

REFERENCE: R-2233BB

PROJECT: 34400

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2233BB	1	161

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:
- 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.
 - 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

M. Arnold

C. Wang

J. Cranston

D. Aiello

S. Davis

T. Sharpe

C. Boyce

J. Hoyle

INVESTIGATED BY F&R, Inc.

DRAWN BY T.T. Walker

CHECKED BY P. Alton

SUBMITTED BY P. Alton

DATE March 2017

ROADWAY SUBSURFACE INVESTIGATION

COUNTY RUTHERFORD

PROJECT DESCRIPTION US 221 SOUTH OF US 74

BUSINESS (CHARLOTTE RD.) TO OF NORTH SR 1366

(ROPER LOOP RD.)

INVENTORY

SECTION A

CONTENTS

LINE	STATION	PLAN	PROFILE
-L3-	738+80.79 to 1004.00	4-22	28-42
-Y2-	23+75 to 32+00	6	
-Y2RPB-	10+00 to 31+16.38	5,6	
-Y2LPB-	10+00 to 22+04.55	6	
-Y2RPC-	10+00 to 27+36.20	6	
-Y2LPC-	10+00 TO 19+94.16	6	
-Y3-	BRIDGE OVER -L3-	11	
-Y3RPA-	10+00 TO 19+85.84	11,12	
-Y3RPD-	10+00 TO 31+20.29	11,12	
-Y3LPD-	10+00 TO 26+86.19	11	
-Y5-	11+75 TO 21+33.23	13	
-Y6-	20+00 TO 33+34.37	24,25	
-Y7A-	13+75 TO 18+45.84	21	
-Y8-	10+00 TO 15+35	26	
-Y10-	12+50 TO 29+82.35	15,26	
-Y11-	10+00 TO 28+00	18,27	
-Y12-	11+25 TO 33+00	15,16	
-Y19-	BRIDGE OVER -L3-	9	
-22A-	34+50 TO 40+35.15	24	
-DR3-	10+00 TO 16+75	11,23	

SECTION B

CONTENTS

LINE	STATION	PROFILE
-Y2-	23+75 to 32+00	43-44
-Y2RPB-	10+00 to 31+16.38	45-46
-Y2LPB-	10+00 to 22+04.55	47
-Y2RPC-	10+00 to 27+36.20	48-49
-Y2LPC-	10+00 TO 19+94.16	50
-Y3-	BRIDGE OVER -L3-	N/A
-Y3RPA-	10+00 TO 19+85.84	51-52
-Y3RPD-	10+00 TO 31+20.29	53-54
-Y3LPD-	10+00 TO 26+86.19	55-56
-Y5-	11+75 TO 21+33.23	57
-Y6-	20+00 TO 33+34.37	58-59
-Y7A-	13+75 TO 18+45.84	60
-Y8-	10+00 TO 15+35	61
-Y10-	12+50 TO 29+82.35	62-63
-Y11-	10+00 TO 28+00	64-65
-Y12-	11+25 TO 33+00	66-67
-Y19-	BRIDGE OVER -L3-	68
-22A-	34+50 TO 40+35.15	69
-DR3-	10+00 TO 16+75	70

LINE	STATION	CROSS SECTION
-L3-	749+50 to 1003+00	71-118
-Y2-	24+50 to 28+50	119-124
-Y2RPB-	15+44 to 24+50	125-137
-Y2RPC-	16+94.45 to 25+50	138-144
-Y2LPC-	17+54.57	145
-Y3-	25+33.03 to 27+72.89	146-147
-Y11-	18+00 to 22+00	148-151

SINCE **Prepared in the Office of:**
F&R
1881

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DocuSigned by:
W. Patrick Alton 4/6/2017

A270EF78 SIGNATURE DATE

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

SECTION A

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 (ASTM D1586)...

SOIL LEGEND AND AASHTO CLASSIFICATION Table with columns for GENERAL CLASS, GROUP CLASS, SYMBOL, and % PASSING.

CONSISTENCY OR DENSENESS Table with columns for PRIMARY SOIL TYPE, COMPACTNESS OR CONSISTENCY, RANGE OF STANDARD PENETRATION RESISTANCE, and RANGE OF UNCONFINED COMPRESSIVE STRENGTH.

TEXTURE OR GRAIN SIZE Table with columns for U.S. STD. SIEVE SIZE OPENING (MM), BOULDER, COBBLE, GRAVEL, COARSE SAND, FINE SAND, SILT, and CLAY.

SOIL MOISTURE - CORRELATION OF TERMS Table with columns for SOIL MOISTURE SCALE, FIELD MOISTURE DESCRIPTION, and GUIDE FOR FIELD MOISTURE DESCRIPTION.

PLASTICITY Table with columns for PLASTICITY INDEX (PI), DRY STRENGTH, and COLOR.

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.

MINERALOGICAL COMPOSITION Table with columns for GRANULAR MATERIALS, SILT-CLAY MATERIALS, and ORGANIC MATERIALS.

PERCENTAGE OF MATERIAL Table with columns for ORGANIC MATERIAL, GRANULAR SOILS, SILT-CLAY SOILS, and OTHER MATERIAL.

MISCELLANEOUS SYMBOLS Table with various symbols for ROADWAY EMBANKMENT, SOIL SYMBOL, ARTIFICIAL FILL, etc.

RECOMMENDATION SYMBOLS Table with symbols for UNDERCUT, UNCLASSIFIED EXCAVATION, etc.

ABBREVIATIONS Table with columns for AR - AUGER REFUSAL, MED. - MEDIUM, VST - VANE SHEAR TEST, etc.

EQUIPMENT USED ON SUBJECT PROJECT Table with columns for DRILL UNITS, ADVANCING TOOLS, HAMMER TYPE, CORE SIZE, HAND TOOLS, etc.

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.

WEATHERING Table with columns for FRESH, VERY SLIGHT, SLIGHT, MODERATE, SEVERE, VERY SEVERE, COMPLETE.

ROCK HARDNESS Table with columns for VERY HARD, HARD, MODERATELY HARD, MEDIUM HARD, SOFT, VERY SOFT.

FRactURE SPACING and BEDDING Table with columns for TERM, SPACING, THICKNESS.

INDURATION Table with columns for FRIABLE, MODERATELY INDURATED, INDURATED, EXTREMELY INDURATED.

TERMS AND DEFINITIONS Table with various terms and their definitions, such as ALLUVIUM, AQUIFER, ARENACEOUS, etc.

NOTES: FIAD= FILLED IMMEDIATELY AFTER DRILLING. ELEVATION: N/A FEET. Notes for TBMs and GPS accuracy.

09/08/99

See Sheet 1A For Index of Sheets

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

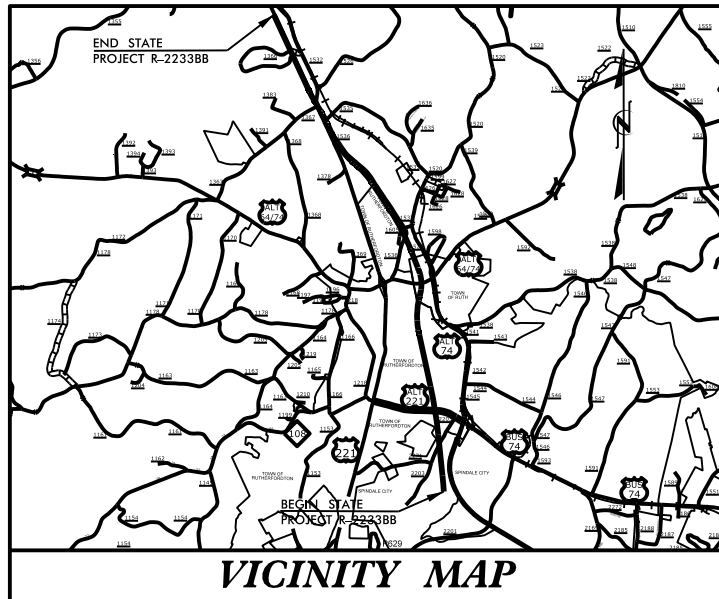
RUTHERFORD COUNTY

LOCATION: US 221 SOUTH OF US 74 BUSINESS (CHARLOTTE ROAD)
TO NORTH OF SR 1366 (ROPER LOOP ROAD)

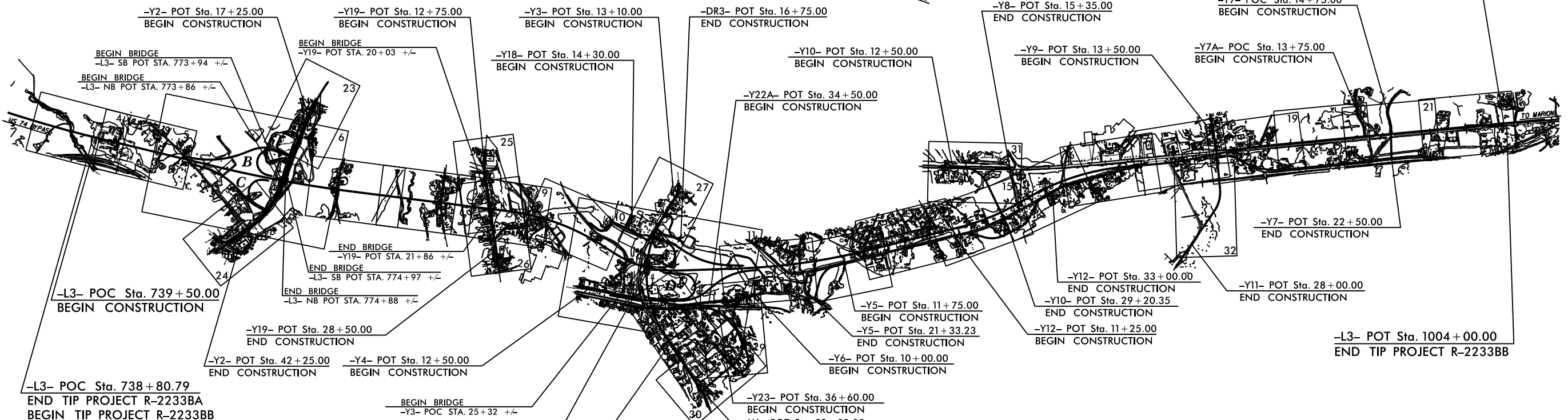
TYPE OF WORK: GRADING, DRAINAGE, PAVING
AND STRUCTURES

25% APPROVED PLANS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2233BB	3	159
STATE PROJ. NO.	P.A. PROJ. NO.	DESCRIPTION	
34400.1.S5		PE	



TIP PROJECT: R-2233BB



THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

THIS IS A PARTIAL CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO POINTS AS SHOWN ON THE PLANS.

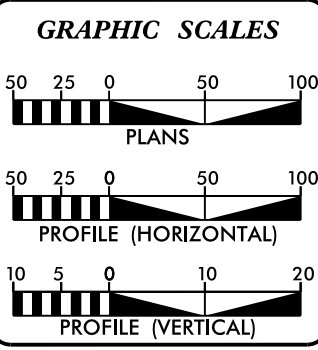
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ____.

A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWNS OF RUTHERFORDTON, RUTH, AND SPINDALE CITY

NCDOT CONTACT: THAD DUNCAN, P.E.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CONTRACT:



DESIGN DATA

ADT 2020 =	13300
ADT 2040 =	14500
K =	9 %
D =	60 %
T =	9 % *
V =	70 MPH
* TTST	5% DUAL 4%
FUNC CLASS =	ARTERIAL
REGIONAL	TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2233BB =	4.991 MILES
LENGTH STRUCTURE TIP PROJECT R-2233BB =	0.019 MILES
TOTAL LENGTH TIP PROJECT R-2233BB =	5.010 MILES
STRUCTURE LENGTH BASED ON	-L3- NB STATIONING.

PLANS PREPARED FOR NCDOT BY:

Dewberry
2610 WYCLIFF ROAD
SUITE 410
RALEIGH, NC 27607
PHONE: 919.881.9939
NC COA No. F-0929

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JULY 21, 2017

LETTING DATE: JANUARY 21, 2020

DENNIS J. MORY, P.E.
PROJECT ENGINEER

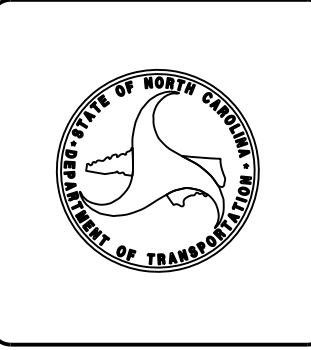
RICK STATON
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



17-MAR-2017 10:09
F:\Projects\661661-0203 (NCDOT-R-2233BB Rutherford Co.)\CADD_GEO\TECH\PlanProf\R2233BB_geo_TSH.dgn
T:\walker AT 661661068



March 16, 2017

State Project No.: 34400.1.S5
 TIP No.: R-2233BB
 F.A. Number: N/A
 County: Rutherford
 Description: US 221 south of US 74 Business (Charlotte Rd) to north of SR 1366 (Roper Loop Rd)

SUBJECT: Geotechnical Report – Inventory

Project Description

This project primarily involves the creation of 5.0 miles of roadway on new alignment (-L3-) in Rutherfordton, Rutherford County, North Carolina. The new roadway begins at -L3- station 738+80.79, which is located off the west side of US-74 Alternate about ¼ mile north of its intersection with Ellington Heights. The roadway ends at -L3- station 1004+00, which is located on existing US 221 about ½ mile north of its northernmost intersection with Roper Loop Road. The new roadway will typically consist of two northbound and two southbound lanes separated by a median. More-specifically, the typical section will incorporate 12-foot lanes, a 10-foot outside shoulder, and a 46-foot median. Two main partial cloverleaf intersections are proposed at Charlotte Road (-Y2-) and East Mountain Street (-Y3-). The intersection at Charlotte Road will consist of a ramp and loop within the B and C quadrants while the East Mountain Street intersection will consist of a ramp and loop within the A and D quadrants. The mainline of the proposed road also crosses the following existing roads: Laurel Hill Road, East 2nd Street, Collett Street, Green Street, Oak Street, Reece Street, Southern Street, Old US 221, Hildebrand Drive, Cedar Lane, Broyhill Road, and Gilboa Church Road.

A majority of the new alignment generally extends through undeveloped/wooded areas and residential properties. In addition, several bridges, culverts, and retaining walls are proposed as follows, although at this preliminary stage of the project, the specifics of such structures are unknown. The locations of the culverts are assumed based on the presence of the more-predominant streams that run through the areas, and additional culverts may be necessary that are not listed below. The locations shown below represent areas where additional subsurface investigation was performed in anticipation of the listed structures.

Dual Bridges on -L3- over -Y2-
 Bridge on -Y19- over -L3-
 Bridge on -Y3- over -L3-

Abutment retaining walls for Dual Bridges on -L3- over -Y2-:
 End Bent 1 from approximate -Y2- station 27+75 to 31+50, right
 End Bent 2 from approximate -Y2- station 28+50 to 31+00, left

Culvert at approximate -L3- station 797+75
 Culvert at approximate -L3- station 831+25
 Culvert at approximate -L3- station 874+50

The geotechnical field investigation was performed between November 2016 and January 2017. During this time period, a total of 214 Standard Penetration Test (SPT) borings were advanced with ATV- and track-mounted CME-55 drill rigs with automatic hammers. In addition, two (2) auger probe borings were completed due to highly variable rock elevations. Representative soil samples were collected from the split spoon for visual classification in the field and for analysis by F&R's testing laboratory.

The following alignments were investigated:

<u>Alignment</u>	<u>Station (±)</u>
-L3-	738+80.79 to 1004+00.00
-Y2-	23+75 to 32+00
-Y2RPB-	10+00 to 31+16.38
-Y2LPB-	10+00 to 22+04.55
-Y2RPC-	10+00 to 27+36.20
-Y2LPC-	10+00 to 19+94.16
-Y3-	Bridge over -L3-
-Y3RPA-	10+00 to 27+55.95
-Y3RPD-	10+00 to 31+20.29
-Y3LPD-	10+00 to 26+86.19
-Y5-	11+75 to 21+33.23
-Y6-	20+00 to 33+34.37
-Y7A-	13+75 to 18+45.84
-Y8-	10+00 to 15+35
-Y10-	12+50 to 29+82.35
-Y11-	10+00 to 28+00
-Y12-	11+25 to 33+00
-Y19-	Bridge over -L3-
-Y22A-	34+50 to 40+35.15
-DR3-	10+00 to 16+75

Areas of Special Geotechnical Interest

- 1) Crystalline Rock: The following areas were found to contain crystalline rock above or within six feet of the proposed grade and will likely require ripping or blasting for removal:

<u>Alignment</u>	<u>Station (±)</u>
-L3-	842+25 to 845+25
-L3-	977+75 to 978+25, right
-Y2-	25+25 to 28+75
-LPC-	17+25 to 17+99
-RPC-	22+65 to 25+90
-RPB-	15+25 to 16+25
-RPB-	18+25 to 19+60
-RPB-	20+30 to 24+75

- 2) Weathered Rock: The following areas were found to contain weathered rock above or within six feet of the proposed grade and have a potential to require ripping or blasting for removal:

<u>Alignment</u>	<u>Station (±)</u>
-L3-	761+00 to 763+00
-L3-	769+00 to 771+00
-L3-	774+25 to 774+75
-L3-	776+50 to 778+00
-L3-	842+00 to 845+50
-L3-	973+50 to 974+50
-Y2-	28+51 to 30+75, left
-RPB-	13+25 to 16+50
-RPB-	20+50 to 20+75
-RPB-	23+80 to 25+40
-LPB-	16+00 to 16+40
-RPC-	14+75 to 15+75
-RPC-	18+30 to 26+50
-LPC-	11+25 to 11+90
-LPC-	14+00 to 19+20

- 3) Soft, Loose and/or Wet Soils: The following areas contain relatively soft or loose and/or wet, near-surface soils that have the potential to cause subgrade problems during construction:

<u>Alignment</u>	<u>Station (±)</u>
-L3-	766+50 to 767+50
-L3-	780+50 to 781+50, left
-L3-	794+50 to 803+00
-L3-	807+50 to 808+50

-L3-	814+50 to 818+00
-L3-	822+50 to 840+00
-L3-	871+50 to 877+00
-L3-	920+00 to 944+00
-L3-	961+50 to 964+50, left
-L3-	968+50 to 969+50, left
-L3-	981+00 to 982+00, left
-L3-	989+50 to 997+50, left
-Y2-	27+50 to 32+00
-RPA-	23+50 to 26+50
-LPD-	18+50 to 19+50
-RPD-	14+00 to 24+00
-DR3-	11+50 to 12+50
-Y5-	19+50 to 20+50
-Y6-	26+12 to 33+22
-Y8-	10+12 to 12+00
-Y10-	18+50 to 19+50
-Y10-	24+50 to 27+50
-Y11-	10+47 to 28+00
-Y12-	16+00 to 20+00
-Y12-	26+00 to 28+00
-Y19-	19+00 to 23+00

- 4) Cohesive Soils: The following areas contain cohesive soils (AASHTO A-5, A-6 & A-7 soils) at existing subgrade in fill areas or at/near proposed subgrade that have the potential to cause subgrade problems during construction:

<u>Alignment</u>	<u>Station (±)</u>
-L3-	739+50 to 740+50
-L3-	745+00 to 753+50
-L3-	757+00 to 760+00
-L3-	766+50 to 767+50
-L3-	775+50 to 776+50
-L3-	778+00 to 803+00
-L3-	807+00 to 841+50
-L3-	859+00 to 884+00
-L3-	903+50 to 948+50
-L3-	956+00 to 957+00, right
-L3-	961+50 to 971+50, left
-L3-	981+00 to 986+00
-L3-	989+50 to 990+50, left
-L3-	995+00 to 997+50, left
-RPA-	10+50 to 11+50

-RPA-	24+50 to 25+50
-RPC-	12+00 to 14+00
-LPD-	14+50 to 19+50
-RPD-	10+00 to 24+00
-Y5-	11+75 to 21+01
-Y6-	20+00 to 23+00
-Y6-	29+00 to 31+00
-Y8-	10+12 to 11+75
-Y10-	12+50 to 29+70
-Y11-	10+47 to 28+00
-Y12-	11+25 to 33+00
-Y19-	19+00 to 22+00
-Y22A-	39+50 to 40+35
-DR3-	10+25 to 16+75

5) Cohesive Soils: The following areas contain deeper deposits of relatively soft cohesive soils (AASHTO A-5, A-6 & A-7 soils) that have the potential to cause embankment instability or long-term settlement problems:

<u>Alignment</u>	<u>Station (±)</u>
-L3-	778+25 to 781+25
-L3-	794+00 to 799+00
-L3-	814+50 to 815+50
-L3-	830+00 to 838+00
-L3-	865+00 to 867+50
-L3-	871+50 to 875+00
-L3-	968+00 to 970+00, left
-L3-	989+00 to 991+00, left
-RPD-	16+50 to 18+00
-RPD-	20+00 to 21+00
-Y8-	10+50 to 12+00
-Y10-	16+50 to 19+50
-Y11-	19+00 to 22+50
-Y12-	16+50 to 17+50

6) Highly Plastic Soils: The following areas of unclassified excavation contain soils with plasticity indices of 26 through 35:

<u>Alignment</u>	<u>Station (±)</u>
-L3-	749+45 to 756+90
-L3-	903+30 to 905+70

7) Groundwater: The following areas exhibited groundwater within six feet of the proposed grade:

<u>Alignment</u>	<u>Station (±)</u>
-L3-	782+50 to 783+50
-L3-	843+00 to 844+00

The following areas exhibited groundwater within three feet of existing grade, which have the potential to cause subgrade problems during construction:

<u>Alignment</u>	<u>Station (±)</u>
-L3-	766+50 to 767+50
-L3-	780+50 to 781+50
-L3-	797+00 to 798+50
-L3-	873+50 to 874+50
-L3-	968+50 to 969+50
-RPD-	18+00 to 22+00
-Y11-	19+00 to 23+00

8) Artificial Fill: The following location contains artificial fill. These soils have the potential to be highly variable, which could cause subgrade problems during construction if undetected pockets of organics, debris, or soft/loose/wet soils are present. In addition, a majority of these soils are cohesive, which may cause embankment instability or long-term settlement problems. It was noted during the field investigation that fill placement/site alteration appeared recent or ongoing in the area of Loop-D/Ramp-D. The similar was true near boring Y6_3200L, where a survey-grade GPS was utilized in order to obtain an accurate ground surface elevation. Therefore, the ground surface elevations depicted on the plans (with the exception of Y6_3200L), may not accurately represent the current ground surface elevations.

<u>Alignment</u>	<u>Station (±)</u>
-L3-	739+50 to 746+50
-L3-	759+50 to 765+25
-L3-	772+70 to 774+50
-L3-	775+75 to 776+25
-L3-	778+00 to 780+00, left
-L3-	807+70 to 814+00
-L3-	816+60 to 821+60
-L3-	872+70 to 874+25
-L3-	894+00 to 906+50
-L3-	934+50 to 936+50, right
-L3-	938+00 to 954+80
-L3-	992+50 to 993+50, left
-Y2-	24+00 to 33+00
-LPB-	17+00 to 22+05

-RPB-	15+50 to 19+50, left
-RPB-	25+50 to 30+40
-RPC-	13+00 to 17+50
-RPC-	22+75 to 23+25, right
-LPD-	15+60 to 25+00
-RPD-	27+00 to 29+00
-Y6-	30+50 to 33+00
-Y11-	11+00 to 12+75, left
-Y12-	14+00 to 15+25
-Y19-	19+00 to 22+50
-Y22A-	39+75 to 40+25
-DR3-	13+80 to 14+25

-L3-	995+65, 212' left
-RPD-	22+28, 49' right

Physiography and Geology

The proposed road will generally run in a north-to-south direction, and primarily through undeveloped, wooded, and residential properties. However, from the beginning of the project through its crossing of Charlotte Road, the proposed road generally traverses through commercial properties. The existing ground surface along the centerline of the proposed road generally slopes upward from an elevation (EL) of ±995 feet at the beginning of the project to EL ±1,076 feet near station 754+00, and then downward to EL ±1,001 feet near station 767+00. The ground surface then generally slopes upward to EL ±1,038 feet near station 771+50 and then downward to EL ±984 feet at the proposed dual bridges over Charlotte Road (-Y2-, near station 774+50). The ground surface then generally slopes upward to EL ±1,072 feet near station 784+00, downward to EL ±929 feet near station 797+75 (location of the first culvert investigated), and then upward to EL ±1,035 feet near station 804+50. The existing ground surface at the proposed bridge on -Y19- over -L3- near station 812+50 is at EL ±982 feet. The ground surface then generally slopes downward to EL ±940 feet near station 815+00, upward to EL ±989 feet near station 822+00, and then downward to EL ±944 feet near station 831+25 (location of the second culvert investigated). The existing ground surface at the proposed bridge on -Y3- over -L3- near station 843+45 is at EL ±1,058 feet. The ground surface then generally slopes upward to EL ±1,075 feet near station 847+50, downward to EL ±925 feet near station 874+50 (location of the third culvert investigated), and then upward to EL ±1,073 feet near station 919+00. The ground surface is then relatively level, sloping gradually upward to EL ±1088 feet near station 954+00 and then gradually downward to EL ±1022 feet near station 998+00. Finally, the ground surface then slopes upward to EL ±1,044 feet near the end of the project.

The surface water across the southern portion of the project is generally drained by Cleghorn Creek, which is present about ¼ to ½ mile west of the proposed road and generally flows in a north-south direction. The surface water across the northern portion of the project is generally drained by Hollands Creek, which generally flows in a northwest-to-southeast direction. Hollands Creek is generally about 700 to 1,500 feet east of the proposed road; however, at about -L3- station 874+50, Hollands Creek crosses the alignment where a culvert will likely be necessary. Numerous other drainage features cross the site with the most notable features located at approximate -L3- stations 797+75 and 831+25, where additional culverts will likely be necessary. In addition, from about -L3- 831+25 to 836+50, several spring-fed streams run about parallel with the alignment and intersect the larger drainage feature at 831+25. Severe erosion was also observed in this area at about 830+50, 180 feet left, which appears to have originated from a drain pipe next to the road. Another noted drainage feature is located on -Y11- at approximate station 21+00, and this is also indicated to be stream-fed. Numerous other springs are also indicated on the roadway plans and are located within the project limits.

