

**CONTRACT: ID: I-5000**

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 NO.	TOTAL SHEETS
N.C.	I-5000	1	67
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
41153.1.1	IMF-85-1(113)17	P.E. RW & UTIL.	

**CONTENTS**

LINE	STATION	PLAN	PROFILE	XSECT
-Y1-	11+00.00 to 45+00.00	4-6	10 - 11	
-Y2-	10+50.00 to 26+53.73	8,9	11 - 12	16 - 30
-Y3-	10+00.00 to 23+79.29	4,8	12	31 - 38
-RPA-	10+00.00 to 24+41.71	7,6,5	13	39 - 46
-RPD-	10+00.00 to 35+90.81	7,6,5,4	13 - 14	47 - 66
-LPB-	10+00.00 to 16+99.28	5	14	
-TRAIL-	14+50 to 31+58.83	6,5	15	

SOIL TEST RESULTS 67

**ROADWAY**  
**SUBSURFACE INVESTIGATION**

PROJ. REFERENCE NO. 41153.1.1 (I-5000) F.A. PROJ. IMF-85-1(113)17  
 COUNTY GASTON  
 PROJECT DESCRIPTION I-85 /US 321 INTERCHANGE GEOMETRIC SAFETY IMPROVEMENTS

**INVENTORY**  
**(REVISED)**

**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 1901 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 UN-PLACED 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

J.K. STICKNEY

C.L. SMITH

JP ROGERS

S&ME

INVESTIGATED BY J.P. ROGERS

CHECKED BY C.B. LITTLE

SUBMITTED BY C.B. LITTLE

DATE JUNE 2014

NORTH CAROLINA  
 LICENSED  
 SEAL  
 1104  
 GEOLOGIST  
 CLINTON B. LITTLE

Designed by:  
Clinton B. Little  
 93047D5AC8E452...

8/11/2014

DRAWN BY: J.K. McClURE /JP ROGERS





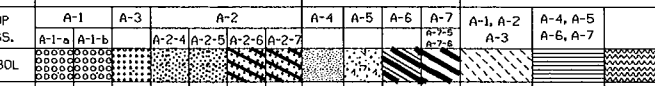
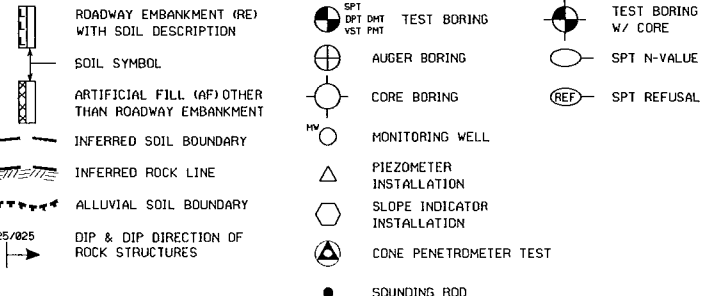
NOTE - THE INFORMATION CONTAINED HEREIN IS NOT IMPLIED OR GUARANTEED BY THE N. C. DEPARTMENT OF TRANSPORTATION AS BEING ACCURATE NOR IT IS CONSIDERED TO BE PART OF THE PLANS, SPECIFICATIONS, OR CONTRACT FOR THE PROJECT.

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, HEAVY 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. <b>ANGULARITY OF GRAINS</b> THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u> , <u>SUBANGULAR</u> , <u>SUBROUNDED</u> , OR <u>ROUNDED</u> .	HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:  WEATHERED ROCK (WR)  CRYSTALLINE ROCK (CR)  NON-CRYSTALLINE ROCK (NCR)  COASTAL PLAIN SEDIMENTARY ROCK (CP)	<b>ALLUVIUM (ALLUV.)</b> - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. <b>AQUIFER</b> - A WATER BEARING FORMATION OR STRATA. <b>ARENACEOUS</b> - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. <b>ARGILLACEOUS</b> - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. <b>ARTESIAN</b> - 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. <b>CALCAREOUS (CALC.)</b> - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. <b>COLLUVIUM</b> - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. <b>CORE RECOVERY (REC.)</b> - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. <b>DIKE</b> - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. <b>DIP</b> - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. <b>DIP DIRECTION (DIP AZIMUTH)</b> - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. <b>FAULT</b> - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. <b>FISSILE</b> - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. <b>FLOAT</b> - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLOADED FROM PARENT MATERIAL. <b>FLOOD PLAIN (FP)</b> - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. <b>FORMATION (FM)</b> - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. <b>JOINT</b> - FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. <b>LEDGE</b> - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. <b>LENS</b> - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. <b>MOTTLED (MOT.)</b> - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS. MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. <b>PERCHED WATER</b> - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. <b>RESIDUAL (RES.) SOIL</b> - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. <b>ROCK QUALITY DESIGNATION (RQD)</b> - 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. <b>SAPROLITE (SAP.)</b> - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. <b>SILL</b> - 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. <b>SLICKENSIDE</b> - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. <b>STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT)</b> - 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. <b>STRATA CORE RECOVERY (SCREC)</b> - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. <b>STRATA ROCK QUALITY DESIGNATION (SRQD)</b> - 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. <b>TOPSOIL (TS)</b> - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.
<b>SOIL LEGEND AND AASHTO CLASSIFICATION</b> GENERAL CLASS. GRANULAR MATERIALS (< 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS GROUP CLASS. A-1, A-3, A-2, A-4, A-5, A-6, A-7, A-1, A-2, A-3, A-4, A-5, A-6, A-7 SYMBOL  % PASSING: * 10, * 40, * 200 LIQUID LIMIT PLASTIC INDEX GROUP INDEX USUAL TYPES OF MAJOR MATERIALS: STONE FRAGS., GRAVEL AND SAND, FINE SAND, SILTY OR CLAYEY GRAVEL AND SAND, SILTY SOILS, CLAYEY SOILS GEN. RATING AS A SUBGRADE: EXCELLENT TO GOOD, FAIR TO POOR, FAIR TO POOR, POOR, UNSUITABLE PI OF A-7-5 SUBGROUP IS ≤ LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30	<b>MINERALOGICAL COMPOSITION</b> MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE. <b>COMPRESSIBILITY</b> SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50 <b>PERCENTAGE OF MATERIAL</b> ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2 - 3% 3 - 5% TRACE 1 - 10% LITTLE ORGANIC MATTER 3 - 5% 5 - 12% LITTLE 10 - 20% MODERATELY ORGANIC 5 - 10% 12 - 20% SOME 20 - 35% HIGHLY ORGANIC >10% >20% HIGHLY 35% AND ABOVE	<b>WEATHERING</b> FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE. 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. 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. MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK. MODERATELY SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. <i>IF TESTED, WOULD YIELD SPT REFUSAL.</i> 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. <i>IF TESTED, YIELDS SPT N VALUES &gt; 100 BPF.</i> 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 &lt; 100 BPF.</i> 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.	<b>CONSISTENCY OR DENSENESS</b> PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FT <sup>2</sup> ) GENERALLY GRANULAR MATERIAL (NON-COHEIVE) VERY LOOSE, LOOSE, MEDIUM DENSE, DENSE, VERY DENSE <4, 4 TO 10, 10 TO 30, 30 TO 50, >50 N/A GENERALLY SILT-CLAY MATERIAL (COHEIVE) VERY SOFT, SOFT, MEDIUM STIFF, STIFF, VERY STIFF, HARD <2, 2 TO 4, 4 TO 8, 8 TO 15, 15 TO 30, >30 <0.25, 0.25 TO 0.50, 0.5 TO 1.0, 1 TO 2, 2 TO 4, >4
<b>TEXTURE OR GRAIN SIZE</b> U.S. STD. SIEVE SIZE OPENING (MM) 4, 10, 40, 60, 200, 270 4.76, 2.00, 0.42, 0.25, 0.075, 0.053 BOULDER (BLDR.), COBBLE (COB.), GRAVEL (GR.), COARSE SAND (CSE. SD.), FINE SAND (F. SD.), SILT (SL.), CLAY (CL.) GRAIN SIZE MM 305, 75, 2.0, 0.25, 0.05, 0.005 IN. 12, 3	<b>MISCELLANEOUS SYMBOLS</b> 	<b>ROCK HARDNESS</b> VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK. HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN. MODERATELY HARD CAN BE SCRATCHED BY KNIFE OR PICK, GOUGES OR GROOVES TO 0.25 INCHES DEEP CAN BE EXCAVATED BY HARD BLOW OF A GEOLOGIST'S PICK. HAND SPECIMENS CAN BE DETACHED BY MODERATE BLOWS. MEDIUM HARD CAN BE GROOVED OR GOUGED 0.05 INCHES DEEP BY FIRM PRESSURE OF KNIFE OR PICK POINT. CAN BE EXCAVATED IN SMALL CHIPS TO PIECES 1 INCH MAXIMUM SIZE BY HARD BLOWS OF THE POINT OF A GEOLOGIST'S PICK. SOFT CAN BE GROOVED OR GOUGED READILY BY KNIFE OR PICK. CAN BE EXCAVATED IN FRAGMENTS FROM CHIPS TO SEVERAL INCHES IN SIZE BY MODERATE BLOWS OF A PICK POINT. SMALL, THIN PIECES CAN BE BROKEN BY FINGER PRESSURE. VERY SOFT CAN BE CARVED WITH KNIFE. CAN BE EXCAVATED READILY WITH POINT OF PICK. PIECES 1 INCH OR MORE IN THICKNESS CAN BE BROKEN BY FINGER PRESSURE. CAN BE SCRATCHED READILY BY FINGER NAIL.	<b>ABBREVIATIONS</b> AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE. - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HI. - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT v - VERY VST - VANE SHEAR TEST WEA. - WEATHERED γ - UNIT WEIGHT γ <sub>d</sub> - DRY UNIT WEIGHT SAMPLE ABBREVIATIONS S - BULK SS - SPLIT SPOON ST - SHELBY TUBE RS - ROCK RT - RECOMPACTED TRIAXIAL CBR - CALIFORNIA BEARING RATIO
<b>SOIL MOISTURE - CORRELATION OF TERMS</b> SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION LL - LIQUID LIMIT - SATURATED - (SAT.) USUALLY LIQUID; VERY WET, USUALLY FROM BELOW THE GROUND WATER TABLE PL - PLASTIC LIMIT - WET - (W) SEMISOLID; REQUIRES DRYING TO ATTAIN OPTIMUM MOISTURE OM - OPTIMUM MOISTURE - MOIST - (M) SOLID; AT OR NEAR OPTIMUM MOISTURE SL - SHRINKAGE LIMIT - DRY - (D) REQUIRES ADDITIONAL WATER TO ATTAIN OPTIMUM MOISTURE	<b>EQUIPMENT USED ON SUBJECT PROJECT</b> DRILL UNITS: MOBILE B-___, BK-51, CME-45C, CME-550, PORTABLE HOIST, DIEDRICH D-50 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, 3 1/4" HOLLOW AUGERS HAMMER TYPE: AUTOMATIC, MANUAL CORE SIZE: B, N_XWL, H HAND TOOLS: POST HOLE DIGGER, HAND AUGER, SOUNDING ROD, VANE SHEAR TEST	<b>FRACTURE SPACING</b> TERM SPACING TERM THICKNESS VERY WIDE MORE THAN 10 FEET VERY THICKLY BEDDED > 4 FEET WIDE 3 TO 10 FEET THICKLY BEDDED 1.5 - 4 FEET MODERATELY CLOSE 1 TO 3 FEET THINLY BEDDED 0.16 - 1.5 FEET CLOSE 0.16 TO 1 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET VERY CLOSE LESS THAN 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET	<b>BENCH MARK:</b> ELEVATION: FT. NOTES: SOIL STRATIGRAPHY IS THROUGH THE BORINGS FOR PROFILES AND CROSS-SECTIONS. HAMMER EFFICIENCY RATINGS: CME-550X HF00064 81% 11/28/05 CME-550X HF00064 91% 01/09/13 DIEDRICH D-50 75% 01/10/13 CME-550X SME3193 80% 06/07/2011
<b>PLASTICITY</b> PLASTICITY INDEX (PI) DRY STRENGTH NON-PLASTIC 0-5 VERY LOW LOW PLASTICITY 6-15 SLIGHT MED. PLASTICITY 16-25 MEDIUM HIGH PLASTICITY 26 OR MORE HIGH		<b>INDURATION</b> FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC. FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE. MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER. INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER. EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.	
<b>COLOR</b> 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.			

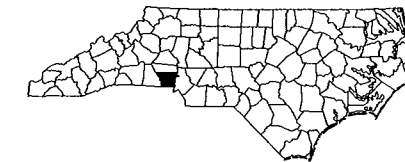
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**GASTON COUNTY**

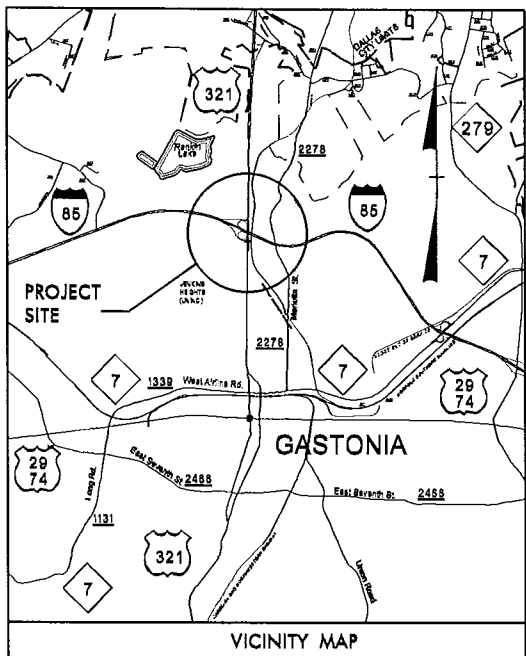
LOCATION: I-85/US 321 INTERCHANGE GEOMETRIC SAFETY IMPROVEMENTS

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

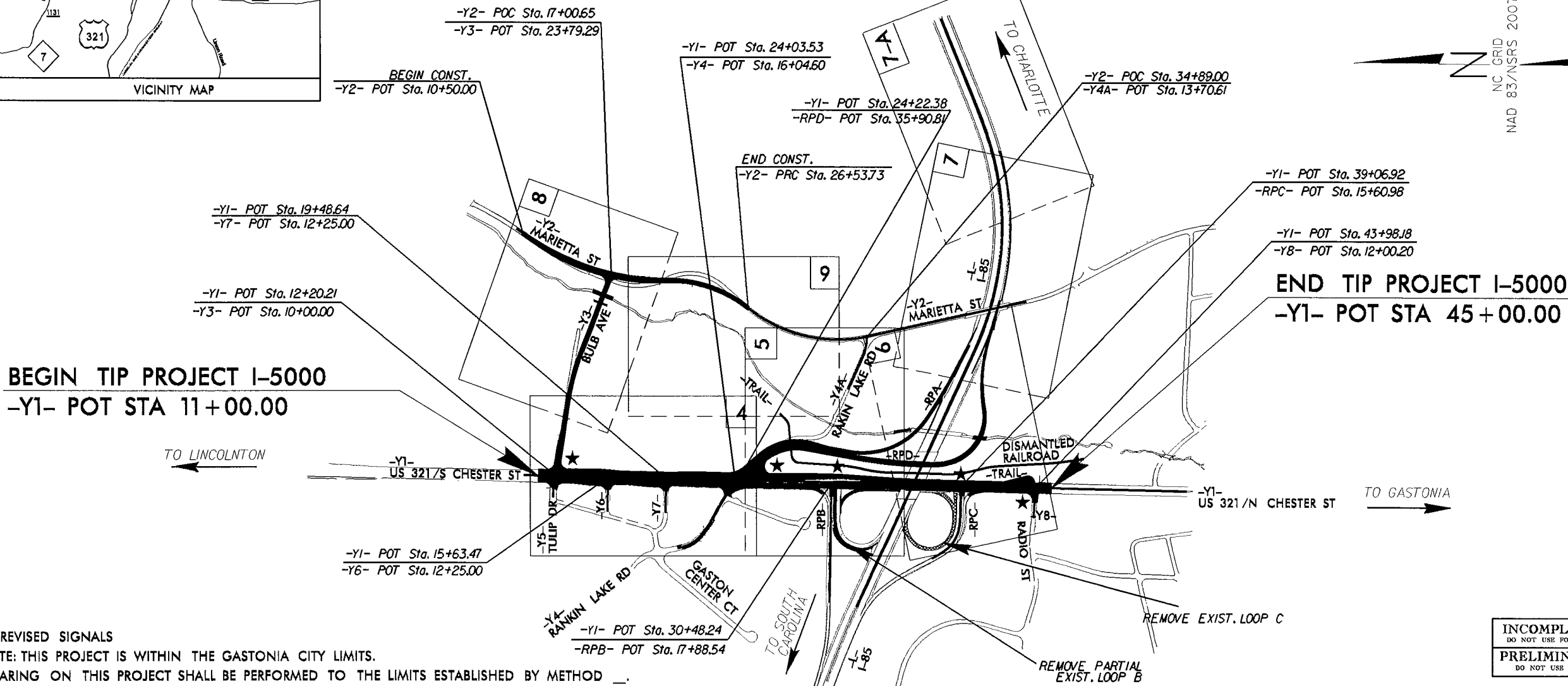
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-5000	2A	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
41153.1.1	IMF-85-1(113)17	PE	



NC GRID  
NAD 83/NSRS 2007

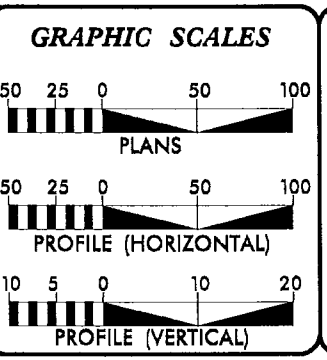


**TIP PROJECT: I-5000**



★ REVISED SIGNALS  
NOTE: THIS PROJECT IS WITHIN THE GASTONIA CITY LIMITS.  
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD \_\_\_\_\_.

INCOMPLETE PLANS  
DO NOT USE FOR R/W ACQUISITION  
PRELIMINARY PLANS  
DO NOT USE FOR CONSTRUCTION



**DESIGN DATA**

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

**PROJECT LENGTH**

LENGTH ROADWAY TIP PROJECT I-5000 =	0.644 MILES
TOTAL LENGTH TIP PROJECT I-5000 =	0.644 MILES

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

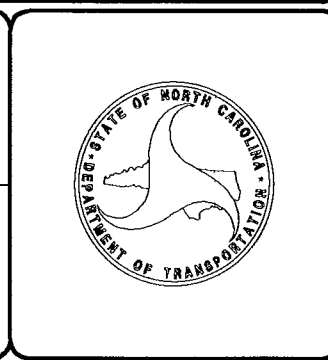
2012 STANDARD SPECIFICATIONS	
<b>RIGHT OF WAY DATE:</b> April 18, 2014	<b>JASON MOORE, PE</b> PROJECT ENGINEER
<b>LETTING DATE:</b> October 20, 2015	<b>BRYAN KEY, PE</b> PROJECT DESIGN ENGINEER

**HYDRAULICS ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.

**ROADWAY DESIGN ENGINEER**

SIGNATURE: \_\_\_\_\_ P.E.



II-FEB-2014 14:20  
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**CONTRACT:**



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

Pat McCrory  
GOVERNOR

Anthony Tata  
SECRETARY

March 6, 2014

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

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

**PROJECT DESCRIPTION**

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

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

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

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

TELEPHONE: 919-707-6850  
FAX: 919-250-4237  
  
**WEBSITE:**  
[www.ncdot.gov/doh/preconstruct/highway/geotech](http://www.ncdot.gov/doh/preconstruct/highway/geotech)

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

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

**AREAS OF SPECIAL GEOTECHNICAL INTEREST**

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

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

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

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

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

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

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

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

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

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

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

## **SOIL PROPERTIES**

### *Residual Soils*

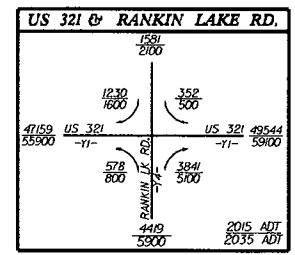
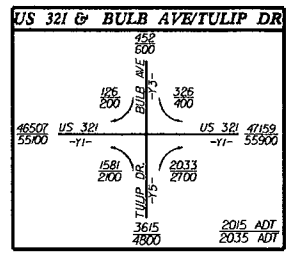
All residual soils on the project are derived from the intrusive, quartz-rich (PPmg) rocks encountered within the project corridor. Crystalline and severely weathered crystalline rock was encountered in the cut sections between Stations 10+50 to 20+50 -Y2- and 18+50 to 20+50 -Y3-. The dominant residual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

Respectfully submitted,

John P. Rogers  
Project Geological Engineer

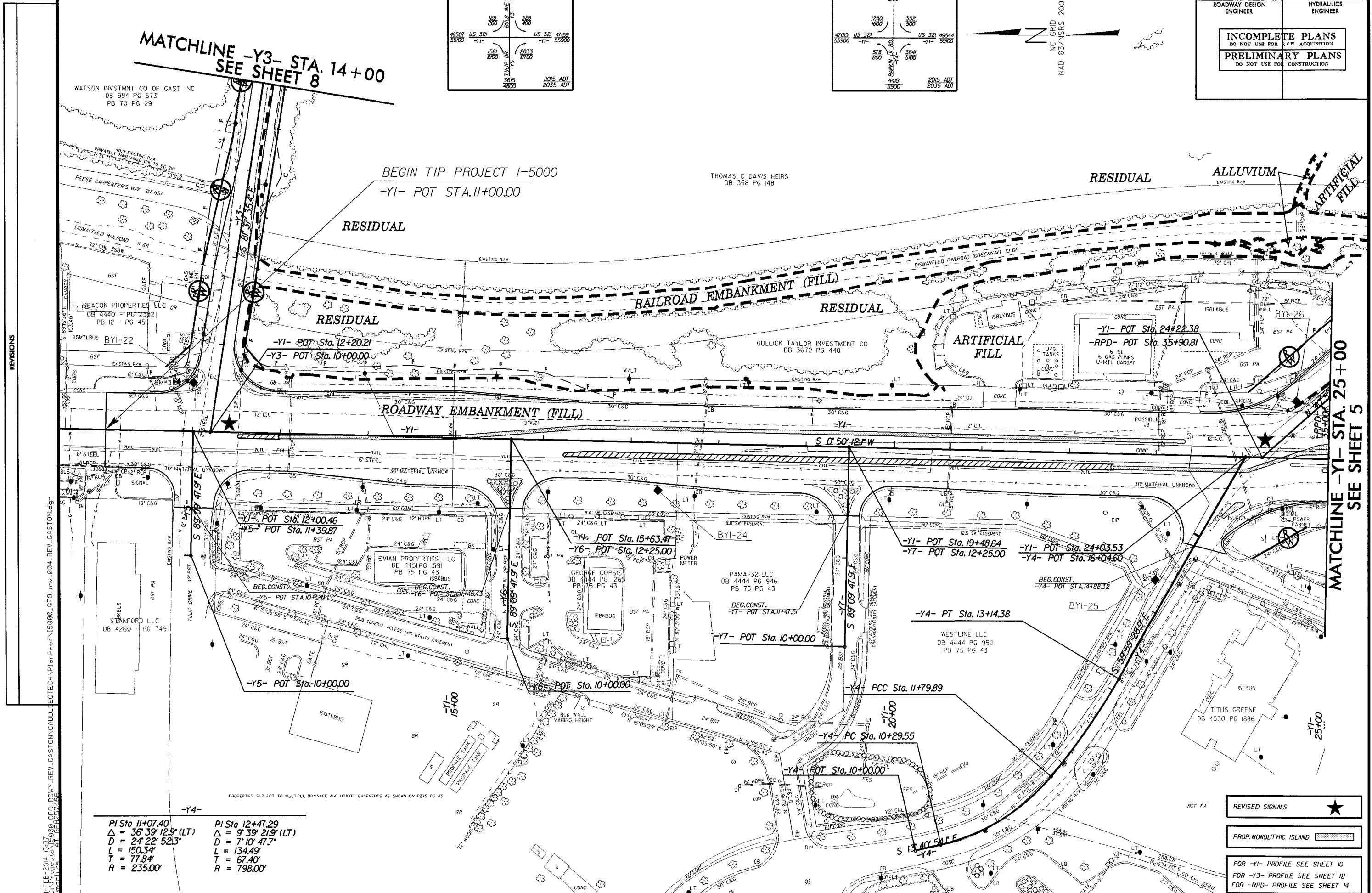
B/17/99

PROJECT REFERENCE NO. I-5000		SHEET NO. 4	
RAW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION			
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION			



**MATCHLINE -Y3- STA. 14+00**  
**SEE SHEET 8**

**MATCHLINE -Y1- STA. 25+00**  
**SEE SHEET 5**



REVISIONS

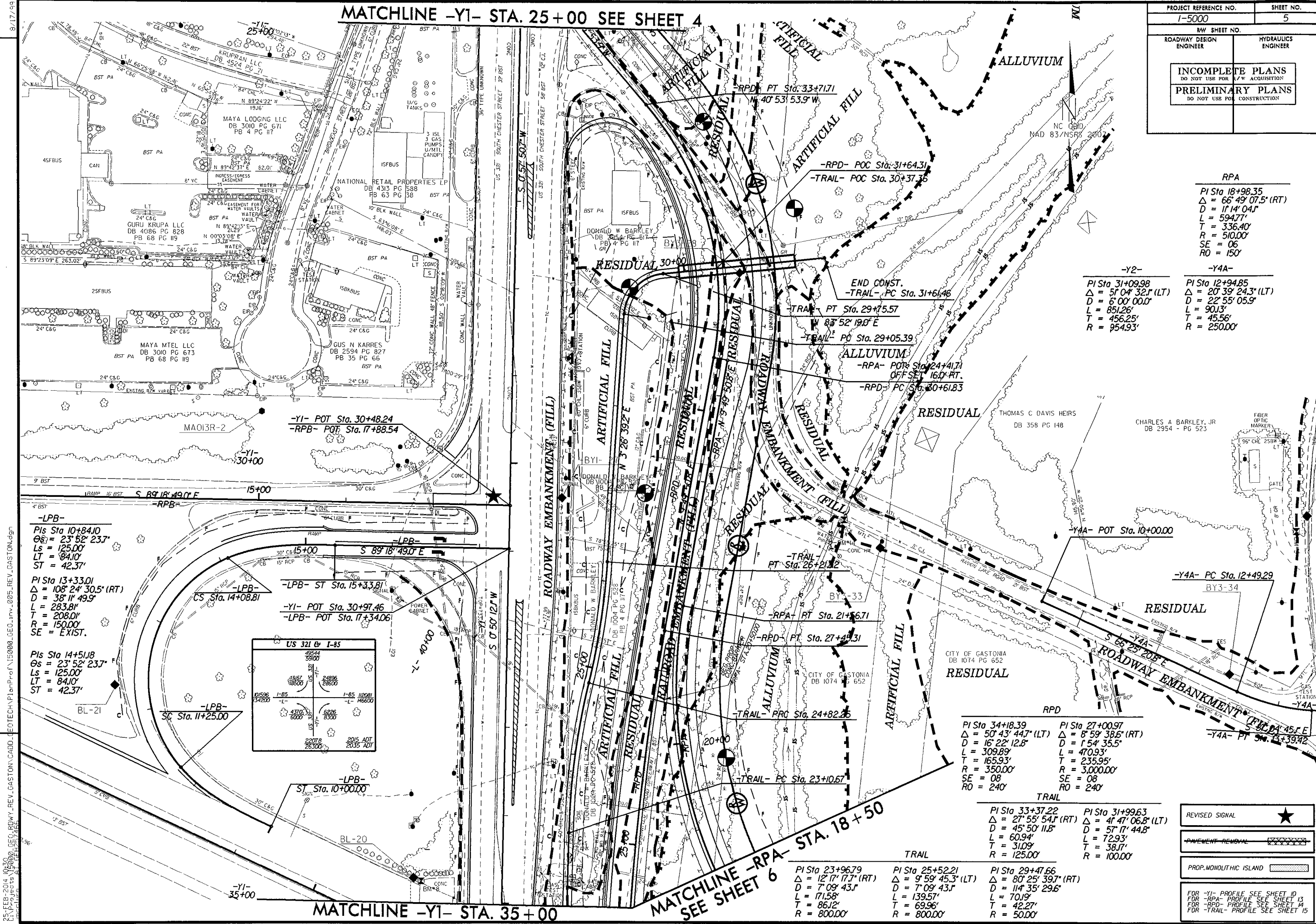
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-Y4-	PI Sta 11+07.40 Δ = 36° 39' 12.9" (LT) D = 24' 22' 52.3" L = 150.34' T = 77.84' R = 235.00'	PI Sta 12+47.29 Δ = 9° 39' 21.9" (LT) D = 7' 10' 47.7" L = 134.49' T = 67.40' R = 798.00'
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- ★ REVISED SIGNALS
- ▨ PROP. MONOLITHIC ISLAND
- FOR -Y1- PROFILE SEE SHEET 10
- FOR -Y3- PROFILE SEE SHEET 12
- FOR -RPD- PROFILE SEE SHEET 14

MATCHLINE -Y1- STA. 25+00 SEE SHEET 4

PROJECT REFERENCE NO.	SHEET NO.
1-5000	5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION	
<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



RPA  
 PI Sta 18+98.35  
 $\Delta = 66' 49' 07.5''$  (RT)  
 $D = 11' 14' 04''$   
 $L = 594.77'$   
 $T = 336.40'$   
 $R = 510.00'$   
 $SE = 06'$   
 $RO = 150'$

-Y2-  
 PI Sta 31+09.98  
 $\Delta = 5' 04' 32.1''$  (LT)  
 $D = 6' 00' 00.0''$   
 $L = 851.26'$   
 $T = 456.25'$   
 $R = 954.93'$

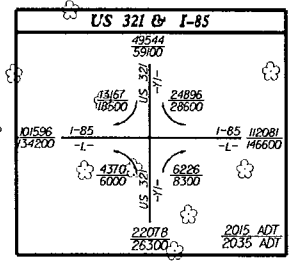
-Y4A-  
 PI Sta 12+94.85  
 $\Delta = 20' 39' 24.3''$  (LT)  
 $D = 22' 55' 05.9''$   
 $L = 90.13'$   
 $T = 45.56'$   
 $R = 250.00'$

-LPB-  
 PIs Sta 10+84.10  
 $\Delta = 23' 52' 23.7''$   
 $Ls = 125.00'$   
 $LT = 84.10'$   
 $ST = 42.37'$

PI Sta 13+33.01  
 $\Delta = 108' 24' 30.5''$  (RT)  
 $D = 38' 11' 49.9''$   
 $L = 283.81'$   
 $T = 208.01'$   
 $R = 150.00'$   
 $SE = EXIST.$

PIs Sta 14+51.18  
 $\Delta = 23' 52' 23.7''$   
 $Ls = 125.00'$   
 $LT = 84.10'$   
 $ST = 42.37'$

-LPB- ST Sta. 15+33.81  
 -Y1- POT Sta. 30+97.46  
 -LPB- POT Sta. 17+34.06



PI Sta 34+18.39  
 $\Delta = 50' 43' 44.7''$  (LT)  
 $D = 16' 22' 12.8''$   
 $L = 309.89'$   
 $T = 165.93'$   
 $R = 350.00'$   
 $SE = 08'$   
 $RO = 240'$

PI Sta 27+00.97  
 $\Delta = 8' 59' 38.5''$  (RT)  
 $D = 1' 54' 35.5''$   
 $L = 470.93'$   
 $T = 235.95'$   
 $R = 3,000.00'$   
 $SE = 08'$   
 $RO = 240'$

TRAIL  
 PI Sta 33+37.22  
 $\Delta = 27' 55' 54.1''$  (RT)  
 $D = 45' 50' 11.8''$   
 $L = 60.94'$   
 $T = 31.09'$   
 $R = 125.00'$

PI Sta 31+99.63  
 $\Delta = 41' 47' 06.8''$  (LT)  
 $D = 57' 17' 44.8''$   
 $L = 72.93'$   
 $T = 38.17'$   
 $R = 100.00'$

TRAIL  
 PI Sta 23+96.79  
 $\Delta = 12' 17' 17.7''$  (RT)  
 $D = 7' 09' 43.1''$   
 $L = 171.58'$   
 $T = 86.12'$   
 $R = 800.00'$

TRAIL  
 PI Sta 25+52.21  
 $\Delta = 9' 59' 45.3''$  (LT)  
 $D = 7' 09' 43.1''$   
 $L = 139.57'$   
 $T = 69.96'$   
 $R = 800.00'$

TRAIL  
 PI Sta 29+47.66  
 $\Delta = 80' 25' 39.7''$  (RT)  
 $D = 114' 35' 29.6''$   
 $L = 70.19'$   
 $T = 42.27'$   
 $R = 50.00'$

REVISED SIGNAL	★
PAVEMENT REMOVAL	XXXXXX
PROP. MONOLITHIC ISLAND	▨

FOR -Y1- PROFILE SEE SHEET 10  
 FOR -RPA- PROFILE SEE SHEET 13  
 FOR -RPD- PROFILE SEE SHEET 14  
 FOR -TRAIL- PROFILE SEE SHEET 15

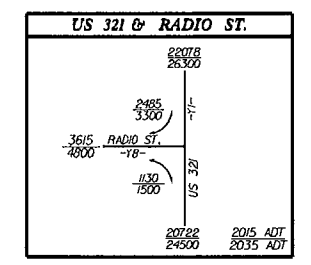
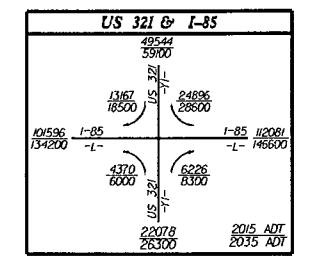
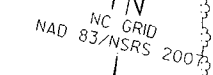
MATCHLINE -Y1- STA. 35+00

MATCHLINE -RPA- STA. 18+50  
 SEE SHEET 6

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
I-5000	6
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



**RPA**

PIs Sta 12+51.52 Δs = 2° 47' 41.7" Ls = 200.00' LT = 133.35' ST = 66.68'	PI Sta 13+71.57 Δ = 2° 59' 03.5" (RT) D = 2° 47' 41.7" L = 106.78' T = 53.40' R = 2,050.00' SE = 06 RO = 200'
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**RPD**

PI Sta 14+20.00 Δ = 27° 28' 20.5" (LT) D = 6° 21' 58.3" L = 431.53' T = 220.00' R = 900.00' SE = 08 RO = 200'	PI Sta 21+24.71 Δ = 110° 50' 03.7" (RT) D = 16° 51' 06.1" L = 657.70' T = 493.17' R = 340.00' SE = 08 RO = 240'
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**RPC**

PIs Sta 11+00.57 Δs = 18° 45' 00.0" Ls = 150.00' LT = 100.57' ST = 50.52'	PI Sta 11+96.84 Δ = 23° 06' 08.8" (LT) D = 25° 00' 00.0" L = 92.41' T = 46.84' R = 229.18'	PIs Sta 12+92.93 Δs = 18° 45' 00.0" Ls = 150.00' LT = 100.57' ST = 50.52'
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**TRAIL**

