

CONTRACT: TIP PROJECT: U-3109A

NOTE: SEE SHEET 2A 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	TOTAL SHEETS
N.C.	U-3109A	1	255
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34900.1.2	STP-119(1)	P.E.	
		RW & UTIL.	

CONTENTS

LINE	STATION	PLAN	PROFILE	XSECT
-L-	9+48 - 196+00	4-18	32-45	84-156
-NBL-	20+80 - 34+51	5	46	NONE
-SBL-	20+80 - 34+55	5	NONE	NONE
-RPA-	11+00 - 15+00	5	47	157-158
-RPA_SPUR-	12+50 - 15+00	5	48	NONE
-RPB-	11+00 - 21+90	5	49	159-160
-RPB_SPUR-	10+00 - 21+90	5	50	NONE
-RPC-	12+25 - 18+75	5	51	NONE
-RPC_SPUR-	16+65 - 19+35	5	52	161
-RPD-	10+00 - 20+25	5	53	NONE
-RPD_SPUR-	17+05 - 19+70	5	54	NONE
-Y2-	13+87 - 14+92	4	55	NONE
-Y3-	10+00 - 11+00	4	NONE	NONE
-Y5A-	10+00 - 14+95	5	56	162-164
-Y5B-	11+57 - 14+42	5	57	NONE
-Y5C-	10+00 - 11+50	19	58	NONE
-Y6-	10+00 - 28+50	6, 20, 21	59-60	165-171
-Y6A-	10+00 - 23+73	6, 20	61	172-178
-Y7-	14+00 - 31+58	6, 19	62-63	179-188
-Y7A-	10+00 - 34+00	8, 22, 23	64-65	189-199
-Y7B-	14+00 - 17+10	22	66	200
-Y8-	13+95 - 18+30	22	67	NONE
-Y9-	10+00 - 12+55	22	68	NONE
-Y10-	14+60 - 37+00	30-31	69-70	201-207
-Y11-	10+00 - 18+85	31	71	208
-Y13-	10+00 - 18+50	11, 24	72	209-211
-Y16-	11+00 - 45+37	14, 25, 26	73-75	212-224
-Y16RPA-	10+00 - 28+53	15, 26, 27	76-77	225-233
-Y19-	10+00 - 12+60	17	78	234
-Y20-	9+70 - 35+95	18, 28, 29	79-80	235-246
-Y26-	11+90 - 15+55	25	81	247-248
-DWY1-	10+00 - 12+20	6	82	NONE
-DWY2-	10+00 - 11+95	19	83	249

SUMMARY OF LAB TEST RESULTS 250-251

ROADWAY SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34900.1.2 (U-3109A) F.A. PROJ. STP-119(1)
 COUNTY ALAMANCE
 PROJECT DESCRIPTION NC 119 RELOCATION FROM I-40I-85
TO NORTH OF SR 1921 (MEBANE ROGERS ROAD/
STAGE COACH ROAD)

INVENTORY

CAUTION NOTICE

THE SUBSURFACE INFORMATION AND THE SUBSURFACE INVESTIGATION ON WHICH IT IS BASED WERE MADE FOR THE PURPOSE OF STUDY, PLANNING, AND DESIGN, AND NOT FOR CONSTRUCTION OR PAY PURPOSES. THE VARIOUS FIELD BORING LOGS, ROCK CORES, AND SOIL TEST DATA AVAILABLE MAY BE REVIEWED OR INSPECTED IN RALEIGH BY CONTACTING THE N.C. DEPARTMENT OF TRANSPORTATION, GEOTECHNICAL ENGINEERING UNIT AT (919) 707-6850. NEITHER THE SUBSURFACE PLANS AND REPORTS, NOR THE FIELD BORING LOGS, ROCK CORES, OR SOIL TEST DATA ARE PART OF THE CONTRACT.

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

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

PERSONNEL

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INVESTIGATED BY AMEC
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 DATE November, 2014

DRAWN BY: R. RAHIE

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.

AMEC Environment & Infrastructure, Inc.
 4021 STIRRUP CREEK DRIVE, SUITE 100
 DURHAM, NORTH CAROLINA 27703
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Engineering F-1253 NC Geology C-247

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

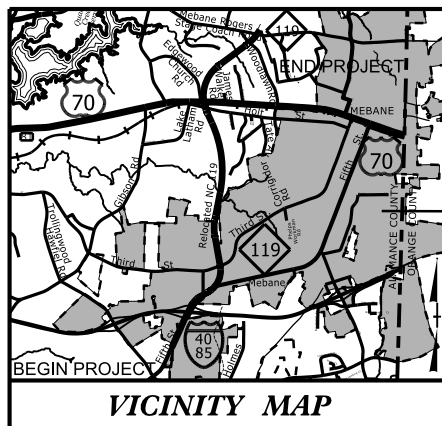
SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION	GRADATION	ROCK DESCRIPTION	TERMS AND DEFINITIONS																																																																																																																																																																																														
<p>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:</p> <p><i>VERY STIFF, GRAY, SILTY CLAY, MOST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i></p>	<p>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)</p> <p>GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES.</p> <p>THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: ANGULAR, SUBANGULAR, SUBROUNDED, OR ROUNDED.</p>	<p>HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS, IN NON-COASTAL PLAIN MATERIAL. THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK.</p> <p>ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:</p>	<p>ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER.</p> <p>AQUIFER - A WATER BEARING FORMATION OR STRATA.</p> <p>ARENACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND.</p> <p>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.</p> <p>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.</p> <p>CALCREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE.</p> <p>COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE.</p> <p>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.</p> <p>DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK.</p> <p>DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL.</p> <p>DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH.</p> <p>FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE.</p> <p>FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES.</p> <p>FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOGGED FROM PARENT MATERIAL.</p> <p>FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM.</p> <p>FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD.</p> <p>JOINT - A FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED.</p> <p>LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT.</p> <p>LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS.</p> <p>MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE.</p> <p>PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM.</p> <p>RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>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.</p> <p>SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>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.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.</p> <p>STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>STRATA ROCK QUALITY DESIGNATION (SROD) - 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.</p> <p>TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>																																																																																																																																																																																														
<p>SOIL LEGEND AND AASHTO CLASSIFICATION</p> <table border="1"> <tr> <th>GENERAL CLASS.</th> <th colspan="7">GRANULAR MATERIALS (≤ 35% PASSING #200)</th> <th colspan="7">SILT-CLAY MATERIALS (> 35% PASSING #200)</th> <th colspan="3">ORGANIC MATERIALS</th> </tr> <tr> <th>GROUP CLASS.</th> <td>A-1-a</td><td>A-1-b</td><td>A-3</td><td colspan="3">A-2</td><td>A-4</td><td>A-5</td><td>A-6</td><td>A-7</td> <td>A-1, A-2</td><td>A-3</td><td>A-4, A-5</td><td>A-6, A-7</td> <td colspan="7"></td> </tr> <tr> <th>SYMBOL</th> <td colspan="2">○○○○○○○○</td><td>○○○○○○○</td><td colspan="3">○○○○○○</td><td>○○○○○</td><td>○○○○</td><td>○○○</td><td>○○</td> <td colspan="2">▨▨▨▨▨▨</td><td colspan="2">▨▨▨▨▨▨▨▨</td><td colspan="7"></td> </tr> <tr> <th>% PASSING</th> <td>10</td><td>30</td><td>50</td><td>10</td><td>25</td><td>50</td><td>10</td><td>15</td><td>30</td><td>40</td><td>50</td><td>60</td><td>70</td><td>80</td><td>90</td><td colspan="7"></td> </tr> <tr> <th>LIQUID LIMIT PLASTIC INDEX</th> <td colspan="2">6</td><td colspan="2">NP</td><td colspan="2">40</td><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td colspan="7"></td> </tr> <tr> <th>GROUP INDEX</th> <td colspan="2">0</td><td colspan="2">0</td><td colspan="2">4</td><td>8</td><td>12</td><td>16</td><td>20</td><td colspan="7"></td> </tr> <tr> <th>USUAL TYPES OF MAJOR MATERIALS</th> <td colspan="2">STONE FRAGS, GRAVEL, AND SAND</td><td colspan="2">FINE SAND</td><td colspan="2">SILTY OR CLAYEY GRAVEL AND SAND</td><td colspan="2">SILTY SOILS</td><td colspan="2">CLAYEY SOILS</td><td colspan="7"></td> </tr> <tr> <th>GEN. RATING AS A SUBGRADE</th> <td colspan="7">EXCELLENT TO GOOD</td><td colspan="7">FAIR TO POOR</td><td colspan="3">POOR</td><td colspan="3">UNSATURABLE</td> </tr> </table> <p>PI OF A-7-5 SUBGROUP IS ≤ LL - 30 ; PI OF A-7-6 SUBGROUP IS > LL - 30</p>	GENERAL CLASS.	GRANULAR MATERIALS (≤ 35% PASSING #200)							SILT-CLAY MATERIALS (> 35% PASSING #200)							ORGANIC MATERIALS			GROUP CLASS.	A-1-a	A-1-b	A-3	A-2			A-4	A-5	A-6	A-7	A-1, A-2	A-3	A-4, A-5	A-6, A-7								SYMBOL	○○○○○○○○		○○○○○○○	○○○○○○			○○○○○	○○○○	○○○	○○	▨▨▨▨▨▨		▨▨▨▨▨▨▨▨									% PASSING	10	30	50	10	25	50	10	15	30	40	50	60	70	80	90								LIQUID LIMIT PLASTIC INDEX	6		NP		40		41	42	43	44	45	46	47	48	49								GROUP INDEX	0		0		4		8	12	16	20								USUAL TYPES OF MAJOR MATERIALS	STONE FRAGS, GRAVEL, AND SAND		FINE SAND		SILTY OR CLAYEY GRAVEL AND SAND		SILTY SOILS		CLAYEY SOILS									GEN. RATING AS A SUBGRADE	EXCELLENT TO GOOD							FAIR TO POOR							POOR			UNSATURABLE			<p>MINERALOGICAL COMPOSITION</p> <p>MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.</p>	<p>WEATHERING</p> <p>FRESH - ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING. ROCK RINGS UNDER HAMMER IF CRYSTALLINE.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>MODERATELY SEVERE (MOD. SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK.</p> <p>SEVERE (SEV.) - ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT. SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN.</p> <p>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></p> <p>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.</p>	<p>COMPRESSIBILITY</p> <p>SLIGHTLY COMPRESSIBLE - LIQUID LIMIT LESS THAN 31</p> <p>MODERATELY COMPRESSIBLE - LIQUID LIMIT EQUAL TO 31-50</p> <p>HIGHLY COMPRESSIBLE - LIQUID LIMIT GREATER THAN 50</p>	<p>PERCENTAGE OF MATERIAL</p> <table border="1"> <tr> <th>ORGANIC MATERIAL</th> <th>GRANULAR SOILS</th> <th>SILT - CLAY SOILS</th> <th>OTHER MATERIAL</th> </tr> <tr> <td>TRACE OF ORGANIC MATTER</td> <td>2 - 3%</td> <td>3 - 5%</td> <td>TRACE</td> </tr> <tr> <td>LITTLE ORGANIC MATTER</td> <td>3 - 5%</td> <td>5 - 12%</td> <td>LITTLE</td> </tr> <tr> <td>MODERATELY ORGANIC</td> <td>5 - 10%</td> <td>12 - 20%</td> <td>SOME</td> </tr> <tr> <td>HIGHLY ORGANIC</td> <td>>10%</td> <td>>20%</td> <td>HIGHLY</td> </tr> </table>	ORGANIC MATERIAL	GRANULAR SOILS	SILT - CLAY SOILS	OTHER MATERIAL	TRACE OF ORGANIC MATTER	2 - 3%	3 - 5%	TRACE	LITTLE ORGANIC MATTER	3 - 5%	5 - 12%	LITTLE	MODERATELY ORGANIC	5 - 10%	12 - 20%	SOME	HIGHLY ORGANIC	>10%	>20%	HIGHLY	<p>GROUND WATER</p> <p>WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING</p> <p>STATIC WATER LEVEL AFTER 24 HOURS</p> <p>PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA</p> <p>SPRING OR SEEP</p>	<p>MISCELLANEOUS SYMBOLS</p> <p>ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION</p> <p>SOIL SYMBOL</p> <p>ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT</p> <p>INFERRED SOIL BOUNDARY</p> <p>INFERRED ROCK LINE</p> <p>ALLUVIAL SOIL BOUNDARY</p> <p>DIP & DIP DIRECTION OF ROCK STRUCTURES</p> <p>SOUNDING ROD</p> <p>TEST BORING W/ CORE</p> <p>SPT N-VALUE</p> <p>SPT REFUSAL</p> <p>MONITORING WELL</p> <p>PIEZOMETER INSTALLATION</p> <p>SLOPE INDICATOR INSTALLATION</p> <p>CONE PENETROMETER TEST</p>	<p>ROCK HARDNESS</p> <p>VERY HARD - CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.</p> <p>HARD - CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.</p> <p>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.</p> <p>MEDIUM HARD - CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PEICES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK.</p> <p>SOFT - CAN BE GROVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE.</p> <p>VERY SOFT - CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGERNAIL.</p>	<p>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.</p> <p>RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK.</p> <p>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.</p> <p>SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK.</p> <p>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.</p> <p>SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE.</p> <p>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS (IN OR BPF) OF A 140 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS.</p> <p>STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE.</p> <p>STRATA ROCK QUALITY DESIGNATION (SROD) - 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.</p> <p>TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.</p>
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GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.</p> <p>MODERATELY INDURATED - GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.</p> <p>INDURATED - GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.</p> <p>EXTREMELY INDURATED - SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.</p>	<p>BENCH MARK: BORING ELEVATIONS OBTAINED FROM TIN FILE PROVIDED BY NCDOT.</p> <p>ELEVATION: _____ FT.</p> <p>NOTES:</p> <p>FIAD - FILLED IMMEDIATELY AFTER DRILLING</p> <p>W - WATER WELL</p>	
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09/08/99

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

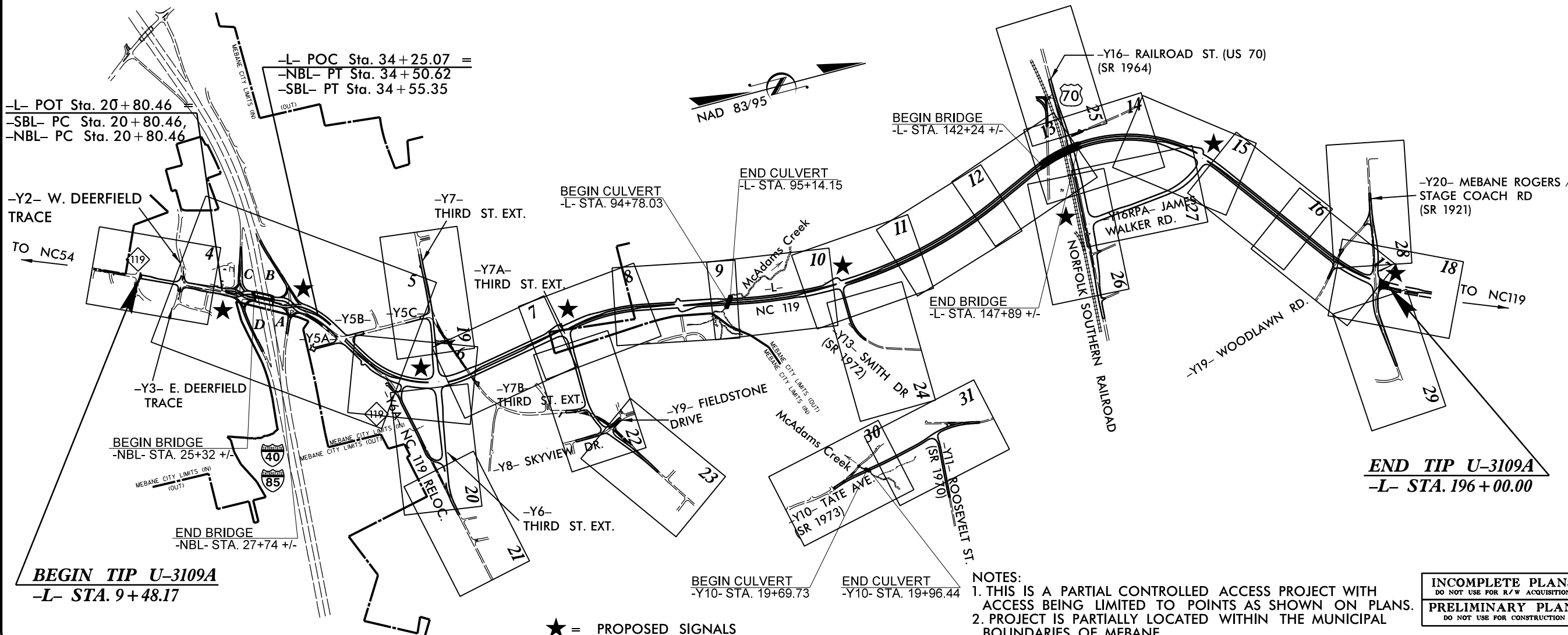
ALAMANCE COUNTY

LOCATION: NC 119 RELOCATION FROM I-40 /85 TO NORTH OF SR 1921
(MEBANE ROGERS ROAD /STAGE COACH ROAD)

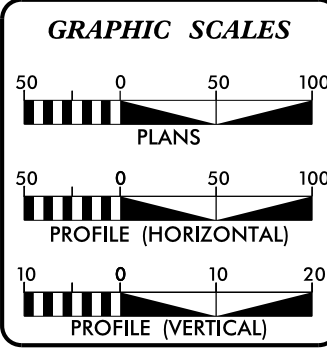
TYPE OF WORK: GRADING, PAVING, DRAINAGE, STRUCTURES, AND SIGNALS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-3109A	2A	255
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34900.1.2	STP-119(1)	PE	

TIP PROJECT: U-3109A



CONTRACT:



DESIGN DATA

ADT 2015 =	32,600
ADT 2035 =	59,267
DHV =	10 %
D =	60 %
T =	6 % *
V =	50 MPH
* TTST 2% DUAL 4%	
FUNC CLASS =	
URBAN COLLECTOR	
REGIONAL TIER	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-3109A	3.378 mi
LENGTH STRUCTURE TIP PROJECT U-3109A	0.160 mi
TOTAL LENGTH OF TIP PROJECT U-3109A	3.538 mi

PLANS PREPARED BY:

Baker

Michael Baker Engineering, Inc.
5550 Seventy-Seven Center Drive, Suite 320
Charlotte, NC 28217
Professional Corporation License Number:
F-1084

DIVISION OF HIGHWAYS

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPTEMBER 20, 2013

LETTING DATE:
DECEMBER 15, 2015

DAVID L. WILVER, P.E.
PROJECT ENGINEER

WARREN JOHNSON
PROJECT DESIGN ENGINEER

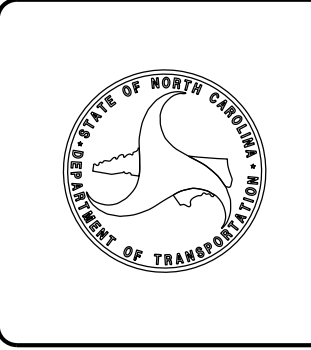
NCDOT CONTACT:
BRENDA L. MOORE, P.E.
PROJECT ENGINEER - ROADWAY DESIGN

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.