The project is located in the Piedmont Physiographic Province of North Carolina within the Inner Piedmont Belt. More-specifically, it is located in an area mapped as migmatitic granitic gneiss (OCgm), amphibolite and biotite gneiss (CZab), and mica schist (CZms). Typical weathered rock samples recovered from our borings primarily exhibit the characteristics of biotite gneiss or mica schist. Soils weathered from the

9) **Organic Soils:** The following locations were found to contain organic-laden soils (greater than 4% organic and 4 inches in thickness), which have the potential to cause subgrade problems during construction, embankment instability, or long-term settlement problems. Organic content tests were performed on 8 topsoil samples, and the results ranged from 7.7 to 17.0% organic content:

<u>Alignment</u>	<u>Station (±)</u>	<u>Association</u>
-L3-	790+50 to 791+50	Topsoil/root mat
-L3-	794+50 to 795+50	Topsoil/root mat
-L3-	809+50 to 810+50	Topsoil/root mat
-L3-	986+50 to 987+50	Topsoil/root mat
-RPA-	20+50 to 21+50	Topsoil/root mat
-Y11-	12+50 to 13+50	Topsoil/root mat
-Y11-	21+50 to 22+50	Topsoil/root mat
-Y12-	21+50 to 22+50	Topsoil/root mat

10) **Springs:** Springs were located within the proposed construction limits at the following locations:

<u>Line</u>	<u>Station (±)</u>
-L3-	739+88, 20' left
-L3-	815+06, 4' left
-L3-	815+48, 103' left
-L3-	834+29, 15' right
-L3-	834+95, 27' left
-L3-	835+24, 29' right
-L3-	835+99, 55' right
-L3-	836+46, 88' right
-L3-	968+63, 161' left
-L3-	969+07, 192' left

parent rock generally consist of sandy silts and silty sands. The in-situ soils are the residual product of in-place chemical weathering of rock that was similar to the rock presently underlying the site.

During the investigation, we observed one general area that contained exposed rock at the existing ground surface. This area is generally located at the proposed dual bridges on -L3- over -Y2- (Charlotte Road). More-specifically, rock was observed within the slope on the north side of the road approximately between -Y2- station 28+00 to 31+00, left. Rock was also observed within the slope face on the south side of -Y2- behind the commercial buildings approximately from -Y2- station 27+00 to 33+00, right.

Soils Properties

The subsurface conditions discussed below and those shown on the attached drawings, represent an estimate of the subsurface conditions based on interpretation of the boring data using normally-accepted geotechnical engineering judgments. The transitions between different soil strata are usually less distinct than those shown on the profile. Sometimes the relatively small sample obtained in the field is insufficient to definitively describe the origin of the subsurface material. Although individual soil test borings are representative of the subsurface conditions at the boring locations on the dates shown, they are not necessarily indicative of subsurface conditions at other locations or at other times.

Soils within the area of this project have been divided into four categories: artificial fill, roadway embankment fill, alluvial soils, and residual soils.

Artificial Fill: Artificial fill (AF) was encountered at the surface of 49 borings. The AF extended to depths ranging from 2 to 37 feet, with most extending to less than about 7 feet. The artificial fill was typically described as moist, medium stiff to very stiff sandy and silty CLAY (A-7) and loose to medium dense silty SAND (A-2-4). A majority of the samples contained trace organic matter, mica and gravel. Trash and debris was encountered at borings L3_77403L(1) and LPD_2260R from a depth of about 16.6 to 20.4 feet and from 2 to 7 feet, respectively. Boulder fill was encountered at boring L3_77377R(1) to a depth of about 4.3 feet, at which depth the boring was terminated. Offset boring L3_77377R(2) was performed to a depth of about 29.8 feet, which did not encounter boulder fill.

Roadway Embankment: Roadway embankment (RE) soils were encountered at the surface of 9 borings. The RE was typically associated with existing Charlotte Road and Collett Street. The RE extended to depths ranging from 2 to 6 feet, with most less than about 2 feet. The fill was variable and described as moist, medium stiff to stiff, sandy and silty CLAY (A-6 & A-7), medium stiff to very stiff sandy SILT (A-4) and loose to medium dense silty SAND (A-2-4). A majority of the samples contained trace organic matter, mica and gravel.

Alluvial Soil: Alluvial soils were encountered in 25 borings. The alluvial soils were typically encountered below artificial fill and at the ground surface where they were associated with varying-sized drainage systems crossing the alignment. The alluvial extended to depths ranging from 2 to 42 feet with an average of about 17 feet. The alluvium was typically described as moist to saturated, very loose to loose, silty and clayey SAND (A-2-4 & A-2-6), very soft to medium stiff sandy and clayey SILT (A-4 & A-5), and very soft to

medium stiff, sandy and silty CLAY (A-6 & A-7). A majority of the soil samples contained trace organic matter, mica, and gravel.

Residual Soil: A majority of the soils encountered on this project were residual soils. Residual soils were encountered at the surface of 146 borings, below artificial fill at 33 borings, below alluvial soils at 25 borings, and below roadway embankment at 7 borings. No residual soils were encountered in 5 borings, and these borings were terminated in artificial fill or weathered rock/crystalline rock. The residual soils were typically described as moist, medium stiff to stiff sandy and silty CLAY (A-6 & A-7) in the upper 2 to 7 feet of the borings. The surficial clays were then typically underlain by moist, medium stiff to very stiff, sandy and clayey SILT (A-4 & A-5), and medium dense to dense silty SAND (A-2-4). A majority of the samples contained varying amounts of mica and manganese oxides.

Rock Properties

Weathered Rock (WR) was encountered in 58 borings. Of these 58 borings, 7 of the borings terminated in residual soils, 22 terminated in WR, and 29 terminated in/on Crystalline Rock (CR). Twenty-five of the borings encountered intermediate layers of WR before re-encountering soils below this layer. Of these 25 borings, 7 borings terminated in residual soils and 18 borings re-encountered WR and/or CR at boring termination. These intermediate zones of WR ranged in thickness from about 1 to 15 feet. Excluding the intermediate zones of WR, the WR was encountered at depths ranging from about 4 to 72 feet and elevations ranging from about 893 to 1,072 feet.

CR was encountered in 51 borings as indicated by auger and SPT refusal. Of these 51 borings, 50 of the borings terminated in/on CR and 1 terminated in WR. Four of the borings encountered intermediate layers of CR before re-encountering soils or WR below this layer. Of these 4 borings, 1 boring terminated in WR and 4 borings re-encountered CR at boring termination. These intermediate zones of CR ranged in thickness from about 1 to 5 feet. The CR was encountered at depths ranging from about 7 to 77 feet, or elevations ranging from about 888 to 1,062 feet. The rock typically consisted of biotite gneiss and mica schist. Refusal is a designation applied to any material that cannot be penetrated by the soil auger, and is typically caused by encountering boulders, hard rock lenses/ledges or bedrock. The nature of the materials causing refusal was not explored in these borings, but is anticipated to represent the CR level.

Groundwater Properties

Generally, groundwater measurements were attempted in a majority of the borings along the project immediately upon their completion and after a stabilization period of approximately 24 hours. Twenty-one borings were backfilled immediately upon their completion. Immediately upon completion, groundwater was encountered in 62 borings at depths ranging from 1.2 to 62.1 feet, and elevations ranging from about 907.7 to 1,034.7 feet. Stabilized groundwater was encountered in 62 borings at depths ranging from 0.5 to 53 feet, and elevations ranging from 914.1 to 1,032.3 feet. Groundwater was not encountered in the remaining borings. The recovered soil samples were generally described as moist above the groundwater level and wet or saturated below the groundwater level. It should be noted that the groundwater levels

fluctuate depending upon seasonal factors such as precipitation and temperature. As such, soil moisture and groundwater conditions at other times may vary or be different from those described in this report.

Geotechnical Descriptive Analysis of the Project

For descriptive purposes, the project has been divided into three segments. The division of the segments is primarily based on the centerline topography of the proposed roadway.

Segment 1: -L3- Station 739+50 to 878+00 (±):

Segment 1 of the project generally traverses existing commercial properties and wooded areas, with fewer impacts on residential areas. The project begins at an existing elevation (EL) of ±995 feet with dramatic upward and downward elevation changes and ends at existing EL ±945. Maximum elevations exist in the following areas: from -L3- station 754+00 to 764+50 (EL ±1,077); at station 784+00 (EL ±1,072); and at station 847+50 (EL ±1,076). The lowest elevations exist in the following areas: station 774+50 (EL ±983, intersection with -Y2-); at station 797+75 (EL ±930, at a stream); at station 815+00 (EL ±940, at a possible spring); at station 831+25 (EL ±944, at a stream); at station 866+00 (EL ±946, at a stream); and at station 874+50 (EL ±925, at a stream). The size and locations of proposed pipes and/or culverts is unknown at this time.

This segment requires maximum fills up to about 90 feet as measured at the centerline of the road, which occurs at about -L3- station 797+75. Other locations where maximum fill depths are required exist at: about station 746+00 (38' fill); station 831+25 (60' fill); and at station 865+75 (36' fill). The subgrade within the areas of proposed fills is anticipated to consist mainly of soft to stiff residual clays (A-7) and soft to medium stiff residual silts (A-4 & A-5).

This segment requires maximum cuts up to about 46 feet as measured at the centerline of the road, which occurs at about -L3- station 784+00. Other locations where maximum cut depths are required exist at: about station 764+50 (40' cut); station 804+50 (40' cut); and at station 847+50 (42' cut). The unclassified excavation to be encountered in the cuts is anticipated to consist mainly of residual clays (A-7) near the surface underlain by silts (A-4 & A-5) and silty sands (A-2-4). The subgrade within the areas of proposed cuts is anticipated to consist mainly of medium stiff to hard residual silts (A-4 & A-5) and medium dense to very dense silty sands (A-2-4).

Segment 2: -L3- Station 878+00 to 951+00 (±):

Segment 2 of the project generally traverses existing residential properties with more-significant impacts to existing homes. The project begins at an existing elevation (EL) of ±945 feet and ends at existing EL ±1,085, with more-gentle and less-significant grade changes. The maximum elevation exists in the area between station 918+00 and 951+00 where the ground surface is relatively level and ranges from about EL ±1,060 to 1,085. The lowest elevation exists at the beginning of this segment at station 878+00 (EL ±945) since the elevation generally increases to the end of this segment.

This segment requires maximum fills up to about 15 feet as measured at the centerline of the road, which occurs at about -L3- station 947+00, although fills less than about 7 feet are typically required. The subgrade within the areas of proposed fills is anticipated to consist mainly of soft to medium stiff residual clays (A-6 & A-7).

This segment requires maximum cuts up to about 11 feet as measured at the centerline of the road, which occurs at about -L3- station 898+50. The unclassified excavation to be encountered in the cuts is anticipated to consist mainly of clayey artificial fill and residual soils (A-7) and residual silts (A-4). The subgrade within the areas of proposed cuts is anticipated to consist mainly of stiff residual clays and silts (A-7 & A-4).

Segment 3: -L3- Station 951+00 to 1004+00 (±):

Segment 3 of the project generally consists of widening existing US-221 from its intersection with Thompson Road to the end of the project, which is just past the northernmost intersection of Roper Loop Road. The widened areas generally extend west of the existing road into residential and commercial properties, although the impacts are generally restricted to the wooded and/or undeveloped portions of the properties. The project begins at an existing EL of ±1,085 and ends at existing EL ±1,045. The maximum elevation exists at about -L3- station 954+00 at EL ±1,088. The lowest elevation exists at station 998+00 (EL ±1,022).

Through station 960+50, the proposed road contains existing cut slopes on the right side of the proposed alignment and is relatively level on the left. Through station 972+50, existing fill slopes are present on both sides, and then through station 988+50, existing cut slopes are present on both sides of the proposed alignment. Through station 998+50, existing fill slopes are present on both sides, and then through the end of the project, existing cut slopes are present on both sides of the proposed alignment.

Generally, cut and fill on the order of 10 feet and less will be required at the centerline of the road. However, the widening will require cuts on the left up to about 50 feet (station 976+00) and cuts on the right up to about 32 feet (station 976+00). The unclassified excavation to be encountered in the cuts is anticipated to consist mainly of residual clays (A-7) near the surface underlain by silts (A-4 & A-5) and silty sands (A-2-4). The subgrade within the areas of proposed cuts is anticipated to consist mainly of medium stiff to very stiff residual silts (A-4 & A-5) and medium dense silty sand (A-2-4).

The widening will require fills up to 54 feet (station 996+00) on the left and fills up to 20 feet (station 970+00) on the right. Generally, only sliver fills are required on the right. The subgrade within the areas of proposed fills is anticipated to consist mainly of soft to medium stiff residual and alluvial clays (A-6 & A-7).

We appreciate the opportunity to work with you on this project. Please contact us if you have any questions regarding this report or if we may be of further service.

Sincerely,
FROEHLING & ROBERTSON, INC.

DocuSigned by:
W. Patrick Alton
 W. Patrick Alton, P.E.
 Geotechnical Services Manager

DocuSigned by:
Derick Racey
 Derick Racey
 Geotechnical Project Manager

Appendix A

Shelby Tubes

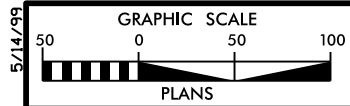
The following Shelby tubes were obtained and transported to our laboratory for potential testing to determine the engineering properties of the soil. A total of 23 Shelby tubes were attempted and only 17 samples were able to be obtained.

Sample No.	Boring No.	Line	Station	Offset	Depth (ft)	Test(s) Performed	
ST-1	L3_77369R	-L3-	773+69	145' Rt.	13.0 – 15.0	No recovery	
					15.0 – 17.0	Not tested	
ST-2	L3_77441L	-L3-	774+41	220' Lt.	18.0 – 20.0	No recovery	
					215' Lt.	17.5 – 19.5	No recovery
					210' Lt.	17.5 – 18.0	Only asphalt recovered
ST-3	L3_77900L	-L3-	779+00	70' Lt.	13.0 – 15.0	Hit a rock	
					70' Lt.	15.0 – 17.0	No recovery
					60' Lt.	13.0 – 15.0	Consolidation
ST-4	L3_80800	-L3-	808+00	CL	14.5 – 16.5	Consolidation	
ST-5	RPB_1732	-RPB-	17+32	CL	15.0 – 17.0	Not tested	
ST-6	RPB_1732	-RPB-	17+32	CL	17.0 – 19.0	CU Triaxial	
ST-7	Samples misnumbered, ST-7 does not exist						
ST-8	RPD_2100L	-RPD-	21+00	25' Lt.	5.5 – 7.5	Consolidation	
ST-9	L3_97600L	-L3-	976+00	70' Lt.	10.0 – 12.0	Not tested	
ST-10	L3_97600L	-L3-	976+00	70' Lt.	12.0 – 14.0	Not tested	
ST-11	L3_97800L	-L3-	978+00	70' Lt.	14.0 – 16.0	CU Triaxial	
ST-12	L3_97800L	-L3-	978+00	70' Lt.	18.5 – 20.5		
ST-13	L3_95625R	-L3-	956+49	98' Rt.	13.0 – 15.0	CU Triaxial	
ST-14	L3_95625R	-L3-	956+49	98' Rt.	15.0 – 17.0	Not tested	
ST-15	Y10_1700R	-Y10-	17+00	10' Rt.	14.0 – 16.0	CU Triaxial	
ST-16	Y10_1700R	-Y10-	17+00	10' Rt.	16.0 – 18.0	Consolidation	
ST-17	RPA_2100L	-RPA-	21+00	30' Lt.	17.0 – 19.0	Not tested	
ST-18	RPA_2100L	-RPA-	21+00	30' Lt.	19.0 – 21.0	Not tested	

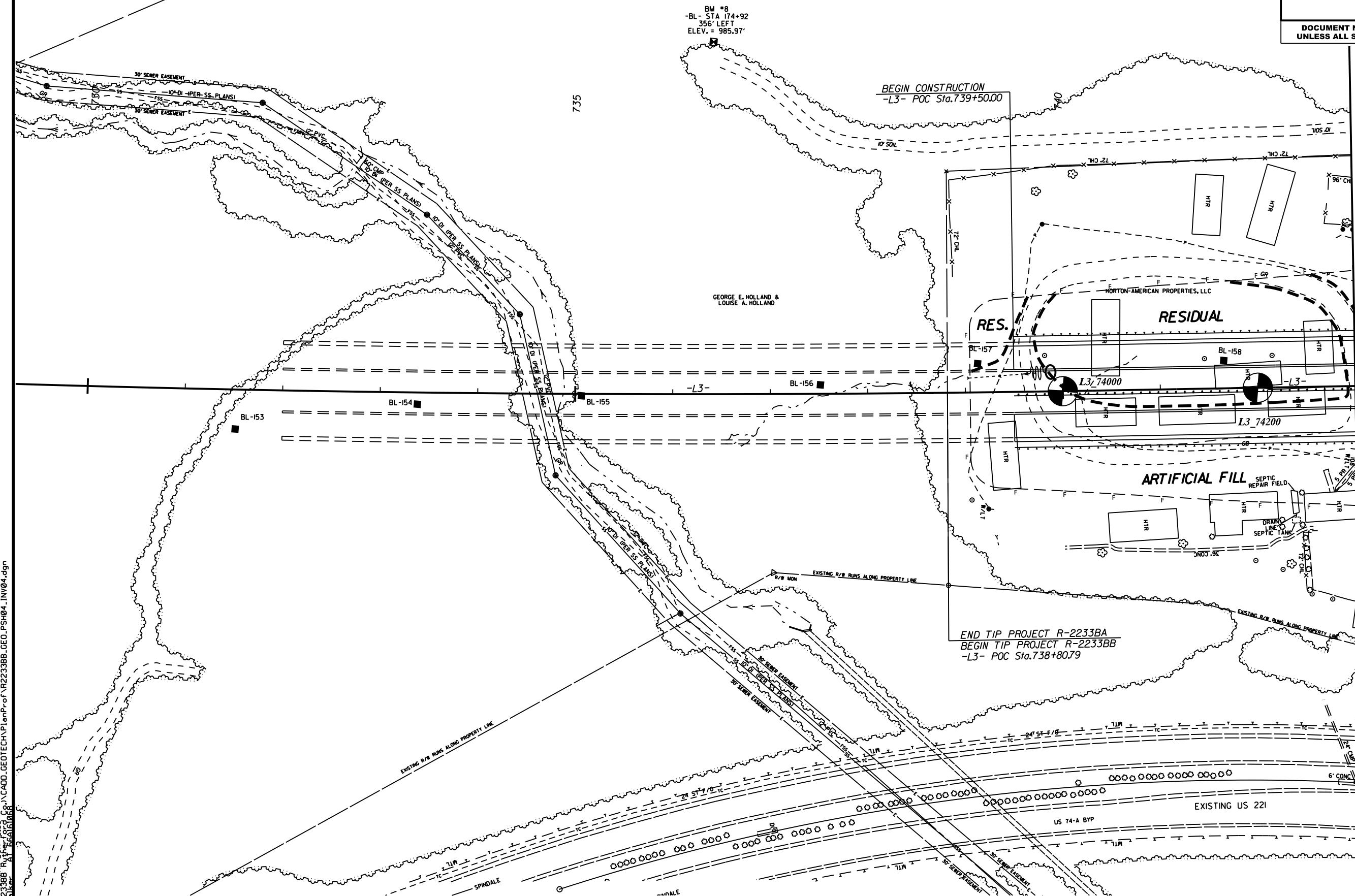
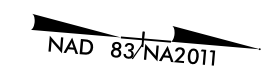
Bulk Samples

The following bulk samples were obtained and transported to our laboratory for testing to determine the engineering properties of the soil:

Sample No.	Boring No.	Line	Station	Offset	Depth (ft)	Test(s) Performed
S-1	L3_76200	-L3-	762+00	CL	5.0 – 13.0	Standard Proctor, CBR
S-2	RPA_2100L	-RPA-	21+00	30' Lt.	17.0 – 35.0	Standard Proctor, CBR
S-3	L3_95625R	-L3-	956+25	95' Rt.	11.0 – 17.0	Standard Proctor, CBR



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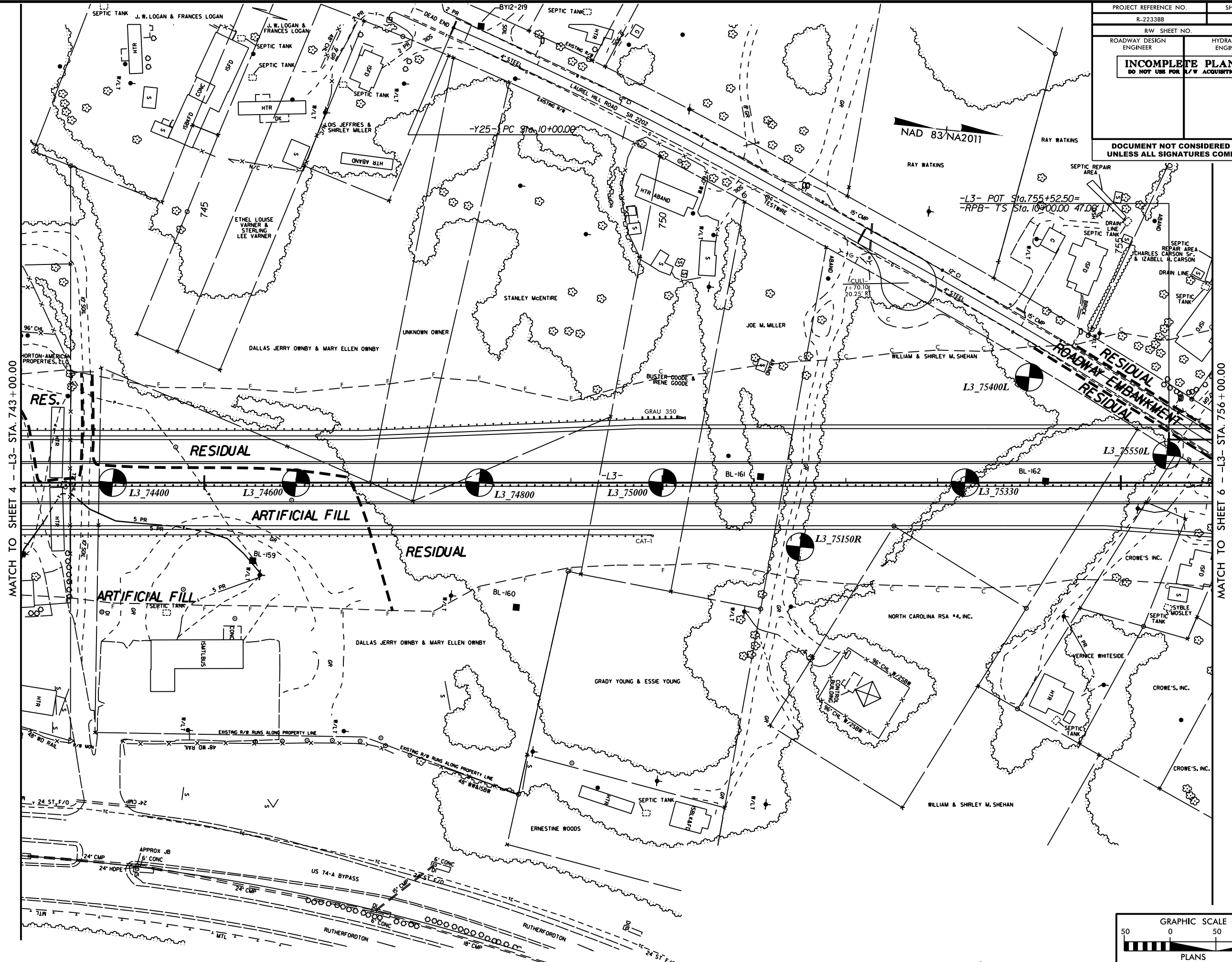