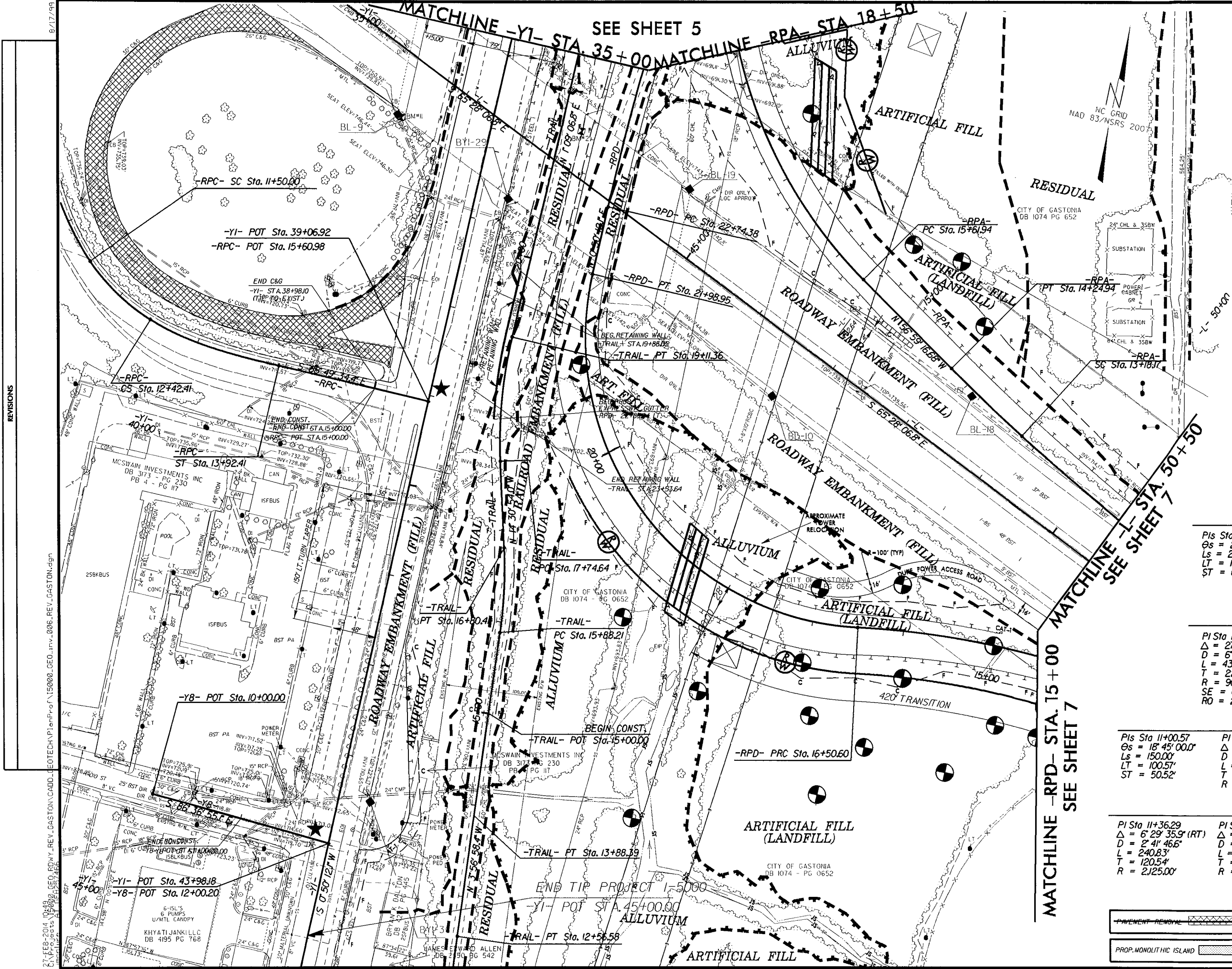
PI Sta 11+36.29 Δ = 6° 29' 35.9" (RT) D = 2° 41' 46.6" L = 240.83' T = 120.54' R = 2,125.00'	PI Sta 16+34.44 Δ = 10° 33' 55.6" (LT) D = 11° 27' 33.0" L = 92.20' T = 46.23' R = 500.00'	PI Sta 18+43.43 Δ = 15° 40' 00.8" (RT) D = 11° 27' 33.0" L = 136.72' T = 68.79' R = 500.00'
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REVISED SIGNALS ★

PAVEMENT REMOVAL [Hatched Box]

PROP. MONOLITHIC ISLAND [Dotted Box]

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



MATCHLINE -RPA- STA. 15+00 SEE SHEET 7

MATCHLINE -L- STA. 50+50 SEE SHEET 7

MATCHLINE -RPD- STA. 15+00 SEE SHEET 7

SEE SHEET 5

MATCHLINE -YI- STA. 35+00 MATCHLINE -RPA- STA. 18+50

REVISIONS

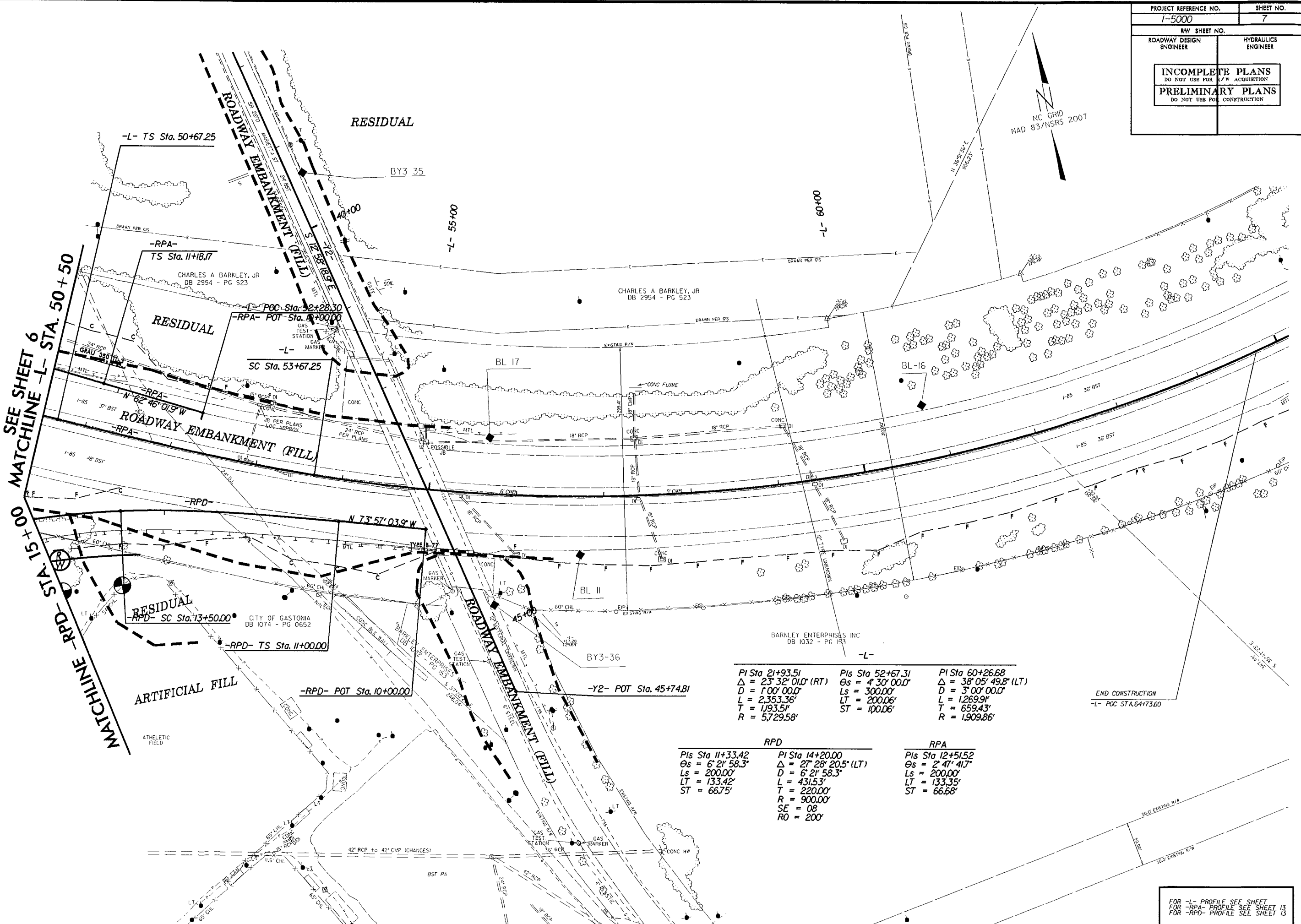
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END TIP PROJECT I-5000



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SEE SHEET 6  
 MATCHLINE -L- STA. 50+50  
 MATCHLINE -RPD- STA. 51+00

PI Sta 21+93.51 $\Delta = 23^{\circ} 32' 01.0''$ (RT) $D = 1^{\circ} 00' 00.0''$ $L = 2,353.36'$ $T = 1,193.51'$ $R = 5,729.58'$	PI Sta 52+67.31 $\Delta = 4^{\circ} 30' 00.0''$ $Ls = 300.00'$ $LT = 200.06'$ $ST = 100.06'$	PI Sta 60+26.68 $\Delta = 38^{\circ} 05' 49.8''$ (LT) $D = 3^{\circ} 00' 00.0''$ $L = 1,269.91'$ $T = 659.43'$ $R = 1,909.86'$
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RPD	RPD	RPA
PI Sta 11+33.42 $\Delta = 6^{\circ} 21' 58.3''$ $Ls = 200.00'$ $LT = 133.42'$ $ST = 66.75'$	PI Sta 14+20.00 $\Delta = 27^{\circ} 28' 20.5''$ (LT) $D = 6^{\circ} 21' 58.3''$ $L = 431.53'$ $T = 220.00'$ $R = 900.00'$ $SE = 08$ $RO = 200'$	PI Sta 12+51.52 $\Delta = 2^{\circ} 47' 41.7''$ $Ls = 200.00'$ $LT = 133.35'$ $ST = 66.68'$

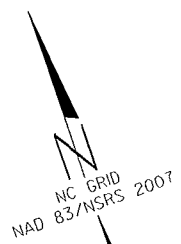
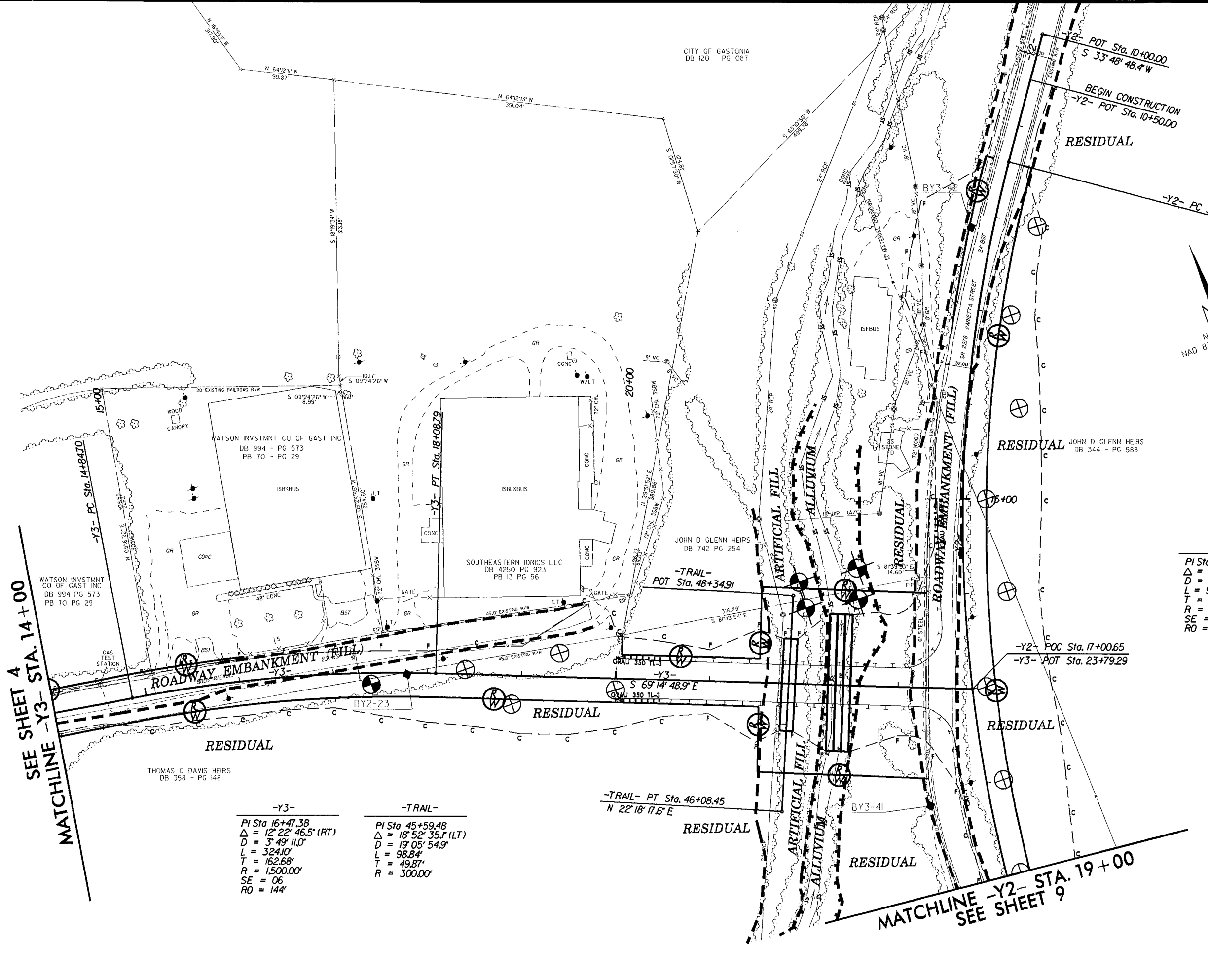
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FOR -L- PROFILE SEE SHEET  
FOR -RPA- PROFILE SEE SHEET 13  
FOR -RPD- PROFILE SEE SHEET 13

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
1-5000	8
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	



SEE SHEET 4  
 MATCHLINE -Y3- STA. 14+00

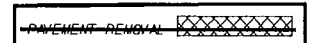
MATCHLINE -Y2- STA. 19+00  
 SEE SHEET 9

-Y3-  
 PI Sta 16+47.38  
 $\Delta = 12' 22'' 46.5''$  (RT)  
 $D = 3' 49'' 11.0''$   
 $L = 324.10'$   
 $T = 162.68'$   
 $R = 1,500.00'$   
 $SE = 06$   
 $RO = 144'$

-TRAIL-  
 PI Sta 45+59.48  
 $\Delta = 18' 52'' 35.1''$  (LT)  
 $D = 19' 05'' 54.9''$   
 $L = 98.84'$   
 $T = 49.87'$   
 $R = 300.00'$

-TRAIL- PT Sta. 46+08.45  
 $N 22' 18'' 17.6'' E$

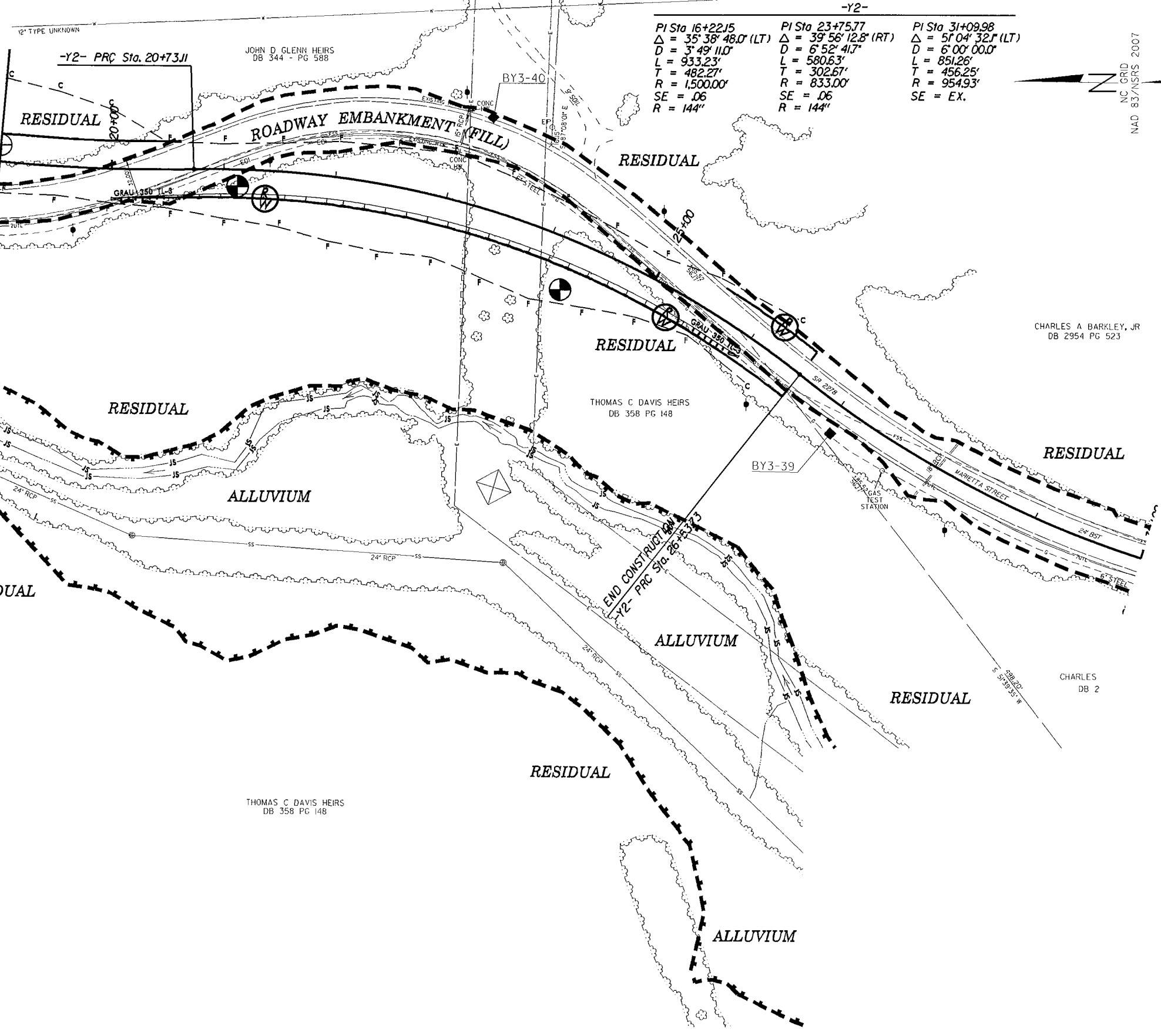
-Y2-  
 PI Sta 16+22.15  
 $\Delta = 35' 38'' 48.0''$  (LT)  
 $D = 3' 49'' 11.0''$   
 $L = 933.23'$   
 $T = 482.27'$   
 $R = 1,500.00'$   
 $SE = 06$   
 $RO = 144'$



FOR -Y2- PROFILE SEE SHEET 12  
 FOR -Y3- PROFILE SEE SHEET 13

8/17/95

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



-Y2-		
PI Sta 16+22.15	PI Sta 23+75.77	PI Sta 31+09.98
$\Delta = 35^{\circ} 38' 48.0''$ (LT)	$\Delta = 39^{\circ} 56' 12.8''$ (RT)	$\Delta = 51^{\circ} 04' 32.1''$ (LT)
$D = 3^{\circ} 49' 11.0''$	$D = 6^{\circ} 52' 41.7''$	$D = 6^{\circ} 00' 00.0''$
$L = 933.23'$	$L = 580.63'$	$L = 851.26'$
$T = 482.27'$	$T = 302.67'$	$T = 456.25'$
$R = 1,500.00'$	$R = 833.00'$	$R = 954.93'$
SE = .06	SE = .06	SE = EX.
R = 144"	R = 144"	



NC GRID  
NAD 83/NSRS 2007

PROJECT REFERENCE NO. 1-5000	SHEET NO. 9
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

REVISIONS

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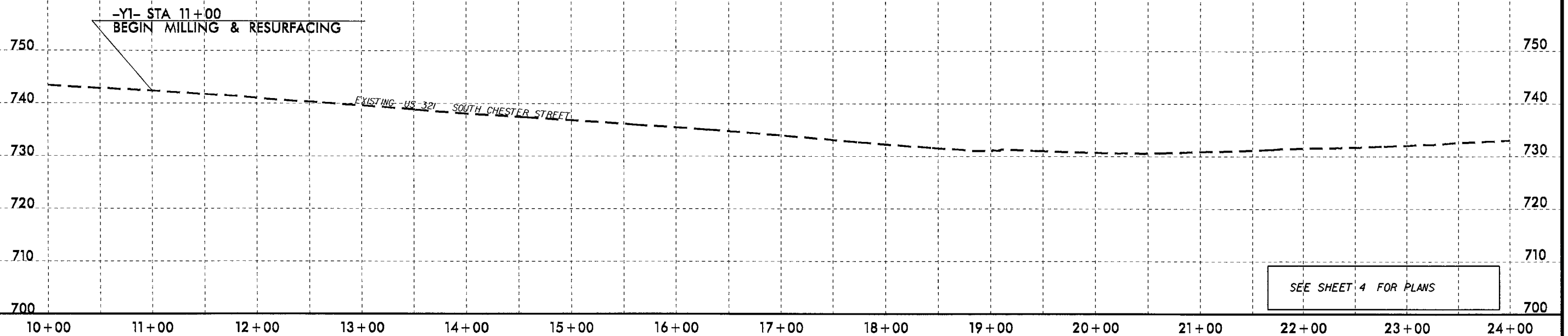
PAVEMENT REMOVAL [XXXXXX]

FOR -Y2- PROFILE SEE SHEETS 11 & 12

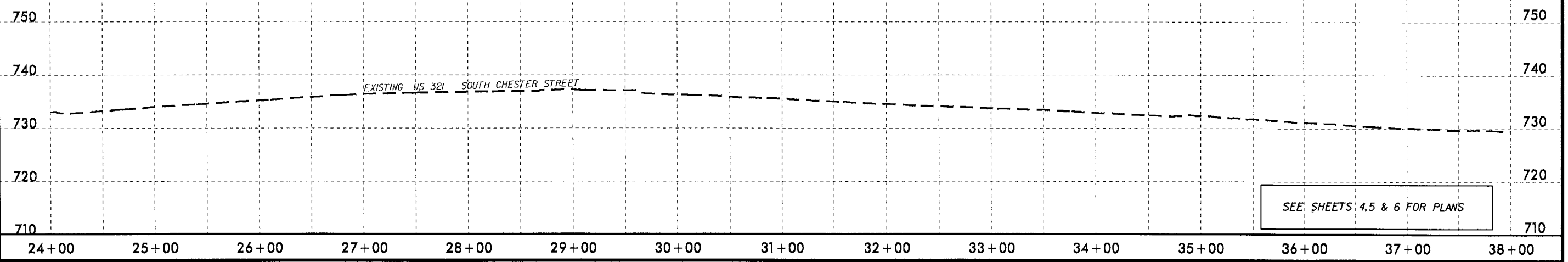
5/28/94

PROJECT REFERENCE NO.		SHEET NO.	
I-5000		10	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER		
<b>INCOMPLETE PLANS</b> <small>DO NOT USE FOR ACQUISITION</small>			
<b>PRELIMINARY PLANS</b> <small>DO NOT USE FOR CONSTRUCTION</small>			

**-Y1-**



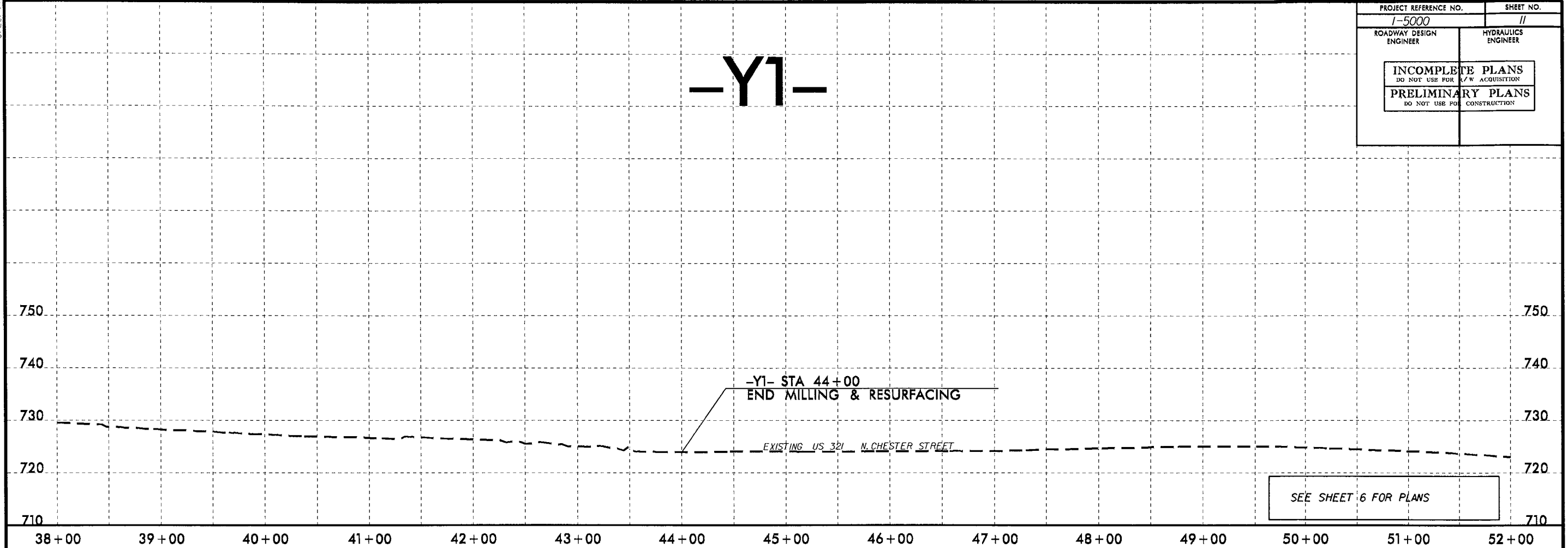
**-Y1-**



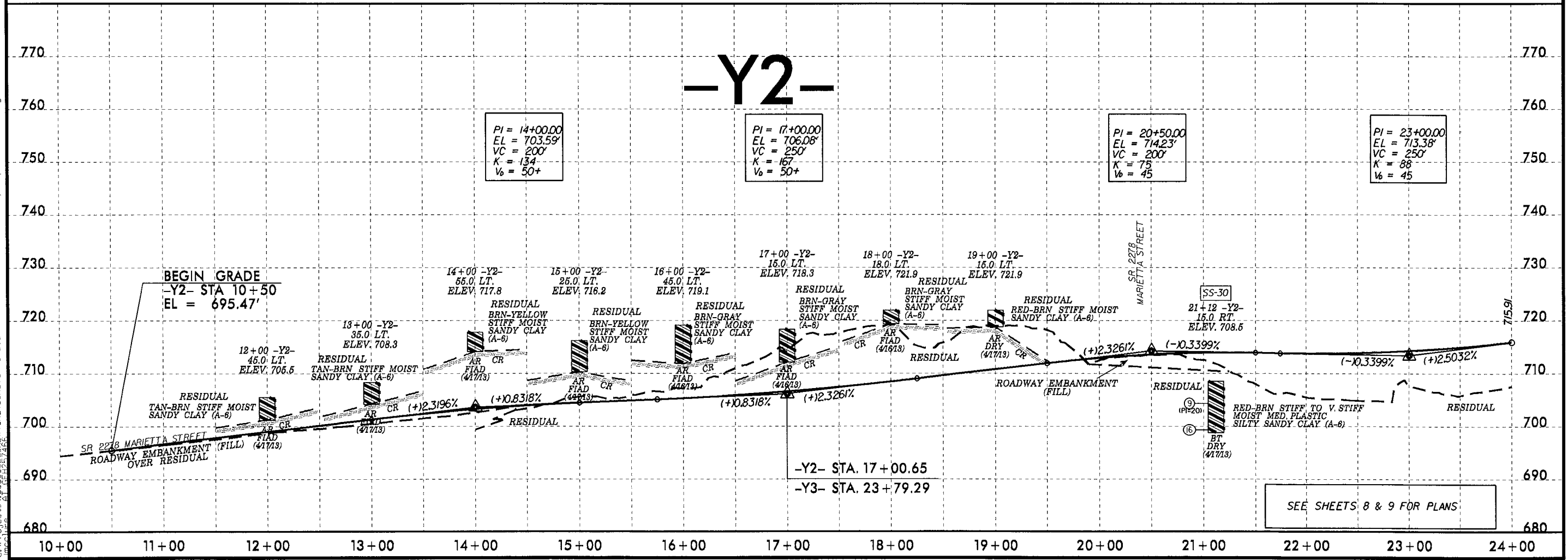
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PROJECT REFERENCE NO. 1-5000	SHEET NO. 11
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

# -Y1-

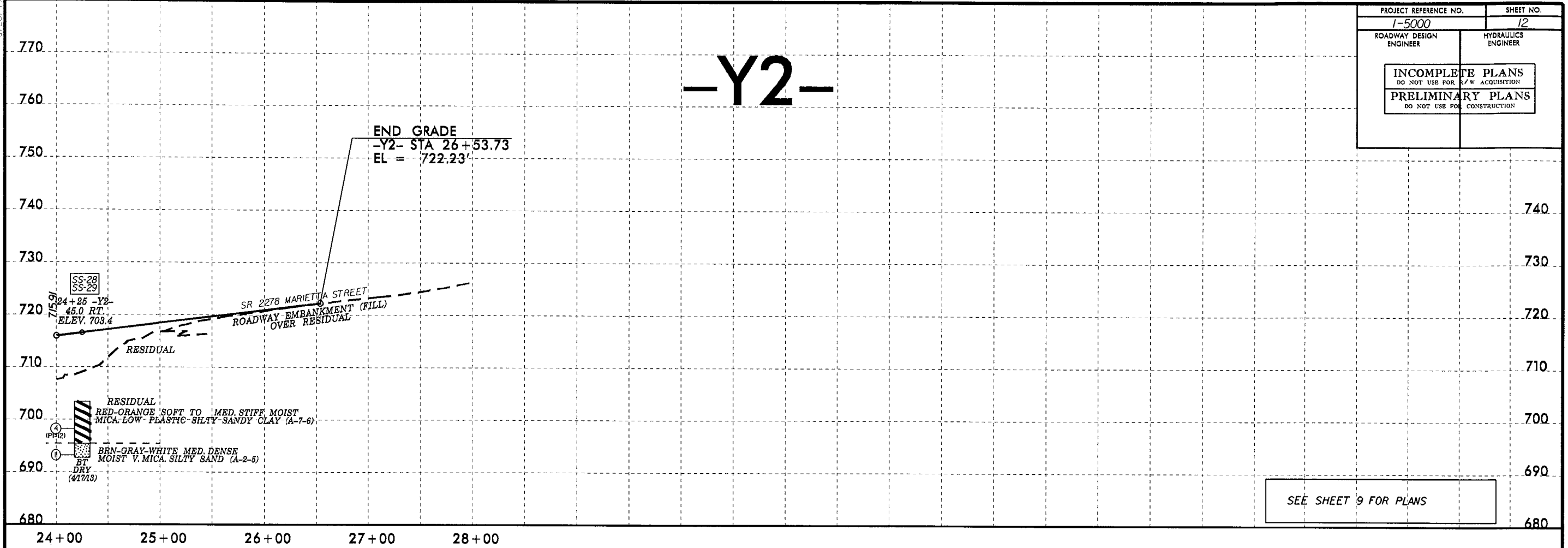


# -Y2-

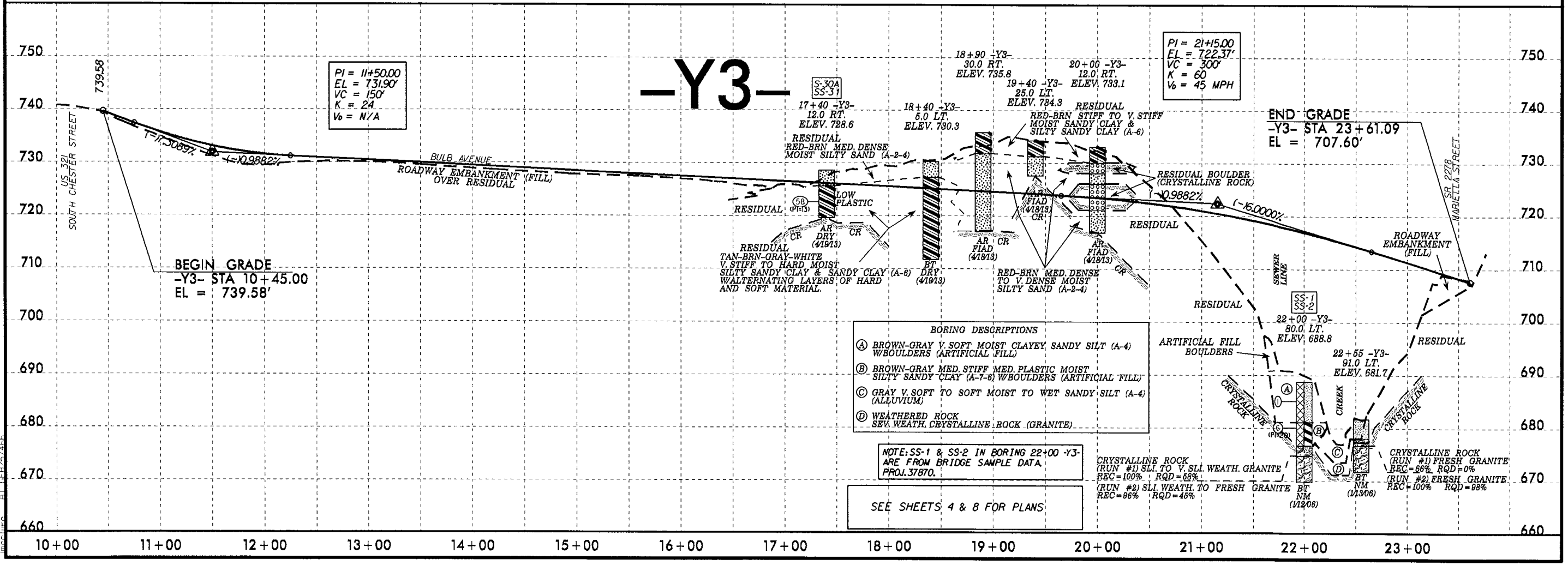


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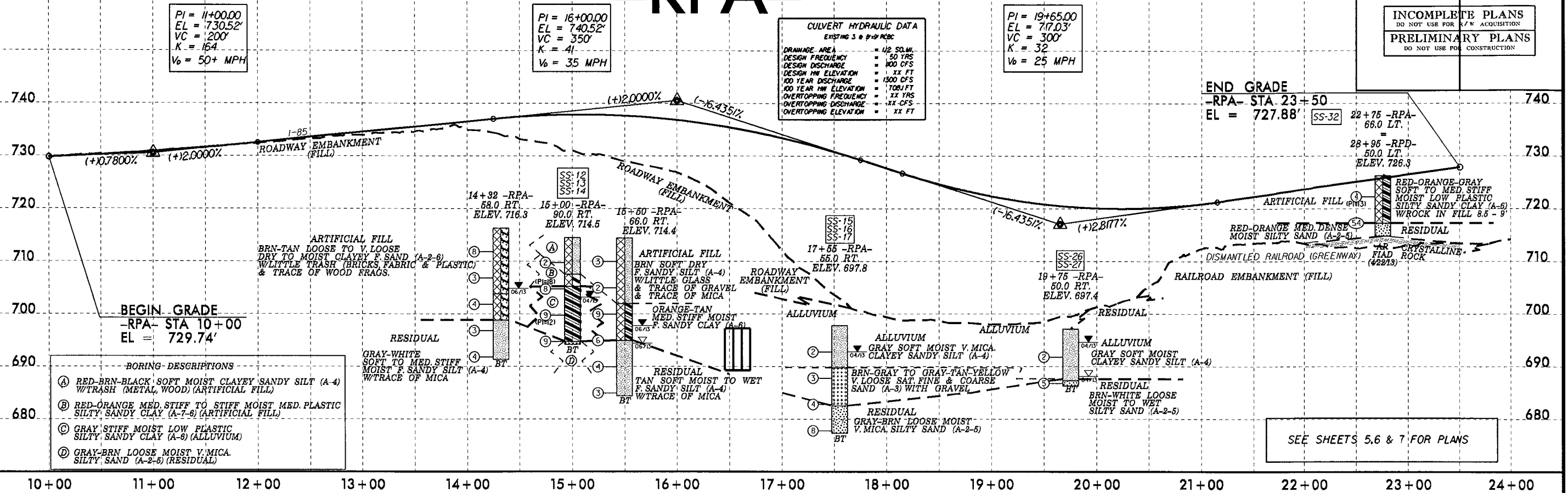


