ID: U-3308

CONTRACT:

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

CONTENTS

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

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. *34915.1.1 (U-3308)* F.A. PROJ. *STP-55 (20)*

COUNTY *DURHAM*

PROJECT DESCRIPTION *DURHAM-NC 55 (ALSTON AVE.) FROM NC 147 (BUCK DEAN FREEWAY) TO US 70 BUS/NC 98 (HOLLOWAY ST.)*

INVENTORY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	34915.1.1 (U-3308)	1	34

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34915.1.1	STP-55 (20)	P.E.
		R/W & UTIL

CAUTION NOTICE

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

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

THE BIDDER OR CONTRACTOR IS CAUTIONED THAT DETAILS SHOWN ON THE SUBSURFACE PLANS ARE PRELIMINARY ONLY AND IN MANY CASES THE FINAL DESIGN DETAILS ARE DIFFERENT. FOR BIDDING AND CONSTRUCTION PURPOSES, REFER TO THE CONSTRUCTION PLANS AND DOCUMENTS FOR FINAL DESIGN INFORMATION ON THIS PROJECT. THE DEPARTMENT DOES NOT WARRANT OR GUARANTEE THE SUFFICIENCY OR ACCURACY OF THE INVESTIGATION MADE, NOR THE INTERPRETATIONS MADE, OR OPINION OF THE DEPARTMENT AS TO THE TYPE OF MATERIALS AND CONDITIONS TO BE ENCOUNTERED. THE BIDDER OR CONTRACTOR IS CAUTIONED TO MAKE SUCH INDEPENDENT SUBSURFACE INVESTIGATIONS AS HE DEEMS NECESSARY TO SATISFY HIMSELF AS TO CONDITIONS TO BE ENCOUNTERED ON THIS PROJECT. THE CONTRACTOR SHALL HAVE NO CLAIM FOR ADDITIONAL COMPENSATION OR FOR AN EXTENSION OF TIME FOR ANY REASON RESULTING FROM THE ACTUAL CONDITIONS ENCOUNTERED AT THE SITE DIFFERING FROM THOSE INDICATED IN THE SUBSURFACE INFORMATION.

PERSONNEL
N.D. MOHS

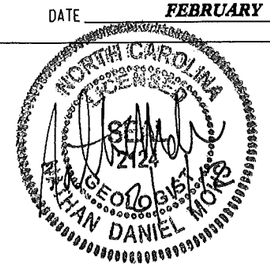
TIERRA PERSONNEL
J. HOWARD
C. BRUINSMA
S. HAN
F. COX

INVESTIGATED BY *N.D. MOHS*

CHECKED BY *N.T. ROBERSON*

SUBMITTED BY *N.T. ROBERSON*

DATE *FEBRUARY 2012*



DRAWN BY: *T.T. WALKER, N.D. MOHS*

NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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

PROJECT REFERENCE NO.	SHEET NO.
34915.1.1 (U-3308)	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-7-5, A-7-6)	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							
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
- 25/026 - DIP & DIP DIRECTION OF ROCK STRUCTURES
- SOUNDING ROD
- SPT, CPT, DPT, DMT, VST, PMT - TEST BORING
- AUGER BORING
- CORE BORING
- MW - MONITORING WELL
- PIEZOMETER INSTALLATION
- SLOPE INDICATOR INSTALLATION
- SPT N-VALUE
- (REF) - SPT REFUSAL

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

ABBREVIATIONS

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

EQUIPMENT USED ON SUBJECT PROJECT

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

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

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

CORE SIZE:
- [ ] -B_____
- [ ] -N_____
- [ ] -H_____

HAND TOOLS:
- [ ] POST HOLE DIGGER
- [ ] HAND AUGER
- [X] 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 IN 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:

T_R: TRIASSIC

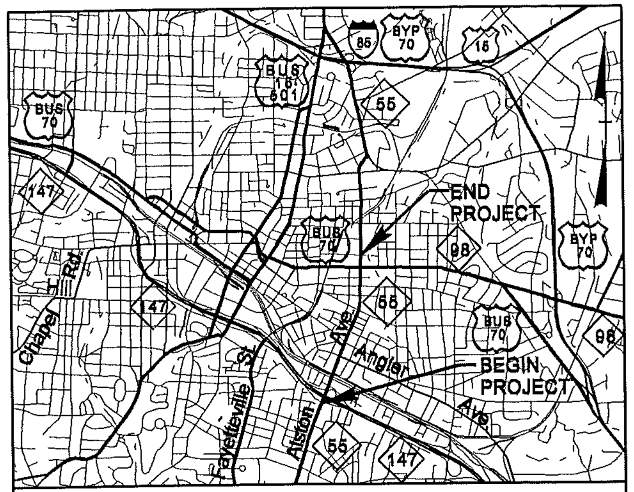
REVISED 02/23/06

TIP PROJECT: U-3308

CONTRACT:

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3308	2A	34
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34915.1.1	STP-55 (20)	PE	

See Sheet 1-A For Index of Sheets
See Sheet 1-B For CONVENTIONAL SYMBOLS



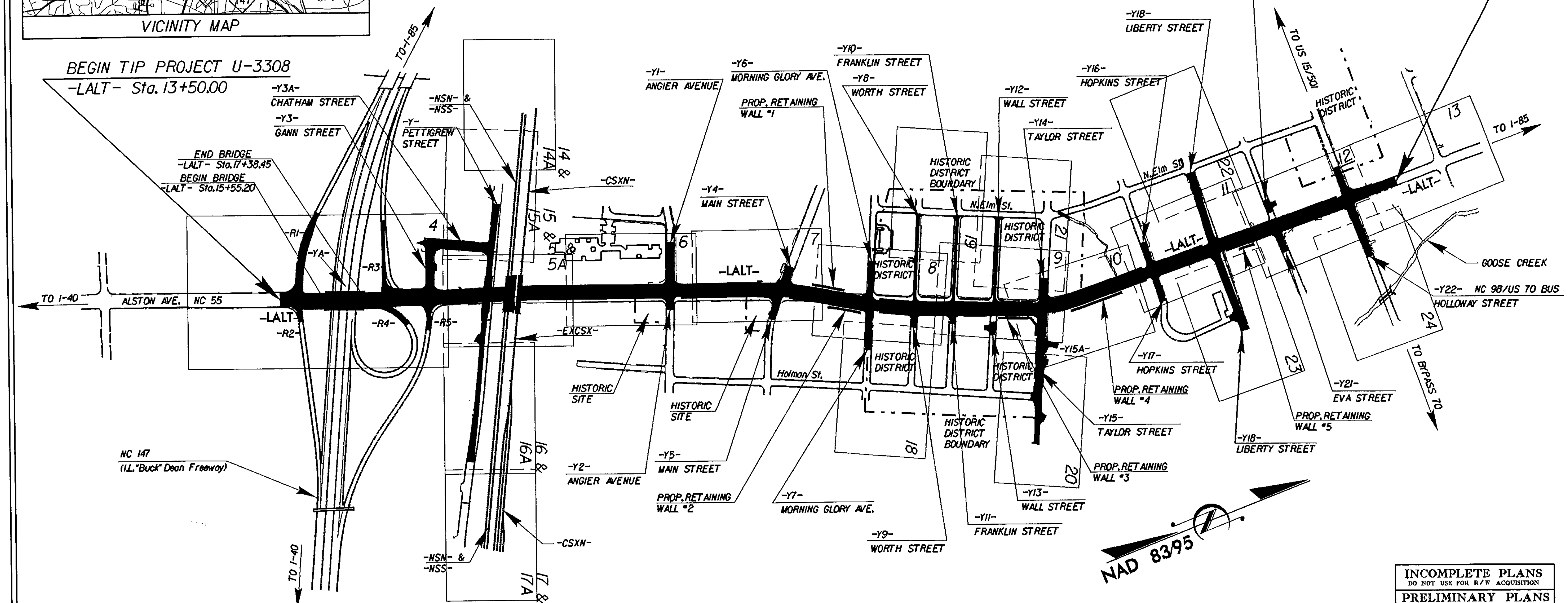
VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

DURHAM COUNTY

LOCATION: NC 55 (ALSTON AVE.) FROM NC 147 (I. L. "BUCK" DEAN FREEWAY) TO NORTH OF US 70 BUS/NC 98 (HOLLOWAY ST.)

TYPE OF WORK: Grading, Drainage, Curb & Gutter, Paving, Sidewalks Retaining Walls, Structures, Railroad Track Work and Signals



THIS PROJECT IS WITHIN THE CITY LIMITS OF DURHAM.
METHOD OF CLEARING III.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

GRAPHIC SCALES

PLANS (20 10 0 20 40)

PROFILE (HORIZONTAL) (20 10 0 20 40)

PROFILE (VERTICAL) (10 5 0 10 20)

DESIGN DATA

ADT 2011 = 20800 VPD
ADT 2035 = 28400 VPD
DHV = 10 %
D = 55 %
T = 6 % *
V = 35 MPH
* TTST 1% DUAL 5%
Regional Tier

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3308 = 0.961 mi
LENGTH STRUCTURE TIP PROJECT U-3308 = 0.035 mi
TOTAL LENGTH TIP PROJECT U-3308 = 0.996 mi

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: SEPTEMBER 21, 2012

LETTING DATE: DECEMBER 16, 2014

JAMES A. SPEER, PE
PROJECT ENGINEER

JOHN C. LANSFORD, PE
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

...\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\u3308_rdy_tsh.dgn
...-JAN-2012 12:37 ...\Raleigh Investigation ... AT GEJ255450 mohs

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Beverly Eaves Perdue
GOVERNOR

P.O. BOX 25201, RALEIGH, N.C. 27611-5201

Gene A. Conti, Jr.
SECRETARY

February 1, 2012

STATE PROJECT: 34915.1.1 (U-3308)
FEDERAL PROJECT: STP-55 (20)
COUNTY: Durham
DESCRIPTION: NC 55 (Alston Ave.) from NC 147 (Buck Dean Freeway) to North of US 70 Business/NC 98 (Holloway St.)

SUBJECT: Geotechnical Report – Inventory

Project Description

This project consists of widening Alston Ave. (-L-, NC 55) in Durham to four lanes with median and turn lanes. The project begins just south of the intersection of the Durham Expressway (NC 147, -L- Sta. 16+42) and extends 1 mile north to Gilbert St. Replacement bridges will be constructed at the Durham Expressway crossing. Replacement structures will also be placed over Alston Ave. on Pettigrew St. (-Y- Sta. 18+19), Norfolk Southern Railroad (-NSS- Sta. 21+21, and –NSN- Sta. 21+11), and CSX Railroad (-CSXN- Sta. 13+22). Some of the smaller intersecting streets are being re-aligned during the widening. Six retaining walls are also planned along the project.

The geotechnical field investigation was conducted during January and July of 2006. Tierra Engineering was contracted to perform the subsurface investigation, they in turn subcontracted Mid-Atlantic Drilling for drilling only. Geologists from Tierra Engineering sampled and logged the borings. ATV-mounted CME-45 and truck mounted D-50 drill machines were used during the field investigation. Standard Penetration Tests were performed in selected borings and additional borings were advanced using continuous flight augers. Representative soil samples were collected for visual classification in the field and submitted for laboratory analysis by NCDOT's Materials and Tests Unit.

The following alignments, totaling 2.22 miles, were investigated. Subsurface soil profiles, or cross-sections, of these alignments are included in this report:

Line		Station	
-LALT-	13+50	to	66+10
-Y-	14+00	to	21+49
-Y4-	10+00	to	13+85
-Y7-	10+43	to	14+05
-Y8-	10+00	to	13+89
-Y10-	10+00	to	14+05
-Y13-	10+00	to	11+22
-Y14-	10+00	to	11+40
-Y15-	10+00	to	12+05
-Y18-	10+20	to	17+83
-Y20-	10+00	to	11+52
-Y22-	12+55	to	17+90
-R1-	11+00	to	15+11
-R3-	10+00	to	13+60
-NSN-	12+00	to	30+40

Areas of Special Geotechnical Interest

1) Highly Plastic Clay Soils: Occurrences of highly plastic clay soil (Plasticity Index greater than 25) are noted below:

Alignment	Station	Offset
-LALT-	14+89	72' RT
-LALT-	21+78	37' LT
-LALT-	25+02	67' LT
-LALT-	30+06	15' RT
-LALT-	30+07	63' LT
-LALT-	30+45	56' LT
-LALT-	35+53	7' RT
-LALT-	37+20	6' LT
-LALT-	58+96	35' LT
-Y-	13+92	27' LT
-Y18-	10+32	35' LT
-NSN-	12+05	26' LT
-NSN-	14+04	23' LT
-NSN-	15+92	15' LT
-NSN-	16+34	34' RT
-NSN-	17+95	21' LT
-NSN-	19+87	29' LT
-NSN-	22+46	32' LT
-NSN-	24+58	47' RT
-NSN-	24+79	32' RT
-NSN-	30+03	27' RT
-R1-	14+03	22' RT

2) Non-Crystalline Rock: Non-Crystalline (Sedimentary Triassic) rock was encountered in the following borings:

Alignment	Station	Offset
-LALT-	50+51	68' RT
-Y-	19+90	34' RT
-Y4-	12+84	38' LT
-Y14-	11+10	22' RT
-Y14-	11+63	19' RT

Physiography and Geology

The project is located in the gently rolling terrain of the Eastern Piedmont area of North Carolina. A mixture of businesses, single-family homes, and churches are located along the project corridor. Small creeks and ephemeral streams run across the project corridor, generally from right to left across the alignment.

Geologically the project lies within the Durham Triassic Basin which is part of a series of failed rifts stretching northward from South Carolina to New Jersey. These rift valleys formed during extensional, normal faulting in the Triassic Period some 200 million years ago. This rifting and separation of Africa from North America eventually formed the Atlantic Ocean.

The geology of the project area consists of Triassic age sedimentary rocks, primarily siltstone and sandstone, and recent alluvial soils. The depositional nature of the Triassic sediments created alternating beds of siltstone, mudstone and sandstone. Combined with the active tectonic environment at the time of deposition, the soils derived from these deposits are highly variable and often laterally discontinuous.

Soil Properties

Soils encountered at the project site include roadway embankment soils, alluvial sediments, and Triassic residual soils.

Roadway embankment soil is common along the -L- alignment. The embankments range up to 24 feet in height Where sampled, the embankment soil consists of dry to moist, stiff to very stiff, silty clay, sandy clay and sandy silt(AASHTO classifications of A-7-6, A-6, and A-4), with some loose to medium dense, dry to moist, silty sand (A-2-4).

Alluvial soils were deposited along small creeks, which flow across the alignment in several areas (-L- 52+50, -Y22- 18+90, -NSN- 17+95 -NSN- 30+03). These soils consist of moist to wet, very loose to medium dense, silty sand (A-2-4) and soft to stiff, silty clay (A-7-6).

The Triassic residual soils are derived from the in-place weathering of the underlying sedimentary bedrock. These soils consist primarily of moist, medium stiff to hard, silty clay (A-7-5 and A-7-6) and moist to dry, loose to dense, silty sand (A-2-4 and A-2-5). Silty soils consisting of moist, medium stiff to very stiff, sandy silt (A-4) occur within the project area as well. Areas containing highly plastic soils (plasticity indices of greater than 25) are listed above in the section "Areas of Special Geotechnical Interest".

Rock Properties

Weathered rock and non-crystalline rock occur in several areas of the project. The weathered rock is derived from the underlying sedimentary rock of the Durham Triassic Basin, and consists of sandstone and siltstone. Weathered and non-crystalline siltstone in this area is known to be highly degradable when exposed to air and water.

Groundwater

Groundwater was encountered in several borings completed on this project. Groundwater, when encountered in Triassic residual soil or weathered rock, was variable across the project, ranging from 2 feet to 12 feet below the ground surface. Groundwater in borings located in alluvial areas ranged from 5 feet to 6 feet in depth. Based on the investigation, groundwater is not anticipated to cause problems during construction.

Prepared by,

Nathan Mohs, LG
Project Geologic Engineer

REVISIONS

PROJECT REFERENCE NO. U-3308 | 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

BEGIN CONSTRUCTION
-RI- POT Sta. 11+00.00
-RI- PC Sta. 11+27.17

END CONSTRUCTION
-R3- POC Sta. 13+60.00
-R3- PC Sta. 13+59.09

POT Sta. 10+00.00 -YA-
PC Sta. 10+02.07 -YA-

BEGIN RESURFACING
-Y3A- POT Sta. 10+00.00
-Y3- POT Sta. 9+99.63

BEGIN TIP PROJECT NO. U-3308
-LALT- STA 13+50.00

PT Sta. 13+02.66 -YA-

-Y3- POT Sta. 10+65.00
BEGIN GRADE

-LALT- POT Sta. 16+42.70 =
-YA- POT Sta. 13+31.37

-LALT- POC Sta. 18+28.75=
-R3- POT Sta. 10+00.00

-LALT- POT Sta. 20+39.12=
-Y3- POT Sta. 12+49.64

-RI- PT Sta. 14+55.67
-LALT- POT Sta. 14+39.63=
-RI- POT Sta. 15+11.05

-LALT- POT Sta. 14+55.00
BEGIN GRADE

NAD 83'95

-LALT- PT Sta. 20+28.04
-LALT- POT Sta. 20+50.00=
-R5- POT Sta. 10+00.00

-LALT- POT Sta. 14+30.60=
-R2- POT Sta. 10+00.00

-R4- PC Sta. 10+52.68
-LALT- POT Sta. 17+40.00=
-R4- POT Sta. 10+00.00
31.00' Rt.

-R2- POT Sta. 11+00.00
END CONSTRUCTION

-R4- POC Sta. 12+30.00
END CONSTRUCTION

END CONSTRUCTION
-R5- POT Sta. 11+50.00

POT Sta. 15+48.91 -YA-

Paint Striping
Pavement Removal
Bridge Approach Slab
Concrete Island or Sidewalk
NW/LT

DURHAM EXPRESSWAY
GILLETTE ST.
CHATHAM PL
DAWN ST
NC 55 ALSTON AVE
TRIASSIC RESIDUAL
MATCH LINE SHEET 15
MATCH LINE SHEET 5

LOCATION
TIP NO.: | COUNTY:
DESIGNED BY:
CHECKED BY: | DATE:

GRAPHIC SCALE
20 10 0 20 40
PLANS

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3308	5
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

MATCH LINE SHEET 15

MATCH LINE SHEET 4

MATCH LINE SHEET 6

MATCH LINE SHEET 16

NC 55 ALSTON AVE

EAST PETTIGREW ST

NORFOLK SOUTHERN RR

ABANDONED BRIDGE (DEMOLISHED)

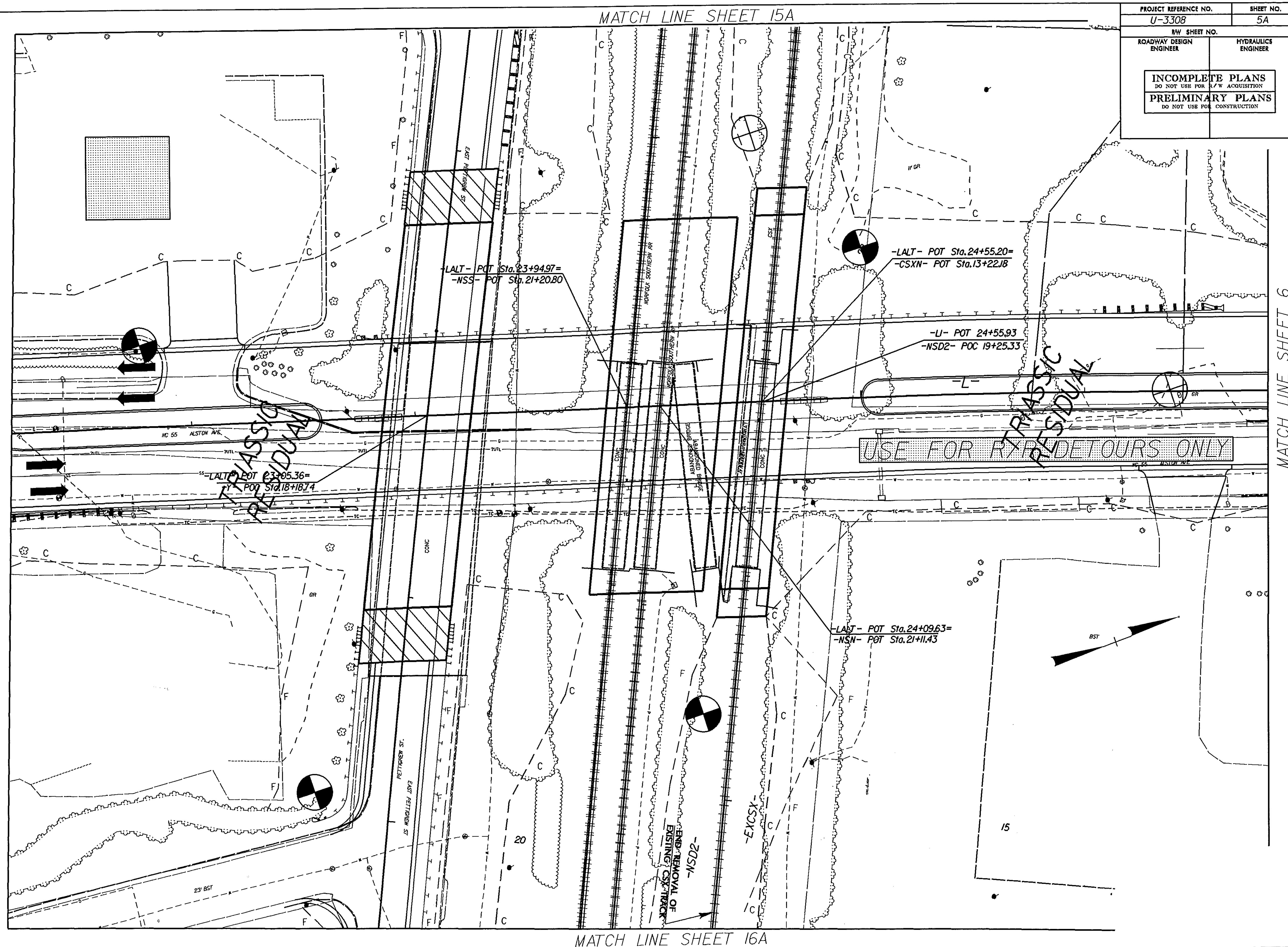
CONC

TRIASSIC RESIDUAL

GR

BST

NAD 83/95



PROJECT REFERENCE NO.
U-3308
SHEET NO.
5A
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
MATCH LINE SHEET 15A
MATCH LINE SHEET 16A
MATCH LINE SHEET 4
MATCH LINE SHEET 6
-LALT- POT Sta.23+94.97=
-NSS- POT Sta.21+20.80
-LALT- POT Sta.24+55.20=
-CSXN- POT Sta.13+22.18
-U- POT 24+55.93
-NSD2- POC 19+25.33
-LALT- POT 23+05.36=
-Y- POC Sta.18+18.74
-LALT- POT Sta.24+09.63=
-NSN- POT Sta.21+11.43
TRIASSIC RESIDUAL
TRIASSIC RESIDUAL
USE FOR R/R DETOURS ONLY
NC 55 ALSTON AVE.
EAST PETTIGREW ST
PETTIGREW ST.
NORFOLK SOUTHERN RR
CONC
-L-
-NSN-
-NSD2-
-EXCSY-
END REMOVAL OF EXISTING CSX TRACK
23' BST
BST
20
15
8/17/99

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3308	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

NAD 83/95

-Y1- POT Sta. 11+00.00
BEGIN CONSTRUCTION

-LALT- POT Sta. 31+51.44
-Y1- POT Sta. 12+73.92

-Y2- POT Sta. 10+16.56=
-LALT- POT Sta. 31+50.12

ANGIER AVE.

