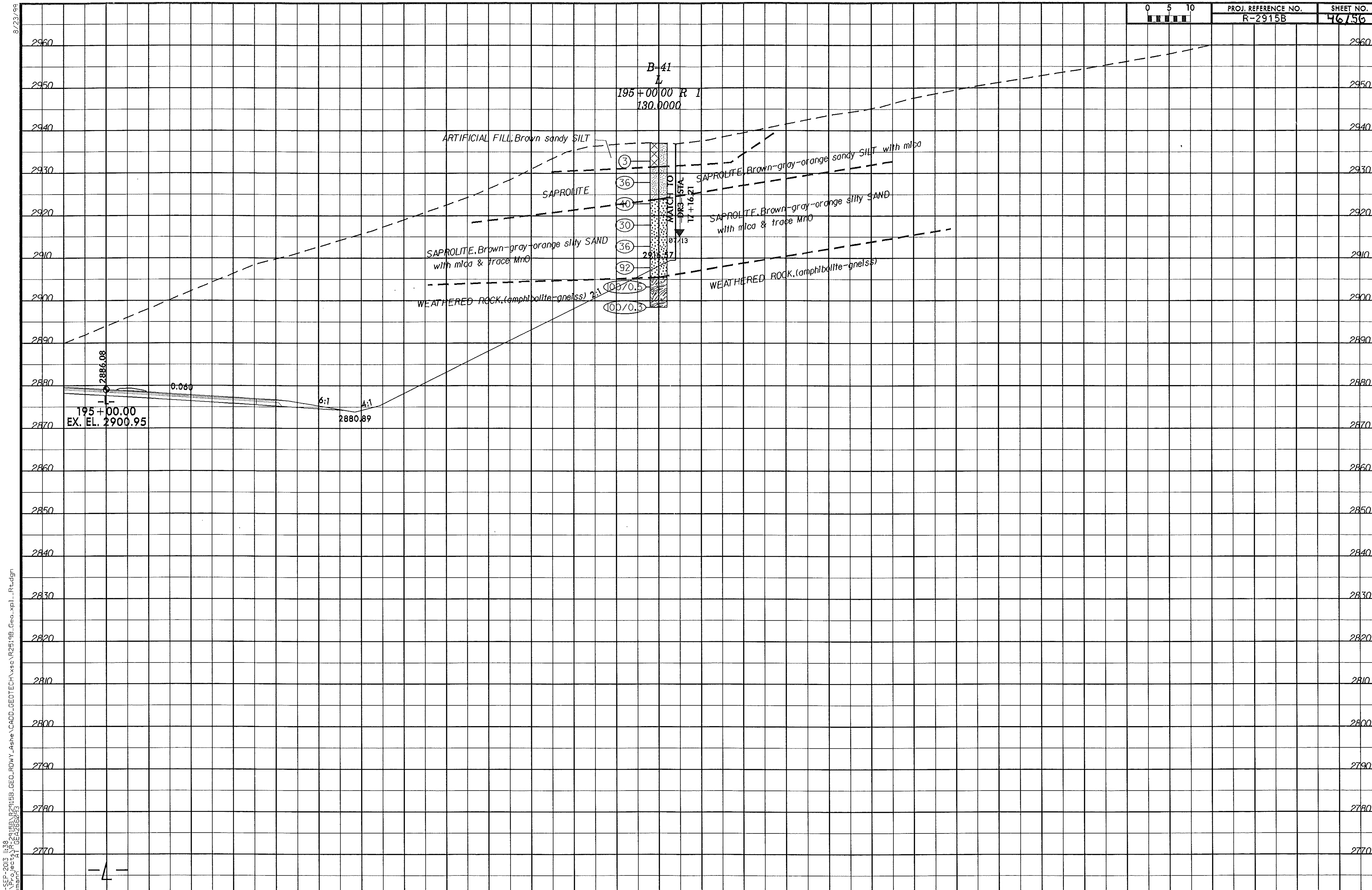
-4-

18-SEP-2013 11:33
C:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2915B_Geo_xpl_Rt.dgn
wmsmith

