

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

STRUCTURE
SUBSURFACE INVESTIGATION

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PROJ. REFERENCE NO. 34373.1.1 F.A. PROJ. _____
 COUNTY MONTGOMERY
 PROJECT DESCRIPTION NC 24-27 (EAST MAIN STREET) FROM
US 220A (NORTH/SOUTH MAIN STREET) TO I-73/74 US 220
 SITE DESCRIPTION RETAINING WALLS

18+60 TO 19+15 -L- LEFT
19+60 TO 20+00 -L- LEFT
28+19 TO 28+96 -L- LEFT
29+16 TO 29+70 -L- LEFT
33+80 TO 34+50 -L- LEFT
53+92 TO 54+75 -L LEFT

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 (ON-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.

PROJECT: ID: R-2107B

PERSONNEL
STICKNEY

C. SMITH

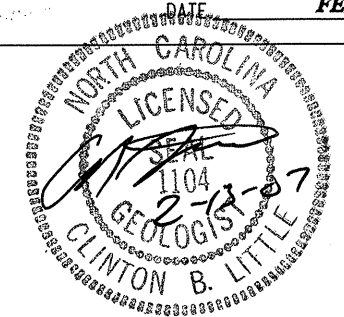
WISE

INVESTIGATED BY **STICKNEY**

CHECKED BY _____

SUBMITTED BY **LITTLE**

DATE **FEB. 2007**



DRAWN BY: **LITTLE**

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.

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION			GRADATION			ROCK DESCRIPTION			TERMS AND DEFINITIONS		
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: <i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>			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.			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 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: 			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 (ROD) - 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 60 BLOWS PER FOOT. STRATA CORE RECOVERY (SCRC) - 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.		
SOIL LEGEND AND AASHTO CLASSIFICATION			MINERALOGICAL COMPOSITION			WEATHERING					
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS			MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.			WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.					
GROUP CLASS. A-1, A-3, A-2, A-4, A-5, A-6, A-7, A-1, A-2, A-4, A-5, A-6, A-7			SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50			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.					
SYMBOL			COMPRESSIBILITY			NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN METAMORPHIC AND NON-COASTAL PLAIN SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.					
% PASSING			PERCENTAGE OF MATERIAL			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.					
LIQUID LIMIT PLASTIC INDEX			GROUND WATER			FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.					
GROUP INDEX			MISCELLANEOUS SYMBOLS			VERY SLIGHT (V SL) 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.					
USUAL TYPES OF MAJOR MATERIALS			ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION			SLIGHT (SL) 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.					
GEN. RATING AS A SUBGRADE			ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT			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.					
P1 OF A-7-5 SUBGROUP IS <= LL - 30 ; P1 OF A-7-6 SUBGROUP IS > LL - 30			INFERRED SOIL BOUNDARY			SEVERE (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. <i>IF TESTED, WOULD YIELD SPT REFUSAL</i>					
CONSISTENCY OR DENSENESS			INFERRED ROCK LINE			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. <i>IF TESTED, YIELDS SPT N VALUES < 100 BPF</i>					
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT ²)			ALLUVIAL SOIL BOUNDARY			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.					
GENERALLY GRANULAR MATERIAL (NON-COHESIVE) VERY LOOSE LOOSE MEDIUM DENSE DENSE VERY DENSE			DIP & DIP DIRECTION OF ROCK STRUCTURES			ROCK HARDNESS					
GENERALLY SILT-CLAY MATERIAL (COHESIVE) VERY SOFT SOFT MEDIUM STIFF STIFF VERY STIFF HARD			SOUNDING ROD			VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.					
TEXTURE OR GRAIN SIZE			ABBREVIATIONS			HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.					
U.S. STD. SIEVE SIZE OPENING (MM) 4 10 40 60 200 270			AR - AUGER REFUSAL HI - HIGHLY MED. - MEDIUM MICA - MICAECIOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST			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.					
BOULDER (BLR.) COBBLE (COB.) GRAVEL (GR.) COARSE SAND (CSE, SD.) FINE SAND (F SD.) SILT (SL.) CLAY (CL.)			F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS			MEDIUM HARD CAN BE GROUVED 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.					
GRAIN SIZE MM 305 75 2.0 0.25 0.05 0.005			SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLL. - SLIGHTLY TCR - TRICONE REFUSAL			SOFT CAN BE GROUVED 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.					
SOIL MOISTURE - CORRELATION OF TERMS			EQUIPMENT USED ON SUBJECT PROJECT			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 FINGER NAIL.					
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION			DRILL UNITS: MOBILE B- BK-51 CME-45C CME-550 PORTABLE HOIST			FRACTIONAL SPACING					
LL - LIQUID LIMIT (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE			ADVANCING TOOLS: CLAY BITS 6" CONTINUOUS FLIGHT AUGER 8" HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE * STEEL TEETH TRICONE * TUNG-CARB. CORE BIT			BEDDING					
- WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE			HAMMER TYPE: AUTOMATIC MANUAL			TERM SPACING THICKNESS					
- MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE			CORE SIZE: B N H			VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET					
- DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE			HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST			WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET					
PLASTICITY						MODERATELY CLOSE 1 TO 3 FEET VERY THINLY BEDDED 0.16 - 1.5 FEET					
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY						CLOSE 0.16 TO 1 FEET THICKLY LAMINATED 0.008 - 0.03 FEET					
PLASTICITY INDEX (PI) DRY STRENGTH						VERY CLOSE LESS THAN 0.16 FEET THINLY LAMINATED < 0.008 FEET					
COLOR						INDURATION					
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.						FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.					



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MIKE F. EASLEY
GOVERNOR

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

LYNDO TIPPETT
SECRETARY

February 8, 2007

STATE PROJECT: 34373.1.1
I.D.: R-2107B
COUNTY: Montgomery

SITE DESCRIPTION: NC 24-27 (East Main Street) from US 220A
(North/South Main Street) to I-73/74 US 220

SUBJECT: Geotechnical Report – Retaining Wall
Foundation Investigation

SITE DESCRIPTION AND GEOLOGY

The project is located along East Main Street through the town of Biscoe. It consists of widening of NC 24-27 through the main business and residential section of Biscoe. The roadway portion of the project is addressed in a separate report. This report addresses six proposed retaining walls located at:

18+60 to 19+15 –L- Left
19+60 to 20+00 –L- Left
28+19 to 28+96 –L- Left
29+16 to 29+70 –L- Left
33+80 to 34+50 –L- Left
53+92 to 54+75 –L- Left.

The investigation consisted of a combination of Standard Penetration Test borings, hand auger borings, and visual observations.

The geology is mapped as CZVe, meta-volcanic epiclastics. No rock core samples were obtained. Soils encountered were predominantly fine-grained, silty clays and clayey silts, commonly with high plasticity. Moisture content based on field classification was generally at or near optimum. The soils were at least medium stiff, commonly very stiff to hard, and weathered rock was encountered within ten feet of the ground surface in several borings. No groundwater was encountered in any boring. The borings were shallow, averaging 10 feet; the deepest was 17 feet.

2
FOUNDATION SUMMARY

All of the walls will be founded on residual, stiff to hard, silty clay or clayey silt. (There were some minor occurrences of roadway fill with similar characteristics.) Groundwater is not a factor. We were not able to obtain Standard Penetration Test borings at all locations due to access problems and utility conflicts. In those instances, the data came from hand auger borings and/or visual observation and interpolation.

