CONTRACT: C203202

ID: K-5002

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

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-Y-	11+11.00-19+00.00	6	7	8-21
-Y1-	13+00.00-14+50.00	6	7	22-25

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 41534.1.1 K-5002 F.A. PROJ. NHS-0023(18)

COUNTY HAYWOOD

PROJECT DESCRIPTION US 23/74 - SOUTHBOUND REST AREA ON NEW LOCATION AS A COMPANION TO THE EXISTING NORTH BOUND REST AREA

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	K-5002	1	25

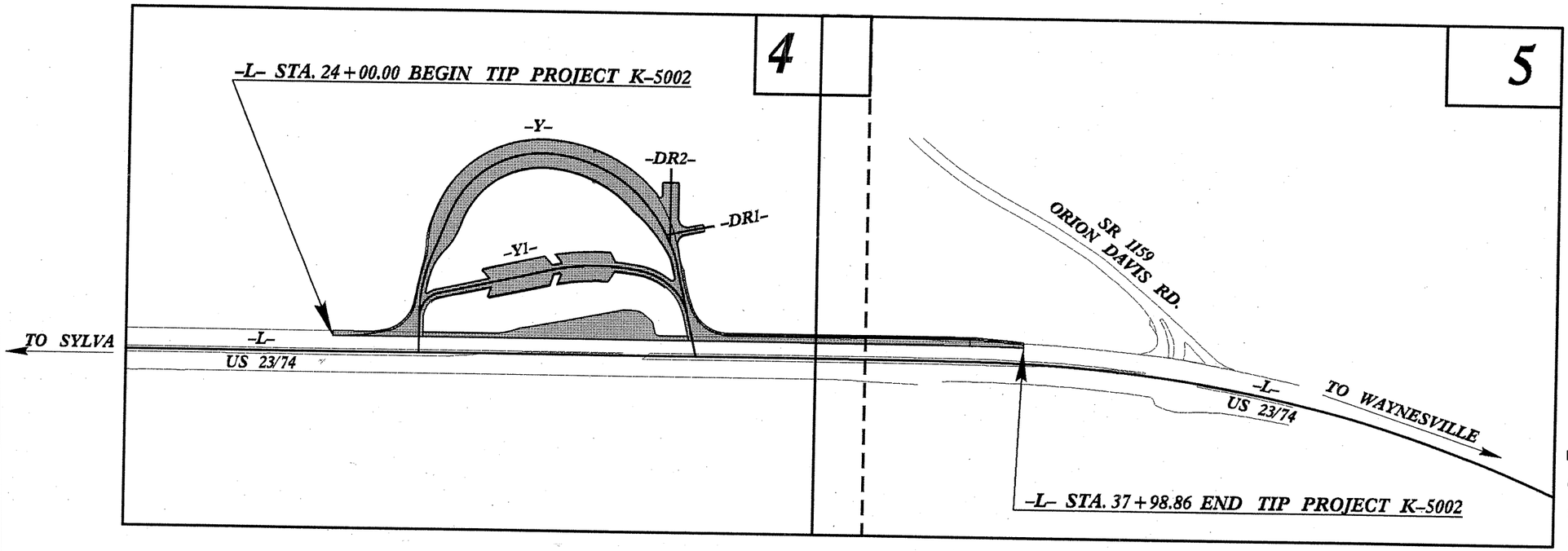
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
41534.1.1	NHS-0023(18)	P.E.
41534.2.1	NHS-0023(18)	R/W
41534.3.1	NHS-0023(18)	CONST.

CAUTION NOTICE

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

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

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

M.M. HAGAR

D.O. CHEEK

C.J. COFFEY

INVESTIGATED BY P.Q. LOCKAMY

CHECKED BY W.D. FRYE

SUBMITTED BY W.D. FRYE

DATE 4.9.12

NORTH CAROLINA LICENSED SEAL 1907 GEOLOGIST Patrick Q. Lockamy

4-9-12

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 IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

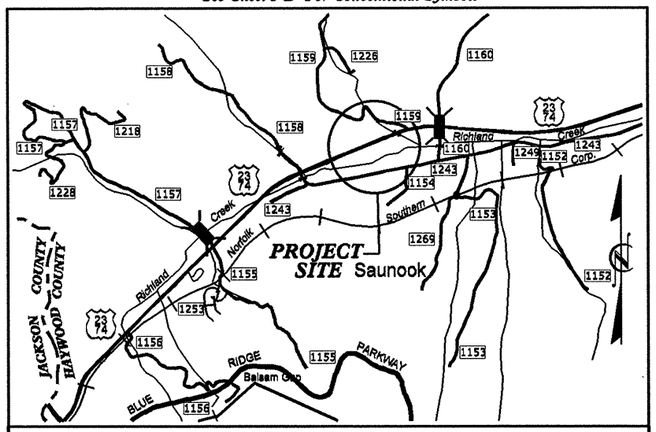
NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

09/06/99

TIP PROJECT: K-5002

CONTRACT:

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



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HAYWOOD COUNTY

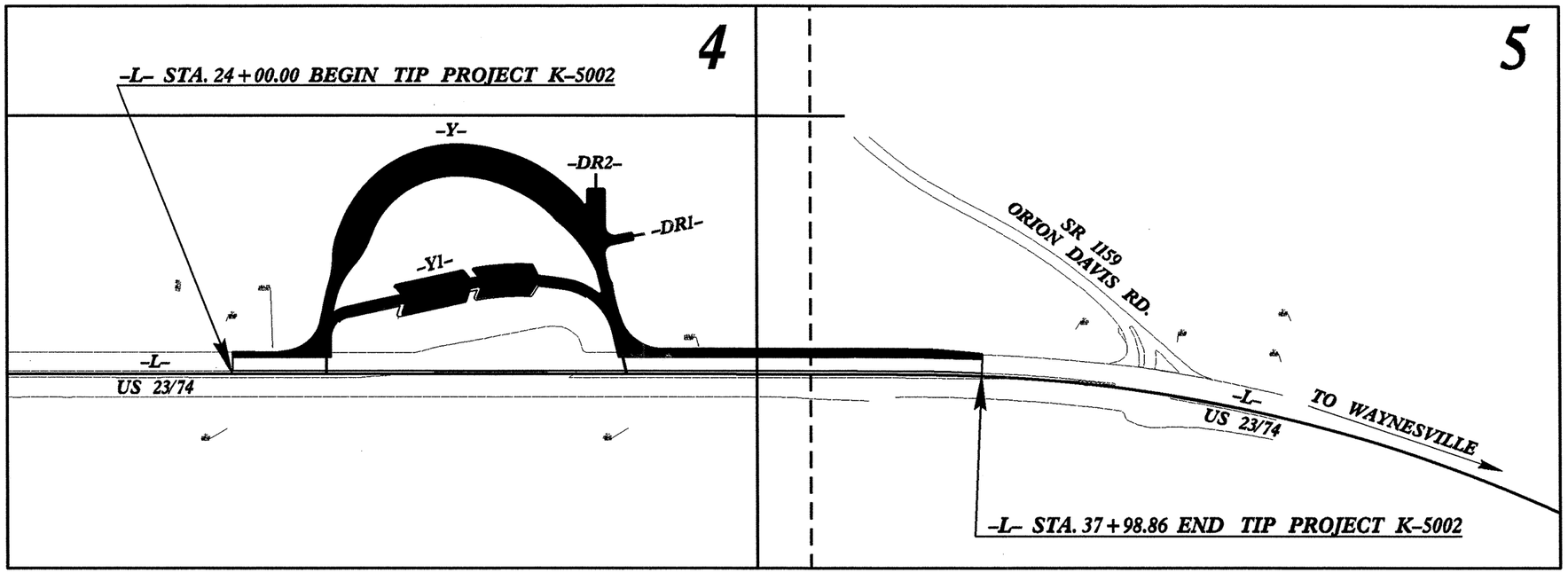
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	K-5002	1-A	25

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
41534.1.1	NHS-0023(18)	P.E.