8/23/99

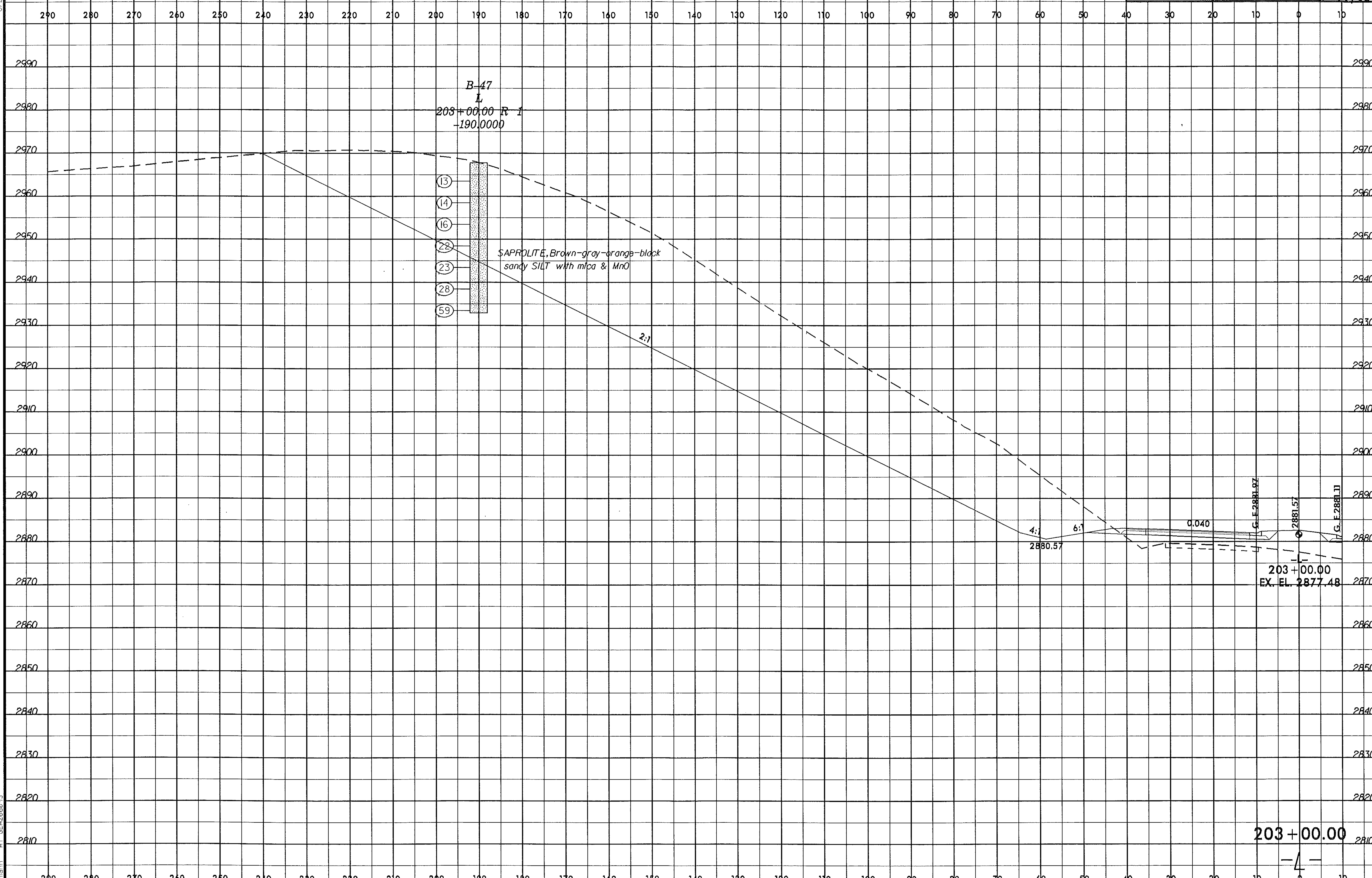
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915B	45756





