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

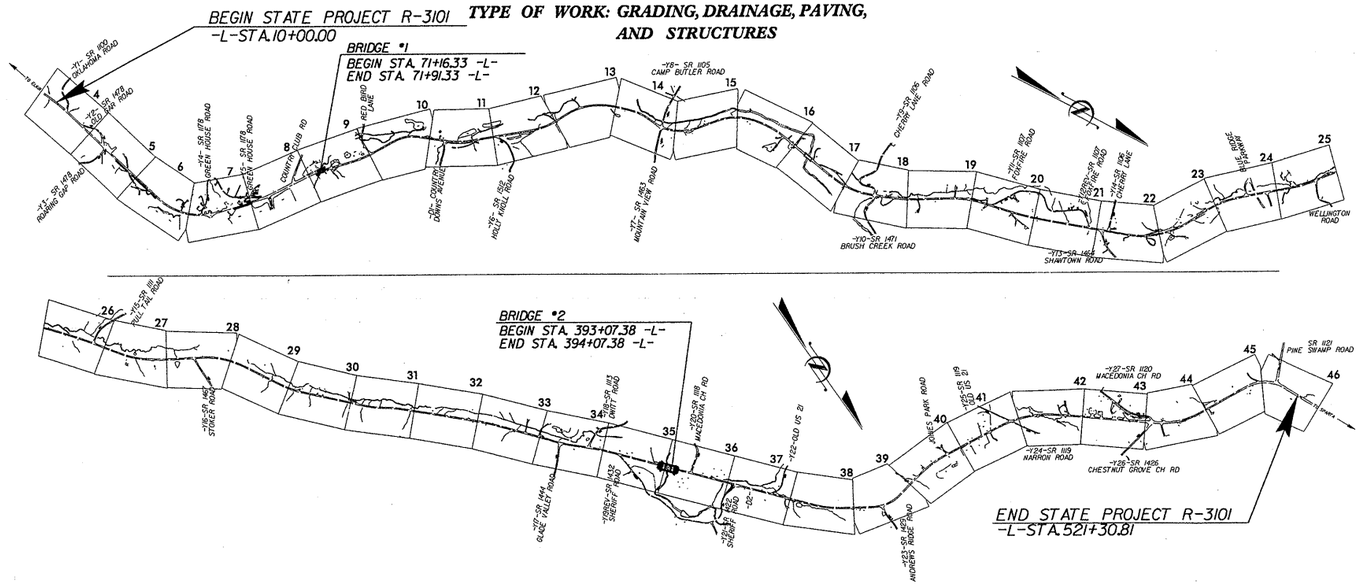
ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. R-3101 F.A. PROJ. STP-21 (11)

COUNTY ALLEGHANY

PROJECT DESCRIPTION US 21 FROM SR 1100 (OKLAHOMA RD.) TO SR 1121 (PINE SWAMP RD.)

INVENTORY



STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3101	1	120

STATE PROJ.NO.	F.A. PROJ.NO.	DESCRIPTION
37044.1.1	STP - 21(11)	PE
37044.2.1	STP-0021(11)	R/W
37044.3.FR1	STP-0021 (14)	CONST
37044.2.U1	STP-0021(11)	UTIL

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

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CHECKED BY W.D. FRYE

SUBMITTED BY W.D. FRYE

DATE 4.25.10

NORTH CAROLINA LICENSED SEAL 1907 GEOLOGIST Patrick Q. Lockamy

4-25-10

DRAWN BY: J.T. WILLIAMS

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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.

CONTRACT: C203386 ID: R-3101

PROJECT REFERENCE NO.	SHEET NO.
37044.1.1 R-3101	2/120

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	50 MX											GRANULAR SOILS	SILT-CLAY SOILS	MUCK, PEAT
#40	30 MX	50 MX		51 MN										
#200	15 MX	25 MX		10 MX	35 MX	35 MX	35 MX	35 MX	36 MN	36 MN	36 MN	36 MN		
LIQUID LIMIT	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/FT²)
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		
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
- 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: N/A

_____ ELEVATION: _____ FT.

NOTES:
-

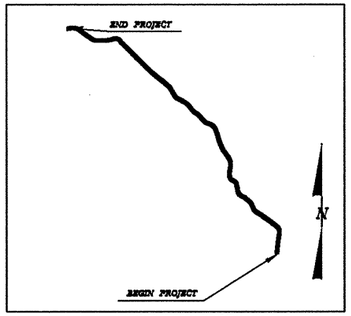
REVISED 02/23/06

09/08/99

TIP PROJECT: R-3101

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP
(NO SCALE)

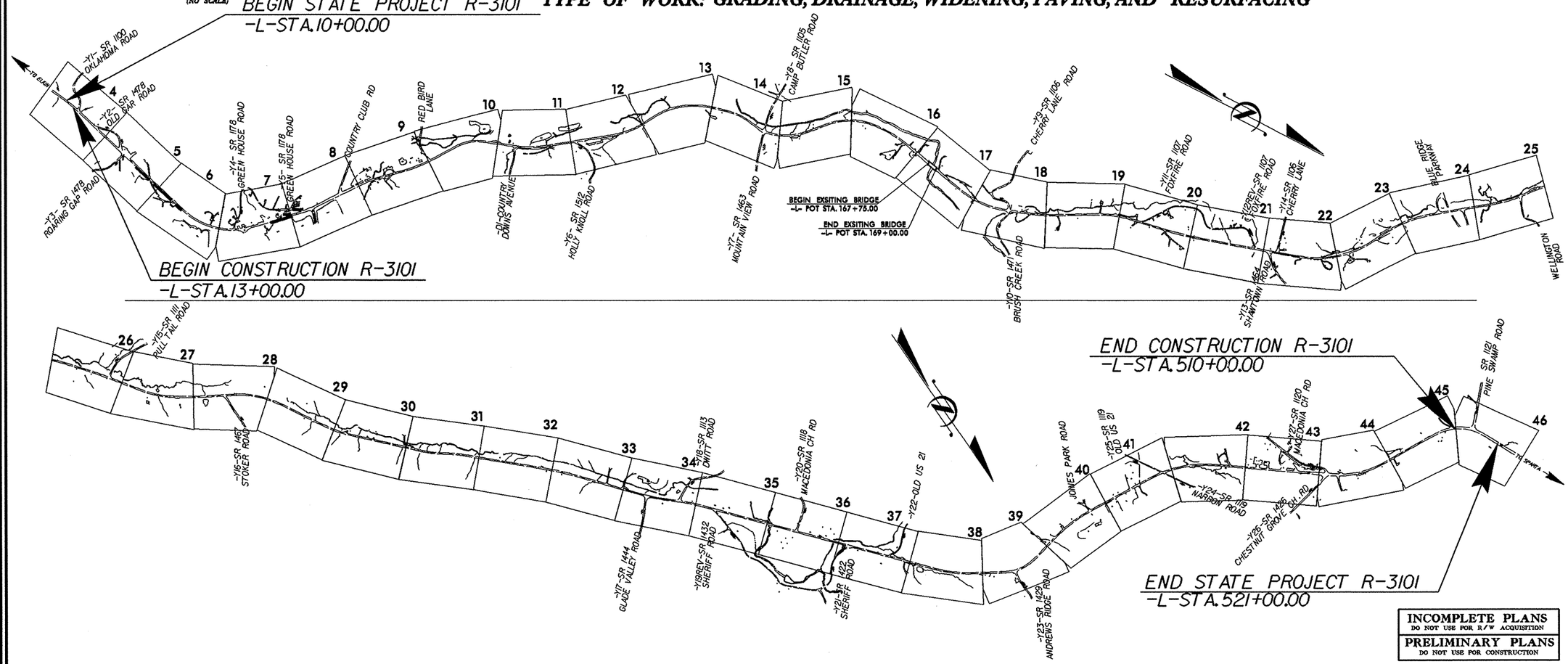
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

ALLEGHANY COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3101	2A	120
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
37044.1.1	STP - 21(11)	P.E.	

LOCATION: US 21 FROM SR 1100 (OKLAHOMA RD.) TO SR 1121 (PINE SWAMP RD.)

TYPE OF WORK: GRADING, DRAINAGE, WIDENING, PAVING, AND RESURFACING



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 2004 = 8300
ADT 2030 = 17000
DHV = 11 %
D ≐ 60 %
T = 10 % *
V = 55 MPH

* TTST 5% DUAL 5%

PROJECT LENGTH

TIP PROJECT R-3101 TOTAL LENGTH = 9.678 MI

Prepared In the Office of:
DIVISION OF HIGHWAYS
801 Statesville Road, North Wilkesboro, NC 28659

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
FEBRUARY 19, 2010

LETTING DATE:
FEBRUARY 15, 2011

DIVISION ENGINEER
M. A. PRITTYJOHN, P.E.

P.E.
SIGNATURE

DATE

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

DIVISION OPERATIONS ENGINEER
W.O. ATKINS, P.E.