LOCATION: US 23/74 – SOUTHBOUND REST AREA ON NEW LOCATION AS A COMPANION TO THE EXISTING NORTHBOUND REST AREA

TYPE OF WORK: GRADING, PAVING, DRAINAGE, TRAFFIC CONTROL AND SIGNING

NAD 83/ NSRS 2007



THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD __.
THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

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

GRAPHIC SCALES

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

DESIGN DATA

ADT 2013 = 760
ADT 2033 = 1,160
DHV = 13%
D = 55%
T = N/A%
V = 20 MPH

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT K-5002 = 0.265 MILES
TOTAL LENGTH TIP PROJECT K-5002 = 0.265 MILES

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: AUGUST 17, 2012

LETTING DATE: AUGUST 20, 2013

RON McCOLLUM, P.E.
PROJECT ENGINEER

JEFFREY L. TEAGUE, P.E.
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

P.E.
STATE HIGHWAY DESIGN ENGINEER

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jtwilliams AT GEA24554

PROJECT REFERENCE NO.	SHEET NO.
41534.1.1 K-5002	2 OF 25

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-1, A-2 A-3	A-4, A-5 A-6, A-7	
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6			
SYMBOL														
% PASSING #10 #40 #200	50 MX 30 MX 15 MX	50 MX 25 MX	51 MN 10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN	GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
LIQUID LIMIT	6 MX		NP	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	40 MX	41 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
PLASTIC INDEX				10 MX	10 MX	11 MN	11 MN	10 MX	10 MX	11 MN	11 MN			
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	No MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

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

CONSISTENCY OR DENSENESS

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

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

SOIL MOISTURE SCALE (ATTERBERG LIMITS)	FIELD MOISTURE DESCRIPTION	GUIDE FOR FIELD MOISTURE DESCRIPTION
	- SATURATED - (SAT.)	USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE
LL — LIQUID LIMIT		
PLASTIC RANGE (PI)	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
PL — PLASTIC LIMIT		
OM — OPTIMUM MOISTURE	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
SL — SHRINKAGE LIMIT		
	- DRY - (D)	REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE

PLASTICITY

	PLASTICITY INDEX (PI)	DRY STRENGTH
NONPLASTIC	0-5	VERY LOW
LOW PLASTICITY	6-15	SLIGHT
MED. PLASTICITY	16-25	MEDIUM
HIGH PLASTICITY	26 OR MORE	HIGH

COLOR

DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	1 - 10%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	10 - 20%
MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	20 - 35%
HIGHLY ORGANIC	>10%	>20%	HIGHLY	35% AND ABOVE

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

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

ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

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

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

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

CORE SIZE:
- [ ] -B-__
- [ ] -N-__
- [ ] -H-__

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

ROCK DESCRIPTION

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

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

WEATHERING

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

ROCK HARDNESS

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

FRACTURE SPACING

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

BEDDING

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

INDURATION

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

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

TERMS AND DEFINITIONS

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

AQUIFER - A WATER BEARING FORMATION OR STRATA.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

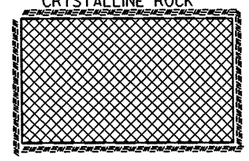
TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:

ELEVATION: FT.

NOTES:

- AREA OF EXPOSED CRYSTALLINE ROCK



REVISED 02/23/06

3A

PROJECT: K-5002 COUNTY: Haywood DATE: 10/22/2013 COMPILED BY: J JOHNSON SHEET__ OF __ SHEETS

Volumes in Cubic Yards

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL
-L- 24+00.00	-L- 25+00.00	69				69							69		69
-L- 31+00.00	-L- 37+98.86	528				528	691		691	795	267				
-Y- 10+42.50	-Y- 20+50.00	38,549	3,237			35,312	3,048	2,438		2,438		799	35,312		36,111
-Y1- 11+50.00	-Y1- 16+50.00	140				140	2,457		2,457	2,826	2,686				
-DR1- 10+25.00	-DR1- 10+75.00						159		159	183	183				
-DR2- 10+50.00	-DR2- 11+13.00						318		318	366	366				
TOTALS		39,286	3,237			36,049	6,673	2,438	3,625	6,608	3,502	799	35,381		36,180
LOSS DUE TO CLEARING & GRUBBING		-55				-55							-55		-55
PROJECT SUBTOTAL		39,231	3,237			35,994	6,673	2,438	3,625	6,608	3,502	799	35,326		36,125
ADJUST FOR ROCK WASTE									-200	-200	-200				
USE ROCK IN LIEU OF BORROW								799	-799		-799	-799			-799
ELIMINATE EARTH SHRINKAGE FACTOR										-150	-150				
USE WASTE IN LIEU OF BORROW											-2,353		-2,353		-2,353
PROJECT TOTAL		39,231	3,237			35,994	6,673	3,237	2,626	6,258			32,973		32,973
GRAND TOTAL		39,231													
SAY		39,300													

Geotechnical Recommendations dtd. Apr. 19, 2012

Geotextile for Soil Stabilization = 3,000 SY
Class IV Subgrade Stabilization = 3,780 Tons
Shallow Undercut = 2,000 CY
Subsurface Drainage _ Underdrain = 300 LF
Undercut = 300 CY
Select Granular Material, Class II or III = 100 CY

EST. DDE = 420CY

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

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

April 9, 2012

STATE PROJECT: 41534.1.1 (K-5002)
F. A. PROJECT: NHS-0023(18)
COUNTY: Haywood

DESCRIPTION: US 23/74 – Southbound Rest Area on New Location as a Companion to the Existing Northbound Rest Area

SUBJECT: Geotechnical Report – Inventory

Project Description

The proposed rest area is located beside a 4-lane divided highway east of Balsam Gap near Hazelwood. Most developed land along the highway is business oriented. The majority of the site, approximately 60 percent, has been filled to highway elevation with the remainder being cut. A bench and a steepened hillside occupy the northern portion of the site. An unnamed creek flowing through the site has been relocated around the filled area. This location has been a lot in a business park, a modular home dealership and more recently a stump dump and mulch yard.

The Geotechnical Unit conducted a field investigation of the project in February of 2012 using a CME 550X drill machine. Hollow stem augers were used to advance 18 borings. Seven soil samples were tested for quality.

Areas of Special Geotechnical Interest

Crystalline Rock

Crystalline rock was encountered above grade or within 6 feet of proposed grade along -Y- from Stations 15+50 to 16+40 and 17+10 to 18+50. The rock line is mounded and does not conform to surface topography.

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

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

Water Well

A water well is located in a shed 66 feet right of -Y- Line Station 16+34.

Physiography and Geology

The project is in the wide valley of Richland Creek which is a corridor for both rail and highway. Practically all of the site has been cut or filled obscuring former alluvial, colluvial and residual soils that presently border the site. Nearby peaks exceed 5,000 feet in elevation with lower slopes and drainages typically blanketed with coalesced colluvial accumulations of varying age. Area creeks tend to be swift and rocky with thin alluvium. Basement rock exposed on site is Proterozoic age dark colored hornblende gneiss to amphibolite with minor areas of light colored gneiss and small micaceous pegmatites. The hornblende gneiss tends to have excellent engineering properties relative to associated basement schists which are not present at this site.

Soils and Materials

Fill, alluvium, saprolite, residuum, weathered rock, crystalline rock and patches of wood mulch were encountered on the project. Colluvium was not identified in test borings but is suspected of being present under fill in limited areas near the relocated stream in the north east corner of the site. Nearby colluvium is red and clayey with quartz cobbles.

Fill soils present across a large part of the site consist dominantly of silty sand (A-2-4) with thin layers of sandy silt (A-4) along with very minor amounts of clayey sand (A-2-6). Fill material was apparently derived from on-site excavation. Rock fragments are common in fill soils while roots or wood debris was very minor. Occasional boulders in fill are also present but not widespread. Areas of trash or copious wood debris were not encountered in fill soils.

Alluvium was encountered below fill in 4 borings. Disturbed alluvium along with insitu alluvium, typically brown sandy silt (A-4) with some clayey sand with silt (A-2-7) and basal sand (A-1-b), underlies significant portions of the fill.

Saprolitic soils present typically consist of silty sand (A-2-4) with lower elevation saprolite having undergone slight gleying where it was plugged by clays transported by groundwater. Gleyed saprolitic soils are only a few feet thick and consist of gray slightly clayey sandy silts (A-4).

Residuum consisting of red sandy silt (A-4) was encountered in only one boring.

Weathered rock and crystalline rock of hornblende gneiss to amphibolite and minor amounts of light colored gneiss is present in proposed cut areas along -Y- and are shown on cross section and profile.

Wood mulch is intermittently spread across the surface of filled area in patches of a few inches with a few deeper patches of a foot or so thick.

Groundwater

Groundwater at this site has been elevated by the filling of the former floodplain and is consistently present from elevation 2970 to 2964 feet going from west to east across the filled area.

The existing benched area has a water table at higher elevations as drainage is restricted by weathered rock present under much of it - see cross section 17+00 -Y-. Groundwater is present above or within 6 feet of proposed grade along -Y- from Station 16+00 to 17+00. This water will be released by excavation but an area of seepage is expected to develop at the toe of the finished cut.

