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NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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LINE	STATION	PLAN	PROFILE	XSECT
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 41153.1.1 (I-5000) F.A. PROJ. IMF-85-1(113)17

COUNTY GASTON

PROJECT DESCRIPTION I-85 /US 321 INTERCHANGE GEOMETRIC SAFETY IMPROVEMENTS

INVENTORY
(REVISED)

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5000	1	67

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
41153.1.1	IMF-85-1(113)17	P.E.
		R/W & UTIL.

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PERSONNEL

J.K. STICKNEY

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JP ROGERS

S&ME

INVESTIGATED BY J.P. ROGERS

CHECKED BY C.B. LITTLE

SUBMITTED BY C.B. LITTLE

DATE JUNE 2014

NORTH CAROLINA LICENSED SEAL 1104 GEOLOGIST CLINTON B. LITTLE

DocuSigned by: Clinton B. Little 03045D5AC8E452...

8/11/2014

ID: I-5000

CONTRACT:

DRAWN BY: J.K. McCLURE /JP ROGERS

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PROJECT REFERENCE NO.	SHEET NO.
41153.1.1 (I-5000)	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

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

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

SOIL LEGEND AND AASHTO CLASSIFICATION

GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)				ORGANIC MATERIALS		
GROUP CLASS.	A-1		A-3	A-2				A-4	A-5	A-6	A-7	A-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 ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE	<4	N/A
	LOOSE	4 TO 10	
	MEDIUM DENSE	10 TO 30	
	DENSE	30 TO 50	
	VERY DENSE	>50	
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT	<2	<0.25
	SOFT	2 TO 4	0.25 TO 0.50
	MEDIUM STIFF	4 TO 8	0.5 TO 1.0
	STIFF	8 TO 15	1 TO 2
	VERY STIFF	15 TO 30	2 TO 4
	HARD	>30	>4

TEXTURE OR GRAIN SIZE

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

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

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

SOIL MOISTURE - CORRELATION OF TERMS

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

PLASTICITY

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

COLOR

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

GRADATION

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

ANGULARITY OF GRAINS

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

MINERALOGICAL COMPOSITION

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

COMPRESSIBILITY

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

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

ABBREVIATIONS

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

SAMPLE ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] MOBILE B-___
- [ ] BK-51
- [ ] CME-45C
- [X] CME-550
- [ ] PORTABLE HOIST
- [X] DIEDRICH D-50
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [X] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [ ] HARD FACED FINGER BITS
- [X] TUNG.-CARBIDE INSERTS
- [X] CASING [ ] W/ ADVANCER
- [ ] TRICONE _____" STEEL TEETH
- [ ] TRICONE _____" TUNG.-CARB.
- [X] CORE BIT
- [X] 3 1/4" HOLLOW AUGERS

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

CORE SIZE:
- [ ] -B_____
- [X] -N XWL
- [ ] -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:
SOIL STRATIGRAPHY IS THROUGH THE BORINGS FOR PROFILES AND CROSS-SECTIONS.

HAMMER EFFICIENCY RATINGS:

CME-550X	HF000064	81%	11/28/05
CME-550X	HF000064	91%	01/09/13
DIEDRICH D-50		75%	01/10/13
CME-550X	SME3193	80%	06/07/2011

REVISED 09/23/09

See Sheet 1-A For Index of Sheets

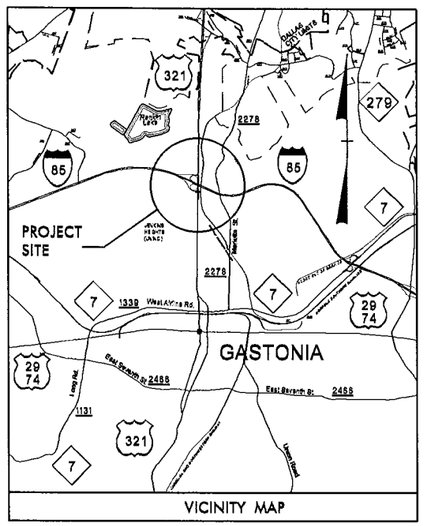
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

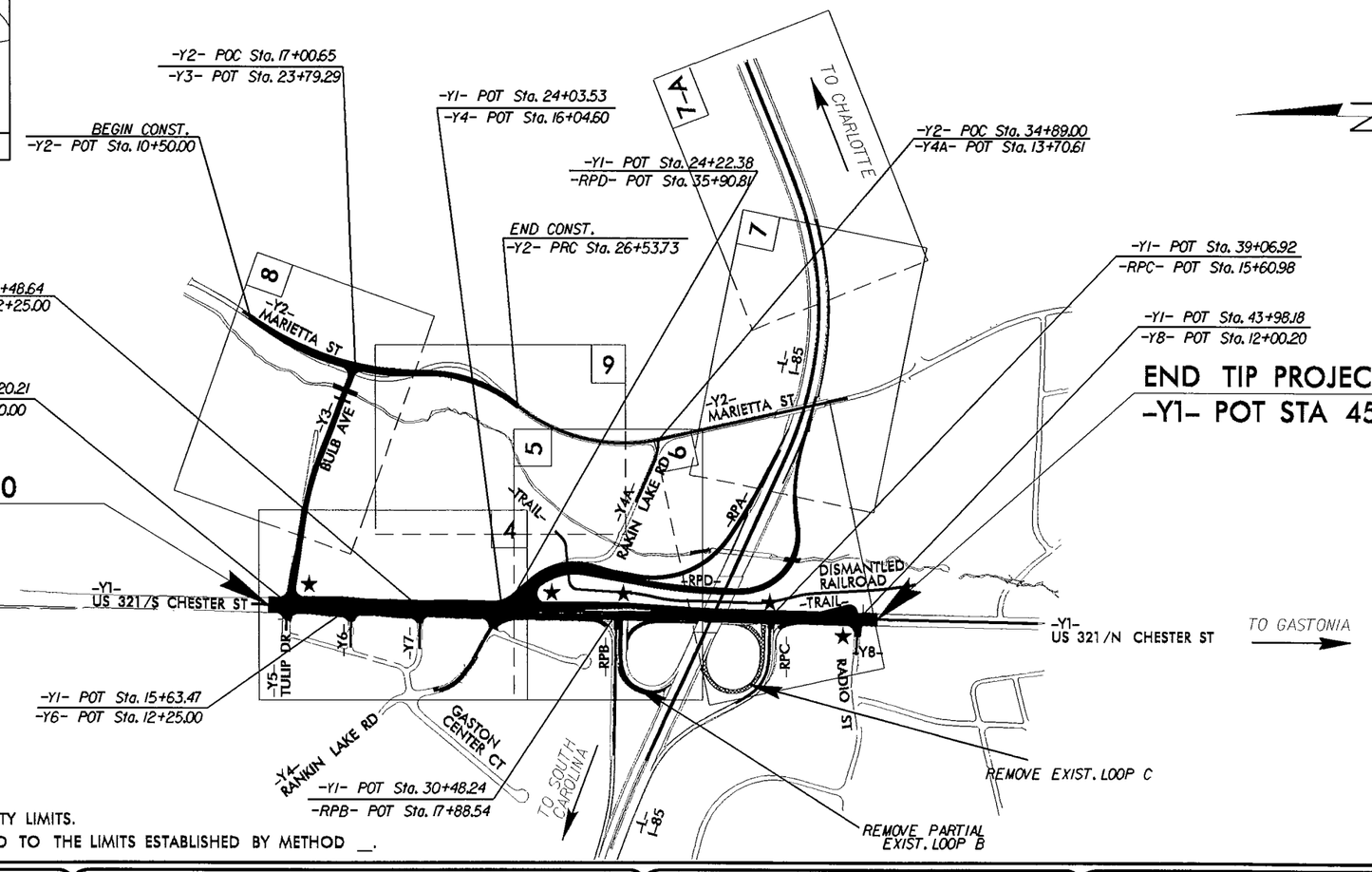
GASTON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5000	2A	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
41153.1.1	IMF-85-1(113)17	PE	

LOCATION: I-85/US 321 INTERCHANGE GEOMETRIC SAFETY IMPROVEMENTS

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERTS AND SIGNALS





NC GRID
NAD 83/NSRS 2007

★ REVISED SIGNALS

NOTE: THIS PROJECT IS WITHIN THE GASTONIA CITY LIMITS.

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

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 2015 = 49,544
ADT 2035 = 59,100
K = 10 %
D = 55 %
T = 12 % *
V = 50 MPH
* TTST = 8 DUAL = 4
FUNC CLASS = PRINCIPAL ARTERIAL
REGIONAL TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT I-5000 = 0.644 MILES

TOTAL LENGTH TIP PROJECT I-5000 = 0.644 MILES

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: April 18, 2014

LETTING DATE: October 20, 2015

JASON MOORE, PE
PROJECT ENGINEER

BRYAN KEY, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION

TIP PROJECT: I-5000

CONTRACT:

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Pat McCrory
GOVERNOR

Anthony Tata
SECRETARY

March 6, 2014

STATE PROJECT: 41153.1.1 (I-5000)
FEDERAL PROJECT: IMF-85-1(113)17
COUNTY: Gaston
DESCRIPTION: I-85/US 321 Interchange Geometric Safety Improvements

SUBJECT: Geotechnical Report – Inventory

Due to a design revision on Ramp D, this report supersedes the report written on September 12, 2013.

PROJECT DESCRIPTION

This project is located in south-central Gaston County in the City of Gastonia. In addition to the existing I-85/US 321 Interchange, the proposed project includes upgrades to Bulb Ave. (Y3) and Marietta Street (Y2). A slight relocation and extension to a Greenway Trail (TRAIL) that runs through the project corridor has also been included. In addition, several culverts and culvert extensions have been proposed over the creek that runs parallel to US 321 thru the project corridor. The culvert at –Y3- and Hardin creek was originally investigated as a bridge crossing in 2006. Two of the borings from that investigation have been included in this project. The following alignments were investigated:

-Y1-	11+00.00 to 45+00.00 (0.66 miles)
-Y2-	10+50.00 to 26+53.73 (0.30 miles)
-Y3-	10+00.00 to 23+79.29 (0.26 miles)
Ramp A	10+00.00 to 24+41.71 (0.27 miles)
Ramp D	10+00.00 to 35+90.81 (0.49 miles)
-TRAIL-	14+50.00 to 31+58.83 (0.32 miles)

The total length of lines investigated is 2.30 miles. The original NCDOT field investigation of the new interchange was conducted in April and May of 2013. After receiving the revised plans in December 2013, S&ME was contracted to return to the site to perform additional Landfill borings.

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

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

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

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

All borings performed during the NCDOT phase of the investigation were conducted with a CME-550X drill machine with an automatic hammer. Standard Penetration Tests were performed utilizing hollow stem augers with carbide insert teeth. Forty-two soil samples were submitted to the Materials and Tests Unit for laboratory analysis.

AREAS OF SPECIAL GEOTECHNICAL INTEREST

Artificial Fill: An old landfill was encountered within the project corridor under two proposed alignments:

Line	Station(s)	Offset
-Ramp A-	13+77 to 17+55	Right.
-Ramp D-	14+08 to 17+65	Left and Right

Alignment Ramp D crosses the edge of the largest landfill which is south of I-85 and east of US 321. Ramp A crosses a smaller landfill which is north of I-85 and east of US 321. It is unclear at this time whether or not either landfill extends underneath existing I-85.

After initially finding these landfill materials and roughly determining their extent, a private engineering firm (S&ME) was called in to do a detailed study of the two areas. In addition to a geotechnical study of the landfill areas, S&ME's investigation included a geophysical and environmental assessment. This report will include their geotechnical findings while the other reports are available from the Geotechnical Engineering Unit's Geoenvironmental branch.

This was an unregulated landfill that was active from 1930 until the late 1950's. The deepest landfill materials encountered extended up to 19.5' below the ground surface in a boring performed around Ramp A. Trace amounts of wood debris, brick, glass, gravel, and micaceous soil were encountered in the borings performed in these two areas. Based on the environmental work done in the area, arsenic, benzene and asbestos were found in both landfill sites. Please refer to the attached plan views, profiles, and cross-sections for a complete graphical depiction of these areas.

The artificial fill encountered on the –TRAIL- alignment (stas. 22+50 to 29+30) is not associated with the landfill. This fill was built to accommodate development adjacent to existing US 321N. Two businesses and a parking area for both currently occupy this property.

Crystalline Rock: Crystalline rock was encountered within 10' of grade at the following locations:

Line	Station(s)
-Y2-	10+50 to 20+50
-Y3-	16+50 to 20+50

Please refer to the attached plan views, profiles, and cross-sections for a complete graphical depiction of these alignments. Rock outcrops are visible on the surface at or near Stations 15+00 to 17+00 –Y2- and in the creek bed at approximately Station 22+40 –Y3-.

Alluvial Soils: This project falls within the Long Creek basin with Highland Creek serving as the primary drainage outlet. Highland Creek parallels US 321 on the eastside and flows south to north. Alluvial materials encountered in its floodplain are up to 19' thick and consist primarily of sandy silts (A-4), silty sands (A-2-4), and coarse sands (A-3) with gravel. In addition, a six-foot lens of stiff,

sandy clay (A-7-5) with gravel was encountered on the east side of Hardin Creek at the proposed Ramp D. Groundwater, where encountered, was between elevations 690' and 700'. Alluvial deposits are thicker on the eastern side of the creek. Maximum fill heights over these deposits are approximately 25' and are associated with Ramp A.

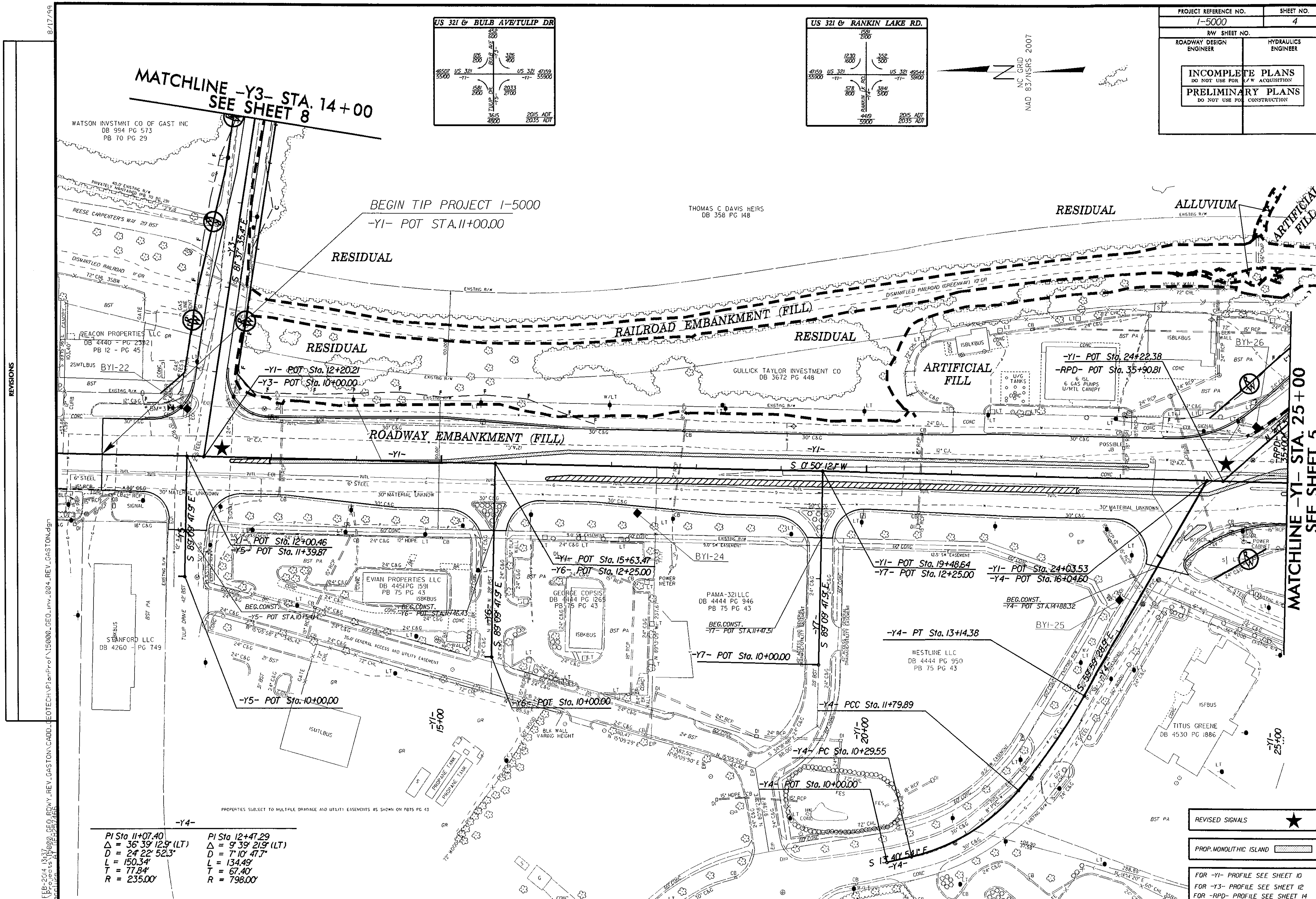
SOIL PROPERTIES

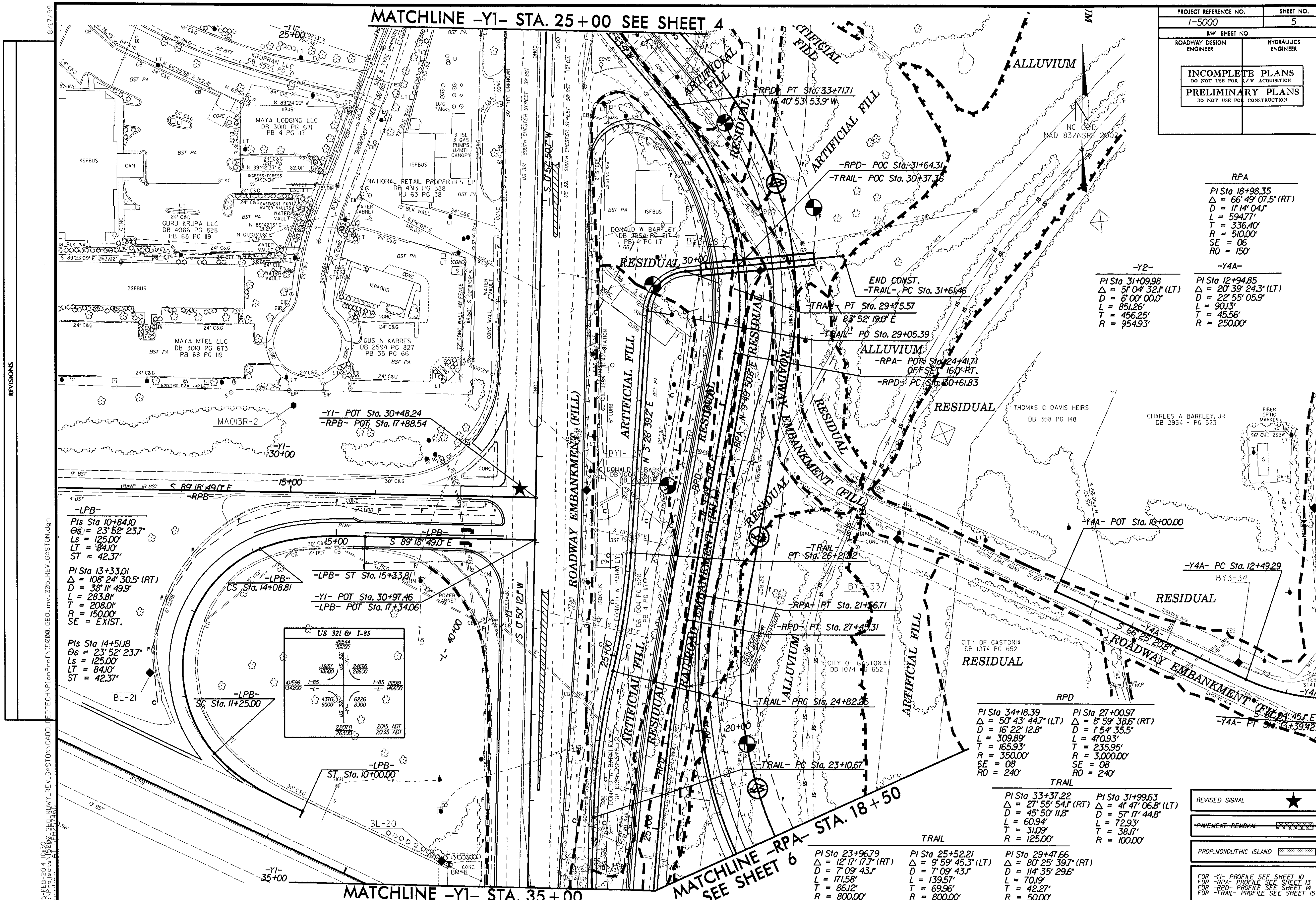
Residual Soils

All residual soils on the project are derived from the intrusive, quartz-rich (PPmg) rocks encountered within the project corridor. Crystalline and severely weathered crystalline rock was encountered in the cut sections between Stations 10+50 to 20+50 –Y2-and 18+50 to 20+50 –Y3-. The dominant residual soil type encountered is sandy clay (A-7-6, A-6) and silty sand (A-2-4). Sandy silt (A-4) is also present within the project corridor, but in lesser concentrations.

Respectfully submitted,

John P. Rogers
Project Geological Engineer


PROJECT REFERENCE NO. I-5000
SHEET NO. 4
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
US 321 & BULB AVE/TULIP DR
US 321 & RANKIN LAKE RD.
2015 ADT
2035 ADT
NC GRID NAD 83/NSRS 2007
MATCHLINE -Y3- STA. 14+00 SEE SHEET 8
MATCHLINE -Y1- STA. 25+00 SEE SHEET 5
BEGIN TIP PROJECT I-5000
-Y1- POT STA.11+00.00
RESIDUAL
ALLUVIUM
ARTIFICIAL FILL
RAILROAD EMBANKMENT (FILL)
ROADWAY EMBANKMENT (FILL)
WATSON INVSTMNT CO OF GAST INC DB 994 PG 573 PB 70 PG 29
THOMAS C DAVIS HEIRS DB 358 PG 148
GULLICK TAYLOR INVESTMENT CO DB 3672 PG 448
BEACON PROPERTIES LLC DB 4440 - PG 2382 PB 12 - PG 45
EVIAN PROPERTIES LLC DB 4451 PG 1591 PB 75 PG 43
GEORGE COPSIS DB 4444 PG 1265 PB 75 PG 43
PAMA-321 LLC DB 4444 PG 946 PB 75 PG 43
WESTLINE LLC DB 4444 PG 950 PB 75 PG 43
STANFORD LLC DB 4260 - PG 749
TITUS GREENE DB 4530 PG 1886
-Y1- POT Sta. 12+20.21
-Y3- POT Sta. 10+00.00
-Y1- POT Sta. 12+00.46
-Y5- POT Sta. 11+39.87
-Y1- POT Sta. 15+63.47
-Y6- POT Sta. 12+25.00
-Y1- POT Sta. 19+48.64
-Y7- POT Sta. 12+25.00
-Y1- POT Sta. 24+03.53
-Y4- POT Sta. 16+04.60
-Y1- POT Sta. 24+22.38
-RPD- POT Sta. 35+90.81
-Y5- POT Sta. 10+00.00
-Y6- POT Sta. 10+00.00
-Y7- POT Sta. 10+00.00
-Y4- PT Sta. 13+14.38
-Y4- PCC Sta. 11+79.89
-Y4- PC Sta. 10+29.55
-Y4- POT Sta. 10+00.00
S 0°50' 12.7" W
S 89°09' 47.9" E
S 13°40' 58.1" E
BYI-22
BYI-24
BYI-25
BYI-26
PROPERTIES SUBJECT TO MULTIPLE DRAINAGE AND UTILITY EASEMENTS AS SHOWN ON PB75 PG 43
-Y4-
PI Sta 11+07.40
Δ = 36°39' 12.9" (LT)
D = 24°22' 52.3"
L = 150.34'
T = 77.84'
R = 235.00'
PI Sta 12+47.29
Δ = 9°39' 21.9" (LT)
D = 7°10' 47.7"
L = 134.49'
T = 67.40'
R = 798.00'
REVISED SIGNALS
PROP. MONOLITHIC ISLAND
FOR -Y1- PROFILE SEE SHEET 10
FOR -Y3- PROFILE SEE SHEET 12
FOR -RPD- PROFILE SEE SHEET 14
REVISIONS
8/17/99

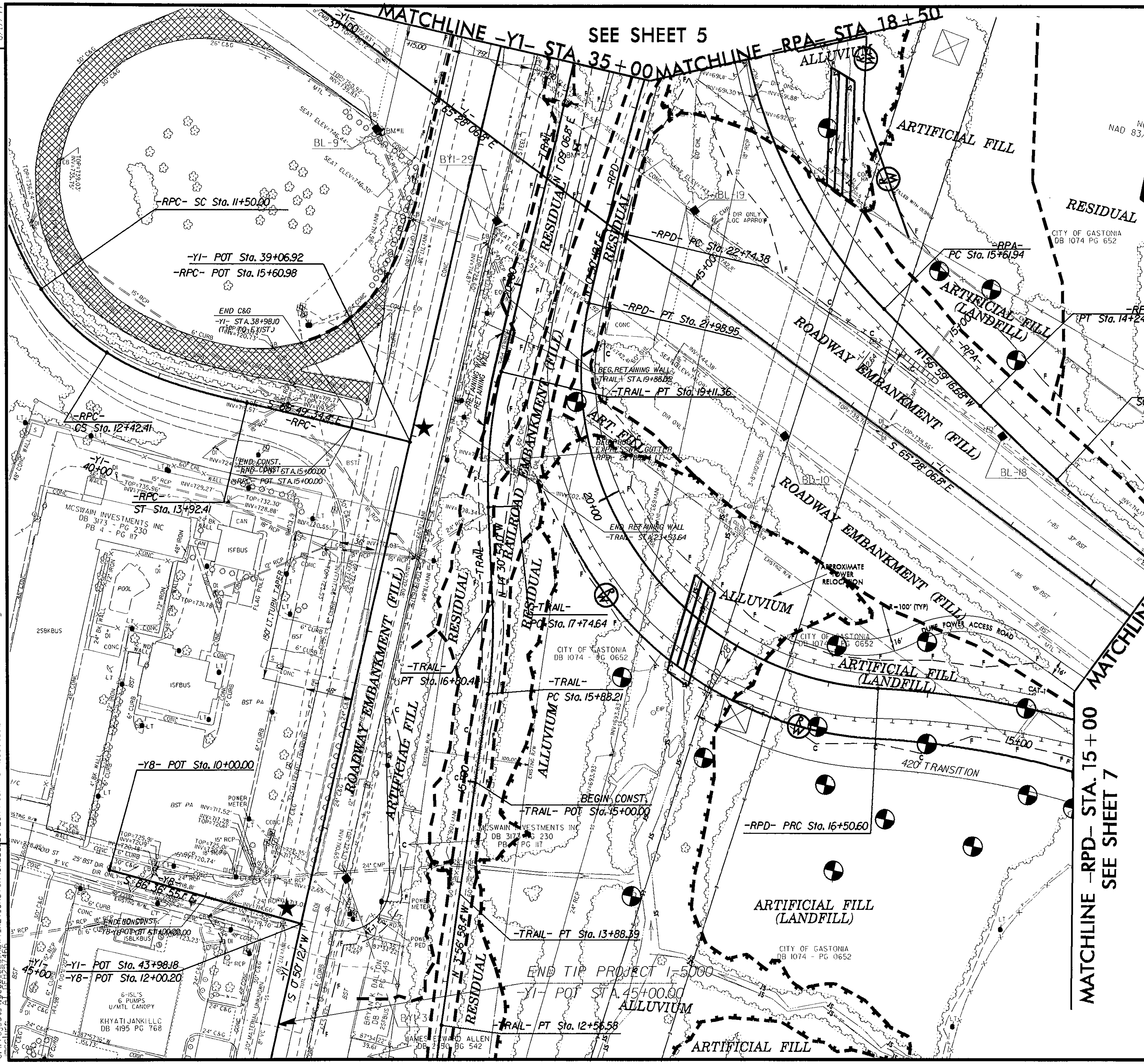


PROJECT REFERENCE NO. I-5000
SHEET NO. 5
RW SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
MATCHLINE -Y1- STA. 25+00 SEE SHEET 4
MATCHLINE -Y1- STA. 35+00
MATCHLINE -RPA- STA. 18+50 SEE SHEET 6
REVISIONS
8/17/99
NC GRID NAD 83/NSRS 2007
ALLUVIUM
ARTIFICIAL FILL
RESIDUAL
ROADWAY EMBANKMENT (FILL)
RAILROAD EMBANKMENT (FILL)
-RPD- PT Sta. 33+71.71
N 40° 53' 53.9" W
-RPD- POC Sta. 31+64.31
-TRAIL- POC Sta. 30+37.35
END CONST. -TRAIL- PC Sta. 31+61.46
-TRAIL- PT Sta. 29+75.57
N 83° 52' 19.0" E
-TRAIL- PC Sta. 29+05.39
-RPA- POT Sta. 24+41.71 OFFSET 16.0' RT.
-RPD- PC Sta. 30+61.83
-Y1- POT Sta. 30+48.24
-RPB- POT Sta. 17+88.54
S 89° 18' 49.0" E
-LPB- ST Sta. 15+33.81
-Y1- POT Sta. 30+97.46
-LPB- POT Sta. 17+34.06
-LPB- CS Sta. 14+08.81
-LPB- SC Sta. 11+25.00
-LPB- ST Sta. 10+00.00
-TRAIL- PT Sta. 26+21.32
-RPA- PT Sta. 21+56.71
-RPD- PT Sta. 27+45.31
-TRAIL- PRC Sta. 24+82.25
-TRAIL- PC Sta. 23+10.67
-Y4A- POT Sta. 10+00.00
-Y4A- PC Sta. 12+49.29
-Y4A- PT Sta. 13+39.42
S 66° 25' 20.8" E
RPA
PI Sta 18+98.35
Δ = 66° 49' 07.5" (RT)
D = 11° 14' 04.1"
L = 594.77'
T = 336.40'
R = 510.00'
SE = .06
RO = 150'
-Y2-
PI Sta 31+09.98
Δ = 51° 04' 32.1" (LT)
D = 6° 00' 00.0"
L = 851.26'
T = 456.25'
R = 954.93'
-Y4A-
PI Sta 12+94.85
Δ = 20° 39' 24.3" (LT)
D = 22° 55' 05.9"
L = 90.13'
T = 45.56'
R = 250.00'
-LPB-
PIs Sta 10+84.10
θs = 23° 52' 23.7"
Ls = 125.00'
LT = 84.10'
ST = 42.37'
PI Sta 13+33.01
Δ = 108° 24' 30.5" (RT)
D = 38° 11' 49.9"
L = 283.81'
T = 208.01'
R = 150.00'
SE = EXIST.
PIs Sta 14+51.18
θs = 23° 52' 23.7"
Ls = 125.00'
LT = 84.10'
ST = 42.37'
RPD
PI Sta 34+18.39
Δ = 50° 43' 44.7" (LT)
D = 16° 22' 12.8"
L = 309.89'
T = 165.93'
R = 350.00'
SE = .08
RO = 240'
PI Sta 27+00.97
Δ = 8° 59' 38.6" (RT)
D = 1° 54' 35.5"
L = 470.93'
T = 235.95'
R = 3,000.00'
SE = .08
RO = 240'
TRAIL
PI Sta 33+37.22
Δ = 27° 55' 54.1" (RT)
D = 45° 50' 11.8"
L = 60.94'
T = 31.09'
R = 125.00'
PI Sta 31+99.63
Δ = 41° 47' 06.8" (LT)
D = 57° 17' 44.8"
L = 72.93'
T = 38.17'
R = 100.00'
TRAIL
PI Sta 23+96.79
Δ = 12° 17' 17.7" (RT)
D = 7° 09' 43.1"
L = 171.58'
T = 86.12'
R = 800.00'
PI Sta 25+52.21
Δ = 9° 59' 45.3" (LT)
D = 7° 09' 43.1"
L = 139.57'
T = 69.96'
R = 800.00'
PI Sta 29+47.66
Δ = 80° 25' 39.7" (RT)
D = 114° 35' 29.6"
L = 70.19'
T = 42.27'
R = 50.00'
US 321 & I-85
REVISED SIGNAL
PAVEMENT REMOVAL
PROP. MONOLITHIC ISLAND
FOR -Y1- PROFILE SEE SHEET 10
FOR -RPA- PROFILE SEE SHEET 13
FOR -RPD- PROFILE SEE SHEET 14
FOR -TRAIL- PROFILE SEE SHEET 15
MAYA LODGING LLC DB 3010 PG 671 PB 4 PG 117
GURU KRUPA LLC DB 4086 PG 828 PB 68 PG 119
MAYA MTEL LLC DB 3010 PG 673 PB 68 PG 119
NATIONAL RETAIL PROPERTIES LP DB 4313 PG 588 PB 63 PG 58
GUS N KARRES DB 2594 PG 827 PB 35 PG 66
DONALD W BARKLEY
THOMAS C DAVIS HEIRS DB 358 PG 148
CHARLES A BARKLEY, JR DB 2954 - PG 523
CITY OF GASTONIA DB 1074 PG 652
MA013R-2
BL-21
BL-20
BY3-34
25-FEB-2014 10:30

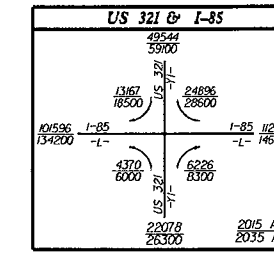
PROJECT REFERENCE NO.	SHEET NO.
I-5000	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

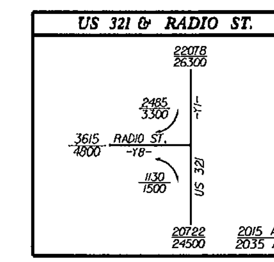
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



MATCHLINE -Y1- STA. 35+00
SEE SHEET 5
MATCHLINE -RPA- STA. 18+50
MATCHLINE -L- STA. 50+50
SEE SHEET 7
MATCHLINE -RPD- STA. 15+00
SEE SHEET 7
NC GRID
NAD 83/NSRS 2007
ARTIFICIAL FILL
RESIDUAL
ALLUVIUM
ROADWAY EMBANKMENT (FILL)
RAILROAD EMBANKMENT (FILL)
ARTIFICIAL FILL (LANDFILL)
CITY OF GASTONIA
DB 1074 PG 652
-RPC- SC Sta. 11+50.00
-Y1- POT Sta. 39+06.92
-RPC- POT Sta. 15+60.98
-RPC- CS Sta. 12+42.41
-RPC- ST Sta. 13+92.41
-RPD- PC Sta. 22+74.38
-RPD- PT Sta. 21+98.95
-RPD- PRC Sta. 16+50.60
-RPA- PC Sta. 15+61.94
-RPA- PT Sta. 14+24.94
-RPA- SC Sta. 13+18.37
-TRAIL- PT Sta. 19+11.36
-TRAIL- RPC Sta. 17+74.64
-TRAIL- PT Sta. 16+60.41
-TRAIL- PC Sta. 15+88.21
BEGIN CONST. -TRAIL- POT Sta. 15+00.00
-TRAIL- PT Sta. 13+88.39
-TRAIL- PT Sta. 12+56.58
-Y8- POT Sta. 10+00.00
-Y1- POT Sta. 43+98.18
-Y8- POT Sta. 12+00.20
END TIP PROJECT I-5000
-Y1- POT STA. 45+00.00
MCSWAIN INVESTMENTS INC
DB 3173 - PG 230
PB 4 - PG 117
KHYATI JANKI LLC
DB 4195 PG 768
APPROXIMATE POWER RELOCATION
POWER ACCESS ROAD
420' TRANSITION





RPA

PIs Sta 12+51.52	PI Sta 13+71.57
Θs = 2° 47′ 41.7″	Δ = 2° 59′ 03.5″ (RT)
Ls = 200.00′	D = 2° 47′ 41.7″
LT = 133.35′	L = 106.78′
ST = 66.68′	T = 53.40′
	R = 2,050.00′
	SE = 06
	RO = 200′

RPD

PI Sta 14+20.00	PI Sta 21+24.71
Δ = 27° 28′ 20.5″ (LT)	Δ = 110° 50′ 03.7″ (RT)
D = 6° 21′ 58.3″	D = 16° 51′ 06.1″
L = 431.53′	L = 657.70′
T = 220.00′	T = 493.17′
R = 900.00′	R = 340.00′
SE = 08	SE = 08
RO = 200′	RO = 240′

RPC

PIs Sta 11+00.57	PI Sta 11+96.84	PIs Sta 12+92.93
Θs = 18° 45′ 00.0″	Δ = 23° 06′ 08.8″ (LT)	Θs = 18° 45′ 00.0″
Ls = 150.00′	D = 25° 00′ 00.0″	Ls = 150.00′
LT = 100.57′	L = 92.41′	LT = 100.57′
ST = 50.52′	T = 46.84′	ST = 50.52′
	R = 229.18′	

TRAIL

PI Sta 11+36.29	PI Sta 16+34.44	PI Sta 18+43.43
Δ = 6° 29′ 35.9″ (RT)	Δ = 10° 33′ 55.6″ (LT)	Δ = 15° 40′ 00.8″ (RT)
D = 2° 41′ 46.6″	D = 11° 27′ 33.0″	D = 11° 27′ 33.0″
L = 240.83′	L = 92.20′	L = 136.72′
T = 120.54′	T = 46.23′	T = 68.79′
R = 2,125.00′	R = 500.00′	R = 500.00′

