

REFERENCE: R-3421B

PROJECT: 34542

SEE SHEET 3 FOR PLAN SHEET LAYOUT
AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3421B	1	134

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ROADWAY
SUBSURFACE INVESTIGATION

COUNTY RICHMOND
PROJECT DESCRIPTION US 220 BYPASS FROM 0.3 MILES OF
SR 1104 (OLD CHARLOTTE HWY) TO 0.2 MILES SW OF
SR 1304 (HARRINGTON RD)

INVENTORY

CAUTION NOTICE

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PERSONNEL

B. KEANEY

C. JONES

C. MYERS

D. TIGNOR

C.C. MURRAY

J.E. ESTEP

J. VANDERBURG

R.Q. CALLAWAY

C.B. LITTLE

HDR ENGINEERING, INC.

INVESTIGATED BY ICA, MAD, INC

DRAWN BY CGM

CHECKED BY ECH/BDK

SUBMITTED BY HDR ENGINEERING, INC.

DATE 7/2015



Digitally signed by Brian V. Keaney

79CD97E4882C436...

8/7/2015

<p>_____ SIGNATURE</p>	<p>_____ DATE</p>
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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT
SUBSURFACE INVESTIGATION

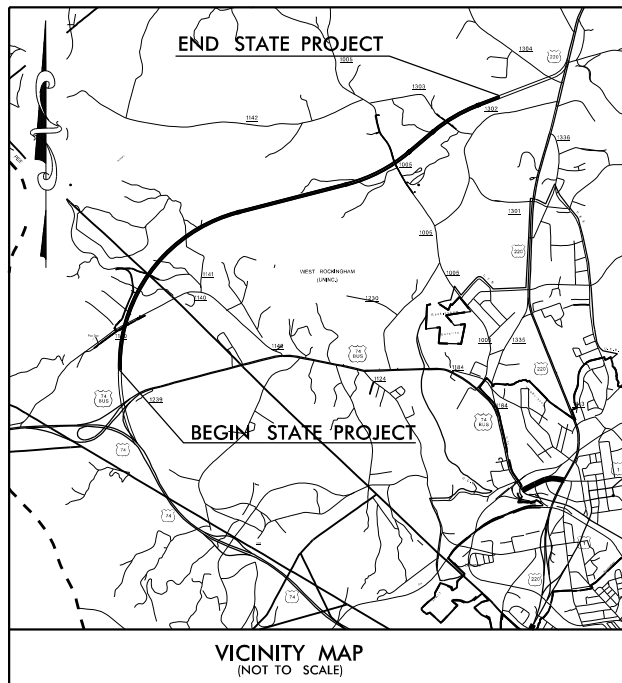
SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, CONSISTENCY OR DENSENESS, TEXTURE OR GRAIN SIZE, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, MISCELLANEOUS SYMBOLS, RECOMMENDATION SYMBOLS, ABBREVIATIONS, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, INDURATION.

TIP: R-3421B

CONTRACT:

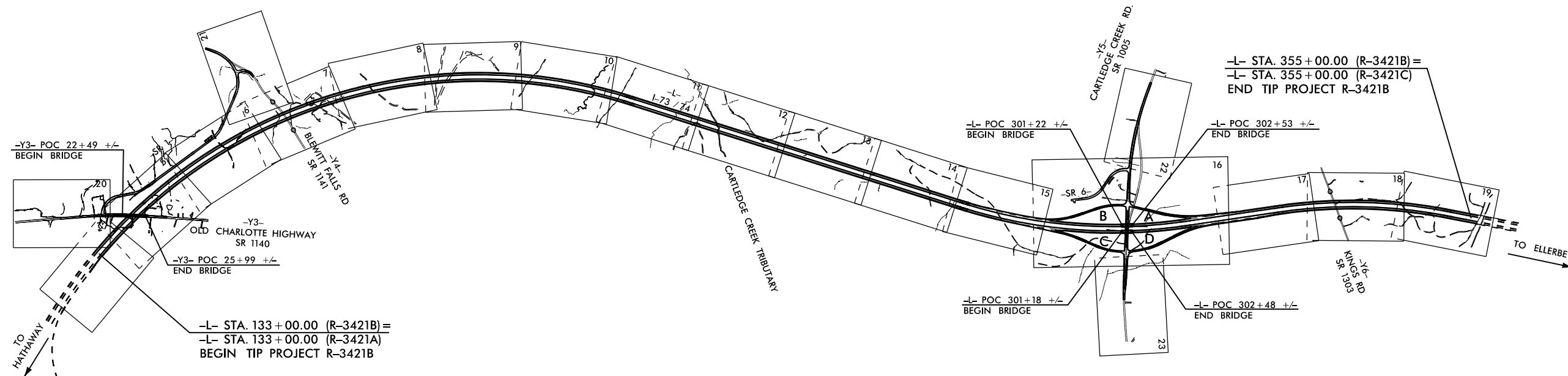
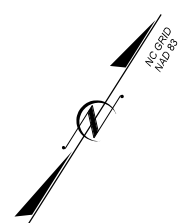
See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
RICHMOND COUNTY

LOCATION: US 220 BYPASS FROM 0.3 MILES SOUTH OF SR 1140 (OLD CHARLOTTE HIGHWAY) TO 0.2 MILES SOUTHWEST OF SR 1304 (HARRINGTON ROAD)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, FENCING, CULVERTS, STRUCTURES, SIGNING

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-3421B	3	
WBS NO.	F.A. PROJ. NO.	DESCRIPTION	
34542.1.1	NHF-220(4)	P.E.	



MULKEY
ENGINEERING & CONSULTANTS
PO BOX 32127
RALEIGH, N.C. 27636
TEL: 919-871-1122
FAX: 919-871-1128 (FAX)
WWW.MULKEY-INC.COM

THIS PROJECT IS A CONTROLLED ACCESS PROJECT WITH ACCESS LIMITED TO THE INTERCHANGE.
CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD ?.

GRAPHIC SCALE

25' 0 50'

PLANS

25' 0 50'

PROFILE (HORIZONTAL)

5' 0 10'

PROFILE (VERTICAL)

DESIGN DATA

ADT 2005 = 5,525
ADT 2025 = 21,150

DHV = 10%
D = 60%
T = 28% *
V = 70 mph

* (Duals = 10% + TTST = 18%)
Functional Class.: Interstate

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-3421B = 4.230 MILES
LENGTH STRUCTURES TIP PROJECT R-3421B = 0.025 MILES
TOTAL LENGTH TIP PROJECT R-3421B = 4.205 MILES

Prepared in the Office of:
Mulkey Engineers & Consultants
FOR THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

2002 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
MAY 20, 2005
(PRODUCTION)

LETTING DATE:
MAY 16, 2006
(PRODUCTION)

NCDOT CONTACT: CATHY S. HOUSER, P.E.
DESIGN SERVICES - PROJECT ENGINEER

JOHNNY BANKS
MULKEY E & C
PROJECT MANAGER

T. S. HAYES, P.E.
MULKEY E & C
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

PE

SIGNATURE: _____

ROADWAY DESIGN

PE

SIGNATURE: _____

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

PE

STATE HIGHWAY ENGINEER - DESIGN

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED FOR

DIVISION ADMINISTRATOR

DATE

DATES # FILES

July 15, 2015

STATE PROJECT: 34542.1.FR3
TIP NUMBER: R-3421B
FEDERAL PROJECT: NHF-0220(76)
PROJECT ID: 16523
COUNTY: Richmond
DESCRIPTION: US 220 Bypass from 0.3 miles South of SR 1104 (Old Charlotte Hwy) to 0.2 miles SW of SR 1304 (Harrington Rd)
SUBJECT: Geotechnical Roadway Inventory Report

*Previously written by NCDOT Geotechnical Engineering Unit (GEU) in January 2007
 – Updated July 2015*

PROJECT DESCRIPTION

The 3421B project is a new alignment, that will connect a widened U.S. 220, (R-3421C), with an improved Rockingham Bypass, (R-3421A). When the R-3421 projects are complete they will be part of the new Interstate Highway, I-73, between Wilmington and Greensboro, utilizing and improving parts of U.S. 220, and U.S. 74, and incorporating new alignment as well.

This R-3421B report describes a project that includes 1 new bridge, 1 interchange with bridges, ramps, several excavations of 50 feet or more, and several embankments 70 feet thick or more, 4.2 miles of new divided interstate highway, and about a mile of surface road.

The field investigation was conducted from January 2005 to April 2005 and supplemented by another investigation from January 2015 to March 2015, using a CME-550 drill machine, a CME-45B and CME-45C track rigs with an automatic hammer. Standard Penetration Tests (SPT) and Cone Penetrometer Tests (CPT) were performed at selected locations. Representative soil samples were collected and forwarded to the Materials and Tests Unit laboratory and approved NCDOT M&T testing facilities for soil quality analysis, moisture content, and ASTM classification.

The reader is expected to make his or her own judgment of the sufficiency of the data and any particular geologic interpretation within this report, and the validity of the interpretation. All available test locations are plotted on the plan view and also appear projected into the profiles.

The following alignments, totaling 8.27 miles, were investigated.

Line	Station			Length
-L-	133+00	to	355+00	22,200'
-Y3-	13+00	to	29+30	1,630'
-SR1REV-	10+00	to	17+53.73	754'
-SR1-	18+56.51	to	49+00.00	3043'
-SR6-	10+00	to	20+82.57	1,083'
-Y4-	9+75.26	to	25+65.88	1591'
-Y5-	10+00	to	43+75.00	3,375'
-Y6-	10+00	to	18+95.53	896'
-RAMP A-	0+00	to	14+03.06	1404'
-RAMP B-	0+00	to	15+23.92	1,524'
-RAMP C-	0+00	to	15+32.68	1,533'
-RAMP D-	0+00	to	14+90.67	1,491'
				Total = 40,524 ft (7.68 miles)

AREAS OF SPECIAL GEOTECHNICAL INTEREST

In the quarried area from –L-182+50 to –L-197+50, and possibly as far as –L- 204+00 the surface elevation has been changed, possibly by as much as 30', and the map does not match present conditions. Mining and reclamation of this area occurred between the time the project was flown, and continued after our investigation.

Artificial Fill

Much of the route of the new alignment crosses quarries excavated for the recovery of gravel. Some areas were backfilled with overburden leaving a significant thickness of disturbed soil. The soil probably originated on site, and as potential fill will have the same characteristics as the equivalent undisturbed section. This fill is not controlled, but the finished centerline grade for the –L- sections is below the base of the fill. Some non-controlled material however, will be left in the slopes.

Artificial Fill Intervals

Line	Station	Material
-L-	182+50 to 197+50	A-7-6, A-6, A-2-6, A-2-7

Highly plastic clays: Soil with plasticity indices equal to or greater than 20, were found in the following areas. The high PI soil is not restricted to just residual or coastal plain sections.

Line	Station			Comment
-L-	135+50	to	161+50	Coastal Plain
-L-	165+50	to	170+00	CP and Residual
-L-	176+50	to	218+00	Coastal Plain
-L-	217+00	to	355+00	CP and Residual
-Y3-	22+00	to	25+00	Single boring, Below grade
-SR1 –	13+00	to	40+00	At & Below grade
-SR6-	15+00	to	18+50	At grade
-Y5-	17+00	to	35+50	At grade
-RAMP A-	0+00	to	14+00	Below fill & @ surface
-RAMP B-	0+00	to	15+00	In Cut & @ grade
-RAMP C-	0+00	to	15+00	In Cut & @ grade
-RAMP D-	0+00	to	13+00	Below grade

Ponds

There is a small pond at –Y3- 30+00 that will not be within the cut and fill limits and outside ROW, but this pond feeds some water to the wetland crossed by –L-, at –L-148+00

Groundwater

The following sections were found to exhibit a water table above grade, seasonal high groundwater, or the potential for groundwater related construction problems.

Line	Station			Comment
-L-	133+00	to	146+00	Likely wet cut in Coastal Plain soil
-L-	153+00	to	164+00	Likely wet cut in Coastal Plain soil
-L-	173+00	to	176+00	Single boring, water at grade
-L-	182+00	to	205+00	Wet cut with water at or above grade; Seepage at slope face possible
-L-	251+00	to	273+00	Wet cut at Residual-Coastal Plain contact
-L-	278+00	to	294+00	Wet cut within Coastal Plain section

Line	Station			Comment
-SR1 -	27+00	to	41+00	Wet cut at residual-coastal plain contact
-Y5-	33+00	to	35+00	Water at grade, single boring
-RAMP B-	0+00	to	15+00	Wet cut in Coastal Plain
-RAMP C-	0+00	to	7+00	Wet cut in Coastal Plain

Notable Utilities and Private property:

There is a Richmond County waterline easement that crosses -L- at about 170+00. Where the project crosses the Old Charlotte Highway, several residences will be taken, but the remainder of the project features large tracts that are agricultural, timber land, or mined out quarry land.

PHYSIOGRAPHY AND GEOLOGY

Physiography

The project is located at the border between the Coastal Plain and the Piedmont physiographic provinces. The roadway on this part of the R-3421 project runs across the flat remnant of the old coastal plain at 400' elevation, and crosses valleys draining to the northwest that have incised the old topography down to an elevation of 200'. Towards the end of this project, the topography rises to 450' elevation on a thickened section of coastal plain sediments.

Geology

The area is on the southeast side of the Wadesboro Basin, northwest of the Coastal Plain. The underlying rock not covered by Tertiary-age gravel or Coastal Plain sand is Lilesville Granite, or the Pee Dee Gabbro, or Phyllite associated with altered slate. Though mapped as part of the Carolina Slate Belt, lithologically it has a lot more in common with the Raleigh Belt than the typical slate of the Carolina Slate Belt. The highly weathered residual soil is 50' thick in places.

Soil Properties

The units that appear on the Geologic Map of North Carolina, (1985), that occur within the project are described below.

Soil mapped as Tt: The uppermost strata of soil are mapped as Tt, or terrace gravel deposits of Tertiary age. This is the Lilesville Gravel, being mined nearby, and is a coarse conglomerate of rounded quartzite pebbles to cobbles. Oxidized sandy red clay forms the matrix that supports the rounded pebbles. This soil is classified as an A-2-6, A-2-7, A-6 or A-7. On the R-3421-A project it occurred above 345'. On this segment, south and west of -L- 212+00, it has been mined above elevation 370. Most of the areas of occurrence have been mined and appear on our profiles as Artificial Fill.

Soil mapped as Km: On the southwest part of the project, the Km, (Coastal Plain Middendorf formation), occurs below the Tt, described above. The transition is often marked by a change from red soil to purple or white, and in places there is a hard white layer of clay with N value of 100. On the northeast side of the project, beyond the Cartledge Creek tributary drainage at -L- 212+00 to -L-254+00, the Tt is scarce. From -L-254+00 to -L-326+00 and elevation 400', the Km soil is typically clayey sand to sandy clay, with SPT "N" values of 20 to 100, but is usually described as white, gray, light gray, etc. Beyond -L-326+00 there are a few intervals of white sand in the Coastal plain section, with a clay constituent of less than 12%. This is similar to the highly erode-able cut slopes of R-3421A, but with no reported water, and N values of 20 and up.

Residual soil mapped as CSph, or Ppg: The Residual soil mapped as CSph and Ppg occurs in the valley at -L-212+00 to -L-247+00. This area will be the site of a roadway embankment.

Residual soil mapped Pgb: The soil mapped as Ppg on the project corridor lies between -L-212+00 and -L-235+00. Our sampling skipped across the interval from -L-212+00 to -L-217+00, but no soil definitely attributable to gabbro was found.

Residual soil mapped Czph: The area mapped as Czph on the project corridor is from -L-235+00 to -L-275+00. From -L-217+00 to -L-275+00 the residual soil we encountered had a high percentage of silt, with relatively little clay, which was strikingly different from the coastal plain soil and consistent with the Czph, (phyllite from slate) rather than the brick red clay of weathered gabbro.

Rock Properties

No in-place rock was identified within the limits of this segment.

Groundwater Properties

There are four recognized aquifer systems in North Carolina's Coastal Plain region¹, and two of them will be encountered in this project. The Surficial Aquifer is nothing more than the permeable soil between land surface and the first impermeable layer. Standing water far above the residual contact at around 310' elevation is evidence of this aquifer, which is probably local in scope. The Cretaceous Aquifer is the lowermost Cretaceous strata and the underlying bedrock aquifer. On this project it is demonstrated in the borings that show a static water table in the lower Coastal Plain soil, above the Residual soil.

GEOTECHNICAL DESCRIPTIVE ANALYSIS

The project covers about 4 miles of interstate highway on a new location with one interchange. For descriptive purposes, the project has been divided into 3 segments.

Segment 1 covers the -L- alignment and all related roads from the beginning at 133+00 up to -L- 212+00, the edge of the Cartledge Creek tributary drainage.

Segment 2 covers the Cartledge Creek drainage feature from -L-212+00 to -L- 274+00.

Segment 3 covers the -L- and all other roads and structures north and east of the Cartledge Creek drainage, from -L-274+00 to the end at -L-355+00, including the Cartledge Creek Road interchange.

Segment 1

-L- 133+00 to 212+00. This segment covers the area mined for gravel. Reclaimed gravel pits with artificial fill mark the limits of the old coastal plain stratigraphy that defines this segment.

Alignment	Type of work	Location
-L-	New alignment	-L-133+00 to -L- 212+00
-Y3-	New bridge, old Alignment	-Y3- 13+00 to 29+30
-SR1- & -SR1REV-	New Alignment	-SR1- 10+00 to 49+00
-Y4-	Modify existing road	-Y4- 9+75 to 24+08

Physical Description

This segment appears in plan on sheets 4 through 10, 20 and 21. The segment is shown in profile on sheets 24 through 30, and sheets 43 through 49. It begins at elevation 325 at the termination of the "A" segment, in 40 feet of cut, then climbs to the top of the hill at -L- 153+00 and elevation 375'. Planned embankments and cut sections will allow the finished road to descend gradually to elevation 330 at the segment, end at -L- 212+00. The existing Old Charlotte Highway will be reworked as -Y3-, requiring a bridge at -Y3- 23+00 to -Y3- 25+50 where the new -L- alignment passes under the existing Old Charlotte Highway.

Geology

This segment is nearly all on Coastal Plain soil, above the residual soil contact at 310' elevation. The residual contacts are at the segment beginning, and at -L-167+00 and 169+50, under a roadway

¹ Ground Water in the Coastal Plain of North Carolina: <http://www.bae.ncsu.edu/programs/extension/publicat/wqwm/ag450>

embankment section. The Coastal Plain sediments at ground surface in this section are mostly sand and gravel held together with red clay, though towards the end of the segment, below the gravel quarry, there are white sandy silty soil layers. Probably rivers deposited the red soil, and the white soil was deposited in ocean water.

Cuts and Fills

The significant (more than 5' thick) cuts and fills of this segment, are listed in the table below. On this segment the left and right side of the cuts or roadway embankments are about the same so a centerline depth is used.

Excavation Activities

Cut			Fill		
Begin Station	End Station	Maximum Height	Begin Station	End Station	Maximum Height
-L- 133+00	-L- 145+00	40'			
			-L-147+00	-L-152+50	40'
-L- 155+00	-L- 162+00	25'			
			-L-165+00	-L-171+00	65'
			-L-177+00	-L-180+00	30'
-L-182+00	-L- 198+00	65'			
-L- 200+00	-L- 204+00	40'			
			-SR1REV-13+00	-SR1-14+75	25'
			-SR1-21+50	-SR1-26+00	40'
-SR1- 27+00	-SR1- 40+00	70'			
			-SR1- 41+50	-SR1- 43+50	20'

Soil

The soil encountered in this project is either residual soil, (created by weathering rock), or sedimentary soil, (deposited by wind or water), or artificial fill, (soil moved, usually by mechanical means and not compacted to a known specification). The residual soil, a weathering product of granite, gabbro, or metamorphic rock, is usually clayey or silty soil. All sedimentary soil is lumped together as alluvial Coastal Plain soil.

Residual Soil

Residual soil was found on this segment only at the base of Seaburn Branch along Blewett Falls Road, -L-166+50 to -L- 169+50. From the surface, 5 feet thick or less of this soil was classified as A-7-5 above 5 feet or less A-5, over rock. On this project, the high silt constituent in some of the soil samples is the distinguishing feature between the alluvial soil and the residual soil.

Coastal Plain Soil

With the exception of the interval near Seaburn Branch, above, this entire segment was classified as coastal plain soil. The Coastal Plain Soil in this area can be separated into two units: 1.) Generally red or orange, river-deposited sediments with clay, sand, and gravel, and 2.) Marine- deposited whitish clay or sand layers. The red soil is the one with gravel, and most of it is gone, having been mined. The remnants of this red gravelly unit are mostly at or above planned grade, with PI values of 25 to 40, A-2-6, A-2-7, A-6, A-7. The whiter non-gravelly coastal plain unit is usually below grade, and is mostly from -L-182+00 to -L-212+00.

Artificial Fill Soil

The soil on this segment from -L- 182+50 to -L-197+50 is in an area that was quarried, and has been disturbed. The uppermost 20' of soil from -L-182+00 to -L-195+00 was also found to be artificial fill soil. This fill was not placed according to a specification, such as is done in roadway embankment construction, so no assumptions should be made in regards to strength or quality of the fill.

Rock

No rock or weathered rock was found on this project.²

Groundwater

Groundwater by definition resides in an aquifer: a permeable reservoir with an impermeable zone below it. Our drilling in the Coastal Plain sediment section found water. The quantity was not determined. The stratigraphy was not consistent enough to know the limits of any particular aquifer. It is probable that in some of the cut slopes there will be seeps related to the groundwater perched on impermeable zones.

Wetlands

A small wetland should be expected alongside Blewett Falls Road at -L- 167+50. .

Segment 2

-L-212+00 to -L- 274+00: This segment covers the major valley on the project. More than 90% of this segment is residual soil, and almost all of it will be under a vast roadway embankment that defines this segment.

Physical Description

This segment appears on plan sheets 10 through 14, and profile sheets 30 through 34. The residual soil is exposed on this segment where the upland network of tributaries to Cartledge Creek has cut down through the coastal plain soil. As the planned road descends into and climbs out of the broader valley, it traverses minor southeast to northwest gulleys. The finished grade will drop from 340' elevation to about 275' elevation over the existing main drainage, then climb to 320 at the end of this segment at -L-274+00.

Geology

According to the Geologic Map of North Carolina, from the segment beginning to the low point at -L-235+00, the bedrock lithology below the residual soil cover is gabbro. Beyond the drainage, the unseen bedrock is mapped as CZph: Slate altered to Phyllite, all the way to the segment end at -L-274+00.

Cuts and Fills

This segment has one large roadway embankment and two small cut areas.

Excavation Activities

Cut			Fill		
Begin Station	End Station	Maximum Height	Begin Station	End Station	Maximum Height
			-L-212+00 to	-L-246+00	80'
-L-251+00	-L-272+00	35'			

Soil

This segment is mostly residual soil, though at each end, alluvial Coastal Plain sediment is exposed. The residual soil samples show an abrupt spike in silt content, up to 40%. The Coastal Plain sandy soil immediately above the silty residual soil has a silt content of less than 10%.

Residual Soil from Gabbro: From -L-212+00 to -L-217+00 no sampling was done, but as mentioned above, this soil should be derived from Gabbro. The section from -L-217+00 to -L-235+00 was thoroughly sampled, and should also be Gabbro. The field descriptions describe the samples as Phyllite or Slate. The upper five feet of soil is generally classified as A-6 or A-7, silty clay with PI values around 20. The soil types change by the second drive to A-4 or A-5 clayey silt.

Residual Soil from Phyllite: From -L-217+00 to -L-249+00, the southwest-facing slope is mapped as Phyllite. The borehole sampling found stiff A-6 and A-7 silty clay soil with PI values from 20 to 30;

² Values of N> 100 were returned from hard sedimentary clay beds, and from gravel layers.

essentially the same as the previous "Gabbro" section. In the second drive, rather than a shift to A-4, the A-6 interval continued, the difference being the persistence of high clay values along with the high silt values.

Coastal Plain :From -L-249+00 to the end of the segment at -L-274+00, the segment is mostly in cut, and the finished grade is at or slightly below the Coastal Plain,- residual soil contact. The coastal plain soil is mostly A-2-6 soil, with PI values above 30. The silt constituent is around 5% or 6% in this soil.

Groundwater

The borings in the bottom of the valley all found water within the residual section. The borings in the southwest-facing slope, up to the south rim found no water. The borings in the cut from -L-263+00 to -L-274+00 all found water at or above the finished grade. The coastal plain in this cut connects to an extensive hinterland that could re-supply the water table for a long time.

Wetlands

There are small wetland areas along the persistent streams listed below.

Wet weather and persistent streams

The following locations are topographic lows that channel water all or part of the year.

Drainage Locations	-L-217+00, -L-226+00, -L-230+00, -L-235+00 to 237+00, -L-259+00
--------------------	-----------------------------------------------------------------

Segment 3

-L- 274 +00 to the end at -L- 355+00: This segment covers the interchange and auxiliary or access roads. This segment is characterized by light colored coastal plain sediments that have a marine origin. The project appears in plan on sheets 15 through 19, 22, and 23 and in profile on sheets 34 through 40, and 48 through 56.

Alignment	Type of work	Stations
-L-	New Alignment	274+00 to 355+00
-SR6-	New Alignment	10+00 to 20+83
-Y5-	New Alignment	10+00 to 43+75
-RampA-	New Alignment	0+00 to 14+03
-RampB-	New Alignment	0+00 to 15+24
-RampC-	New Alignment	0+00 to 15+33
-RampD-	New Alignment	0+00 to 14+91

Physical Description

The finished grade of this segment of "-L-" begins at about elevation 320 and gradually climbs to elevation 420 at -L-340+00, then drops to the end at -L-355+00 and elevation 400 (plan sheets 15 through 19, profile sheets 34 through 40). The topography is somewhat undulating, requiring cuts and fills up to 50' thick, as the road gradually ascends.

-SR6-: This service road will provide access to the new alignment of -Y5-, (Cartledge Creek road), from the property north of -L-. It begins at existing grades, elevation 390, and drops gradually to the connection with -Y5- at -SR6- 20+70, elevation 358.

-Y5-: Cartledge Creek Road, (-Y5-) will be re-aligned slightly west at the new interchange with -L-. The new alignment begins at -Y5- 10+00 at existing grade elevation 369, runs level to -Y5- 16+50, then descends on fill, connecting with -SR6- at 23+80 and onto existing grade at -Y5-25+00, elevation 355. The road then descends gradually to the end at -Y5-43+75, elevation 316.

-RampA-: This is the off-ramp for the south-bound lane, and begins at 0+00, equivalent to -L-316+00, elevation 375, then descends on fill to eventually to existing grade at 14+00, 5' below original surface, elevation 342.

-RampB-: This is the on-ramp onto south-bound -L- at the Cartledge Creek interchange. It begins at 0+00, finished grade elevation 337, and ends at station 15+00, elevation 342. The alignment is in cut the entire way.

-RampC -: This is the off-ramp for the north-bound side of -L-, beginning at 0+00, equivalent to -L- 287+00, and elevation 338'. The ramp begins in cut, but at about 7+50 it crosses over to fill, and is on less than 10' of fill or cut to the end at 15+00 and elevation 320.

-RampD- This is the on-ramp onto the north-bound side of -L-, and begins at - finished elevation 374, where 0+00, equivalent to -L-315+80. It is on about 20' of fill all of the way to grade at 14+00 and elevation 318.

Cuts and Fills

The significant (more than 5' thick) cuts and fills of this segment, are listed in the table below. On this segment the left and right side of the cuts or roadway embankments are about the same so a centerline depth is used.

Excavation Activities

Cut		Fill			
Begin Station	End Station	Maximum Height	Begin Station	End Station	Maximum Height
-L- 282+00	-L-294+00	45'			
			-L- 295+00	-L- 323+50	40'
-L- 326+00	-L-348+00	35'			
			-L- 349+50	-L- 355+00	45'
			-Y5-17+50	-Y5- 25+00	25'
			-RPA- 0+00	-RPA- 11+50	25'
-RPB- 0+00	-RPB- 15+00	70'			
-RPC- 0+00	-RPC- 6+50	40'			
-RPD- 0+00	-RPD- 11+50	20'			

Soil

The segment is underlain by residual and alluvial soil.

Residual Soil: No residual soil was found above planned grade.

Coastal Plain Soil: Most of the Coastal Plain soil is light colored A-2-6, A-2-7, A-7 or A-6 clayey soil that is probably of marine origin. Near-L-326+00, there is a white, non plastic, sandy interval below red or tan A-2-6, and A-2-7 clayey sands.

Groundwater

Because ground water can be perched on an impermeable layer, groundwater of the Cretaceous Aquifer was encountered even though the confining layer in the residual soil was not. From the beginning of the segment at -L- 274+00 to -L- 295+00, the roadway is in cut and the finished grade is close to the impermeable residual soil. Groundwater was measured at or above grade in most of the borings. It is likely that there will be some seeps in the road cuts here. From -L- 295+00 to -L- 326+00, water was measured at or near ground surface, though the roadway will be an embankment section. From -L- 326+00 to the end of the segment, there are significant cuts, and potentially fragile sand layers, but water was not measured in any of the borings, nor was the soil described as "wet".

Wetlands

Though there are no flowing or wet-weather streams crossing the alignment on this segment, wetland locations are plotted on the base map on plan sheets 16,17,19, 22, and 23. This part of the project is fairly high elevation, and is a local drainage divide.

Sincerely,

HDR ENGINEERING, INC.

Brian D. Keaney, P.E.
Project Manager



Attachments: Roadway Subsurface Investigation Inventory Plans
 Laboratory Test Results

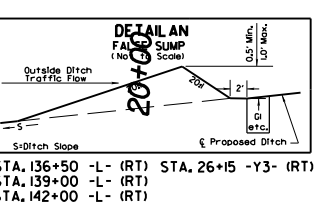
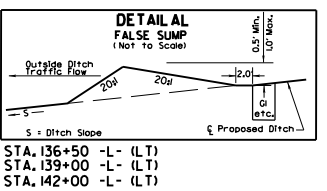
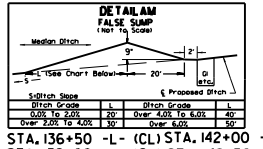
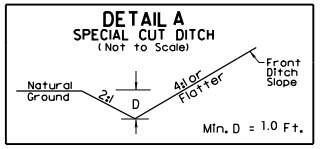
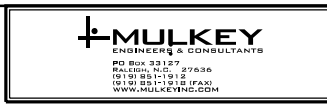


NC GRID
NAD 83

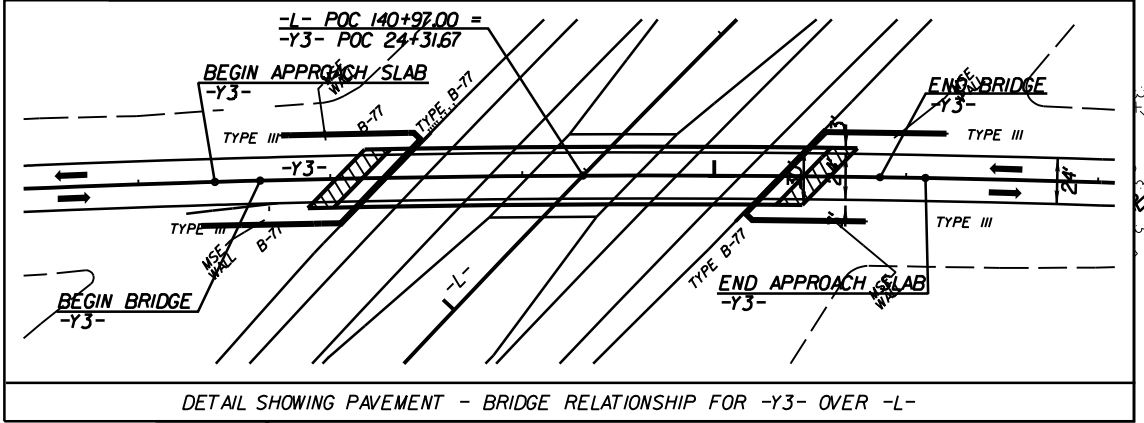
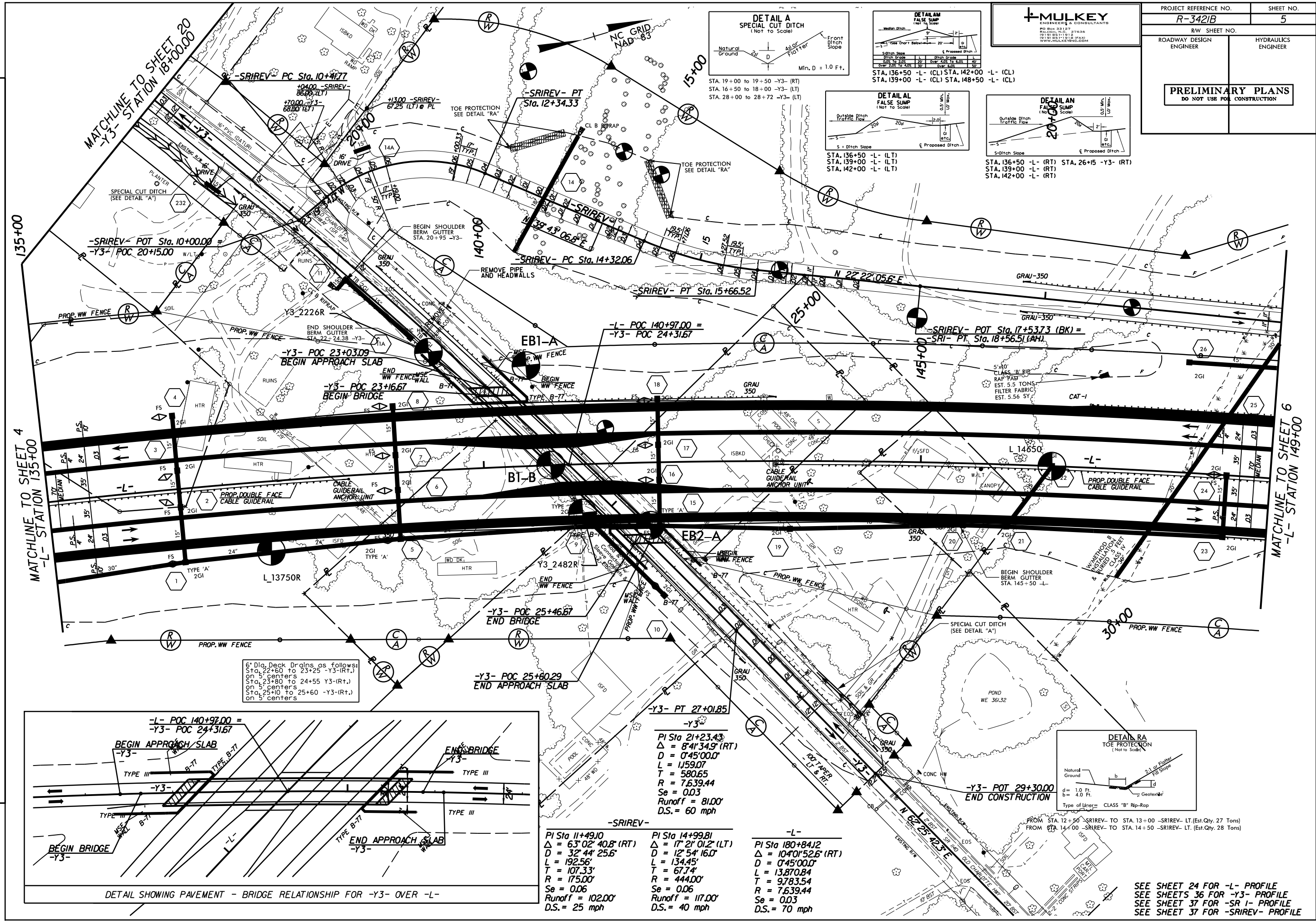
3/5/2005 PM 04:15
7/9/2005

-L-
 PI Sta 180+84.12
 = 104°01'52.6" (RT)
 D = 0°45'00.0"
 L = 13,870.84
 T = 9,783.54
 R = 7,639.44
 Se = 0.03
 D.S. = 70 mph

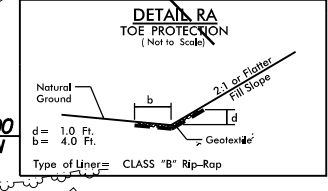
SEE SHEET 24 FOR -L- PROFILE



RIGHT OF WAY REVISION: JUNE 26, 2014 - REVISING THE PROPOSED RIGHT OF WAY TO AVOID TAKING THE DWELLING ON PARCEL 8 (CHARLES R. EZZELL) BY SHIFTING THE SERVICE ROAD CONNECTION APPROXIMATELY 80' EAST.
 RIGHT OF WAY REVISION: SEPT. 11, 2014 - ADDED ACCESS AND UTILITY EASEMENT ON PARCEL 1A; PROPERTY OWNER NAME CHANGED ON PARCELS 2 AND 6.