P.E.
SIGNATURE:

DIVISION DESIGN ENGINEER
PHILIP J. SHEPHERD, PE

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION

15-APR-2010 07:33
D:\Projects\R-3101_GEO_RDWY_02\CADD_GEOTECH\Site&Sub\R-3101_GEO_tsh_rdwy.dgn
jtwilliams
AT GEA245854

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

June 25, 2010

STATE PROJECT: 37044.1.1 (R-3101)
F.A. PROJECT: STP-21(11)
COUNTY: Alleghany
DESCRIPTION: US-21 from SR-1100 (Oklahoma Rd.) to SR-1121 (Pine Swamp Rd.)

SUBJECT: Geotechnical Report – Inventory

Project Description

The project area lies in the New River Valley between Roaring Gap and Sparta along US-21. It consists of improvements to nine miles of two-lane highway, mainly lane widening. Existing alignment will be followed. A 2,250 foot long section of US-21 in proximity to the Blue Ridge Parkway will be resurfaced only. The focus of this investigation is to quantify crystalline rock in proposed cuts along Line -L-. This was mainly accomplished by walking the project and visual inspecting the existing cut slopes.

Fieldwork for this project was conducted in February and March of 2010. Seven SPT borings were advanced with a CME-550 drill machine with an automatic hammer.

The following alignments were investigated. Cross-section showing crystalline rock and subsurface conditions at boring sites are included in this report.

Line	Station (+)
-L-	10+00 to 246+50
-L-	269+00 to 510+00

Areas of Special Geotechnical Interest

1) Areas of crystalline rock in proposed cuts:

Estimated Volume of Crystalline Rock in Cubic Yards	-L- Station
385	13+25 to 14+25
676	32+75 to 34+75
269	39+25 to 39+75
233	59+25 to 60+25
1,724	102+75 to 105+25
2,763	120+25 to 121+75
6,519	133+25 to 136+25
4,756	140+25 to 142+75
3,276	151+75 to 155+25
2,230	156+25 to 158+25
93	159+25 to 159+75
4,181	226+25 to 229+75
2,272	241+25 to 244+25
4,272	269+25 to 273+25
624	284+75 to 285+75
922	292+25 to 293+75
498	323+75 to 324+75
744	325+75 to 326+75
1,507	328+25 to 330+75
150	336+25 to 336+75
3,657	337+75 to 342+75
967	359+25 to 360+75
2,956	365+25 to 367+75
3,315	368+25 to370+75
661	373+25 to 374+75
5,061	378+25 to383+25
581	408+25 to 409+25
443	412+75 to 414+25

Total 55,285

2) A water well outside of the construction limits but within the construction easement is located approximately 38 feet left of - L- Station 276+20.

Physiography and Geology

Elevations along existing roadway range between 2,580 and 2,980 feet. The larger creeks draining the project - Laurel Branch, Brush Creek, Little Creek and Glade Creek, all drain into the New River. The creeks have a dendritic habit while prominent ridges follow regional strike, which is North 50 to 60 degrees East. Creek bottoms typically have alluvium less than 10 feet thick. They can be prone to slow drainage. The valley of Laurel Branch, which US-21 follows,

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

sits in a bulge along the Blue Ridge Escarpment. Its drainage will eventually be captured by headwaters of the Yadkin River. Rocks along the project are recognized as late Proterozoic Age Alligator Back Formation gneiss, schist with minor amphibolite.

Crystalline Rock

Crystalline rock is present in many cuts along the project. The contact of soil or weathered rock with crystalline rock is seldom flat or plainer. It undulates can be erratic due to rapid changes in weathering along layers. This may be especially noticeable going perpendicular to strike or parallel to -L-. Fins or hogbacks of bedrock can be seen protruding from the ground occasionally. Strike is typically highly oblique or nearly perpendicular to the majority of the US-21. This makes rock orientation along the length of the project generally favorable for both rippability and slope stability.

Foliation or layering created by the parallel orientation of minerals is well defined in the Alligator Back Formation. This gives the rock a pronounced layered look with fine micaceous laminations. Weathered outcrops of schist look like layers of paper. Occasional thick or more massive layers grading into gneissic rock are also present.

Groundwater Properties

Groundwater is expected to be between 2 and 6 feet deep in alluvial bottoms. It can be considerably deeper in cut slopes. Wet cuts are not anticipated.

Respectfully Submitted,

Patrick Lockamy

Patrick Q. Lockamy, P.G.

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT R-3101 COUNTY: Alleghany DATE: 6/3/2012 COMPILED BY: DLH SHEET__ OF __ SHEETS

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL
-L- 13+00 LT	43+00 LT	9,581	945			8,636	2,536	945	1355	2,503			7,078		7,078
	SUBTOTAL	9,581	945			8,636	2,536	945	1,355	2,503			7,078		7,078
-L- 43+00 LT	70+50 LT	4,350	233			4,117	61	49		49		184	4,117		4,301
-Y4- 10+00	11+50	212				212							212		212
-Y5- 10+00	15+00	997				997	5		5	6			991		991
	SUBTOTAL	5,559	233			5,326	66	49	5	55		184	5,320		5,504
-L- 72+50 LT	102+00 LT	392				392	2,904		2904	3,340	2,948				
	SUBTOTAL	392				392	2,904		2,904	3,340	2,948				
-L- 102+00 LT	132+00 LT	842				842	3,489		3489	4,012	3,170				
	SUBTOTAL	842				842	3,489		3,489	4,012	3,170				
-L- 132+00 LT	162+00 LT	223				223	475		475	546	323				
	SUBTOTAL	223				223	475		475	546	323				
-L- 162+00 LT	167+50 LT	81				81							81		81
	SUBTOTAL	81				81							81		81
-L- 169+00 LT	198+00 LT	9,152				9,152	415		415	477			8,675		8,675
	SUBTOTAL	9,152				9,152	415		415	477			8,675		8,675
-L- 198+00 LT	228+00 LT	4,182				4,182	2,618		2618	3,011			1,171		1,171
-Y11- 10+00	12+00	30				30	683		683	785	755				
-Y12REV- 10+00	15+00	124				124	461		461	530	406				
	SUBTOTAL	4,336				4,336	3,762		3,762	4,326	1,162		1,171		1,171
-L- 228+00 LT	258+00 LT	1,609				1,609	9		9	10			1,599		1,599
	SUBTOTAL	1,609				1,609	9		9	10			1,599		1,599
-L- 258+00 LT	288+00 LT	975				975	2,047		2047	2,354	1,379				
	SUBTOTAL	975				975	2,047		2,047	2,354	1,379				
-L- 288+00 LT	318+00 LT	715				715	1,728		1728	1,987	1,272				
	SUBTOTAL	715				715	1,728		1,728	1,987	1,272				
-L- 318+00 LT	348+00 LT	671				671	2,739		2739	3,150	2,479				
	SUBTOTAL	671				671	2,739		2,739	3,150	2,479				
-L- 348+00 LT	378+00 LT	525				525	3,272		3272	3,763	3,238				
	SUBTOTAL	525				525	3,272		3,272	3,763	3,238				
SHEET 1 TOTAL		34,661	1,178			33,483	23,442	994	22,200	26,524	15,971	184	23,924		24,108

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

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT R-3101 COUNTY: Alleghany DATE: 6/3/2012 COMPILED BY: DLH SHEET__ OF __ SHEETS

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL
-L- 378+00 LT	392+50 LT	50				50	33		33	38			12		12
	SUBTOTAL	50				50	33		33	38			12		12
-L- 394+50 LT	424+00 LT	3,475				3,475	306		306	352			3,123		3,123
	SUBTOTAL	3,475				3,475	306		306	352			3,123		3,123
-L- 424+00 LT	454+00 LT	10,094				10,094	1,349		1349	1,551			8,543		8,543
	SUBTOTAL	10,094				10,094	1,349		1,349	1,551			8,543		8,543
-L- 454+00 LT	484+00 LT	2,234				2,234	1,458		1458	1,677			557		557
	SUBTOTAL	2,234				2,234	1,458		1,458	1,677			557		557
-L- 484+00 LT	510+00 LT	2,241				2,241	1,609		1609	1,850			391		391
	SUBTOTAL	2,241				2,241	1,609		1,609	1,850			391		391
-L- 13+00 RT	43+00 RT	2,651	385			2,266	1,908	385	1427	2,026			625		625
	SUBTOTAL	2,651	385			2,266	1,908	385	1,427	2,026			625		625
-L- 43+00 RT	70+50 RT	739				739	3,100		3100	3,565	2,826				
	SUBTOTAL	739				739	3,100		3,100	3,565	2,826				
-L- 72+50 RT	102+00 RT	11,709				11,709	72		72	83			11,626		11,626
-D1- 10+00	11+50	55				55							55		55
	SUBTOTAL	11,764				11,764	72		72	83			11,681		11,681
-L- 102+00 RT	132+00 RT	42,239	4,487			37,752	127	102		102		4,385	37,752		42,137
-Y6- 10+00	11+00	110				110							110		110
	SUBTOTAL	42,349	4,487			37,862	127	102		102		4,385	37,862		42,247
-L- 132+00 RT	162+00 RT	52,390	16,874			35,516	60	48		48		16,826	35,516		52,342
	SUBTOTAL	52,390	16,874			35,516	60	48		48		16,826	35,516		52,342
-L- 162+00 RT	167+50 RT	326				326	2		2	2			324		324
	SUBTOTAL	326				326	2		2	2			324		324
-L- 169+00 RT	198+00 RT	5,508				5,508	675		675	776			4,732		4,732
	SUBTOTAL	5,508				5,508	675		675	776			4,732		4,732
-L- 198+00 RT	228+00 RT	10,944				10,944	608		608	699			10,245		10,245
-Y13- 10+00	15+00	34				34	4		4	5			29		29
	SUBTOTAL	10,978				10,978	612		612	704			10,274		10,274
SHEET 2 TOTAL		144,799	21,746			123,053	11,311	535	10,643	12,774	2,826	21,211	113,640		134,851