TRIASSIC RESIDUAL

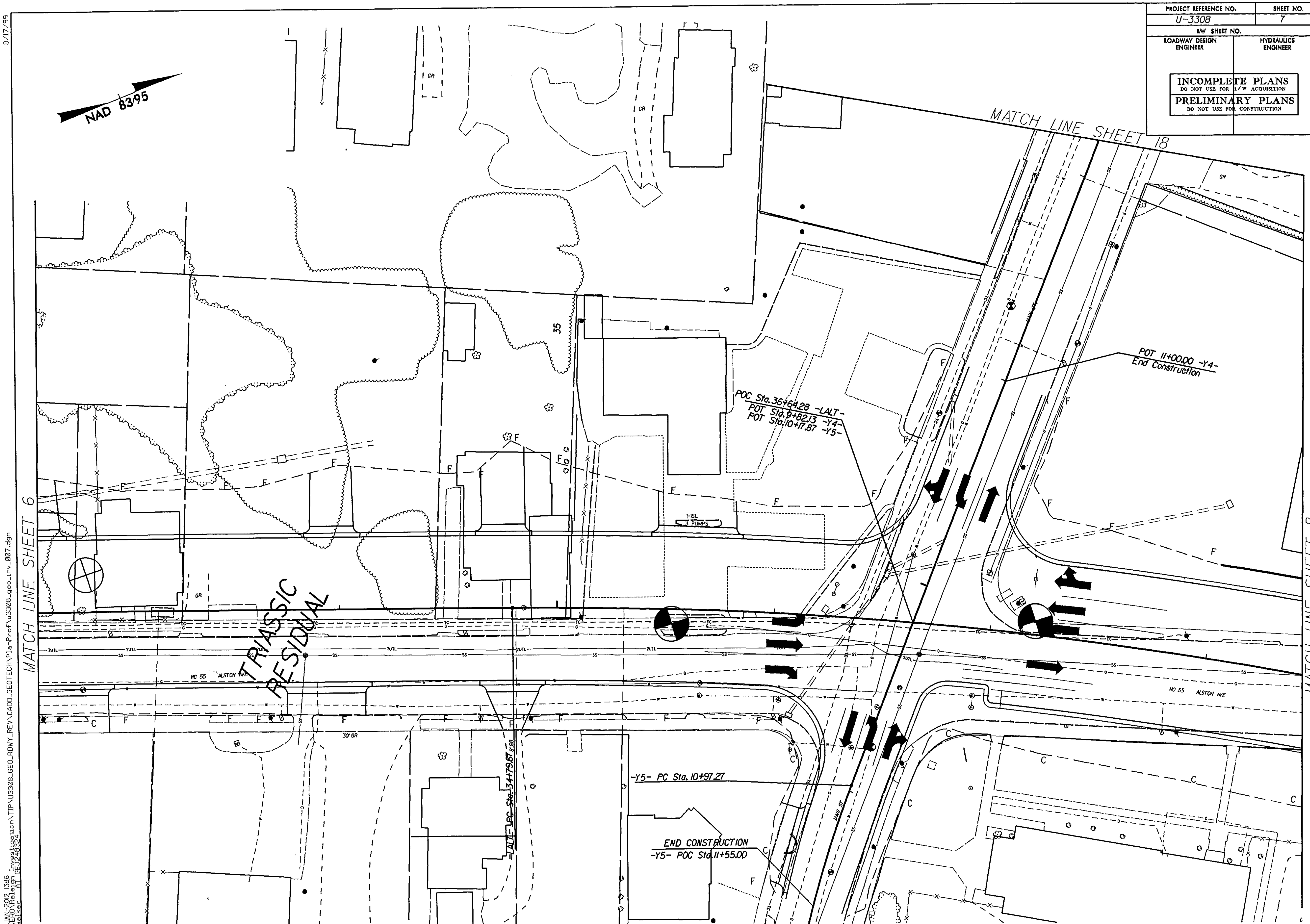
END CONSTRUCTION
-Y2- POT Sta. 9+00.00

6" CONC CURB

MATCH LINE SHEET 5

MATCH LINE SHEET 7

8/17/99

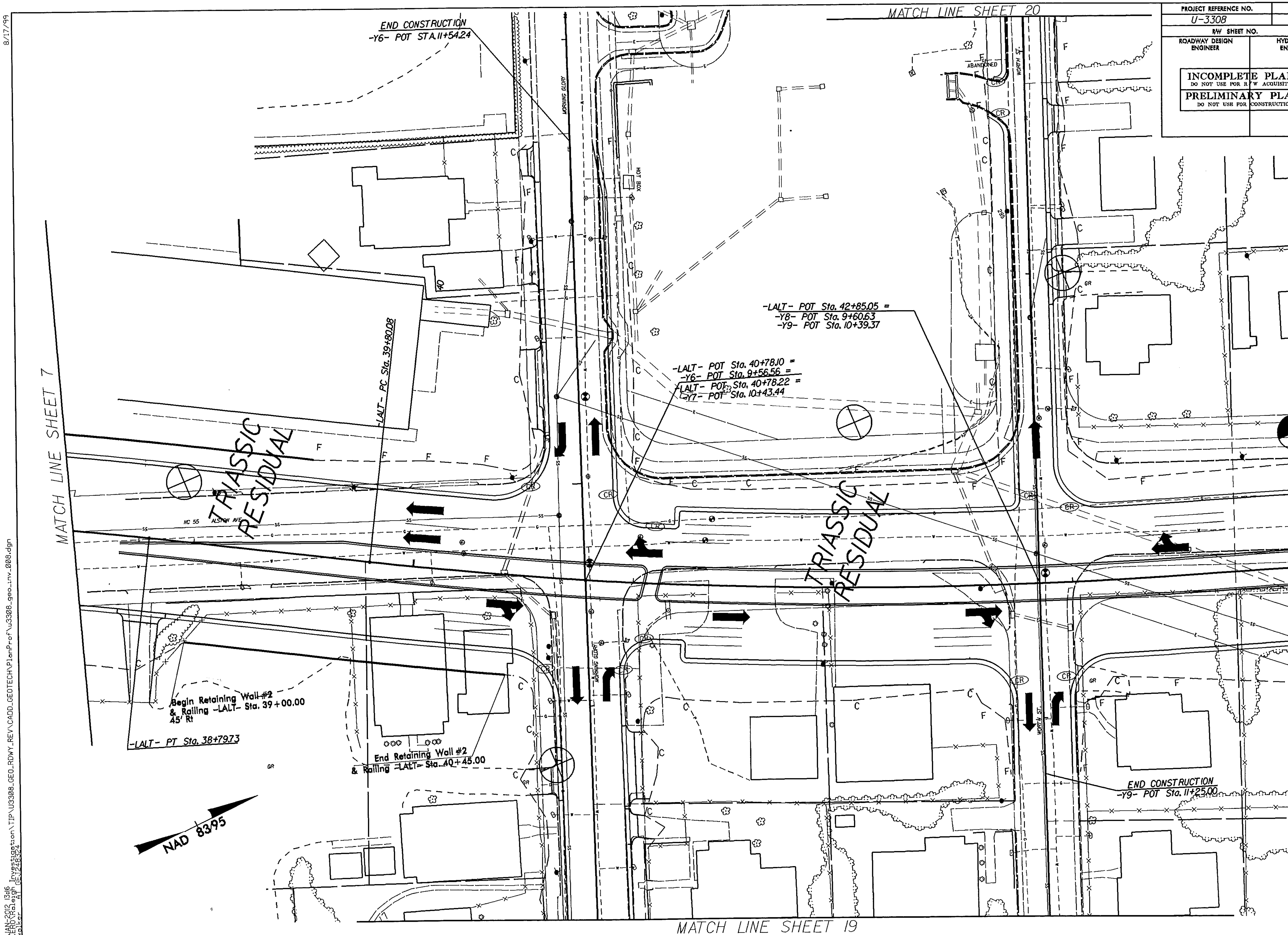


-JAN-2012 13:16
:\ERO\Raleigh Investigation\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\u3308_geo_inv_007.dgn
twalker AT GEJ248324

PROJECT REFERENCE NO.	SHEET NO.
U-3308	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



8/17/99

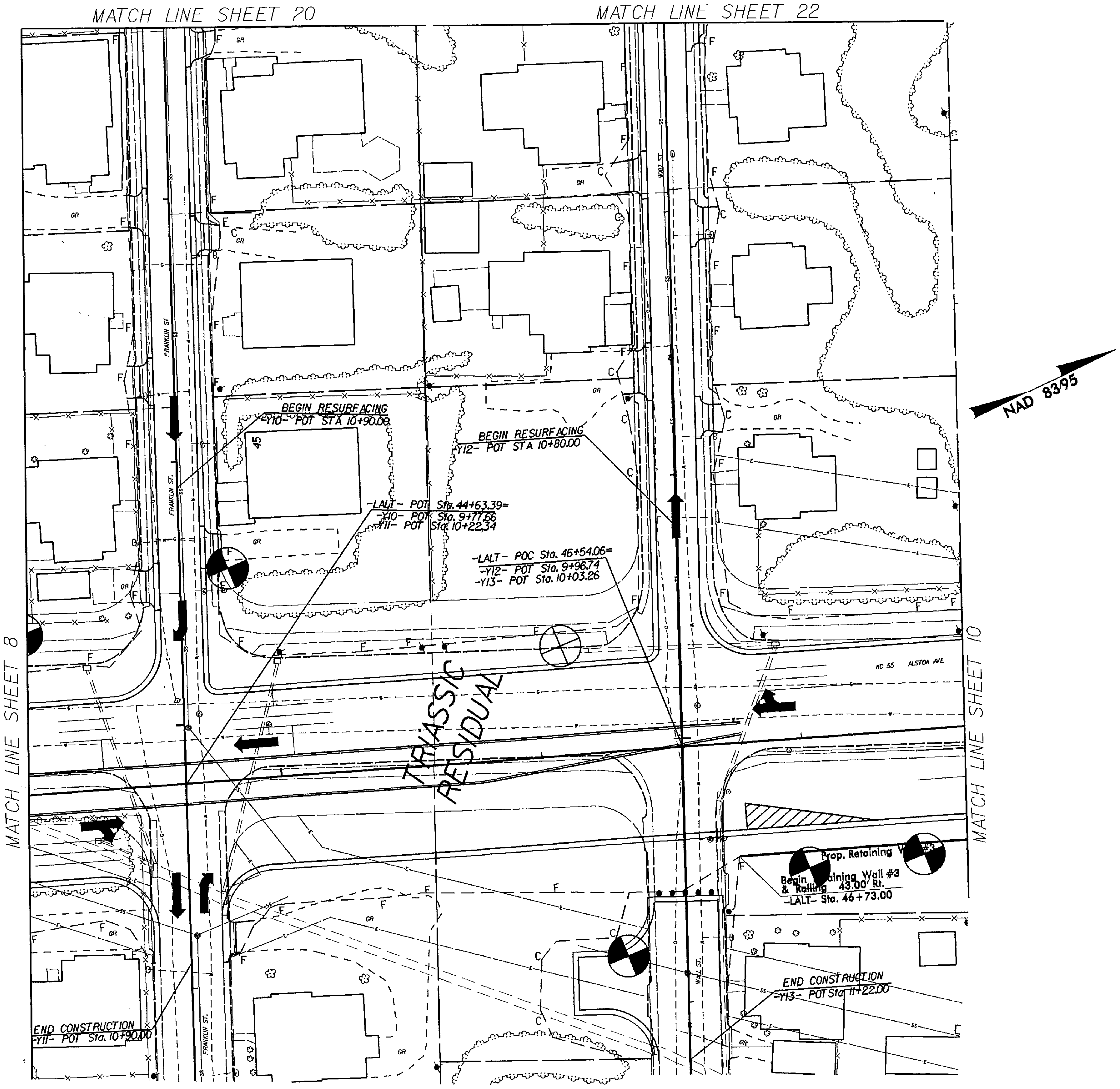
JAN-2012 13:16
:\ERO\Raleigh Investigation\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\u3308_geo_inv_008.dgn
twalker AT GEJ248324

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3308	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

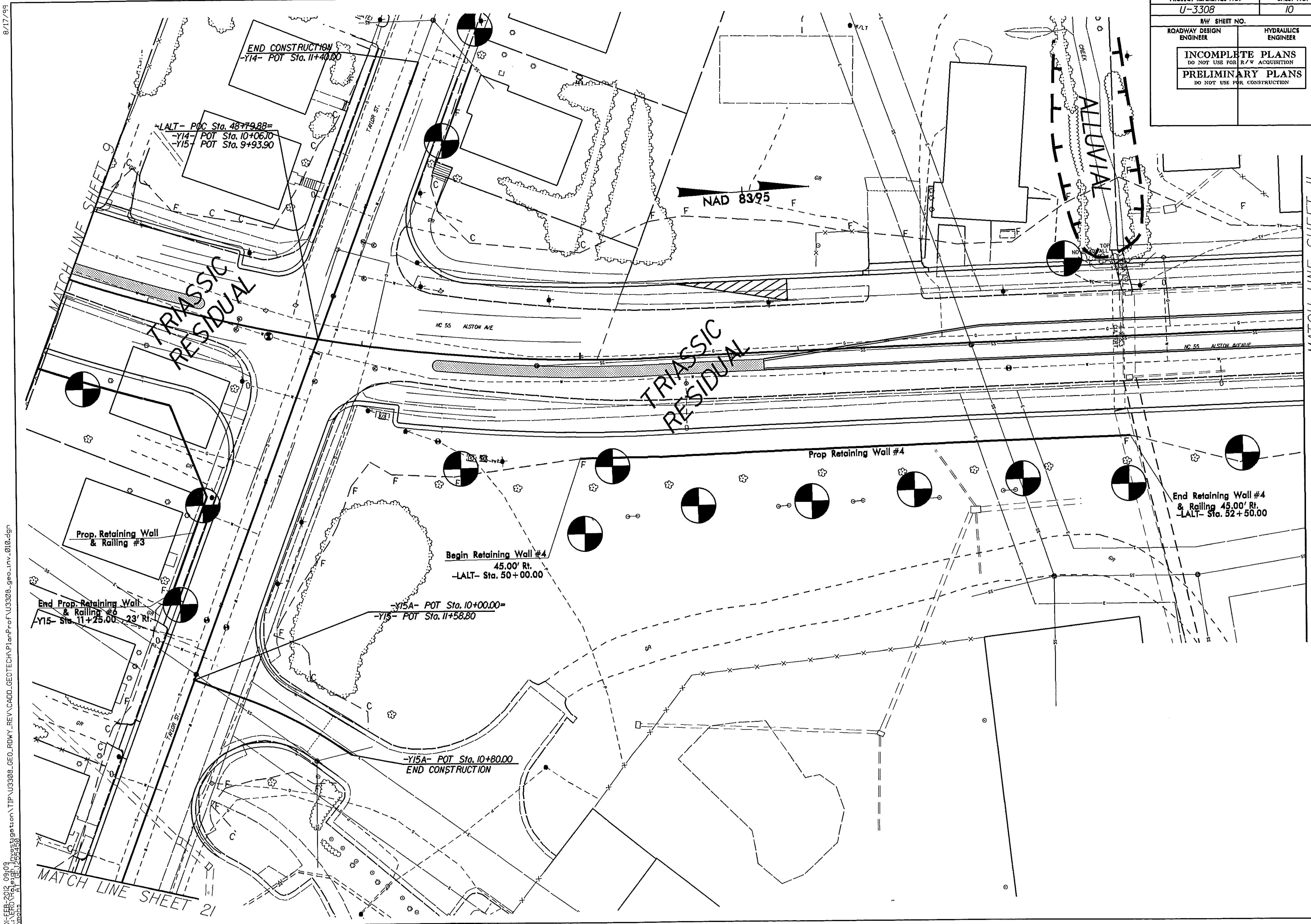
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



PROJECT REFERENCE NO.	SHEET NO.
U-3308	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

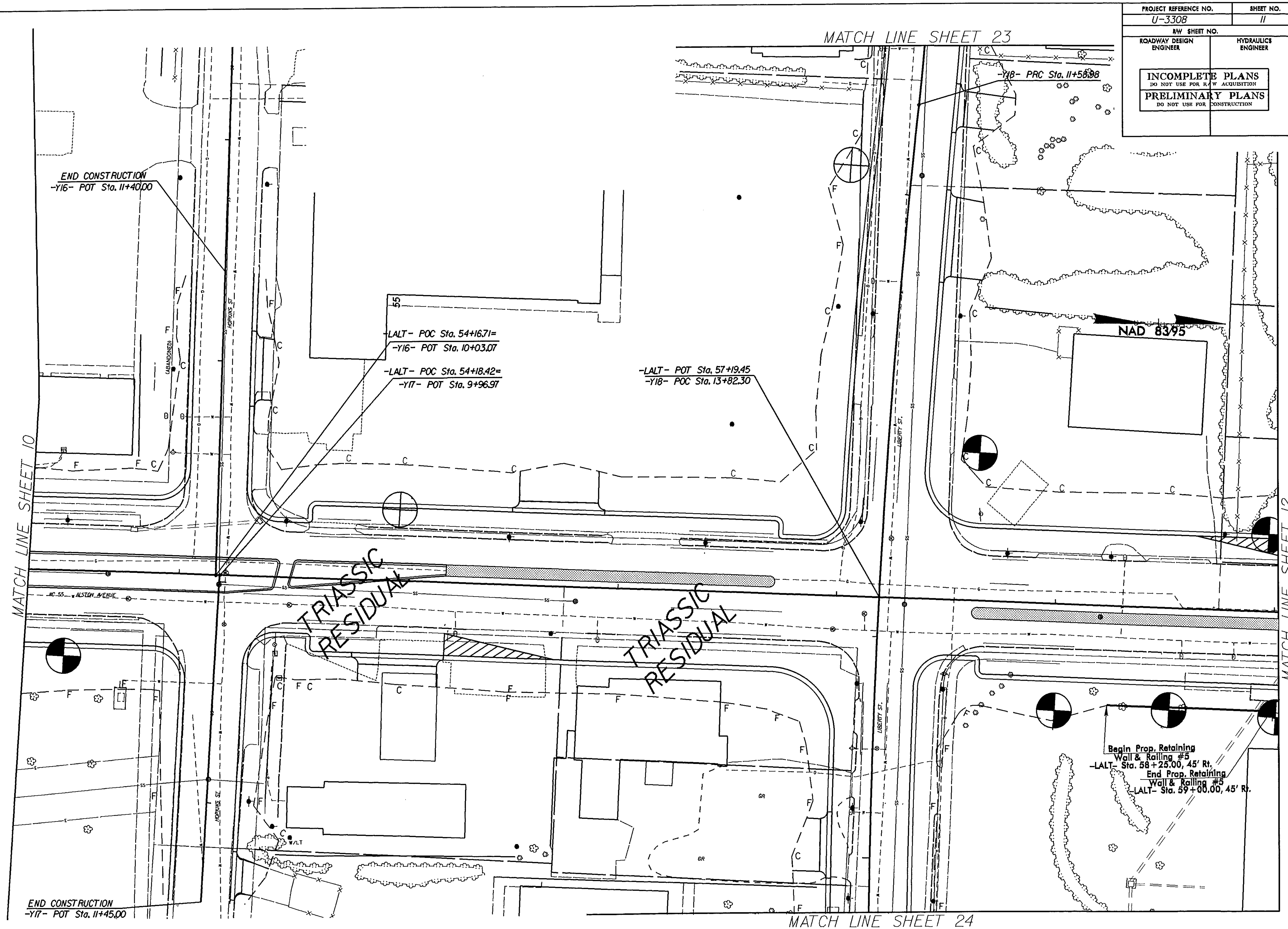
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



01-FEB-2012 09:09
...\Raleigh Investigation\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\U3308-geo_inv_010.dgn
...mohs AT GEJ12554510

8/17/99

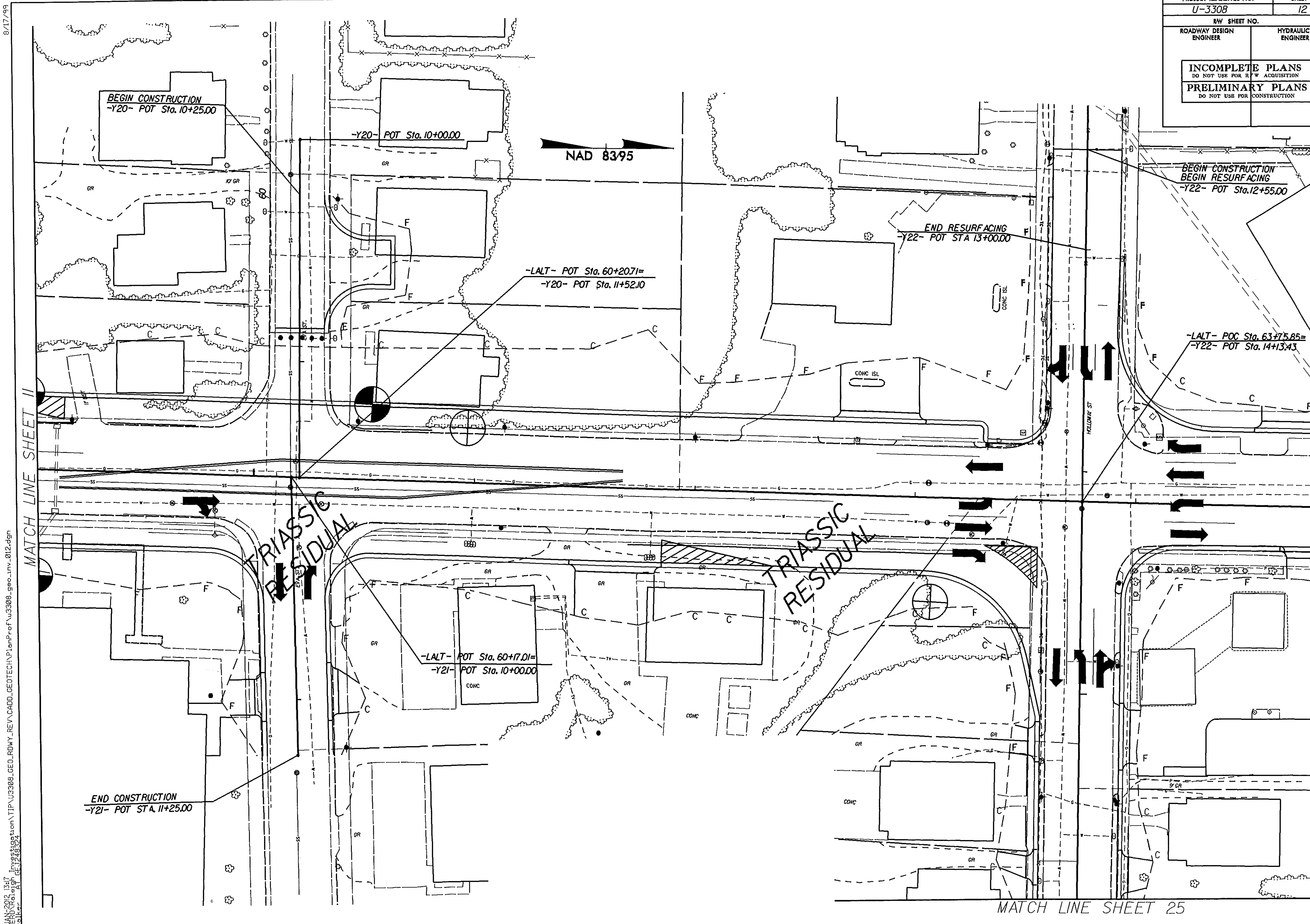


PROJECT REFERENCE NO. U-3308
SHEET NO. 11
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
MATCH LINE SHEET 23
MATCH LINE SHEET 10
MATCH LINE SHEET 12
MATCH LINE SHEET 24
END CONSTRUCTION -Y16- POT Sta. 11+40.00
-LALT- POC Sta. 54+16.71= -Y16- POT Sta. 10+03.07
-LALT- POC Sta. 54+18.42= -Y17- POT Sta. 9+96.97
-LALT- POT Sta. 57+19.45 -Y18- POC Sta. 13+82.30
-Y18- PRC Sta. 11+58.98
NAD 83/95
TRIASSIC RESIDUAL
TRIASSIC RESIDUAL
HOPKINS ST.
LIBERTY ST.
ALSTON AVENUE
(ABANDONED)
Begin Prop. Retaining Wall & Railing #5 -LALT- Sta. 58+25.00, 45' Rt.
End Prop. Retaining Wall & Railing #5 -LALT- Sta. 59+00.00, 45' Rt.
END CONSTRUCTION -Y17- POT Sta. 11+45.00