Respectfully Submitted,

P. Q. Lockamy

P. Q. Lockamy, P.G.

PROJECT REFERENCE NO.	SHEET NO.
K-5002	6 OF 25
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/ NSRS 2007

BEGIN TIP PROJECT K-5002
-L- POT STA. 24+00.00

-Y- PCC Sta. 15+61.01

END CONSTRUCTION
-DR2- STA. 11+20.00

-DR2- POT Sta. 11+50.00

-Y- POC Sta. 12+52.00
-DR1- POT Sta. 10+00.00

END CONSTRUCTION
-DR1- STA. 10+75.00

-DR1- POT Sta. 11+00.00

-Y- POC Sta. 12+33.75
-DR2- POT Sta. 30+00.00

-Y- PC Sta. 11+86.01

-Y- PT Sta. 18+03.58

-Y- PC Sta. 18+99.91

-Y- PT Sta. 20+15.84

-Y- POT Sta. 20+22.09 =
-Y1- PT Sta. 17+02.85

-Y- PC Sta. 10+83.45 =
-Y1- PC Sta. 10+83.45

END 2'P.S.
BEGIN 2'-6" C&G
-Y1- STA. 11+59.00

END 2'-6" C&G
BEGIN 2'P.S.
-Y1- STA. 16+60.00

-L- POT Sta. 25+75.00 =
-Y- POT Sta. 20+91.15

-L- POT Sta. 31+35.75 =
-Y- POT Sta. 10+00.00

-Y1- PC Sta. 16+35.20

-Y1- PT Sta. 14+42.11

-Y1- PCC Sta. 12+17.11

MATCH LINE SEE SHEET 5 -L- STA. 34+50.00

-BL-2

-BL-3

-BL-4

AREA OF EXPOSED CRYSTALLINE ROCK

-Y-

PI Sta 14+06.24	PI Sta 16+99.73	PI Sta 19+58.61
Δ = 75° 23' 21.1" (LT)	Δ = 69° 29' 33.6" (LT)	Δ = 22° 08' 27.2" (LT)
D = 20° 06' 13.6"	D = 28° 38' 52.4"	D = 19° 05' 54.9"
L = 375.00'	L = 242.58'	L = 115.93'
T = 220.23'	T = 138.73'	T = 58.70'
R = 285.00'	R = 200.00'	R = 300.00'

-Y1-

PI Sta 11+58.98	PI Sta 13+18.46	PI Sta 16+75.34
Δ = 66° 35' 25.1" (LT)	Δ = 22° 55' 05.9" (LT)	Δ = 77° 30' 50.9" (LT)
D = 49° 49' 20.7"	D = 11° 27' 33.0"	D = 114° 35' 29.6"
L = 133.66'	L = 200.00'	L = 67.64'
T = 75.53'	T = 101.36'	T = 40.14'
R = 115.00'	R = 500.00'	R = 50.00'

-L-

PIs Sta 37+44.52	PI Sta 43+91.07
Θs = 2° 59' 22.7"	Δ = 21° 26' 37.3" (RT)
Ls = 301.05'	D = 1° 59' 10.1"
LT = 200.73'	L = 1,079.67'
ST = 100.38'	T = 546.23'
	R = 2,884.79'
	S 88° 12' 55.2" E (AHEAD)

NOTES:
1.) FOR -Y-, -Y1-, -DR1-, AND -DR2- PROFILES SEE SHEET 6.
2.) NO PROFILE PROVIDED FOR -L- WIDEN OFF THE EXISTING.
3.) ALL CONC. ISLAND RADII ARE 2' UNLESS OTHERWISE NOTED.

8/17/99

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
K-5002	7 OF 25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

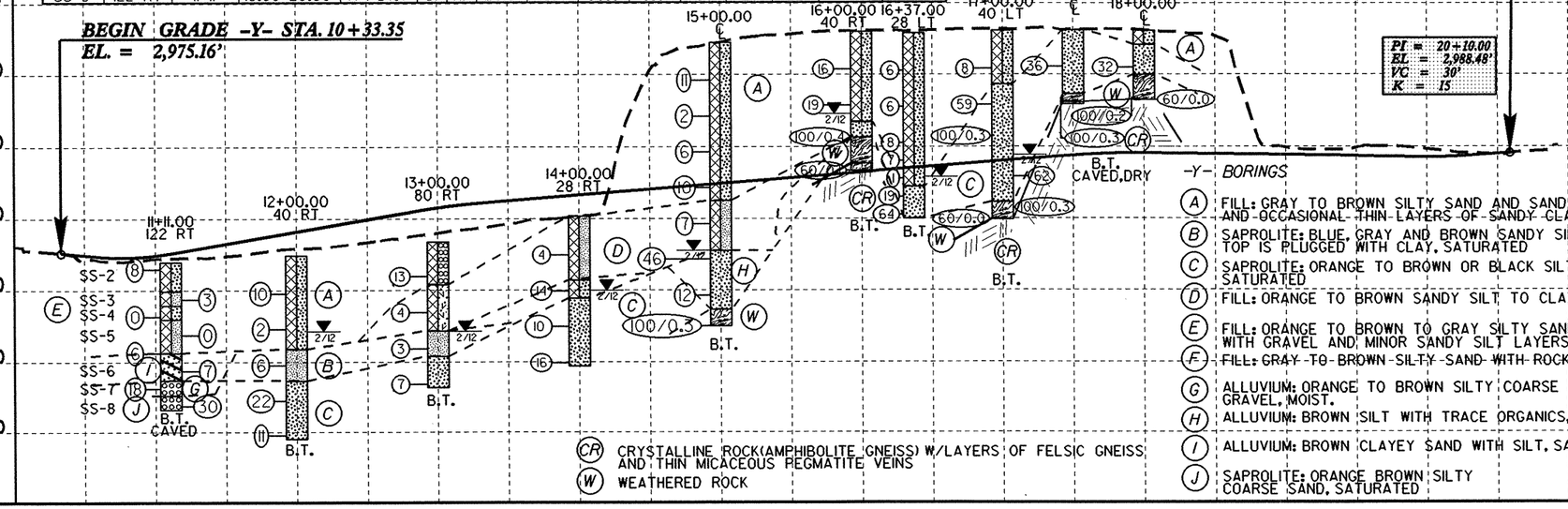
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

PROFILE ALONG ℄ OF -Y-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-2	122 RT	11+11	1.00-1.50	A-2-4(0)	31	3	42.6	26.3	27.1	4.0	95	67	30		
SS-3	122 RT	11+11	4.60-5.60	A-4(0)	34	NP	37.1	26.7	28.1	8.0	96	73	36		
SS-4	122 RT	11+11	7.10-8.10	A-2-4(0)	34	NP	41.4	27.1	25.5	6.0	97	70	32		
SS-5	122 RT	11+11	9.60-10.60	A-4(0)	36	5	30.5	27.7	33.7	8.0	98	79	43		
SS-6	122 RT	11+11	14.60-15.60	A-2-7(0)	43	11	44.2	19.1	20.7	16.1	89	60	33		
SS-7	122 RT	11+11	17.10-18.10	A-4-b(0)	35	NP	51.2	21.5	21.3	6.0	61	38	17		
SS-8	122 RT	11+11	19.60-20.60	A-4-b(0)	31	NP	29.5	10.4	60.0	0.0	36	28	22		



-Y- BORINGS

(A) FILL: GRAY TO BROWN SILTY SAND AND SANDY SILT WITH GRAVEL, OCCASIONAL BOULDER AND OCCASIONAL THIN LAYERS OF SANDY CLAY AND SILTY CLAY, MOIST TO SATURATED.

(B) SAPROLITE: BLUE, GRAY AND BROWN SANDY SILT WITH CLAY. TOP IS PLUGGED WITH CLAY, SATURATED

(C) SAPROLITE: ORANGE TO BROWN OR BLACK SILTY SAND, SATURATED

(D) FILL: ORANGE TO BROWN SANDY SILT TO CLAYEY SILT, MOIST

(E) FILL: ORANGE TO BROWN TO GRAY SILTY SAND WITH GRAVEL AND MINOR SANDY SILT LAYERS, MOIST

(F) FILL: GRAY TO BROWN SILTY SAND WITH ROCK FRAGMENTS

(G) ALLUVIUM: ORANGE TO BROWN SILTY COARSE SAND AND GRAVEL, MOIST.

(H) ALLUVIUM: BROWN SILT WITH TRACE ORGANICS, MOIST.

(I) ALLUVIUM: BROWN CLAYEY SAND WITH SILT, SATURATED.

(J) SAPROLITE: ORANGE BROWN SILTY COARSE SAND, SATURATED

NOTE:
1.) FOR -Y- PLAN VIEW SEE SHEET 4.