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

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT R-3101 COUNTY: Alleghany DATE: 6/3/2012 COMPILED BY: DLH SHEET__ OF __ SHEETS

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL
-L- 228+00 RT	258+00 RT	9,661	6,453			3,208	452	362		362		6,091	3,208		9,299
	SUBTOTAL	9,661	6,453			3,208	452	362		362		6,091	3,208		9,299
-L- 258+00 RT	288+00 RT	21,450	4,896			16,554	48	38		38		4,858	16,554		21,412
	SUBTOTAL	21,450	4,896			16,554	48	38		38		4,858	16,554		21,412
-L- 288+00 RT	318+00 RT	15,298	922			14,376	124	99		99		823	14,376		15,199
	SUBTOTAL	15,298	922			14,376	124	99		99		823	14,376		15,199
-L- 318+00 RT	348+00 RT	41,924	6,556			35,368	300	240		240		6,316	35,368		41,684
	SUBTOTAL	41,924	6,556			35,368	300	240		240		6,316	35,368		41,684
-L- 348+00 RT	378+00 RT	23,587	7,899			15,688	127	102		102		7,797	15,688		23,485
-Y17- 10+00	12+50	305				305							305		305
	SUBTOTAL	23,892	7,899			15,993	127	102		102		7,797	15,993		23,790
-L- 378+00 RT	392+50 RT	11,259	5,061			6,198	897	718		718		4,343	6,198		10,541
-Y19REV- 10+00	12+00	194				194							194		194
	SUBTOTAL	11,453	5,061			6,392	897	718		718		4,343	6,392		10,735
-L- 394+50 RT	424+00 RT	4,979	1,024			3,955	1,450	1,024	170	1,220			3,760		3,760
-Y21- 10+00	12+00	15				15	328		328	377	362				
-D2- 10+00	11+50	141				141	25		25	29			112		112
	SUBTOTAL	5,135	1,024			4,111	1,803	1,024	523	1,625	362		3,872		3,872
-L- 424+00 RT	454+00 RT	5,053				5,053	1,996		1996	2,295			2,758		2,758
	SUBTOTAL	5,053				5,053	1,996		1,996	2,295			2,758		2,758
-L- 454+00 RT	484+00 RT	4,642				4,642	1,025		1025	1,179			3,463		3,463
	SUBTOTAL	4,642				4,642	1,025		1,025	1,179			3,463		3,463
-L- 484+00 RT	510+00 RT	7,992				7,992	172		172	198			7,794		7,794
	SUBTOTAL	7,992				7,992	172		172	198			7,794		7,794
SHEET 3 TOTAL		146,500	32,811			113,689	6,944	2,582	3,716	6,856	362	30,229	109,778		140,006

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

3E

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT: R-3101 COUNTY: Alleghany DATE: 6/3/2012 COMPILED BY: DLH SHEET__ OF __ SHEETS

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL
	TOTAL FROM SHEET 1	34661	1178			33483	23442	994	22200	26524	15971	184	23924		24108
	TOTAL FROM SHEET 2	144799	21746			123053	11311	535	10643	12774	2826	21211	113640		134851
	TOTAL FROM SHEET 3	146500	32811			113689	6944	2582	3716	6856	362	30229	109778		140006
TOTAL		325,960	55,735			270,225	41,697	4,111	36,559	46,153	19,159	51,624	247,342		298,966
LOSS DUE TO CLEARING & GRUBBING		-11,600				-11,600							-11,600		-11,600
ROCK WASTE TO REPLACE BORROW								13,328	-13,328		-13,328	-13,328			-13,328
ADJUST FOR ROCK SWELL									-3,332	-3,332	-3,332				
ELIMINATE EARTH SHRINKAGE										-2,499	-2,499				
PROJECT TOTAL		314,360	55,735			258,625	41,697	17,439	19,899	40,322		38,296	235,742		274,038
ADJUST FOR ROCK WASTE SWELL												9,574			9,574
ELIMINATE EARTH SHRINKAGE												7,181			7,181
GRAND TOTAL		314,360	55,735			258,625	41,697	17,439	19,899	40,322		55,051	235,742		290,793
SAY		**315,000**													
SHALLOW UNDERCUT CONTINGENCY		2000 CY													
CONTINGENCY UNDERCUT		6000 CY													
SHOULDER BORROW		19200 CY													
DDE		2940 CY													
PAVEMENT STRUCTURE VOLUME		25000 CY													

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

ROCK SWELL FACTOR = 25%

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
R-3101	4 1120
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 83/95

(1)

ROARING GAP INCORPORATED

DB 224	PG 925	DB 37	PG 28		
DB 224	PG 761	DB 33	PG 494		
DB 242	PG 627	DB 35	PG 25		
DB 43	PG 49	DB 35	PG 35		
DB 39	PG 279	DB 35	PG 43		
DB 39	PG 571	DB 35	PG 441		
DB 39	PG 299	DB 33	PG 471		
DB 39	PG 99	DB 33	PG 446		
DB 39	PG 88	DB 34	PG 146		
DB 39	PG 93	DB 34	PG 149		
DB 35	PG 127	DB 34	PG 179		
DB 35	PG 58	DB 35	PG 46		
DB 34	PG 144	DB 35	PG 54		
DB 34	PG 224	DB 35	PG 48		
DB 34	PG 274	DB 35	PG 201		
DB 34	PG 386	DB 35	PG 196		
DB 35	PG 207	DB 39	PG 96		
DB 35	PG 28	DB 39	PG 97		
DB 35	PG 206	DB 39	PG 58		
DB 35	PG 199	DB 34	PG 143		
DB 38	PG 853	DB 38	PG 1		
DB 34	PG 884	DB 39	PG 95		

(2)

ROARING GAP INCORPORATED

DB 224	PG 925	DB 37	PG 28		
DB 224	PG 761	DB 33	PG 494		
DB 242	PG 627	DB 35	PG 25		
DB 43	PG 49	DB 35	PG 35		
DB 39	PG 279	DB 35	PG 43		
DB 39	PG 571	DB 35	PG 441		
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DB 34	PG 274	DB 35	PG 201		
DB 34	PG 386	DB 35	PG 196		
DB 35	PG 207	DB 39	PG 96		
DB 35	PG 28	DB 39	PG 97		
DB 35	PG 206	DB 39	PG 58		
DB 35	PG 199	DB 34	PG 143		
DB 38	PG 853	DB 38	PG 1		
DB 34	PG 884	DB 39	PG 95		

(3)

ROARING GAP INCORPORATED

DB 224	PG 925	DB 37	PG 28		
DB 224	PG 761	DB 33	PG 494		
DB 242	PG 627	DB 35	PG 25		
DB 43	PG 49	DB 35	PG 35		
DB 39	PG 279	DB 35	PG 43		
DB 39	PG 571	DB 35	PG 441		
DB 39	PG 299	DB 33	PG 471		
DB 39	PG 99	DB 33	PG 446		
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DB 39	PG 93	DB 34	PG 149		
DB 35	PG 127	DB 34	PG 179		
DB 35	PG 58	DB 35	PG 46		
DB 34	PG 144	DB 35	PG 54		
DB 34	PG 224	DB 35	PG 48		
DB 34	PG 274	DB 35	PG 201		
DB 34	PG 386	DB 35	PG 196		
DB 35	PG 207	DB 39	PG 96		
DB 35	PG 28	DB 39	PG 97		
DB 35	PG 206	DB 39	PG 58		
DB 35	PG 199	DB 34	PG 143		
DB 38	PG 853	DB 38	PG 1		
DB 34	PG 884	DB 39	PG 95		

BEGIN TIP R-3101 POT Sta. 10+00.00

-L- N 1° 36' 58.0" E

-BL- 165 5+00.00 POT

-Y1-POT Sta. 10+00.00

-BY36- 163 5+00.00 POT

-Y1- N 15° 50' 24.8" E

PC

PT

L

N 43° 01' 14.5" E

BEGIN CONSTRUCTION
-Y1- STA. 12+50.00

EXISTING R/W

-Y1- PI Sta. 11+52.70

-BL- PI Sta. 11+47.61

PC Sta. 11+47.61

BEGIN RESURFACING
-L- POC STA. 12+00.00

BEGIN CONSTRUCTION
-L- POC STA. 13+00.00

B-1
14+00
70 RT

-Y1-POT Sta. 13+23.97 =
-L-POC Sta. 15+08.63

PT Sta. 15+13.23

N 11° 57' 01.1" E

50'

40'