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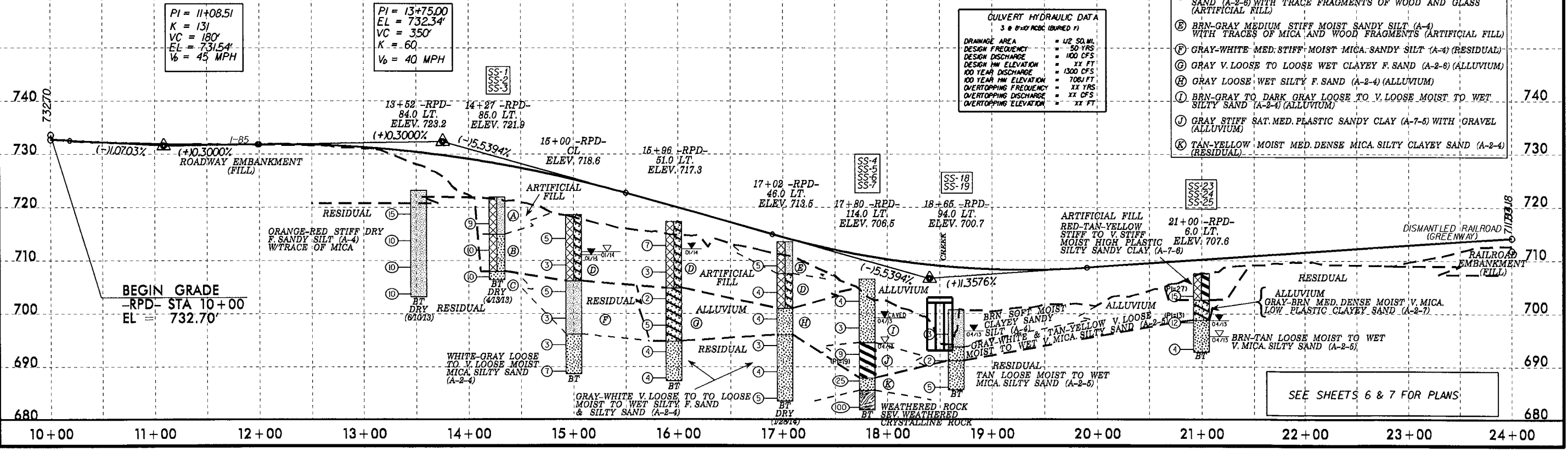


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# -RPA-



# -RPD-

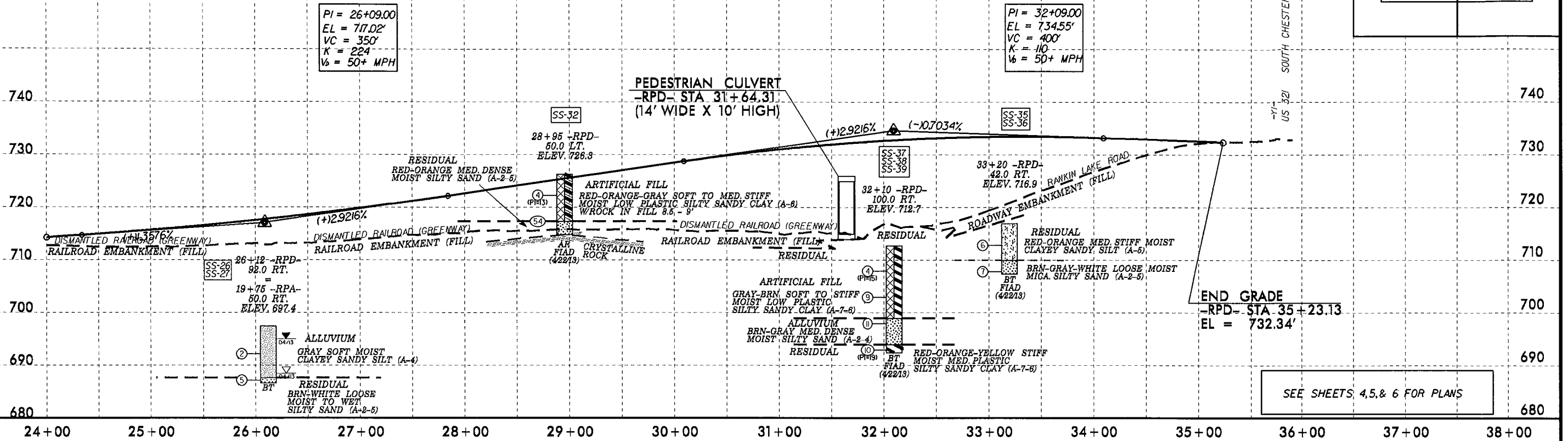


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5/28/99

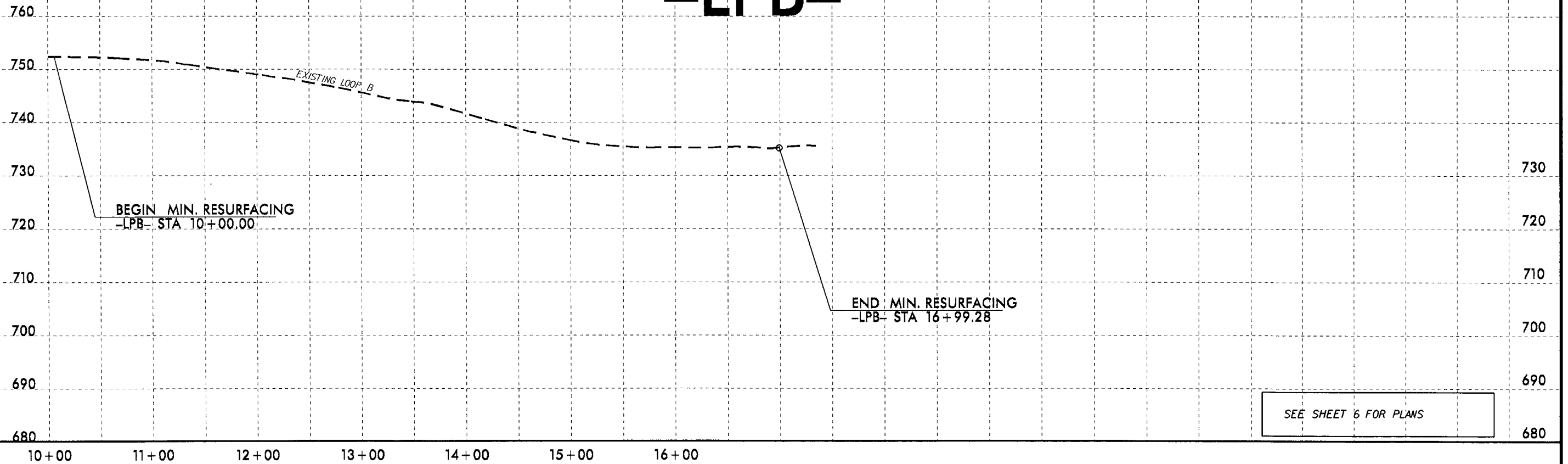
PROJECT REFERENCE NO. 1-5000	SHEET NO. 14
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR A/W ACQUISITION <b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

# -RPD-



SEE SHEETS 4, 5, & 6 FOR PLANS

# -LPB-



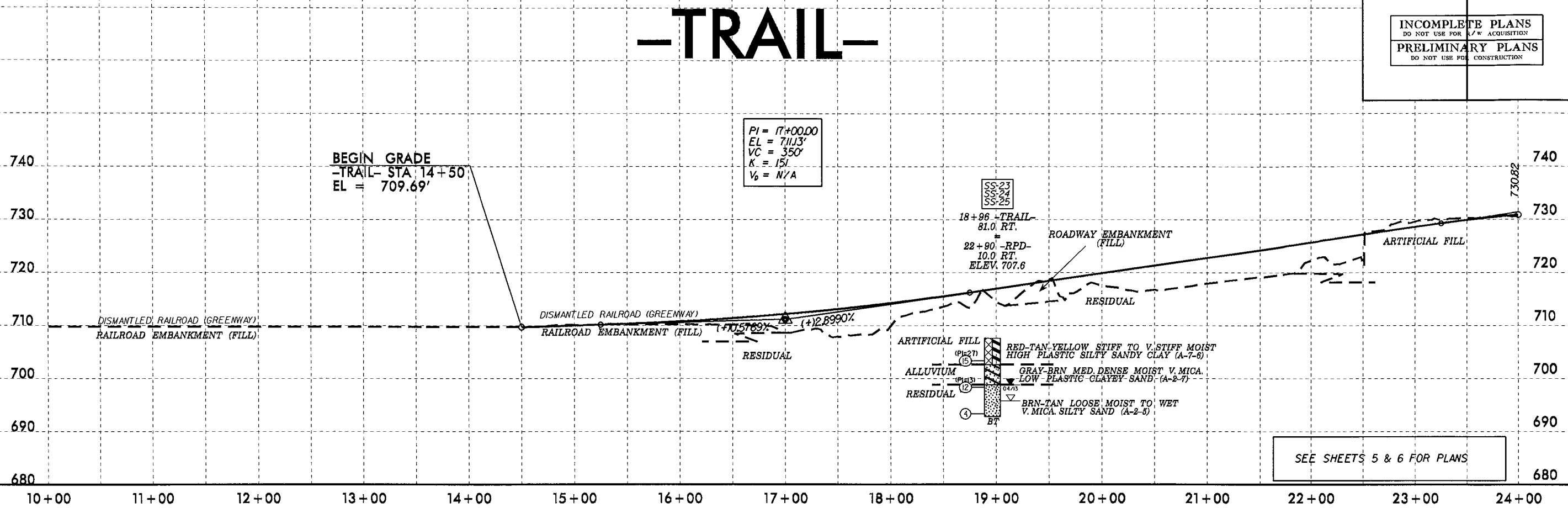
SEE SHEET 6 FOR PLANS

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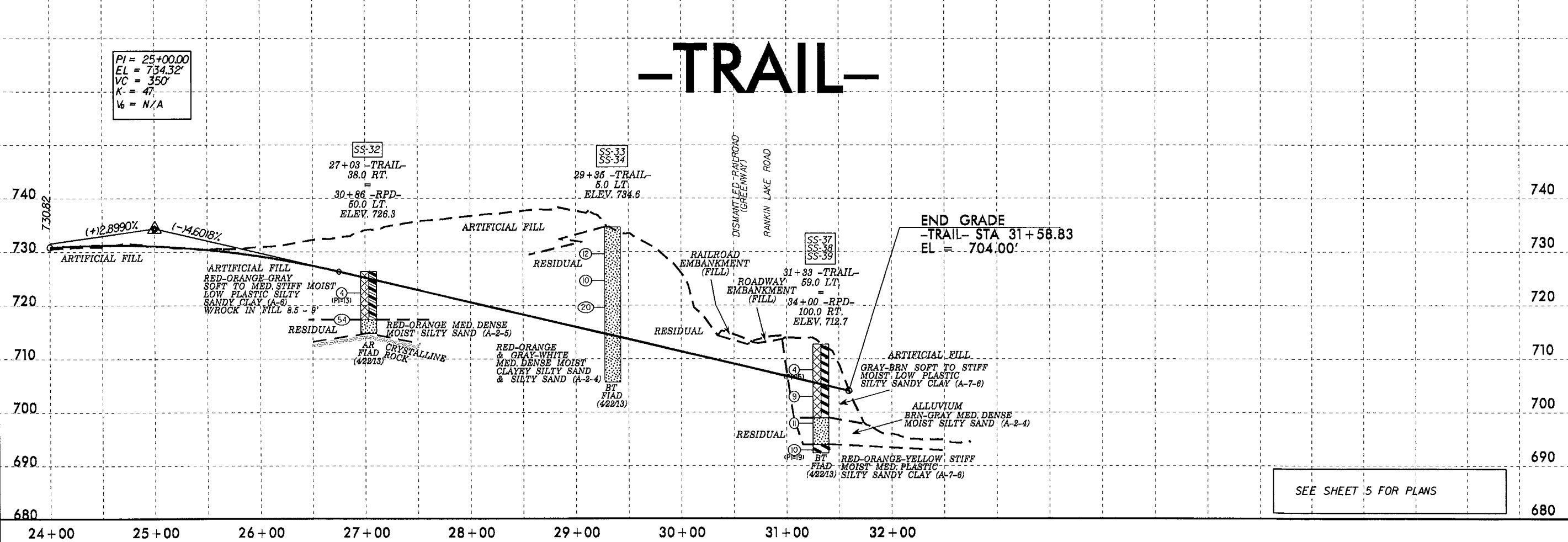
PROJECT REFERENCE NO. I-5000	SHEET NO. 15
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
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<b>PRELIMINARY PLANS</b> DO NOT USE FOR CONSTRUCTION	

5/28/19



SEE SHEETS 5 & 6 FOR PLANS

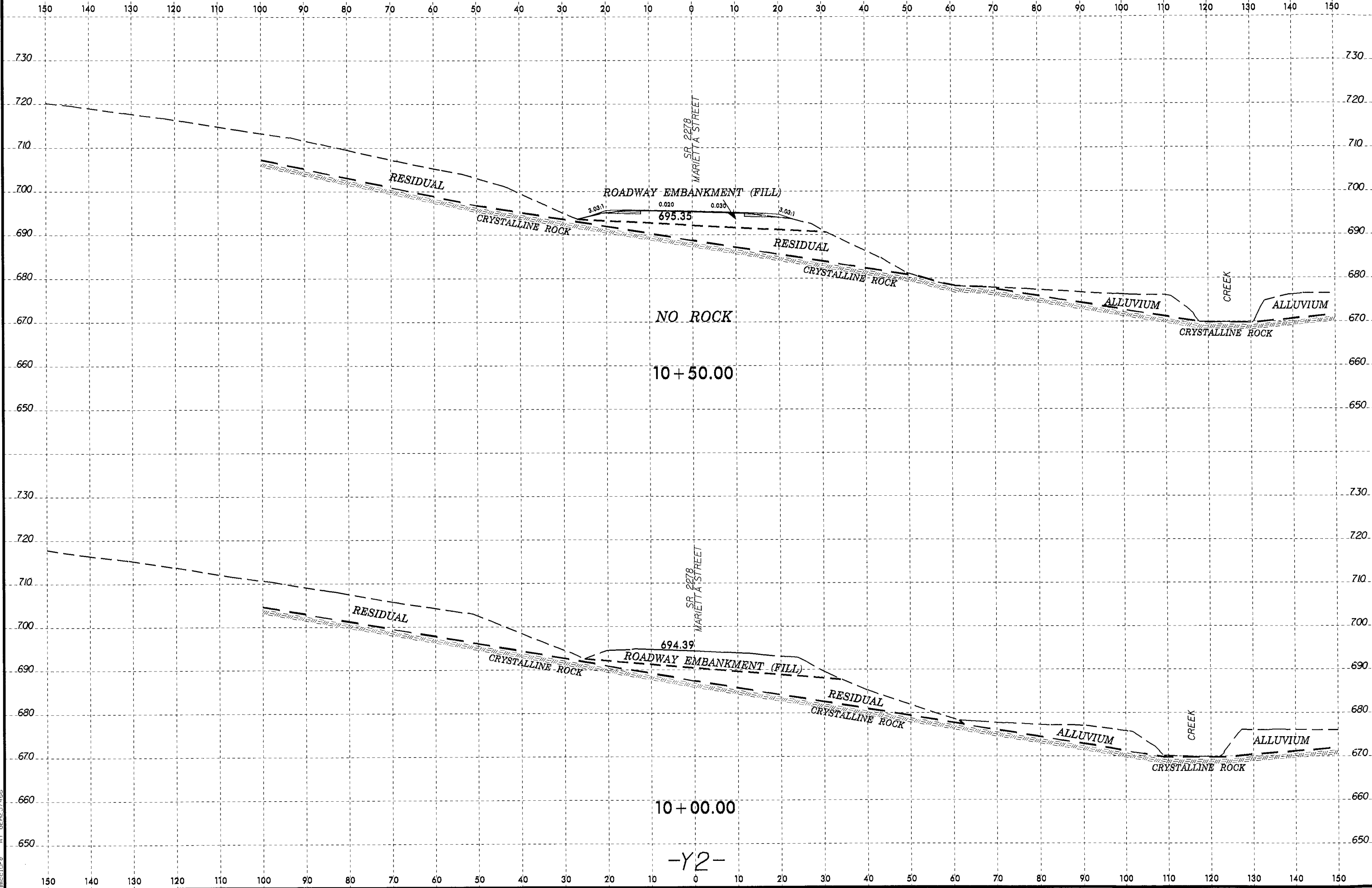
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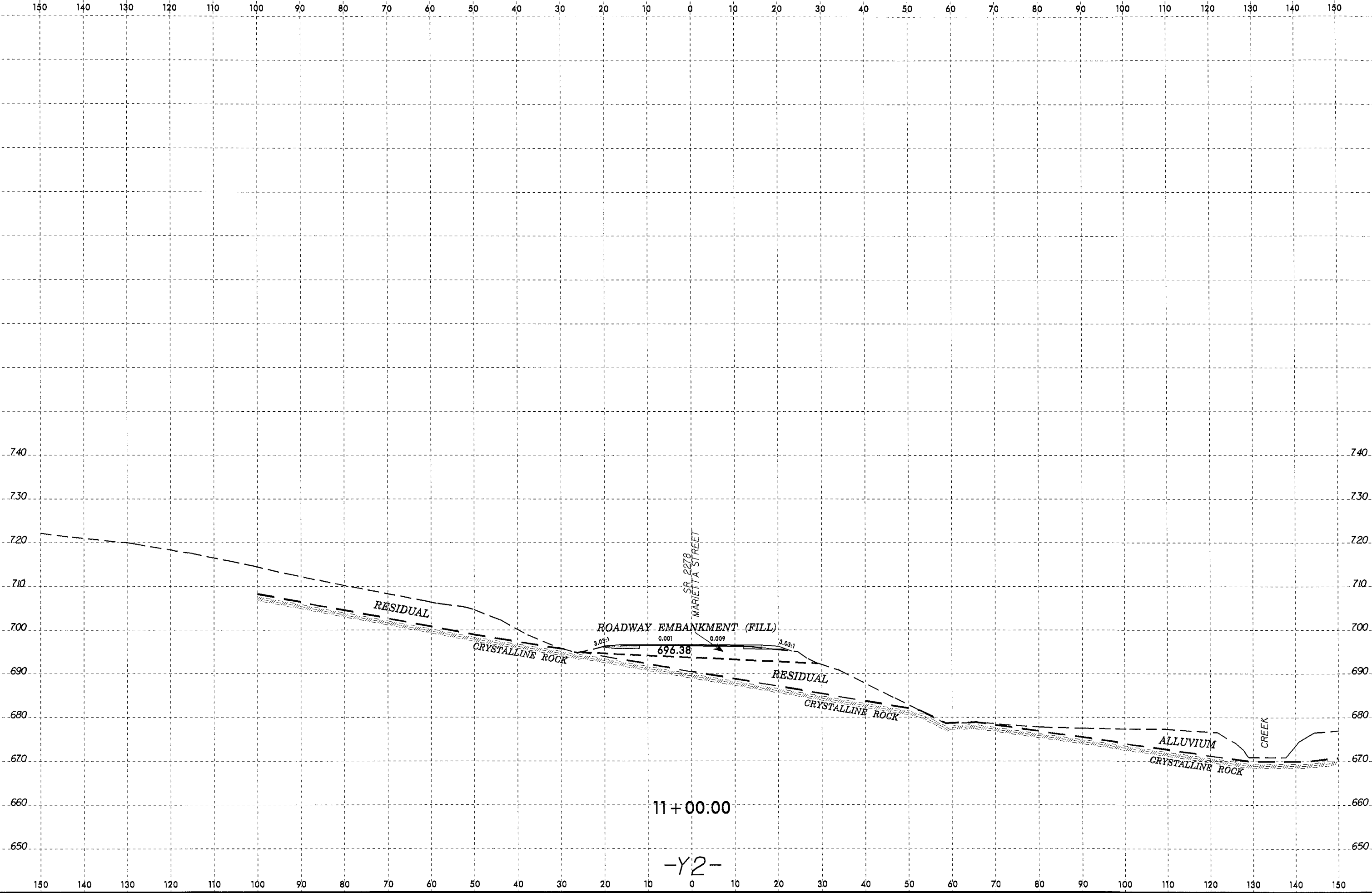
SEE SHEET 5 FOR PLANS

8/23/99

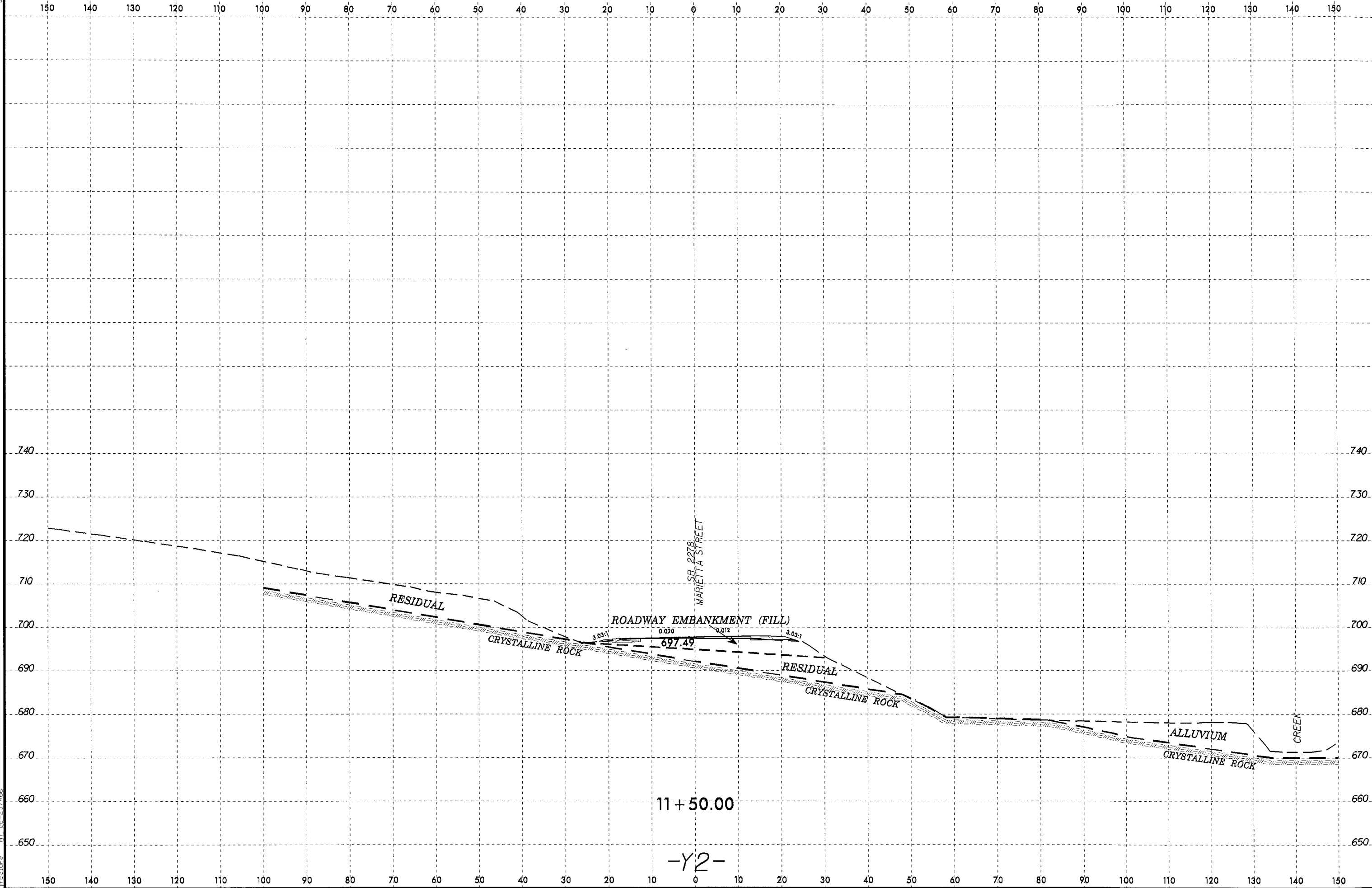
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8/23/99  
25 FEB 2014 11:26  
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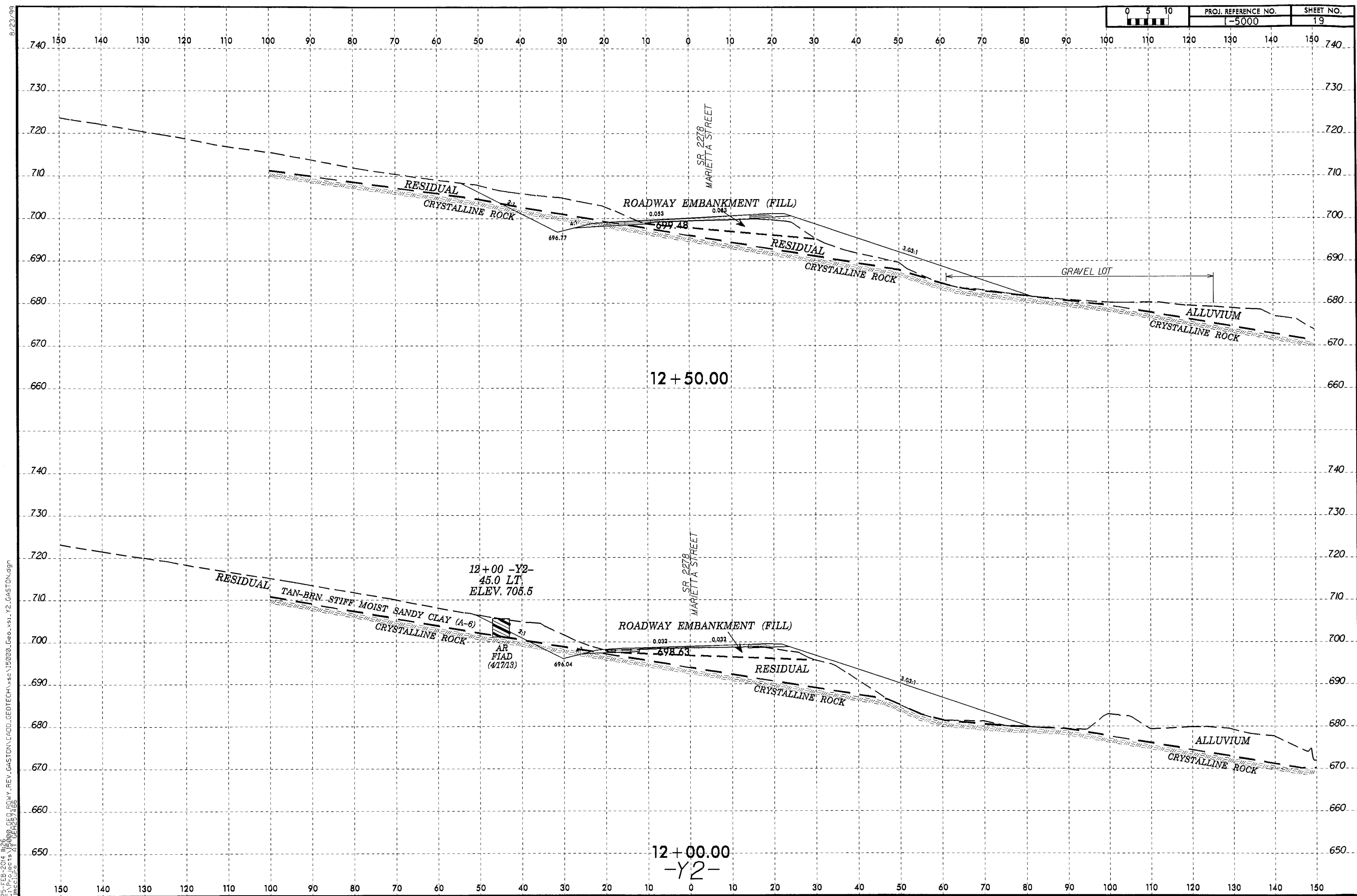


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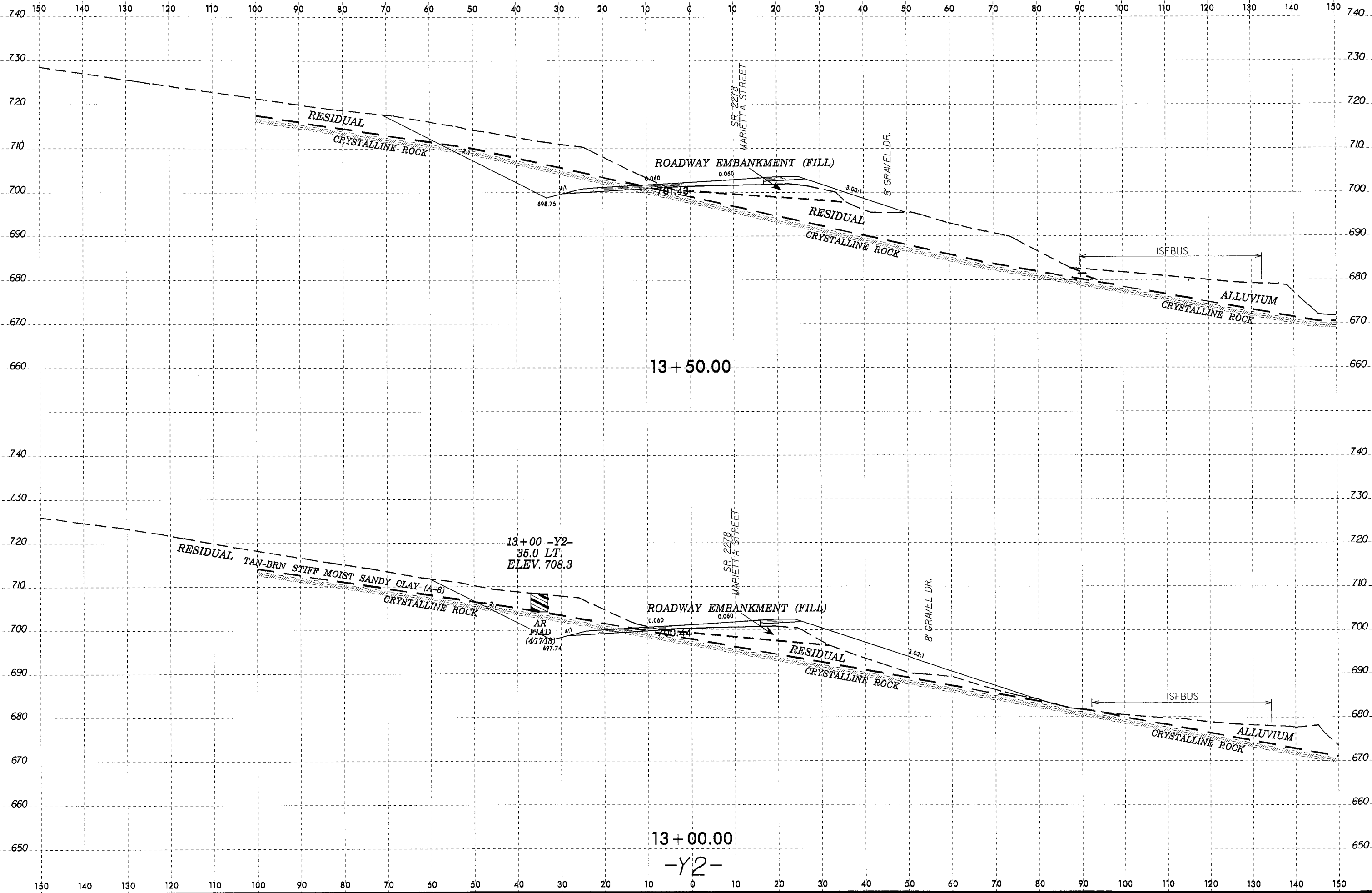
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-Y2-

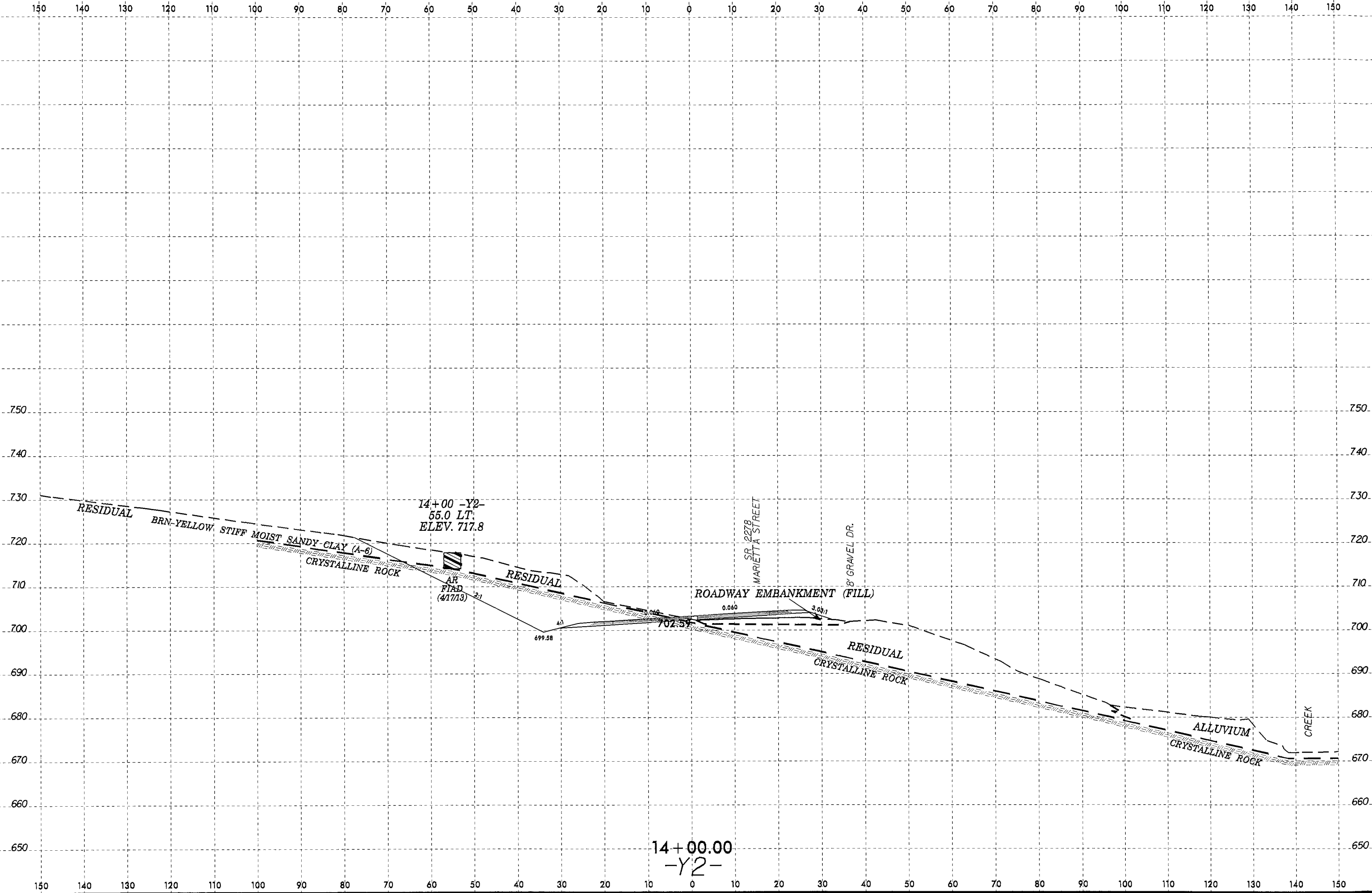


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 157466



8/23/99  
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150000.GEO\XSL\Y2\_GASTON.DGN



14+00 -Y2-  
55.0 LT.  
ELEV. 717.8

ROADWAY EMBANKMENT (FILL)

SR 2278  
MARIETTA STREET

8' GRAVEL DR.