10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00

PROFILE ALONG ℄ OF -Y1-

-DR1-

-DR2-

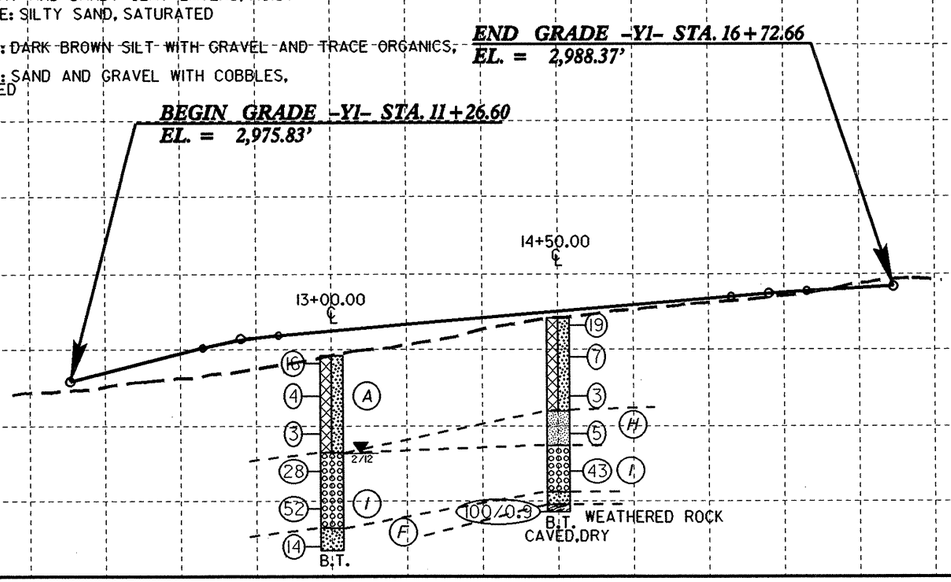
-Y1- BORINGS

(A) MIXED FILL: SILTY SAND WITH SANDY SILT AND MINOR GRAVEL SILTY CLAY AND SANDY CLAY LAYERS, MOIST

(F) SAPROLITE: SILTY SAND, SATURATED

(H) ALLUVIUM: DARK BROWN SILT WITH GRAVEL AND TRACE ORGANICS, MOIST

(I) ALLUVIUM: SAND AND GRAVEL WITH COBBLES, SATURATED



NOTE:
1.) FOR -DR2- PLAN VIEW SEE SHEET 4.

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PROJ. REFERENCE NO.	SHEET NO.
K-5002	8 OF 25

0 2.5 5

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

2975
2970

11+50.00

2980
2975
2970
2965
2960
2955
2950

11+00.00

-Y-

B-17
11+11.00
122 RT

FILL: BROWN SILTY SAND, MOIST — (8) SS-2
FILL: BROWN SANDY SILT, MOIST — (3) SS-3
FILL: BROWN SILTY SAND, WET — (0) SS-4
FILL: BROWN SILTY SAND. NOTE: BORING WAS CAVED AT 9.0 FEET INDICATING THE TOP OF THE WATERTABLE IS NEAR 9 FEET. — (0) SS-5
(6)
ALLUVIUM: BLUE, GRAY TO BROWN CLAYEY SAND WITH SILT, SATURATED — (7) SS-6
ALLUVIUM: ORANGE TO BROWN SILTY SAND TO COARSE SAND, SATURATED — (18) SS-7
SAPROLITE: ORANGE BROWN SILTY COARSE SAND, SATURATED — (30) SS-8

B.T.
CAVED, DRY
2/12

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C. SAND	F. SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-2	122 RT	11+11	1.00-1.50	A-2-4(0)	31	3	42.6	26.3	27.1	4.0	95	67	30		
SS-3	122 RT	11+11	4.60-5.60	A-4(0)	34	NP	37.1	26.7	28.1	8.0	96	73	36		
SS-4	122 RT	11+11	7.10-8.10	A-2-4(0)	34	NP	41.4	27.1	25.5	6.0	97	70	32		
SS-5	122 RT	11+11	9.60-10.60	A-4(0)	35	5	30.5	27.7	33.7	8.0	98	79	43		
SS-6	122 RT	11+11	14.60-15.60	A-2-7(0)	43	11	44.2	19.1	20.7	16.1	89	60	33		
SS-7	122 RT	11+11	17.10-18.10	A-1-b(0)	35	NP	51.2	21.5	21.3	6.0	61	38	17		
SS-8	122 RT	11+11	19.60-20.60	A-1-b(0)	31	NP	29.5	10.4	60.0	0.0	36	28	22		

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	K-5002	9 OF 25

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

2990
2985
2980
2975
2970
2965
2960
2955
2950
2945

SHEAR -DRI-

12+50.00

B-II
12+00.00
40 RT

FILL: SILTY SAND WITH ROCK FRAGMENT SAND OCCASIONAL BOULDER, MOIST TO SATURATED.

10
12
2/12
SAPROLITE: GLEYED SILTY SAND WITH ANGULAR GRAVEL, WET
6
22
111
B.T.

12+00.00
-Y-

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AT GEA245854

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0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	K-5002	10 OF 25

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

2990
2985
2980
2975
2970
2965
2960
2955

SHEAR –DR2–

13+00.00

–Y–

B-12
13+00.001
80 RT

FILL: BROWN AND GRAY SILTY SAND AND GRAVEL WITH SILTY CLAY AND SANDY CLAY LAYERS, MOIST

(13)

(14) FILL: ORANGE TO BROWN CLAYEY SILT WITH GRAVEL, MOIST

2/12

(3) SAPROLITE: ORANGE TO BROWN SANDY SILT, WET

(17) SAPROLITE: BROWN SILTY SAND, SATURATED

B.T.

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

2990
2985
2980
2975
2970
2965
2960
2955

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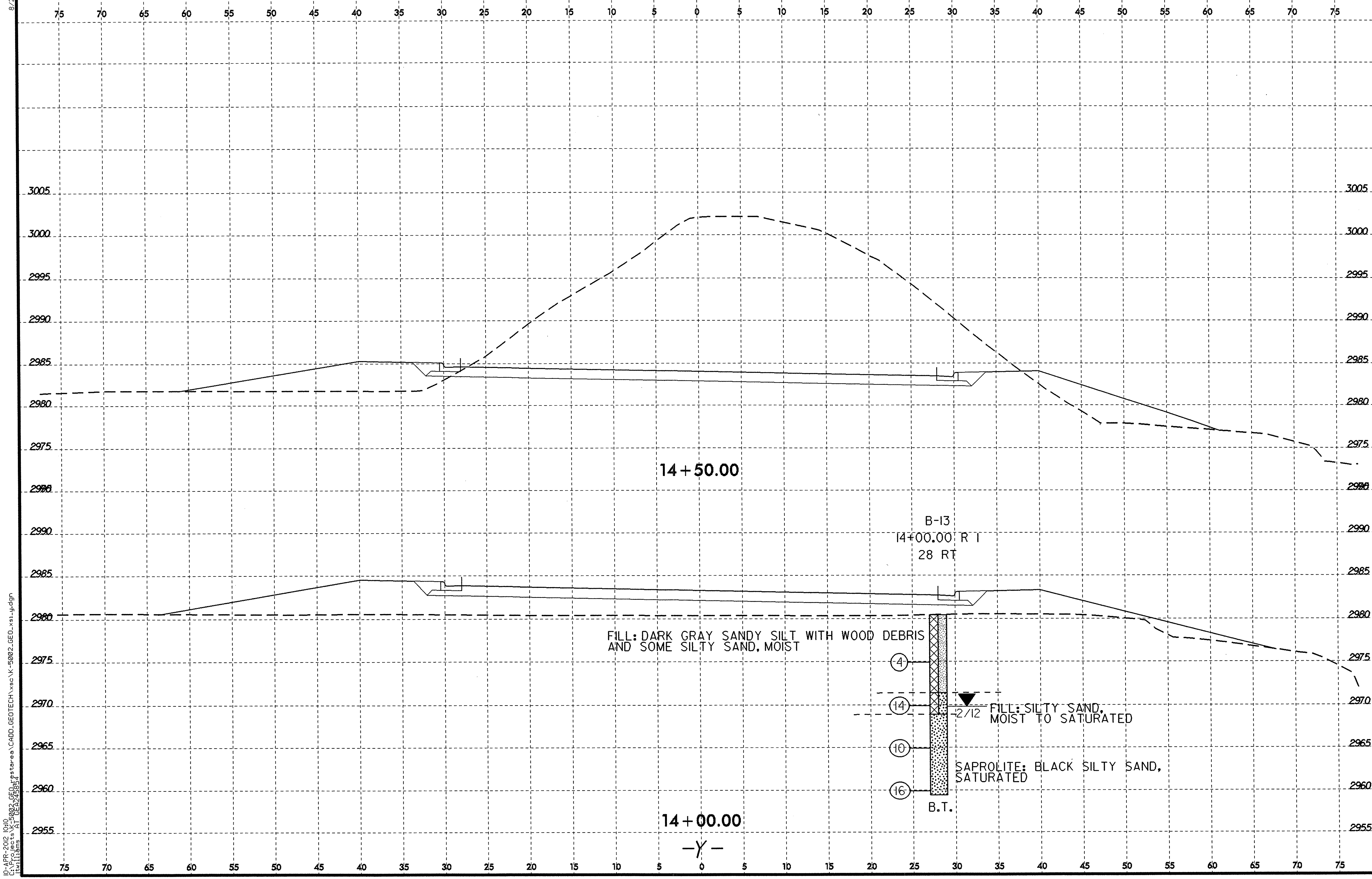