REVISED SIGNALS ★

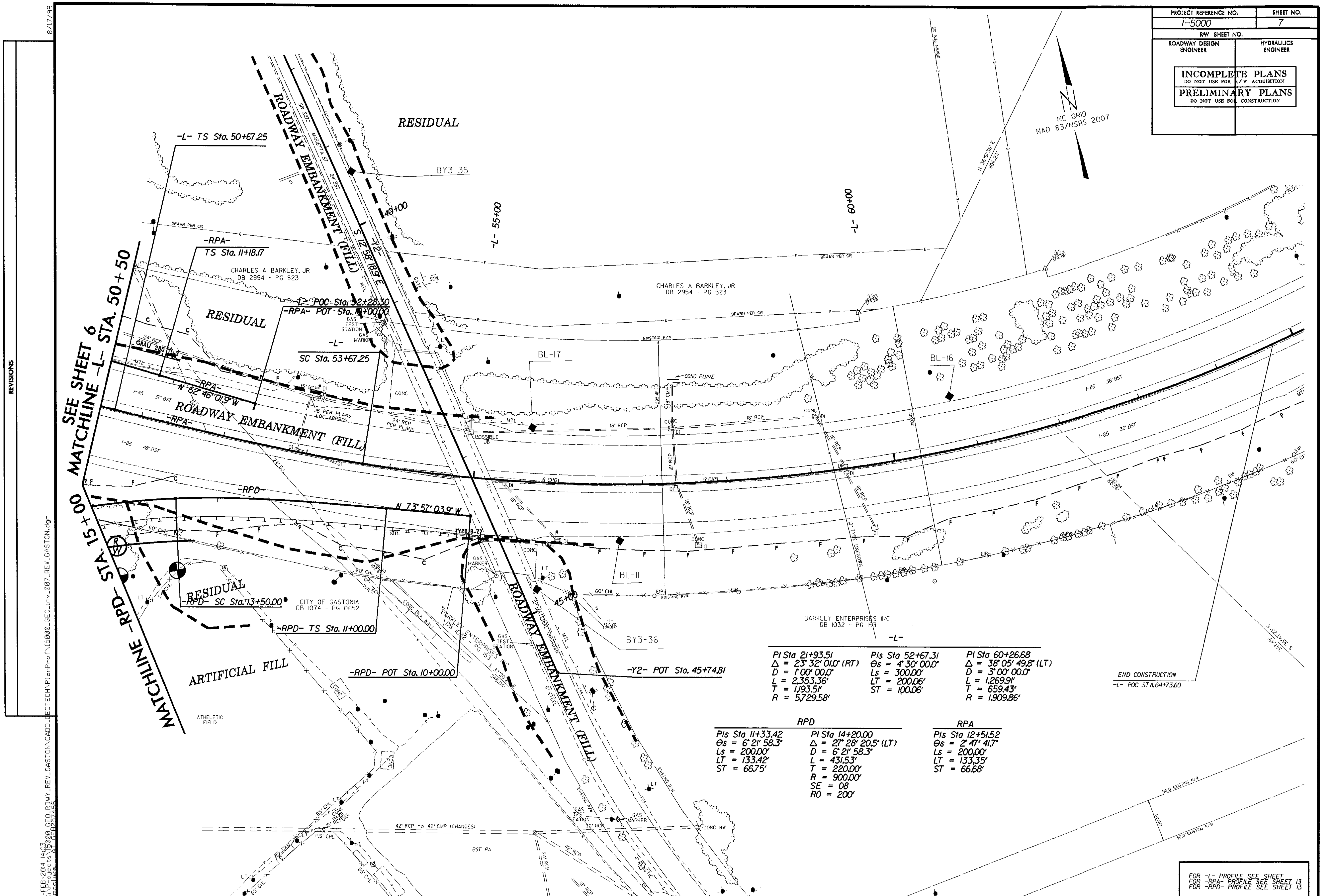
~~PAVEMENT REMOVAL~~

PROP. MONOLITHIC ISLAND

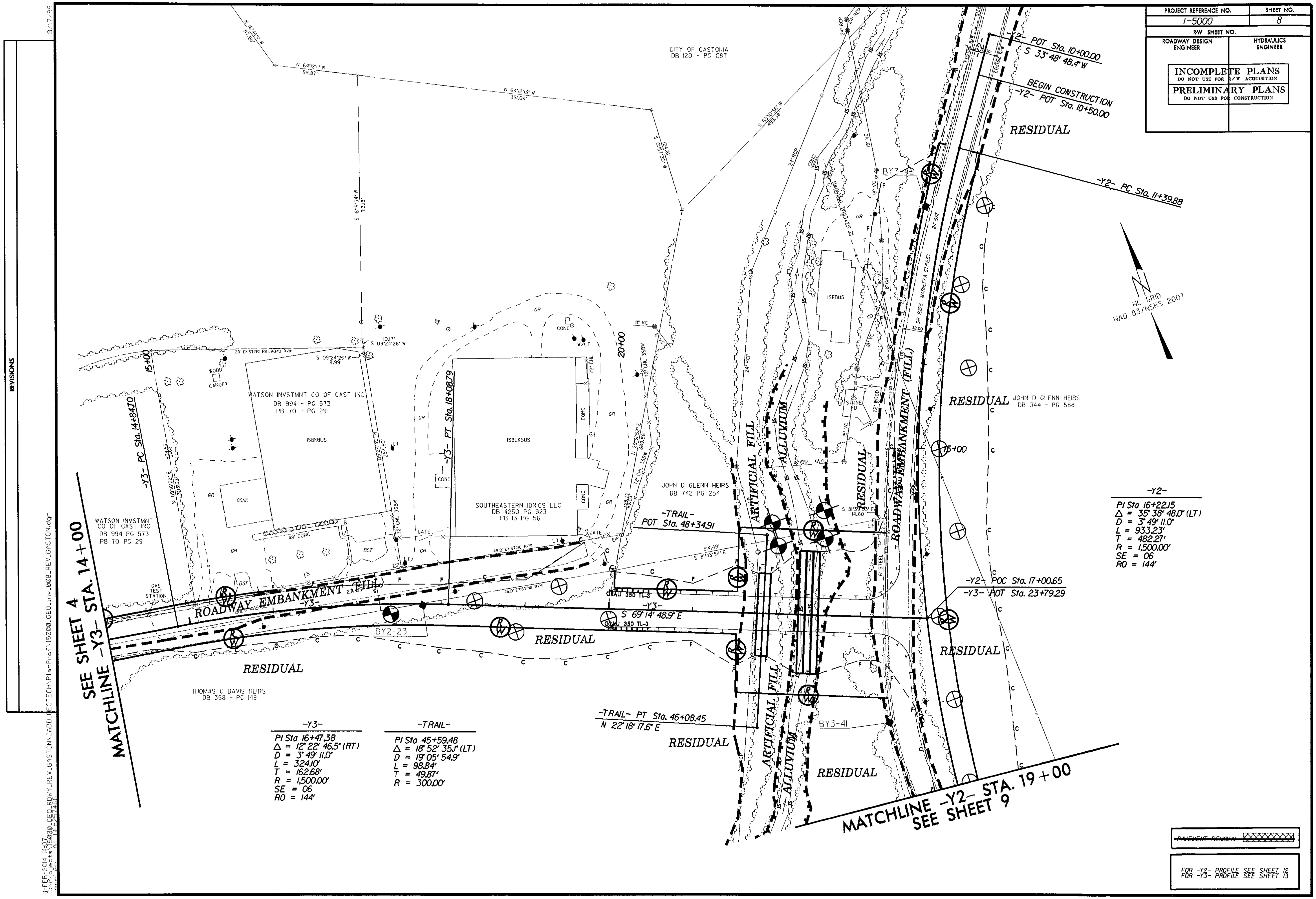
FOR -Y1- PROFILE SEE SHEETS 10 & 11
FOR -RPA- PROFILE SEE SHEET 13
FOR -RPD- PROFILE SEE SHEETS 14
FOR -RPDD- PROFILE SEE SHEET 15
FOR -TRAIL- PROFILE SEE SHEET 16

REVISIONS

8/17/99



PROJECT REFERENCE NO.
I-5000
SHEET NO.
7
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
NC GRID
NAD 83/NSRS 2007
REVISIONS
RESIDUAL
ROADWAY EMBANKMENT (FILL)
ARTIFICIAL FILL
SEE SHEET 6
MATCHLINE -L- STA. 50+50
MATCHLINE -RPD- STA. 15+00
-L- TS Sta. 50+67.25
-RPA- TS Sta. 11+18.17
-L- POC Sta. 52+28.30
-RPA- POT Sta. 10+00.00
-L- SC Sta. 53+67.25
-RPD- SC Sta. 13+50.00
-RPD- TS Sta. 11+00.00
-RPD- POT Sta. 10+00.00
-Y2- POT Sta. 45+74.81
N 62° 46' 01.9" W
N 73° 57' 03.9" W
S 12° 58' 18.9" E
BY3-35
BY3-36
BL-17
BL-16
BL-11
-L- 55+00
-L- 60+00
CHARLES A BARKLEY, JR
DB 2954 - PG 523
CITY OF GASTONIA
DB 1074 - PG 0652
BARKLEY ENTERPRISES INC
DB 1032 - PG 153
ATHELETIC FIELD
END CONSTRUCTION
-L- POC STA.64+73.60
-L-
PI Sta 21+93.51
Δ = 23° 32' 01.0" (RT)
D = 1° 00' 00.0"
L = 2,353.36'
T = 1,193.51'
R = 5,729.58'
PIs Sta 52+67.31
θs = 4° 30' 00.0"
Ls = 300.00'
LT = 200.06'
ST = 100.06'
PI Sta 60+26.68
Δ = 38° 05' 49.8" (LT)
D = 3° 00' 00.0"
L = 1,269.91'
T = 659.43'
R = 1,909.86'
RPD
PIs Sta 11+33.42
θs = 6° 21' 58.3"
Ls = 200.00'
LT = 133.42'
ST = 66.75'
PI Sta 14+20.00
Δ = 27° 28' 20.5" (LT)
D = 6° 21' 58.3"
L = 431.53'
T = 220.00'
R = 900.00'
SE = 08
RO = 200'
RPA
PIs Sta 12+51.52
θs = 2° 47' 41.7"
Ls = 200.00'
LT = 133.35'
ST = 66.68'
FOR -L- PROFILE SEE SHEET
FOR -RPA- PROFILE SEE SHEET 13
FOR -RPD- PROFILE SEE SHEET 13
8/17/99


PROJECT REFERENCE NO.
I-5000
SHEET NO.
8
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
-Y2- POT Sta. 10+00.00
S 33° 48' 48.4" W
BEGIN CONSTRUCTION
-Y2- POT Sta. 10+50.00
RESIDUAL
-Y2- PC Sta. 11+39.88
CITY OF GASTONIA
DB 120 - PG 087
NC GRID
NAD 83/NSRS 2007
BY3
ISFBUS
RESIDUAL
JOHN D GLENN HEIRS
DB 344 - PG 588
ROADWAY EMBANKMENT (FILL)
RESIDUAL
ALLUVIUM
ARTIFICIAL FILL
WATSON INVSTMNT CO OF GAST INC
DB 994 - PG 573
PB 70 - PG 29
SOUTHEASTERN IONICS LLC
DB 4250 PG 923
PB 13 PG 56
-Y3- PT Sta. 18+08.79
-Y3- PC Sta. 14+84.70
JOHN D GLENN HEIRS
DB 742 PG 254
-TRAIL-
POT Sta. 48+34.91
WATSON INVSTMNT
CO OF GAST INC
DB 994 PG 573
PB 70 PG 29
GAS TEST STATION
ROADWAY EMBANKMENT (FILL)
-Y3-
S 69° 14' 48.9" E
BY2-23
RESIDUAL
RESIDUAL
-Y2- POC Sta. 17+00.65
-Y3- POT Sta. 23+79.29
RESIDUAL
-Y2-
PI Sta 16+22.15
Δ = 35° 38' 48.0" (LT)
D = 3° 49' 11.0"
L = 933.23'
T = 482.27'
R = 1,500.00'
SE = .06
RO = 144'
SEE SHEET 4
MATCHLINE -Y3- STA. 14+00
THOMAS C DAVIS HEIRS
DB 358 - PG 148
-Y3-
PI Sta 16+47.38
Δ = 12° 22' 46.5" (RT)
D = 3° 49' 11.0"
L = 324.10'
T = 162.68'
R = 1,500.00'
SE = .06
RO = 144'
-TRAIL-
PI Sta 45+59.48
Δ = 18° 52' 35.1" (LT)
D = 19° 05' 54.9"
L = 98.84'
T = 49.87'
R = 300.00'
-TRAIL- PT Sta. 46+08.45
N 22° 18' 17.6" E
RESIDUAL
ARTIFICIAL FILL
ALLUVIUM
BY3-41
RESIDUAL
MATCHLINE -Y2- STA. 19+00
SEE SHEET 9
PAVEMENT REMOVAL
FOR -Y2- PROFILE SEE SHEET 12
FOR -Y3- PROFILE SEE SHEET 13
REVISIONS
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
I-5000	9
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

-Y2-

PI Sta 16+22.15
Δ = 35° 38' 48.0" (LT)
D = 3° 49' 11.0"
L = 933.23'
T = 482.27'
R = 1,500.00'
SE = .06
R = 144"

PI Sta 23+75.77
Δ = 39° 56' 12.8" (RT)
D = 6° 52' 41.7"
L = 580.63'
T = 302.67'
R = 833.00'
SE = .06
R = 144"

PI Sta 31+09.98
Δ = 51° 04' 32.1" (LT)
D = 6° 00' 00.0"
L = 851.26'
T = 456.25'
R = 954.93'
SE = EX.

NC GRID
NAD 83/ANSRS 2007

MATCHLINE -Y2- STA. 19+00
SEE SHEET 8

-Y2- PRC Sta. 20+73.11

12" TYPE UNKNOWN

JOHN D GLENN HEIRS
DB 344 - PG 588

BY3-40

RESIDUAL

ROADWAY EMBANKMENT (FILL)

GRAU-350 TL-8

RESIDUAL

CHARLES A BARKLEY, JR
DB 2954 PG 523

THOMAS C DAVIS HEIRS
DB 358 PG 148

RESIDUAL

ALLUVIUM

24" RCP

RESIDUAL

BY3-39

SR 2278

MARIETTA STREET

24" BST

GAS TEST STATION

END CONSTRUCT RDWY -Y2- PRC Sta. 26+45.73

ALLUVIUM

RESIDUAL

CHARLES
DB 2

THOMAS C DAVIS HEIRS
DB 358 PG 148

RESIDUAL

ALLUVIUM

~~PAVEMENT REMOVAL~~

FOR -Y2- PROFILE SEE SHEETS 11 & 12

REVISIONS

8/17/99

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5/28/99

PROJECT REFERENCE NO.	SHEET NO.
1-5000	10

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-Y1-

-Y1- STA 11+00
BEGIN MILLING & RESURFACING

EXISTING US 321 SOUTH CHESTER STREET

750
740
730
720
710

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

SEE SHEET 4 FOR PLANS

-Y1-

EXISTING US 321 SOUTH CHESTER STREET

750
740
730
720
710

24+00 25+00 26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00

SEE SHEETS 4,5 & 6 FOR PLANS

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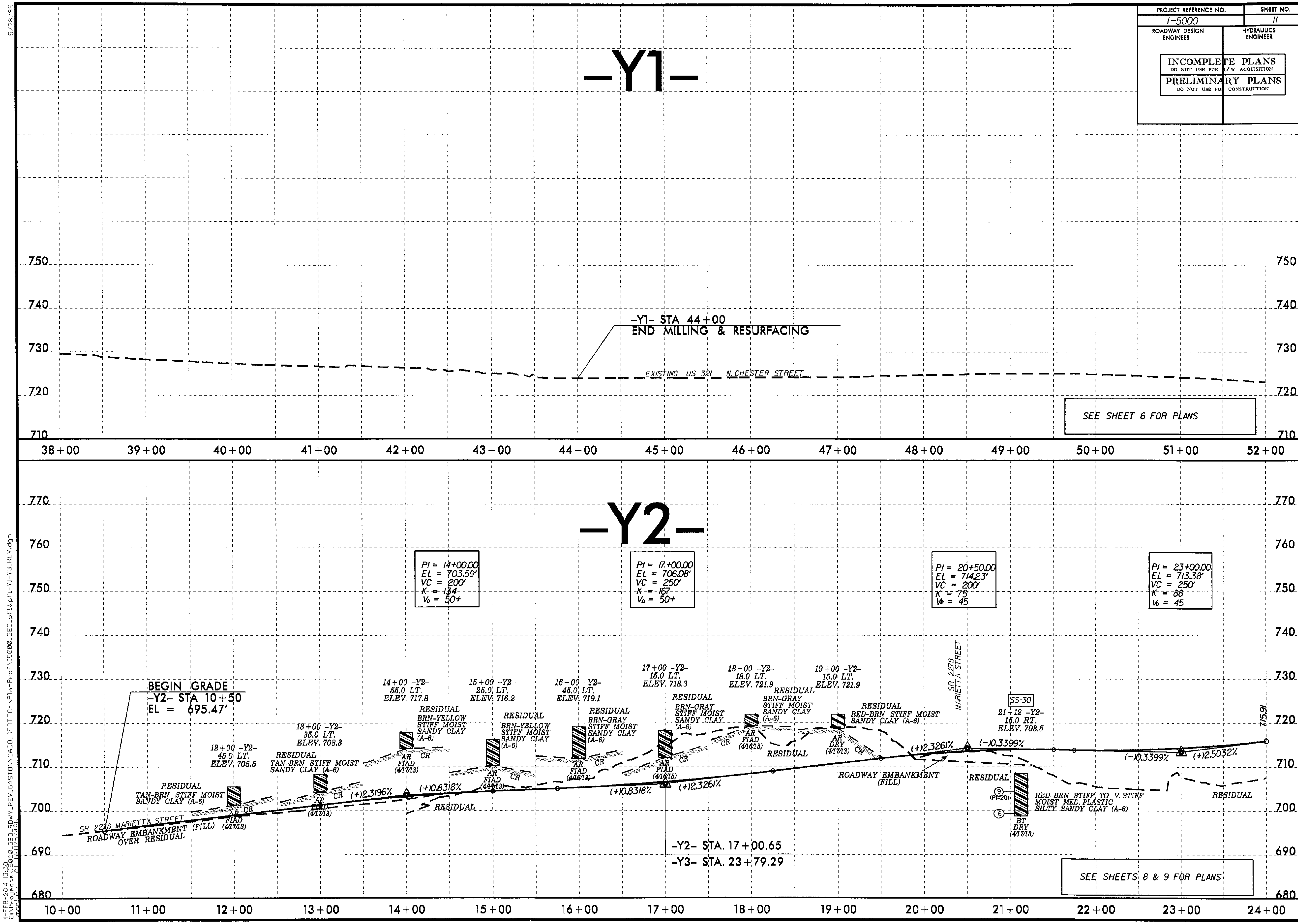
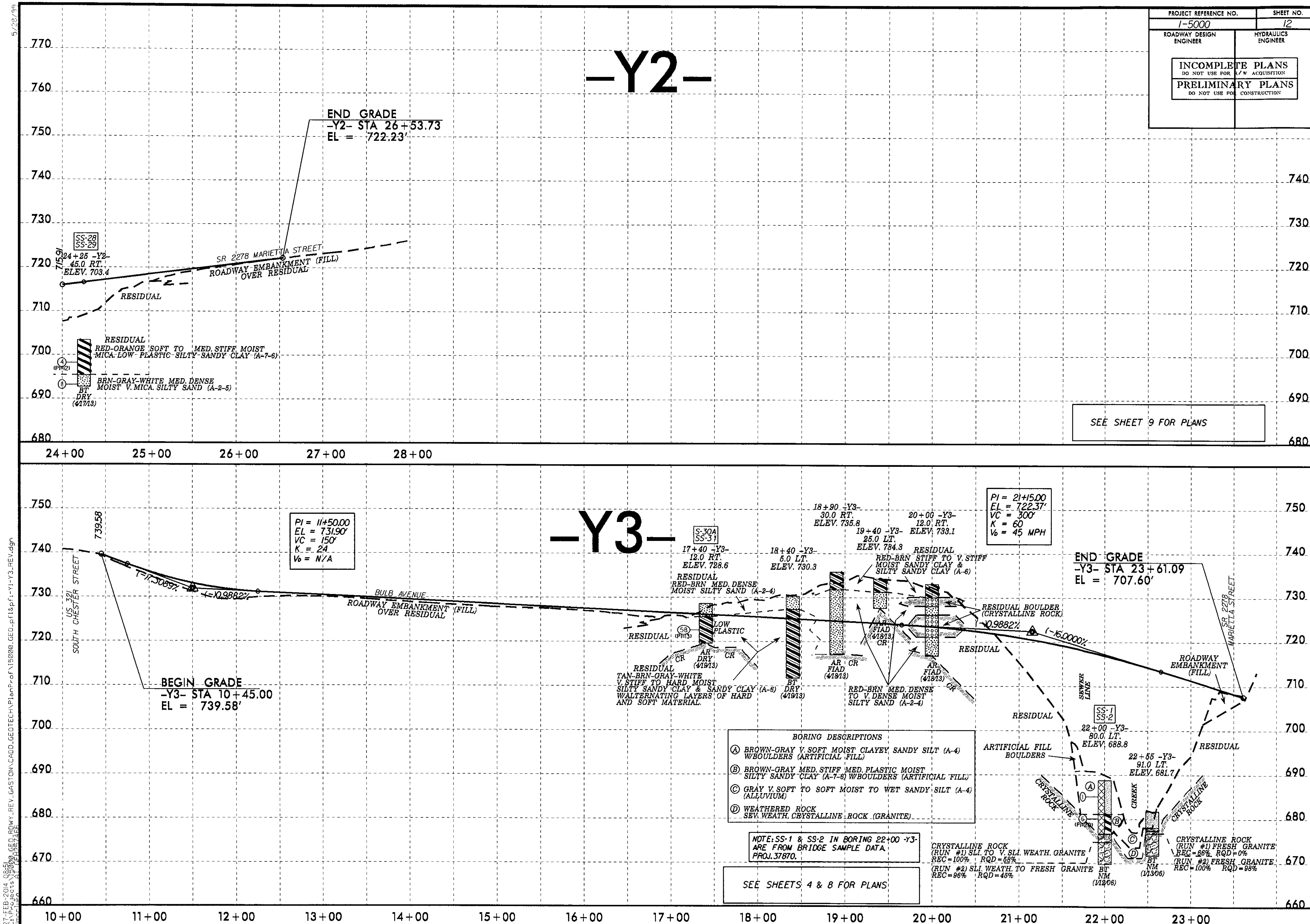


PROJECT REFERENCE NO. I-5000
SHEET NO. 11
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
-Y1-
-Y1- STA 44+00
END MILLING & RESURFACING
EXISTING US 321 N. CHESTER STREET
SEE SHEET 6 FOR PLANS
38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00
-Y2-
PI = 14+00.00 EL = 703.59' VC = 200' K = 134 V = 50+
PI = 17+00.00 EL = 706.08' VC = 250' K = 167 V = 50+
PI = 20+50.00 EL = 714.23' VC = 200' K = 75 V = 45
PI = 23+00.00 EL = 713.38' VC = 250' K = 88 V = 45
BEGIN GRADE
-Y2- STA 10+50
EL = 695.47'
SR 2278 MARIETTA STREET
ROADWAY EMBANKMENT (FILL) OVER RESIDUAL
(+)2.3196%
(+)0.8318%
(+)2.3261%
(-)0.3399%
(+)2.5032%
-Y2- STA. 17+00.65
-Y3- STA. 23+79.29
ROADWAY EMBANKMENT (FILL)
SR 2278 MARIETTA STREET
SS-30
21+12 -Y2- 15.0 RT. ELEV. 708.5
RED-BRN STIFF TO V. STIFF MOIST MED. PLASTIC SILTY SANDY CLAY (A-6)
RESIDUAL
715.91
SEE SHEETS 8 & 9 FOR PLANS
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



PROJECT REFERENCE NO. I-5000
SHEET NO. 12
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
-Y2-
END GRADE -Y2- STA 26+53.73 EL = 722.23'
SS-28 SS-29
24+25 -Y2- 45.0 RT. ELEV. 703.4
715.91
SR 2278 MARIETTA STREET
ROADWAY EMBANKMENT (FILL) OVER RESIDUAL
RESIDUAL
RESIDUAL RED-ORANGE SOFT TO MED. STIFF MOIST MICA. LOW PLASTIC SILTY-SANDY CLAY (A-7-6)
BRN-GRAY-WHITE MED. DENSE MOIST V. MICA. SILTY SAND (A-2-5)
BT DRY (4/17/13)
SEE SHEET 9 FOR PLANS
24+00 25+00 26+00 27+00 28+00
-Y3-
PI = 11+50.00 EL = 731.90' VC = 150' K = 24 V₀ = N/A
739.58
US 321 SOUTH CHESTER STREET
BULB AVENUE
ROADWAY EMBANKMENT (FILL) OVER RESIDUAL
BEGIN GRADE -Y3- STA 10+45.00 EL = 739.58'
S-30A SS-31
17+40 -Y3- 12.0 RT. ELEV. 728.6
18+40 -Y3- 5.0 LT. ELEV. 730.3
18+90 -Y3- 30.0 RT. ELEV. 735.8
19+40 -Y3- 25.0 LT. ELEV. 734.3
20+00 -Y3- 12.0 RT. ELEV. 733.1
PI = 21+15.00 EL = 722.37' VC = 300' K = 60 V₀ = 45 MPH
RESIDUAL RED-BRN MED. DENSE MOIST SILTY SAND (A-2-4)
RESIDUAL BRN STIFF TO V. STIFF MOIST SANDY CLAY & SILTY SANDY CLAY (A-6)
LOW PLASTIC
RESIDUAL BOULDER (CRYSTALLINE ROCK)
RESIDUAL TAN-BRN-GRAY-WHITE V. STIFF TO HARD MOIST SILTY SANDY CLAY & SANDY CLAY (A-6) W/ALTERNATING LAYERS OF HARD AND SOFT MATERIAL
RED-BRN MED. DENSE TO V. DENSE MOIST SILTY SAND (A-2-4)
AR DRY (4/19/13)
BT DRY (4/19/13)
AR FIAD (4/18/13)
CR
END GRADE -Y3- STA 23+61.09 EL = 707.60'
SR 2278 MARIETTA STREET
ROADWAY EMBANKMENT (FILL)
RESIDUAL
SEWER LINE
SS-1 SS-2
22+00 -Y3- 80.0 LT. ELEV. 688.8
22+55 -Y3- 91.0 LT. ELEV. 681.7
ARTIFICIAL FILL BOULDERS
CRYSTALLINE ROCK
CREEK
BORING DESCRIPTIONS
(A) BROWN-GRAY V. SOFT MOIST CLAYEY SANDY SILT (A-4) W/BOULDERS (ARTIFICIAL FILL)
(B) BROWN-GRAY MED. STIFF MED. PLASTIC MOIST SILTY SANDY CLAY (A-7-6) W/BOULDERS (ARTIFICIAL FILL)
(C) GRAY V. SOFT TO SOFT MOIST TO WET SANDY SILT (A-4) (ALLUVIUM)
(D) WEATHERED ROCK SEV. WEATH. CRYSTALLINE ROCK (GRANITE)
NOTE: SS-1 & SS-2 IN BORING 22+00 -Y3- ARE FROM BRIDGE SAMPLE DATA PROJ. 37870.
CRYSTALLINE ROCK (RUN #1) SLI. TO V. SLI. WEATH. GRANITE REC=100% RQD=88% (RUN #2) SLI. WEATH. TO FRESH GRANITE REC=96% RQD=45%
CRYSTALLINE ROCK (RUN #1) FRESH GRANITE REC=66% RQD=0% (RUN #2) FRESH GRANITE REC=100% RQD=98%
BT NM (1/12/06)
BT NM (1/13/06)
SEE SHEETS 4 & 8 FOR PLANS
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

5/28/99

PROJECT REFERENCE NO.	SHEET NO.
I-5000	13

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-RPA-

PI = 11+00.00
EL = 730.52'
VC = 200'
K = 164
V_D = 50+ MPH

PI = 16+00.00
EL = 740.52'
VC = 350'
K = 41
V_D = 35 MPH

PI = 19+65.00
EL = 717.03'
VC = 300'
K = 32
V_D = 25 MPH

CULVERT HYDRAULIC DATA
EXISTING 3 @ 8'x9' RCBC

DRAINAGE AREA	=	1/2 SQ.MI.
DESIGN FREQUENCY	=	50 YRS
DESIGN DISCHARGE	=	1100 CFS
DESIGN HW ELEVATION	=	XX FT
100 YEAR DISCHARGE	=	1300 CFS
100 YEAR HW ELEVATION	=	708.1 FT
OVERTOPPING FREQUENCY	=	XX YRS
OVERTOPPING DISCHARGE	=	XX CFS
OVERTOPPING ELEVATION	=	XX FT

(+)0.7800% (+)2.0000% (+)2.0000% (-)16.4351% (-)16.4351% (+)2.8177%

I-85 ROADWAY EMBANKMENT (FILL)

ROADWAY EMBANKMENT (FILL)

ROADWAY EMBANKMENT (FILL)

RAILROAD EMBANKMENT (FILL)

BEGIN GRADE
-RPA- STA 10+00
EL = 729.74'

END GRADE
-RPA- STA 23+50
EL = 727.88'

14+32 -RPA-
68.0 RT.
ELEV. 716.3

15+00 -RPA-
90.0 RT.
ELEV. 714.5

15+50 -RPA-
66.0 RT.
ELEV. 714.4

17+55 -RPA-
55.0 RT.
ELEV. 697.8

19+75 -RPA-
50.0 RT.
ELEV. 697.4

22+75 -RPA-
66.0 LT.

28+95 -RPD-
50.0 LT.
ELEV. 726.3

SS-12 SS-13 SS-14

SS-15 SS-16 SS-17

SS-26 SS-27

SS-32

ARTIFICIAL FILL
BRN-TAN LOOSE TO V. LOOSE DRY TO MOIST CLAYEY F. SAND (A-2-6) W/LITTLE TRASH (BRICKS, FABRIC & PLASTIC) & TRACE OF WOOD FRAGS.

ARTIFICIAL FILL
BRN SOFT DRY F. SANDY SILT (A-4) W/LITTLE GLASS & TRACE OF GRAVEL & TRACE OF MICA

ARTIFICIAL FILL
RED-ORANGE-GRAY SOFT TO MED. STIFF MOIST LOW PLASTIC SILTY SANDY CLAY (A-6) W/ROCK IN FILL 8.5 - 9'

RESIDUAL
GRAY-WHITE SOFT TO MED. STIFF MOIST F. SANDY SILT (A-4) W/TRACE OF MICA

ORANGE-TAN MED. STIFF MOIST F. SANDY CLAY (A-6)

RESIDUAL
TAN SOFT MOIST TO WET F. SANDY SILT (A-4) W/TRACE OF MICA

ALLUVIUM
GRAY SOFT MOIST V. MICA. CLAYEY SANDY SILT (A-4)

ALLUVIUM
GRAY SOFT MOIST CLAYEY SANDY SILT (A-4)

BRN-GRAY TO GRAY-TAN-YELLOW V. LOOSE SAT. FINE & COARSE SAND (A-3) WITH GRAVEL

RESIDUAL
GRAY-BRN LOOSE MOIST V. MICA. SILTY SAND (A-2-5)

RESIDUAL
BRN-WHITE LOOSE MOIST TO WET SILTY SAND (A-2-5)

RED-ORANGE MED. DENSE MOIST SILTY SAND (A-2-5)

DISMANTLED RAILROAD (GREENWAY)

AR CRYSTALLINE FIAD ROCK (4/22/13)

BORING DESCRIPTIONS
- (A) RED-BRN-BLACK SOFT MOIST CLAYEY SANDY SILT (A-4) W/TRASH (METAL, WOOD) (ARTIFICIAL FILL)
- (B) RED-ORANGE MED. STIFF TO STIFF MOIST MED. PLASTIC SILTY SANDY CLAY (A-7-6) (ARTIFICIAL FILL)
- (C) GRAY STIFF MOIST LOW PLASTIC SILTY SANDY CLAY (A-6) (ALLUVIUM)
- (D) GRAY-BRN LOOSE MOIST V. MICA. SILTY SAND (A-2-5) (RESIDUAL)

SEE SHEETS 5,6 & 7 FOR PLANS

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

-RPD-

PI = 11+08.51
K = 131
VC = 180'
EL = 731.54'
V_D = 45 MPH

PI = 13+75.00
EL = 732.34'
VC = 350'
K = 60
V_D = 40 MPH

PI = 18+40.00
EL = 706.58'
VC = 300'
K = 43
V_D = 30 MPH

CULVERT HYDRAULIC DATA
3 @ 8'x10' RCBC (BURIED 1')

DRAINAGE AREA	=	1/2 SQ.MI.
DESIGN FREQUENCY	=	50 YRS
DESIGN DISCHARGE	=	1100 CFS
DESIGN HW ELEVATION	=	XX FT
100 YEAR DISCHARGE	=	1300 CFS
100 YEAR HW ELEVATION	=	708.1 FT
OVERTOPPING FREQUENCY	=	XX YRS
OVERTOPPING DISCHARGE	=	XX CFS
OVERTOPPING ELEVATION	=	XX FT

(+)11.07.03% (+)0.3000% (+)0.3000% (-)15.5394% (-)15.5394% (+)11.3576%

I-85 ROADWAY EMBANKMENT (FILL)

RAILROAD EMBANKMENT (FILL)

13+52 -RPD-
84.0 LT.
ELEV. 723.2

14+27 -RPD-
86.0 LT.
ELEV. 721.9

15+00 -RPD-
CL
ELEV. 718.6

15+86 -RPD-
51.0 LT.
ELEV. 717.3

17+02 -RPD-
46.0 LT.
ELEV. 713.6

17+80 -RPD-
114.0 LT.
ELEV. 706.5

18+65 -RPD-
94.0 LT.
ELEV. 700.7

21+00 -RPD-
6.0 LT.
ELEV. 707.6

SS-1 SS-2 SS-3

SS-4 SS-5 SS-6 SS-7

SS-18 SS-19

SS-23 SS-24 SS-25

ARTIFICIAL FILL

RESIDUAL
ORANGE-RED STIFF DRY F. SANDY SILT (A-4) W/TRACE OF MICA

RESIDUAL

ARTIFICIAL FILL
RED-TAN-YELLOW STIFF TO V. STIFF MOIST HIGH PLASTIC SILTY SANDY CLAY (A-7-6)

ALLUVIUM
GRAY-BRN MED. DENSE MOIST V. MICA. LOW PLASTIC CLAYEY SAND (A-2-7)

ALLUVIUM
BRN SOFT MOIST CLAYEY SANDY SILT (A-4)

ALLUVIUM
GRAY-WHITE & TAN-YELLOW V. LOOSE MOIST TO WET V. MICA. SILTY SAND (A-2-5)

RESIDUAL
TAN LOOSE MOIST TO WET MICA. SILTY SAND (A-2-5)

RESIDUAL
BRN-TAN LOOSE MOIST TO WET V. MICA. SILTY SAND (A-2-5)

WHITE-GRAY LOOSE TO V. LOOSE MOIST MICA. SILTY SAND (A-2-4)

GRAY-WHITE V. LOOSE TO TO LOOSE MOIST TO WET SILTY F. & SILTY SAND (A-2-4)

WEATHERED ROCK SEV. WEATHERED CRYSTALLINE ROCK

DISMANTLED RAILROAD (GREENWAY)

RAILROAD EMBANKMENT (FILL)

BORING DESCRIPTIONS
- (A) BRN-GRAY STIFF MOIST CLAYEY SANDY SILT (A-4) (ARTIFICIAL FILL)
- (B) BRN LOOSE TO MED. DENSE MOIST SILTY SAND (A-2-5) WITH PIECES OF RUBBER AND PLASTIC AT 9' (ARTIFICIAL FILL)
- (C) BRN LOOSE TO MED. DENSE MOIST MICA. SILTY SAND (A-2-4) (RESIDUAL)
- (D) BRN & BRN-GRAY LOOSE TO V. LOOSE MOIST CLAYEY FINE SAND (A-2-6) WITH TRACE FRAGMENTS OF WOOD AND GLASS (ARTIFICIAL FILL)
- (E) BRN-GRAY MEDIUM STIFF MOIST SANDY SILT (A-4) WITH TRACES OF MICA AND WOOD FRAGMENTS (ARTIFICIAL FILL)
- (F) GRAY-WHITE MED. STIFF MOIST MICA. SANDY SILT (A-4) (RESIDUAL)
- (G) GRAY V. LOOSE TO LOOSE WET CLAYEY F. SAND (A-2-6) (ALLUVIUM)
- (H) GRAY LOOSE WET SILTY F. SAND (A-2-4) (ALLUVIUM)
- (I) BRN-GRAY TO DARK GRAY LOOSE TO V. LOOSE MOIST TO WET SILTY SAND (A-2-4) (ALLUVIUM)
- (J) GRAY STIFF SAT. MED. PLASTIC SANDY CLAY (A-7-6) WITH GRAVEL (ALLUVIUM)
- (K) TAN-YELLOW MOIST MED. DENSE MICA. SILTY CLAYEY SAND (A-2-4) (RESIDUAL)

SEE SHEETS 6 & 7 FOR PLANS

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

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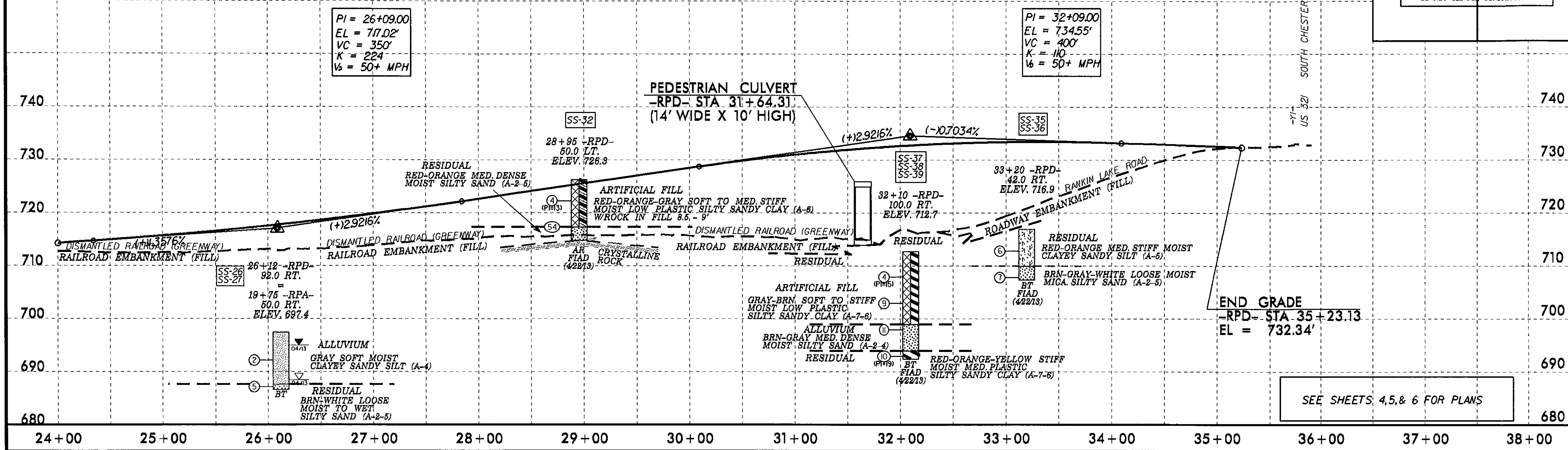
PROJECT REFERENCE NO.	SHEET NO.
I-5000	14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

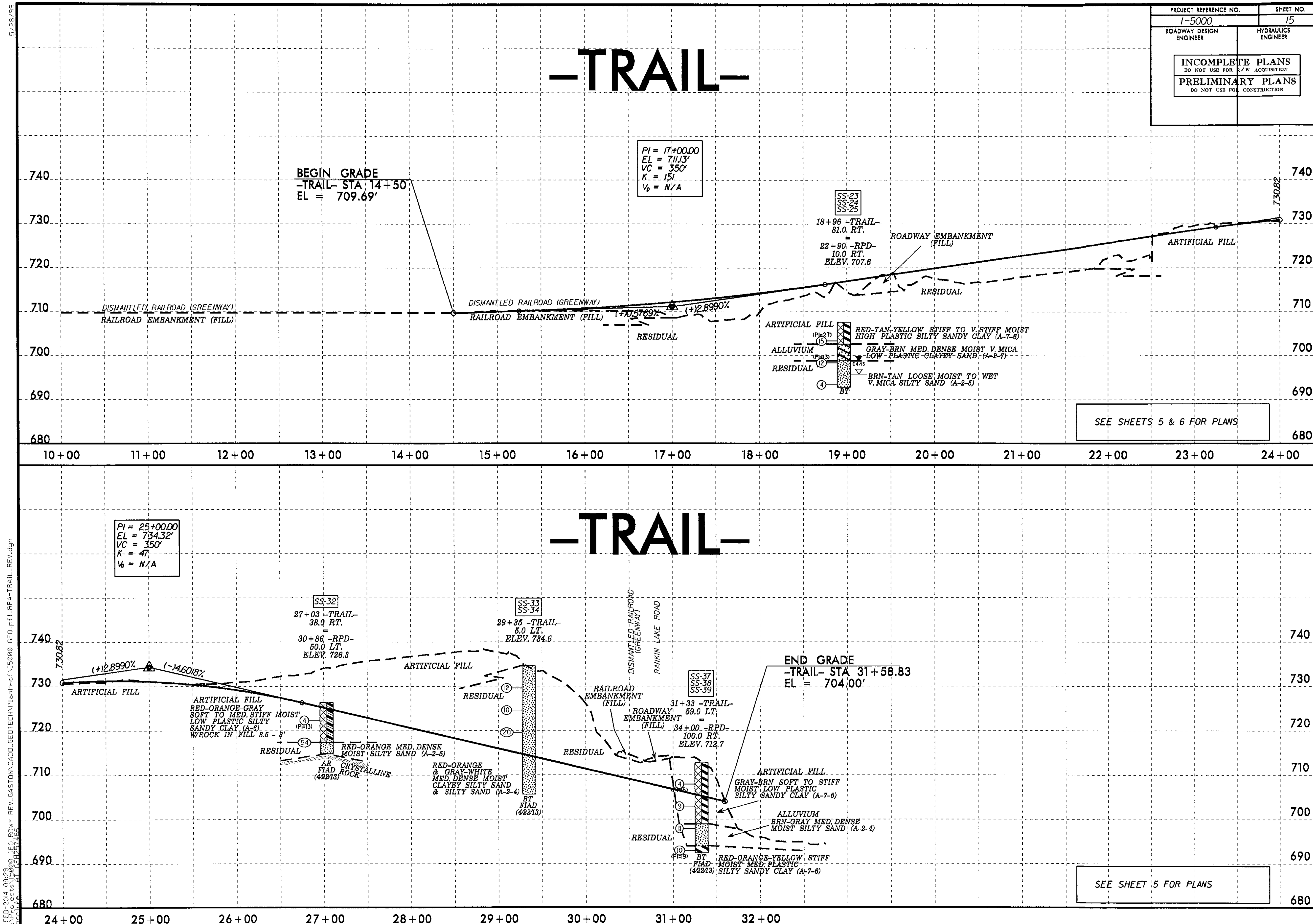
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