RESIDUAL

BRN-YELLOW STIFF MOIST SANDY-CLAY (A-6)

CRYSTALLINE ROCK

RESIDUAL

AR  
FIAD  
(41713)

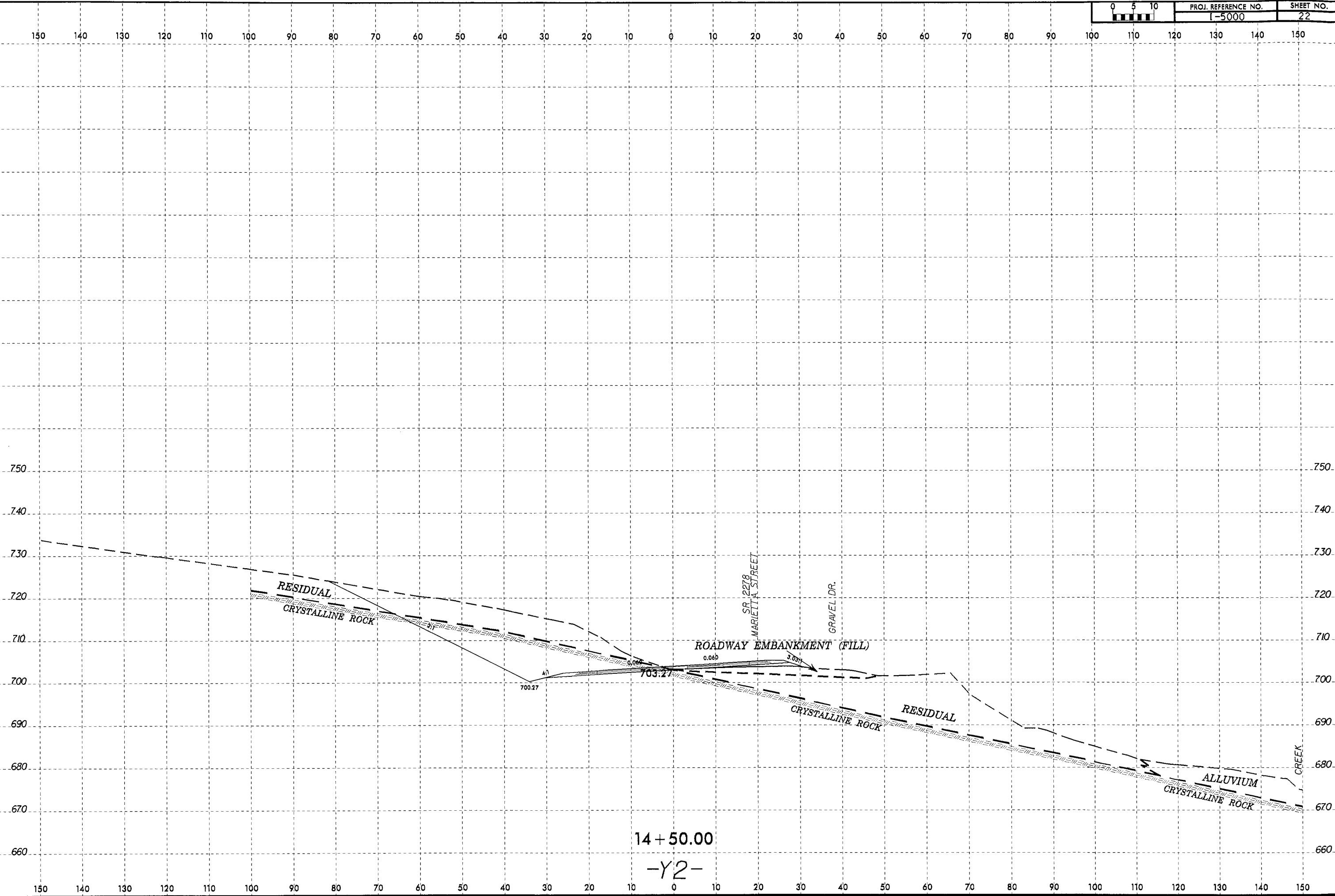
RESIDUAL  
CRYSTALLINE ROCK

ALLUVIUM  
CRYSTALLINE ROCK

CREEK

14+00.00  
-Y2-

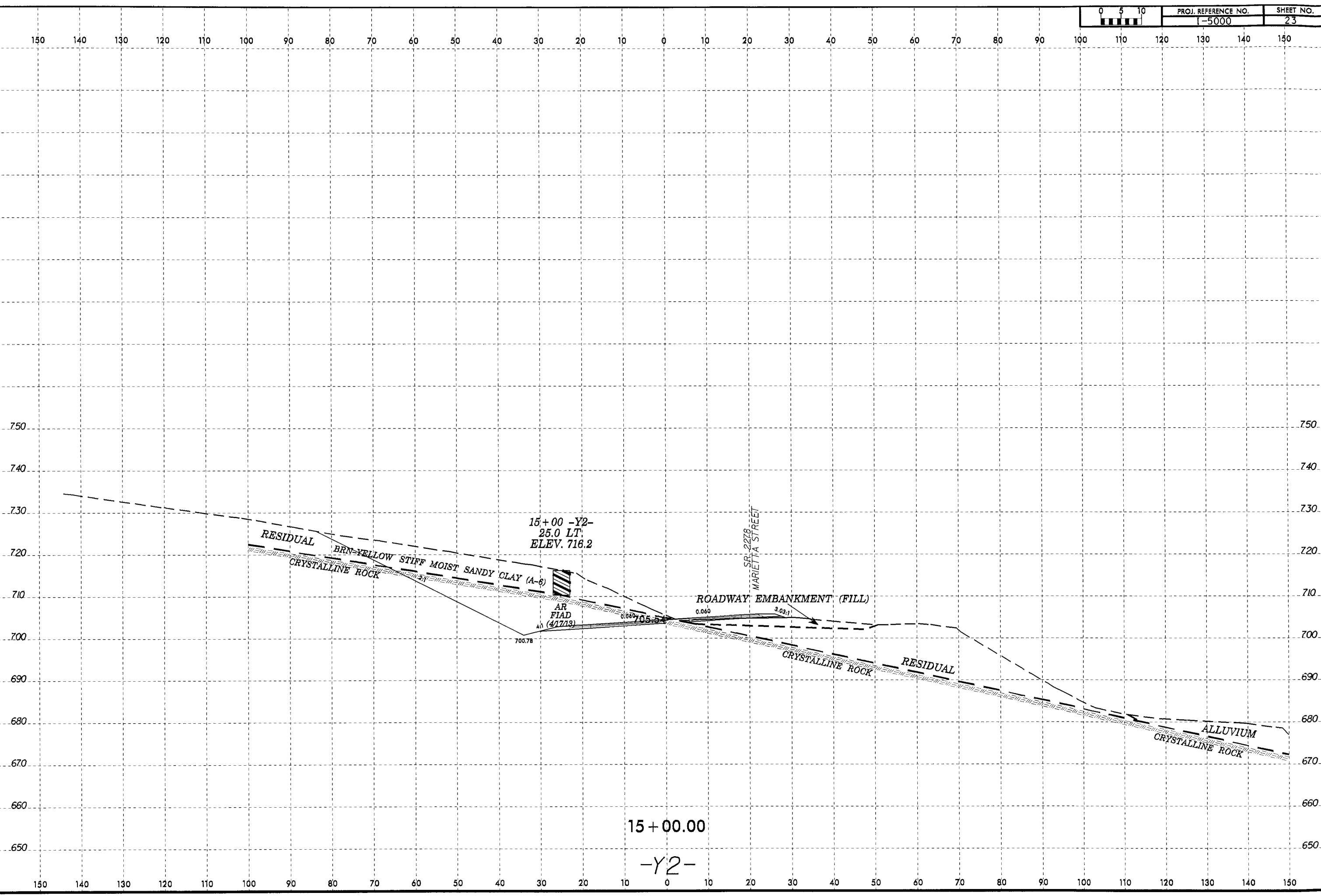
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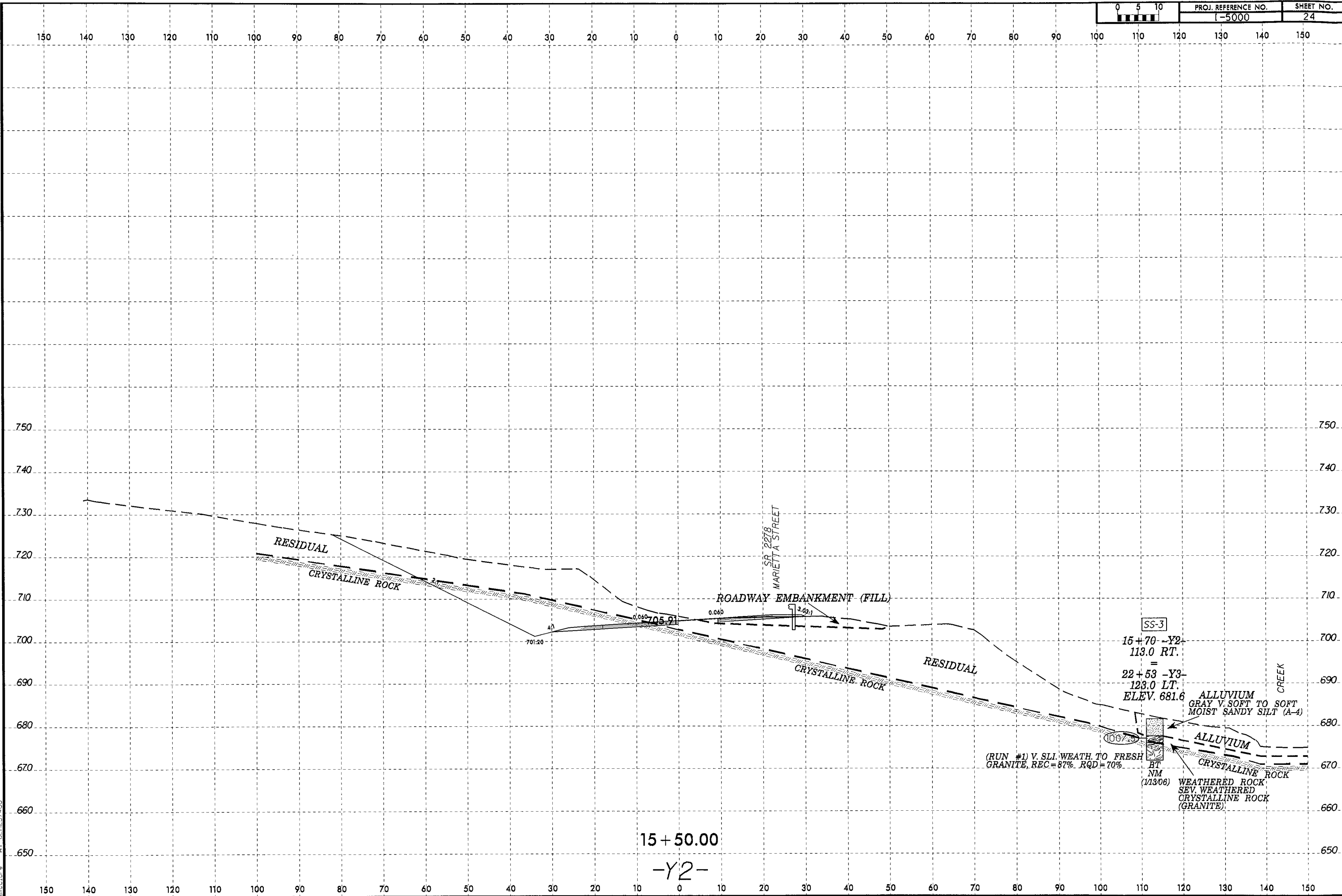
14 + 50.00  
 -Y2-



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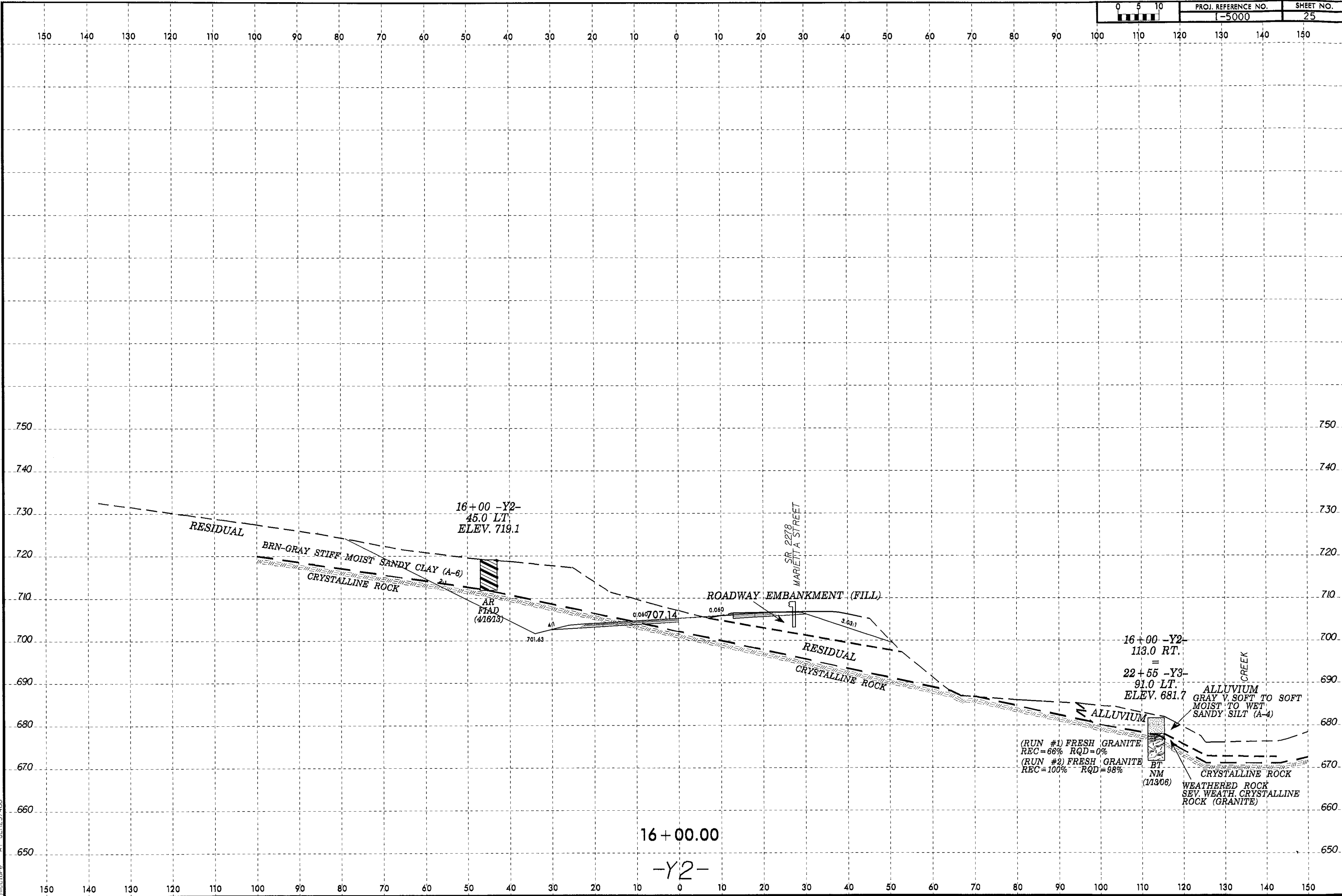


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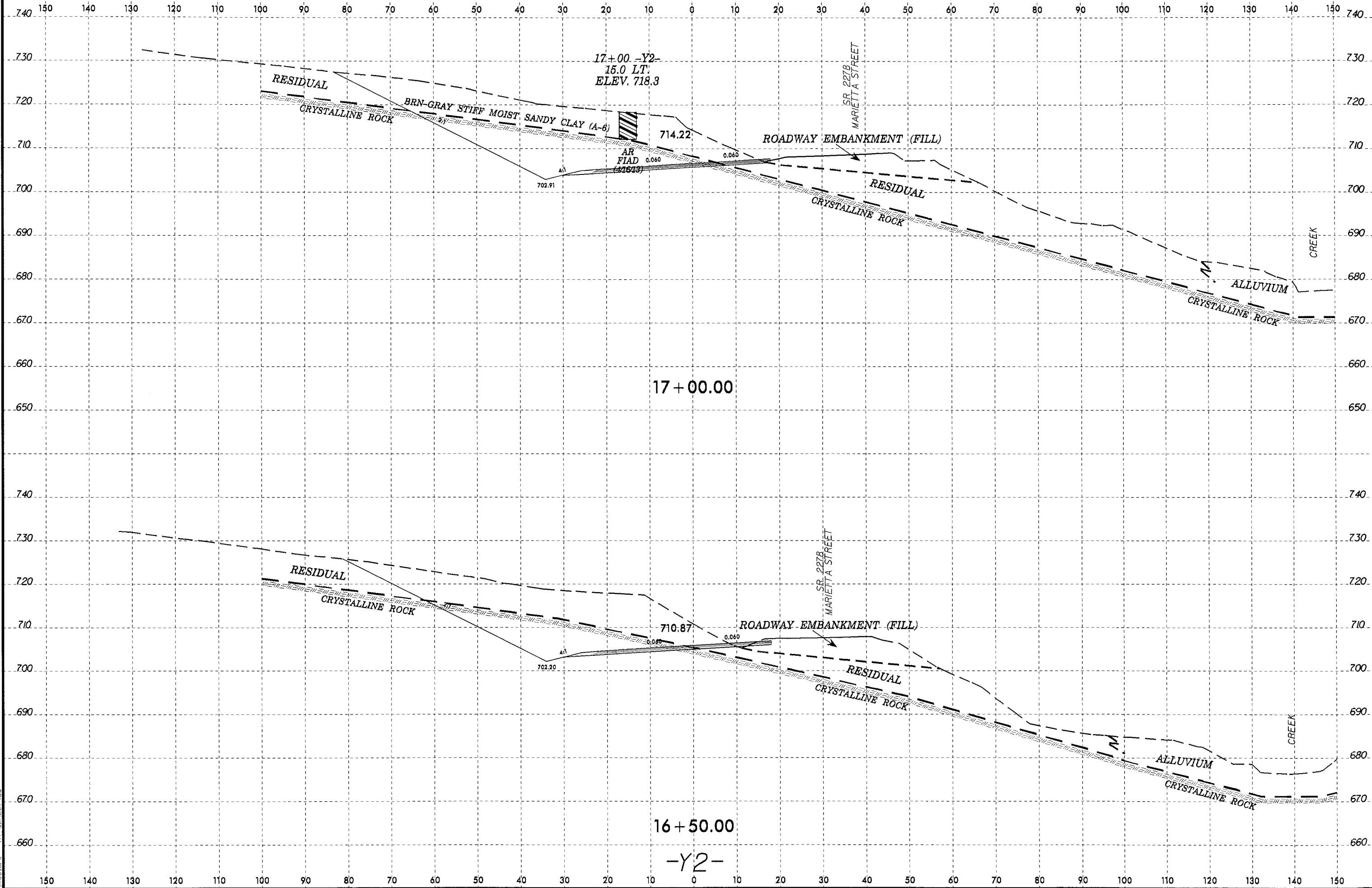


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 -Y2-

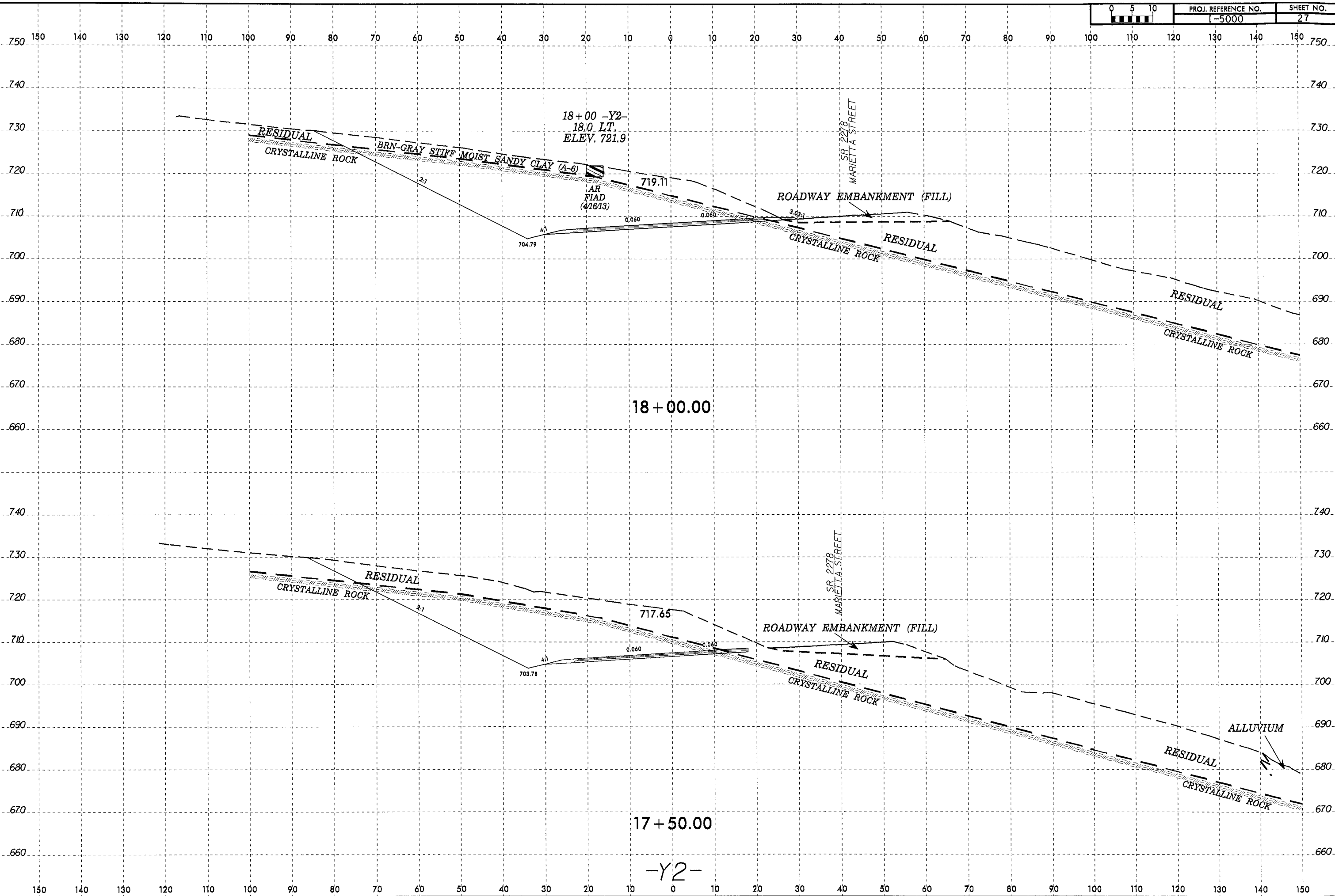
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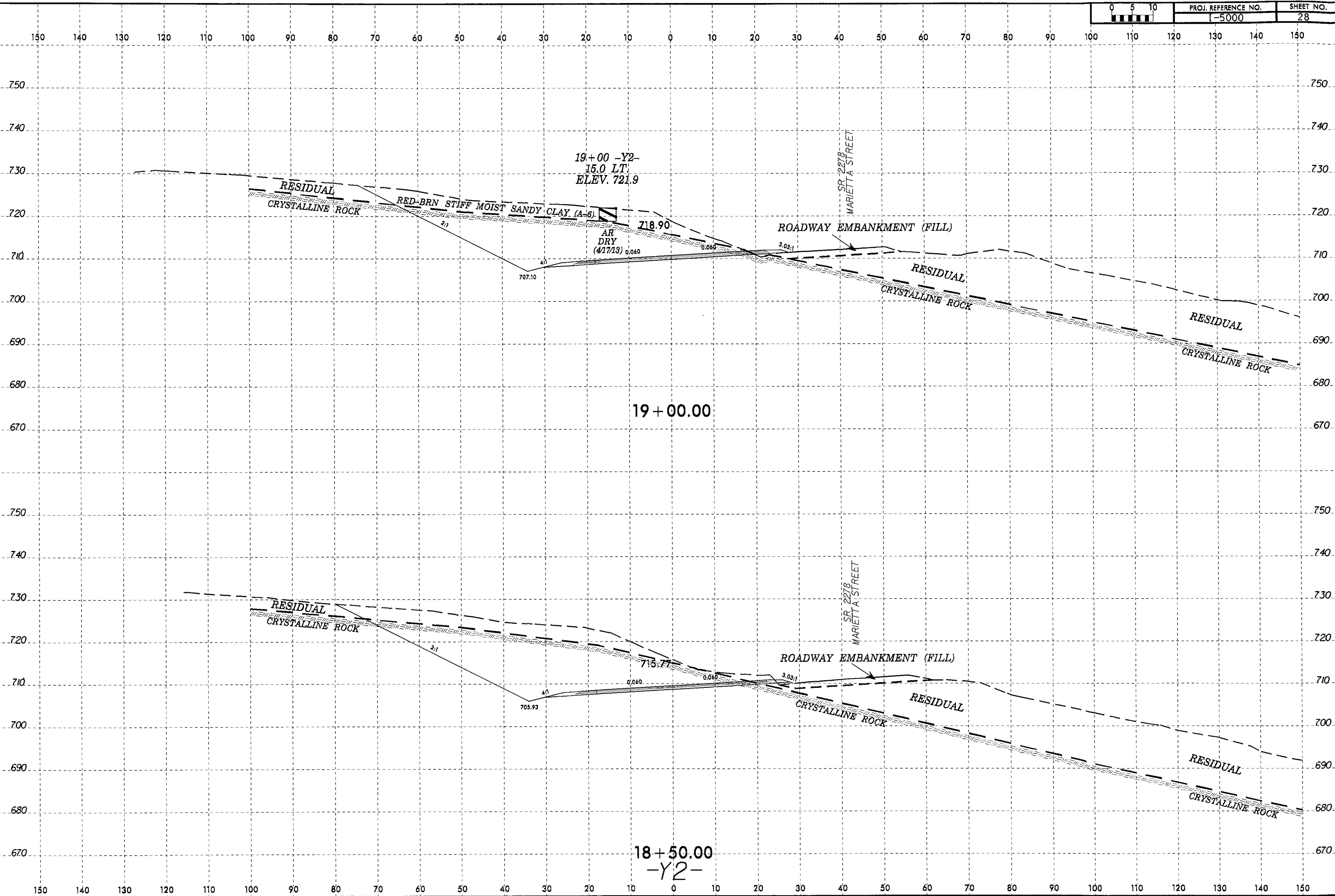
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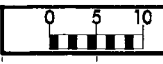


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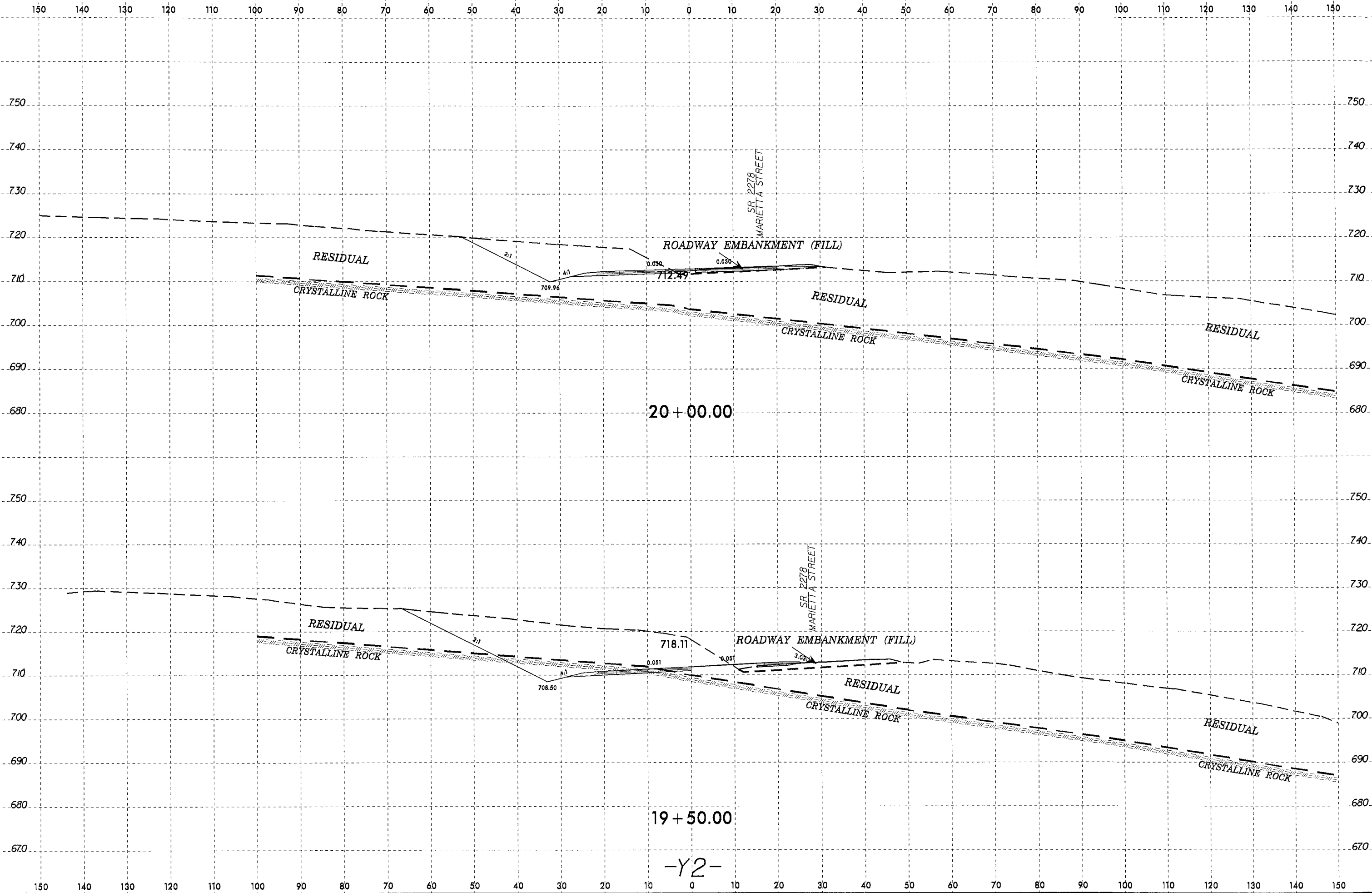