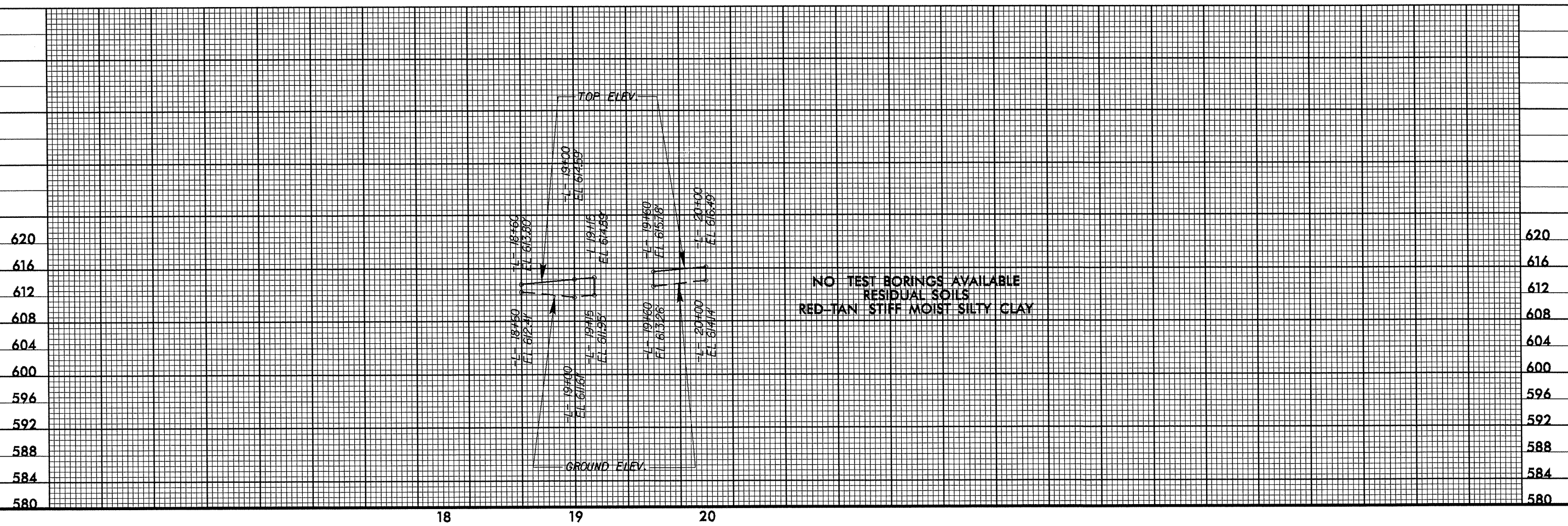
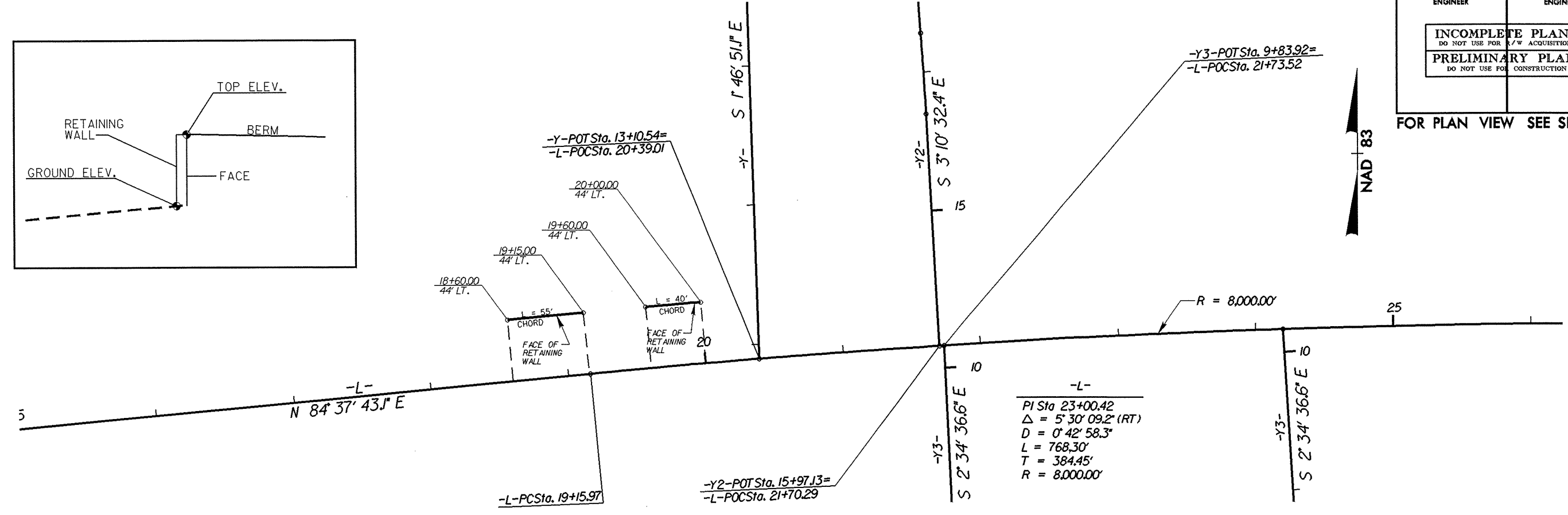
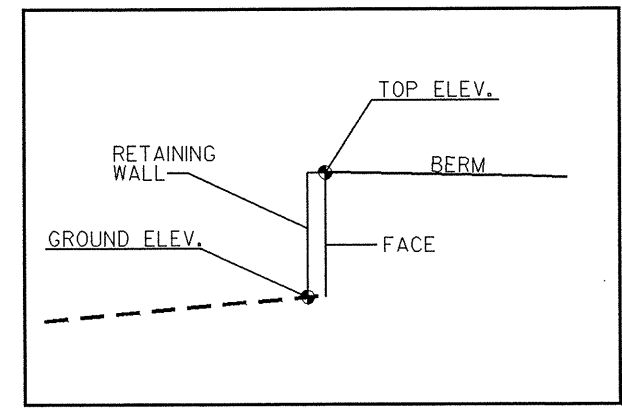
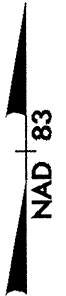
Respectfully submitted,

Clint Little
Regional Geologic Engineer
Geotechnical Engineering Unit
Western Regional Office



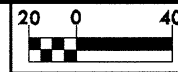
PROJECT REFERENCE NO. R-2107B	SHEET NO. WALL 1
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

FOR PLAN VIEW SEE SHT. 4



NO TEST BORINGS AVAILABLE
RESIDUAL SOILS
RED-TAN STIFF MOIST SILTY CLAY

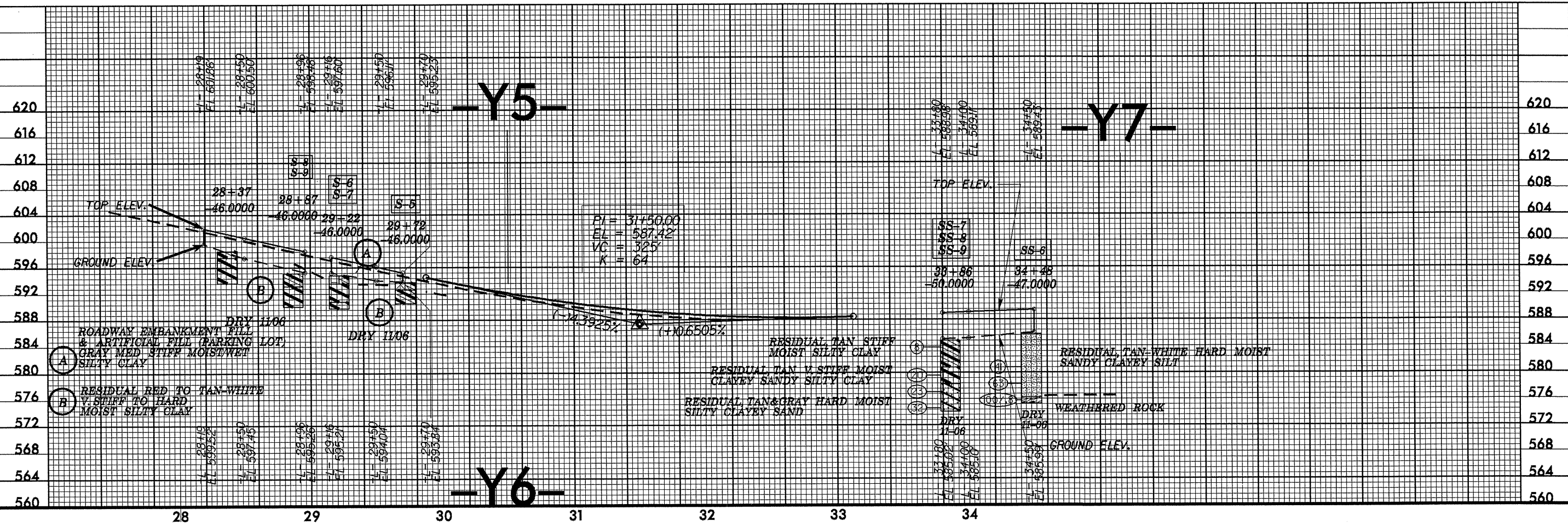
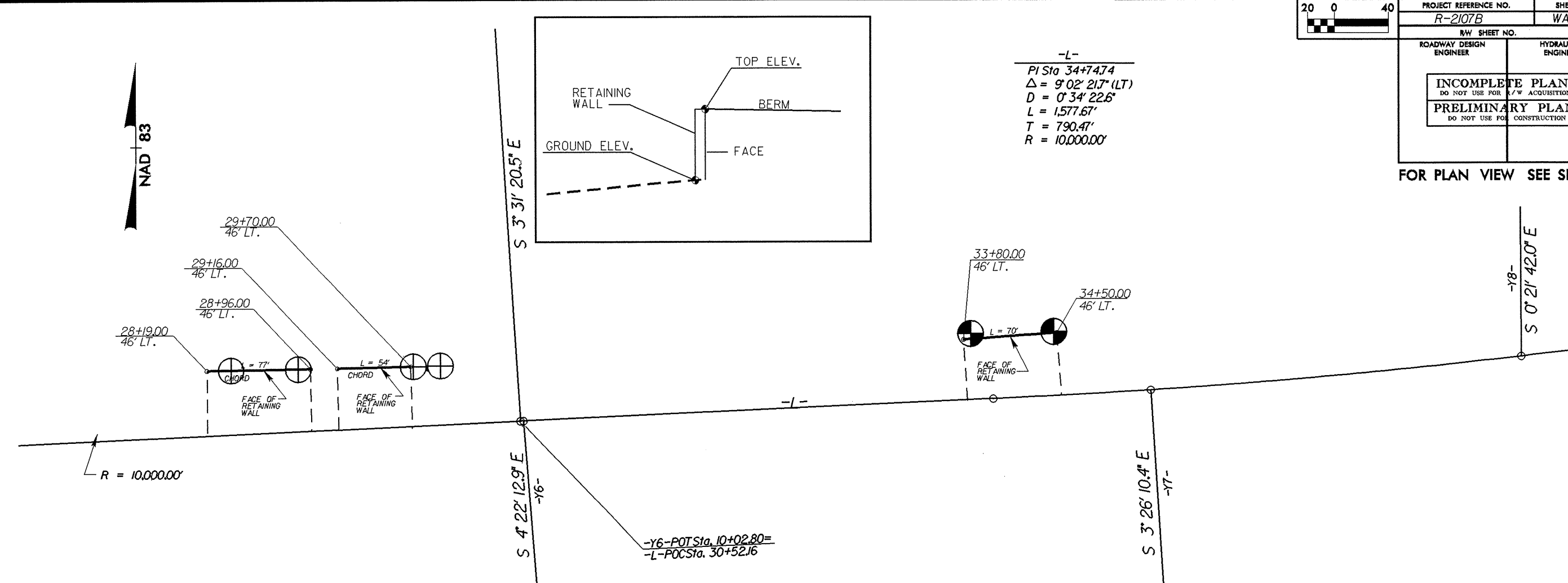
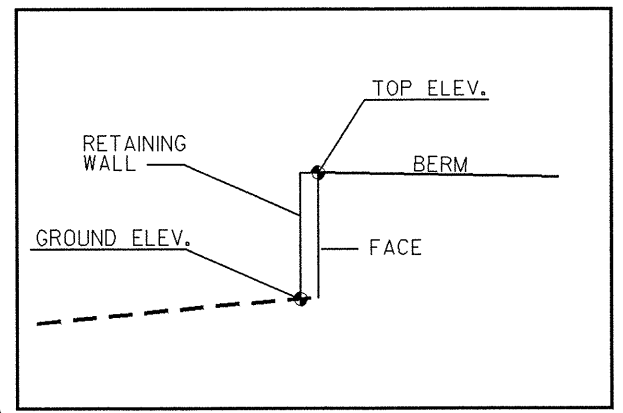
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PROJECT REFERENCE NO. R-2107B	SHEET NO. WALL 2
RWY SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