PROJECT REFERENCE NO.	SHEET NO.
U-3308	12
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



8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3308	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

VINEYARD

END TIP PROJECT NO. U-3308
STA. 66+10.00 -LALT-

TRIASSIC RESIDUAL

NC 55 ALSTON AVENUE

GR

SS

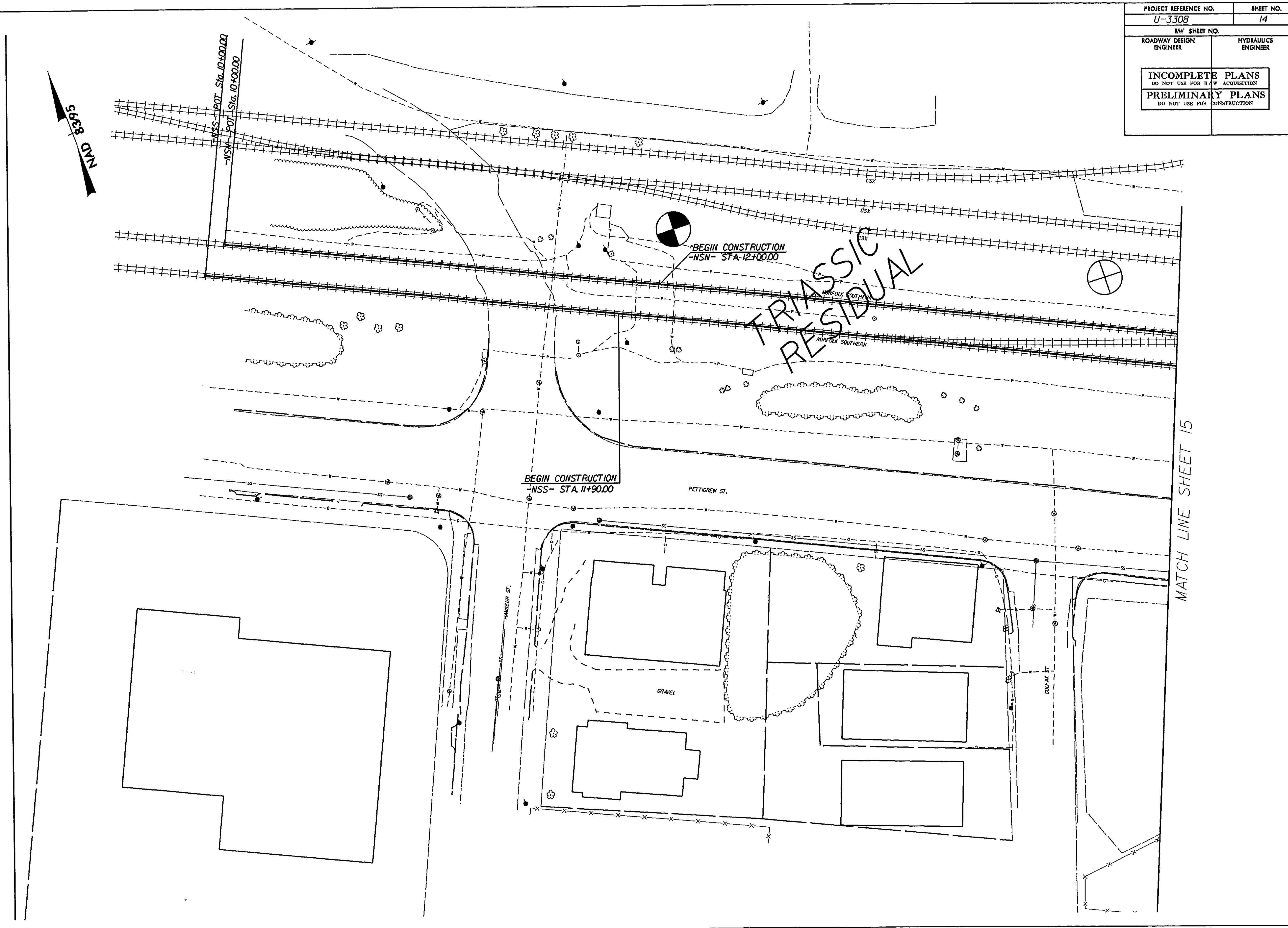
MATCH LINE SHEET 12

J-JAN-2012 13:18
:\VERO\Raleigh Investigation\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\u3308_geo_inv_013.dgn
Meiser
08/28/24

PROJECT REFERENCE NO.	SHEET NO.
U-3308	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

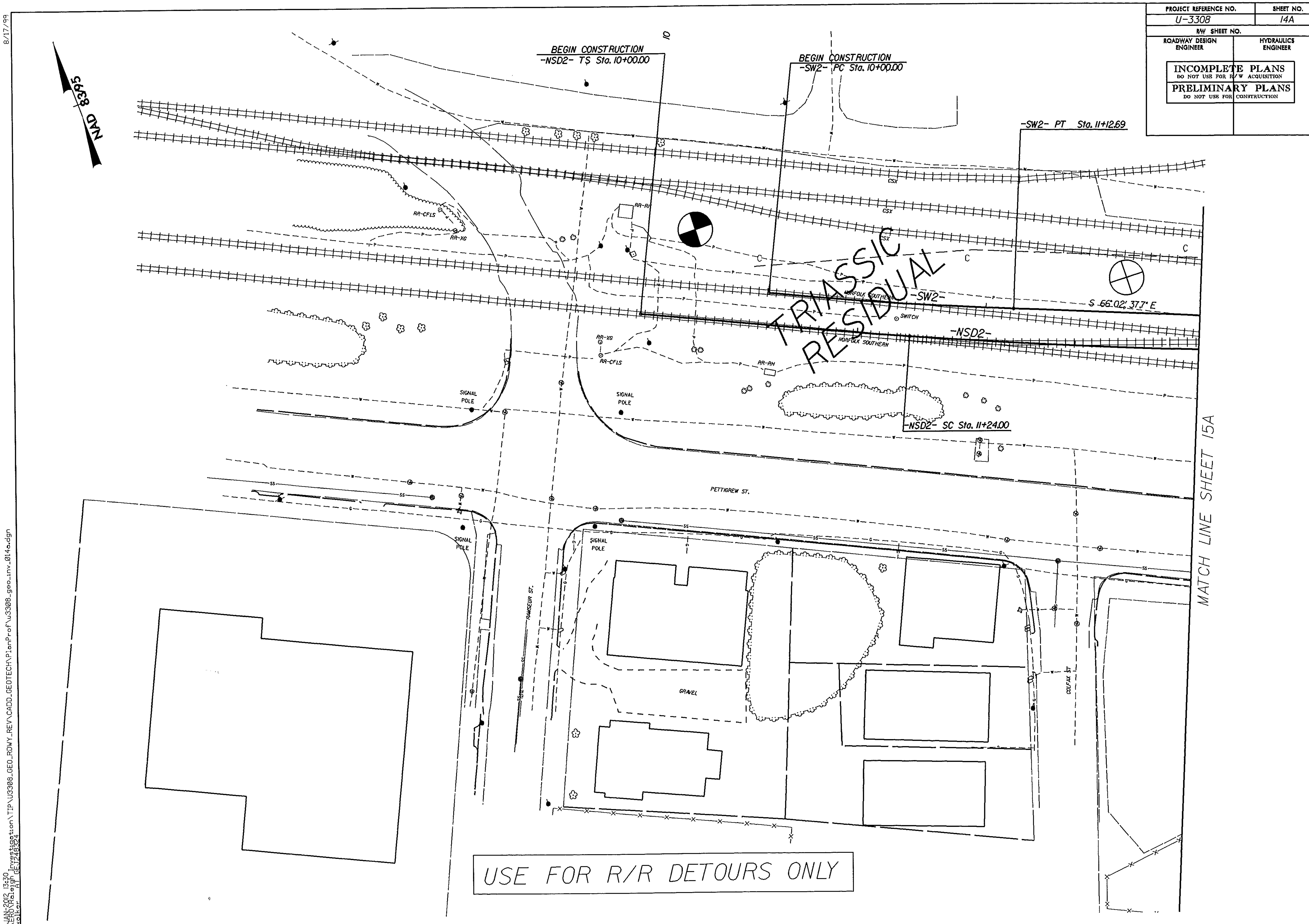
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION



8/17/99

31-JAN-2012 13:18
...\ERO\Raleigh Investigation\TIP\U3308_GED_RDWY_REV\CADD_GEDTECH\PlanProf\U3308_geo_inv_014.dgn
...twalker AT GEJ2483324


PROJECT REFERENCE NO.
SHEET NO.
U-3308
14A
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/95
BEGIN CONSTRUCTION
-NSD2- TS Sta. 10+00.00
BEGIN CONSTRUCTION
-SW2- PC Sta. 10+00.00
-SW2- PT Sta. 11+12.69
TRIASSIC RESIDUAL
S 66°02' 37.7" E
-SW2-
-NSD2-
NORFOLK SOUTHERN
SWITCH
CSX
RR-CFLS
RR-XG
RR-RH
SIGNAL POLE
-NSD2- SC Sta. 11+24.00
PETTIGREW ST.
RAMSEUR ST.
COLFAX ST.
GRAVEL
MATCH LINE SHEET 15A
USE FOR R/R DETOURS ONLY
8/17/99

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3308	15
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

MATCH LINE SHEET 14

BEGIN CONSTRUCTION
-CSXN- POT Sta. 10+00.00

CSX

TRIASSIC RESIDUAL

SWITCH

NORFOLK SOUTHERN RR

GR

-Y- POT Sta. 14+00.00
BEGIN CONSTRUCTION
BEGIN RESURFACING

PETTIGREW ST.

NAD 83'95

MURPHY ST.

-Y- POT Sta. 16+00.00
END RESURFACING
BEGIN GRADE

-Y3A- POT Sta. 12+93.27=
-Y- POT Sta. 16+02.73

CHATHAM PL.

MATCH LINE SHEET 5

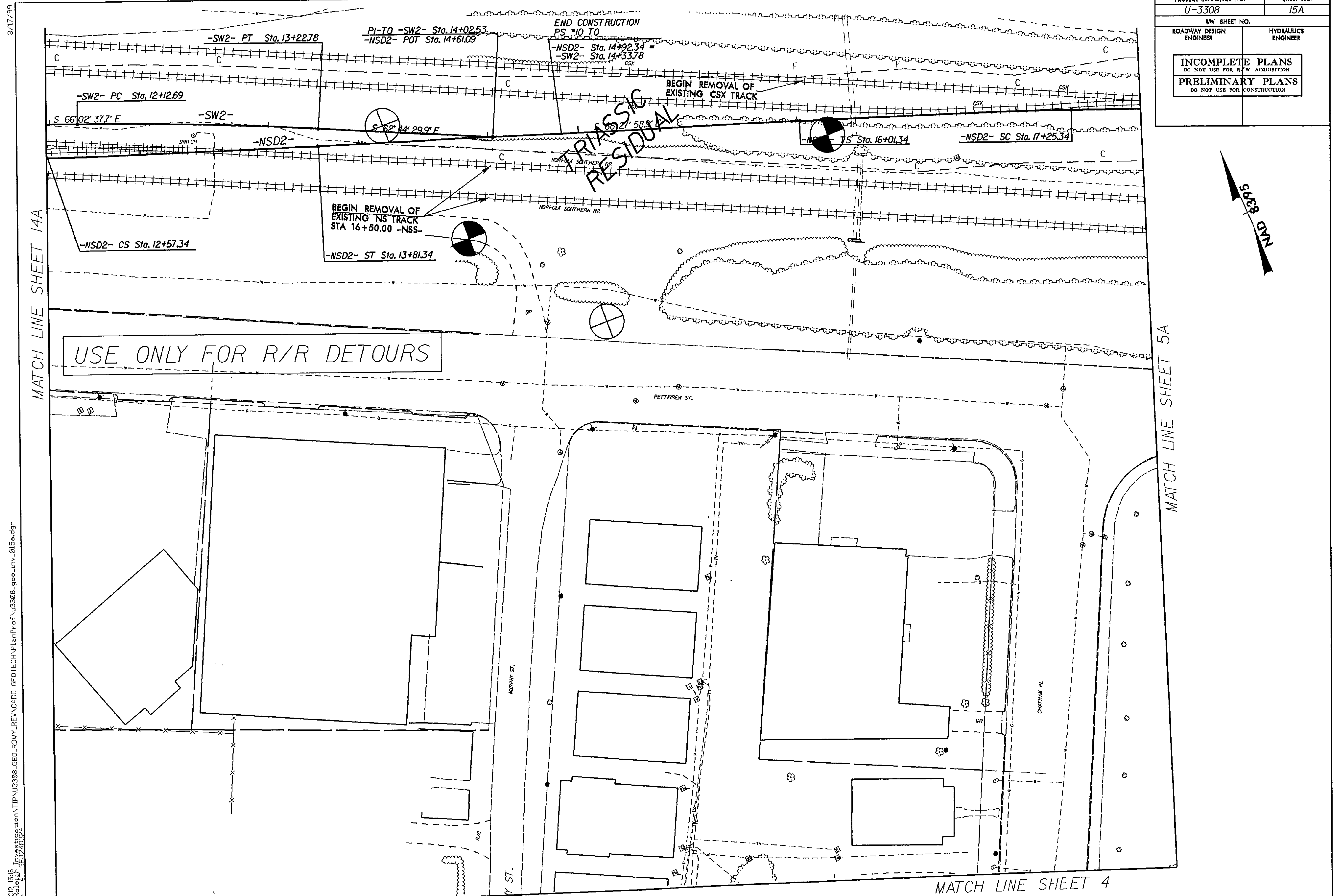
MATCH LINE SHEET 4

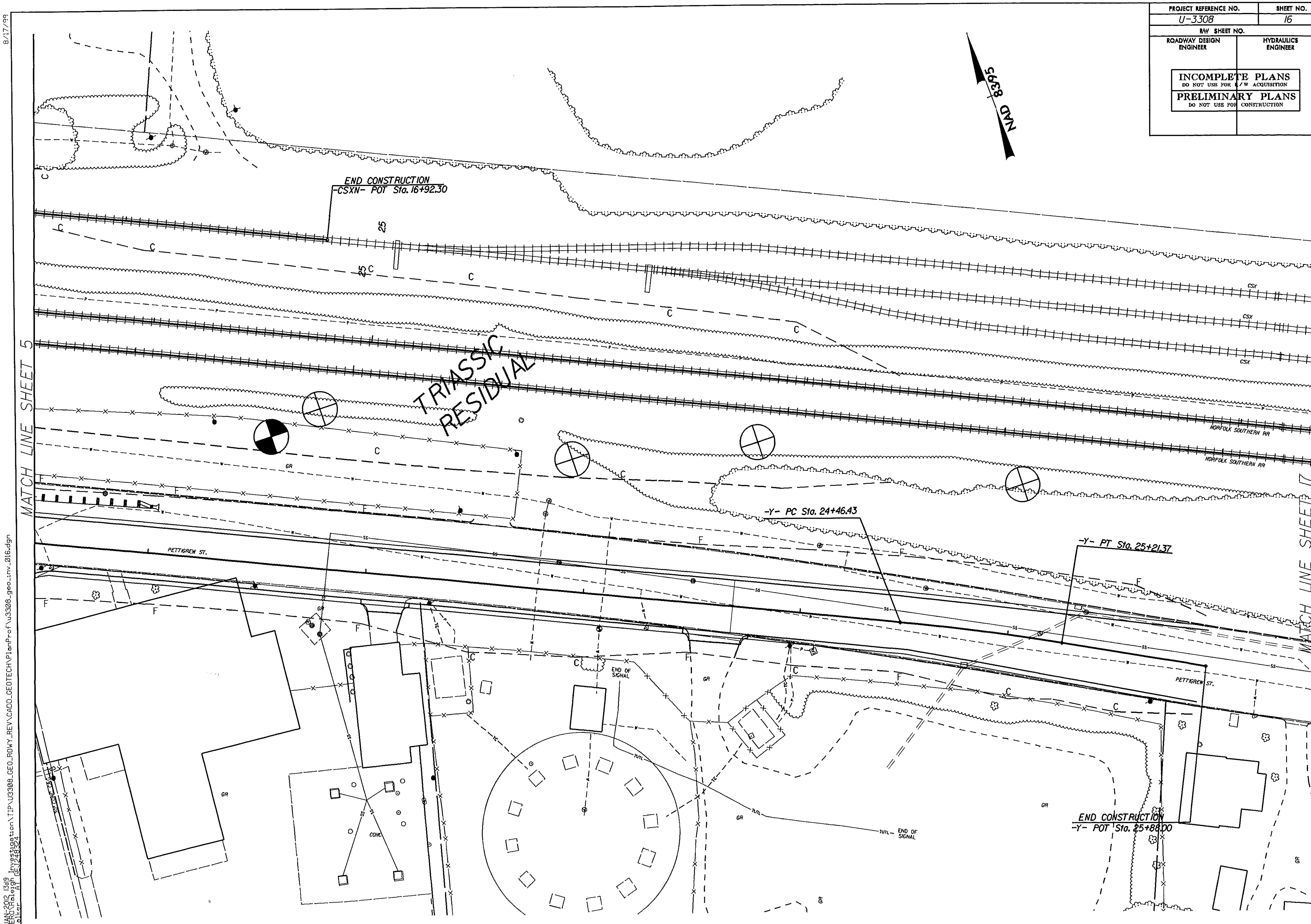
I:\ERD\Raleigh Investigation\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\u3308_geo_rnv_015.dgn
10-JAN-2012 13:48
jwalker

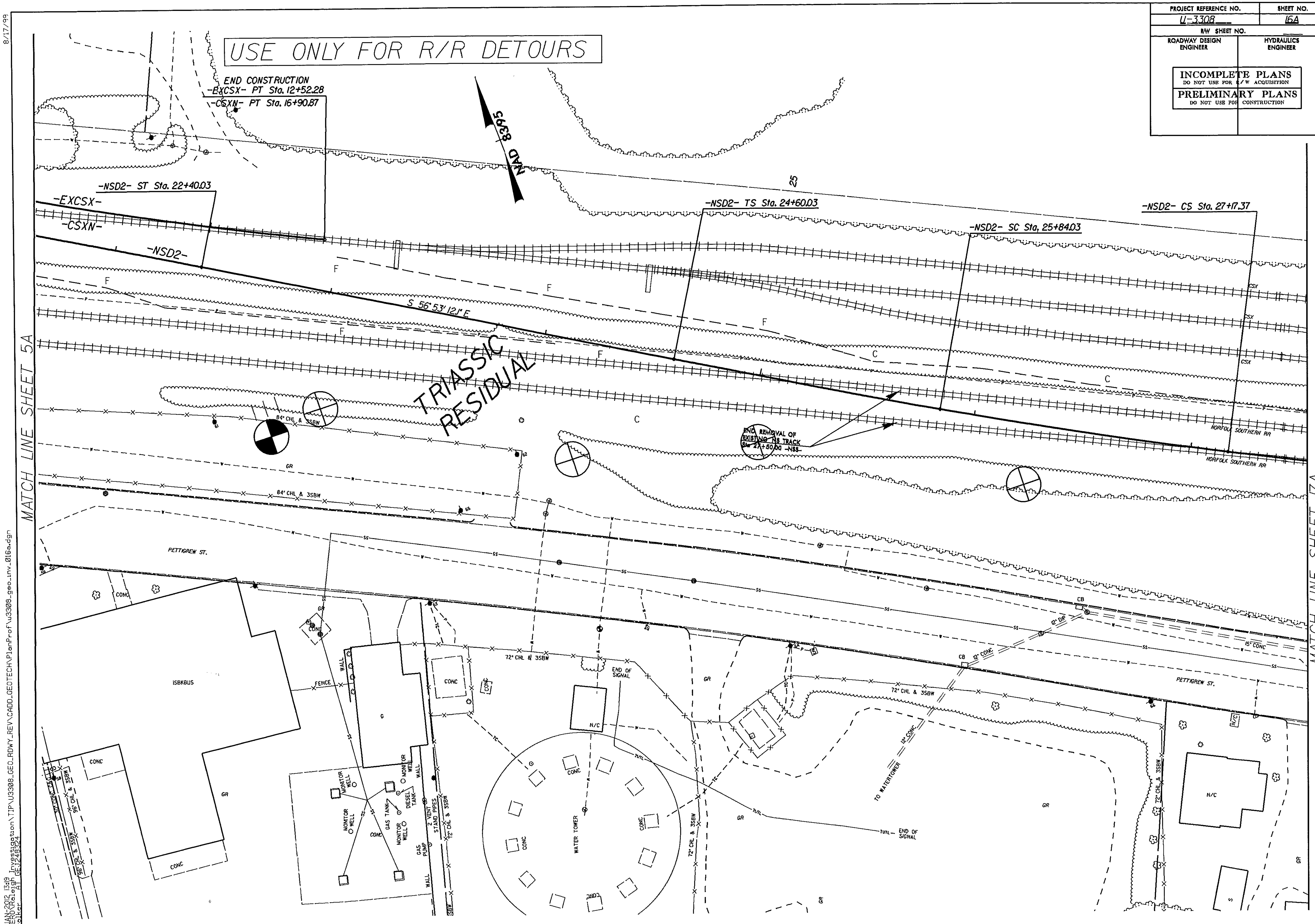
PROJECT REFERENCE NO.	SHEET NO.
U-3308	15A
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