03-NOV-2014 12:12 C:\Users\royar\Desktop\U3109A_GEO_FDWY_AMEC\CADD_GEO\TECH\PlanPr of U3109A_GEO Inv_TSH.dgn royar\rahle AT DGT960

November 3, 2014

STATE PROJECT: 34900.1.2 (U-3109A)
 F.A. NUMBER: STP-119(1)
 COUNTY: Alamance
 DESCRIPTION: NC 119 Relocation from I-40/I-85 to North of SR 1921 (Mebane Rogers Road/Stage Coach Road)
 SUBJECT: Geotechnical Inventory

Project Description

The project consists of a proposed 3.538-mile, widening and realignment of the existing NC 119 located in Alamance County near and in the Town of Mebane, North Carolina. The purpose of this project is to realign NC 119 around the Town of Mebane, North Carolina.

The existing NC 119 will be widened from 2 to 4 lanes from the beginning of the project to north of its intersection with Holmes Road (-Y5-) near Station 45+00 -L-. Within this section, a Diverging Diamond Interchange (DDI) is planned at the NC 119 and I-40/I-85 interchange. As part of the DDI, a new bridge over I-40/I-85 is planned for the north bound lane from approximate station 25+32 -NBL- to 27+74 -NBL-. The remainder of the main line (-L-) will be a 4-lane highway on new alignment. The new alignment will extend from existing NC 119 near -L- station 45+00 and intersect Third Street Extension (-Y7-), cross over Holt Road and US 70 (-Y16-), intersect Woodlawn Road (-Y19-) and intersect Mebane Rogers/Stage Coach Road (-Y20-) and end just north of Mebane Rogers/Stage Coach Road. A culvert is planned at McAdams Creek on the new alignment at approximate station -L- 95+00. A bridge to cross Holt Road and US 70 (-Y16-) is planned on the main alignment from approximate station -L- 142+24 to 147+89.

The -Y2-, -Y3-, -Y5A-, -Y5B-, -Y6-, -Y6A-, -Y7-, -Y7A-, -Y13-, -Y16RPA-, -Y19- and -Y20- alignments are planned to be improved, widened and/or realigned and tied into the main line (-L-). The -Y16- alignment will be slightly realigned and widened. Improvements are planned for the -Y5C-, -Y7B-, -Y8-, -Y9- and -Y26- alignments and the ramps at the NC 119 and I-40/I-85 interchange. New driveway alignments DWY1 and DWY2 are also planned for the project.

The -Y10- and -Y11- alignments are not connected to the mainline (-L-) and are located in the vicinity of the Town of Mebane's Waste Water Treatment Plant and other Town of Mebane related buildings. The -Y10- alignment will connect Corrigidor Street to Tate Avenue. The -Y11- alignment intersects the -Y10- alignment near Station 30+25 -Y10- and connects the -Y10- alignment to Roosevelt Street.

The geotechnical field investigation was conducted from May to August 2013. A CME-55 drill rig mounted on an all-terrain carrier and a track mounted CME-55LC drill rig, equipped with automatic hammers, were used to advance borings for the subsurface investigation. Hollow stem auger drilling procedures was used to advance borings to the required depths. Standard Penetration Tests were performed at selected boring locations. Hand auger borings and bridge rod soundings were performed in areas that could not be accessed with drilling equipment due to overhead utilities, wet/soft areas and on steep slopes. Representative soil samples were collected for visual classification in the field and selected samples were submitted for laboratory analysis.

The following alignments, totalling approximately 8.6 miles, were investigated. Subsurface profiles and/or cross sections of these alignments are included in this report.

<u>Line</u>	<u>Stations(±)</u>
-L-	9+48 to 196+00
-NBL-	20+80 to 34+51
-SBL-	20+80 to 34+55
-RPA-	11+00 to 15+14
-RPA SPUR-	12+50 to 15+20
-RPB-	11+00 to 21+94
RPB SPUR	10+00 to 12+97
-RPC-	12+25 to 18+77
-RPC SPUR-	16+63 to 19+39
-RPD-	10+00 to 20+29
-RPD SPUR-	17+06 to 19+71
-Y2-	13+87 to 14+92
-Y5A-	10+17 to 14+96
-Y5B-	11+57 to 14+42
-Y5C-	10+00 to 11+50
-Y6-	10+15 to 28+25
-Y6A-	10+15 to 23+73
-Y7-	14+00 to 31+58
-Y7A-	10+00 to 34+00
-Y7B-	14+00 to 17+13
-Y8-	13+98 to 18+32
-Y9-	10+00 to 12+55
-Y10-	14+60 to 36+50
-Y11-	10+00 to 18+85
-Y13-	10+00 to 18+50
-Y16-	12+21 to 45+37
-Y16RPA-	10+00 to 28+53
-Y19-	10+00 to 12+60
-Y20-	12+00 to 35+95
-Y26-	10+25 to 17+21
-DWY1-	10+00 to 12+24
-DWY2-	10+00 to 11+95

Areas of Special Geotechnical Interest

- 1) Highly Plastic Clays: Highly plastic clays (PI > 25) were encountered on the project at the following locations:

<u>Line</u>	<u>Stations(±)</u>
-L-	9+48 to 49+30
-L-	49+30 to 62+60
-L-	65+55 to 69+70
-L-	72+25 to 77+70
-L-	79+65 to 85+20
-L-	86+55 to 94+25
-L-	98+75 to 107+65
-L-	113+50 to 124+95
-L-	127+05 to 133+00
-L-	134+15 to 155+15
-L-	163+40 to 167+75
-L-	171+55 to 178+70
-L-	180+45 to 196+00
-NBL-	20+80 to 34+51
-SBL-	20+80 to 34+55
-RPA-	11+00 to 15+14
-RPB-	15+70 to 17+95
-RPB SPUR-	10+00 to 12+97
-RPC SPUR-	16+63 to 19+39
-Y5A-	10+17 to 14+96
-Y5B-	11+57 to 14+42
-Y6-	10+15 to 14+00
-Y6-	17+70 to 28+25
-Y6A-	13+55 to 15+15
-Y6A-	17+15 to 23+73
-Y7-	14+00 to 31+58
-Y7A-	12+10 to 13+65
-Y7A-	17+75 to 22+45
-Y7A-	25+00 to 28+65
-Y7A-	32+50 to 34+00
-Y7B-	14+00 to 17+13
-Y9-	10+00 to 12+55
-Y10-	22+20 to 27+25
-Y16-	18+60 to 41+75
-Y16RPA-	10+00 to 18+30
-Y16RPA-	26+70 to 28+53
-Y19-	10+00 to 12+60
-Y20-	10+00 to 28+75
-Y20-	29+50 to 32+00
-Y26-	10+25 to 17+21
-DWY1-	10+80 to 12+20
-DWY2-	10+00 to 11+95

Most of the soils encountered along the proposed alignments within the upper three to five feet were visually classified as a red silty clay and are moderately to highly plastic (PI greater than 25).

- 2) Alluvial and Wet Loose/Soft Soil Areas: Alluvial soils and wet residual soils which have very soft to soft consistencies or very loose relative densities were encountered on the project and may impact subgrade or embankment construction. These soils were found at the following locations:

<u>Line</u>	<u>Stations(±)</u>	<u>Offsets (ft)</u>
-L-	62+80 – 65+70	LT to RT
-L-	70+05 – 73+40	LT to RT
-L-	78+10 – 79+90	LT
-L-	85+05 – 86+75	LT to RT
-L-	94+05 – 97+80	LT to RT
-L-	108+30 – 111+50	LT to RT
-L-	125+90 – 126+80	LT to RT
-L-	162+00 – 162+65	LT to RT
-L-	178+80 – 180+35	LT to RT
-Y7A-	10+00 – 11+70	LT to RT
-Y7A-	28+85 – 29+10	RT
-Y10-	19+30 – 20+10	LT to RT
-Y10-	20+20 – 21+50	LT to RT
-Y10-	28+40 – 31+30	LT to RT
-Y10-	33+35 – 33+80	LT to RT
-Y11-	10+00 – 10+80	LT to RT
-Y13-	10+00 – 11+70	LT to RT
-Y16RPA-	25+50 – 26+30	LT to RT
-Y20-	33+55 – 34+30	LT to RT

- 3) Crystalline Rock: The crystalline rock on this project consists of meta-volcanic rock and was encountered within 6 feet of proposed grade at the following location:

<u>Line</u>	<u>Stations(±)</u>	<u>Offsets (ft)</u>
-Y16RPA-	22+25 to 23+75	75 LT to 85 LT

- 4) Groundwater: The following areas exhibit high water table, seasonal high groundwater or the potential for groundwater related construction problems:

<u>Line</u>	<u>Stations(±)</u>
-L-	88+50 to 93+00
-L-	97+50 to 98+50
-L-	112+50 to 122+00
-Y10-	25+50-29+50
-Y16RPA-	21+00 to 23+50
-Y20-	19+00 to 21+00

- 5) Ponds/Surface Water: Six ponds occur on or within close proximity of right of way at the following locations:

<u>Line</u>	<u>Stations(±)</u>	<u>Offsets (ft)</u>
-L-	77+68 to 81+40	30 LT to 425 LT
-L-	91+40 to 92+55	105 LT to 130 LT
-L-	156+80 to 157+40	135 LT to 260 LT
-Y7-	20+30 to 25+60	230 LT to 330 LT
-Y16RPA-	18+30 to 19+80	255 LT to 370 LT
-Y13-	13+00 to 14+70	55 RT to 250 RT

- 6) Artificial Fill: Artificial fill was identified at the following locations:

<u>Line</u>	<u>Stations(±)</u>	<u>Offsets (ft)</u>
-L-	36+40 to 38+80	80 LT to 25 RT
-L-	39+60 to 45+50	100 LT to 5 RT
-L-	88+55 to 89+20	110 LT to 35 RT
-L-	89+25 to 89+80	40 RT to 70 RT
-Y6-	15+00 to 15+70	65 LT to 80 RT
-Y7A-	13+55 to 22+05	50 LT to 50 RT

Several smaller areas of artificial fill are present throughout the project corridor, and are mostly related to gravel and soil driveways.

- 7) Water wells/Monitoring Wells: Several water wells and monitoring wells were found within or in close proximity to the proposed right of way at the following locations:

<u>Line</u>	<u>Stations(±)</u>	<u>Type of Well</u>
-L-	49+28, 31 RT	Water Well
-L-	48+87, 32 LT	Water Well
-L-	156+58, 23 LT	Water Well
-Y6-	22+66, 101 LT	Water Well
-Y6-	18+99, 102 RT	Water Well
-Y6A-	19+59, 125 LT	Water Well
-Y7-	26+29, 47 RT	Water Well
-Y7-	28+25, 100 RT	Water Well
-L-	69+68, 38 LT	Monitoring Well
-L-	69+77, 26 LT	Monitoring Well
-L-	69+23, 44 RT	Monitoring Well
-L-	67+94, 130 RT	Monitoring Well
-L-	67+68, 136 RT	Monitoring Well
-L-	69+41, 101 RT	Monitoring Well

-L-	71+30, 50 LT	Monitoring Well
-L-	75+53, 43 RT	Monitoring Well
-L-	62+70, 65 RT	Monitoring Well
-L-	73+18, 5 LT	Monitoring Well
-L-	71+90, 219 RT	Monitoring Well
-L-	70+94, 76 RT	Monitoring Well
-L-	68+67, 117 RT	Monitoring Well
-Y10-	20+79, 28 LT	Monitoring Well

The above wells were found during our subsurface exploration. Additional wells may be located on or in close proximity of the proposed right of way.

Physiography and Geology

The project is located in the central Piedmont Physiographic Province. The topography is nearly flat to gently rolling. The elevation along the project corridor ranges from 565± to 680± feet. The project traverses commercial property, residential dwellings, wooded areas, agricultural fields and pastures. The beginning of the project consists mainly of commercial property and some residential dwellings. The middle of the project mainly traverses through wooded areas and agricultural fields. The highest concentration of single family dwellings is near the end of the project in the vicinity of -Y19- and -Y20-. The -Y10- and -Y11- alignments traverse the Town of Mebane's Waste Water Treatment Facilities property and wooded areas. The alignments cross several drainage features including creeks, ditches and ponds.

Geologically, the project is located within the Carolina Slate Belt. Soils within the Slate Belt are mostly derived from in-place weathering of the underlying metamorphosed volcanic rock. Rocks in the Carolina Slate Belt can be foliated and generally trend in a northeasterly direction.

Soil Properties

Soils encountered during this investigation are separated into four categories based on origin, including roadway embankment fill, artificial fill, alluvial and residual soils.

Roadway embankment soils are present along existing NC 119 (-L-) and all of the -Y- alignments except for -Y16RPA- and -Y11-. Based on borings performed in the roadway embankment, these soils consist of medium stiff to stiff, moist, red, orange, brown and tan, silty clay with trace fine sand, fine sandy silt and clayey silt (A-7-5, A-7-6, A-4). The plasticity Index of tested soils ranged from 21 to 37.

Artificial fill soils are present at the locations listed above. The artificial fill shown on the -L- alignment appears to be isolated areas of disturbed residual soil placed for use at commercial parking areas and at the outparcel for a shopping center. The artificial fill encountered on -Y6- appears to be backfill associated with a possible filled in pond. The area of artificial fill on -Y7A- appears to be a privacy berm likely created to separate the adjacent apartments from the Post Office. Soils used to create the berm may consist of a mix of suitable and unsuitable materials left over from site grading of the adjacent apartments or the post office. Materials used to create the berm were likely not compacted to a specified density. The artificial fill soils consist of very soft to very stiff, reddish orange, gray, orange, brown, red-brown, moist, yellow-brown, silty clay (A-7-5/A-7-6) with trace fine to coarse sand. Trace amounts of organic matter and rock fragments were encountered in the artificial fill on the -Y7A- alignment. The artificial fill soils associated with the possible pond on -Y6- consists of very soft to soft silty

clay (A-7-5/A-7-6). These soils were wet or saturated and portions of the area were observed to have standing water at the time of our field work. The plasticity Index of tested soils ranged from 16 to 39.

Alluvial soils were identified associated with the creeks and drainage features noted above. Alluvial soils encountered consist of very soft to medium stiff, moist to saturated, tan, brown, gray, light brown silty clay with trace fine sand, silty clay and clayey silt (A-7-6, A-7-5, A-6, A-5, A-4). Trace amounts of organic matter and gravel were observed in the alluvial soils. The plasticity Index of tested soils ranged from 10 to 15.

Residual soils comprise the majority of the soils identified along the investigated proposed alignments. Residual soils mostly consist of medium stiff to hard, dry to wet, red, orange, red-orange, orange-brown, brown, tan and gray silty clay with trace of fine sand, clayey silts and fine sandy silts (A-7-5, A-7-6, A-6, A-5, A-4). Medium dense to very dense, brown and gray, silty sand and clayey sand (A-2-4/A-2-6) with trace rock fragments was encountered above the weathered rock at some locations. Laboratory testing of selected fine grained samples determined plastic indices ranging from 3 to 52. At depth, the residual soils may be saprolitic.

Soils at this project were observed to have high fines contents with most fine grained soils having greater than 90% passing the U.S. No. 200 sieve. Laboratory testing of selected fine grained samples determined the percent passing the No. 200 sieve ranging from 62.9% to 99.4%.

Rock Properties

Weathered rock and crystalline rock occur in several areas of the project. The weathered rock is derived from the underlying meta-volcanic bedrock and was encountered at depths ranging from approximately 2 to 55 feet below the existing ground surface. The elevation of weathered rock encountered in the borings ranged from approximately 572 feet to 630 feet. Crystalline rock occurs within six feet of proposed grade in the areas listed above. Crystalline bedrock encountered consists of gray to brown and tan meta-volcanic rock. The elevation of crystalline rock encountered in the borings ranged from approximately 566 feet to 623 feet.

Groundwater

Groundwater information was limited as many borings either did not penetrate the water table or caved-in above the water table immediately after drilling. Groundwater was found to be nearest the ground surface in the lowland areas. Where encountered, depths to groundwater ranged from the existing ground surface to approximately 32 feet below the existing ground surface. The elevation of groundwater encountered in the borings ranged from approximately 578 feet to 626 feet.

Ponds

Six ponds are present on or in close proximity of the proposed right of way. The locations are listed above. A pond survey was not completed as part of this investigation as directed by the NCDOT. Approximately 2 feet or less of alluvial very soft muck is anticipated at the bottom of these ponds.