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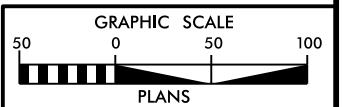
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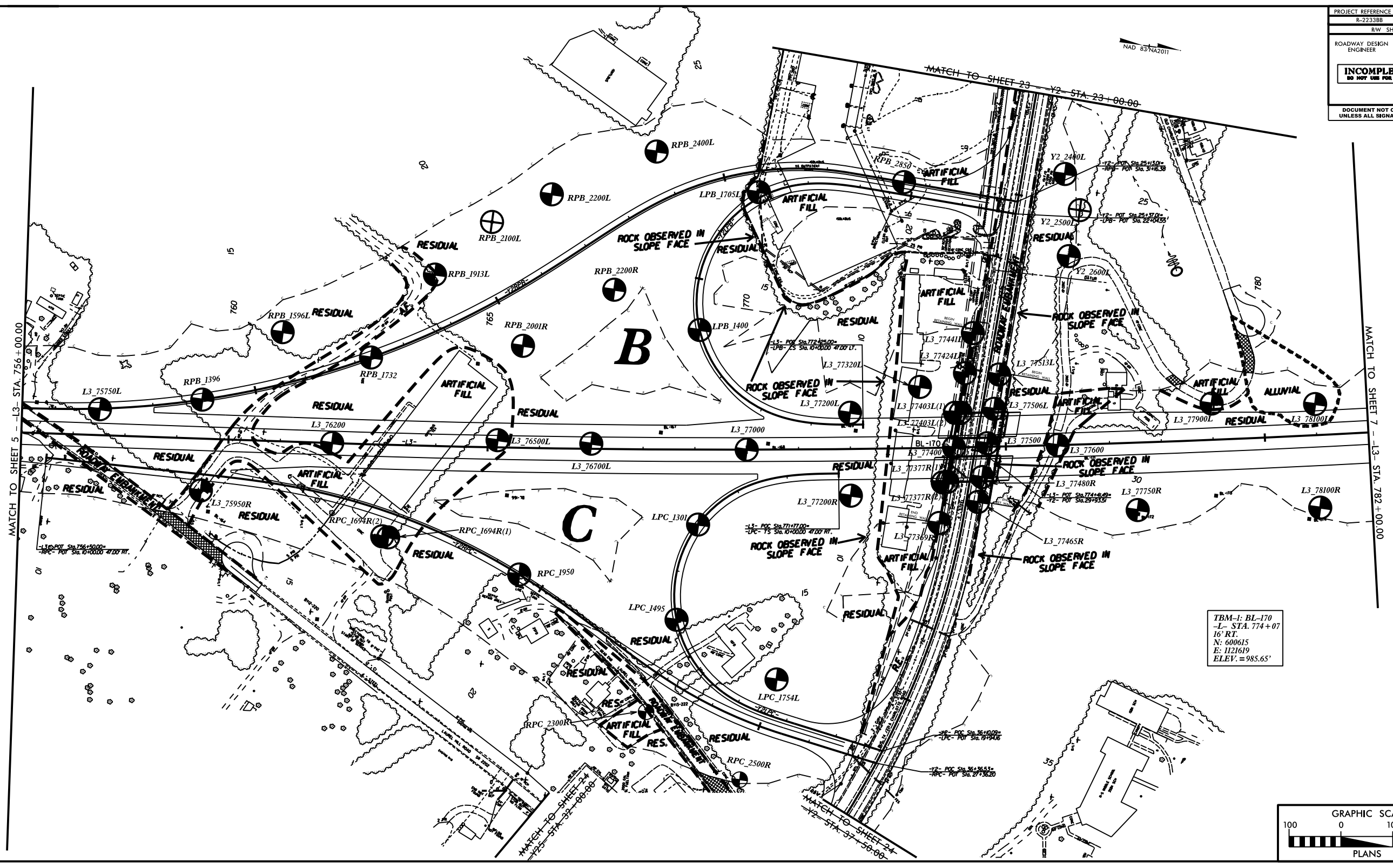
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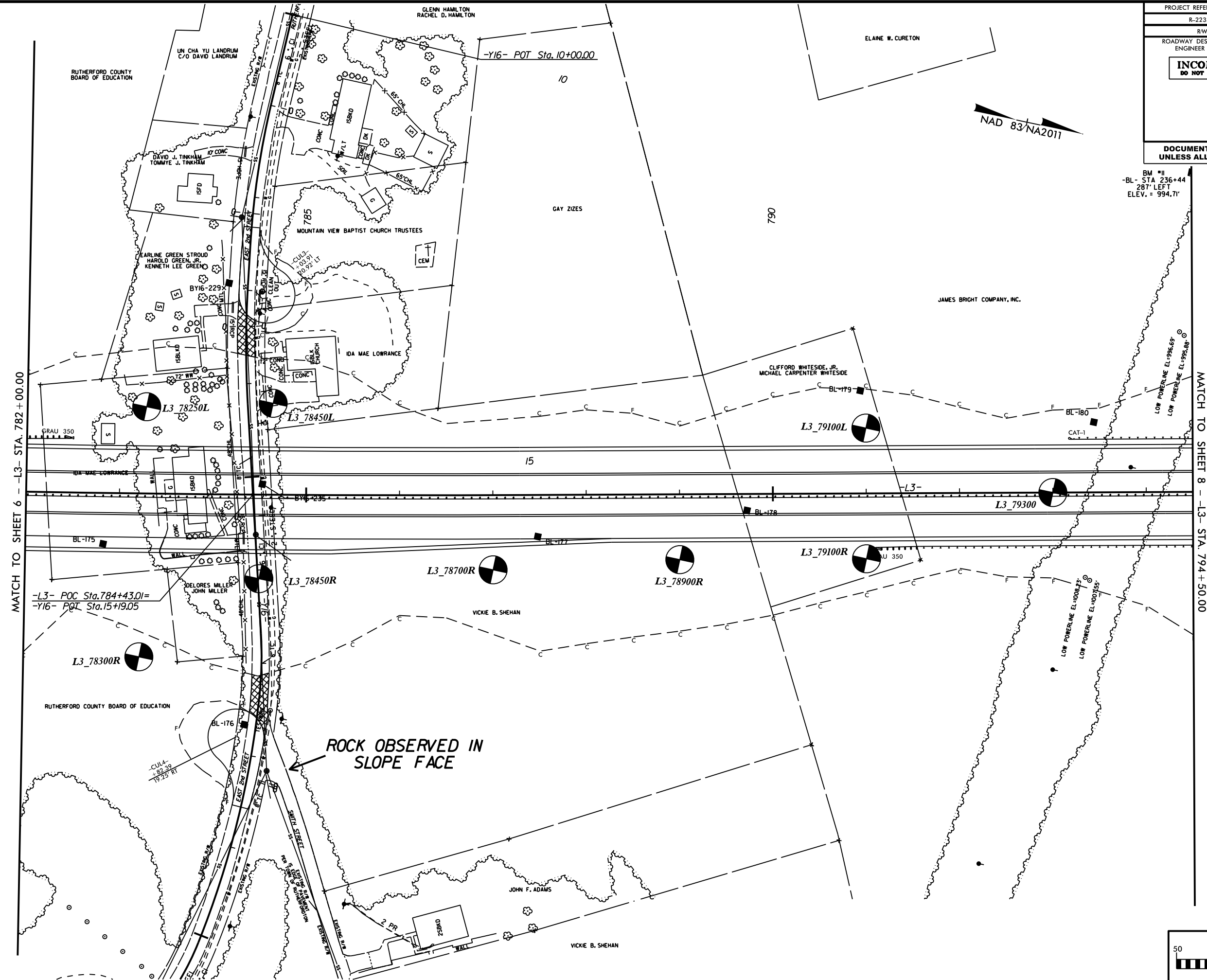


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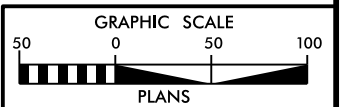
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LOW POWERLINE EL=995.88'

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MATCH TO SHEET 6 - L3- STA. 782+00.00

-L3- POC Sta. 784+43.01 =
-Y16- POT Sta. 15+19.05

ROCK OBSERVED IN SLOPE FACE

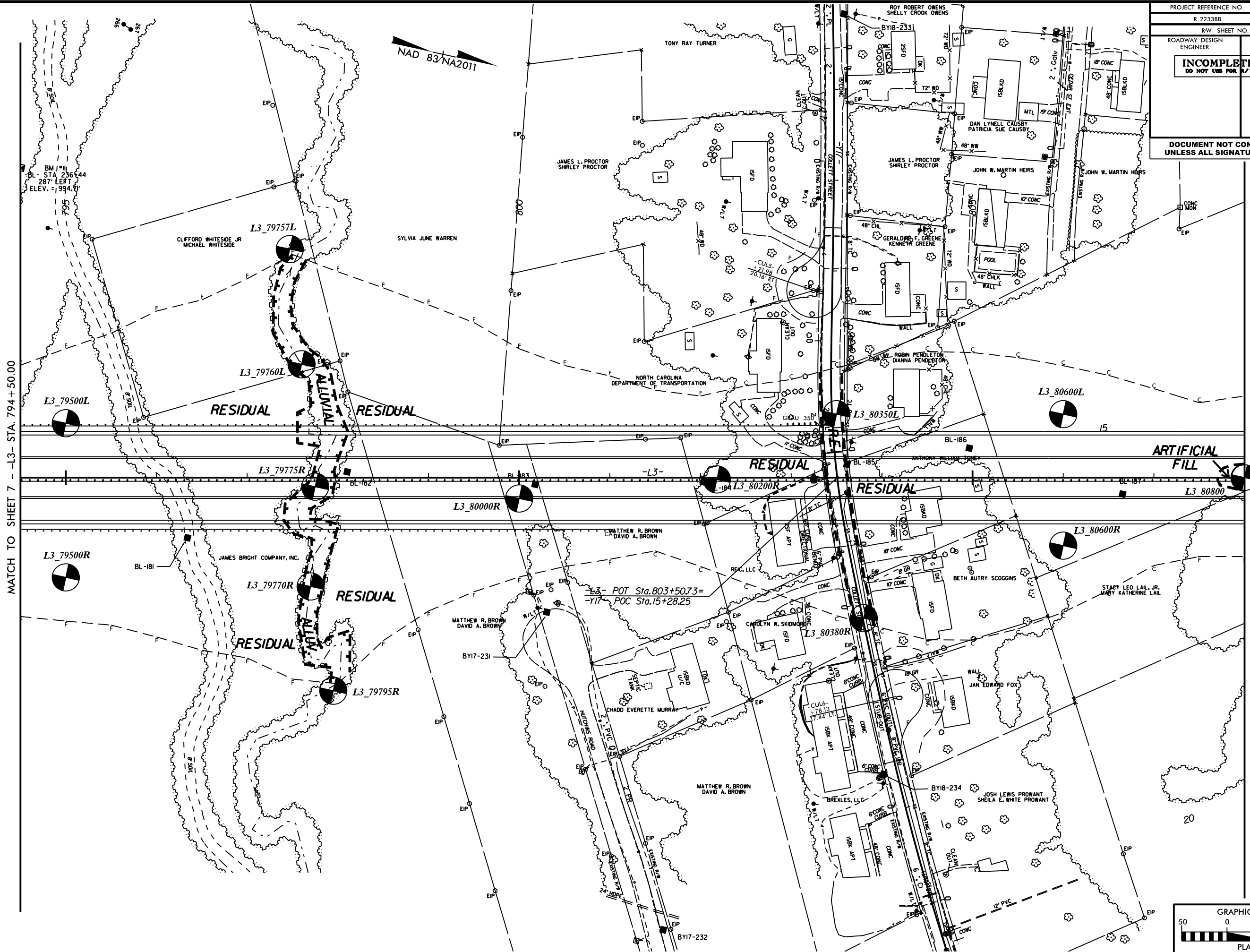


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223388 Rutherford County Board of Education
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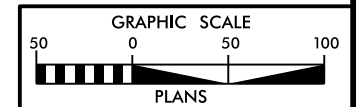
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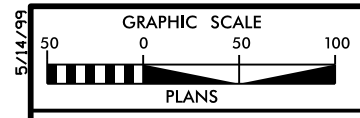
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MATCH TO SHEET 9 -- L3-- STA. 808+00.00

NAD 83/NA2011



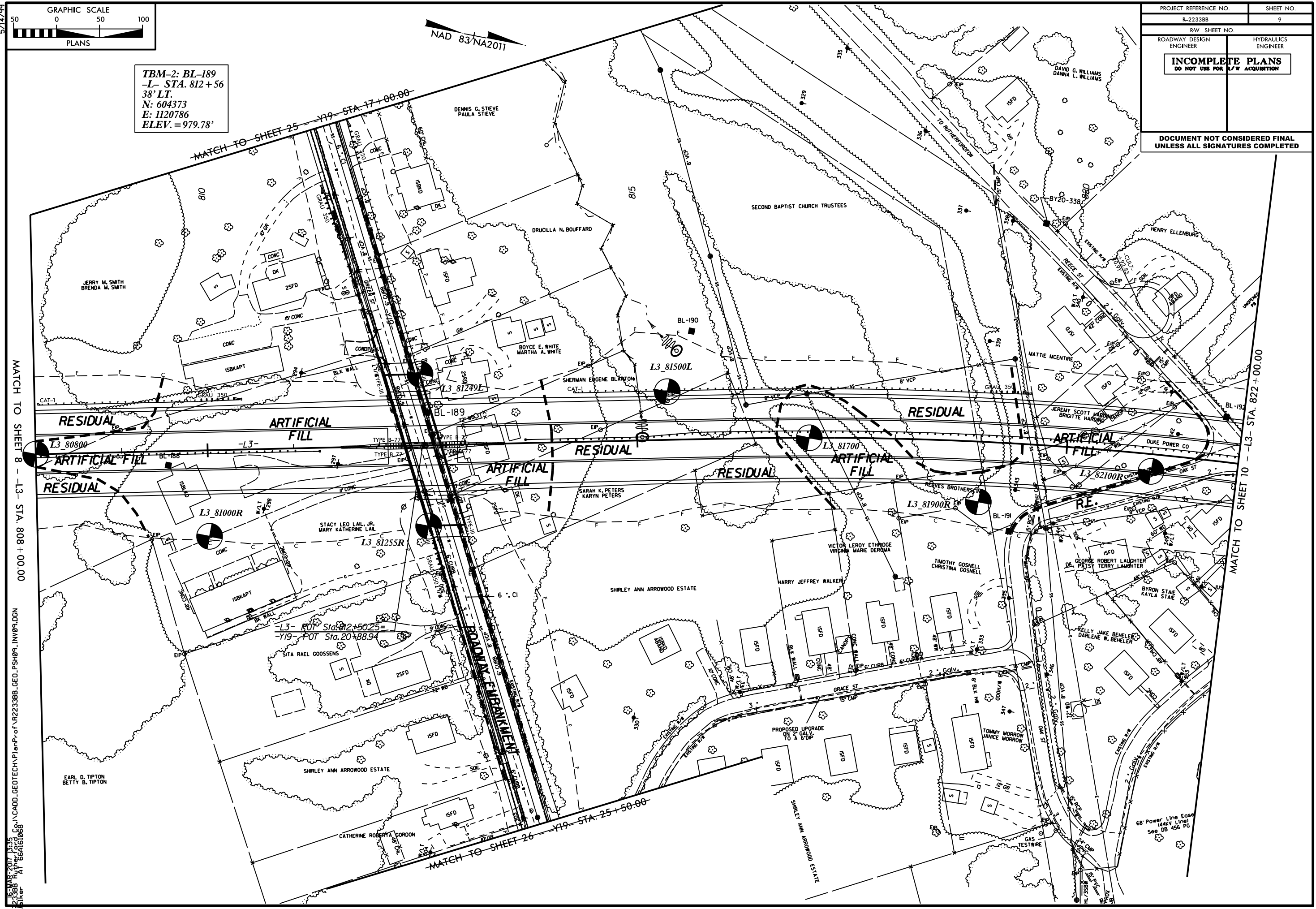
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 N: 604373
 E: 1120786
 ELEV. = 979.78'

NAD 83/NA2011

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 9
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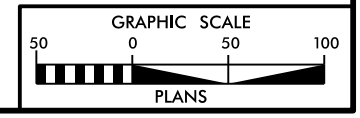
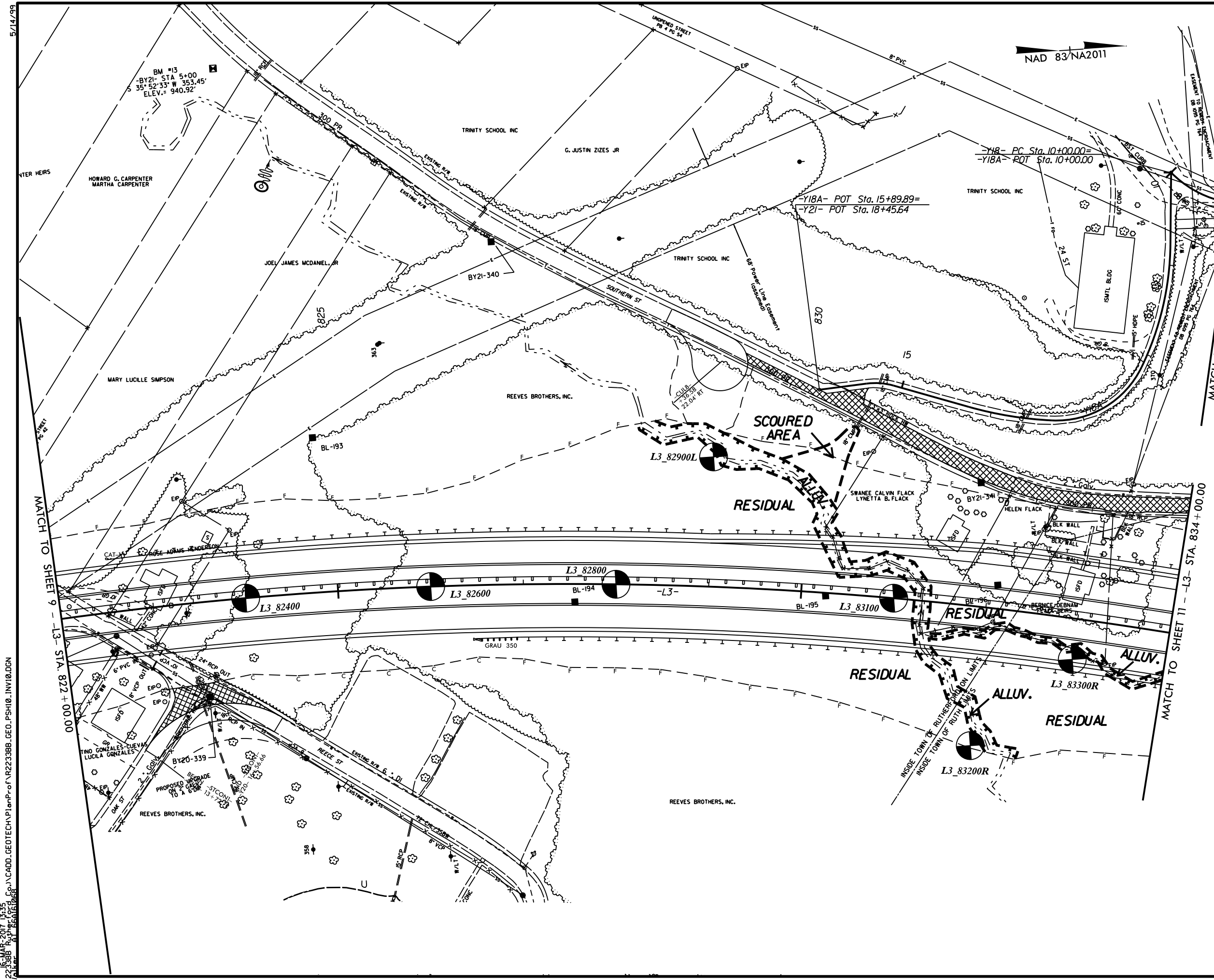
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 See DB 456 PG

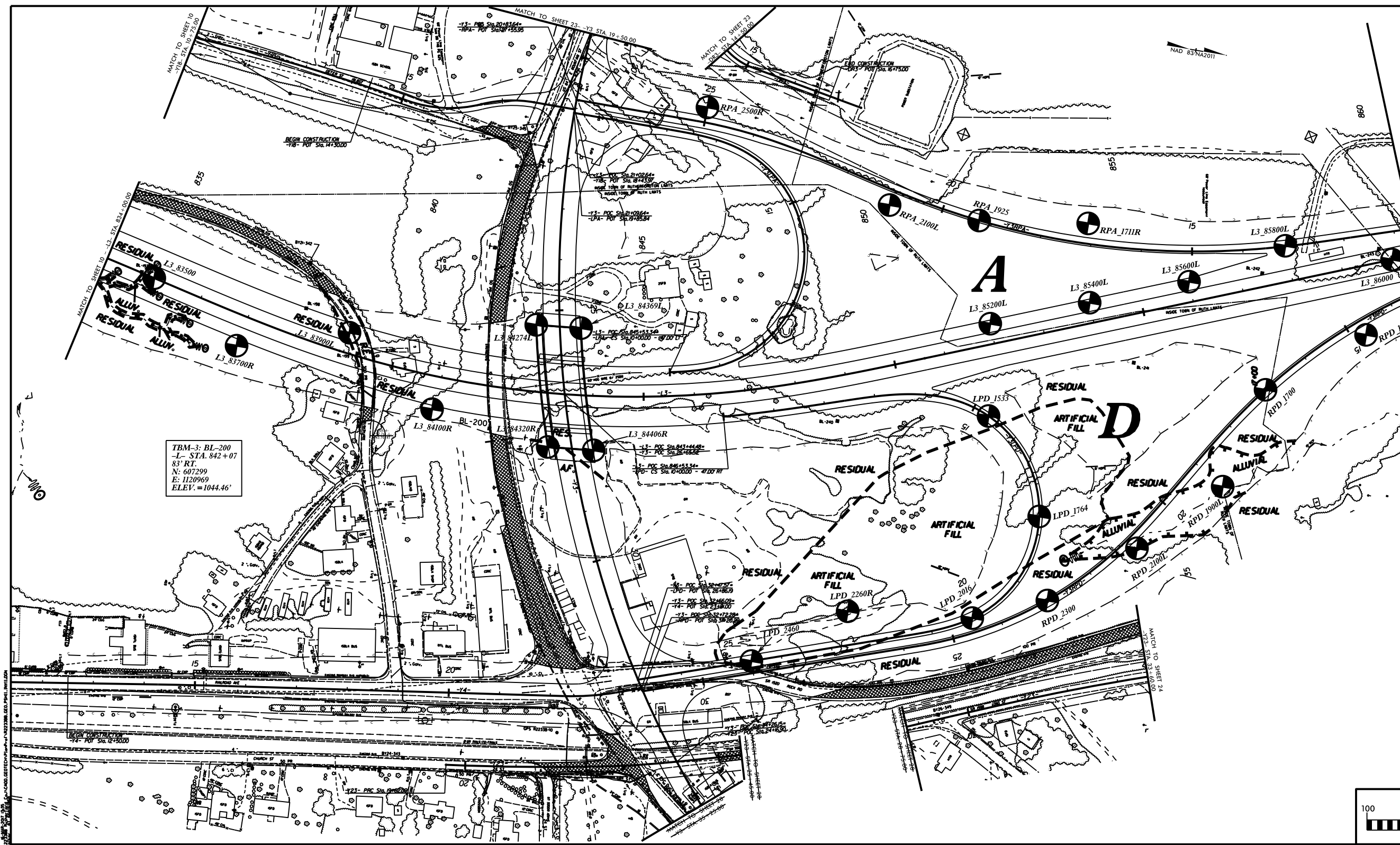
PROJECT REFERENCE NO. R-2233BB	SHEET NO. 10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

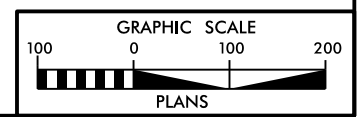


5/14/99
 15-MAR-2017 13:35
 2233BB_Rutherville\Projects\2233BB_GED_PSH10_INV19.DGN
 15-MAR-2017 13:35
 2233BB_Rutherville\Projects\2233BB_GED_PSH10_INV19.DGN

PROJECT REFERENCE NO.	SHEET NO.
R-2233BB	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS	
DO NOT USE FOR B/L/V ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



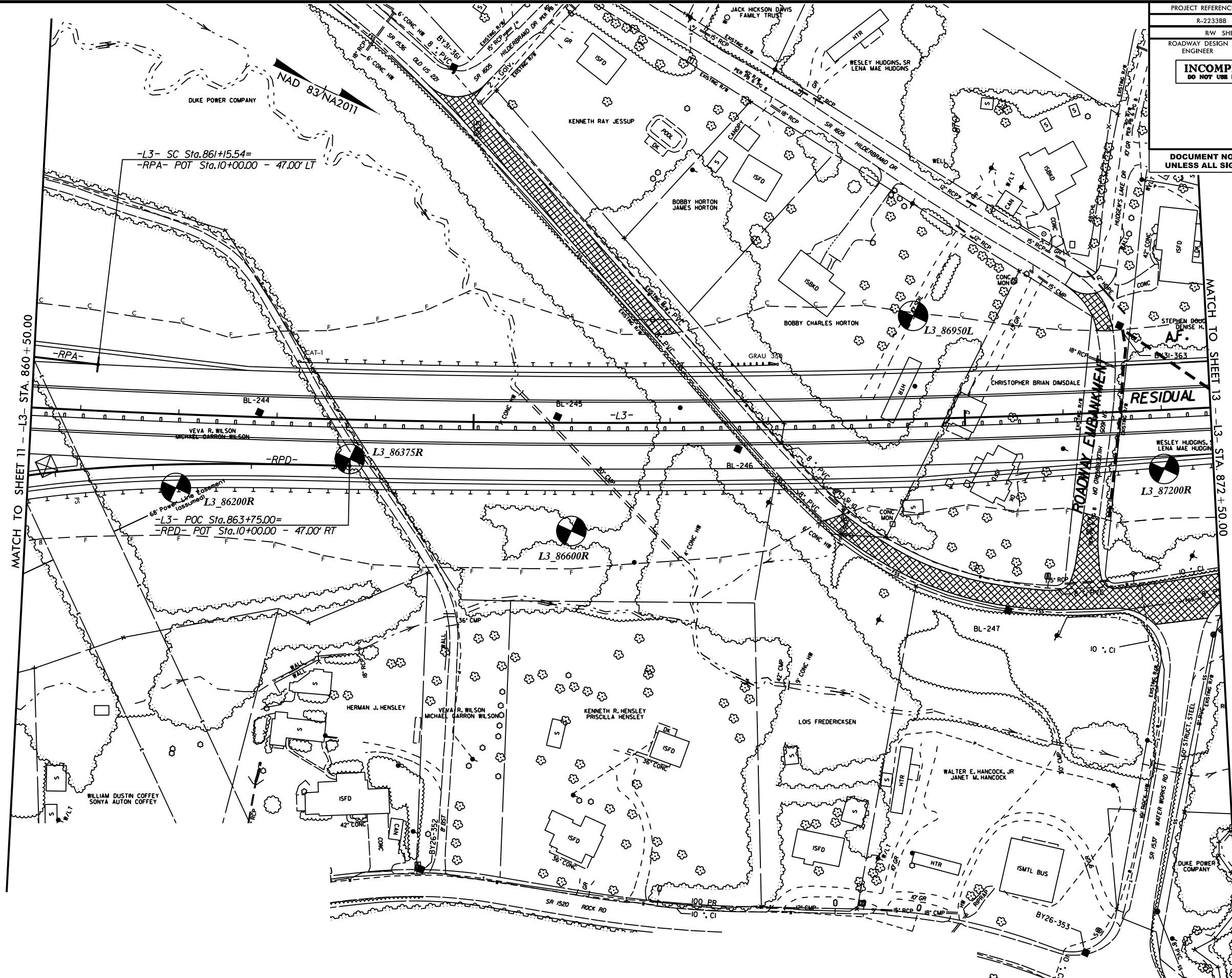
TBM-3: BL-200
 L- STA. 842+07
 83' RT.
 N: 607299
 E: 1120969
 ELEV. = 1044.46'



5/14/99

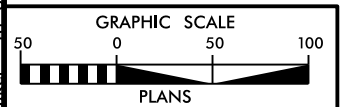
PROJECT REFERENCE NO. R-2233BB	SHEET NO. 12
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