GRAU 350

BL-FGPS #310-7 36.14 PINC

B+BL 88

△ RW MON

GRAU 350

EXISTING R/W

N 10° 41' 47.5" W

-Y2- PI Sta. 10+38.74

BEGIN RESURFACING
-Y2- STA. 11+00.00

PC

PT

PT

-Y2-POT Sta. 10+00.00 =
-L-POT Sta. 19+16.00

N 6° 06' 39.5" E

GRAU 350

MATCH LINE -L- STA. 21+00 SHEET 5

-L-	-Y1-	-Y2-			
PI Sta 13+30.67	PI Sta 11+52.70	PI Sta 10+38.74	PI Sta 11+61.23	PI Sta 13+79.08	PI Sta 15+61.24
△ = 1° 18' 45.0" (RT)	△ = 49° 44' 23.5" (RT)	△ = 35° 42' 15.2" (RT)	△ = 3° 57' 13.7" (RT)	△ = 62° 19' 17.3" (RT)	△ = 25° 37' 39.5" (RT)
D = 2° 00' 00.0"	D = 40° 00' 00.0"	D = 100° 00' 00.0"	D = 12° 00' 00.0"	D = 30° 00' 00.0"	D = 30° 00' 00.0"
L = 365.63'	L = 124.35'	L = 35.70'	L = 32.95'	L = 207.74'	L = 85.43'
T = 183.06'	T = 66.40'	T = 18.45'	T = 16.48'	T = 115.49'	T = 43.44'
R = 2,864.79'	R = 143.24'	R = 57.30'	R = 477.46'	R = 190.99'	R = 190.99'

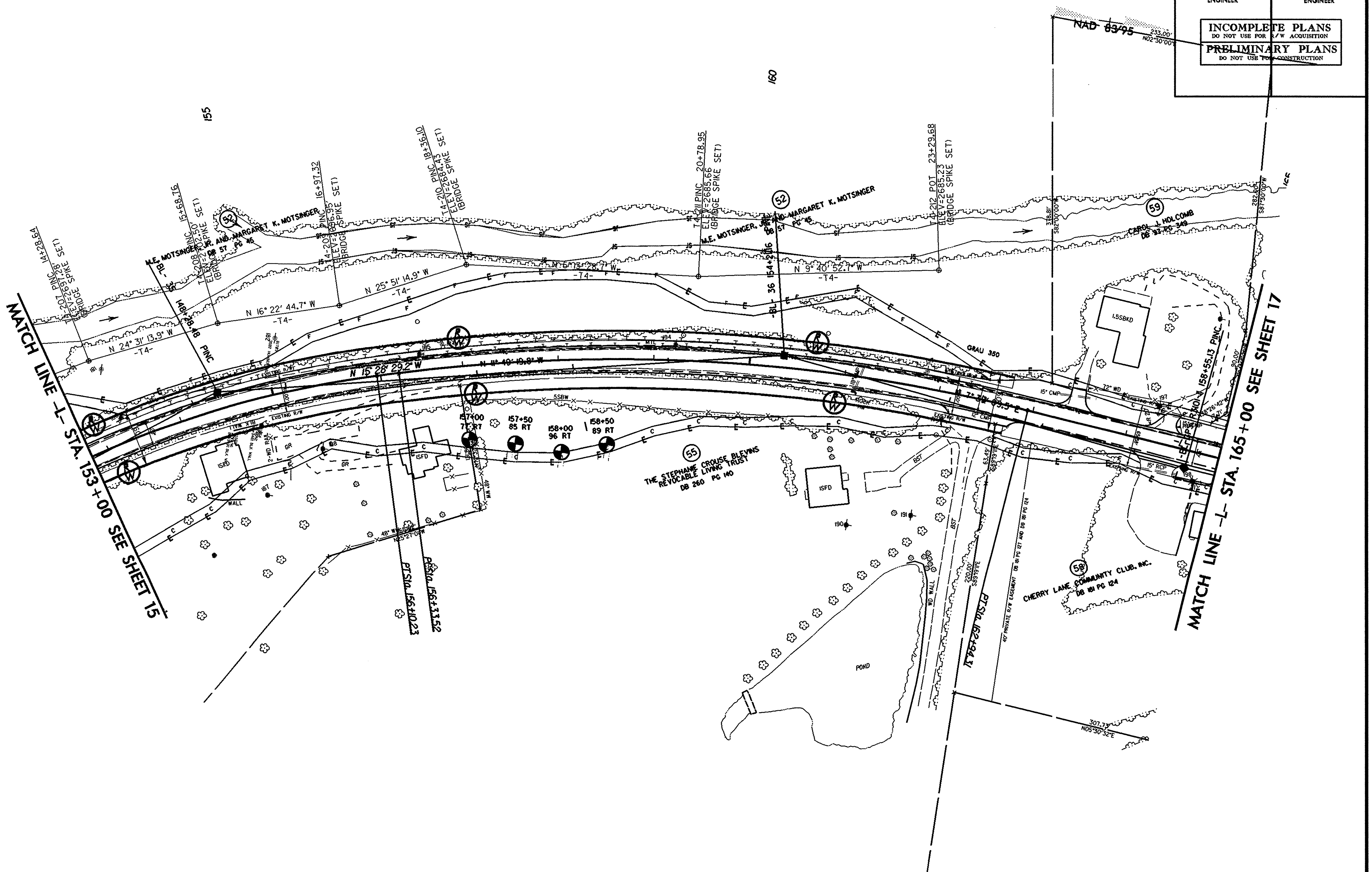
8/17/99

02-JUN-2010 08:38
D:\Projects\R-3101_050_RDWY_021\CADD_GEOTECH\PlanProf\R3101_geo_psi_04.dgn
Williams AT 1pA2.5x52

PROJECT REFERENCE NO.	SHEET NO.
R-3101	5/120
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



-L-

PI Sta 152+73.49	PI Sta 159+67.84
Δ = 38° 34' 01.7" (RT)	Δ = 21° 28' 31.9" (RT)
D = 5° 30' 00.0"	D = 3° 15' 00.0"
L = 701.22'	L = 660.79'
T = 364.48'	T = 334.32'
R = 1,041.74'	R = 1,762.95'

8/17/99

02-JUN-2010 08:35
R:\Projects\R-3101\CADD\GEOTECH\PlanProf\R3101_GEO_psi_16.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-3101	6/120
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 83/95

-Y9-

-Y9-POT Sta. 10+00.00
N 22° 41' 21.7" W
-Y9-PC Sta. 10+74.92
PI Sta 11+35.56
Δ = 64° 50' 10.4" (RT)
D = 60° 00' 00.0"
L = 108.06'
T = 60.64'
R = 95.49'
-Y9-PT Sta. 11+82.98
N 42° 08' 48.7" E
-Y9-PC Sta. 11+92.09
PI Sta 12+16.82
Δ = 19° 35' 23.8" (RT)
D = 40° 00' 00.0"
L = 48.97'
T = 24.73'
R = 143.24'
-Y9-PT Sta. 12+41.06
N 61° 44' 12.4" E
-Y9-POT Sta. 12+67.5=
-L-POC Sta. 182+93.02

MATCH LINE -L- STA. 177+00 SEE SHEET 17

MATCH LINE -L- STA. 189+00 SEE SHEET 19

-Y9- POC STA.12+67.51 =
-L- POC STA.182+93.02

-Y10- POC STA.10+00.00=
-L- POC STA.182+95.24

-L-

PI Sta 178+35.30	PIs Sta 181+98.34	PI Sta 188+50.39
Δ = 24° 04' 03.0" (LT)	Θs = 4° 00' 00.0"	Δ = 9° 19' 37.3" (LT)
D = 4° 00' 00.0"	Ls = 200.00'	D = 2° 00' 00.0"
L = 601.69'	LT = 133.37'	L = 466.35'
T = 305.35'	ST = 66.70'	T = 233.69'
R = 1,432.39'		R = 2,864.79'

CULVERT 6
ONE BARREL

	NORTH	EAST	ELEV.
CUL1	982105.33	1408176.24	2674.11
CUL2	982114.44	1408176.02	2674.12
CE1	982109.94	1408157.65	2680.11
HW1	982110.12	1408157.51	2681.81

-Y10-

-Y10-POT Sta. 10+00.00=
-L-POC Sta. 182+95.24
N 72° 07' 15.3" E
-Y10-PC Sta. 10+34.73
PI Sta 10+95.41
Δ = 36° 21' 15.5" (RT)
D = 3° 00' 00.0"
L = 117.27'
T = 60.69'
R = 184.83'
-10-PT Sta. 11+52.00
S 71° 31' 29.2" E
-Y10-POT Sta. 12+03.83

THE REBA E. BLEVINS REVOCABLE LIVING TRUST
DB 251 PG 851

F. A. MCKNIGHT AND JANET W. MCKNIGHT
DB 67 PG 373

JOE F. MCKNIGHT AND JANET MCKNIGHT
DB 257 PG 875

CHARLES C. WI

CHERRY LANE FIRE DEPARTMENT
DB 408 PG 770
DB 450 PG 89

ISBKD
CHERRY LANE FIRE STA

ISFD

SR 1106 CHERRY LANE ROAD (SR1)