Prepared by,

J. Shane Johnson
J. Shane Johnson, P.E., P.G.
Senior Geotechnical Engineer



Sharat Gollamudi 11/3/14
Sharat Gollamudi, P.E.
Senior Geotechnical Engineer

UNDISTURBED SAMPLES

The following Undisturbed sample was taken for tests to determine the engineering properties of the soil:

<u>Sample No.</u>	<u>Location</u>	<u>Depth (ft)</u>	<u>Test</u>
ST-1	-L-, 109+50, CL	2.0-4.0	Not tested

PROJECT REFERENCE NO.	SHEET NO.
U-3109A	4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-Y2-
 PI Sta 13+14.89
 $\Delta = 24' 12' 39.3"$ (RT)
 $D = 18' 39' 47.2"$
 $L = 129.73'$
 $T = 65.85'$
 $R = 307.00'$

-L-

PI Sta 17+45.94	PI Sta 22+13.49
$\Delta = 1' 33' 56.6"$ (LT)	$\Delta = 4' 20' 48.0"$ (RT)
$D = 0' 28' 38.9"$	$D = 0' 42' 58.3"$
$L = 327.92'$	$L = 606.91'$
$T = 163.97'$	$T = 303.60'$
$R = 12,000.00'$	$R = 8,000.00'$
$Ds = 50$ mph	$Ds = 50$ mph
SE = NC	SE = NC

-Y3-
 PI Sta 12+53.15
 $\Delta = 28' 56' 43.7"$ (RT)
 $D = 13' 19' 28.6"$
 $L = 217.23'$
 $T = 110.99'$
 $R = 430.00'$

BEGIN TIP PROJECT U-3109A
-L- POT Sta. 9+48.17

BEGIN CONSTRUCTION
-Y2- POT Sta.13+87.26

-Y3- POT Sta.10+00.00 =
-L- POT Sta.15+15.86

-Y2- POT Sta.14+92.23 =
-L- POT Sta.15+21.28

PC Sta. 15+81.97

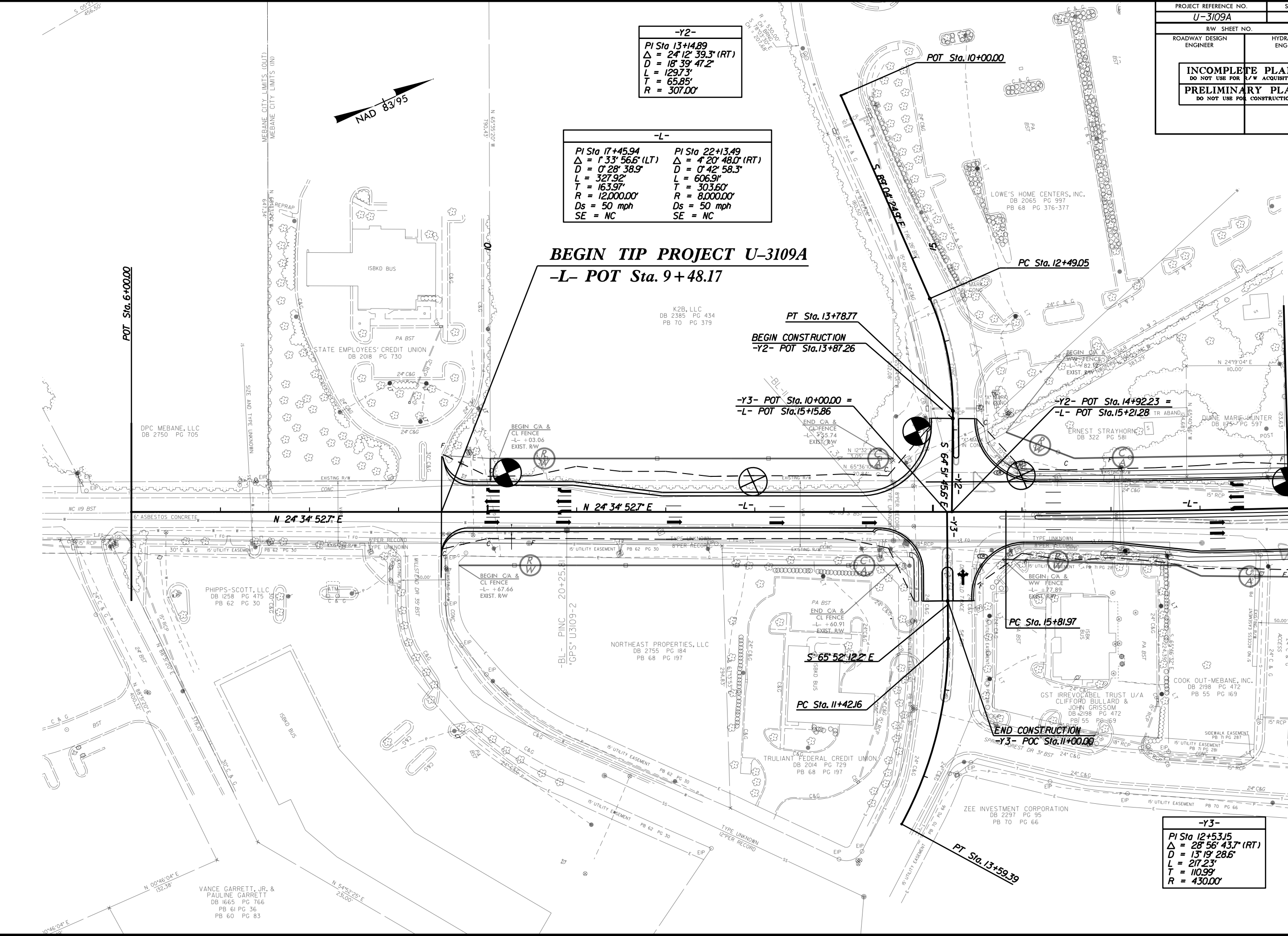
PC Sta. 11+42.16

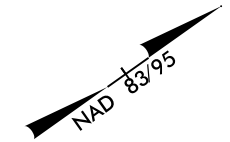
END CONSTRUCTION
-Y3- POT Sta.11+00.00

PT Sta. 13+59.39

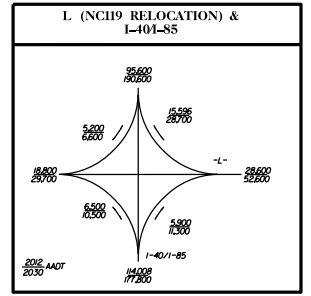
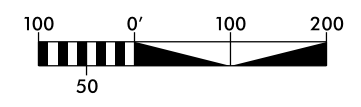
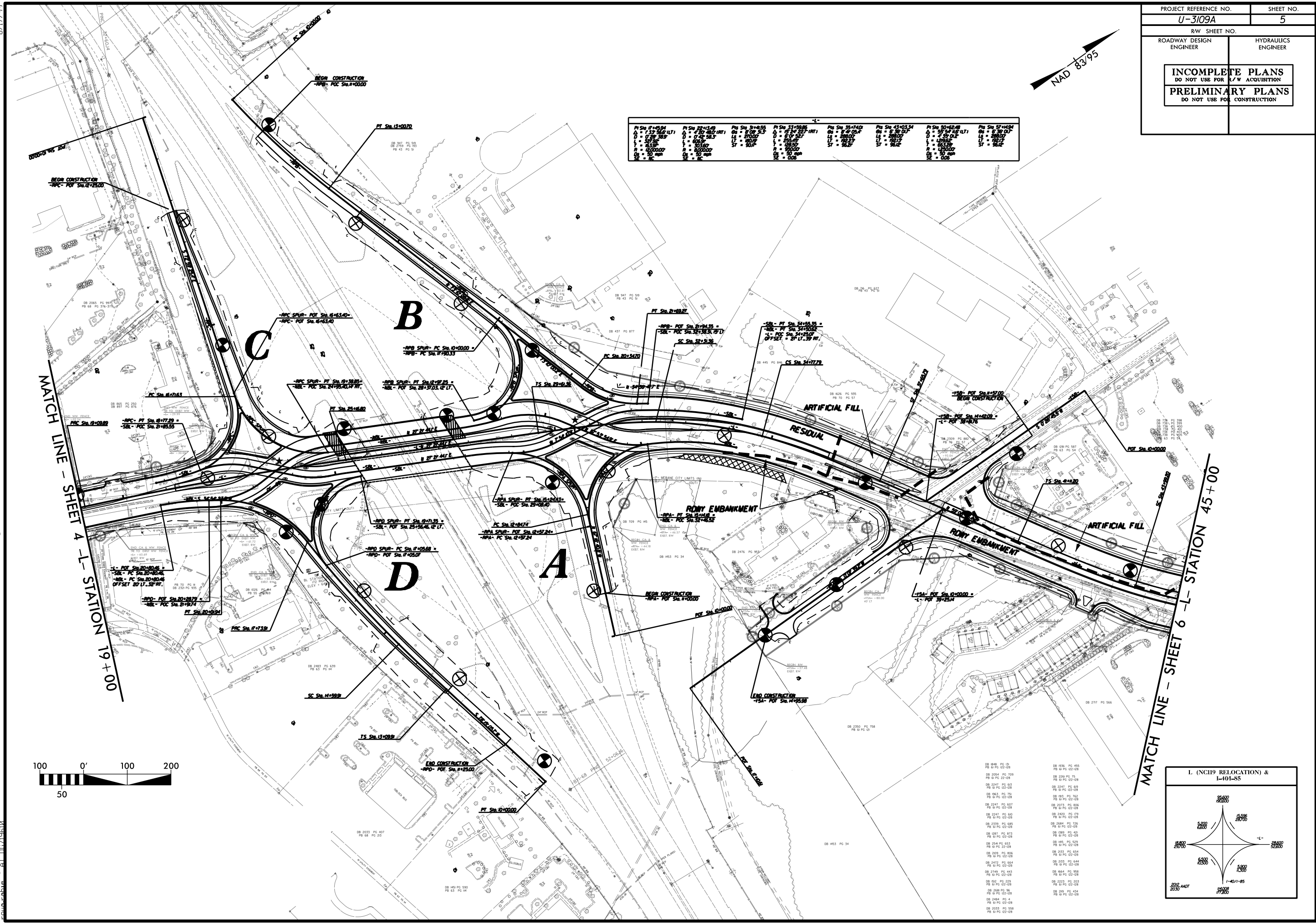
MATCH LINE - SHEET 5 -L- STATION 19+00

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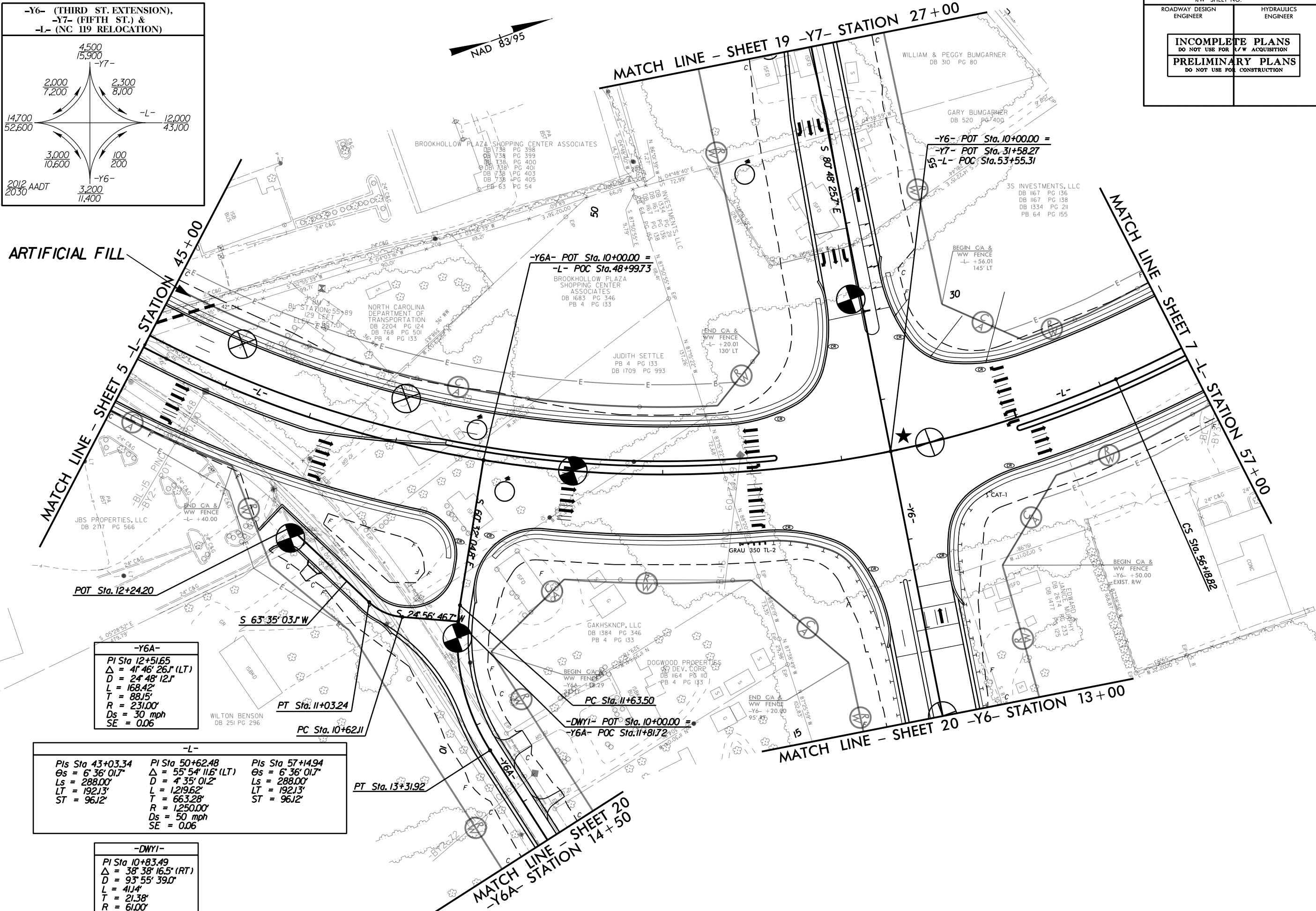
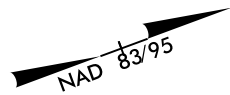
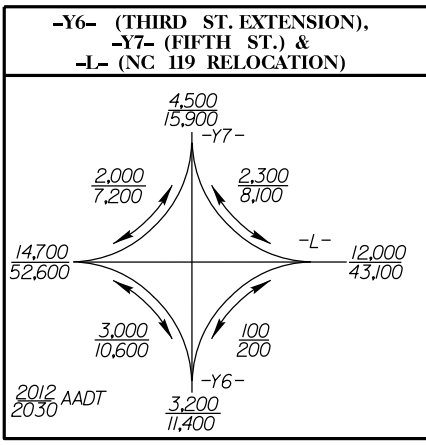




PC Sta 11+00.00 PT Sta 11+00.00 Δ = 0.00 L = 0.00 T = 0.00 S = 0.00 SE = 0.00	PC Sta 12+00.00 PT Sta 12+00.00 Δ = 0.00 L = 0.00 T = 0.00 S = 0.00 SE = 0.00	PC Sta 13+00.00 PT Sta 13+00.00 Δ = 0.00 L = 0.00 T = 0.00 S = 0.00 SE = 0.00	PC Sta 14+00.00 PT Sta 14+00.00 Δ = 0.00 L = 0.00 T = 0.00 S = 0.00 SE = 0.00	PC Sta 15+00.00 PT Sta 15+00.00 Δ = 0.00 L = 0.00 T = 0.00 S = 0.00 SE = 0.00	PC Sta 16+00.00 PT Sta 16+00.00 Δ = 0.00 L = 0.00 T = 0.00 S = 0.00 SE = 0.00	PC Sta 17+00.00 PT Sta 17+00.00 Δ = 0.00 L = 0.00 T = 0.00 S = 0.00 SE = 0.00	PC Sta 18+00.00 PT Sta 18+00.00 Δ = 0.00 L = 0.00 T = 0.00 S = 0.00 SE = 0.00	PC Sta 19+00.00 PT Sta 19+00.00 Δ = 0.00 L = 0.00 T = 0.00 S = 0.00 SE = 0.00
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-Y6A-
 PI Sta 12+51.65
 $\Delta = 41^\circ 46' 26.1\"$ (LT)
 $D = 24^\circ 48' 12.1\"$
 $L = 168.42'$
 $T = 88.15'$
 $R = 231.00'$
 $Ds = 30$ mph
 $SE = 0.06$

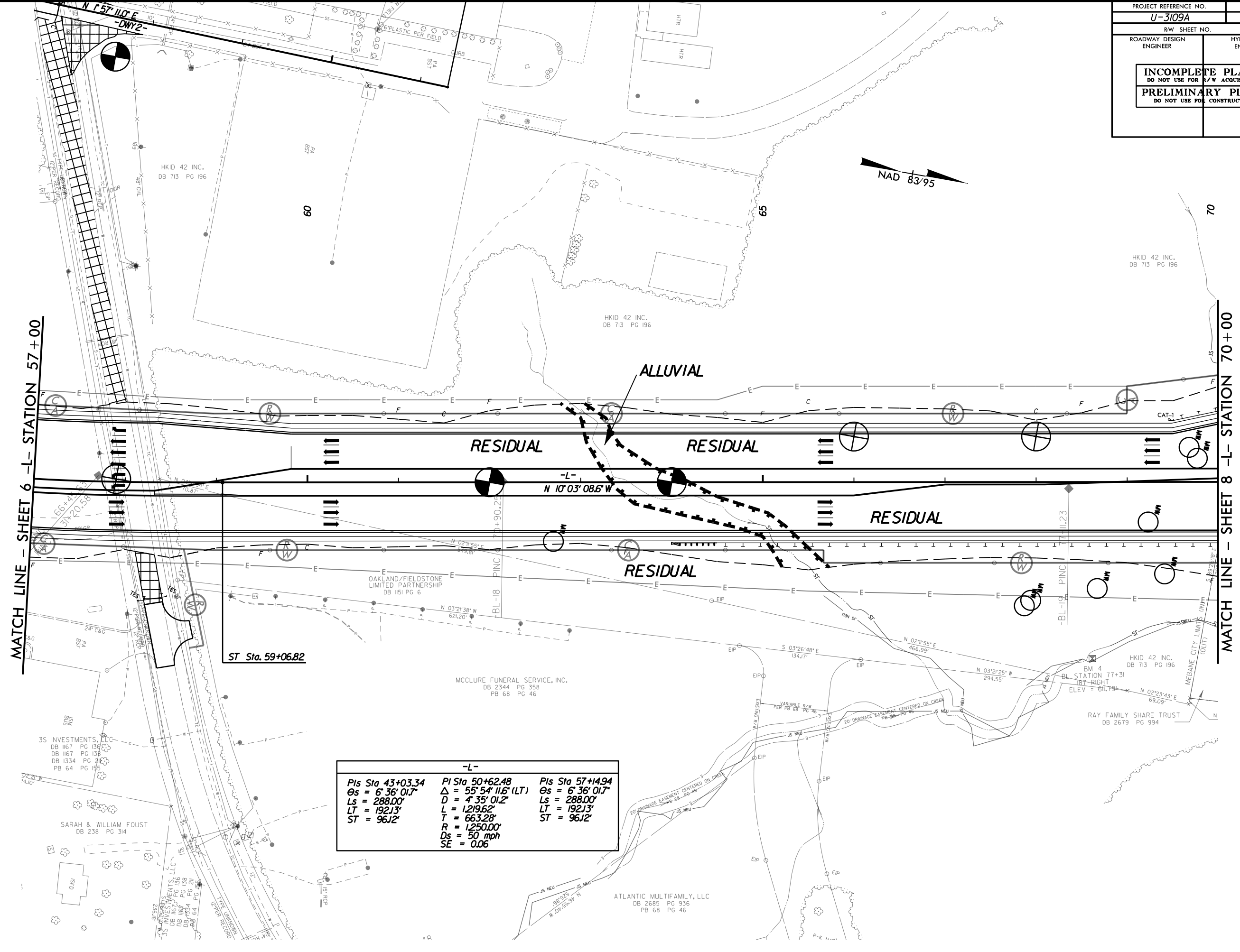
-L-		
PIs Sta 43+03.34	PI Sta 50+62.48	PIs Sta 57+14.94
$\Theta_s = 6^\circ 36' 01.7\"$	$\Delta = 55^\circ 54' 11.6\"$ (LT)	$\Theta_s = 6^\circ 36' 01.7\"$
$L_s = 288.00'$	$D = 4^\circ 35' 01.2\"$	$L_s = 288.00'$
$LT = 192.13'$	$L = 1219.62'$	$LT = 192.13'$
$ST = 96.12'$	$T = 663.28'$	$ST = 96.12'$
	$R = 1250.00'$	
	$Ds = 50$ mph	
	$SE = 0.06$	