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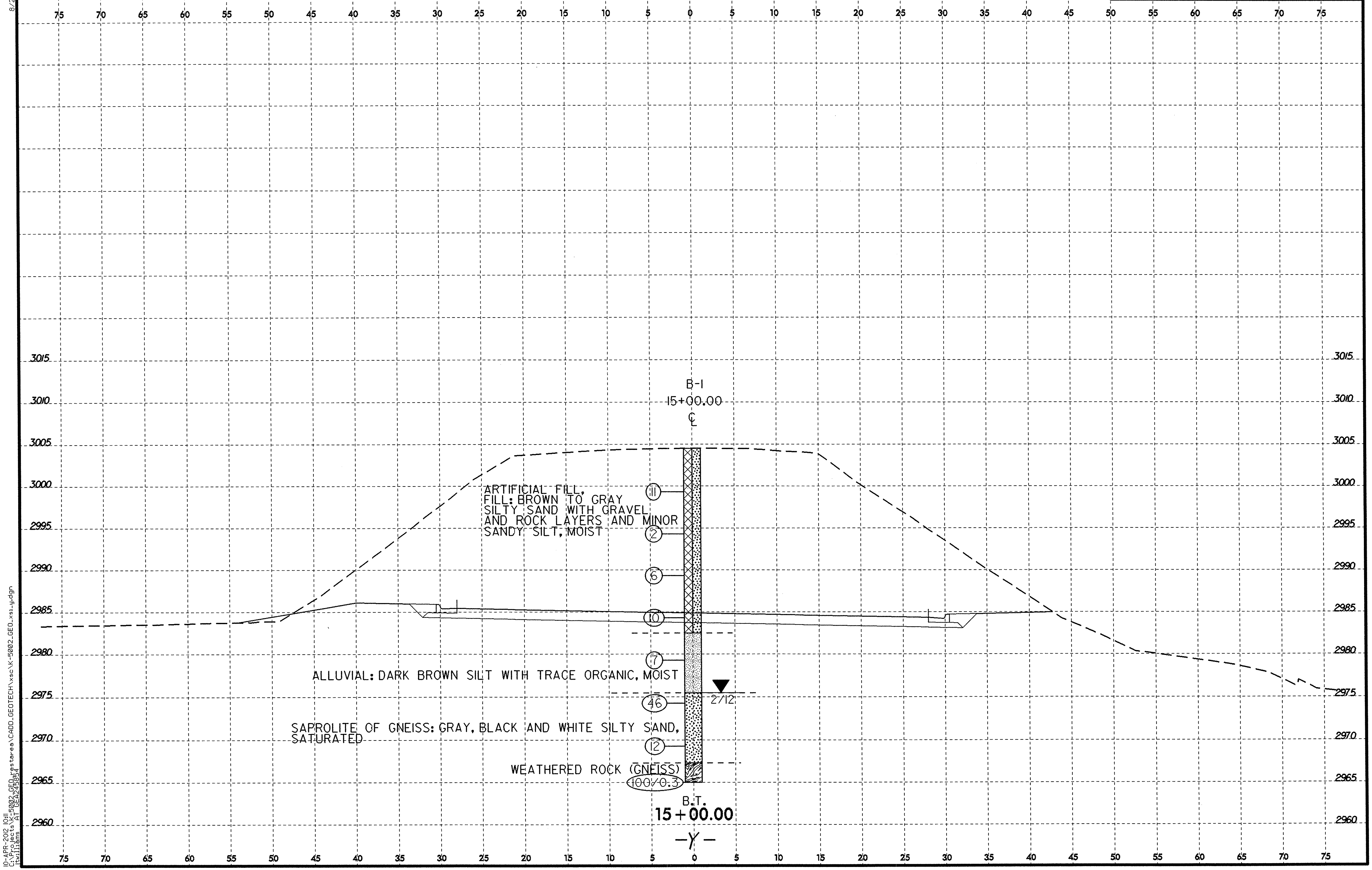

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itwilliams AT GEA245854

0 2.5 5

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

3015
3010
3005
3000
2995
2990
2985
2980
2975
2970
2965
2960

15+00.00
℄

ARTIFICIAL FILL,
FILL: BROWN TO GRAY SILTY SAND WITH GRAVEL AND ROCK LAYERS AND MINOR SANDY SILT, MOIST

ALLUVIAL: DARK BROWN SILT WITH TRACE ORGANIC, MOIST

SAPROLITE OF GNEISS: GRAY, BLACK AND WHITE SILTY SAND, SATURATED

WEATHERED ROCK (GNEISS)

2/12

B.T.
15+00.00

B-15
15+00.00
126 LT

FILL: BROWN SILTY SAND AND GRAVEL WITH A MULCH CAP, MOIST

RESIDUAL: RED CLAYEY SAND, MOIST

SAPROLITE: ORANGE TO BROWN SILTY SAND, MOIST

B.T.
CAVED, DRY
2/12

10-APR-2012 10:12
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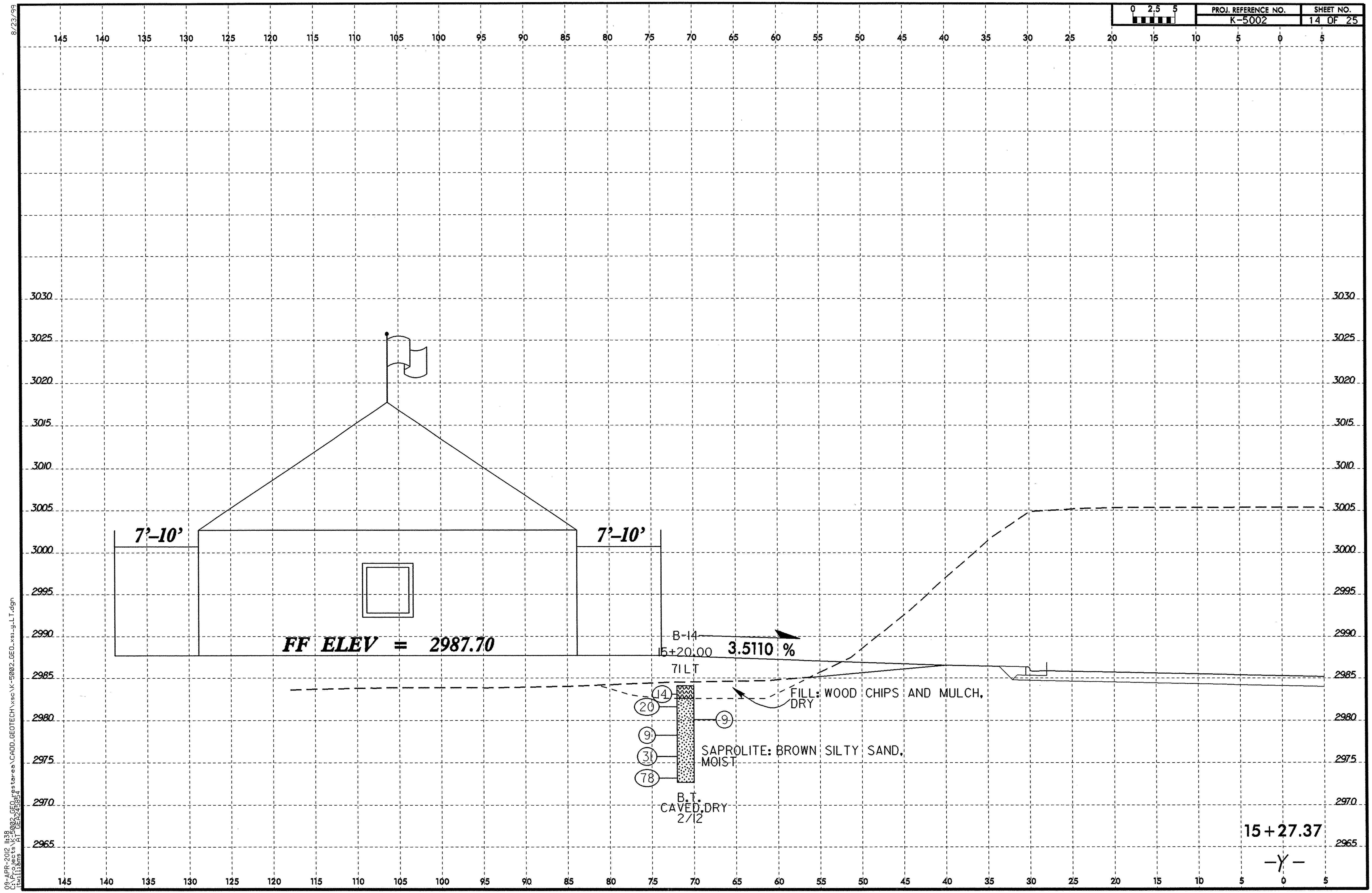
itwilliams
AT 0EA2458854