-L-

-Y9-

-Y10-

-L1-

EXISTING R/W

GRAU 350

179+50
120 LT

B+31.42 POT
-BY12- 106

-Y9-POT Sta. 10+00.00
-BY11- 102

CSSta.181+31.64

7+74.68 PINC
-BY11- 103

STSta.183+31.64

PCSta.186+16.70

15-213 PINC
ELEV=2685.98'
(BRIDGE SPIKE SET)

15-214 PINC
ELEV=2688.97'
(BRIDGE SPIKE SET)
9+09.10

15-215 PINC
ELEV=2691.87'
(BRIDGE SPIKE SET)

177+10.86 PINC

5+36.72
5+00.00

10

180

185

235

234

233

231

215

64

65

66

67

69

48" WW

15" RCP

18" RCP

24" CMP

8'X5' BARREL

8'X5'

231.5' NORTH 10°02'12" W

N 16° 51' 24.65" W

N 15° 49' 45.8" W

N 25° 04' 00.2" W

N 30° 34' 08.8" W

N 72° 07' 15.3" E

S 71° 31' 29.2" E

02-JUN-2010 08:32
O:\Projects\3101_GEO_RDWY_021\CADD_GEOTECH\Plan Prof\R3101_GEO_ps1_18.dgn
tmiller
dgn_lib_name: DEFAULT

PROJECT REFERENCE NO.	SHEET NO.
R-3101	7/120
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 83/95

REVISIONS

8/17/99

25-JUN-2010 07:36
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jwilliams

S-8 (EPHEMERAL)

WETLAND 17

WETLAND 18

PTSta 190+83.05

TS- 216 PINC 12+60.16
ELEV=2696.10'
(BRIDGE SPIKE SET)

-BL- 39 184+54.14 PINC

TS- 39 POT 14+08.75
ELEV=2704.47'
(TRAV. MON.)

(67) JOE F. MCKNIGHT AND JANET MCKNIGHT DB 167 PG 639 PB 98

(69) F. A. MCKNIGHT AND JANE W. MCKNIGHT DB 67 PG 373

40'

-BL- 40 193+49.87 PINC

(72) TOMMY CHARLES MCKNIGHT DB 192 PG 660

N 35° 23' 37.5" W -L- N 35° 23' 37.5" W -L- N 37° 01' 20.8" W

MATCH LINE -L- STA. 189+00 SEE SHEET 18

MATCH LINE -L- STA. 201+00 SEE SHEET 20

190+00
75 RT

(68) LIAMS AND LINDA MCKNIGHT WILLIAMS DB 93 PG 479

(70) JACKIE D. BILLINGS AND MILDRED T. BILLINGS DB 257 PG 784 DB 257 PG 786

(71) BURT & BRONA CR DB 39 PG 56

UT-28

PCSta 197+12.94

-L-

PI Sta 188+50.39	PI Sta 200+28.18
Δ = 9° 19' 37.3" (LT)	Δ = 18° 44' 44.5" (RT)
D = 2° 00' 00.0"	D = 3° 00' 00.0"
L = 466.35'	L = 624.86'
T = 233.69'	T = 315.25'
R = 2,864.79'	R = 1,909.86'

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	8/120

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

3005
3000
2995
2990
2985
2980
2975
2970
2965
2960
2955
2950
2945
2940

13+50.00

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

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	9/120

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

3000 2995 2990 2985 2980 2975 2970 2965 2960 2955 2950 2945 2940 2935 2930

RESIDUAL: BROWN SANDY CLAY

SAPROLITE: BROWN, RED, AND TAN SILTY FINE SAND

WEATHERED ROCK

8 4 7 6 23 22 100/.9

14+00.00

—L—

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	10/120

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

2970
2965
2960
2955
2950
2945
2940
2935
2930
2925
2920
2915
2910
2905

33+00.00

-4-

04-JUN-2010 07:36
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twilliams AT GEA2455954

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	11/120

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

2970
2965
2960
2955
2950
2945
2940
2935
2930
2925
2920
2915

33+50.00

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8/23/99

0 2,5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	12/120

34+50.00

34+00.00

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bwilliams

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	13/120

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

2940
2935
2930
2925
2920
2915
2910
2905
2900
2895
2890
2885
2880
2875
2870
2865
2860

39+50.00

-L-

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

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tw11sms AT GEA24595A

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	14/22

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

2880 2875 2870 2865 2860 2855 2850 2845 2840 2835 2830 2825 2820 2815 2810 2805 2800 2795

59+50.00

—L—

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

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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	15/120

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

2885
2880
2875
2870
2865
2860
2855
2850
2845
2840
2835
2830
2825
2820
2815
2810
2805
2800

60+00.00

—L—

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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	16 / 20

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

2795
2790
2785
2780
2775
2770
2765
2760
2755
2750
2745

103+00.00

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8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-3101	17 / 20

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

2805
2800
2795
2790
2785
2780
2775
2770
2765
2760
2755
2750
2745

103 + 50.00

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	18/126

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

2810
2805
2800
2795
2790
2785
2780
2775
2770
2765
2760
2755
2750
2745

104+00.00

—L—

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

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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	19/120

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

2810
2805
2800
2795
2790
2785
2780
2775
2770
2765
2760
2755
2750
2745

104+50.00

—L—

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

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	20 of 20

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

2810
2805
2800
2795
2790
2785
2780
2775
2770
2765
2760
2755
2750
2745

105+00.00

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

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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	21 of 30

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

2805
2800
2795
2790
2785
2780
2775
2770
2765
2760
2755
2750
2745
2740
2735
2730

120+50.00

—℄—

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

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$$$$USERNAME$$$$

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-3101	22/126

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

2800
2795
2790
2785
2780
2775
2770
2765
2760
2755
2750
2745
2740
2735
2730

121+00.00
—/—

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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	23/120

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

2800
2795
2790
2785
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2770
2765
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2740
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2730

121+50.00

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$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	24/120

133+50.00

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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	25/120

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

2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710

134+00.00

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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	26/120

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

2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705

134+50.00

—L—

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

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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	27/120

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

2770
2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705

135+00.00

—℄—

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$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	28/120

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

2770
2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705

135+50.00

—℄—

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$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	29/120

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

2770
2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705

136+00.00

01-JUN-2010 14:19
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$$$$USERNAME$$$$

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-3101	30/120

0 2.5 5

140+50.00

01-JUN-2010 14:19
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$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	31/120

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

2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705
2700

141+00.00

—L—

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

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$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	32/120

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

2770
2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705

141+50.00

—℄—

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

01-JUN-2010 14:19
D:\Projects\R-3101_GEO_RDWY_02i\CADD_GEOTECH\xsc\R-3101_Geo_xs1_102i.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	23/120

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

2770
2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705
2700

142+00.00

—℄—

01-JUN-2010 14:19
$$$$USERNAME$$$$
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xsi_1_021.dgn

8/23/99

0 2.5 5

PROJ. REFERENCE NO. R-3101

SHEET NO. 34/120

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

2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705
2700

142+50.00

—L—

02-JUN-2010 08:24
C:\projects\GEO_RDWY_021\CADD\GEOTECH\xsc\R-3101_Geo_xsl_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	35/120

2780 2775 2770 2765 2760 2755 2750 2745 2740 2735 2730 2725 2720 2715 2710 2705 2700 2695

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

152+00.00

—L—

02-JUN-2010 08:24
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xsl_1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	20 / 120

152+50.00

—L—

02-JUN-2000 08:24
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xs_1_021.dgn
$$$$USERNAME$$$$

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-3101	37/120

0 2.5 5

153+00.00

—L—

02-JUN-2010 08:24
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xs_1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	38/120

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

2780 2775 2770 2765 2760 2755 2750 2745 2740 2735 2730 2725 2720 2715 2710 2705 2700 2695 2690

153+50.00

—L—

02-JUN-2010 08:24
D:\Projects\R-3101_GEO_RDWY.021\CADD_GEOTECH\xsc\R-3101_Geo_xsi_1.021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	39/120

154+00.00

02-JUN-2010 08:24
D:\Projects\R-3101_GEO_RDWY_02\CADD_GEOTECH\xsc\R-3101_Geo_xsc1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	40/120

2775 2770 2765 2760 2755 2750 2745 2740 2735 2730 2725 2720 2715 2710 2705 2700 2695 2690

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

154+50.00

—℄—

02-JUN-2010 08:24
D:\Projects\R-3101_GEO_RDWY.021\CADD_GEOTECH\xsc\R-3101_Geo_xsi_1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	41

155+00.00

08-JUN-2010 07:19
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	42/120

156+50.00
—℄—

02-JUN-2010 08:28
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$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	43/120

6

13

68/.3

6070

SAPROLITE:BROWN TO GREY SILTY FINE SAND

WEATHERED ROCK

CRYSTALLINE ROCK

157+00.00

$\frac{-L-}{}$

02-JUN-2010 08:28
D:\Projects\R-3101_GEO_RDWY.02\CADD.GEOTECH\xsc\R-3101_Geo_xsi_1_02i.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	44/128

5:1

17:1

60%

60%

SAPROLITE: BROWN TOP GREY SILTY SAND

CRYSTALLINE ROCK

157+50.00

—L—

02-JUN-2010 08:28
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xs1_1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	45/120