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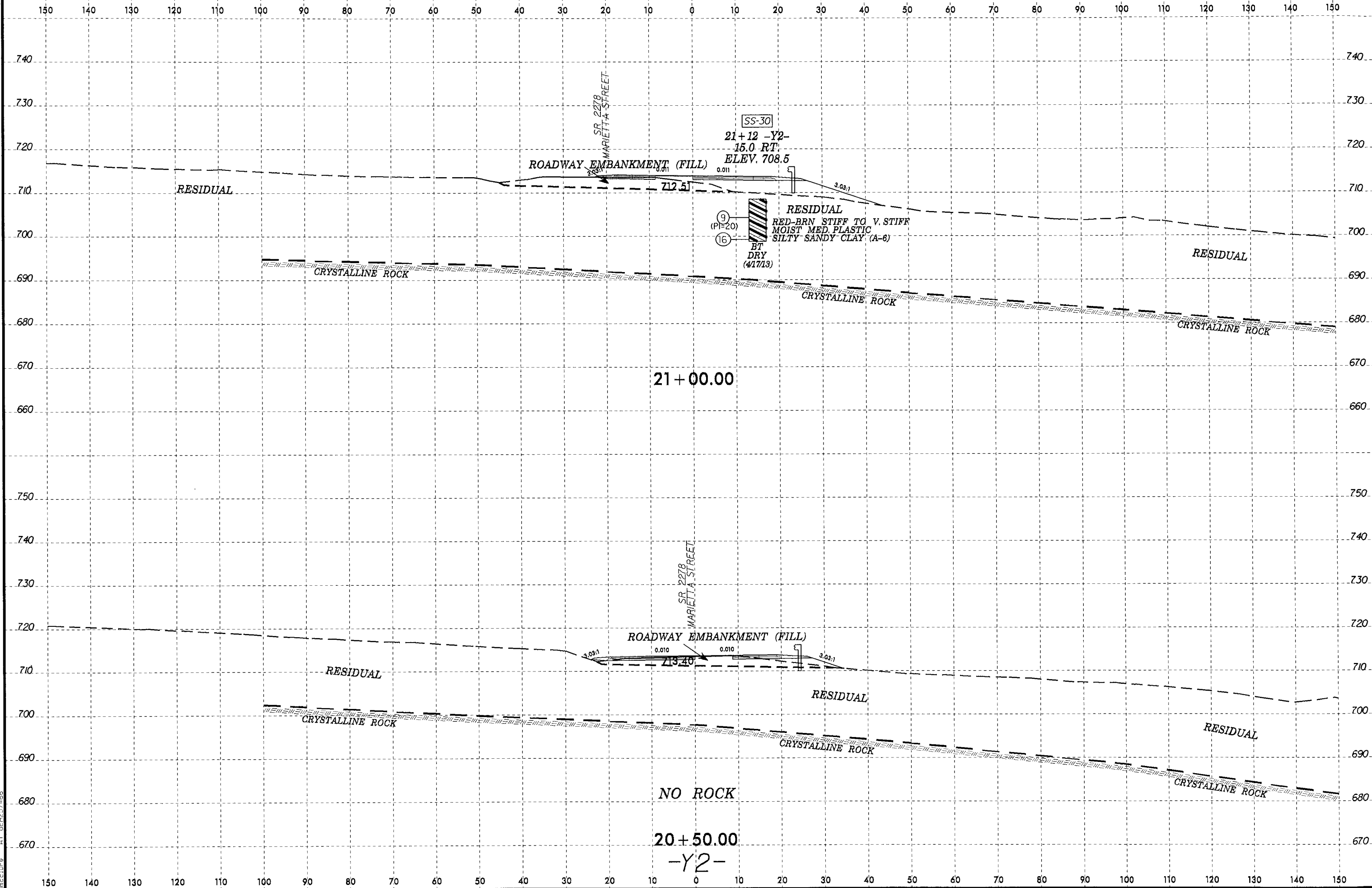




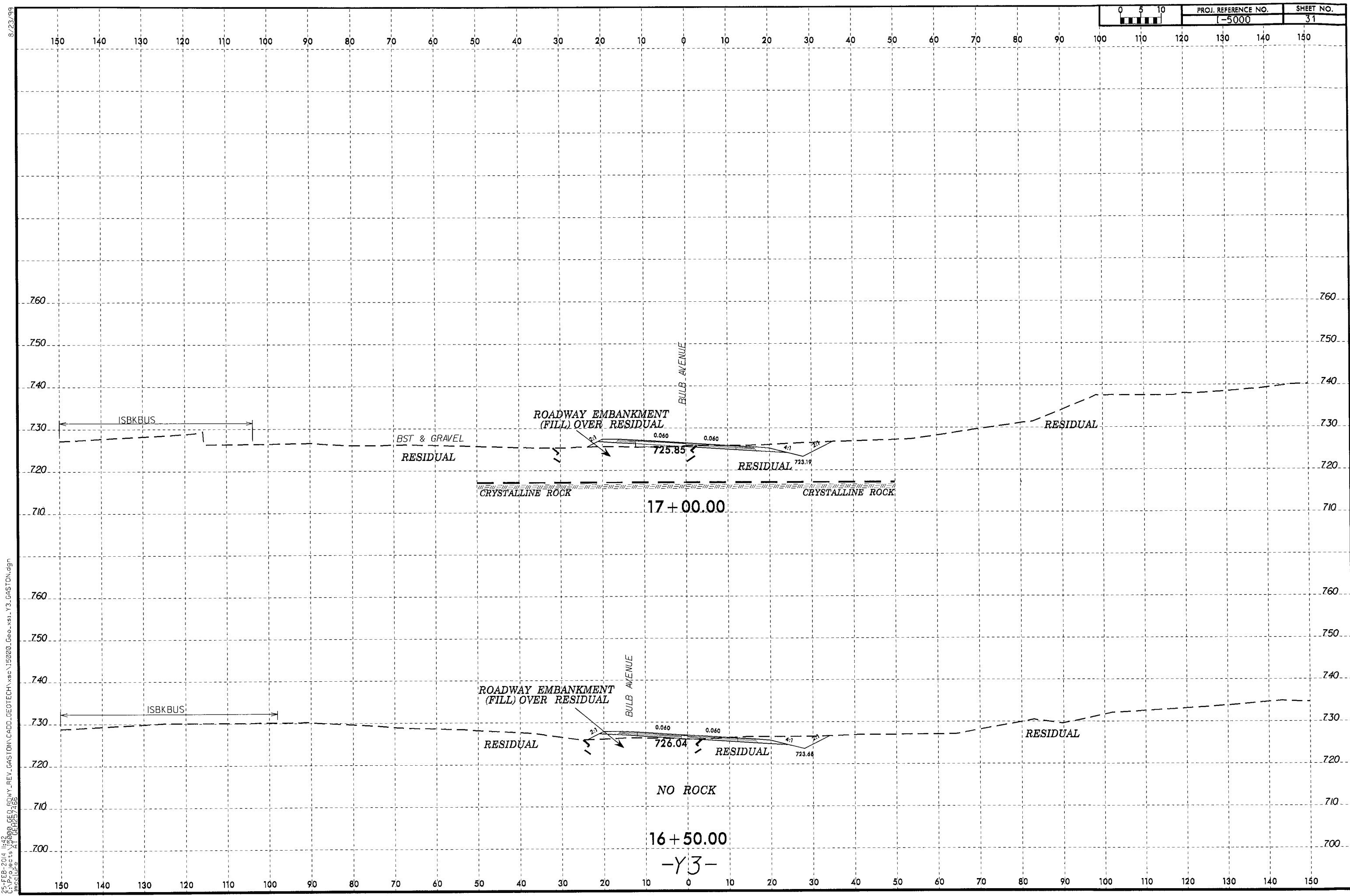
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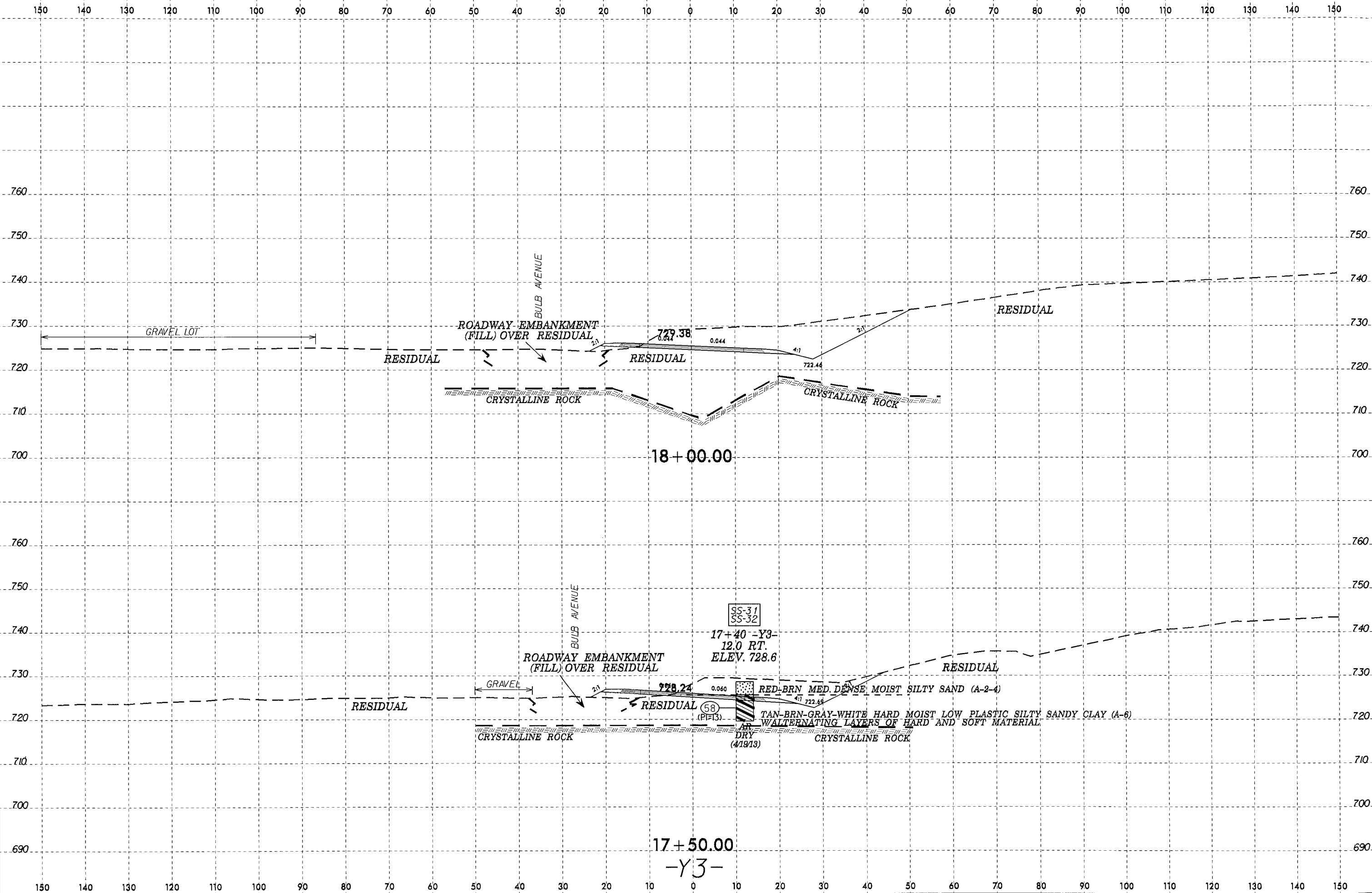




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-Y3-

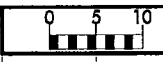
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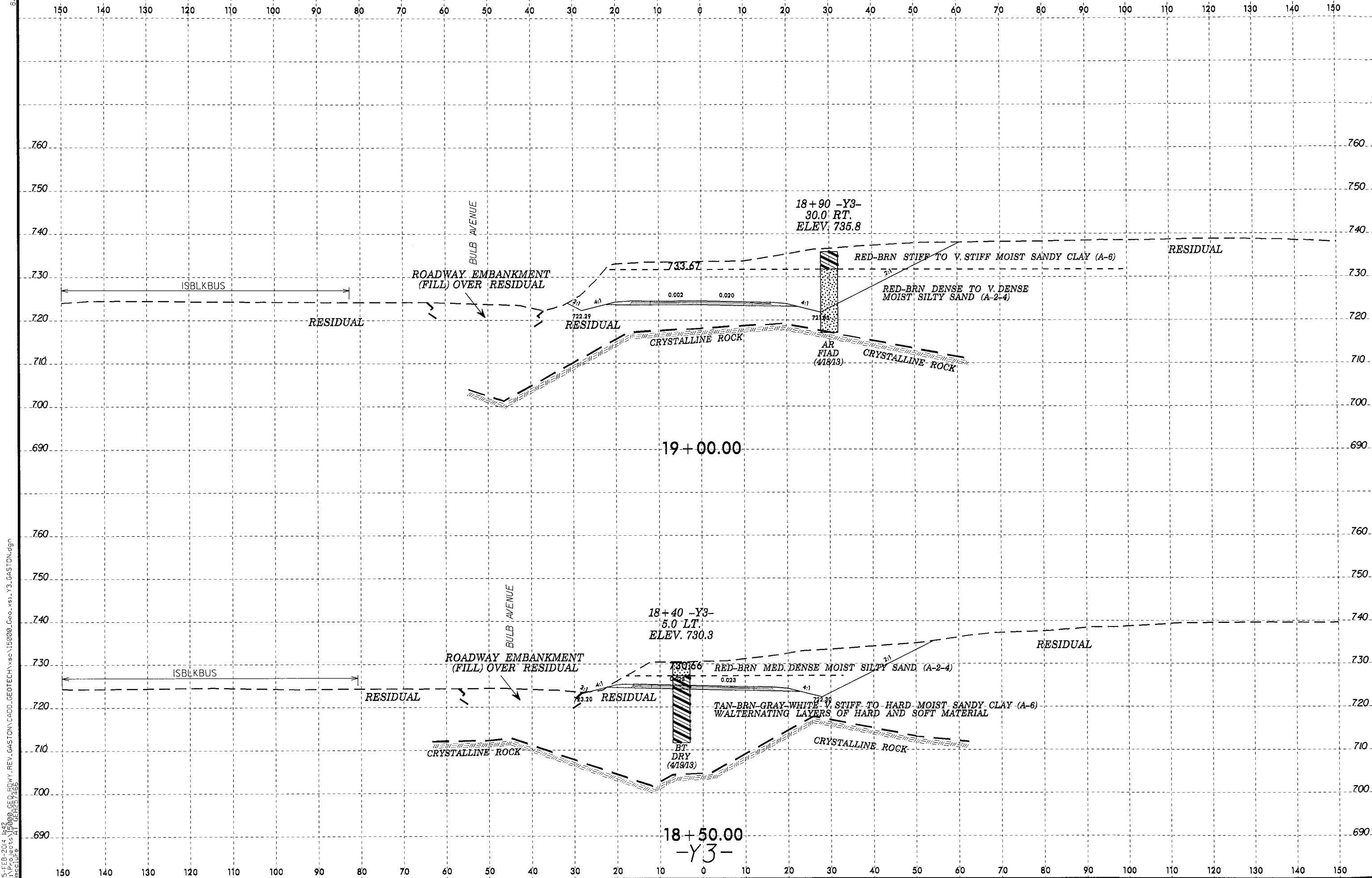
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760 750 740 730 720 710 700 690

18+00.00  
17+50.00  
-Y3-

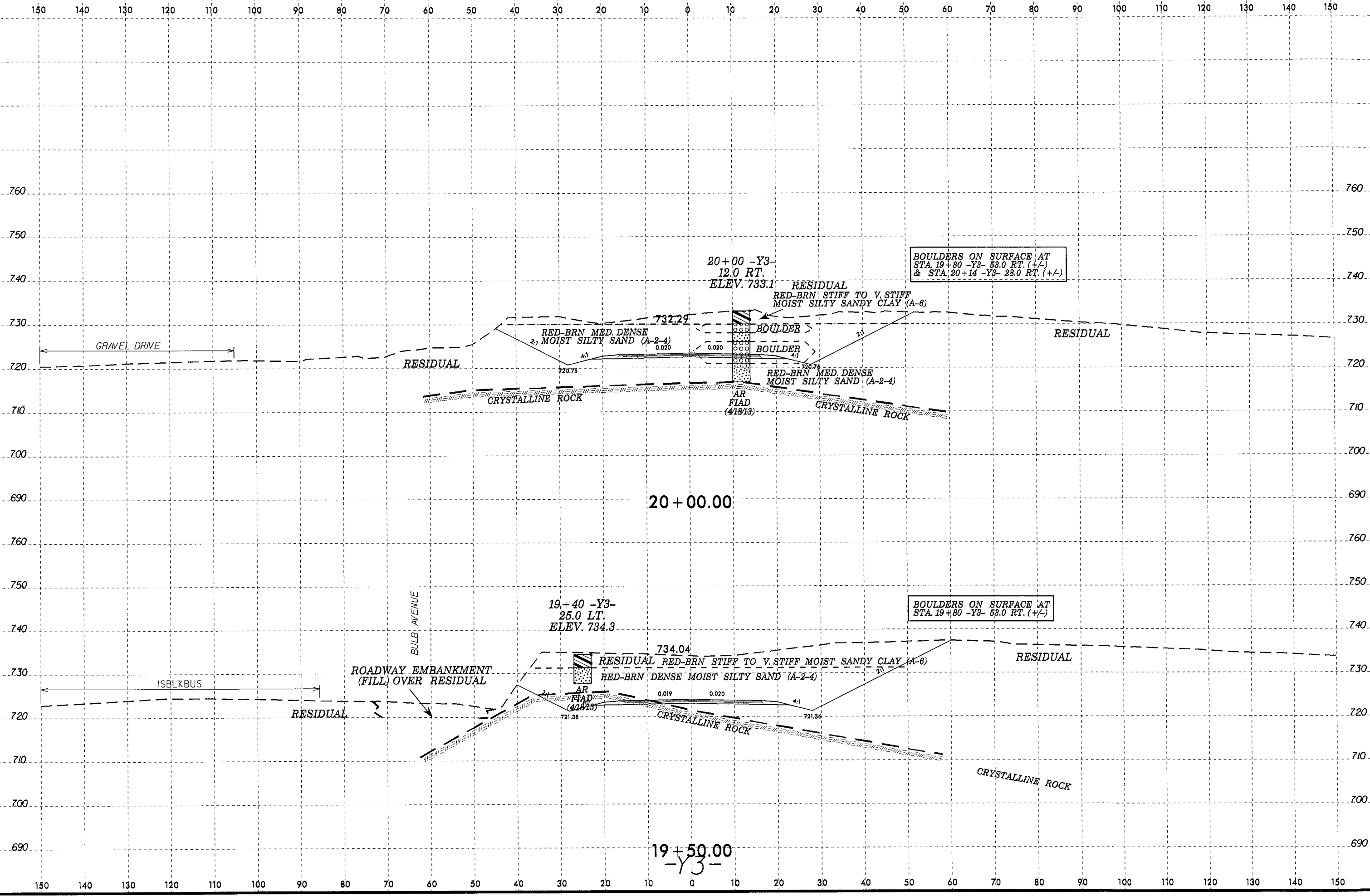


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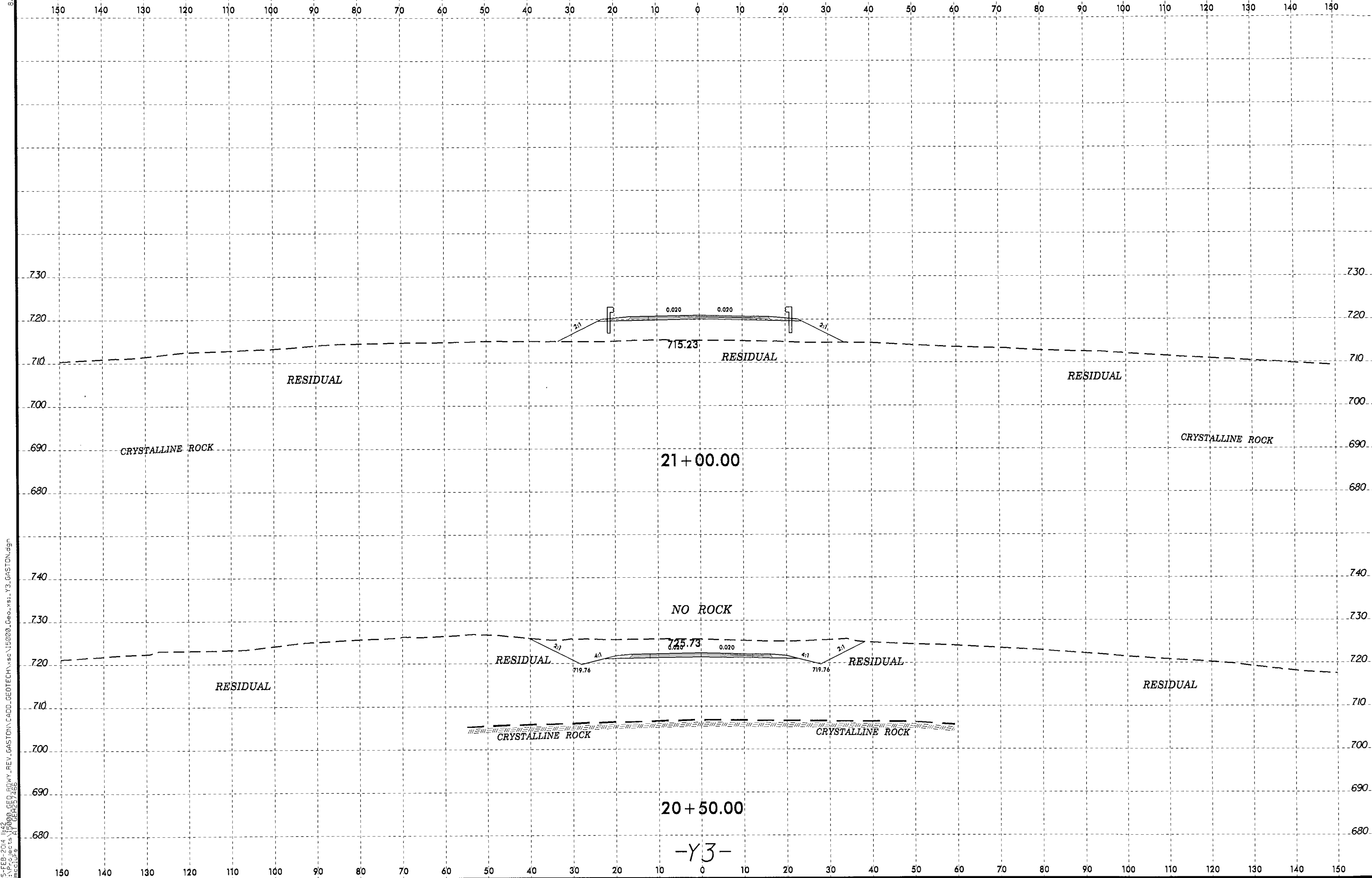


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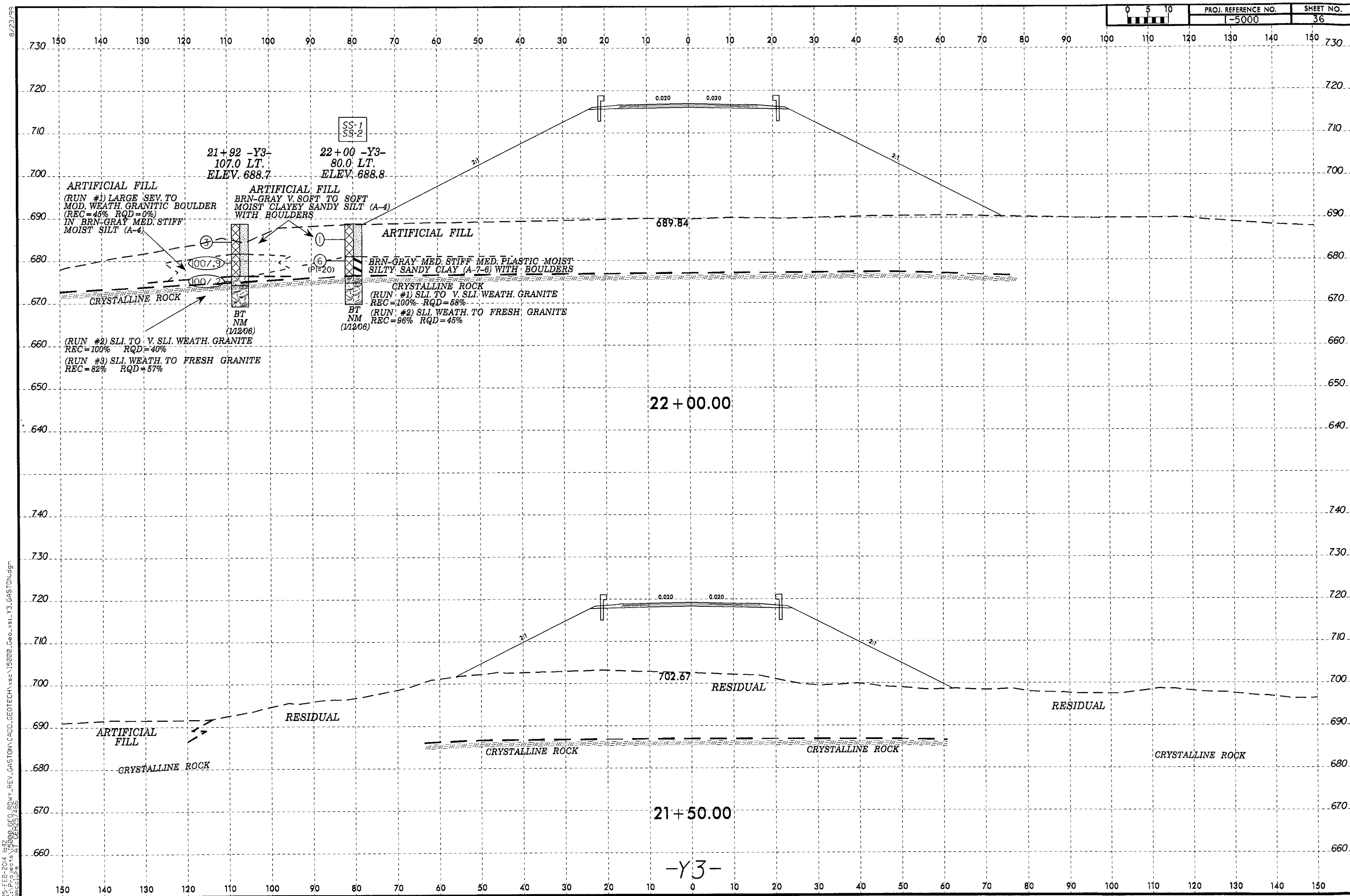


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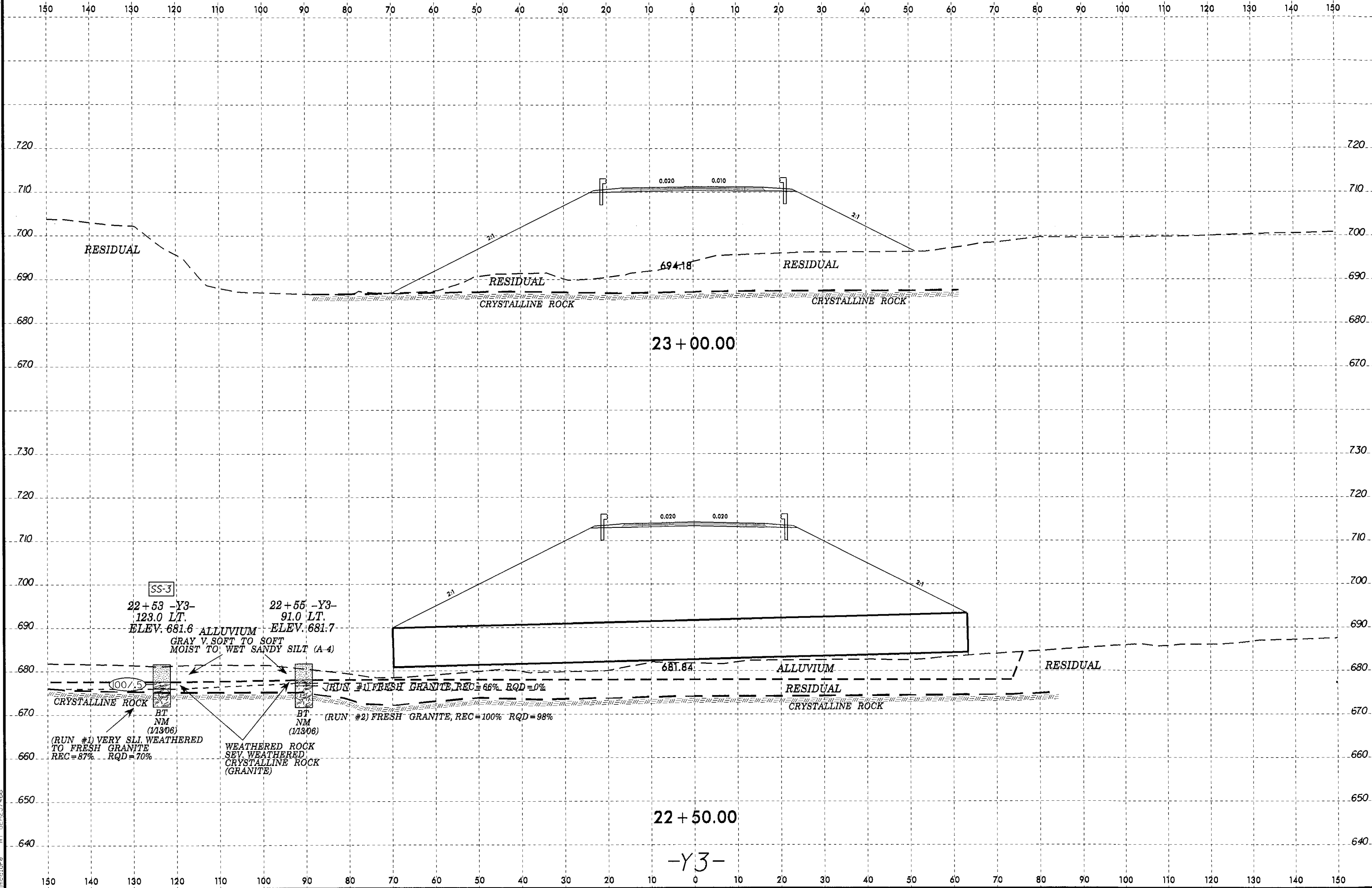
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-Y3-



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RESIDUAL

RESIDUAL

RESIDUAL

CRYSTALLINE ROCK

CRYSTALLINE ROCK

23 + 00.00

SS-3

22 + 53 -Y3-  
123.0 LT.  
ELEV. 681.6  
ALLUVIUM  
GRAY V. SOFT TO SOFT  
MOIST TO WET SANDY SILT (A-4)

22 + 55 -Y3-  
91.0 LT.  
ELEV. 681.7  
ALLUVIUM  
GRAY V. SOFT TO SOFT  
MOIST TO WET SANDY SILT (A-4)

100/5

CRYSTALLINE ROCK

CRYSTALLINE ROCK

681.84

ALLUVIUM

RESIDUAL

RESIDUAL

CRYSTALLINE ROCK

(RUN #1) VERY SLI WEATHERED  
TO FRESH GRANITE  
REC = 87% RQD = 70%

BT  
NM  
(1/1306)

WEATHERED ROCK  
SEV WEATHERED  
CRYSTALLINE ROCK  
(GRANITE)

BT  
NM  
(1/1306)