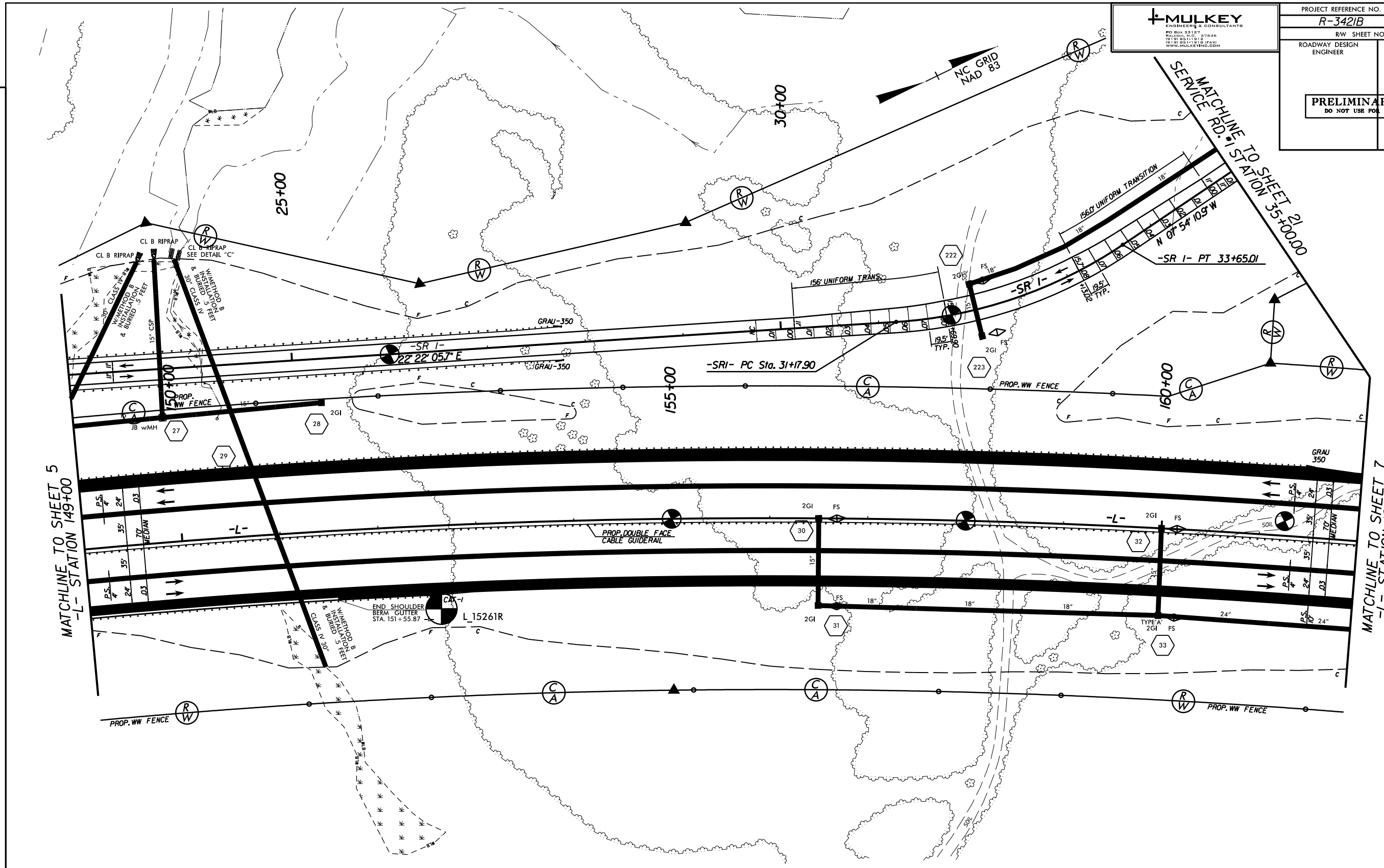


<p>-L- POC 140+97.00 = -Y3- POC 24+31.67</p> <p>BEGIN APPROACH SLAB -Y3-</p> <p>BEGIN BRIDGE -Y3-</p> <p>END BRIDGE -Y3-</p> <p>END APPROACH SLAB -Y3-</p>	<p>-Y3- PT 27+01.85</p> <p>PI Sta 21+23.43 $\Delta = 84' 34.9" (RT)$ $D = 0'45'00.0"$ $L = 1159.07$ $T = 580.65$ $R = 7.639.44$ $Se = 0.03$ $Runoff = 81.00'$ $D.S. = 60 \text{ mph}$</p>	<p>-SRIREV-</p> <p>PI Sta 11+49.10 $\Delta = 63' 02' 40.8" (RT)$ $D = 32' 44' 25.6"$ $L = 192.56'$ $T = 107.33'$ $R = 175.00'$ $Se = 0.06$ $Runoff = 102.00'$ $D.S. = 25 \text{ mph}$</p>	<p>-L-</p> <p>PI Sta 14+99.81 $\Delta = 17' 21' 01.2" (LT)$ $D = 12' 54' 16.0"$ $L = 134.45'$ $T = 67.74'$ $R = 444.00'$ $Se = 0.06$ $Runoff = 117.00'$ $D.S. = 40 \text{ mph}$</p>	<p>-L-</p> <p>PI Sta 180+84.12 $\Delta = 104'01'52.6" (RT)$ $D = 0'45'00.0"$ $L = 13,870.84$ $T = 9,783.54$ $R = 7,639.44$ $Se = 0.03$ $D.S. = 70 \text{ mph}$</p>
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SEE SHEET 24 FOR -L- PROFILE
 SEE SHEETS 36 FOR -Y3- PROFILE
 SEE SHEET 37 FOR -SR- PROFILE
 SEE SHEET 37 FOR -SRIREV- PROFILE

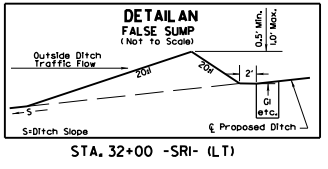
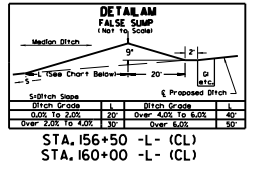
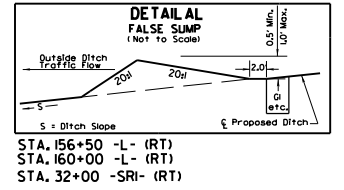
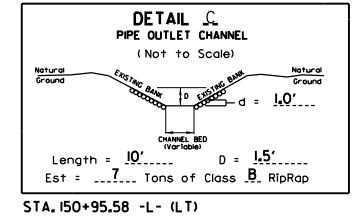
RIGHT OF WAY REVISION: SEPT. 11, 2014 - PROPERTY OWNER NAME CHANGED ON PARCEL 6.



MATCHLINE TO SHEET 5
-L- STATION 149+00

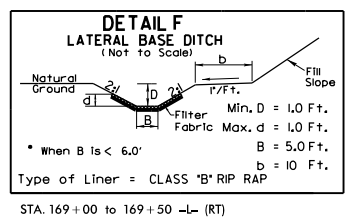
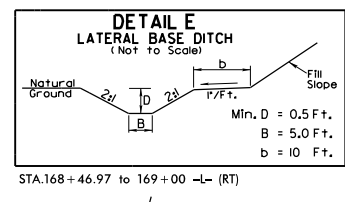
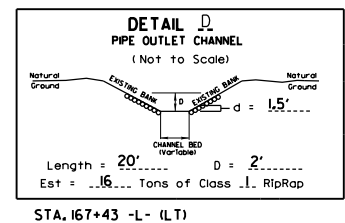
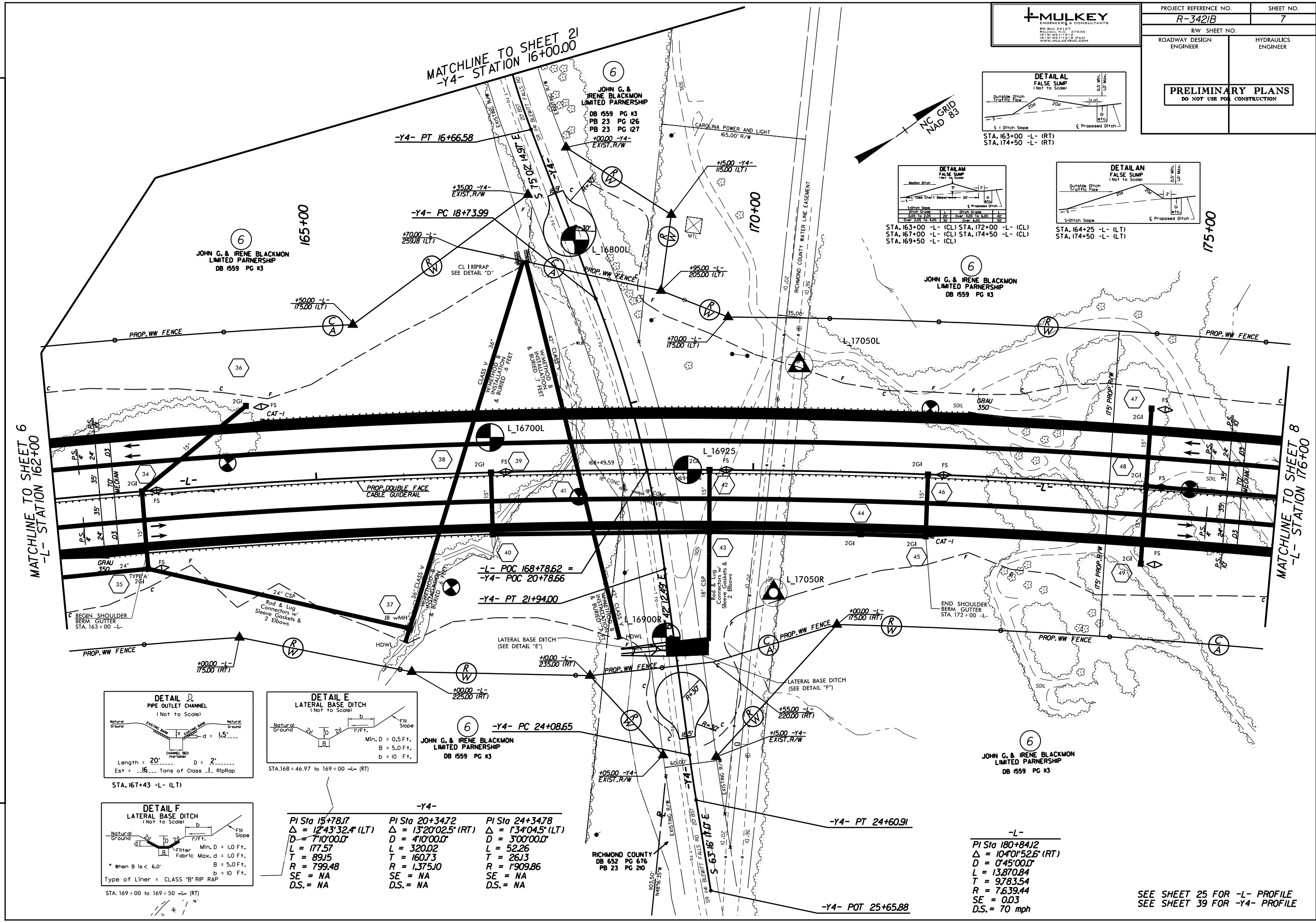
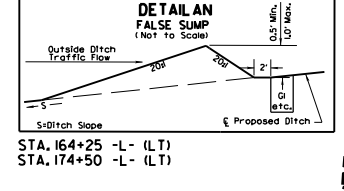
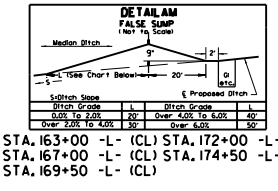
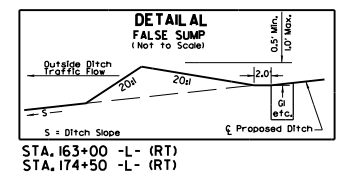
MATCHLINE TO SHEET 7
-L- STATION 162+00

-L-	-SR I-
PI Sta 180+84.12	PI Sta 32+44.41
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D = 0'45"00.0"	D = 12'15"00.0"
L = 13,870.84	L = 247.11
T = 9,783.54	T = 126.51
R = 7,639.44	R = 467.72
Se = 0.03	Se = 0.08
D.S. = 70 mph	D.S. = 40 mph



SEE SHEET 25 FOR -L- PROFILE
SEE SHEET 37 & 38 FOR -SR I- PROFILE

7/9/2005 3:57:07 PM #115



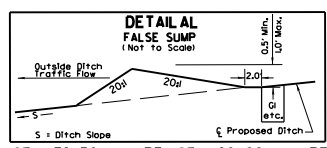
-Y4-		
PI Sta 15+78.17	PI Sta 20+34.72	PI Sta 24+34.78
$\Delta = 12'43.32.4$ (LT)	$\Delta = 13'20'02.5$ (RT)	$\Delta = 1'34'04.5$ (LT)
D = 7'10'00.0	D = 4'10'00.0	D = 3'00'00.0
L = 177.57	L = 320.02	L = 52.26
T = 89.15	T = 160.73	T = 26.13
R = 799.48	R = 1,375.10	R = 1,909.86
SE = NA	SE = NA	SE = NA
D.S. = NA	D.S. = NA	D.S. = NA

-L-	
PI Sta 180+84.12	$\Delta = 10'40'52.6$ (RT)
D = 0'45'00.0	L = 13,870.84
T = 9,783.54	R = 7,639.44
SE = 0.03	D.S. = 70 mph

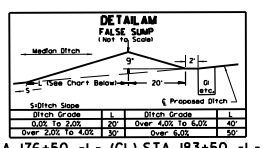
RIGHT OF WAY REVISION: SEPT. 11, 2014 - PROPERTY OWNER NAME CHANGED ON PARCEL 6.

4/9/2005 PM 04:15

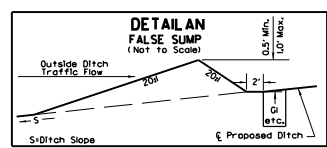
SEE SHEET 25 FOR -L- PROFILE
SEE SHEET 39 FOR -Y4- PROFILE



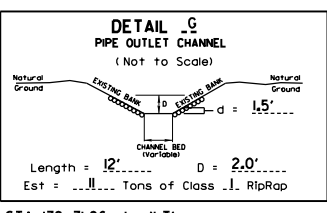
STA. 176+50 -L- (RT) STA. 190+00 -L- (RT)
STA. 183+50 -L- (RT)
STA. 187+00 -L- (RT)



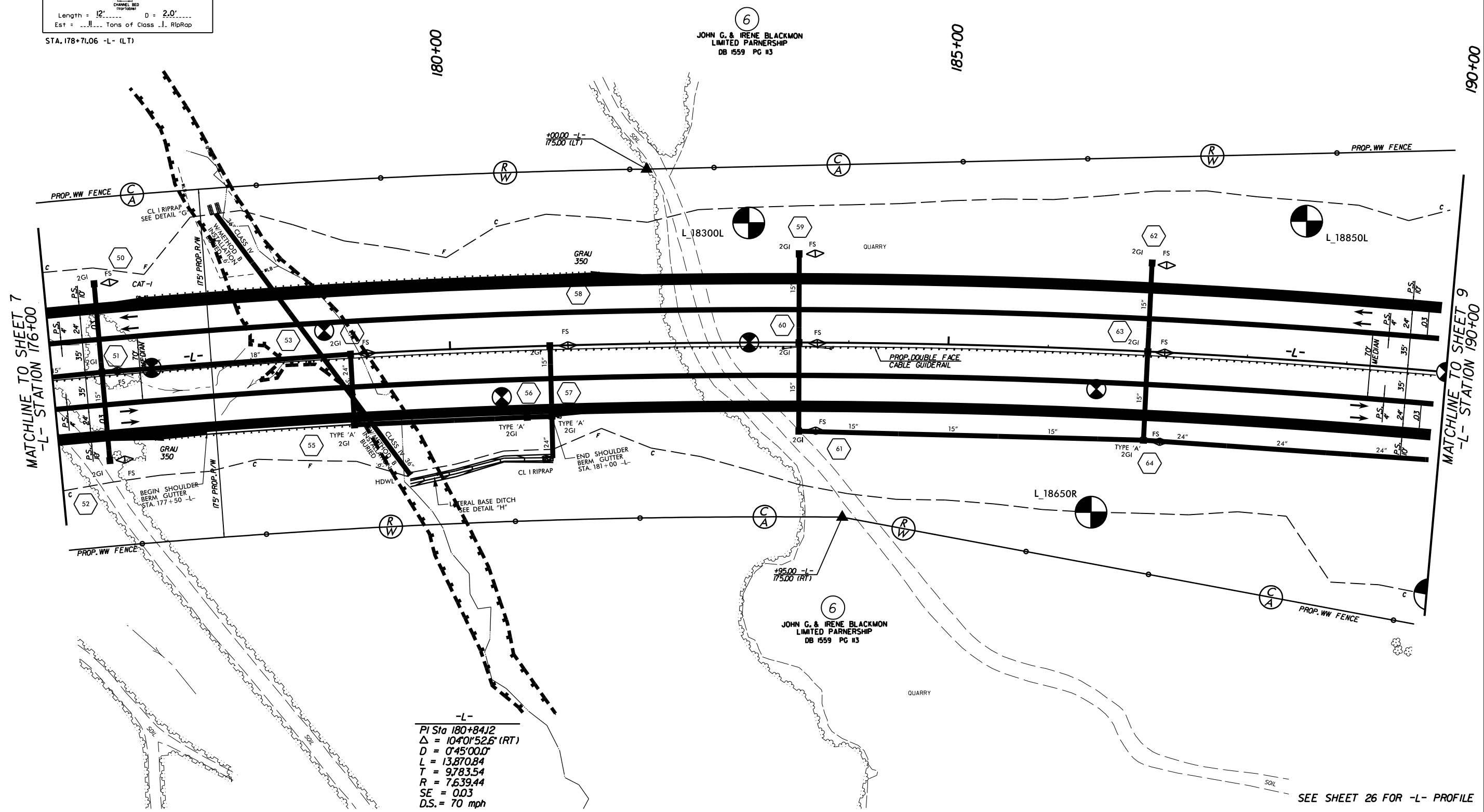
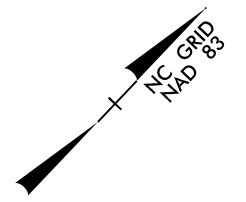
STA. 176+50 -L- (CL) STA. 183+50 -L- (CL)
STA. 179+00 -L- (CL) STA. 187+00 -L- (CL)
STA. 181+00 -L- (CL) STA. 190+00 -L- (CL)



STA. 176+50 -L- (LT) STA. 190+00 -L- (LT)
STA. 183+50 -L- (LT)
STA. 187+00 -L- (LT)



STA. 178+71.06 -L- (LT)

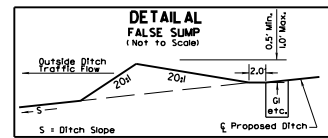


RIGHT OF WAY REVISION: SEPT. 11, 2014 - PROPERTY OWNER NAME CHANGED ON PARCEL 6.

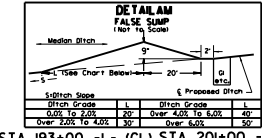
7/9/2005 4:05:33PM \$FILES

-L-
PI Sta 180+84.2
 $\Delta = 10401^{\circ}52.6' (RT)$
 $D = 0^{\circ}45'00.0''$
 $L = 13,870.84$
 $T = 9,783.54$
 $R = 7,639.44$
 $SE = 0.03$
 $DS. = 70 \text{ mph}$

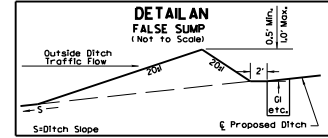
SEE SHEET 26 FOR -L- PROFILE



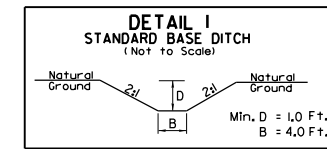
STA. 193+00 -L- (RT) STA. 201+00 -L- (RT)
STA. 196+00 -L- (RT) STA. 203+00 -L- (RT)
STA. 198+50 -L- (RT)



STA. 193+00 -L- (CL) STA. 201+00 -L- (CL)
STA. 196+00 -L- (CL) STA. 203+00 -L- (CL)
STA. 198+96.64 -L- (CL)



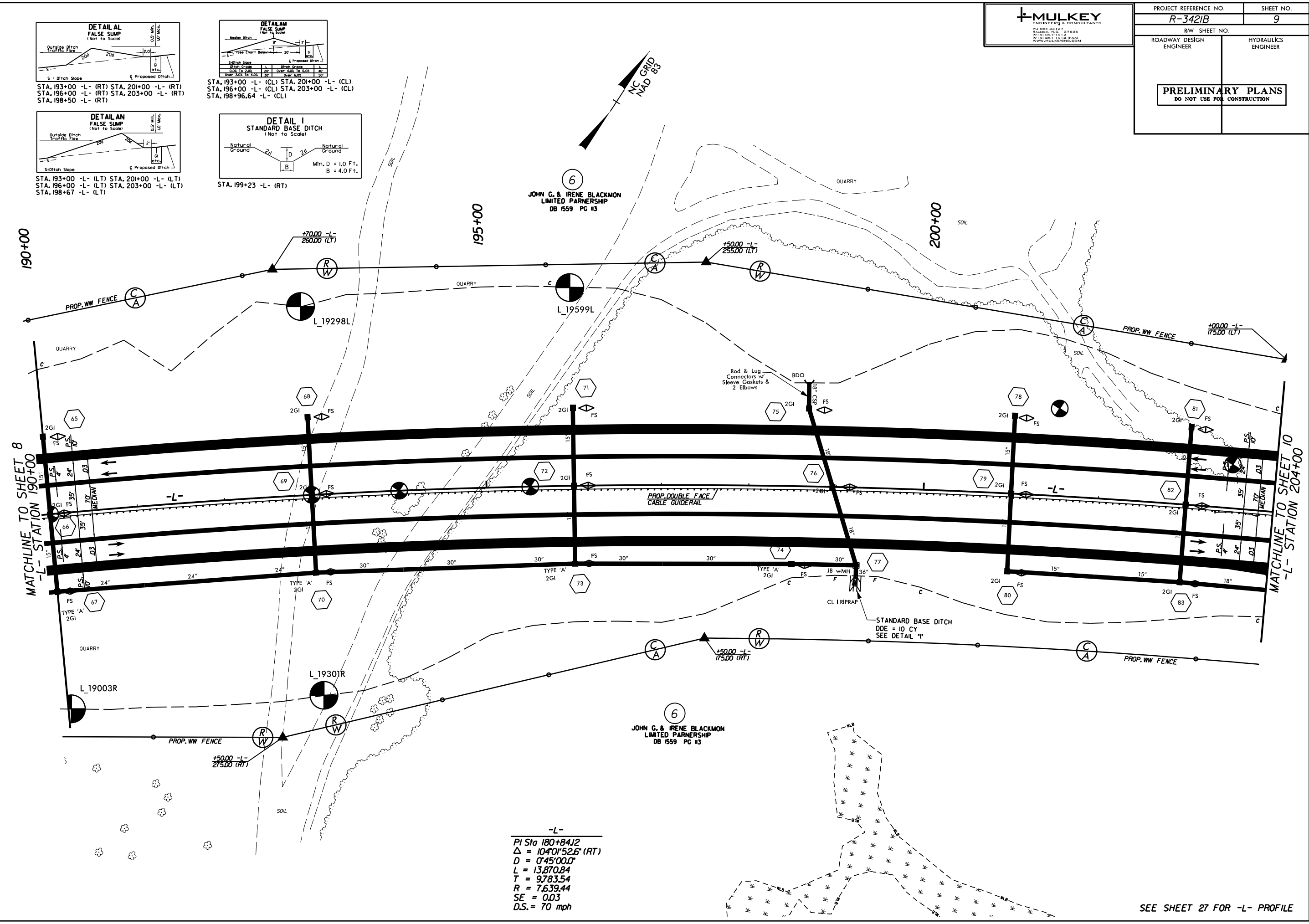
STA. 193+00 -L- (LT) STA. 201+00 -L- (LT)
STA. 196+00 -L- (LT) STA. 203+00 -L- (LT)
STA. 198+67 -L- (LT)



STA. 199+23 -L- (RT)
Min. D = 1.0 Ft.
B = 4.0 Ft.

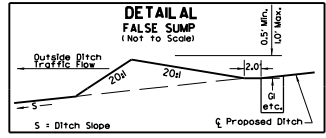
RIGHT OF WAY REVISION: SEPT. 11, 2014 - PROPERTY OWNER NAME CHANGED ON PARCEL 6.

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7/9/2015

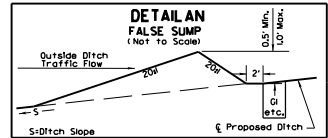


-L-
PI Sta 180+84.2
Δ = 104°01'52.6" (RT)
D = 0'45"00.0"
L = 13.870.84
T = 9783.54
R = 7.639.44
SE = 0.03
D.S. = 70 mph

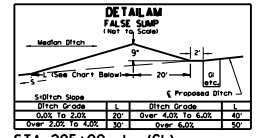
SEE SHEET 27 FOR -L- PROFILE



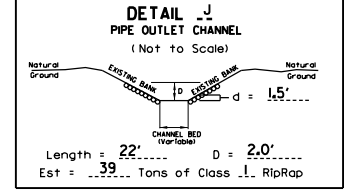
STA. 205+00 -L- (RT)
STA. 211+50 -L- (RT)



STA. 205+00-L- (LT)
STA. 211+50 -L- (LT)

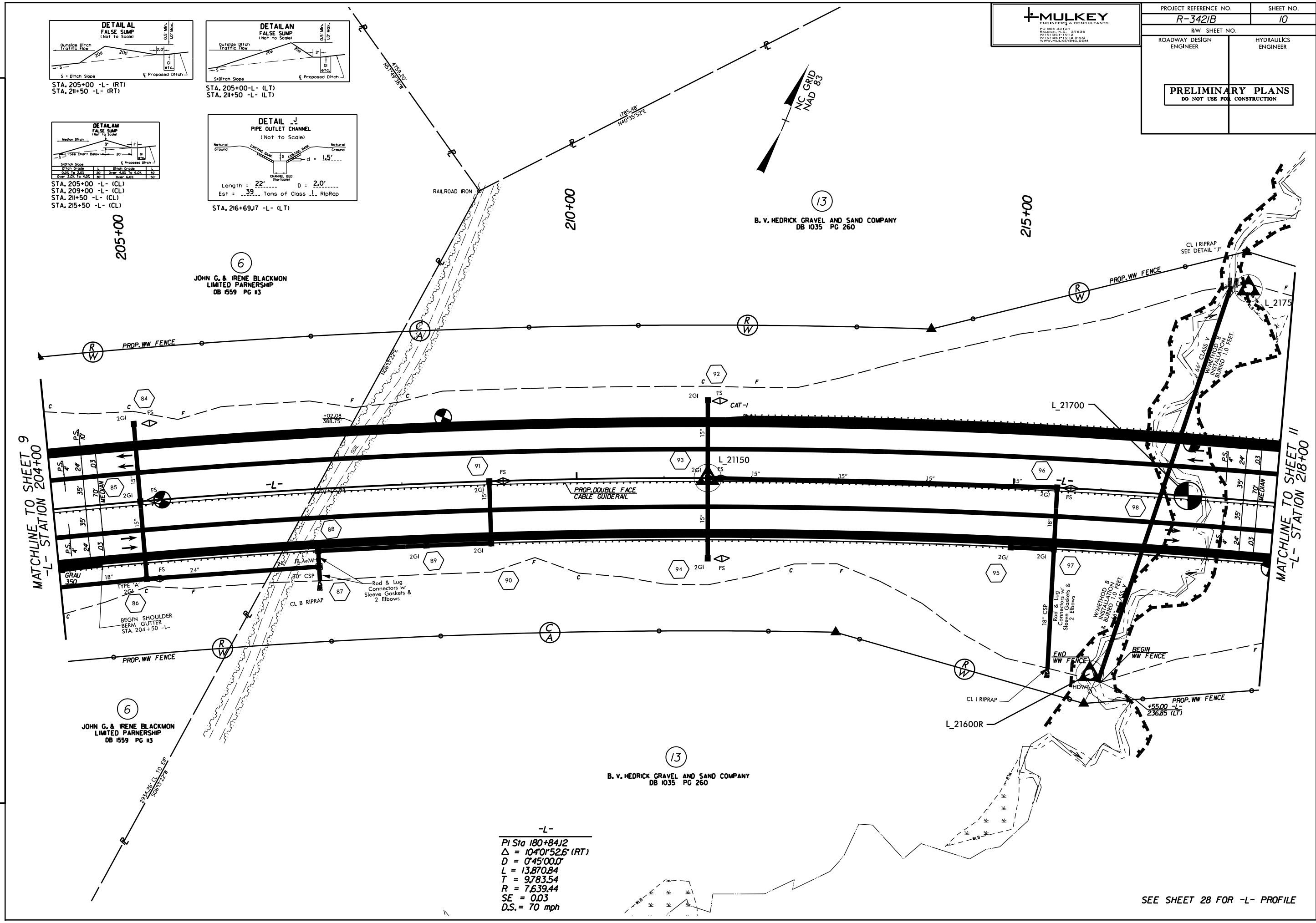


STA. 205+00 -L- (CL)
STA. 209+00 -L- (CL)
STA. 211+50 -L- (CL)
STA. 215+50 -L- (CL)



Length = 22'
Est = 39 Tons of Class 1 RipRap
STA. 216+69.17 -L- (LT)

RIGHT OF WAY REVISION: SEPT. 11, 2014 - CHANGED PARCEL NUMBER 12 TO PARCEL 13; PROPERTY OWNER NAME CHANGED ON PARCEL 13.



MATCHLINE TO SHEET 9
-L- STATION 204+00

MATCHLINE TO SHEET 11
-L- STATION 218+00

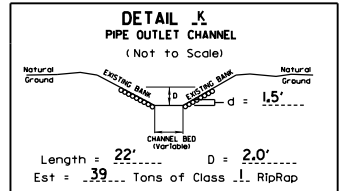
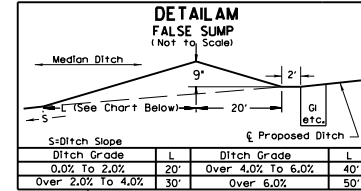
6
JOHN G. & IRENE BLACKMON
LIMITED PARTNERSHIP
DB 1559 PG 13

6
JOHN G. & IRENE BLACKMON
LIMITED PARTNERSHIP
DB 1559 PG 13

13
B. V. HEDRICK GRAVEL AND SAND COMPANY
DB 1035 PG 260

-L-
PI Sta 180+84.12
 $\Delta = 104^{\circ}01'52.6''$ (RT)
 $D = 0^{\circ}45'00.0''$
 $L = 13,870.84$
 $T = 9,783.54$
 $R = 7,639.44$
 $SE = 0.03$
 $D.S. = 70$ mph

SEE SHEET 28 FOR -L- PROFILE

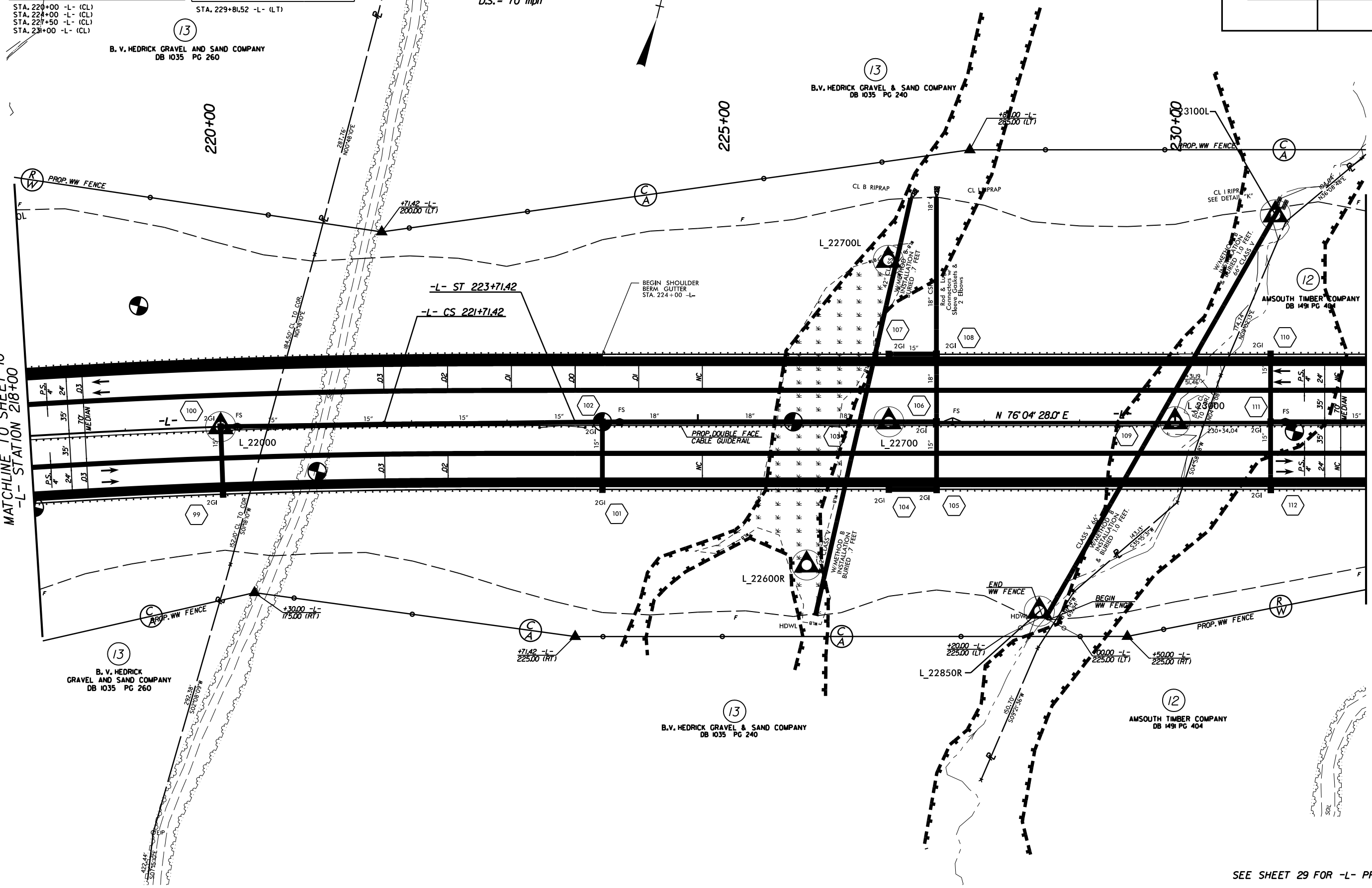


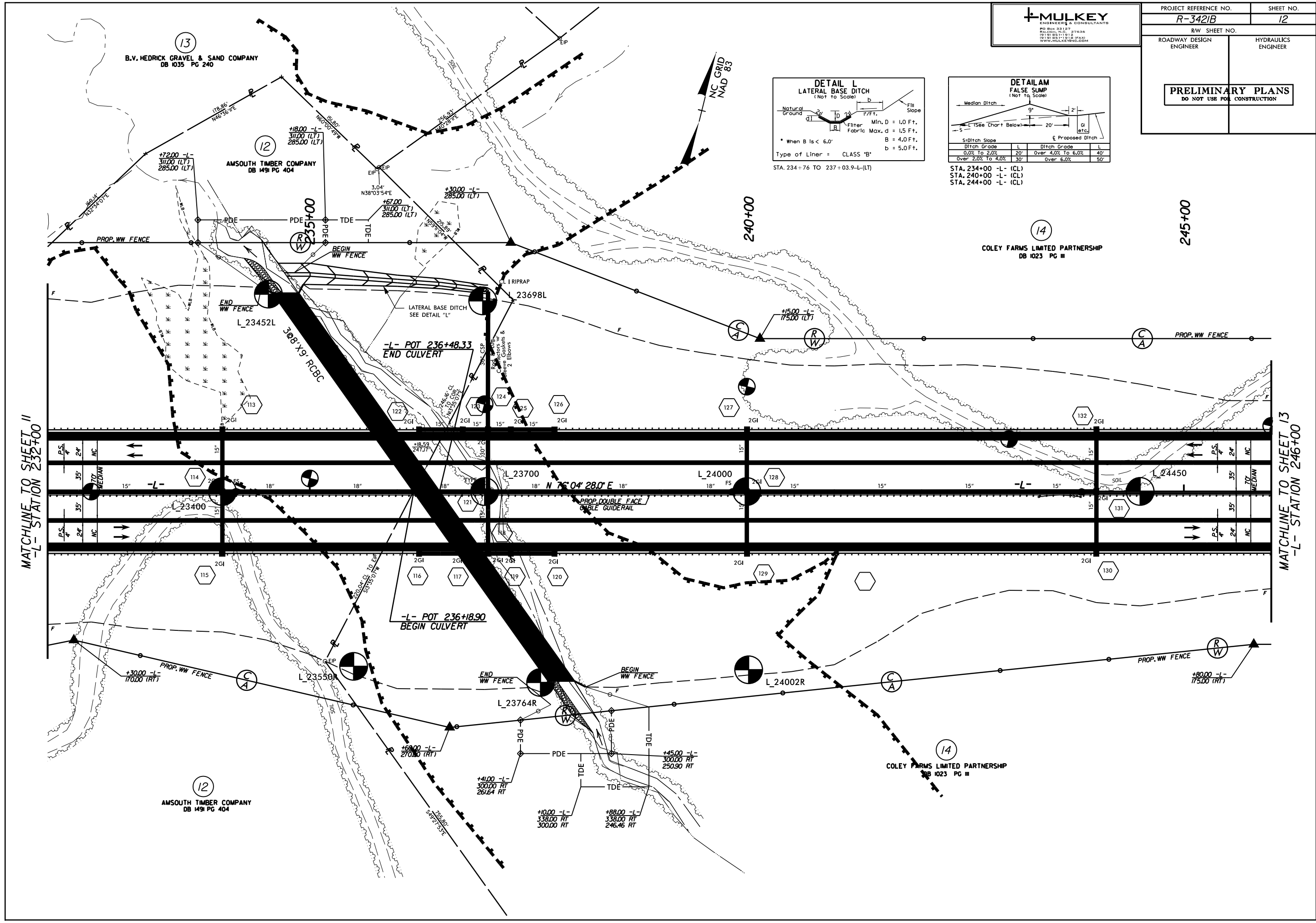
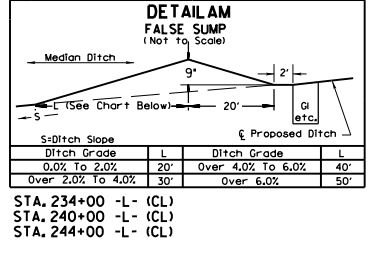
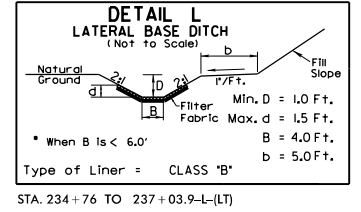
-L-
PI Sta 180+84.2 **PIs Sta 222+38.09**
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 $D = 045'00.0"$ $L_s = 200.00$
 $L = 13,870.84$ $ST = 66.67$
 $T = 9783.54$ $LT = 133.33$
 $R = 7,639.44$
 $SE = 0.03$
 $D.S. = 70 \text{ mph}$

RIGHT OF WAY REVISION: SEPT. 11, 2014 - CHANGED PARCEL NUMBER 12 TO PARCEL 13; PROPERTY OWNER NAMES CHANGED ON PARCEL 12 AND PARCEL 13.