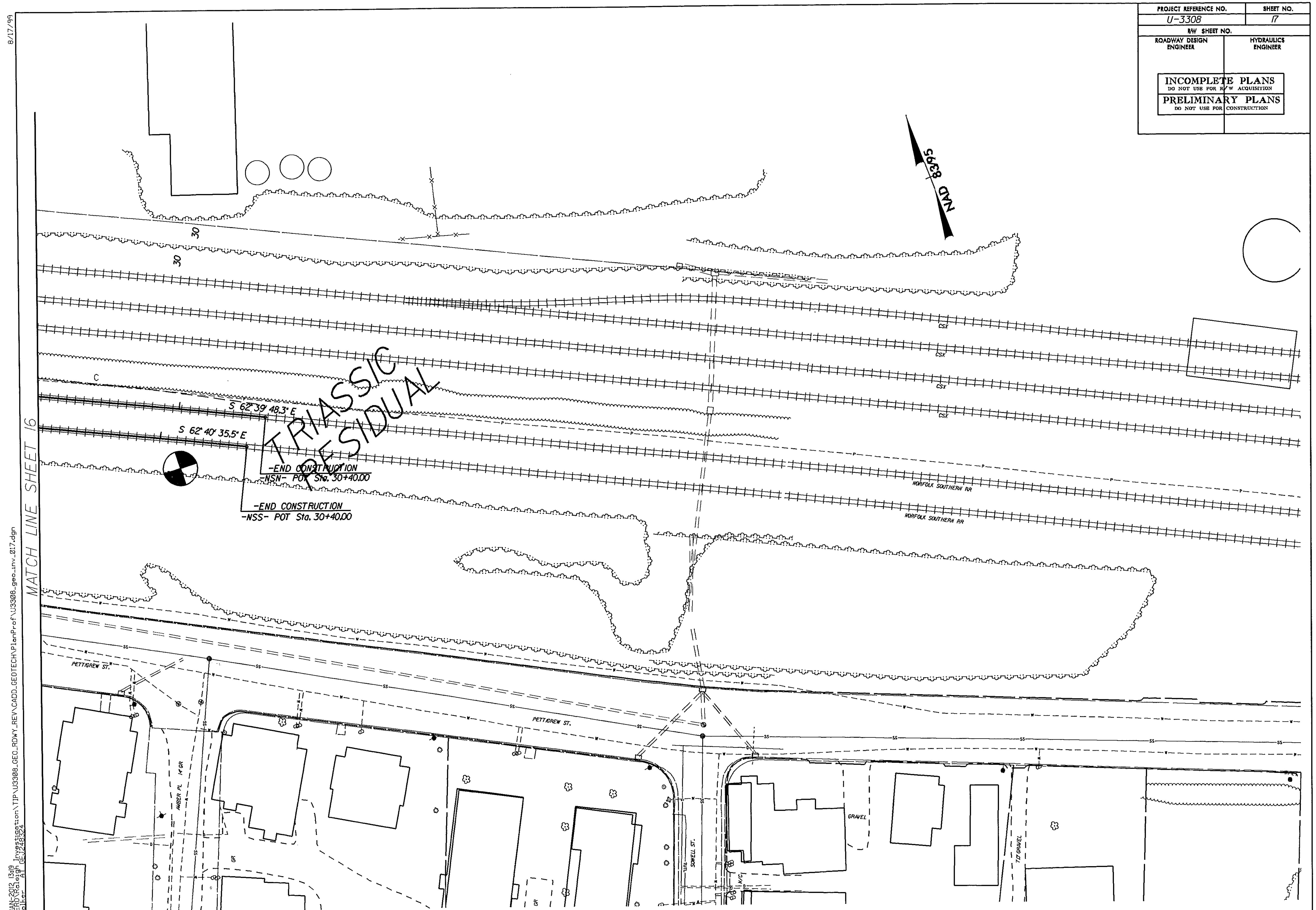
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION




PROJECT REFERENCE NO.
U-3308
SHEET NO.
16
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/95
END CONSTRUCTION
-CSXN- POT Sta. 16+92.30
TRIASSIC RESIDUAL
MATCH LINE SHEET 5
MATCH LINE SHEET 17
CSX
NORFOLK SOUTHERN RR
PETTIGREW ST.
-Y- PC Sta. 24+46.43
-Y- PT Sta. 25+21.37
END OF SIGNAL
END CONSTRUCTION
-Y- POT Sta. 25+86.00
8/17/99



PROJECT REFERENCE NO.
U-3308
SHEET NO.
16A
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
USE ONLY FOR R/R DETOURS
END CONSTRUCTION
-EXCSX- PT Sta. 12+52.28
-CSXN- PT Sta. 16+90.87
NAD 83/95
-NSD2- ST Sta. 22+40.03
-NSD2- TS Sta. 24+60.03
-NSD2- SC Sta. 25+84.03
-NSD2- CS Sta. 27+17.37
-EXCSX-
-CSXN-
-NSD2-
S 56°53' 12.1" E
TRIASSIC RESIDUAL
END REMOVAL OF EXISTING NS TRACK Sta. 27+50.00 -NSS-
NORFOLK SOUTHERN RR
PETTIGREW ST.
84" CHL & 3SBW
72" CHL & 3SBW
ISBKBUS
FENCE
WALL
MONITOR WELL
GAS TANK
DIESEL TANK
GAS PUMP
2 VENT STAND PIPES
WATER TOWER
END OF SIGNAL
TO WATERTOWER
12" CONC
15" CONC
CB
MATCH LINE SHEET 5A
MATCH LINE SHEET 17A
8/17/99



PROJECT REFERENCE NO.
SHEET NO.
U-3308
17
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
NAD 83/95
MATCH LINE SHEET 16
TRIASSIC RESIDUAL
S 62° 39' 48.3" E
S 62° 40' 35.5" E
-END CONSTRUCTION
-NSN- POT Sta. 30+40.00
-END CONSTRUCTION
-NSS- POT Sta. 30+40.00
CSX
NORFOLK SOUTHERN RR
PETTIGREW ST.
AMBER PL.
SOWELL ST.
GRAVEL
8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3308	17A
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

8/17/99

USE ONLY FOR R/R DETOUR

NAD 83/95

END CONSTRUCTION
-NSD2- ST Sta. 28+41.37
-NSS- POT Sta. 30+26.20

TRIASSIC RESIDUAL

MATCH LINE SHEET 16A

NORFOLK SOUTHERN RR

NORFOLK SOUTHERN RR

PETTIGREW ST.

PETTIGREW ST.

AMBER PL 14"CR

SOWELL ST.

GRAVEL

TO GRAVEL

11-JAN-2012 13:20
$:\NCDOT\Raleigh Investigation\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\U3308_geo_inv_017a.dgn
Bowler

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3308	18
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

MATCH LINE SHEET 21

-Y9- POT Sta.14+24.47

WORTH ST.

GR

END CONSTRUCTION
-Y7- POT Sta.12+50.00

MORNING GLORY

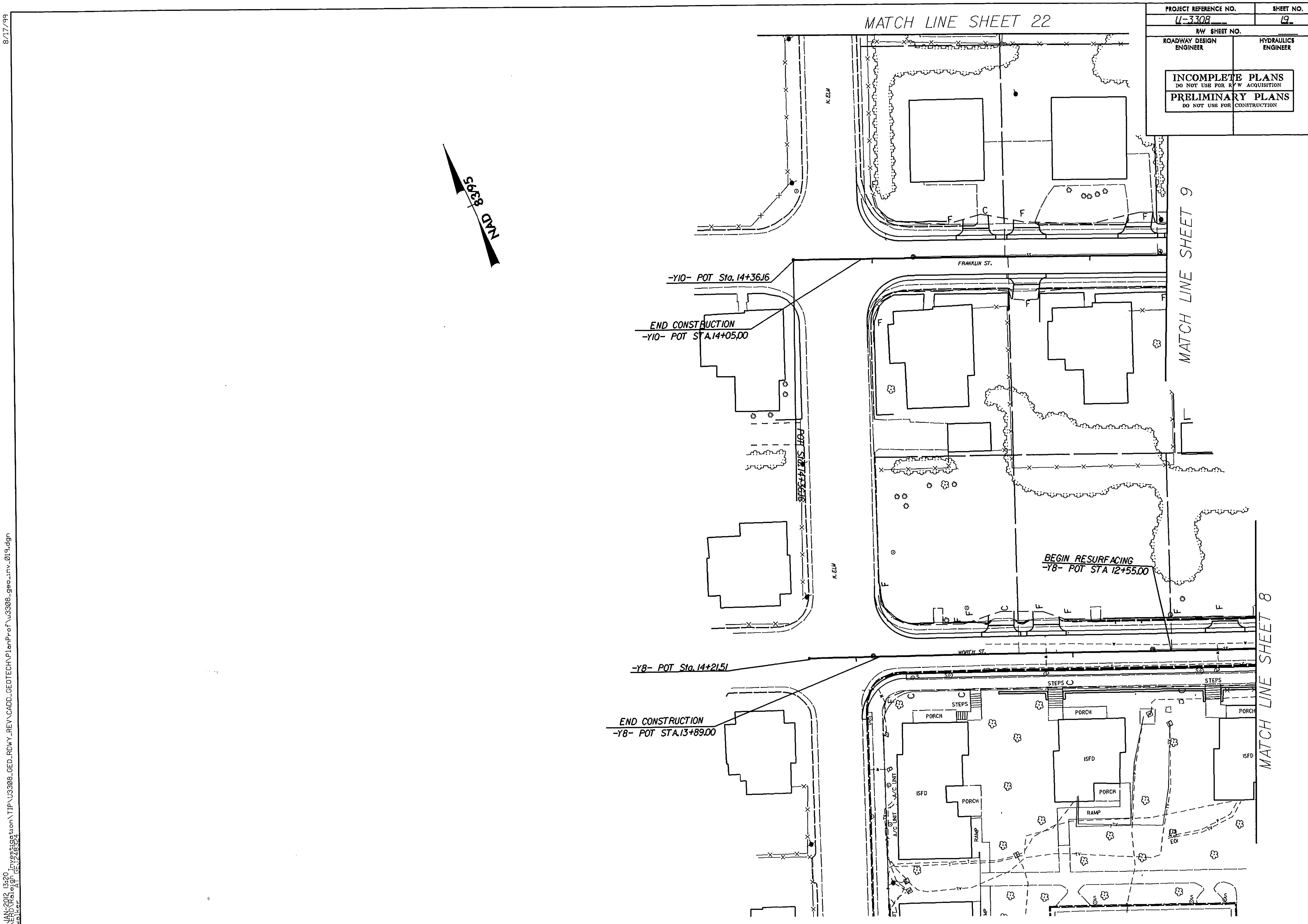
SS

MATCH LINE SHEET 8

NAD 83'95

PROJECT REFERENCE NO.	SHEET NO.
U-3308	19
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



8/17/99
\u3308_geo_inv_019.dgn

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3308	20
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

MATCH LINE SHEET 10

POT Sta. 16+25.58 -Y15-

END CONSTRUCTION
Sta.16+20.00 -Y15-

TAYLOR ST

EXISTING R/W

HOLMAN ST.

EXISTING R/W

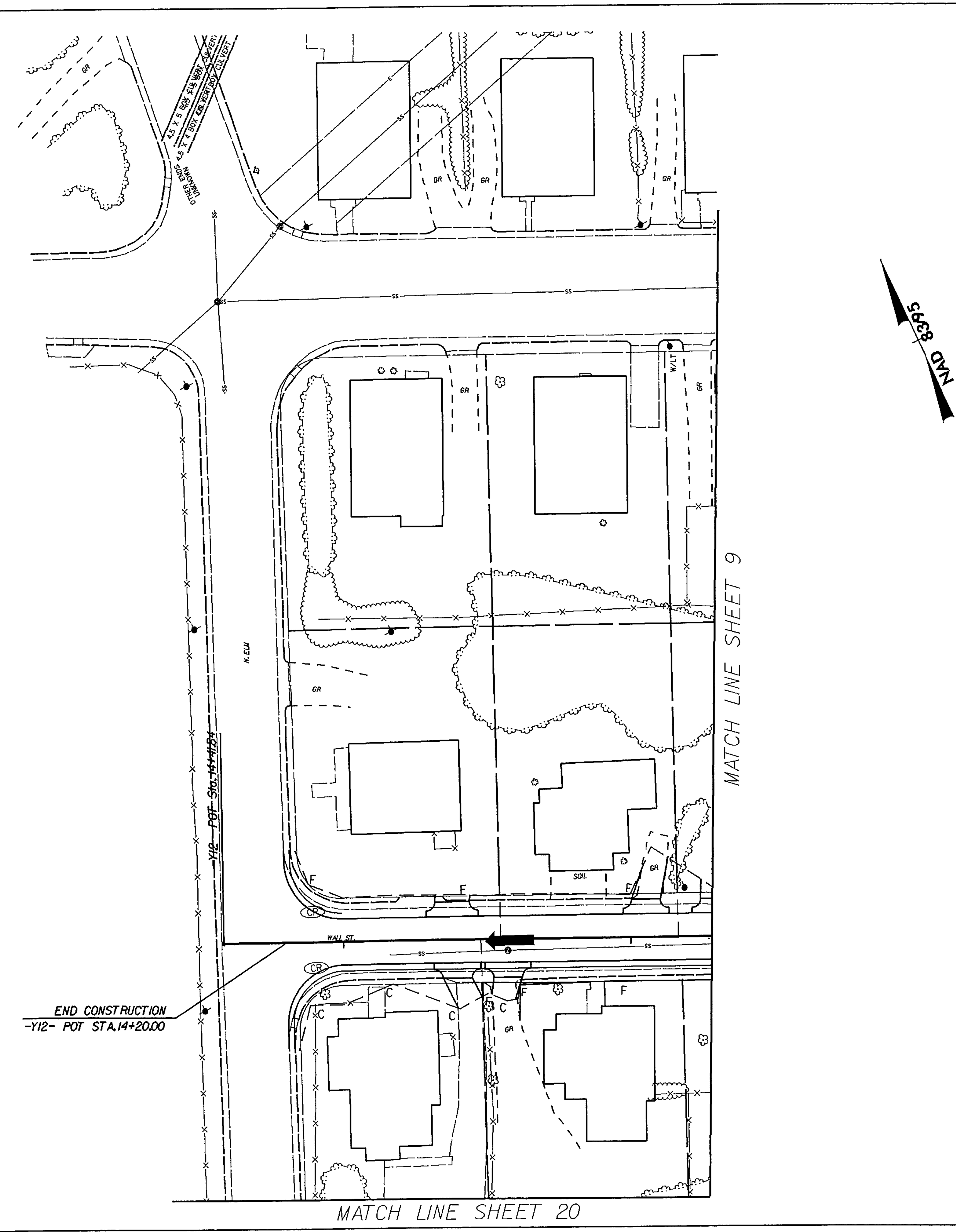
NAD 83/95

EXISTING R/W

PROJECT REFERENCE NO.	SHEET NO.
U-3308	21
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



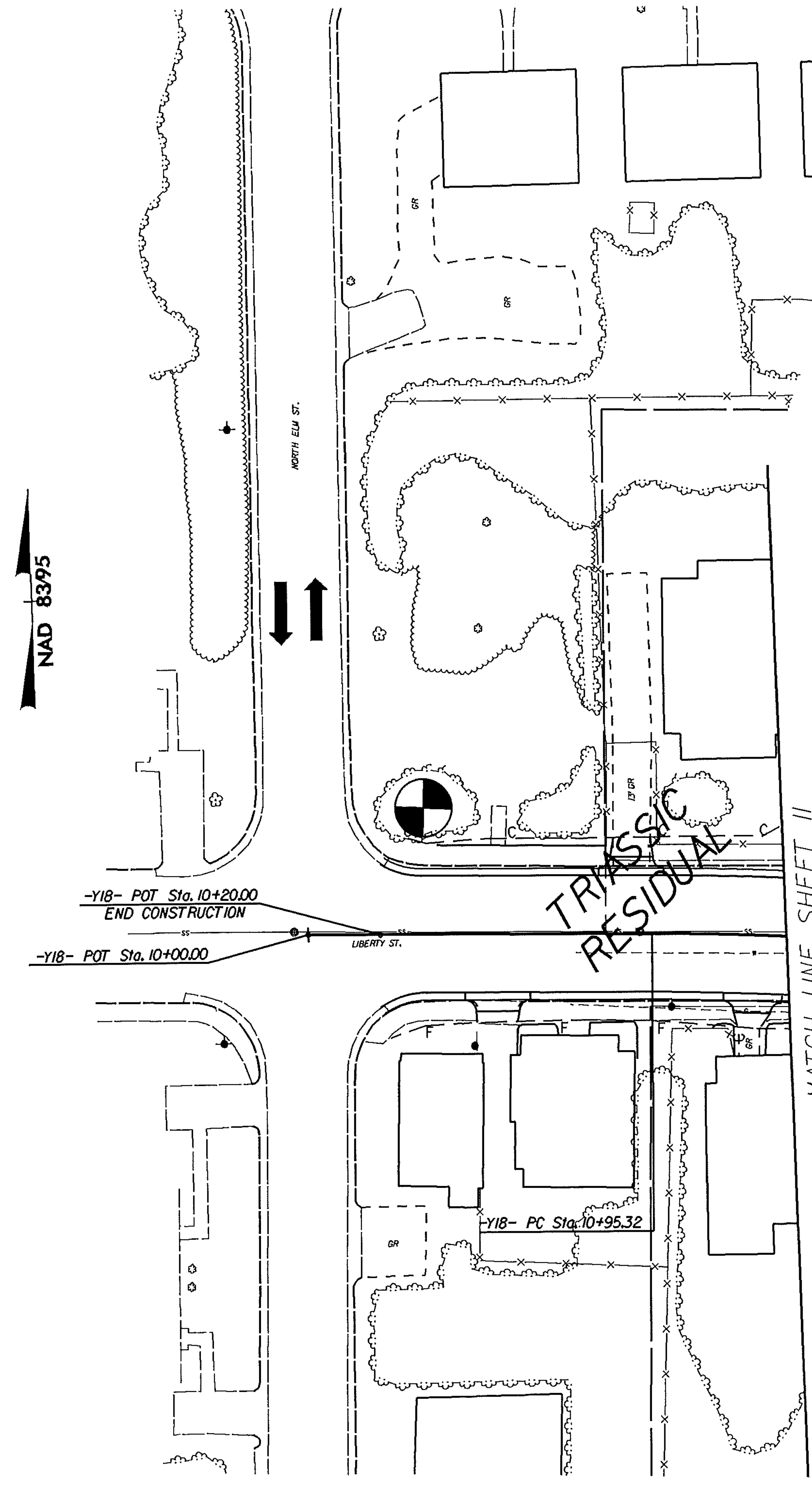
8/17/99

31-JAN-2012 13:21
:\ERO\Raleigh Investigation\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\U3308_geo_inv_021.dgn
ttwalker AT GEJ248324

PROJECT REFERENCE NO.	SHEET NO.
U-3308	22
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



8/17/99

Investigation\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\U3308_geo_inv_022.dgn

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3308	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

NAD 83/95

PA U/C

MATCH LINE SHEET 11

LIBERTY ST.