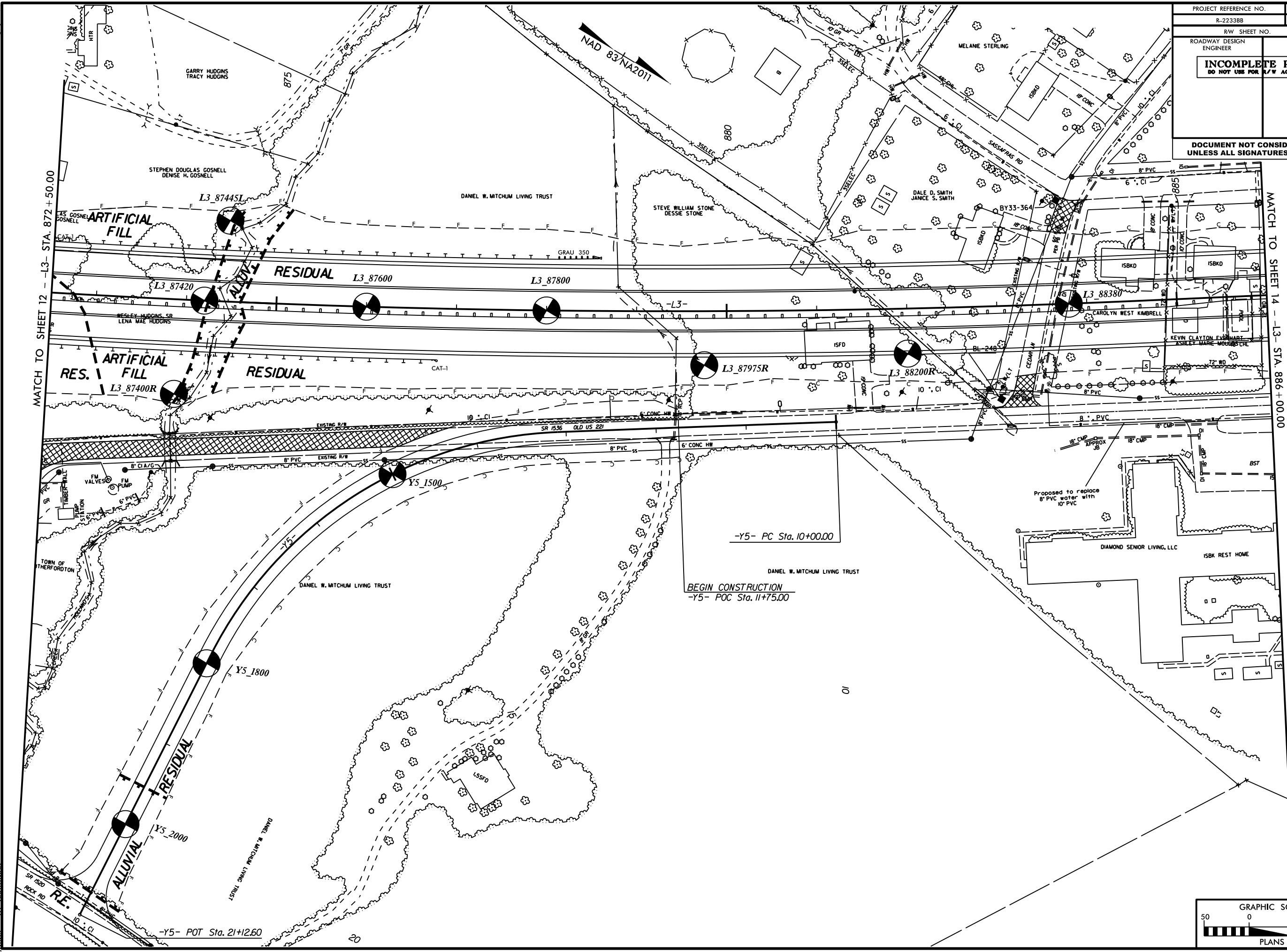
MATCH TO SHEET 11 - L3- STA. 860 + 50.00

MATCH TO SHEET 13 - L3- STA. 872 + 50.00



15-MAR-2017 13:35
 2233BB R-2233BB-Geo-CADD_GEDTECHPlanP-01\2233BB_GED_PSH12_INV12.DGN
 15-MAR-2017 13:35
 2233BB R-2233BB-Geo-CADD_GEDTECHPlanP-01\2233BB_GED_PSH12_INV12.DGN

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 13
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

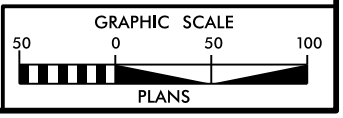


MATCH TO SHEET 12 - L3- STA. 872+50.00

MATCH TO SHEET 14 - L3- STA. 886+00.00

-Y5- PC Sta. 10+00.00
 DANEL W. MITCHUM LIVING TRUST
BEGIN CONSTRUCTION
 -Y5- POC Sta. 11+75.00

-Y5- POT Sta. 21+12.60

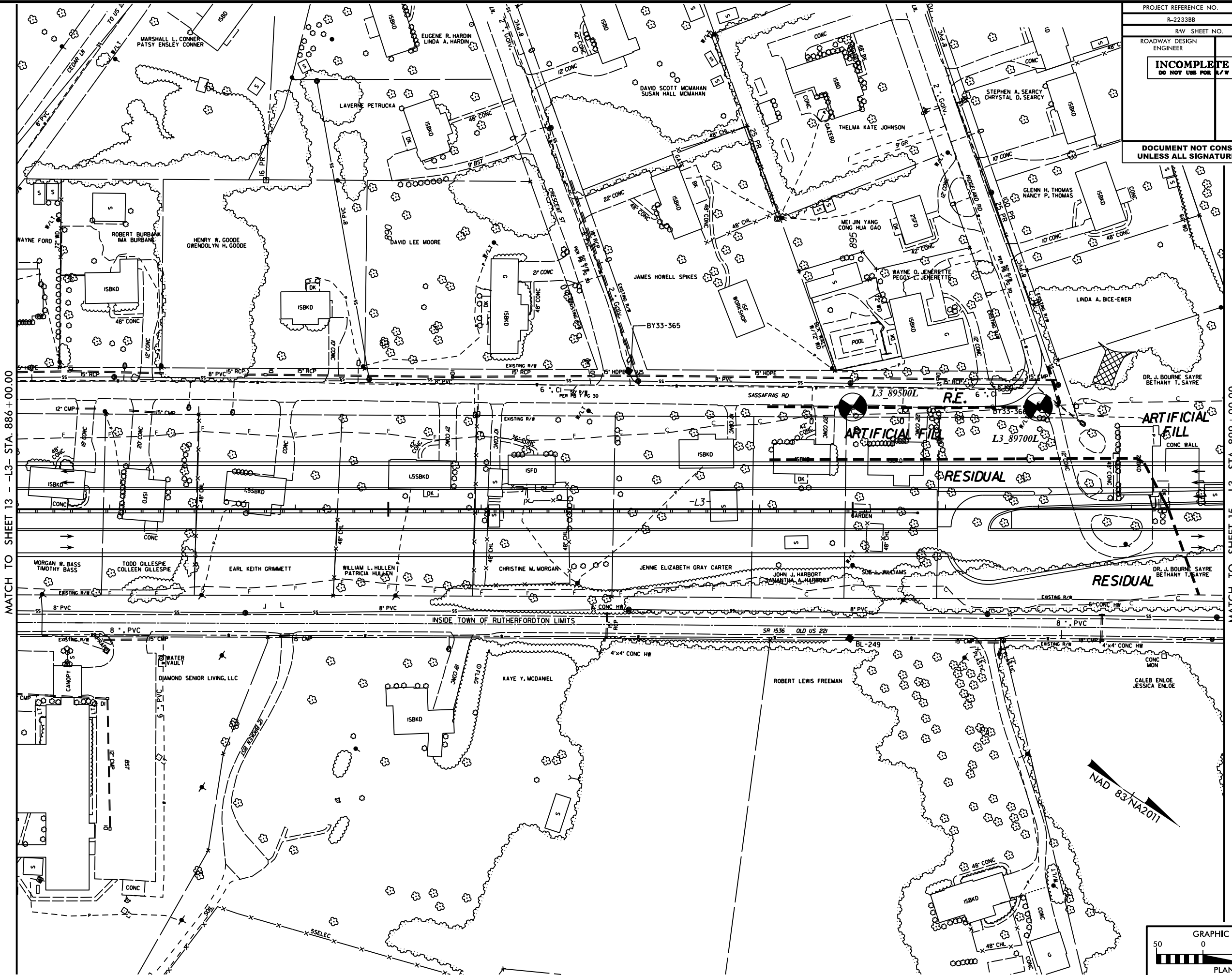


5/14/09
 15-MAR-2017 13:35
 2233BB_RoadPlan.dwg
 C:\Users\jgoff\OneDrive\Documents\2233BB\RoadPlan.dwg
 15-MAR-2017 13:35
 2233BB_RoadPlan.dwg
 C:\Users\jgoff\OneDrive\Documents\2233BB\RoadPlan.dwg

5/14/09

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 14
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

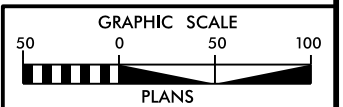
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



MATCH TO SHEET 13 - L3- STA. 886 + 00.00

MATCH TO SHEET 15 - L3- STA. 899 + 00.00

15-MAR-2017 13:35
2233BB Rutherford Co. CADD_GEDTECH\PlanPof\R2233BB_GED_PSH14_INV14.DGN
15-MAR-2017 13:35
2233BB Rutherford Co. CADD_GEDTECH\PlanPof\R2233BB_GED_PSH14_INV14.DGN

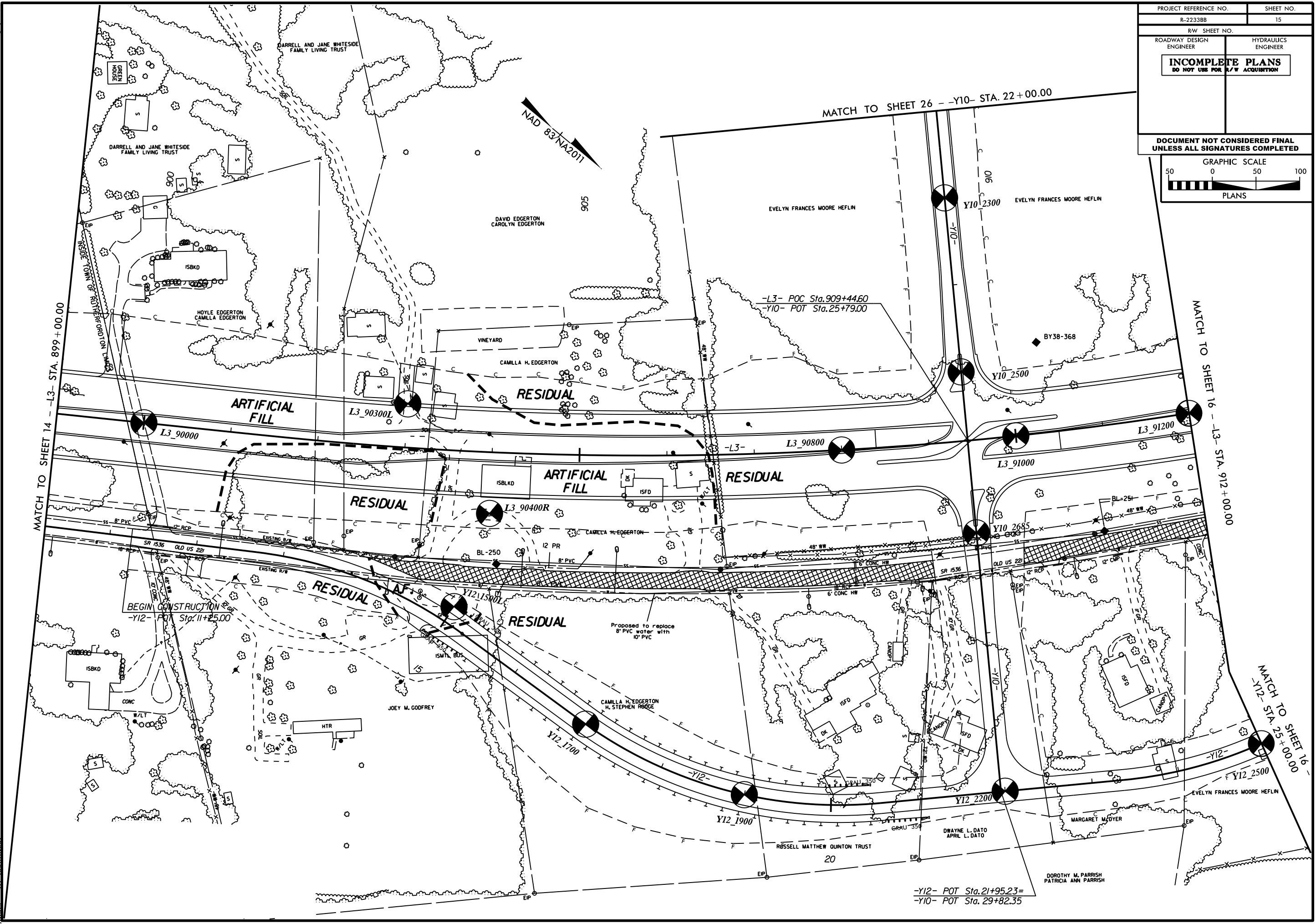


5/14/99

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

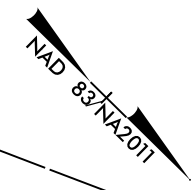
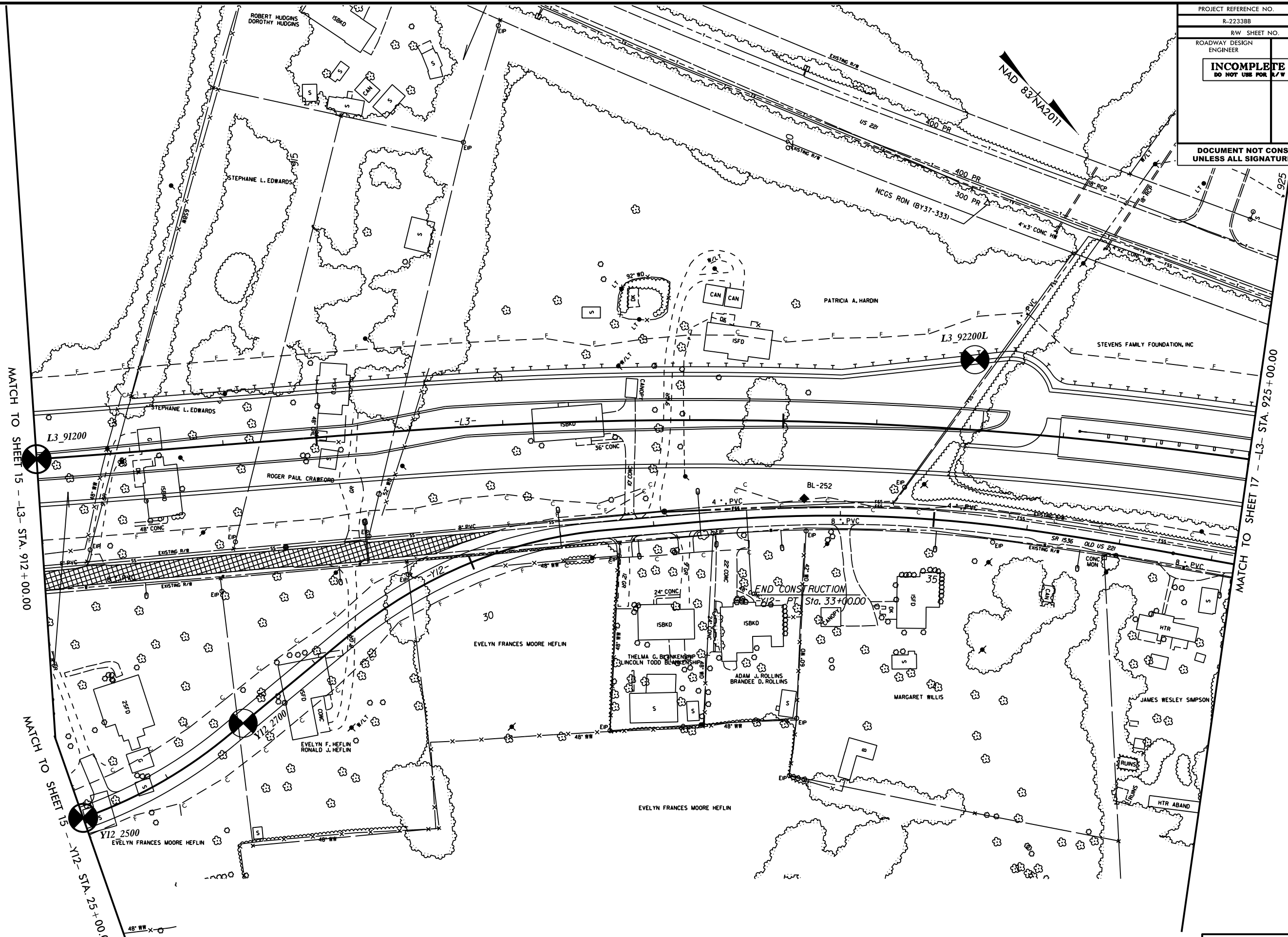
GRAPHIC SCALE
50 0 50 100
PLANS



15-MAR-2017 13:35
 2233BB R:\CADD_GEDTECH\Plan\2233BB_GED_PSH15_INV15.DGN
 5/14/99

-Y12- POT Sta. 21+95.23=
-Y10- POT Sta. 29+82.35

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 16
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

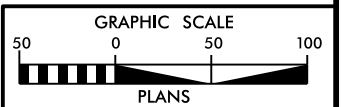


MATCH TO SHEET 15 --L3- STA. 912+00.00

MATCH TO SHEET 15 --Y12- STA. 25+00.00

MATCH TO SHEET 17 --L3- STA. 925+00.00

END CONSTRUCTION
Y12- PT Sta. 33+00.00

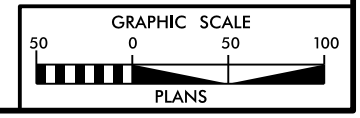
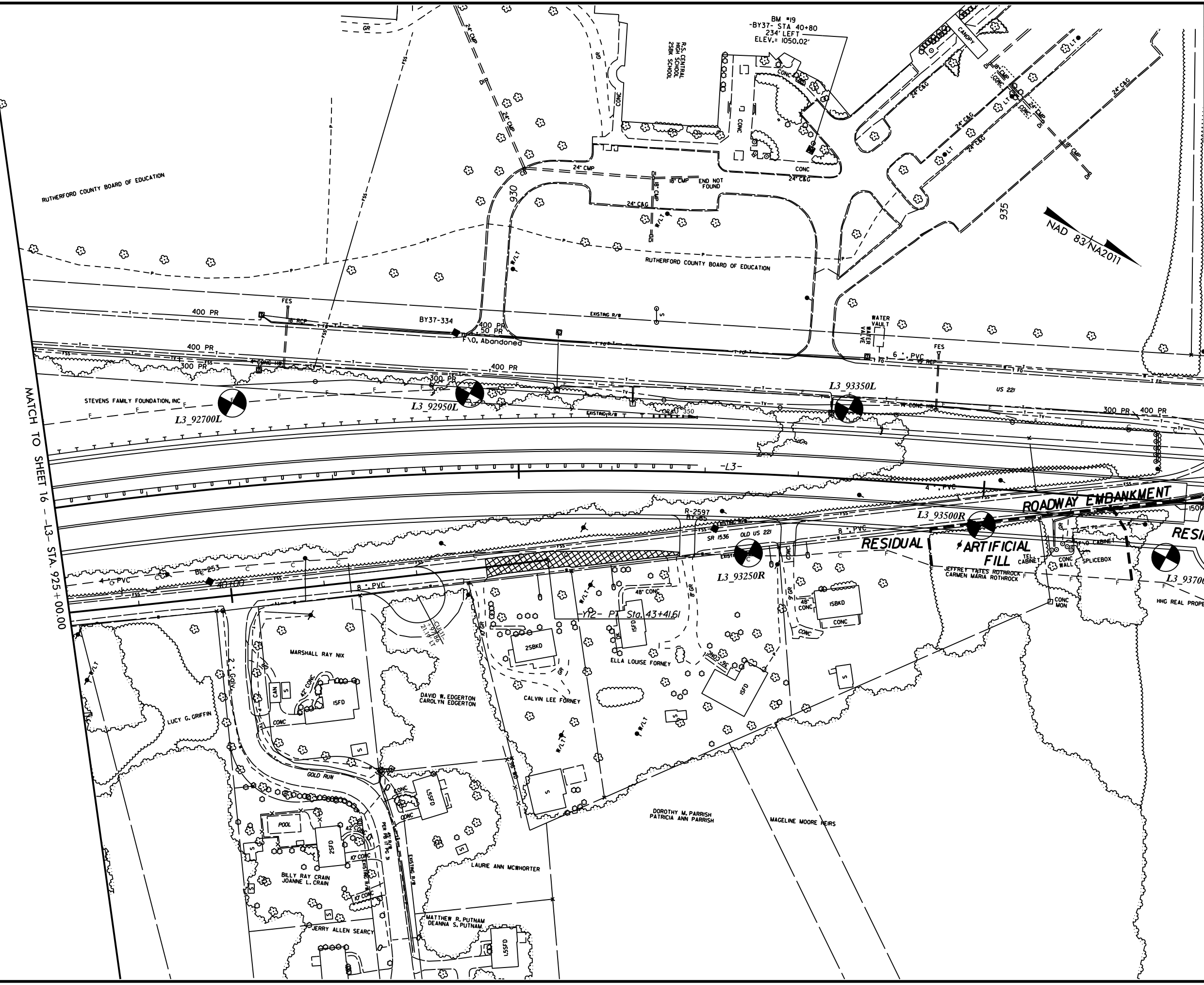


5/14/09
15-MAR-2017 13:35
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At 56416088

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 17
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

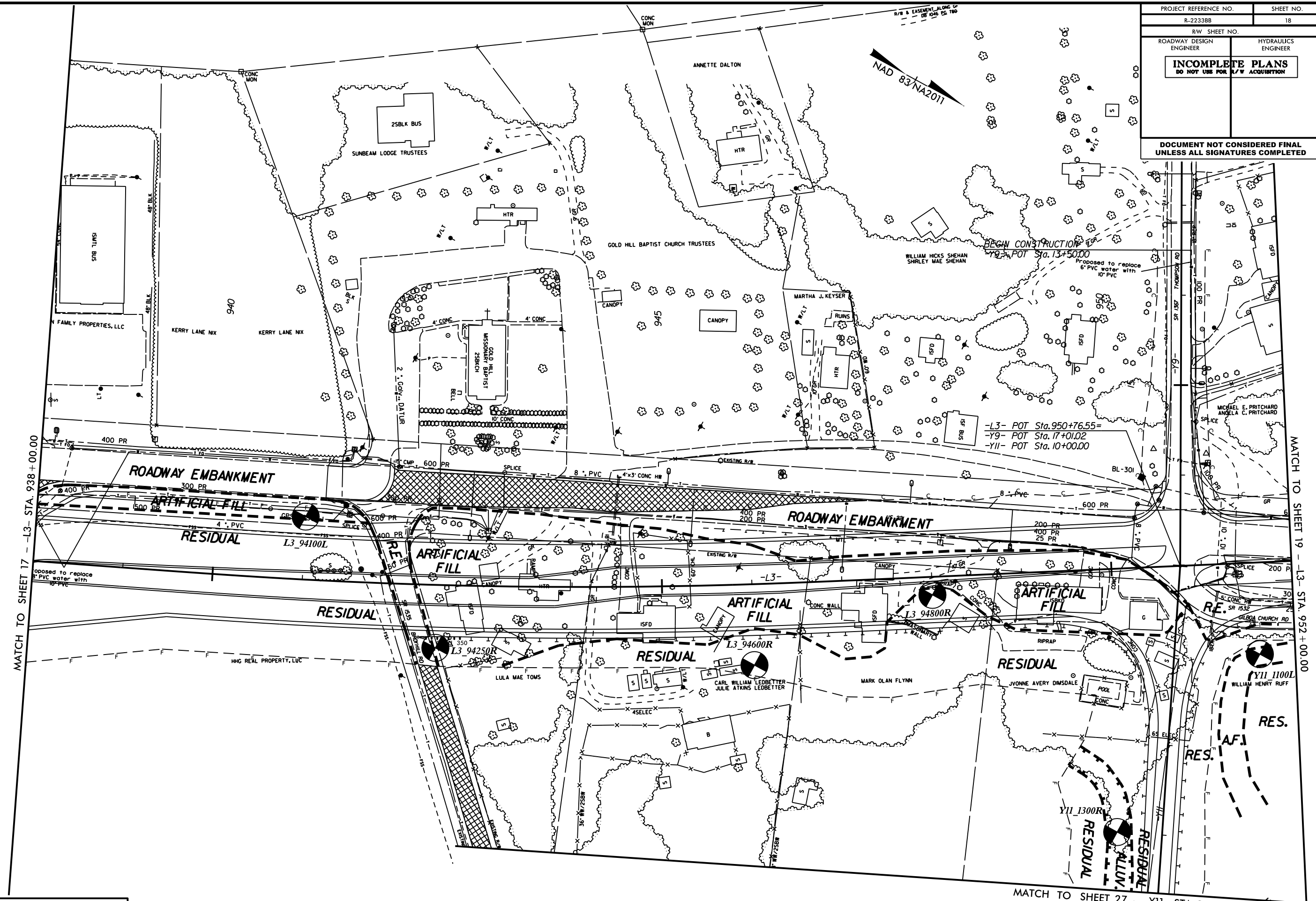
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

5/14/99
15-MAR-2017 13:35
2233BB Rutherford County, GA - CADD_GEDTECH\PlanPof\R2233BB_GED_PSH17_INV17.DGN
Author: J. B. B. 5/14/99



5/14/99

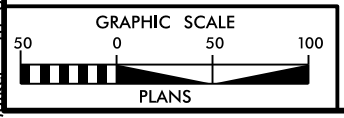
PROJECT REFERENCE NO.		SHEET NO.	
R-2233BB		18	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			