MATCHLINE TO SHEET 10
-L- STATION 218+00

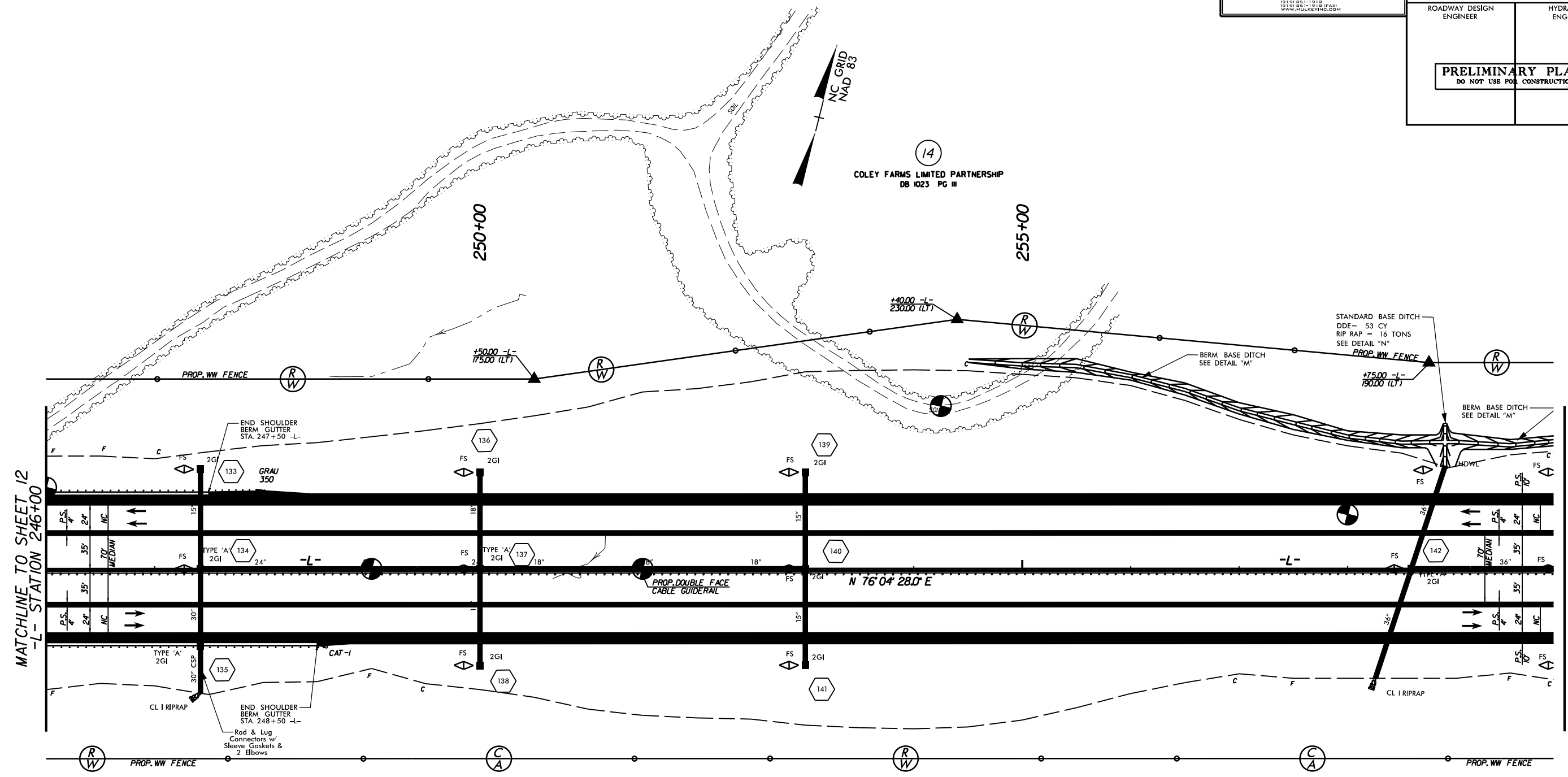
MATCHLINE TO SHEET 12
-L- STATION 232+00





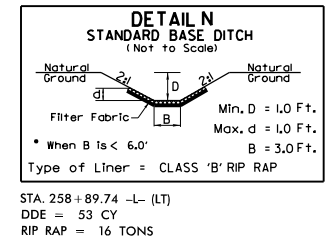
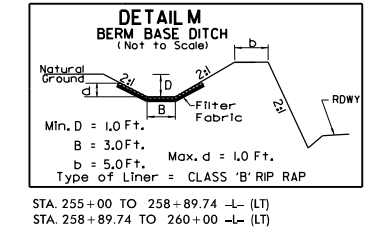
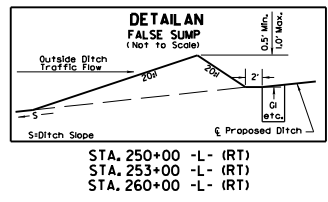
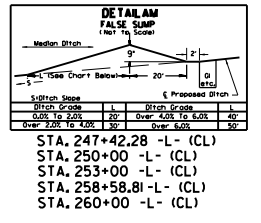
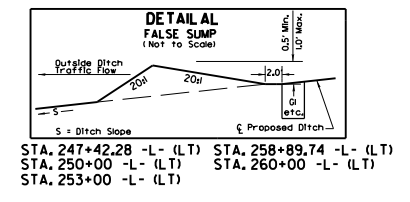
MATCHLINE TO SHEET 11
-L- STATION 232+00

MATCHLINE TO SHEET 13
-L- STATION 246+00



MATCHLINE TO SHEET 12
-L- STATION 246+00

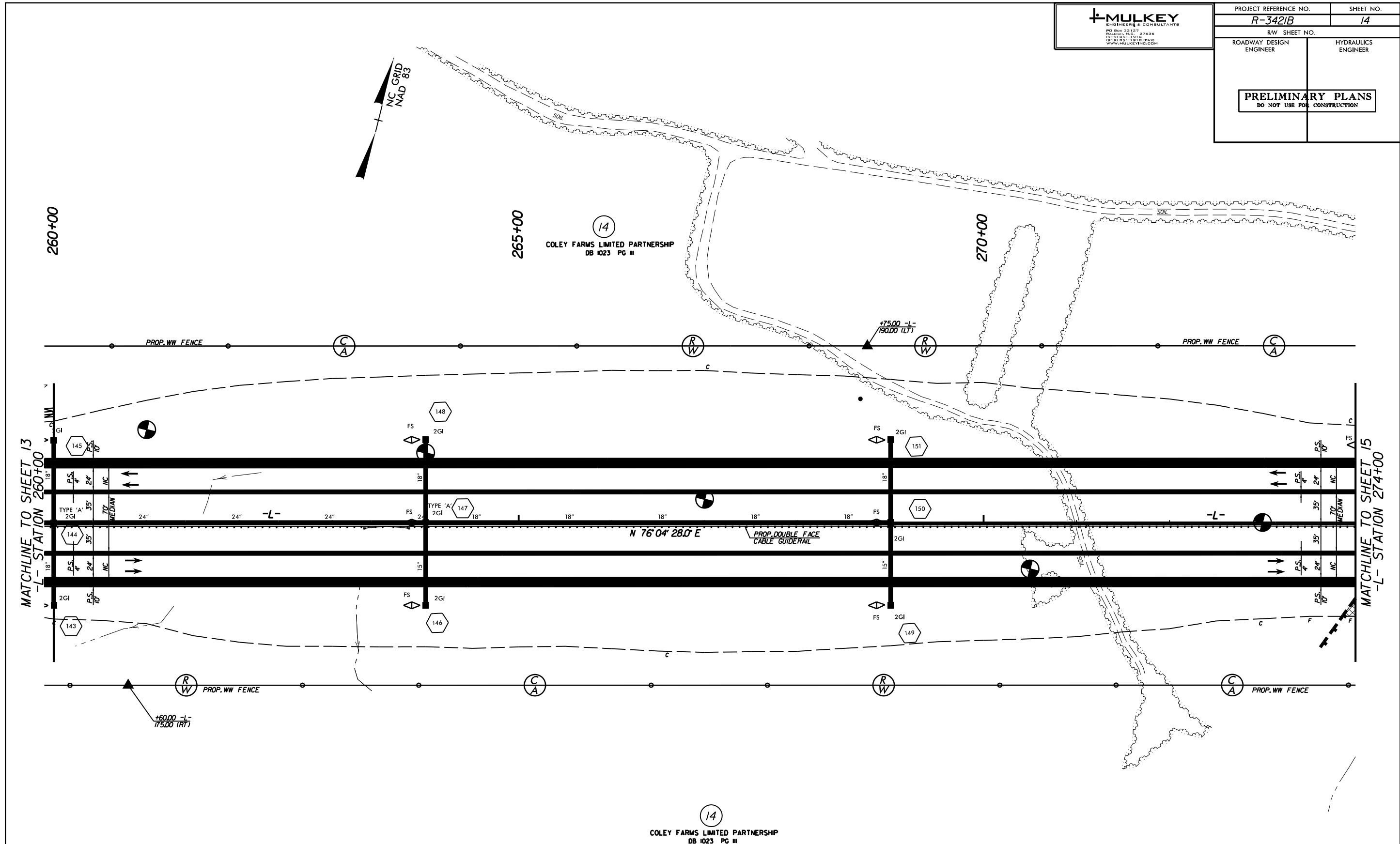
MATCHLINE TO SHEET 14
-L- STATION 260+00



(14)
COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG III

40957 PW 05LES
7/9/2005

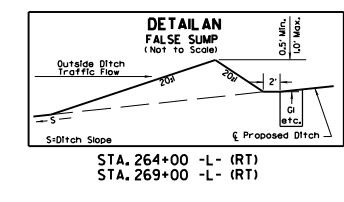
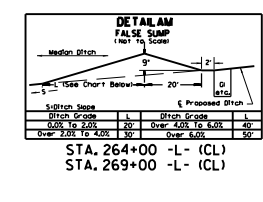
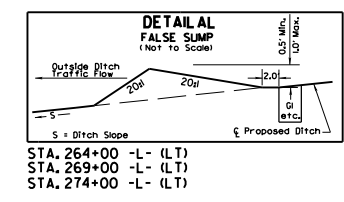
SEE SHEET 31 FOR -L- PROFILE



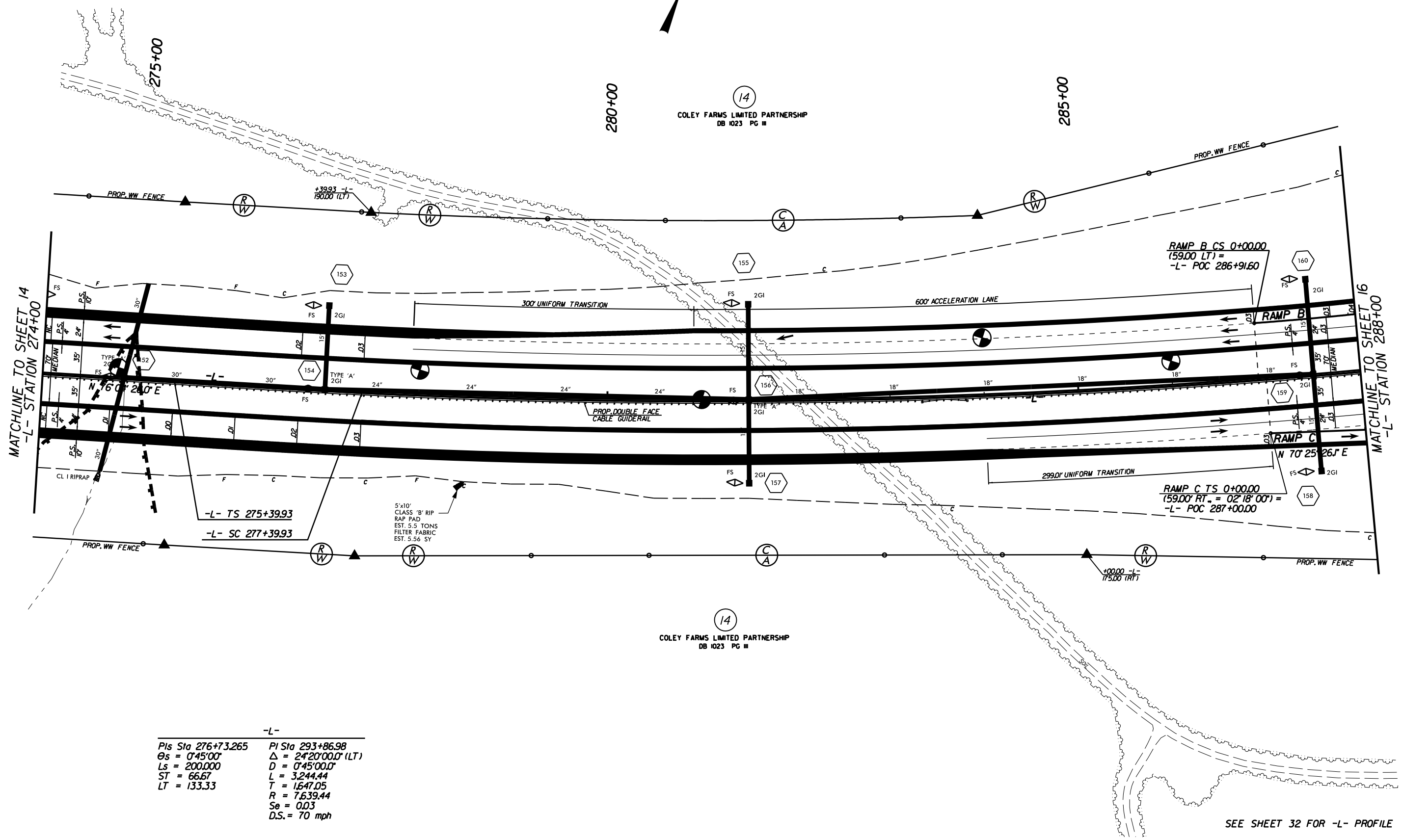
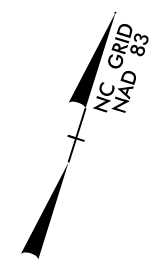
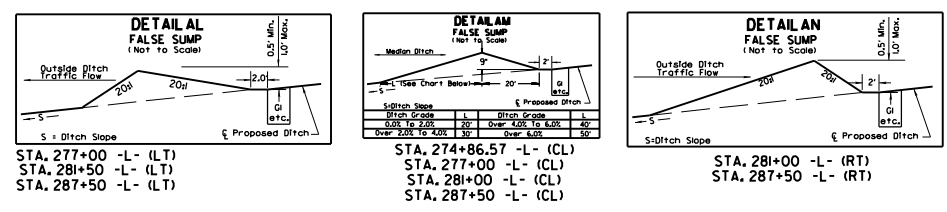
MATCHLINE TO SHEET 13
-L- STATION 260+00

MATCHLINE TO SHEET 15
-L- STATION 274+00

(14)
COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG III



SEE SHEET 32 FOR -L- PROFILE

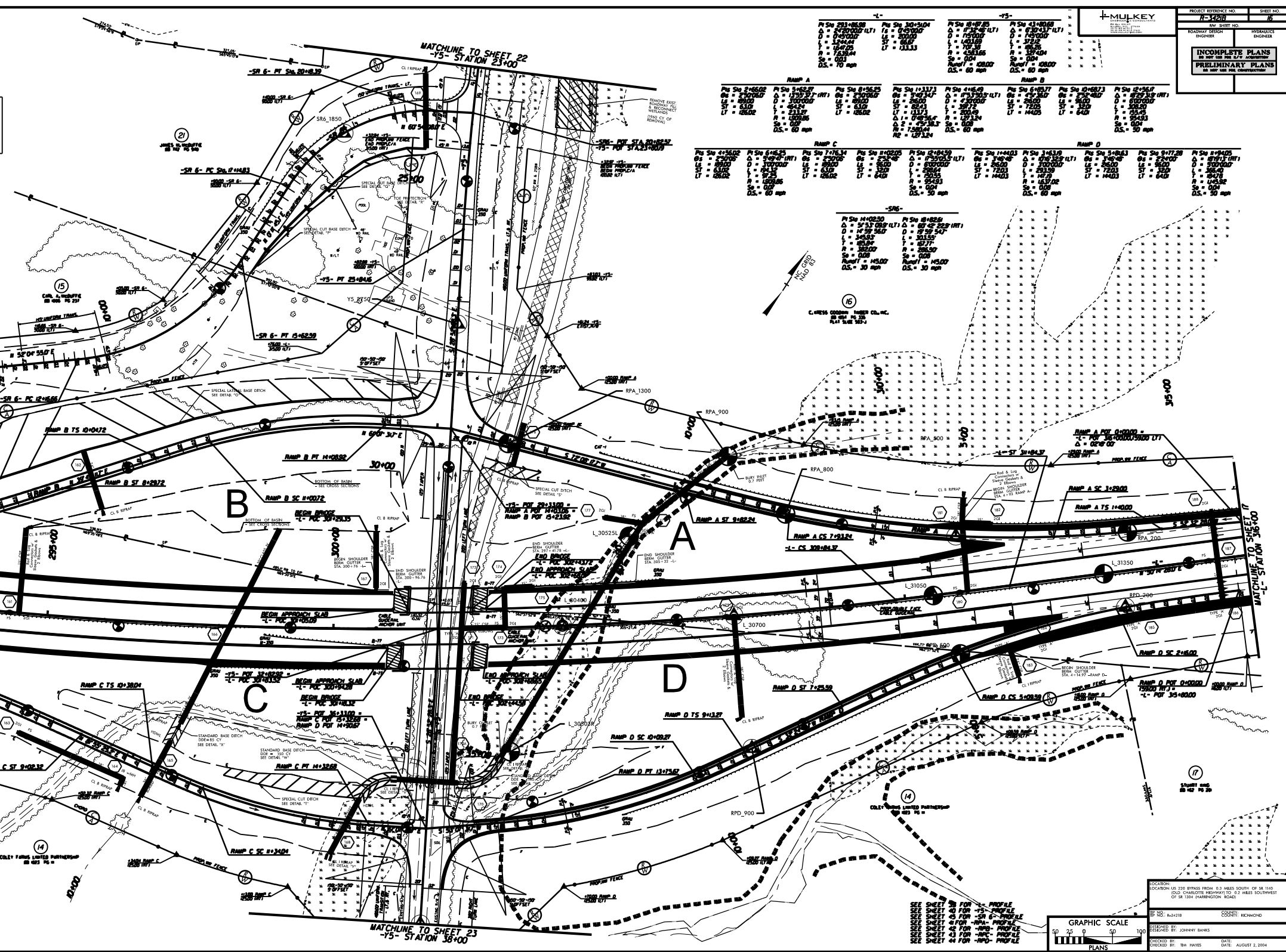
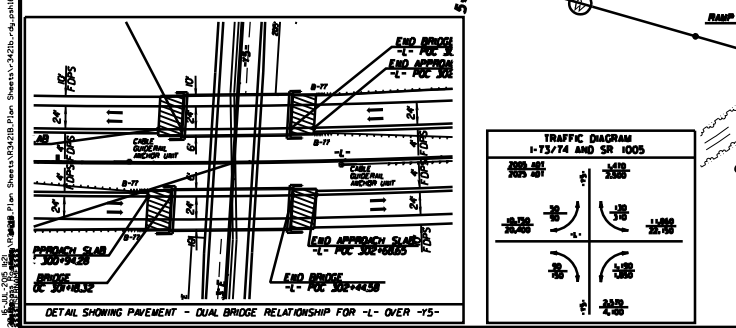
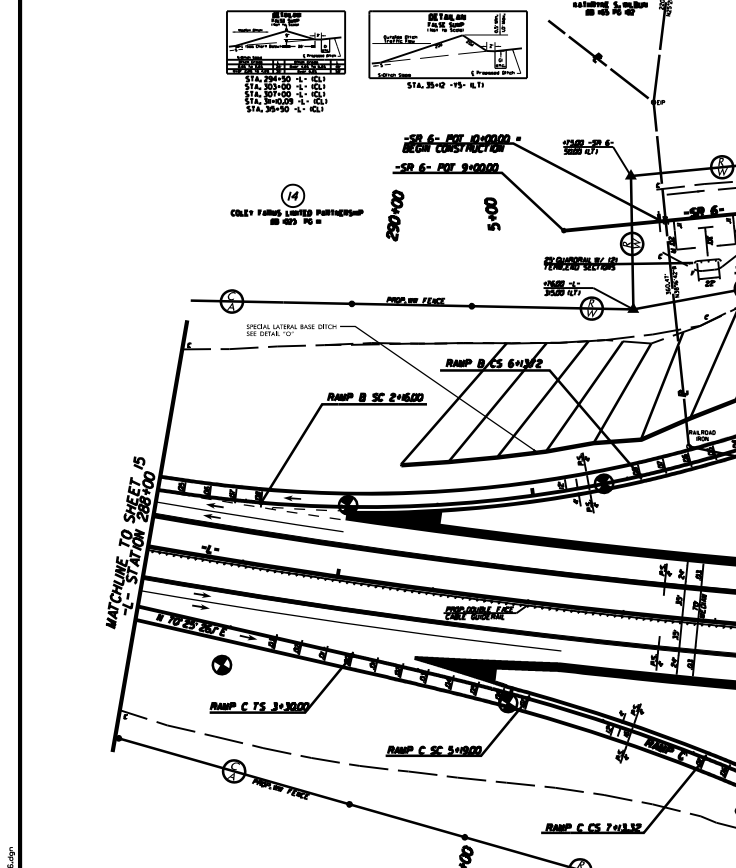
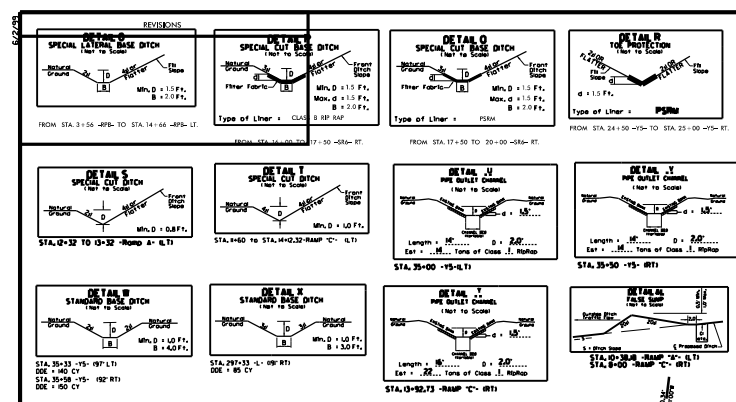


MATCHLINE TO SHEET 14
-L- STATION 274+00

MATCHLINE TO SHEET 16
-L- STATION 288+00

-L-	
PI Sta 276+73.265	PI Sta 293+86.98
Os = 0°45'00"	Δ = 24°20'00.0" (LT)
Ls = 200.000	D = 0°45'00.0"
ST = 66.67	L = 3,244.44
LT = 133.33	T = 1,647.05
	R = 7,639.44
	Se = 0.03
	D.S. = 70 mph

SEE SHEET 32 FOR -L- PROFILE

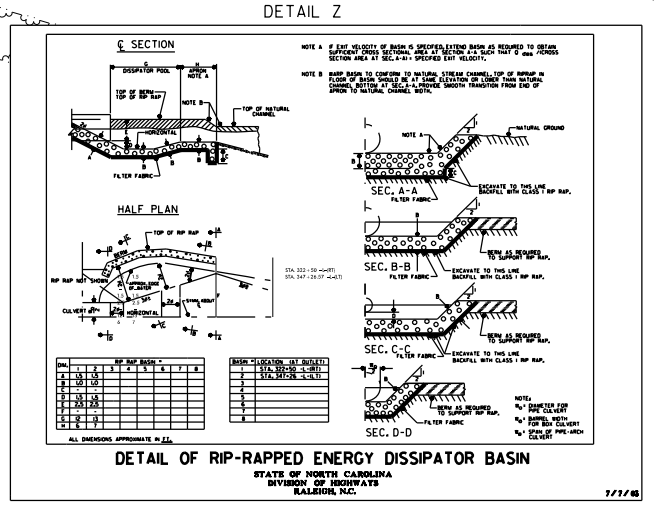
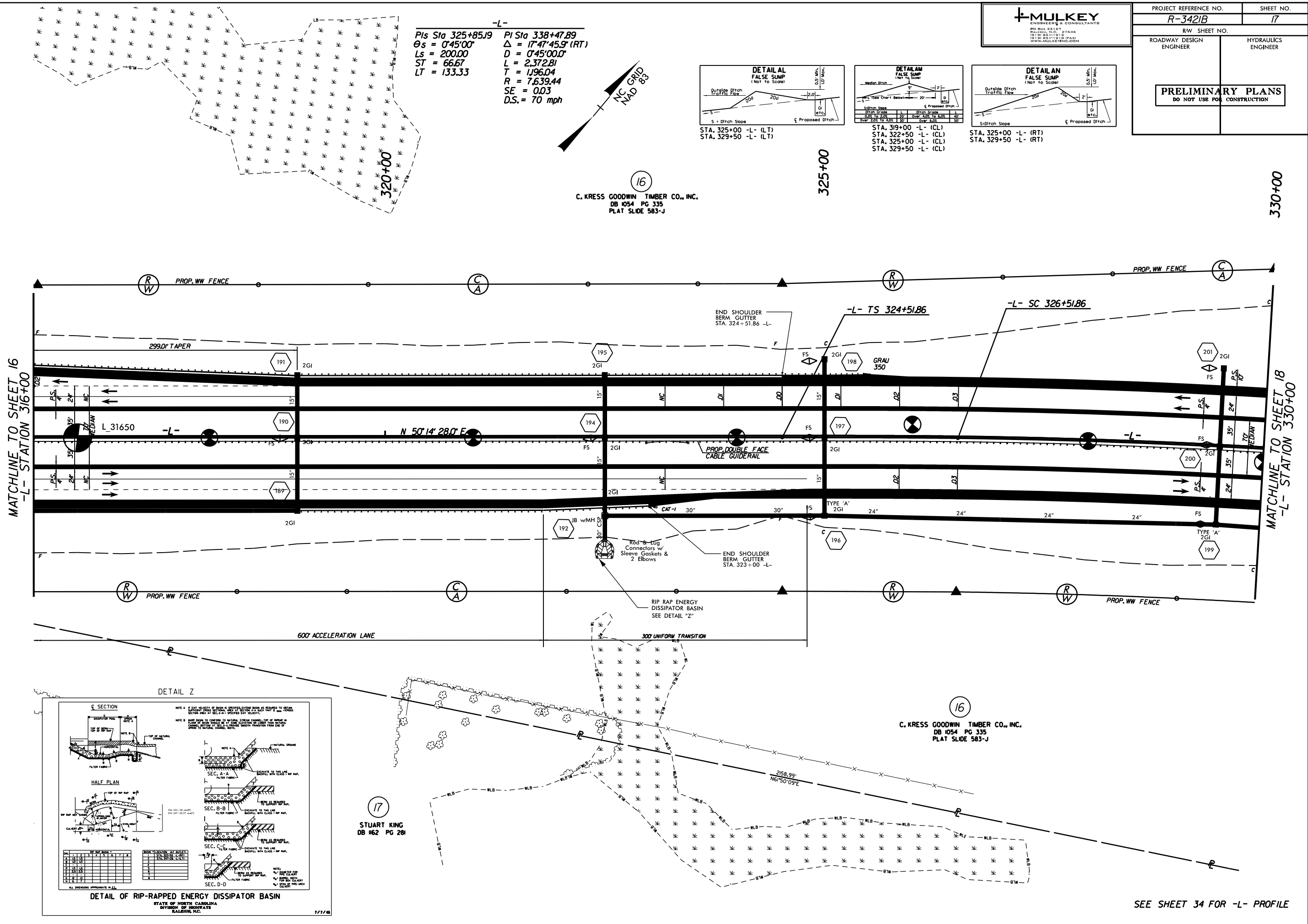
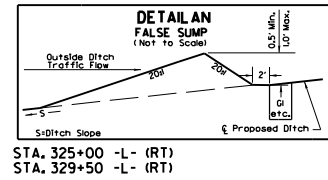
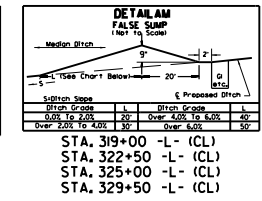
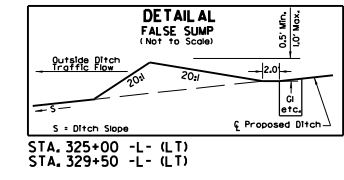
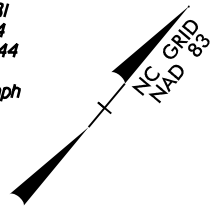


RAMP A		RAMP B		RAMP C		RAMP D	
Sta	23+00.00	Sta	23+00.00	Sta	23+00.00	Sta	23+00.00
End	23+00.00	End	23+00.00	End	23+00.00	End	23+00.00
Δ	0.00	Δ	0.00	Δ	0.00	Δ	0.00
L	0.00	L	0.00	L	0.00	L	0.00
LT	0.00	LT	0.00	LT	0.00	LT	0.00
OS	60 mph	OS	60 mph	OS	60 mph	OS	60 mph

MULKEY
PROJECT REFERENCE NO. **15-1278**
SHEET NO. **15**
ROADWAY DESIGN ENGINEER
HYDRAULIC ENGINEER
INCOMPLETE PLANS
DO NOT USE FOR CONSTRUCTION
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

LOCATION: I-75 BRIDGE FROM 0.3 MILES SOUTH OF SR 1005
OLD CHARLOTTE HIGHWAY TO 0.2 MILES SOUTHWEST
OF SR 1005 SUBSTATION ROAD
SHEET NO. 15 OF 15
DATE: AUGUST 2, 2004
CHECKED BY: TIM HAYES

-L-
 PIs Sta 325+85.19 PI Sta 338+47.89
 $\Theta_s = 0'45'00''$ $\Delta = 17'47'45.9''$ (RT)
 $L_s = 200.00$ $D = 0'45'00.0''$
 $ST = 66.67$ $L = 2,372.81$
 $LT = 133.33$ $T = 1,196.04$
 $R = 7,639.44$
 $SE = 0.03$
 $D.S. = 70$ mph



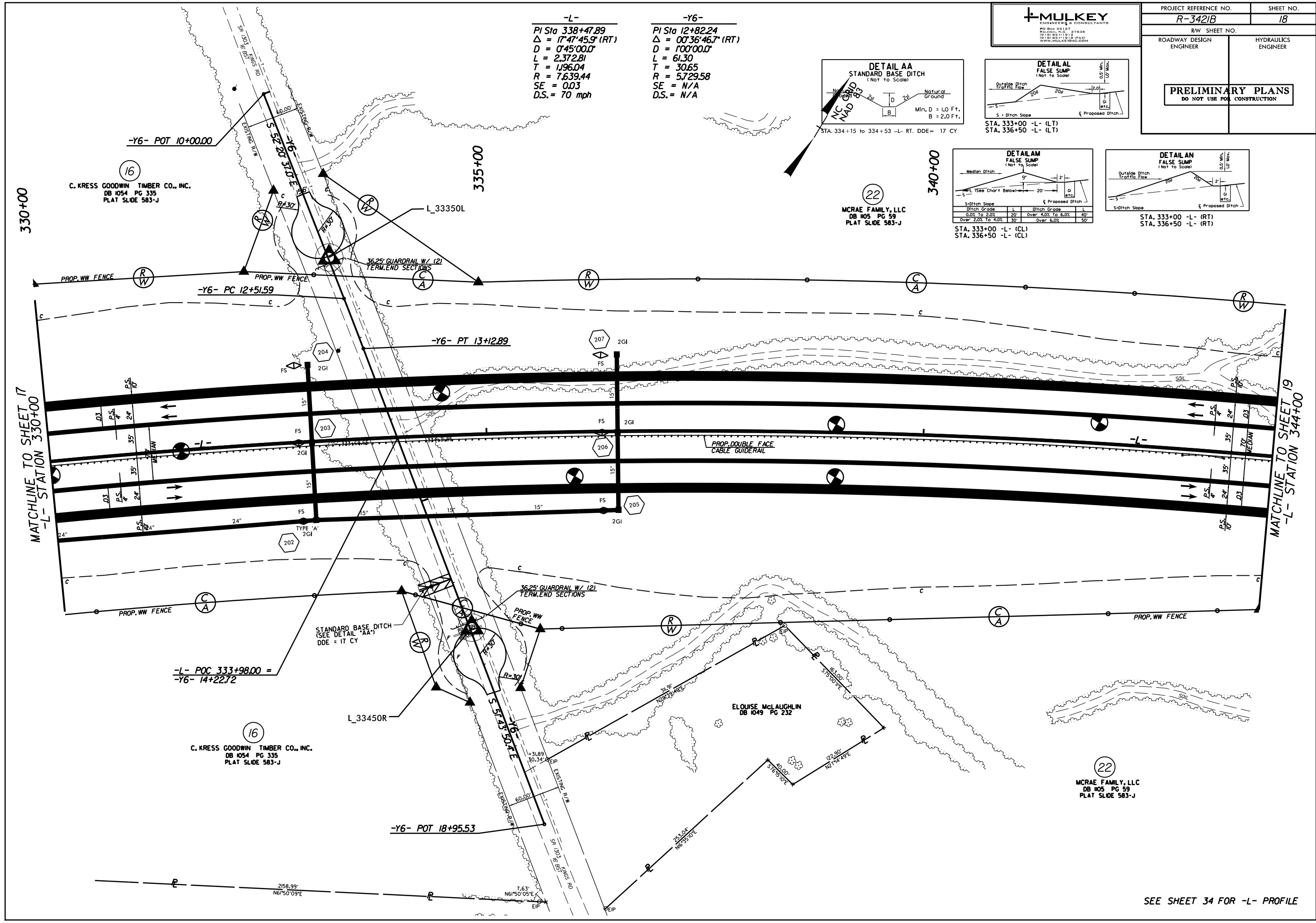
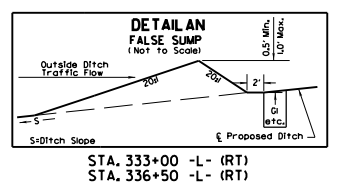
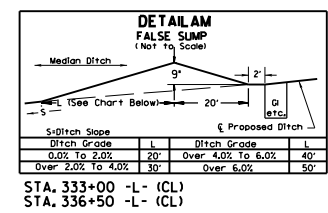
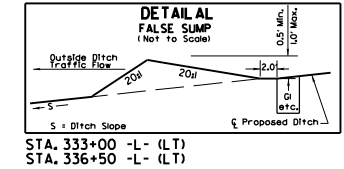
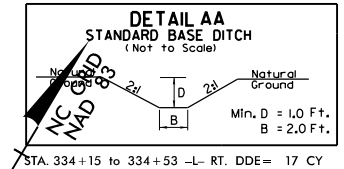
17
STUART KING
 DB #62 PG 281

16
C. KRESS GOODWIN TIMBER CO., INC.
 DB 1054 PG 335
 PLAT SLIDE 583-J

SEE SHEET 34 FOR -L- PROFILE

-L-
PI Sta 338+47.89
 $\Delta = 17'47.45.9" (RT)$
 $D = 0'45.00.0"$
 $L = 2.372.81$
 $T = 1.196.04$
 $R = 7.639.44$
 $SE = 0.03$
 $D.S. = 70 \text{ mph}$

-Y6-
PI Sta 12+82.24
 $\Delta = 00'36.46.7" (RT)$
 $D = 1'00.00.0"$
 $L = 61.30$
 $T = 30.65$
 $R = 5,729.58$
 $SE = N/A$
 $D.S. = N/A$