FOR PLAN VIEW SEE SHT. 5

-L-
 PI Sta 34+74.74
 $\Delta = 9^{\circ} 02' 21.7" (LT)$
 $D = 0^{\circ} 34' 22.6"$
 $L = 1,577.67'$
 $T = 790.47'$
 $R = 10,000.00'$



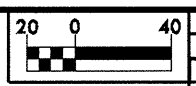
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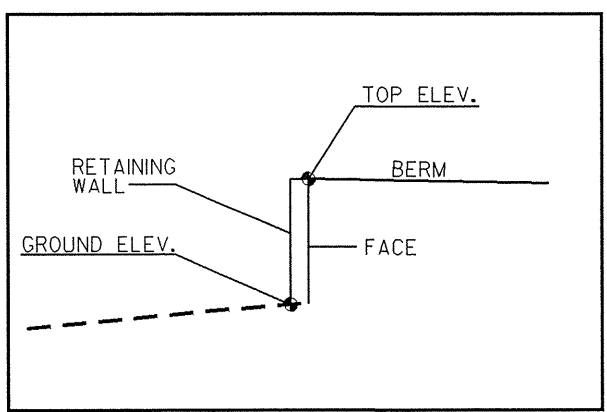
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1025.000
10+25
7.0000

550.564
1025.000
10+25
8.0000



PROJECT REFERENCE NO. R-2107B	SHEET NO. WALL 3
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

FOR PLAN VIEW SEE SHT. 7



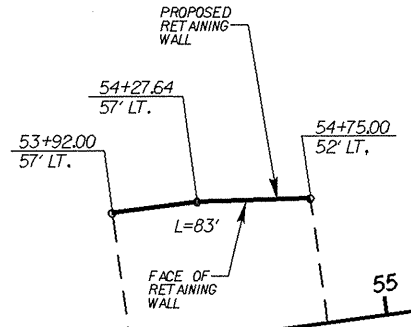
563.564
593.000
59+33
-64.0000

564.8807
569.000
56+90
-64.0000

-POT Sta. 52+42.63=
RVE - POT Sta. 16+54.78
10 - POT Sta. 9+91.97

S 73° 32' 50.7" E
15
-DRIVE

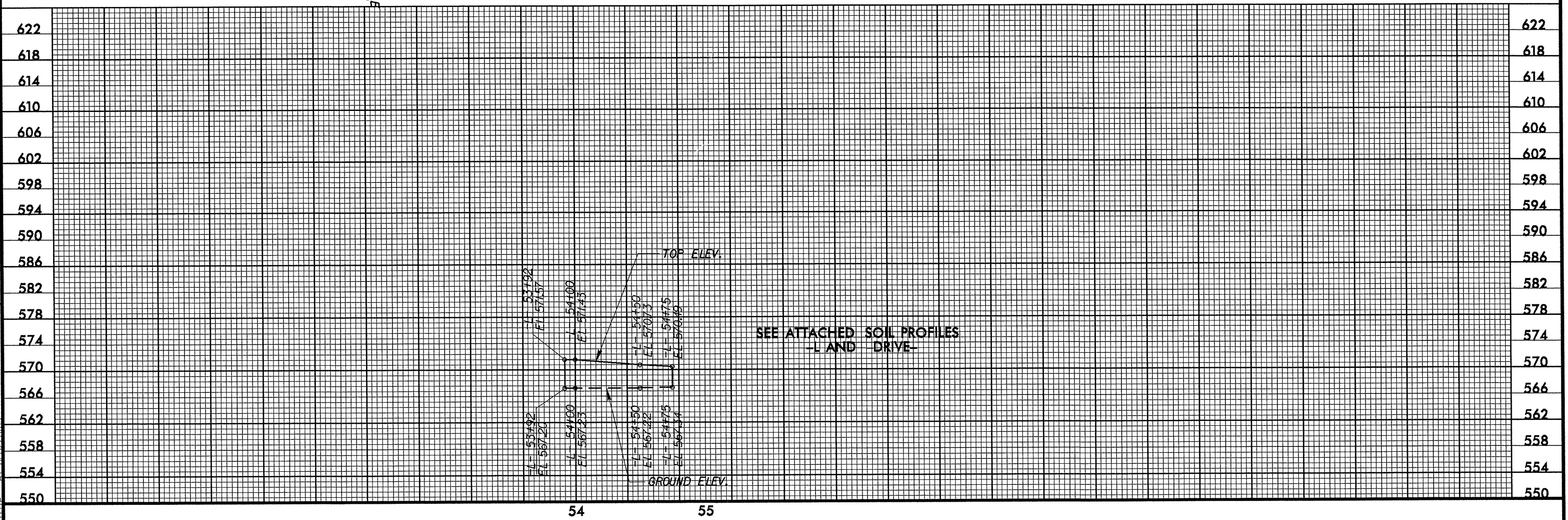
NAD 83



N 82° 27' 09.3" E
10
1 S 14° 56.7" E
-Y10-

577.8977
492.000
49+20
-45.0000

07-FEB-2007 10:07
d:\p\sc\ar-2107b\egdd-geotech\planpr of wall v-2107b-geo-wal13.dgn
cl:\p\sc\ar-2107b\egdd-geotech\planpr of wall v-2107b-geo-wal13.dgn



SEE ATTACHED SOIL PROFILES
-L AND -DRIVE-

54 55

PROJECT REFERENCE NO.	SHEET NO.
R-2107B	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