-RPD-



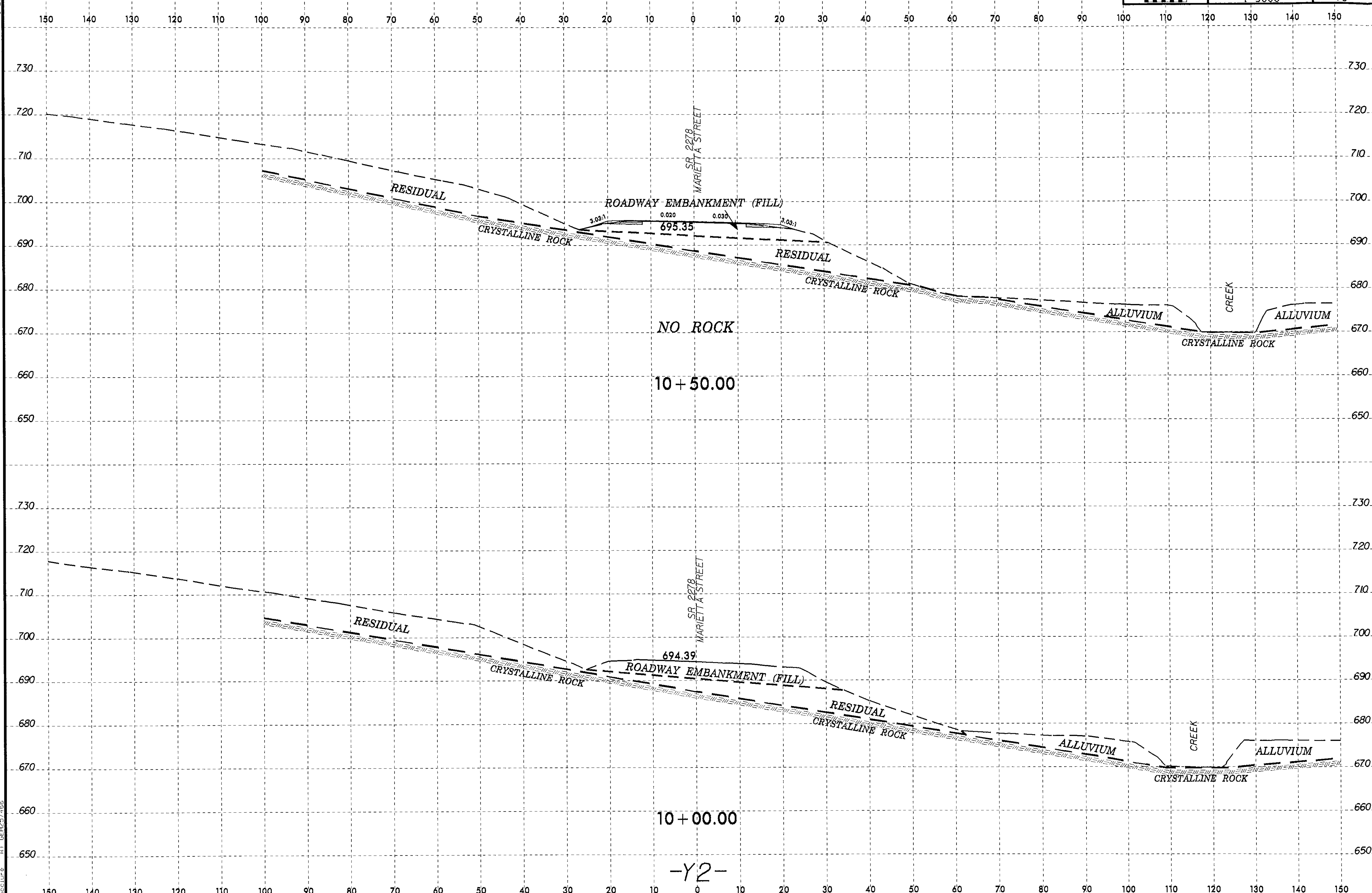
PI = 26+09.00
EL = 717.02'
VC = 350'
K = 224
V = 50+ MPH
PI = 32+09.00
EL = 734.55'
VC = 400'
K = 110
V = 50+ MPH
PEDESTRIAN CULVERT
-RPD- STA 31+64.31
(14' WIDE X 10' HIGH)
SOUTH CHESTER STREET
-Y1- US 321
SS-32
28+95 -RPD-
50.0 LT.
ELEV. 726.3
RESIDUAL
RED-ORANGE MED. DENSE MOIST SILTY SAND (A-2-5)
ARTIFICIAL FILL
RED-ORANGE-GRAY SOFT TO MED. STIFF MOIST LOW PLASTIC SILTY SANDY CLAY (A-6) W/ROCK IN FILL 8.5 - 9'
AR
FIAD
(4/22/13)
CRYSTALLINE ROCK
(+)2.9216%
(-)0.7034%
(+)1.3576%
SS-35
SS-36
SS-37
SS-38
SS-39
32+10 -RPD-
100.0 RT.
ELEV. 712.7
33+20 -RPD-
42.0 RT.
ELEV. 716.9
RANKIN LAKE ROAD
ROADWAY EMBANKMENT (FILL)
DISMANTLED RAILROAD (GREENWAY)
RAILROAD EMBANKMENT (FILL)
RESIDUAL
RED-ORANGE MED. STIFF MOIST CLAYEY SANDY SILT (A-6)
BRN-GRAY-WHITE LOOSE MOIST MICA. SILTY SAND (A-2-5)
BT
FIAD
(4/22/13)
SS-26
SS-27
26+12 -RPD-
92.0 RT.
=
19+75 -RPA-
50.0 RT.
ELEV. 697.4
ALLUVIUM
GRAY SOFT MOIST CLAYEY SANDY SILT (A-4)
RESIDUAL
BRN-WHITE LOOSE MOIST TO WET SILTY SAND (A-2-5)
BT
ARTIFICIAL FILL
GRAY-BRN. SOFT TO STIFF MOIST LOW PLASTIC SILTY SANDY CLAY (A-7-6)
ALLUVIUM
BRN-GRAY MED. DENSE MOIST SILTY SAND (A-2-4)
RESIDUAL
RED-ORANGE-YELLOW STIFF MOIST MED. PLASTIC SILTY SANDY CLAY (A-7-6)
BT
FIAD
(4/22/13)
END GRADE
-RPD- STA 35+23.13
EL = 732.34'
SEE SHEETS 4,5,& 6 FOR PLANS
740
730
720
710
700
690
680
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00
33+00
34+00
35+00
36+00
37+00
38+00

-LPB-



PROJECT REFERENCE NO.
SHEET NO.
I-5000
15
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
-TRAIL-
BEGIN GRADE
-TRAIL- STA 14+50
EL = 709.69'
PI = 17+00.00
EL = 711.13'
VC = 350'
K = 151
V_D = N/A
SS-23
SS-24
SS-25
18+96 -TRAIL-
81.0 RT.
=
22+90 -RPD-
10.0 RT.
ELEV. 707.6
ROADWAY EMBANKMENT (FILL)
ARTIFICIAL FILL
RESIDUAL
DISMANTLED RAILROAD (GREENWAY)
RAILROAD EMBANKMENT (FILL)
(+)0.5769%
(+)2.8990%
730.82
ALLUVIUM
RED-TAN-YELLOW STIFF TO V. STIFF MOIST HIGH PLASTIC SILTY SANDY CLAY (A-7-6)
GRAY-BRN MED. DENSE MOIST V. MICA. LOW PLASTIC CLAYEY SAND (A-2-7)
BRN-TAN LOOSE MOIST TO WET V. MICA. SILTY SAND (A-2-5)
BT
SEE SHEETS 5 & 6 FOR PLANS
740
730
720
710
700
690
680
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
-TRAIL-
PI = 25+00.00
EL = 734.32'
VC = 350'
K = 47
V_D = N/A
SS-32
27+03 -TRAIL-
38.0 RT.
=
30+86 -RPD-
60.0 LT.
ELEV. 726.3
SS-33
SS-34
29+36 -TRAIL-
5.0 LT.
ELEV. 734.6
DISMANTLED RAILROAD (GREENWAY)
RANKIN LAKE ROAD
SS-37
SS-38
SS-39
31+33 -TRAIL-
59.0 LT.
=
34+00 -RPD-
100.0 RT.
ELEV. 712.7
END GRADE
-TRAIL- STA 31+58.83
EL = 704.00'
730.82
(+)2.8990%
(-)4.6018%
ARTIFICIAL FILL
RED-ORANGE-GRAY SOFT TO MED. STIFF MOIST LOW PLASTIC SILTY SANDY CLAY (A-6) W/ROCK IN FILL 8.5 - 9'
RESIDUAL
AR
FIAD
(4/22/13)
CRYSTALLINE ROCK
RED-ORANGE MED. DENSE MOIST SILTY SAND (A-2-5)
RED-ORANGE & GRAY-WHITE MED. DENSE MOIST CLAYEY SILTY SAND & SILTY SAND (A-2-4)
BT
FIAD
(4/22/13)
RAILROAD EMBANKMENT (FILL)
ROADWAY EMBANKMENT (FILL)
GRAY-BRN SOFT TO STIFF MOIST LOW PLASTIC SILTY SANDY CLAY (A-7-6)
ALLUVIUM
BRN-GRAY MED. DENSE MOIST SILTY SAND (A-2-4)
RED-ORANGE-YELLOW STIFF MOIST MED. PLASTIC SILTY SANDY CLAY (A-7-6)
SEE SHEET 5 FOR PLANS
24+00
25+00
26+00
27+00
28+00
29+00
30+00
31+00
32+00

PROJ. REFERENCE NO.	SHEET NO.
I-5000	16



8/23/99

25-FEB-2014 11:39
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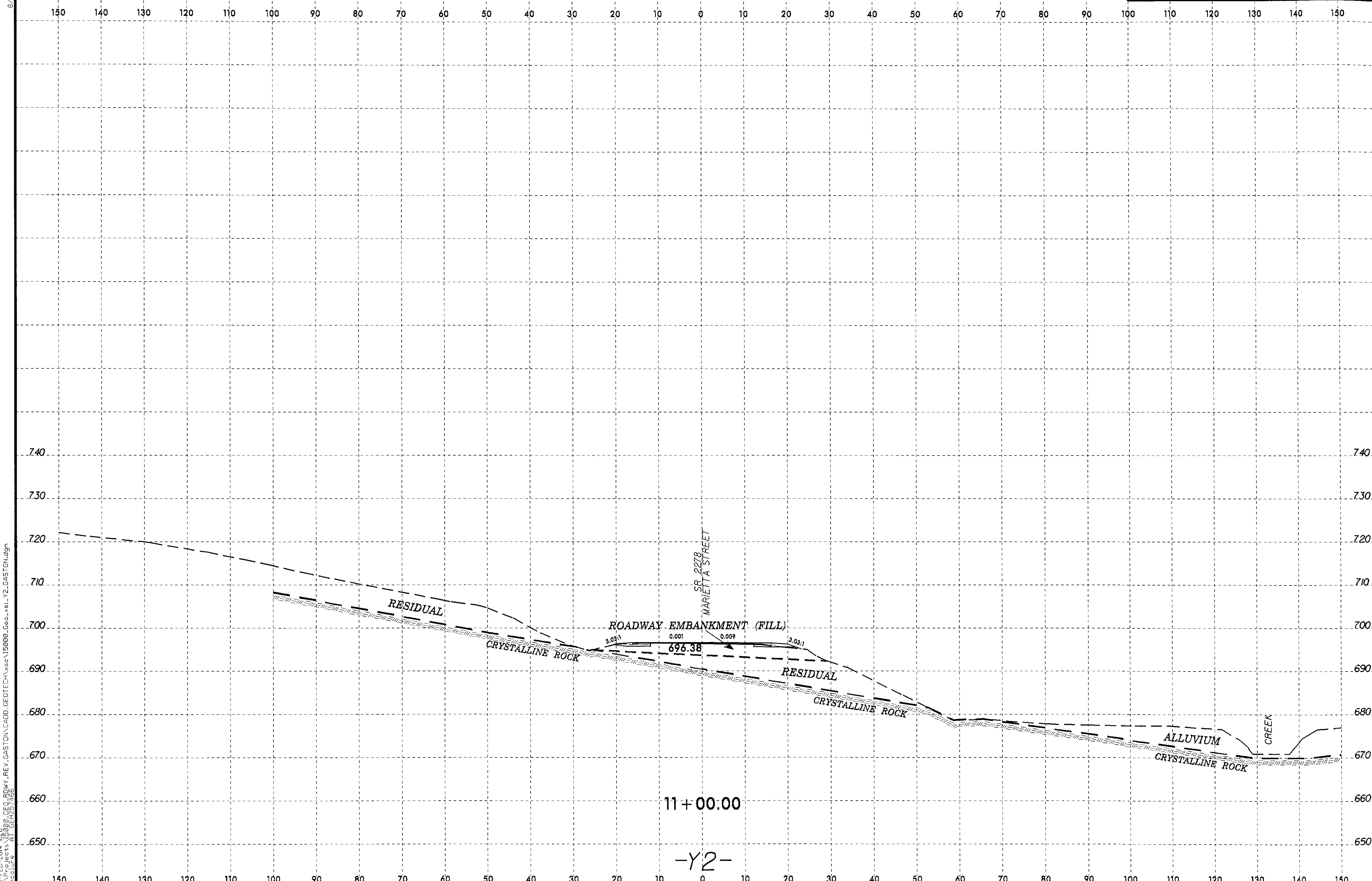
lmcclure AT GEH257466

PROJ. REFERENCE NO.	SHEET NO.
I-5000	17



8/23/99

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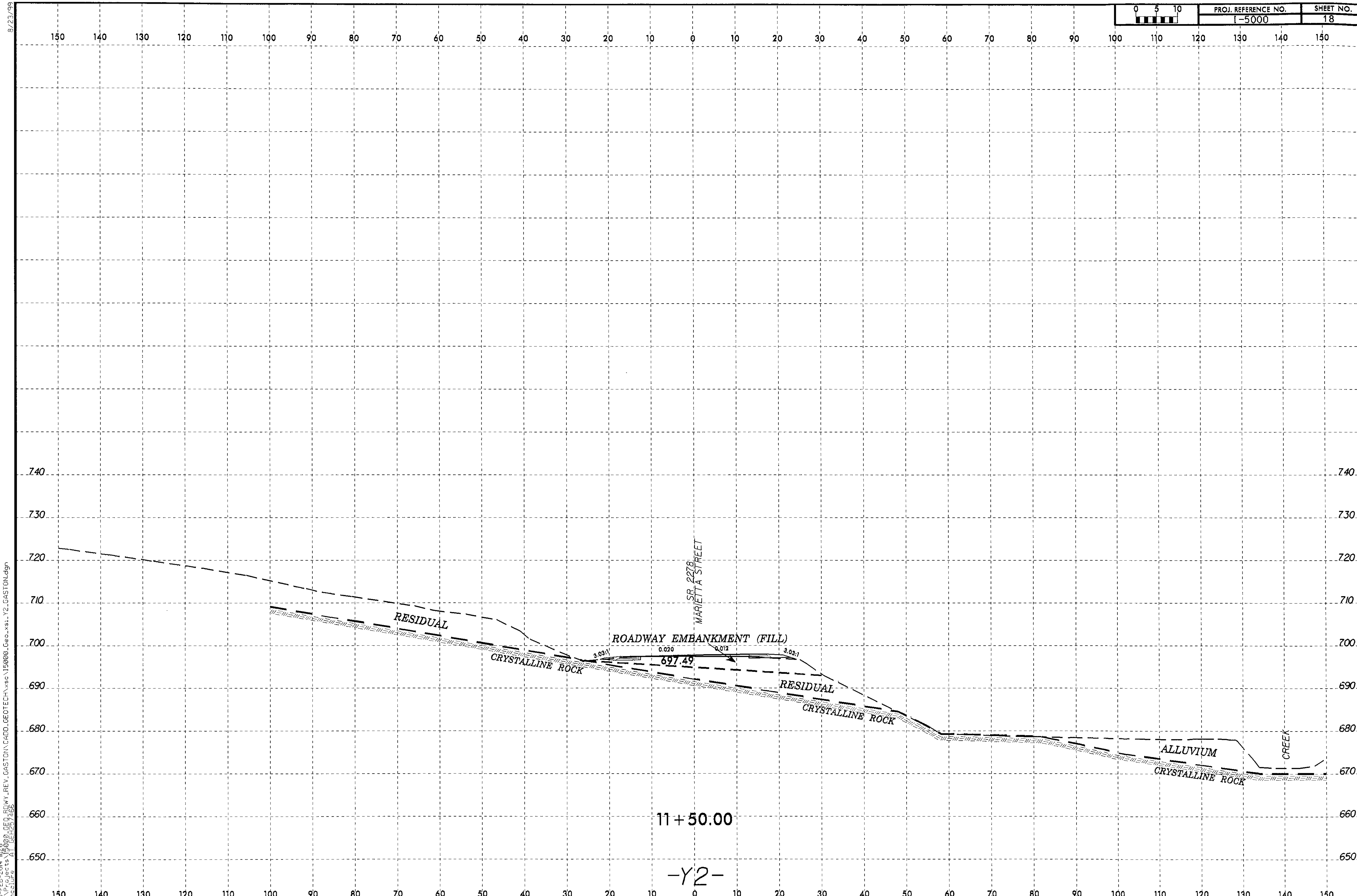
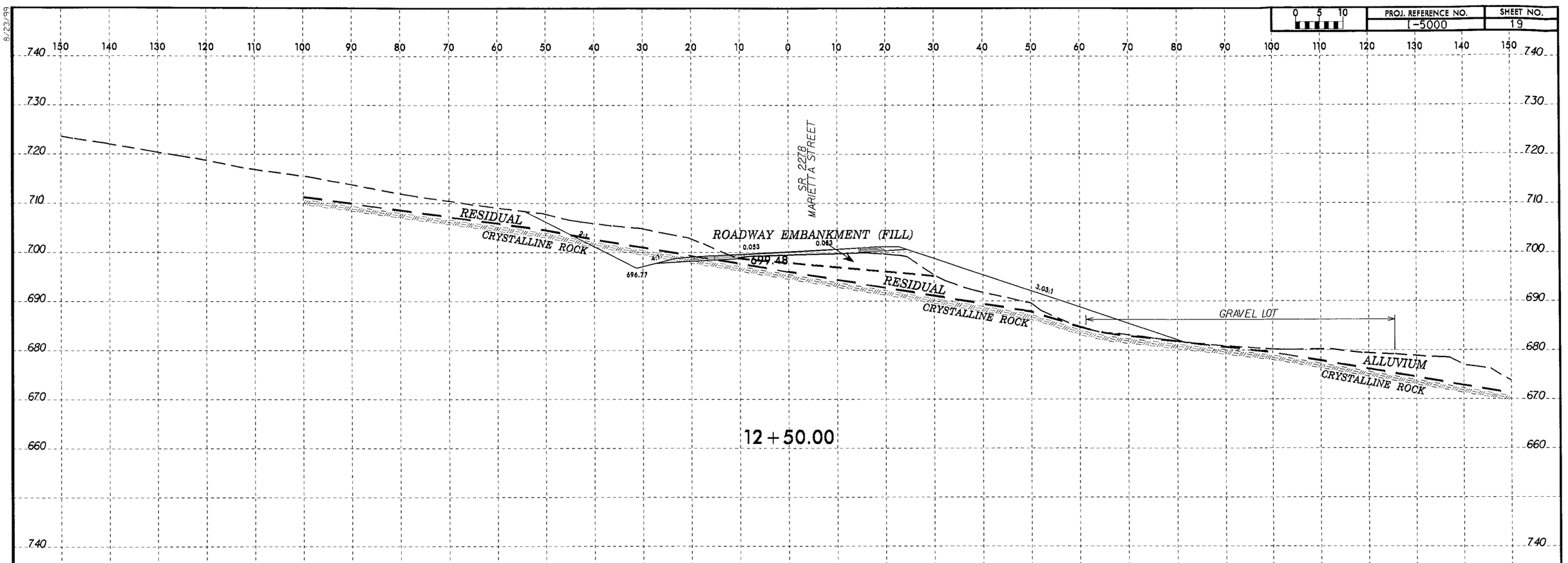
lmcclure AT GEH257466



PROJ. REFERENCE NO.
I-5000
SHEET NO.
18
0 5 10
RESIDUAL
CRYSTALLINE ROCK
SR 2278
MARIETTA STREET
ROADWAY EMBANKMENT (FILL)
3.03:1
0.020
0.012
697.49
RESIDUAL
CRYSTALLINE ROCK
ALLUVIUM
CREEK
CRYSTALLINE ROCK
740
730
720
710
700
690
680
670
660
650
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150
11+50.00
-Y2-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	19



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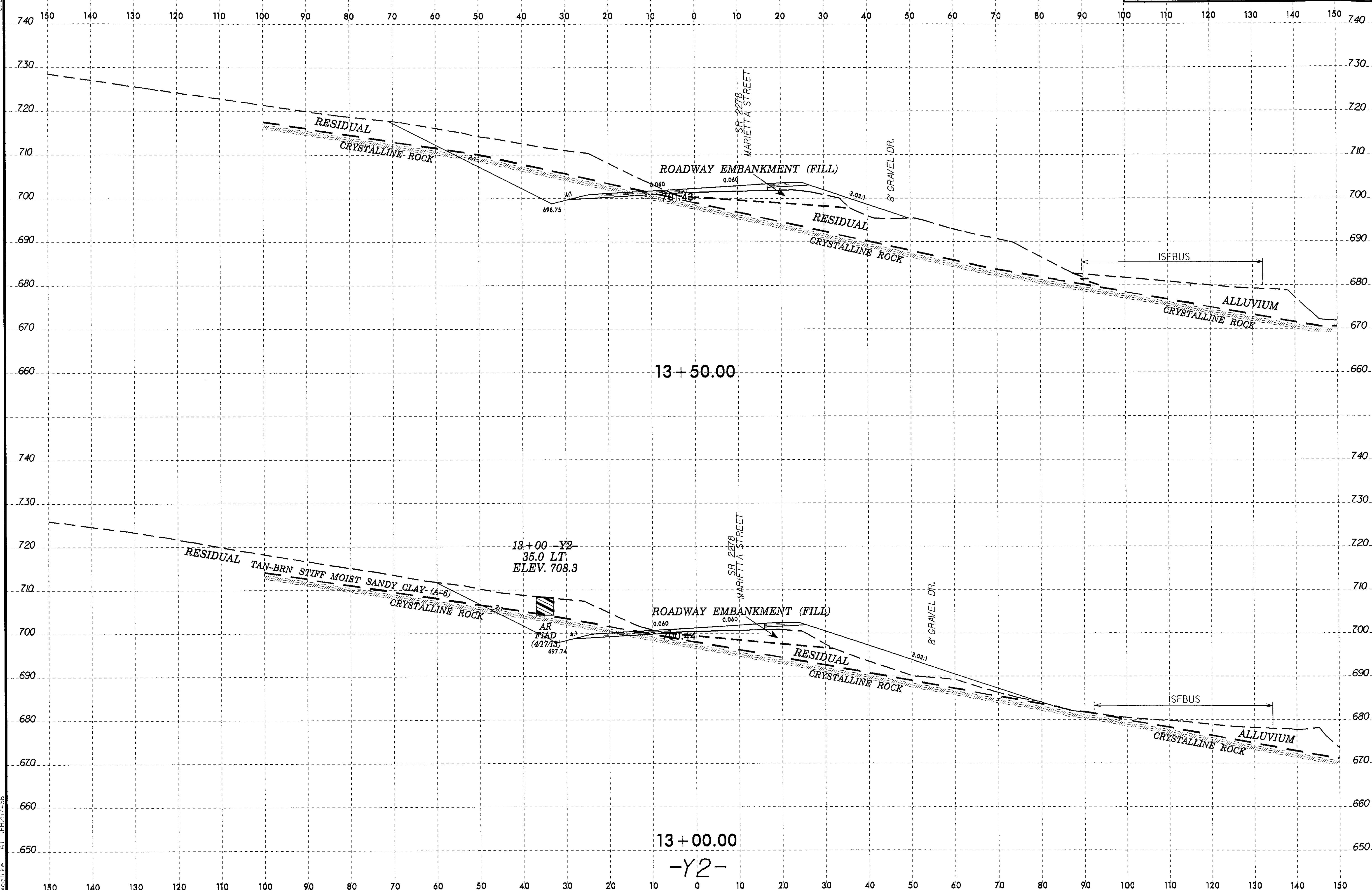
mcclure
AT GEMS-7486

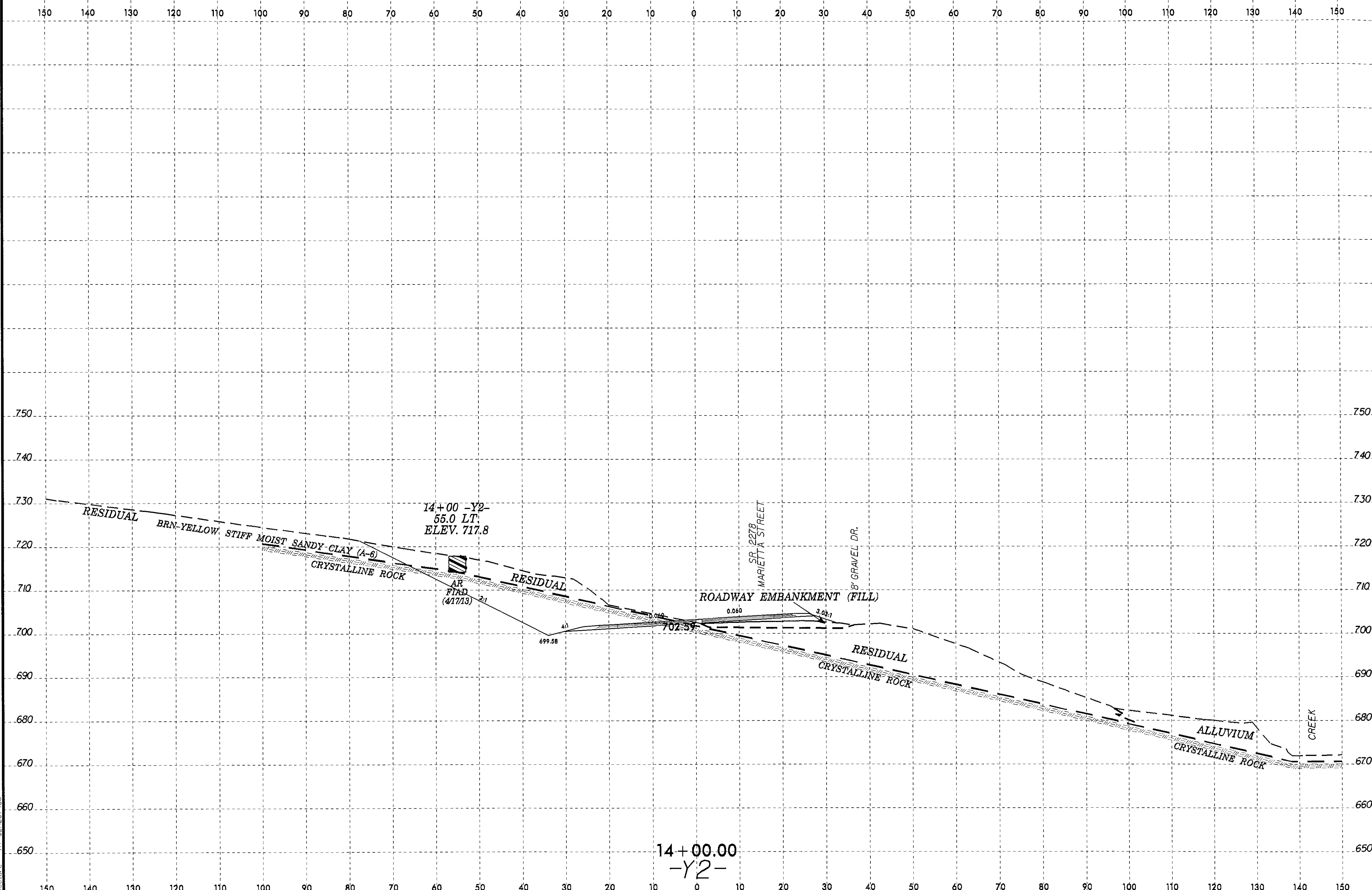
8/23/99

PROJ. REFERENCE NO.	SHEET NO.
I-5000	20



RESIDUAL
CRYSTALLINE ROCK
SR 2278
MARIETTA STREET
ROADWAY EMBANKMENT (FILL)
8' GRAVEL DR.
701.43
698.75
RESIDUAL
CRYSTALLINE ROCK
ISFBUS
ALLUVIUM
CRYSTALLINE ROCK
13+50.00
13+00 -Y2-
35.0 LT.
ELEV. 708.3
RESIDUAL TAN-BRN STIFF MOIST SANDY CLAY (A-6)
CRYSTALLINE ROCK
AR
FIAD
(4/17/13)
697.74
700.44
SR 2278
MARIETTA STREET
ROADWAY EMBANKMENT (FILL)
8' GRAVEL DR.
RESIDUAL
CRYSTALLINE ROCK
ISFBUS
ALLUVIUM
CRYSTALLINE ROCK
13+00.00
-Y2-

PROJ. REFERENCE NO.	SHEET NO.
I-5000	21



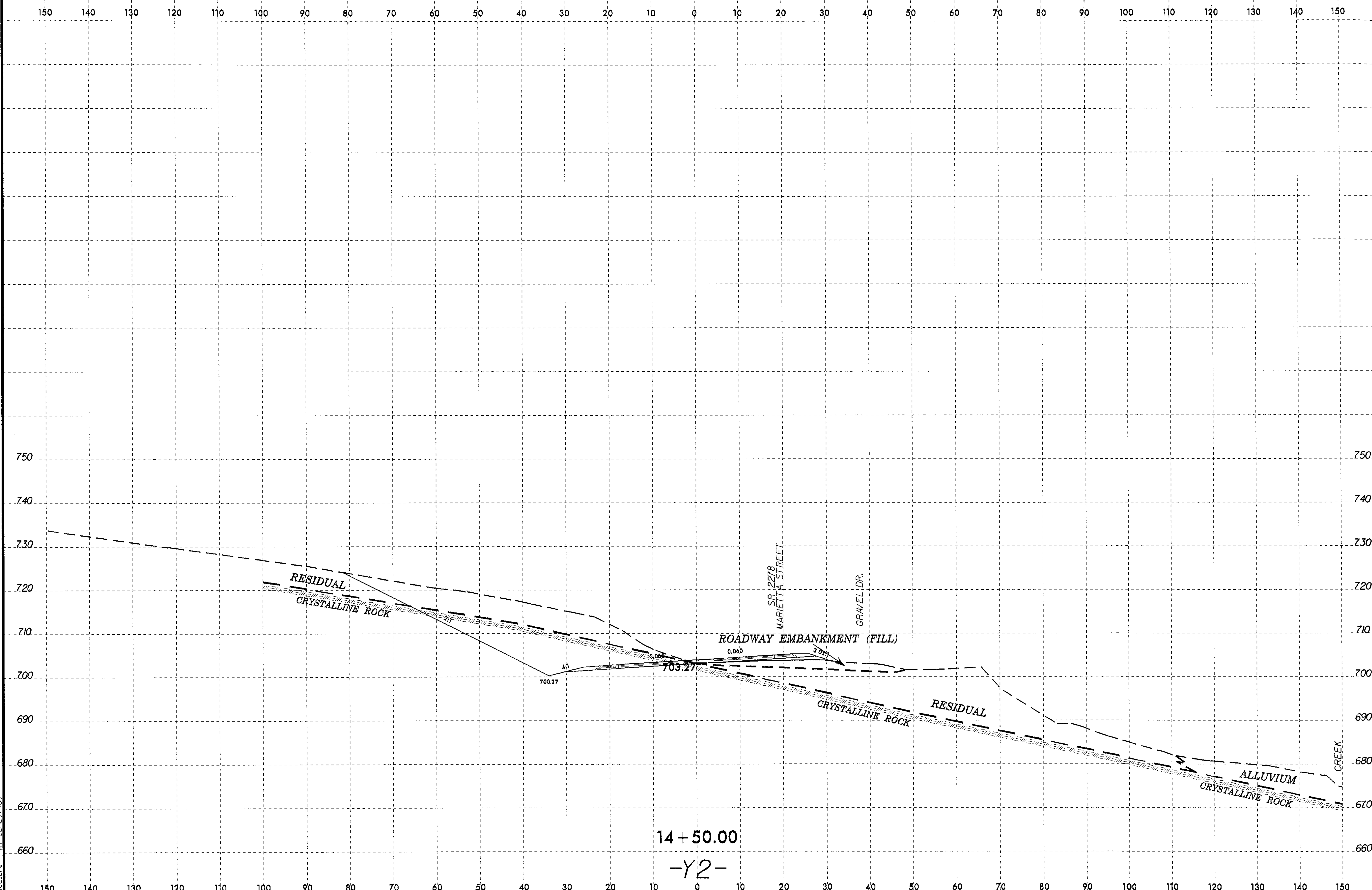
0 5 10
14+00 -Y2-
55.0 LT
ELEV. 717.8
RESIDUAL
BRN-YELLOW STIFF MOIST SANDY CLAY (A-6)
CRYSTALLINE ROCK
AR
FIAD
(4/17/13)
SR 2278
MARIETTA STREET
8' GRAVEL DR.
ROADWAY EMBANKMENT (FILL)
0.060
3.0:1
702.57
699.58
RESIDUAL
CRYSTALLINE ROCK
ALLUVIUM
CRYSTALLINE ROCK
CREEK
750
740
730
720
710
700
690
680
670
660
650
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

14+00.00
-Y2-

8/23/99

25-FEB-2014 11:26
C:\Projects\I5000_GEO_RDWY_REV_GASTON\CADD_GEOTECH\xsc\I5000_Geo_xs1_Y2_GASTON.dgn
lmcclure AT GEH257466

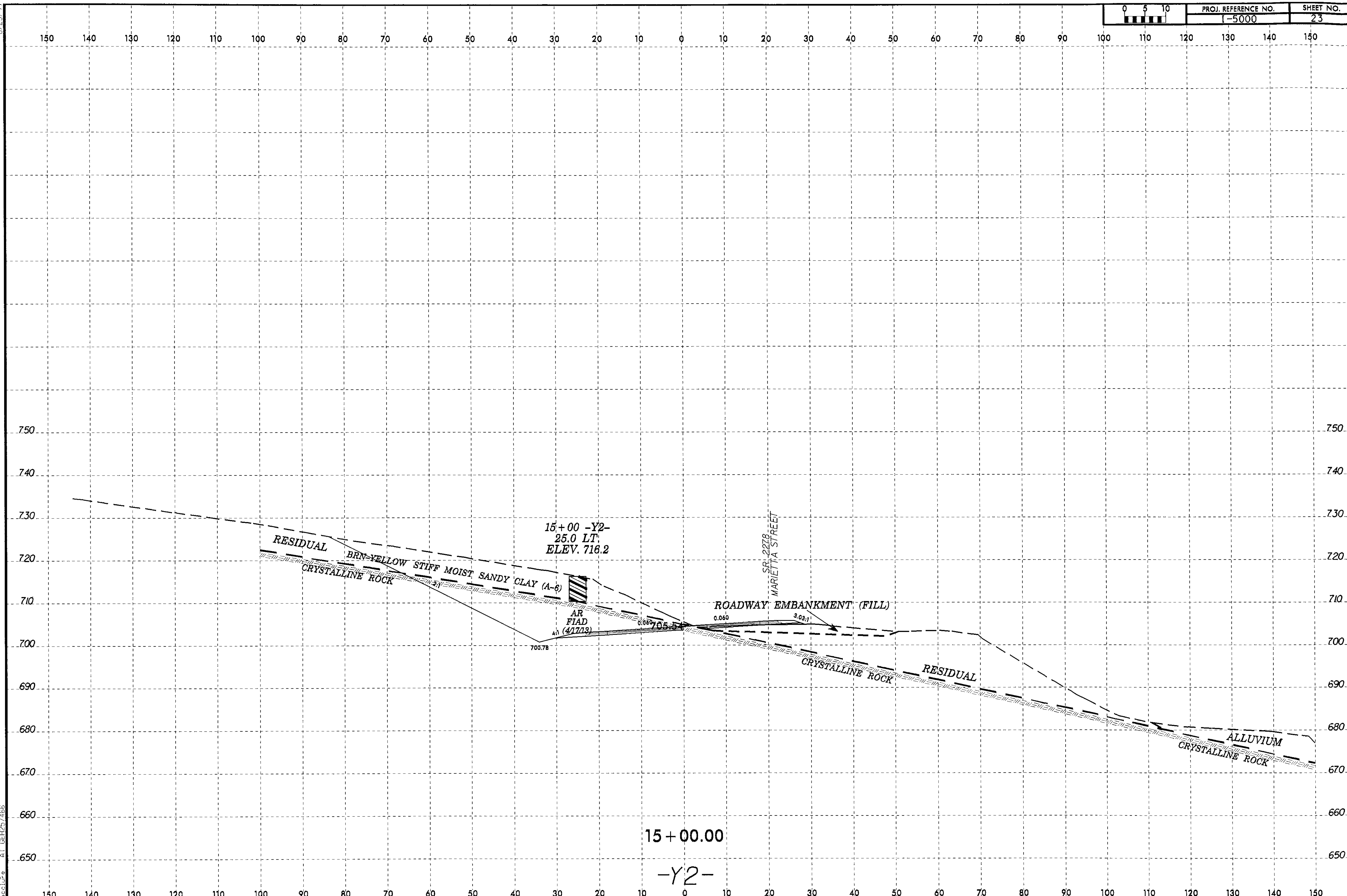
PROJ. REFERENCE NO.	SHEET NO.
I-5000	22



14 + 50.00

-Y2-

PROJ. REFERENCE NO.	SHEET NO.
I-5000	23



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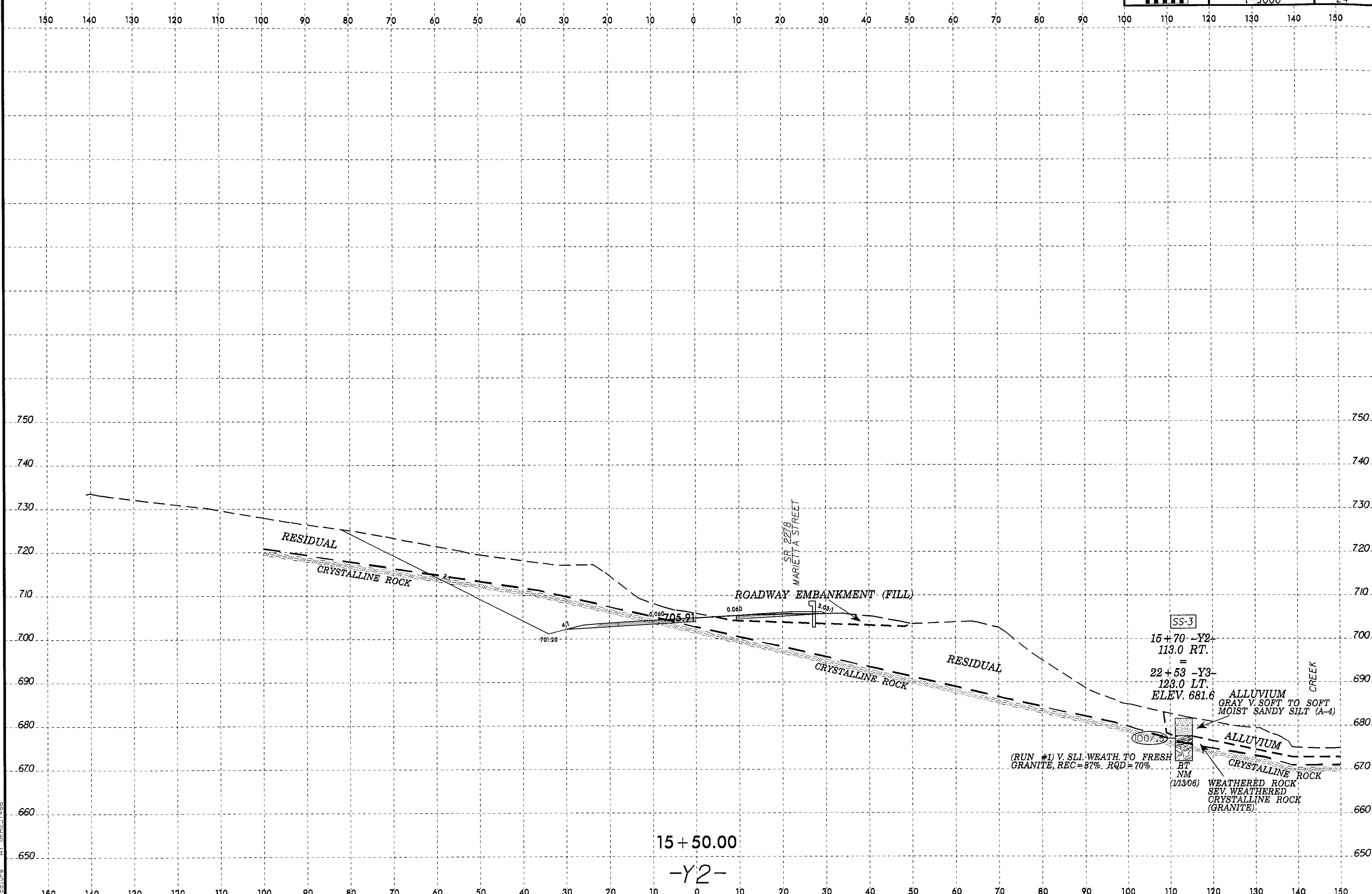
mcclure AT GEH257466