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

2765 2760 2755 2750 2745 2740 2735 2730 2725 2720 2715 2710 2705 2700 2695 2690 2685 2680

6

SAPROLITE: BROWN TO GREY SILTY FINE SAND

45

WEATHERED ROCK

100/.1

60/.1

CRYSTALLINE ROCK

158+00.00

—L—

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

2765 2760 2755 2750 2745 2740 2735 2730 2725 2720 2715 2710 2705 2700 2695 2690 2685 2680

02-JUN-2010 08:28
D:\Projects\R-3101_GEO_RDWY_02I\CADD_GEOTECH\xsc\R-3101_Geo_xsl_1_02I.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	46/120

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

2760 2755 2750 2745 2740 2735 2730 2725 2720 2715 2710 2705 2700 2695 2690 2685 2680

22 7 12 22 91 24 43 88 9

SAPROLITE: BROWN SILTY FINE SAND WITH MICACEOUS LAYERS

WEATHERED ROCK

158+50.00

—L—

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

02-JUN-2010 08:28
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xsl_1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	47/126

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

2750
2745
2740
2735
2730
2725
2720
2715
2710
2705
2700
2695
2690
2685
2680

159+50.00

—L—

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

08-JUN-2010 08:07
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\Copy of R-3101_Geo_xst_1_021.dgn
lewilliams
AT GE2459954

8/23/99

0 2.5 5

PROJ. REFERENCE NO. R-3101

SHEET NO. 48/120

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

2745 2740 2735 2730 2725 2720 2715 2710 2705 2700 2695 2690 2685 2680 2675 2670

13
17
25
25
11
12
25
16
19

RED, BROWN, AND TAN SILTY FINE SAND, BLACK IN LAYERS WITH IRON AND MANGANESE OXIDES

179+50.00

—L—

01-JUN-2010 08:32
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xs1_1_021_1t.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	497126

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

2735
2730
2725
2720
2715
2710
2705
2700
2695
2690
2685
2680

13
9
23
13
27
48
44
92

SAPROLITE: BROWN TO GREY MICACEOUS SLITY SAND

190+00.00

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

02-JUN-2010 08:28
D:\Projects\R-3101_GEO_RDWY.021\CADD_GEOTECH\xs\R-3101_Geo_xs_1_021.dgn
$$$$USERNAME$$$$

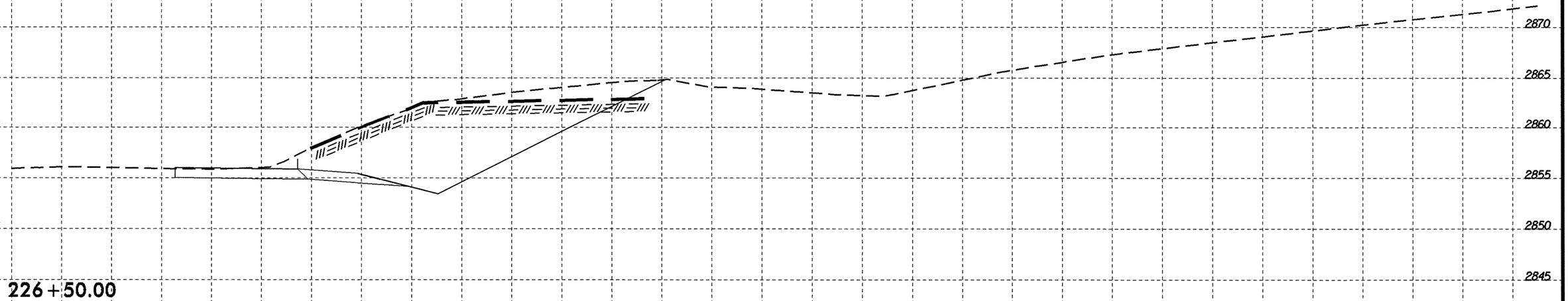
8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	50/126

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

2880 2875 2870 2865 2860 2855 2850 2845

226+50.00



2880 2875 2870 2865 2860 2855 2850 2845 2840

226+00.00

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

25-JUN-2010 08:11
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Williams
CT_GEO_2D_ENGLISH

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	51/120

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

2880
2875
2870
2865
2860
2855
2850

227+50.00

2880
2875
2870
2865
2860
2855
2850

227+00.00

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

08-JUN-2000 07:23
D:\Projects\R-3101_GEO_RDWY_02\CADD_GEOTECH\xsc\R-3101_Geo_xsl_1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	52/120

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

2880
2875
2870
2865
2860
2855
2850

228+50.00

2880
2875
2870
2865
2860
2855
2850

228+00.00

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

08-JUN-2010 07:23
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xsc_1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	53/126

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

2865
2860
2855
2850
2845

229+50.00

2870
2865
2860
2855
2850
2845

229+00.00

$-\mathit{L}-$

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

08-JUN-2010 07:24
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xsc1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	54/120

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

2795
2790
2785
2780
2775
2770
2765
2760
2755

241+50.00

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

02-JUN-2010 08:30
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xs1_1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	55/120

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

2795
2790
2785
2780
2775
2770
2765
2760
2755
2750

242+00.00

-L-

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

10-JUN-2010 09:26
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xsl_1_021.dgn
tswilliams
AT_DEA2_9004

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	56/128

2790
2785
2780
2775
2770
2765
2760
2755
2750

242+50.00

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

08-JUN-2010 07:26
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xs_1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO. R-3101

SHEET NO. 57/120

243+00.00

02-JUN-2010 08:30
$$USERNAME$$
$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	58/120

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

2785
2780
2775
2770
2765
2760
2755
2750
2745

243+50.00

02-JUN-2010 08:30
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$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	69/120

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

2770
2765
2760
2755
2750
2745
2740

244+50.00

2780
2775
2770
2765
2760
2755
2750
2745
2740

244+00.00

—℄—

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

02-JUN-2010 08:30
$$$$USERNAME$$$$
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xs_1_021.dgn

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	60/120

269+50.00

02-JUN-2010 08:30
$$$$USERNAME$$$$
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsec\R-3101_Geo_xsi_1021.dgn

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	61/128

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

2725
2720
2715
2710
2705
2700
2695
2690
2685
2680
2675
2670

270+00.00

—L—

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

08-JUN-2010 07:27
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xss_1_021.dgn
$$$$USERNAME$$$$

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

2740
2735
2730
2725
2720
2715
2710
2705
2700
2695
2690
2685
2680
2675
2670

270+50.00

—℄—

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

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	63/120

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

2745
2740
2735
2730
2725
2720
2715
2710
2705
2700
2695
2690
2685
2680
2675

272+00.00

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

02-JUN-2010 08:51
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$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO. R-3101

SHEET NO. 69/120

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

2745 2740 2735 2730 2725 2720 2715 2710 2705 2700 2695 2690 2685 2680 2675

272+50.00

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

02-JUN-2010 08:51
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$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET, NO.
	R-3101	65/120

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

27.40
27.35
27.30
27.25
27.20
27.15
27.10
27.05
27.00
26.95
26.90
26.85
26.80

273+00.00

℄

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

02-JUN-2010 08:51
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\Copy of R-3101_Geo_xsi_1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	66/120

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

2780
2775
2770
2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710

285+00.00

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

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	67/120

285+50.00

02-JUN-2010 08:51
D:\Projects\R-3101_GEO_RDWY.021\CADD_GEOTECH\xsl\Copy of R-3101_Geo_xsl_1.021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	68/120

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

2770
2765
2760
2755
2750
2745
2740
2735
2730
2725

292+50.00

—L—

02-JUN-2010 08:51
D:\Projects\R-3101_GEO_RDWY.021\CADD_GEOTECH\xs\Copy of R-3101_Geo_xs_1_021.dgn
$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO. R-3101