MATCH TO SHEET 17 --L3-- STA. 938+00.00

MATCH TO SHEET 19 --L3-- STA. 952+00.00

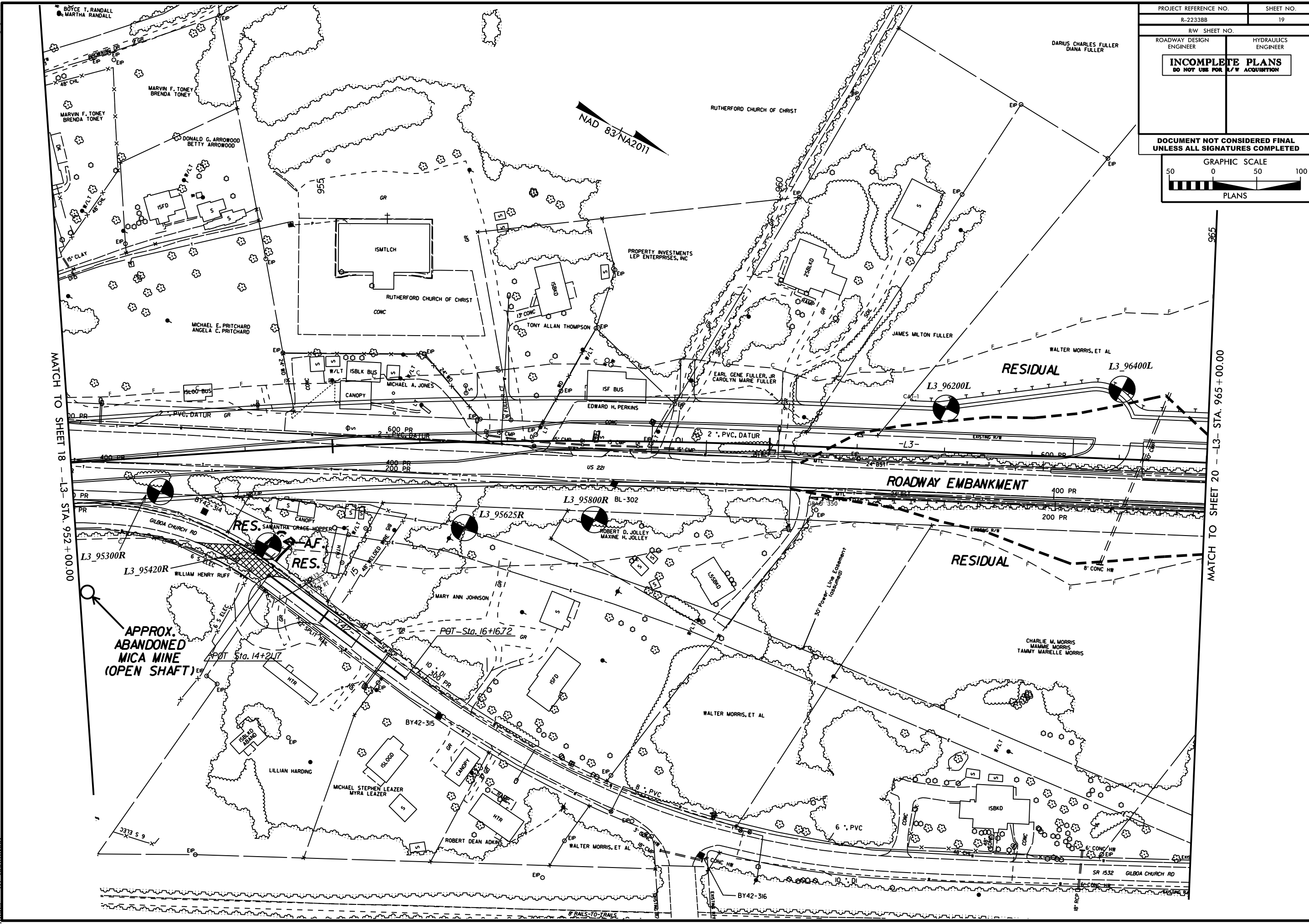
MATCH TO SHEET 27 --Y11-- STA. 13+65.00



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 2233BB RWD.Plot of R2233BB.GED_PSH18_INV18.DGN
 at 55:15:08

5/14/99

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 19
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	DO NOT USE FOR R/W ACQUISITION
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
GRAPHIC SCALE 50 0 50 100 PLANS	



MATCH TO SHEET 18 - L3- STA. 952+00.00

MATCH TO SHEET 20 - L3- STA. 965+00.00

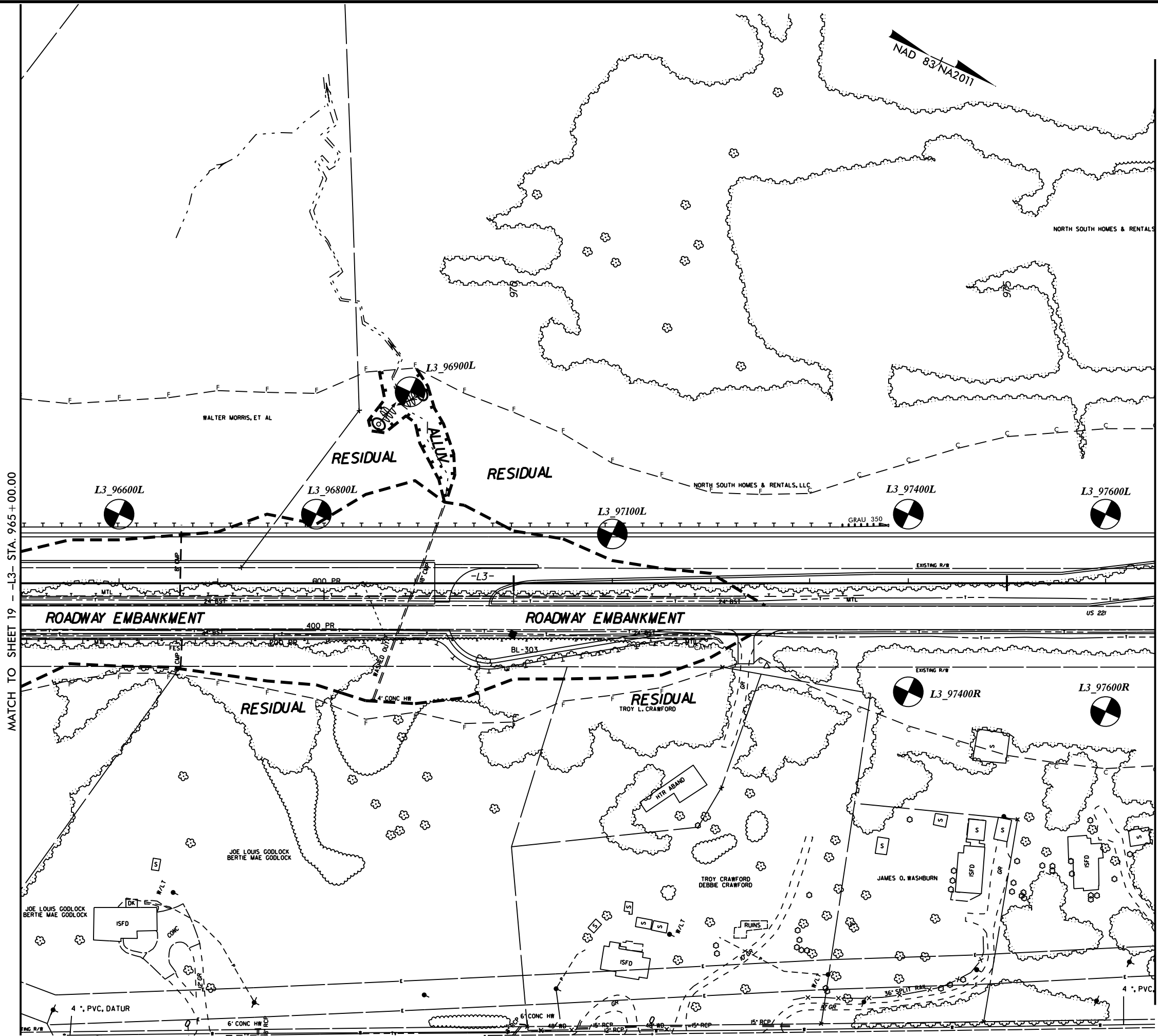
APPROX. ABANDONED MICA MINE (OPEN SHAFT)

15-MAR-2017 13:35
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15-MAR-2017 13:35
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5/14/99

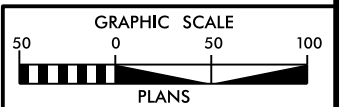
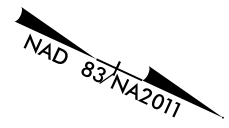
PROJECT REFERENCE NO. R-2233BB	SHEET NO. 20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



MATCH TO SHEET 19 -- L3-- STA. 965+00.00

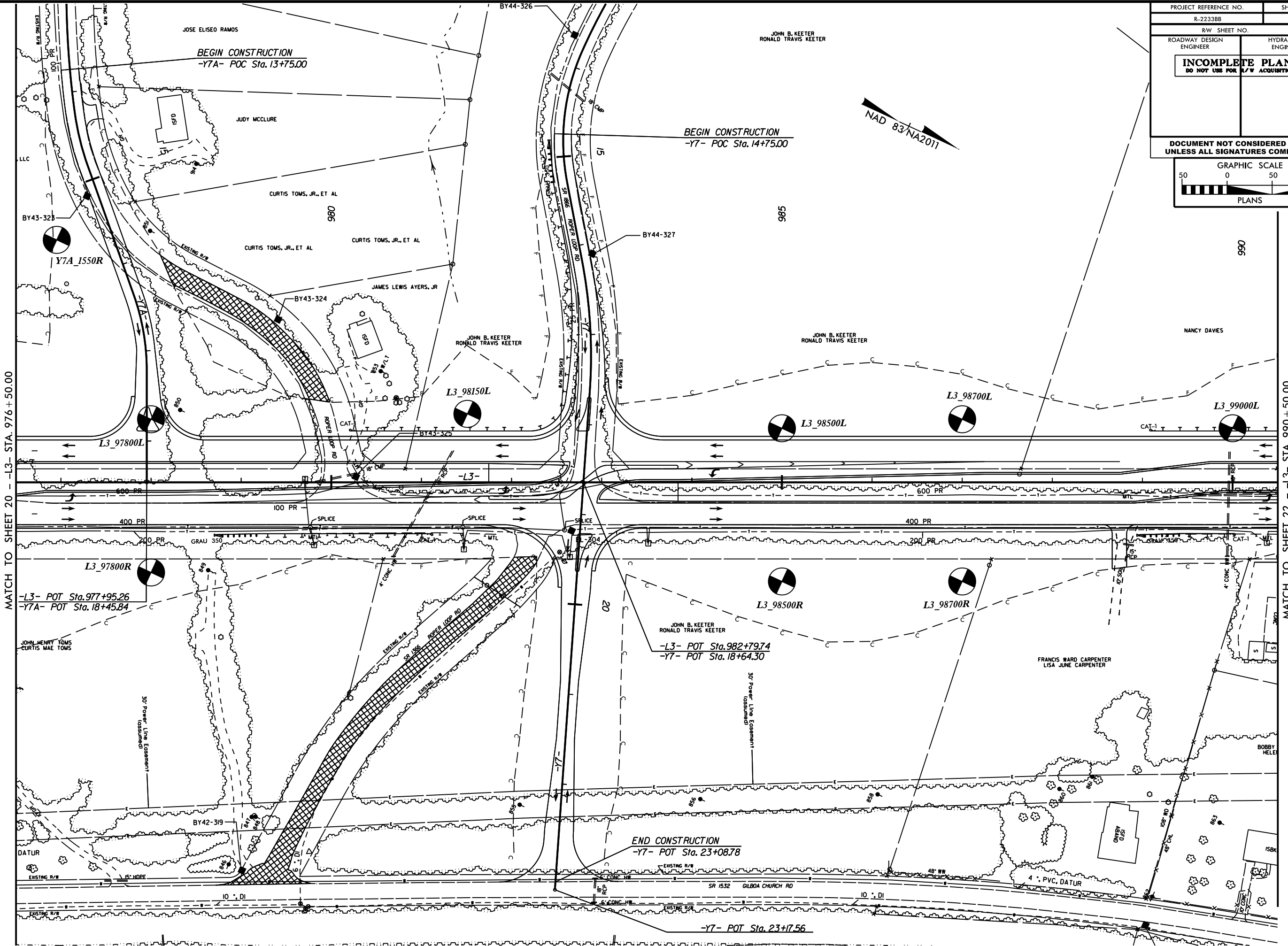
MATCH TO SHEET 21 -- L3-- STA. 976+50.00



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 5/14/99

5/14/99

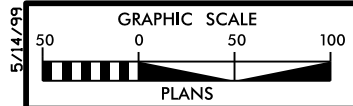
PROJECT REFERENCE NO. R-2233BB	SHEET NO. 21
R/W SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
GRAPHIC SCALE 50 0 50 100 PLANS	



MATCH TO SHEET 20 - L3- STA. 976+50.00

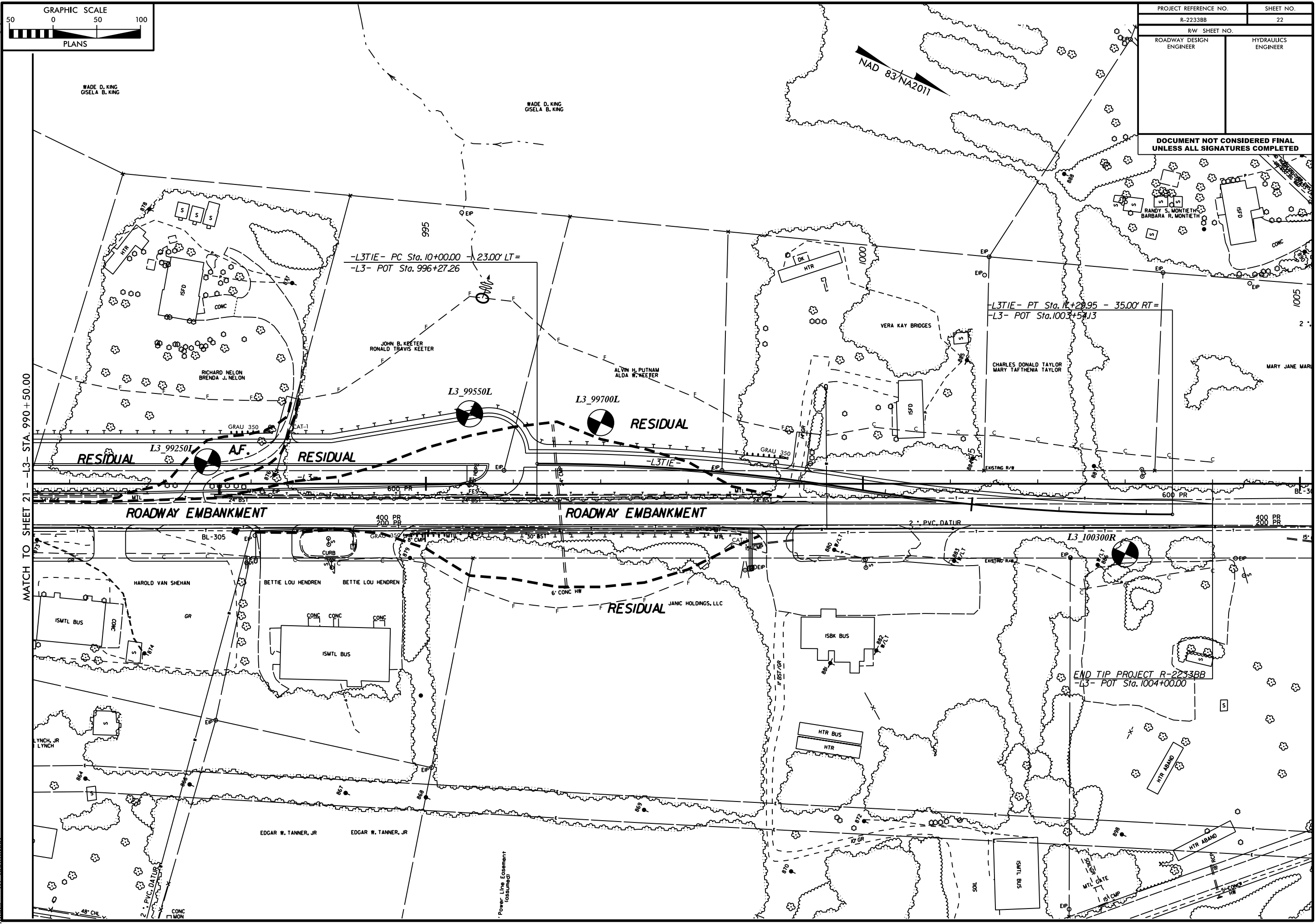
MATCH TO SHEET 22 - L3- STA. 990+50.00

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5/14/99



PROJECT REFERENCE NO. R-2233BB	SHEET NO. 22
ROADWAY DESIGN ENGINEER RANDY S. MONTETH BARBARA R. MONTETH	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

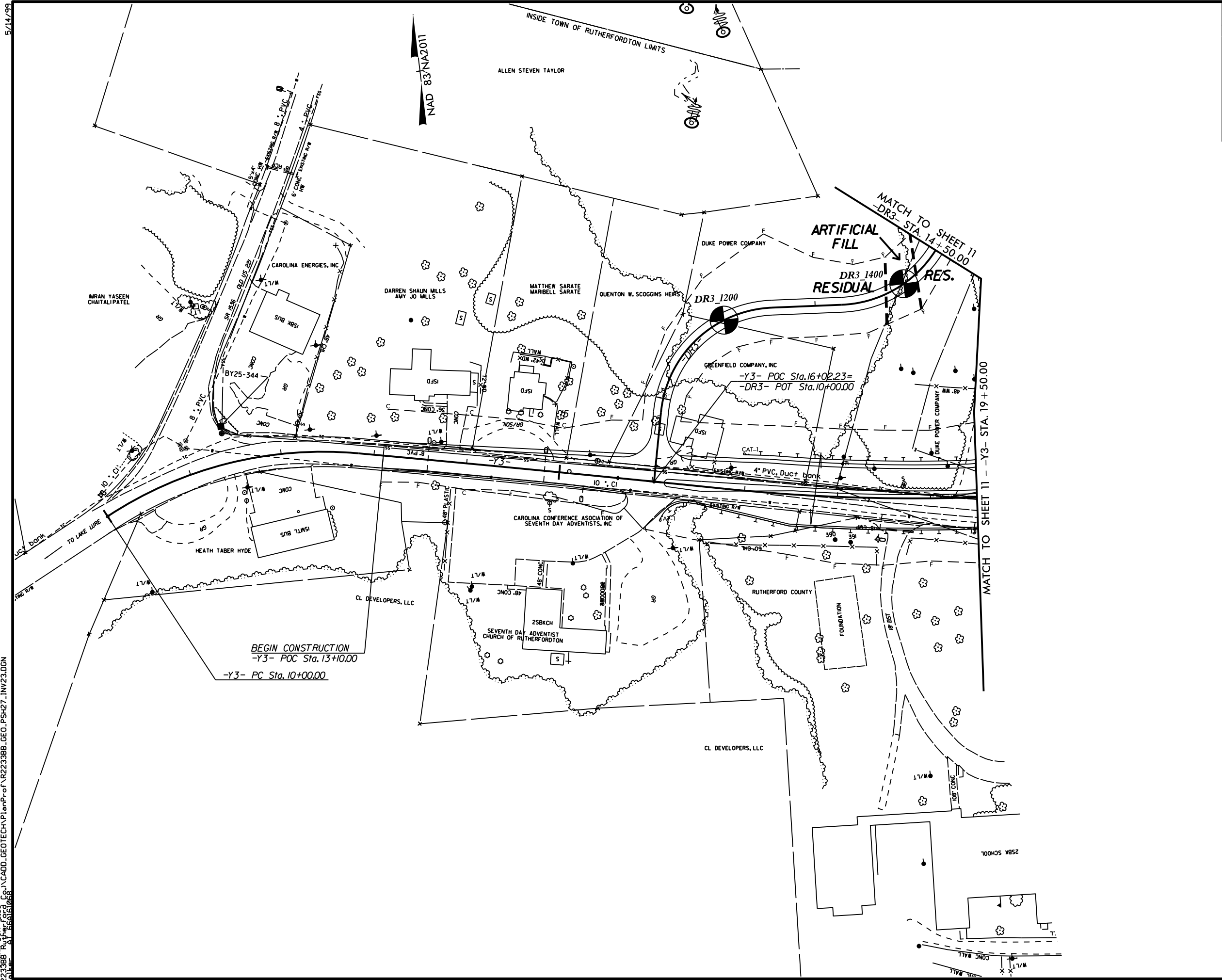


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 User: rsm
 Plot: 156161088

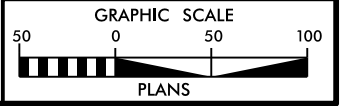
5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-2233BB	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

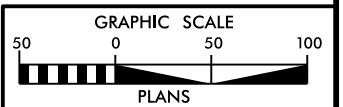
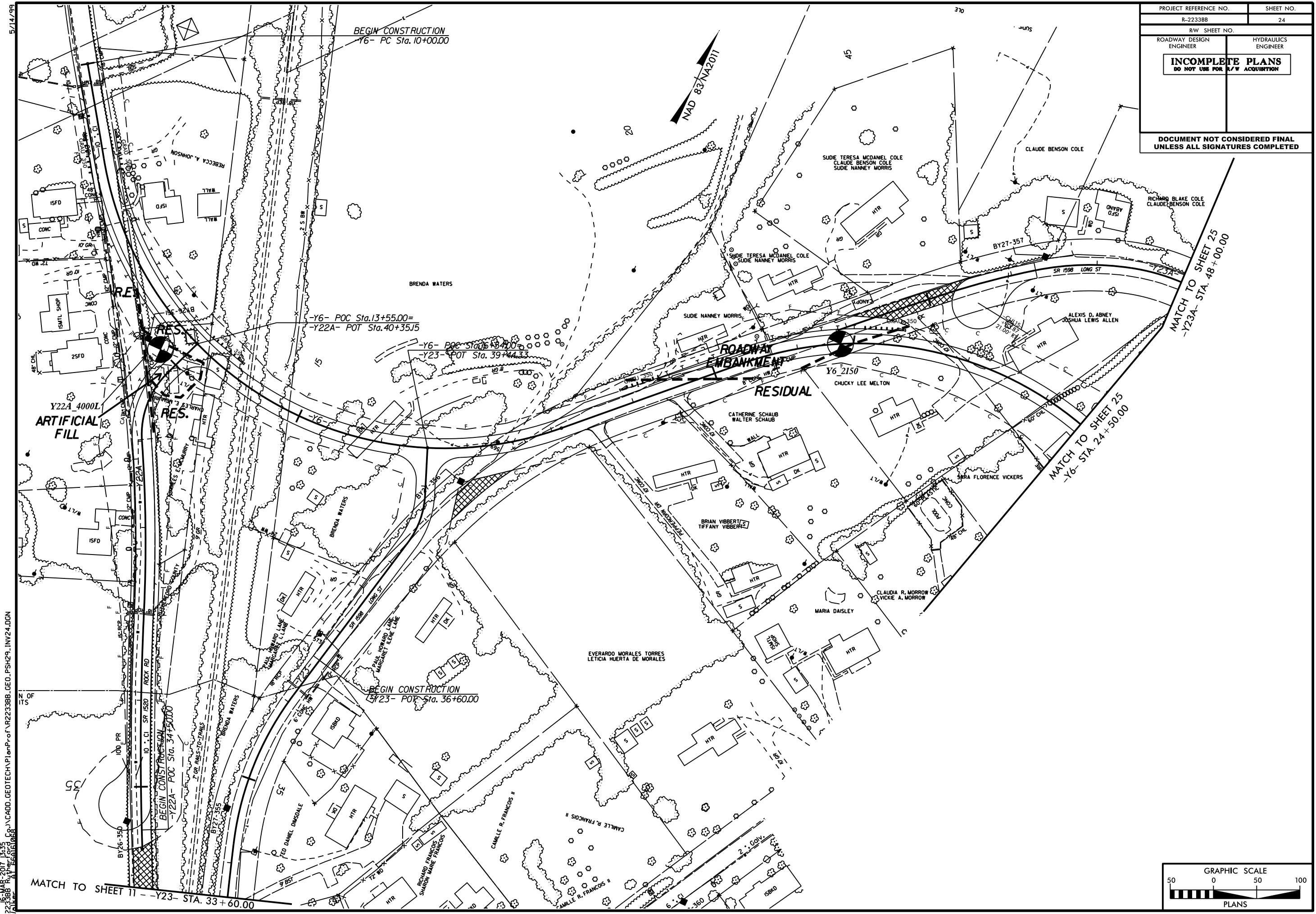


15-MAR-2017 13:35
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223388 R:\Projects\223388\223388.dwg



PROJECT REFERENCE NO. R-2233BB	SHEET NO. 24
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



15-MAR-2017 13:35
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 15-MAR-2017 13:35