PROJ. REFERENCE NO.	SHEET NO.
I-5000	24



8/23/99

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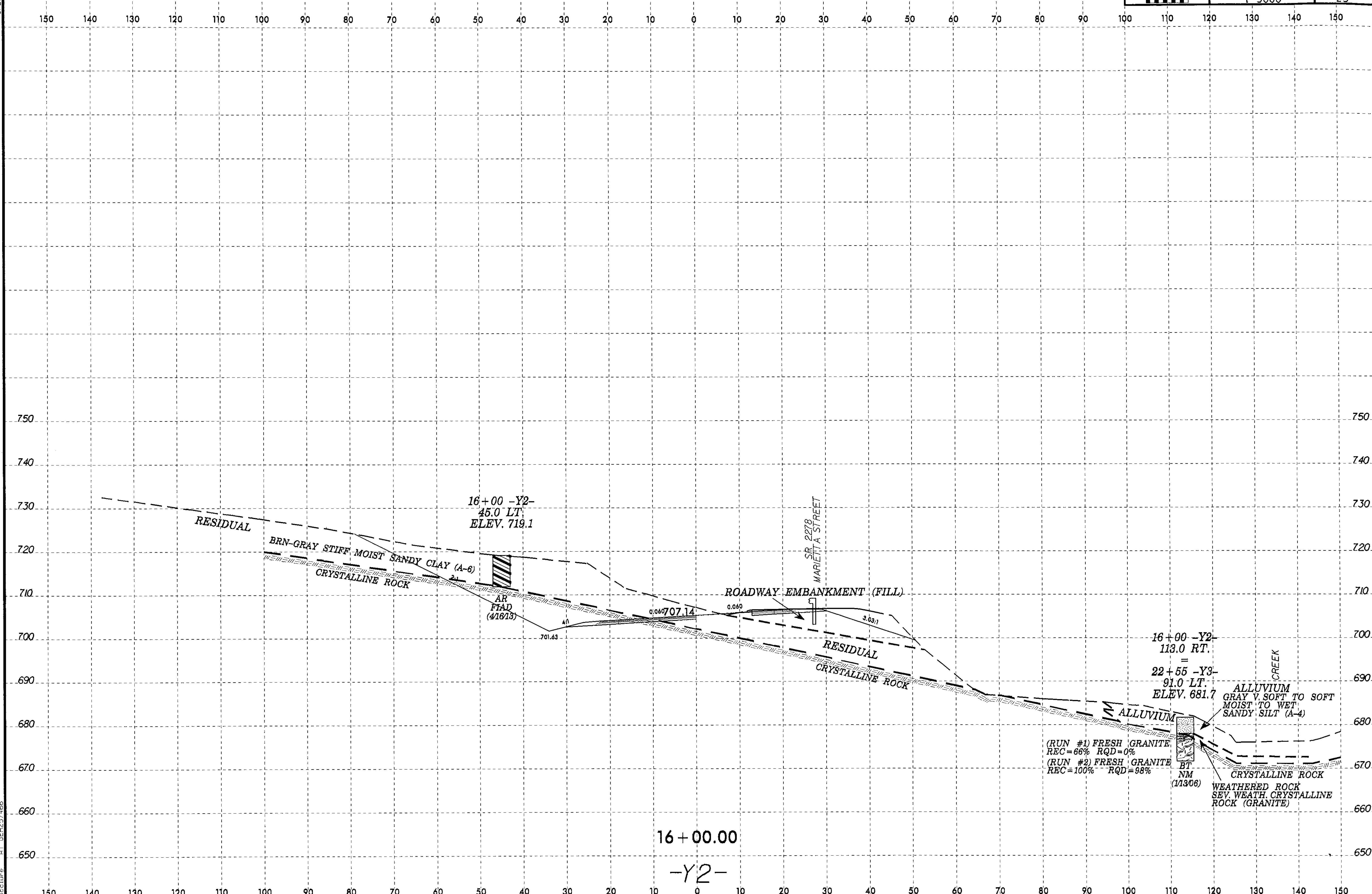
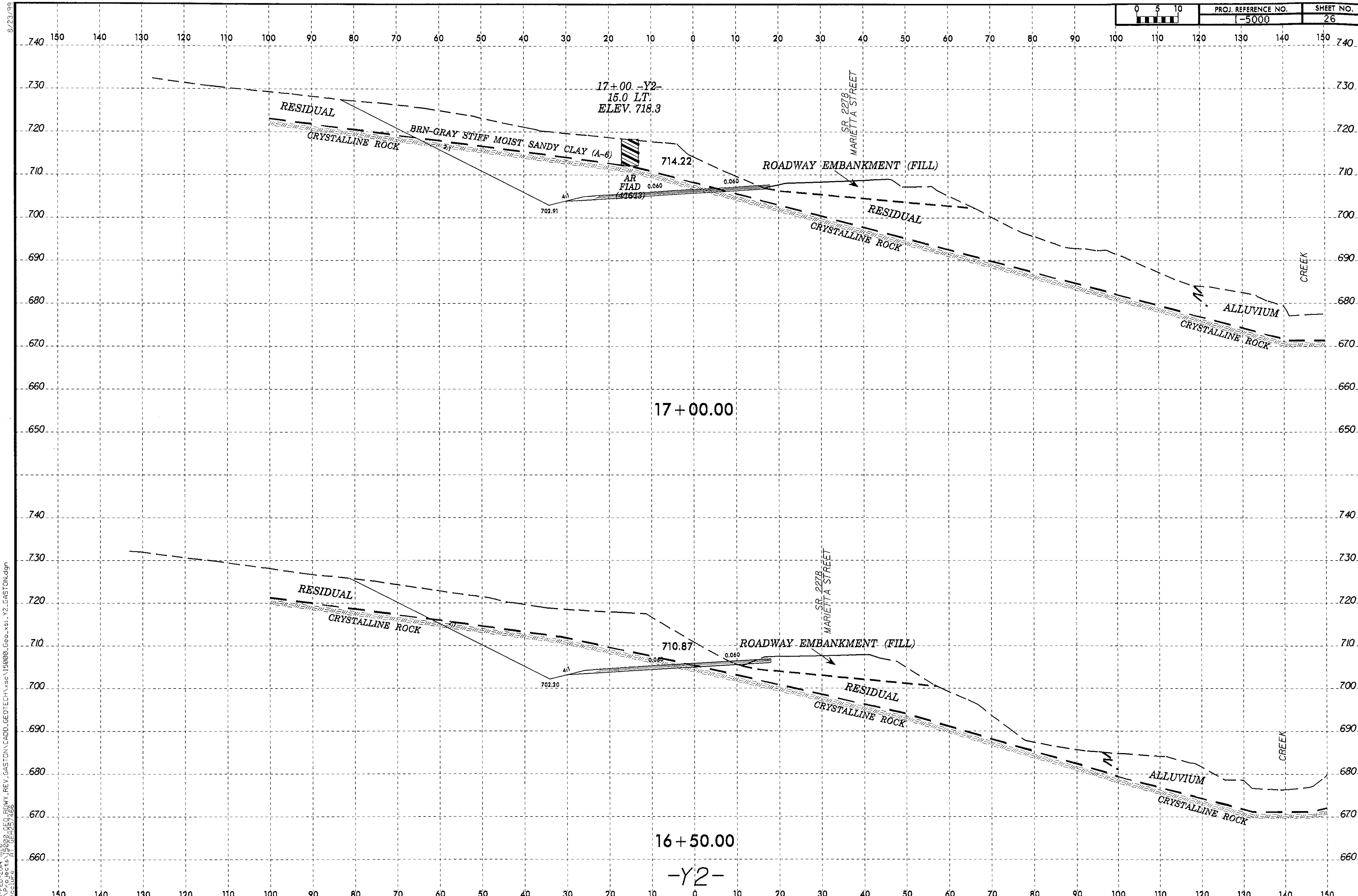
lmcclure AT GEH257466


16+00 -Y2-
45.0 LT.
ELEV. 719.1
RESIDUAL
BRN-GRAY STIFF MOIST SANDY CLAY (A-6)
CRYSTALLINE ROCK
AR
FIAD
(4/16/13)
SR 2278
MARIETTA STREET
ROADWAY EMBANKMENT (FILL)
707.14
RESIDUAL
CRYSTALLINE ROCK
16+00 -Y2-
113.0 RT.
=
22+55 -Y3-
91.0 LT.
ELEV. 681.7
CREEK
ALLUVIUM
GRAY V. SOFT TO SOFT MOIST TO WET SANDY SILT (A-4)
ALLUVIUM
(RUN #1) FRESH GRANITE
REC=66% RQD=0%
(RUN #2) FRESH GRANITE
REC=100% RQD=98%
BT
NM
(1/13/06)
CRYSTALLINE ROCK
WEATHERED ROCK
SEV. WEATH. CRYSTALLINE ROCK (GRANITE)
16+00.00
-Y2-

25-FEB-2014 16:26
C:\Projects\15000_GEO_RDWY_REV_GASTON\CADD_GEOTECH\xsc\15000_Geo_xsc_Y2_GASTON.dgn



8/23/99
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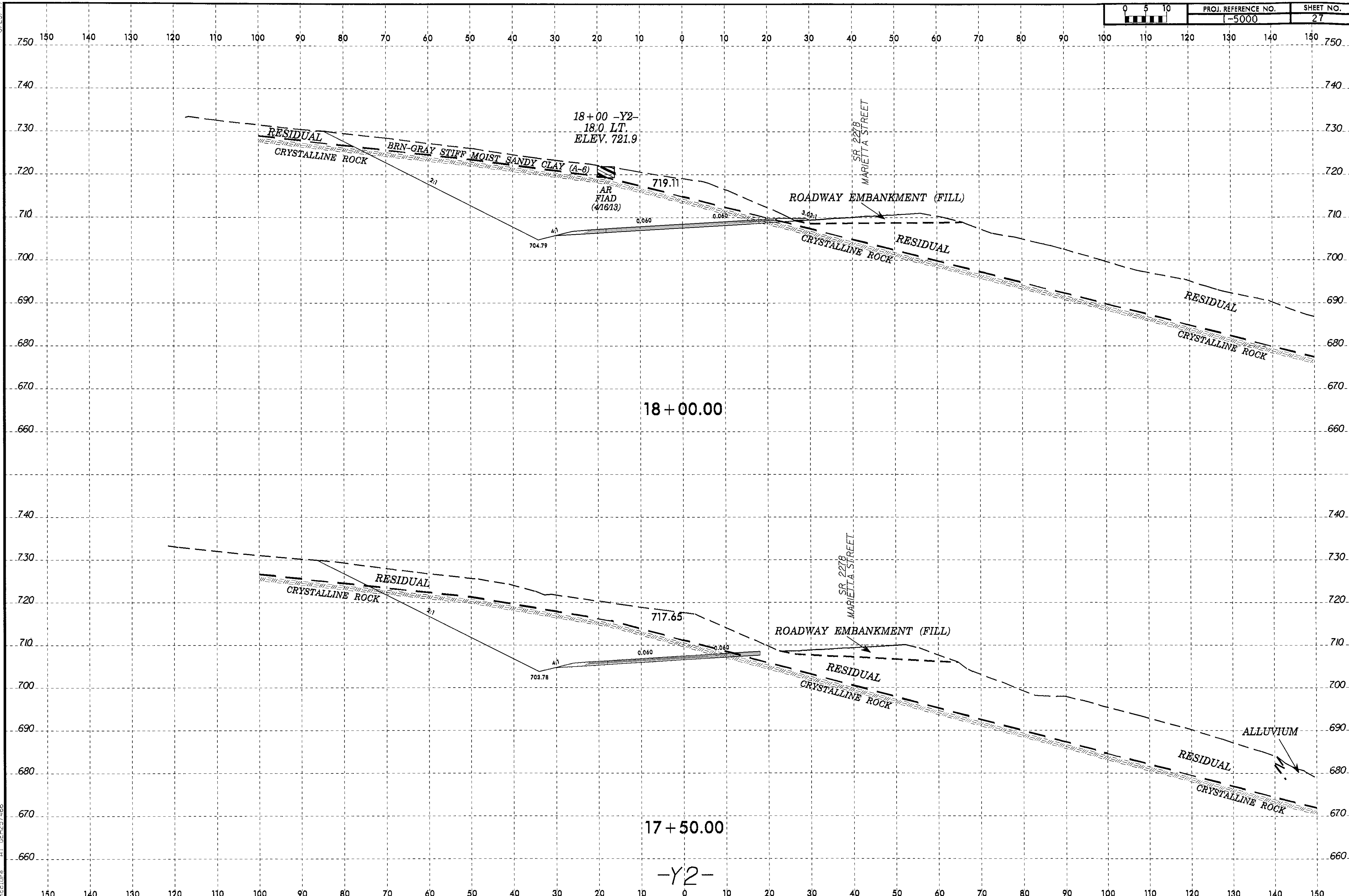

8/23/99

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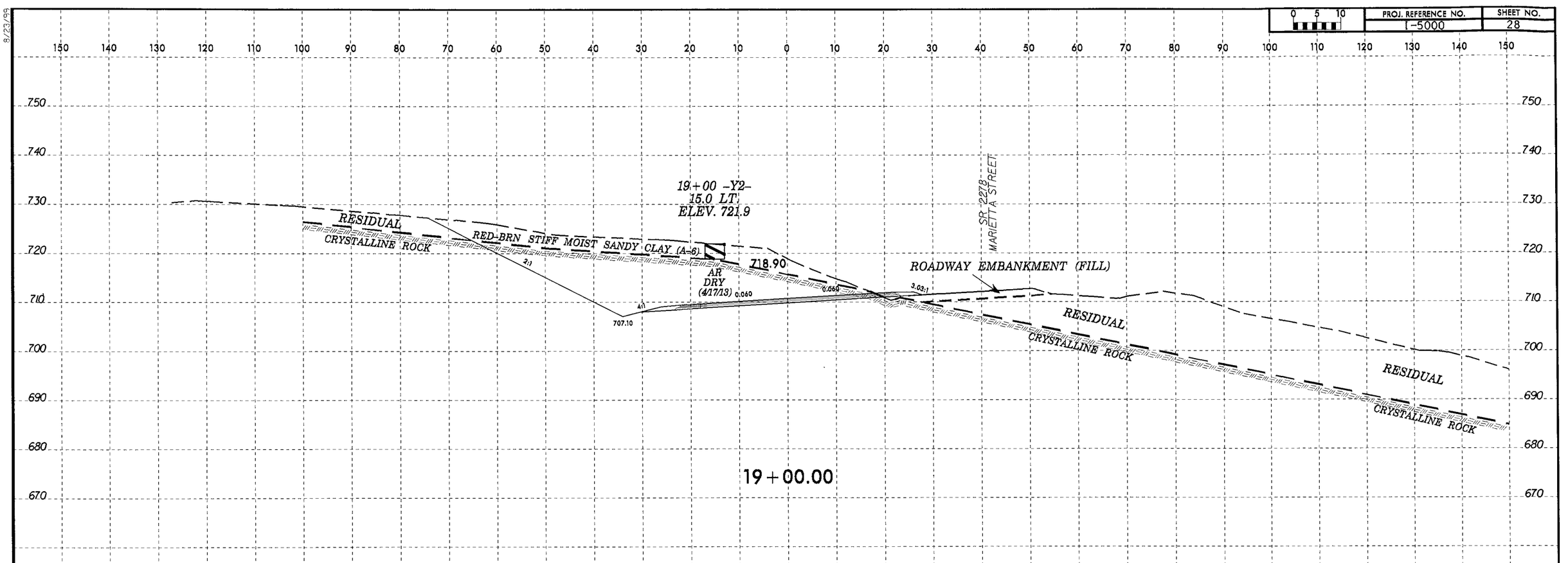
imcclure AT GEH257466

PROJ. REFERENCE NO.	SHEET NO.
I-5000	28

8/23/99



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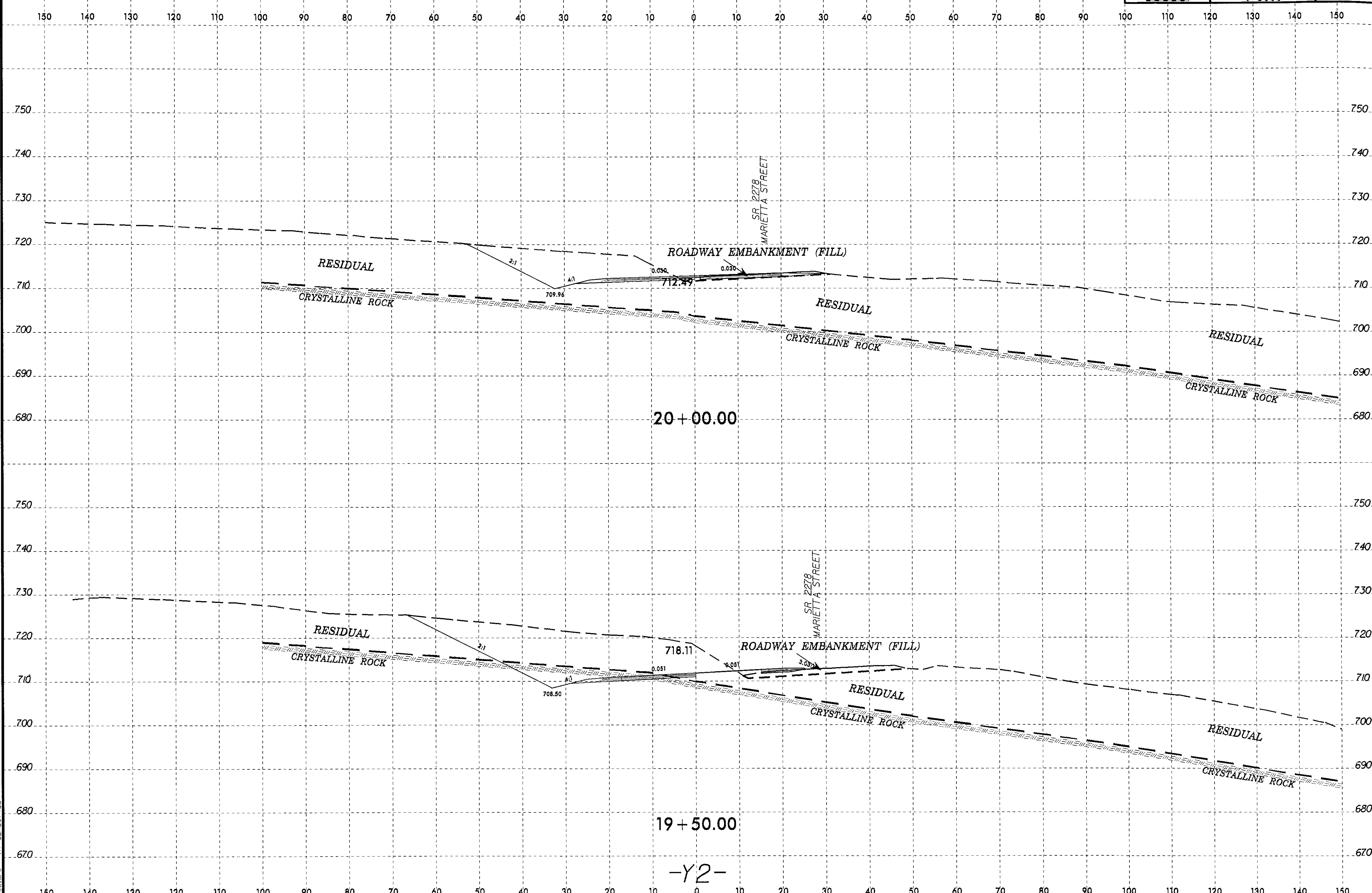
mcclure AT GEH25746



-Y2-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	30

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

740 730 720 710 700 690 680 670 660

SR 2278
MARIETTA STREET

SS-30
21+12 -Y2-
15.0 RT
ELEV. 708.5

ROADWAY EMBANKMENT (FILL)

3.03:1 0.011 0.011 3.03:1

Z12.5

RESIDUAL

(9)
(P)=20
(16)
BT
DRY
(4/17/13)

RESIDUAL
RED-BRN STIFF TO V. STIFF
MOIST MED. PLASTIC
SILTY SANDY CLAY (A-6)

RESIDUAL

CRYSTALLINE ROCK

CRYSTALLINE ROCK

CRYSTALLINE ROCK

21+00.00

750 740 730 720 710 700 690 680 670

SR 2278
MARIETTA STREET

ROADWAY EMBANKMENT (FILL)

3.03:1 0.010 0.010 3.03:1

Z13.40

RESIDUAL

RESIDUAL

RESIDUAL

CRYSTALLINE ROCK

CRYSTALLINE ROCK

CRYSTALLINE ROCK

NO ROCK

20+50.00
-Y2-

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

25-FEB-2014 11:39
C:\Projects\15000_GEO_RDWY_REV_GASTON\CADD_GEOTECH\xsc\15000_Geo_xsi_Y2_GASTON.dgn
mscline

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	31

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

760
750
740
730
720
710
700

ISBKBUS

BST & GRAVEL

RESIDUAL

ROADWAY EMBANKMENT
(FILL) OVER RESIDUAL

BULB AVENUE

2:1
0.060
0.060
4:1
2:1
725.85
723.19

RESIDUAL

RESIDUAL

CRYSTALLINE ROCK

CRYSTALLINE ROCK

17+00.00

ISBKBUS

ROADWAY EMBANKMENT
(FILL) OVER RESIDUAL

BULB AVENUE

2:1
0.060
0.060
4:1
2:1
726.04
723.68

RESIDUAL

RESIDUAL

RESIDUAL

NO ROCK

16+50.00

-Y3-

25-FEB-2014 11:42
C:\Projects\15000_GEO_RDWY_REV_GASTON\CADD_GEOTECH\xsc\15000_Geo_xsi_Y3_GASTON.dgn
mcclure
AT GEH25/ABB

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	32

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

760 750 740 730 720 710 700

GRAVEL LOT

RESIDUAL

BULB AVENUE

ROADWAY EMBANKMENT (FILL) OVER RESIDUAL

729.38

0.041 0.044

2:1 4:1 2:1

722.46

RESIDUAL

CRYSTALLINE ROCK

CRYSTALLINE ROCK

RESIDUAL

18+00.00

SS-31
SS-32

17+40 -Y3-
12.0 RT.
ELEV. 728.6

BULB AVENUE

ROADWAY EMBANKMENT (FILL) OVER RESIDUAL

RESIDUAL

GRAVEL

2:1 728.24 0.060 4:1 722.68

RED-BRN MED. DENSE MOIST SILTY SAND (A-2-4)

RESIDUAL

58
(PI=13)

TAN-BRN-GRAY-WHITE HARD MOIST LOW PLASTIC SILTY SANDY CLAY (A-6)

ALTERNATING LAYERS OF HARD AND SOFT MATERIAL

AR
DRY
(4/19/13)

CRYSTALLINE ROCK

CRYSTALLINE ROCK

17+50.00

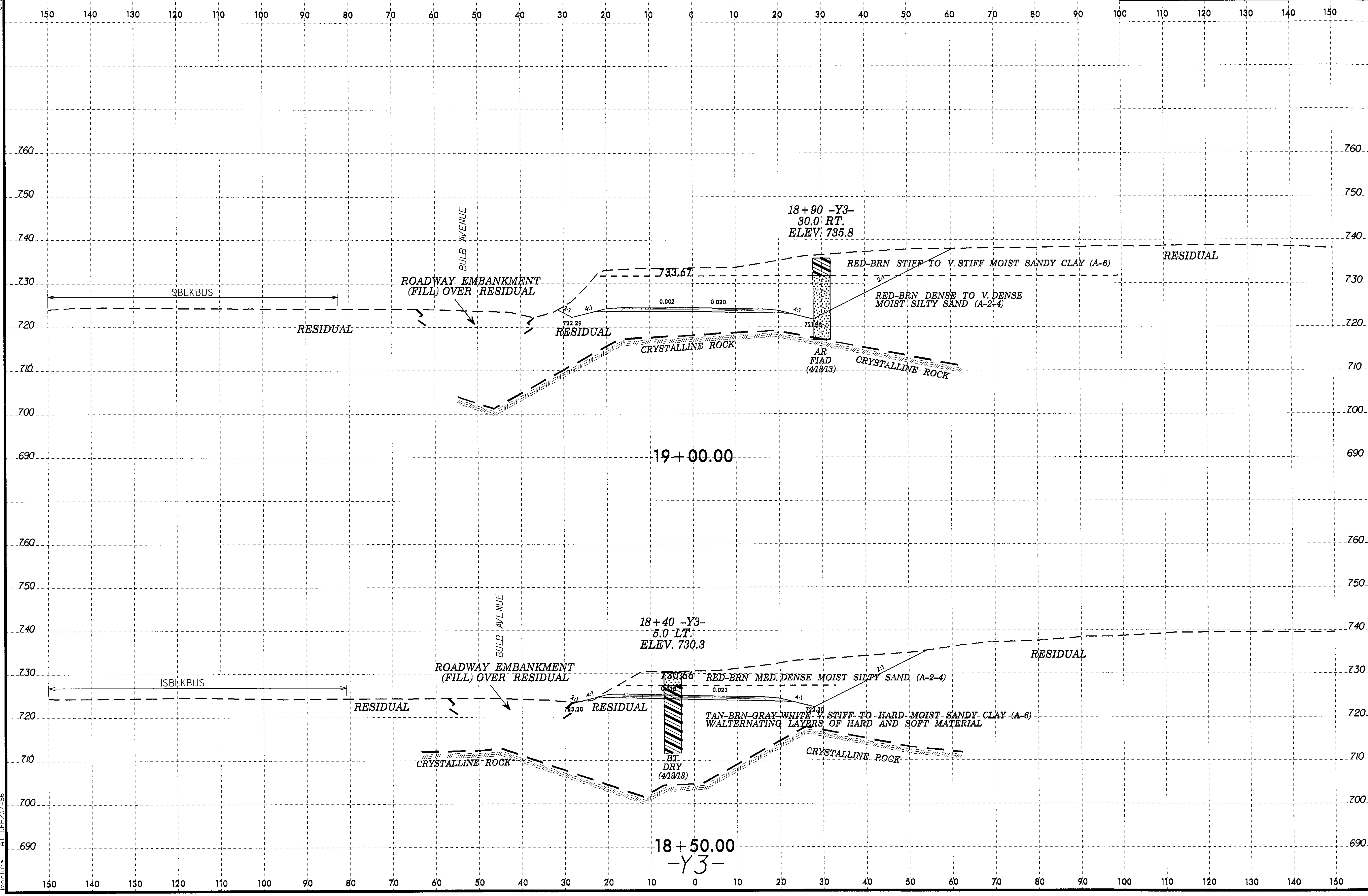
-Y3-

760 750 740 730 720 710 700 690

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

25-FEB-2014 11:42
C:\Projects\150000_GEO_ROW_REV_GASTON\CADD_GEOTECH\xsc\150000_Geo_xs1_Y3_GASTON.dgn
meclure AT GEH25/7466

PROJ. REFERENCE NO.	SHEET NO.
I-5000	33



8/23/99

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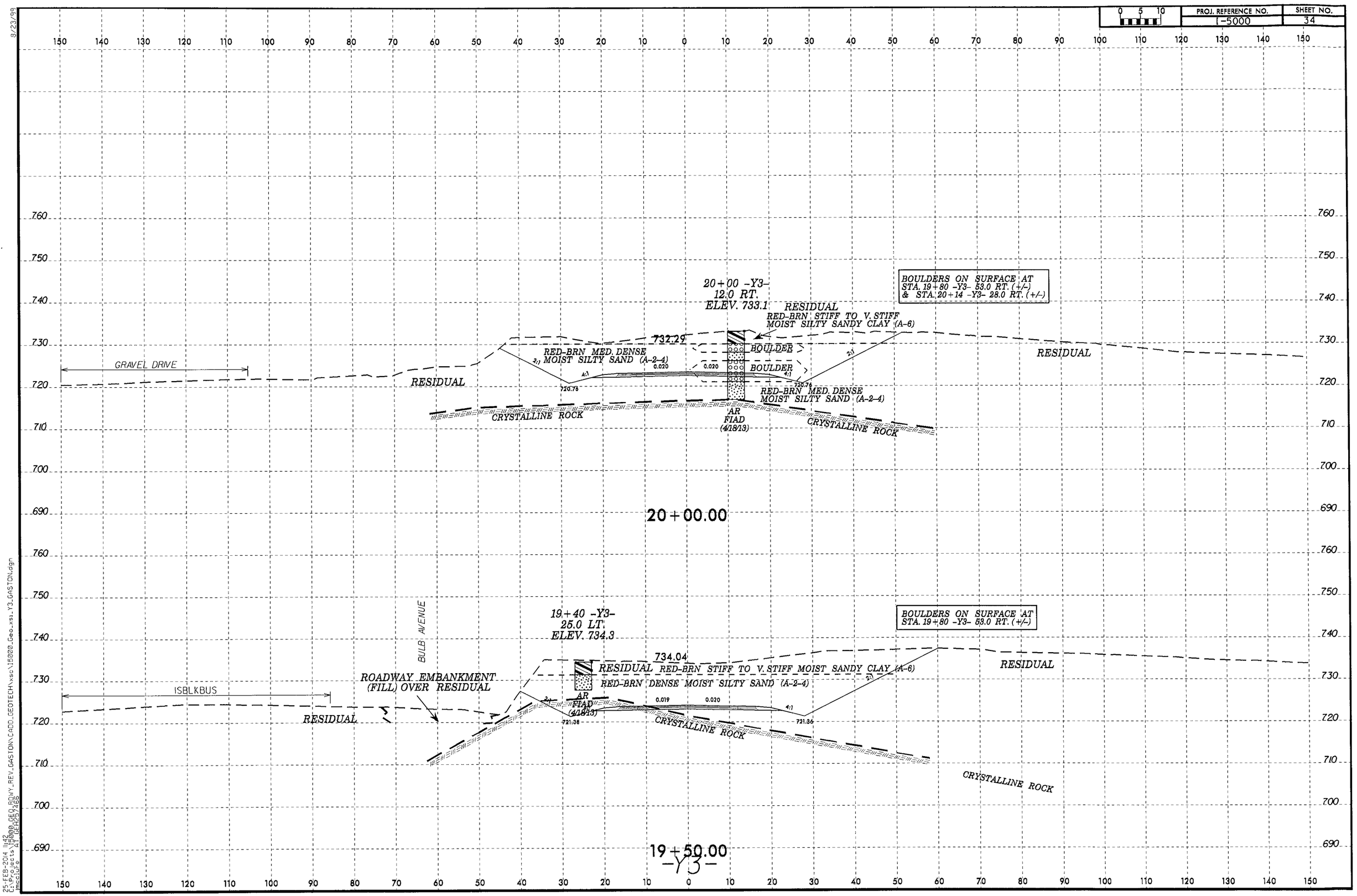
8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	34



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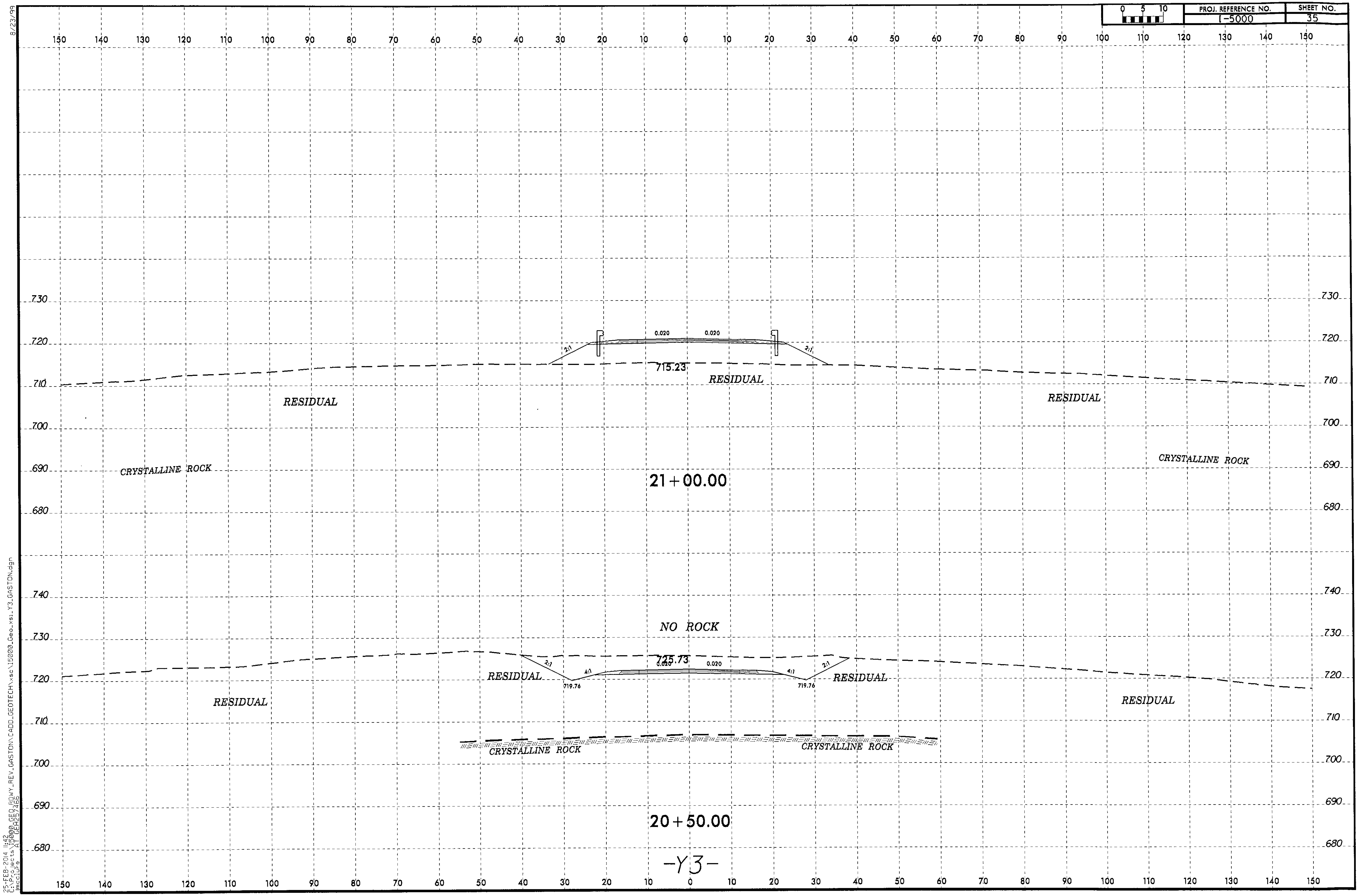
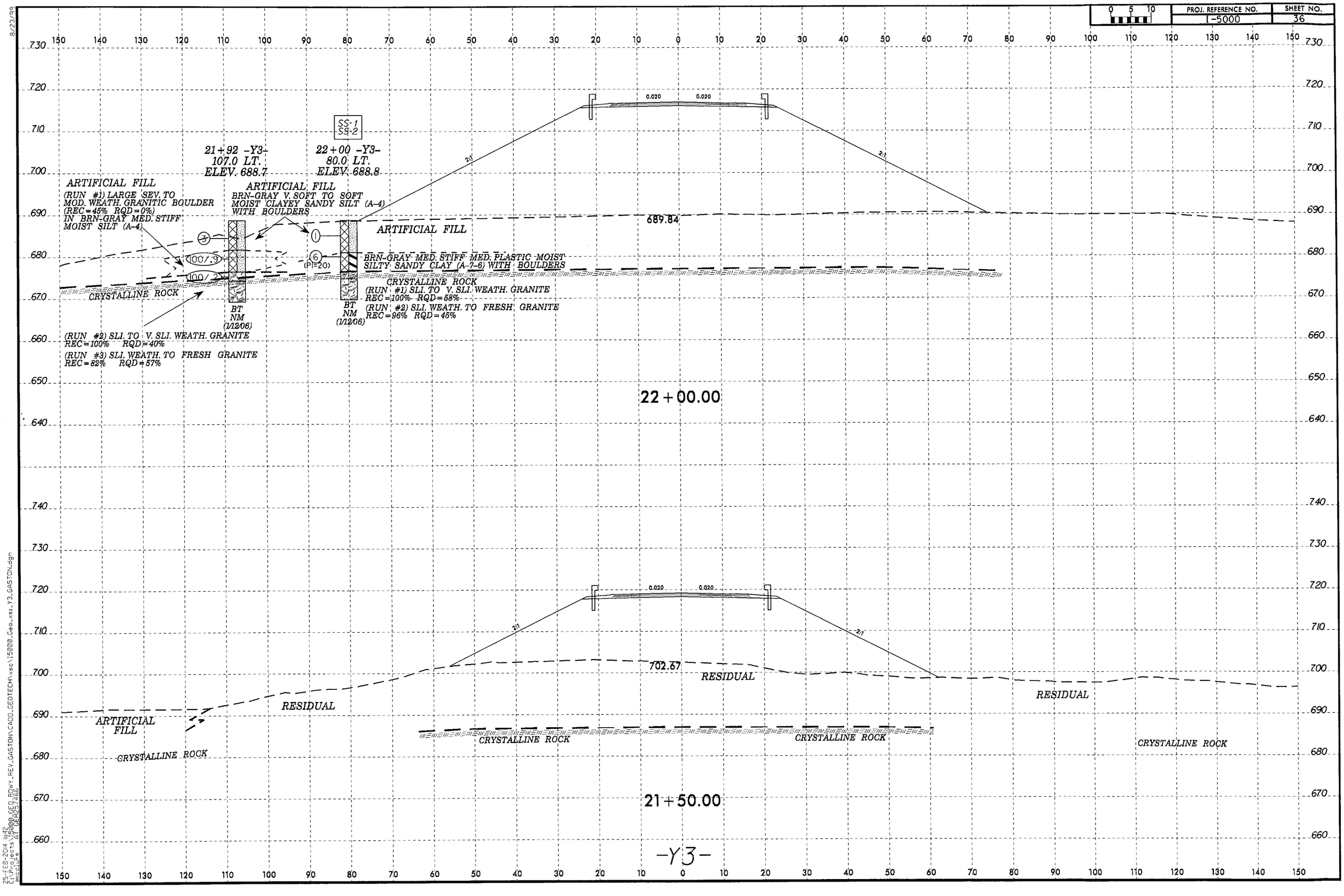
mcclurg AT GEH25748G


PROJ. REFERENCE NO.
I-5000
SHEET NO.
35
0 5 10
0.020
0.020
2:1
2:1
715.23
RESIDUAL
RESIDUAL
RESIDUAL
CRYSTALLINE ROCK
CRYSTALLINE ROCK
21+00.00
NO ROCK
725.73
0.020
0.020
2:1
4:1
4:1
2:1
719.76
719.76
RESIDUAL
RESIDUAL
RESIDUAL
RESIDUAL
CRYSTALLINE ROCK
CRYSTALLINE ROCK
20+50.00
-Y3-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	36



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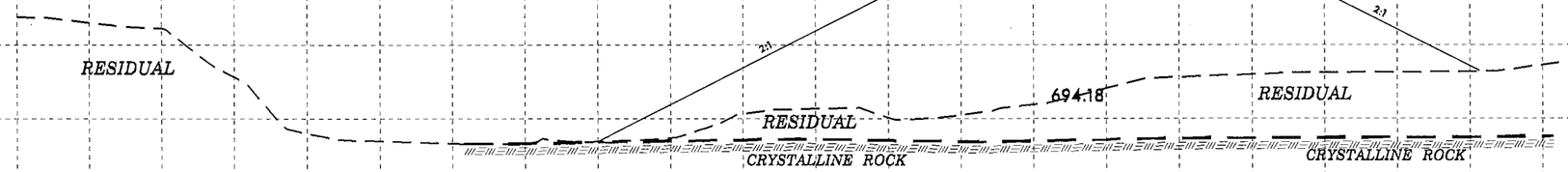
imeclure AT GEPS7465