PROJ. REFERENCE NO.
R-2915B
SHEET NO.
46/56
0 5 10
B-41
L
195+00.00 R 1
130.0000
ARTIFICIAL FILL,Brown sandy SILT
SAPROLITE
SAPROLITE,Brown-gray-orange sandy SILT with mica
SAPROLITE,Brown-gray-orange silty SAND with mica & trace MnO
SAPROLITE,Brown-gray-orange silty SAND with mica & trace MnO
WEATHERED ROCK,(amphibolite-gneiss)
WEATHERED ROCK,(amphibolite-gneiss)
MATCH TO -DR3- STA. 12+16.21
3
36
40
30
36
92
100/0.5
100/0.3
2916.57
2:1
2886.08
0.060
6:1
4:1
2880.89
195+00.00
EX. EL. 2900.95
2960
2950
2940
2930
2920
2910
2900
2890
2880
2870
2860
2850
2840
2830
2820
2810
2800
2790
2780
2770
-4-
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	47/56



203+00.00

19-SEP-2013 14:38
C:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2519B_Geo_xpl_L_Lt.dgn
lwmann AT GEA266093

8/23/99

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	48/56

B-48
L
204+00.00 R 1
-170.0000

7
7
14
21
19
20
30

SAPROLITE. Brown-gray-orange sandy SILT with mica & MnO

2:1

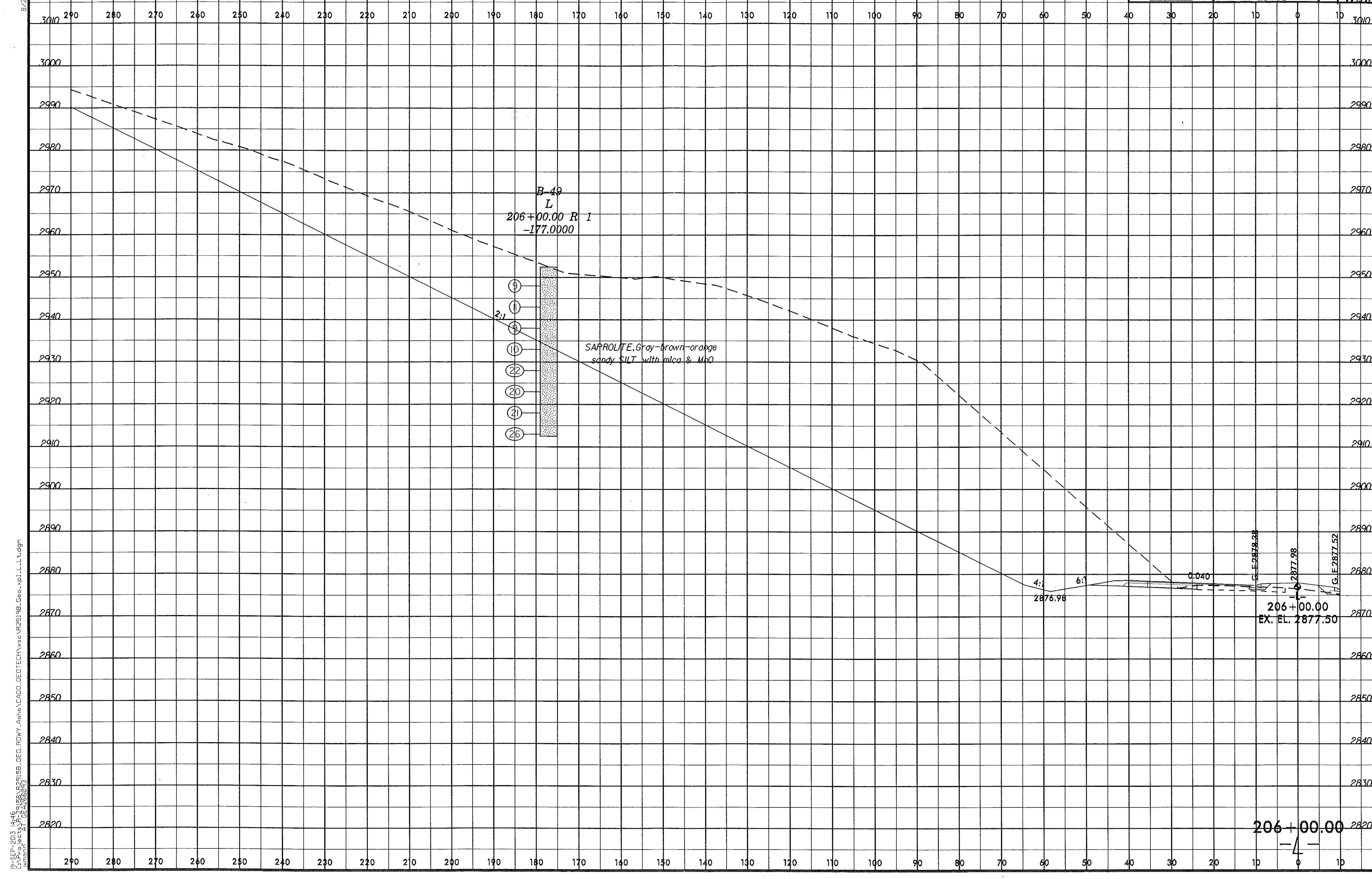
4:1
6:1
2879.22
0.040
G.E 2880.62
2880.22
G.E 2879.76