-DWY1-
 PI Sta 10+83.49
 $\Delta = 38^\circ 38' 16.5\"$ (RT)
 $D = 9^\circ 55' 39.0\"$
 $L = 41.14'$
 $T = 21.38'$
 $R = 61.00'$

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PROJECT REFERENCE NO. U-3109A	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	

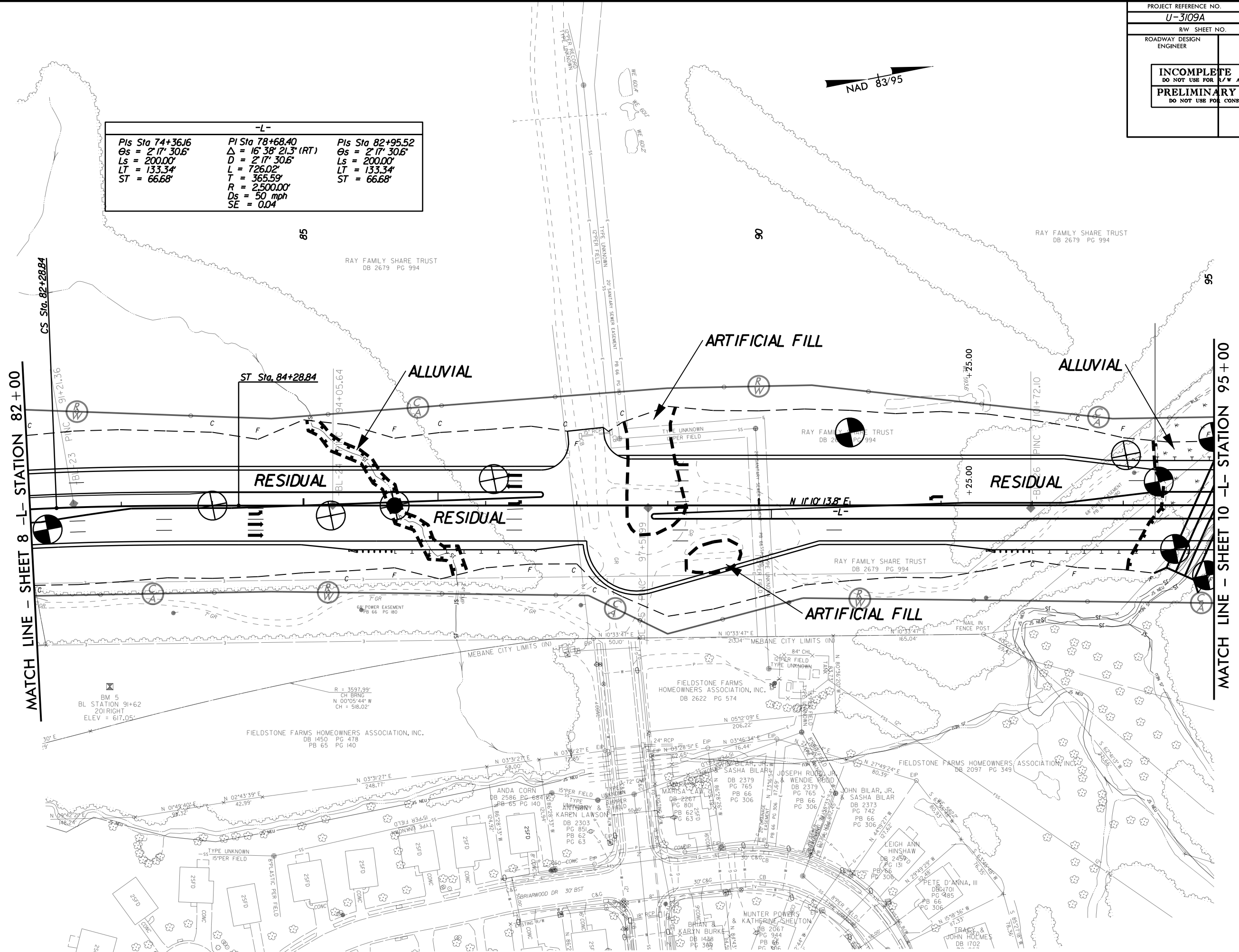
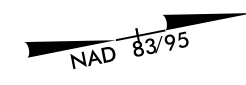
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-L-		
Pls Sta 43+03.34	PI Sta 50+62.48	Pls Sta 57+14.94
$\Theta_s = 6^\circ 36' 01.7''$	$\Delta = 55^\circ 54' 11.6''$ (LT)	$\Theta_s = 6^\circ 36' 01.7''$
$L_s = 288.00'$	$D = 4^\circ 35' 01.2''$	$L_s = 288.00'$
$LT = 192.13'$	$L = 1219.62'$	$LT = 192.13'$
$ST = 96.12'$	$T = 663.28'$	$ST = 96.12'$
	$R = 1,250.00'$	
	$D_s = 50$ mph	
	$SE = 0.06$	

PROJECT REFERENCE NO. U-3109A	SHEET NO. 9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-L-		
PIs Sta 74+36.16	PI Sta 78+68.40	PIs Sta 82+95.52
$\theta_s = 2'17''30.6''$	$\Delta = 16'38''21.3''$ (RT)	$\theta_s = 2'17''30.6''$
$L_s = 200.00'$	$D = 2'17''30.6''$	$L_s = 200.00'$
$LT = 133.34'$	$L = 726.02'$	$LT = 133.34'$
$ST = 66.68'$	$T = 365.59'$	$ST = 66.68'$
	$R = 2,500.00'$	
	$D_s = 50$ mph	
	$SE = 0.04$	



REVISIONS

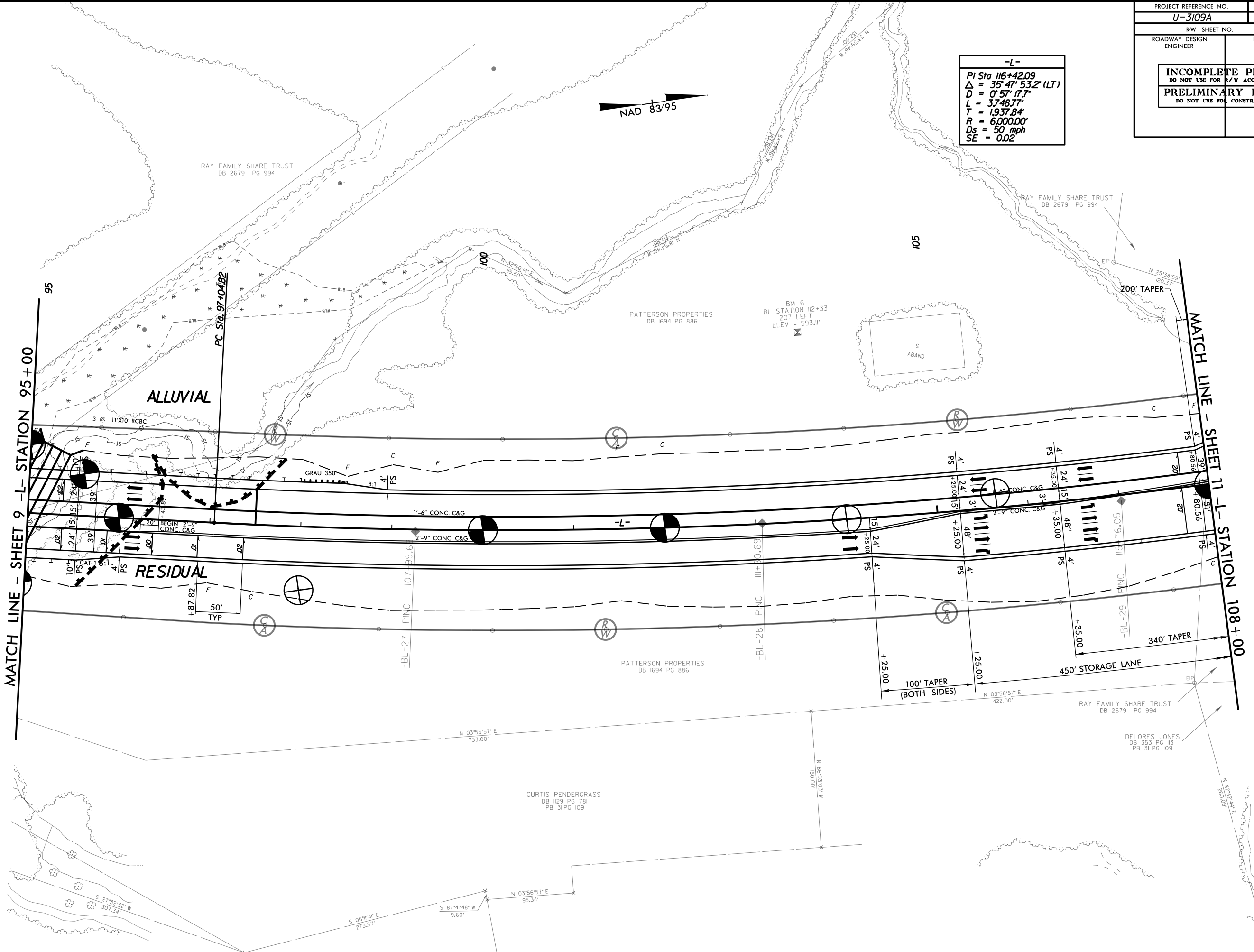
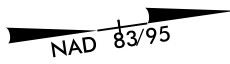
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PROJECT REFERENCE NO. U-3109A	SHEET NO. 10
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-L-

PI Sta 116+42.09
 $\Delta = 35^\circ 47' 53.2" (LT)$
 $D = 0^\circ 57' 17.7"$
 $L = 3,748.77'$
 $T = 1,937.84'$
 $R = 6,000.00'$
 $Ds = 50 \text{ mph}$
 $SE = 0.02$



MATCH LINE - SHEET 9 - L- STATION 95+00

MATCH LINE - SHEET 11 - L- STATION 108+00

REVISIONS

8/17/99

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CURTIS PENDERGRASS
DB 1129 PG 781
PB 31 PG 109

PATTERSON PROPERTIES
DB 1694 PG 886

PATTERSON PROPERTIES
DB 1694 PG 886

RAY FAMILY SHARE TRUST
DB 2679 PG 994

RAY FAMILY SHARE TRUST
DB 2679 PG 994

DELORES JONES
DB 353 PG 113
PB 31 PG 109

RAY FAMILY SHARE TRUST
DB 2679 PG 994

100' TAPER
(BOTH SIDES)

450' STORAGE LANE

340' TAPER

200' TAPER

105

100

95

ALLUVIAL

RESIDUAL

PC Sta 97+04.82

-BL-27 PINC 107+99.6

-BL-28 PINC 110+0.6

-BL-29 PINC 115+76.05

N 03°56'57" E
733.00'

N 86°03'03" W
150.00'

N 03°56'57" E
95.34'

S 87°41'48" W
9.60'

S 06°11'41" E
273.51'

N 03°56'57" E
422.00'

N 02°42'44" E
150.00'

GRAU-350

GRAU-350

GRAU-350

GRAU-350

GRAU-350

GRAU-350

GRAU-350

GRAU-350

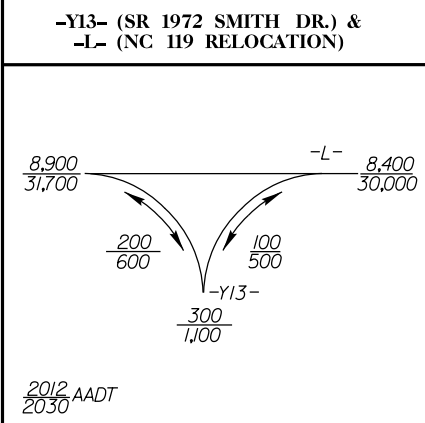
GRAU-350

GRAU-350

GRAU-350

GRAU-350

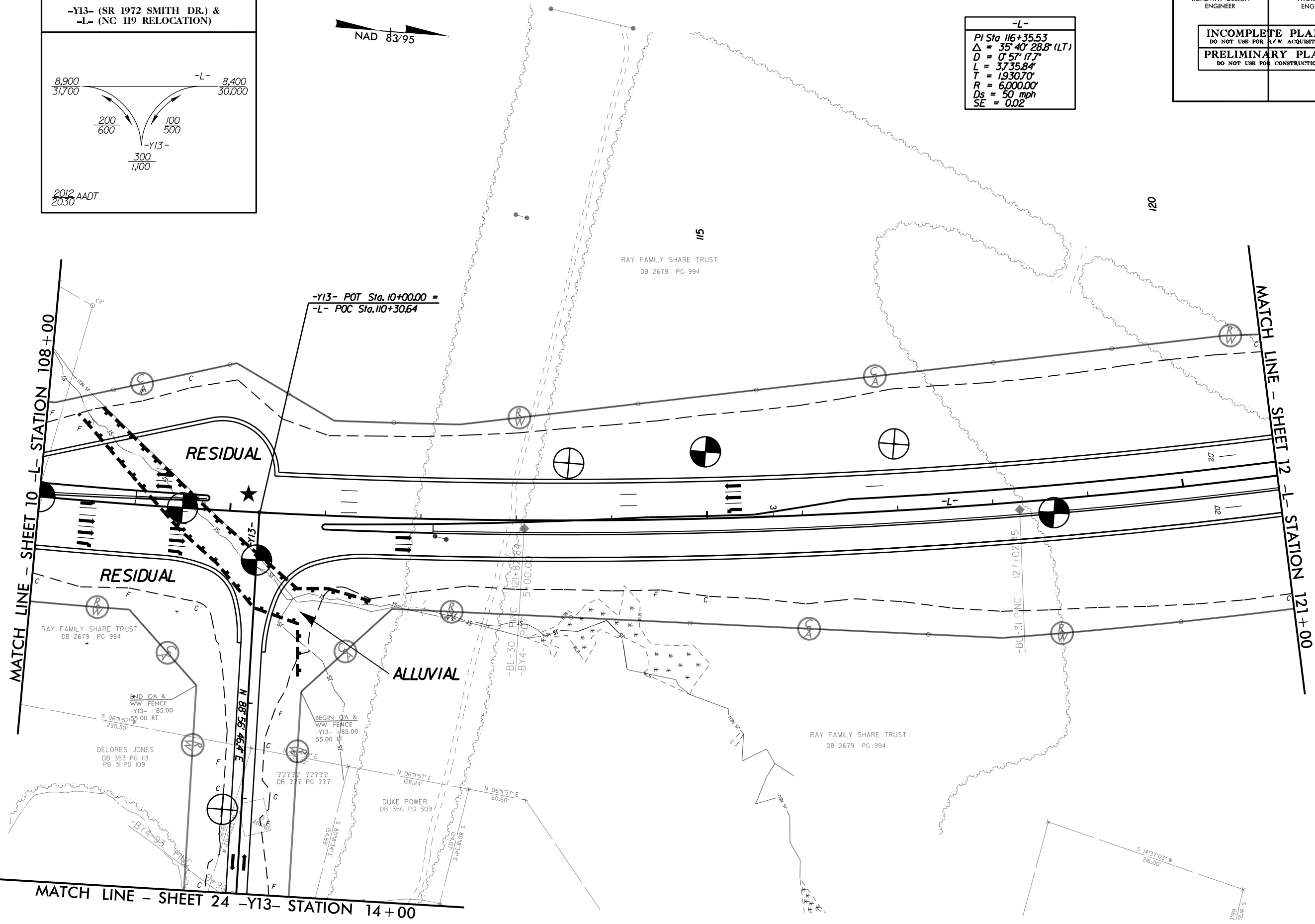
PROJECT REFERENCE NO. U-3109A	SHEET NO. 11
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



-L-

PI Sta 116+35.53
 $\Delta = 35^\circ 40' 28.8" (LT)$
 $D = 0' 57' 17.7"$
 $L = 3,735.84'$
 $T = 1,930.70'$
 $R = 6,000.00'$
 $Ds = 50 \text{ mph}$
 $SE = 0.02$