5/14/09

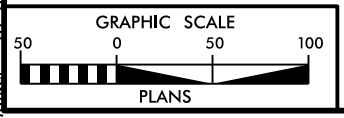
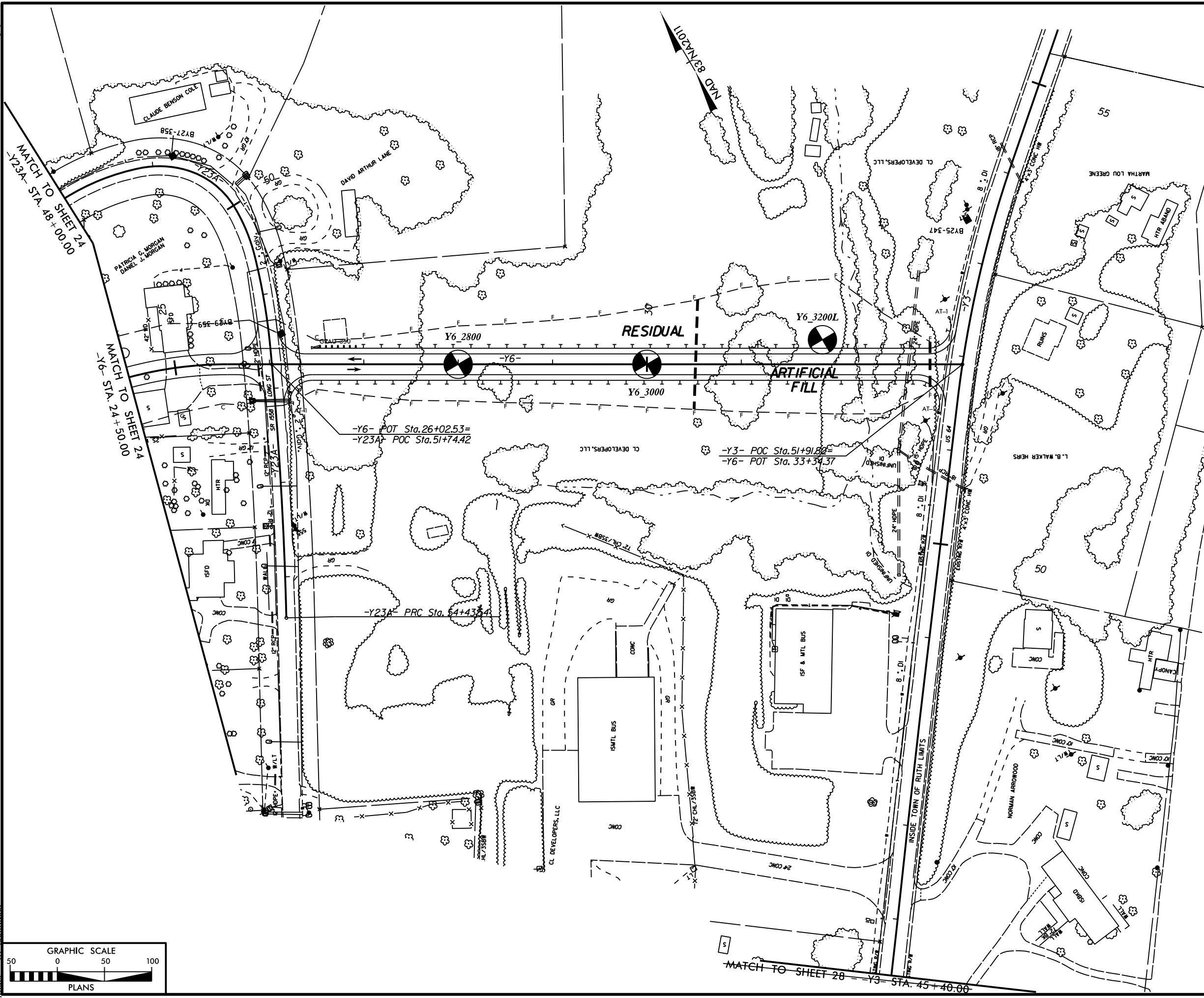
PROJECT REFERENCE NO. R-2233BB	SHEET NO. 25
R/W SHEET NO. ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

WILLIAM B. STEFFE
HANNAH TILLOTSON
Pg 5 Pg 9
Pg 6 Pg 74

SEE SHEET 76 FOR -Y6- PROFILE
SEE SHEETS 2- THRU 2- FOR DRAINAGE DETAILS

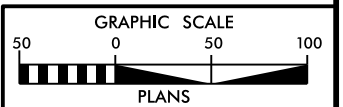
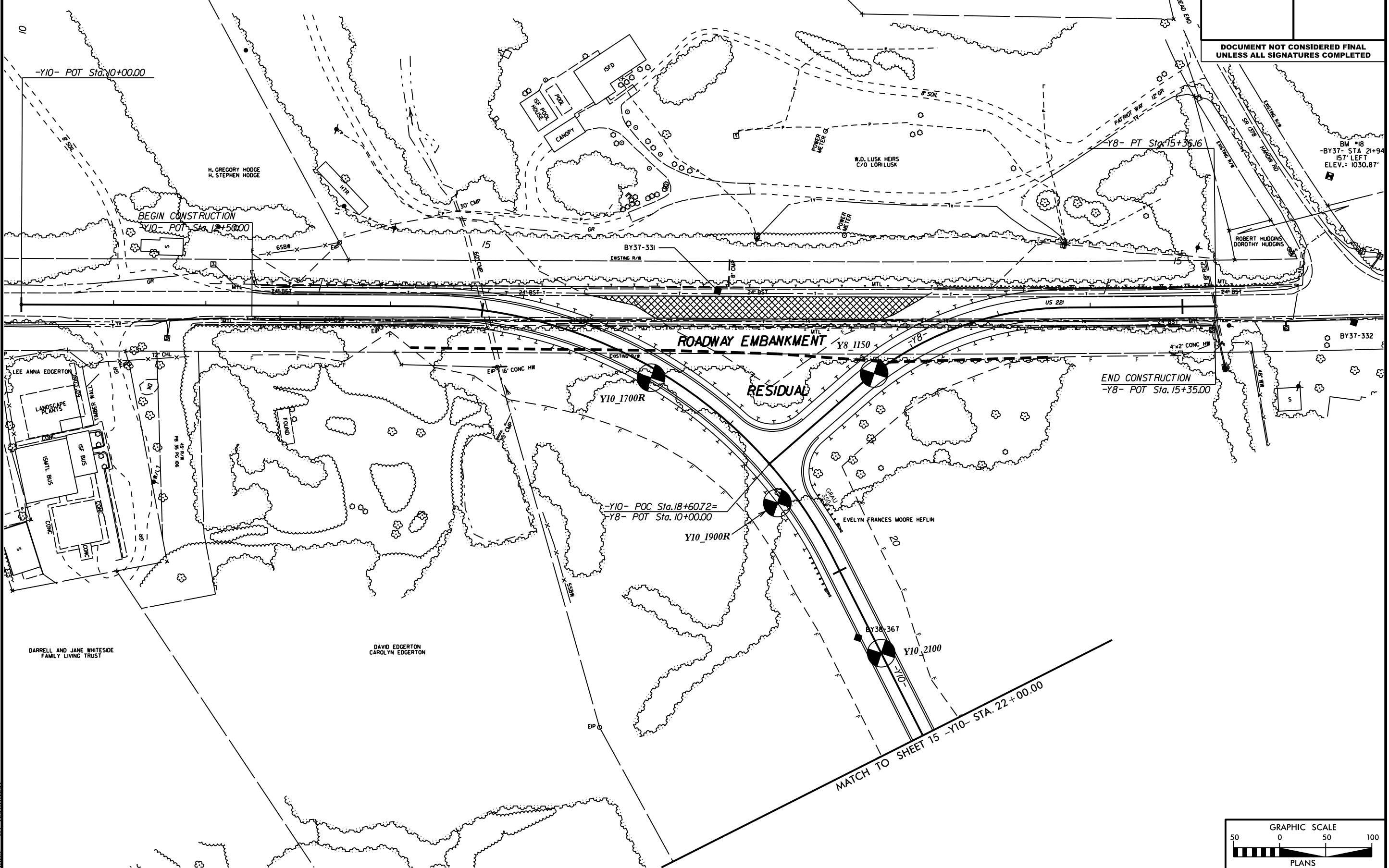
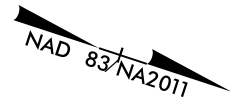
5/14/09
15-MAR-2017 13:35
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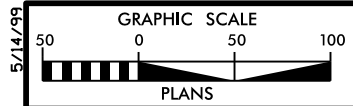
5/14/99

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

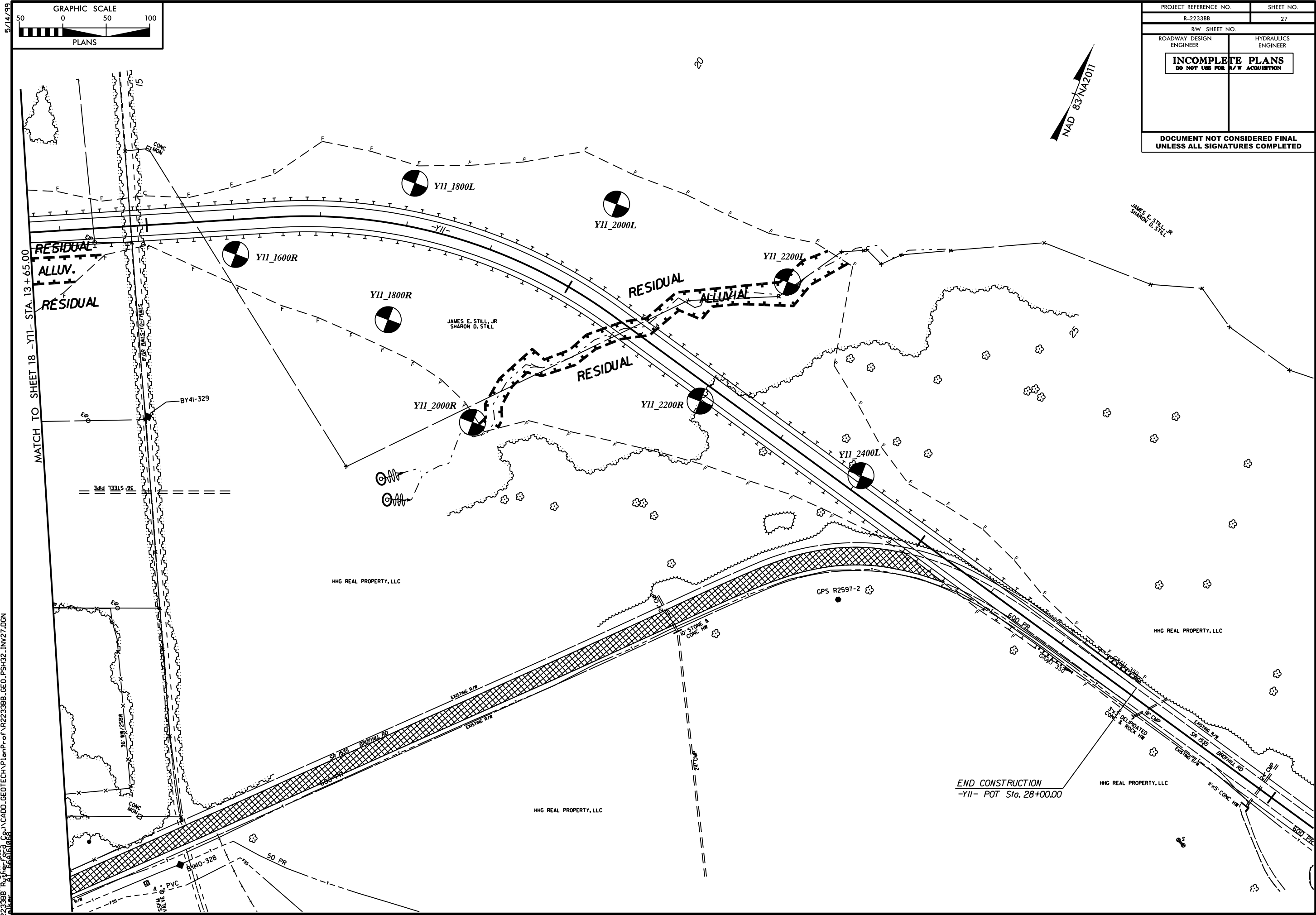


15-MAR-2017 13:35
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 5/14/99



PROJECT REFERENCE NO. R-2233BB	SHEET NO. 27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

NAD 83/NAZ011



MATCH TO SHEET 18 -YII- STA. 13 + 65.00

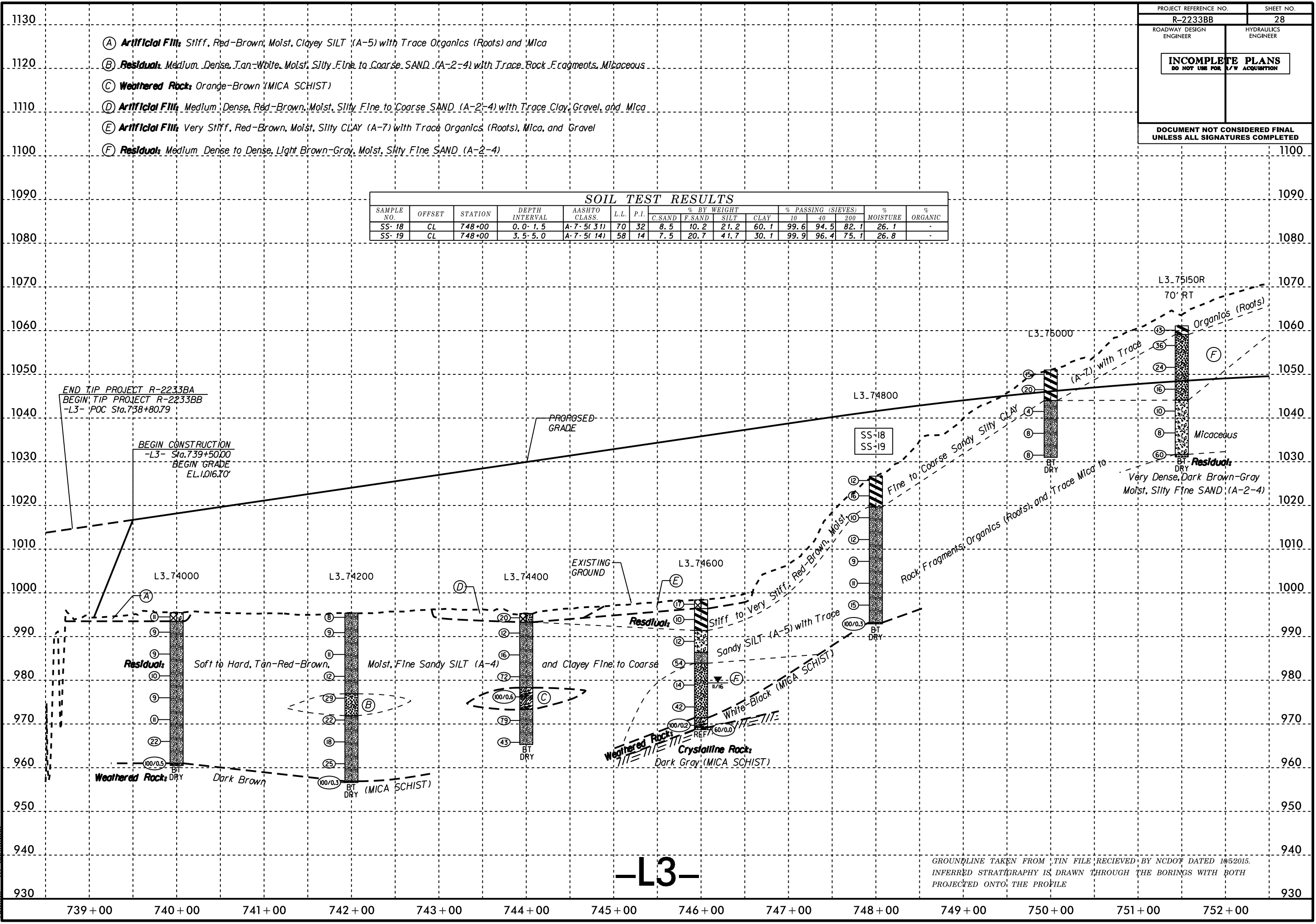
END CONSTRUCTION
-YII- POT Sta. 28+00.00

15-MAR-2017 13:35
223388 R:\proj\223388\cadd\geotech\plan\Pr of R223388_GEO_PSH32_INV27.DGN
Author: J. S. B. 156161088

- (A) Artificial Fill: Stiff, Red-Brown, Moist, Clayey SILT (A-5) with Trace Organics (Roots) and Mica
- (B) Residual: Medium Dense, Tan-White, Moist, Silty Fine to Coarse SAND (A-2-4) with Trace Rock Fragments, Micaceous
- (C) Weathered Rock: Orange-Brown (MICA SCHIST)
- (D) Artificial Fill: Medium Dense, Red-Brown, Moist, Silty Fine to Coarse SAND (A-2-4) with Trace Clay, Gravel, and Mica
- (E) Artificial Fill: Very Stiff, Red-Brown, Moist, Silty CLAY (A-7) with Trace Organics (Roots), Mica, and Gravel
- (F) Residual: Medium Dense to Dense, Light Brown-Gray, Moist, Silty Fine SAND (A-2-4)

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-18	CL	748+00	0.0-1.5	A-7-5(31)	70	32	8.5	10.2	21.2	60.1	99.6	94.5	82.1	26.1	-
SS-19	CL	748+00	3.5-5.0	A-7-5(14)	58	14	7.5	20.7	41.7	30.1	99.9	96.4	75.1	26.8	-

5/14/99
 16-MAR-2017 13:18
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 Walker - 616581068



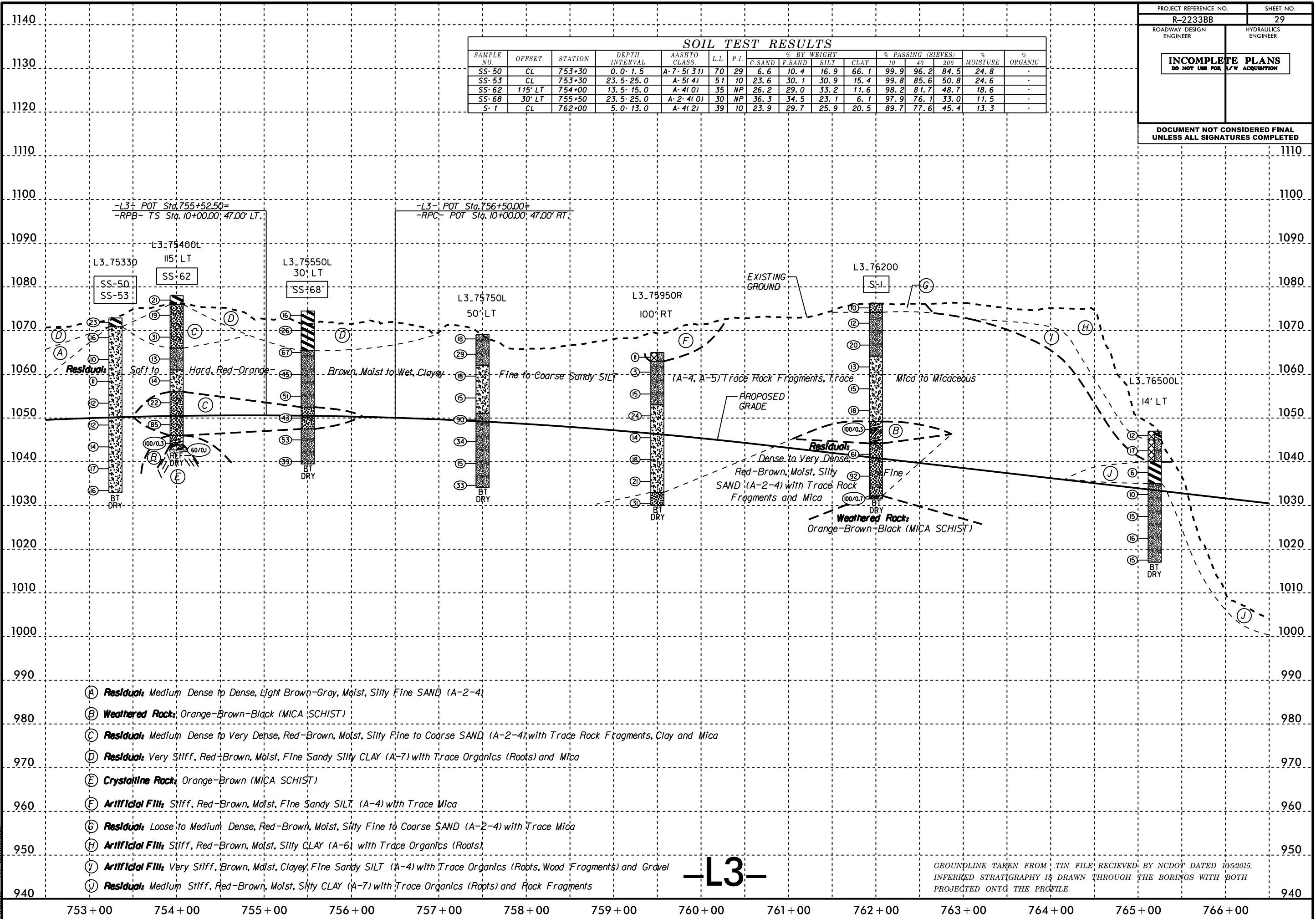
-L3-

GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY NCDOT DATED 10/5/2015.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE PROFILE

5/14/99

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-50	CL	753+30	0.0-1.5	A-7-5(31)	70	29	6.6	10.4	16.9	66.1	99.9	96.2	84.5	24.8	-
SS-53	CL	753+30	23.5-25.0	A-5(4)	51	10	23.6	30.1	30.9	15.4	99.8	85.6	50.8	24.6	-
SS-62	115' LT	754+00	13.5-15.0	A-4(0)	35	NP	26.2	29.0	33.2	11.6	98.2	81.7	48.7	18.6	-
SS-68	30' LT	755+50	23.5-25.0	A-2-4(0)	30	NP	36.3	34.5	23.1	6.1	97.9	76.1	33.0	11.5	-
S-1	CL	762+00	5.0-13.0	A-4(2)	39	10	23.9	29.7	25.9	20.5	89.7	77.6	45.4	13.3	-

16-MAR-2017 13:18 J:\Projects\661066\0203 INCDOT-R-2233BB Rutherford Co.\CAD\GEO\TECH\Plan\Profile\2233BB_GEO_pf1.L3.dgn



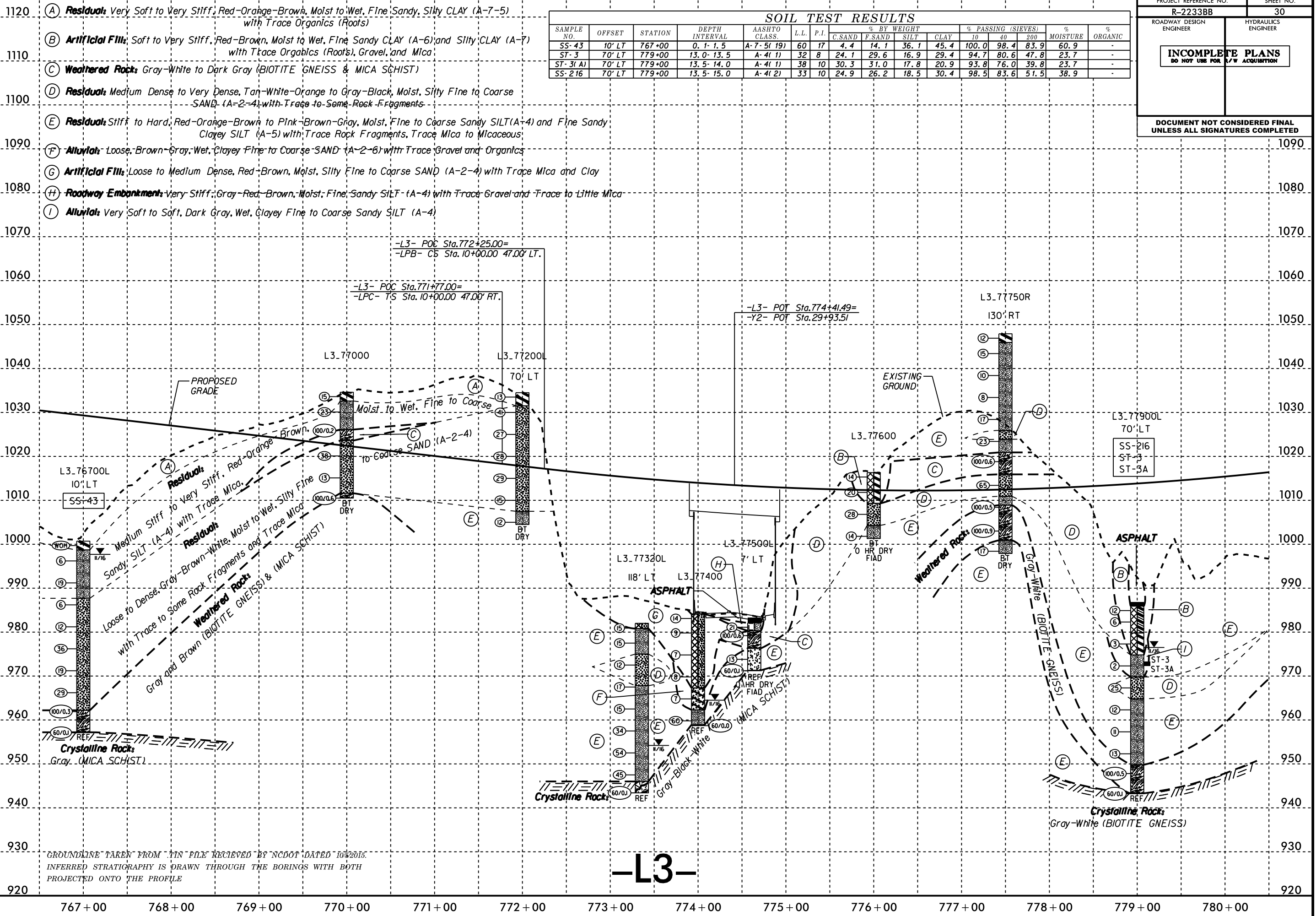
- (A) Residuals: Medium Dense to Dense, Light Brown-Gray, Moist, Silty Fine SAND (A-2-4)
- (B) Weathered Rocks: Orange-Brown-Black (MICA SCHIST)
- (C) Residuals: Medium Dense to Very Dense, Red-Brown, Moist, Silty Fine to Coarse SAND (A-2-4) with Trace Rock Fragments, Clay and Mica
- (D) Residuals: Very Stiff, Red-Brown, Moist, Fine Sandy Silty CLAY (A-7) with Trace Organics (Roots) and Mica
- (E) Crystaline Rock: Orange-Brown (MICA SCHIST)
- (F) Artificial Fills: Stiff, Red-Brown, Moist, Fine Sandy SILT (A-4) with Trace Mica
- (G) Residuals: Loose to Medium Dense, Red-Brown, Moist, Silty Fine to Coarse SAND (A-2-4) with Trace Mica
- (H) Artificial Fills: Stiff, Red-Brown, Moist, Silty CLAY (A-6) with Trace Organics (Roots)
- (I) Artificial Fills: Very Stiff, Brown, Moist, Clayey, Fine Sandy SILT (A-4) with Trace Organics (Roots, Wood Fragments) and Gravel
- (J) Residuals: Medium Stiff, Red-Brown, Moist, Silty CLAY (A-7) with Trace Organics (Roots) and Rock Fragments