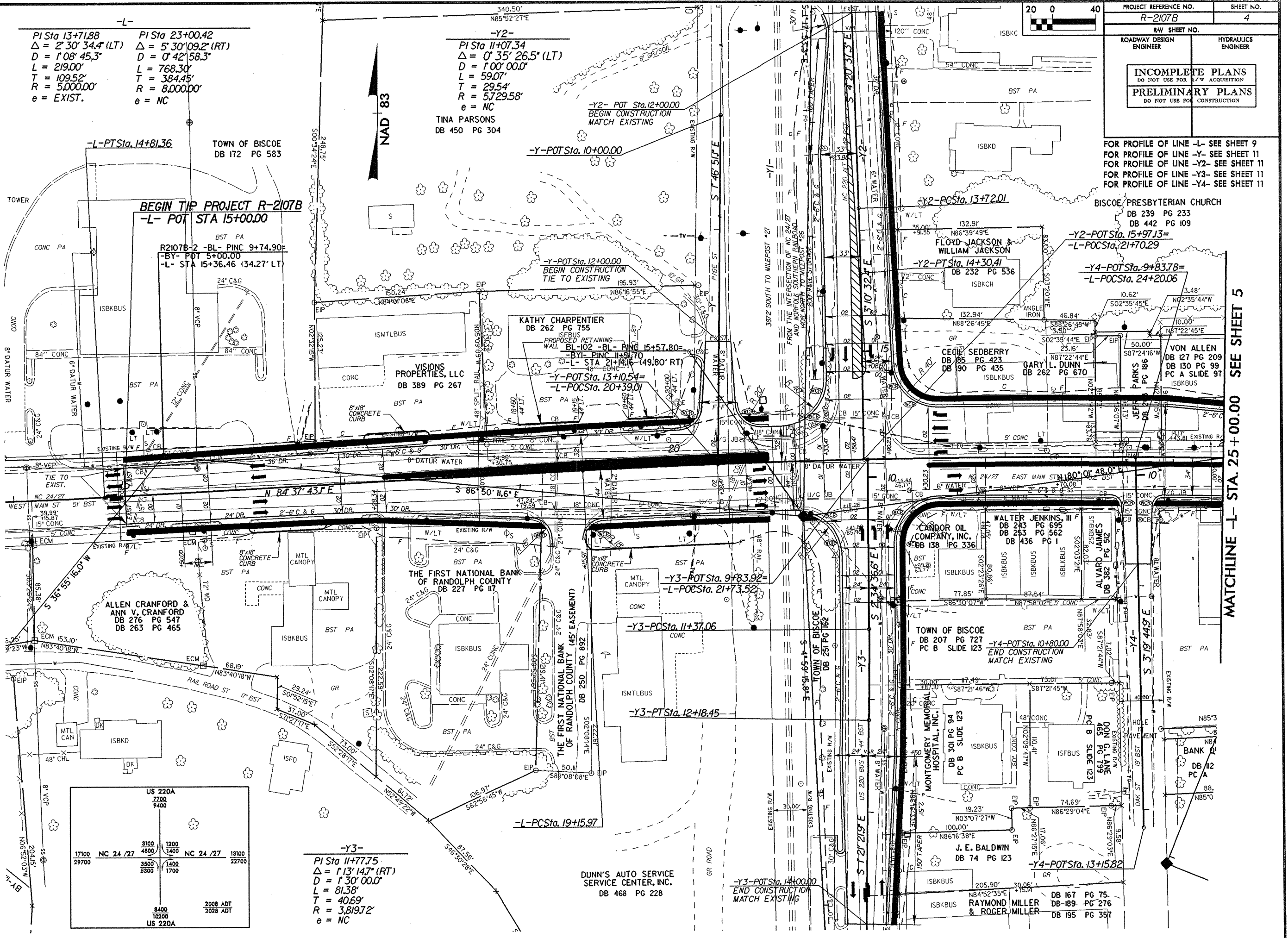
FOR PROFILE OF LINE -L- SEE SHEET 9
 FOR PROFILE OF LINE -Y- SEE SHEET 11
 FOR PROFILE OF LINE -Y2- SEE SHEET 11
 FOR PROFILE OF LINE -Y3- SEE SHEET 11
 FOR PROFILE OF LINE -Y4- SEE SHEET 11

-L-
 PI Sta 13+71.88 Δ = 2°30'34.4" (LT)
 D = 1'08'45.3" L = 219.00'
 T = 109.52' R = 5,000.00'
 e = EXIST.

PI Sta 23+00.42 Δ = 5°30'09.2" (RT)
 D = 0'42'58.3" L = 768.30'
 T = 384.45' R = 8,000.00'
 e = NC

-Y2-
 PI Sta 11+07.34 Δ = 0°35'26.5" (LT)
 D = 1'00'00.0" L = 59.07'
 T = 29.54' R = 5729.58'
 e = NC

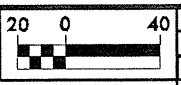
-Y3-
 PI Sta 11+77.75 Δ = 1°13'14.7" (RT)
 D = 1'30'00.0" L = 81.38'
 T = 40.69' R = 3,819.72'
 e = NC



US 220A			
17100	3100	1200	18100
29700	4800	1400	22700
	3500	1400	
	5300	1700	
2008 ADT			
	8400	1800	
US 220A			
2028 ADT			

MATCHLINE -L- STA. 25 + 00.00 SEE SHEET 5

06-FEB-2007 11:01:07... 8/17/09



PROJECT REFERENCE NO. R-2107B	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

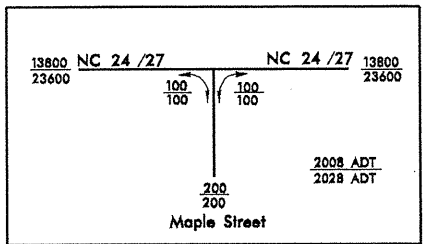
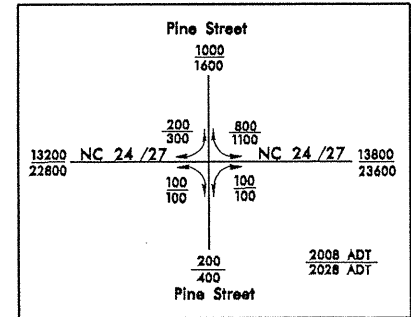
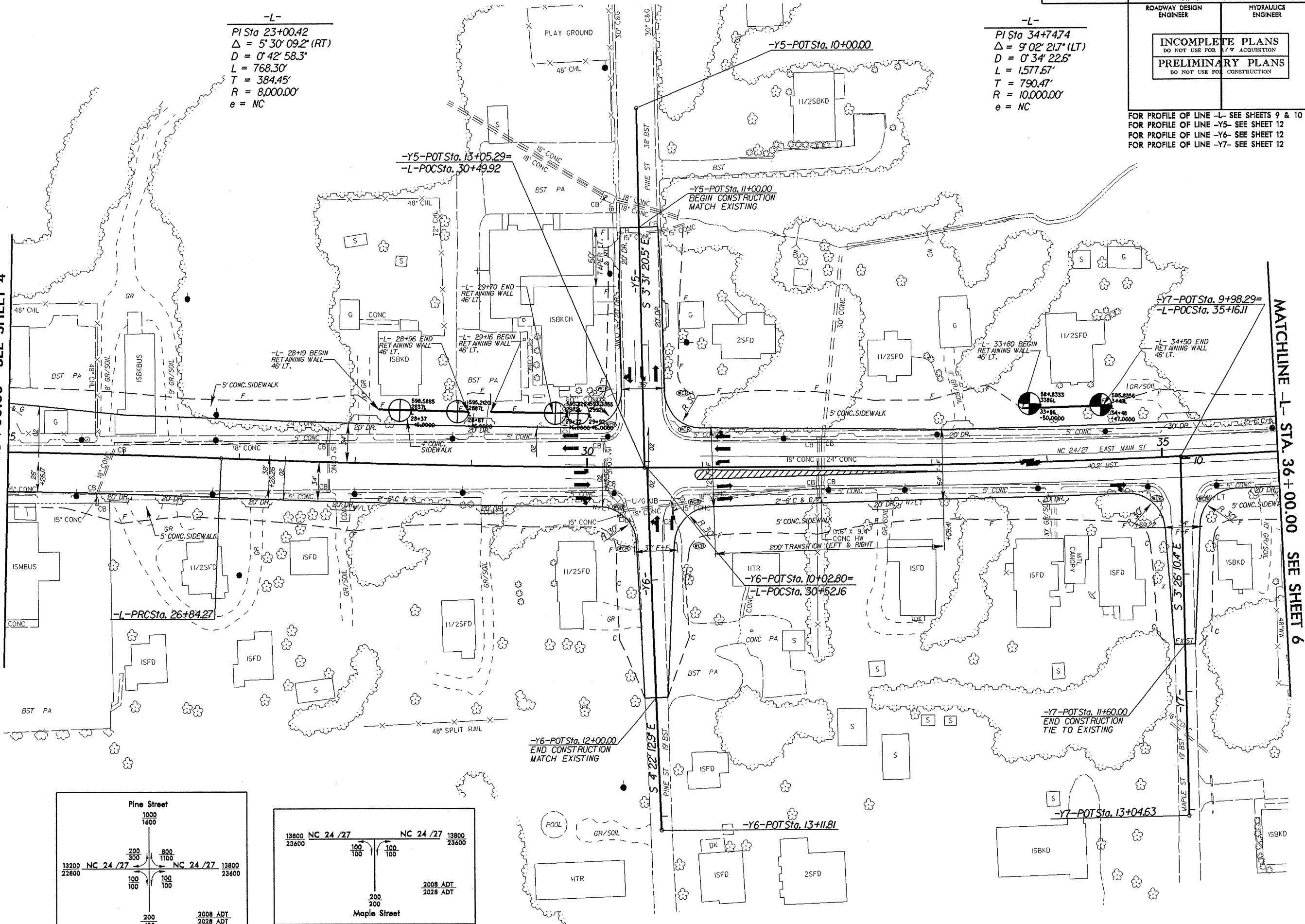


-L-
 PI Sta 23+00.42
 $\Delta = 5' 30'' 09.2''$ (RT)
 $D = 0' 42'' 58.3''$
 $L = 768.30'$
 $T = 384.45'$
 $R = 8,000.00'$
 $e = NC$

-L-
 PI Sta 34+74.74
 $\Delta = 9' 02'' 21.7''$ (LT)
 $D = 0' 34'' 22.6''$
 $L = 1,577.67'$
 $T = 790.47'$
 $R = 10,000.00'$
 $e = NC$

MATCHLINE -L- STA. 25+00.00 SEE SHEET 4

MATCHLINE -L- STA. 36+00.00 SEE SHEET 6

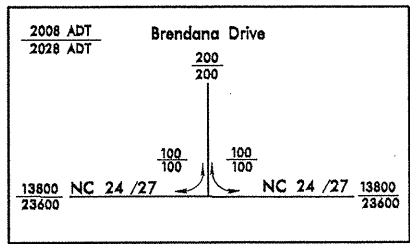


REVISIONS

PROJECT REFERENCE NO. R-2107B	SHEET NO. 6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