NAD 83/95

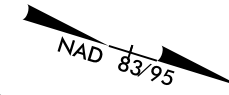


REVISIONS

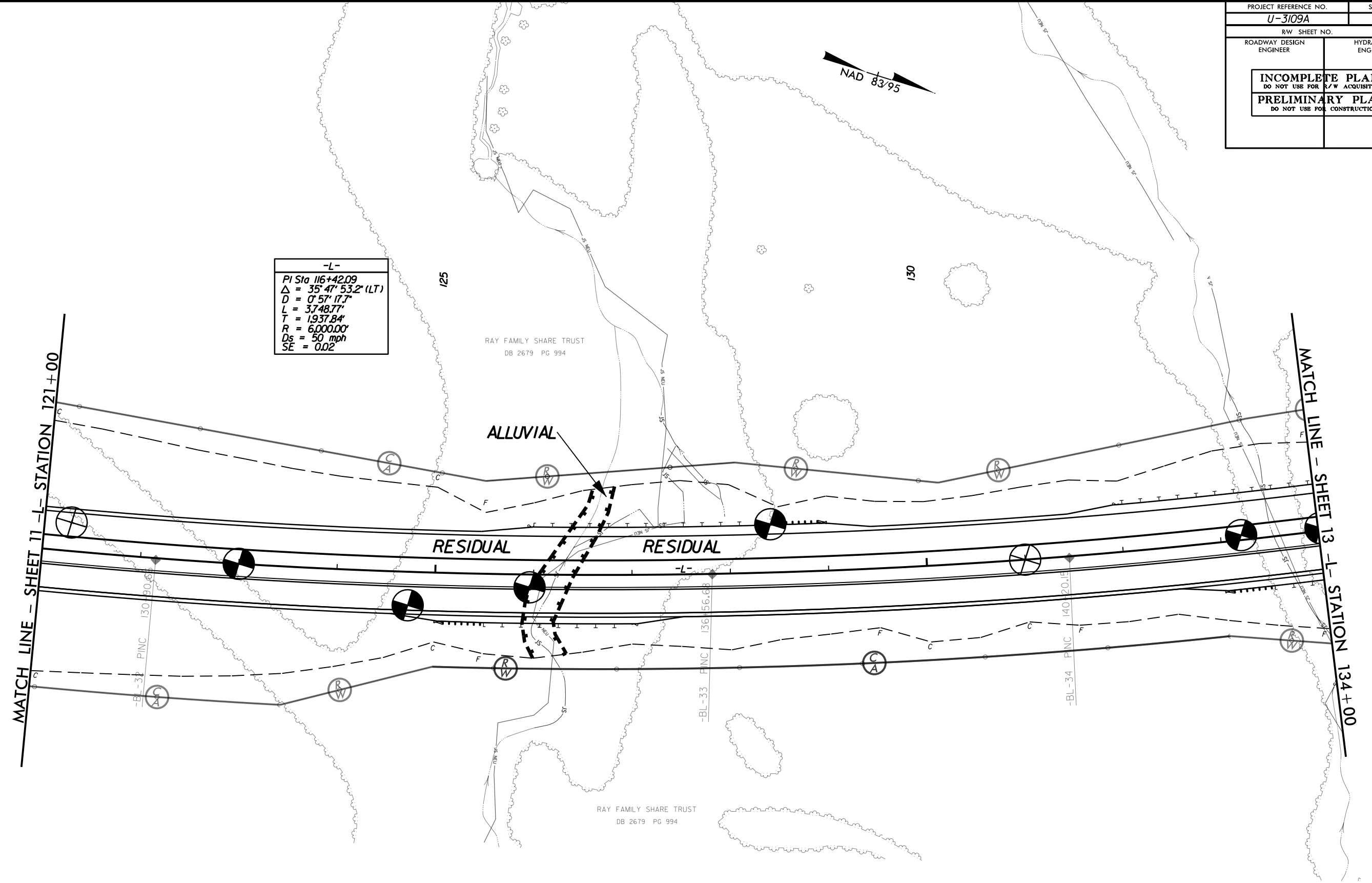
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PROJECT REFERENCE NO. U-3109A	SHEET NO. 12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



-L-
PI Sta 116+42.09
$\Delta = 35^{\circ} 47' 53.2" (LT)$
$D = 0^{\circ} 57' 17.7"$
$L = 3,748.77'$
$T = 1,937.84'$
$R = 6,000.00'$
$D_s = 50 \text{ mph}$
$SE = 0.02$



MATCH LINE - SHEET 11 - L - STATION 121+00

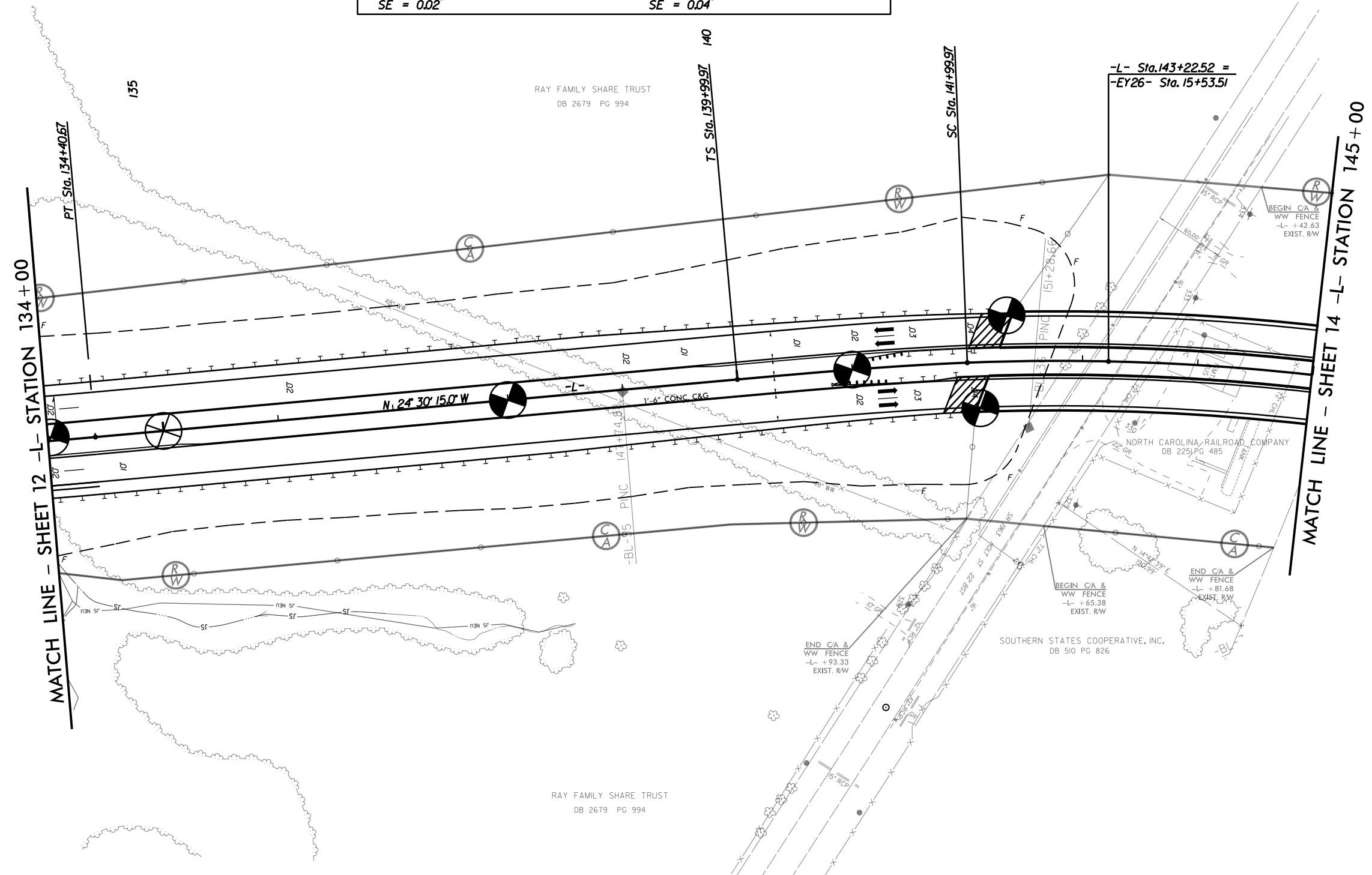
MATCH LINE - SHEET 13 - L - STATION 134+00

REVISIONS

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 11/16/10

PROJECT REFERENCE NO. U-3109A	SHEET NO. 13
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 116+42.09	PIs Sta 141+33.32	PI Sta 156+58.38	PIs Sta 167+86.90
$\Delta = 35^{\circ} 47' 53.2''$ (LT)	$\Theta_s = 2^{\circ} 51' 53.2''$	$\Delta = 72^{\circ} 11' 58.8''$ (RT)	$\Theta_s = 2^{\circ} 51' 53.2''$
$D = 0^{\circ} 57' 17.7''$	$L_s = 200.00'$	$D = 2^{\circ} 51' 53.2''$	$L_s = 200.00'$
$L = 3,748.77'$	$LT = 133.35'$	$L = 2,520.24'$	$LT = 133.35'$
$T = 1,937.84'$	$ST = 66.68'$	$T = 1,458.42'$	$ST = 66.68'$
$R = 6,000.00'$		$R = 2,000.00'$	
$D_s = 50$ mph		$D_s = 50$ mph	
$SE = 0.02$		$SE = 0.04$	

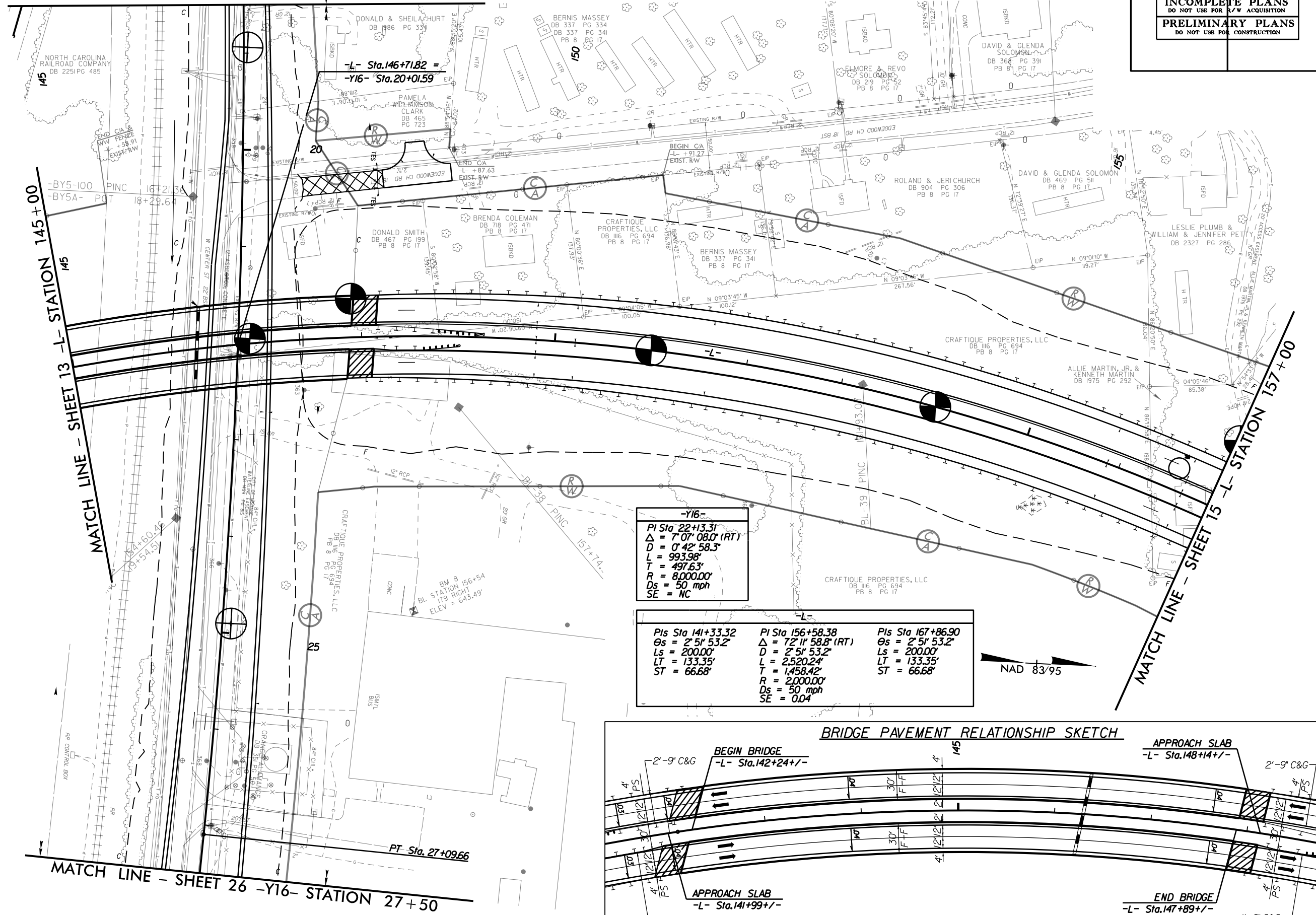


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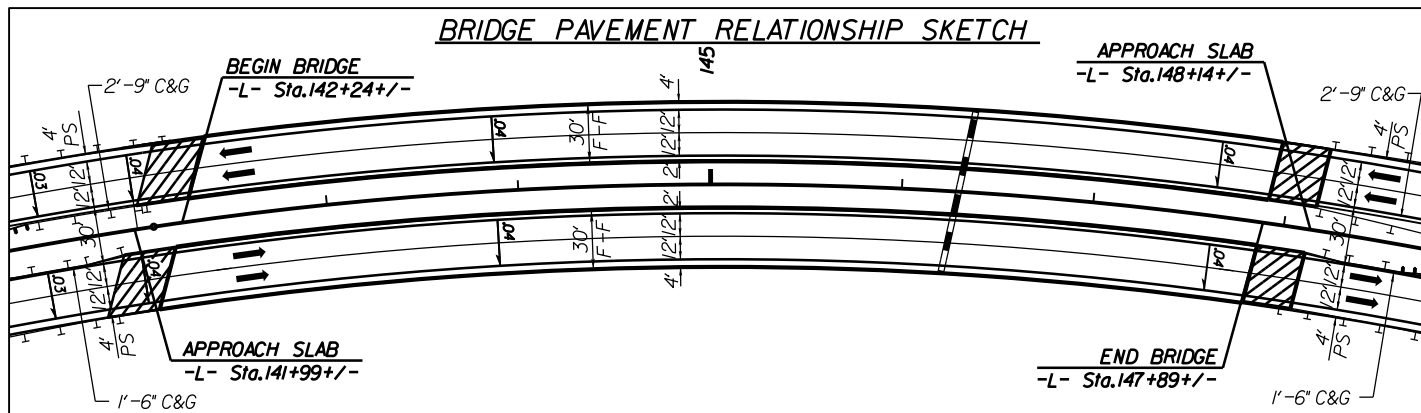
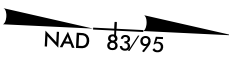
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RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

MATCH LINE - SHEET 25 -Y16- STATION 18+50



-Y16-
 PI Sta 22+13.31
 Δ = 7'07' 08.0" (RT)
 D = 0'42' 58.3"
 L = 993.98'
 T = 497.63'
 R = 8,000.00'
 Ds = 50 mph
 SE = NC

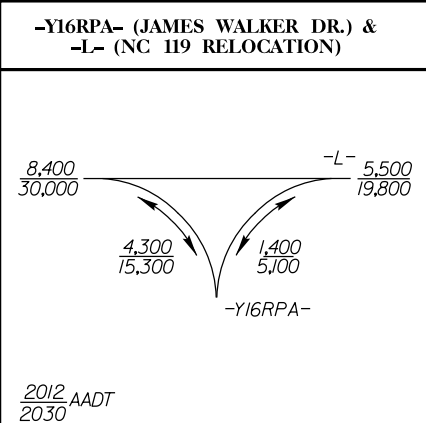
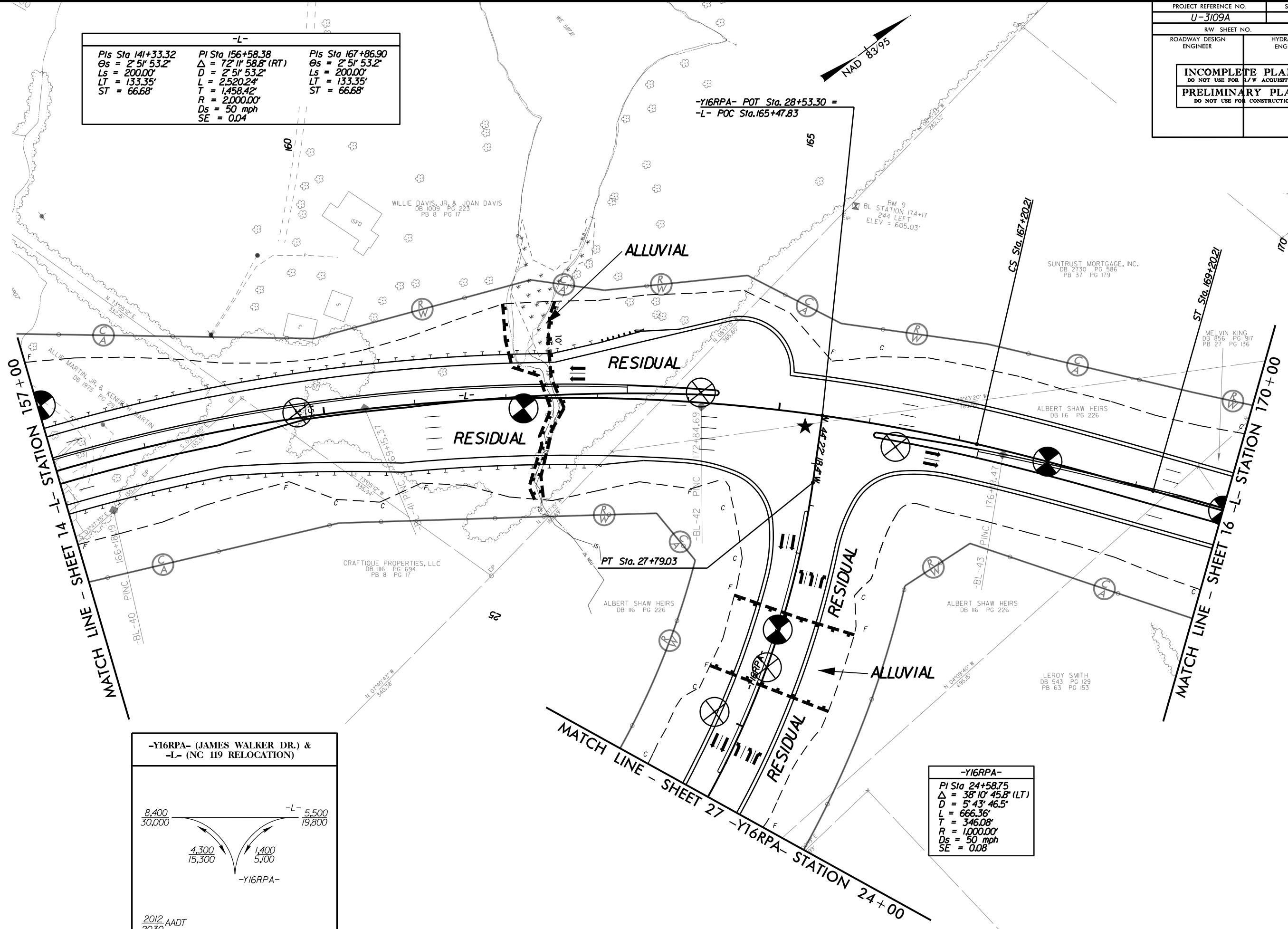
-L-
 PIs Sta 141+33.32 PI Sta 156+58.38 PIs Sta 167+86.90
 Δs = 2'51' 53.2" Δ = 72'11' 58.8" (RT) Δs = 2'51' 53.2"
 Ls = 200.00' D = 2'51' 53.2" Ls = 200.00'
 LT = 133.35' T = 2,520.24' LT = 133.35'
 ST = 66.68' T = 1,458.42' ST = 66.68'
 R = 2,000.00'
 Ds = 50 mph
 SE = 0.04