-Y18- POT Sta. 17+83.00
END CONSTRUCTION

LIBERTY ST

-Y18- PT Sta. 17+82.35

EXIST R/W VARIES

F

SS

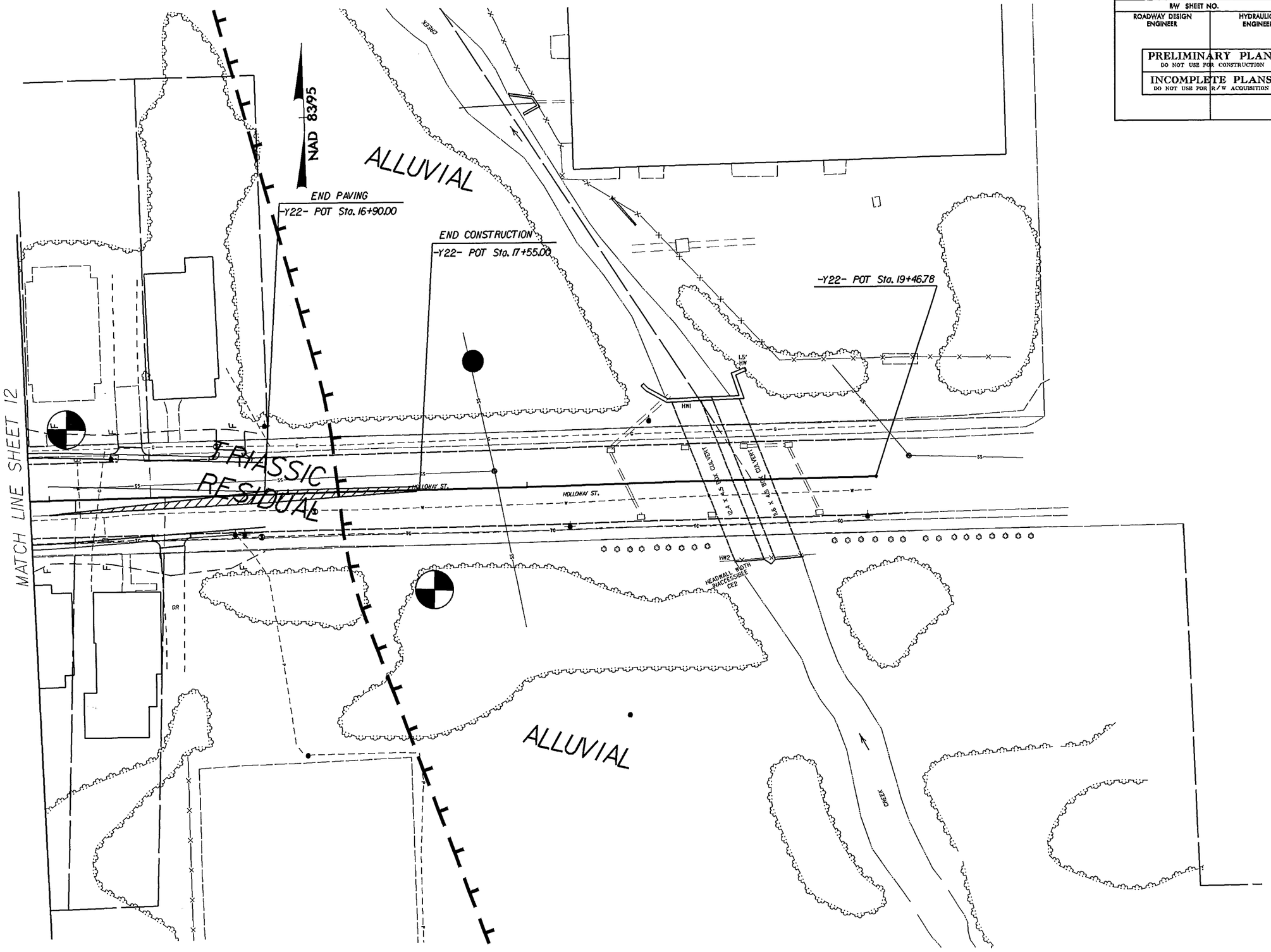
W

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
U-3308	24
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION



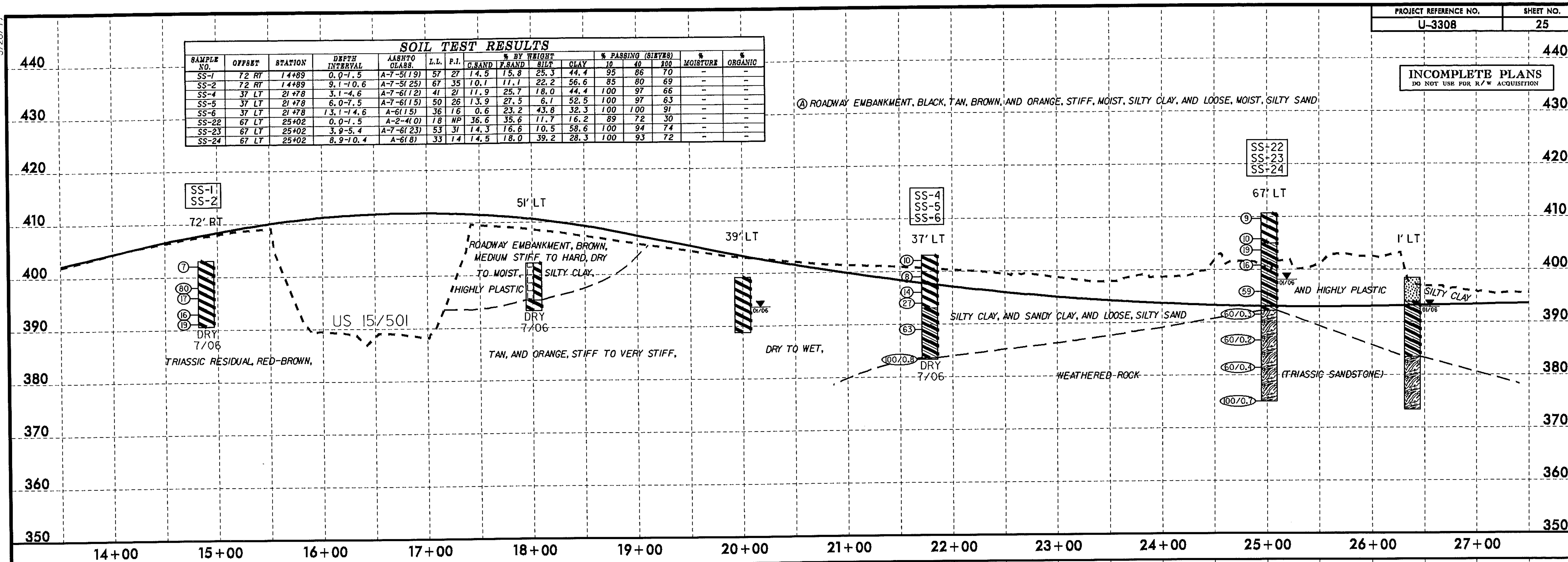
I:\VAN-2012 13:21
C:\ERO\Raleigh Projects\Division\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\U3308_geo_inv_024.dgn
Parker AT 06.24.824

PROJECT REFERENCE NO.	SHEET NO.
U-3308	25

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

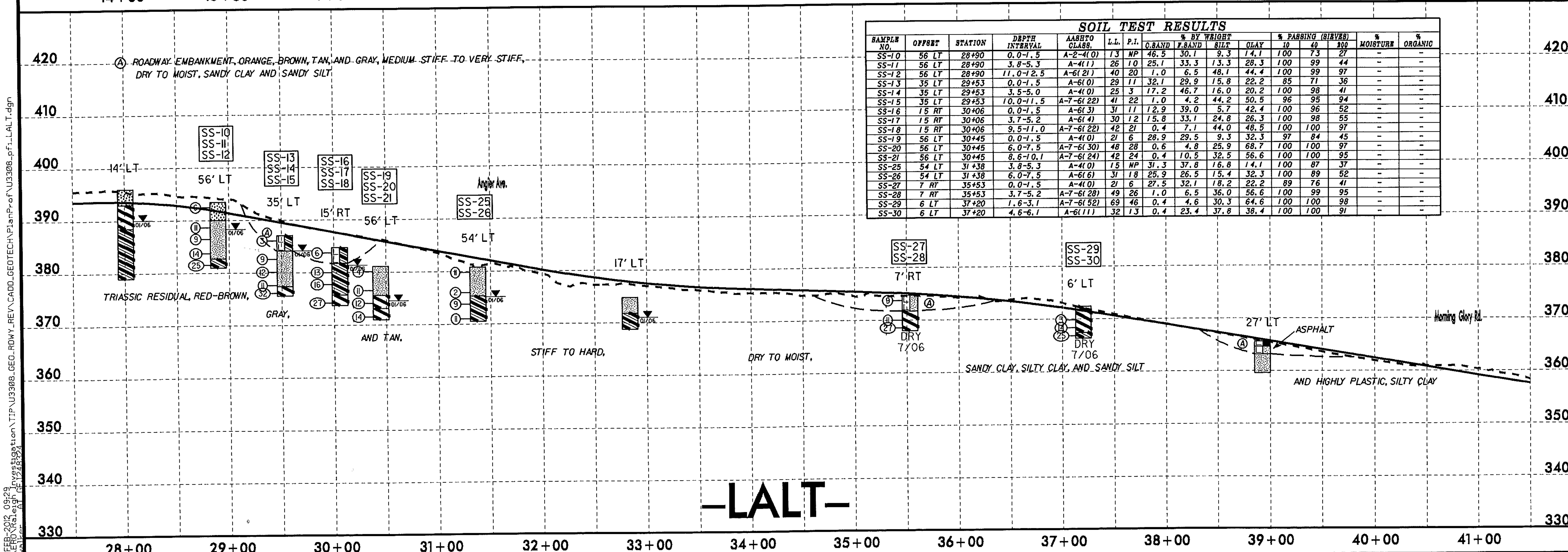
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-1	72 RT	14+89	0.0-1.5	A-7-5(19)	57	27	14.5	15.8	25.3	44.4	95	86	70	-	-
SS-2	72 RT	14+89	9.1-10.6	A-7-5(25)	67	35	10.1	11.1	22.2	56.6	85	80	69	-	-
SS-4	37 LT	21+78	3.1-4.6	A-7-6(12)	41	21	11.9	25.7	18.0	44.4	100	97	66	-	-
SS-5	37 LT	21+78	6.0-7.5	A-7-6(15)	50	26	13.9	27.5	6.1	52.5	100	97	63	-	-
SS-6	37 LT	21+78	13.1-14.6	A-6(15)	36	16	0.6	23.2	43.8	32.3	100	100	91	-	-
SS-22	67 LT	25+02	0.0-1.5	A-2-4(0)	18	NP	36.6	35.6	11.7	16.2	89	72	30	-	-
SS-23	67 LT	25+02	3.9-5.4	A-7-6(23)	53	31	14.3	16.6	10.5	58.6	100	94	74	-	-
SS-24	67 LT	25+02	8.9-10.4	A-6(8)	33	14	14.5	18.0	39.2	28.3	100	93	72	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-10	56 LT	28+90	0.0-1.5	A-2-4(0)	13	NP	46.5	30.1	9.3	14.1	100	73	27	-	-
SS-11	56 LT	28+90	3.8-5.3	A-4(1)	26	10	25.1	33.3	13.3	28.3	100	99	44	-	-
SS-12	56 LT	28+90	11.0-12.5	A-6(21)	40	20	1.0	6.5	48.1	44.4	100	99	97	-	-
SS-13	35 LT	29+53	0.0-1.5	A-6(0)	29	11	32.1	29.9	15.8	22.2	85	71	36	-	-
SS-14	35 LT	29+53	3.5-5.0	A-4(0)	25	3	17.2	46.7	16.0	20.2	100	98	41	-	-
SS-15	35 LT	29+53	10.0-11.5	A-7-6(22)	41	22	1.0	4.2	44.2	50.5	96	95	94	-	-
SS-16	15 RT	30+06	0.0-1.5	A-6(3)	31	11	12.9	39.0	5.7	42.4	100	96	52	-	-
SS-17	15 RT	30+06	3.7-5.2	A-6(4)	30	12	15.8	33.1	24.8	26.3	100	98	55	-	-
SS-18	15 RT	30+06	9.5-11.0	A-7-6(22)	42	21	0.4	7.1	44.0	48.5	100	100	97	-	-
SS-19	56 LT	30+45	0.0-1.5	A-4(0)	21	6	28.9	29.5	9.3	32.3	97	84	45	-	-
SS-20	56 LT	30+45	6.0-7.5	A-7-6(30)	48	28	0.6	4.8	25.9	68.7	100	100	97	-	-
SS-21	56 LT	30+45	8.6-10.1	A-7-6(24)	42	24	0.4	10.5	32.5	56.6	100	100	95	-	-
SS-25	54 LT	31+38	3.8-5.3	A-4(0)	15	NP	31.3	37.8	16.8	14.1	100	87	37	-	-
SS-26	54 LT	31+38	6.0-7.5	A-6(6)	31	18	25.9	26.5	15.4	32.3	100	89	52	-	-
SS-27	7 RT	35+53	0.0-1.5	A-4(0)	21	6	27.5	32.1	18.2	22.2	89	76	41	-	-
SS-28	7 RT	35+53	3.7-5.2	A-7-6(28)	49	26	1.0	6.5	36.0	56.6	100	99	95	-	-
SS-29	6 LT	37+20	1.6-3.1	A-7-6(52)	69	46	0.4	4.6	30.3	64.6	100	100	98	-	-
SS-30	6 LT	37+20	4.6-6.1	A-6(11)	32	13	0.4	23.4	37.8	38.4	100	100	91	-	-



-LALT-

5/28/99

1-FEB-2012 09:29 ...\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\U3308_pf1_LALT.dgn

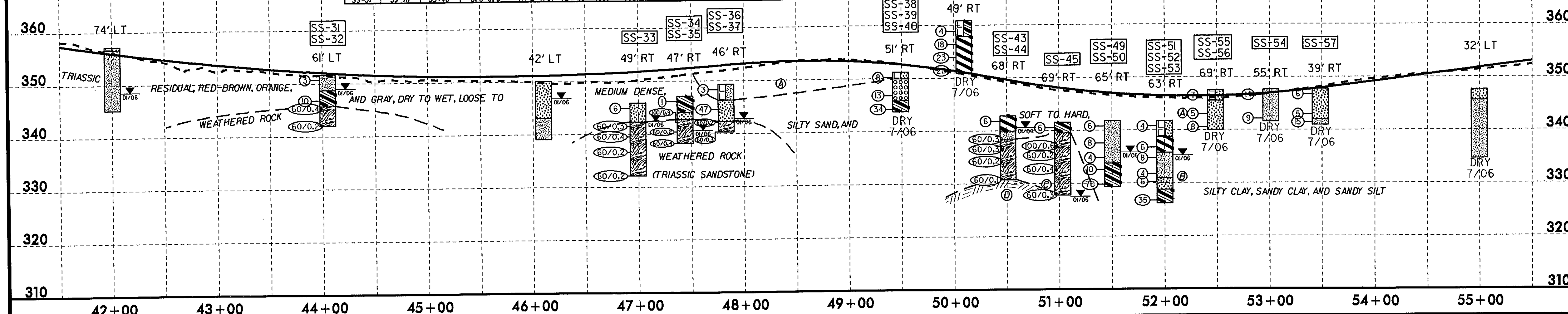
PROJECT REFERENCE NO.	SHEET NO.
U-3308	26

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

5/28/99

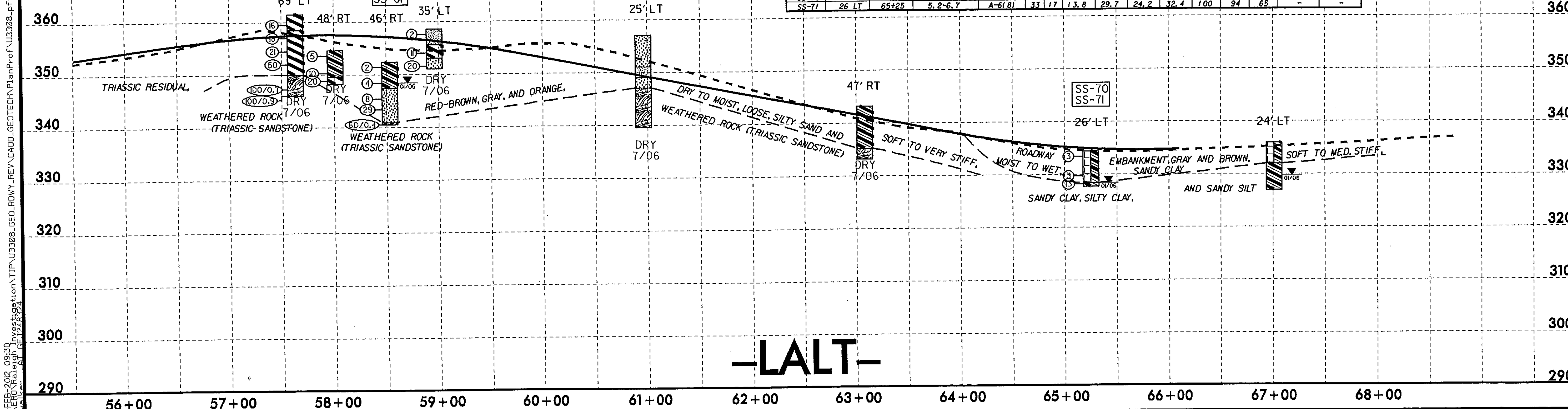
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-31	61 LT	44+05	0.0-1.5	A-4(0)	18	1	37.0	30.7	12.1	20.2	91	66	36	-	-
SS-32	61 LT	44+05	3.9-5.4	A-6(5)	27	14	17.4	32.3	18.0	32.3	100	91	58	-	-
SS-33	49 RT	47+00	0.0-1.5	A-2-4(0)	22	4	41.6	25.1	15.2	18.2	78	58	29	-	-
SS-34	47 RT	47+44	0.0-1.5	A-6(3)	25	12	27.8	26.2	17.5	28.5	99	82	51	-	-
SS-35	47 RT	47+44	3.5-5.0	A-2-4(0)	23	4	52.7	21.7	17.4	8.1	100	63	29	-	-
SS-36	46 RT	47+83	0.0-1.5	A-4(1)	24	10	33.1	23.5	19.1	24.3	97	77	46	-	-
SS-37	46 RT	47+83	3.7-5.2	A-2-4(0)	21	1	49.3	22.9	19.7	8.1	100	86	32	-	-
SS-38	51 RT	49+49	0.0-1.5	A-2-4(0)	25	9	53.1	13.8	14.8	18.3	99	70	35	-	-
SS-39	51 RT	49+49	3.4-4.9	A-1-b(0)	26	5	63.5	13.6	14.8	8.1	99	45	25	-	-
SS-40	51 RT	49+49	6.0-7.5	A-6(18)	39	17	0.6	4.9	74.2	20.3	100	100	98	-	-
SS-85	49 RT	50+14	1.0-2.5	A-6(15)	40	16	5.2	13.9	48.8	32.1	100	96	89	-	-
SS-86	49 RT	50+14	6.0-7.5	A-7-6(27)	50	24	0.6	1.6	33.5	64.3	98	98	97	-	-
SS-43	68 RT	50+51	0.0-1.5	A-7-6(8)	44	17	23.3	21.7	34.7	20.3	96	83	57	-	-
SS-44	68 RT	50+51	3.4-4.9	A-4(0)	22	4	13.8	52.1	21.9	12.2	100	95	42	-	-
SS-45	69 RT	51+03	0.0-1.5	A-6(2)	29	11	20.5	38.3	22.9	18.3	100	89	48	-	-
SS-49	65 RT	51+50	3.2-4.7	A-4(0)	16	NP	12.6	47.5	27.8	12.2	100	96	48	-	-
SS-50	65 RT	51+50	8.2-9.7	A-6(18)	38	21	0.4	17.0	50.1	32.5	100	100	89	-	-
SS-51	63 RT	52+00	4.0-5.5	A-7-6(18)	46	26	8.9	25.4	29.2	36.5	100	96	73	-	-
SS-52	63 RT	52+00	9.0-10.5	A-4(0)	24	7	8.3	54.8	14.6	22.3	100	99	45	-	-
SS-53	63 RT	52+00	14.0-15.5	A-6(11)	35	13	8.3	10.1	61.3	20.3	100	94	85	-	-
SS-55	69 RT	52+49	0.0-1.5	A-2-4(0)	31	7	47.3	20.1	24.5	8.1	66	40	25	-	-
SS-56	69 RT	52+49	3.5-5.0	A-2-4(0)	32	4	54.6	18.7	22.7	4.1	81	46	26	-	-
SS-54	55 RT	53+01	4.5-6.0	A-4(0)	20	4	21.7	38.5	21.5	18.3	100	89	48	-	-
SS-57	39 RT	53+48	3.8-5.3	A-2-4(0)	24	5	30.4	36.5	16.8	16.2	85	69	33	-	-



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-91	69 LT	57+63	6.0-7.5	A-7-6(15)	41	19	4.0	19.7	28.1	48.2	100	97	81	-	-
SS-58	48 RT	58+01	0.0-1.5	A-6(8)	35	18	20.5	25.4	35.9	18.3	100	89	60	-	-
SS-59	48 RT	58+01	4.8-6.3	A-7-6(21)	45	22	0.8	14.8	47.9	36.5	100	100	90	-	-
SS-60	46 RT	58+53	0.0-1.5	A-6(4)	29	11	16.6	32.3	30.8	20.3	99	90	58	-	-
SS-61	46 RT	58+53	6.0-7.5	A-2-4(0)	27	6	41.4	26.8	19.7	12.2	100	80	35	-	-
SS-81	35 LT	58+96	0.0-1.5	A-4(0)	20	6	27.7	32.8	7.2	32.4	87	75	39	-	-
SS-82	35 LT	58+96	3.5-5.0	A-7-6(10)	48	27	32.2	19.6	5.8	42.5	100	87	50	-	-
SS-83	35 LT	58+96	6.0-7.5	A-2-4(0)	25	6	60.1	13.3	4.3	22.2	99	56	29	-	-
SS-70	26 LT	65+25	3.7-5.2	A-6(5)	28	11	13.8	25.7	30.2	30.3	100	93	67	-	-
SS-71	26 LT	65+25	5.2-6.7	A-6(8)	33	17	13.8	29.7	24.2	32.4	100	94	65	-	-



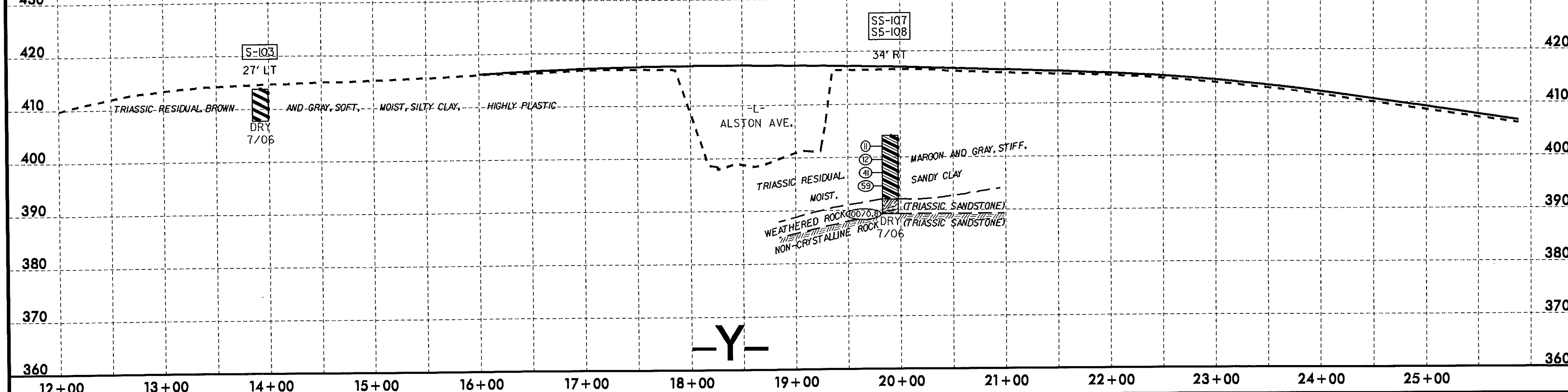
-LALT-

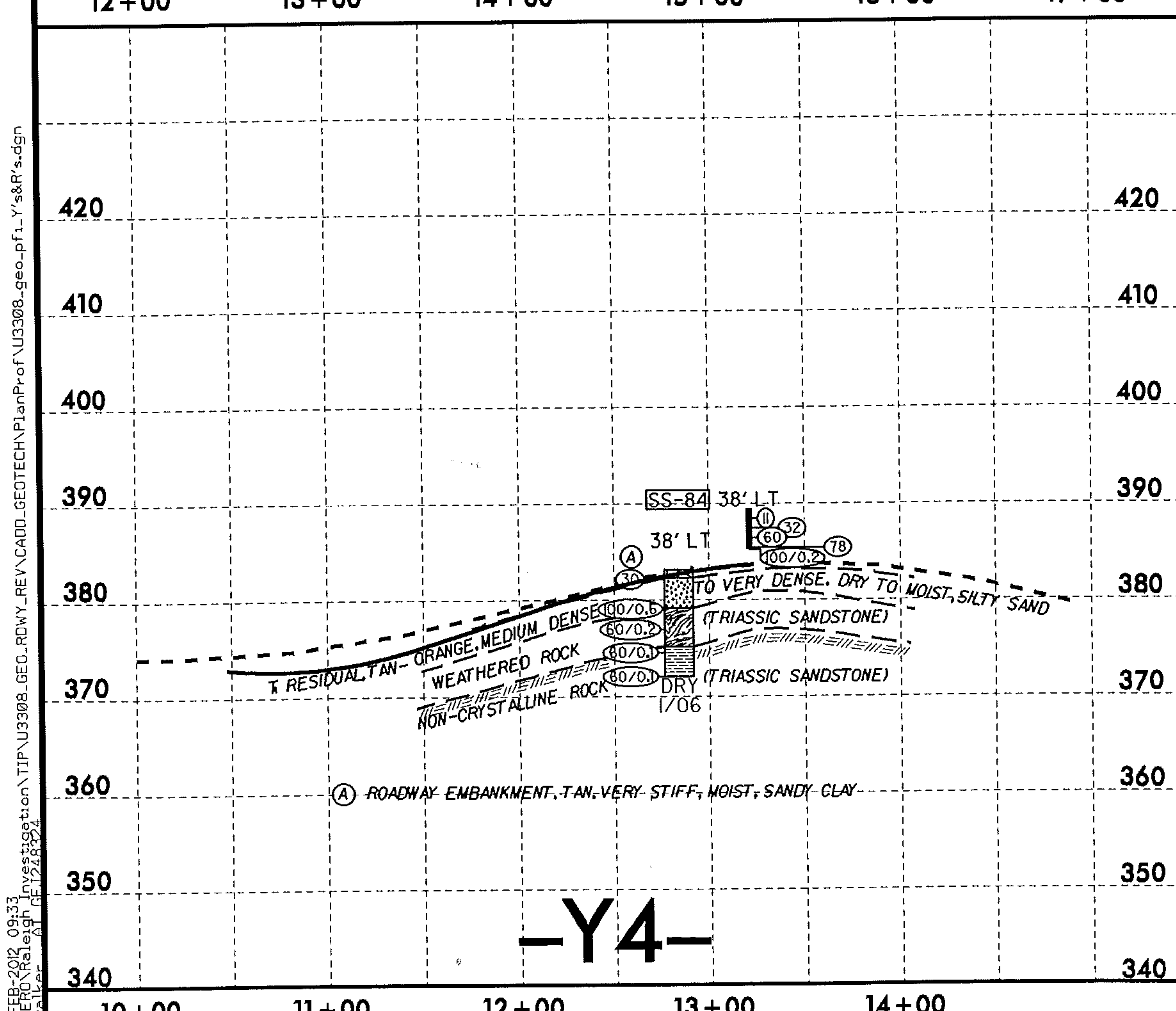
1-FEB-2012 09:30
E:\ERO\Raleigh\Investigation\TIP\U3308\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\U3308_pf1_LALT.dgn