(RUN #1) FRESH GRANITE, REC = 68% RQD = 0%

(RUN #2) FRESH GRANITE, REC = 100% RQD = 98%

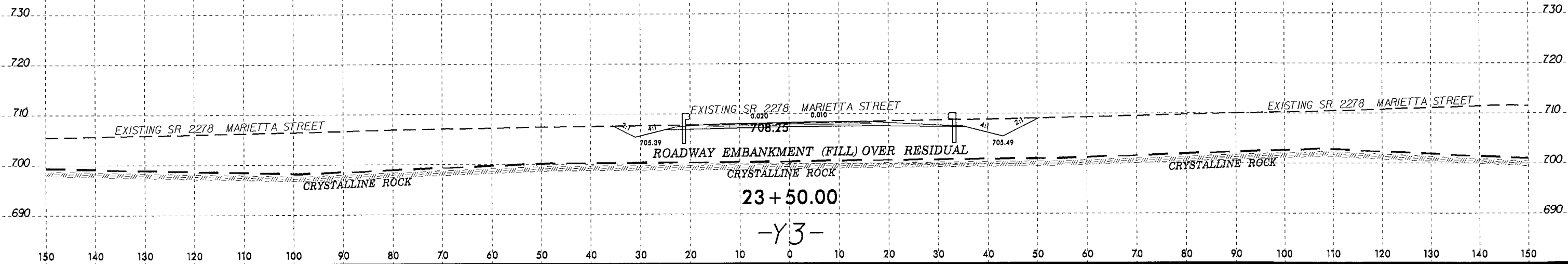
22 + 50.00

-Y3-

8/23/99

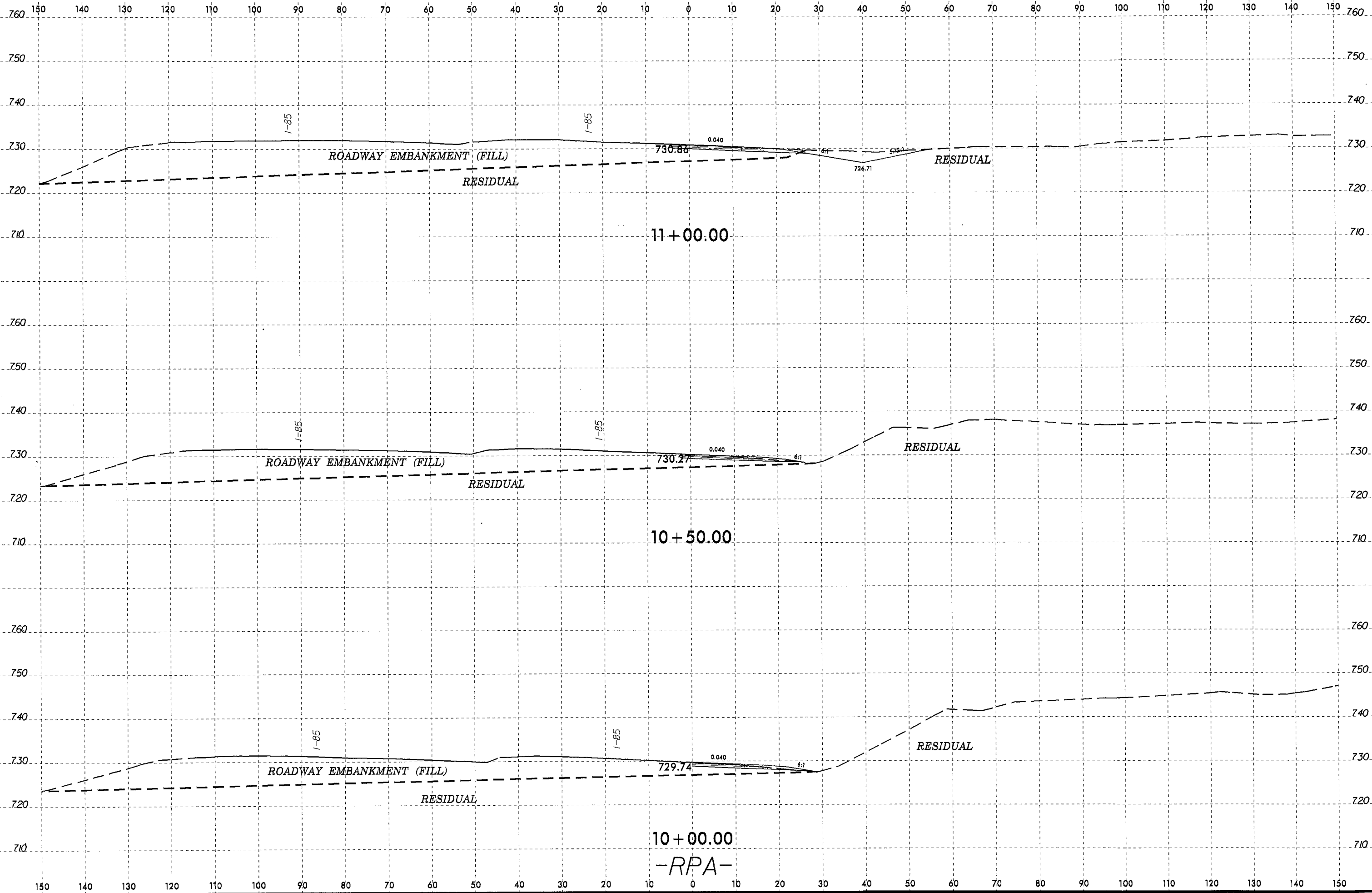
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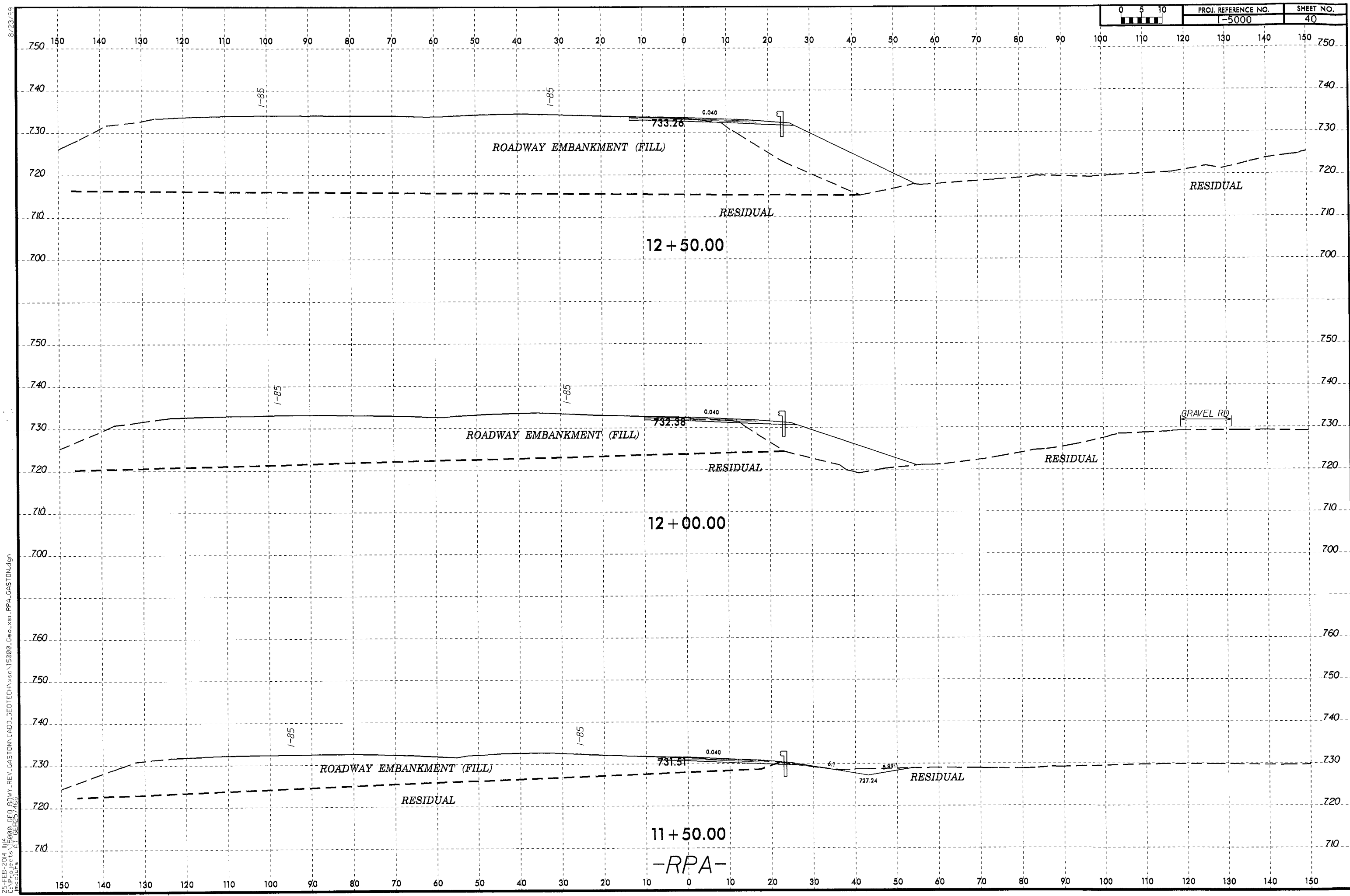
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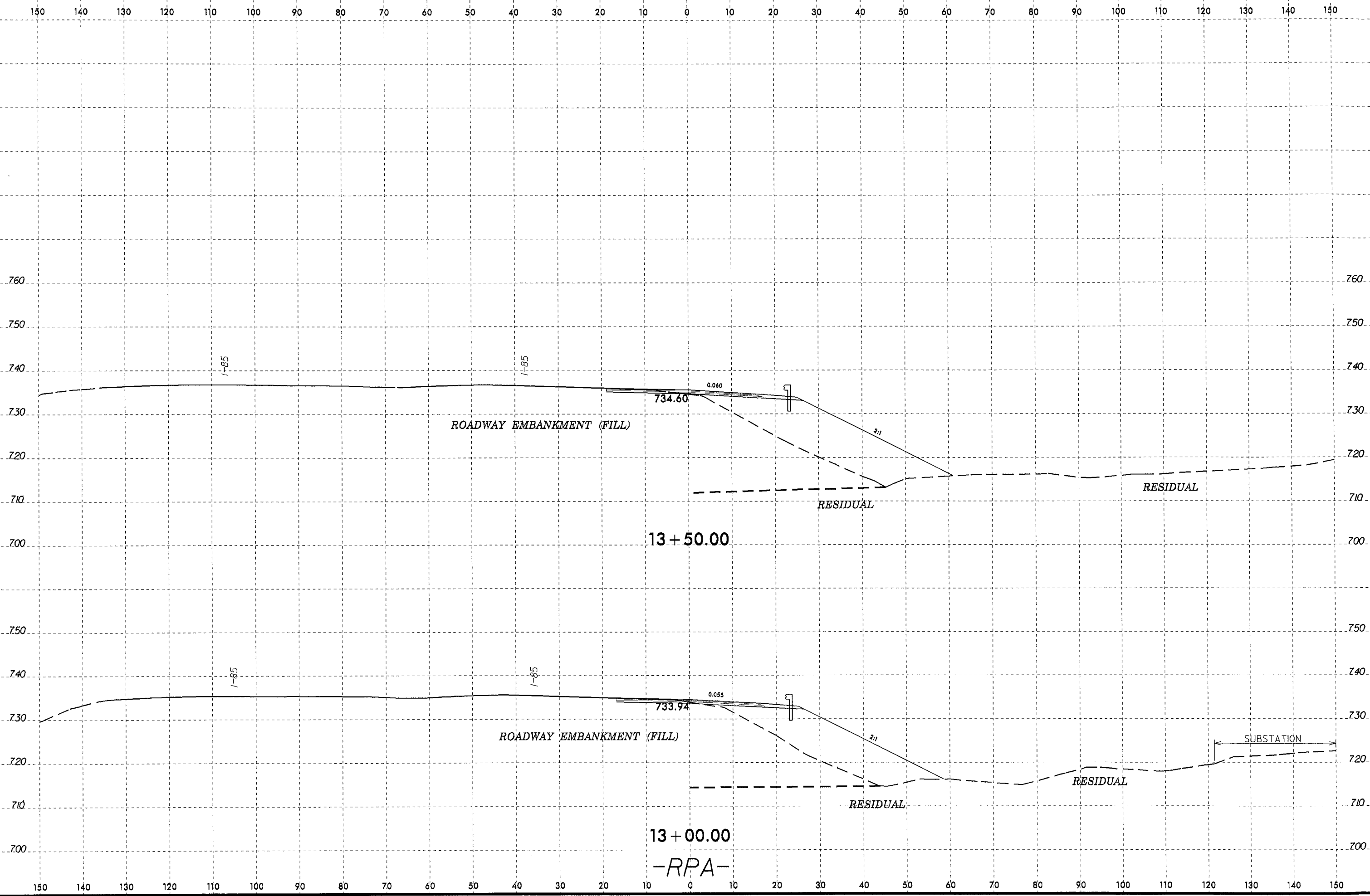
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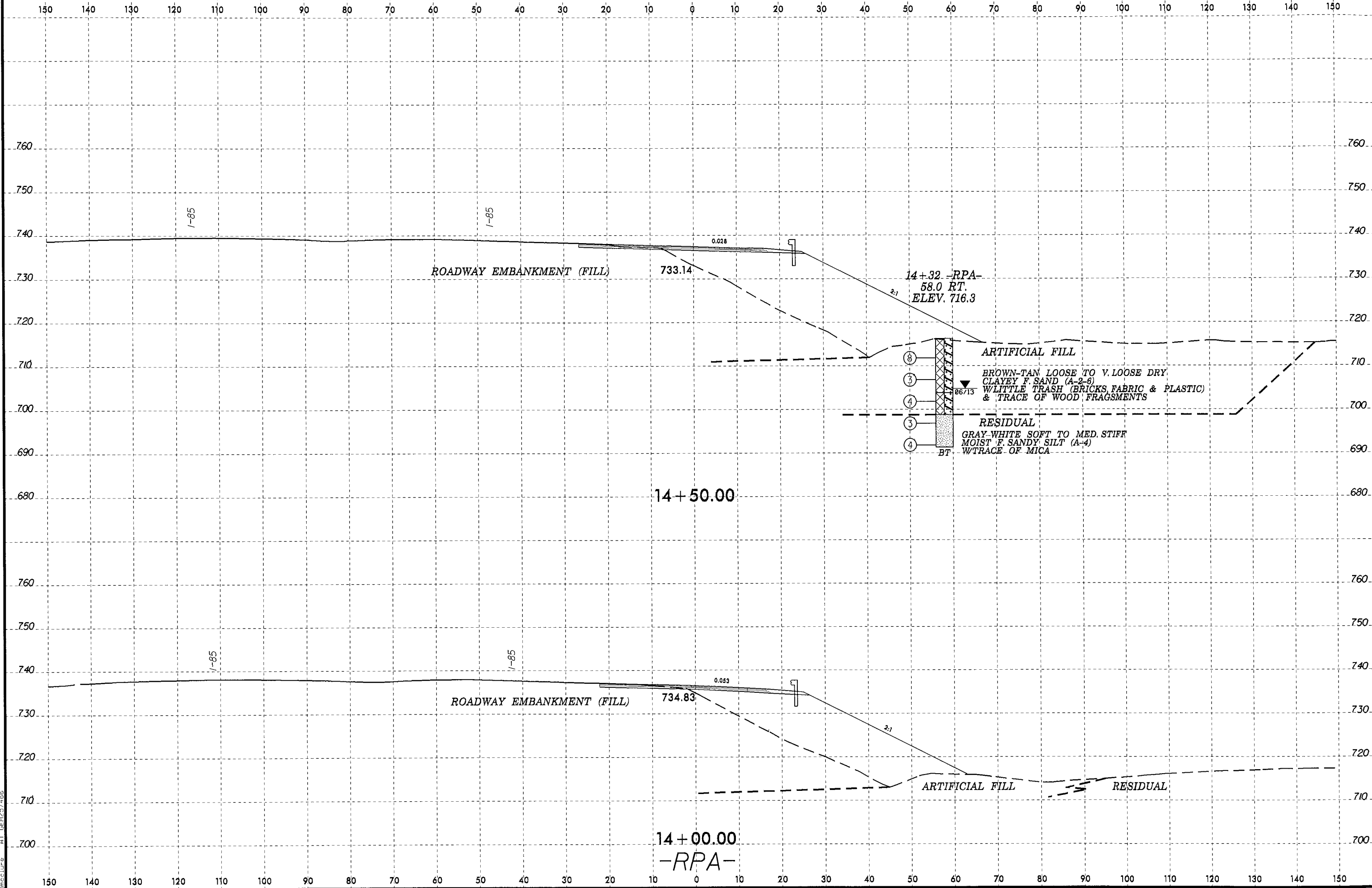


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ROADWAY EMBANKMENT (FILL)

14+32.00 -RPA-  
58.0 FT.  
ELEV. 716.3

ARTIFICIAL FILL  
8'  
BROWN-TAN LOOSE TO V. LOOSE DRY  
CLAYEY F SAND (A-2-6)  
3'  
W/LITTLE TRASH (BRICKS, FABRIC & PLASTIC)  
& TRACE OF WOOD FRAGMENTS  
4'  
RESIDUAL  
3'  
GRAY-WHITE SOFT TO MED. STIFF  
MOIST F SANDY SILT (A-4)  
W/TRACE OF MICA  
BT

14+50.00

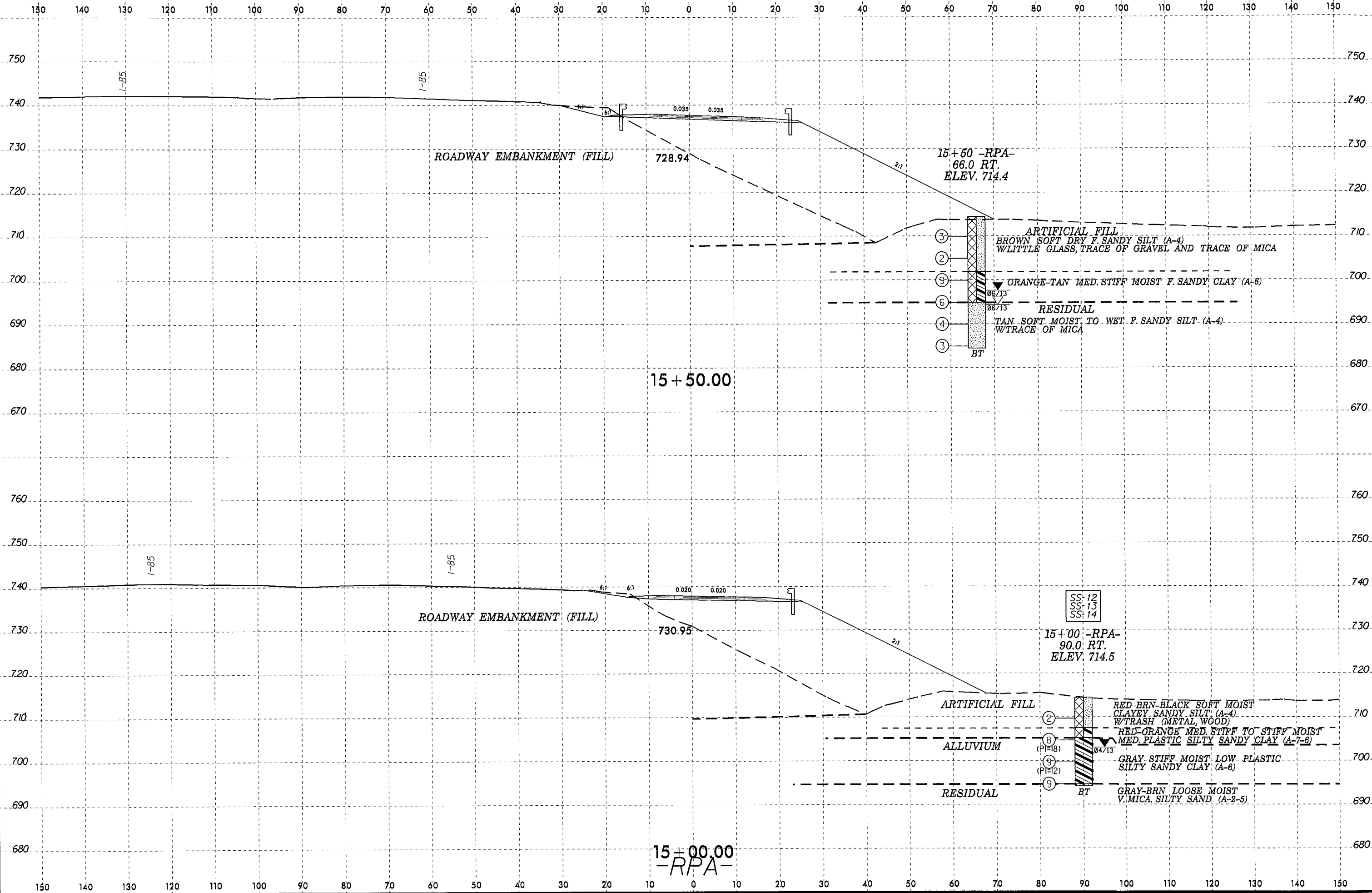
ROADWAY EMBANKMENT (FILL)

14+00.00  
-RPA-

ARTIFICIAL FILL  
RESIDUAL

8/23/99

25-FEB-2014 11:22:00 CED\_BRMV\_REV\_GASTON\CADD\_GEDTECH\ssc\150000\_Geo\_vst\_1\_RPA\_GASTON.dgn  
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ROADWAY EMBANKMENT (FILL)

728.94

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

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

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

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

15+50.00

ROADWAY EMBANKMENT (FILL)

730.95

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

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

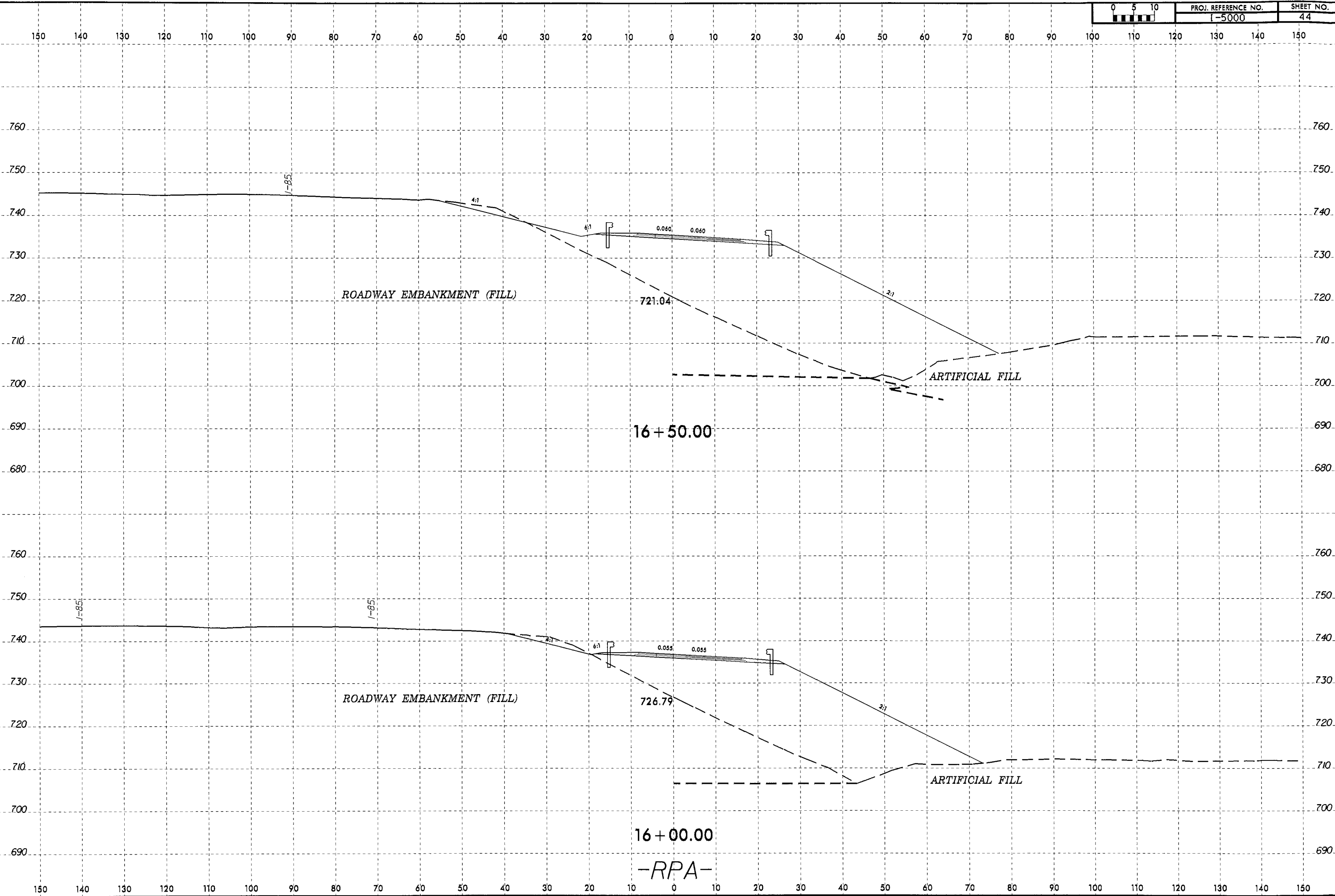
ALLUVIUM  
 RED-ORANGE MED. STIFF TO STIFF MOIST  
 MED. PLASTIC SILTY SANDY CLAY (A-7-6)

RESIDUAL  
 GRAY STIFF MOIST LOW PLASTIC  
 SILTY SANDY CLAY (A-6)

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

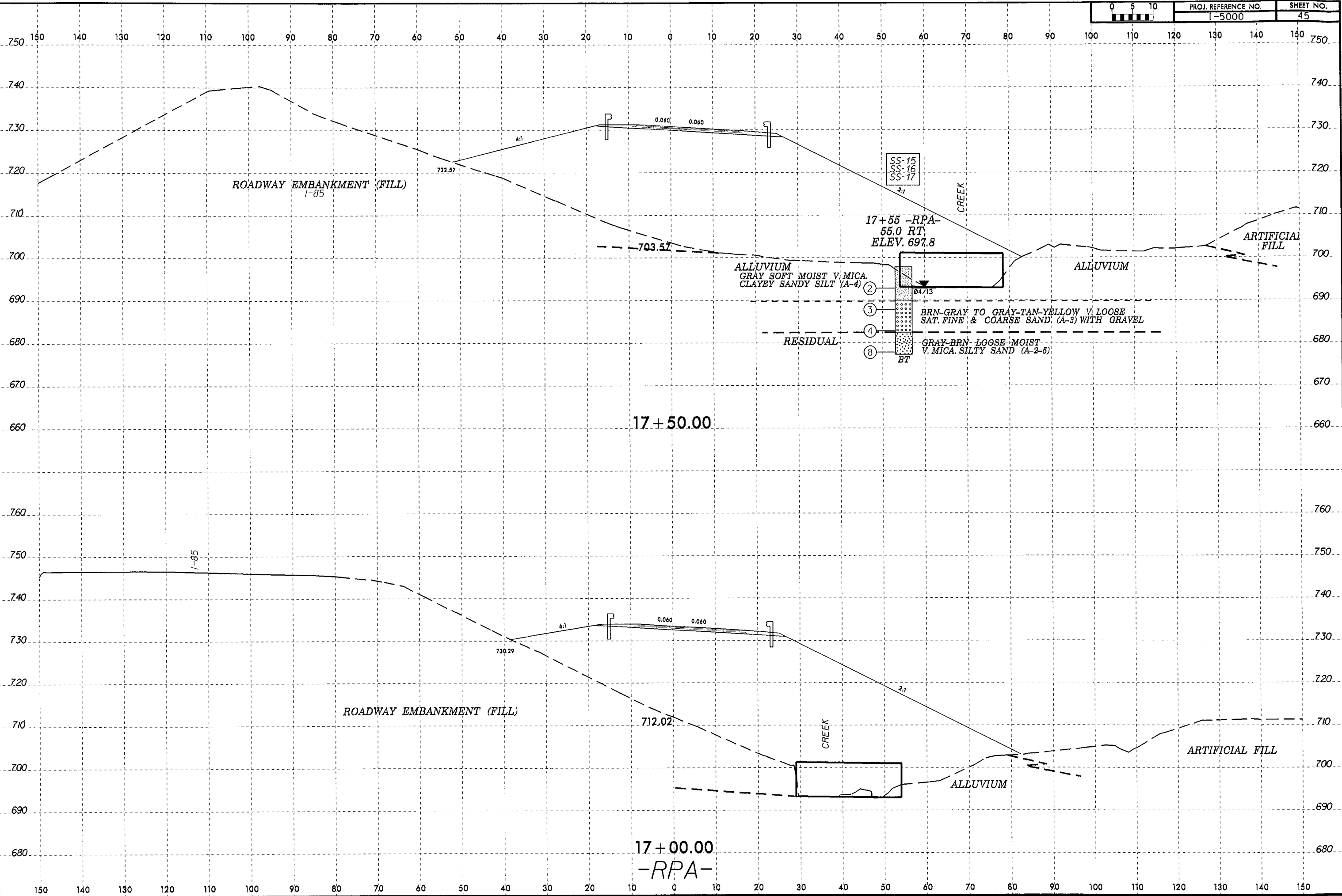
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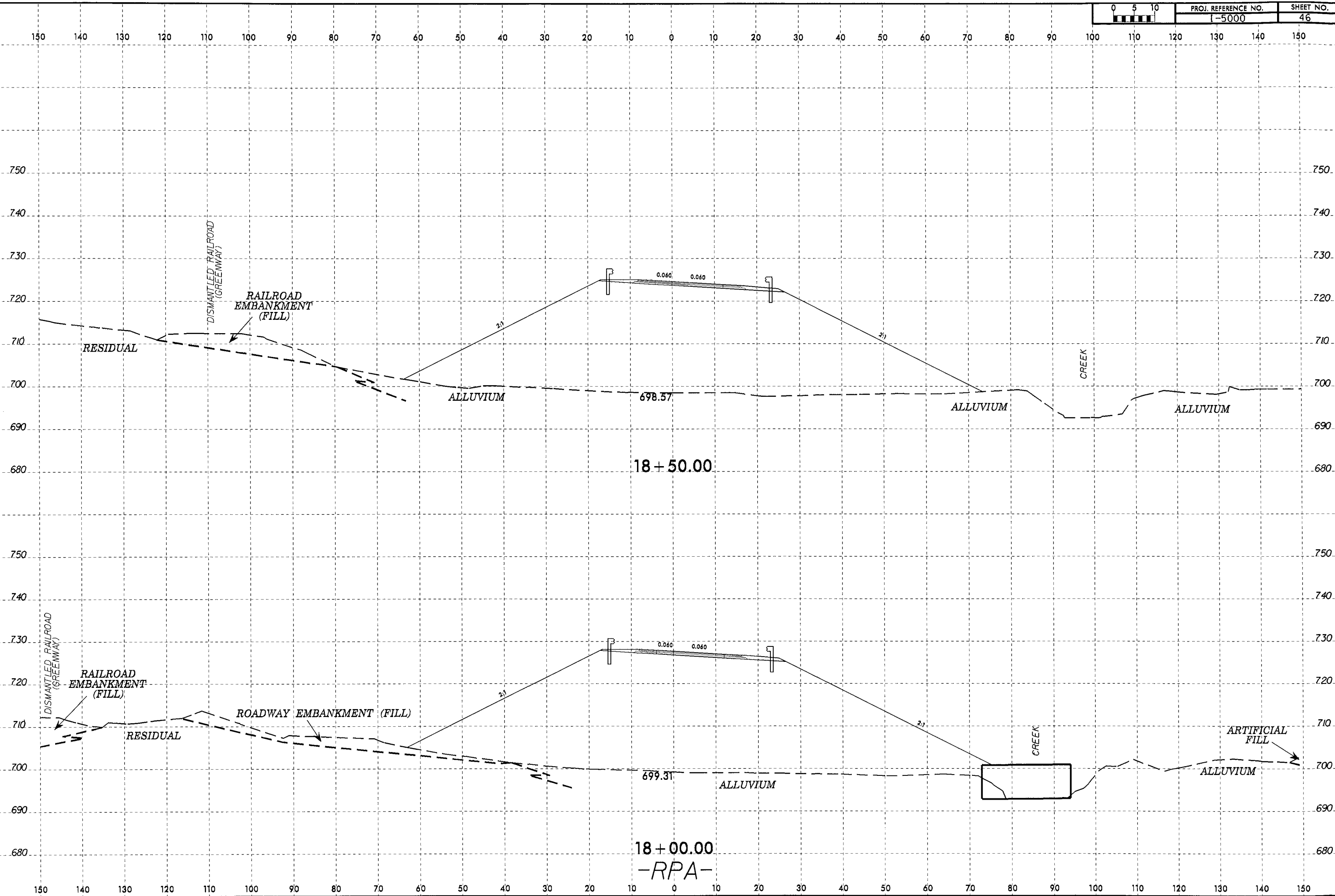


-RPA-

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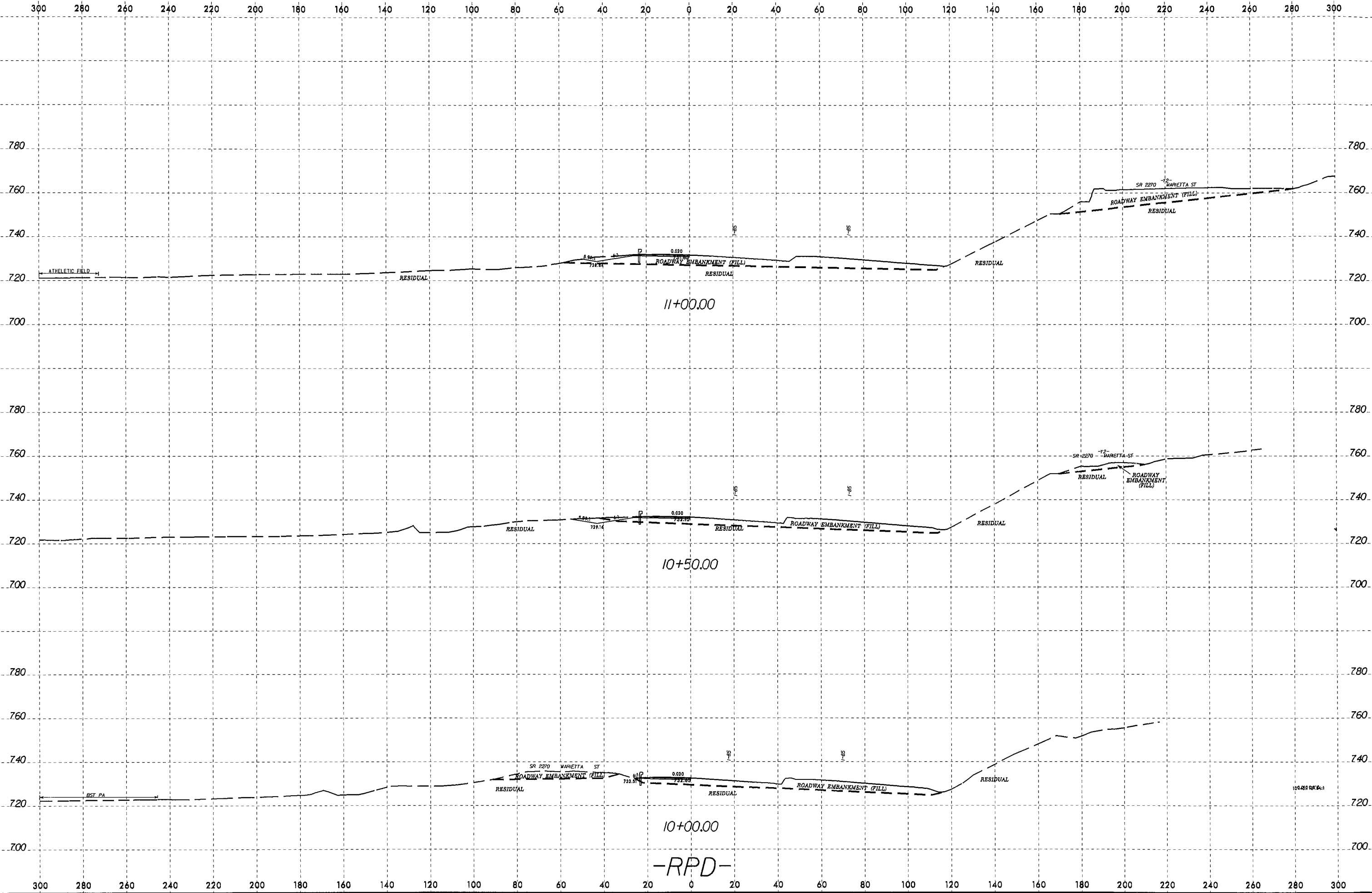