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-L-		
PIs Sta 141+33.32 Os = 2' 51' 53.2" Ls = 200.00' LT = 133.35' ST = 66.68'	PI Sta 156+58.38 Δ = 72' 11' 58.8" (RT) D = 2' 51' 53.2" L = 2,520.24' T = 1,458.42' R = 2,000.00' Ds = 50 mph SE = 0.04	PIs Sta 167+86.90 Os = 2' 51' 53.2" Ls = 200.00' LT = 133.35' ST = 66.68'

-Y16RPA- POT Sta. 28+53.30 =
-L- POC Sta. 165+47.83



-Y16RPA-	
PI Sta 24+58.75	Δ = 38' 10' 45.8" (LT)
D = 5' 43' 46.5"	L = 666.36'
T = 346.08'	R = 1,000.00'
Ds = 50 mph	SE = 0.08

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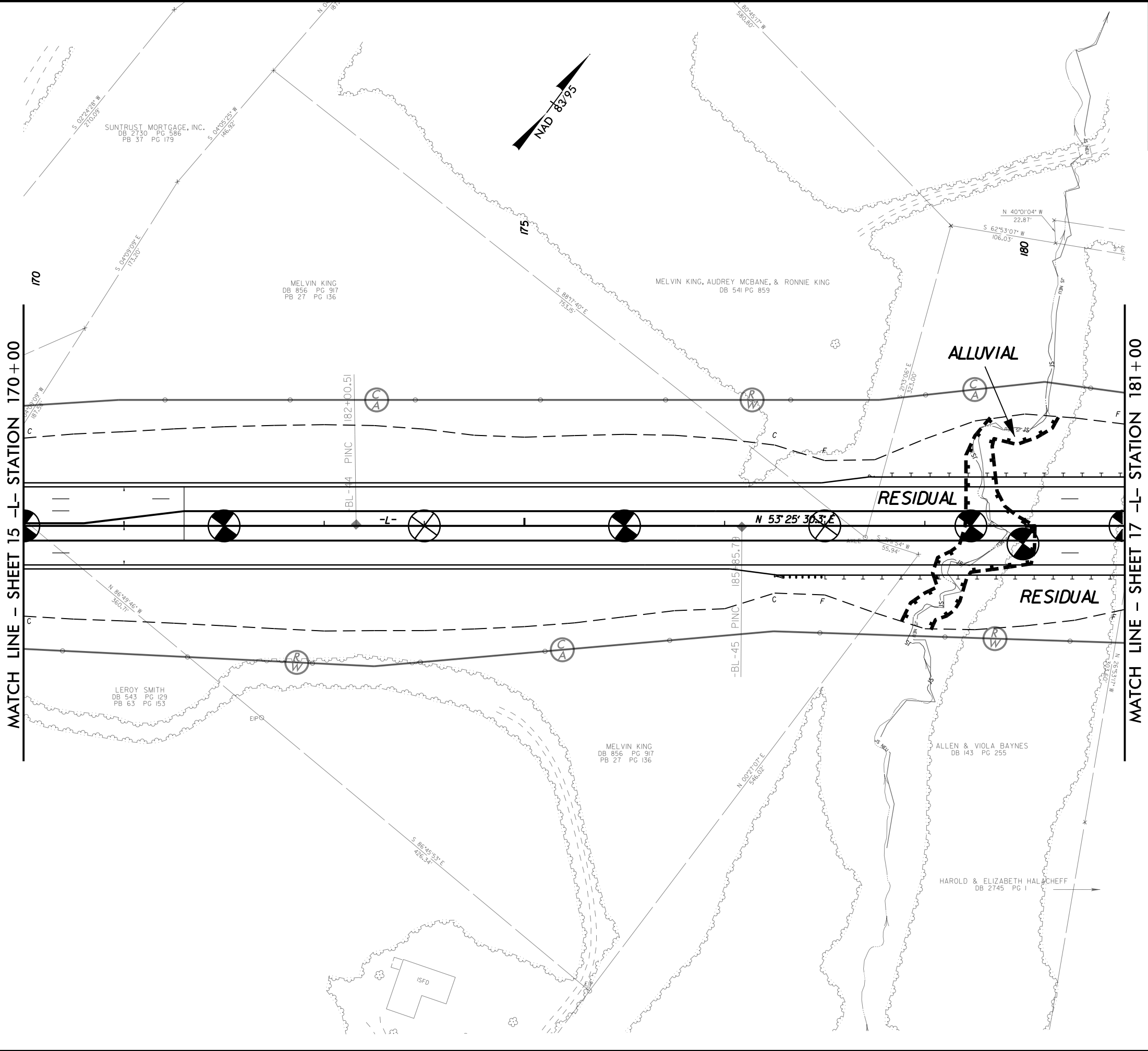
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MATCH LINE - SHEET 15 -L- STATION 170+00

MATCH LINE - SHEET 17 -L- STATION 181+00

PROJECT REFERENCE NO. U-3109A	SHEET NO. 16
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

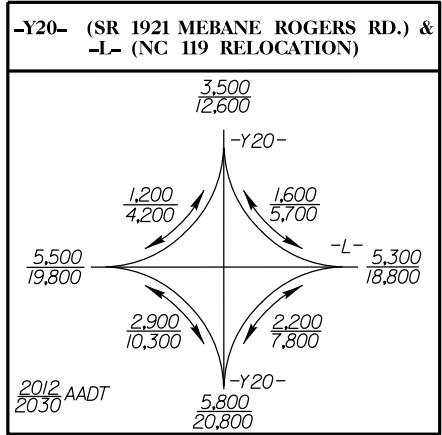
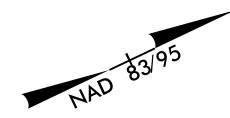


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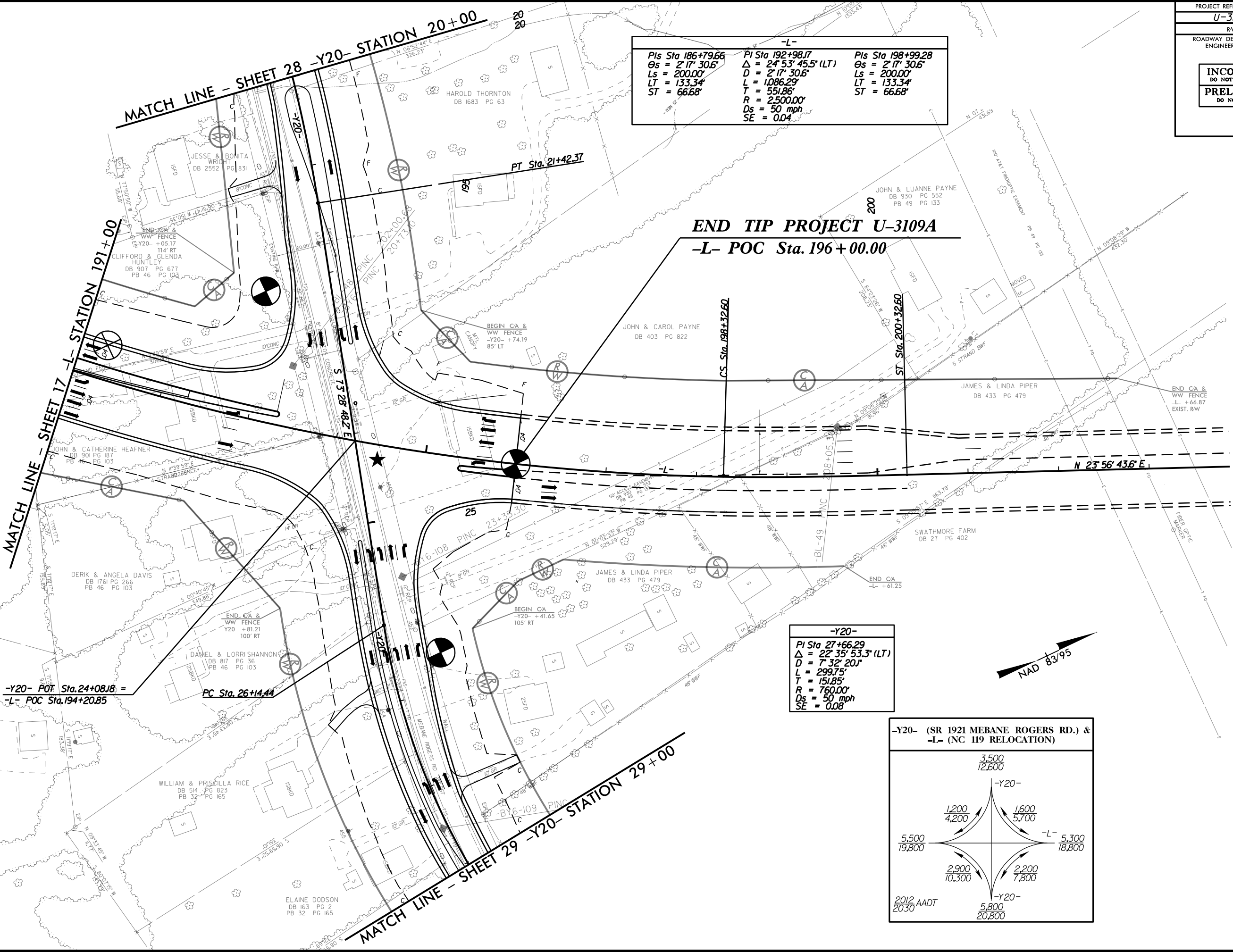
PROJECT REFERENCE NO. U-3109A	SHEET NO. 18
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR L/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-L-		
PIs Sta 186+79.66 θs = 2° 17' 30.6" Ls = 200.00' LT = 133.34' ST = 66.68'	PI Sta 192+98.17 Δ = 24° 53' 45.5" (LT) D = 2° 17' 30.6" L = 1086.29' T = 551.86' R = 2500.00' Ds = 50 mph SE = 0.04	PIs Sta 198+99.28 θs = 2° 17' 30.6" Ls = 200.00' LT = 133.34' ST = 66.68'

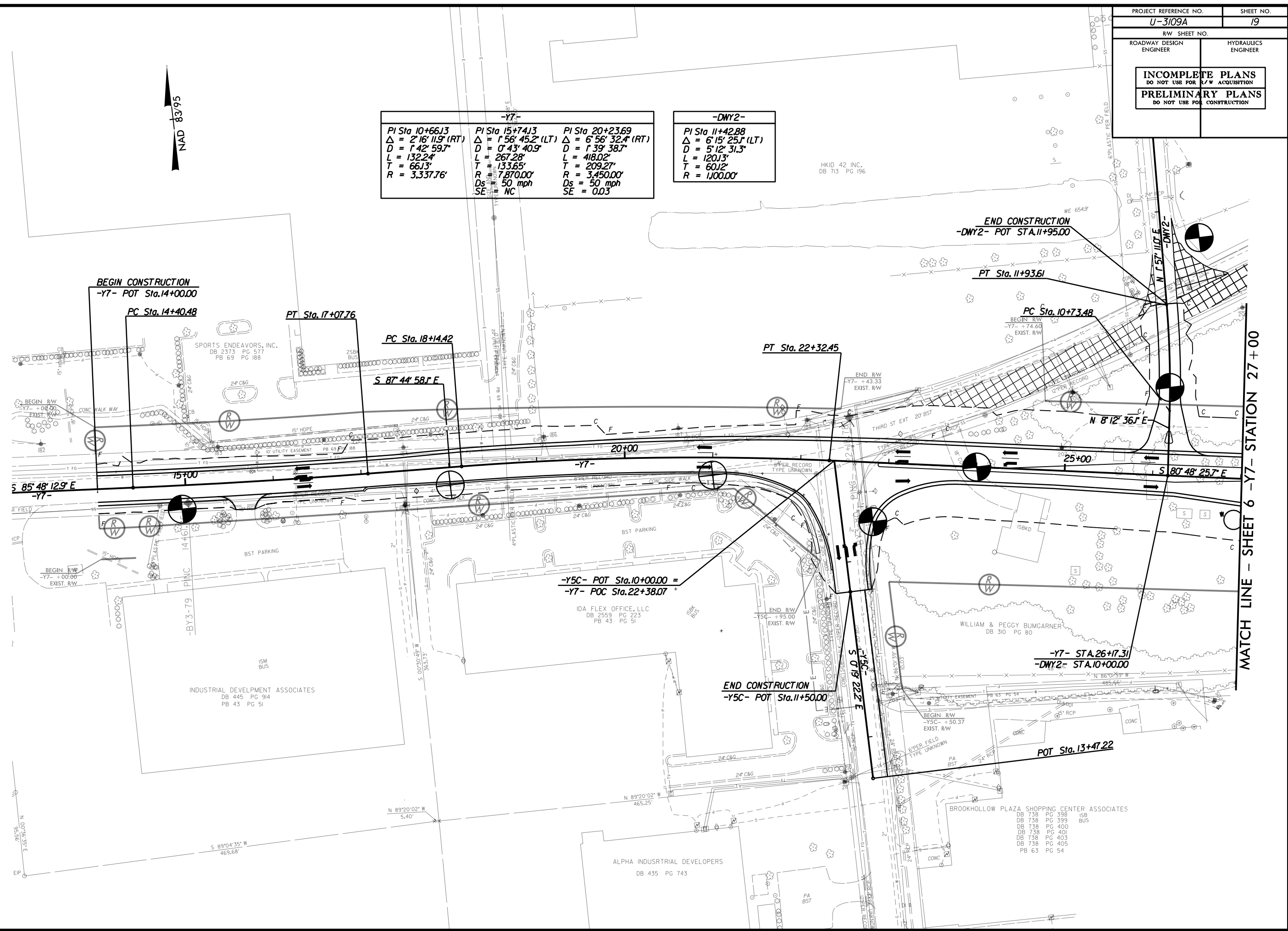
-Y20-	
PI Sta 27+66.29 Δ = 22° 35' 53.3" (LT) D = 7° 32' 20.1" L = 299.75' T = 151.85' R = 760.00' Ds = 50 mph SE = 0.08	



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 15153.dgn



-Y7-			-DWY2-	
PI Sta 10+66.13	PI Sta 15+74.13	PI Sta 20+23.69	PI Sta 11+42.88	
$\Delta = 2' 16' 11.9''$ (RT)	$\Delta = 1' 56' 45.2''$ (LT)	$\Delta = 6' 56' 32.4''$ (RT)	$\Delta = 6' 15' 25.1''$ (LT)	
$D = 1' 42' 59.7''$	$D = 0' 43' 40.9''$	$D = 1' 39' 38.7''$	$D = 5' 12' 31.3''$	
$L = 132.24'$	$L = 267.28'$	$L = 418.02'$	$L = 120.13'$	
$T = 66.13'$	$T = 133.65'$	$T = 209.27'$	$T = 60.12'$	
$R = 3,337.76'$	$R = 7,870.00'$	$R = 3,450.00'$	$R = 1,100.00'$	
	$D_s = 50$ mph	$D_s = 50$ mph		
	$SE = NC$	$SE = 0.03$		