8/23/99

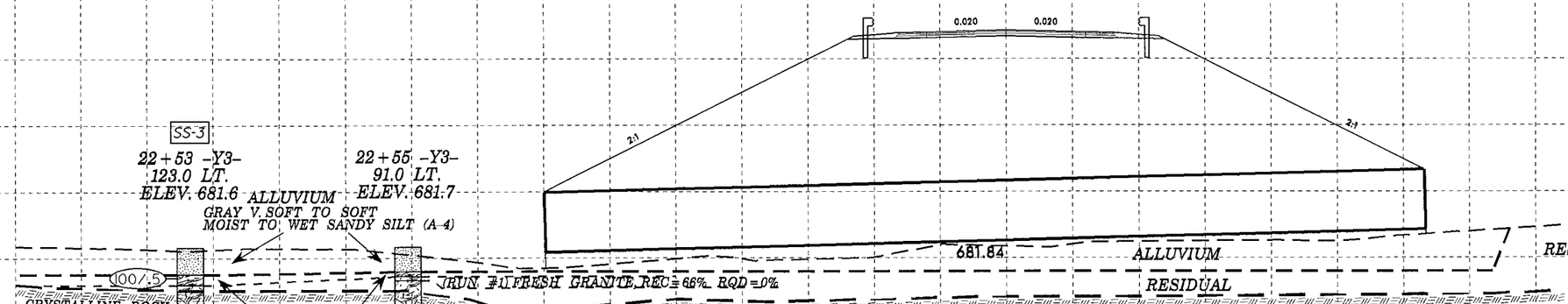
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	37

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

720
710
700
690
680
670
730
720
710
700
690
680
670
660
650
640



23+00.00



22+50.00

-Y3-

25-FEB-2014 11:42
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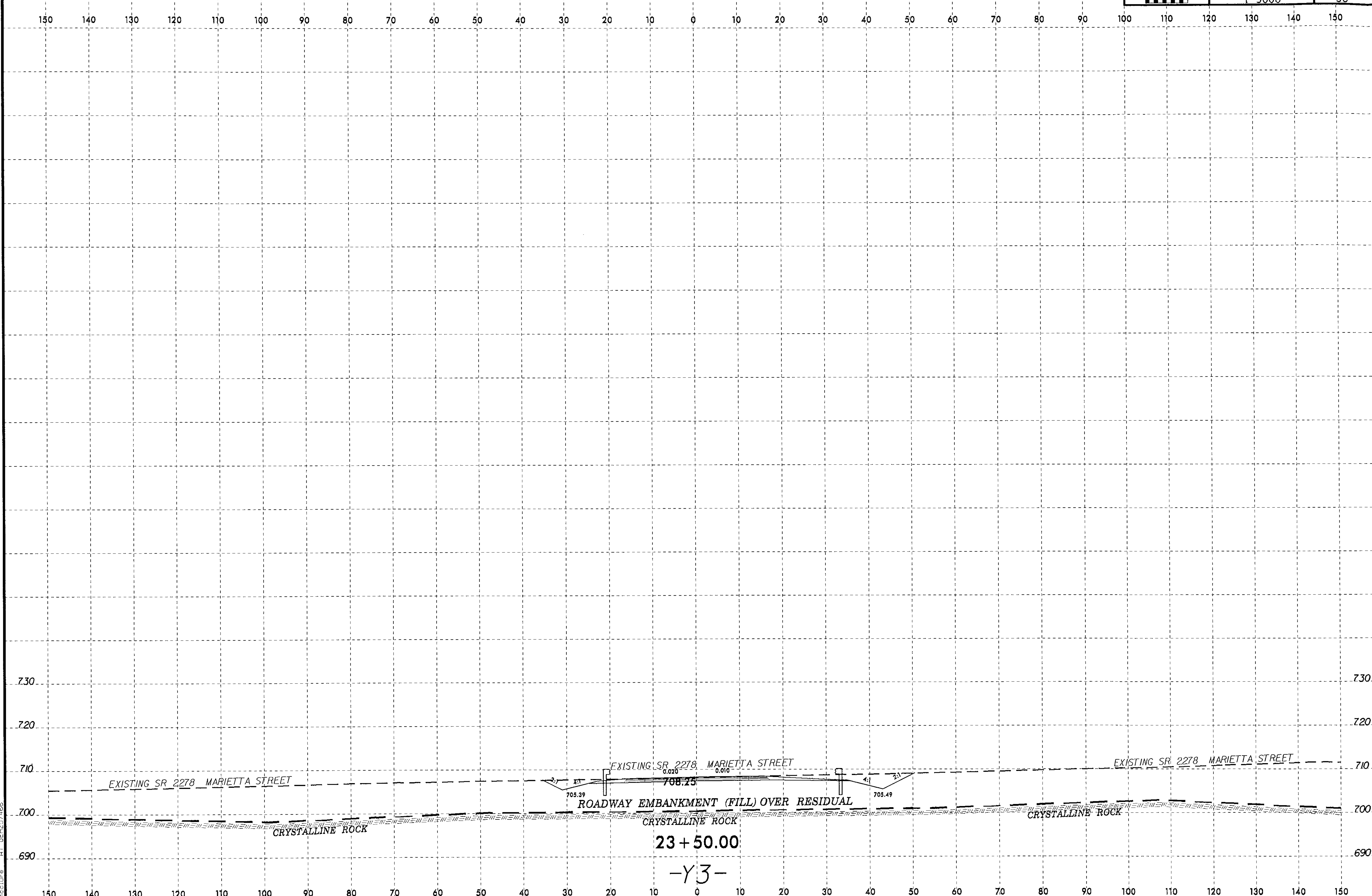
mcclure AI GEH257466

PROJ. REFERENCE NO.	SHEET NO.
I-5000	38



8/23/99

25-FEB-2014 11:42
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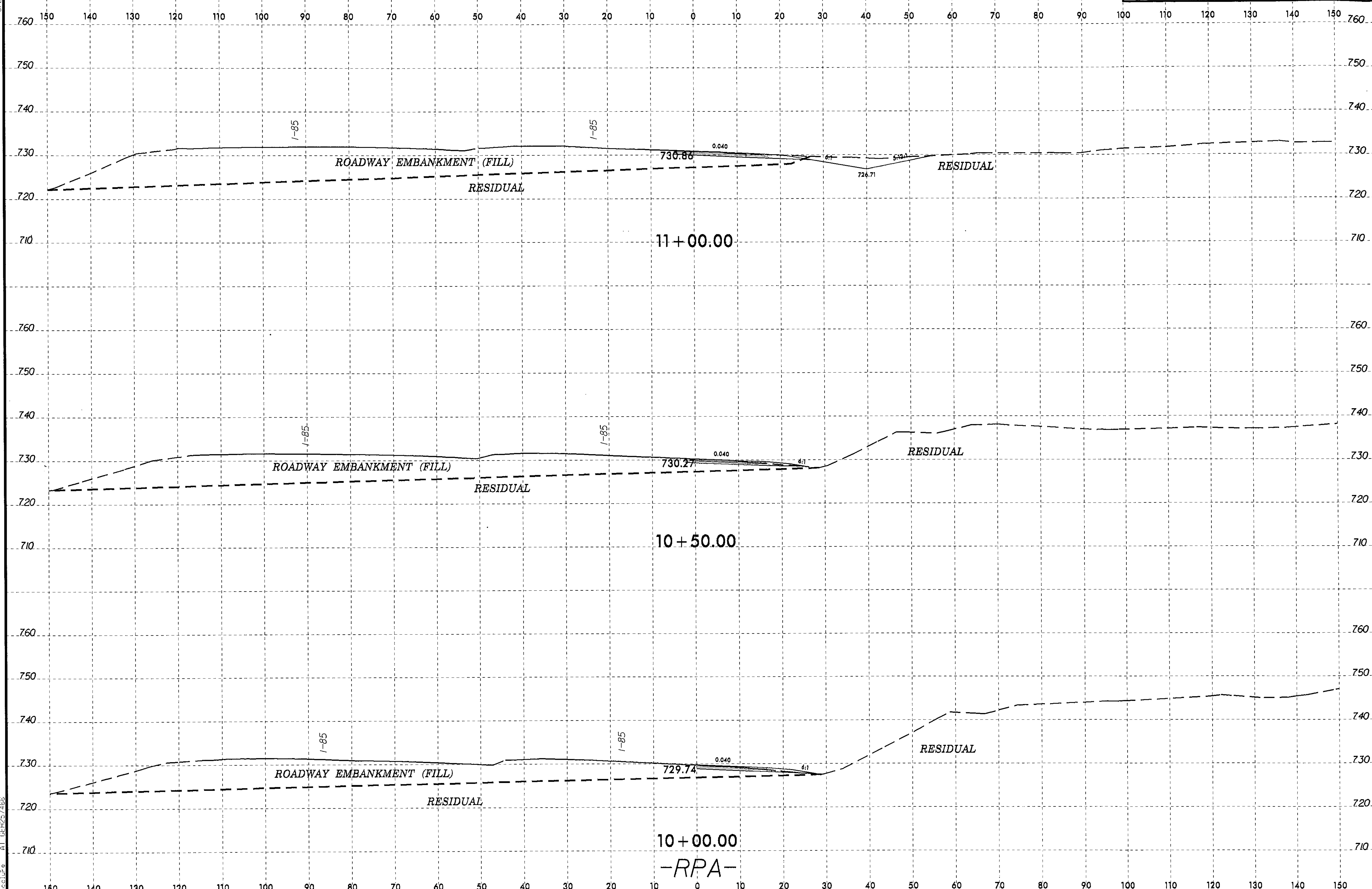
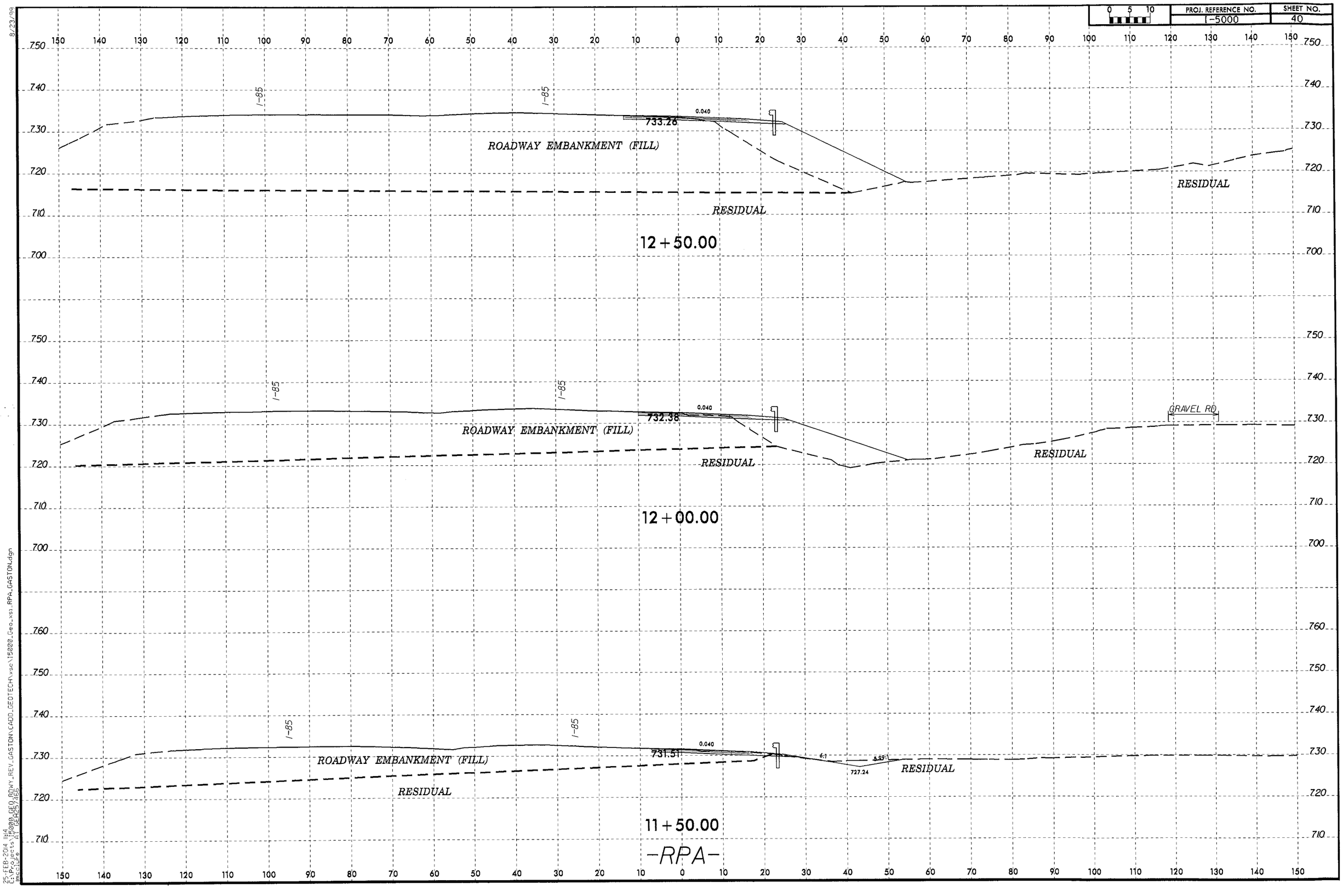
lmcclure AT GEH257466

PROJ. REFERENCE NO.	SHEET NO.
I-5000	39



8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	40



8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	41

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

760
750
740
730
720
710
700

I-85

0.060

734.60

ROADWAY EMBANKMENT (FILL)

2:1

RESIDUAL

RESIDUAL

13+50.00

I-85

0.055

733.94

ROADWAY EMBANKMENT (FILL)

2:1

SUBSTATION

RESIDUAL

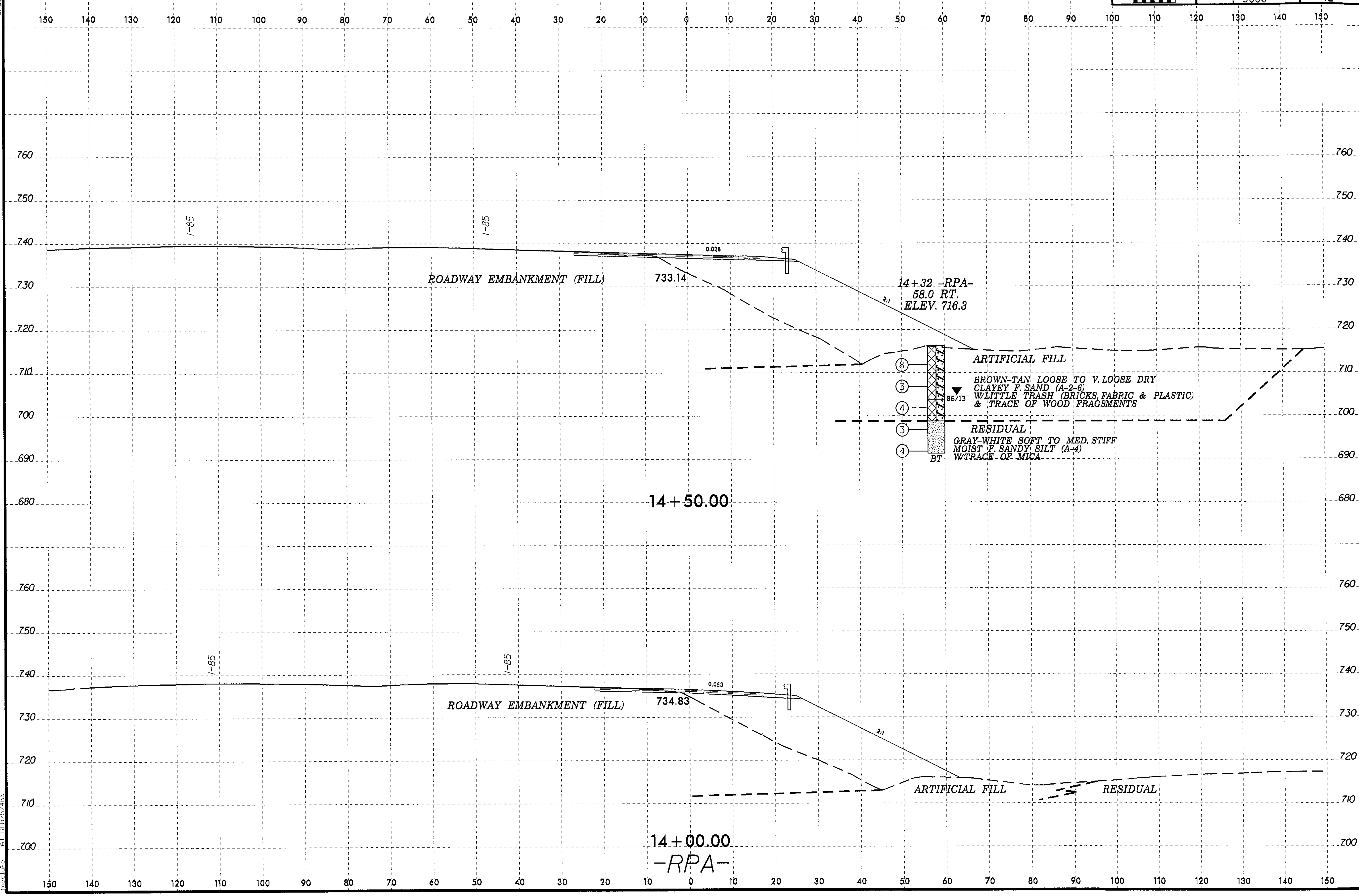
RESIDUAL

13+00.00

-RPA-

25-FEB-2014 11:14
C:\Projects\I5000-DES2-RDWY_REV_GASTON\CADD_GEOTECH\xsc\I5000_Geo_xsi_RPA_GASTON.dgn
mcclure A1 DEC/ADS

PROJ. REFERENCE NO.	SHEET NO.
I-5000	42



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lmcclure AT GEH257466

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	43

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

750 740 730 720 710 700 690 680 670

I-85 I-85

4:1 6:1 0.035 0.035

ROADWAY EMBANKMENT (FILL)

728.94

2:1

15+50 -RPA-
66.0 RT.
ELEV. 714.4

ARTIFICIAL FILL
BROWN SOFT DRY F. SANDY SILT (A-4)
W/LITTLE GLASS, TRACE OF GRAVEL AND TRACE OF MICA

③ ② ⑨ ⑥ ④ ③

ORANGE-TAN MED. STIFF MOIST F. SANDY CLAY (A-6)

Ø6/13 Ø6/13

RESIDUAL
TAN SOFT MOIST TO WET F. SANDY SILT (A-4)
W/TRACE OF MICA

BT

15+50.00

760 750 740 730 720 710 700 690 680

I-85 I-85

6:1 6:1 0.020 0.020

ROADWAY EMBANKMENT (FILL)

730.95

2:1

SS-12
SS-13
SS-14

15+00 -RPA-
90.0 RT.
ELEV. 714.5

ARTIFICIAL FILL
② RED-BRN-BLACK SOFT MOIST CLAYEY SANDY SILT (A-4) W/TRASH (METAL, WOOD)

ALLUVIUM
⑧ (PI=18) RED-ORANGE MED. STIFF TO STIFF MOIST MED. PLASTIC SILTY SANDY CLAY (A-7-6)
Ø4/13
⑨ (PI=12) GRAY, STIFF MOIST LOW PLASTIC SILTY SANDY CLAY (A-6)

RESIDUAL
⑨ BT GRAY-BRN LOOSE MOIST V. MICA, SILTY SAND (A-2-5)

15+00.00
-RPA-

760 750 740 730 720 710 700 690 680

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

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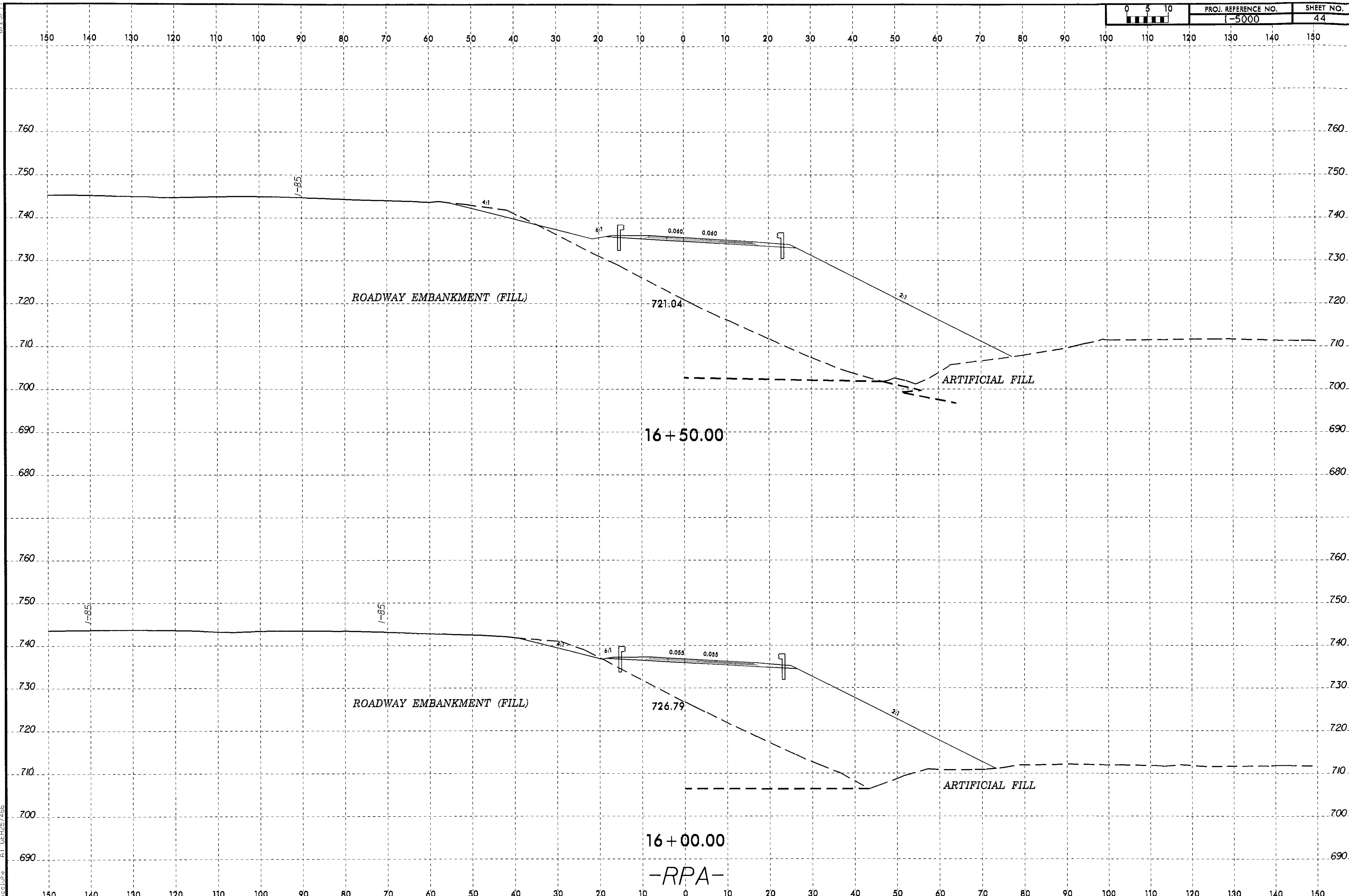
mcclure
AT GEN125466


PROJ. REFERENCE NO.
I-5000
SHEET NO.
44
I-85
ROADWAY EMBANKMENT (FILL)
721.04
ARTIFICIAL FILL
16+50.00
I-85
I-85
ROADWAY EMBANKMENT (FILL)
726.79
ARTIFICIAL FILL
16+00.00
-RPA-

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	45

17+50.00

ROADWAY EMBANKMENT (FILL)
I-85
722.57
703.57
4:1
0.060
0.060
SS-15
SS-16
SS-17
2:1
CREEK
17+55 -RPA-
55.0 RT,
ELEV. 697.8
ALLUVIUM
GRAY SOFT MOIST V. MICA.
CLAYEY SANDY SILT (A-4)
ALLUVIUM
ARTIFICIAL FILL
2
3
4
8
04/13
BRN-GRAY TO GRAY-TAN-YELLOW V. LOOSE
SAT. FINE & COARSE SAND (A-3) WITH GRAVEL
RESIDUAL
GRAY-BRN- LOOSE MOIST
V. MICA. SILTY SAND (A-2-5)
BT

17+00.00 -RPA-

I-85
ROADWAY EMBANKMENT (FILL)
730.29
712.02
6:1
0.060
0.060
2:1
CREEK
ALLUVIUM
ARTIFICIAL FILL

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

760 750 740 730 720 710 700 690 680 670 660

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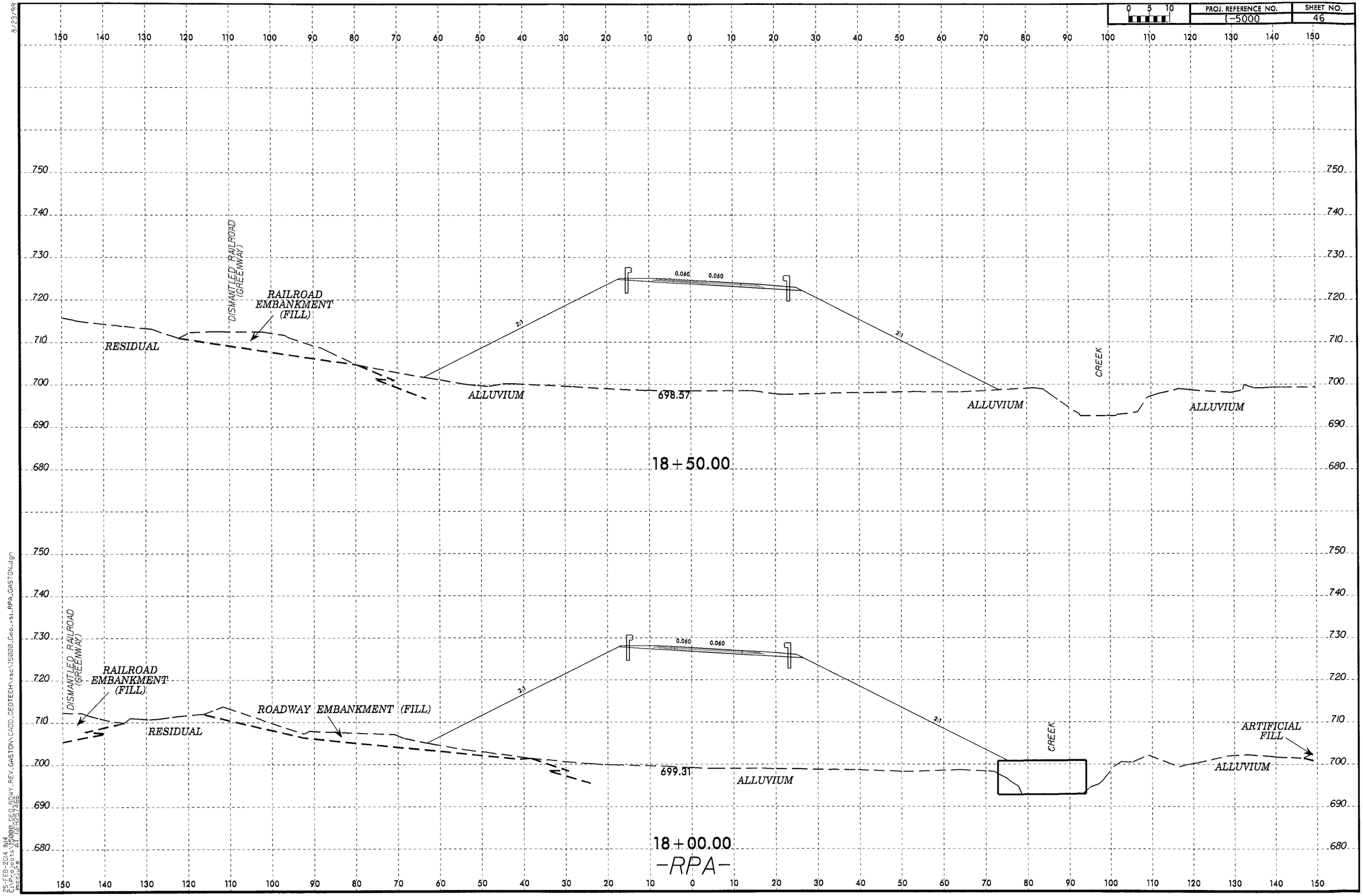
mcclure
AT GEH257466

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	46



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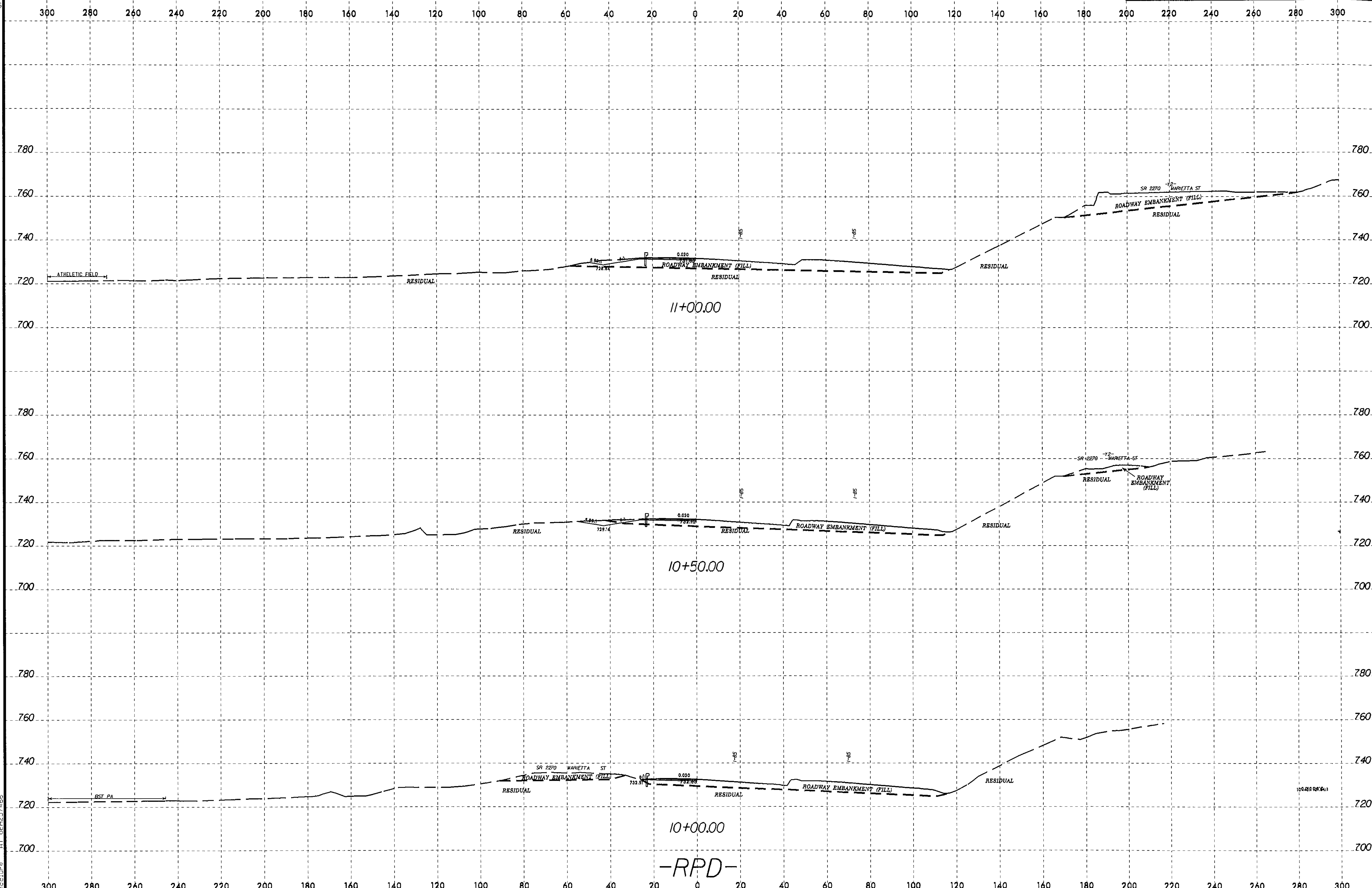
mcclure AT GEH257466

PROJ. REFERENCE NO.	SHEET NO.
I-5000	47



8/23/99

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lmcclure AT GEH257466

8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	48

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

760 740 720 700 780

ATHELETIC FIELD — ATHELETIC FIELD — RESIDUAL — RESIDUAL — ROADWAY EMBANKMENT (FILL) — RESIDUAL — RESIDUAL

I-85 I-85

0.018 .026 731.59

12+50.00

ATHELETIC FIELD — RESIDUAL — RESIDUAL — ROADWAY EMBANKMENT (FILL) — RESIDUAL — RESIDUAL

I-85 I-85

0.012 .04 731.75

12+00.00

ATHELETIC FIELD — RESIDUAL — RESIDUAL — ROADWAY EMBANKMENT (FILL) — RESIDUAL — RESIDUAL

I-85 I-85

5.84 .63 726.53 0.024 .02 731.84

11+50.00

SR 2270 "F" VARIETTA ST.

ROADWAY EMBANKMENT (FILL)

RESIDUAL

-RPD-

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mcclure AT GE257466

8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	49

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

760 740 720 700 680

ATHELETIC FIELD
ARTIFICIAL FILL
ATHELETIC FIELD
ARTIFICIAL FILL
ARTIFICIAL FILL
RESIDUAL
0.060 0.060 6:1
726.95
I-85
ROADWAY EMBANKMENT (FILL)
RESIDUAL
I-85
ROADWAY EMBANKMENT (FILL)
RESIDUAL

14+00.00

760 740 720 700 680

ATHELETIC FIELD
ARTIFICIAL FILL
ARTIFICIAL FILL
ATHELETIC FIELD
RESIDUAL
13+62 -RPD-
84.0 LT.
ELEV. 729.2
15
10
10
10
BY
-DAY-
(603)
ORANGE-RED STIFF DRY FINE SANDY SILT (A-4)
WITH TRACE OF MICA
0.060 0.060 6:1 (A)
738.05
730.18
I-85
ROADWAY EMBANKMENT (FILL)
RESIDUAL
I-85
RESIDUAL

13+50.00

760 740 720 700 680 660

ATHELETIC FIELD
ARTIFICIAL FILL
ARTIFICIAL FILL
RESIDUAL
ATHELETIC FIELD
RESIDUAL
0.044
730.96
I-85
ROADWAY EMBANKMENT (FILL)
RESIDUAL
I-85
RESIDUAL

13+00.00

-RPD-

760 740 720 700

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

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mcclure

8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	50

15+50.00

15+29 -RPD-
146.0 LT.
ELEV. 720.2

ARTIFICIAL FILL
RESIDUAL
ARTIFICIAL FILL
⑦ GRAY-RED-BRN MED STIFF DRY F SANDY SILT (A-4) W/TRACE OF MICA, GLASS & LEAVES
⑤ GRAY-RED-ORANGE MED STIFF MOIST SILTY CLAY (A-7)
⑬ WHITE-ORANGE-RED MED DENSE MOIST CLAYEY F SAND (A-2-6)
⑥ GRAY-WHITE-ORANGE-GRAY SOFT TO MED STIFF MOIST F SANDY SILT (A-4) W/TRACE OF MICA
⑥ BT

0.032 0.032 2:1 715.93
ARTIFICIAL FILL
RESIDUAL
ROADWAY EMBANKMENT (FILL)
ROADWAY EMBANKMENT (FILL)
I-85

15+00.00

14+79 -RPD-
84.0 LT.
ELEV. 721.4

ARTIFICIAL FILL
RESIDUAL
⑨ BRN-GRAY MED DENSE DRY CLAYEY F SAND (A-2-4) W/TRACE OF ORGANICS (ROOTS) & TRACE OF TRASH, (PAPER)
⑧ ORANGE-RED & GRAY-WHITE-ORANGE STIFF TO MED STIFF DRY F SANDY SILT (A-4) W/TRACE OF MICA
⑥ BT DRY (6/03)

15+00 -RPD-
CL
ELEV. 718.6

0.048 0.048 2:1 6:1 722.44
⑤ BRN LOOSE MOIST CLAYEY FINE SAND (A-2-6) WITH TRACE FRAGMENTS OF WOOD AND GLASS
③ WHITE MICA
⑤ GRAY-WHITE MED STIFF MOIST MICA SANDY SILT (A-4)
③
⑤ WHITE-GRAY LOOSE TO V LOOSE MOIST MICA SILTY SAND (A-2-4)
⑦ BT
ROADWAY EMBANKMENT (FILL)
ROADWAY EMBANKMENT (FILL)
I-85

15+00.00

14+27 -RPD-
85.0 LT.
ELEV. 721.9

ATHELETIC FIELD
ARTIFICIAL FILL
RESIDUAL
⑨ BRN-GRAY STIFF MOIST CLAYEY SANDY SILT (A-4)
⑩ BRN LOOSE TO MED DENSE MOIST SILTY SAND (A-2-6) WITH PIECES OF RUBBER AND PLASTIC AT 5'
⑩ BT DRY (4/03) BRN LOOSE TO MED. DENSE MOIST MICA SILTY SAND (A-2-4)

0.060 0.060 2:1 6:1 720.91 725.96
ROADWAY EMBANKMENT (FILL)
ROADWAY EMBANKMENT (FILL)
RESIDUAL
I-85

14+50.00

-RPD-

760 740 720 700 680 660

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

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mcclure
AT GEH2S/7466

8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	51

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

760 740 720 700 680 660

16+73 -RPD-
184.0 LT.
ELEV. 715.9

16+85 -RPD-
129.0 LT.
ELEV. 716.0

SS-8
SS-9
SS-10
SS-11

ARTIFICIAL FILL
RED-GRAY MED STIFF DRY F. SANDY SILT (A-4)
W/ TRACE OF MICA
GRAY & GRAY-BRN V LOOSE TO LOOSE MOIST CLAYEY SAND (A-2-6) W/TRACE OF MICA & TRACE OF TRASH (METAL & PLASTIC) 15.5-16.0
ALLUVIUM
GRAY-BRN LOOSE WET SILTY F. TO CSE. SAND (A-3)
RESIDUAL
GRAY-WHITE LOOSE WET SILTY F. TO CSE. SAND (A-3)

ARTIFICIAL FILL
ALLUVIUM
RESIDUAL
GRAY LOOSE MOIST MICA SILTY SAND (A-2-5) WITH PLASTIC GLASS AND WOOD AT 9.5', ASSORTED TRASH BETWEEN 8.5' AND 18.5'
GRAY LOOSE MOIST SILTY SAND (A-3-5)
GRAY-WHITE LOOSE MOIST SILTY SAND (A-3-5)

5.39% 6:1 713.56
0.000 0.000
712.85 2:1
ARTIFICIAL FILL
ALLUVIUM
RESIDUAL
ROADWAY EMBANKMENT (FILL)
I-85

16+50.00

15+96 -RPD-
61.0 LT.
ELEV. 717.3

16+06 -RPD-
50.0 RT.
ELEV. 713.4

ARTIFICIAL FILL
BRN V LOOSE TO LOOSE MOIST CLAYEY FINE SAND (A-2-6) WITH TRACE FRAGMENTS OF WOOD AND GLASS
ALLUVIUM
GRAY V LOOSE TO LOOSE WET CLAYEY F. SAND (A-2-6)
RESIDUAL
GRAY-WHITE LOOSE MOIST TO WET SILTY F. SAND (A-3-4)

5.39% 6:1 714.74
0.016 0.016
ARTIFICIAL FILL
BRN-ORANGE LOOSE TO MED. DENSE MOIST CLAYEY F. SAND (A-2-6) WITH TRACE AMOUNTS OF GLASS, BRICK AND WOOD
ALLUVIUM
GRAY LOOSE WET SILTY SAND (A-3-4)
RESIDUAL
ORANGE-TAN LOOSE MOIST SILTY F. SAND (A-3-4)
2:1
ROADWAY EMBANKMENT (FILL)
I-85