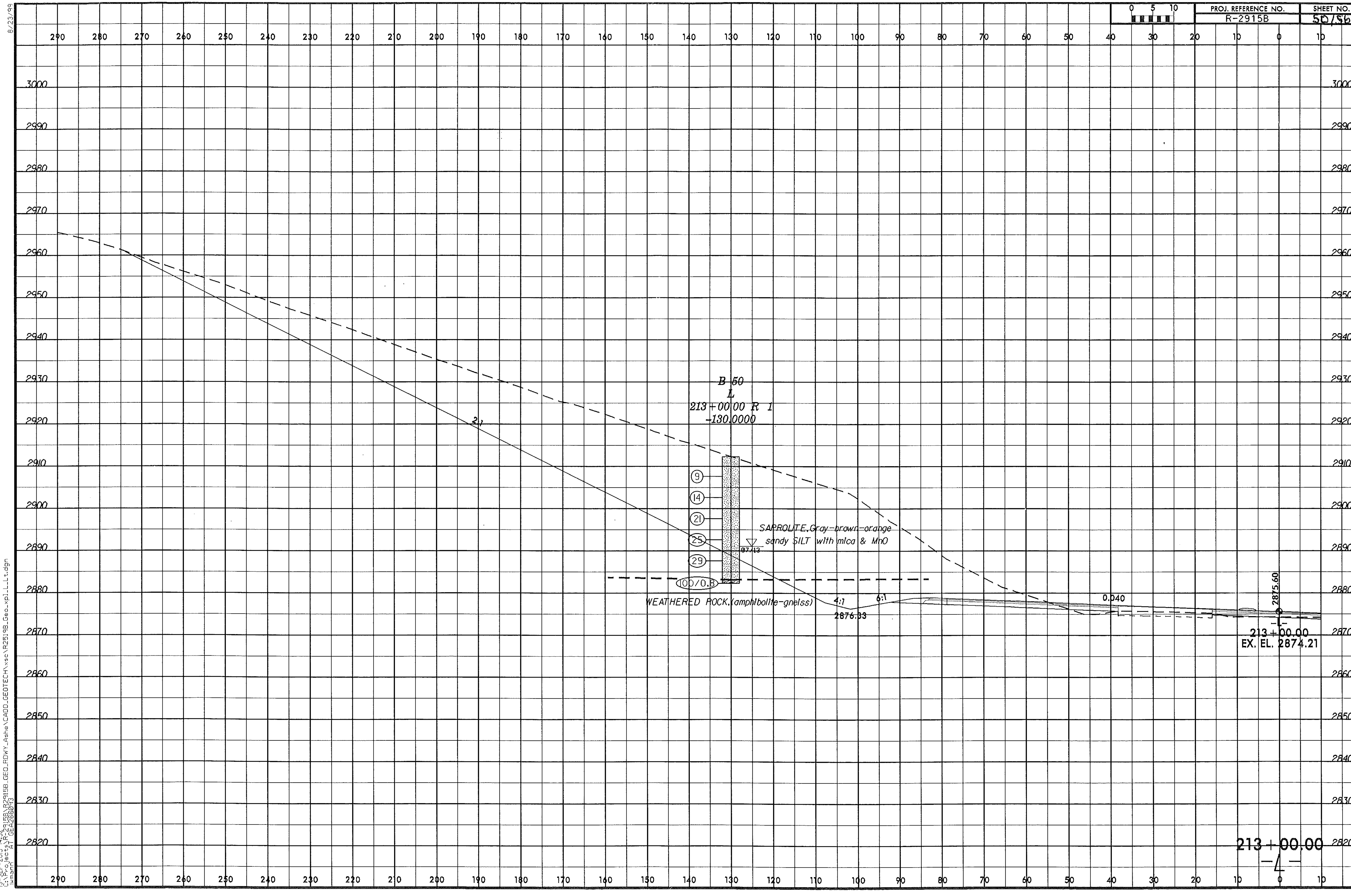
204+00.00
EX. EL. 2877.98

204+00.00
-L-

19-SEP-2013 14:40
C:\Projects\R-2915B_GEO_ROWY_Ashe\CADD_GEOTECH\xsc\R2915B_Geo_xpl_L_Lt.dgn
smarti

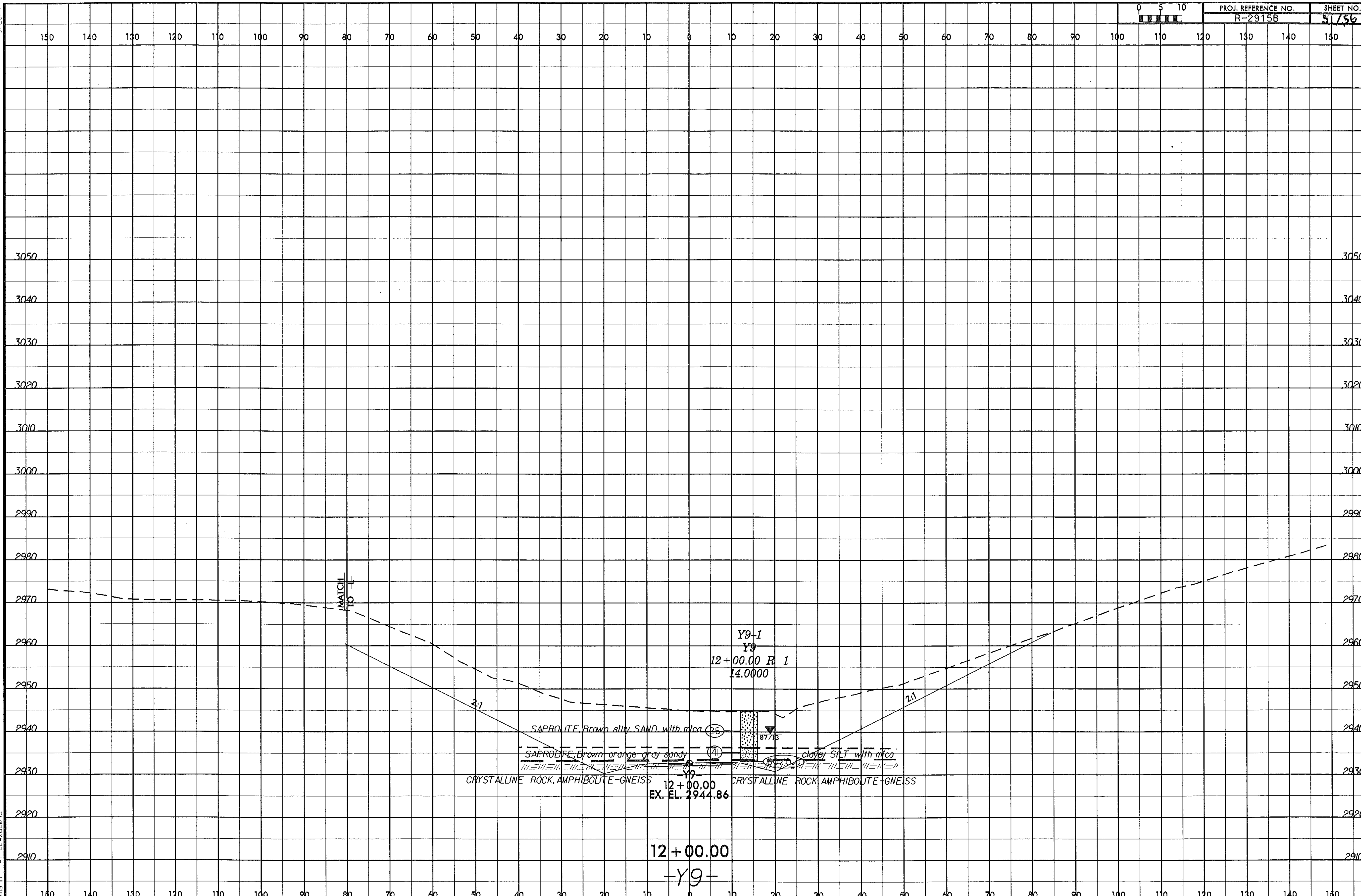
PROJ. REFERENCE NO.	SHEET NO.
R-2915B	49/56