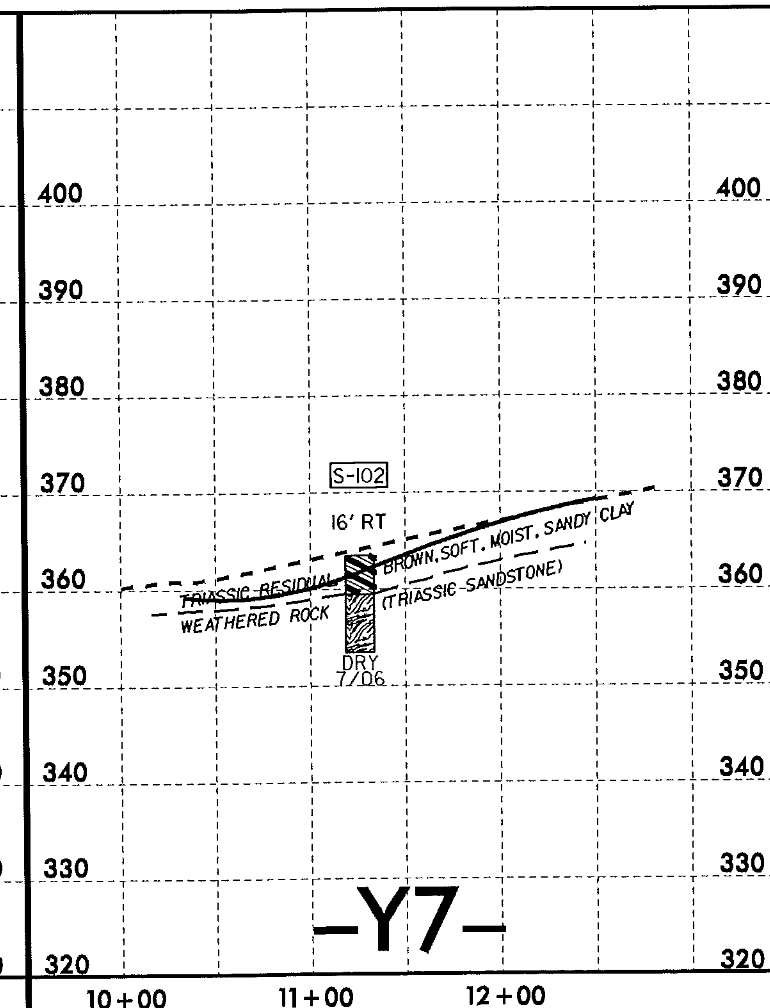
PROJECT REFERENCE NO.	SHEET NO.
U-3308	27

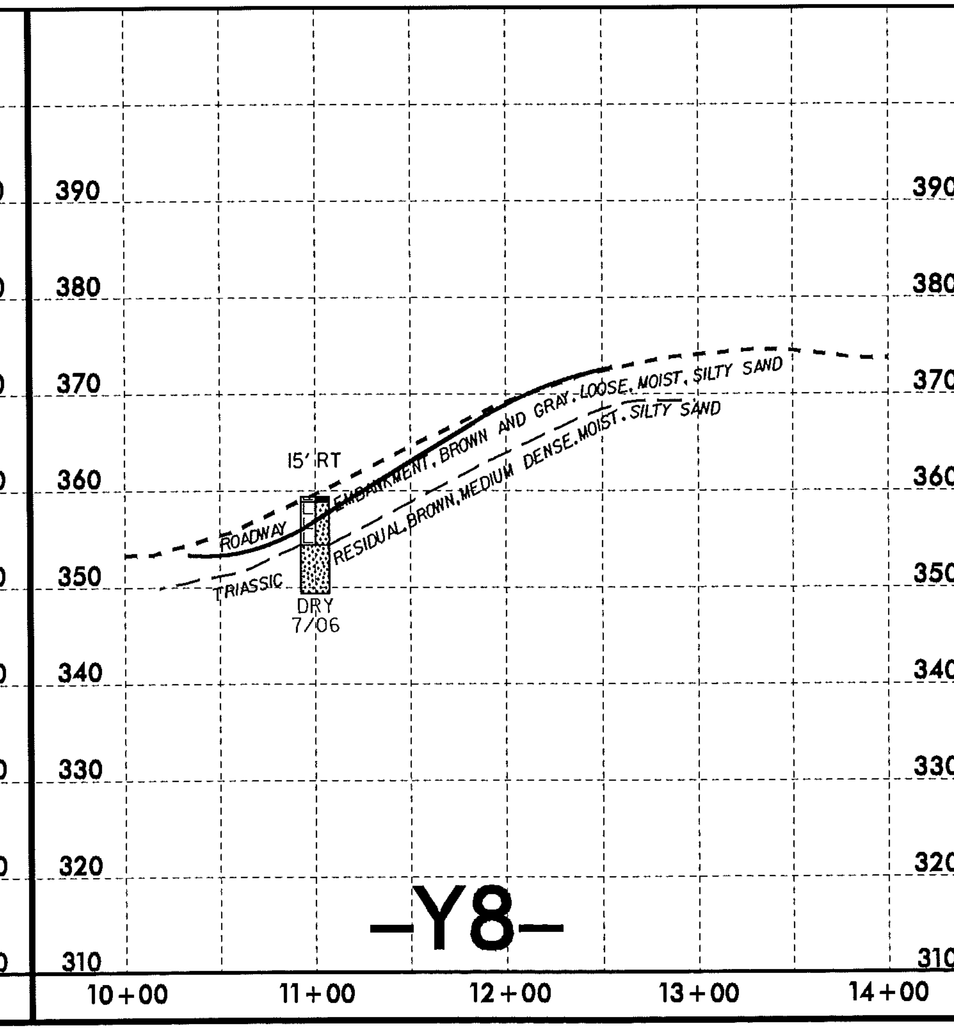
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
S-103	27 LT	13+93	0.0-6.0	A-7-6(60)	82	56	3.1	5.7	13.9	77.3	100	98	93	-	-
SS-107	34 RT	19+90	1.0-2.5	A-6(5)	34	11	2.2	48.2	31.2	18.3	100	100	62	-	-
SS-108	34 RT	19+90	0.0-0.0	A-6(7)	32	12	1.0	35.6	34.9	28.5	100	100	73	-	-
SS-84	38 LT	12+84	3.5-5.0	A-2-4(0)	25	6	54.6	16.6	6.6	22.2	81	45	26	-	-
S-102	16 RT	11+26	0.0-4.0	A-6(2)	30	16	36.5	22.7	12.7	28.1	92	70	41	-	-

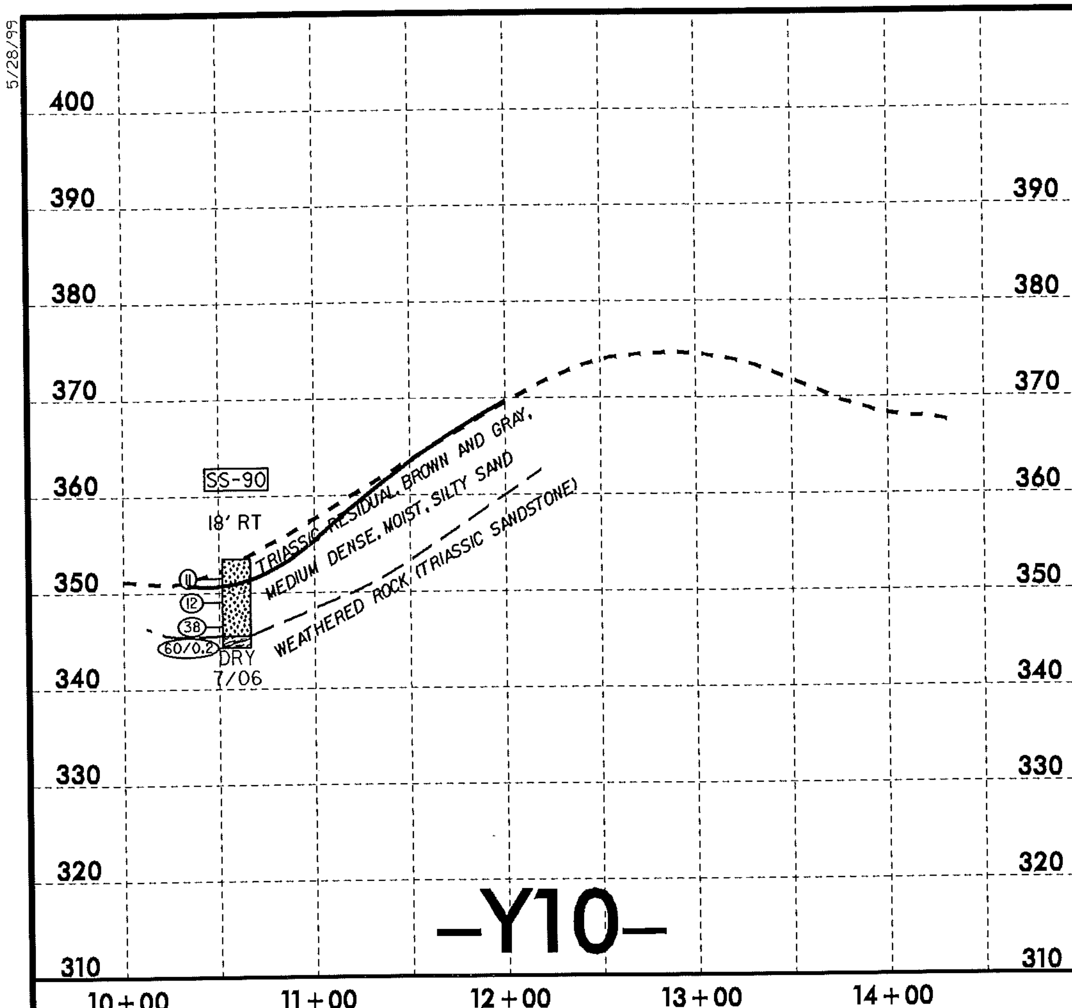


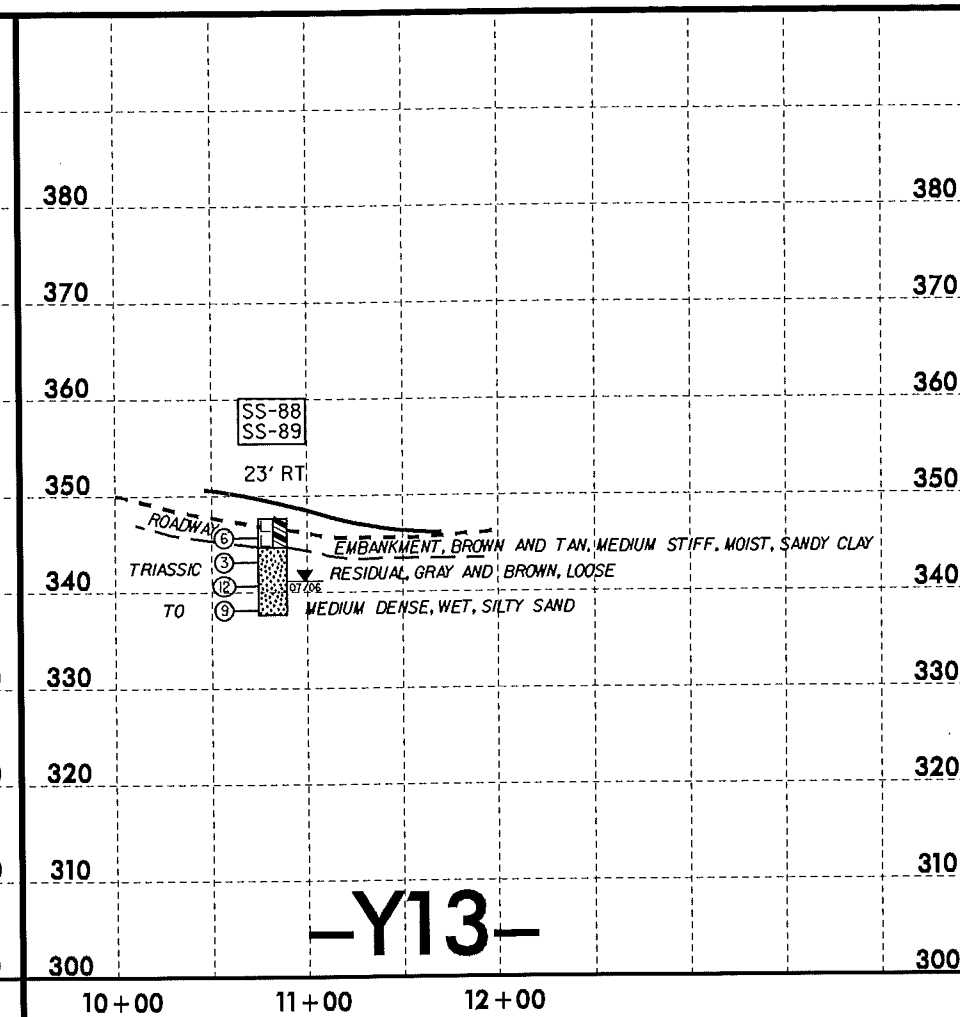


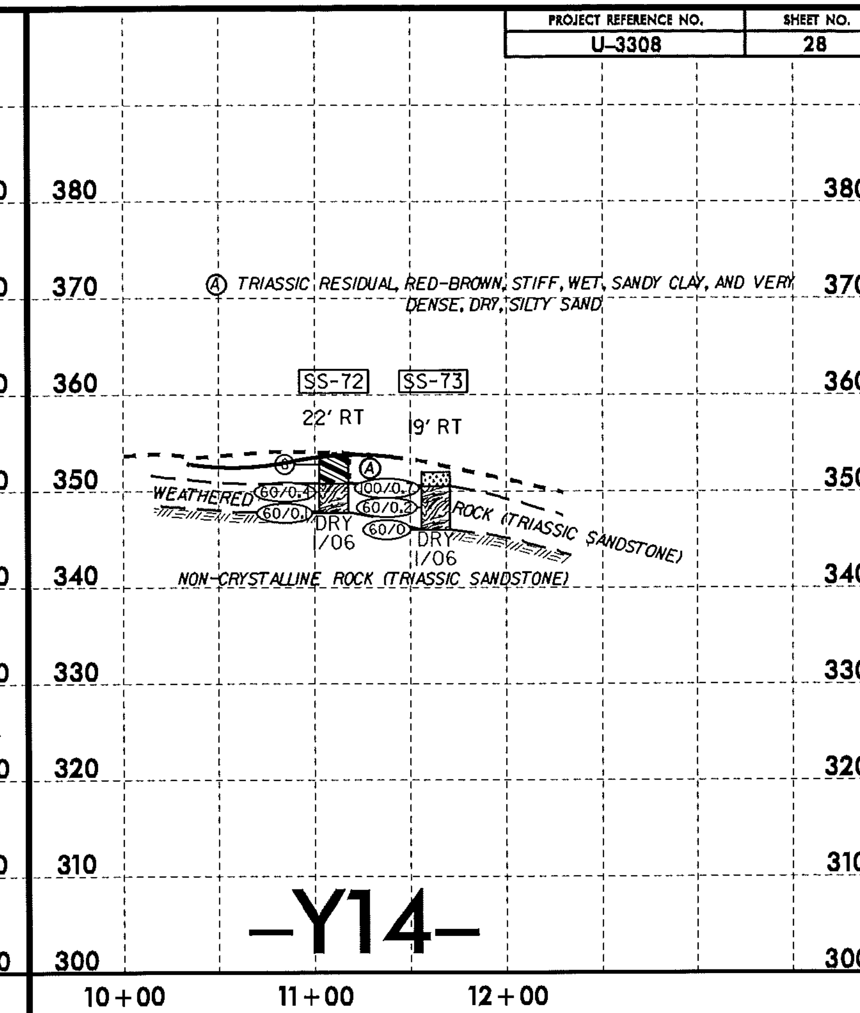




PROJECT REFERENCE NO.	SHEET NO.
U-3308	28

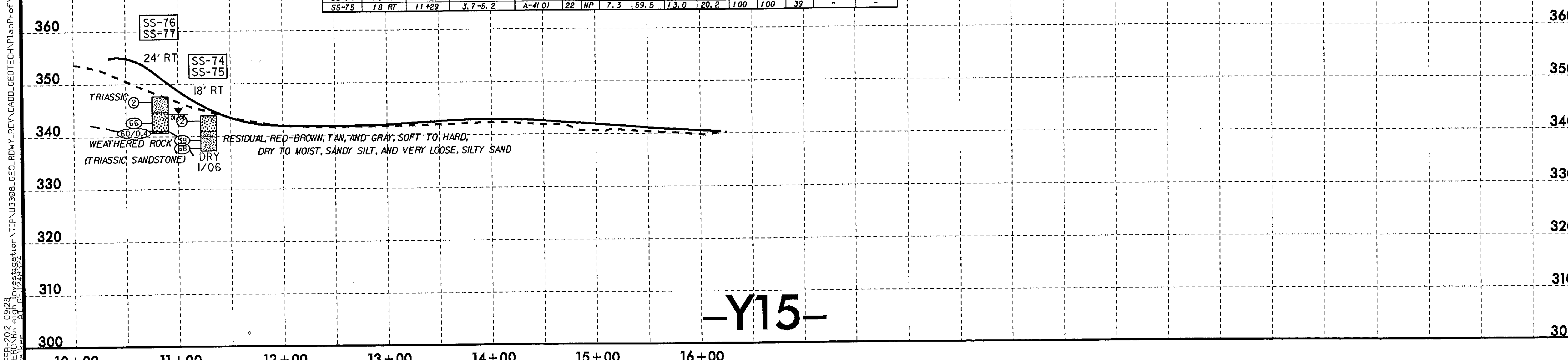






SOIL TEST RESULTS

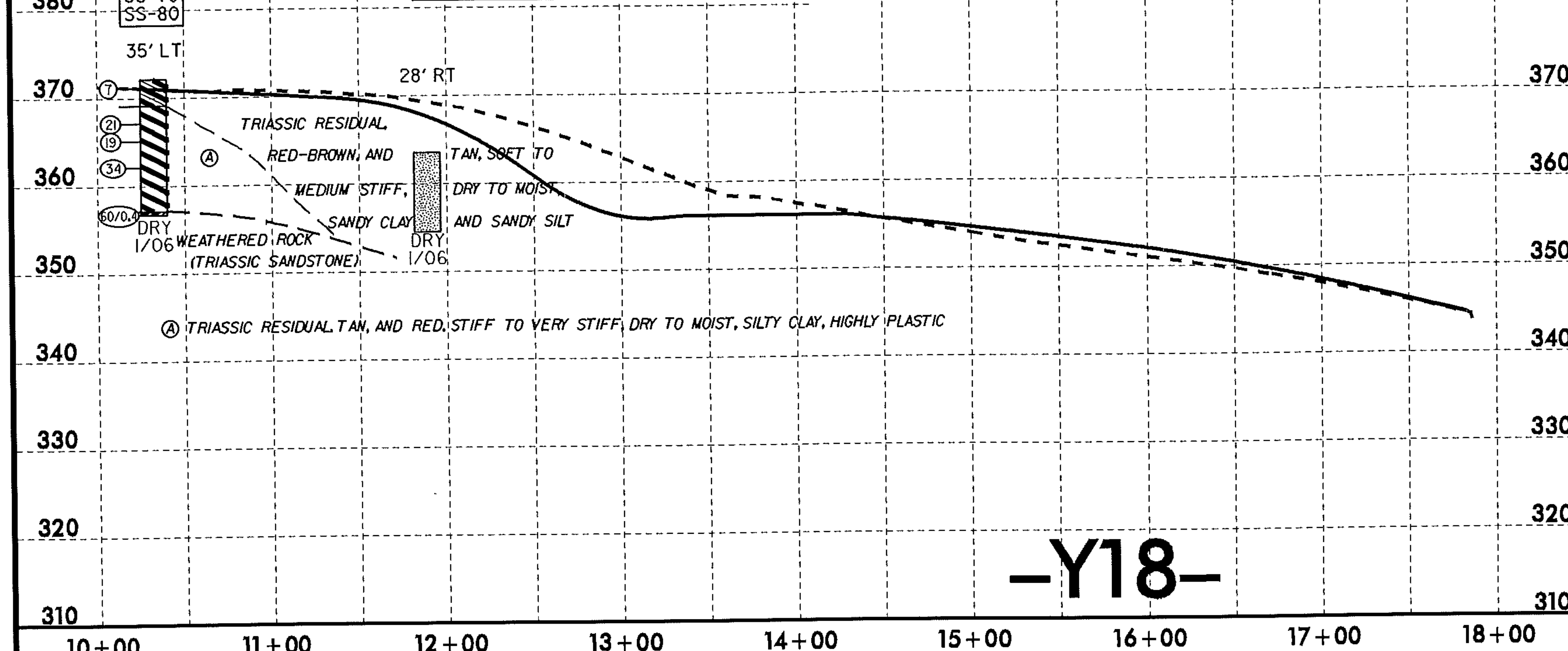
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-90	18 RT	10+59	6.0-7.5	A-2-4(0)	23	NP	53.2	22.3	12.4	12.0	100	68	28	-	-
SS-88	23 RT	10+82	1.0-2.5	A-6(8)	33	16	13.9	28.5	21.5	36.1	100	92	63	-	-
SS-89	23 RT	10+82	6.0-7.5	A-2-4(0)	25	9	32.9	38.0	9.0	20.1	96	79	33	-	-
SS-72	22 RT	11+10	0.0-1.5	A-6(4)	30	11	8.1	42.7	18.9	30.3	100	96	56	-	-
SS-73	19 RT	11+63	1.0-2.5	A-2-4(0)	20	NP	16.4	52.6	12.8	18.2	100	98	35	-	-
SS-76	24 RT	10+83	0.0-1.5	A-4(0)	20	5	43.3	21.8	2.5	32.4	94	69	36	-	-
SS-77	24 RT	10+83	3.9-5.4	A-2-4(0)	23	5	55.0	18.8	10.0	16.2	100	68	29	-	-
SS-74	18 RT	11+29	0.0-1.5	A-2-4(0)	15	NP	51.0	27.1	13.9	8.1	98	70	25	-	-
SS-75	18 RT	11+29	3.7-5.2	A-4(0)	22	NP	7.3	59.5	13.0	20.2	100	100	39	-	-