FOR PROFILE OF LINE -L- SEE SHEET 9 & 10
FOR PROFILE OF LINE -Y8- SEE SHEET 12
FOR PROFILE OF LINE -Y9- SEE SHEET 13

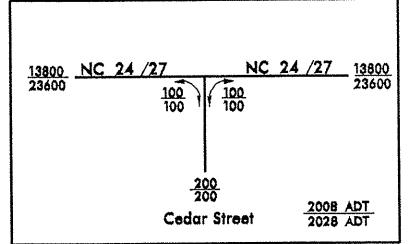
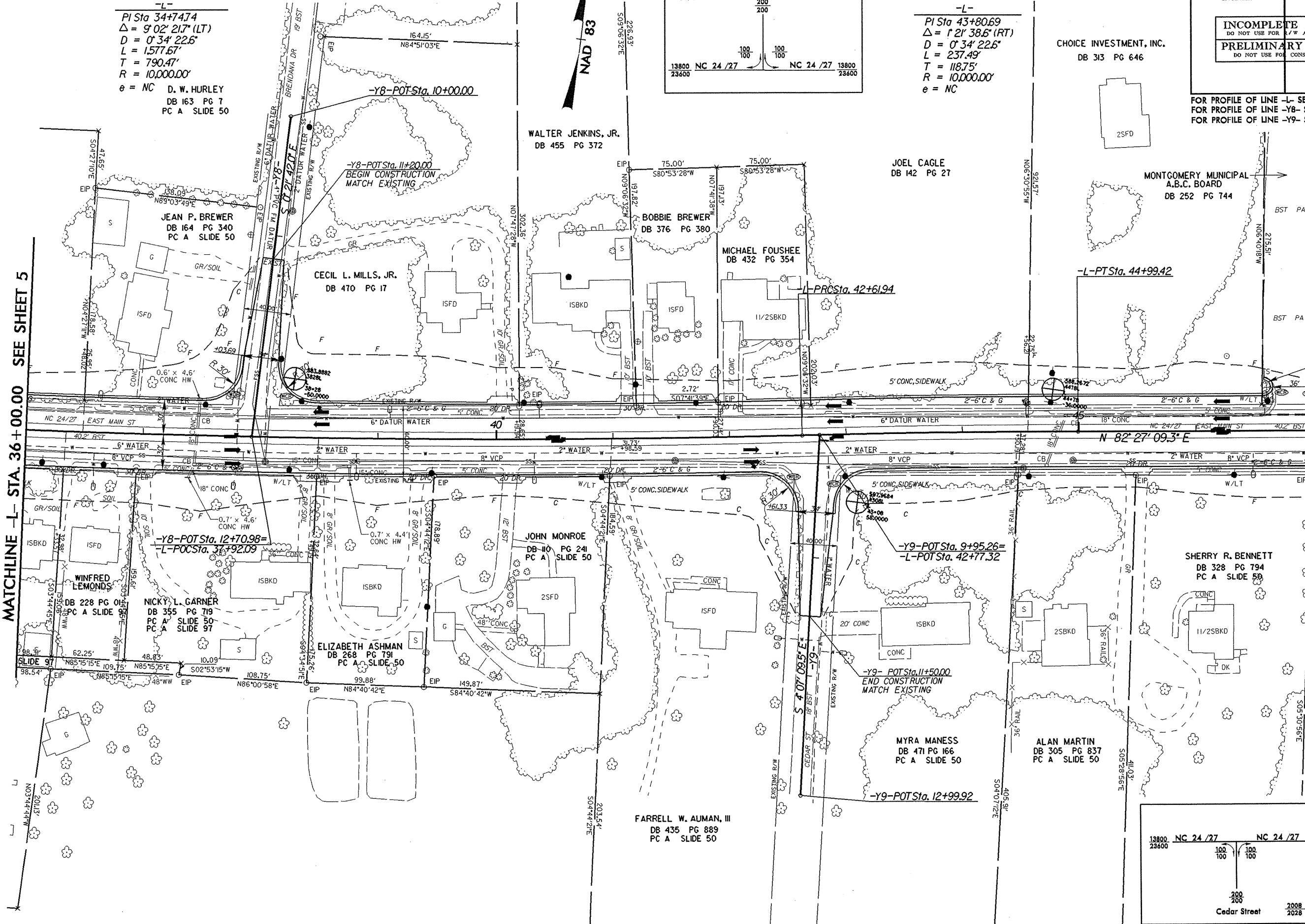
-L-
PI Sta 34+74.74
 $\Delta = 9' 02' 21.7''$ (LT)
 $D = 0' 34' 22.6''$
 $L = 1,577.67'$
 $T = 790.47'$
 $R = 10,000.00'$
e = NC D. W. HURLEY
DB 163 PG 7
PC A SLIDE 50



-L-
PI Sta 43+80.69
 $\Delta = 1' 21' 38.6''$ (RT)
 $D = 0' 34' 22.6''$
 $L = 237.49'$
 $T = 118.75'$
 $R = 10,000.00'$
e = NC

MATCHLINE -L- STA. 36+00.00 SEE SHEET 5

MATCHLINE -L- STA. 47+00.00 SEE SHEET 7

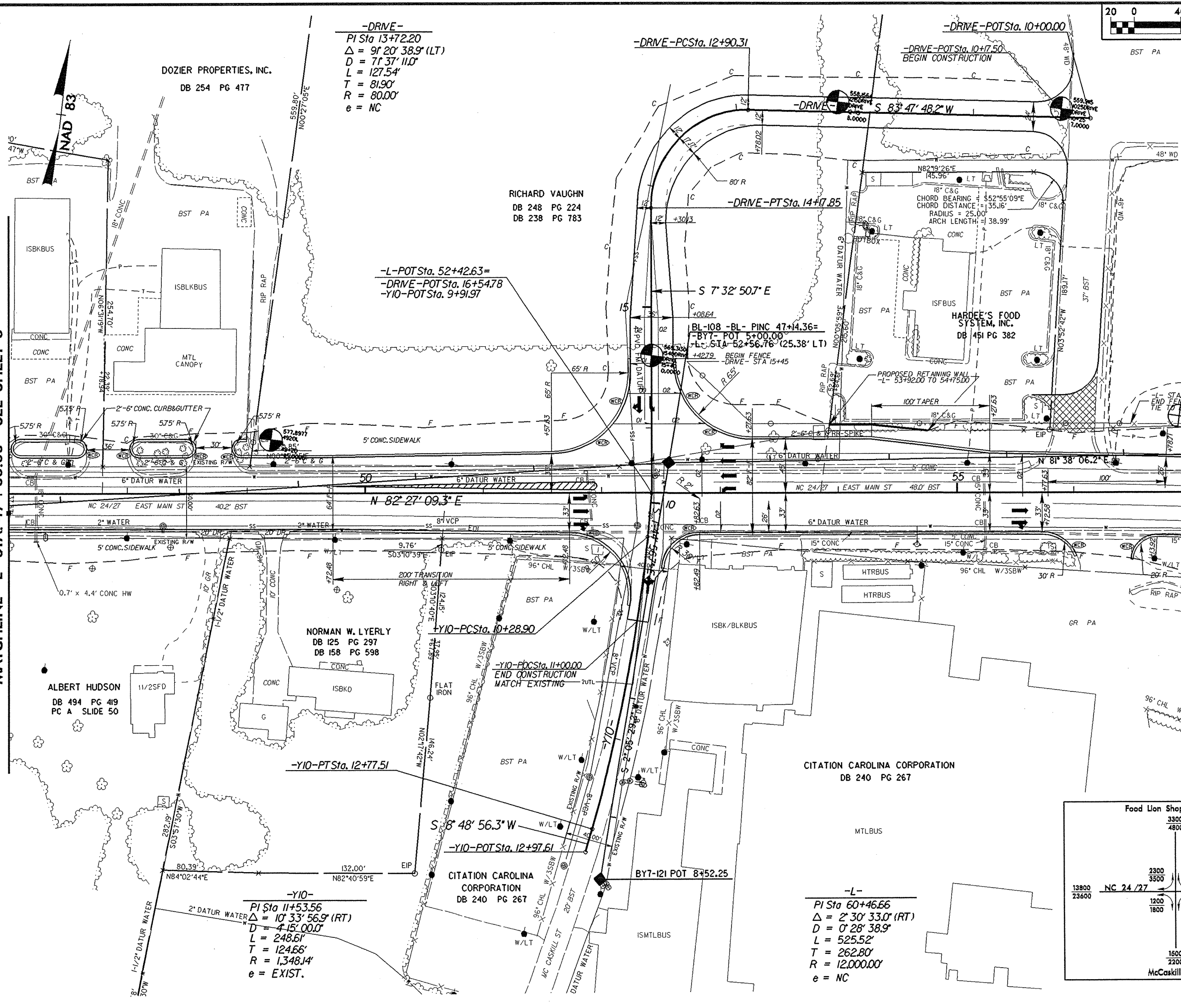


REVISIONS

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8/17/99
05-FEB-2007 13:40 d:\projects\10776\cadd\geotech\Plan\p1\2-07b_rdy_psh07.dgn