SHEET NO. 69/120

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

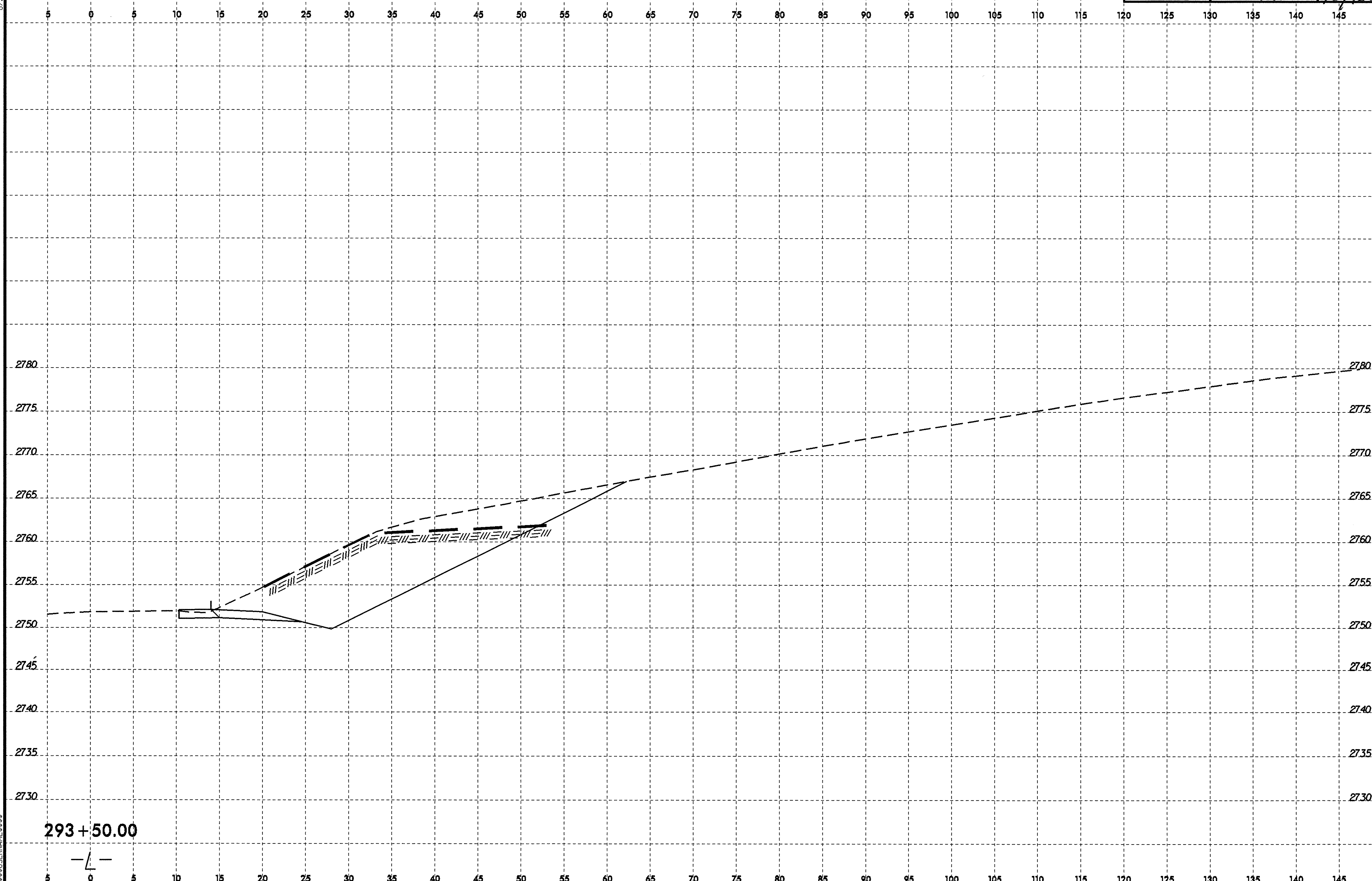
2775
2770
2765
2760
2755
2750
2745
2740
2735
2730

293+00.00
—℄—

02-JUN-2000 08:51
D:\Projects\R-3101_GEO_RDWY_02\CADD_GEOTECH\xsec\Copy of R-3101_Geo_xs1_021.dgn
$$$$USERNAME$$$$

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
R-3101	70/120



02-JUN-2010 08:51
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$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO. R-3101

SHEET NO. 21/126

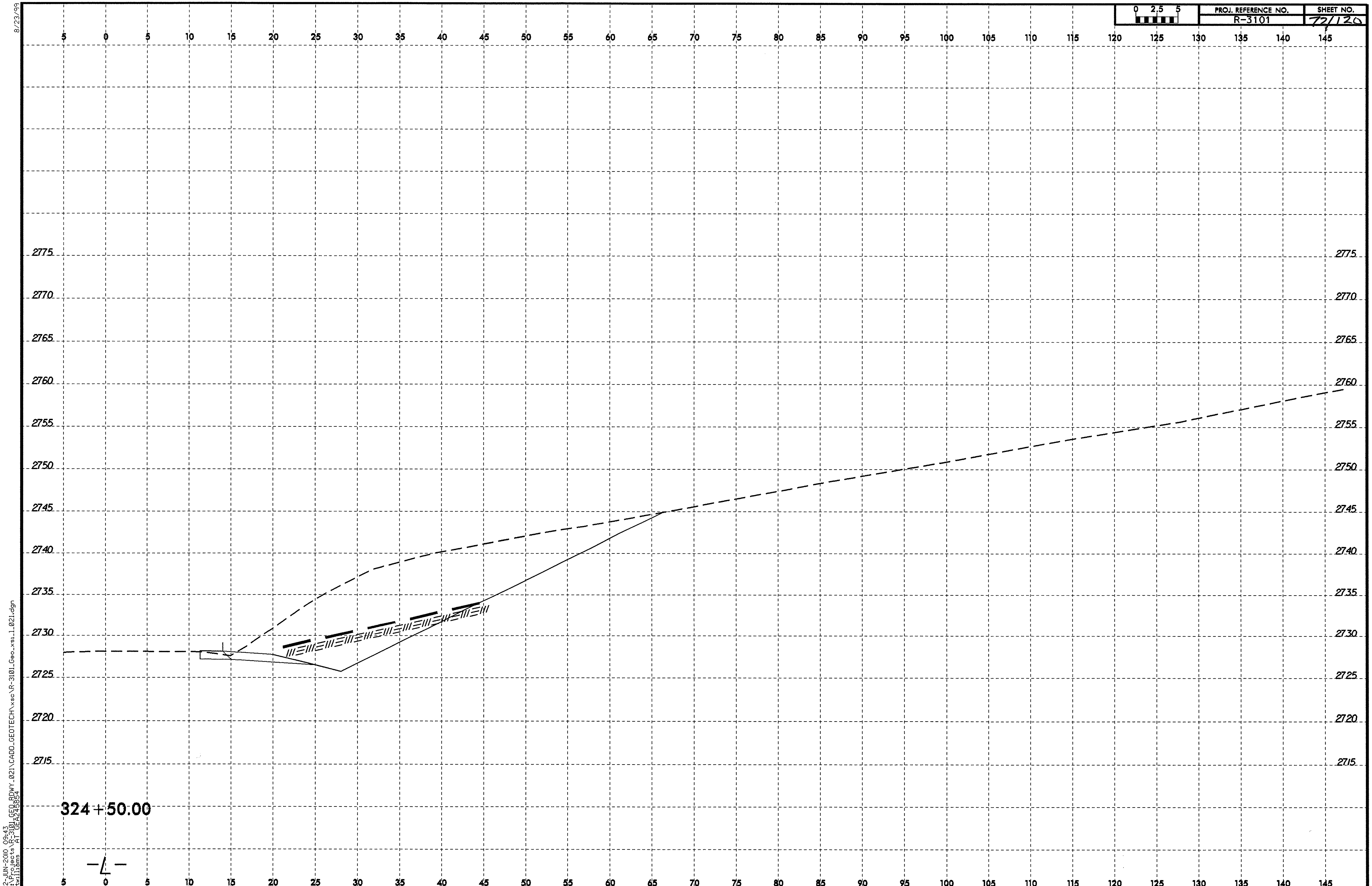
5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100 105 110 115 120 125 130 135 140 145

2780
2775
2770
2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715

324+00.00

—L—

02-JUN-2010 09:41
D:\Projects\R-3101\GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xsl_1_021.dgn
Williams
21 Geo 3054


8/23/99
0 2.5 5
PROJ. REFERENCE NO.
R-3101
SHEET NO.
72/120
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
2775
2770
2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
324+50.00
-L-
02-JUN-2010 09:43
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\R-3101_Geo_xsl_1_021.dgn
jtwilliams AT GEA245854

6/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	73/120

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

2755
2750
2745
2740
2735
2730
2725
2720
2715
2710

326+00.00

—L—

02-JUN-2010 08:53
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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	24

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

2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705

326+50.00

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

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	75/120

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

2780
2775
2770
2765
2760
2755
2750
2745
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2725
2720
2715
2710
2705
2700

328+50.00

02-JUN-2010 08:53
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	76/126

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

2775
2770
2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705
2700

329+00.00

—℄—

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	77/120

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

2775
2770
2765
2760
2755
2750
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2740
2735
2730
2725
2720
2715
2710
2705
2700

329+50.00

02-JUN-2010 08:53
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\Copy of R-3101_Geo_xsc_1_021.dgn
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	28/120

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

2765
2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705
2700

330+00.00

—℄—

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

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	79/120

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

2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705
2700
2695

330+50.00

02-JUN-2010 08:53
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8/23/99

0 2.5 5

PROJ. REFERENCE NO. R-3101

SHEET NO. 80/120

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

2760
2755
2750
2745
2740
2735
2730
2725
2720
2715
2710
2705
2700
2695
2690
2685

336+50.00

—L—

02-JUN-2000 08:53
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	21 of 26

338+00.00
—L—

02-JUN-2010 08:57
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	82/120

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

2765 2760 2755 2750 2745 2740 2735 2730 2725 2720 2715 2710 2705 2700 2695 2690 2685 2680

338+50.00

02-JUN-2010 08:57
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	83/120

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

2740
2735
2730
2725
2720
2715
2710
2705
2700
2695
2690
2685
2680

339+00.00

02-JUN-2010 08:57
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	84/120

339+50.00

—L—

02-JUN-2010 08:57
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	85 / 126

340+00.00

—L—

08-JUN-2010 07:34
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Bentley Systems, Inc. SELECTseries 3