PROJ. REFERENCE NO.
R-2915B
SHEET NO.
50/56
0 5 10
B 50
L
213+00.00 R 1
-130.0000
2:1
9
14
21
25
29
100/0.8
07/13
SAPROLITE, Gray-brown-orange sandy SILT with mica & MnO
WEATHERED ROCK, (amphibolite-gneiss)
4:1
6:1
2876.33
0.040
2875.60
213+00.00
EX. EL. 2874.21
213+00.00
-L-

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	51/56



8/23/99

17-SEP-2013 16:36
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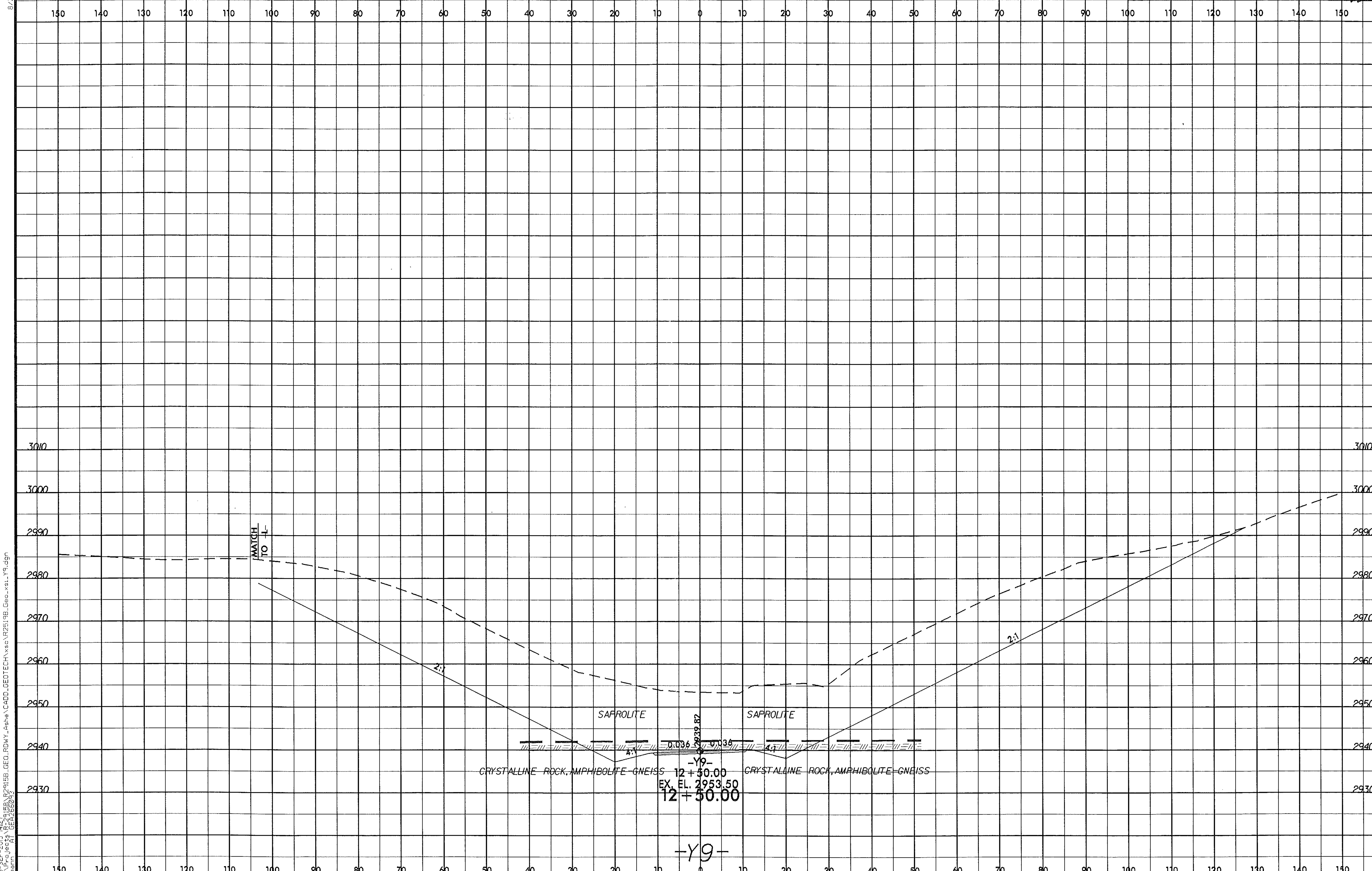
lwmann AT GEA26093