0 2.5 5
7'-10'
7'-10'
FF ELEV = 2987.70
B-14
15+20.00
71 LT
3.5110 %
FILL: WOOD CHIPS AND MULCH, DRY
SAPROLITE: BROWN SILTY SAND, MOIST
B.T.
CAVED DRY
2/12
15+27.37
-Y-
8/23/99
09-APR-2012 11:38
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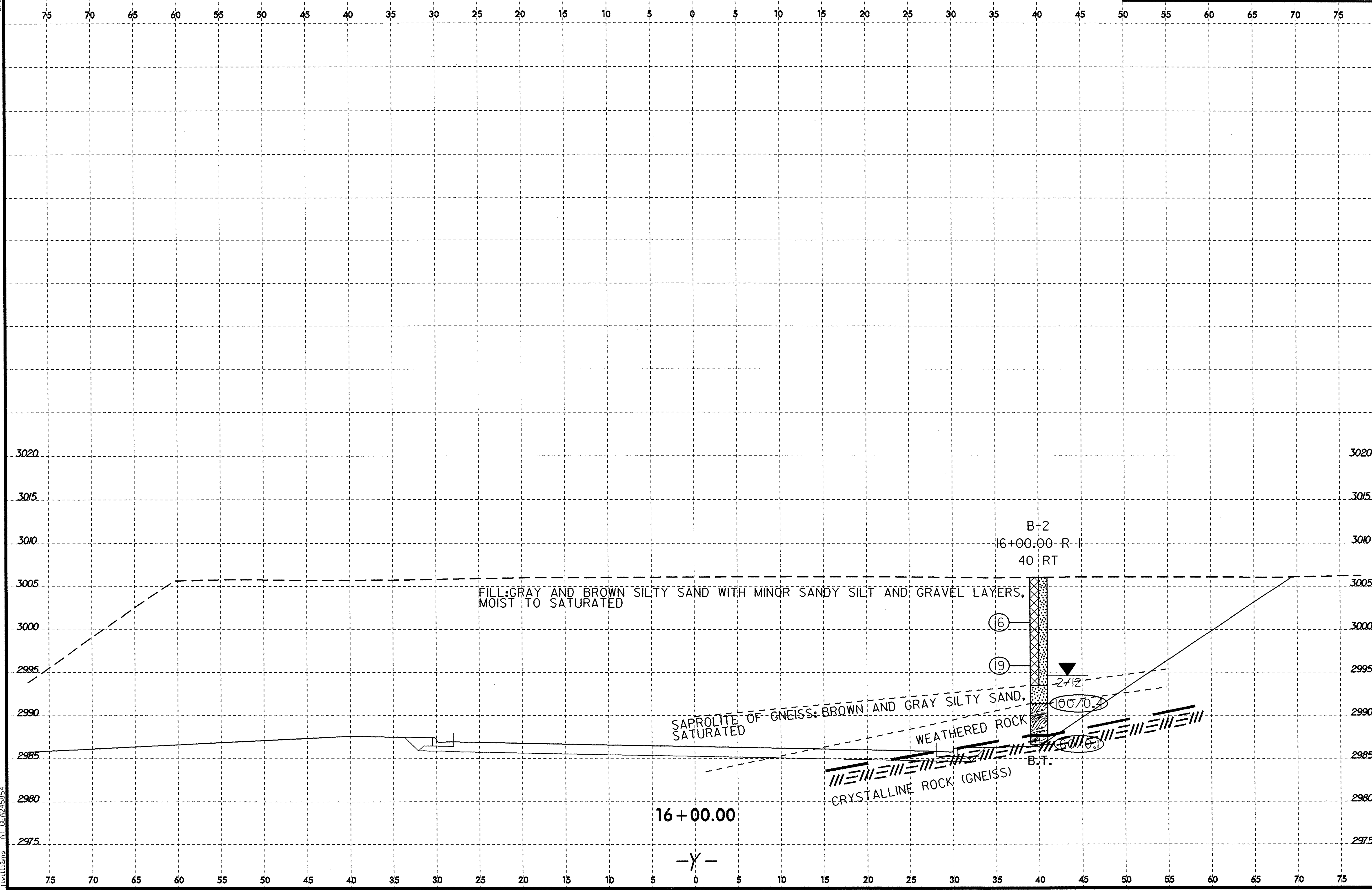
twilliams AT GEA245854

PROJ. REFERENCE NO.	SHEET NO.
K-5002	15 OF 25



8/23/99

09-APR-2012 11:46
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twilliams AT GEA245854

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	K-5002	16 OF 25

B-18
16+37.00
28 LT

FILL: BROWN SILTY SAND AND GRAVEL, MOIST TO SATURATED

6
6
8
7
1
2/12
19
64

SAPROLITE: SILTY SAND, SATURATED

B.T.

0.9317 %

16+27.99

-Y-

09-APR-2012 11:46
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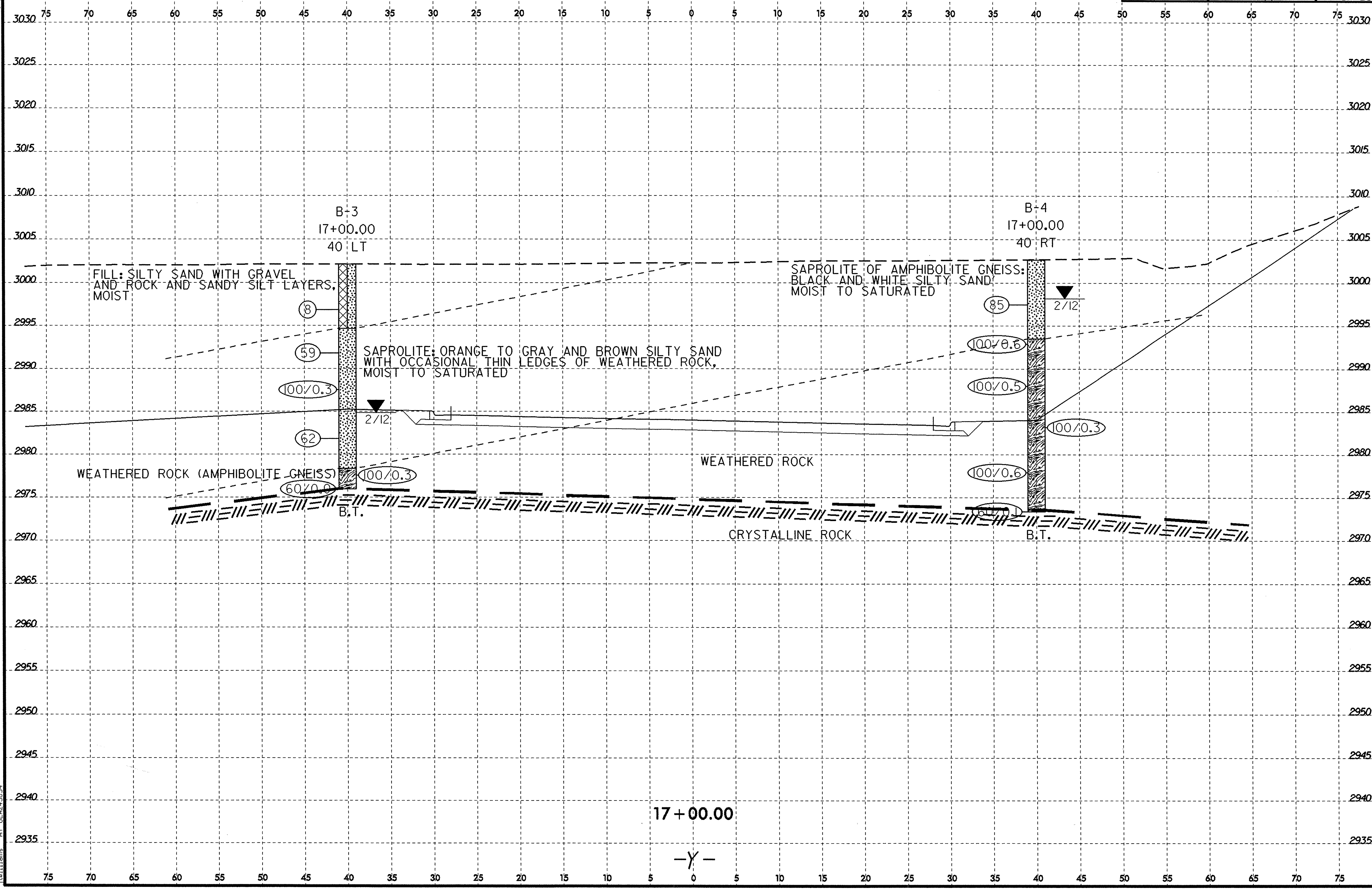
AT_GEA245854