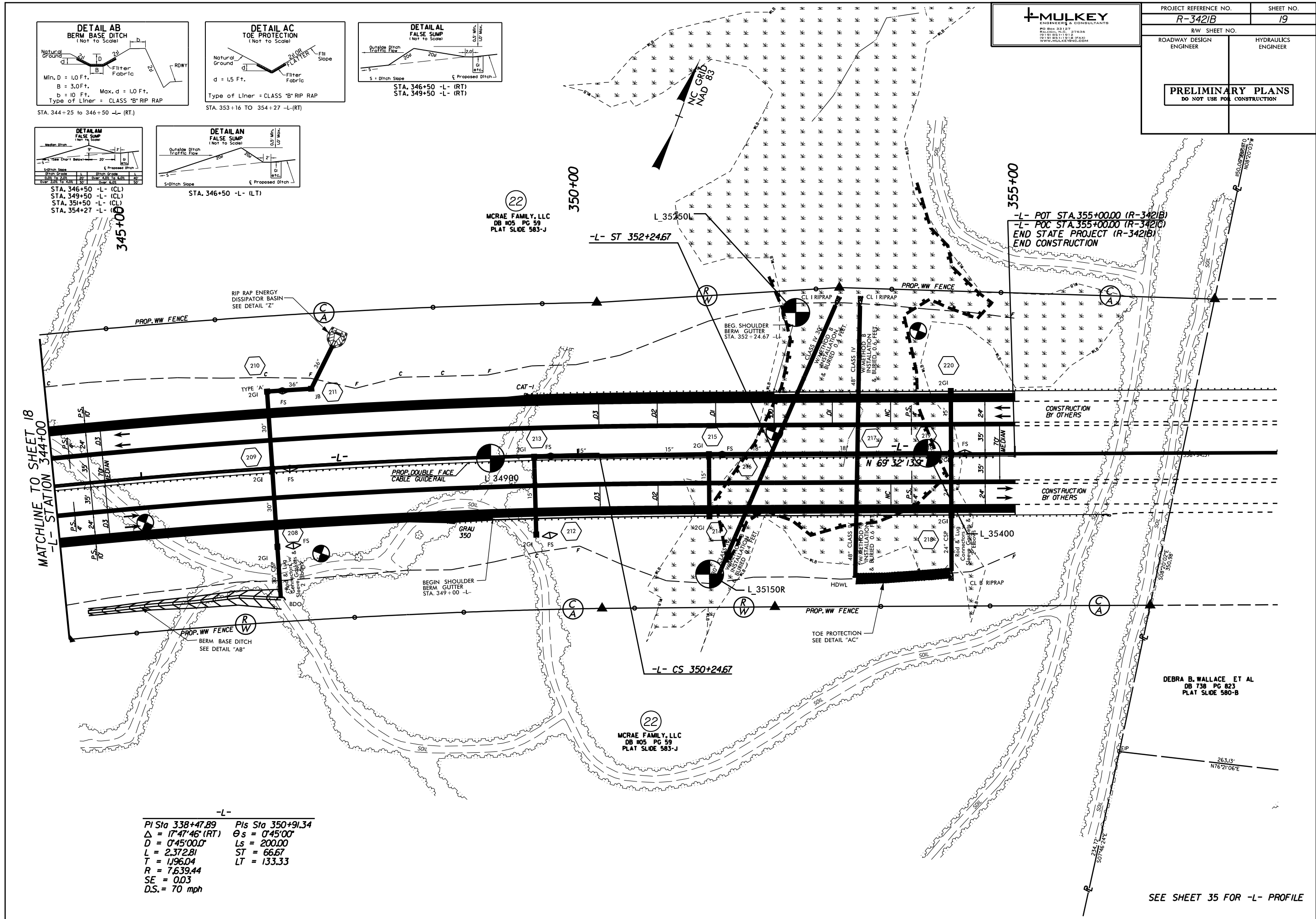
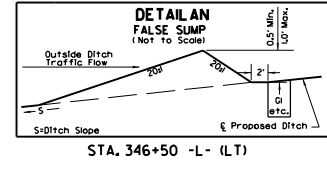
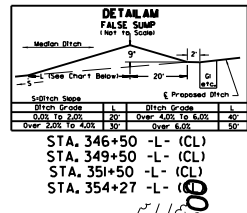
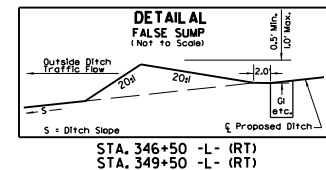
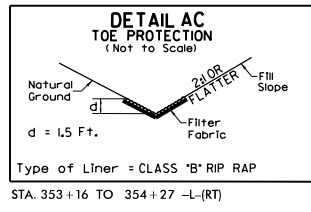
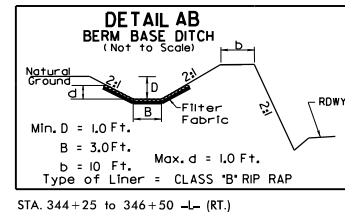


16
C. KRESS GOODWIN TIMBER CO., INC.
DB 1054 PG 335
PLAT SLIDE 583-J

22
MCRAE FAMILY, LLC
DB 105 PG 59
PLAT SLIDE 583-J

16
C. KRESS GOODWIN TIMBER CO., INC.
DB 1054 PG 335
PLAT SLIDE 583-J

22
MCRAE FAMILY, LLC
DB 105 PG 59
PLAT SLIDE 583-J

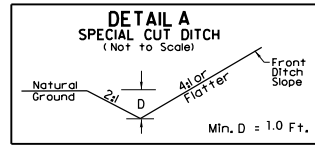


-L-

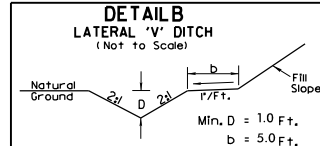
PI Sta 338+47.89	PIs Sta 350+91.34
$\Delta = 174^\circ 46' (RT)$	$\Theta s = 0^\circ 45' 00''$
$D = 0^\circ 45' 00.0''$	$Ls = 200.00$
$L = 2.37281$	$ST = 66.67$
$T = 1.09604$	$LT = 133.33$
$R = 7.639.44$	
$SE = 0.03$	
$D.S. = 70 \text{ mph}$	

RIGHT OF WAY REVISION: SEPT. 11, 2014 - CHANGED PARCEL NUMBER 7 TO PARCEL 6; PROPERTY OWNER NAME CHANGED ON PARCEL 6.

7/9/2005 4:34:47 PM 0FILES



STA. 19+00 to 19+50 -Y3- (RT)
 STA. 16+50 to 18+00 -Y3- (LT)
 STA. 28+00 to 28+72 -Y3- (LT)

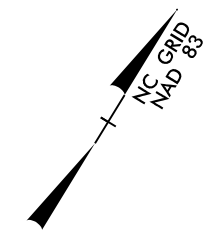


STA. 16+84.60 to 19+00 -Y3- (RT)

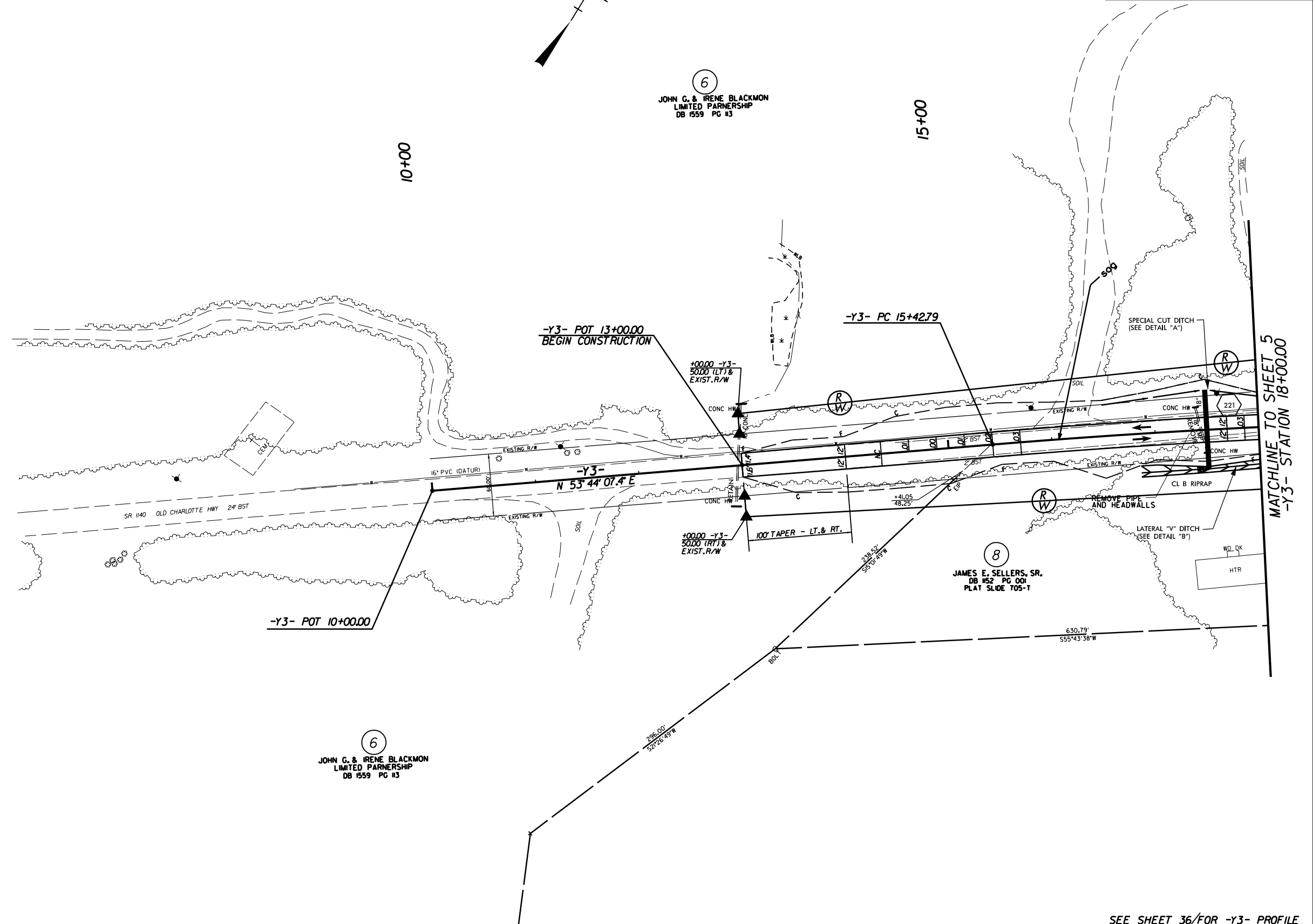
MULKEY
ENGINEERING & CONSULTANTS
PO Box 32127
Raleigh, N.C. 27636
(919) 851-9118
WWW.MULKEYINC.COM

PROJECT REFERENCE NO. R-3421B		SHEET NO. 20	
R/W SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			

-Y3-
 PI Sta 21+23.43
 $\Delta = 841'34.9" (RT)$
 $D = 0'45'00.0"$
 $L = 1159.07$
 $T = 580.65$
 $R = 7.639.44$
 $Se = 0.03$
 Runoff = 81.00'
 D.S. = 60 mph



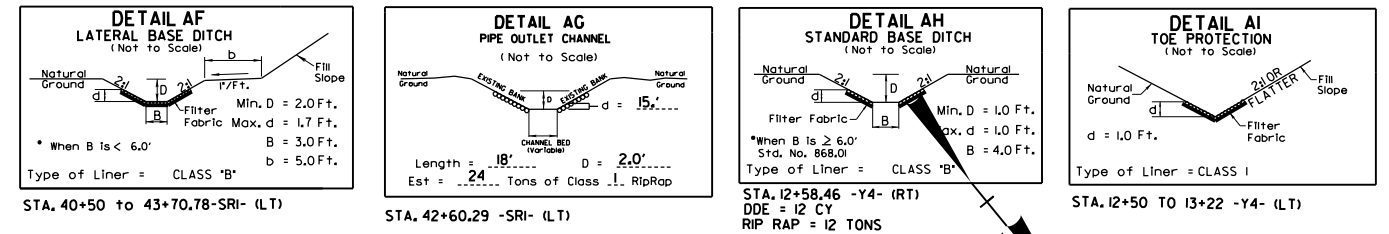
6
 JOHN G. & IRENE BLACKMON
 LIMITED PARTNERSHIP
 DB 1559 PG 13



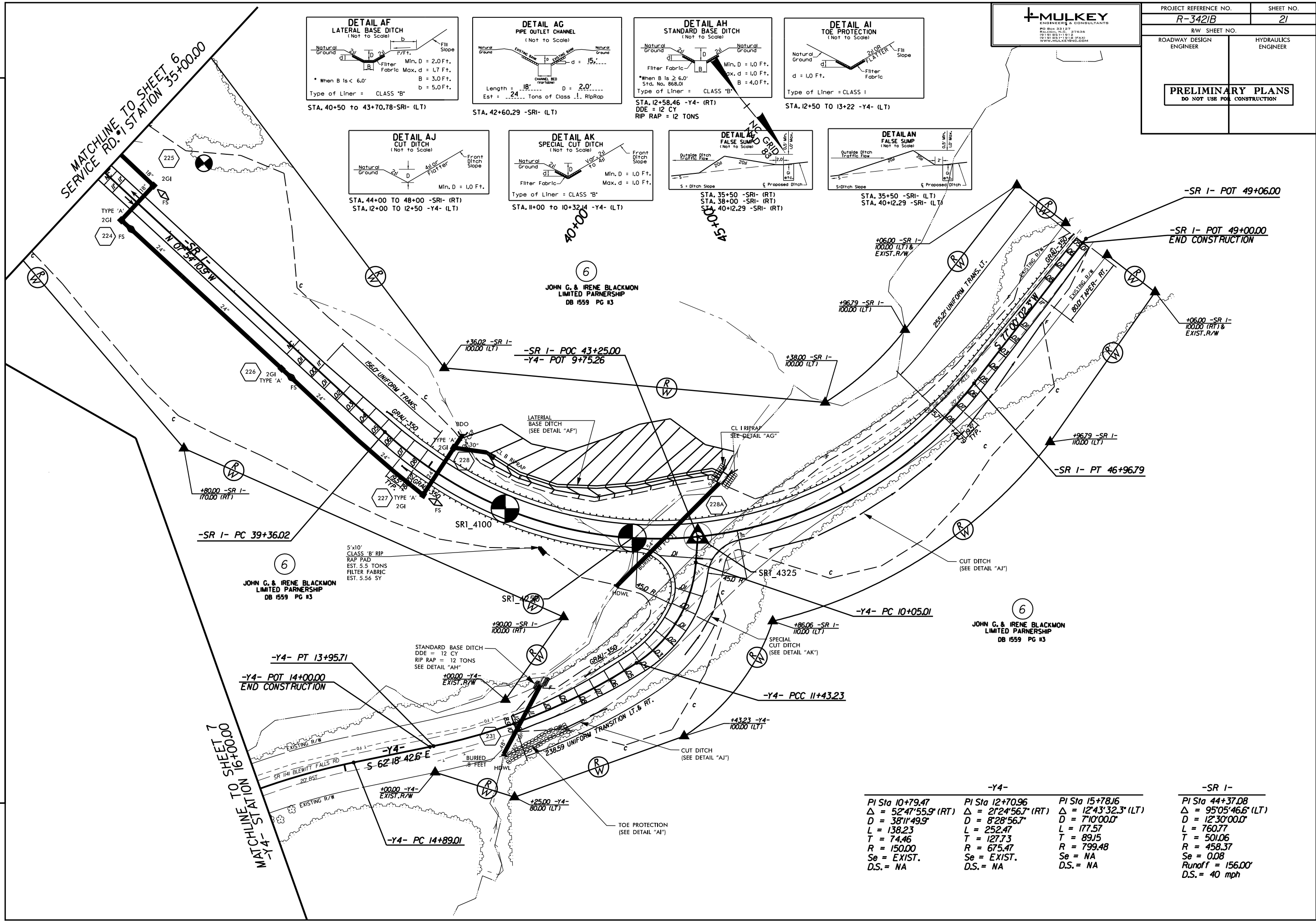
6
 JOHN G. & IRENE BLACKMON
 LIMITED PARTNERSHIP
 DB 1559 PG 13

SEE SHEET 36/FOR -Y3- PROFILE

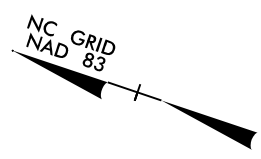
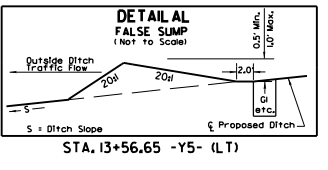
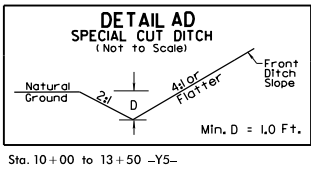
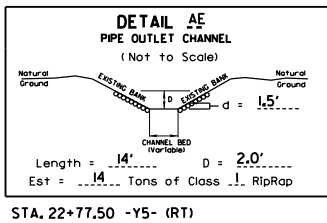
MATCHLINE TO SHEET 5
 -Y3- STATION 18+00.00



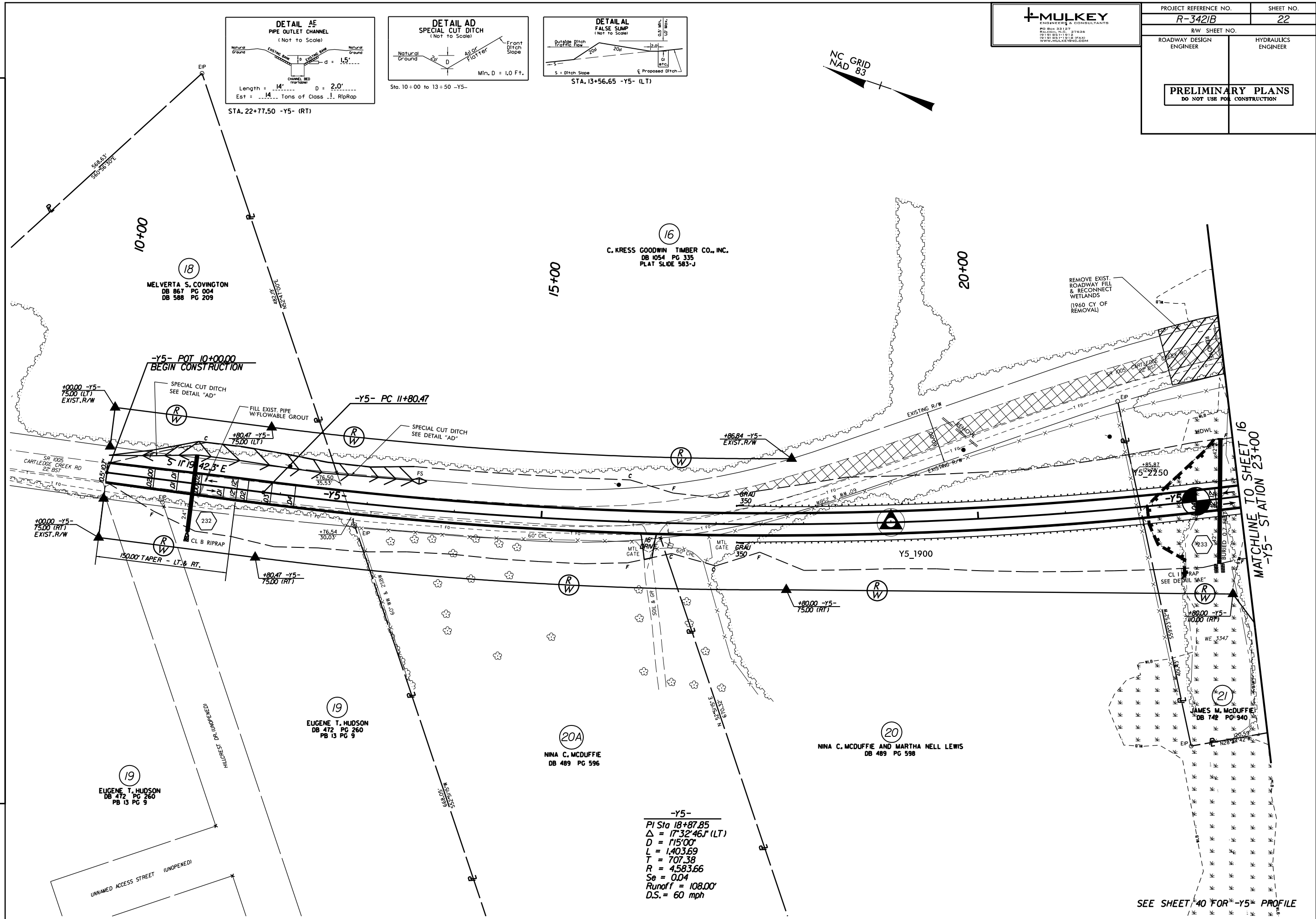
RIGHT OF WAY REVISION: SEPT. 11, 2014 - CHANGED PARCEL NUMBER 7 TO PARCEL 6; PROPERTY OWNER NAME CHANGED ON PARCEL 6.



-Y4-		-SR 1-	
PI Sta 10+79.47	PI Sta 12+70.96	PI Sta 15+78.16	PI Sta 44+37.08
$\Delta = 52^{\circ}47'55.9"$ (RT)	$\Delta = 21^{\circ}24'56.7"$ (RT)	$\Delta = 12^{\circ}43'32.3"$ (LT)	$\Delta = 95^{\circ}05'46.6"$ (LT)
D = 3811.49'	D = 828.56'	D = 710.00'	D = 1230.00'
L = 138.23	L = 252.47	L = 177.57	L = 760.77
T = 74.46	T = 127.73	T = 89.15	T = 501.06
R = 150.00	R = 675.47	R = 799.48	R = 458.37
Se = EXIST.	Se = EXIST.	Se = NA	Se = 0.08
D.S. = NA	D.S. = NA	D.S. = NA	Runoff = 156.00'
			D.S. = 40 mph

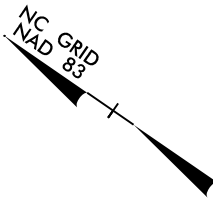
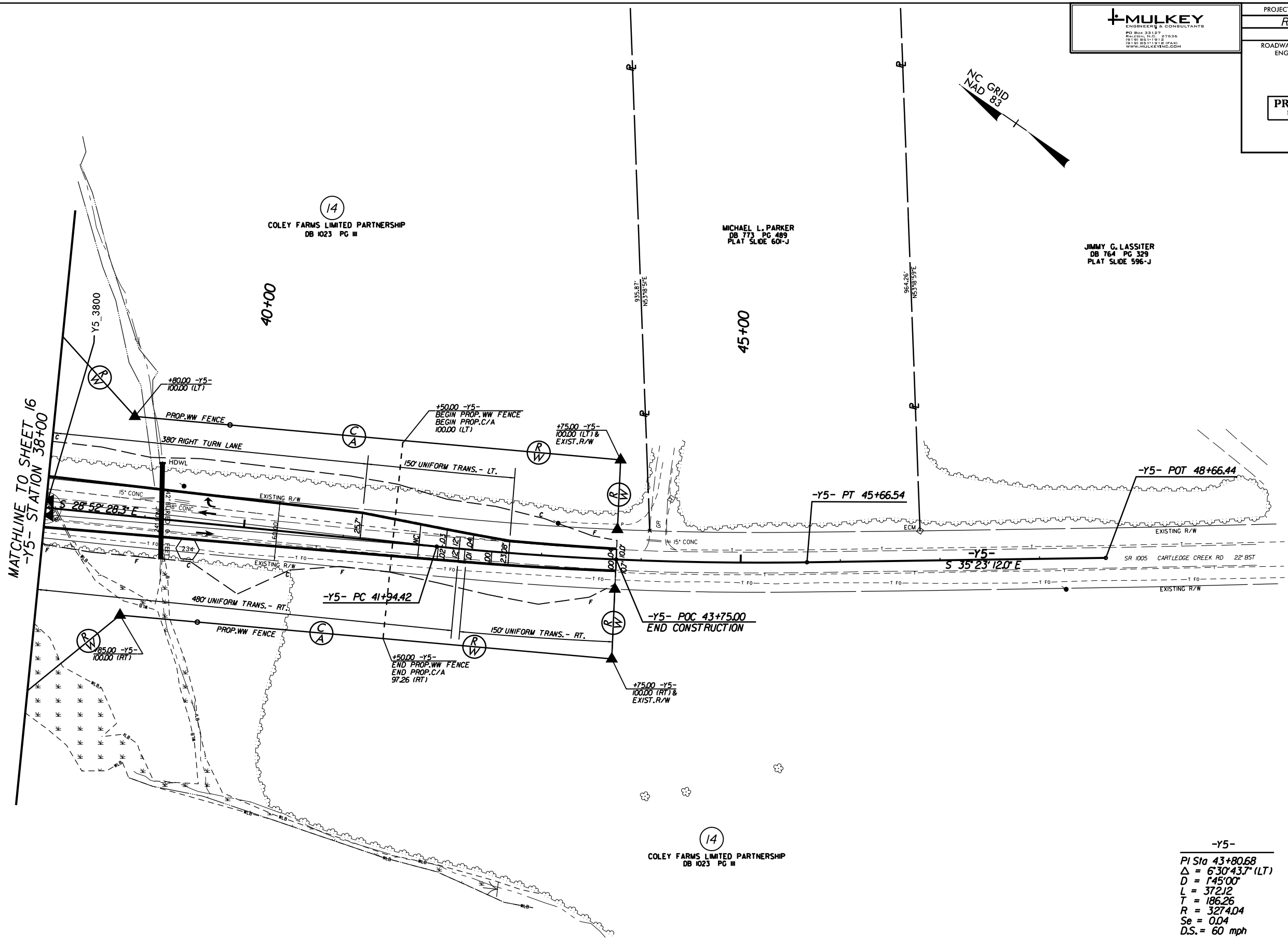


RIGHT OF WAY REVISION: SEPT. 11, 2014 - ADDED PARCEL 20A; PROPERTY OWNER NAME CHANGED ON PARCEL 20.



7/9/2005 4:46:02 PM 05LES

SEE SHEET 40 FOR -Y5- PROFILE



14
COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG III

MICHAEL L. PARKER
DB 773 PG 489
PLAT SLIDE 60-J

JIMMY C. LASSITER
DB 764 PG 329
PLAT SLIDE 596-J

MATCHLINE TO SHEET 16
-Y5- STATION 38+00

-Y5-
PI Sta 43+80.68
 $\Delta = 6'30''43.7''$ (LT)
 $D = 1'45''00''$
 $L = 372.12$
 $T = 186.26$
 $R = 3274.04$
 $Se = 0.04$
 $D.S. = 60$ mph

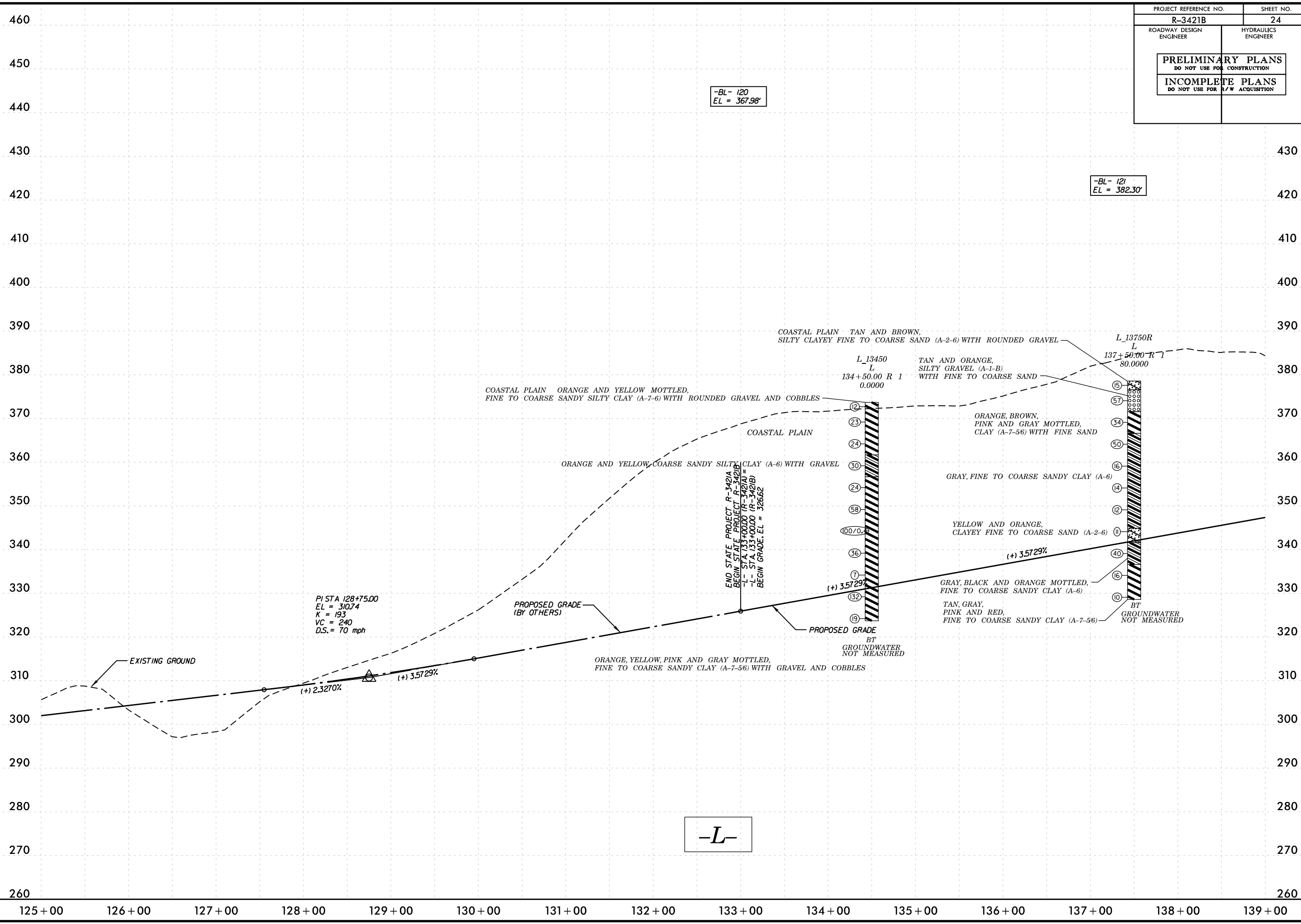
14
COLEY FARMS LIMITED PARTNERSHIP
DB 1023 PG III

DATES
FILES

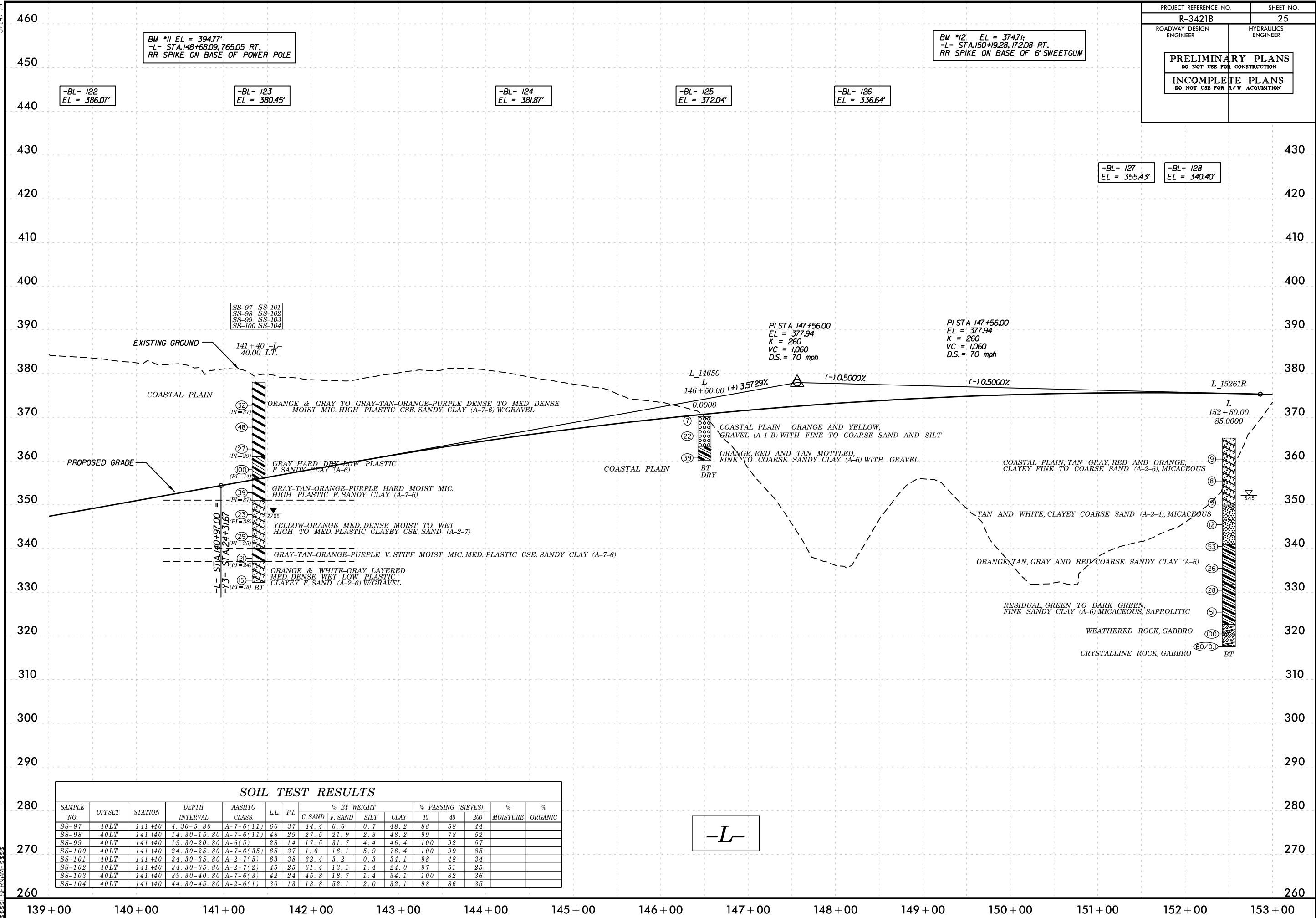
SEE SHEET 41 FOR -Y5- PROFILE

5/14/99

PROJECT REFERENCE NO. R-3421B		SHEET NO. 24	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION			



R-3421B.dwg
5/14/99
RDG



BM *11 EL = 394.77'
-L- STA.148+68.09, 765.05 RT.
RR SPIKE ON BASE OF POWER POLE

BM *12 EL = 374.71;
-L- STA.150+19.28, 172.08 RT.
RR SPIKE ON BASE OF 6' SWEETGUM

-BL- 122
EL = 386.07'

-BL- 123
EL = 380.45'

-BL- 124
EL = 381.87'

-BL- 125
EL = 372.04'

-BL- 126
EL = 336.64'

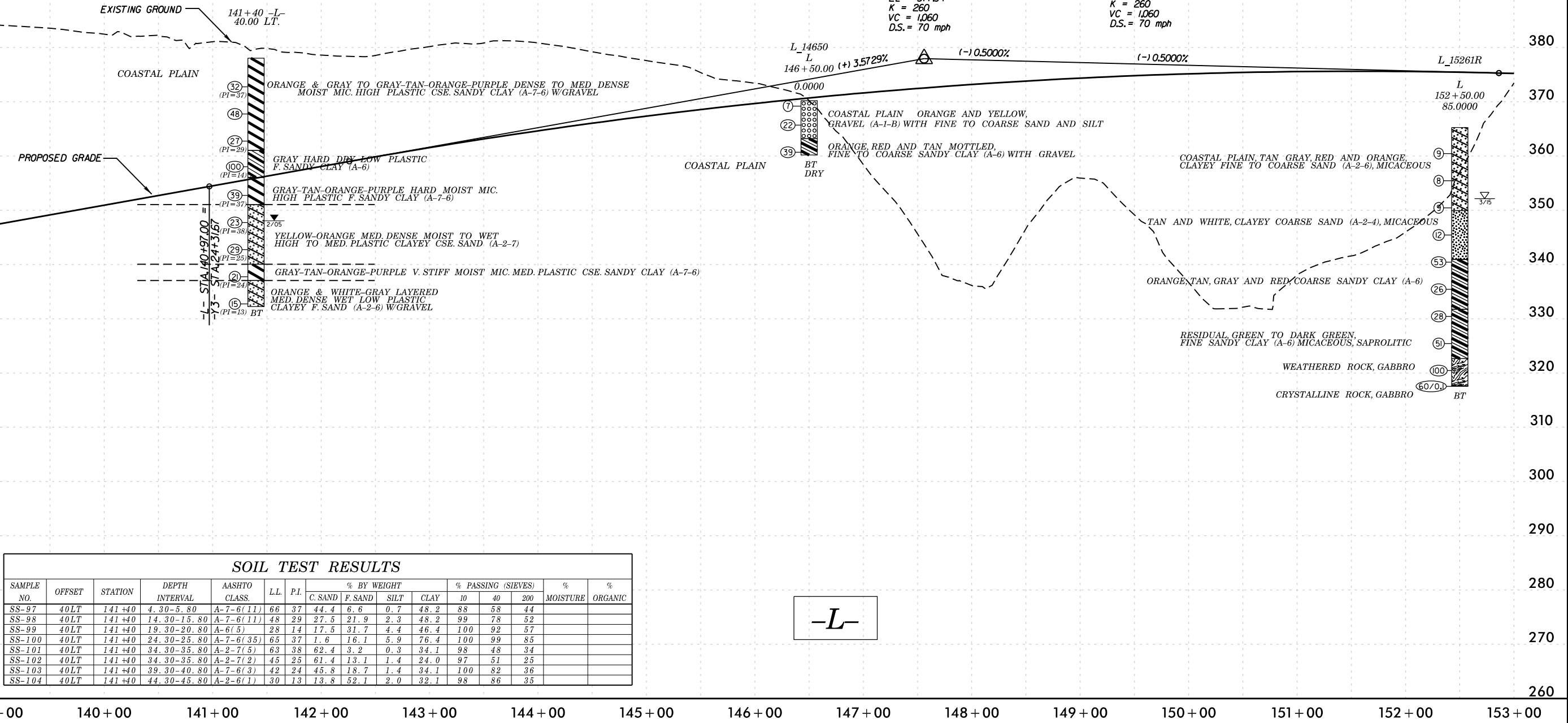
-BL- 127
EL = 355.43'