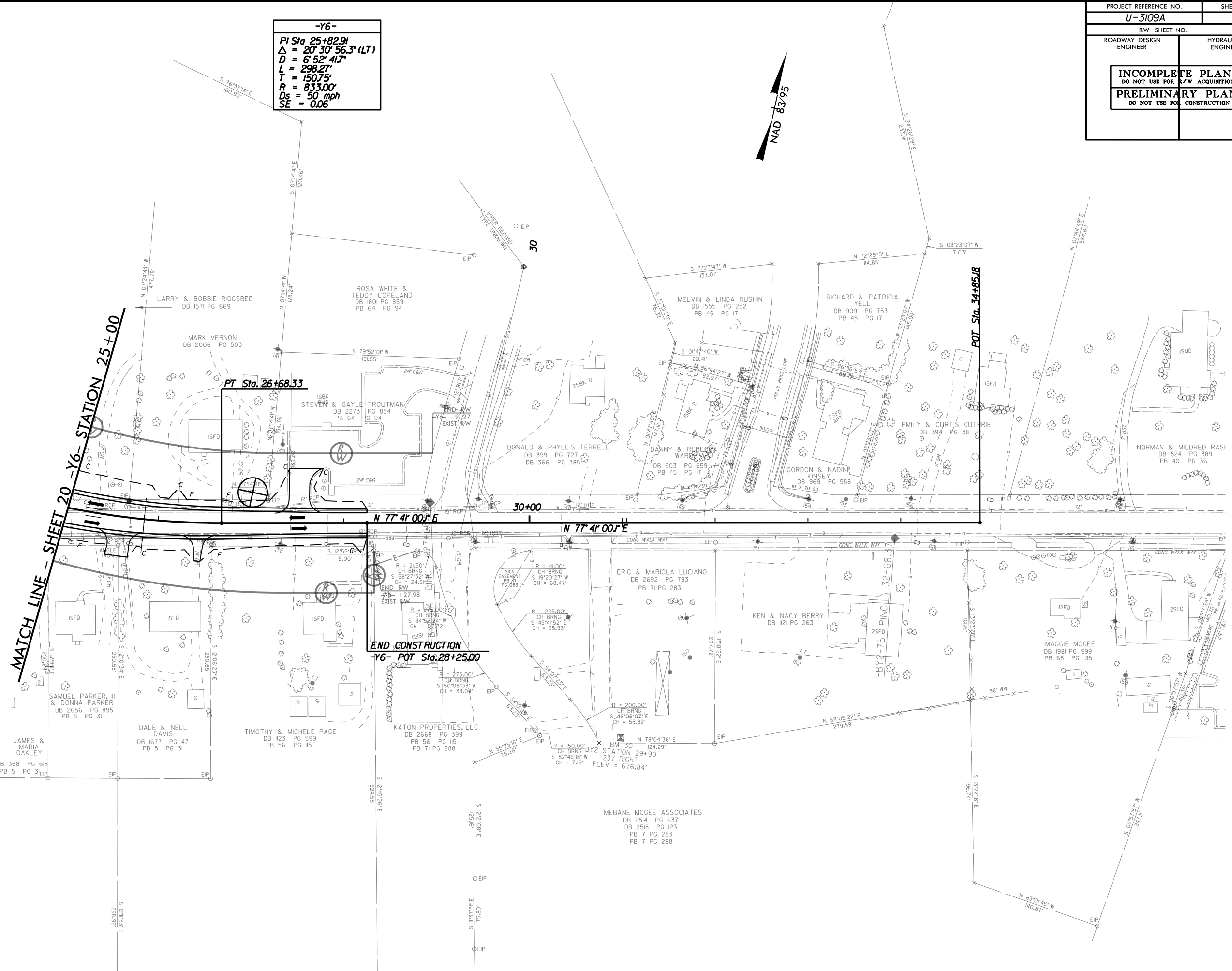
MATCH LINE - SHEET 6 -Y7- STATION 27+00

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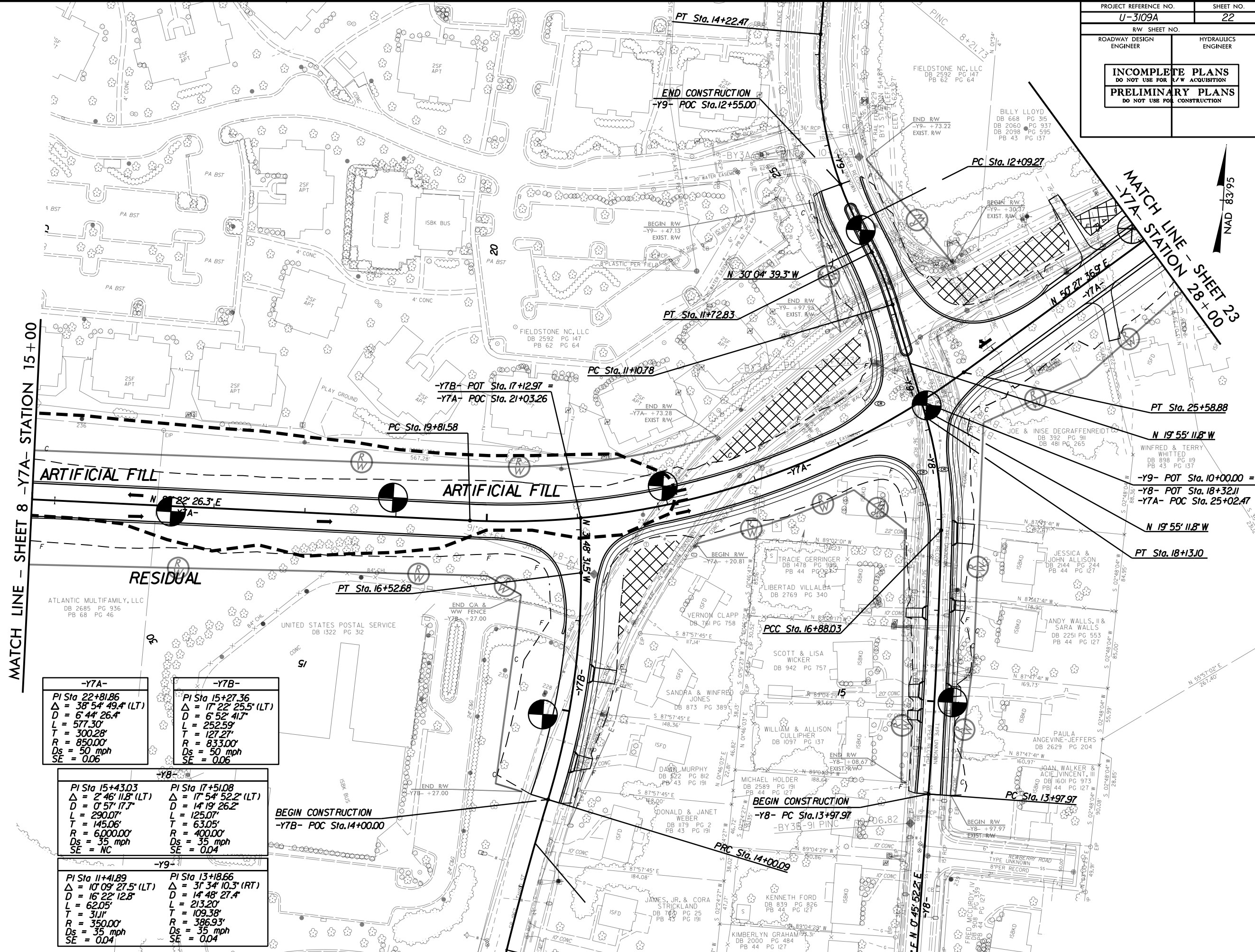
PROJECT REFERENCE NO. U-3109A	SHEET NO. 21
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-Y6-

PI Sta 25+82.91
 $\Delta = 20^\circ 30' 56.3" (LT)$
 $D = 6' 52' 41.7"$
 $L = 298.27'$
 $T = 150.75'$
 $R = 833.00'$
 $D_s = 50 \text{ mph}$
 $SE = 0.06$



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 MEANE CITY LIMITS (OUT)
 MEANE CITY LIMITS (IN)



MATCH LINE - SHEET 8 -Y7A- STATION 15+00

MATCH LINE - SHEET 28+00 -Y7A- STATION 28+00

NAD 83 95

-Y7A-	-Y7B-
PI Sta 22+81.86	PI Sta 15+27.36
$\Delta = 38^{\circ} 54' 49.4''$ (LT)	$\Delta = 17^{\circ} 22' 25.5''$ (LT)
D = 6' 44" 26.4"	D = 6' 52" 41.7"
L = 577.30'	L = 252.59'
T = 300.28'	T = 127.27'
R = 850.00'	R = 833.00'
Ds = 50 mph	Ds = 50 mph
SE = 0.06	SE = 0.06

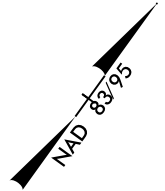
-Y8-	-Y9-
PI Sta 15+43.03	PI Sta 17+51.08
$\Delta = 2^{\circ} 46' 11.8''$ (LT)	$\Delta = 17^{\circ} 54' 52.2''$ (LT)
D = 0' 57" 17.7"	D = 14' 19" 26.2"
L = 290.07'	L = 125.07'
T = 145.06'	T = 63.05'
R = 6,000.00'	R = 400.00'
Ds = 35 mph	Ds = 35 mph
SE = NC	SE = 0.04

-Y9-	-Y7A-
PI Sta 11+41.89	PI Sta 13+18.66
$\Delta = 10^{\circ} 09' 27.5''$ (LT)	$\Delta = 31^{\circ} 34' 10.3''$ (RT)
D = 16' 22" 12.8"	D = 14' 48" 27.4"
L = 62.05'	L = 213.20'
T = 31.11'	T = 109.38'
R = 350.00'	R = 386.93'
Ds = 35 mph	Ds = 35 mph
SE = 0.04	SE = 0.04

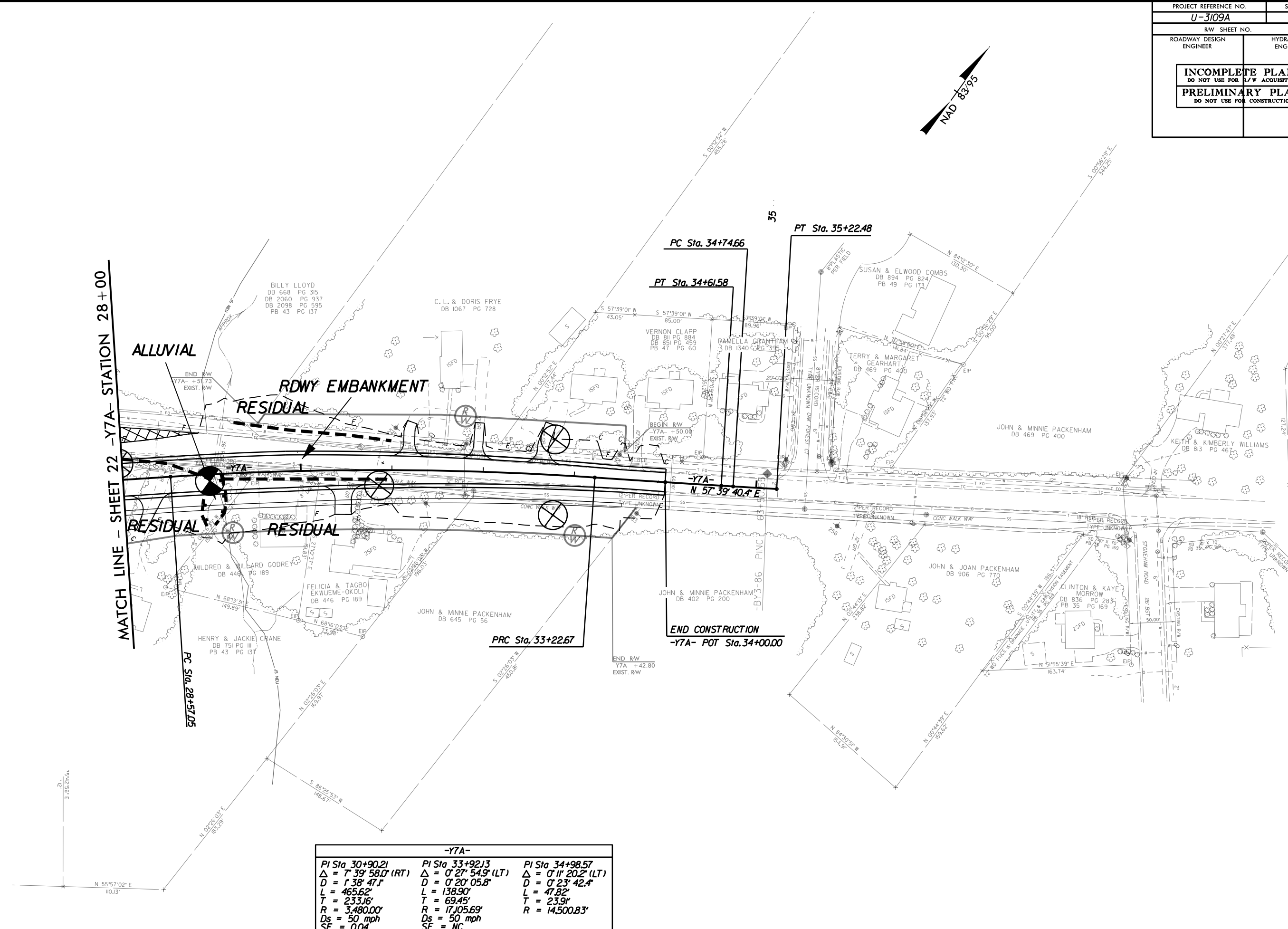
BEGIN CONSTRUCTION
-Y7B- POC Sta.14+00.00

BEGIN CONSTRUCTION
-Y8- PC Sta.13+97.97

END CONSTRUCTION
-Y9- POC Sta.12+55.00



MATCH LINE - SHEET 22 -Y7A- STATION 28+00



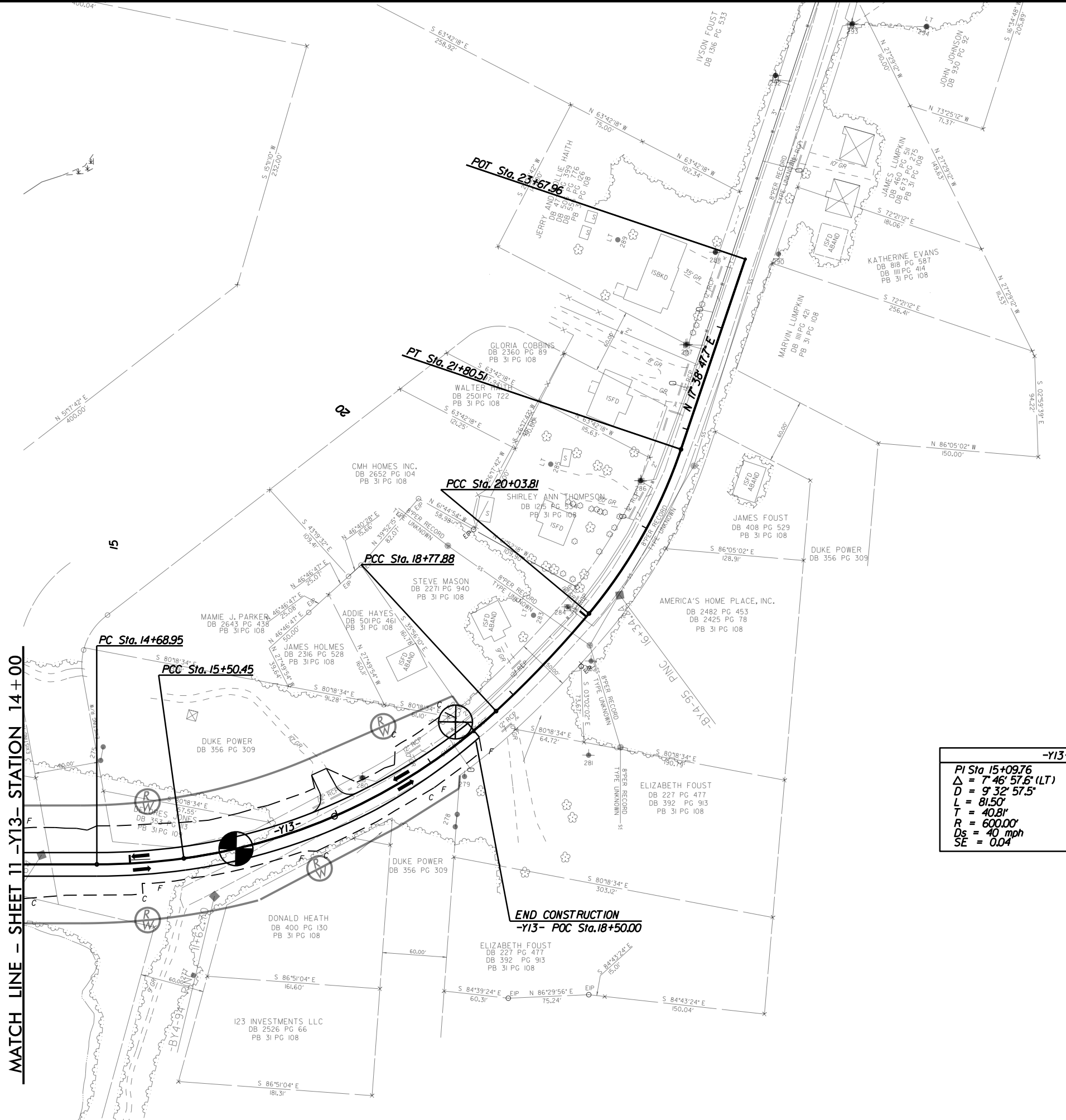
-Y7A-		
PI Sta 30+90.21	PI Sta 33+92.13	PI Sta 34+98.57
$\Delta = 7^{\circ} 39' 58.0''$ (RT)	$\Delta = 0^{\circ} 27' 54.9''$ (LT)	$\Delta = 0^{\circ} 11' 20.2''$ (LT)
$D = 1^{\circ} 38' 47.1''$	$D = 0^{\circ} 20' 05.8''$	$D = 0^{\circ} 23' 42.4''$
$L = 465.62'$	$L = 138.90'$	$L = 47.82'$
$T = 233.16'$	$T = 69.45'$	$T = 23.91'$
$R = 3,480.00'$	$R = 17,105.69'$	$R = 14,500.83'$
$D_s = 50$ mph	$D_s = 50$ mph	
$SE = 0.04$	$SE = NC$	

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PROJECT REFERENCE NO. U-3109A	SHEET NO. 24
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

NAD 83/95

MATCH LINE - SHEET 11 -Y13- STATION 14+00

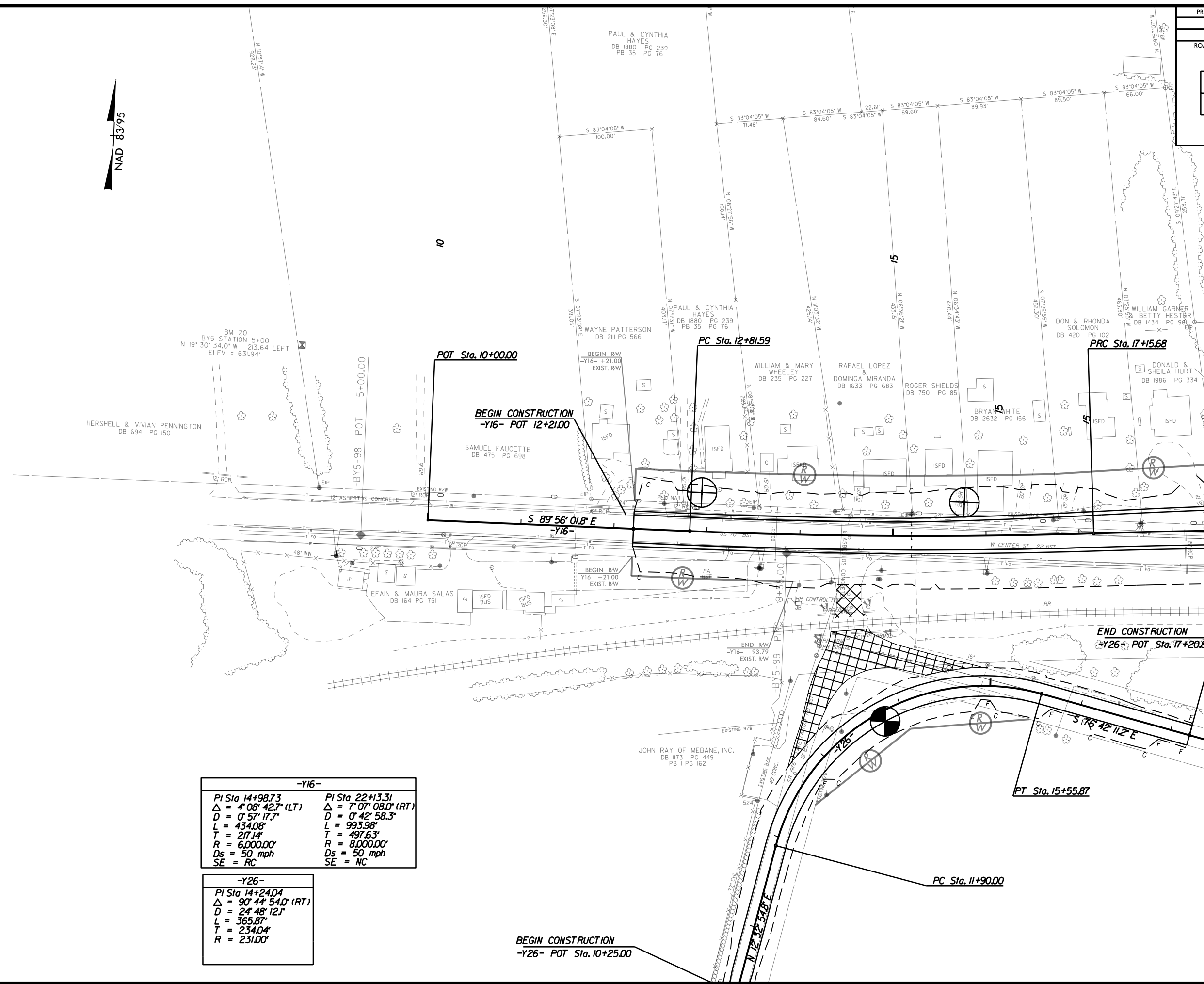


-Y13-	
PI Sta 15+09.76	PI Sta 17+19.40
$\Delta = 7' 46'' 57.6'' (LT)$	$\Delta = 34' 50'' 24.9'' (LT)$
$D = 9' 32'' 57.5''$	$D = 10' 38'' 26.3''$
$L = 81.50'$	$L = 327.43'$
$T = 40.81'$	$T = 168.95'$
$R = 600.00'$	$R = 538.46'$
$D_s = 40 \text{ mph}$	$D_s = 40 \text{ mph}$
$SE = 0.04$	$SE = 0.04$