PROJECT REFERENCE NO.	SHEET NO.
U-3308	29

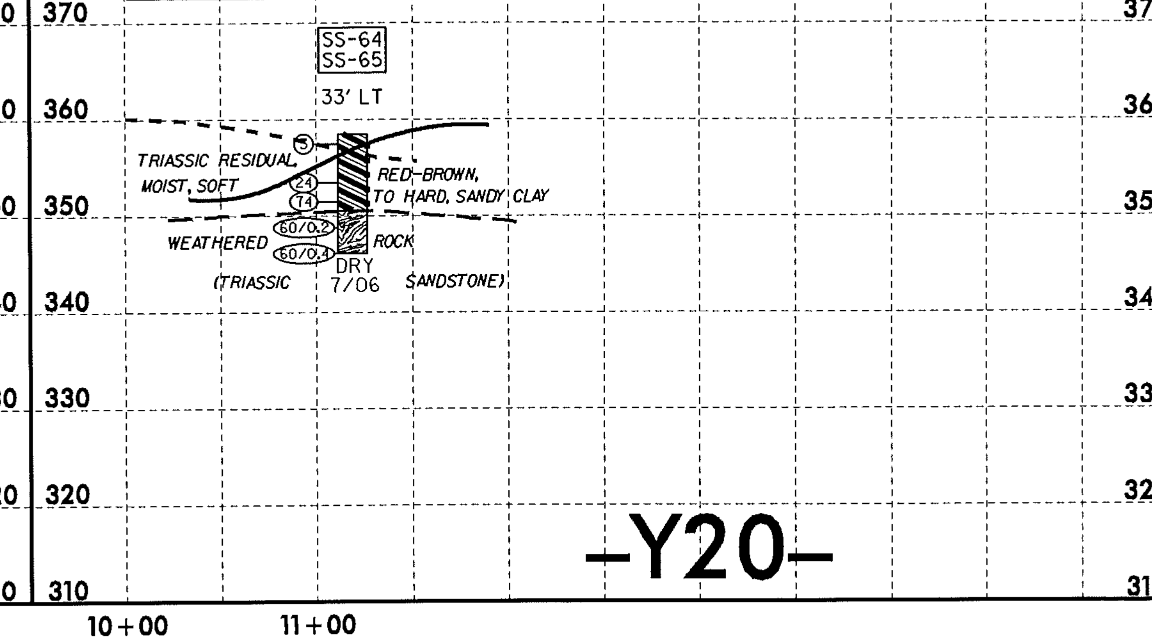
SOIL TEST RESULTS

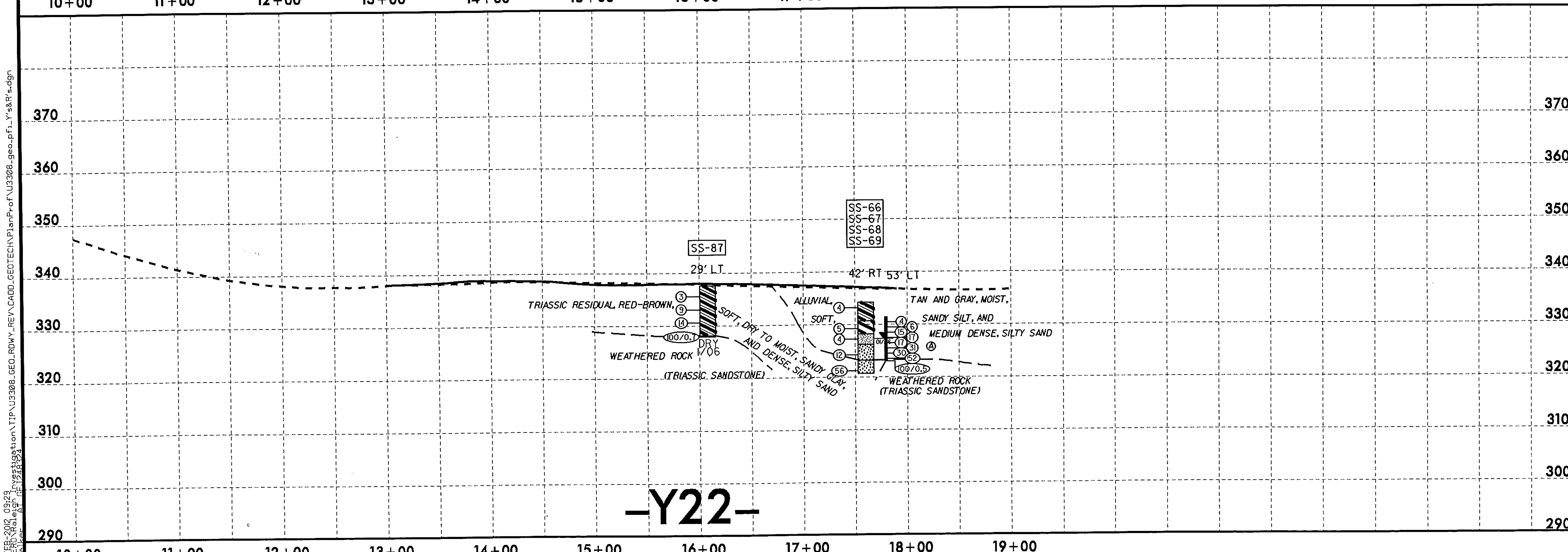
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-78	35 LT	10+32	0.0-1.5	A-6(5)	30	16	17.6	29.3	12.6	40.4	92	83	54	-	-
SS-79	35 LT	10+32	4.0-5.5	A-7-6(44)	68	40	3.0	4.7	29.6	62.7	100	98	95	-	-
SS-80	35 LT	10+32	9.0-10.5	A-7-6(26)	48	24	0.2	4.4	42.8	52.6	100	100	96	-	-
SS-87	29 LT	16+08	6.0-7.5	A-6(4)	29	13	11.6	39.6	20.7	28.1	100	96	56	-	-
SS-66	42 RT	17+60	4.0-5.5	A-7-6(18)	43	18	2.6	7.3	53.5	36.5	100	99	92	-	-
SS-67	42 RT	17+60	6.0-7.5	A-4(4)	27	10	12.2	28.8	36.7	22.3	100	94	68	-	-
SS-68	42 RT	17+60	9.0-10.0	A-2-4(0)	25	8	38.9	28.6	12.2	20.3	92	82	33	-	-
SS-69	42 RT	17+60	12.0-13.5	A-2-4(0)	24	NP	29.6	45.2	13.0	12.2	100	91	31	-	-



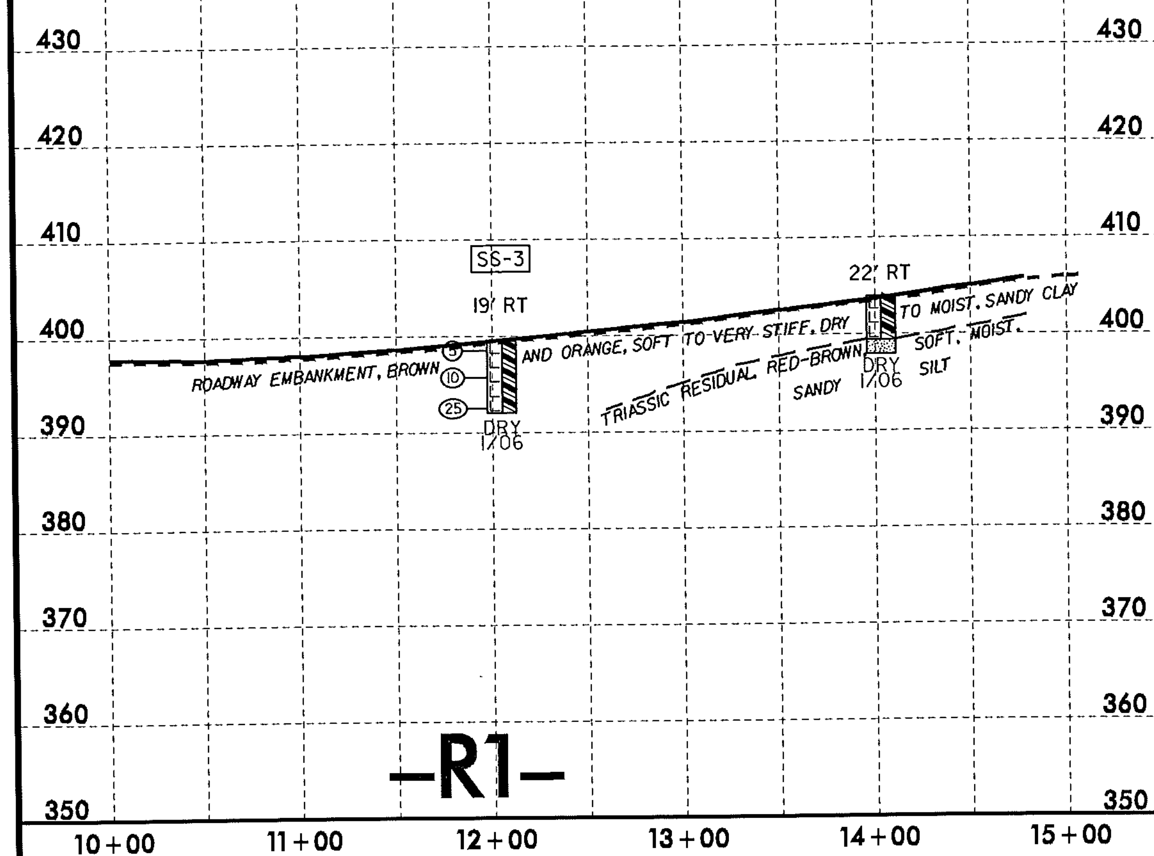
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-64	33 LT	11+19	0.0-1.5	A-6(4)	32	14	20.7	31.0	13.8	34.5	99	90	51	-	-
SS-65	33 LT	11+19	4.0-5.5	A-6(10)	36	14	0.6	39.4	39.8	20.3	100	100	75	-	-



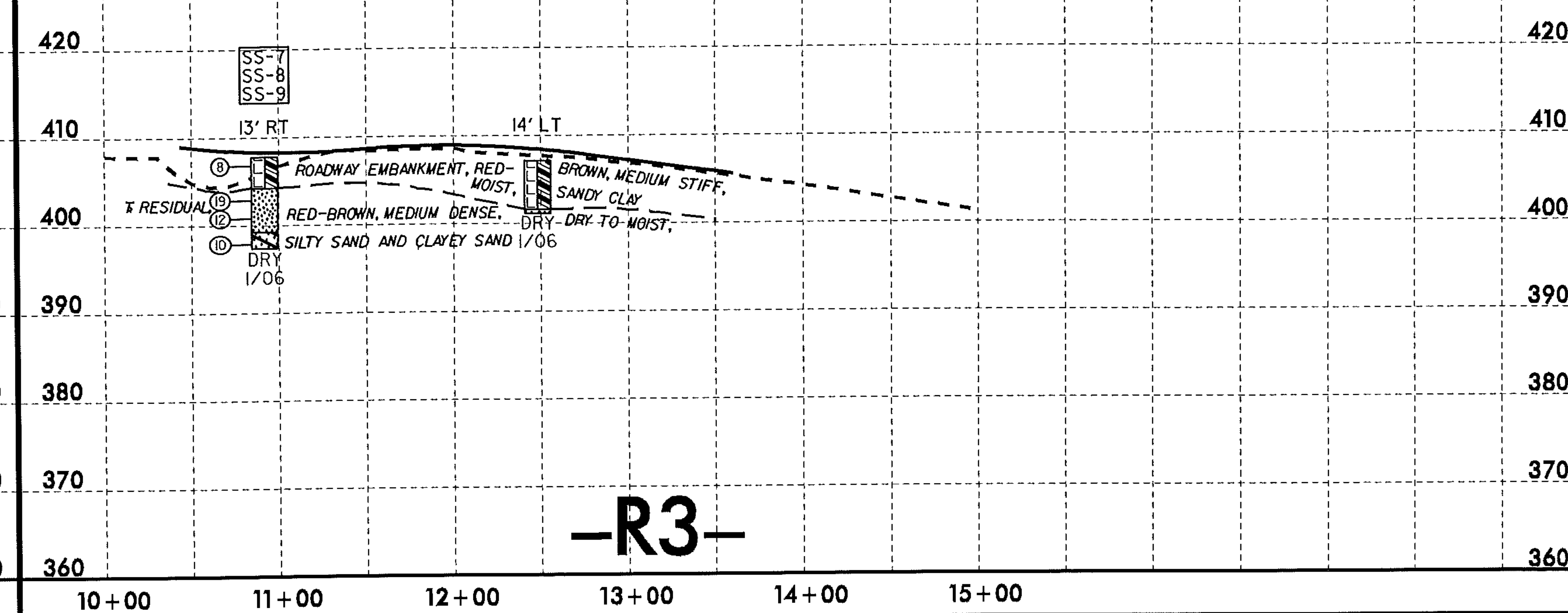


5/28/99



SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-3	19 RT	12+05	2.8-4.3	A-6(5)	38	17	34.5	19.2	9.9	36.4	95	70	48	-	-
SS-7	13 RT	10+92	0.0-1.5	A-6(8)	34	14	14.3	18.6	36.8	30.3	94	84	70	-	-
SS-8	13 RT	10+92	3.9-5.4	A-2-4(0)	27	7	54.5	16.2	11.1	18.2	86	47	28	-	-
SS-9	13 RT	10+92	8.9-10.4	A-2-6(1)	35	15	29.7	21.2	14.7	34.3	56	43	31	-	-

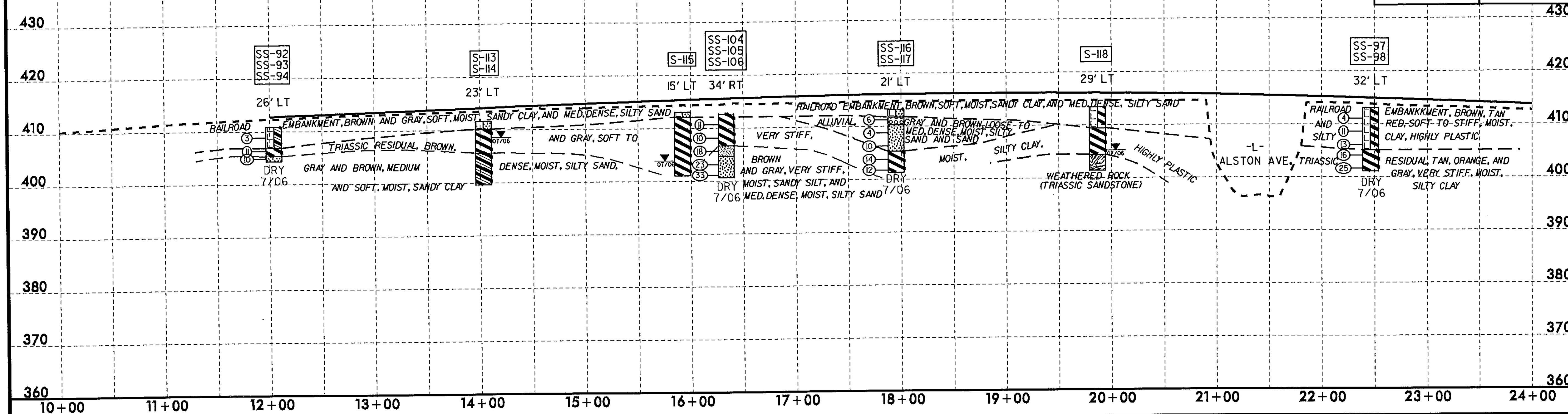


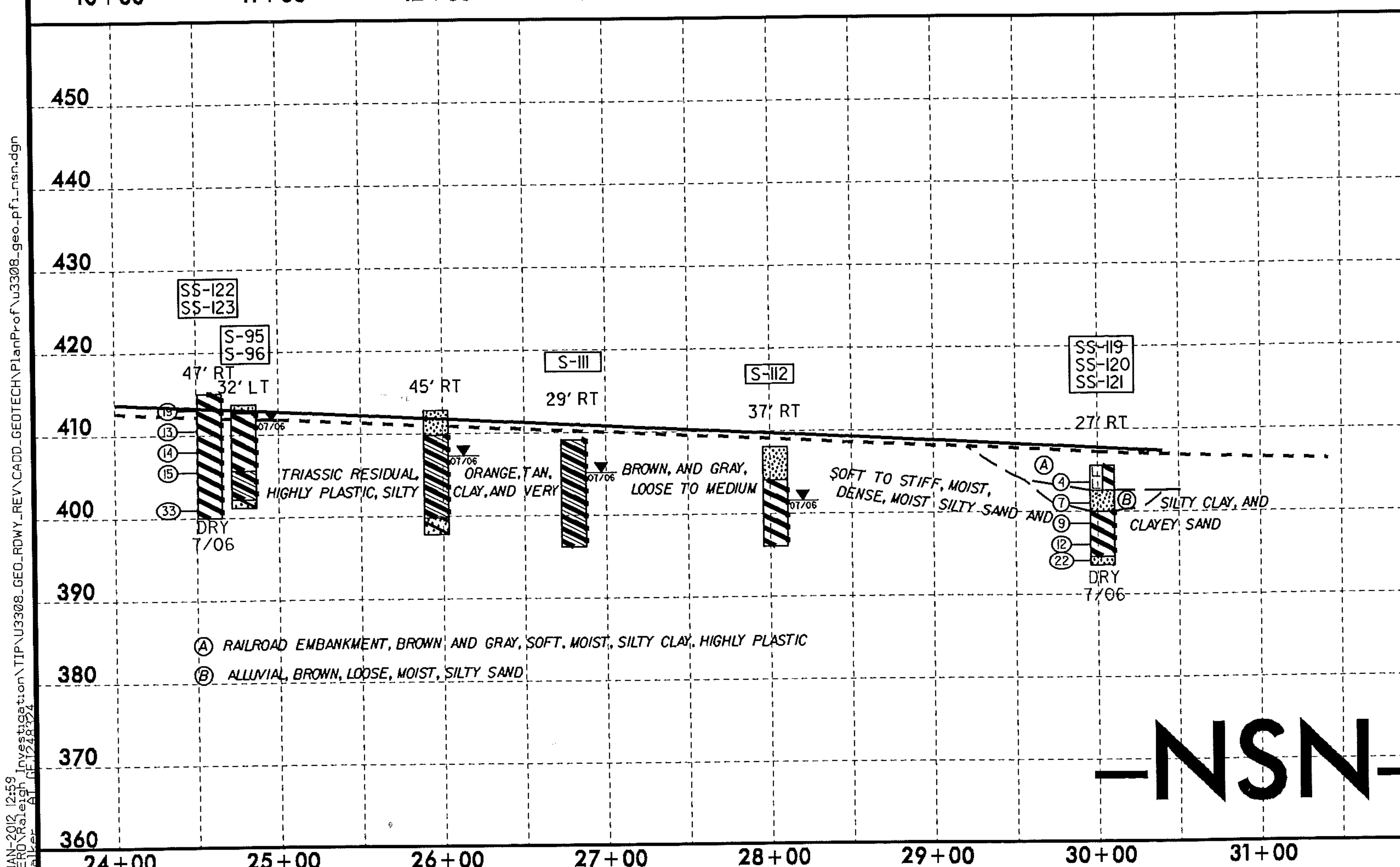
-JAN-2012 13:00
...\TIP\U3308_GEO_ROWY_REV\CADD_GEOTECH\PlanProf\U3308-geo-pf1_Y's&R's.dgn

PROJECT REFERENCE NO.	SHEET NO.
U-3308	31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION





SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-92	26 LT	12+05	1.0-2.5	A-6(1)	30	12	43.2	19.3	9.4	28.1	100	82	40	-	-
SS-93	26 LT	12+05	3.5-5.0	A-7-6(19)	51	27	7.2	25.1	19.5	48.2	100	99	71	-	-
SS-94	26 LT	12+05	5.0-6.5	A-2-4(0)	25	5	47.6	22.7	13.7	16.1	100	76	33	-	-
S-95	32 LT	24+79	0.0-8.0	A-7-6(32)	57	33	1.2	17.3	27.3	54.2	100	99	89	-	-
S-96	32 LT	24+79	9.0-12.5	A-6(3)	31	15	28.9	27.3	13.7	30.1	100	92	47	-	-
SS-97	32 LT	22+47	3.5-5.0	A-7-5(12)	51	21	22.7	18.3	28.9	30.1	100	88	62	-	-
SS-98	32 LT	22+47	8.5-10.0	A-7-6(29)	54	28	2.4	9.8	25.5	62.2	100	98	91	-	-
SS-104	34 LT	16+34	2.5-5.0	A-7-6(17)	54	31	10.0	32.1	13.1	44.8	100	99	61	-	-
SS-105	34 LT	16+34	6.0-7.5	A-4(0)	28	9	32.6	34.6	18.6	14.2	100	96	37	-	-
SS-106	34 RT	16+34	8.5-12.0	A-2-4(0)	26	7	36.6	32.1	17.0	14.2	100	94	35	-	-
SS-111	29 RT	76+80	0.0-13.0	A-6(3)	31	14	13.0	41.9	16.6	28.5	100	99	48	-	-
S-112	37 RT	28+03	0.0-12.0	A-7-6(12)	43	24	8.5	36.6	16.2	38.7	100	99	60	-	-
S-113	23 RT	14+04	0.0-6.0	A-7-6(27)	71	45	12.6	28.5	10.1	48.8	99	91	64	-	-
S-114	23 RT	14+04	0.0-12.0	A-6(6)	35	18	12.6	38.5	16.4	32.6	100	99	54	-	-
S-115	15 RT	15+92	1.0-12.0	A-7-6(8)	42	25	28.3	25.4	11.7	34.6	100	94	48	-	-
SS-116	21 LT	17+95	1.0-1.5	A-1-b(0)	22	NP	85.9	7.7	2.3	4.1	86	30	6	-	-
SS-117	21 LT	17+95	8.5-10.0	A-7-6(10)	46	29	22.0	30.7	12.7	34.6	99	89	50	-	-
S-118	29 LT	19+87	0.0-9.0	A-7-6(9)	48	30	37.6	17.3	10.5	34.6	100	81	47	-	-
SS-119	27 RT	30+03	1.0-1.3	A-7-6(11)	46	25	22.6	19.3	21.5	36.6	91	76	57	-	-
SS-120	27 RT	30+03	3.5-5.0	A-2-4(0)	18	NP	37.2	41.9	10.7	10.2	97	76	27	-	-
SS-121	27 RT	30+03	8.5-10.0	A-7-6(11)	42	18	0.6	40.1	28.8	30.5	100	100	69	-	-
SS-122	47 RT	24+58	3.5-5.0	A-7-6(24)	52	26	1.0	23.4	32.9	42.7	100	99	84	-	-
SS-123	47 RT	24+58	8.5-10.0	A-7-6(34)	56	33	0.8	9.6	42.8	46.8	100	100	92	-	-