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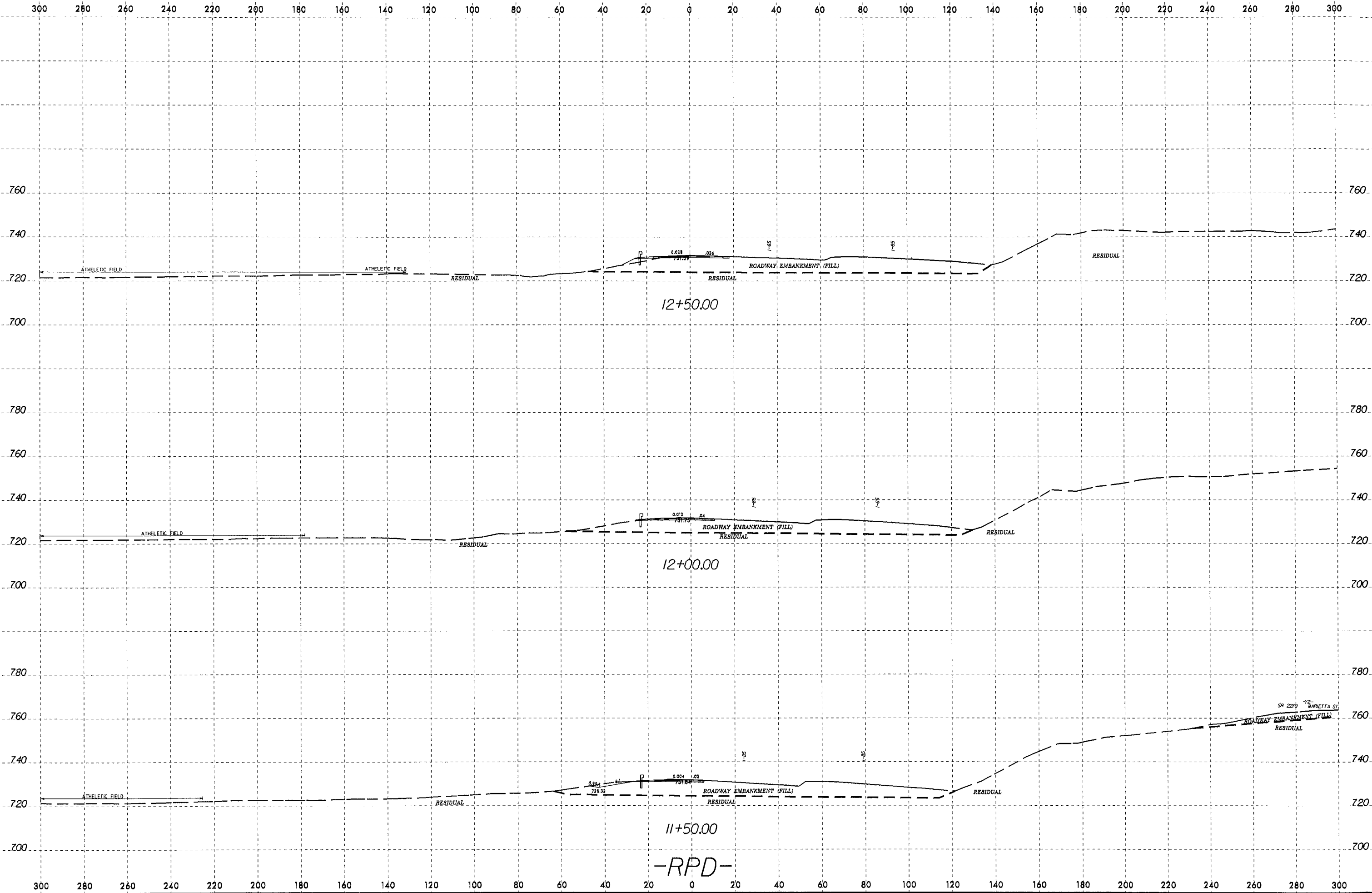
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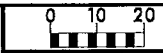
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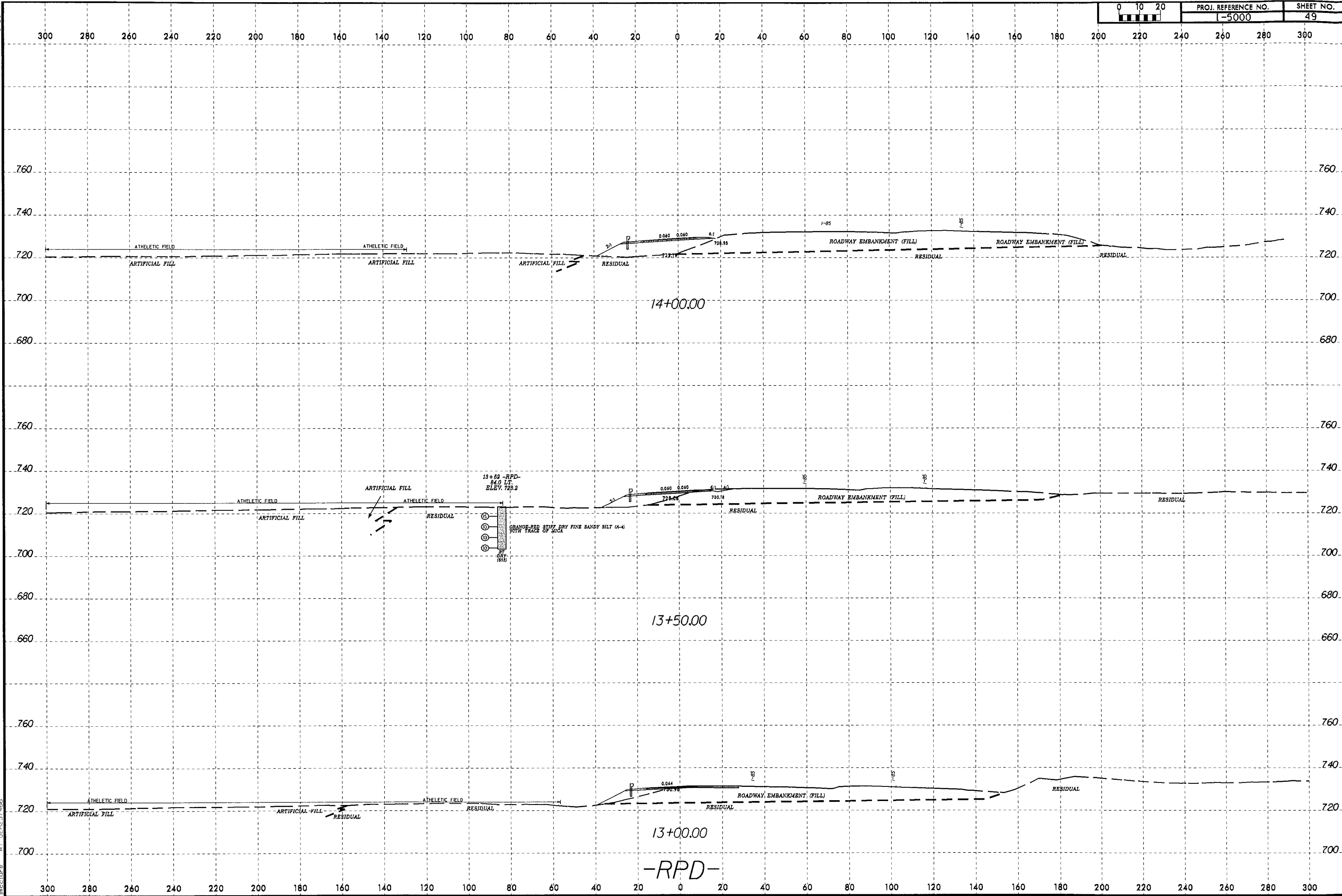
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-RPD-

SR 2270  
BARRETTA ST



8/23/95  
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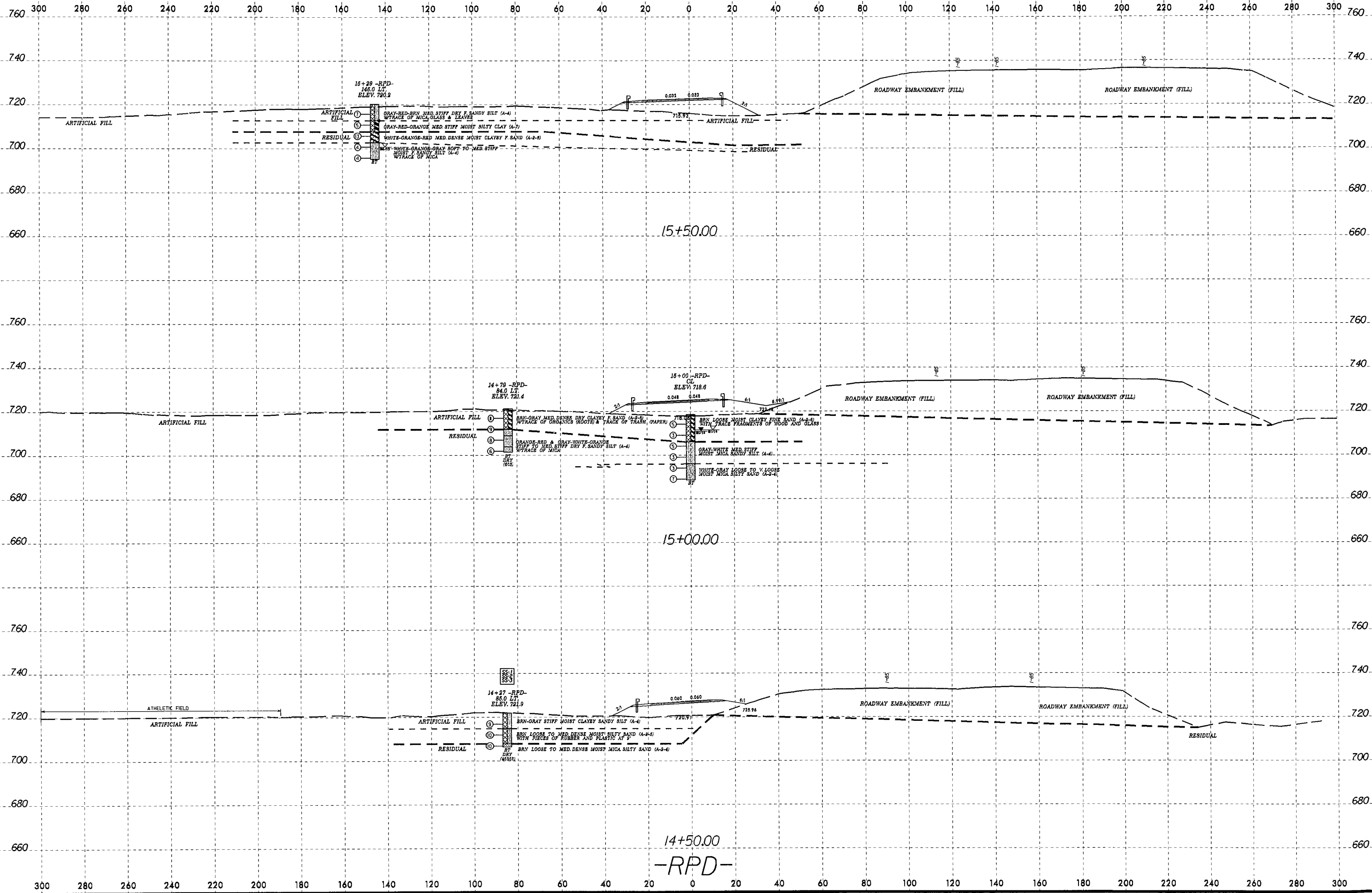
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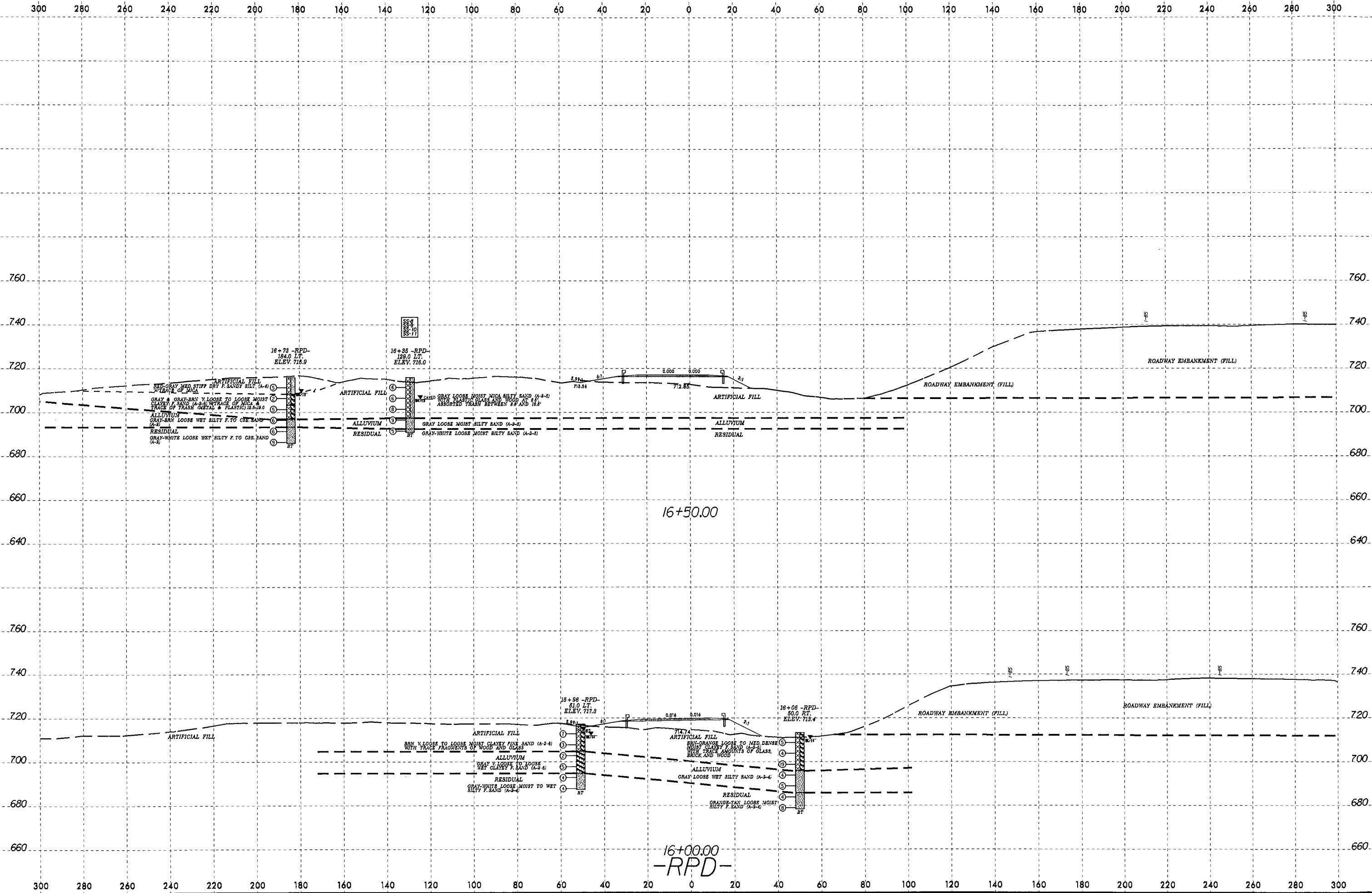
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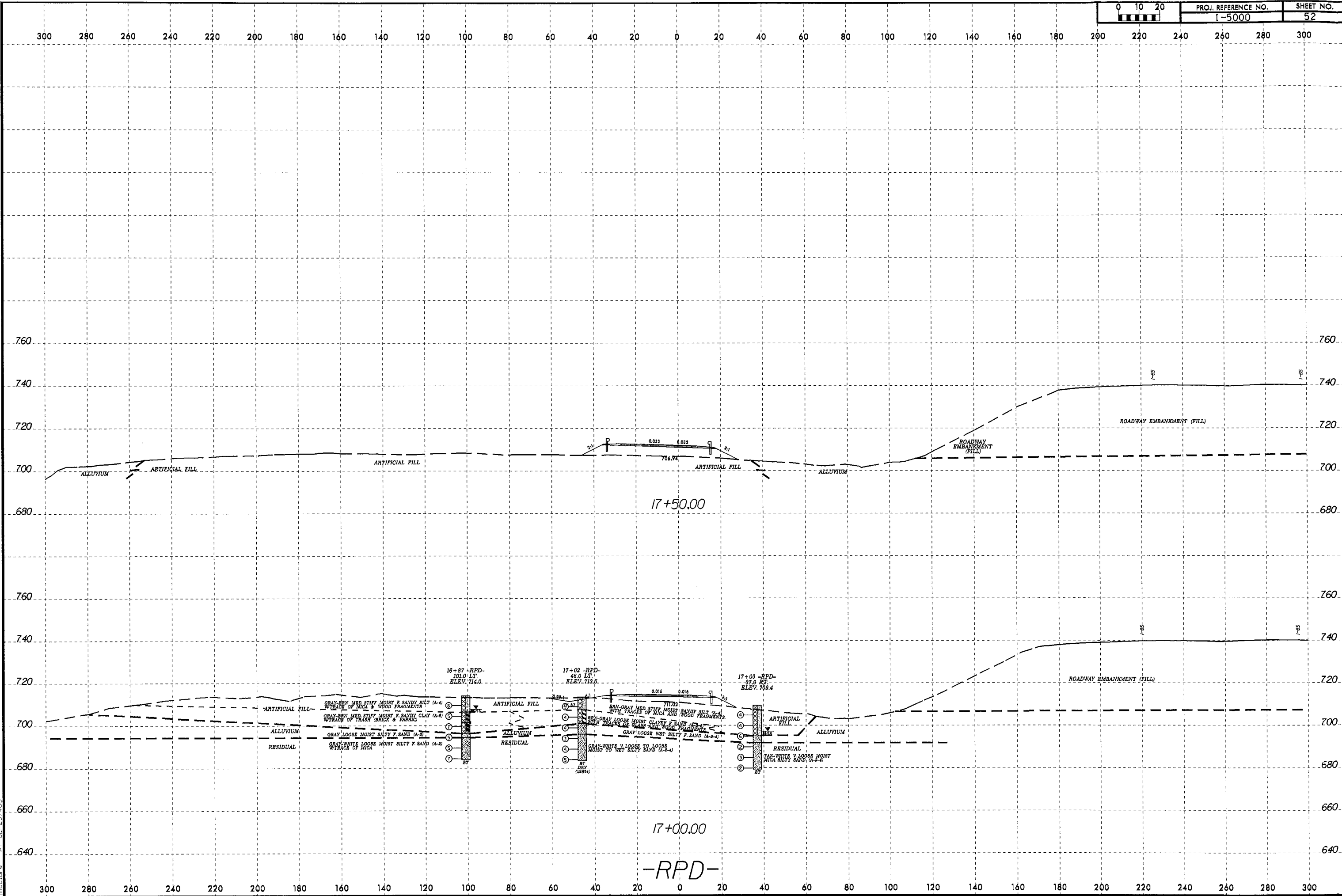


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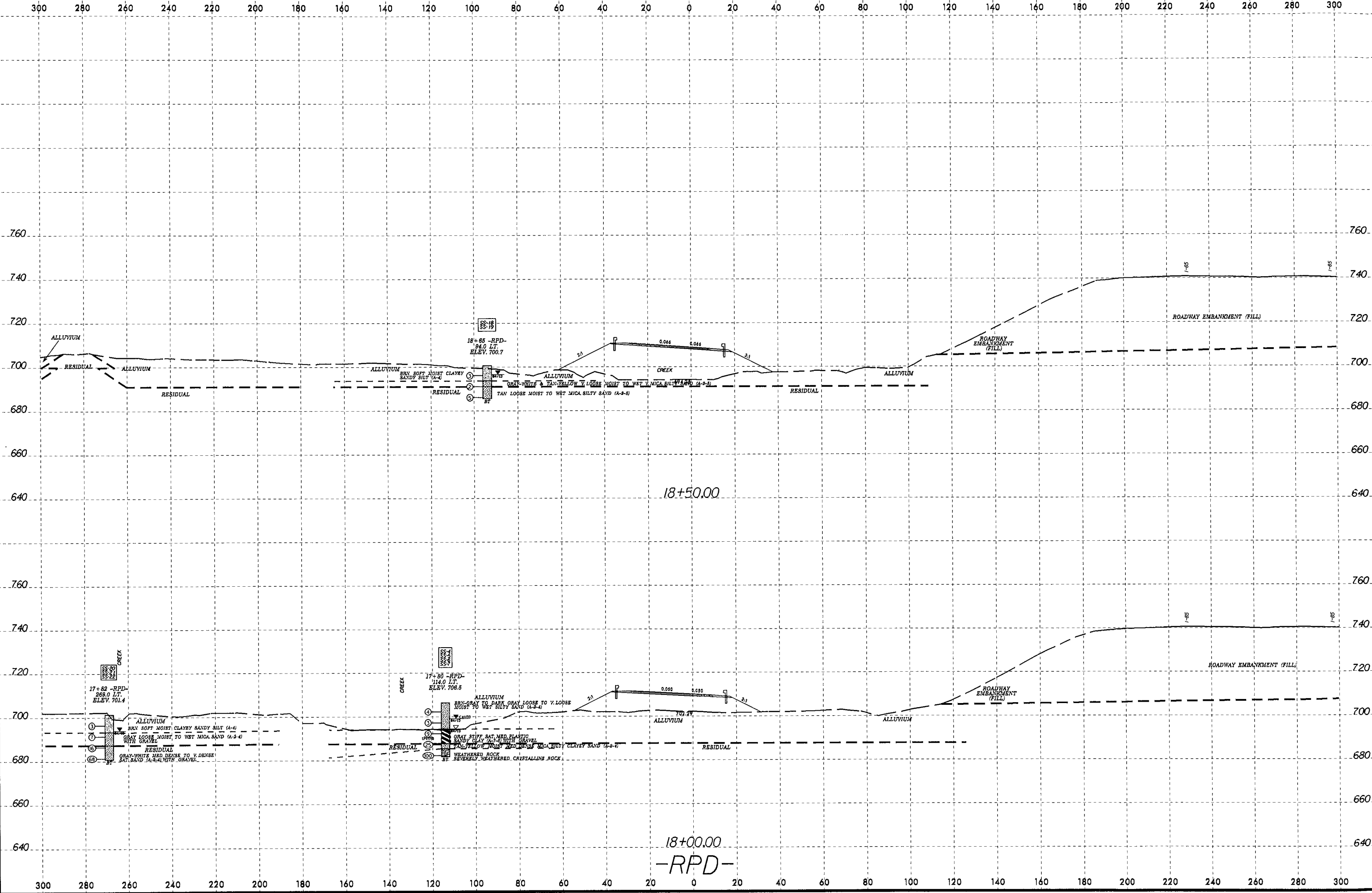


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8/23/99

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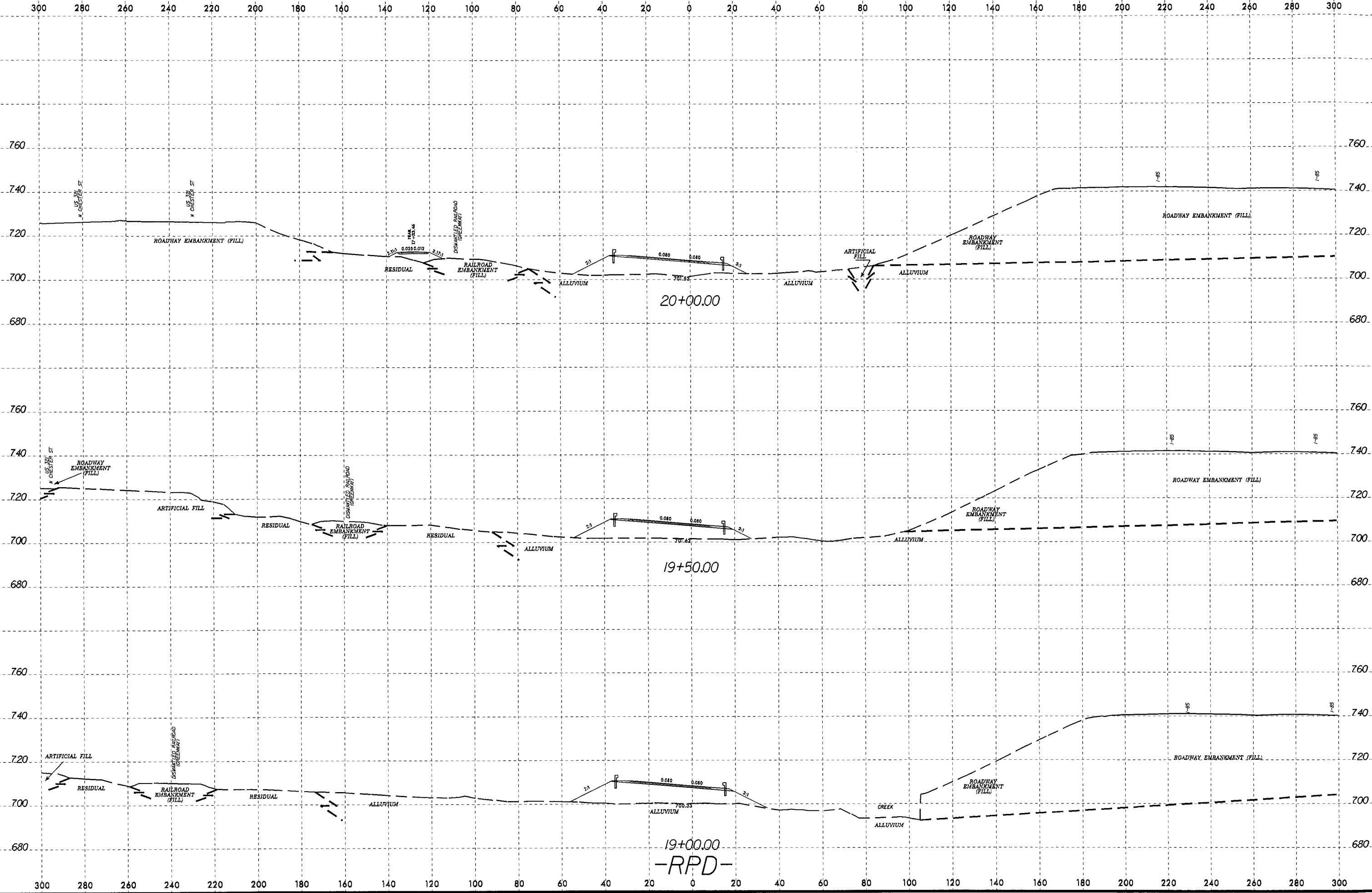


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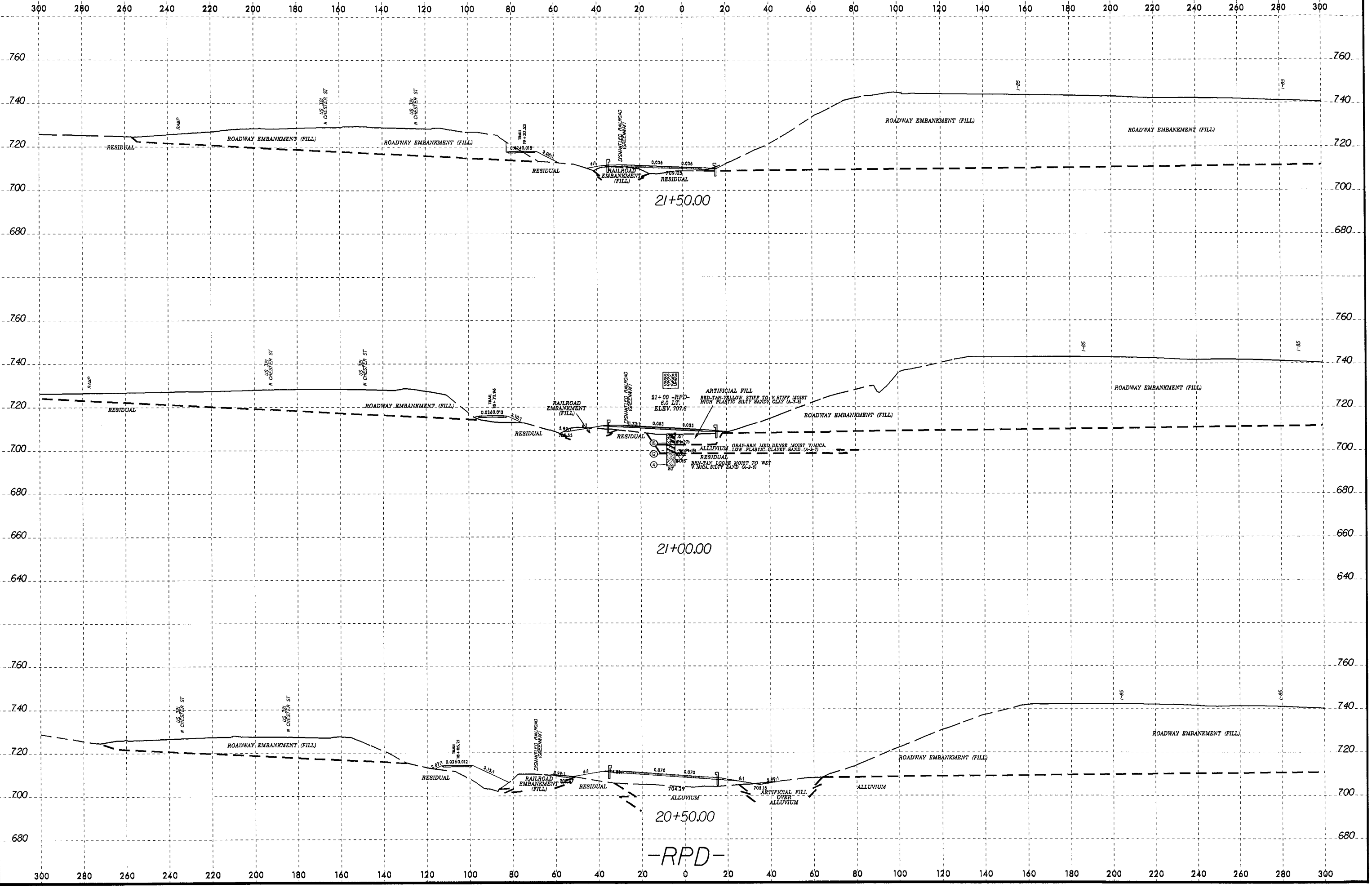
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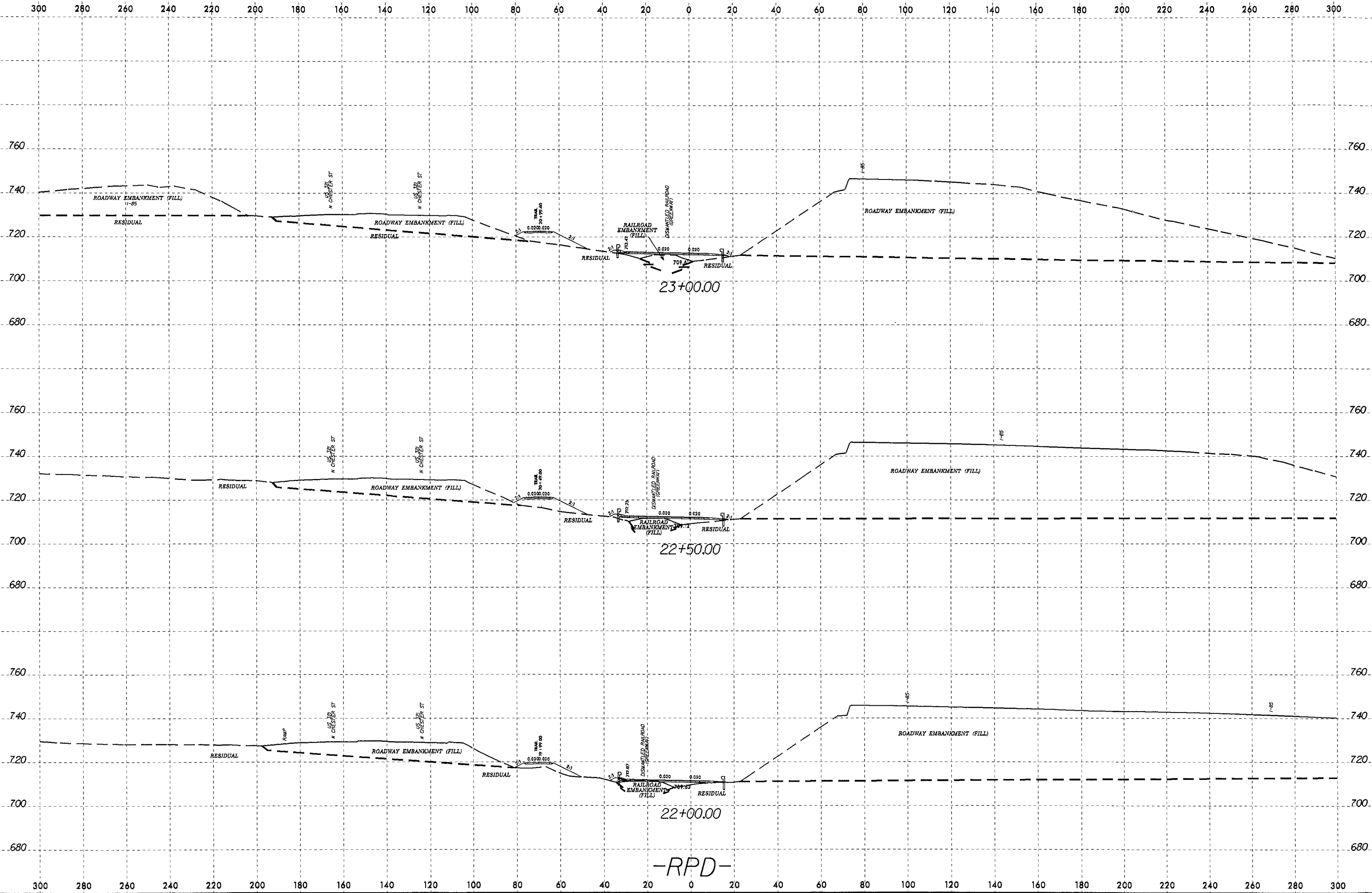