END CONSTRUCTION
-Y13- POC Sta. 18+50.00

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-Y16-	
PI Sta 14+98.73	PI Sta 22+13.31
$\Delta = 4^{\circ} 08' 42.7''$ (LT)	$\Delta = 7^{\circ} 07' 08.0''$ (RT)
D = 0' 57' 17.7"	D = 0' 42' 58.3"
L = 434.08'	L = 993.98'
T = 217.14'	T = 497.63'
R = 6,000.00'	R = 8,000.00'
Ds = 50 mph	Ds = 50 mph
SE = RC	SE = NC

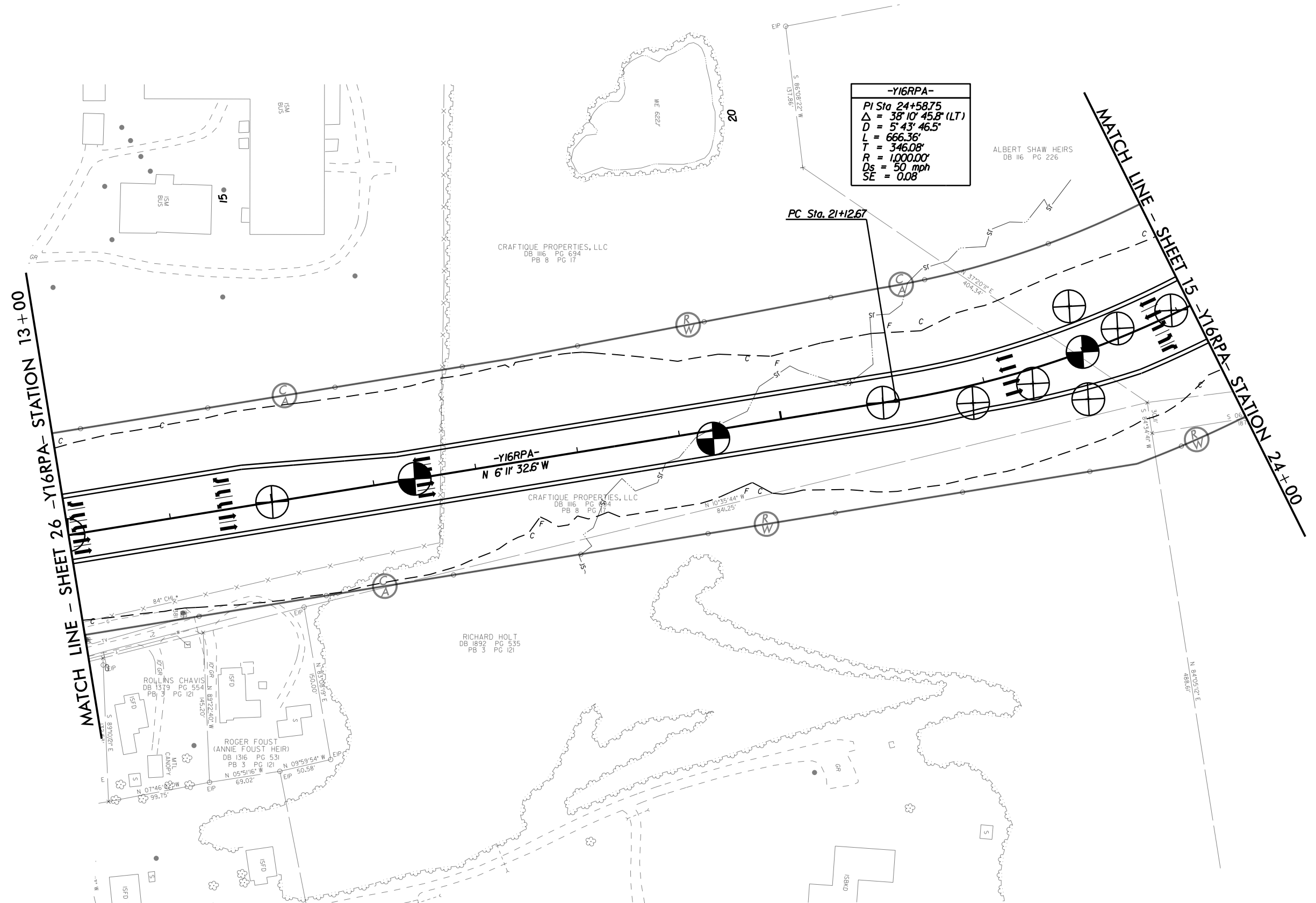
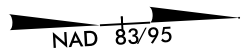
-Y26-	
PI Sta 14+24.04	
$\Delta = 90^{\circ} 44' 54.0''$ (RT)	
D = 24' 48" 12.1"	
L = 365.87'	
T = 234.04'	
R = 231.00'	

BEGIN CONSTRUCTION
-Y26- POT Sta. 10+25.00

MATCH LINE - SHEET 14 -Y16- STATION 18 + 50

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PROJECT REFERENCE NO. U-3109A	SHEET NO. 27
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



-Y16RPA-
 PI Sta 24+58.75
 $\Delta = 38^\circ 10' 45.8\" (LT)$
 $D = 5^\circ 43' 46.5\"$
 $L = 666.36'$
 $T = 346.08'$
 $R = 1,000.00'$
 $D_s = 50 \text{ mph}$
 $SE = 0.08$

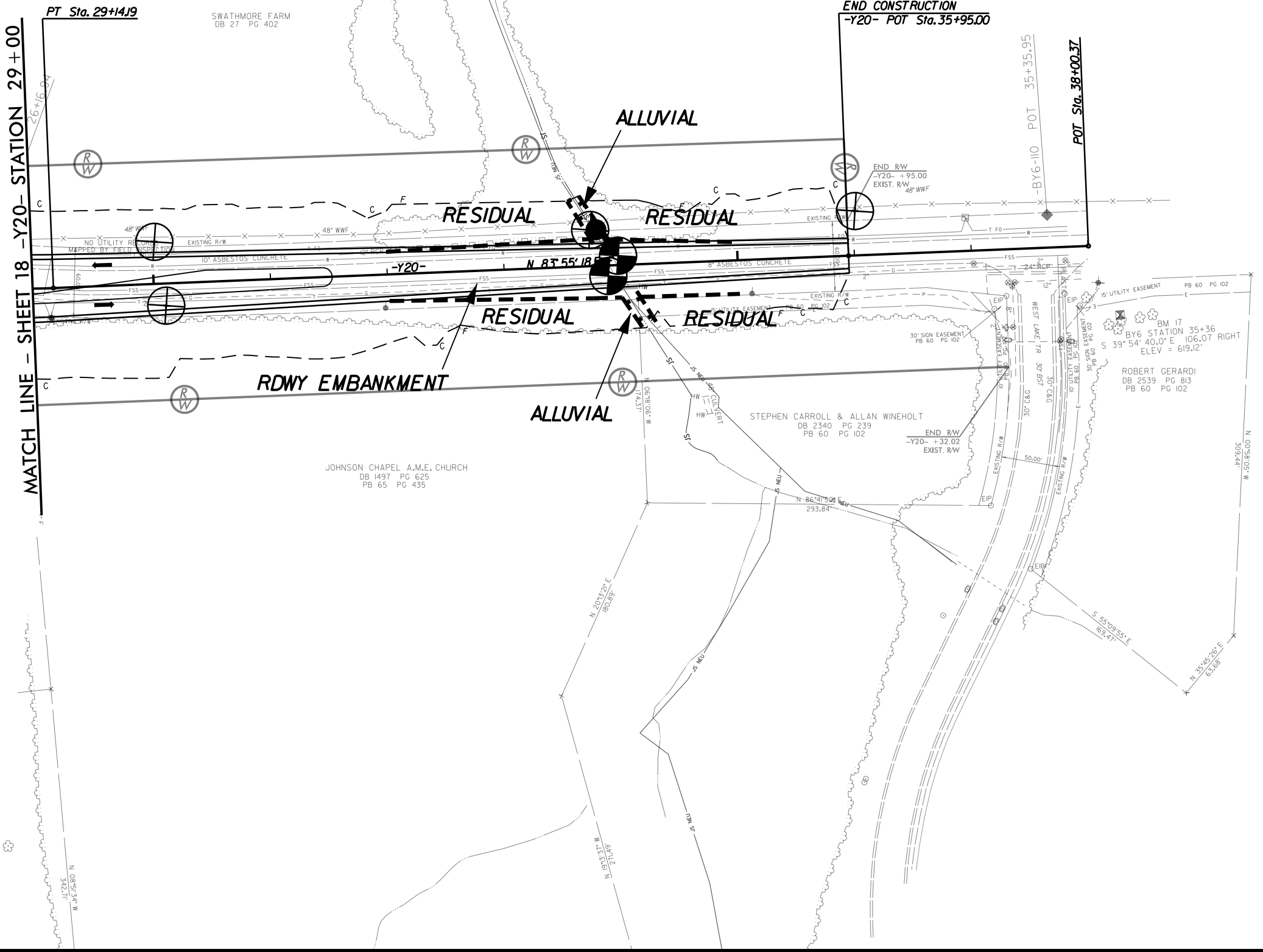
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PROJECT REFERENCE NO. U-3109A	SHEET NO. 29
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

-Y20-
PI Sta 27+66.29
$\Delta = 22^\circ 35' 53.3" (LT)$
$D = 7^\circ 32' 20"$
$L = 299.75'$
$T = 151.85'$
$R = 760.00'$
$D_s = 50 \text{ mph}$
$SE = 0.08$



MATCH LINE - SHEET 18 -Y20- STATION 29+00

PT Sta. 29+14.19

SWATHMORE FARM
DB 27 PG 402

SWATHMORE FARM
DB 27 PG 402

END CONSTRUCTION
-Y20- POT Sta. 35+95.00

ALLUVIAL

RESIDUAL

RESIDUAL

RESIDUAL

RESIDUAL

RDWY EMBANKMENT

ALLUVIAL

JOHNSON CHAPEL A.M.E. CHURCH
DB 1497 PG 625
PB 65 PG 435

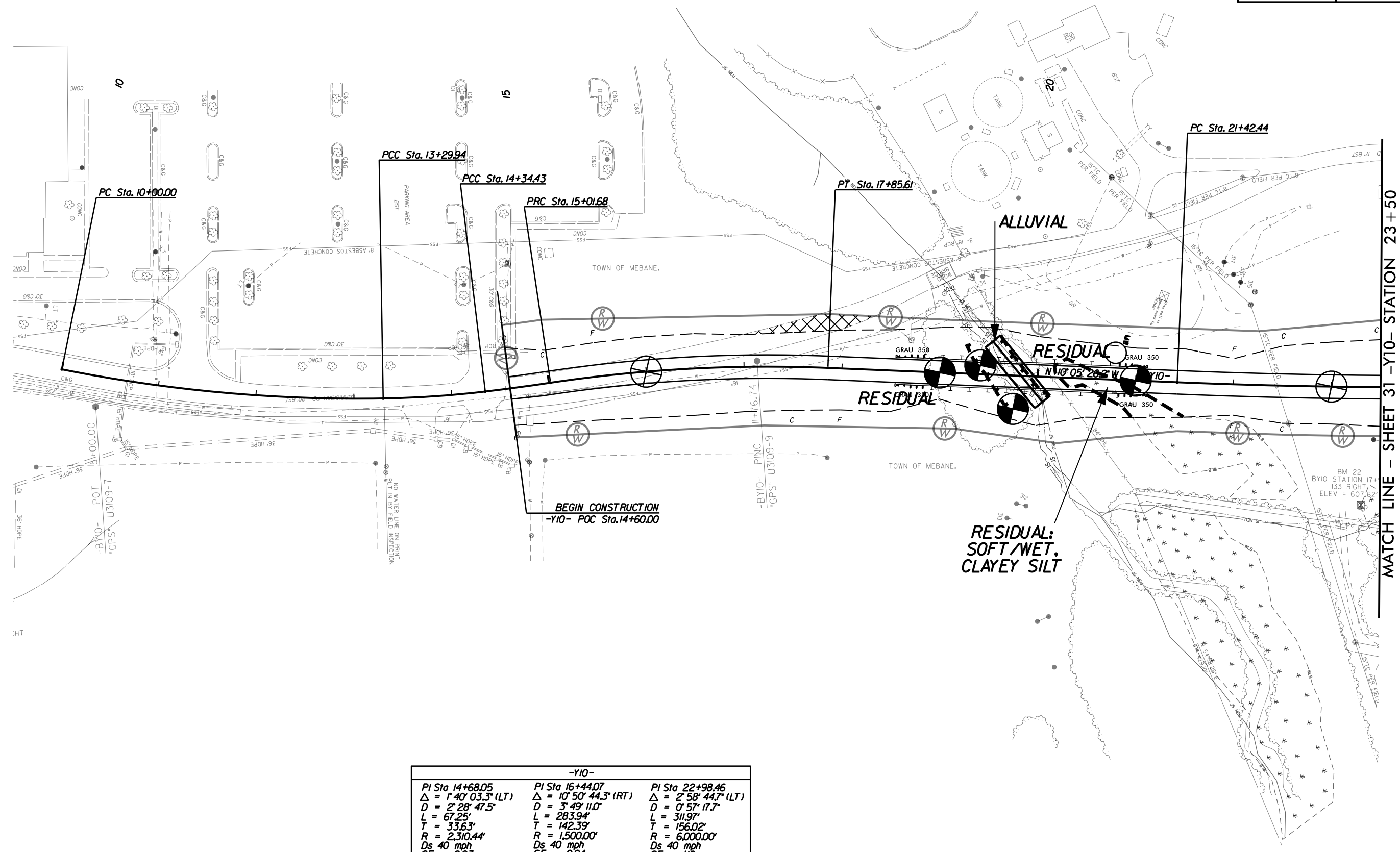
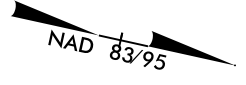
STEPHEN CARROLL & ALLAN WINEHOLT
DB 2340 PG 239
PB 60 PG 102

ROBERT GERARDI
DB 2539 PG 813
PB 60 PG 102

BM 17
BY6 STATION 35+36
S 39° 54' 40.0" E 106.07 RIGHT
ELEV = 619.12'

NAD 83/95

PROJECT REFERENCE NO. U-3109A	SHEET NO. 30
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



MATCH LINE - SHEET 31 -Y10- STATION 23 + 50

-Y10-		
PI Sta 14+68.05	PI Sta 16+44.07	PI Sta 22+98.46
$\Delta = 1^{\circ} 40' 03.3" (LT)$	$\Delta = 10^{\circ} 50' 44.3" (RT)$	$\Delta = 2^{\circ} 58' 44.7" (LT)$
$D = 2^{\circ} 28' 47.5"$	$D = 3^{\circ} 49' 11.0"$	$D = 0^{\circ} 57' 17.7"$
$L = 67.25'$	$L = 283.94'$	$L = 311.97'$
$T = 33.63'$	$T = 142.39'$	$T = 156.02'$
$R = 2,310.44'$	$R = 1,500.00'$	$R = 6,000.00'$
$Ds = 40 \text{ mph}$	$Ds = 40 \text{ mph}$	$Ds = 40 \text{ mph}$
$SE = 0.03$	$SE = 0.04$	$SE = NC$

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PROJECT REFERENCE NO.		SHEET NO.	
U-3109A		31	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER		
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

-Y10-

PI Sta 22+98.46 Δ = 2° 58' 44.7" (LT) D = 0' 57' 17.7" L = 311.97' T = 156.02' R = 6,000.00' Ds = 40 mph SE = NC	PI Sta 28+12.72 Δ = 8° 15' 37.4" (LT) D = 3' 49' 11.0" L = 216.26' T = 108.32' R = 1,500.00' Ds = 40 mph SE = 0.04	PI Sta 32+49.66 Δ = 3° 10' 58.6" (RT) D = 5' 21' 17.7" L = 638.37' T = 329.00' R = 1,070.00' Ds = 40 mph SE = 0.05
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-Y10-

PI Sta 35+89.42 Δ = 1° 15' 51.2" (LT) D = 2' 04' 48.7" L = 60.78' T = 30.39' R = 2,754.57' Ds = 40 mph SE = 0.03	PI Sta 36+88.31 Δ = 16° 31' 39.2" (LT) D = 12' 08' 53.8" L = 136.05' T = 68.50' R = 471.64' Ds = 40 mph SE = 0.06
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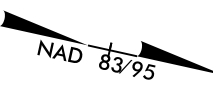
-Y11-

PI Sta 11+42.60 Δ = 9° 05' 45.4" (RT) D = 5' 43' 46.5" L = 158.75' T = 79.54' R = 1,000.00' Ds = 30 mph SE = 0.04	PI Sta 18+18.51 Δ = 2° 49' 26.3" (LT) D = 5' 43' 46.5" L = 49.29' T = 24.65' R = 1,000.00' Ds = 30 mph SE = 0.04	PI Sta 18+74.71 Δ = 2° 49' 45.5" (RT) D = 4' 29' 00.6" L = 63.10' T = 31.56' R = 1,277.93' Ds = 30 mph SE = 0.04
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MATCH LINE - SHEET 30 -Y10- STATION 23+50

MATCH LINE - INSERT -Y11- STATION 16+00

MATCH LINE - INSERT -Y11- STATION 16+00



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