-NSN-

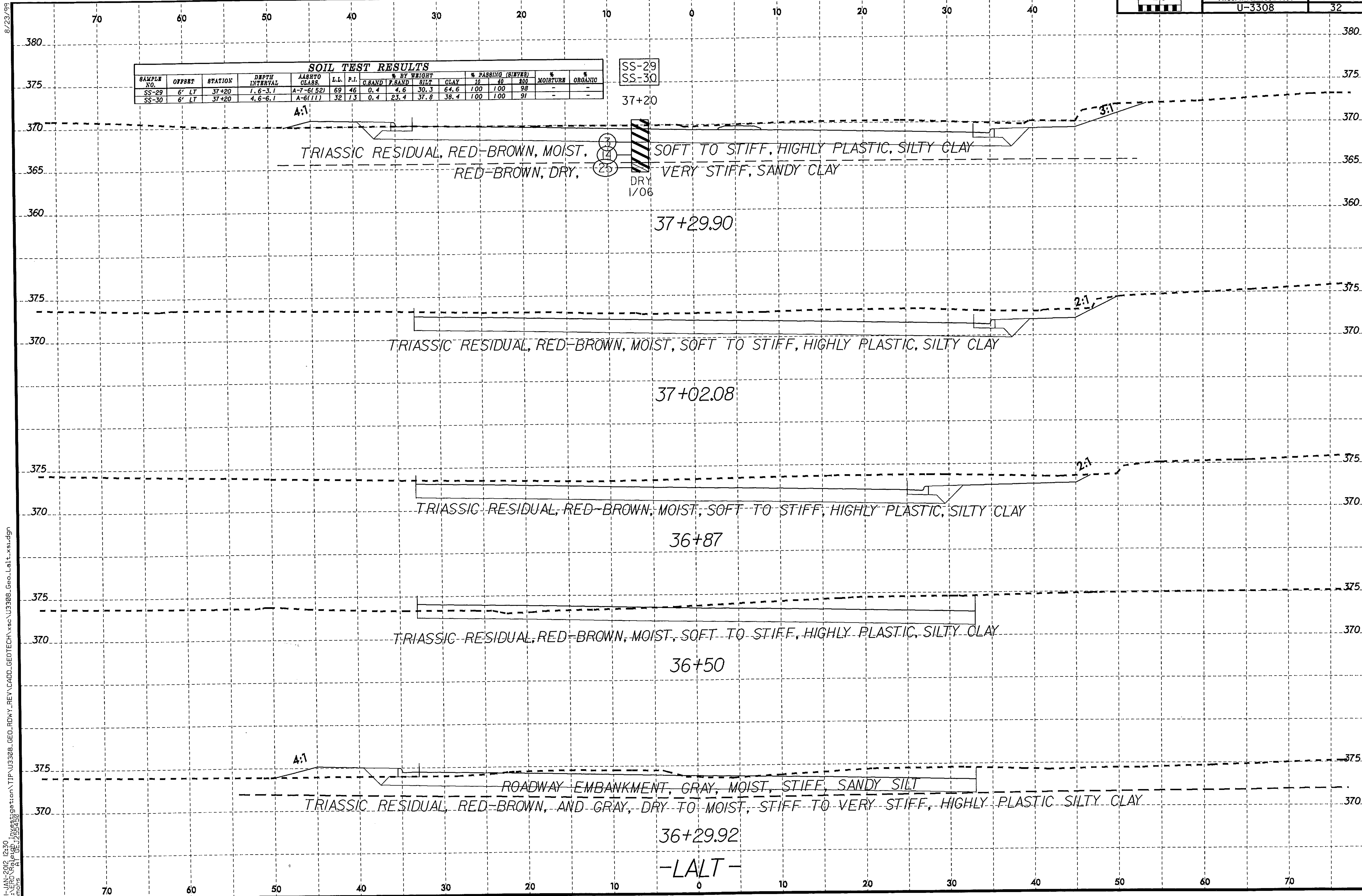
5/28/99

11-JAN-2012 12:59
r:\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\PlanProf\u3308_geo_pf1_nsn.dgn

PROJ. REFERENCE NO.	SHEET NO.
U-3308	32

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	% BY WEIGHT F.SAND	% BY WEIGHT SILT	% BY WEIGHT CLAY	% PASSING (SIEVES) 10	% PASSING (SIEVES) 40	% PASSING (SIEVES) 200	% MOISTURE	% ORGANIC
SS-29	6' LT	37+20	1.6-3.1	A-7-6(52)	69	46	0.4	4.6	30.3	64.6	100	100	98	-	-
SS-30	6' LT	37+20	4.6-6.1	A-6(11)	32	13	0.4	23.4	37.8	38.4	100	100	91	-	-



8/23/99

8/23/99

0 2.5 5	PROJ. REFERENCE NO.	SHEET NO.
	U-3308	33

70 60 50 40 30 20 10 0 10 20 30 40

375
370
365

3:1

TRIASSIC RESIDUAL, RED-BROWN, MOIST, SOFT TO STIFF, HIGHLY PLASTIC, SILTY CLAY

38+25

375
370
365

3:1

TRIASSIC RESIDUAL, RED-BROWN, MOIST, SOFT TO STIFF, HIGHLY PLASTIC, SILTY CLAY

38+00

375
370

4:1

3:1

TRIASSIC RESIDUAL, RED-BROWN, MOIST, SOFT TO STIFF, HIGHLY PLASTIC, SILTY CLAY

37+50

-LALT-

70 60 50 40 30 20 10 0 10 20 30 40 50 60 70

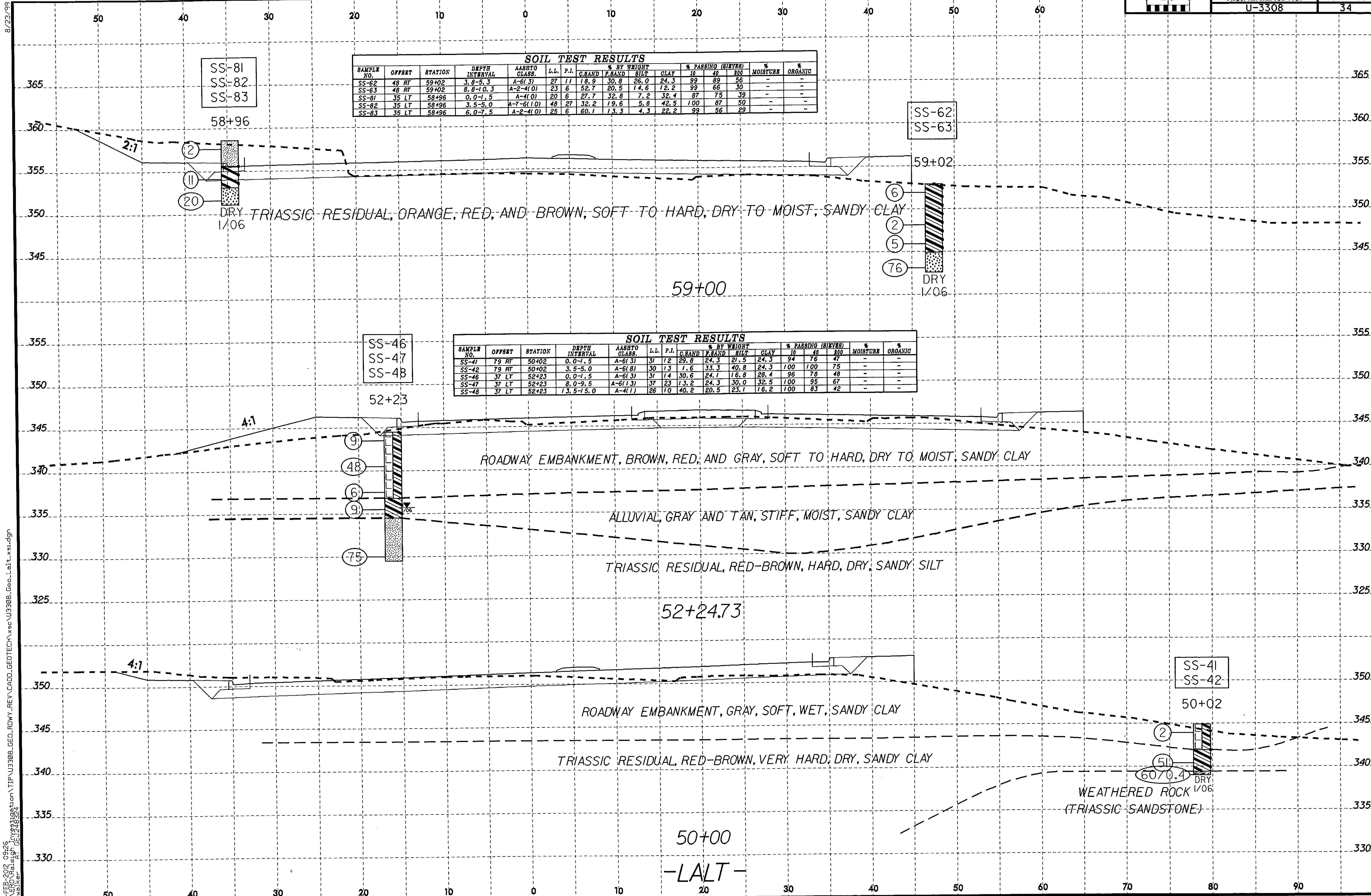
11-JAN-2012 12:30
J:\ERO\Raleigh Traves\gation\TIP\U3308_GEO_RDWY_REV\CADD_GEOTECH\xsc\U3308_Geo_Lalt_xs1.dgn
mmohs A1 GE_2_25_38

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-62	48 RT	59+02	3.8-5.3	A-6(3)	27	11	18.9	30.8	26.0	24.3	99	89	56	-	-
SS-63	48 RT	59+02	8.8-10.3	A-2-4(0)	23	6	52.7	20.5	14.6	12.2	99	66	30	-	-
SS-81	35 LT	58+96	0.0-1.5	A-4(0)	20	6	27.7	32.8	7.2	32.4	87	75	39	-	-
SS-82	35 LT	58+96	3.5-5.0	A-7-6(10)	48	27	32.2	19.6	5.8	42.5	100	87	50	-	-
SS-83	35 LT	58+96	6.0-7.5	A-2-4(0)	25	6	60.1	13.3	4.3	22.2	99	56	29	-	-

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT C.SAND	F.SAND	SILT	CLAY	% PASSING (SIEVES) 10	40	200	% MOISTURE	% ORGANIC
SS-41	79 RT	50+02	0.0-1.5	A-6(3)	31	12	29.8	24.3	21.5	24.3	94	76	47	-	-
SS-42	79 RT	50+02	3.5-5.0	A-6(8)	30	13	1.6	33.3	40.8	24.3	100	100	75	-	-
SS-46	37 LT	52+23	0.0-1.5	A-6(3)	31	14	30.6	24.1	16.8	28.4	96	78	48	-	-
SS-47	37 LT	52+23	8.0-9.5	A-6(13)	37	23	13.2	24.3	30.0	32.5	100	95	67	-	-
SS-48	37 LT	52+23	13.5-15.0	A-4(1)	26	10	40.2	20.5	23.1	16.2	100	83	42	-	-



8/23/99
01-FEB-2012 09:26 ...U3308_GEO_RDWY_REV\CADD_GEOTECH\xsc\U3308_Geo_Lalt_xs1.dgn

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3308	1	5

PROJECT: 34915 REFERENCE: U-3308

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

ROADWAY SUBSURFACE INVESTIGATION

COUNTY *DURHAM*

PROJECT DESCRIPTION *NC 55- WIDENING AND IMPROVEMENTS FROM NC 147 (DURHAM FREEWAY) TO US 70/NC 98 (HOLLOWAY ST.)*

SITE DESCRIPTION *TEMPORARY SHORING ALONG -LALT-*

CONTENTS

PERSONNEL

TERRACON

N.D. MOHS

INVESTIGATED BY *N.D. MOHS*

DRAWN BY *N.D. MOHS*

CHECKED BY *N.T. ROBERSON*

SUBMITTED BY *N.T. ROBERSON*

DATE *SEPTEMBER 2014*

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.

DocuSigned by:

Nathan D. Mohs 10/8/2014

CB814151D7B34AE...

SIGNATURE DATE

PROJECT REFERENCE NO.	SHEET NO.
U-3308	2

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS
(PAGE 1 OF 2)

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 RESISTANCE (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) PL — PLASTIC LIMIT	- WET - (W)	SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE
OM — OPTIMUM MOISTURE SL — SHRINKAGE LIMIT	- MOIST - (M)	SOLID; AT OR NEAR OPTIMUM MOISTURE
	- 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
TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%
LITTLE ORGANIC MATTER	3 - 5%	5 - 12%
MODERATELY ORGANIC	5 - 10%	12 - 20%
HIGHLY ORGANIC	> 10%	> 20%

OTHER MATERIAL	
TRACE	1 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
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 WITH CORE
- SPT N-VALUE

RECOMMENDATION SYMBOLS

- UNDERCUT EXCAVATION
- 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] D-50
- [ ] _____

ADVANCING TOOLS:
- [ ] CLAY BITS
- [ ] 6" CONTINUOUS FLIGHT AUGER
- [X] 8" HOLLOW AUGERS
- [X] 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
- [ ] HAND AUGER
- [ ] SOUNDING ROD
- [ ] VANE SHEAR TEST
- [ ] _____

PROJECT REFERENCE NO.	SHEET NO.
U-3308	2A

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS
(PAGE 2 OF 2)

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.

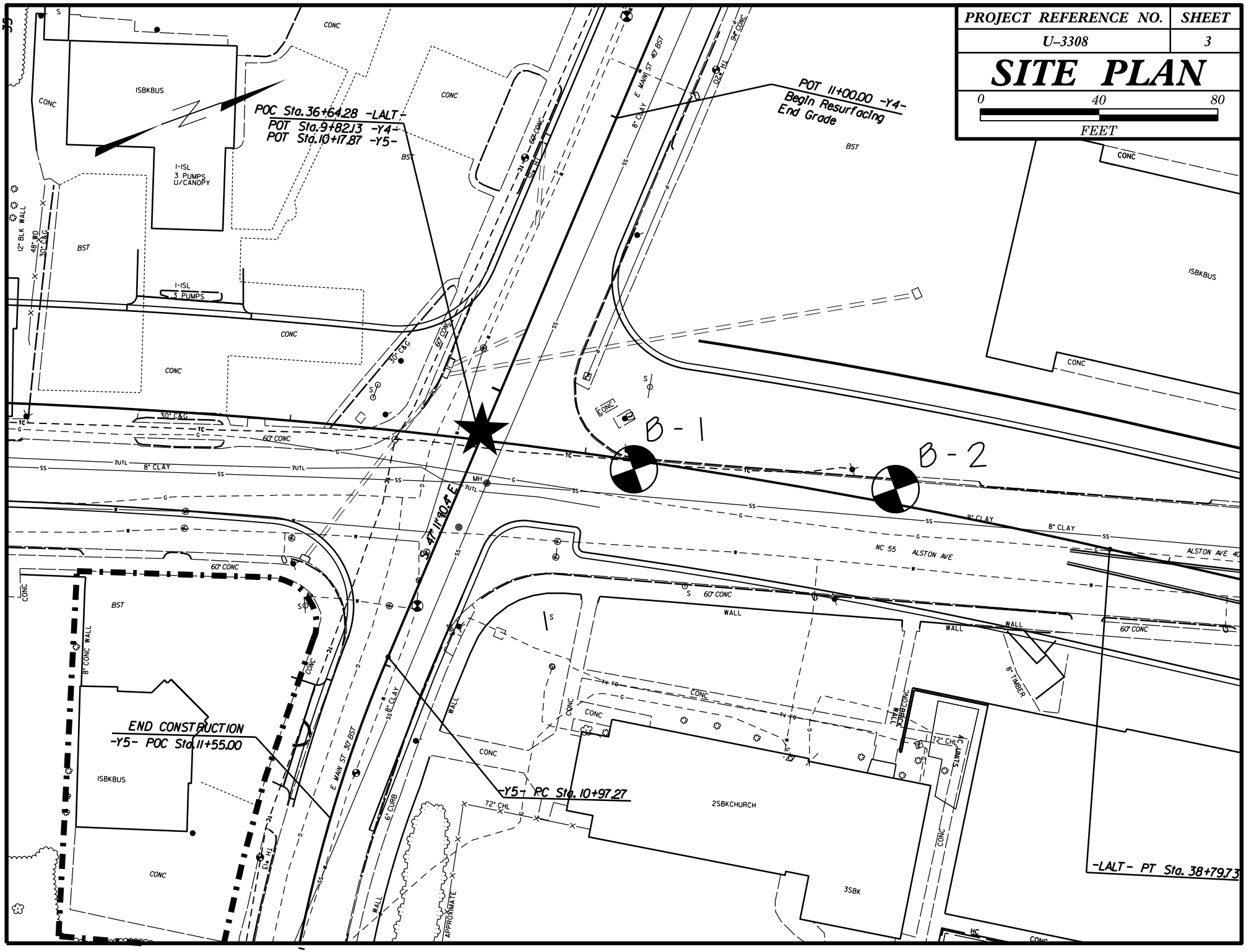
TOPSOIL (TS.) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.

BENCH MARK:

ELEVATION: FEET

NOTES:

DATE: 8-15-14


PROJECT REFERENCE NO.
U-3308
SHEET
3
SITE PLAN
0
40
80
FEET
POC Sta.36+64.28 -LALT-
POT Sta.9+82.13 -Y4-
POT Sta.10+17.87 -Y5-
POT 11+00.00 -Y4-
Begin Resurfacing
End Grade
B-1
B-2
S47°11'04"E
END CONSTRUCTION
-Y5- POC Sta.11+55.00
-Y5- PC Sta. 10+97.27
-LALT- PT Sta. 38+79.73
NC 55 ALSTON AVE
E MAIN ST
ISBKBUS
2SBKCHURCH
3SBK
I-ISL
3 PUMPS
U/CANOPY
12" BLK WALL
8" CONC WALL
8" CLAY
60" CONC
30" C&G
6" CURB
72" CHL
8" TIMBER
APPROXIMATE

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34915.1.1	**TIP** U-3308	**COUNTY** DURHAM	**GEOLOGIST** Contract Geologist	
SITE DESCRIPTION TEMPORARY SHORING ON -LALT-				**GROUND WTR (ft)**
BORING NO. B-1	**STATION** 37+17	**OFFSET** 3 ft RT	**ALIGNMENT** -LALT-	**0 HR.** Dry
COLLAR ELEV. 372.2 ft	**TOTAL DEPTH** 23.6 ft	**NORTHING** 814,378	**EASTING** 2,033,171	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TER255 DIEDRICH D-50 76% 02/25/2014		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic	
DRILLER Contract Driller	**START DATE** 09/16/14	**COMP. DATE** 09/16/14	**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 ELEV. (ft)	DEPTH (ft)
375											
										372.2 GROUND SURFACE	0.0
	370.9	1.3								370.9 **ROADWAY EMBANKMENT** ASPALT AND ABC	1.3
370			2	4	4	8		M			
	369.0	3.2								368.5 DARK GRAY AND BROWN, SILTY SAND	3.7
			2	2	2	4		W		**TRIASSIC RESIDUAL**	
	366.2	6.0								366.7 BROWN, HIGHLY PLASTIC, SILTY CLAY	5.5
365			5	8	9	17		D		BROWN, SILTY CLAY	
	364.0	8.2									
			8	10	16	26		D			
360											
	359.0	13.2									
			18	20	22	42		D			
										356.2	16.0
355										**WEATHERED ROCK** (TRIASSIC SILTSTONE)	
	354.0	18.2									
			54	46/0.3		100/0.8					
350											
	349.0	23.2									
			100/0.4			100/0.4				348.6	23.6
										Boring Terminated at Elevation 348.6 ft IN WEATHERED ROCK (TRIASSIC SILTSTONE)	

NCDOT GEOTECHNICAL ENGINEERING UNIT
BORELOG REPORT

WBS 34915.1.1	**TIP** U-3308	**COUNTY** DURHAM	**GEOLOGIST** Contract Geologist	
SITE DESCRIPTION TEMPORARY SHORING ON -LALT-				**GROUND WTR (ft)**
BORING NO. B-2	**STATION** 38+05	**OFFSET** 5 ft LT	**ALIGNMENT** -LALT-	**0 HR.** Dry
COLLAR ELEV. 368.5 ft	**TOTAL DEPTH** 18.2 ft	**NORTHING** 814,459	**EASTING** 2,033,207	**24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TER255 DIEDRICH D-50 76% 02/25/2014		**DRILL METHOD** H.S. Augers		**HAMMER TYPE** Automatic
DRILLER Contract Driller	**START DATE** 09/16/14	**COMP. DATE** 09/16/14	**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 ELEV. (ft)	DEPTH (ft)
370										368.5 GROUND SURFACE	0.0
	367.4	1.1	5	3	3	6		M		367.4 **ROADWAY EMBANKMENT**	1.1
365	365.4	3.1	2	2	5	7		W		366.1 ASPALT AND ABC GRAY, SILTY SAND	2.4
	362.5	6.0	6	9	15	24		D		363.0 **TRIASSIC RESIDUAL** GRAY AND TAN, HIGHLY PLASTIC, SILTY CLAY	5.5
360	360.4	8.1	12	20	27	47		D		BROWN, SILTY CLAY	
355	355.4	13.1	30	37	47	84		D		353.5 **WEATHERED ROCK** (TRIASSIC SILTSTONE)	15.0
	350.4	18.1	60/0.1			60/0.1				350.4	18.1
										350.3 **NON-CRYSTALLINE ROCK** (TRIASSIC SILTSTONE)	18.2
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 350.3 ft IN NON-CRYSTALLINE ROCK (TRIASSIC SILTSTONE)	