16+00.00
-RPD-

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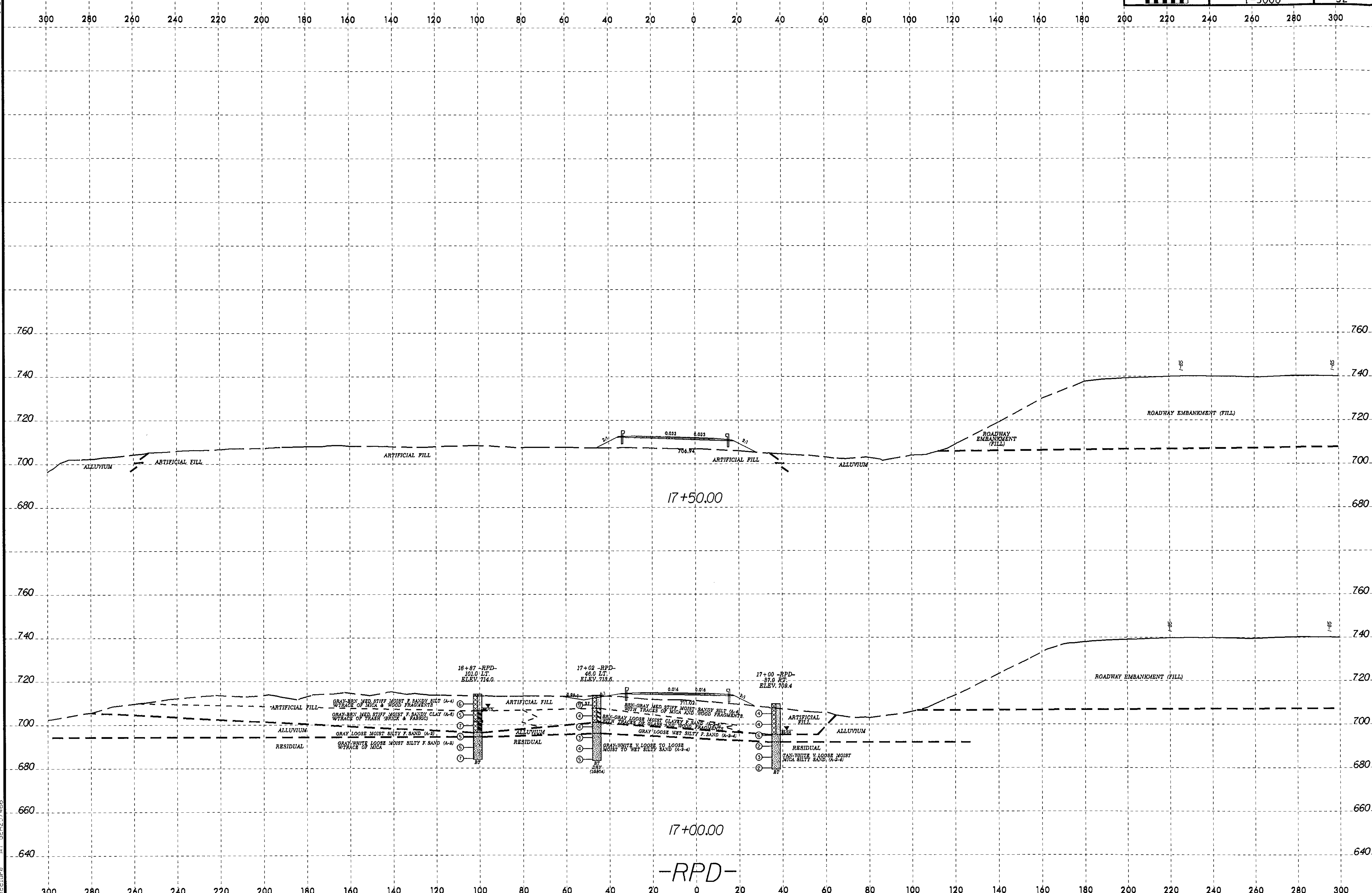
mcclure AT GEN257486

PROJ. REFERENCE NO.	SHEET NO.
I-5000	52



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mcclure AT GE425748B

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8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	53

300 280 260 240 220 200 180 160 140 120 100 80 60 40 20 0 20 40 60 80 100 120 140 160 180 200 220 240 260 280 300

760 740 720 700 680 660 640

ALLUVIUM
RESIDUAL
ALLUVIUM
RESIDUAL
ALLUVIUM
BRN SOFT MOIST CLAYEY SANDY SILT (A-4)
SS-15
SS-16
18'-65 -RPD-
94.0 LT.
ELEV. 700.7
WATER
RESIDUAL
TAN LOOSE MOIST TO WET MICA SILTY SAND (A-2-4)
ALLUVIUM
GRAY-WHITE & TAN-YELLOW V LOOSE MOIST TO WET V MICA SILTY SAND (A-2-5)
CREEK
2:1
0.046
0.046
2:1
ALLUVIUM
RESIDUAL
ROADWAY EMBANKMENT (FILL)
I-85
I-85
ROADWAY EMBANKMENT (FILL)

18+50.00

CREEK
17+82 -RPD-
269.0 LT.
ELEV. 701.4
ALLUVIUM
BRN SOFT MOIST CLAYEY SANDY SILT (A-4)
GRAY LOOSE MOIST TO WET MICA SAND (A-2-4) WITH GRAVEL
RESIDUAL
GRAY-WHITE MED DENSE TO V DENSE SAT SAND (A-2-4) WITH GRAVEL
BT
CREEK
17+80 -RPD-
114.0 LT.
ELEV. 706.5
ALLUVIUM
BRN-GRAY TO DARK GRAY LOOSE TO V LOOSE MOIST TO WET SILTY SAND (A-2-4)
WATER
GRAY STIFF SAT MED PLASTIC SANDY CLAY (A-7-5) WITH GRAVEL
TAN-YELLOW MOIST MED DENSE MICA SILTY CLAYEY SAND (A-2-6)
WEATHERED ROCK
BEYERLY WEATHERED CRYSTALLINE ROCK
BT
RESIDUAL
2:1
0.050
0.050
2:1
ALLUVIUM
ALLUVIUM
ROADWAY EMBANKMENT (FILL)
I-85
I-85
ROADWAY EMBANKMENT (FILL)

18+00.00
-RPD-

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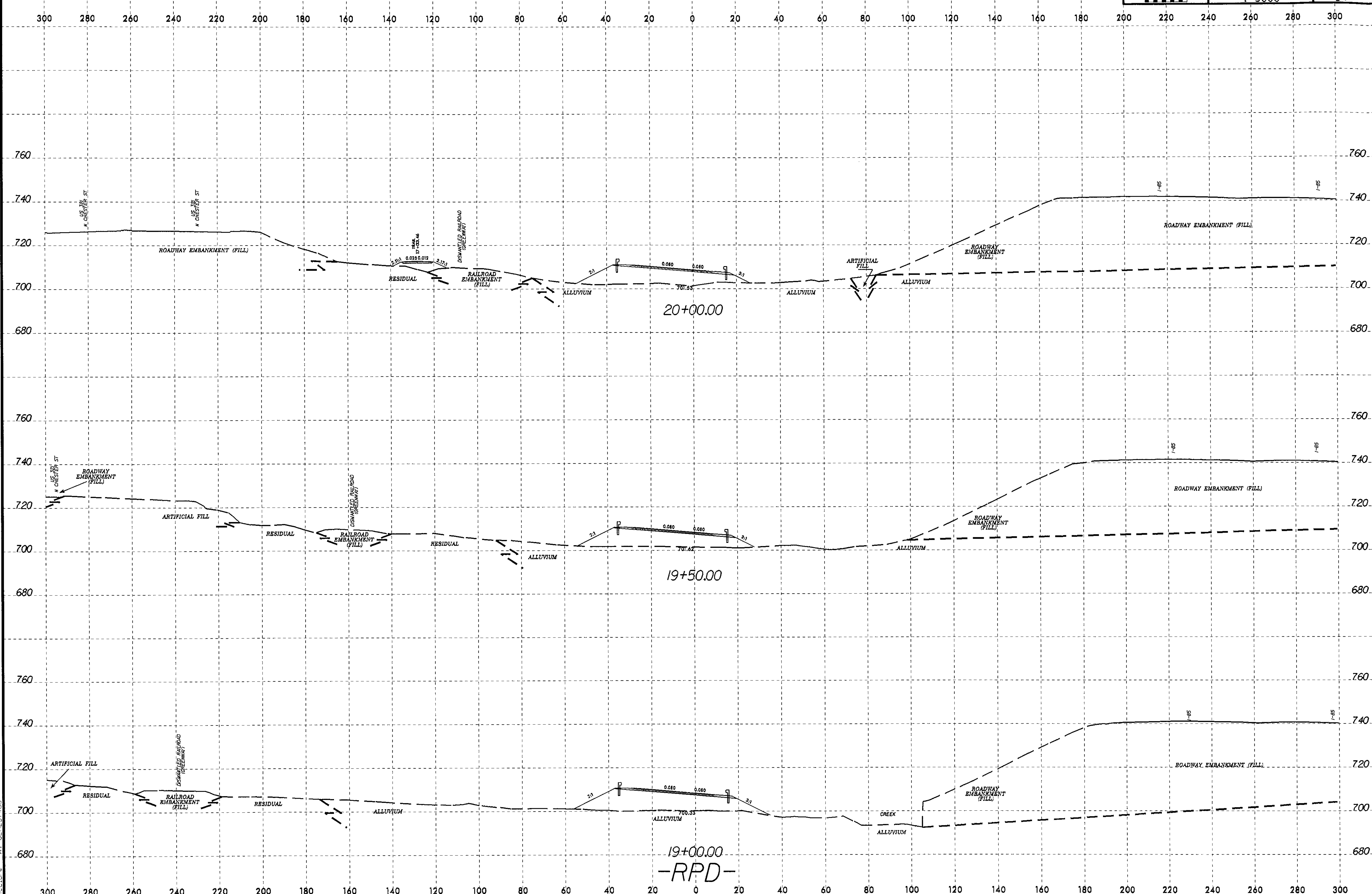
meclure
AT GEH257466

PROJ. REFERENCE NO.	SHEET NO.
I-5000	54



8/23/99

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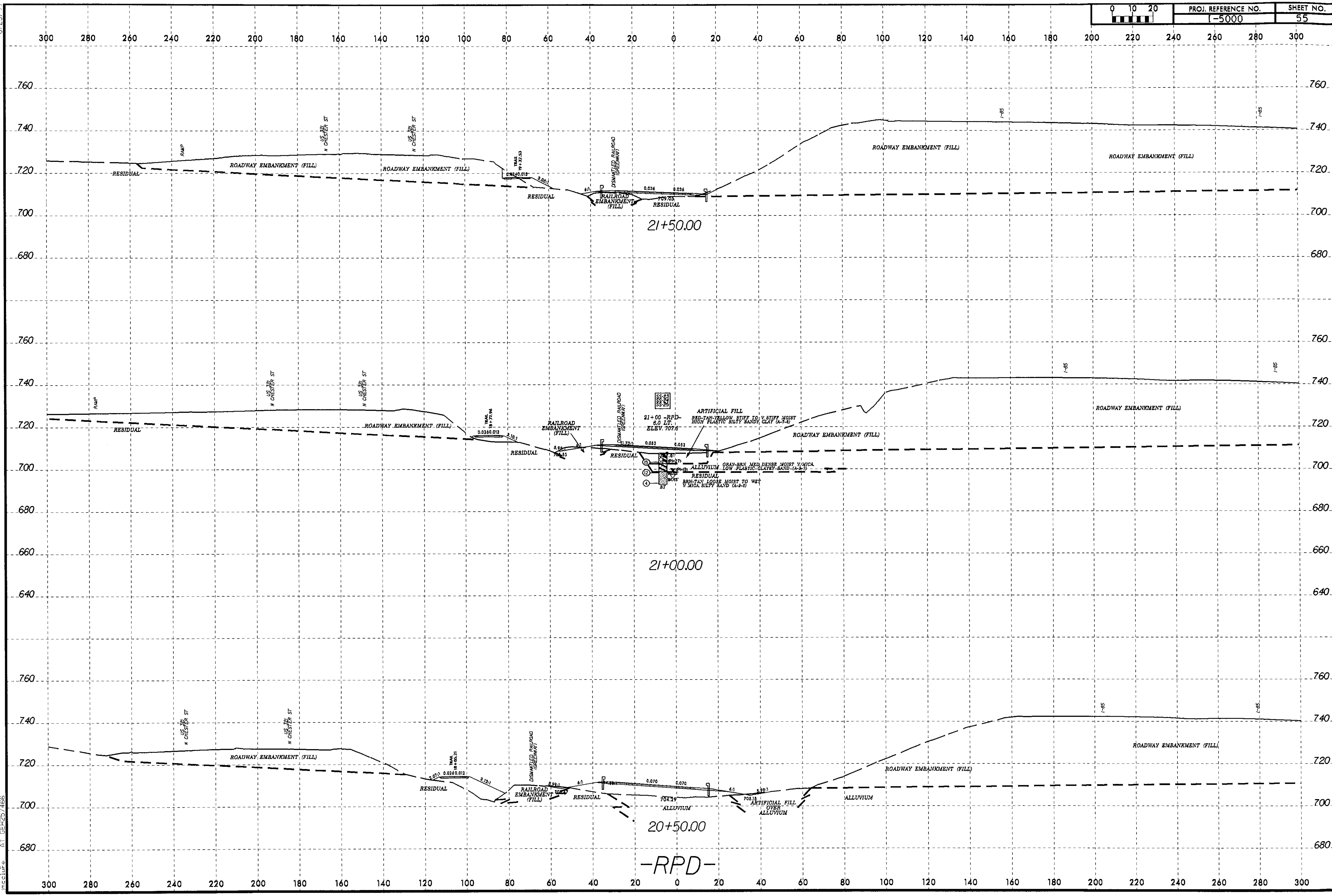
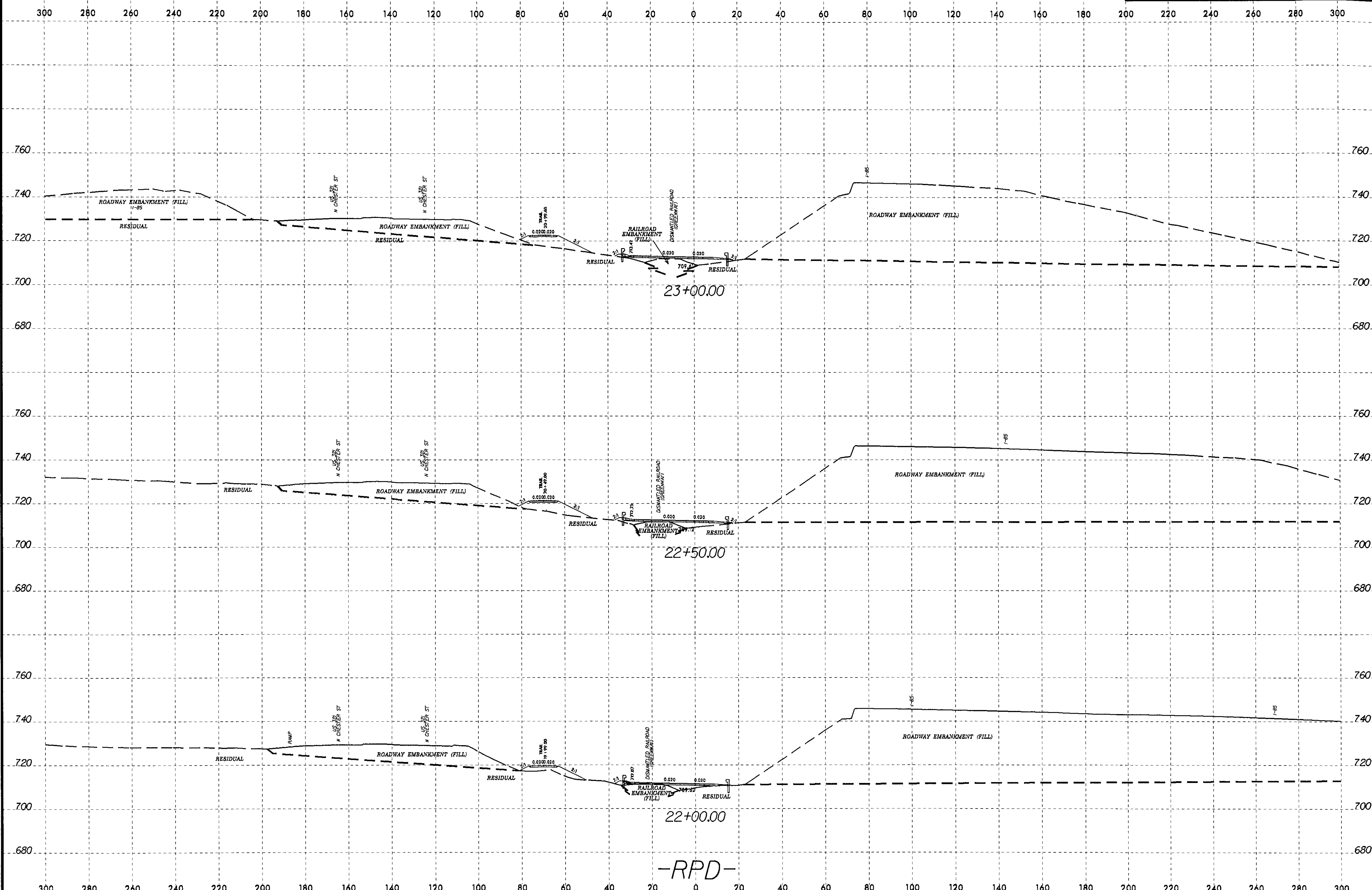
mcclure AT GEH257466



PROJ. REFERENCE NO.
I-5000
SHEET NO.
55
0 10 20
8/23/99
21+50.00
ROADWAY EMBANKMENT (FILL)
RESIDUAL
RAILROAD EMBANKMENT (FILL)
DISMANTLED RAILROAD (GREENWAY)
709.05
21+00.00
ARTIFICIAL FILL
21+00 -RPD-
6.0 LT.
ELEV. 707.6
ALLUVIUM
20+50.00
ARTIFICIAL FILL OVER ALLUVIUM
704.29
705.18
-RPD-

8/23/99

PROJ. REFERENCE NO.	SHEET NO.
I-5000	56



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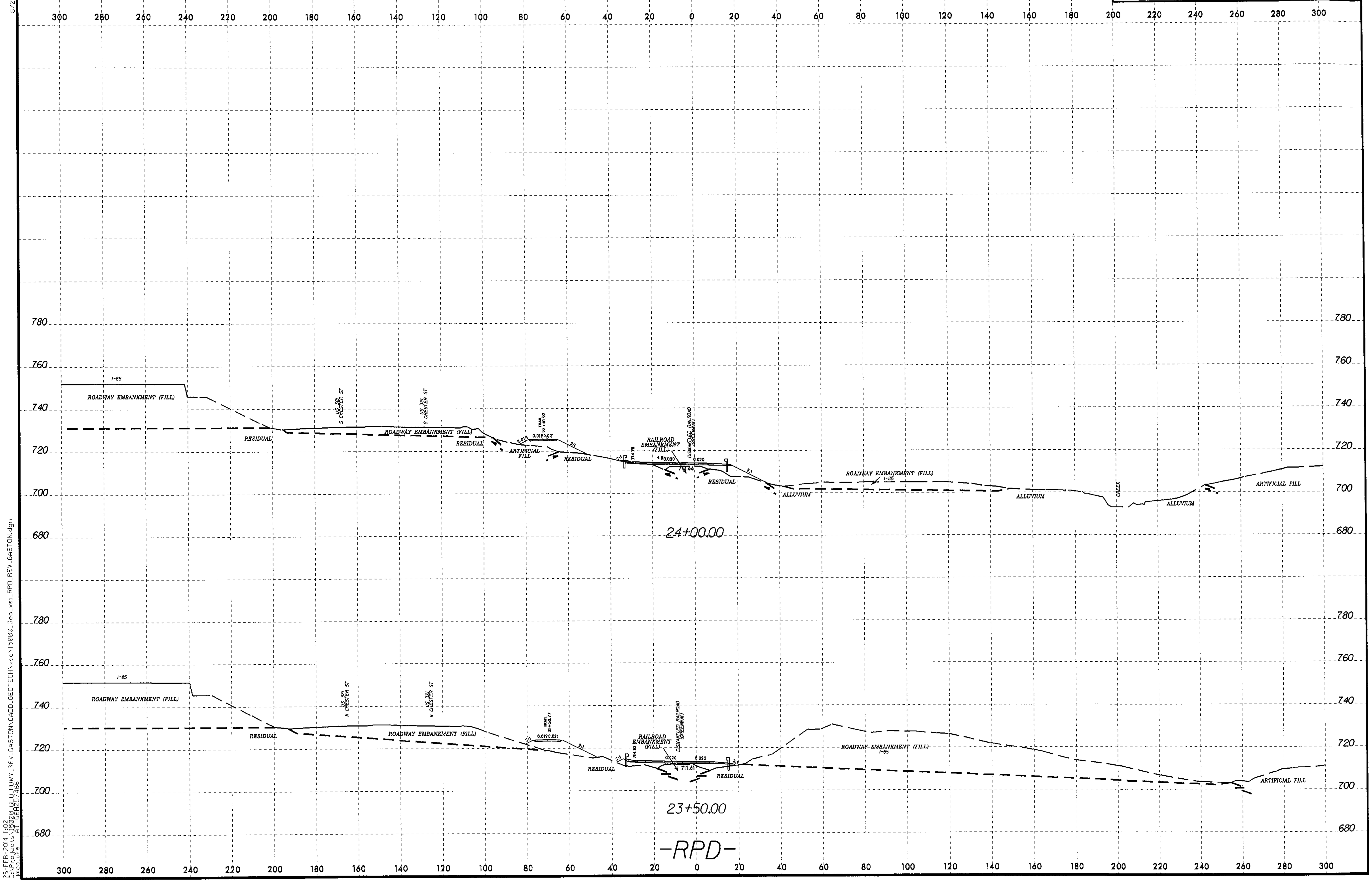
lmcclure AT GEH257466

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	57


I-85
ROADWAY EMBANKMENT (FILL)
US 321 S CHESTER ST
US 321 S CHESTER ST
ROADWAY EMBANKMENT (FILL)
RESIDUAL
ARTIFICIAL FILL
RAILROAD EMBANKMENT (FILL)
DISMANTLED RAILROAD (GREENWAY)
ROADWAY EMBANKMENT (FILL)
ALLUVIUM
CREEK
ARTIFICIAL FILL
24+00.00
I-85
ROADWAY EMBANKMENT (FILL)
US 321 N CHESTER ST
US 321 N CHESTER ST
ROADWAY EMBANKMENT (FILL)
RESIDUAL
RAILROAD EMBANKMENT (FILL)
DISMANTLED RAILROAD (GREENWAY)
711.61
ROADWAY EMBANKMENT (FILL)
ARTIFICIAL FILL
23+50.00
-RPD-

8/23/99

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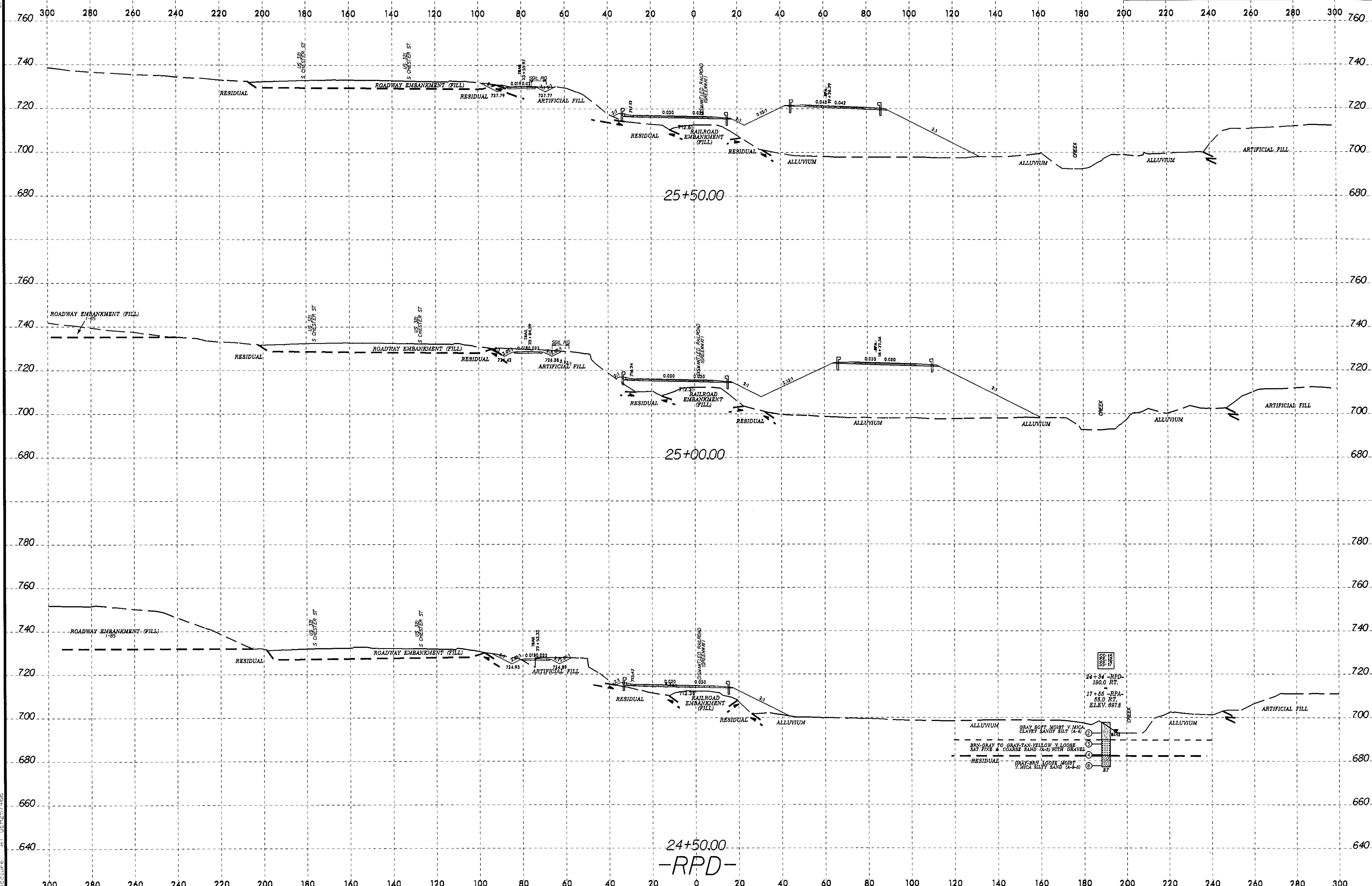
lmcclure AT GEH257466

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	58

8/23/99



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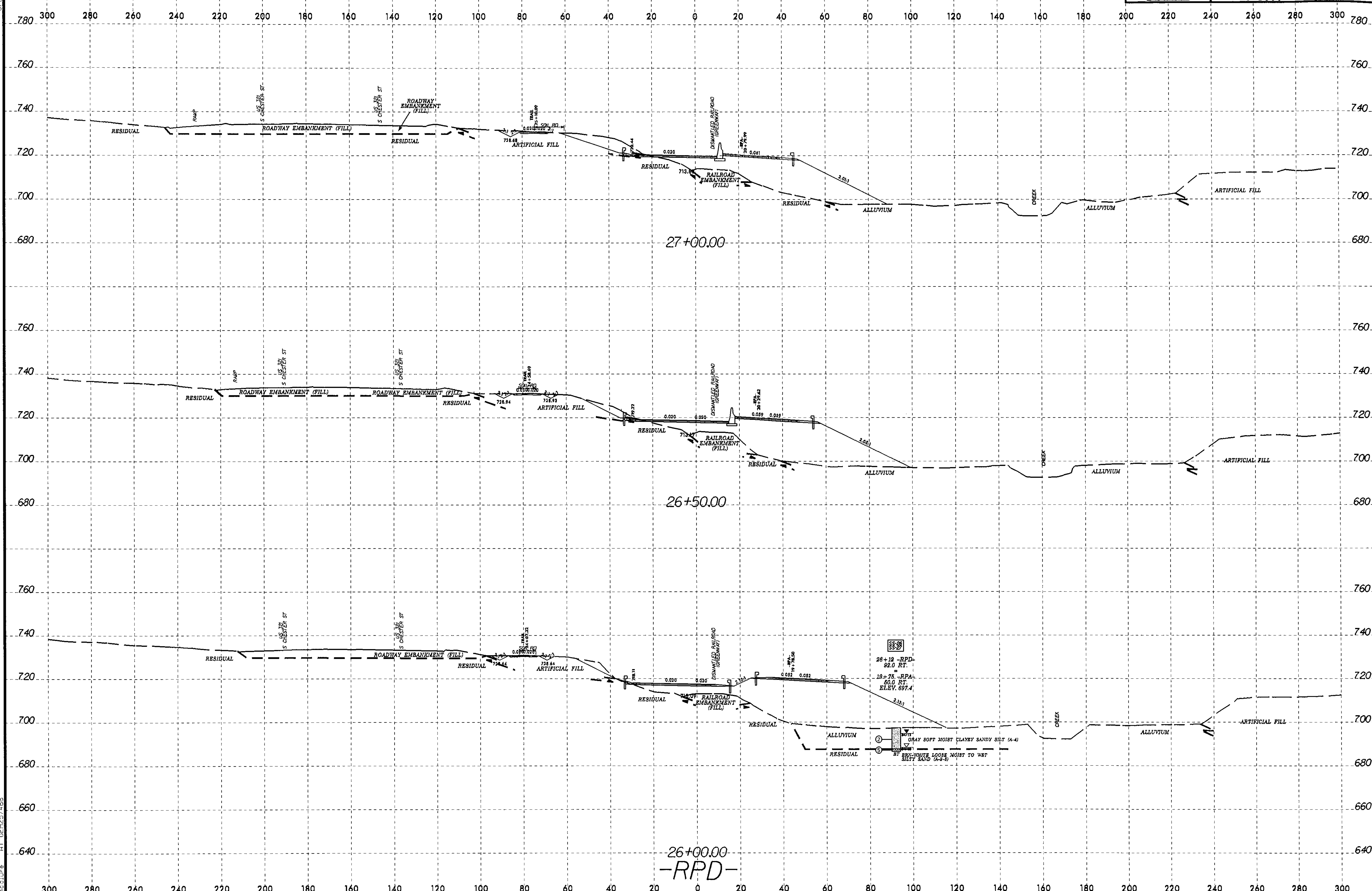
lmcclure AT GEH257466

PROJ. REFERENCE NO.	SHEET NO.
I-5000	59



8/23/99

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lmcclure AT GEH257466

8/23/99

0 10 20	PROJ. REFERENCE NO.	SHEET NO.
	I-5000	60

28+50.00

RAMP
US 321 S CHESTER ST
ROADWAY EMBANKMENT (FILL)
RESIDUAL
GST
TRAIL 26+61.44
3.0(1)
1.99:1
0.020
0.050
0.015
3.0(1)
1.99:1
724.84
724.65
ARTIFICIAL FILL
723.47
DISMANTLED RAILROAD (GREENWAY)
RR= 27+39.55
0.020
0.011
RAILROAD EMBANKMENT (FILL)
RESIDUAL
2:1
ALLUVIUM
CREEK
ARTIFICIAL FILL

28+00.00

RAMP
US 321 S CHESTER ST
ROADWAY EMBANKMENT (FILL)
RESIDUAL
CONC
3.0(1)
GST
TRAIL 28+91.34
2:1
0.020
0.050
0.015
726.46
726.55
ARTIFICIAL FILL
DISMANTLED RAILROAD (GREENWAY)
RR= 27+79.55
0.005
0.031
RESIDUAL
RAILROAD EMBANKMENT (FILL)
2:1
ALLUVIUM
CREEK
ARTIFICIAL FILL

27+50.00 -RPD-

RAMP
US 321 S CHESTER ST
ROADWAY EMBANKMENT (FILL)
RESIDUAL
ISABKBUS
TRAIL 28+61.22
2:1
0.020
0.018
727.84
727.64
ARTIFICIAL FILL
DISMANTLED RAILROAD (GREENWAY)
RR= 27+79.54
0.032
RESIDUAL
RAILROAD EMBANKMENT (FILL)
199:1
ALLUVIUM
CREEK
ARTIFICIAL FILL

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mcluff AT GEHEC/7466

8/23/99

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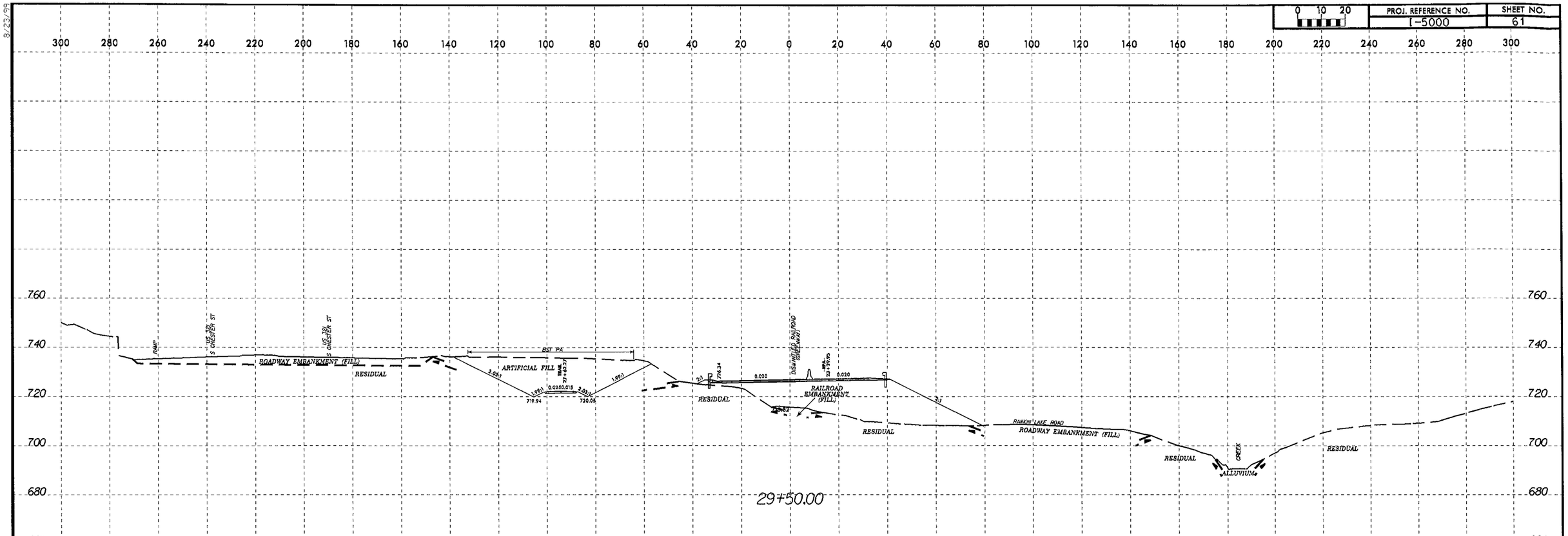

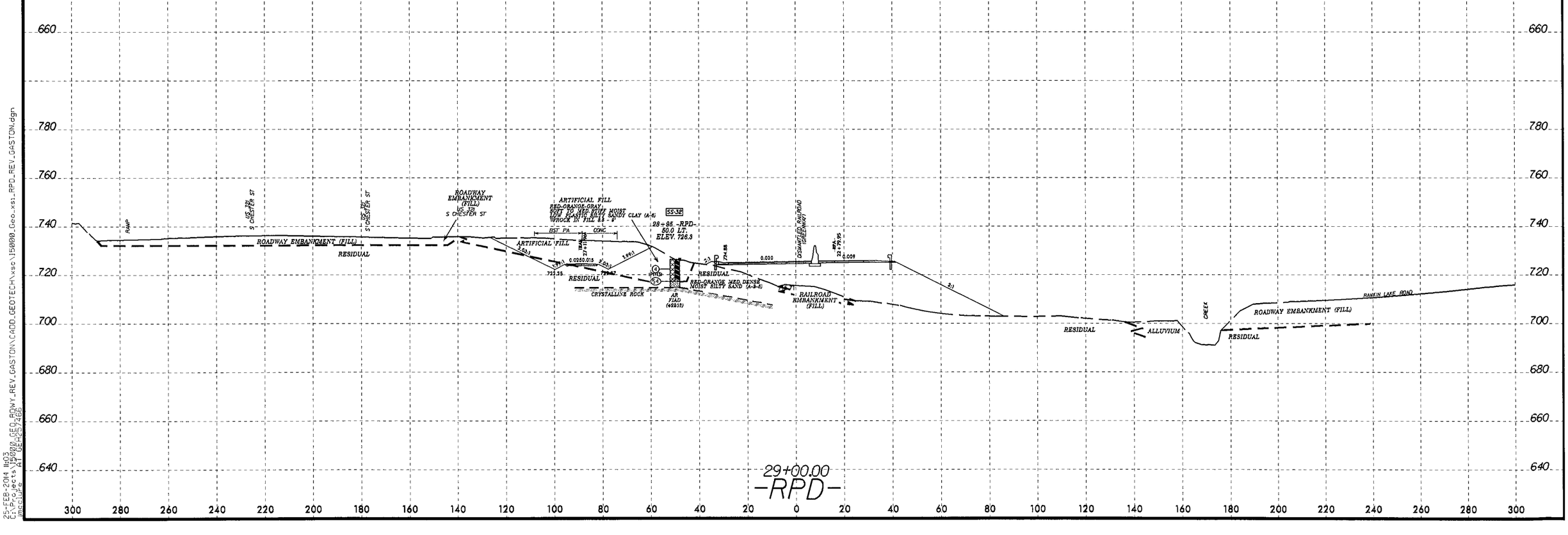

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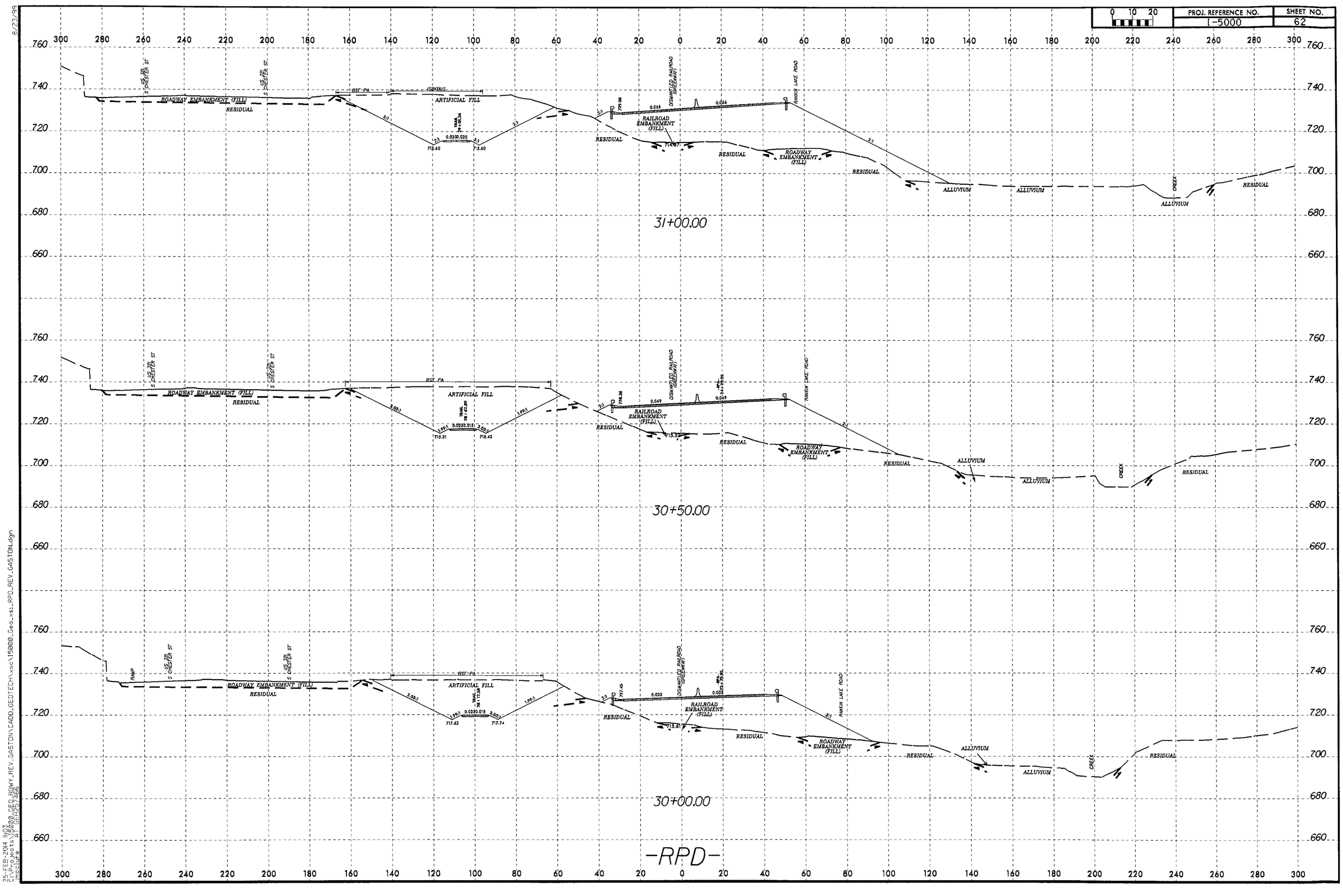