MATCHLINE -L- STA. 47+00.00 SEE SHEET 6



-DRIVE-
PI Sta 13+72.20
 $\Delta = 91^{\circ} 20' 38.9"$ (LT)
D = 71' 37" 11.0"
L = 127.54'
T = 81.90'
R = 80.00'
e = NC

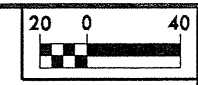
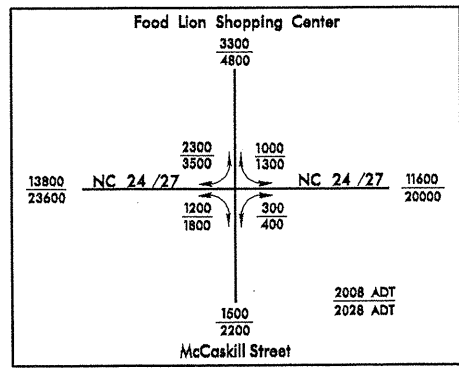
RICHARD VAUGHN
DB 248 PG 224
DB 238 PG 783

-L-POT Sta. 52+42.63=
-DRIVE-POT Sta. 16+54.78
-Y10-POT Sta. 9+91.97

BL-108 -BL- PINC 47+14.36=
-BYT- POT 5+00.00
-L- STA 52+56.76 (25.38' LT)

-Y10-
PI Sta 11+53.56
 $\Delta = 10^{\circ} 33' 56.9"$ (RT)
D = 4' 15" 00.0"
L = 248.61'
T = 124.66'
R = 1,348.14'
e = EXIST.

-L-
PI Sta 60+46.66
 $\Delta = 2^{\circ} 30' 33.0"$ (RT)
D = 0' 28' 38.9"
L = 525.52'
T = 262.80'
R = 12,000.00'
e = NC



PROJECT REFERENCE NO. R-2107B	SHEET NO. 7
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

FOR PROFILE OF LINE -L- SEE SHEET 10
FOR PROFILE OF LINE -DRIVE- SEE SHEET 13
FOR PROFILE OF LINE -Y10- SEE SHEET 13

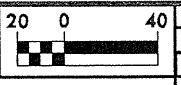
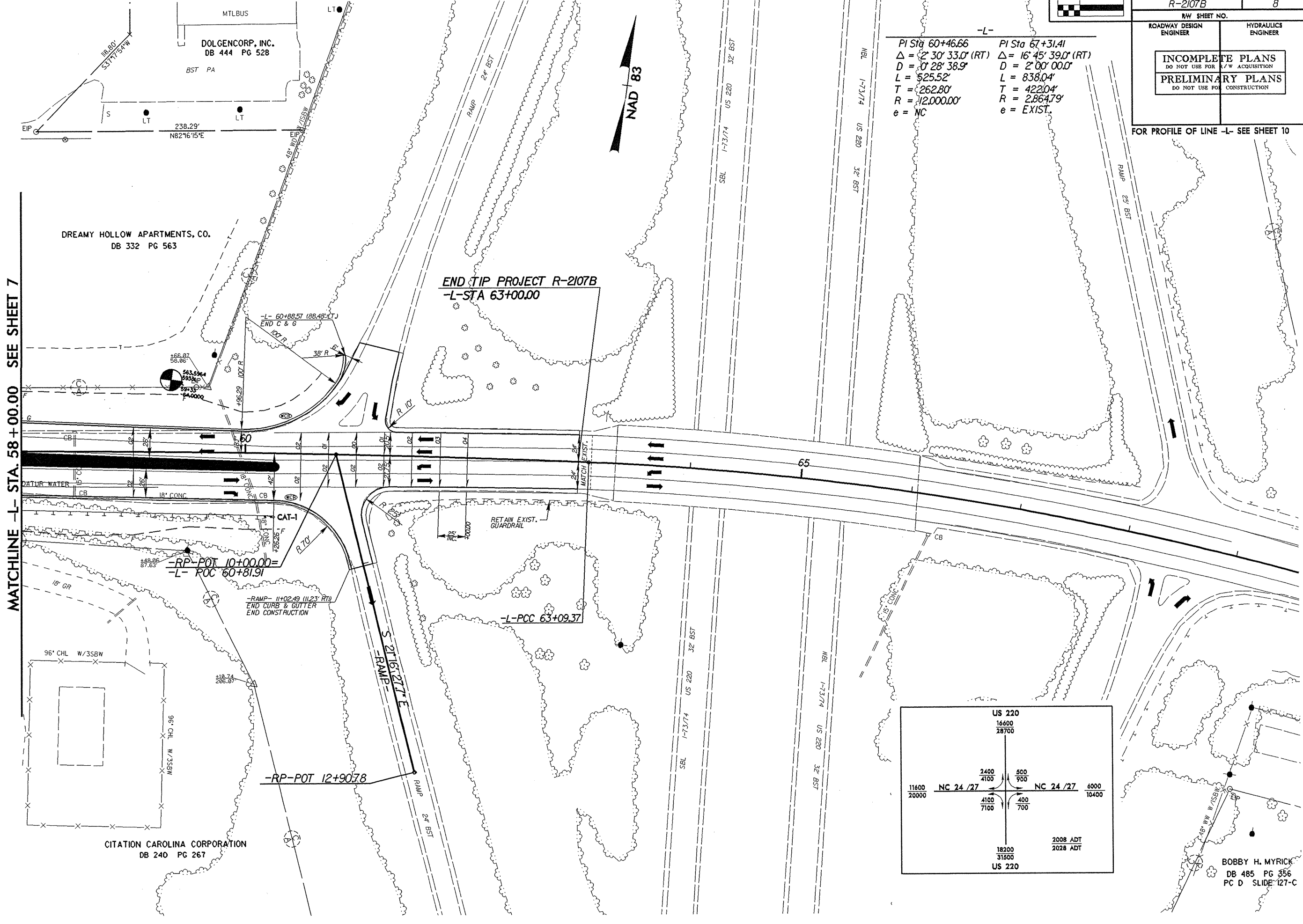
DREAMY HOLLOW APARTMENTS, CO.
DB 332 PG 563

MATCHLINE -L- STA. 58+00.00 SEE SHEET 8

REVISIONS

8/17/99

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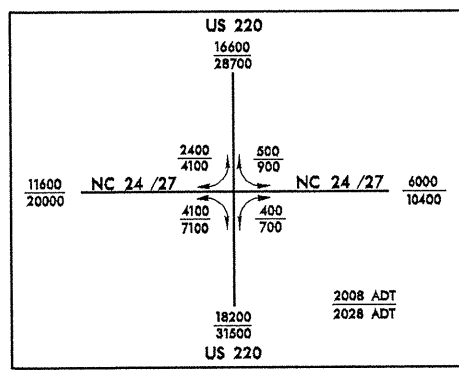
PROJECT REFERENCE NO. R-2107B	SHEET NO. 8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
FOR PROFILE OF LINE -L- SEE SHEET 10	

-L-

PI Sta 60+46.66	PI Sta 67+31.41
$\Delta = 2' 30' 33.0''$ (RT)	$\Delta = 16' 45' 39.0''$ (RT)
$D = 0' 28' 38.9''$	$D = 2' 00' 00.0''$
$L = 525.52'$	$L = 838.04'$
$T = 262.80'$	$T = 422.04'$
$R = 12,000.00'$	$R = 2,864.79'$
$e = NC$	$e = EXIST.$

MATCHLINE -L- STA. 58+00.00 SEE SHEET 7

END TIP PROJECT R-2107B
-L- STA 63+00.00



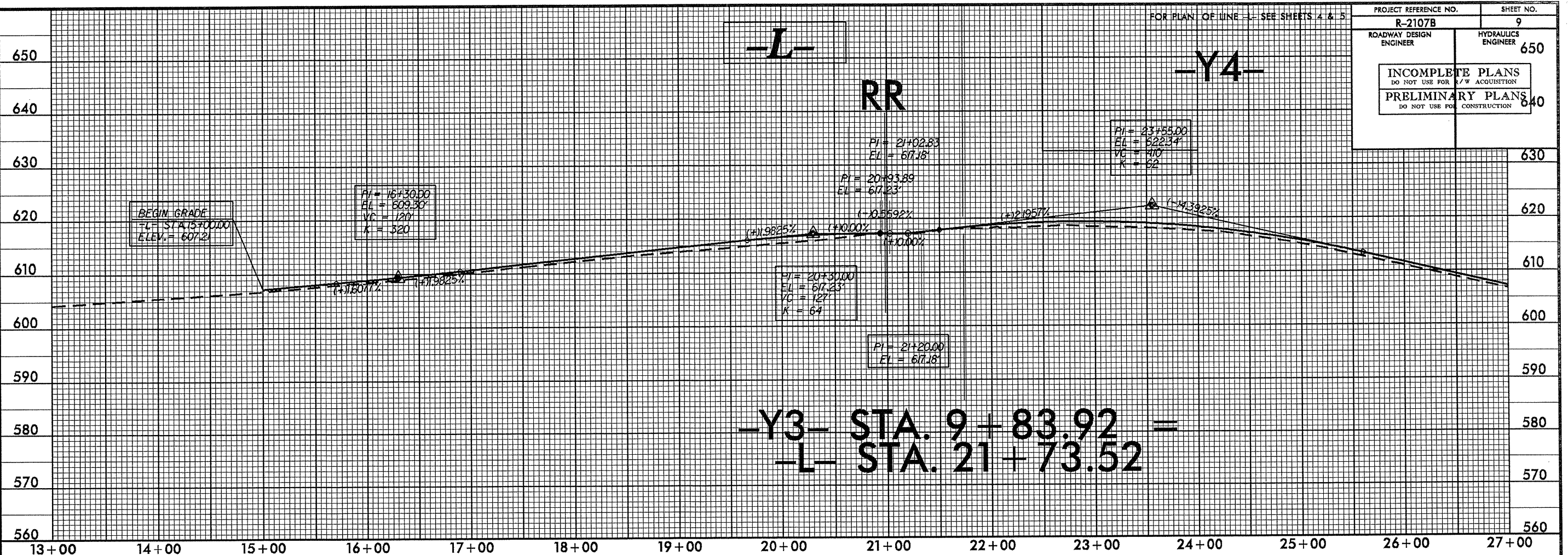
BOBBY H. MYRICK
DB 485 PG 356
PC D SLIDE 127-C