-BL- 128
EL = 340.40'

SS-97 SS-101
SS-98 SS-102
SS-99 SS-103
SS-100 SS-104

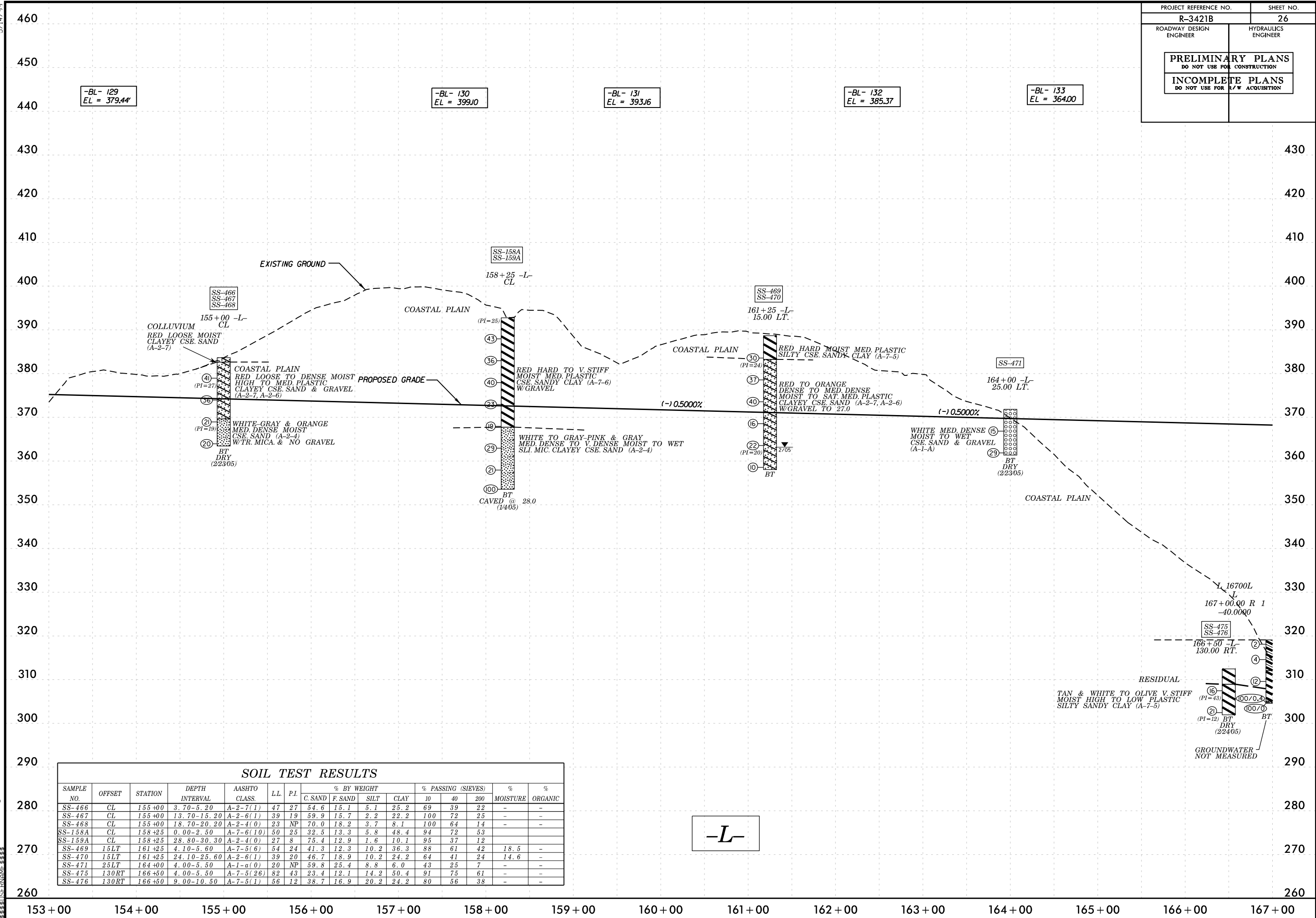
PI STA 147+56.00
EL = 377.94
K = 260
VC = 1,060
D.S. = 70 mph

PI STA 147+56.00
EL = 377.94
K = 260
VC = 1,060
D.S. = 70 mph



-L-

5/14/99
R:\256 AM REF. OF L_csh24_HDR.dgn



-BL- 129
EL = 379.44'

-BL- 130
EL = 399.10

-BL- 131
EL = 393.16

-BL- 132
EL = 385.37

-BL- 133
EL = 364.00

SS-466
SS-467
SS-468

SS-158A
SS-159A

SS-469
SS-470

SS-471

SS-475
SS-476

SOIL TEST RESULTS																
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT					% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200			
SS-466	CL	155+00	3.70-5.20	A-2-7(1)	47	27	54.6	15.1	5.1	25.2	69	39	22	-	-	
SS-467	CL	155+00	13.70-15.20	A-2-6(1)	39	19	59.9	15.7	2.2	22.2	100	72	25	-	-	
SS-468	CL	155+00	18.70-20.20	A-2-4(0)	23	NP	70.0	18.2	3.7	8.1	100	64	14	-	-	
SS-158A	CL	158+25	0.00-2.50	A-7-6(10)	50	25	32.5	13.3	5.8	48.4	94	72	53	-	-	
SS-159A	CL	158+25	28.80-30.30	A-2-4(0)	27	8	75.4	12.9	1.6	10.1	95	37	12	-	-	
SS-469	15LT	161+25	4.10-5.60	A-7-5(6)	54	24	41.3	12.3	10.2	36.3	88	61	42	18.5	-	
SS-470	15LT	161+25	24.10-25.60	A-2-6(1)	39	20	46.7	18.9	10.2	24.2	64	41	24	14.6	-	
SS-471	25LT	164+00	4.00-5.50	A-1-a(0)	20	NP	59.8	25.4	8.8	6.0	43	25	7	-	-	
SS-475	130RT	166+50	4.00-5.50	A-7-5(26)	82	43	23.4	12.1	14.2	50.4	91	75	61	-	-	
SS-476	130RT	166+50	9.00-10.50	A-7-5(1)	56	12	38.7	16.9	20.2	24.2	80	56	38	-	-	

-L-

5/14/99
15425 BY GEO. OF L. PSH24-HDR.dgn

5/14/99

15421 BY GEO. OF L. psh24_HDR.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	27
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

BM #13 EL = 338.2'
 -L- STA.170+37.94, 545.05 RT.
 RR SPIKE ON BASE OF 8' PINE

BM #14 EL = 364.76'
 -L- STA.178+77.0, 237.70 RT.
 RR SPIKE ON BASE OF 15' PINE

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-473	30RT	168+00	3.60-5.10	A-7-5(29)	81	30	9.1	10.9	15.6	64.5	93	88	77	52.7	-
SS-474	30RT	168+00	8.60-10.10	A-5(7)	52	8	13.1	27.6	41.2	18.1	97	91	64	-	-
SS-488	75LT	172+00	1.50-3.00	A-2-6(0)	38	19	74.5	8.1	2.3	15.1	93	30	17	-	-
SS-489	75LT	172+00	4.00-5.50	A-2-6(0)	31	15	70.4	11.1	1.3	17.2	93	38	18	-	-
SS-490	75LT	172+00	9.00-10.50	A-2-6(0)	34	12	76.9	7.4	2.6	13.1	100	31	17	19.1	-
SS-491	75LT	172+00	14.00-15.50	A-2-7(4)	59	35	60.7	6.4	1.6	31.3	96	50	32	-	-
SS-492	CL	175+00	3.00-5.10	A-2-4(0)	24	5	67.2	13.8	2.8	16.1	100	65	20	-	-
SS-493	CL	175+00	8.60-10.10	A-2-6(0)	39	17	73.7	6.9	1.3	18.2	95	38	19	-	-
SS-494	CL	175+00	13.60-15.10	A-6(13)	40	19	6.3	28.5	20.9	44.4	98	94	72	-	-
SS-495	CL	175+00	18.60-20.10	A-2-6(0)	32	12	57.6	23.1	1.1	18.2	100	70	20	-	-
SS-496	CL	177+00	1.50-3.00	A-7-6(5)	45	27	39.2	18.0	8.6	34.3	84	59	39	-	-
SS-497	CL	177+00	3.40-4.90	A-7-6(16)	53	28	13.1	27.6	12.8	46.4	97	88	63	-	-
SS-498	CL	177+00	8.40-9.90	A-7-6(7)	55	35	50.7	10.1	2.9	36.3	96	62	38	-	-
SS-499	25LT	178+75	4.00-5.50	A-2-6(1)	37	18	55.8	15.3	4.6	24.2	76	45	23	-	-
SS-500	25LT	178+75	9.00-10.50	A-2-6(1)	40	29	67.9	8.1	4.8	19.2	84	34	21	-	-
SS-501	50RT	180+50	3.70-5.20	A-7-6(15)	56	34	30.5	16.0	5.1	48.5	100	84	55	15.3	-
SS-502	50RT	180+50	8.70-10.20	A-2-7(4)	51	32	54.0	14.3	1.4	30.3	97	57	32	13.7	-

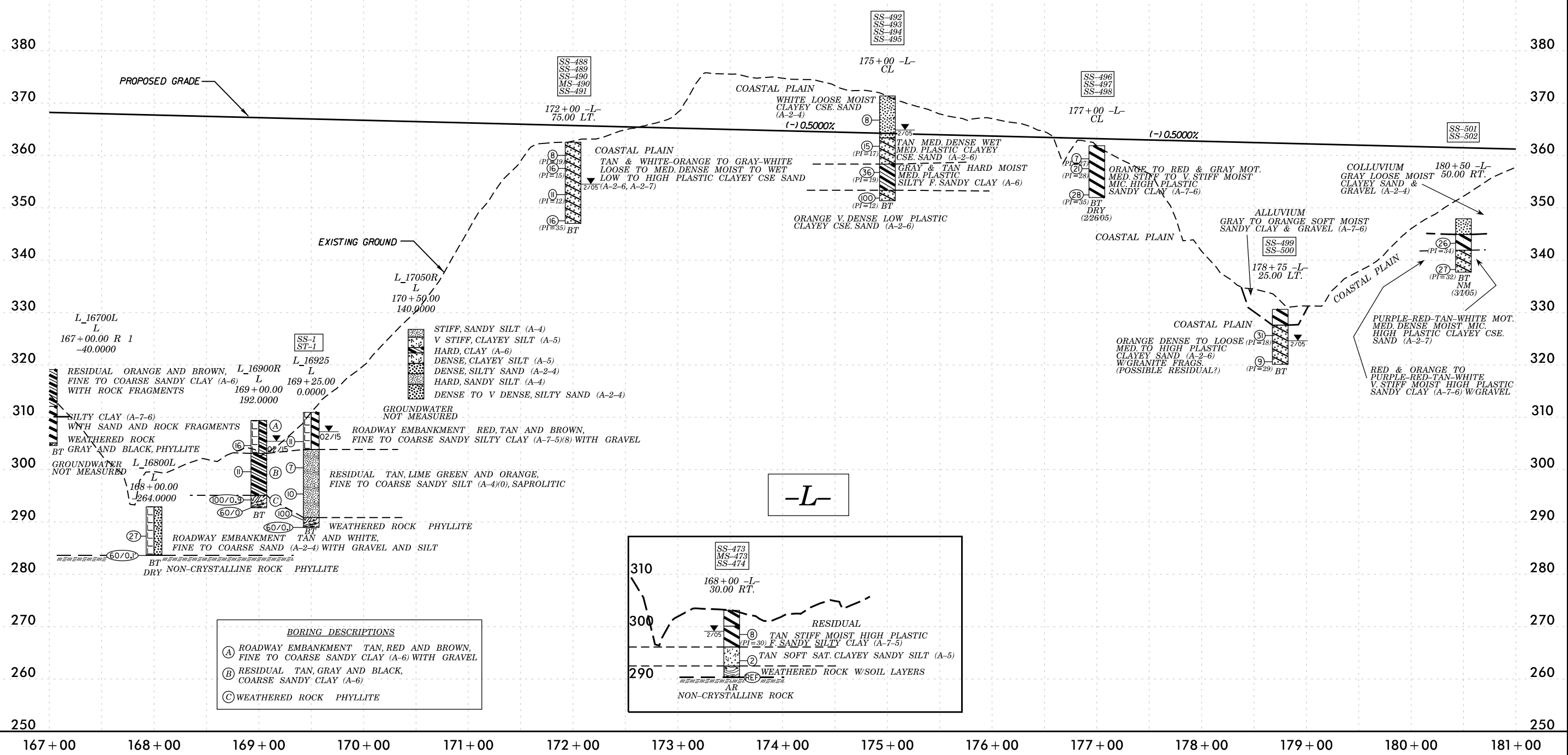
-BL- 136
 EL = 374.82

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	CL	169+25	4.6'-6.1'	A-7-5(8)	61	20	28.4	18.0	21.8	31.8	86.0	69.0	49.0	-	-
ST-1	CL	169+25	11.2'-12.7'	A-4(0)	40	NP	18.2	44.1	33.7	3.9	97.0	86.0	46.0	-	-

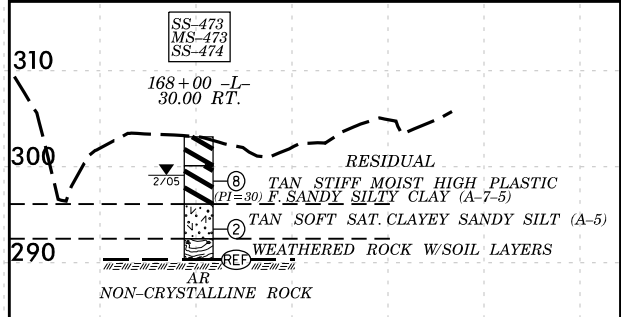
-BL- 134
 EL = 301.08

-BL- 135
 EL = 361.90



BORING DESCRIPTIONS

(A)	ROADWAY EMBANKMENT TAN, RED AND BROWN, FINE TO COARSE SANDY CLAY (A-6) WITH GRAVEL
(B)	RESIDUAL TAN, GRAY AND BLACK, COARSE SANDY CLAY (A-6)
(C)	WEATHERED ROCK PHYLLITE

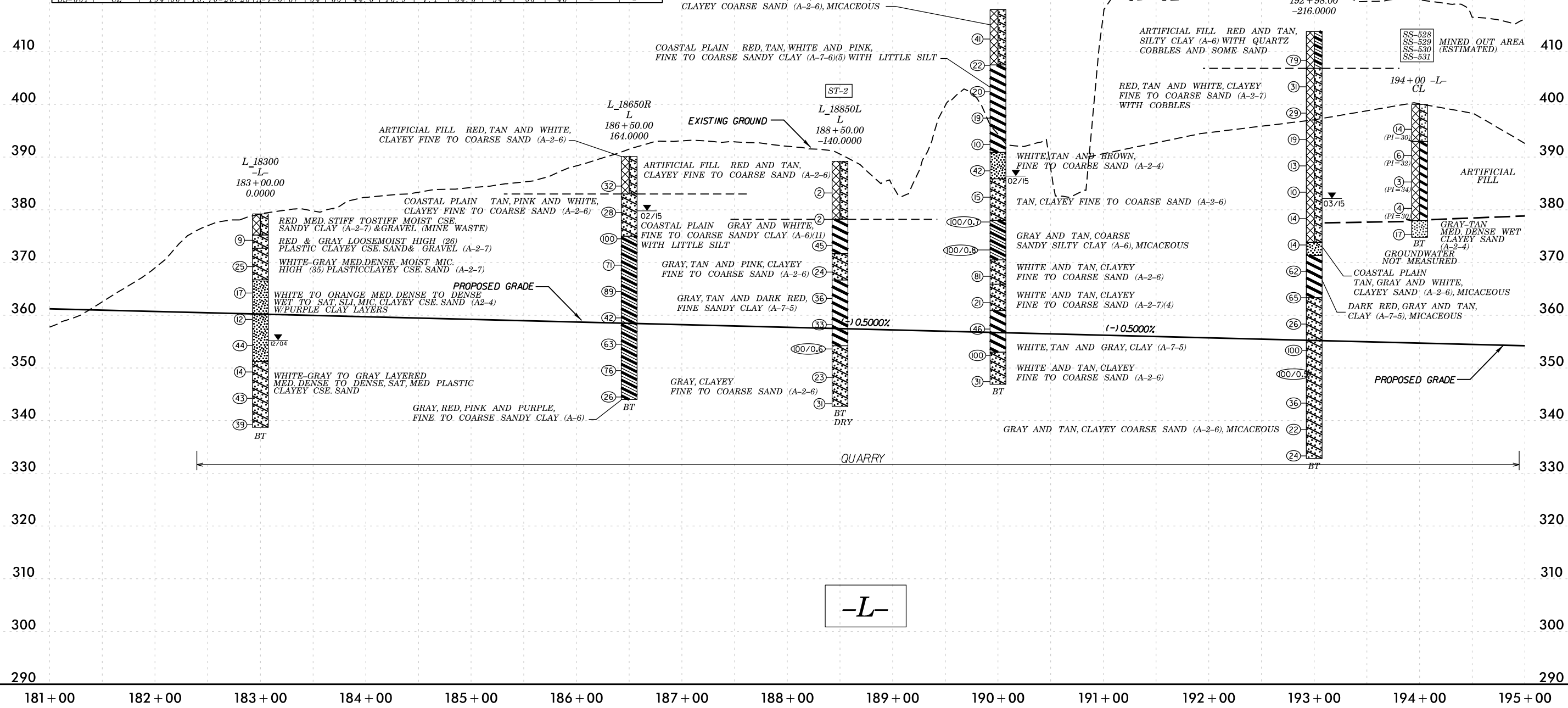


-L-

167+00 168+00 169+00 170+00 171+00 172+00 173+00 174+00 175+00 176+00 177+00 178+00 179+00 180+00 181+00

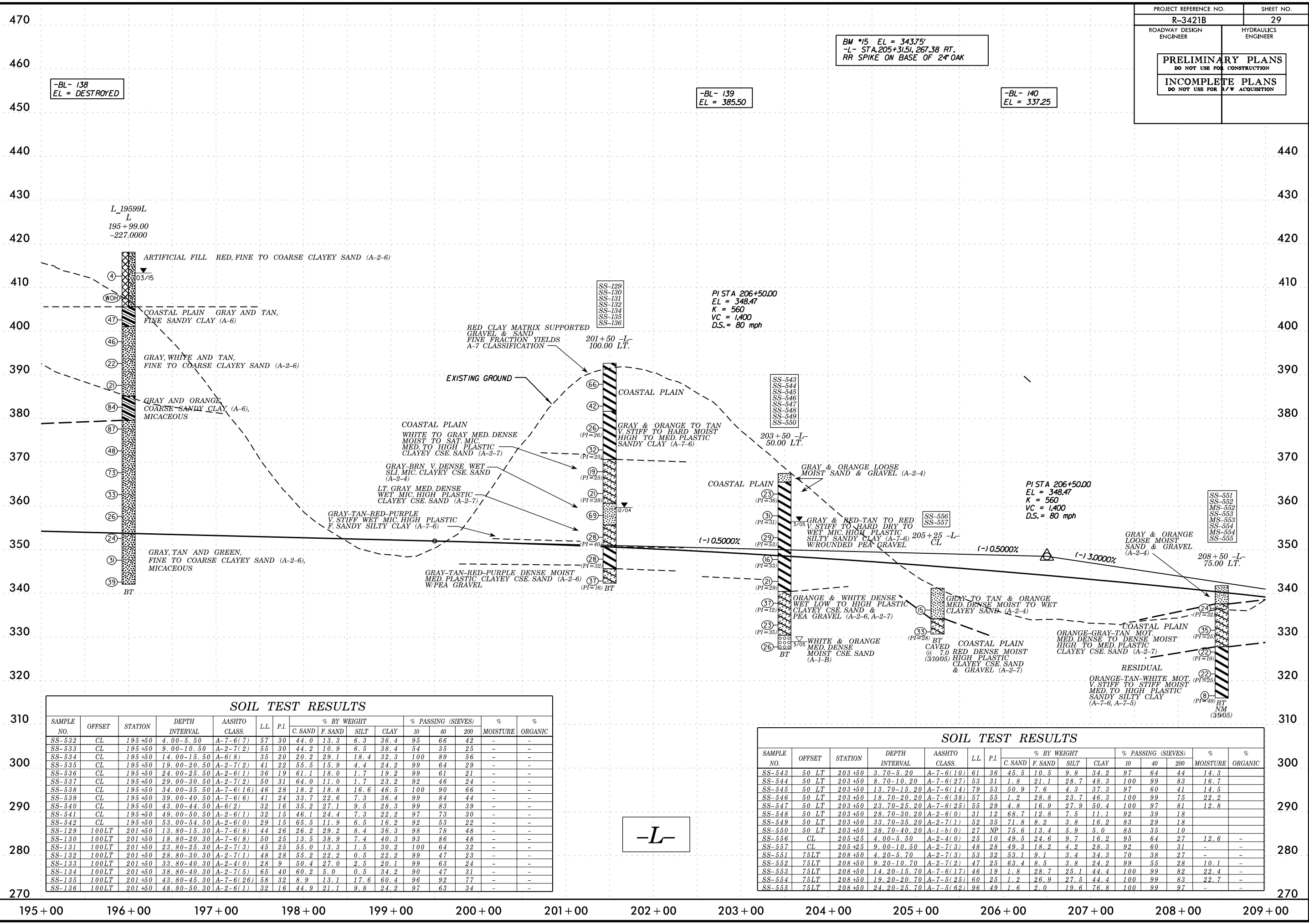
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-124	CL	183+00	4.00-5.50	A-2-7(2)	52	26	45.7	13.3	6.7	34.3	65	41	28	-	-
SS-125	CL	183+00	9.00-10.50	A-2-7(4)	59	35	48.7	19.6	1.4	30.3	100	64	32	-	-
SS-126	CL	183+00	14.00-15.50	A-2-4(0)	29	9	54.5	24.6	2.6	18.2	100	78	21	-	-
SS-127	CL	183+00	29.00-30.50	A-2-7(0)	42	22	71.7	9.5	0.6	18.2	98	35	19	-	-
SS-128	CL	183+00	39.00-40.50	A-2-6(2)	39	24	55.6	12.9	5.3	26.3	98	62	32	-	-
SS-503	40RT	186+50	3.90-5.40	A-2-7(2)	43	21	43.7	16.6	6.4	33.3	83	57	35	-	-
SS-504	40RT	186+50	8.90-10.40	A-7-6(5)	50	23	36.7	14.1	8.8	40.4	83	61	42	-	-
SS-505	40RT	186+50	18.90-20.40	A-6(15)	38	19	5.7	17.8	30.2	46.4	100	96	83	-	-
SS-506	40RT	186+50	23.90-25.40	A-2-7(2)	41	24	52.9	14.8	3.0	29.3	97	62	32	13.1	-
SS-507	40RT	186+50	28.90-30.40	A-6(2)	39	19	46.3	16.6	5.8	31.3	95	65	36	-	-
SS-508	40RT	186+50	33.90-35.40	A-2-7(3)	60	35	67.3	6.7	0.8	25.3	100	47	28	22.9	-
SS-509	40RT	186+50	38.90-40.40	A-7-6(15)	42	25	13.3	25.0	13.2	48.4	100	93	67	10.6	-
SS-510	CL	190+00	3.80-5.50	A-7-6(8)	54	25	37.1	14.3	4.1	44.4	91	65	46	-	-
SS-511	CL	190+00	8.80-10.30	A-2-7(2)	54	31	48.4	15.7	7.7	28.1	66	41	26	-	-
SS-512	CL	190+00	13.80-15.30	A-2-7(1)	41	18	47.2	17.9	10.8	24.1	64	42	24	-	-
SS-513	CL	190+00	18.80-20.30	A-7-6(14)	60	35	29.3	16.5	7.9	46.2	94	76	52	-	-
SS-514	CL	190+00	23.80-25.30	A-2-7(2)	43	24	50.8	19.2	4.9	25.1	100	77	31	-	-
SS-515	CL	190+00	28.80-30.30	A-2-6(0)	30	14	76.3	5.3	3.3	15.1	99	50	19	-	-
SS-516	CL	190+00	33.80-35.30	A-6(9)	36	19	19.7	24.1	18.0	38.2	100	89	60	-	-
SS-517	CL	190+00	43.80-45.30	A-2-7(3)	51	29	60.3	7.2	3.3	29.1	92	47	30	-	-
SS-518	CL	190+00	48.80-50.30	A-2-6(1)	30	13	37.9	30.7	6.3	25.1	99	83	32	-	-
SS-519	CL	193+00	4.00-5.50	A-7-6(4)	58	30	47.7	12.9	7.1	32.3	89	58	36	-	-
SS-520	CL	193+00	14.00-15.50	A-2-7(3)	49	26	49.9	11.7	10.1	28.3	87	55	34	-	-
SS-521	CL	193+00	19.00-20.50	A-7-6(22)	48	26	10.3	10.5	28.7	50.5	100	94	82	-	-
SS-522	CL	193+00	24.00-25.50	A-6(11)	36	21	15.4	23.4	22.8	38.4	100	91	66	-	-
SS-523	CL	193+00	29.00-30.50	A-2-7(1)	42	25	71.7	6.9	1.2	20.2	99	51	22	-	-
SS-524	CL	193+00	34.00-35.50	A-7-6(12)	47	34	29.1	24.0	12.5	34.3	100	84	50	-	-
SS-525	CL	193+00	39.00-40.50	A-7-6(8)	60	40	54.7	6.7	4.2	34.3	96	56	38	-	-
SS-526	CL	193+00	44.00-45.50	A-7-6(5)	46	27	52.3	10.7	8.7	28.3	99	65	38	-	-
SS-527	CL	193+00	49.00-50.50	A-2-6(1)	32	15	43.6	24.4	7.7	24.2	99	79	33	-	-
SS-528	CL	194+00	3.70-5.20	A-2-7(3)	51	30	50.3	15.4	8.1	26.3	89	57	32	-	-
SS-529	CL	194+00	8.70-10.20	A-7-6(6)	61	32	48.3	11.3	8.1	32.3	92	58	38	-	-
SS-530	CL	194+00	13.70-15.20	A-7-6(8)	60	34	44.2	12.3	7.1	36.4	92	63	41	-	-
SS-531	CL	194+00	18.70-20.20	A-7-6(6)	54	30	44.6	13.9	7.1	34.3	94	65	40	-	-

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-3	150 RT	190+00	14.6'-16.1'	A-7-6(5)	50	25	42.1	12.7	11.5	33.8	85.0	56.0	40.0	-	-
SS-9	150 RT	190+00	54.6'-56.1'	A-2-7(4)	53	28	63.9	8.3	2.3	25.5	98.0	53.0	28.0	-	-
SS-34	150 RT	193+00	14.8'-16.3'	A-2-6(1)	34	13	86.0	3.6	1.2	9.2	100.0	32.0	11.0	-	-
SS-39	150 RT	193+00	49.8'-51.3'	A-2-4(0)	27	7	70.8	15.6	3.6	10.0	100.0	53.0	14.0	-	-
ST-2	140' LT	188+50	12.0'-13.0'	A-6(11)	35	17	9.4	18.6	16.2	55.8	100.0	95.0	75.0	-	-



-L-

5/14/99



-BL- 138
EL = DESTROYED

-BL- 139
EL = 385.50

-BL- 140
EL = 337.25

BM #15 EL = 343.75'
-L- STA.205+31.51, 267.38 RT.
RR SPIKE ON BASE OF 2" OAK

L_19599L
L
195+99.00
-227.0000

PI STA 206+50.00
EL = 348.47
K = 560
VC = 1,400
D.S. = 80 mph

PI STA 206+50.00
EL = 348.47
K = 560
VC = 1,400
D.S. = 80 mph

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-532	CL	195+50	4.00-5.50	A-7-6(7)	57	30	44.0	13.3	6.3	36.4	95	66	42	-	-
SS-533	CL	195+50	9.00-10.50	A-2-7(2)	55	30	44.2	10.9	6.5	38.4	54	35	25	-	-
SS-534	CL	195+50	14.00-15.50	A-6(8)	35	20	20.2	29.1	18.4	32.3	100	89	56	-	-
SS-535	CL	195+50	19.00-20.50	A-2-7(2)	41	22	55.5	15.9	4.4	24.2	99	64	29	-	-
SS-536	CL	195+50	24.00-25.50	A-2-6(1)	36	19	61.1	18.0	1.7	19.2	99	61	21	-	-
SS-537	CL	195+50	29.00-30.50	A-2-7(2)	50	31	64.0	11.0	1.7	23.2	92	46	24	-	-
SS-538	CL	195+50	34.00-35.50	A-7-6(16)	46	28	18.2	18.8	16.6	46.5	100	90	66	-	-
SS-539	CL	195+50	39.00-40.50	A-7-6(6)	41	24	33.7	22.6	7.3	36.4	99	84	44	-	-
SS-540	CL	195+50	43.00-44.50	A-6(2)	32	16	35.2	27.1	9.5	28.3	99	83	39	-	-
SS-541	CL	195+50	49.00-50.50	A-2-6(1)	32	15	46.1	24.4	7.3	22.2	97	73	30	-	-
SS-542	CL	195+50	53.00-54.50	A-2-6(0)	29	15	65.5	11.9	6.5	16.2	92	53	22	-	-
SS-129	100LT	201+50	13.80-15.30	A-7-6(8)	44	26	26.2	29.2	8.4	36.3	98	78	48	-	-
SS-130	100LT	201+50	18.80-20.30	A-7-6(8)	50	25	13.5	38.9	7.4	40.3	93	86	48	-	-
SS-131	100LT	201+50	23.80-25.30	A-2-7(3)	45	25	55.0	13.3	1.5	30.2	100	64	32	-	-
SS-132	100LT	201+50	28.80-30.30	A-2-7(1)	48	28	55.2	22.2	0.5	22.2	99	47	23	-	-
SS-133	100LT	201+50	33.80-40.30	A-2-4(0)	28	9	50.4	27.0	2.5	20.1	99	63	24	-	-
SS-134	100LT	201+50	38.80-40.30	A-2-7(5)	65	40	60.2	5.0	0.5	34.2	90	47	31	-	-
SS-135	100LT	201+50	43.80-45.30	A-7-6(26)	58	32	8.9	13.1	17.6	60.4	96	92	77	-	-
SS-136	100LT	201+50	48.80-50.30	A-2-6(1)	32	16	44.9	21.1	9.8	24.2	97	63	34	-	-

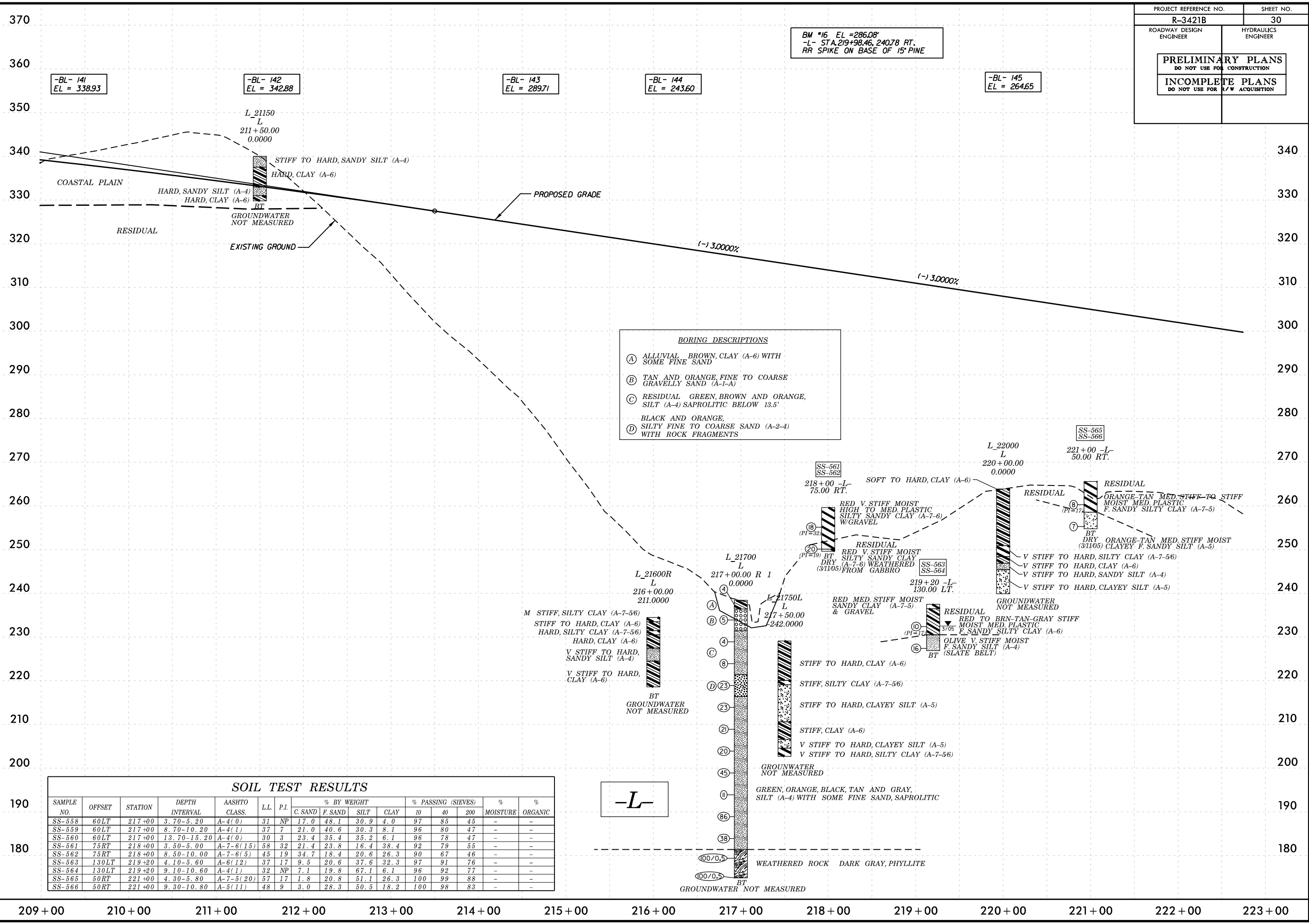
SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-543	50 LT	203+50	3.70-5.20	A-7-6(10)	61	36	45.5	10.5	9.8	34.2	97	64	44	14.3	-
SS-544	50 LT	203+50	8.70-10.20	A-7-6(27)	53	31	1.8	21.1	28.7	48.3	100	99	83	16.7	-
SS-545	50 LT	203+50	13.70-15.20	A-7-6(14)	79	53	50.9	7.6	4.3	37.3	97	60	41	14.5	-
SS-546	50 LT	203+50	18.70-20.20	A-7-6(38)	57	55	1.2	28.8	23.7	46.3	100	99	75	22.2	-
SS-547	50 LT	203+50	23.70-25.20	A-7-6(25)	55	29	4.8	16.9	27.9	50.4	100	97	81	12.8	-
SS-548	50 LT	203+50	28.70-30.20	A-2-6(0)	31	12	68.7	12.8	7.5	11.1	92	39	18	-	-
SS-549	50 LT	203+50	33.70-35.20	A-2-7(1)	52	35	71.8	8.2	3.8	16.2	83	29	18	-	-
SS-550	50 LT	203+50	38.70-40.20	A-1-b(0)	27	NP	75.6	13.4	5.9	5.0	85	35	10	-	-
SS-556	CL	205+25	4.00-5.50	A-2-4(0)	25	10	49.5	24.6	9.7	16.2	95	64	27	12.6	-
SS-557	CL	205+25	9.00-10.50	A-2-7(3)	48	28	49.3	18.2	4.2	28.3	92	60	31	-	-
SS-551	75LT	208+50	4.20-5.70	A-2-7(3)	53	32	53.1	9.1	3.4	34.3	70	38	27	-	-
SS-552	75LT	208+50	9.20-10.70	A-2-7(2)	47	25	63.4	8.5	3.8	24.2	99	55	28	10.1	-
SS-553	75LT	208+50	14.20-15.70	A-7-6(17)	46	19	1.8	28.7	25.1	44.4	100	99	82	22.4	-
SS-554	75LT	208+50	19.20-20.70	A-7-5(25)	60	25	1.2	26.9	27.5	44.4	100	99	83	22.7	-
SS-555	75LT	208+50	24.20-25.70	A-7-5(62)	96	49	1.6	2.0	19.6	76.8	100	99	97	-	-

-L-

15421B.DWG of L_19599L.dwg

5/14/99
R:\3256\B\00_of_L\csh24_HDR.dgn

PROJECT REFERENCE NO. R-3421B	SHEET NO. 30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