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	52/56



8/23/99

09-SEP-2013 14:27
C:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2519B_Geo_xsl_Y9.dgn
lmann AT GEA266093

8/23/99

0 5 10

PROJ. REFERENCE NO. R-2915B

SHEET NO. 53/56

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

3040 3030 3020 3010 3000 2990 2980 2970 2960 2950 2940 2930 2920

Y9-3
Y9
13+00.00 R 1
110.0000

ARTIFICIAL FILL, SILT

SAPROLITE, SILTY SAND

WEATHERED ROCK, (amphibolite-gneiss)

CRYSTALLINE ROCK, AMPHIBOLITE GNEISS

46

100/1.0

60/0.1

60/0.1

Y9-2
Y9
13+00.00 R 1
40.0000

100/0.8

60/0.1

MATCH TO -L-

SAPROLITE TO WEATHERED ROCK

2:1

4:1

0.060

2946.98

0.060

4:1

2944.22

2945.58

-Y9-
13+00.00
EX. EL. 2963.09

13+00.00

-Y9-

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

09-SEP-2013 14:30
C:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2519B_Geo_xsi_Y9.dgn
lmann AT GEE-2960043

8/23/99

PROJ. REFERENCE NO. R-2915B

SHEET NO. 54/54

0 5 10

MATCH TO -L-

2:1

SAPROLITE TO WEATHERED ROCK

2951.38

0.060

0.660

2954.14

4:1

2952.74

CRYSTALLINE ROCK, AMPHIBOLITE-GNEISS

-Y9-
13+50.00
EX. EL. 2984.07

13+50.00

-Y9-

09-SEP-2013 14:32
C:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2519B_Geo_xsl_Y9.dgn
mann
Al GEF298013

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2915B	55A6

Y9-4
Y9
14+00.00 R 1
-10.0000

MATCH TO ⊥

SAPROLITE

2:1

SAPROLITE, Brown-gray-orange-black silty SAND with MnO & mica

WEATHERED ROCK, (amphibolite-gneiss seam)

SAPROLITE

WEATHERED ROCK, (amphibolite-gneiss)

9
10
17
50
46
36
100/0.7
36
54
100/0.5

07.13
0.035
2941.80
0.035

2958.80

-Y9-
14+00.00
EX. EL. 3010.00

4:1

2959.60

1.7:1

SAPROLITE, Brown-gray-orange-black silty SAND with MnO & mica

WEATHERED ROCK, (amphibolite-gneiss seam)

WEATHERED ROCK, (amphibolite-gneiss)

14+00.00

-Y9-

09-SEP-2013 14:35
C:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2915B_Geo_xs1_Y9.dgn
lmann
A1 GE1260802

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-2915B	56/56

0 5 10

Y9-5
Y9
14+50.00 R 1
0.0000

MATCH TO -L-

SAPROLITE, Brown-gray-orange-black silty SAND with mica & MnO

WEATHERED ROCK, (amphibolite-gneiss)

CRYSTALLINE ROCK, AMPHIBOLITE-GNEISS

19
20
26
56
34
34
43
49
100/0.9
60/0

07.13

0.00

2:1
4:1
4:1
1.7:1

2986.10
2965.33

-Y9-
14+50.00
EX. EL. 3018.51

14+50.00
-Y9-

09-SEP-2013 14:38
C:\Projects\R-2915B\R2915B_GEO_RDWY_Ashe\CADD_GEOTECH\xsc\R2519B_Geo_xst_Y9.dgn
imann
AT GEN26003