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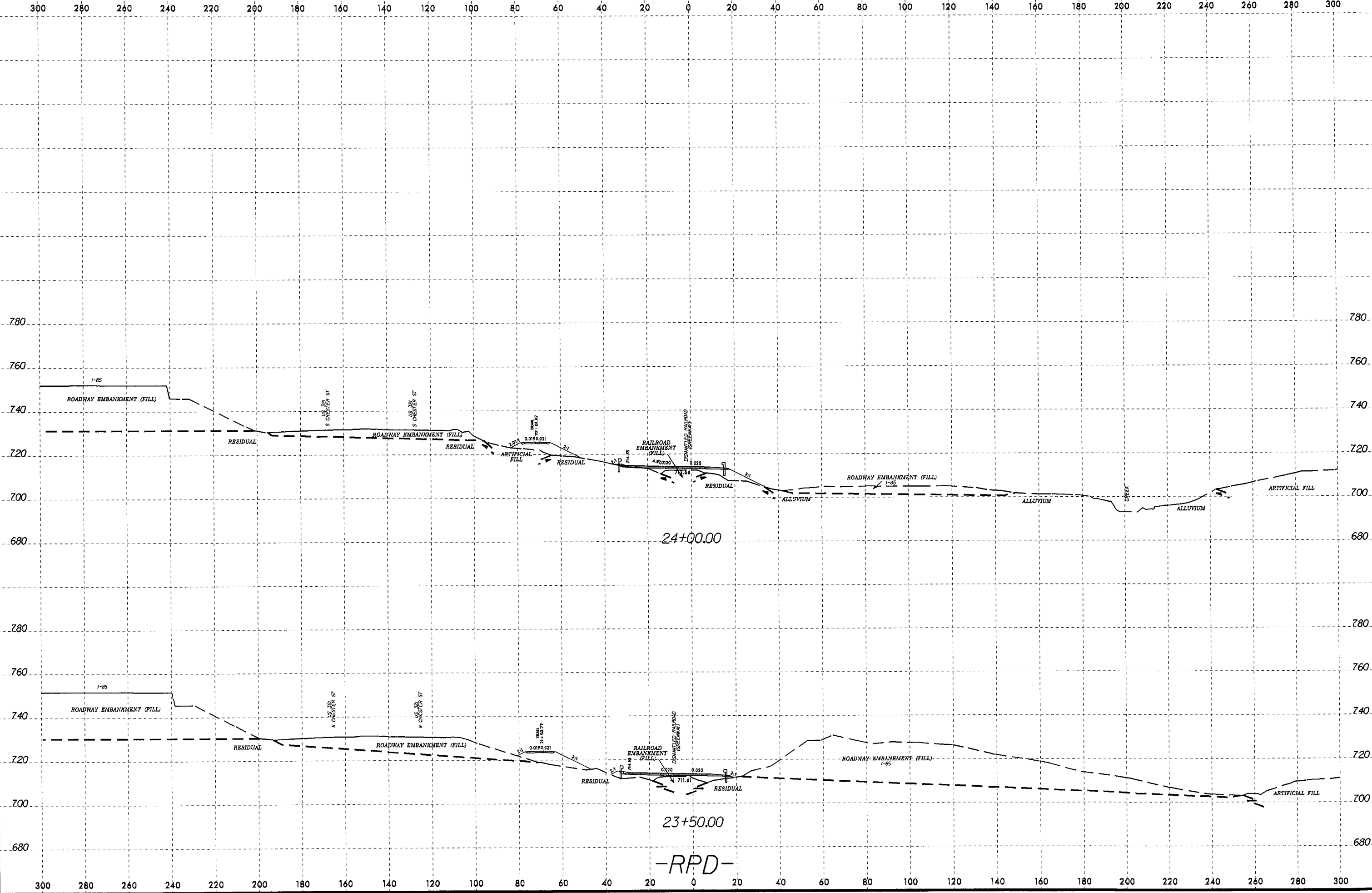
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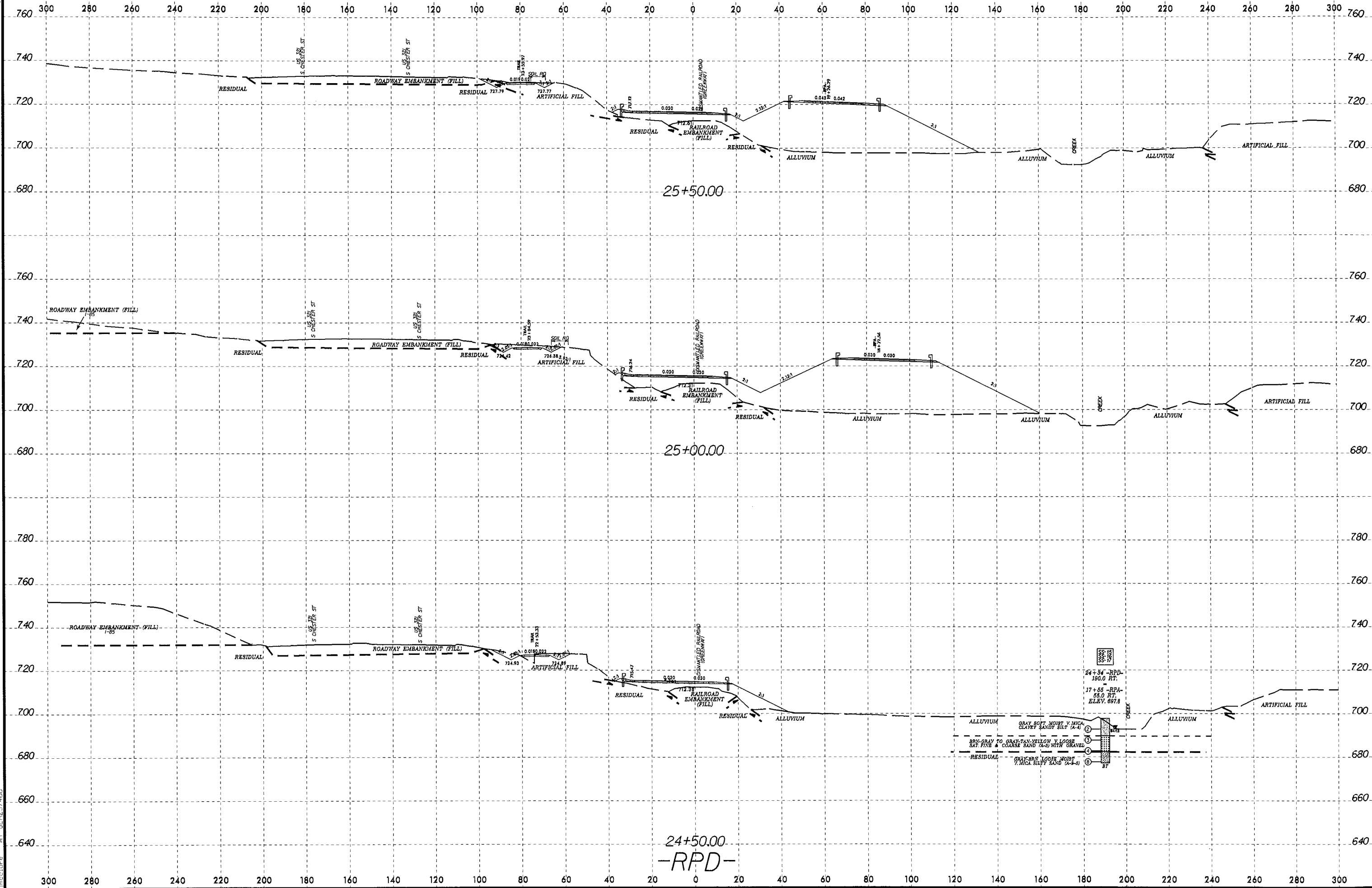
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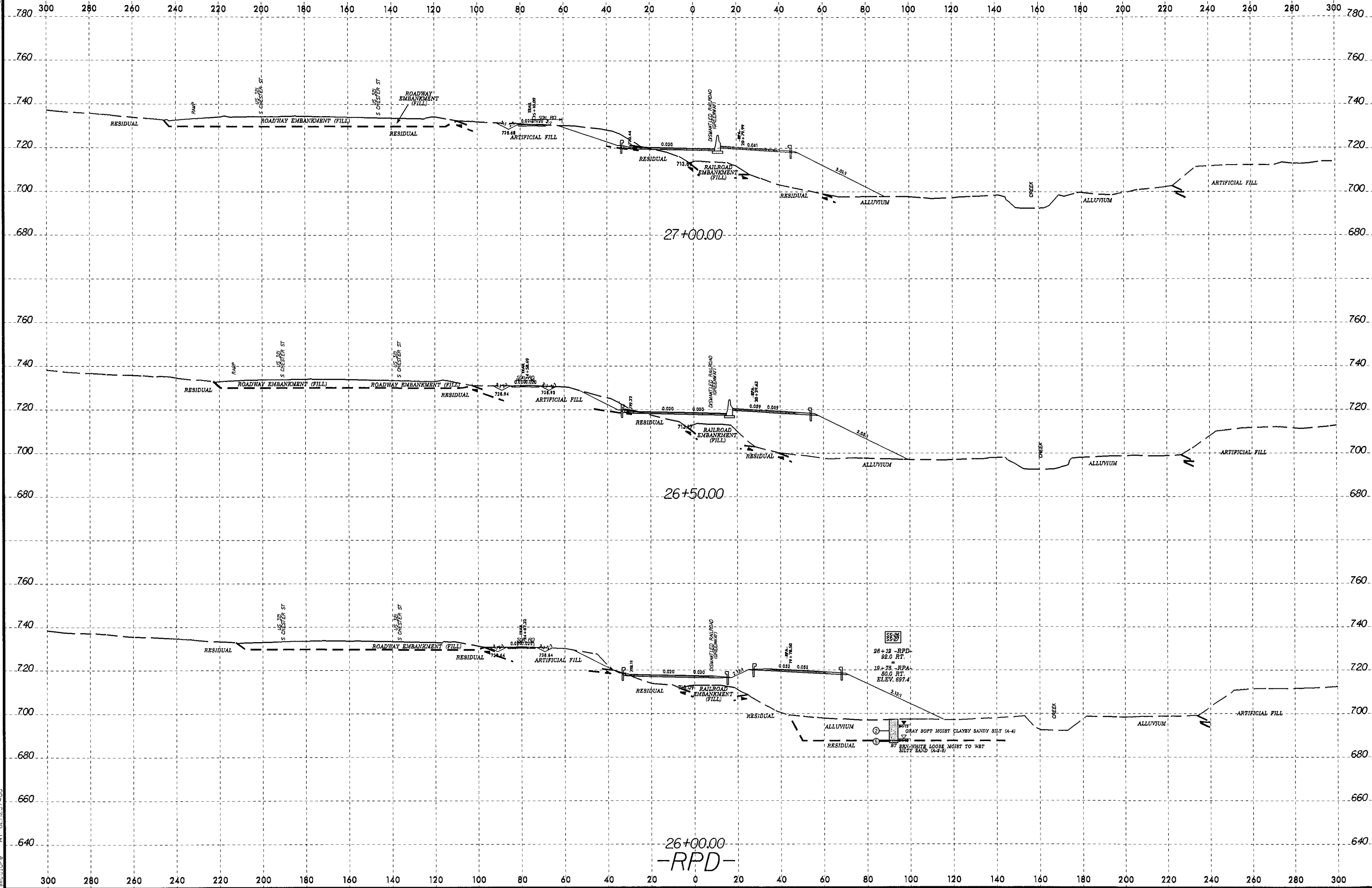
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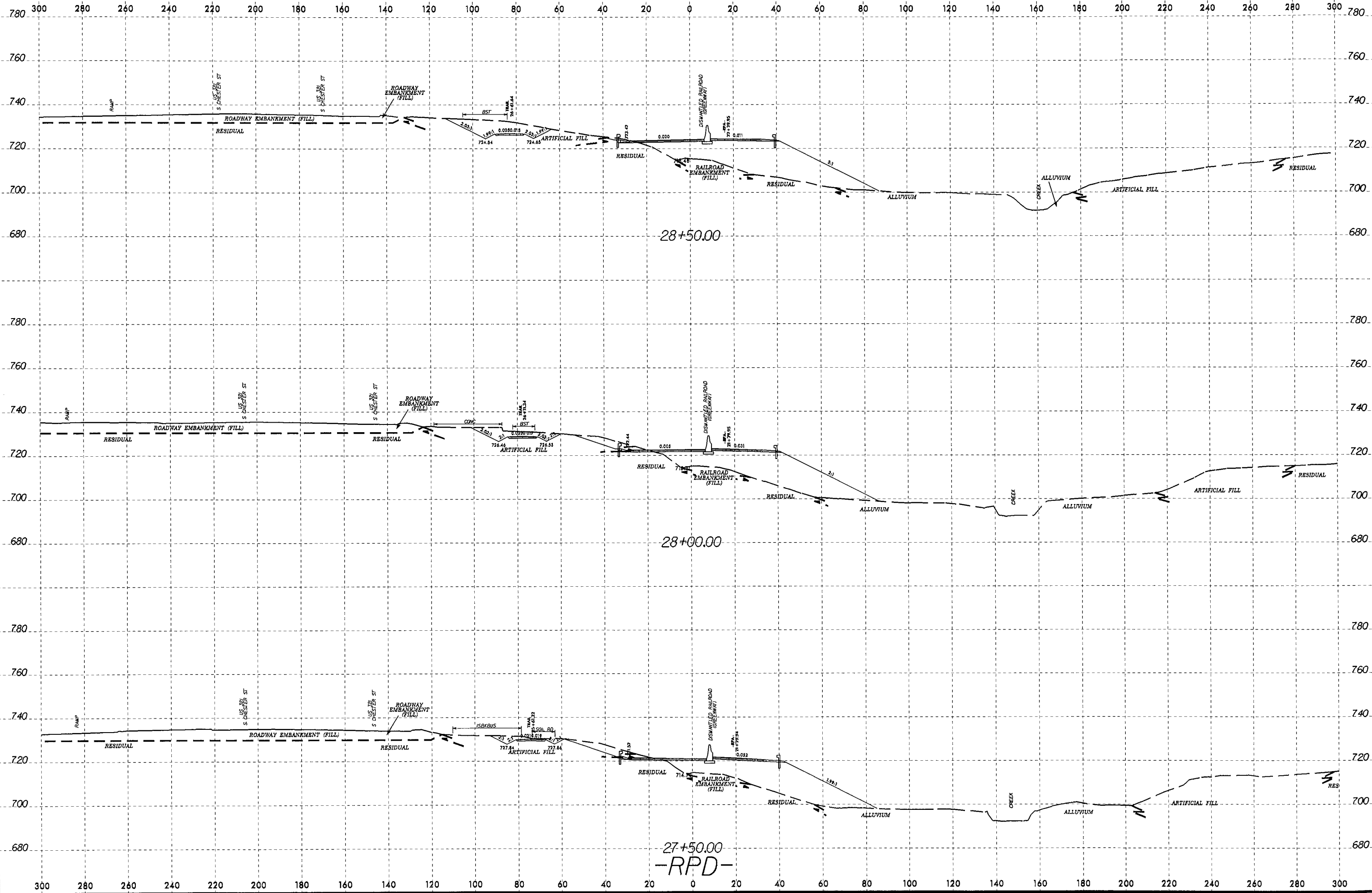
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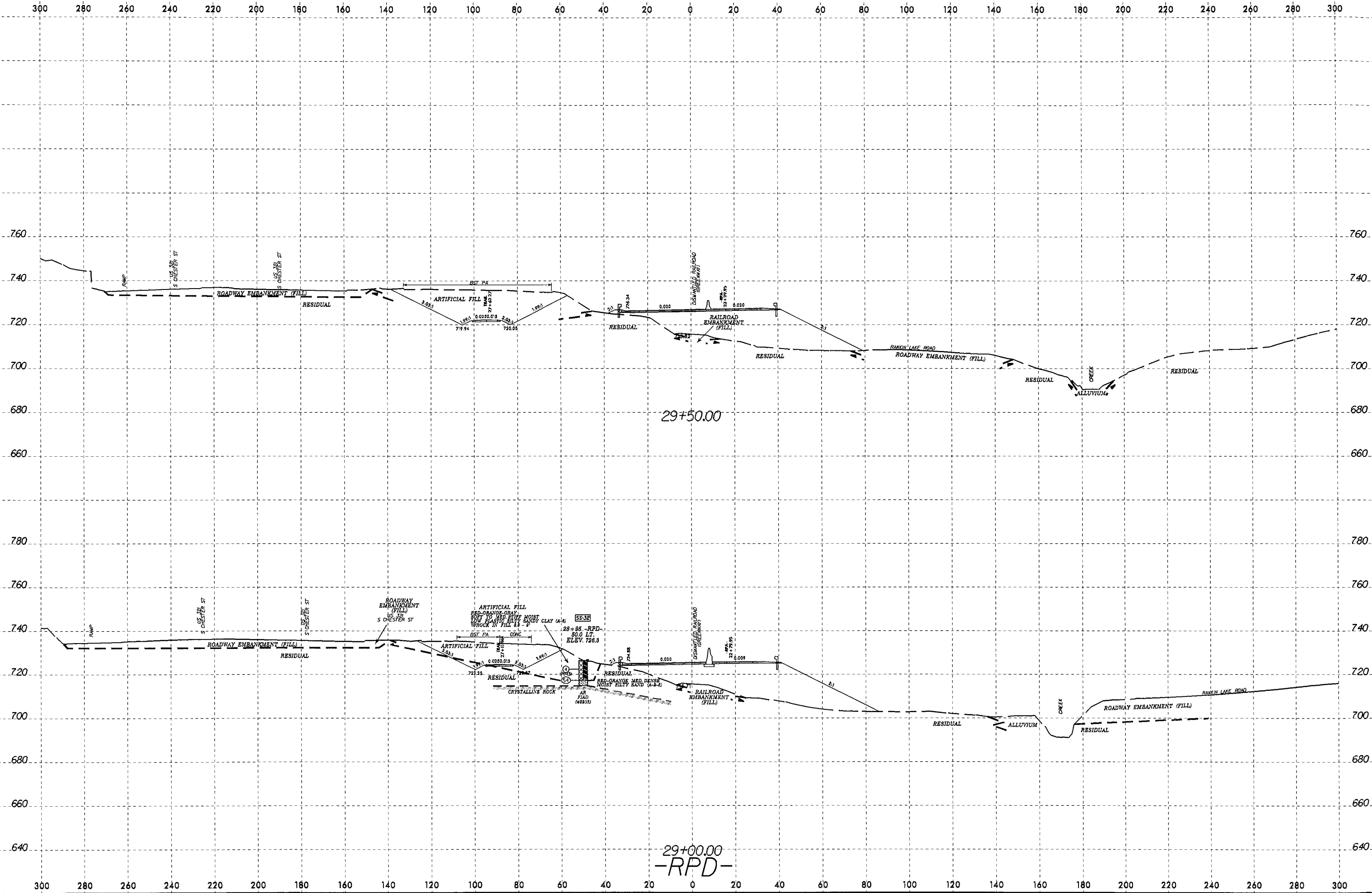


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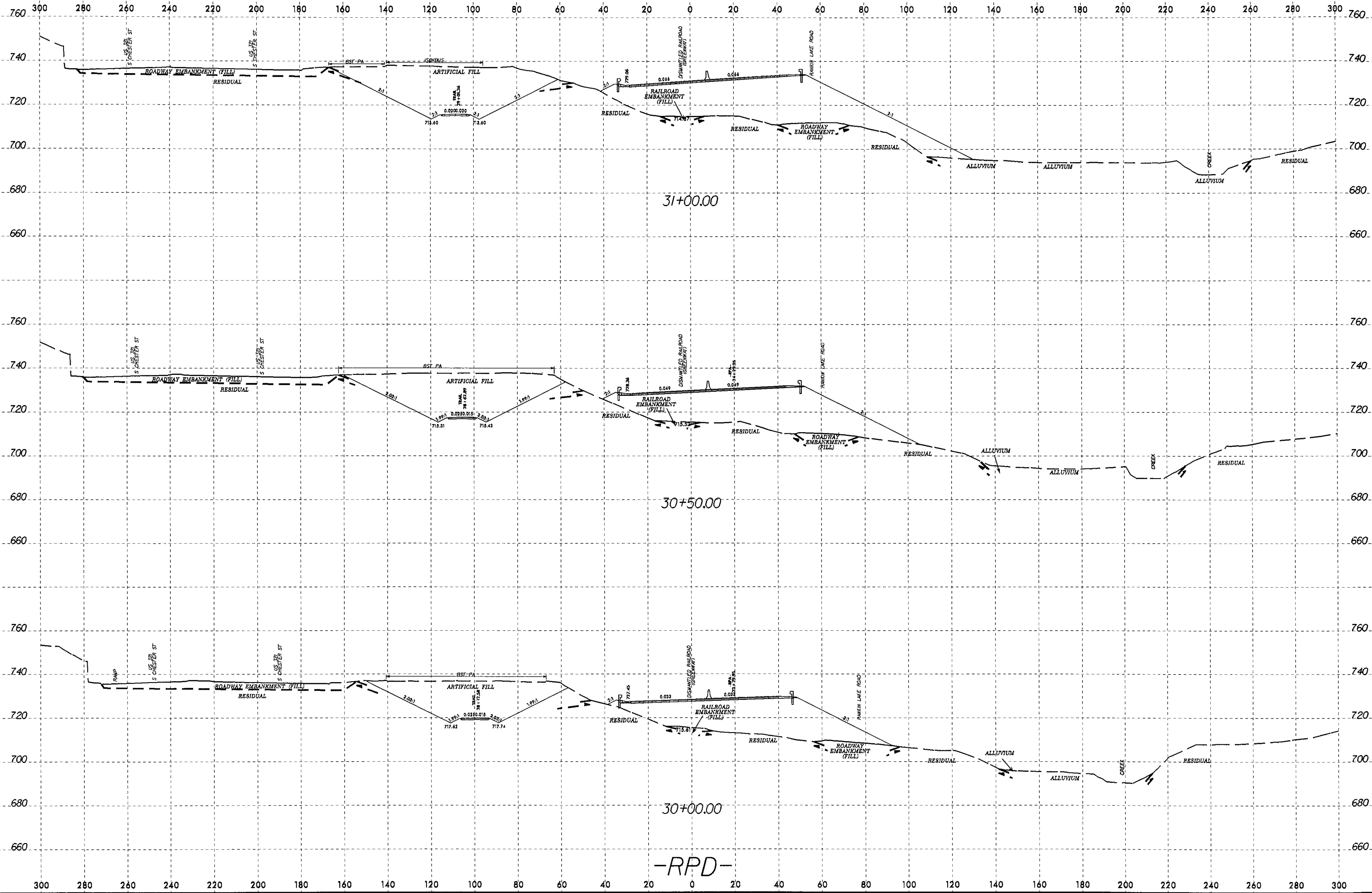


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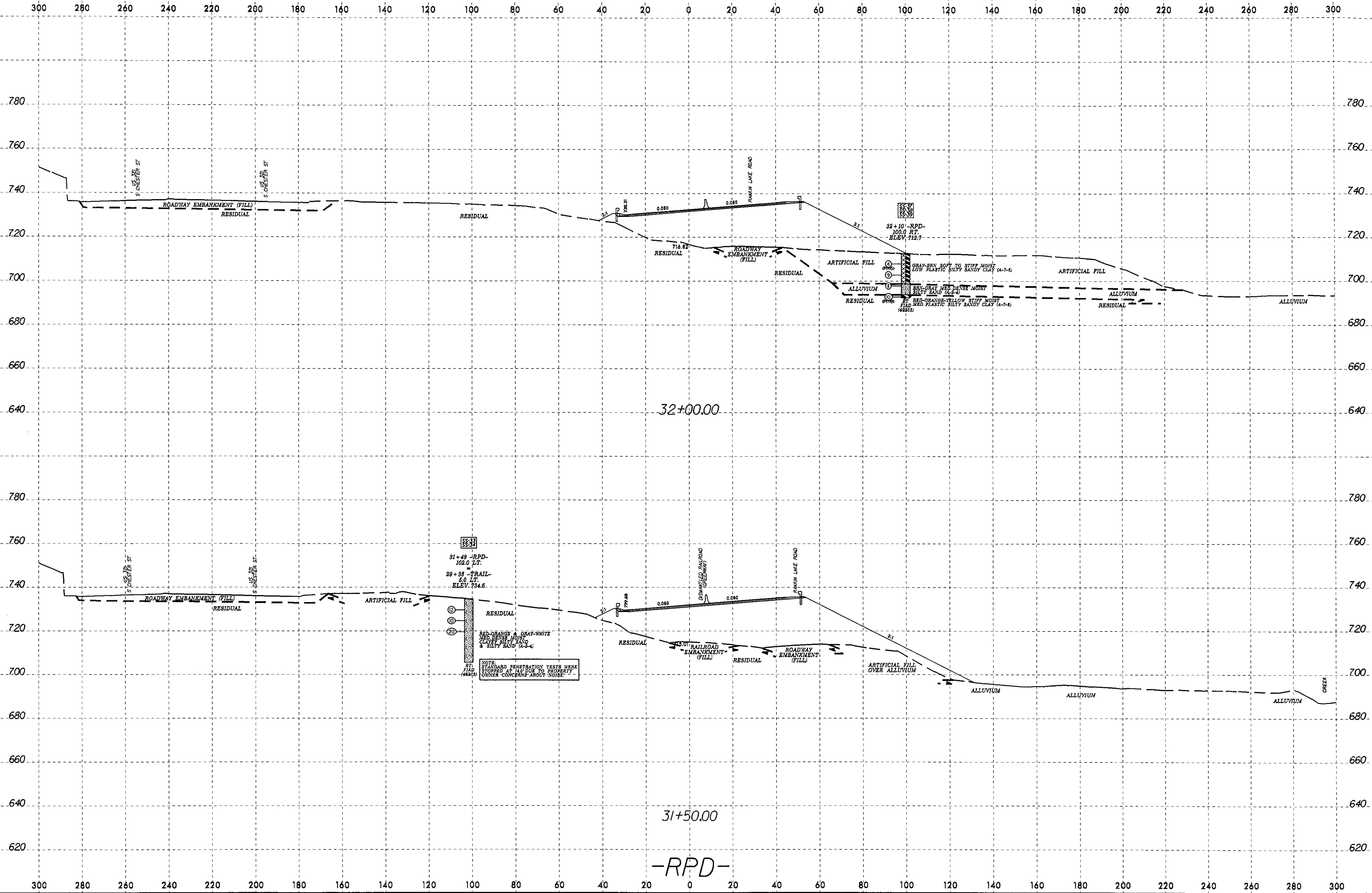
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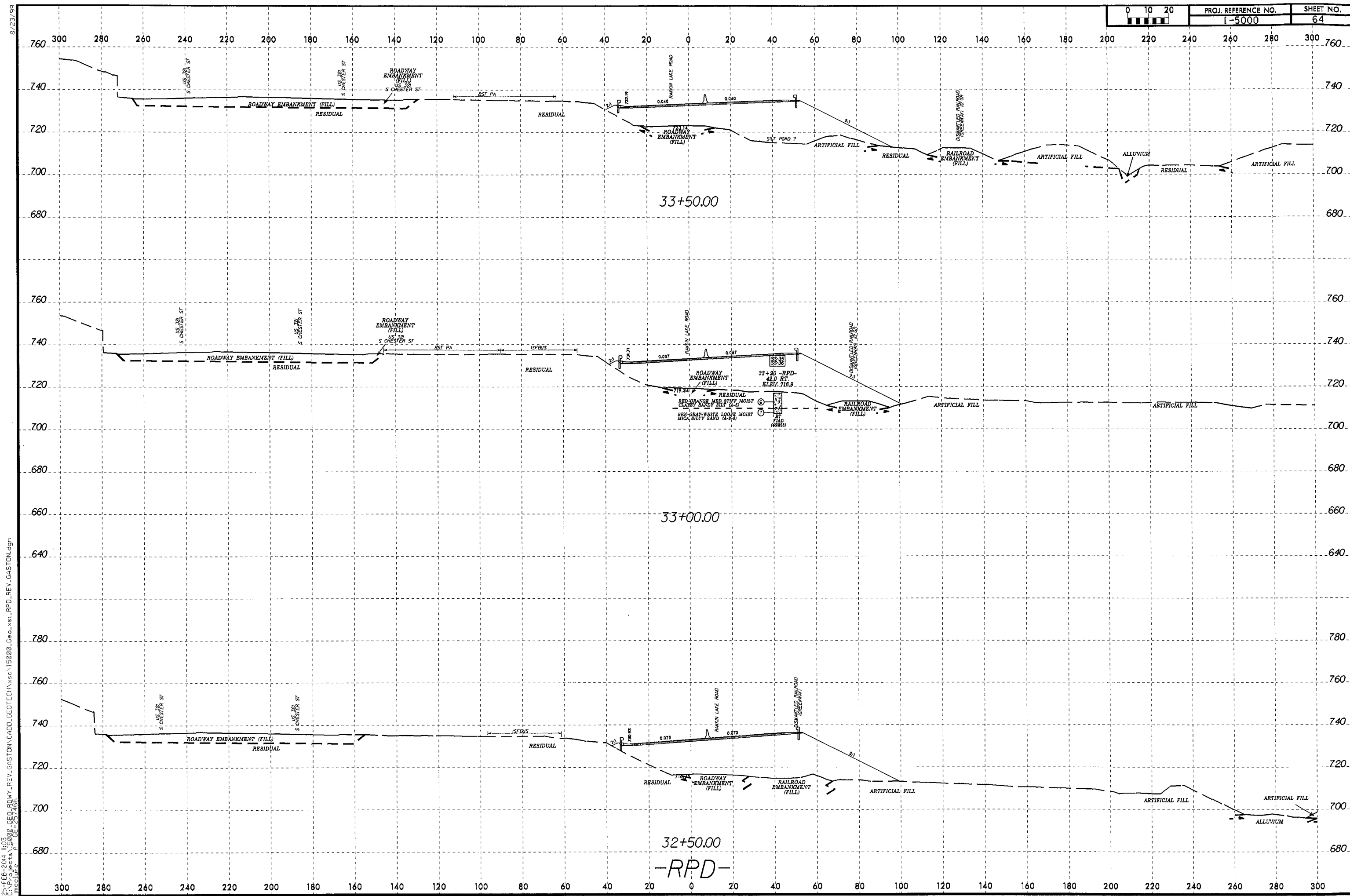
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 imc\lbf



32-33  
 31+49 -RPD-  
 102.0 LT.  
 38+35 -TRAIL-  
 6.0 LT.  
 ELEV. 754.6  
 (C)  
 (10)  
 (20)  
 RED-ORANGE & GRAY-WHITE  
 MID-DENSE RED  
 CLAYEY SILTY SAND  
 & SILTY SAND (A-3-U)  
 NOTE:  
 STANDARD PENETRATION TESTS WERE  
 STOPPED AT 140 DUE TO PROPERTY  
 OWNER CONCERNS ABOUT NOISE

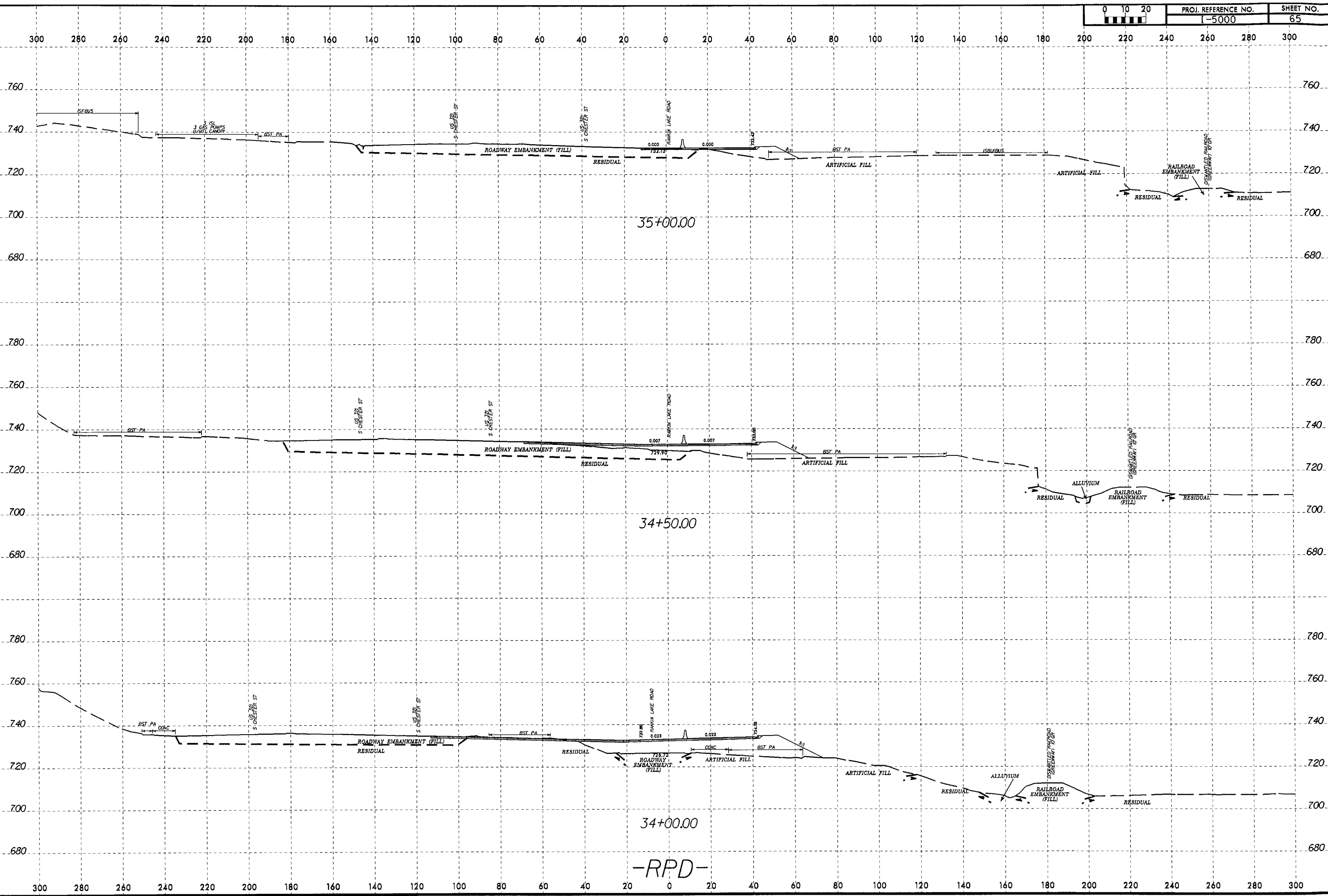
32-33  
 32+10 -RPD-  
 100.0 RT.  
 ELEV. 712.7  
 (C)  
 (10)  
 (20)  
 GRAY-BEN SOFT TO STIFF MOIST  
 SILTY ELASTIC SILTY SANDY CLAY (A-7-6)  
 RED-ORANGE & GRAY-WHITE  
 MID-DENSE RED  
 CLAYEY SILTY SAND  
 & SILTY SAND (A-3-U)  
 RED-ORANGE-YELLOW STIFF MOIST  
 FINE MED PLASTIC SILTY SANDY CLAY (A-7-6)  
 (42813)

-RPD-



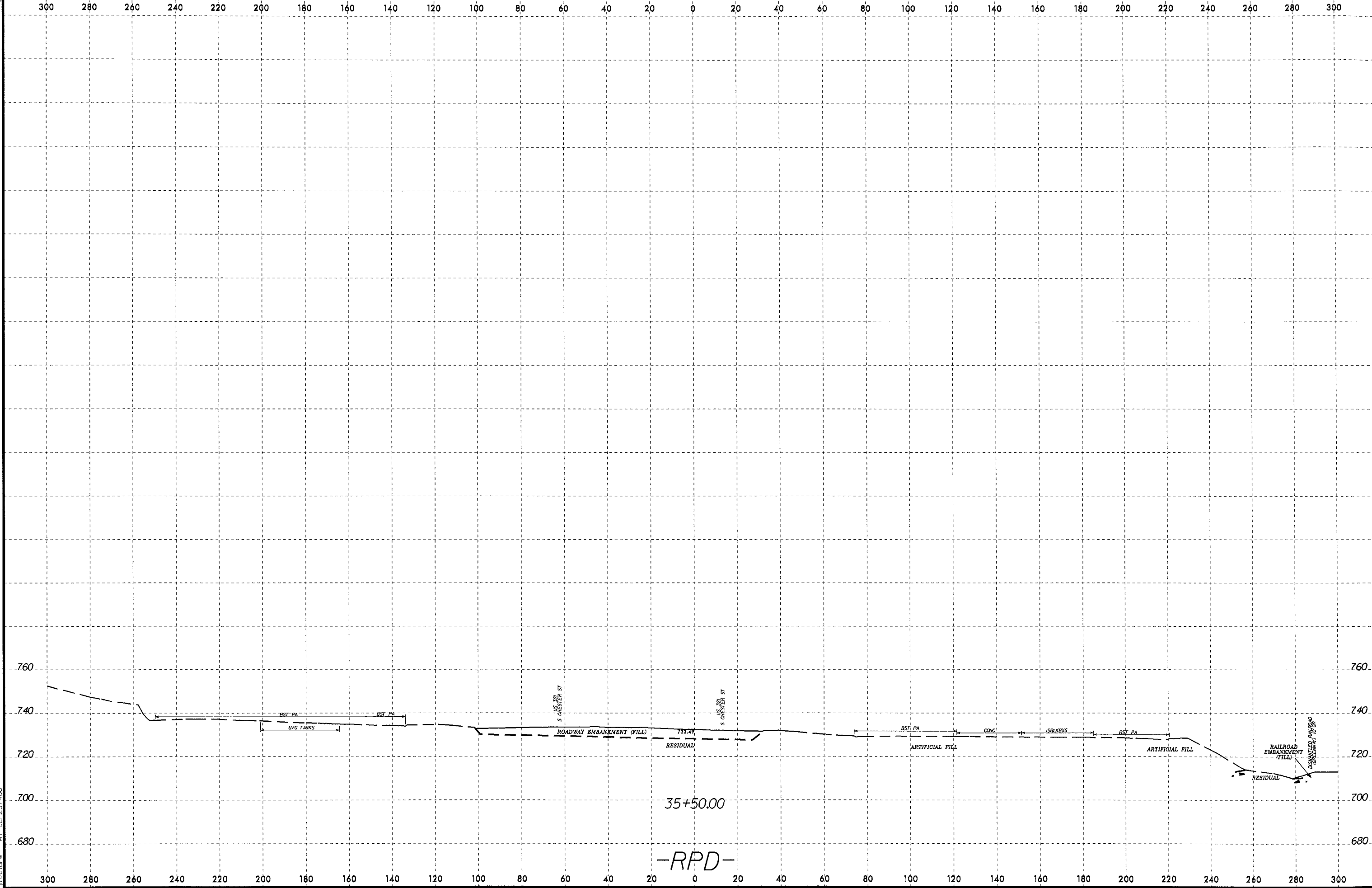
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35+50.00

-RPD-

## SOIL TEST RESULTS

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