BM #16 EL = 286.08'
-L- STA. 219+98.46, 240.78 RT.
RR SPIKE ON BASE OF 15' PINE

-BL- 141
EL = 338.93

-BL- 142
EL = 342.88

-BL- 143
EL = 289.71

-BL- 144
EL = 243.60

-BL- 145
EL = 264.65

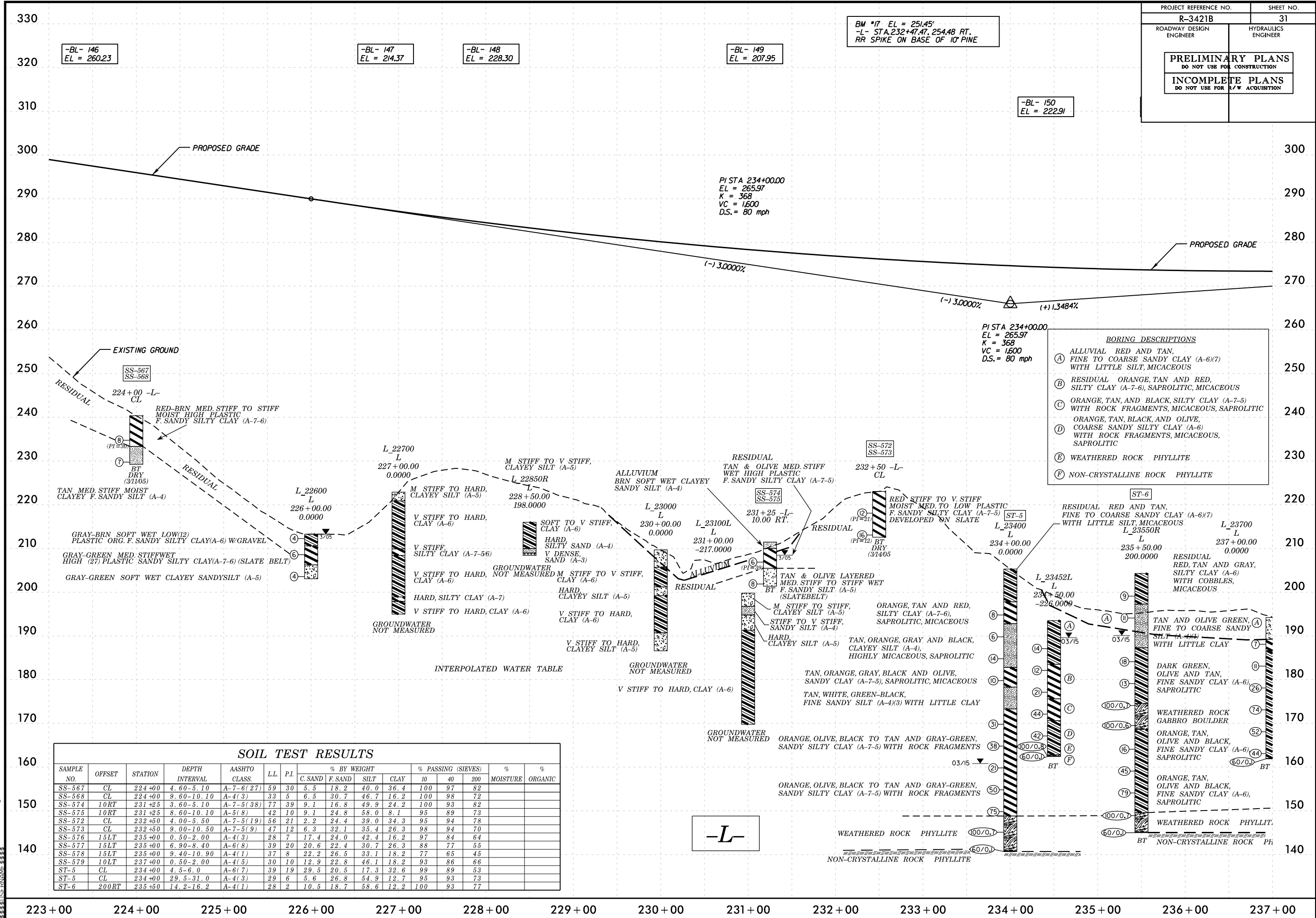
SS-565
SS-566

SS-561
SS-562

SS-563
SS-564

-L-

209+00 210+00 211+00 212+00 213+00 214+00 215+00 216+00 217+00 218+00 219+00 220+00 221+00 222+00 223+00



BM *17 EL = 251.45'
 -L- STA 232+47.47, 254.48 RT.
 RR SPIKE ON BASE OF 10' PINE

-BL- 146
 EL = 260.23

-BL- 147
 EL = 214.37

-BL- 148
 EL = 228.30

-BL- 149
 EL = 207.95

-BL- 150
 EL = 222.91

PI STA 234+00.00
 EL = 265.97
 K = 368
 VC = 1,600
 D.S. = 80 mph

PI STA 234+00.00
 EL = 265.97
 K = 368
 VC = 1,600
 D.S. = 80 mph

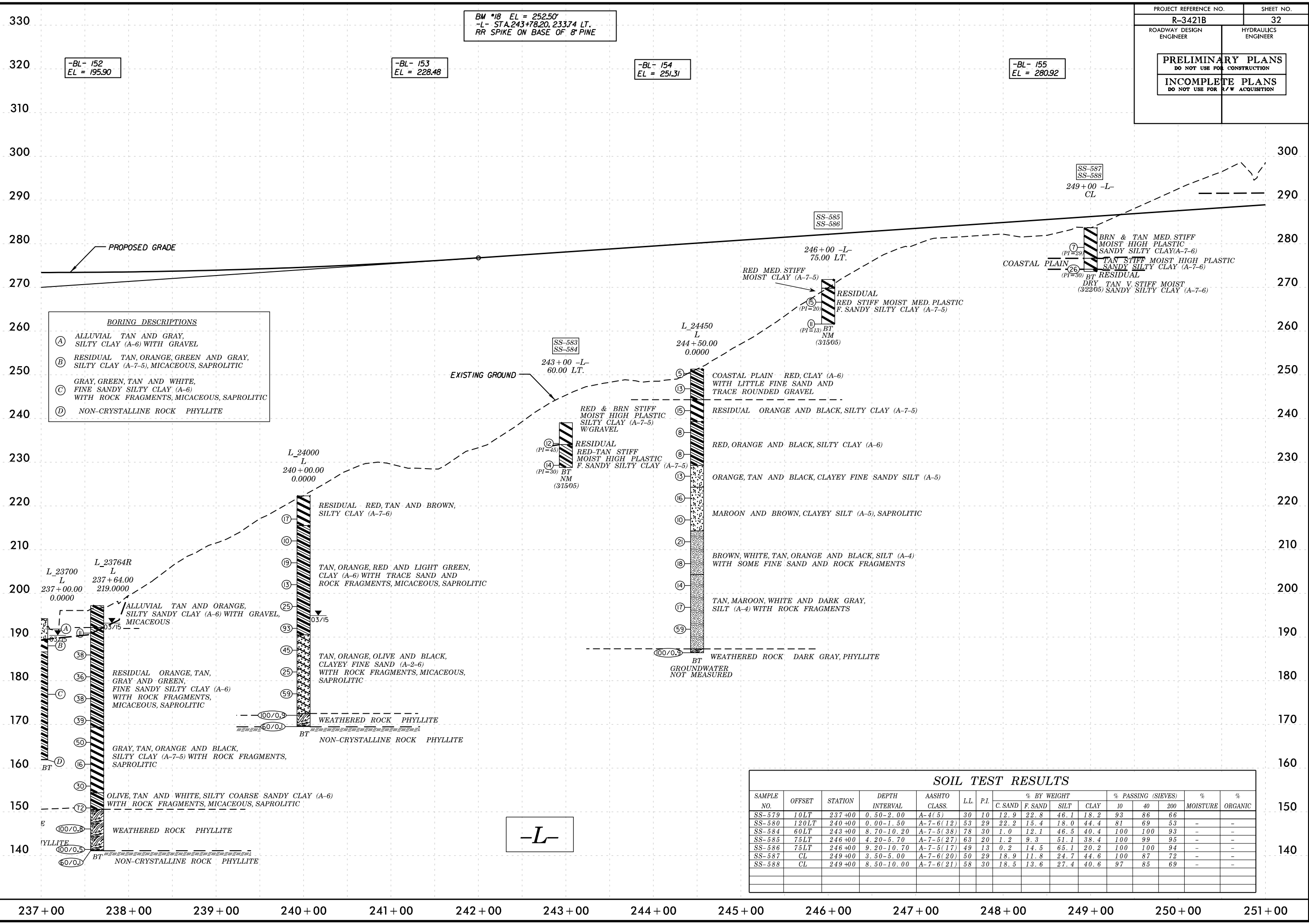
- BORING DESCRIPTIONS**
- (A) ALLUVIAL RED AND TAN, FINE TO COARSE SANDY CLAY (A-6)(7) WITH LITTLE SILT, MICACEOUS
 - (B) RESIDUAL ORANGE, TAN AND RED, SILTY CLAY (A-7-6), SAPROLITIC, MICACEOUS
 - (C) ORANGE, TAN, AND BLACK, SILTY CLAY (A-7-5) WITH ROCK FRAGMENTS, MICACEOUS, SAPROLITIC
 - (D) ORANGE, TAN, BLACK, AND OLIVE, COARSE SANDY SILTY CLAY (A-6) WITH ROCK FRAGMENTS, MICACEOUS, SAPROLITIC
 - (E) WEATHERED ROCK PHYLLITE
 - (F) NON-CRYSTALLINE ROCK PHYLLITE

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-567	CL	224+00	4.60-5.10	A-7-6(27)	59	30	5.5	18.2	40.0	36.4	100	97	82		
SS-568	CL	224+00	9.60-10.10	A-4(3)	33	5	6.5	30.7	46.7	16.2	100	98	72		
SS-574	10RT	231+25	3.60-5.10	A-7-5(38)	77	39	9.1	16.8	49.9	24.2	100	93	82		
SS-575	10RT	231+25	8.60-10.10	A-5(8)	42	10	9.1	24.8	58.0	8.1	95	89	73		
SS-572	CL	232+50	4.00-5.50	A-7-5(19)	56	21	2.2	24.4	39.0	34.3	95	94	78		
SS-573	CL	232+50	9.00-10.50	A-7-5(9)	47	12	6.3	32.1	35.4	26.3	98	94	70		
SS-576	15LT	235+00	0.50-2.00	A-4(3)	28	7	17.4	24.0	42.4	16.2	97	84	64		
SS-577	15LT	235+00	6.90-8.40	A-6(8)	39	20	20.6	22.4	30.7	26.3	88	77	55		
SS-578	15LT	235+00	9.40-10.90	A-4(1)	37	8	22.2	26.5	33.1	18.2	77	65	45		
SS-579	10LT	237+00	0.50-2.00	A-4(5)	30	10	12.9	22.8	46.1	18.2	93	86	66		
ST-5	CL	234+00	4.5-6.0	A-6(7)	39	19	29.5	20.5	17.3	32.6	99	89	53		
ST-5	CL	234+00	29.5-31.0	A-4(3)	29	6	5.6	26.8	54.9	12.7	95	93	73		
ST-6	200RT	235+50	14.2-16.2	A-4(1)	28	2	10.5	18.7	58.6	12.2	100	93	77		

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 154456 PM 0.0 of 1.0 pch24_HDR.dgn
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R-3421B.dwg
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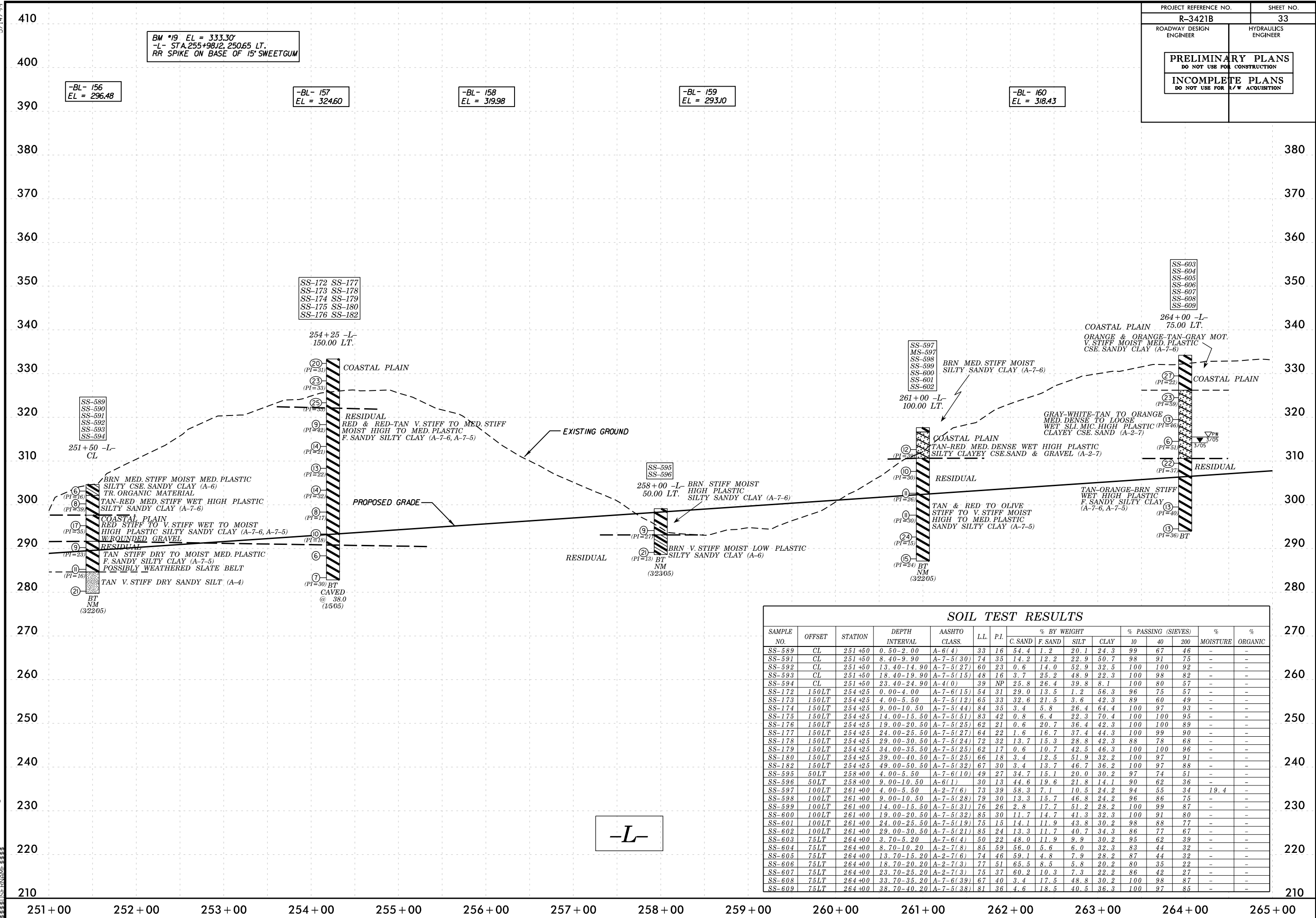
PROJECT REFERENCE NO. R-3421B	SHEET NO. 32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



BORING DESCRIPTIONS	
(A)	ALLUVIAL TAN AND GRAY, SILTY CLAY (A-6) WITH GRAVEL
(B)	RESIDUAL TAN, ORANGE, GREEN AND GRAY, SILTY CLAY (A-7-5), MICACEOUS, SAPROLITIC
(C)	GRAY, GREEN, TAN AND WHITE, FINE SANDY SILTY CLAY (A-6) WITH ROCK FRAGMENTS, MICACEOUS, SAPROLITIC
(D)	NON-CRYSTALLINE ROCK PHYLLITE

SOIL TEST RESULTS														
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT			% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40		
SS-579	10LT	237+00	0.50-2.00	A-4(5)	30	10	12.9	22.8	46.1	18.2	93	86	66	-
SS-580	120LT	240+00	0.00-1.50	A-7-6(12)	53	29	22.2	15.4	18.0	44.4	81	69	53	-
SS-584	60LT	243+00	8.70-10.20	A-7-5(38)	78	30	1.0	12.1	46.5	40.4	100	93	-	-
SS-585	75LT	246+00	4.20-5.70	A-7-5(27)	63	20	1.2	9.3	51.1	38.4	100	99	95	-
SS-586	75LT	246+00	9.20-10.70	A-7-5(17)	49	13	0.2	14.5	65.1	20.2	100	100	94	-
SS-587	CL	249+00	3.50-5.00	A-7-6(20)	50	29	18.9	11.8	24.7	44.6	100	87	72	-
SS-588	CL	249+00	8.50-10.00	A-7-6(21)	58	30	18.5	13.6	27.4	40.6	97	85	69	-

-L-



BM #19 EL = 333.30'
 -L- STA. 255+98.12, 250.65 LT.
 RR SPIKE ON BASE OF 15' SWEETGUM

-BL- 156
 EL = 296.48

-BL- 157
 EL = 324.60

-BL- 158
 EL = 319.98

-BL- 159
 EL = 293.10

-BL- 160
 EL = 318.43

SS-172 SS-177
 SS-173 SS-178
 SS-174 SS-179
 SS-175 SS-180
 SS-176 SS-182

SS-603
 SS-604
 SS-605
 SS-606
 SS-607
 SS-608
 SS-609

SS-589
 SS-590
 SS-591
 SS-592
 SS-593
 SS-594

SS-597
 MS-597
 SS-598
 SS-599
 SS-600
 SS-601
 SS-602

SS-595
 SS-596

154456 PM 06.0 of 1. L. psh24_HDP.dgn
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 154456 PM 06.0 of 1. L. psh24_HDP.dgn

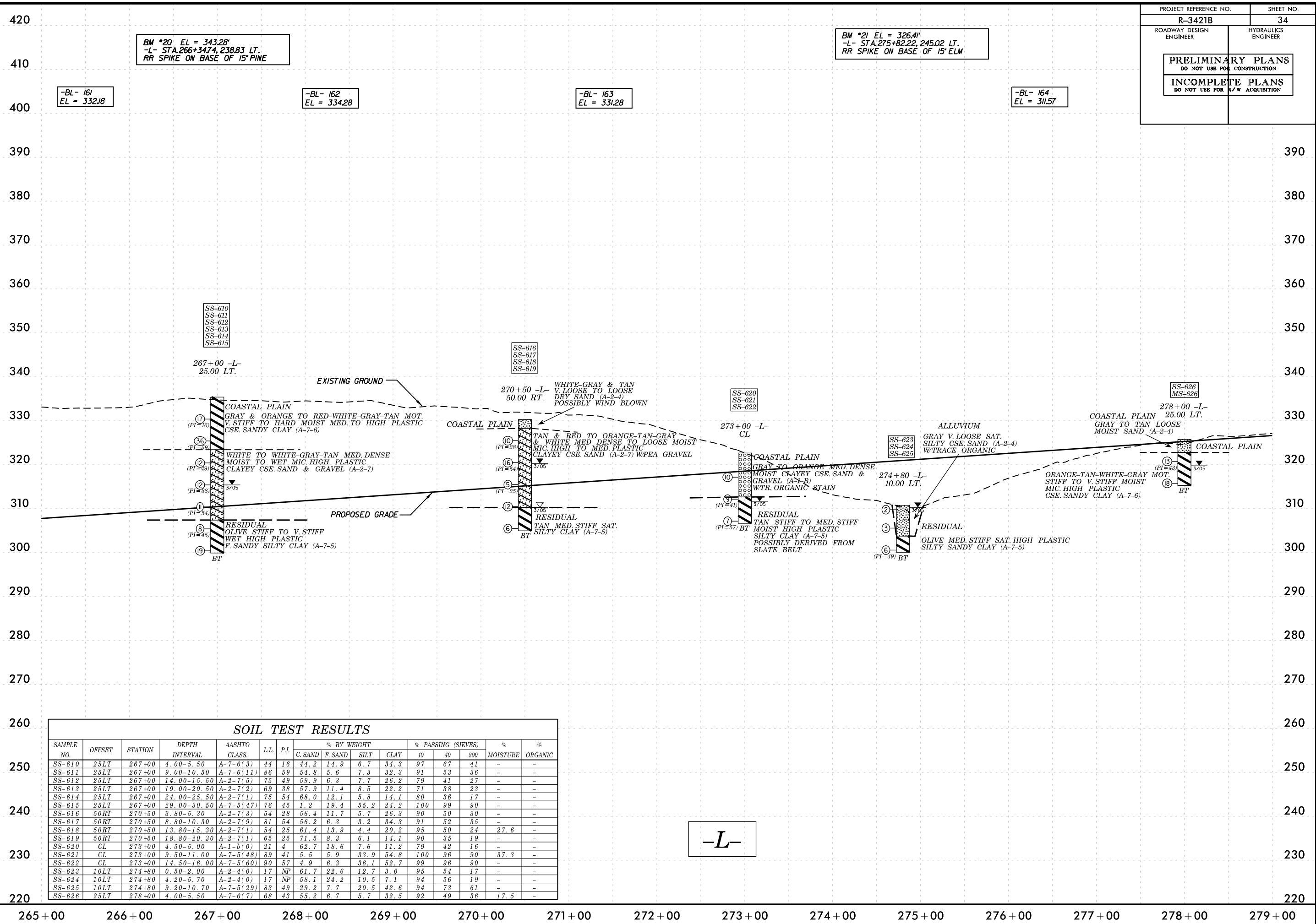
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-589	CL	251+50	0.50-2.00	A-6(4)	33	16	54.4	1.2	20.1	24.3	99	67	46	-	-
SS-591	CL	251+50	8.40-9.90	A-7-5(30)	74	35	14.2	12.2	22.9	50.7	98	91	75	-	-
SS-592	CL	251+50	13.40-14.90	A-7-5(27)	60	23	0.6	14.0	52.9	32.5	100	100	92	-	-
SS-593	CL	251+50	18.40-19.90	A-7-5(15)	48	16	3.7	25.2	48.9	22.3	100	98	82	-	-
SS-594	CL	251+50	23.40-24.90	A-4(0)	39	NP	25.8	26.4	39.8	8.1	100	80	57	-	-
SS-172	150LT	254+25	0.00-4.00	A-7-6(15)	54	31	29.0	13.5	1.2	56.3	96	75	57	-	-
SS-173	150LT	254+25	4.00-5.50	A-7-5(12)	65	33	32.6	21.5	3.6	42.3	89	60	49	-	-
SS-174	150LT	254+25	9.00-10.50	A-7-5(44)	84	35	3.4	5.8	26.4	64.4	100	97	93	-	-
SS-175	150LT	254+25	14.00-15.50	A-7-5(51)	83	42	0.8	6.4	22.3	70.4	100	100	95	-	-
SS-176	150LT	254+25	19.00-20.50	A-7-5(25)	62	21	0.6	20.7	36.4	42.3	100	100	89	-	-
SS-177	150LT	254+25	24.00-25.50	A-7-5(27)	64	22	1.6	16.7	37.4	44.3	100	99	90	-	-
SS-178	150LT	254+25	29.00-30.50	A-7-5(24)	72	32	13.7	15.3	28.8	42.3	88	78	68	-	-
SS-179	150LT	254+25	34.00-35.50	A-7-5(25)	62	17	0.6	10.7	42.5	46.3	100	100	96	-	-
SS-180	150LT	254+25	39.00-40.50	A-7-5(25)	66	18	3.4	12.5	51.9	32.2	100	97	91	-	-
SS-182	150LT	254+25	49.00-50.50	A-7-5(32)	67	30	3.4	13.7	46.7	36.2	100	97	88	-	-
SS-595	50LT	258+00	4.00-5.50	A-7-6(10)	49	27	34.7	15.1	20.0	30.2	97	74	51	-	-
SS-596	50LT	258+00	9.00-10.50	A-6(1)	30	13	44.6	19.6	21.8	14.1	90	62	36	-	-
SS-597	100LT	261+00	4.00-5.50	A-2-7(6)	73	39	58.3	7.1	10.5	24.2	94	55	34	19.4	-
SS-598	100LT	261+00	9.00-10.50	A-7-5(28)	79	30	13.3	15.7	46.8	24.2	96	86	75	-	-
SS-599	100LT	261+00	14.00-15.50	A-7-5(31)	76	26	2.8	17.7	51.2	28.2	100	99	87	-	-
SS-600	100LT	261+00	19.00-20.50	A-7-5(32)	85	30	11.7	14.7	41.3	32.3	100	91	80	-	-
SS-601	100LT	261+00	24.00-25.50	A-7-5(19)	75	15	14.1	11.9	43.8	30.2	98	88	77	-	-
SS-602	100LT	261+00	29.00-30.50	A-7-5(21)	85	24	13.3	11.7	40.7	34.3	86	77	67	-	-
SS-603	75LT	264+00	3.70-5.20	A-7-6(4)	50	22	48.0	11.9	9.9	30.2	95	62	39	-	-
SS-604	75LT	264+00	8.70-10.20	A-2-7(8)	85	59	56.0	5.6	6.0	32.3	83	44	32	-	-
SS-605	75LT	264+00	13.70-15.20	A-2-7(6)	74	46	59.1	4.8	7.9	28.2	87	44	32	-	-
SS-606	75LT	264+00	18.70-20.20	A-2-7(3)	77	51	65.5	8.5	5.8	20.2	80	35	22	-	-
SS-607	75LT	264+00	23.70-25.20	A-2-7(3)	75	37	60.2	10.3	7.3	22.2	86	42	27	-	-
SS-608	75LT	264+00	33.70-35.20	A-7-6(39)	67	40	3.4	17.5	48.8	30.2	100	98	87	-	-
SS-609	75LT	264+00	38.70-40.20	A-7-5(38)	81	36	4.6	18.5	40.5	36.3	100	97	85	-	-

-L-

5/14/99

R-3421B, 06.0, cf, L, psh24, HDR.dgn

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



-L-

460
450
440
430
420
410
400
390
380
370
360
350
340
330
320
310
300
290
280
270
260

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	PI	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-627	CL	281+00	3.90-5.40	A-2-7(3)	45	26	48.4	18.3	6.0	27.4	94	63	33	-	-
SS-628	CL	281+00	8.90-10.40	A-2-7(7)	68	45	52.7	9.3	5.5	32.5	90	53	35	-	-
SS-629	CL	281+00	13.90-15.40	A-2-7(3)	56	35	63.6	11.0	5.2	20.3	94	49	25	-	-
SS-630	60LT	284+00	3.50-5.00	A-7-5(28)	75	37	23.7	7.5	9.9	58.8	100	83	70	-	-
SS-631	60LT	284+00	8.50-10.00	A-7-6(6)	58	36	53.8	8.9	6.9	30.4	98	59	37	-	-
SS-632	60LT	284+00	13.50-15.00	A-7-6(12)	80	55	51.3	6.9	5.3	36.5	93	55	39	-	-
SS-633	60LT	284+00	18.50-20.00	A-6(9)	39	23	25.8	22.1	13.6	38.5	97	82	54	-	-
SS-634	25LT	286+00	3.30-4.80	A-2-4(0)	16	NP	66.9	21.6	4.4	7.1	99	55	13	-	-
SS-635	25LT	286+00	8.30-19.80	A-6(3)	36	20	12.6	49.5	9.5	28.4	100	96	40	-	-
SS-636	25LT	286+00	13.30-14.80	A-7-6(10)	58	36	39.6	11.8	10.1	38.5	87	59	44	13.1	-
SS-637	25LT	286+00	18.30-19.80	A-2-6(0)	27	12	32.9	36.9	12.0	18.3	98	80	32	-	-
SS-638	25LT	286+00	23.30-24.80	A-2-6(1)	30	14	44.2	29.4	4.1	22.3	100	75	28	-	-
SS-639	25LT	286+00	28.30-29.80	A-7-6(7)	51	32	45.8	11.0	4.7	38.5	91	65	40	-	-
SS-640	40RT	2+00-Y5RPC	3.70-5.20	A-2-4(0)	26	10	63.8	18.1	5.0	13.2	89	49	17	-	-
SS-641	40RT	2+00-Y5RPC	8.70-10.20	A-7-6(5)	46	23	22.7	36.5	12.4	28.4	96	81	41	12.2	-
SS-642	40RT	2+00-Y5RPC	13.70-15.20	A-2-7(1)	45	27	66.1	12.1	3.5	18.3	100	70	22	17.6	-
SS-643	40RT	2+00-Y5RPC	18.70-20.20	A-2-7(2)	56	37	66.2	8.6	2.8	22.3	94	50	24	-	-
SS-644	40RT	2+00-Y5RPC	23.70-25.20	A-2-6(1)	40	22	59.1	16.8	4.8	19.3	86	51	21	-	-
SS-645	40RT	2+00-Y5RPC	28.70-30.20	A-2-7(8)	69	48	52.8	8.4	6.3	32.5	88	55	35	-	-
SS-646	40RT	2+00-Y5RPC	33.70-35.20	A-6(5)	38	23	31.0	26.2	8.3	34.5	100	87	44	-	-
SS-647	40RT	2+00-Y5RPC	38.70-40.20	A-7-6(15)	69	46	45.4	8.4	7.6	38.5	98	67	46	-	-
SS-648	40RT	2+00-Y5RPC	43.70-45.20	A-7-6(13)	74	53	51.4	5.7	2.3	40.6	95	56	41	-	-
SS-649	40RT	2+00-Y5RPC	48.70-50.20	A-6(11)	40	24	21.1	23.7	12.6	42.6	100	87	59	-	-
SS-160	75LT	290+00	4.10-5.60	A-2-7(1)	42	20	58.5	12.8	3.4	25.2	91	52	27	-	-
SS-161	75LT	290+00	9.10-10.60	A-2-6(1)	32	16	61.3	13.9	2.6	22.2	93	58	24	-	-
SS-162	75LT	290+00	14.10-15.60	A-2-7(1)	41	22	61.8	14.1	2.9	21.2	95	54	24	-	-
SS-163	75LT	290+00	19.10-20.60	A-7-6(13)	44	26	24.4	19.6	11.6	44.4	100	86	60	-	-
SS-164	75LT	290+00	24.10-25.60	A-7-6(11)	48	30	23.2	25.8	6.6	44.4	99	86	52	-	-
SS-165	75LT	290+00	29.10-30.60	A-2-7(4)	46	32	56.5	11.7	3.5	28.3	96	65	31	-	-
SS-166	75LT	290+00	34.10-35.60	A-2-6(1)	40	21	56.7	17.8	3.3	22.2	96	56	25	-	-
SS-167	75LT	290+00	39.10-40.60	A-7-6(9)	52	31	32.5	19.6	3.5	44.4	91	74	45	-	-
SS-168	75LT	290+00	44.10-45.60	A-6(10)	39	26	26.4	22	7.2	44.4	100	92	53	-	-
SS-169	75LT	290+00	49.10-50.60	A-2-6(0)	31	14	64.8	15.6	1.4	18.2	98	59	20	-	-
SS-170	75LT	290+00	54.10-55.60	A-7-6(27)	58	37	25.4	11.1	7.0	56.5	100	84	73	-	-
SS-171	75LT	290+00	59.10-60.60	A-7-6(18)	43	28	13.1	18.2	20.3	48.4	98	91	72	-	-
SS-650	10RT	5+00-Y5RPC	3.80-5.30	A-2-4(0)	15	NP	63.8	27.3	3.9	5.1	97	59	11	-	-
SS-651	10RT	5+00-Y5RPC	8.80-10.30	A-2-7(4)	60	35	61.9	7.5	4.3	26.4	95	52	29	-	-
SS-652	10RT	5+00-Y5RPC	13.80-15.30	A-7-6(11)	59	35	35.5	20.5	5.5	38.5	99	75	46	-	-
SS-653	10RT	5+00-Y5RPC	18.80-20.30	A-7-6(33)	56	36	7.1	10.1	23.9	58.8	100	96	86	-	-
SS-655	10RT	5+00-Y5RPC	33.80-35.30	A-7-6(24)	52	34	15.8	12.2	23.3	48.7	100	90	74	-	-
SS-654	10RT	5+00-Y5RPC	38.80-40.30	A-2-7(3)	52	35	65.0	9.2	2.4	23.3	93	46	25	-	-

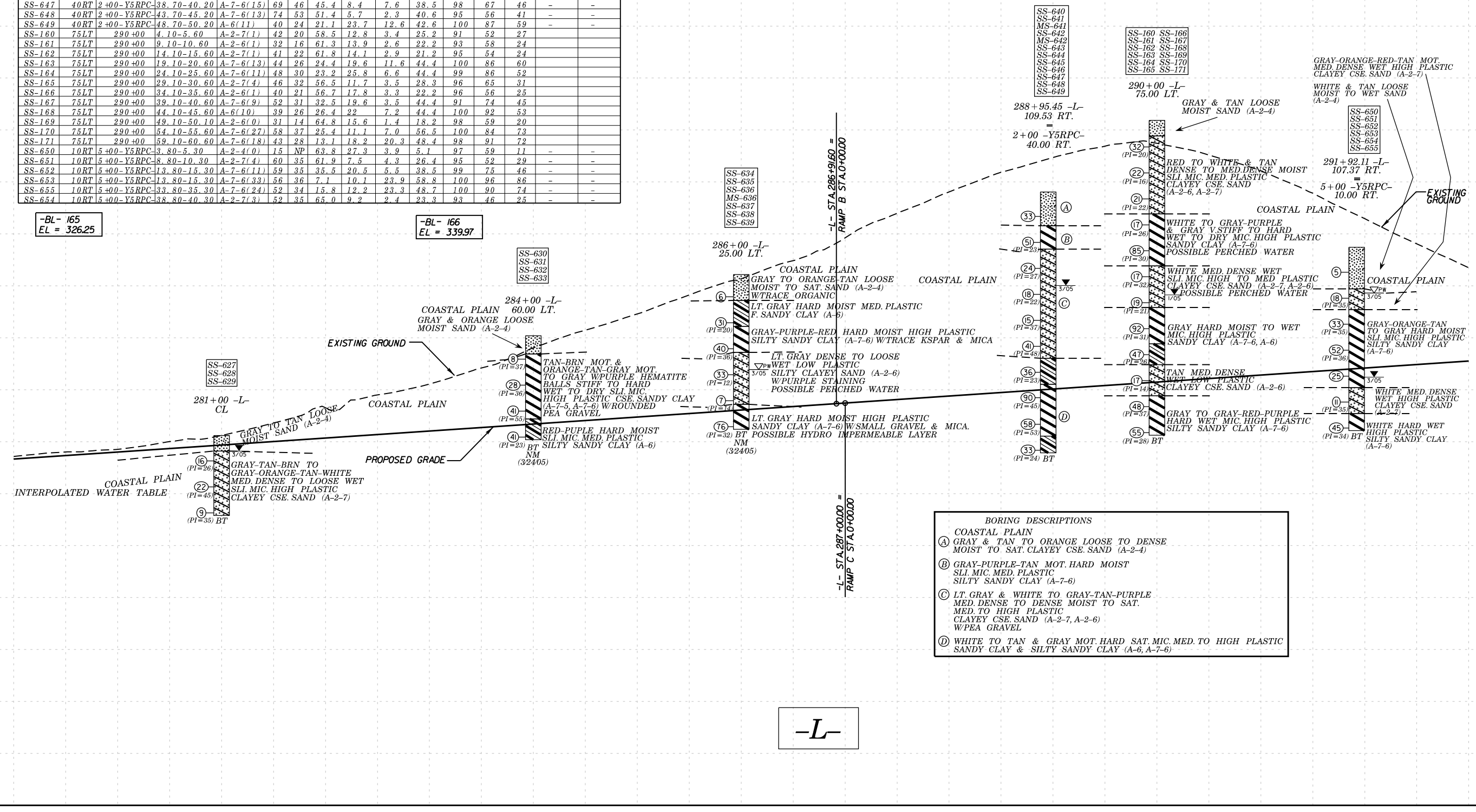
BM *22 EL = 355.28'
-L- STA.286+37.62, 213.61 RT.
RR SPIKE ON BASE OF 6' PINE

-BL- 167
EL = 367.98

-BL- 168
EL = 387.12

-BL- 165
EL = 326.25

-BL- 166
EL = 339.97



- BORING DESCRIPTIONS**
- (A) COASTAL PLAIN
GRAY & TAN TO ORANGE LOOSE TO DENSE
MOIST TO SAT. CLAYEY CSE. SAND (A-2-4)
 - (B) GRAY-PURPLE-TAN MOT. HARD MOIST
SLI. MIC. MED. PLASTIC
SILTY SANDY CLAY (A-7-6)
 - (C) LT. GRAY & WHITE TO GRAY-TAN-PURPLE
MED. DENSE TO DENSE MOIST TO SAT.
MED. TO HIGH PLASTIC
CLAYEY CSE. SAND (A-2-7, A-2-6)
WPEA GRAVEL
 - (D) WHITE TO TAN & GRAY MOT. HARD SAT. MIC. MED. TO HIGH PLASTIC
SANDY CLAY & SILTY SANDY CLAY (A-6, A-7-6)

-L-

279+00 280+00 281+00 282+00 283+00 284+00 285+00 286+00 287+00 288+00 289+00 290+00 291+00 292+00 293+00

5/14/99

PROJECT REFERENCE NO.		SHEET NO.	
R-3421B		36	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER		
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION			
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			