8/23/99

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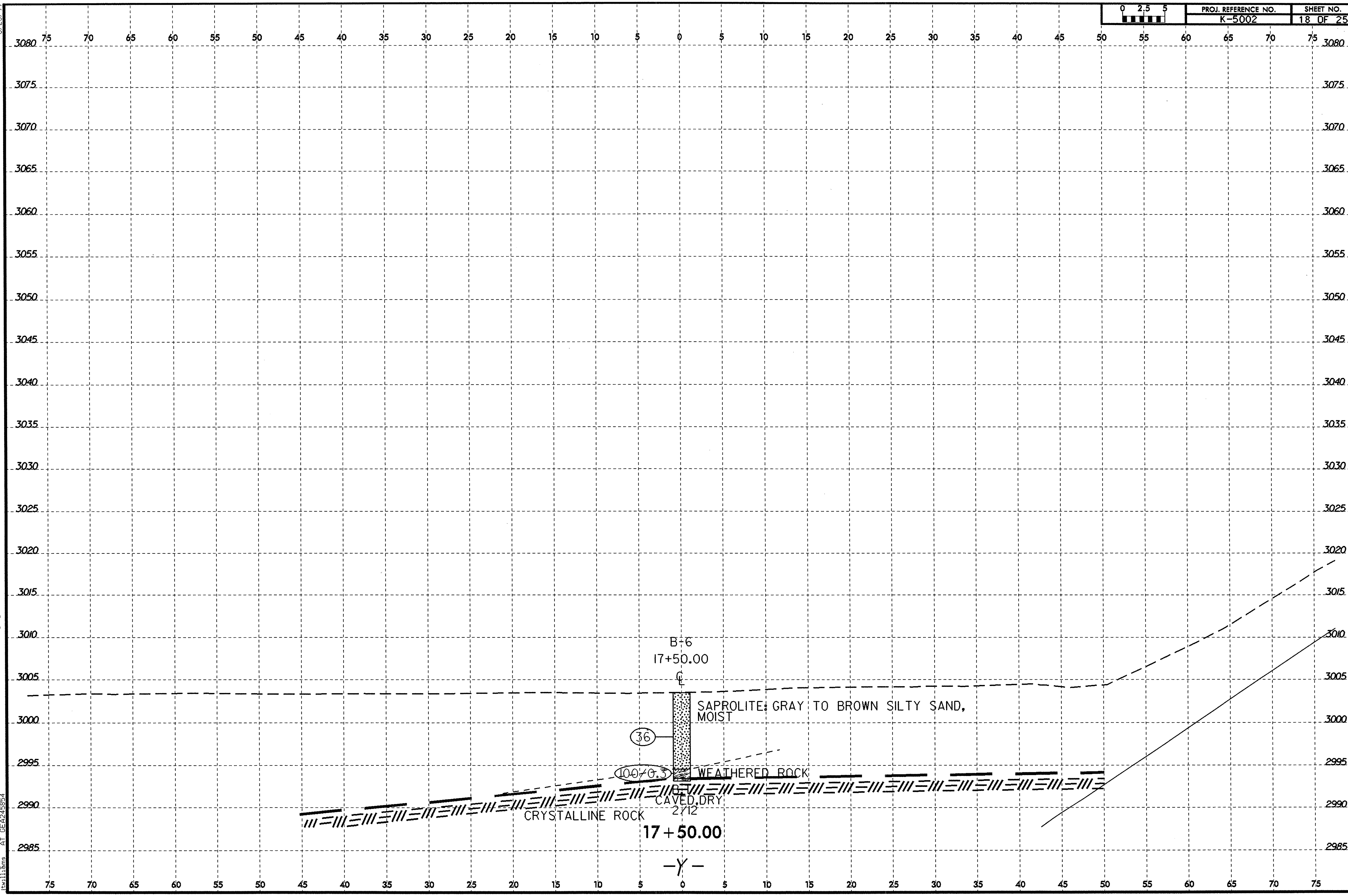
twilliams AT GEA245854



8/23/99

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	K-5002	19 OF 25

B-5
18+00.00
℄

FILL: SILTY SAND, DRY

SAPROLITE: SILTY SAND, MOIST

WEATHERED ROCK

32

100/0.2

60/0.0

B-5
CAVED, DRY
2/12

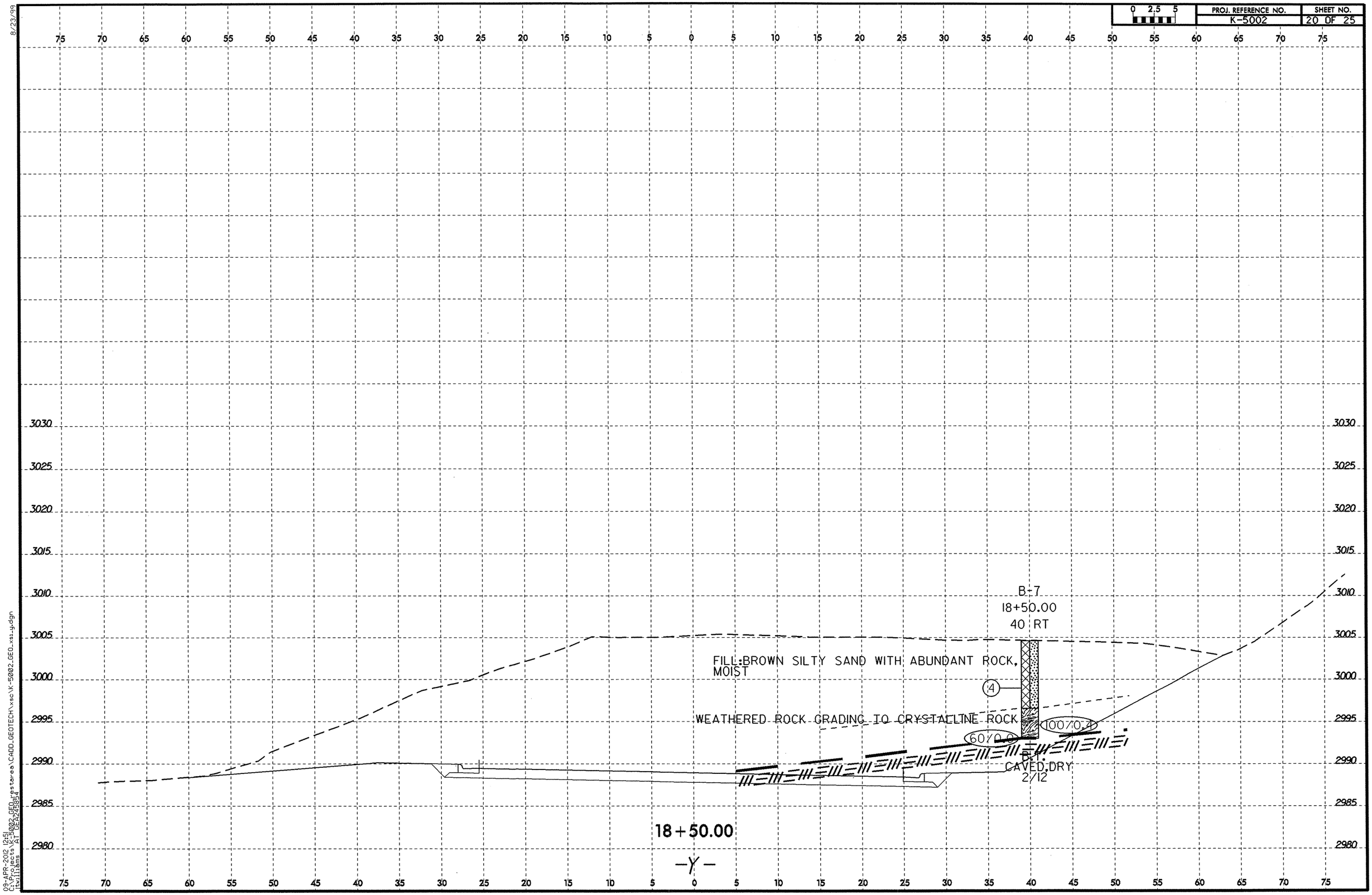
18+00.00

-Y-

09-APR-2012 12:49
C:\Projects\K-5002_GEO_restores\CADD_GEOTECH\xsc\K-5002_GEO_xs1_y.dgn
ltwilliams
AT_GEA245854