REVISIONS

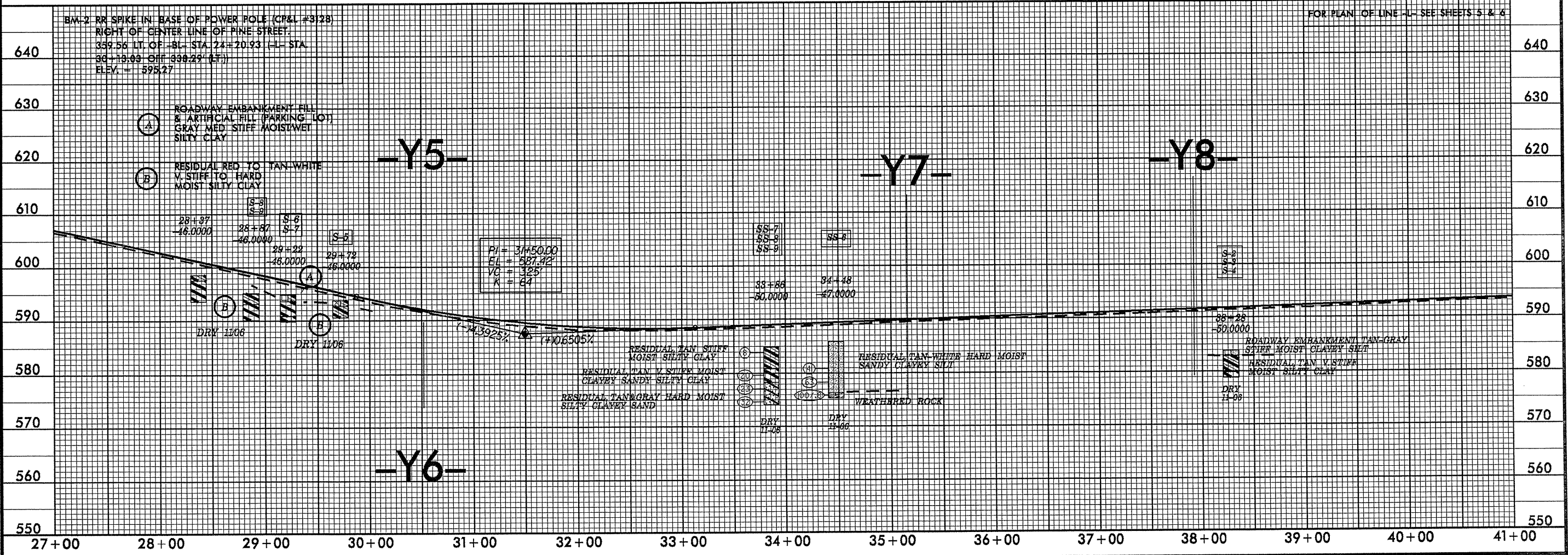
5/28/99

FOR PLAN OF LINE -L- SEE SHEETS 4 & 5

PROJECT REFERENCE NO. R-2107B	SHEET NO. 9
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



FOR PLAN OF LINE -L- SEE SHEETS 5 & 6



06-FEB-2007 09:55
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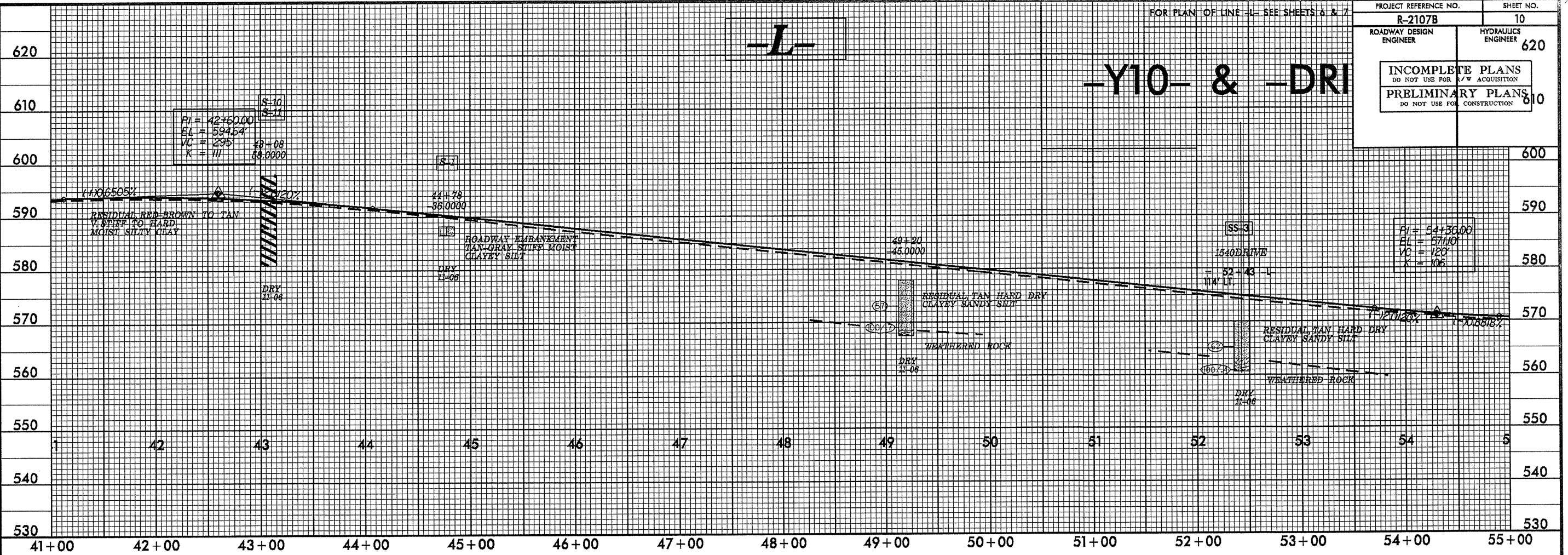
5/28/99

FOR PLAN OF LINE -L- SEE SHEETS 6 & 7

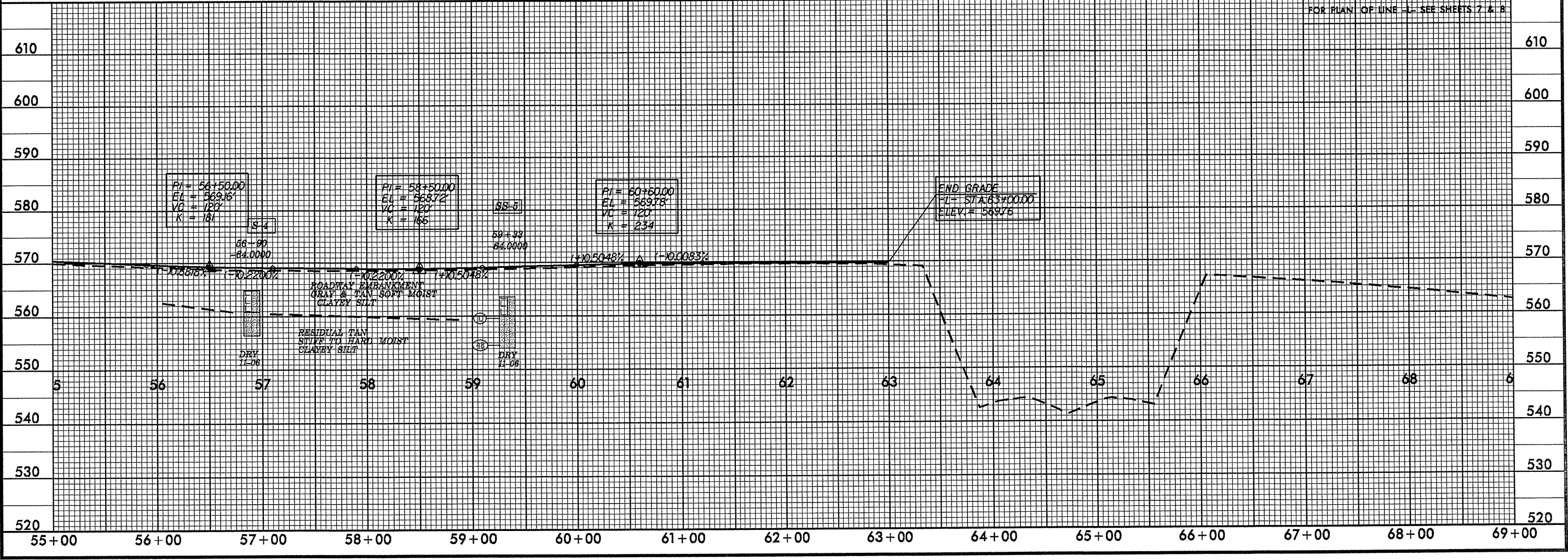
PROJECT REFERENCE NO. R-2107B	SHEET NO. 10
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER 620
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-L-