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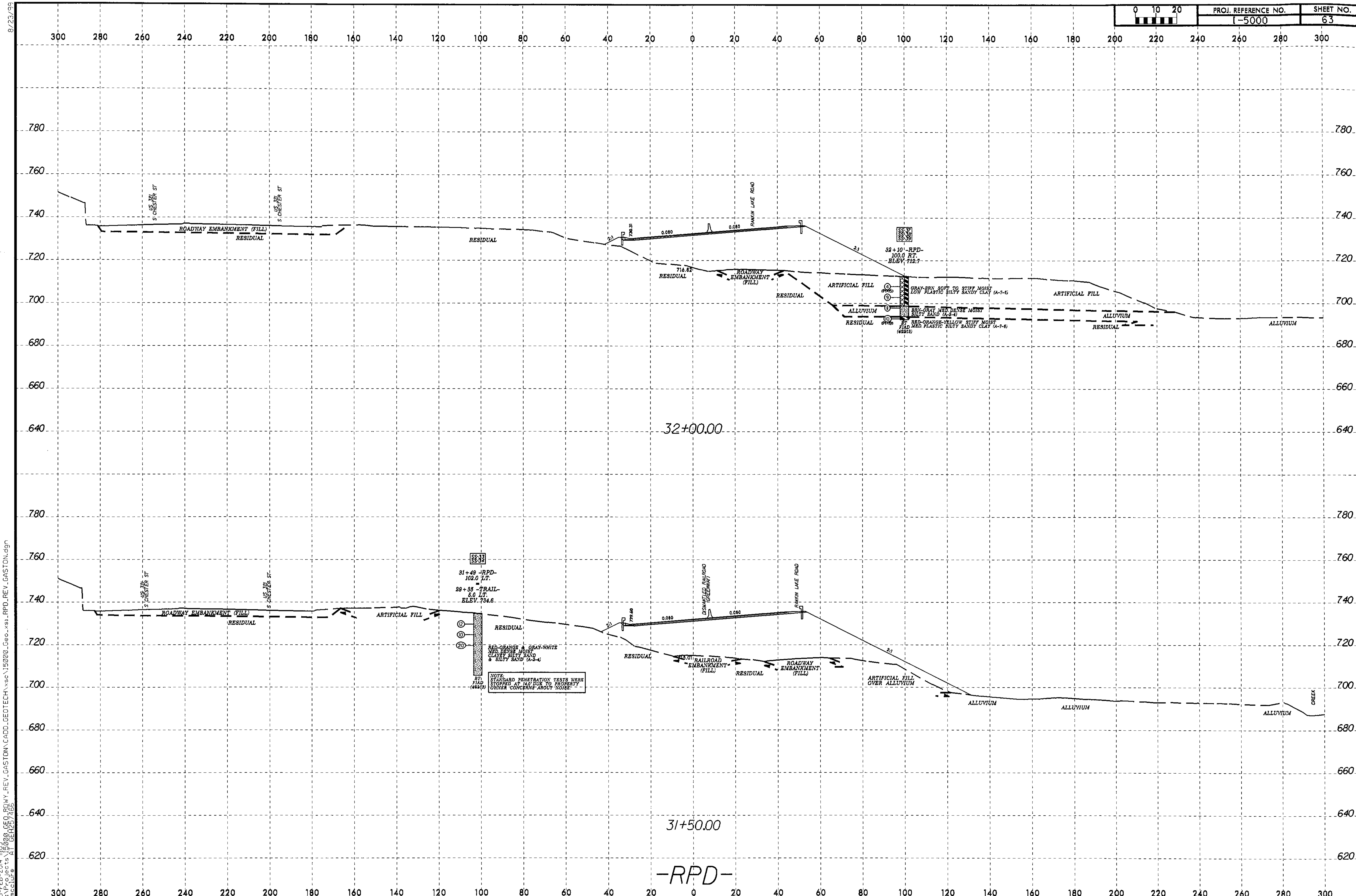
mcclure



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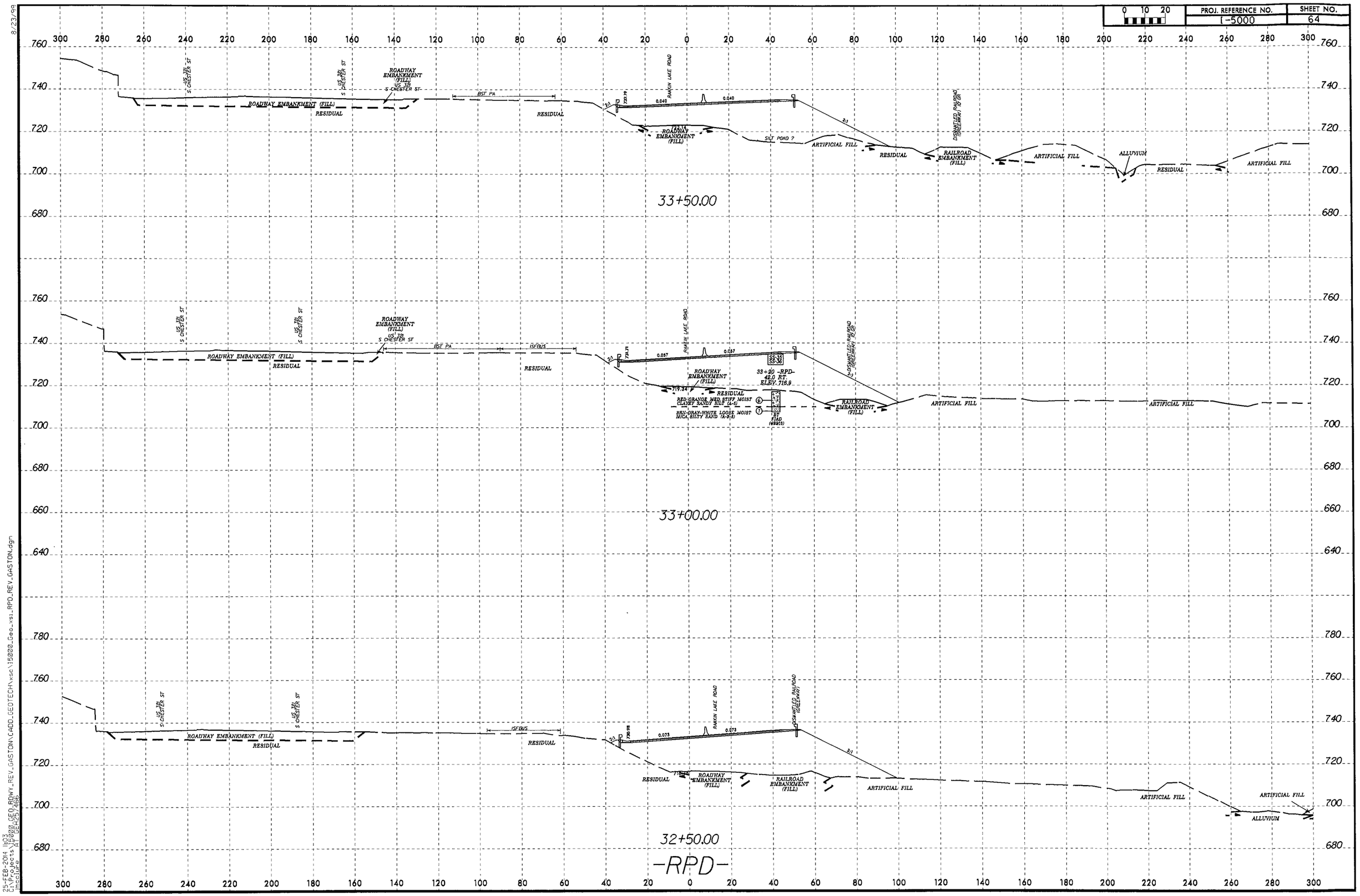

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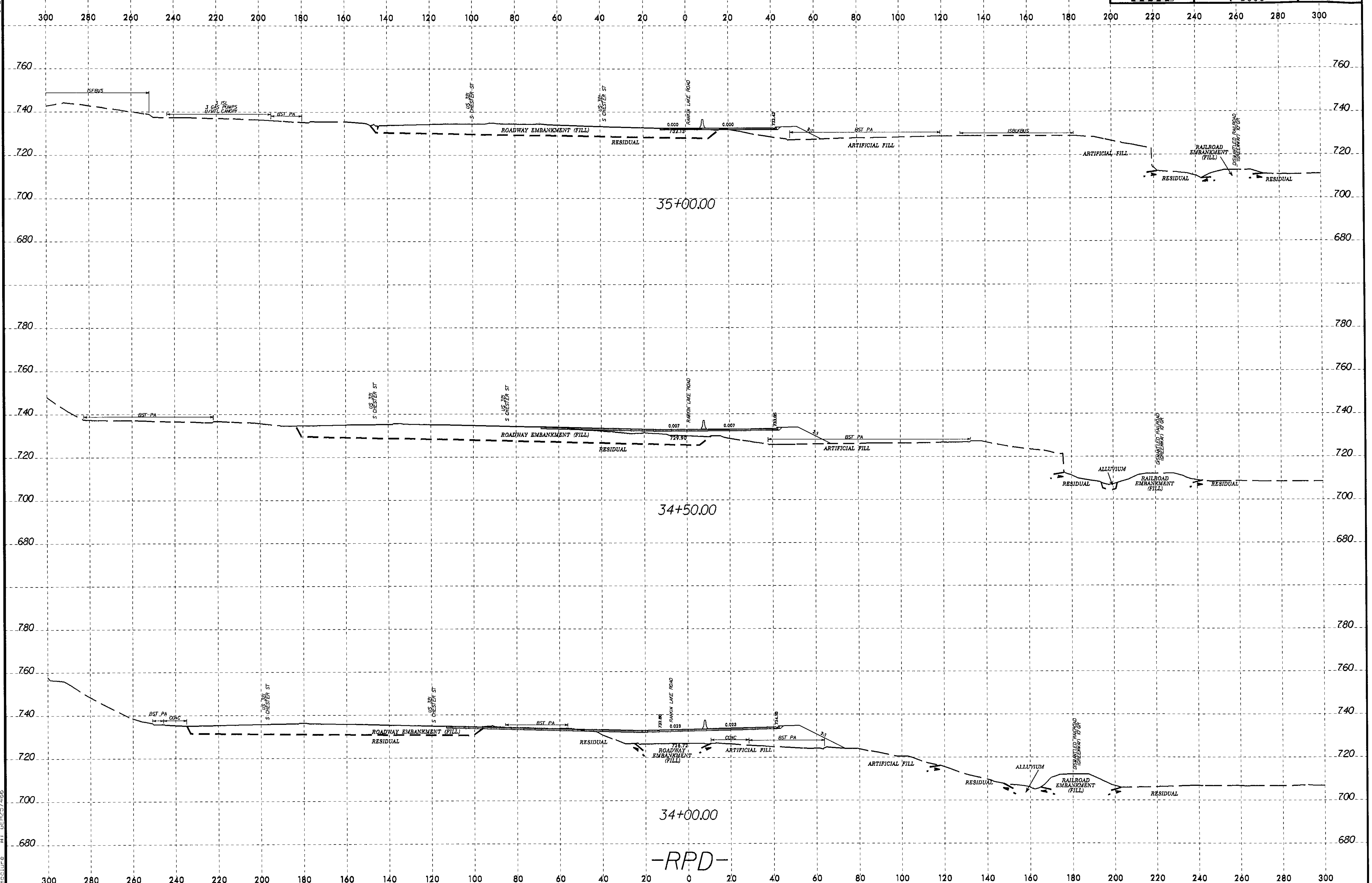

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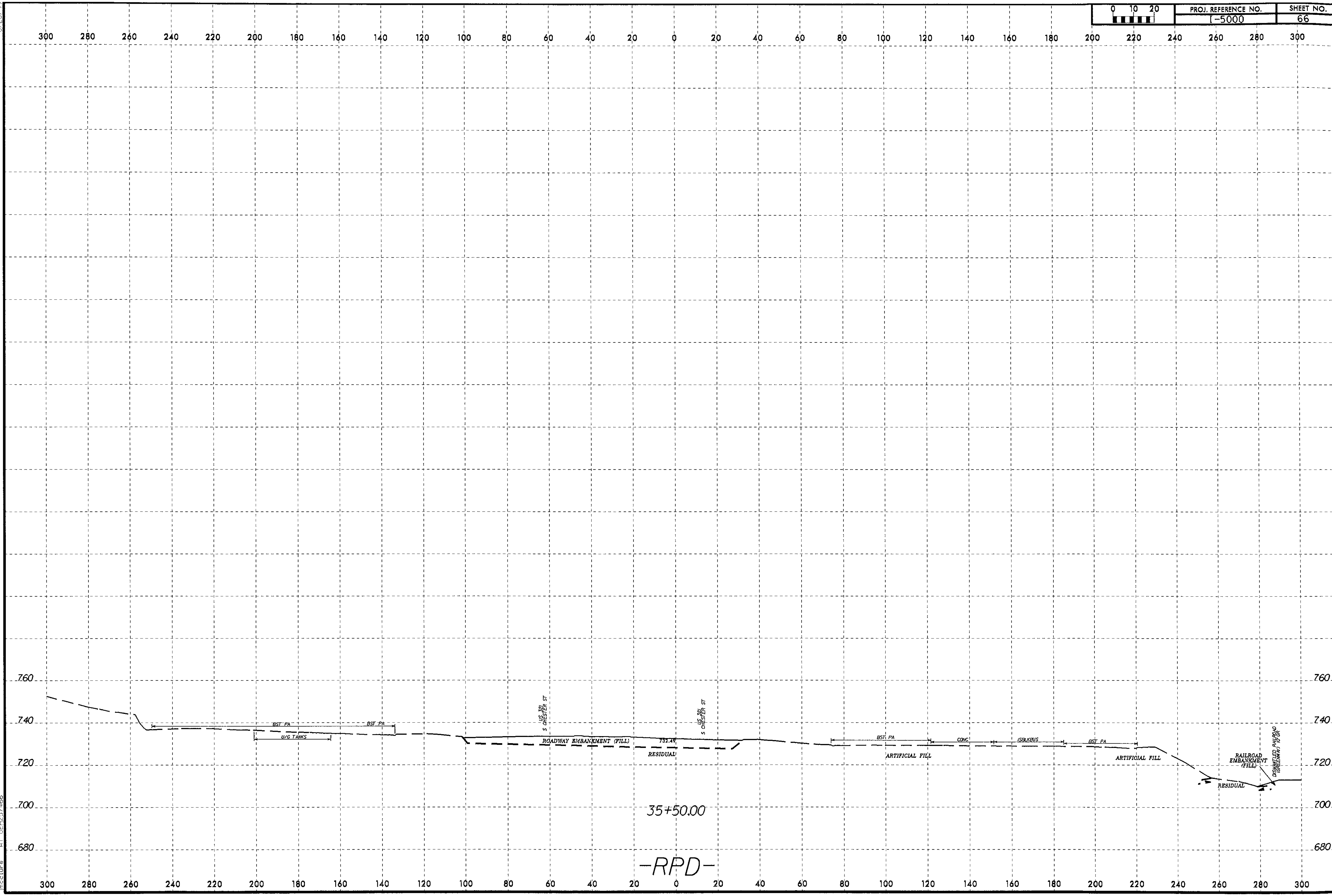

35+50.00

-RPD-

8/23/99
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imcclure AT GEH25766

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC	Line or Boring ID
							C.SAND	F.SAND	SILT	CLAY	10	40	200			
SS-1	85 LT.	14+27	4.5-5.5	A-4(0)	40	4	17.5	54.6	9.6	18.3	100	91	36	-	-	RPD
SS-2	85 LT.	14+27	9.5-10.5	A-2-5(0)	47	NP	28.3	50.7	12.8	8.1	97	83	26	-	-	RPD
SS-3	85 LT.	14+27	14.5-15.5	A-2-4(0)	30	NP	30.9	52.2	12.8	4.1	96	82	24	-	-	RPD
SS-4	114 LT.	17+80	3.7-4.7	A-2-4(0)	34	NP	30.3	49.9	13.6	6.1	95	83	25	-	-	RPD
SS-5	114 LT.	17+80	8.7-9.7	A-2-4(0)	30	NP	49.3	33.8	8.8	8.1	84	57	20	-	-	RPD
SS-6	114 LT.	17+80	13.7-14.7	A-7-5(3)	49	19	29.3	32.4	9.8	28.5	93	77	40	-	-	RPD
SS-7	114 LT.	17+80	18.7-19.7	A-2-4(0)	37	1	28.7	42.4	10.6	18.3	91	78	30	-	-	RPD
SS-8	129 LT.	16+35	4.0-5.0	A-2-5(0)	43	NP	50.9	33.4	9.6	6.1	97	69	19	-	-	RPD
SS-9	129 LT.	16+35	14.0-15.0	A-2-5(0)	42	NP	24.6	55.8	13.4	6.1	98	88	26	-	-	RPD
SS-10	129 LT.	16+35	19.0-20.0	A-2-5(0)	57	NP	26.1	57.6	12.2	4.1	100	91	21	-	-	RPD
SS-11	129 LT.	16+35	24.0-25.0	A-2-5(0)	49	NP	39.5	37.3	15.1	8.1	98	75	28	-	-	RPD
SS-12	90 RT.	15+00	4.3-5.3	A-4(0)	35	9	35.8	26.5	17.3	20.4	84	66	36	-	-	RPA
SS-13	90 RT.	15+00	9.3-10.3	A-7-6(8)	44	18	28.5	17.7	11.0	42.8	98	82	56	-	-	RPA
SS-14	90 RT.	15+00	14.3-15.3	A-6(3)	34	12	32.4	23.8	13.2	30.5	100	82	48	-	-	RPA
SS-15	55 RT.	17+55	4.5-5.5	A-4(0)	31	2	34.4	25.9	19.3	20.4	95	75	42	-	-	RPA
SS-16	55 RT.	17+55	9.5-10.5	A-3(0)	29	NP	66.0	27.3	2.6	4.1	93	64	8	-	-	RPA
SS-17	55 RT.	17+55	19.5-20.5	A-2-5(0)	49	NP	46.6	33.4	13.8	6.1	91	62	23	-	-	RPA
SS-18	94 LT.	18+65	4.1-5.1	A-4(0)	27	6	22.6	38.7	18.3	20.4	100	89	45	-	-	RPD
SS-19	94 LT.	18+65	9.1-10.1	A-2-5(0)	47	NP	44.8	29.5	17.5	8.1	88	60	28	-	-	RPD
SS-20	269 LT.	17+82	4.5-5.5	A-4(0)	25	2	16.5	53.8	13.4	16.3	99	91	37	-	-	RPD
SS-21	269 LT.	17+82	9.5-10.5	A-2-4(0)	26	NP	43.0	41.8	7.1	8.1	91	70	18	-	-	RPD
SS-22	269 LT.	17+82	14.5-15.5	A-2-4(0)	28	NP	54.2	32.2	9.6	4.1	92	59	17	-	-	RPD
SS-23	6 LT.	21+00	3.8-4.8	A-7-6(16)	56	27	24.1	16.7	18.9	40.2	100	85	63	-	-	RPD
SS-24	6 LT.	21+00	8.8-9.8	A-2-7(0)	45	13	47.7	24.3	9.9	18.1	100	69	31	-	-	RPD
SS-25	6 LT.	21+00	13.8-14.8	A-2-5(0)	53	NP	45.9	30.6	17.5	6.0	97	65	28	-	-	RPD
SS-26	50 RT.	19+75	4.8-5.8	A-4(0)	21	3	46.7	19.7	15.5	18.1	100	67	37	-	-	RPA
SS-27	50 RT.	19+75	9.8-10.8	A-2-5(0)	48	NP	48.3	24.9	18.7	8.0	94	60	31	-	-	RPA
SS-28	45 RT.	24+25	4.7-5.7	A-7-6(2)	41	12	40.4	23.3	14.1	22.1	100	72	40	-	-	Y2
SS-29	45 RT.	24+25	9.7-10.7	A-2-5(0)	47	NP	40.8	28.8	22.3	8.0	99	72	34	-	-	Y2
SS-30	15 RT.	21+12	3.7-4.7	A-6(7)	40	20	30.0	22.7	15.1	32.2	100	85	51	-	-	Y2
S-30A	12 RT.	17+40	0.0-3.0	A-4(4)	35	10	24.7	25.4	23.7	26.2	100	87	56	-	-	Y3
SS-31	12 RT.	17+40	5.5-6.5	A-2-4(0)	28	NP	43.3	34.2	18.5	4.0	99	75	28	-	-	Y3
SS-32	50 LT.	28+95	3.5-4.5	A-6(2)	35	13	31.4	22.1	18.3	28.2	85	67	43	-	-	RPD
SS-33	5 LT.	29+35	4.5-5.5	A-2-4(0)	35	5	45.5	27.4	17.1	10.1	98	67	31	-	-	TRAIL
SS-34	5 LT.	29+35	9.5-10.5	A-2-4(0)	33	NP	53.7	23.1	15.1	8.0	97	59	26	-	-	TRAIL
SS-35	42 RT.	33+20	3.6-4.6	A-5(5)	43	10	25.8	20.7	27.4	26.2	100	82	60	-	-	RPD
SS-36	42 RT.	33+20	8.6-9.6	A-2-5(0)	53	9	42.1	30.6	19.3	8.0	95	66	31	-	-	RPD
SS-37	100 RT.	32+10	4.3-5.3	A-7-6(5)	42	15	31.4	19.3	21.1	28.2	99	78	52	-	-	RPD
SS-38	100 RT.	32+10	14.3-15.3	A-2-4(0)	27	NP	57.5	26.2	10.3	6.0	94	58	19	-	-	RPD
SS-39	100 RT.	32+10	19.3-20.3	A-7-6(6)	46	19	37.0	18.7	14.1	30.2	100	75	48	-	-	RPD
SAMPLES FROM PROJECT: 37870, BULB AVENUE EXTENSION OVER LONG CREEK																
SS-1	15 RT.	22+10	3.2-4.2	A-4(0)	30	7	36.6	26.5	22.7	14.2	95	73	40	-	-	L
SS-2	15 RT.	22+10	8.2-9.2	A-7-6(7)	42	20	28.3	26.1	23.3	22.3	100	84	51	-	-	L
SS-3	17 LT.	22+71	0.0-3.7	A-4(0)	25	3	32.6	30.8	28.5	8.1	100	82	42	-	-	L

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	41153.1.1	1	23

REFERENCE: I-5000

PROJECT: 41153

SEE SHEET 3 FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

CONTENTS

LINE	STATION	PLAN	PROFILE
L8_DS	0+00 - 37+50	3-5	6-8

BORING LOGS SHEETS 9-20

SITE PHOTOS SHEETS 21-23

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *GASTON*

PROJECT DESCRIPTION *I-85/US 321 INTERCHANGE GEOMETRIC SAFETY IMPROVEMENTS SPECIAL: STREAM AGGRADATION INVESTIGATION*

INVENTORY

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N. C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. THE SUBSURFACE PLANS AND REPORTS, FIELD BORING LOGS, ROCK CORES AND SOIL TEST DATA ARE NOT 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 THE 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.

NOTES:
1. THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS ACCURATE NOR IS IT CONSIDERED PART OF THE PLANS, SPECIFICATIONS OR CONTRACT FOR THE PROJECT.
2. 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.

PERSONNEL

B. WORLEY, PG

A. STEWART

J. BARE

D. SUTTON

INVESTIGATED BY *B. WORLEY, PG*

DRAWN BY *B. WORLEY, PG*

CHECKED BY *D. DEWEY, PE*

SUBMITTED BY *Summit Design and Engineering Services PLLC*

DATE *JULY 2016*

NORTH CAROLINA LICENSED SEAL 1926 GEOLOGIST BRADLEY D. WORLEY

DocuSigned by:
Bradley D. Worley
CA8721209FCB476...

7/25/2016

SIGNATURE DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT REFERENCE NO.	SHEET NO.
41153.1.1	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION

SOIL IS CONSIDERED 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 THE STANDARD PENETRATION TEST (AASHTO T 206, ASTM D1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY INCLUDE THE FOLLOWING: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGULARITY, STRUCTURE, PLASTICITY, ETC. FOR 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
MATERIAL PASSING #40 LL PI	— 6 MX		— NP	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	40 MX 10 MX	41 MN 10 MX	40 MX 11 MN	41 MN 11 MN	SOILS WITH LITTLE OR MODERATE AMOUNTS OF ORGANIC MATTER		HIGHLY ORGANIC SOILS
GROUP INDEX	0		0	0		4 MX		8 MX	12 MX	16 MX	NO MX			
USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS. GRAVEL, AND SAND		FINE SAND	SILTY OR CLAYEY GRAVEL AND SAND				SILTY SOILS		CLAYEY SOILS				
GEN. RATING AS SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR				FAIR TO POOR	POOR	UNSUITABLE

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

CONSISTENCY OR DENSENESS

PRIMARY SOIL TYPE	COMPACTNESS OR CONSISTENCY	RANGE OF STANDARD PENETRATION RESISTENCE (N-VALUE)	RANGE OF UNCONFINED COMPRESSIVE STRENGTH ($TONS/FT^2$)
GENERALLY GRANULAR MATERIAL (NON-COHESIVE)	VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE	< 4 4 TO 10 10 TO 30 30 TO 50 > 50	N/A
GENERALLY SILT-CLAY MATERIAL (COHESIVE)	VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD	< 2 2 TO 4 4 TO 8 8 TO 15 15 TO 30 > 30	< 0.25 0.25 TO 0.5 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
NON PLASTIC	0-5	VERY LOW
SLIGHTLY PLASTIC	6-15	SLIGHT
MODERATELY PLASTIC	16-25	MEDIUM
HIGHLY PLASTIC	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.
UNIFORMLY GRADED - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE.
GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLE SIZES 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 WHEN THEY ARE CONSIDERED OF SIGNIFICANCE.

COMPRESSIBILITY

SLIGHTLY COMPRESSIBLE	LL < 31
MODERATELY COMPRESSIBLE	LL = 31 - 50
HIGHLY COMPRESSIBLE	LL > 50

PERCENTAGE OF MATERIAL

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

GROUND WATER

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

MISCELLANEOUS SYMBOLS

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

RECOMMENDATION SYMBOLS

- UNDERCUT
- SHALLOW UNDERCUT
- UNCLASSIFIED EXCAVATION - UNSUITABLE WASTE
- UNCLASSIFIED EXCAVATION - ACCEPTABLE DEGRADABLE ROCK
- UNCLASSIFIED EXCAVATION - ACCEPTABLE, BUT NOT TO BE USED IN THE TOP 3 FEET OF EMBANKMENT OR BACKFILL

ABBREVIATIONS

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

SAMPLE ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

DRILL UNITS:
- [ ] CME-45C
- [ ] CME-55
- [ ] CME-550
- [ ] VANE SHEAR TEST
- [ ] PORTABLE HOIST
- [x] Diedrich D-50
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [x] 6" 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 _____
- [ ] -H _____
- [ ] -N _____

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

ROCK DESCRIPTION

HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT REFUSAL IF TESTED. 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, WOULD YIELD SPT N VALUES > 100 BPF*
VERY SEVERE (V SEV.)	ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE THAT ONLY MINOR VESTIGES OF ORIGINAL ROCK FABRIC REMAIN. *IF TESTED, WOULD YIELD 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 FOOT
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 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, SUCH 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: See Notes

ELEVATION: FEET

NOTES:

Boring collar elevations derived using Geopak and the TIN file (15000_ls_tin (2).tin)

REF = SOUNDING ROD REFUSAL

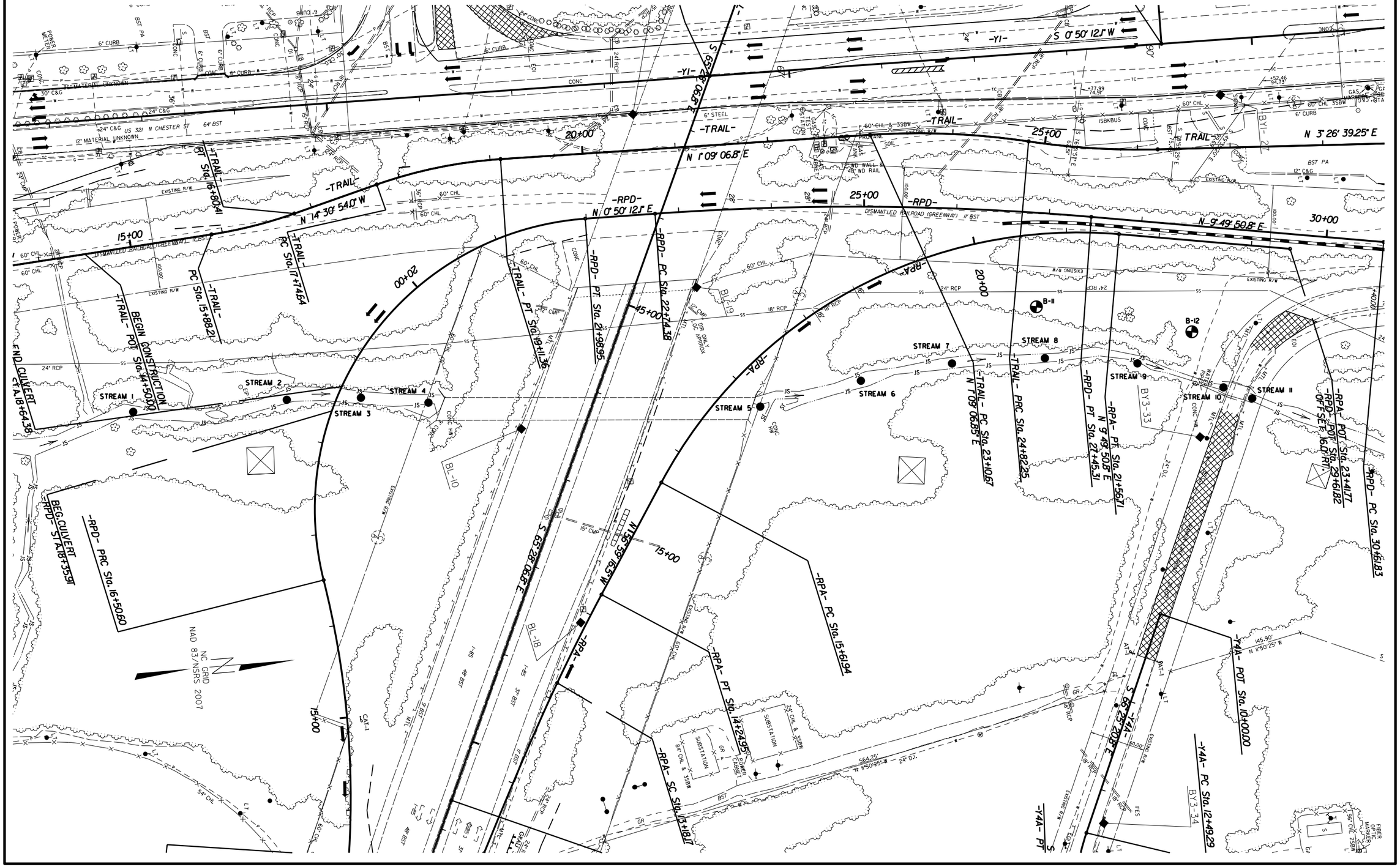
DATE: 8-15-14

PROJECT REFERENCE NO.	SHEET NO.
41153.1.1 (I-5000)	3

SITE PLAN

0 100 200

FEET



PROJECT REFERENCE NO.	SHEET NO.
41153.1.1 (I-5000)	4

SITE PLAN

0 100 200

FEET

NAD 83/NSRS 2007

NC GRID

-RPD- POT Sta. 24+22.38
N 40° 57' 53.91" W

-RPD- PC Sta. 30+69.83

-RPD- PC Sta. 29+05.39

-TRAIL- PC Sta. 31+61.46
-TRAIL- POT Sta. 31+58.83
BEGIN CMAQ FUNDING

-RPD- POC Sta. 31+64.31
-TRAIL- POT Sta. 30+37.36

-RPD- PT Sta. 33+71.71
-TRAIL- PC Sta. 33+98.77
N 40° 57' 53.91" W

-TRAIL- PT Sta. 34+42.47

-TRAIL- PC Sta. 32+34.38
N 42° 05' 12.18" E

35+00
N 44° 58' 42.11" E

-TRAIL- PC Sta. 38+99.10

-TRAIL- PT Sta. 40+48.61

40+00
N 00° 48' 07" E

-TRAIL- PC Sta. 42+95.94

-TRAIL- PT Sta. 43+32.23

45+00
N 22° 56' 10.94" E

-TRAIL- PRC Sta. 45+08.61

-TRAIL- PT Sta. 46+08.45
N 22° 18' 17.59" E

-TRAIL- POT Sta. 46+92.81
END CMAQ FUNDING

-TRAIL- PC Sta. 44+14.08

-Y2- PRC Sta. 20+73.11

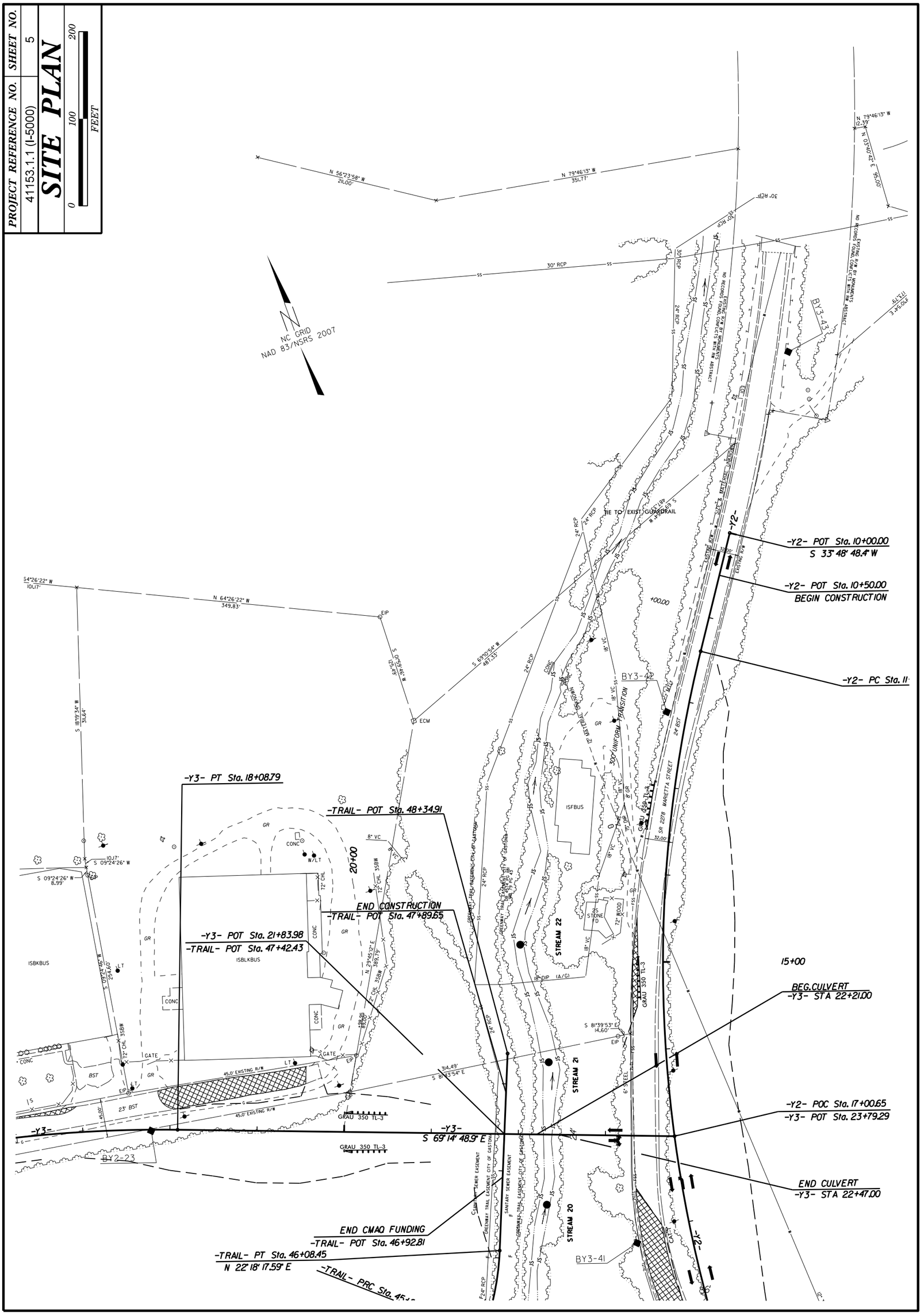
-Y2- PRC Sta. 26+33.13
END CONSTRUCTION

STREAM 11
STREAM 13
STREAM 14
STREAM 15
STREAM 16
STREAM 17
STREAM 18
STREAM 19

GREENWAY TRAIL EASEMENT CITY OF GASTONIA
SANITARY SEWER EASEMENT
GREENWAY TRAIL EASEMENT

S 23°54'35" W 251.00'
S 23°54'35" W 251.00'
S 51°39'35" W 498.20'

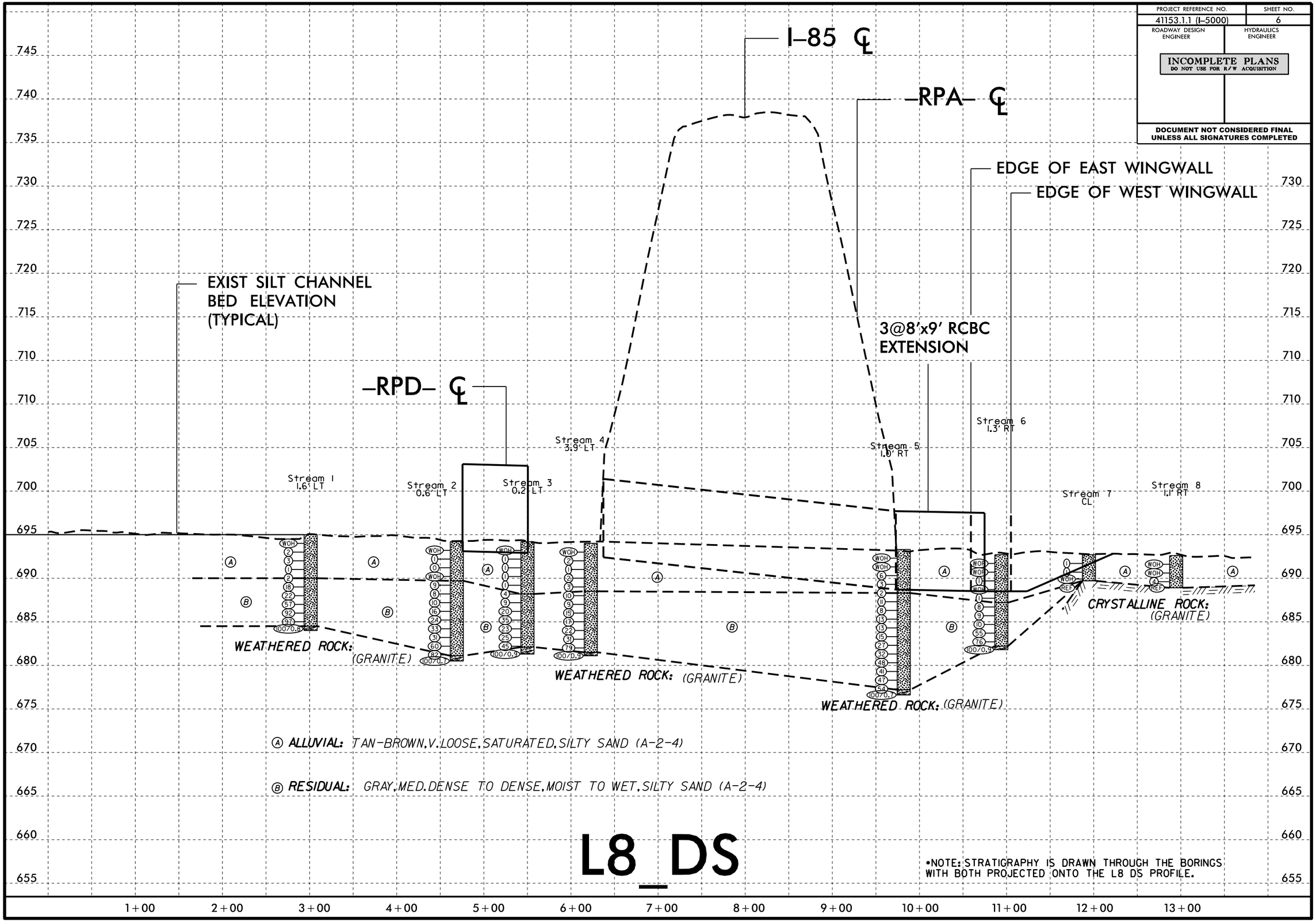
SR 2278 MARIETTA STREET
2# BST
EXISTING R/W
CONC
CURB
GRAU 350-TE-2
12" TYPE UNKNOWN
3" STEEL
6" S STEEL
FIBER OPTIC MARKER
BY3-39
BY3-40
BY3-41


PROJECT REFERENCE NO.
41153.1.1 (I-5000)
SHEET NO.
5
SITE PLAN
0
100
200
FEET
NC GRID
NAD 83/NSRS 2007
-Y2- POT Sta. 10+00.00
S 33° 48' 48.4" W
-Y2- POT Sta. 10+50.00
BEGIN CONSTRUCTION
-Y2- PC Sta. 11
-Y3- PT Sta. 18+08.79
-TRAIL- POT Sta. 48+34.91
-Y3- POT Sta. 21+83.98
-TRAIL- POT Sta. 47+42.43
END CONSTRUCTION
-TRAIL- POT Sta. 47+89.65
15+00
BEG.CULVERT
-Y3- STA 22+21.00
-Y2- POC Sta. 17+00.65
-Y3- POT Sta. 23+79.29
END CULVERT
-Y3- STA 22+47.00
END CMAQ FUNDING
-TRAIL- POT Sta. 46+92.81
-TRAIL- PT Sta. 46+08.45
N 22° 18' 17.59" E
-TRAIL- PRC Sta. 45+
-Y3-
S 69° 14' 48.9" E
STREAM 22
STREAM 21
STREAM 20
BY3-43
BY3-42
BY3-41
BY2-23
TIE TO EXIST GUARDRAIL
ISFBUS
ISBKBUS
ISBLKBUS
GRAU 350 TL-3
SR 2278 MARIETTA STREET
24" RCP
30" RCP
18" VC
8" VC
72" CMP
72" WOOD
6" STEEL
24" BST
23' BST
45.0' EXISTING R/W
GREENWAY TRAIL EASEMENT CITY OF GASTONIA
SANITARY SEWER EASEMENT
GREENWAY TRAIL EASEMENT CITY OF GASTONIA
N 64°26'22" W
349.83'
S 09°24'26" W
8.99'
S 18°39'34" W
316.64'
N 79°46'13" W
351.77'
N 56°23'58" W
24.00'
S 69°10'48" W
487.33'
S 09°56'48" W
125.49'
N 22°45'27" E
383.79'
S 81°39'53" E
14.60'
S 81°23'54" E
314.49'
S 09°24'26" W
254.60'
N 79°46'13" W
12.39'
N 22°45'27" E
95.00'

PROJECT REFERENCE NO.	SHEET NO.
41153.1.1 (I-5000)	6
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



Ⓐ **ALLUVIAL:** TAN-BROWN, V. LOOSE, SATURATED, SILTY SAND (A-2-4)

Ⓑ **RESIDUAL:** GRAY, MED. DENSE TO DENSE, MOIST TO WET, SILTY SAND (A-2-4)

L8_DS

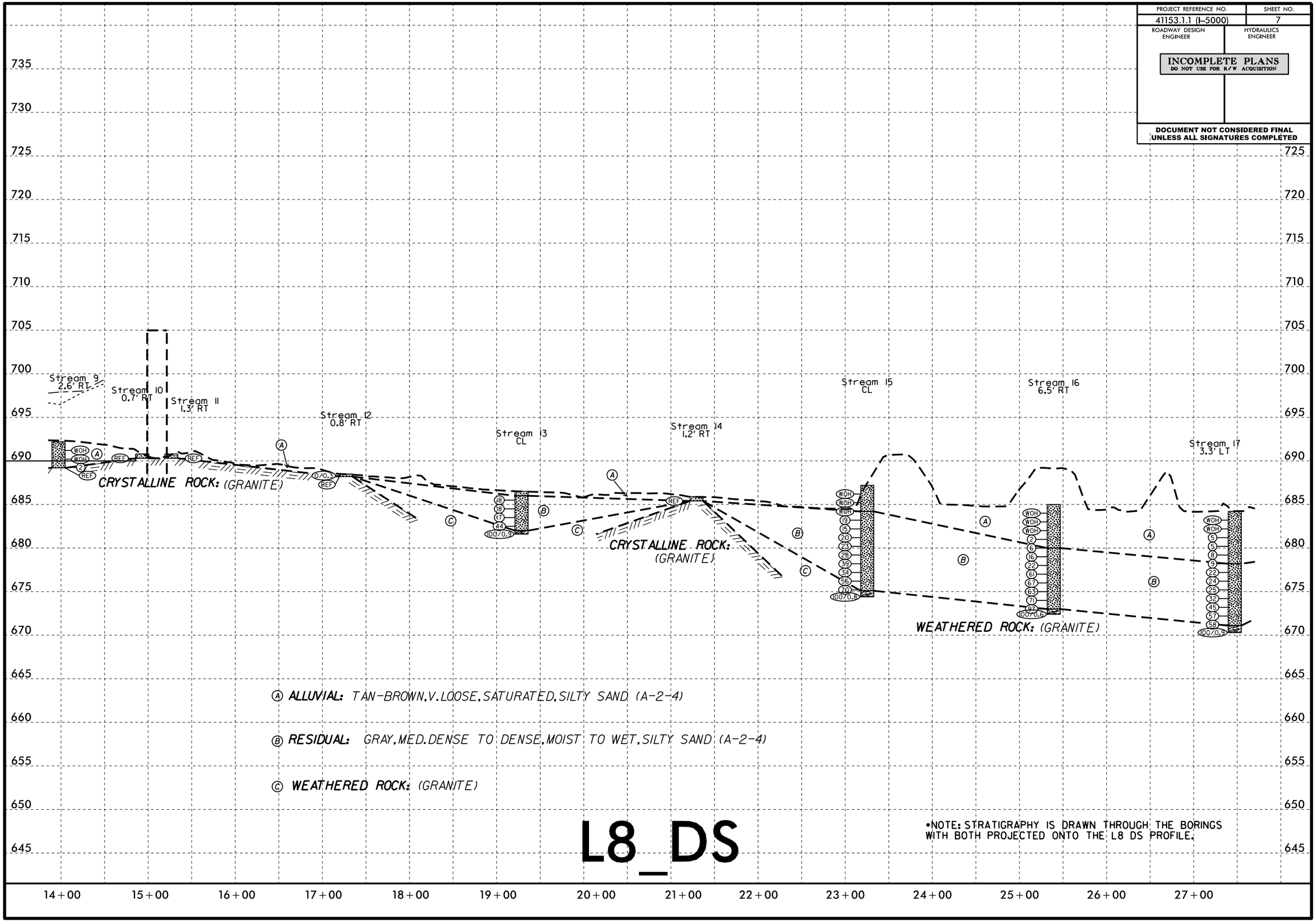
•NOTE: STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE L8 DS PROFILE.