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	K-5002	20 OF 25



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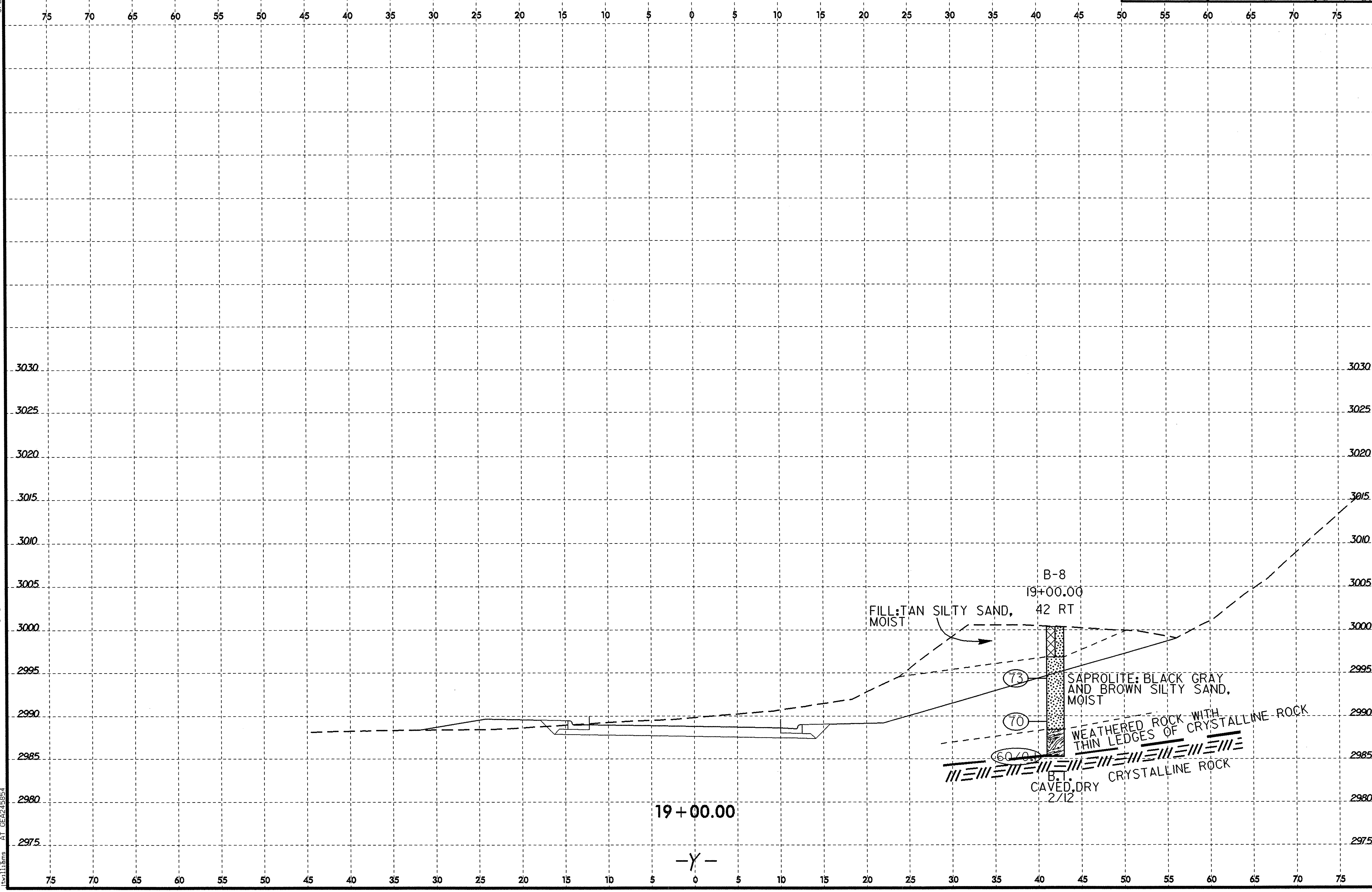
itwilliams
ATT 0EA2458954

PROJ. REFERENCE NO.	SHEET NO.
K-5002	21 OF 25



8/23/99

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jtwilliams AT GEA245854

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	K-5002	22 OF 25

3.5787 %

13+73.21

13+50.00

B-10
13+00.00
℄

16	MIXED FILL: SILTY SAND WITH SANDY SILT AND MINOR GRAVEL, MOIST
14	
13	
	2/12
28	ALLUVIUM: SILTY SAND AND ROUNDED GRAVEL, SATURATED
52	
14	SAPROLITE: NO RECOVERY

B.T.
13+00.00
-Y/-

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
K-5002	23 OF 25

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

2995
2990
2985
2980
2975
2970
2965
2960
2955
2950

B-9
14+50.00
℄

19
17
3
5
43
100/0.9

FILL: BROWN TO GRAY SILTY SAND WITH GRAVEL SIZE ROCK FRAGMENTS, MOIST

ALLUVIUM: DARK BROWN SILT WITH GRAVEL AND TRACE ORGANICS, MOIST

BASAL ALLUVIUM: SAND AND GRAVEL WITH COBBLES, SATURATED

SAPROLITE: SILTY SAND, SATURATED

WEATHERED ROCK

B.T.
CAVED, DRY
2/12
14+50.00

-Y/-

10-APR-2012 10:15
K:\Projects\K-5002_GEO_restarea\CADD_GEOTECH\xsc\K-5002_GEO_xs1_gi.dgn
Williams AT 0EA245854

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
K-5002	24 OF 25

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

2995 2990 2985 2980 2975

14+00.00

3020 3015 3010 3005 3000 2995 2990 2985 2980 2975

7'-10'

B-15
13+75.65
100.2085 RT

3.5787 %

FF ELEV = 2987.70

FILL: BROWN SILTY SAND AND GRAVEL WITH A MULCH CAP, MOIST

RESIDUAL: RED CLAYEY SAND, MOIST

SAPROLITE: ORANGE TO BROWN SILTY SAND, MOIST

13+73.21

-Y/-

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

09-APR-2012 13:07
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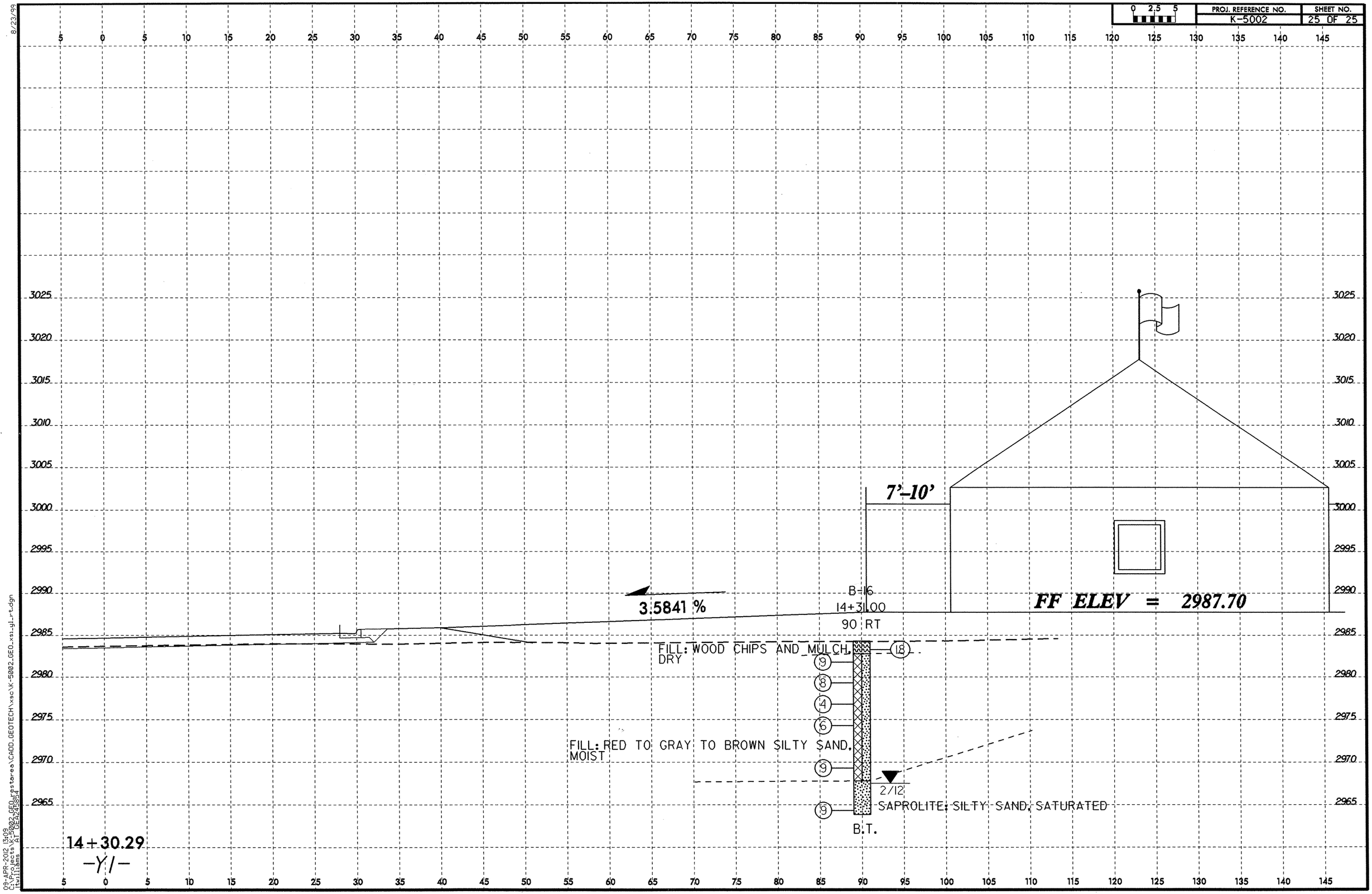
tiwilliams AT GEA25854

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	K-5002	25 OF 25



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itwilliams
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