-Y10- & -DRI



FOR PLAN OF LINE -L- SEE SHEETS 7 & 8



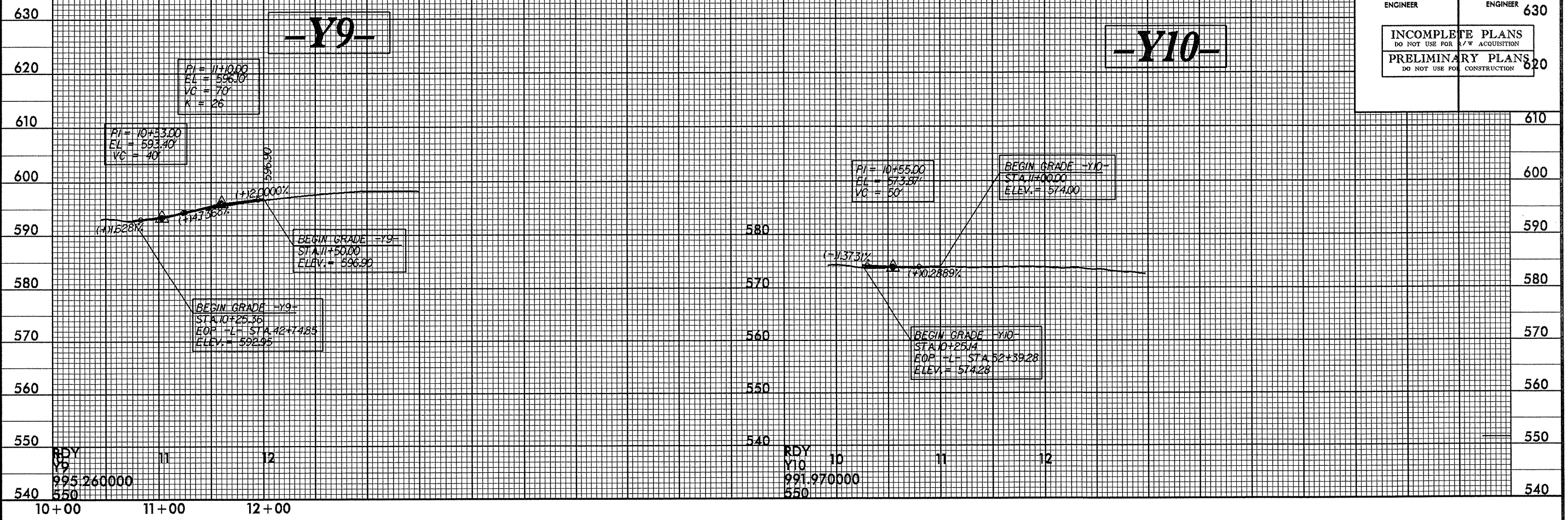
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5/28/99

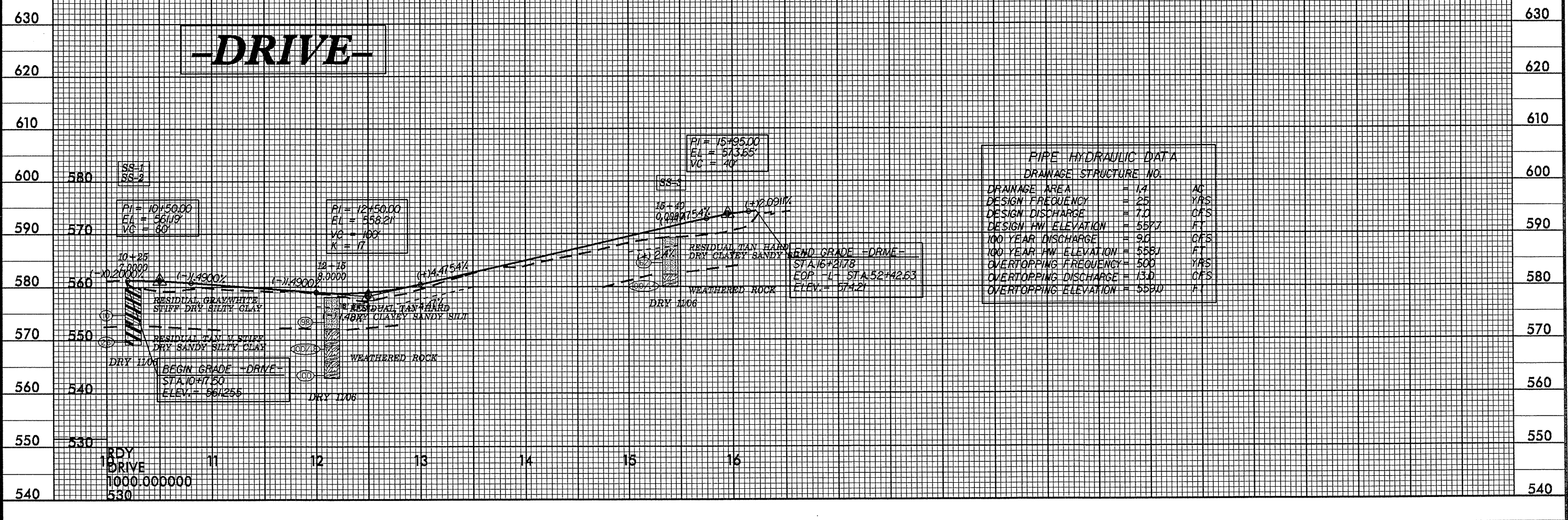
FOR PLAN OF LINE -Y9- SEE SHEET 6

FOR PLAN OF LINE -Y10- SEE SHEET 7

PROJECT REFERENCE NO. R-2107B	SHEET NO. 13
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



FOR PLAN OF LINE -DRIVE- SEE SHEET 7



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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		
S-1	36 LT	44+78	0.0-1.5	A-4(0)	22	2	5.6	8.2	66.1	20.0	84	80	75	-	-
S-S	50 LT	38+28	0.0-1.0	A-4(5)	32	6	7.0	6.0	60.9	26.1	94	89	84	-	-
S-3	50 LT	38+28	1.0-4.0	A-6(15)	40	15	3.2	3.4	51.3	42.1	94	92	89	-	-
S-4	50 LT	38+28	4.0-5.0	A-7-6(30)	56	27	1.0	5.8	39.1	54.1	100	99	95	-	-
S-5	46 LT	29+72	0.0-1.1	A-6(5)	36	12	20.2	9.6	48.1	22.0	83	71	60	-	-
S-6	46 LT	29+22	1.2-4.0	A-7-5(47)	77	42	2.0	2.2	27.7	68.1	95	94	92	-	-
S-7	46 LT	29+22	4.0-5.0	A-7-5(34)	63	33	6.4	6.0	27.5	60.1	100	95	89	-	-
S-8	46 LT	28+87	0.0-2.0	A-6(9)	38	14	14.4	7.0	36.5	42.1	89	80	72	-	-
S-9	46 LT	28+87	2.0-5.1	A-7-6(39)	63	35	1.8	5.2	30.9	62.1	100	99	95	-	-
SS-1	7 RT	10+25	4.7-5.7	A-6(12)	35	13	2.8	10.8	48.3	38.1	100	99	90	-	-
SS-2	7 RT	10+25	9.7-10.7	A-7-6(9)	43	15	16.0	19.0	38.9	26.1	92	83	64	-	-
SS-3	C/L	15+40	4.3-5.3	A-4(2)	30	9	25.1	20.8	32.1	22.0	91	75	53	-	-
S-4	64 RT	56+90	0.0-4.0	A-4(0)	25	NP	2.8	4.4	78.8	14.0	99	97	93	-	-
SS-5	64 LT	59+33	3.5-4.5	A-4(5)	35	7	13.8	16.4	45.7	24.0	100	92	74	-	-
SS-6	47 LT	34+48	4.5-5.5	A-4(4)	34	7	20.2	18.6	35.1	26.1	100	89	65	-	-
SS-7	50 LT	33+86	0.5-1.5	A-6(9)	33	12	5.2	8.4	52.3	34.1	92	89	82	-	-
SS-8	50 LT	33+86	4.7-5.7	A-7-6(8)	45	19	20.8	23.8	29.3	26.1	91	77	56	-	-
SS-9	50 LT	33+86	7.2-8.2	A-2-6(1)	36	17	42.9	14.4	18.6	24.0	75	49	34	-	-
S-10	58 RT	43+08	0.0-10.0	A-7-5(68)	93	55	0.2	0.8	22.8	76.2	100	100	99	-	-
S-11	58 RT	43+08	10.0-17.0	A-7-5(24)	50	20	0.4	4.6	46.9	48.1	100	100	97	-	-