PROJECT REFERENCE NO.	SHEET NO.
41153.1.1 (I-5000)	7

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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Ⓑ **RESIDUAL:** GRAY, MED. DENSE TO DENSE, MOIST TO WET, SILTY SAND (A-2-4)

Ⓒ **WEATHERED ROCK:** (GRANITE)

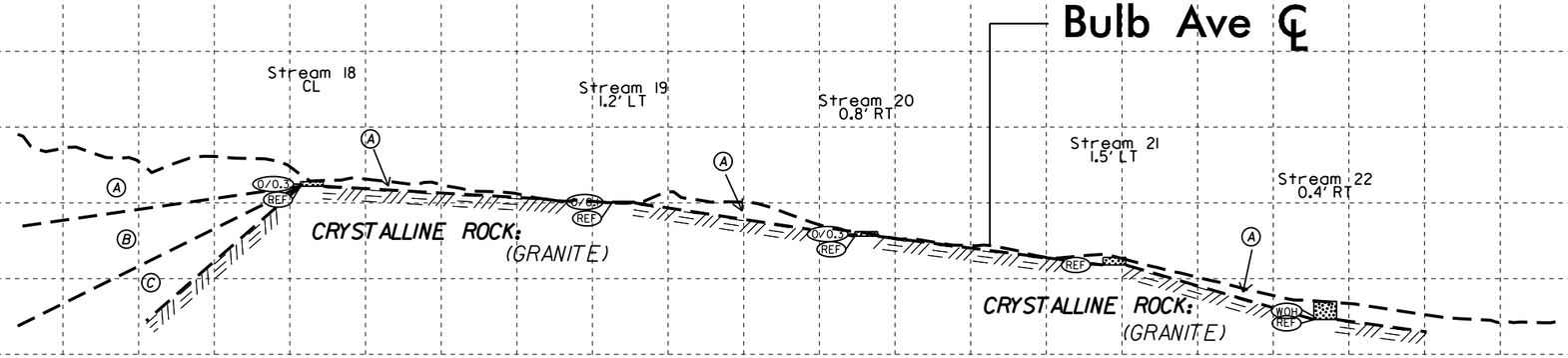
L8_DS

•NOTE: STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE L8 DS PROFILE.

PROJECT REFERENCE NO.	SHEET NO.
41153.1.1 (I-5000)	8
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



715
710
705
700
695
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685
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675
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665
660
655
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645
640
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630
625

Ⓐ **ALLUVIAL:** TAN-BROWN, V. LOOSE, SATURATED, SILTY SAND (A-2-4)

Ⓑ **RESIDUAL:** GRAY, MED. DENSE TO DENSE, MOIST TO WET, SILTY SAND (A-2-4)

Ⓒ **WEATHERED ROCK:** (GRANITE)

•NOTE: STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE L8 DS PROFILE.

L8_DS

28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 1	**STATION** 3+02	**OFFSET** 2 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 695.0 ft	**TOTAL DEPTH** 11.0 ft	**NORTHING** 564,719	**EASTING** 1,347,442	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Manual	
DRILLER N/A	**START DATE** 06/06/16	**COMP. DATE** 06/06/16	**SURFACE WATER DEPTH** 0.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
695										
	695.0	0.0	n/a	WOR	WOH	0		Sat.		695.0 WATER SURFACE (06/06/16) 0.0
	694.0	1.0	n/a	1	1	2				**ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4)
	693.0	2.0	n/a	2	1	3				
	692.0	3.0	n/a	0	1	1				
690	691.0	4.0	n/a	0	2	2				690.0 5.0
	690.0	5.0	n/a	8	10	18				**RESIDUAL** (interpreted as)
	689.0	6.0	n/a	10	12	22				
	688.0	7.0	n/a	21	36	57				Gray, Silty SAND (A-2-4)
	687.0	8.0	n/a	35	57	92				
685	686.0	9.0	n/a	49	48	97				684.5 10.5
	685.0	10.0	n/a	59	41/0.3	100/0.8				684.0 11.0 **WEATHERED ROCK** (granite)
										Boring Terminated at Elevation 684.0 ft in WR (granite)
										*Hand auger boring collapse @ 1.5'. Tried hand auger in both thalweg and sandbar.

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 2	**STATION** 4+71	**OFFSET** 1 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 694.2 ft	**TOTAL DEPTH** 13.7 ft	**NORTHING** 564,885	**EASTING** 1,347,443	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Manual	
DRILLER N/A	**START DATE** 06/07/16	**COMP. DATE** 06/07/16	**SURFACE WATER DEPTH** 0.2ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
695										
	694.2	0.0								694.2 WATER SURFACE (06/07/16) 0.0
	693.2	1.0	n/a	WOH	WOH	0		Sat.		**ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4)
	692.2	2.0	n/a	0	1	1				
	691.2	3.0	n/a	0	0	0				
690	690.2	4.0	n/a	WOH	WOH	0				689.7 4.5
	689.2	5.0	n/a	2	7	9				**RESIDUAL** (interpreted as)
	688.2	6.0	n/a	5	3	8				
	687.2	7.0	n/a	4	6	10				Gray, Silty SAND (A-2-4)
	686.2	8.0	n/a	7	9	16				
685	685.2	9.0	n/a	10	14	24				681.1 13.1
	684.2	10.0	n/a	13	20	33				680.5 13.7 **WEATHERED ROCK** (granite)
	683.2	11.0	n/a	17	14	31				Boring Terminated at Elevation 680.5 ft in WR (granite)
	682.2	12.0	n/a	17	43	60				*Hand auger collapse @ 1.5'
	681.2	13.0	n/a	44	38	82				
			n/a	75	25/0.2	100/0.7				

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 3	**STATION** 5+52	**OFFSET** 0 ft LT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 692.2 ft	**TOTAL DEPTH** 12.9 ft	**NORTHING** 564,965	**EASTING** 1,347,448	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Manual	
DRILLER N/A	**START DATE** 06/07/16	**COMP. DATE** 06/07/16	**SURFACE WATER DEPTH** 0.2ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
695										
	692.2	0.0	n/a	WOH	WOH	0		Sat.		692.2 WATER SURFACE (06/07/16) 0.0
	691.2	1.0	n/a	0	1	1				**ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4)
690	690.2	2.0	n/a	0	1	1				
	689.2	3.0	n/a	0	1	1				
	688.2	4.0	n/a	0	1	1				
	687.2	5.0	n/a	0	1	1				
	686.2	6.0	n/a	0	1	1				686.2 6.0
685	685.2	7.0	n/a	1	3	4 9				**RESIDUAL** (interpreted as)
	684.2	8.0	n/a	4	5	9				
	683.2	9.0	n/a	10	10	20				Gray, Silty SAND (A-2-4)
	682.2	10.0	n/a	15	20	35				
	681.2	11.0	n/a	13	10	23				
680	680.2	12.0	n/a	11	14	25 45				680.1 12.1
			n/a	15	30					679.3 **WEATHERED ROCK** (granite) 12.9
			n/a	37	63/0.4	100/0.9				Boring Terminated at Elevation 679.3 ft in WR (granite)
										*Hand auger collapse @ 0.5'

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 4	**STATION** 6+24	**OFFSET** 4 ft LT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 694.0 ft	**TOTAL DEPTH** 12.9 ft	**NORTHING** 565,037	**EASTING** 1,347,460	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Manual	
DRILLER N/A	**START DATE** 06/07/16	**COMP. DATE** 06/07/16	**SURFACE WATER DEPTH** 0.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
695										
	694.0	0.0								694.0 WATER SURFACE (06/07/16) 0.0
	693.0	1.0	n/a	WOH	WOH	0		Sat.		**ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4)
	692.0	2.0	n/a	1	1	2				
	691.0	3.0	n/a	WOH	1	1				
690	690.0	4.0	n/a	1	1	2				
	689.0	5.0	n/a	2	1	3				688.5 5.5
	688.0	6.0	n/a	7	3	10				**RESIDUAL** (interpreted as)
	687.0	7.0	n/a	3	6	9				
	686.0	8.0	n/a	6	9	15				Gray, Silty SAND (A-2-4)
685	685.0	9.0	n/a	7	10	17				
	684.0	10.0	n/a	8	14	22				
	683.0	11.0	n/a	15	16	31				
	682.0	12.0	n/a	18	61	79				681.5 12.5
			n/a	52	48/0.4	100/0.9				681.1 **WEATHERED ROCK** (granite) 12.9
										Boring Terminated at Elevation 681.1 ft in WR (granite)
										*Located at mouth of existing I-85 culvert
										*Hand auger collapse @ 0.5'

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 5	**STATION** 9+83	**OFFSET** 1 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 693.3 ft	**TOTAL DEPTH** 16.7 ft	**NORTHING** 565,393	**EASTING** 1,347,494	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Manual	
DRILLER N/A	**START DATE** 06/07/16	**COMP. DATE** 06/07/16	**SURFACE WATER DEPTH** 0.2ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
695										
	693.3	0.0								693.3 0.0 WATER SURFACE (06/07/16)
	692.3	1.0	n/a	WOH	WOH	0		Sat.		**ALLUVIAL**
	691.3	2.0	n/a	WOH	WOH	0				Tan-brown, v. loose, Silty v. cse SAND
690	690.3	3.0	n/a	2	4	6				(A-2-4)
	689.3	4.0	n/a	2	1	3				
	688.3	5.0	n/a	1	1	2				688.3 5.0
	687.3	6.0	n/a	6	5	11				**RESIDUAL**
	686.3	7.0	n/a	4	4	8				(interpreted as)
685	685.3	8.0	n/a	5	8	13				
	684.3	9.0	n/a	6	7	13				Gray, Silty SAND (A-2-4)
	683.3	10.0	n/a	7	8	15				
	682.3	11.0	n/a	12	15	27				
	681.3	12.0	n/a	14	18	32				
680	680.3	13.0	n/a	24	24	48				
	679.3	14.0	n/a	20	21	41				
	678.3	15.0	n/a	25	22	47				
	677.3	16.0	n/a	28	26	54				677.2 16.1
			n/a	63	47/0.2	100/0.7				676.6 16.7 **WEATHERED ROCK**
										(granite)
										Boring Terminated at Elevation 676.6 ft in WR (granite)
										*Located at mouth of existing I-85 culvert
										*Hand auger collapse @ 0.5'

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 6	**STATION** 10+96	**OFFSET** 1 ft LT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 692.7 ft	**TOTAL DEPTH** 10.9 ft	**NORTHING** 565,503	**EASTING** 1,347,476	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Manual	
DRILLER N/A	**START DATE** 06/07/16	**COMP. DATE** 06/07/16	**SURFACE WATER DEPTH** 0.8ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
695										
	692.7	0.0								WATER SURFACE (06/07/16)
	691.7	1.0	n/a	WOR	WOR	0		Sat.		692.7 GROUND SURFACE 0.0
	690.7	2.0	n/a	WOR	WOR	0				**ALLUVIAL**
690	689.7	3.0	n/a	1	WOH	1				Tan-brown, v. loose, Silty v. cse SAND
	688.7	4.0	n/a	WOH	WOH	0				(A-2-4)
	687.7	5.0	n/a	WOH	1	1				687.2 5.5
	686.7	6.0	n/a	4	4	8				**RESIDUAL**
685	685.7	7.0	n/a	4	4	9				(interpreted as)
	684.7	8.0	n/a	5	4	10				
	683.7	9.0	n/a	5	5	55				Gray, Silty SAND (A-2-4)
	682.7	10.0	n/a	26	29	76				682.2 10.5
			n/a	39	37	100/0.9				681.8 10.9 **WEATHERED ROCK**
			n/a	38	62/0.4					(granite)
										Boring Terminated at Elevation 681.8 ft in WR (granite)
										*Hand auger collapse @ 0.5'

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 7	**STATION** 11+96	**OFFSET** CL	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 692.7 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 565,603	**EASTING** 1,347,466	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/07/16	**COMP. DATE** 06/07/16	**SURFACE WATER DEPTH** 0.4ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
695										
	692.7	0.0								692.7 WATER SURFACE (06/07/16) 0.0
	691.7	1.0	n/a	WOR	1	1		Sat.		**ALLUVIAL**
	690.7	2.0	n/a	1	0	1				Tan-brown, v. loose, Silty v. cse SAND
690	689.7	3.0	n/a	0	WOH	0				(A-2-4) 689.7 3.0
			n/a	REF		REF				**CRYSTALLINE ROCK** (granite)
										Boring Terminated at Elevation 689.7 ft on CR (granite) by sounding rod refusal
										*Hand auger collapse @ 0.5'

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 8	**STATION** 12+96	**OFFSET** 1 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 692.6 ft	**TOTAL DEPTH** 3.7 ft	**NORTHING** 565,703	**EASTING** 1,347,469	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/07/16	**COMP. DATE** 06/07/16	**SURFACE WATER DEPTH** 0.2ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
695										
	692.6	0.0								692.6 WATER SURFACE (06/07/16) 0.0
	691.6	1.0	n/a	WOH	WOH	0		Sat.		**ALLUVIAL**
	690.6	2.0	n/a	WOH	WOH	0				Tan-brown, v. loose, Silty v. cse SAND
690	689.6	3.0	n/a	1	3	4				(A-2-4) 688.9 3.7
			n/a	4	1/0.2	REF				**CRYSTALLINE ROCK** (granite)
										Boring Terminated at Elevation 688.9 ft on CR (granite) by sounding rod refusal
										*Hand auger collapse @ 0.5'
										*Moved rod sounding 3 times w/ same refusal depth

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 9	**STATION** 13+98	**OFFSET** 3 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 692.2 ft	**TOTAL DEPTH** 3.0 ft	**NORTHING** 565,802	**EASTING** 1,347,483	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/07/16	**COMP. DATE** 06/07/16	**SURFACE WATER DEPTH** 0.4ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
695										
	692.2	0.0								WATER SURFACE (06/07/16)
	691.2	1.0	n/a	WOH	WOH	0		Sat.		**ALLUVIAL**
690	690.2	2.0	n/a	WOH	WOH	0				Tan-brown, v. loose, Silty v. cse SAND (A-2-4)
	689.2	3.0	n/a	WOH	2	2 REF				**CRYSTALLINE ROCK** (granite)

Boring Terminated at Elevation 689.2 ft on CR (granite) by sounding rod refusal

*Hand auger collapse @ 0.5'
*Moved rod sounding 4 times w/ same refusal depth

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 10	**STATION** 14+95	**OFFSET** 1 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 690.8 ft	**TOTAL DEPTH** 0.5 ft	**NORTHING** 565,892	**EASTING** 1,347,517	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/07/16	**COMP. DATE** 06/07/16	**SURFACE WATER DEPTH** 0.9ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
695										
	690.8	0.0	n/a	3	REF	REF				WATER SURFACE (06/07/16)
										GROUND SURFACE
	690.3	0.5								**ALLUVIAL**
										Tan-brown, v. loose, Silty v. cse SAND (A-2-4)
										CRYSTALLINE ROCK (granite)

Boring Terminated at Elevation 690.3 ft on CR (granite) by sounding rod refusal

*Located @ south side of Rankin Lake Rd. bridge/culvert

*Moved to multiple locations with same refusal result

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 11	**STATION** 15+28	**OFFSET** 1 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 690.8 ft	**TOTAL DEPTH** 0.5 ft	**NORTHING** 565,922	**EASTING** 1,347,531	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/07/16	**COMP. DATE** 06/07/16	**SURFACE WATER DEPTH** 1.0ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG
695									
	690.8	0.0	n/a	2	REF	REF			

SOIL AND ROCK DESCRIPTION

ELEV. (ft)	DEPTH (ft)
	WATER SURFACE (06/07/16)
690.8	0.0 GROUND SURFACE
690.3	0.5

ALLUVIAL
Tan-brown, v. loose, Silty v. cse SAND
(A-2-4)

CRYSTALLINE ROCK
(granite)
Boring Terminated at Elevation 690.3 ft on CR (granite) by sounding rod refusal

*Located @ north side of Rankin Lake Rd. bridge/culvert
*Moved to multiple locations with same refusal result

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 12	**STATION** 17+28	**OFFSET** 1 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 688.5 ft	**TOTAL DEPTH** 0.3 ft	**NORTHING** 566,101	**EASTING** 1,347,621	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/07/16	**COMP. DATE** 06/07/16	**SURFACE WATER DEPTH** 0.5ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG
690									
	688.5	0.0	n/a	0/0.3		REF			

SOIL AND ROCK DESCRIPTION

ELEV. (ft)	DEPTH (ft)
	WATER SURFACE (06/07/16)
688.5	0.0 GROUND SURFACE
688.2	0.3

ALLUVIAL
Tan-brown, v. loose, Silty v. cse SAND
(A-2-4)

CRYSTALLINE ROCK
(granite)
Boring Terminated at Elevation 688.2 ft on CR (granite) by sounding rod refusal

*Moved sounding 4 times w/ same refusal depth.

*In-situ outcrop visible in stream bed near sounding.

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 13	**STATION** 19+30	**OFFSET** CL	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 686.5 ft	**TOTAL DEPTH** 4.9 ft	**NORTHING** 566,264	**EASTING** 1,347,738	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/08/16	**COMP. DATE** 06/08/16	**SURFACE WATER DEPTH** 0.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft) / DEPTH (ft)
690										
	686.5	0.0								WATER SURFACE (06/08/16) 686.5 / 0.0
685	685.5	1.0	n/a	2	16	18		Sat.		686.0 / 0.5 **ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4)
	684.5	2.0	n/a	10	8	18				
	683.5	3.0	n/a	10	7	17				
	682.5	4.0	n/a	11	33	44				682.0 / 4.5 **RESIDUAL** (interpreted as)
			n/a	58	42/0.4	100/0.9				681.6 / 4.9 Gray, Silty SAND (A-2-4) **WEATHERED ROCK** (granite) Boring Terminated at Elevation 681.6 ft on CR (granite) by sounding rod refusal

*Hand auger collapse @ 0.5'

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 14	**STATION** 21+31	**OFFSET** 1 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 685.9 ft	**TOTAL DEPTH** 0.5 ft	**NORTHING** 566,405	**EASTING** 1,347,878	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/08/16	**COMP. DATE** 06/08/16	**SURFACE WATER DEPTH** 0.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
690										
	685.9	0.0	n/a	3	REF	REF		Sat.		685.9 WATER SURFACE (06/08/16) 0.0
										685.4 / 0.5 **ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4) **CRYSTALLINE ROCK** (granite) Boring Terminated at Elevation 685.4 ft on CR (granite) by sounding rod refusal

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 15	**STATION** 23+27	**OFFSET** CL	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 687.2 ft	**TOTAL DEPTH** 12.8 ft	**NORTHING** 566,493	**EASTING** 1,348,051	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/08/16	**COMP. DATE** 06/08/16	**SURFACE WATER DEPTH** 0.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
										ELEV. (ft) DEPTH (ft)
690										
	687.2	0.0						Sat.		687.2 WATER SURFACE (06/08/16) 0.0
	686.2	1.0	n/a	WOH	WOH	0				**ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4)
685	685.2	2.0	n/a	WOH	WOH	0				
	684.2	3.0	n/a	WOH	WOH	0				684.2 3.0
	683.2	4.0	n/a	12	7	19				**RESIDUAL** (interpreted as)
	682.2	5.0	n/a	9	6	15				
	681.2	6.0	n/a	8	12	20				Gray, Silty SAND (A-2-4)
680	680.2	7.0	n/a	10	13	23				
	679.2	8.0	n/a	12	16	28				
	678.2	9.0	n/a	20	19	39				
	677.2	10.0	n/a	16	18	34				
	676.2	11.0	n/a	25	31	56				
675	675.2	12.0	n/a	38	32	70				675.1 12.1
			n/a	56	44/0.3	100/0.8				674.4 12.8 **WEATHERED ROCK** (granite) Boring Terminated at Elevation 674.4 ft in WR (granite)
										*Hand auger collapse @ 0.5'

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 16	**STATION** 25+41	**OFFSET** 7 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 685.0 ft	**TOTAL DEPTH** 12.6 ft	**NORTHING** 566,651	**EASTING** 1,348,180	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/08/16	**COMP. DATE** 06/08/16	**SURFACE WATER DEPTH** 0.2ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
685										685.0 WATER SURFACE (06/08/16) 0.0
	685.0	0.0	n/a	WOH	WOH	0		Sat.		**ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4)
	684.0	1.0	n/a	WOH	WOH	0				
	683.0	2.0	n/a	WOH	WOH	0				
	682.0	3.0	n/a	WOH	WOH	0				
	681.0	4.0	n/a	1	1	2				
680	680.0	5.0	n/a	1	5	6				680.0 5.0
	679.0	6.0	n/a	10	6	16				**RESIDUAL** (interpreted as)
	678.0	7.0	n/a	5	17	22				
	677.0	8.0	n/a	30	31	61				Gray, Silty SAND (A-2-4)
	676.0	9.0	n/a	33	34	67				
675	675.0	10.0	n/a	31	32	63				
	674.0	11.0	n/a	41	30	71				
	673.0	12.0	n/a	49	48	97				673.0 12.0
			n/a	58	42/0.1	100/0.6				672.4 12.6 **WEATHERED ROCK** (granite) Boring Terminated at Elevation 672.4 ft in WR (granite)
										*Hand auger collapse @ 0.5'

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 17	**STATION** 27+48	**OFFSET** 3 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 684.2 ft	**TOTAL DEPTH** 13.9 ft	**NORTHING** 566,838	**EASTING** 1,348,253	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/08/16	**COMP. DATE** 06/08/16	**SURFACE WATER DEPTH** 0.4ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
685										ELEV. (ft) DEPTH (ft)
	684.2	0.0								684.2 0.0 WATER SURFACE (06/08/16)
	683.2	1.0	n/a	WOH	WOH	0		Sat.		**ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4)
	682.2	2.0	n/a	WOH	WOH	0				
	681.2	3.0	n/a	1	4	5				
680	680.2	4.0	n/a	2	3	5				
	679.2	5.0	n/a	4	4	8				
	678.2	6.0	n/a	4	5	9				678.2 6.0 **RESIDUAL** (interpreted as)
	677.2	7.0	n/a	7	15	22				
	676.2	8.0	n/a	12	12	24				Gray, Silty SAND (A-2-4)
675	675.2	9.0	n/a	13	12	25				
	674.2	10.0	n/a	15	17	32				
	673.2	11.0	n/a	22	23	45				
	672.2	12.0	n/a	26	31	57				
	671.2	13.0	n/a	30	28	58				671.1 13.1
			n/a	49	51/0.4	100/0.9				670.3 13.9 **WEATHERED ROCK** (granite) Boring Terminated at Elevation 670.3 ft in WR (granite)
										*Hand auger collapse @ 0.5'

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 18	**STATION** 29+66	**OFFSET** CL	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 681.4 ft	**TOTAL DEPTH** 0.3 ft	**NORTHING** 567,028	**EASTING** 1,348,196	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/08/16	**COMP. DATE** 06/08/16	**SURFACE WATER DEPTH** 0.4ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
685										
	681.4	0.0	n/a	0/0.3		REF				681.4 0.0 WATER SURFACE (06/08/16)
										681.1 0.3 **ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4)
										CRYSTALLINE ROCK (granite) Boring Terminated at Elevation 681.1 ft on CR (granite) by sounding rod refusal
										*Sounding rod performed in thalweg *In-situ outcrop in creek bed all around thalweg

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 19	**STATION** 31+72	**OFFSET** 1 ft LT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 680.1 ft	**TOTAL DEPTH** 0.1 ft	**NORTHING** 567,217	**EASTING** 1,348,253	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/08/16	**COMP. DATE** 06/08/16	**SURFACE WATER DEPTH** 0.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
685										
680	680.1	0.0	n/a	0/0.1		REF				WATER SURFACE (06/08/16) 680.1 0.0 680.0 0.1 **ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4) **CRYSTALLINE ROCK** (granite) Boring Terminated at Elevation 680.0 ft on CR (granite) by sounding rod refusal *Sounding rod performed in thalweg *In-situ outcrop in creek bed all around thalweg

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 20	**STATION** 33+32	**OFFSET** 1 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 678.1 ft	**TOTAL DEPTH** 0.3 ft	**NORTHING** 567,357	**EASTING** 1,348,330	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/08/16	**COMP. DATE** 06/08/16	**SURFACE WATER DEPTH** 0.2ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
680										
	678.1	0.0	n/a	0/0.3		REF				WATER SURFACE (06/08/16) 678.1 0.0 677.8 0.3 **ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4) **CRYSTALLINE ROCK** (granite) Boring Terminated at Elevation 677.8 ft on CR (granite) by sounding rod refusal *Sounding rod performed in thalweg *In-situ outcrop in creek bed all around thalweg

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 21	**STATION** 34+96	**OFFSET** 2 ft LT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 676.4 ft	**TOTAL DEPTH** 0.5 ft	**NORTHING** 567,510	**EASTING** 1,348,388	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/08/16	**COMP. DATE** 06/08/16	**SURFACE WATER DEPTH** 0.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
680										
	676.4	0.0	n/a	WOH	REF	REF		Sat.		676.4 / 0.0 WATER SURFACE (06/08/16)
	675.9	0.5								675.9 / 0.5 **ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4) **CRYSTALLINE ROCK** (granite) Boring Terminated at Elevation 675.9 ft on CR (granite) by sounding rod refusal *Sounding rod performed in thalweg

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** B. Worley, PG	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Stream Aggradation Study)				**GROUND WTR (ft)**
BORING NO. Stream 22	**STATION** 36+36	**OFFSET** 0 ft RT	**ALIGNMENT** L8_DS	**0 HR.** N/A
COLLAR ELEV. 673.5 ft	**TOTAL DEPTH** 1.2 ft	**NORTHING** 567,648	**EASTING** 1,348,404	**24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE N/A		**DRILL METHOD** Rod Sounding	**HAMMER TYPE** Automatic	
DRILLER N/A	**START DATE** 06/08/16	**COMP. DATE** 06/08/16	**SURFACE WATER DEPTH** 0.3ft	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
675										
	673.5	0.0	n/a	WOH	WOH	0 REF		Sat.		673.5 / 0.0 WATER SURFACE (06/08/16)
	672.5	1.0	n/a	REF						672.3 / 1.2 **ALLUVIAL** Tan-brown, v. loose, Silty v. cse SAND (A-2-4) **CRYSTALLINE ROCK** (granite) Boring Terminated at Elevation 672.3 ft on CR (granite) by sounding rod refusal *Sounding rod performed in thalweg

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** Worley, B.	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Slope Boring)				**GROUND WTR (ft)**
BORING NO. B-11	**STATION** N/A	**OFFSET** N/A	**ALIGNMENT** N/A	**0 HR.** 7.3
COLLAR ELEV. 697.9 ft	**TOTAL DEPTH** 11.9 ft	**NORTHING** 565,698	**EASTING** 1,347,419	**24 HR.** 7.7
DRILL RIG/HAMMER EFF./DATE SUM0093 DIEDRICH D-50 88% 11/05/2015		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Bare, J.	**START DATE** 05/25/16	**COMP. DATE** 05/25/16	**SURFACE WATER DEPTH** N/A	

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
700										ELEV. (ft) DEPTH (ft)
	697.9	0.0	2	3	6	9		M		697.9 GROUND SURFACE 0.0 **ARTIFICIAL FILL** Orange-brown, Clayey SAND (A-2-6)
695										(harder drilling @ 7.5')
	694.3	3.6	1	2	1	3		M		
690										690.4 7.5 **WEATHERED ROCK** (granite)
	689.3	8.6	41	54	46/0.1	100/00.6				
	686.0	11.9	60/0.0			60/0.0				686.0 11.9 **CRYSTALLINE ROCK** (granite) Boring Terminated at Elevation 686.0 ft On Crystalline Rock (Granite)

WBS 41153.1.1	**TIP** I-5000	**COUNTY** GASTON	**GEOLOGIST** Worley, B.	
SITE DESCRIPTION I-85 / US 321 Interchange Geometric Safety Improvements (Slope Boring)				**GROUND WTR (ft)**
BORING NO. B-12	**STATION** N/A	**OFFSET** N/A	**ALIGNMENT** N/A	**0 HR.** 9.0
COLLAR ELEV. 699.5 ft	**TOTAL DEPTH** 11.9 ft	**NORTHING** 565,861	**EASTING** 1,347,469	**24 HR.** 8.2
DRILL RIG/HAMMER EFF./DATE SUM0093 DIEDRICH D-50 88% 11/05/2015		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Bare, J.	**START DATE** 05/25/16	**COMP. DATE** 05/25/16	**SURFACE WATER DEPTH** N/A	

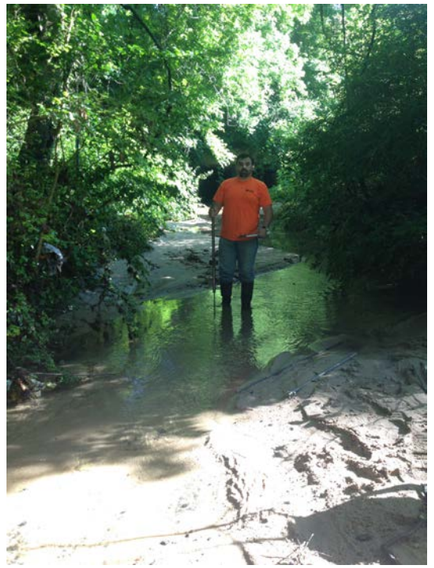
ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
700										
										699.5 GROUND SURFACE 0.0
	696.3	3.2	1	2	4	6		M		**ARTIFICIAL FILL** Brown, Clayey SAND (A-2-6)
695										693.5 6.0
	691.3	8.2	1	1	2	3		W		**ALLUVIAL** Gray, Silty cse. SAND (A-2-4) (hard drilling @ 11.5')
690										688.0 11.5
	686.6	12.9	60/0.0			60/0.0				686.6 12.9 **WEATHERED ROCK** (granite) (auger refusal @ 12.9') Boring Terminated at Elevation 687.6 ft On Crystalline Rock (Granite) **CRYSTALLINE ROCK** (granite)

SITE PHOTOGRAPHS

Stream Aggradation Study

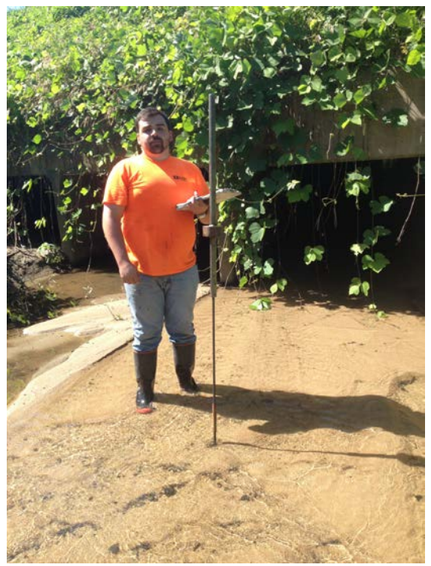
STREAM 1: View Facing North

STREAM 2: View Facing North



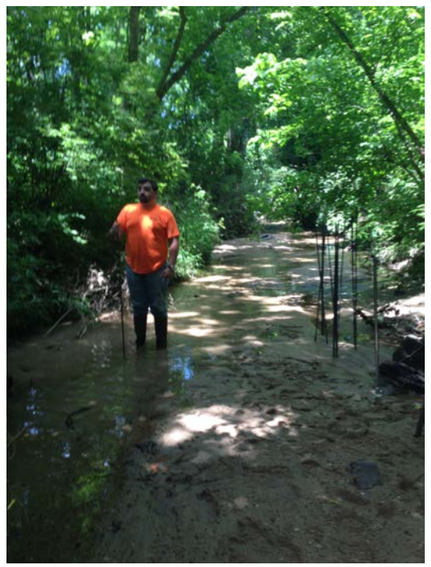
STREAM 3: View Facing North

STREAM 4: View Facing North



STREAM 5: View Facing South

STREAM 6: View Facing Northeast



STREAM 7: View Facing North

STREAM 8: View Facing North

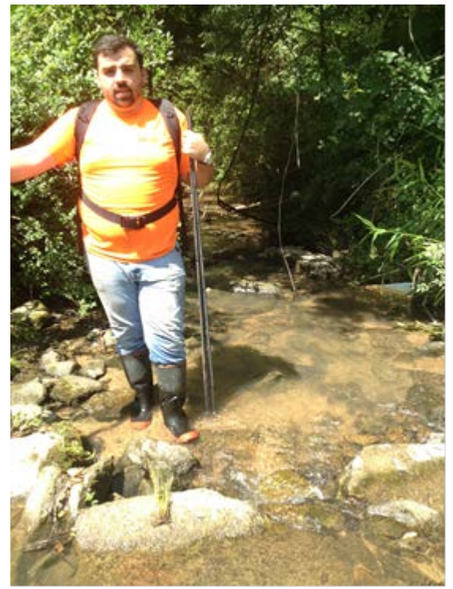
SITE PHOTOGRAPHS

Stream Aggradation Study

STREAM 9: View Facing North

STREAM 10: View Facing South

STREAM 11: View From Rankin Lake Rd.



STREAM 12 : View Facing North

STREAM 13: View Facing North

STREAM 14: View Facing North

STREAM 15: View Facing North

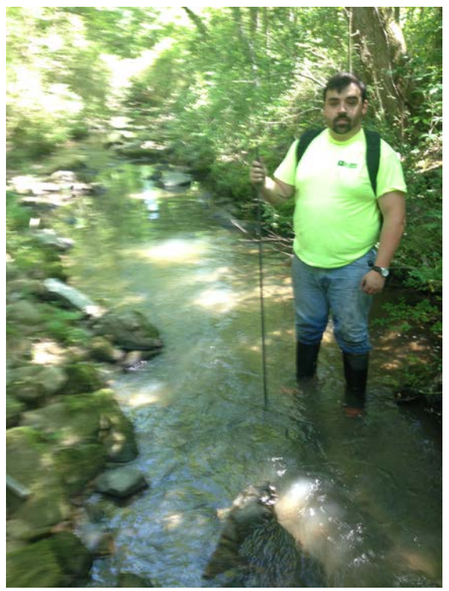
STREAM 16: View Facing South

SITE PHOTOGRAPHS

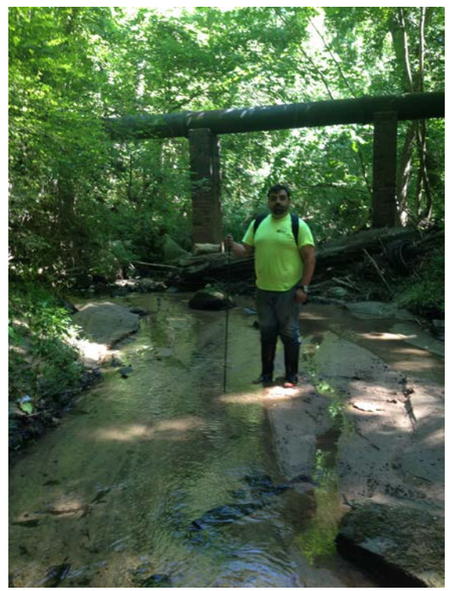
Stream Aggradation Study

STREAM 17: View Facing North

STREAM 18: View Facing North



STREAM 19: View Facing North



STREAM 20: View Facing North

STREAM 21: View Facing North

STREAM 22: View Facing North