SOIL TEST RESULTS

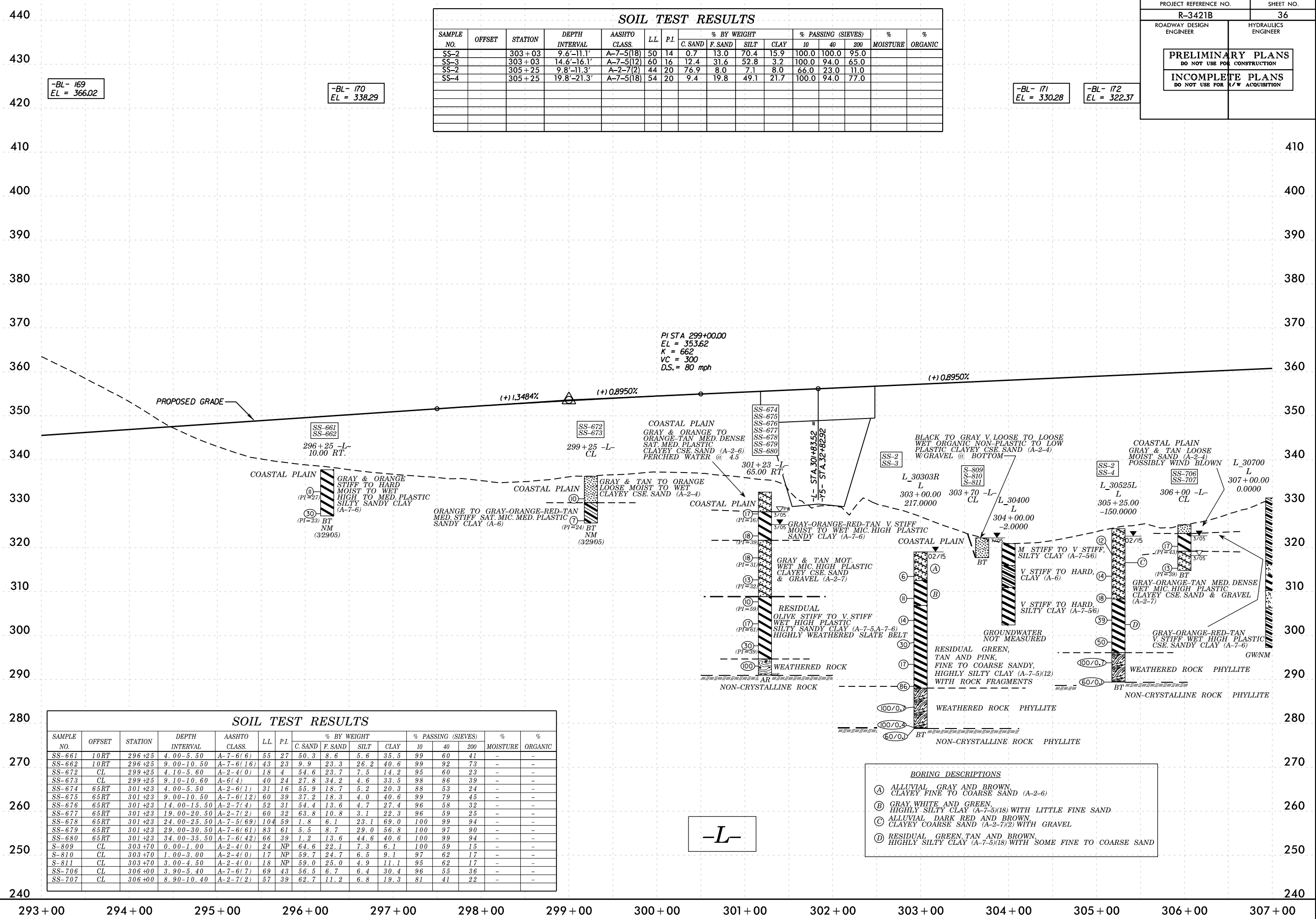
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2		303+03	9.6'-11.1'	A-7-5(18)	50	14	0.7	13.0	70.4	15.9	100.0	100.0	95.0		
SS-3		303+03	14.6'-16.1'	A-7-5(12)	60	16	12.4	31.6	52.8	3.2	100.0	94.0	65.0		
SS-2		305+25	9.8'-11.3'	A-2-7(2)	44	20	76.9	8.0	7.1	8.0	66.0	23.0	11.0		
SS-4		305+25	19.8'-21.3'	A-7-5(18)	54	20	9.4	19.8	49.1	21.7	100.0	94.0	77.0		

-BL- 169
EL = 366.02

-BL- 170
EL = 338.29

-BL- 171
EL = 330.28

-BL- 172
EL = 322.37



- BORING DESCRIPTIONS**
- (A) ALLUVIAL GRAY AND BROWN, CLAYEY FINE TO COARSE SAND (A-2-6)
 - (B) GRAY, WHITE AND GREEN, HIGHLY SILTY CLAY (A-7-5(18)) WITH LITTLE FINE SAND
 - (C) ALLUVIAL DARK RED AND BROWN, CLAYEY COARSE SAND (A-2-7(2)) WITH GRAVEL
 - (D) RESIDUAL GREEN, TAN AND BROWN, HIGHLY SILTY CLAY (A-7-5(18)) WITH SOME FINE TO COARSE SAND

-L-

15:50 PM C:\p00\cf1\psh24_HDR.dgn

BM *24 EL = 354.26'
-L- STA. 315+96.71, 193.54 LT.
RR SPIKE ON BASE OF 20' PINE

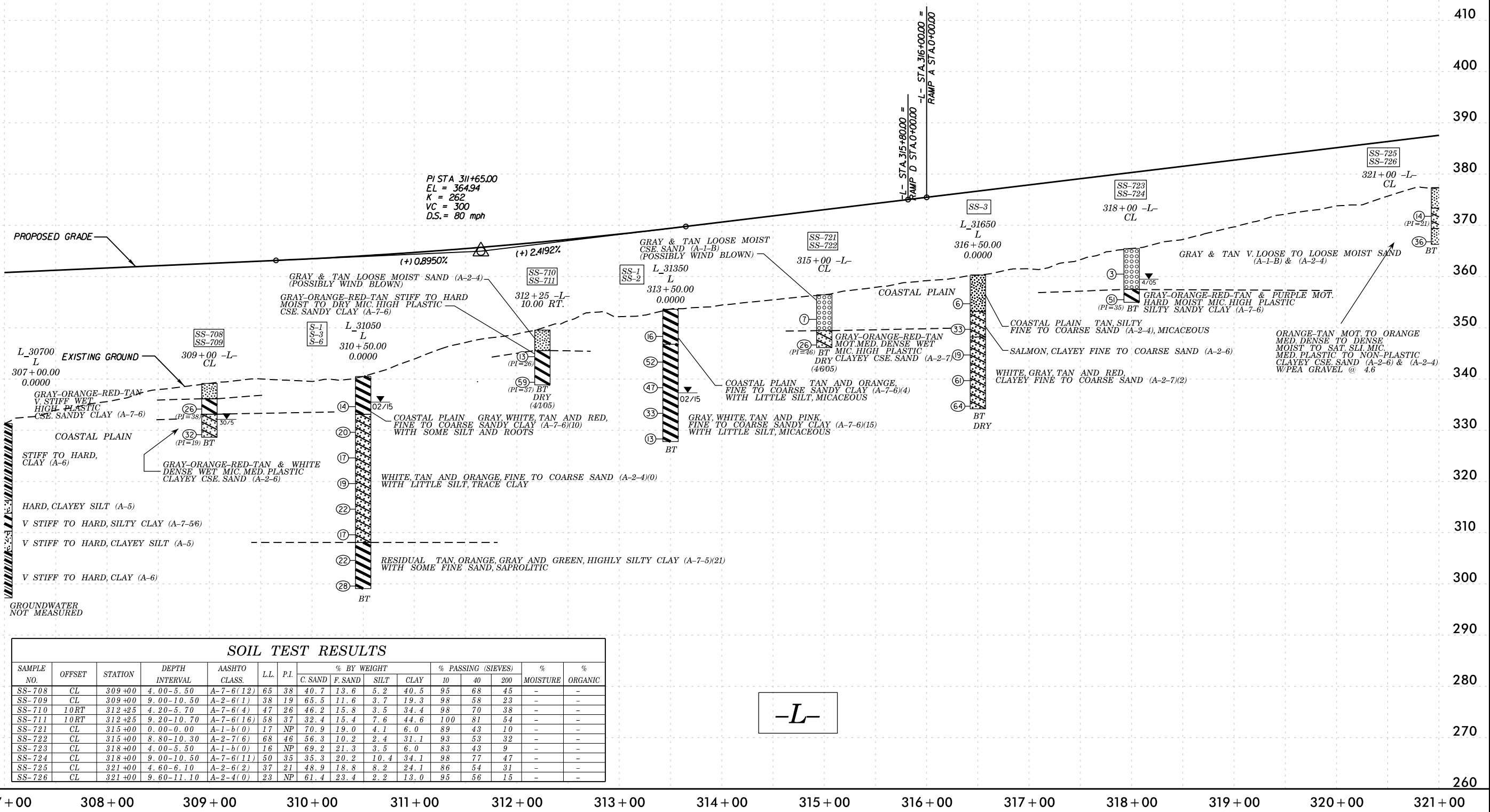
-BL- 173
EL = 336.18

-BL- 174
EL = 349.02

-BL- 175
EL = 358.90

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	CL	310+50	4.9'-6.4'	A-7-6(10)	43	19	21.9	19.2	21.1	37.8	100.0	88.0	63.0		
SS-3	CL	310+50	14.9'-16.4'	A-2-4(0)	27	3	68.8	11.3	8.4	11.5	99.0	52.0	21.0		
SS-6	CL	310+50	34.9'-36.4'	A-7-5(21)	54	22	4.3	23.5	54.3	18.0	100.0	97.0	82.0		
SS-1	CL	313+50	4.3'-5.8'	A-7-6(4)	48	23	49.5	9.8	13.8	26.9	95.0	59.0	40.0		
SS-2	CL	313+50	9.3'-10.8'	A-7-6(15)	46	22	16.3	15.2	17.6	50.9	100.0	91.0	72.0		
SS-3	CL	316+50	14.6'-16.1'	A-2-7(2)	42	21	57.0	58.4	24.6	46.1	98.0	60.0	29.0		

5/14/99



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-708	CL	309+00	4.00-5.50	A-7-6(12)	65	38	40.7	13.6	5.2	40.5	95	68	45	-	-
SS-709	CL	309+00	9.00-10.50	A-2-6(1)	38	19	65.5	11.6	3.7	19.3	98	58	23	-	-
SS-710	10RT	312+25	4.20-5.70	A-7-6(4)	47	26	46.2	15.8	3.5	34.4	98	70	38	-	-
SS-711	10RT	312+25	9.20-10.70	A-7-6(16)	58	37	32.4	15.4	7.6	44.6	100	81	54	-	-
SS-721	CL	315+00	0.00-0.00	A-1-b(0)	17	NP	70.9	19.0	4.1	6.0	89	43	10	-	-
SS-722	CL	315+00	8.80-10.30	A-2-7(6)	68	46	56.3	10.2	2.4	31.1	93	53	32	-	-
SS-723	CL	318+00	4.00-5.50	A-1-b(0)	16	NP	69.2	21.3	3.5	6.0	83	43	9	-	-
SS-724	CL	318+00	9.00-10.50	A-7-6(11)	50	35	35.3	20.2	10.4	34.1	98	77	47	-	-
SS-725	CL	321+00	4.60-6.10	A-2-6(2)	37	21	48.9	18.8	8.2	24.1	86	54	31	-	-
SS-726	CL	321+00	9.60-11.10	A-2-4(0)	23	NP	61.4	23.4	2.2	13.0	95	56	15	-	-

-L-

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510
500
490
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390
380
370
360
350
340
330
320
310

SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE	ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-725	CL	321+00	4.60-6.10	A-2-6(2)	37	21	48.9	18.8	8.2	24.1	86	54	31	-	-
SS-726	CL	321+00	9.60-11.10	A-2-4(0)	23	NP	61.4	23.4	2.2	13.0	95	56	15	-	-
SS-727	CL	324+00	4.00-5.50	A-2-7(3)	52	27	55.1	8.6	5.2	31.1	89	49	33	-	-
SS-728	CL	324+00	9.00-10.50	A-2-4(0)	35	10	62.5	15.4	5.0	17.1	100	58	23	-	-
SS-729	CL	324+00	14.00-15.50	A-2-7(1)	48	26	72.5	6.3	2.1	19.1	94	36	20	-	-
SS-730	CL	324+00	19.00-20.50	A-2-4(0)	19	NP	26.0	52.3	7.7	14.0	100	90	26	-	-
SS-731	CL	324+00	24.00-25.50	A-2-4(0)	20	NP	58.6	25.4	6.0	10.0	98	53	18	-	-
SS-732	15LT	326+00	4.10-5.60	A-1-b(0)	20	NP	68.8	14.9	3.2	13.0	90	42	16	-	-
SS-733	15LT	326+00	9.10-10.60	A-2-6(0)	33	11	56.2	18.8	6.0	19.1	89	58	23	-	-
SS-734	15LT	326+00	14.10-15.60	A-2-4(0)	26	NP	65.2	15.3	6.4	13.0	98	57	20	-	-
SS-735	15LT	326+00	19.10-20.60	A-1-b(0)	20	NP	75.2	14.6	0.1	10.0	94	47	11	-	-
SS-736	CL	328+00	3.30-4.80	A-2-6(1)	32	16	57.5	17.6	4.9	20.1	95	62	25	-	-
SS-737	CL	328+00	8.30-9.80	A-2-7(1)	41	23	56.6	17.6	4.8	21.1	97	62	26	-	-
SS-738	CL	328+00	13.30-14.80	A-2-4(0)	24	4	69.0	12.0	4.9	14.0	100	65	20	-	-
SS-739	CL	328+00	18.30-19.80	A-2-7(0)	46	23	70.0	9.4	5.5	15.0	77	29	17	-	-
SS-740	CL	328+00	23.30-24.80	A-2-4(0)	23	NP	64.7	17.3	4.0	14.0	95	69	18	-	-
SS-741	15RT	330+00	3.70-5.20	A-2-7(2)	41	22	57.4	12.0	3.5	27.1	95	59	30	-	-
SS-742	15RT	330+00	8.70-10.20	A-2-7(3)	49	27	54.7	14.8	4.4	26.1	94	59	30	-	-
SS-743	15RT	330+00	13.70-15.20	A-2-4(0)	23	4	62.0	20.8	2.2	15.0	97	59	17	-	-
SS-744	15RT	330+00	18.70-20.20	A-2-4(0)	25	NP	55.6	28.8	2.6	13.0	100	72	16	-	-
SS-745	15RT	330+00	23.70-25.20	A-2-7(1)	58	38	74.2	6.6	1.1	18.1	96	32	19	-	-
SS-746	15RT	330+00	28.70-30.20	A-1-b(0)	23	NP	77.3	10.4	3.2	9.0	98	45	13	-	-
SS-747	15RT	330+00	33.70-35.20	A-2-4(0)	29	9	67.9	14.3	5.7	12.0	87	44	16	-	-
SS-748	15RT	330+00	38.70-40.20	A-2-4(0)	28	7	78.0	6.9	2.0	13.0	95	35	15	-	-
SS-749	15RT	330+00	43.70-45.20	A-1-b(0)	27	5	68.2	14.0	3.7	14.0	91	48	17	-	-
SS-750	CL	331+50	4.30-5.80	A-2-4(0)	17	NP	59.2	29.3	3.5	8.0	99	66	13	-	-
SS-751	CL	331+50	9.30-10.80	A-2-7(1)	44	24	66.2	8.8	2.9	22.1	95	49	24	-	-
SS-752	CL	331+50	14.30-15.80	A-1-b(0)	28	5	71.6	13.2	1.1	14.0	99	47	15	-	-
SS-753	CL	331+50	19.30-20.80	A-2-4(0)	25	NP	72.6	13.6	1.7	12.0	100	51	14	-	-
SS-754	CL	331+50	24.30-25.80	A-2-6(0)	35	16	76.6	8.4	1.9	13.0	95	31	15	-	-
SS-755	CL	331+50	29.30-30.80	A-2-4(0)	26	3	44.9	34.3	2.7	18.1	100	73	22	-	-
SS-756	CL	331+50	34.30-35.80	A-2-6(0)	33	14	72.8	10.0	3.1	14.0	100	35	18	-	-
SS-757	CL	331+50	39.30-40.80	A-2-4(0)	24	NP	68.6	15.6	1.7	14.0	100	61	17	-	-

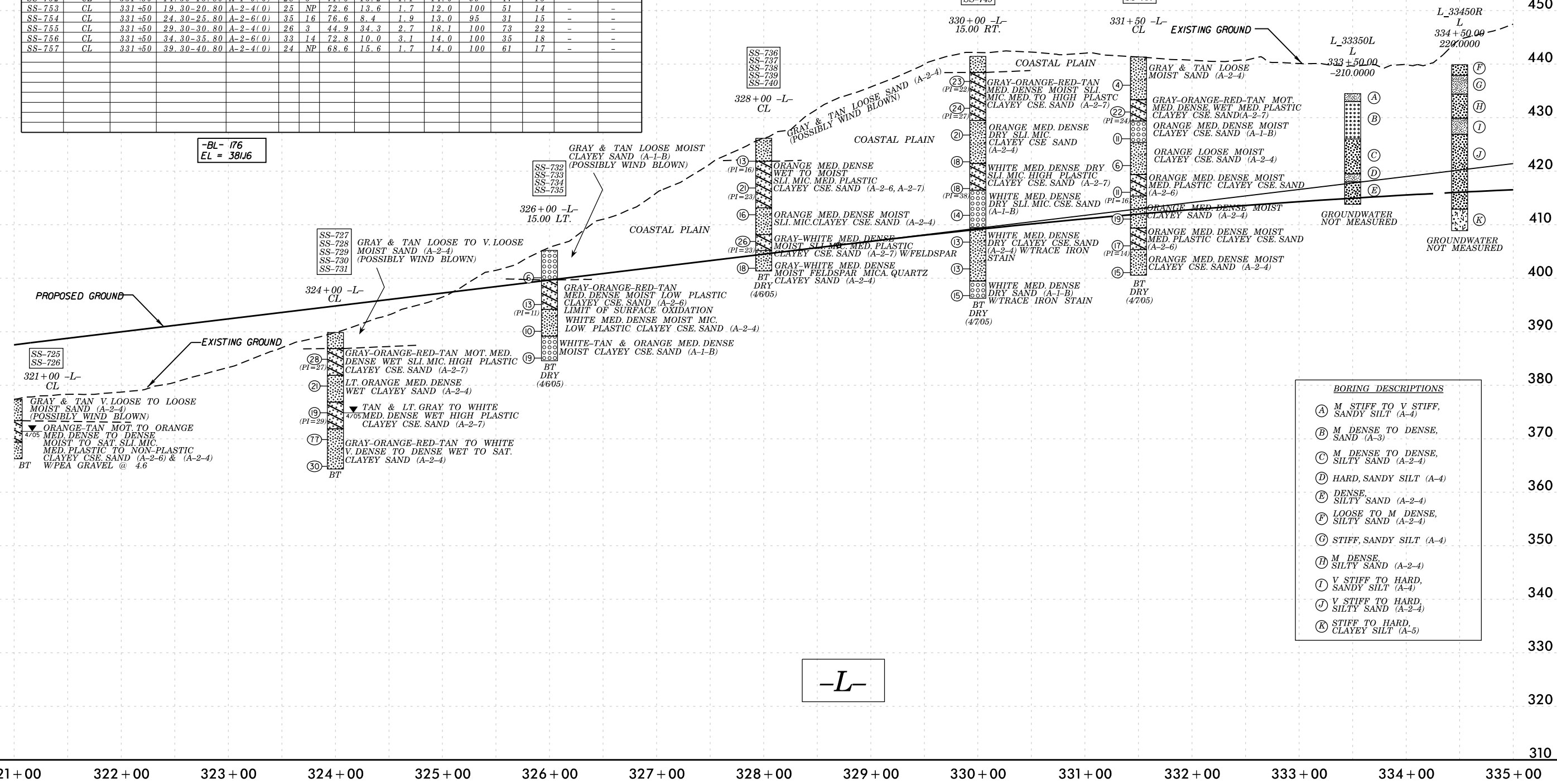
-BL- 177
EL = 412.09

BM *25 EL = 420.38
-L- STA. 332+38.28, 409.40 LT.
RR SPIKE ON BASE OF POWER POLE

-BL- 178
EL = 441.42

-BL- 179
EL = 439.77

-BL- 176
EL = 381.6

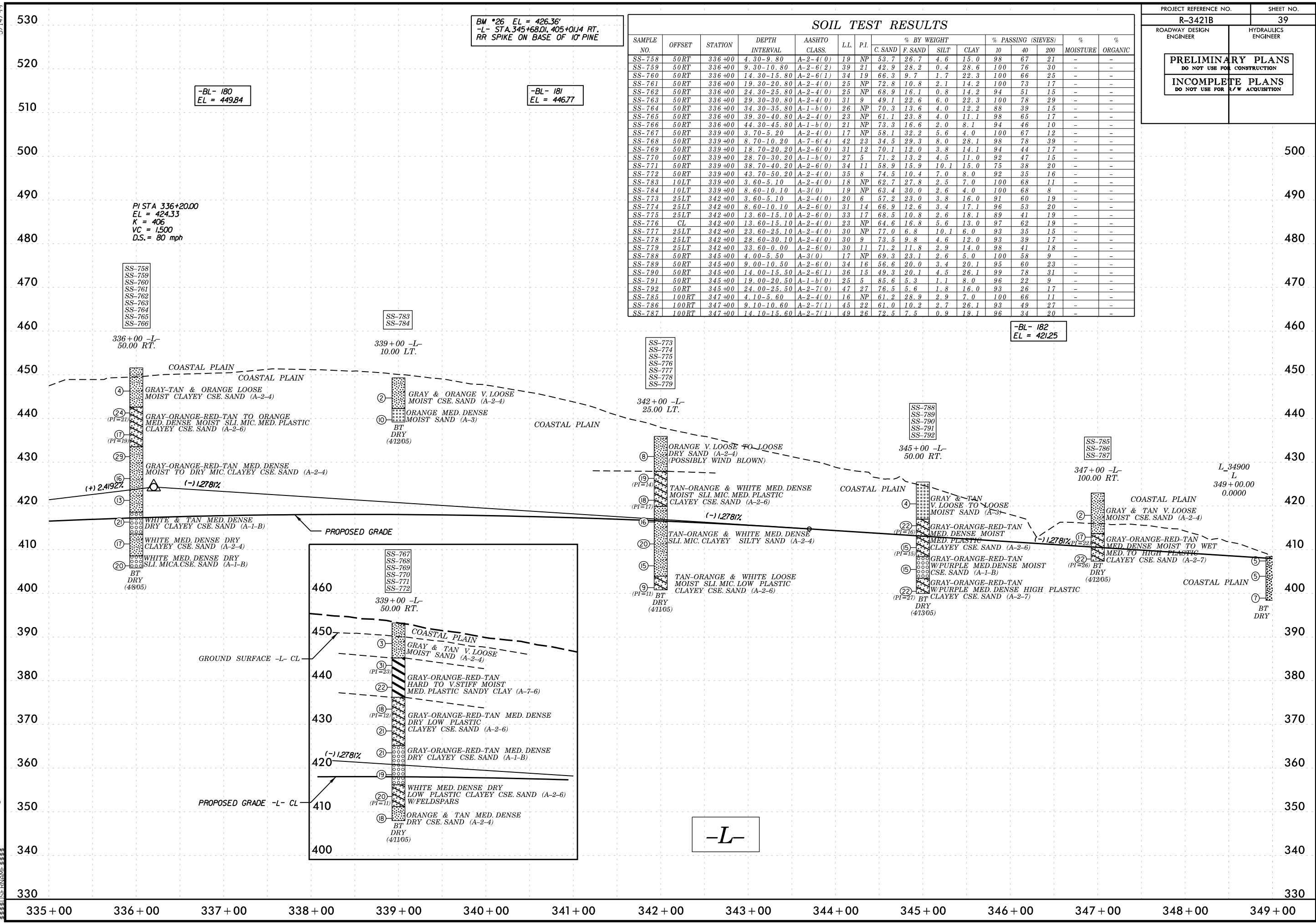


- #### BORING DESCRIPTIONS
- (A) M STIFF TO V STIFF, SANDY SILT (A-4)
 - (B) M DENSE TO DENSE, SAND (A-3)
 - (C) M DENSE TO DENSE, SILTY SAND (A-2-4)
 - (D) HARD, SANDY SILT (A-4)
 - (E) DENSE, SILTY SAND (A-2-4)
 - (F) LOOSE TO M DENSE, SILTY SAND (A-2-4)
 - (G) STIFF, SANDY SILT (A-4)
 - (H) M DENSE, SILTY SAND (A-2-4)
 - (I) V STIFF TO HARD, SANDY SILT (A-4)
 - (J) V STIFF TO HARD, SILTY SAND (A-2-4)
 - (K) STIFF TO HARD, CLAYEY SILT (A-5)

-L-

BM *26 EL = 426.36'
 -L- STA. 345+68.01, 405+01.4 RT.
 RR SPIKE ON BASE OF 10' PINE

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-758	50 RT	336+00	4.30-9.80	A-2-4(0)	19	NP	53.7	26.7	4.6	15.0	98	67	21	-	-
SS-759	50 RT	336+00	9.30-10.80	A-2-6(2)	39	21	42.9	28.2	0.4	28.6	100	76	30	-	-
SS-760	50 RT	336+00	14.30-15.80	A-2-6(1)	34	19	66.3	9.7	1.7	22.3	100	66	25	-	-
SS-761	50 RT	336+00	19.30-20.80	A-2-4(0)	25	NP	72.8	10.8	2.1	14.2	100	73	17	-	-
SS-762	50 RT	336+00	24.30-25.80	A-2-4(0)	25	NP	68.9	16.1	0.8	14.2	94	51	15	-	-
SS-763	50 RT	336+00	29.30-30.80	A-2-4(0)	31	9	49.1	22.6	6.0	22.3	100	78	29	-	-
SS-764	50 RT	336+00	34.30-35.80	A-1-b(0)	26	NP	70.3	13.6	4.0	12.2	88	39	15	-	-
SS-765	50 RT	336+00	39.30-40.80	A-2-4(0)	23	NP	61.1	23.8	4.0	11.1	98	65	17	-	-
SS-766	50 RT	336+00	44.30-45.80	A-1-b(0)	21	NP	73.3	16.6	2.0	8.1	94	46	10	-	-
SS-767	50 RT	339+00	3.70-5.20	A-2-4(0)	17	NP	58.1	32.2	5.6	4.0	100	67	12	-	-
SS-768	50 RT	339+00	8.70-10.20	A-7-6(4)	42	23	34.5	29.3	8.0	28.1	98	78	39	-	-
SS-769	50 RT	339+00	18.70-20.20	A-2-6(0)	31	12	70.1	12.0	3.8	14.1	94	44	17	-	-
SS-770	50 RT	339+00	28.70-30.20	A-1-b(0)	27	5	71.2	13.2	4.5	11.0	92	47	15	-	-
SS-771	50 RT	339+00	38.70-40.20	A-2-6(0)	34	11	58.9	15.9	10.1	15.0	75	38	20	-	-
SS-772	50 RT	339+00	43.70-50.20	A-2-4(0)	35	8	74.5	10.4	7.0	8.0	92	35	16	-	-
SS-783	10 LT	339+00	3.60-5.10	A-2-4(0)	18	NP	62.7	27.8	2.5	7.0	100	68	11	-	-
SS-784	10 LT	339+00	8.60-10.10	A-3(0)	19	NP	63.4	30.0	2.6	4.0	100	68	8	-	-
SS-773	25 LT	342+00	3.60-5.10	A-2-4(0)	20	6	57.2	23.0	3.8	16.0	91	60	19	-	-
SS-774	25 LT	342+00	8.60-10.10	A-2-6(0)	31	14	66.9	12.6	3.4	17.1	96	53	20	-	-
SS-775	25 LT	342+00	13.60-15.10	A-2-6(0)	33	17	68.5	10.8	2.6	18.1	89	41	19	-	-
SS-776	CL	342+00	13.60-15.10	A-2-4(0)	23	NP	64.6	16.8	5.6	13.0	97	62	19	-	-
SS-777	25 LT	342+00	23.60-25.10	A-2-4(0)	30	NP	77.0	6.8	10.1	6.0	93	35	15	-	-
SS-778	25 LT	342+00	28.60-30.10	A-2-4(0)	30	9	73.5	9.8	4.6	12.0	93	39	17	-	-
SS-779	25 LT	342+00	33.60-0.00	A-2-6(0)	30	11	71.2	11.8	2.9	14.0	98	41	18	-	-
SS-788	50 RT	345+00	4.00-5.50	A-3(0)	17	NP	69.3	23.1	2.6	5.0	100	58	9	-	-
SS-789	50 RT	345+00	9.00-10.50	A-2-6(0)	34	16	56.6	20.0	3.4	20.1	95	60	23	-	-
SS-790	50 RT	345+00	14.00-15.50	A-2-6(1)	36	15	49.3	20.1	4.5	26.1	99	78	31	-	-
SS-791	50 RT	345+00	19.00-20.50	A-1-b(0)	25	5	85.6	5.3	1.1	8.0	96	22	9	-	-
SS-792	50 RT	345+00	24.00-25.50	A-2-7(0)	47	27	76.5	5.6	1.8	16.0	93	26	17	-	-
SS-785	100 RT	347+00	4.10-5.60	A-2-4(0)	16	NP	61.2	28.9	2.9	7.0	100	66	11	-	-
SS-786	100 RT	347+00	9.10-10.60	A-2-7(1)	45	22	61.0	10.2	2.7	26.1	93	49	27	-	-
SS-787	100 RT	347+00	14.10-15.60	A-2-7(1)	49	26	72.5	7.5	0.9	19.1	96	34	20	-	-



-BL- 180
 EL = 449.84

-BL- 181
 EL = 446.77

-BL- 182
 EL = 421.25

-L-

PI STA 336+20.00
 EL = 424.33
 K = 406
 VC = 1,500
 D.S. = 80 mph

SS-758
 SS-759
 SS-760
 SS-761
 SS-762
 SS-763
 SS-764
 SS-765
 SS-766

SS-783
 SS-784

SS-773
 SS-774
 SS-775
 SS-776
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 SS-778
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SS-788
 SS-789
 SS-790
 SS-791
 SS-792

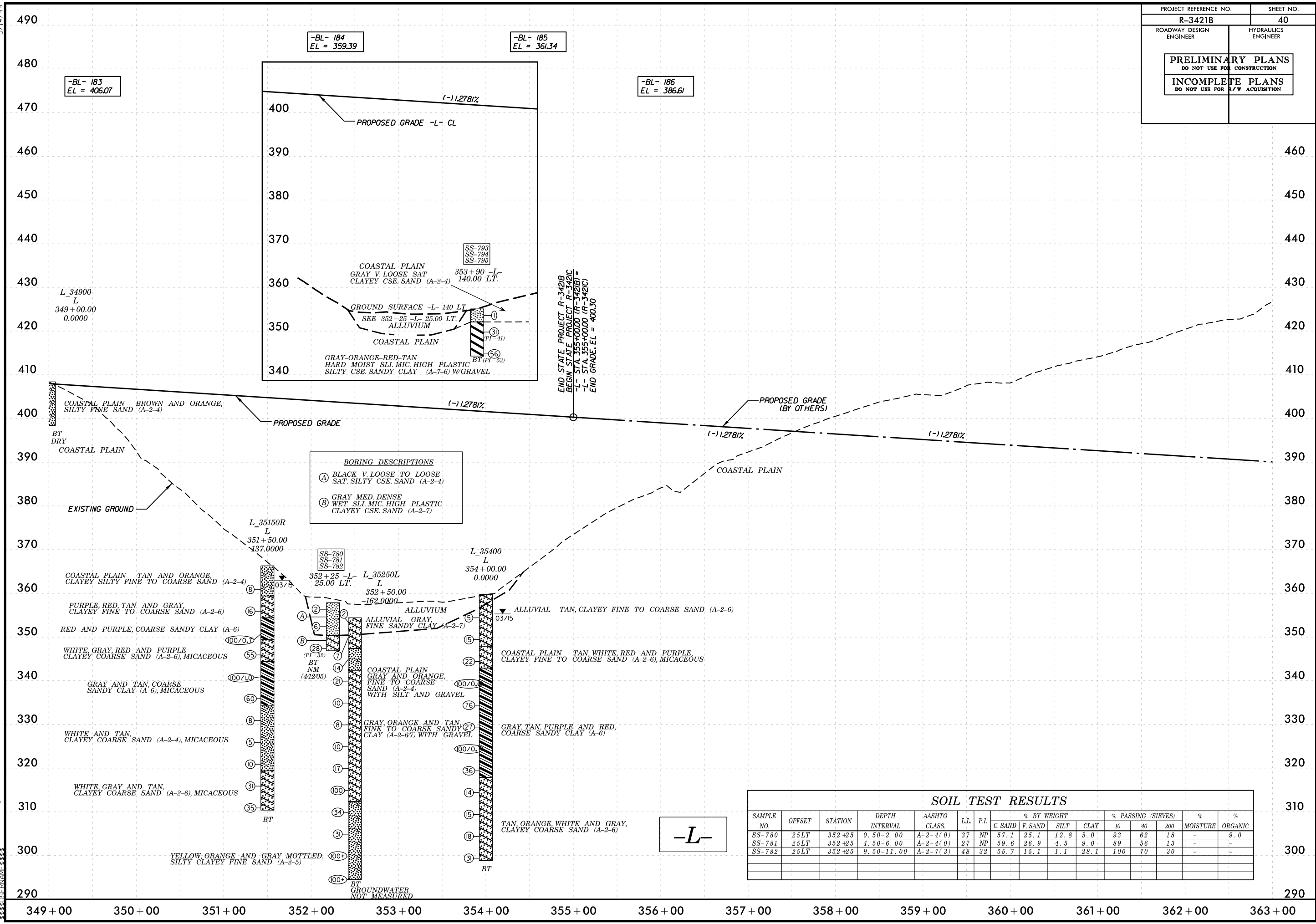
SS-785
 SS-786
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SS-767
 SS-768
 SS-769
 SS-770
 SS-771
 SS-772

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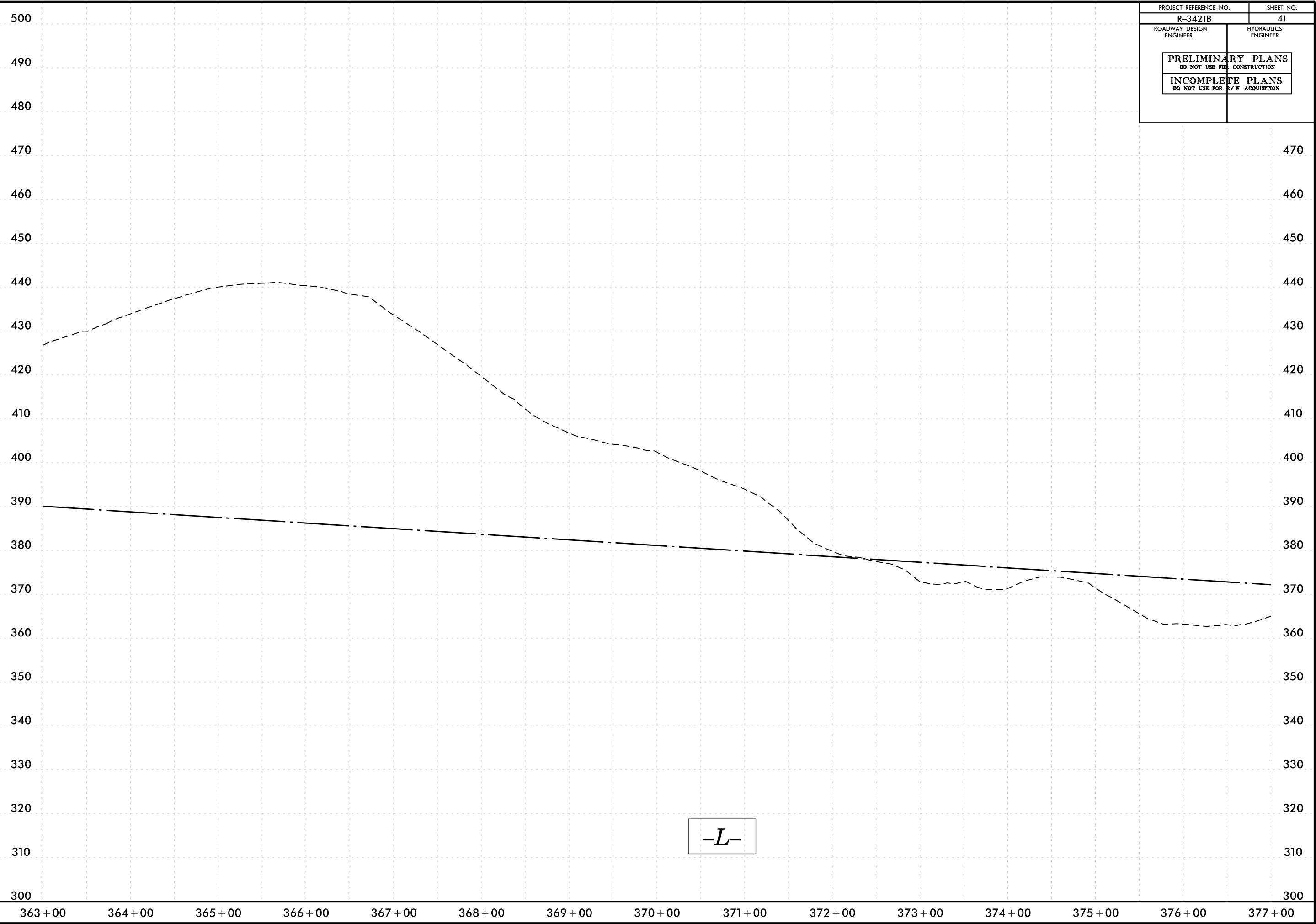
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R-3421B		40	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
PRELIMINARY PLANS			
DO NOT USE FOR CONSTRUCTION			
INCOMPLETE PLANS			
DO NOT USE FOR R/W ACQUISITION			