-L3-

GROUNDLINE TAKEN FROM TIN FILE, RECEIVED BY NCDOT DATED 10/5/2015. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-43	10' LT	767+00	0.1-1.5	A-7.5(19)	60	17	4.4	14.1	36.1	45.4	100.0	98.4	83.9	60.9	-
ST-3	70' LT	779+00	13.0-13.5	A-4(1)	32	8	24.1	29.6	16.9	29.4	94.7	80.6	47.8	23.7	-
ST-3(A)	70' LT	779+00	13.5-14.0	A-4(1)	38	10	30.3	31.0	17.8	20.9	93.8	76.0	39.8	23.7	-
SS-216	70' LT	779+00	13.5-15.0	A-4(2)	33	10	24.9	26.2	18.5	30.4	98.5	83.6	51.5	38.9	-

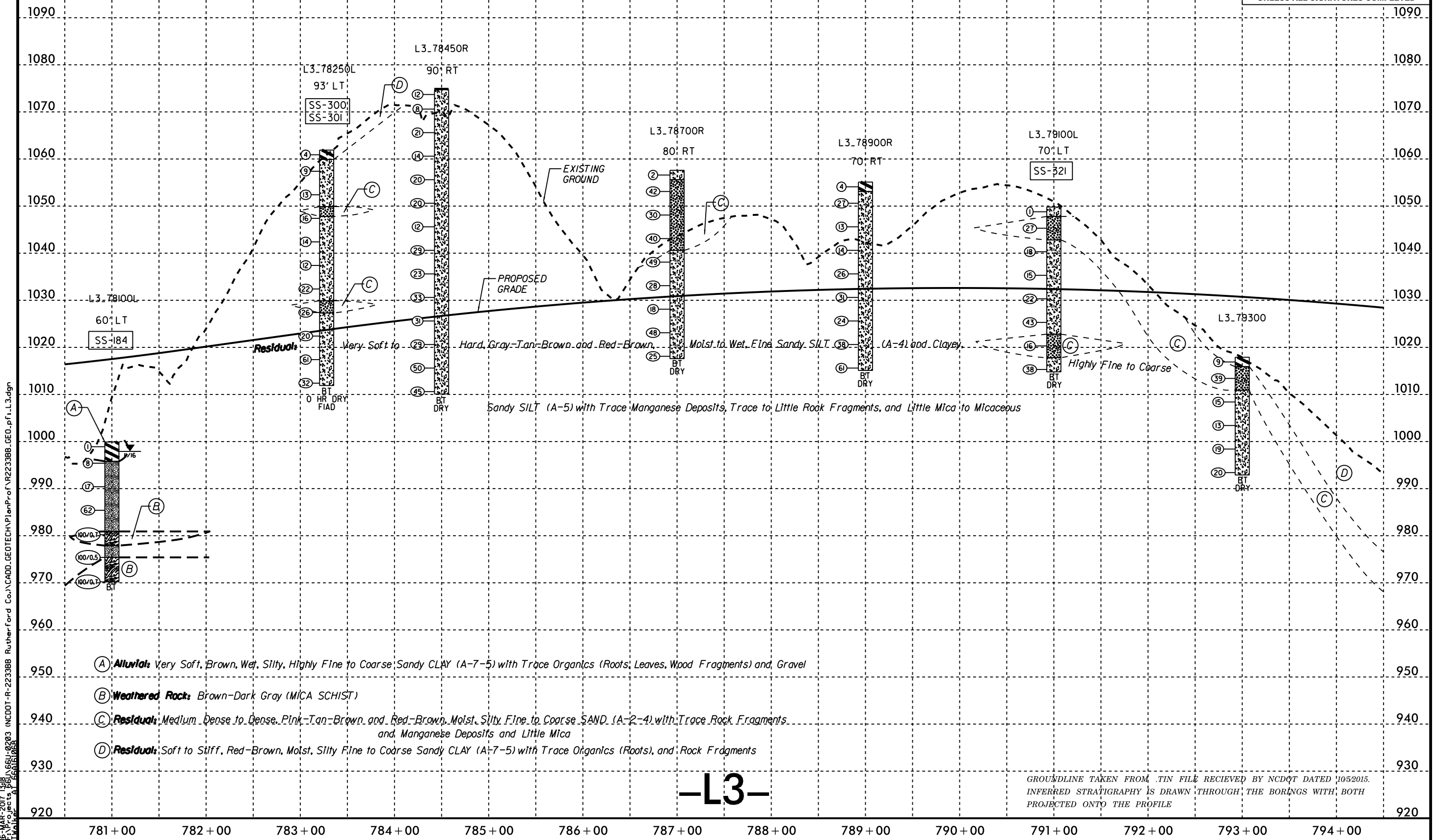


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PROJECT REFERENCE NO. R-2233BB	SHEET NO. 31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-184	60' LT	781+00	0.0-1.5	A-7-5(1)	62	11	33.0	30.2	22.1	14.7	96.2	77.3	38.3	53.8	-
SS-300	93' LT	783+28	0.1-1.5	A-7-5(14)	54	22	12.6	26.0	12.9	48.5	99.7	92.8	65.5	28.8	-
SS-301	93' LT	783+28	3.5-5.0	A-5(0)	49	NP	28.2	33.9	22.7	15.2	87.6	71.6	37.1	22.7	-
SS-321	70' LT	791+00	0.0-0.4	-	-	-	-	-	-	-	-	-	47.6	16.5	



-L3-

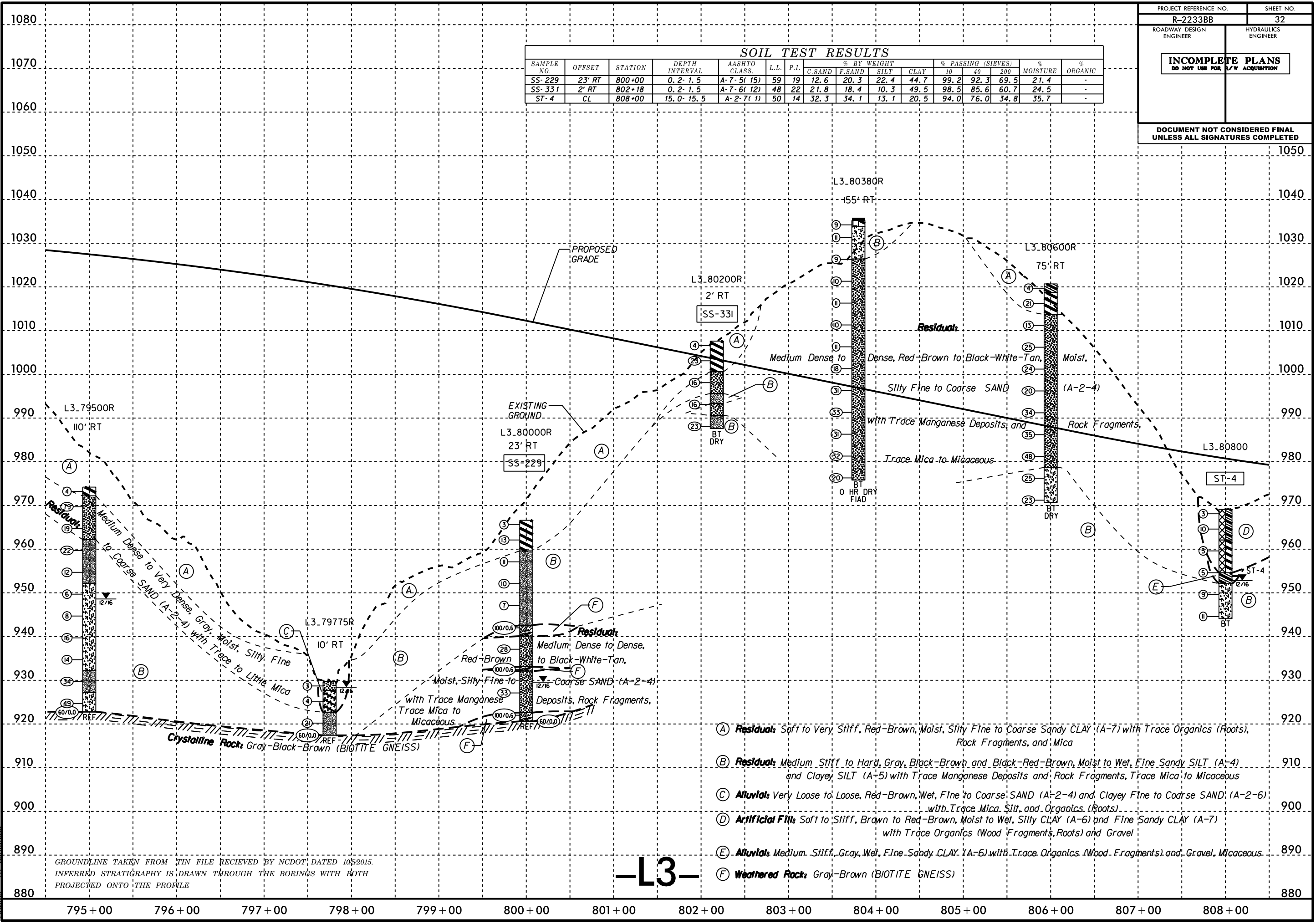
GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY NCDOT DATED 10/5/2015.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE PROFILE

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 User: jg
 Plotter: AT

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 Walker - 6/16/16

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-229	23' RT	800+00	0.2-1.5	A-7-5(15)	59	19	12.6	20.3	22.4	44.7	99.2	92.3	69.5	21.4	-
SS-331	2' RT	802+18	0.2-1.5	A-7-6(12)	48	22	21.8	18.4	10.3	49.5	98.5	85.6	60.7	24.5	-
ST-4	CL	808+00	15.0-15.5	A-2-7(1)	50	14	32.3	34.1	13.1	20.5	94.0	76.0	34.8	35.7	-



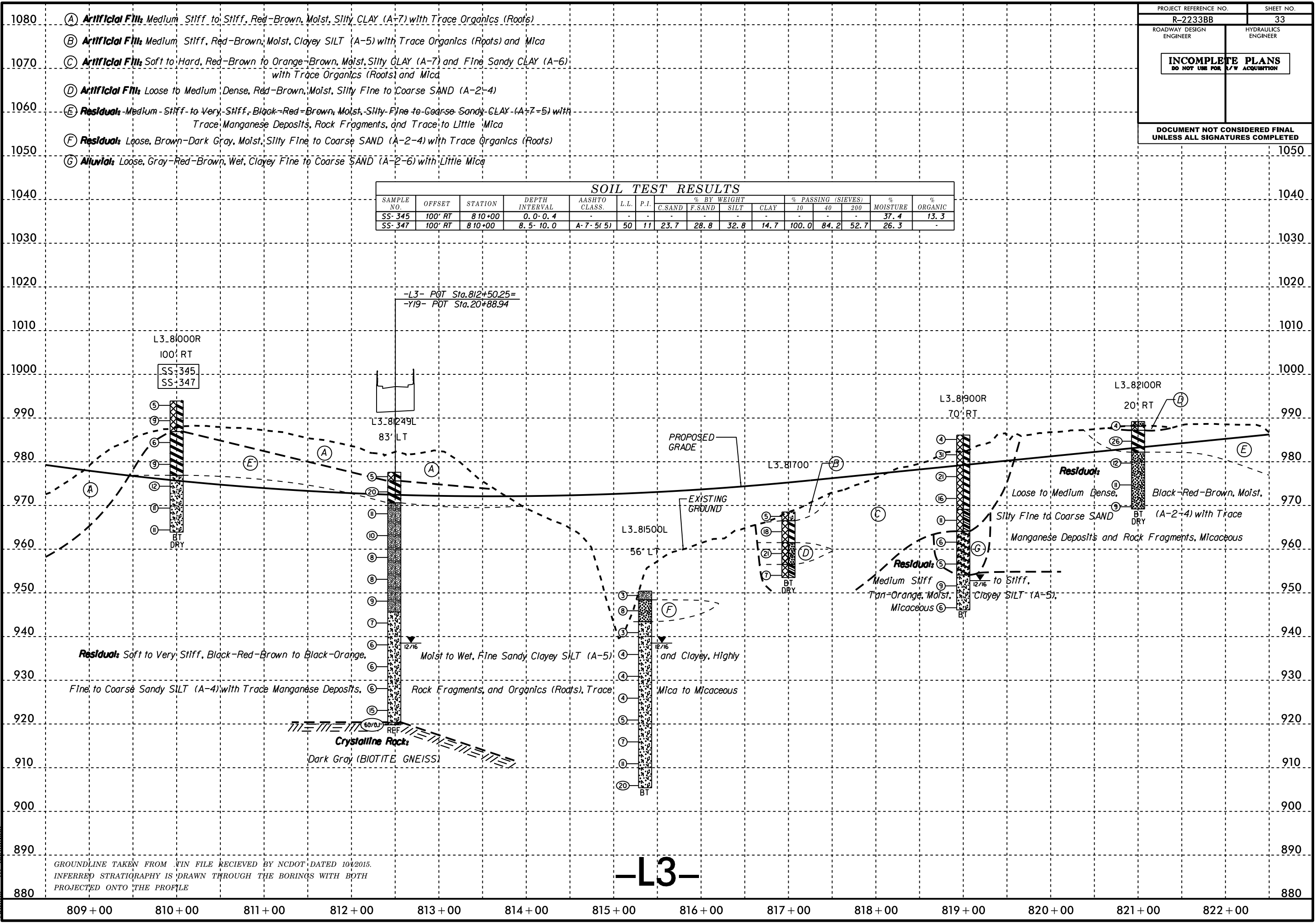
GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY NCDOT, DATED 10/5/2015.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE PROFILE

-L3-

- (A) **Residual:** Soft to Very Stiff, Red-Brown, Moist, Silty Fine to Coarse Sandy CLAY (A-7) with Trace Organics (Roots), Rock Fragments, and Mica
- (B) **Residual:** Medium Stiff to Hard, Gray, Black-Brown and Black-Red-Brown, Moist to Wet, Fine Sandy SILT (A-4) and Clayey SILT (A-5) with Trace Manganese Deposits and Rock Fragments, Trace Mica to Micaceous
- (C) **Alluvial:** Very Loose to Loose, Red-Brown, Wet, Fine to Coarse SAND (A-2-4) and Clayey Fine to Coarse SAND (A-2-6) with Trace Mica, Silt, and Organics (Roots)
- (D) **Artificial Fill:** Soft to Stiff, Brown to Red-Brown, Moist to Wet, Silty CLAY (A-6) and Fine Sandy CLAY (A-7) with Trace Organics (Wood Fragments, Roots) and Gravel
- (E) **Alluvial:** Medium Stiff, Gray, Wet, Fine Sandy CLAY (A-6) with Trace Organics (Wood Fragments) and Gravel, Micaceous
- (F) **Weathered Rock:** Gray-Brown (BIOTITE GNEISS)

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 Walker - AT 66161058

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



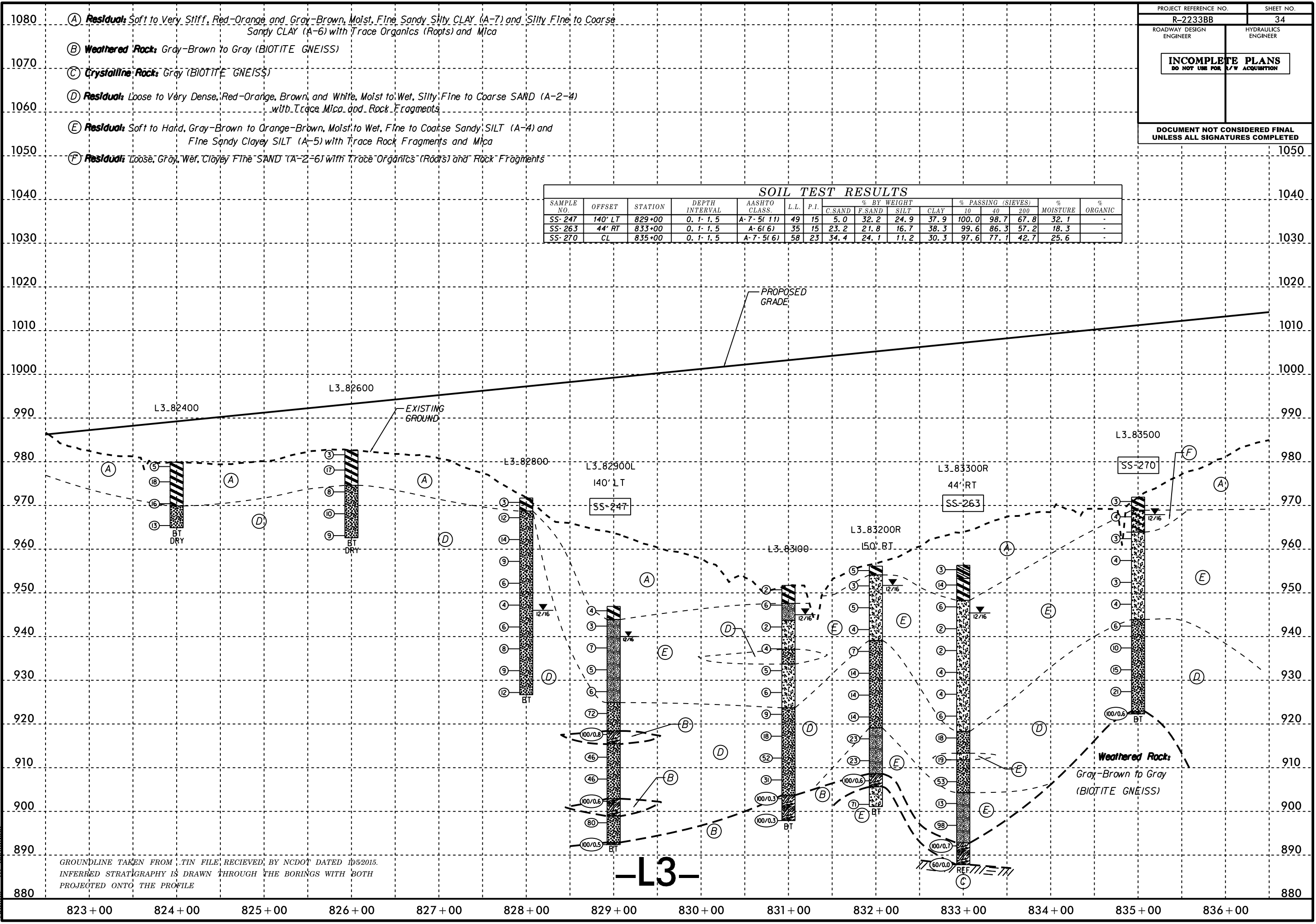
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GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY NCDOT DATED 10/2015.
 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE PROFILE

- (A) **Residual:** Soft to Very Stiff, Red-Orange and Gray-Brown, Moist, Fine Sandy Silty CLAY (A-7) and Silty Fine to Coarse Sandy CLAY (A-6) with Trace Organics (Roots) and Mica
- (B) **Weathered Rock:** Gray-Brown to Gray (BIOTITE GNEISS)
- (C) **Crystalline Rock:** Gray (BIOTITE GNEISS)
- (D) **Residual:** Loose to Very Dense, Red-Orange, Brown, and White, Moist to Wet, Silty, Fine to Coarse SAND (A-2-4) with Trace Mica and Rock Fragments
- (E) **Residual:** Soft to Hard, Gray-Brown to Orange-Brown, Moist to Wet, Fine to Coarse Sandy SILT (A-4) and Fine Sandy Clayey SILT (A-5) with Trace Rock Fragments and Mica
- (F) **Residual:** Loose, Gray, Wet, Clayey Fine SAND (A-2-6) with Trace Organics (Roots) and Rock Fragments

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-247	140' LT	829+00	0.1-1.5	A-7-5(11)	49	15	5.0	32.2	24.9	37.9	100.0	98.7	67.8	32.1	-
SS-263	44' RT	833+00	0.1-1.5	A-6(6)	35	15	23.2	21.8	16.7	38.3	99.6	86.3	57.2	18.3	-
SS-270	CL	835+00	0.1-1.5	A-7-5(6)	58	23	34.4	24.1	11.2	30.3	97.6	77.1	42.7	25.6	-

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 Walker - BT 6/6/16



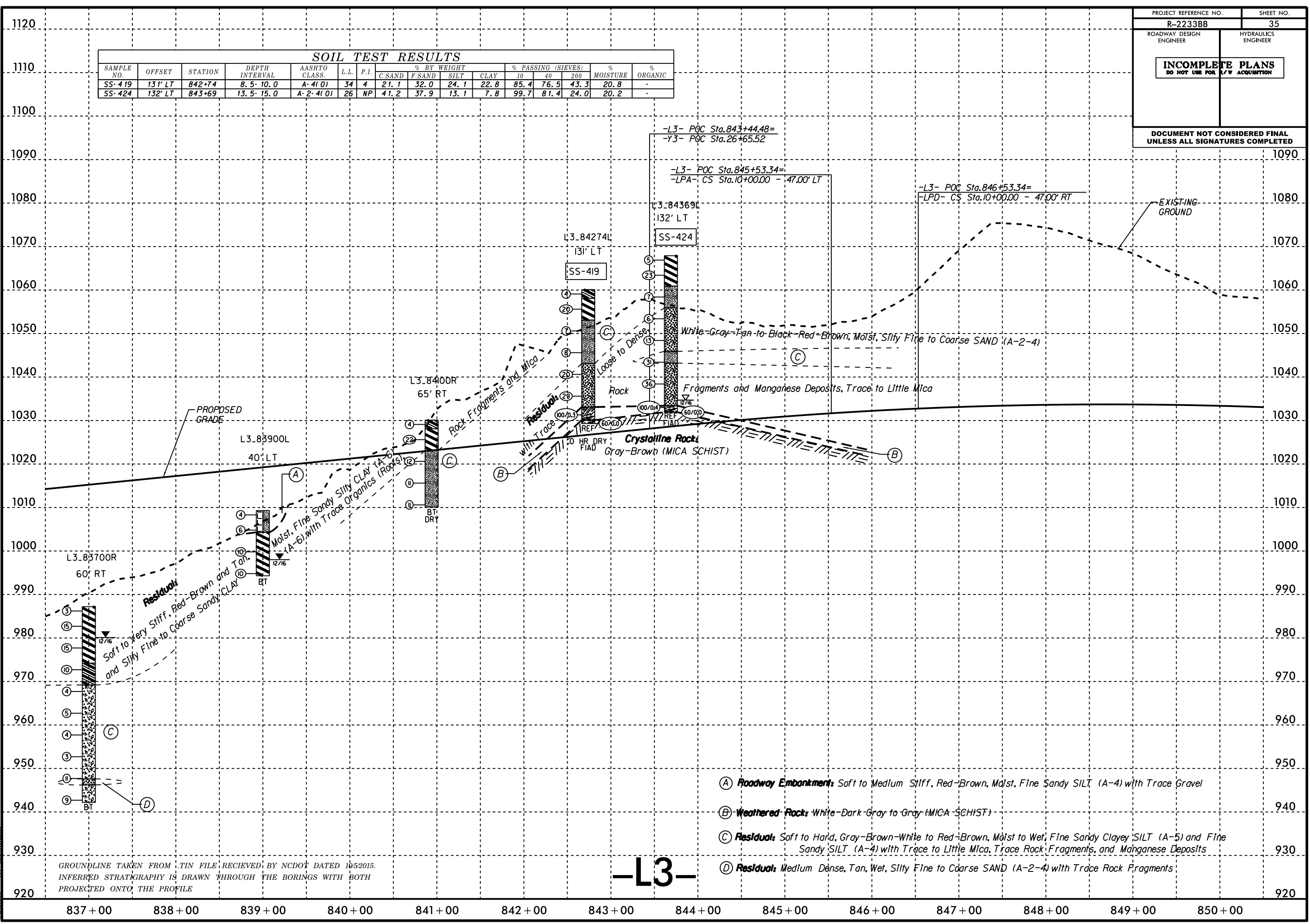
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INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
							SS-419	131' LT	842+74	8.5-10.0	A-4(0)	34	4		
SS-424	132' LT	843+69	13.5-15.0	A-2-4(0)	26	NP	41.2	37.9	13.1	7.8	99.7	81.4	24.0	20.2	-