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	86/120

340+50.00
—L—

02-JUN-2010 08:57
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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	87/120

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

2755 2750 2745 2740 2735 2730 2725 2720 2715 2710 2705 2700 2695 2690 2685 2680 2675 2670

341+50.00

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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

08-JUN-2010 07:37
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twilliams A1 GEA245854

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	88/120

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

2740 2735 2730 2725 2720 2715 2710 2705 2700 2695 2690 2685 2680 2675 2670

342+00.00

—L—

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

10-JUN-2010 09:27
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tvillisms ATT_OE#295954

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	89/120

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

2725
2720
2715
2710
2705
2700
2695
2690
2685
2680
2675
2670

342 + 50.00

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02-JUN-2010 09:05
D:\Projects\R-3101_GEO_RDWY_021\CADD_GEOTECH\xsc\Copy of R-3101_Geo_xsi_1_021.dgn
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	90/120

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

2685
2680
2675
2670
2665
2660
2655
2650
2645
2640

359+50.00

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

02-JUN-2010 09:05
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	97/120

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

2680 2675 2670 2665 2660 2655 2650 2645 2640 2635

360+00.00

—L—

02-JUN-2010 09:05
$$USERNAME$$
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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	92/120

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

2680
2675
2670
2665
2660
2655
2650
2645
2640
2635

360+50.00
—L—

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

02-JUN-2010 09:05
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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	93/120

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

2685 2680 2675 2670 2665 2660 2655 2650 2645 2640 2635 2630 2625

365+50.00

—L—

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

02-JUN-2010 09:05
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$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	94/120

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

2685
2680
2675
2670
2665
2660
2655
2650
2645
2640
2635
2630

366+00.00

—L—

02-JUN-2010 09:05
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	95/120

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

2685 2680 2675 2670 2665 2660 2655 2650 2645 2640 2635 2630 2625

366+50.00

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10-JUN-2010 09:28
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kwilliams AT GEAZ9654

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	96/120

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

2670
2665
2660
2655
2650
2645
2640
2635
2630
2625

367+00.00

—℄—

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

08-JUN-2010 07:38
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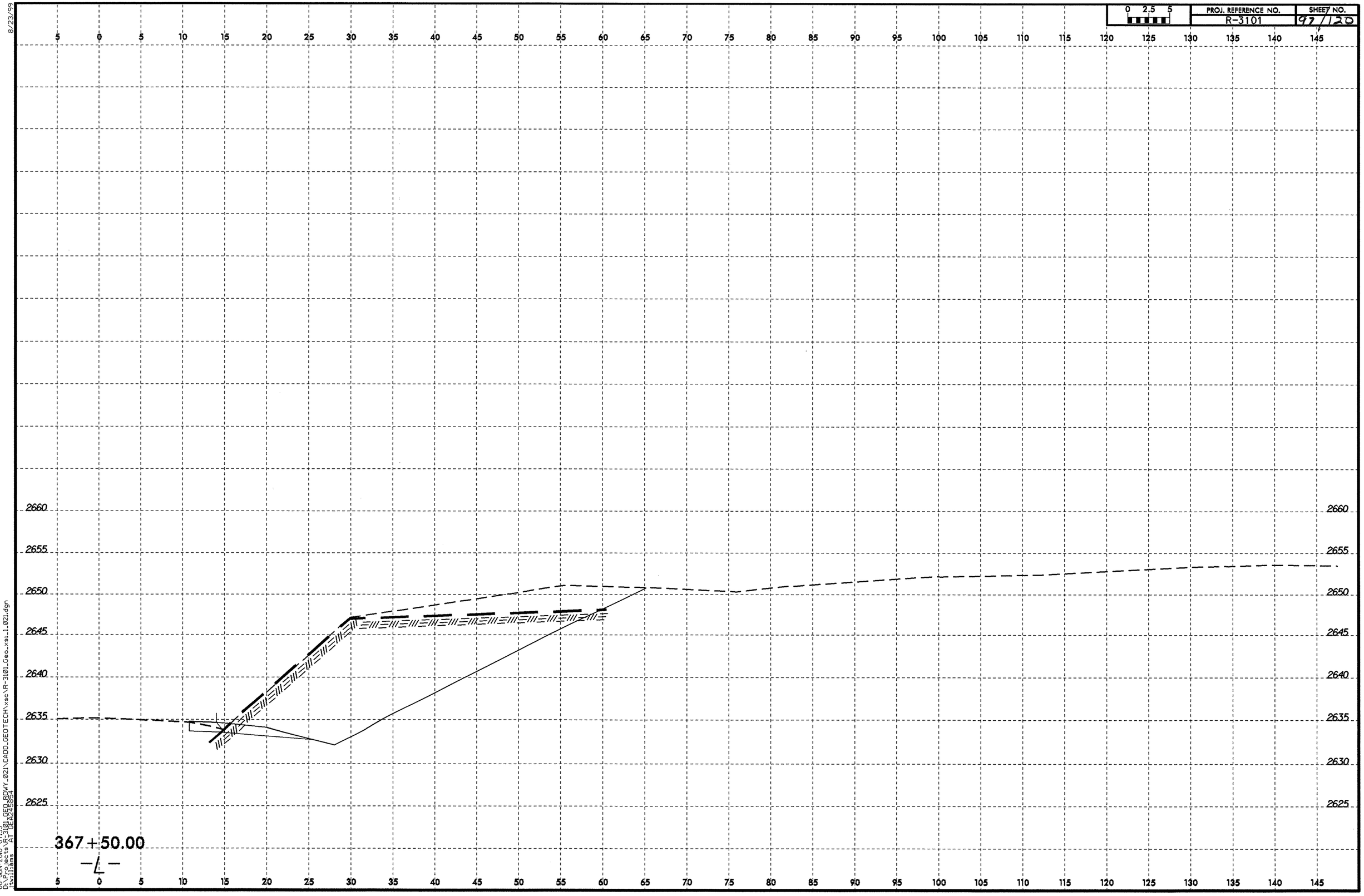
tw113ms
Al UEA29654

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	97/120



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tlwilliams
AT GEA245854

8/23/99

0 2.5 5

PROJ. REFERENCE NO. R-3101

SHEET NO. 98/120

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

2680
2675
2670
2665
2660
2655
2650
2645
2640
2635
2630
2625
2620

368+50.00

-L-

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

08-JUN-2010 07:40
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twilliams
AT GE4295854

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	99/120

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

2670
2665
2660
2655
2650
2645
2640
2635
2630
2625
2620

369+00.00

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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

02-JUN-2010 09:08
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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	50/120

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

2675
2670
2665
2660
2655
2650
2645
2640
2635
2630
2625
2620

369+50.00

$-\not{L}-$

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

08-JUN-2010 07:42
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twilliams A1_GEA24x36H

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	101 / 120

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

2675 2670 2665 2660 2655 2650 2645 2640 2635 2630 2625 2620

370+00.00
—℄—

08-JUN-2000 07:43
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jwilliams

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	102/120

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

2670
2665
2660
2655
2650
2645
2640
2635
2630
2625
2620

370+50.00

02-JUN-2010 09:09
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$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	103/120

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

2665 2660 2655 2650 2645 2640 2635 2630 2625 2620 2615

373+50.00

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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

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	104/120

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

2675
2670
2665
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2645
2640
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2625
2620
2615

374+00.00

—L—

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

02-JUN-2010 09:09
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	105 / 120

374+50.00

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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	106/120

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

2690 2685 2680 2675 2670 2665 2660 2655 2650 2645 2640 2635 2630 2625 2620 2615 2610 2605

378+50.00

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

02-JUN-2010 09:09
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8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	107/120

379+00.00

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08-JUN-2010 07:50
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Williams, Al DEA2595

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	102/120

379+50.00

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tswilliams AT GEA29854

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	109/120

380+00.00

08-JUN-2010 07:53
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tswilliams AT GEA23554

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	110/120

380+50.00

-L-

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	11 / 20

381+00.00

—L—

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Users
Files
Settings

8/23/99

0 2.5 5

PROJ. REFERENCE NO. R-3101

SHEET NO. 112/120

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

2695 2690 2685 2680 2675 2670 2665 2660 2655 2650 2645 2640 2635 2630 2625 2620 2615 2610 2605

381+50.00

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bwilliams AT GEA2459S4

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET/NO.
R-3101	113/120

382+00.00

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twilliams
Al 08424864

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	114/120

382+50.00

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	115/120

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

2680 2675 2670 2665 2660 2655 2650 2645 2640 2635 2630 2625 2620 2615 2610 2605 2600 2595

383+00.00

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

02-JUN-2010 09:17
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$$$$USERNAME$$$$

8/23/99

0 2.5 5

PROJ. REFERENCE NO.	SHEET NO.
R-3101	116 of 120

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

2660 2655 2650 2645 2640 2635 2630 2625 2620 2615 2610 2605 2600 2595 2590 2585

408+50.00

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02-JUN-2010 09:17
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8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	117/120

409+00.00

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$$$$USERNAME$$$$

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	R-3101	118 /120

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