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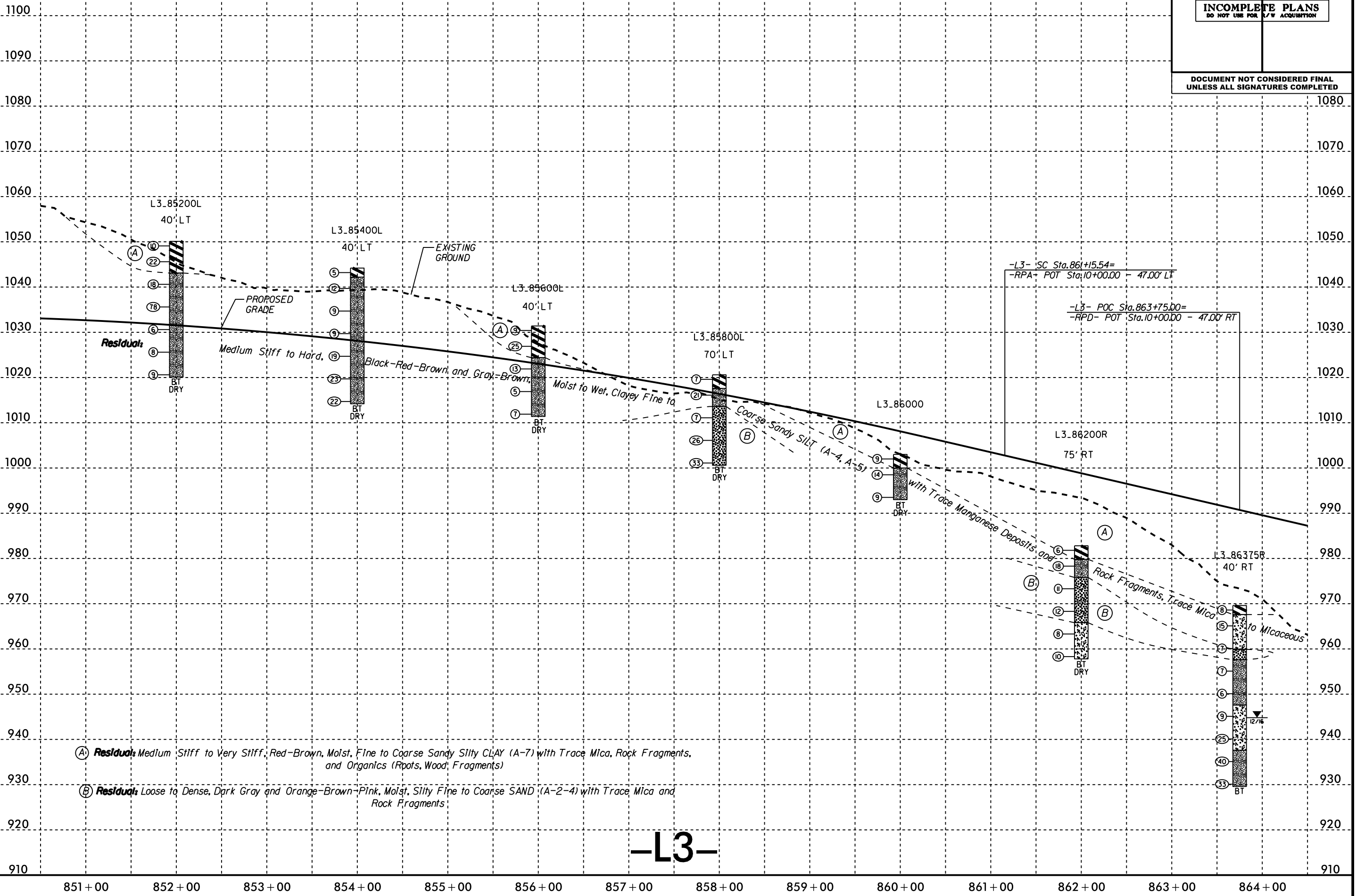
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INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE PROFILE

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GROUNDLINE TAKEN FROM TIN FILE RECEIVED BY NCDOT, DATED 10/2015.
INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
PROJECTED ONTO THE PROFILE

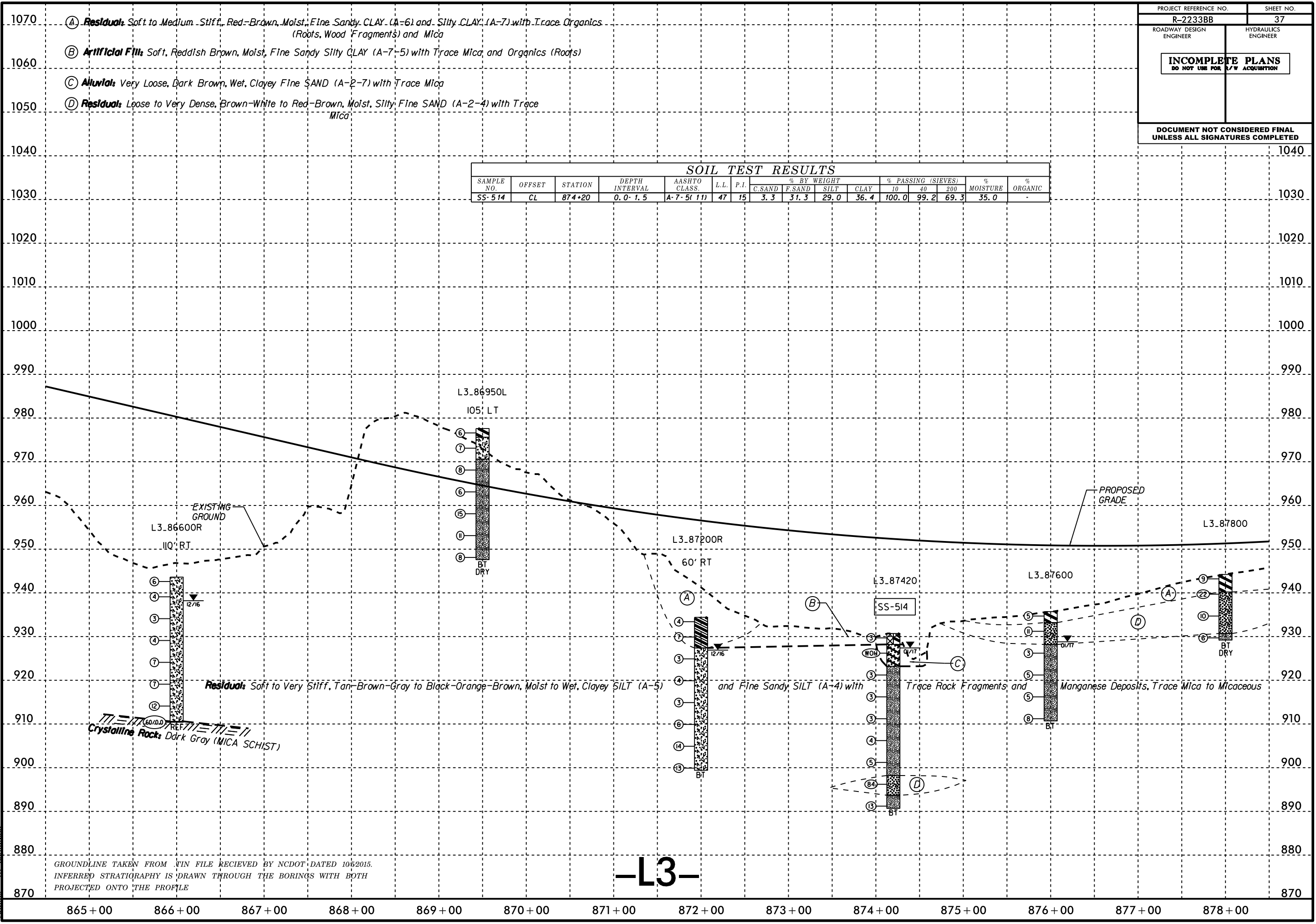
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ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



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 Walker - BT 6/18/08

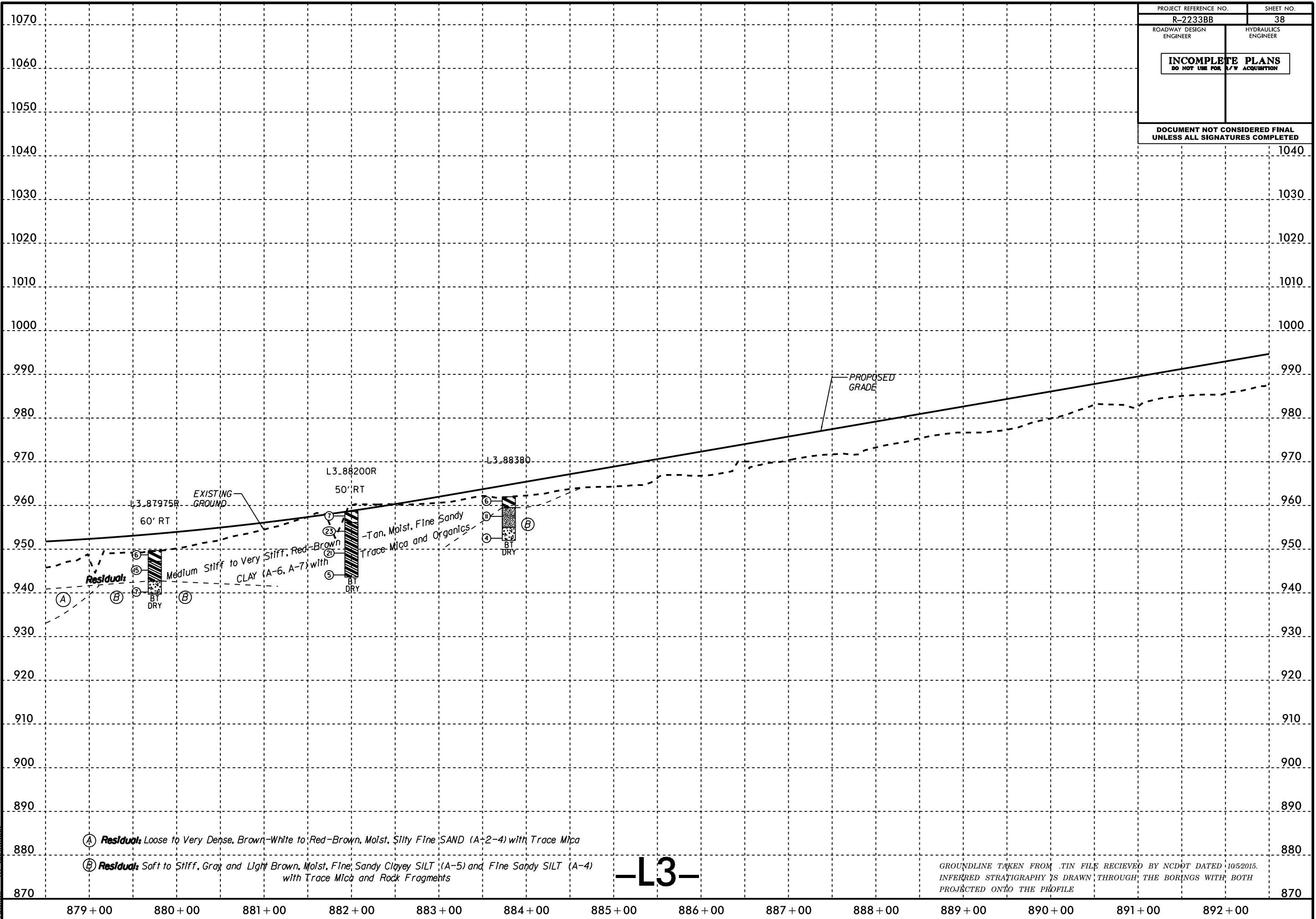


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PROJECT REFERENCE NO. R-2233BB	SHEET NO. 38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



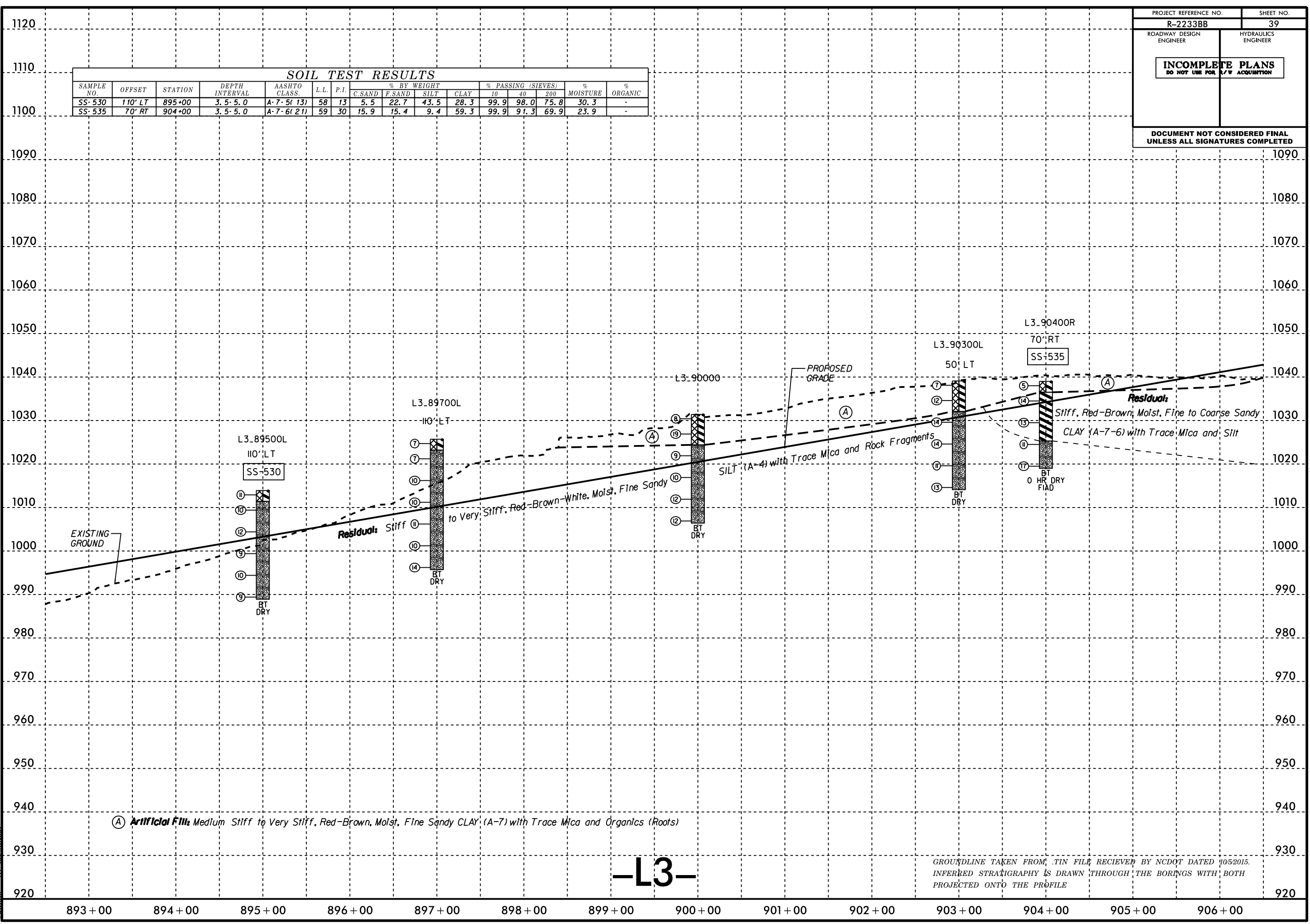
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 PROJECTED ONTO THE PROFILE

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 Walker - AT 65181058

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
SS-530	110' LT	895+00	3.5-5.0	A-7-5(13)	58	13	5.5	22.7	43.5	28.3	99.9	98.0	75.8	30.3	-
SS-535	70' RT	904+00	3.5-5.0	A-7-6(21)	59	30	15.9	15.4	9.4	59.3	99.9	97.3	69.9	23.9	-

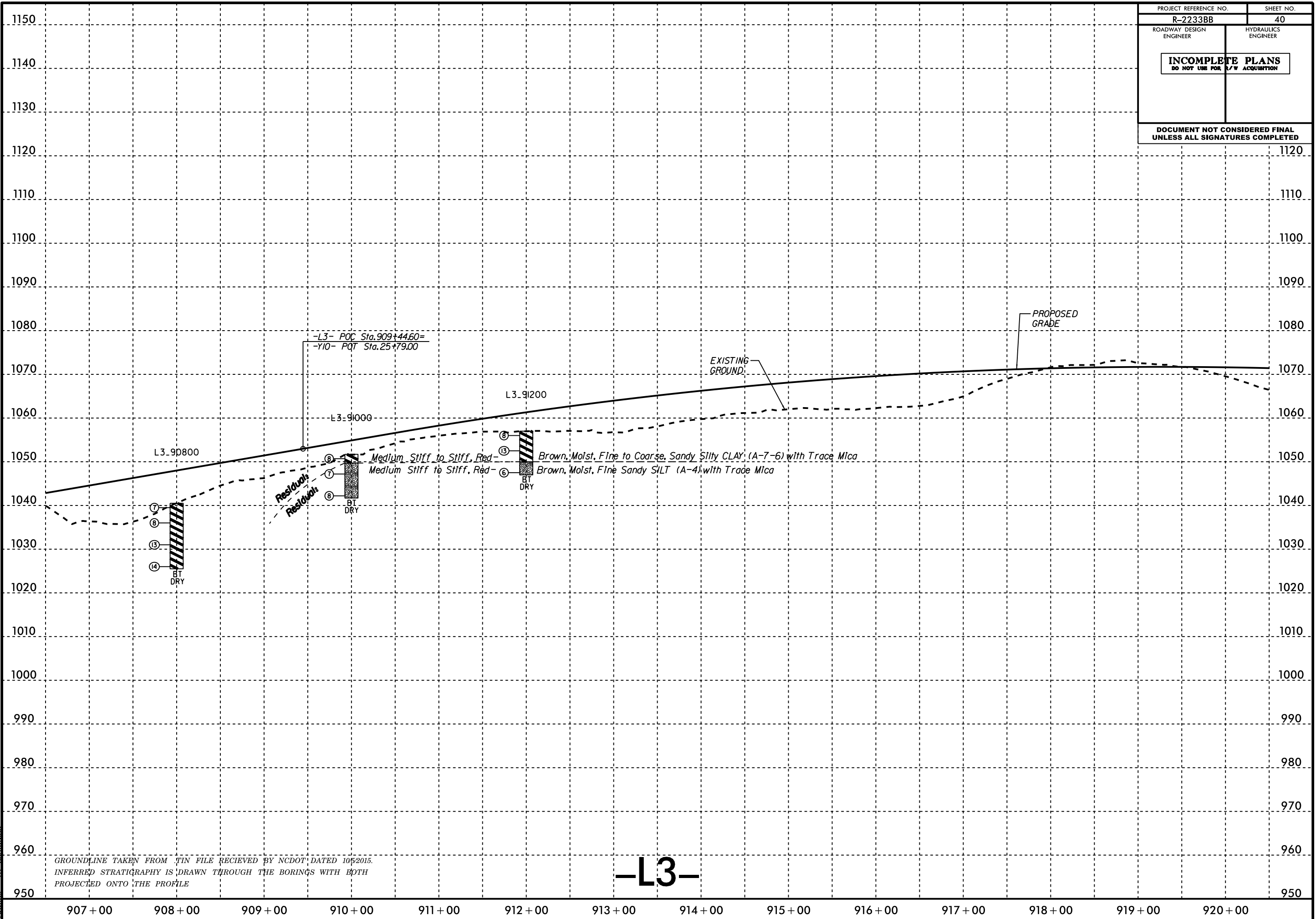


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 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE PROFILE

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 Walker - AT 6611058

PROJECT REFERENCE NO. R-2233BB	SHEET NO. 40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	

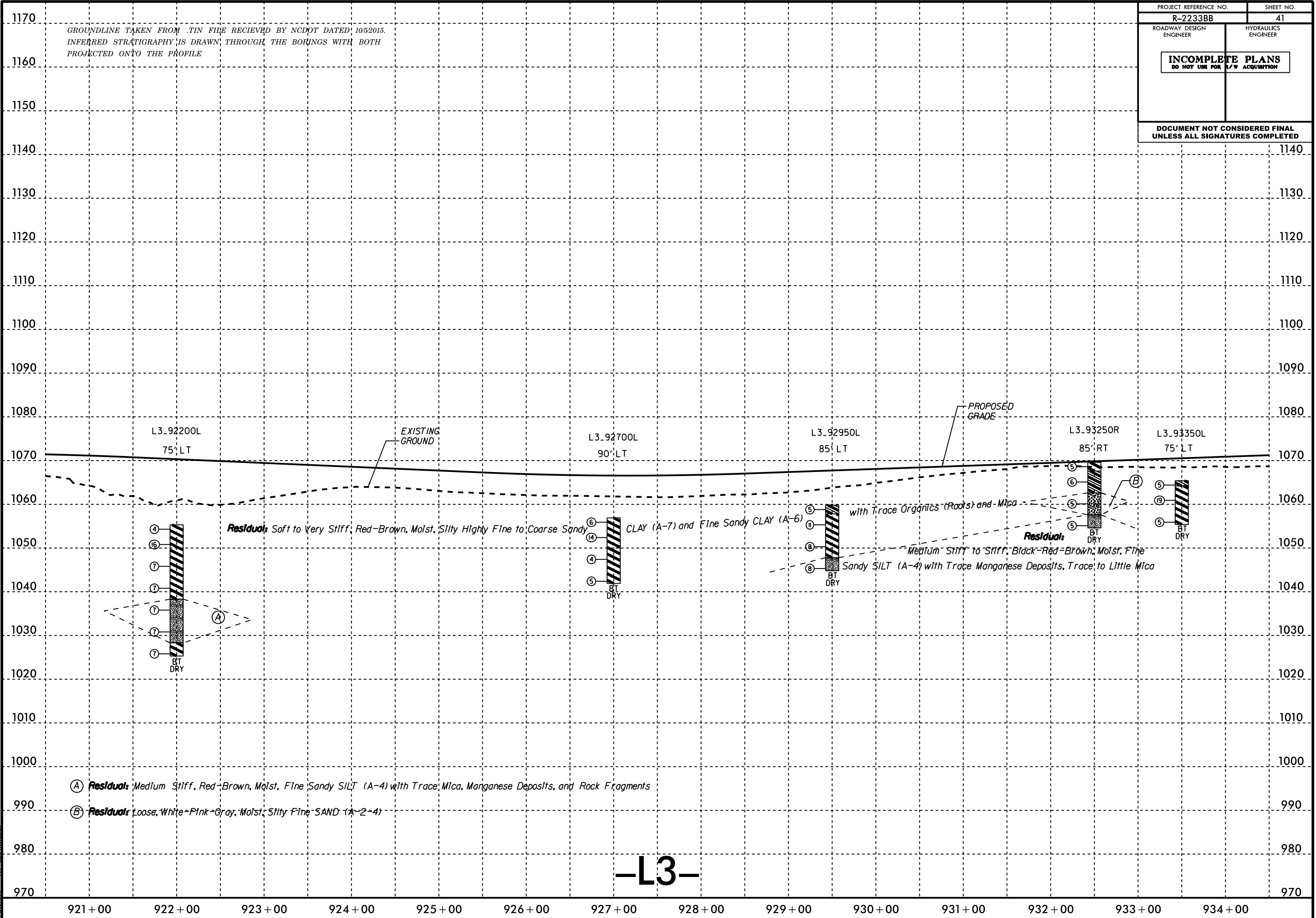


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 INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH
 PROJECTED ONTO THE PROFILE

-L3-

PROJECT REFERENCE NO.	SHEET NO.
R-2233BB	41
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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Walker - AT 65181058

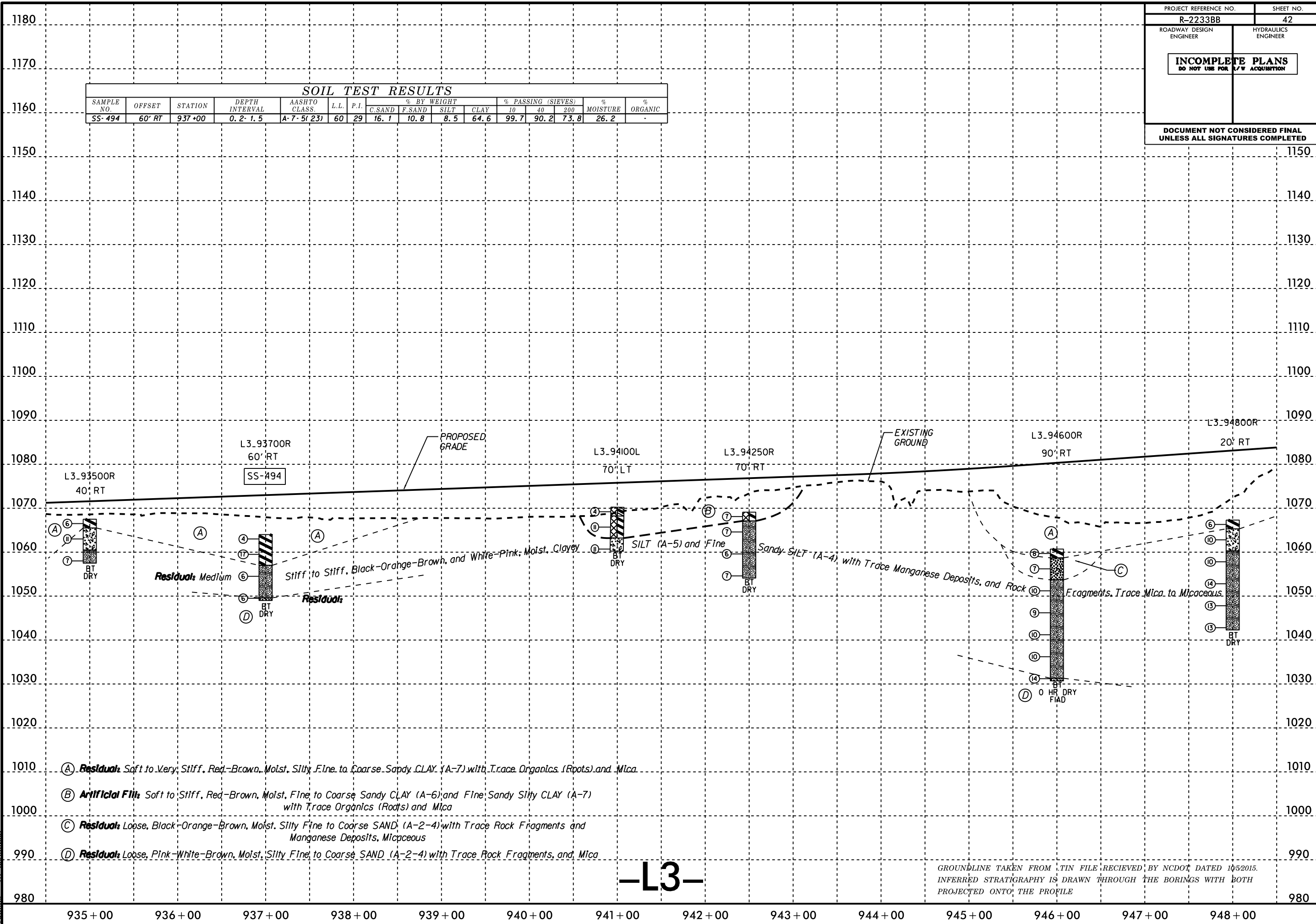


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PROJECT REFERENCE NO. R-2233BB		SHEET NO. 42	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C.SAND	F.SAND	SILT	CLAY	10	40	200		
							SS-494	60' RT	937+00	0.2-1.5	A-7-5(23)	60	29		

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GROUNDLINE TAKEN FROM .TIN FILE RECEIVED BY NCDOT, DATED 10/5/2015. INFERRED STRATIGRAPHY IS DRAWN THROUGH THE BORINGS WITH BOTH PROJECTED ONTO THE PROFILE