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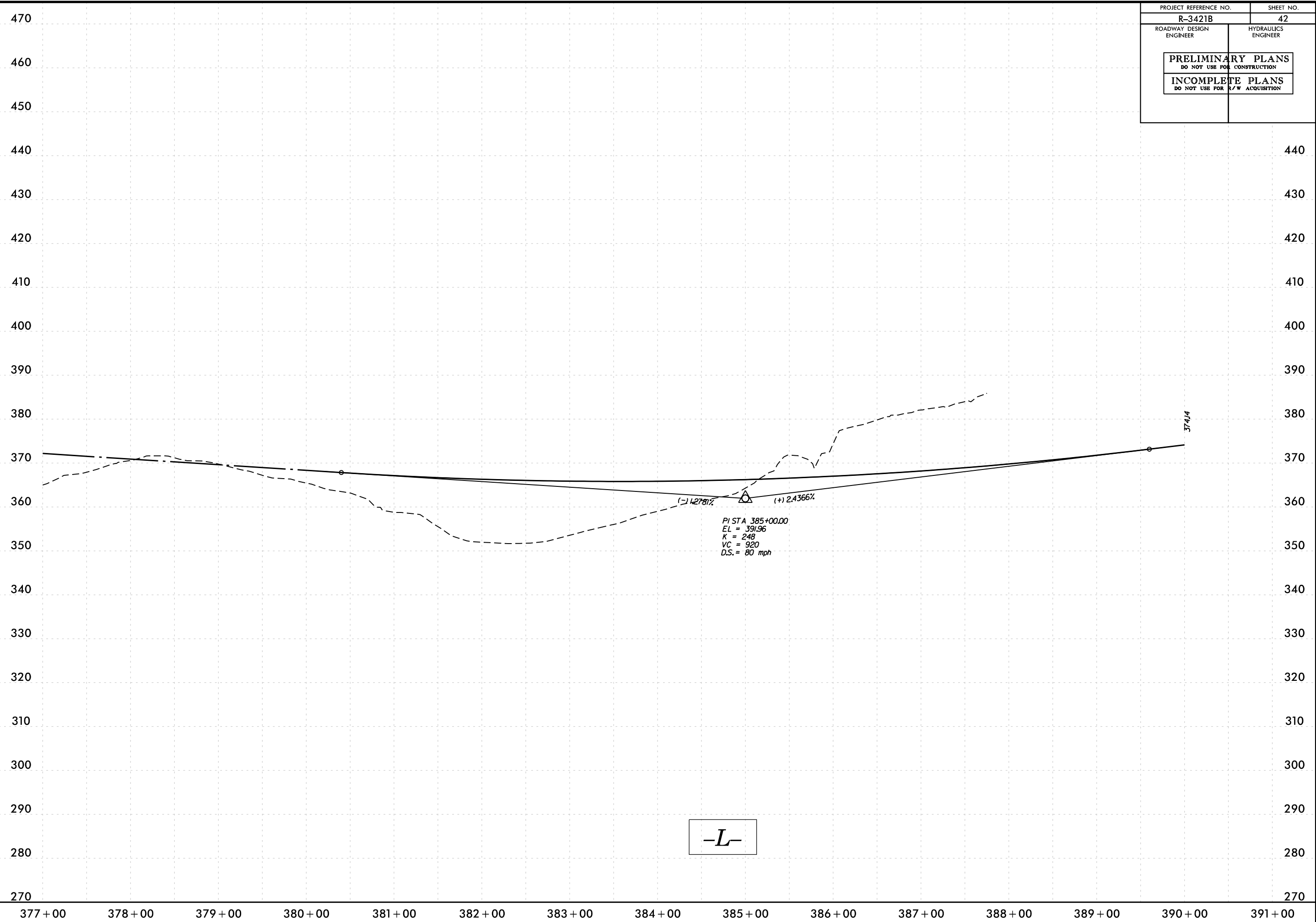
PROJECT REFERENCE NO.	SHEET NO.
R-3421B	41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



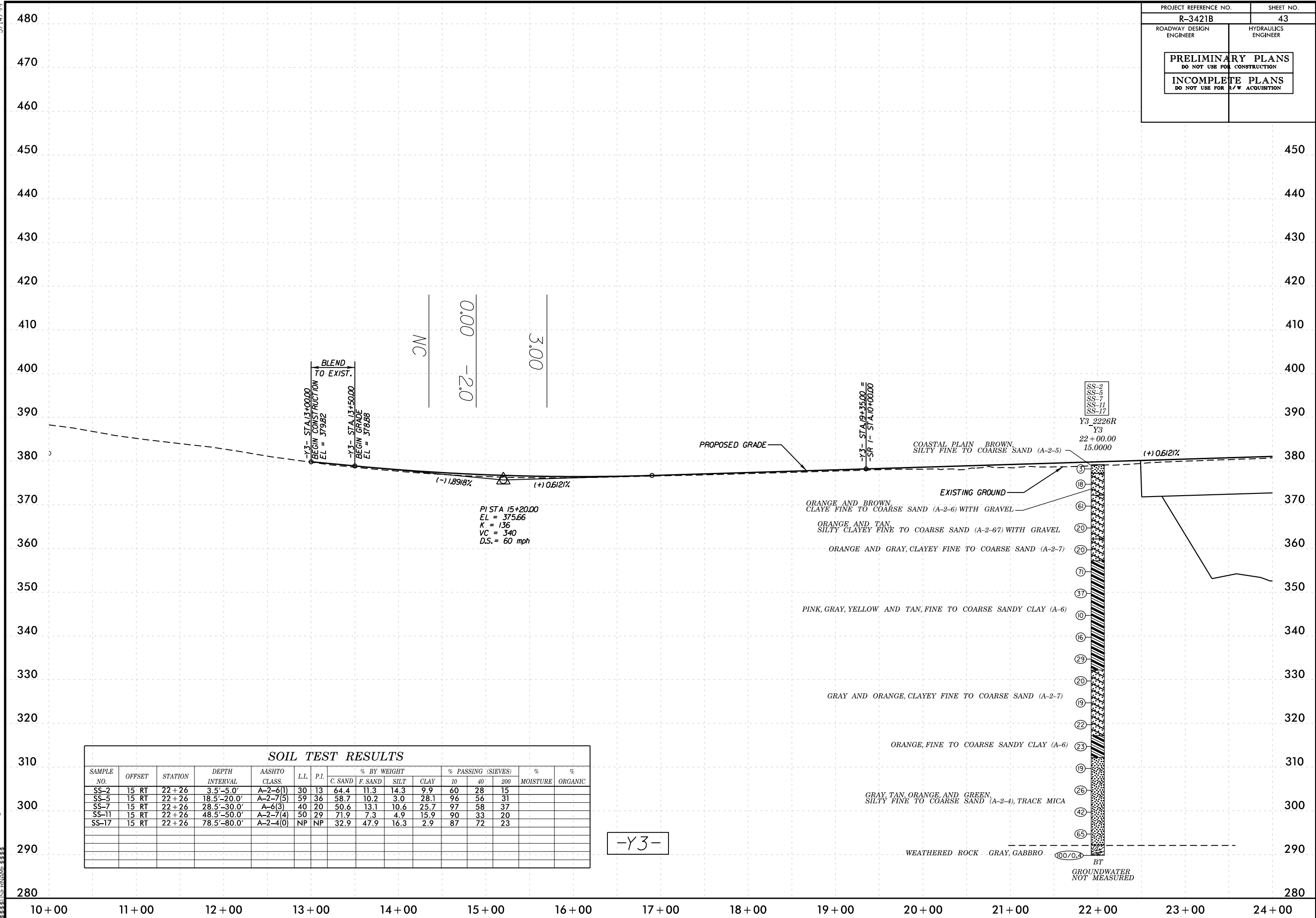
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5/14/99

PROJECT REFERENCE NO. R-3421B	SHEET NO. 42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



R-3421B_Plan_0_of_11_pch24_HDR.dgn



SOIL TEST RESULTS

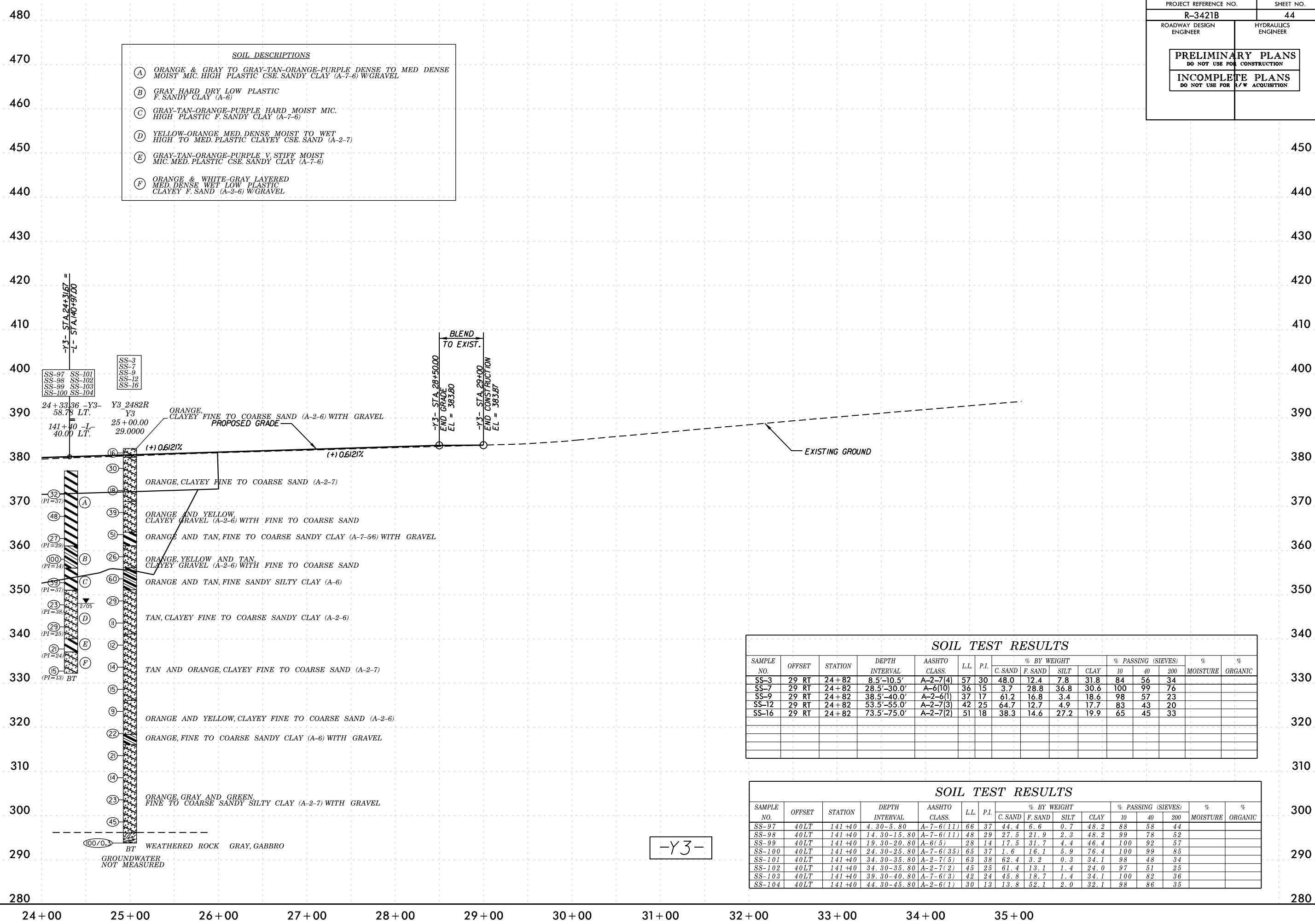
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-2	15 RT	22 + 26	3.5'-5.0'	A-2-6(1)	30	13	64.4	11.3	14.3	9.9	60	28	15		
SS-5	15 RT	22 + 26	18.5'-20.0'	A-2-7(5)	59	36	58.7	10.2	3.0	28.1	96	56	31		
SS-7	15 RT	22 + 26	28.5'-30.0'	A-6(3)	40	20	50.6	13.1	10.6	25.7	97	58	37		
SS-11	15 RT	22 + 26	48.5'-50.0'	A-2-7(4)	50	29	71.9	7.3	4.9	15.9	90	33	20		
SS-17	15 RT	22 + 26	78.5'-80.0'	A-2-4(0)	NP	NP	32.9	47.9	16.3	2.9	87	72	23		

-Y3-

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5/14/99

PROJECT REFERENCE NO. R-3421B	SHEET NO. 44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

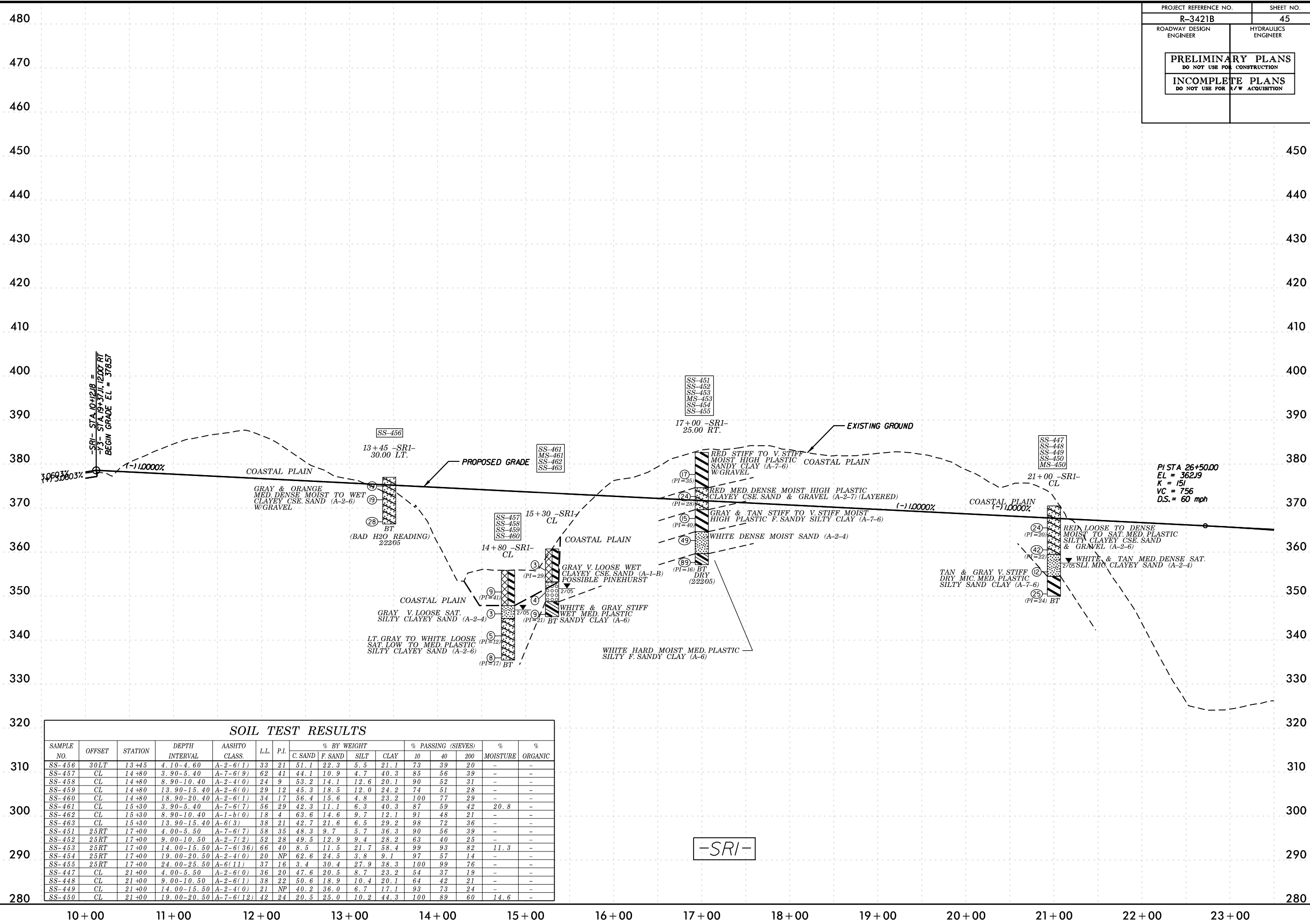


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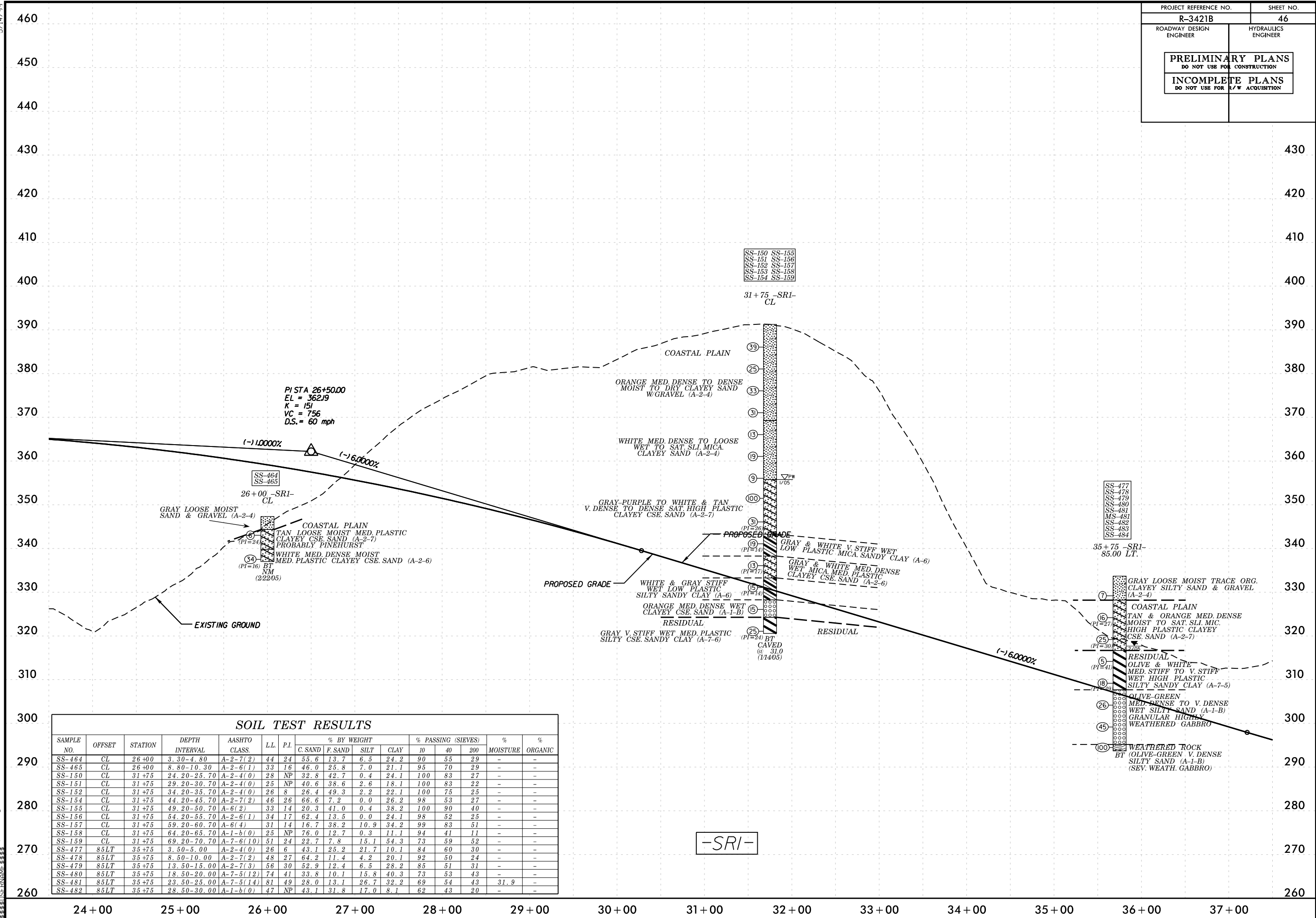
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PROJECT REFERENCE NO. R-3421B	SHEET NO. 45
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-456	30LT	13+45	4.10-4.60	A-2-6(1)	33	21	51.1	22.3	5.5	21.1	73	39	20	-	-
SS-457	CL	14+80	3.90-5.40	A-7-6(9)	62	41	44.1	10.9	4.7	40.3	85	56	39	-	-
SS-458	CL	14+80	8.90-10.40	A-2-4(0)	24	9	53.2	14.1	12.6	20.1	90	52	31	-	-
SS-459	CL	14+80	13.90-15.40	A-2-6(0)	29	12	45.3	18.5	12.0	24.2	74	51	28	-	-
SS-460	CL	14+80	18.90-20.40	A-2-6(1)	34	17	56.4	15.6	4.8	23.2	100	77	29	-	-
SS-461	CL	15+30	3.90-5.40	A-7-6(7)	56	29	42.3	11.1	6.3	40.3	87	59	42	20.8	-
SS-462	CL	15+30	8.90-10.40	A-1-b(0)	18	4	63.6	14.6	9.7	12.1	91	48	21	-	-
SS-463	CL	15+30	13.90-15.40	A-6(3)	38	21	42.7	21.6	6.5	29.2	98	72	36	-	-
SS-451	25RT	17+00	4.00-5.50	A-7-6(7)	58	35	48.3	9.7	5.7	36.3	90	56	39	-	-
SS-452	25RT	17+00	9.00-10.50	A-2-7(2)	52	28	49.5	12.9	9.4	28.2	63	40	25	-	-
SS-453	25RT	17+00	14.00-15.50	A-7-6(36)	66	40	8.5	11.5	21.7	58.4	99	93	82	11.3	-
SS-454	25RT	17+00	19.00-20.50	A-2-4(0)	20	NP	62.6	24.5	3.8	9.1	97	57	14	-	-
SS-455	25RT	17+00	24.00-25.50	A-6(11)	37	16	3.4	30.4	27.9	38.3	100	99	76	-	-
SS-447	CL	21+00	4.00-5.50	A-2-6(0)	36	20	47.6	20.5	8.7	23.2	54	37	19	-	-
SS-448	CL	21+00	9.00-10.50	A-2-6(1)	38	22	50.6	18.9	10.4	20.1	64	42	21	-	-
SS-449	CL	21+00	14.00-15.50	A-2-4(0)	21	NP	40.2	36.0	6.7	17.1	93	73	24	-	-
SS-450	CL	21+00	19.00-20.50	A-7-6(12)	42	24	20.5	25.0	10.2	44.3	100	89	60	14.6	-

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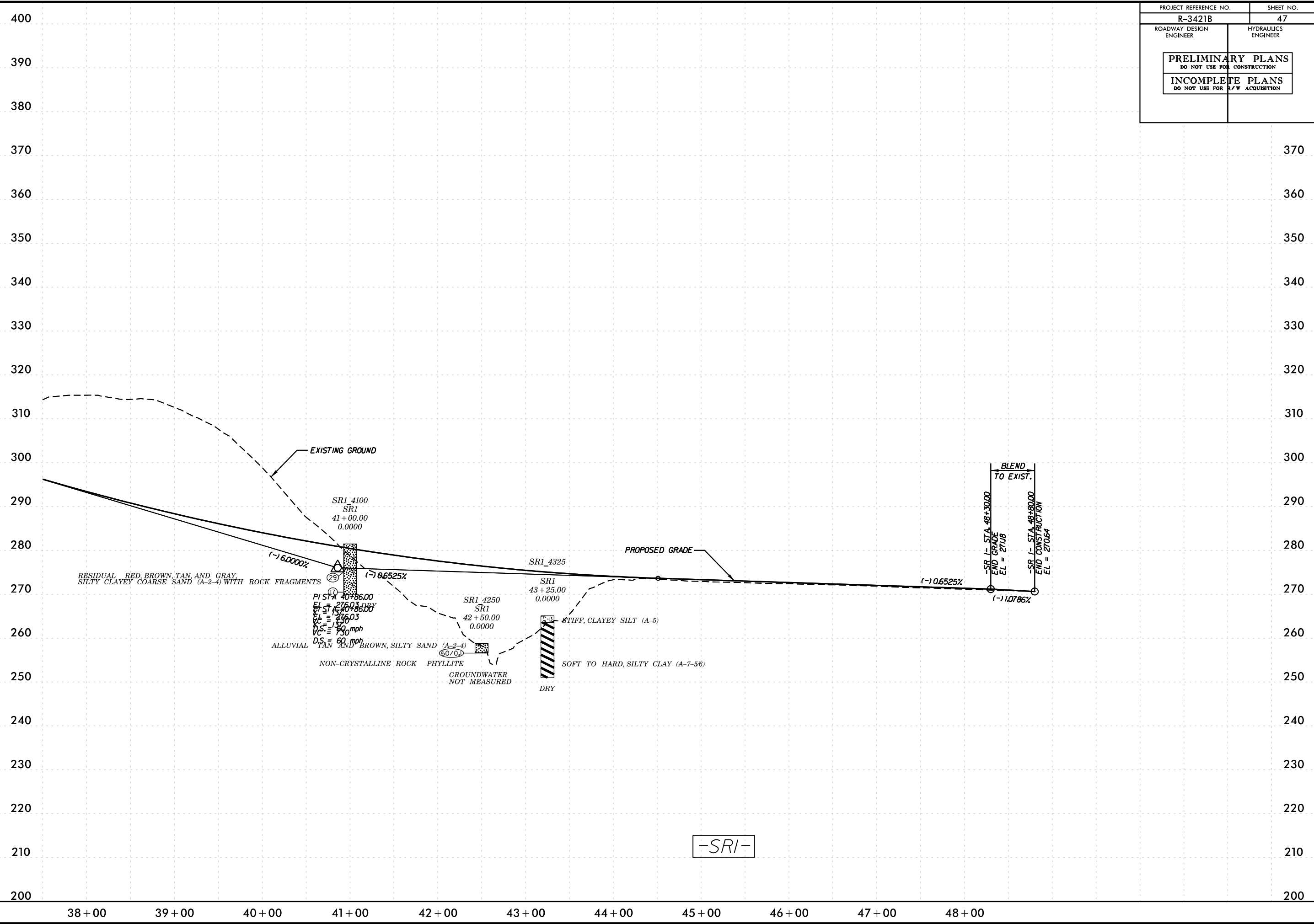
SOIL TEST RESULTS

SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-464	CL	26+00	3.30-4.80	A-2-7(2)	44	24	55.6	13.7	6.5	24.2	90	55	29	-	-
SS-465	CL	26+00	8.80-10.30	A-2-6(1)	33	16	46.0	25.8	7.0	21.1	95	70	29	-	-
SS-150	CL	31+75	24.20-25.70	A-2-4(0)	28	NP	32.8	42.7	0.4	24.1	100	83	27	-	-
SS-151	CL	31+75	29.20-30.70	A-2-4(0)	25	NP	40.6	38.6	2.6	18.1	100	83	22	-	-
SS-152	CL	31+75	34.20-35.70	A-2-4(0)	26	8	26.4	49.3	2.2	22.1	100	75	25	-	-
SS-154	CL	31+75	44.20-45.70	A-2-7(2)	46	26	66.6	7.2	0.0	26.2	98	53	27	-	-
SS-155	CL	31+75	49.20-50.70	A-6(2)	33	14	20.3	41.0	0.4	38.2	100	90	40	-	-
SS-156	CL	31+75	54.20-55.70	A-2-6(1)	34	17	62.4	13.5	0.0	24.1	98	52	25	-	-
SS-157	CL	31+75	59.20-60.70	A-6(4)	31	14	16.7	38.2	10.9	34.2	99	83	51	-	-
SS-158	CL	31+75	64.20-65.70	A-1-b(0)	25	NP	76.0	12.7	0.3	11.1	94	41	11	-	-
SS-159	CL	31+75	69.20-70.70	A-7-6(10)	51	24	22.7	7.8	15.1	54.3	73	59	52	-	-
SS-477	85LT	35+75	3.50-5.00	A-2-4(0)	26	6	43.1	25.2	21.7	10.1	84	60	30	-	-
SS-478	85LT	35+75	8.50-10.00	A-2-7(2)	48	27	64.2	11.4	4.2	20.1	92	50	24	-	-
SS-479	85LT	35+75	13.50-15.00	A-2-7(3)	56	30	52.9	12.4	6.5	28.2	85	51	31	-	-
SS-480	85LT	35+75	18.50-20.00	A-7-5(12)	74	41	33.8	10.1	15.8	40.3	73	53	43	-	-
SS-481	85LT	35+75	23.50-25.00	A-7-5(14)	81	49	28.0	13.1	26.7	32.2	69	54	43	31.9	-
SS-482	85LT	35+75	28.50-30.00	A-1-b(0)	47	NP	43.1	31.8	17.0	8.1	62	43	20	-	-

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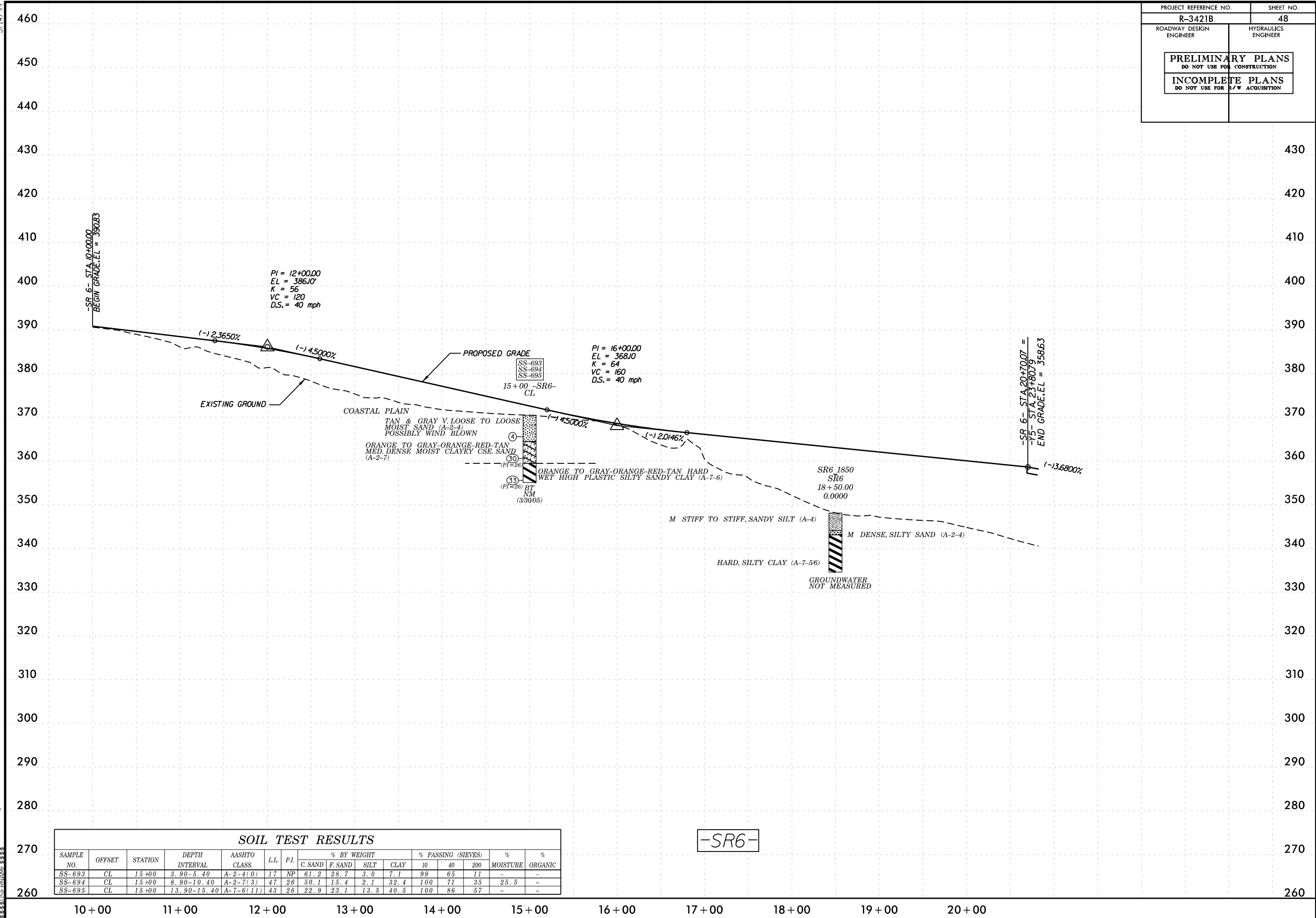
5/14/99

PROJECT REFERENCE NO. R-3421B	SHEET NO. 47
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



-SRI-

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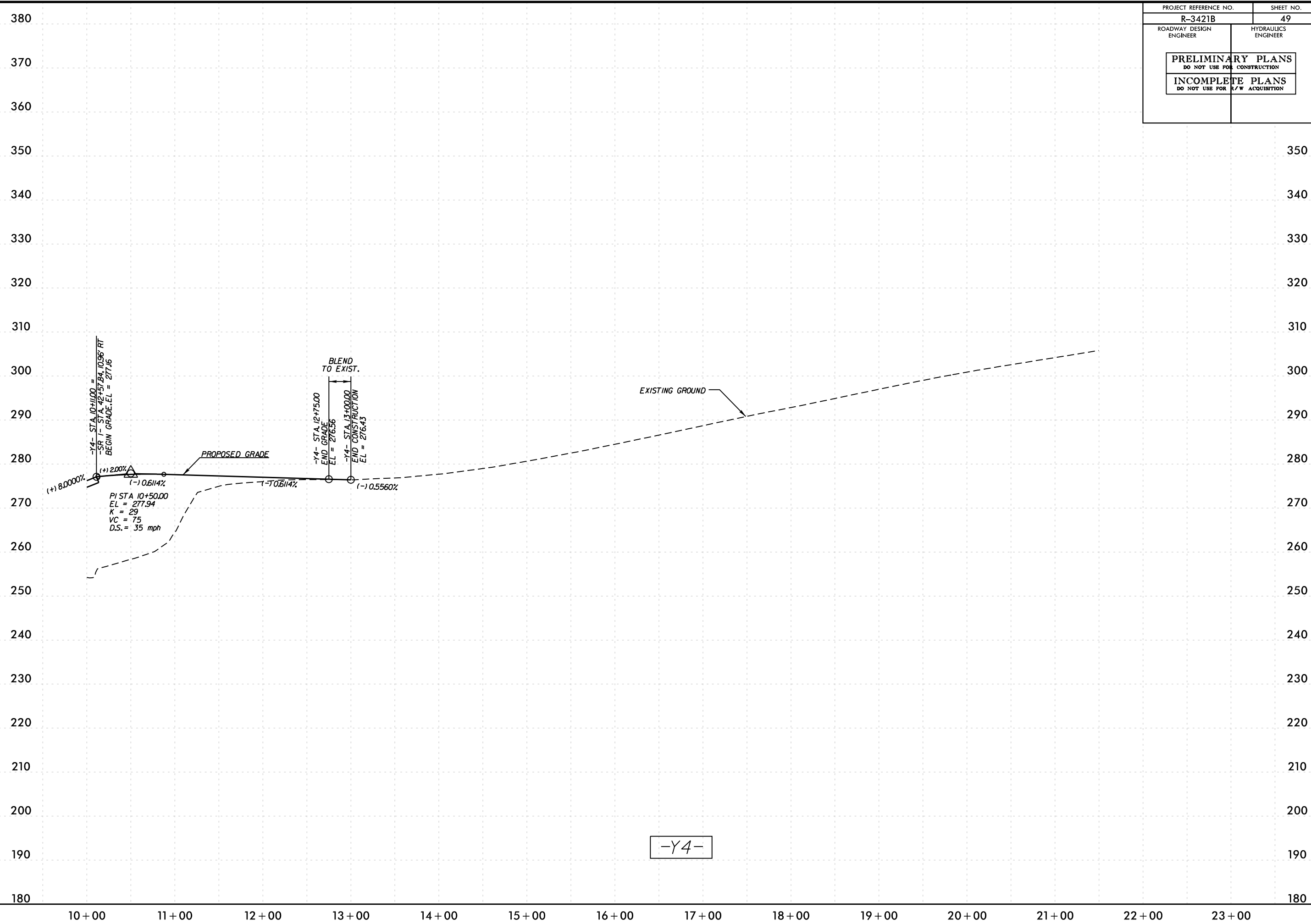


SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE	%
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-693	CL	15+00	3.90-5.40	A-2-4(0)	17	NP	61.2	28.7	3.0	7.1	99	65	11	-	-
SS-694	CL	15+00	8.90-10.40	A-2-7(3)	47	26	50.1	15.4	2.1	32.4	100	71	35	25.5	-
SS-695	CL	15+00	13.90-15.40	A-7-6(11)	43	26	22.9	23.1	13.5	40.5	100	86	57	-	-

5/14/99
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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	49
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

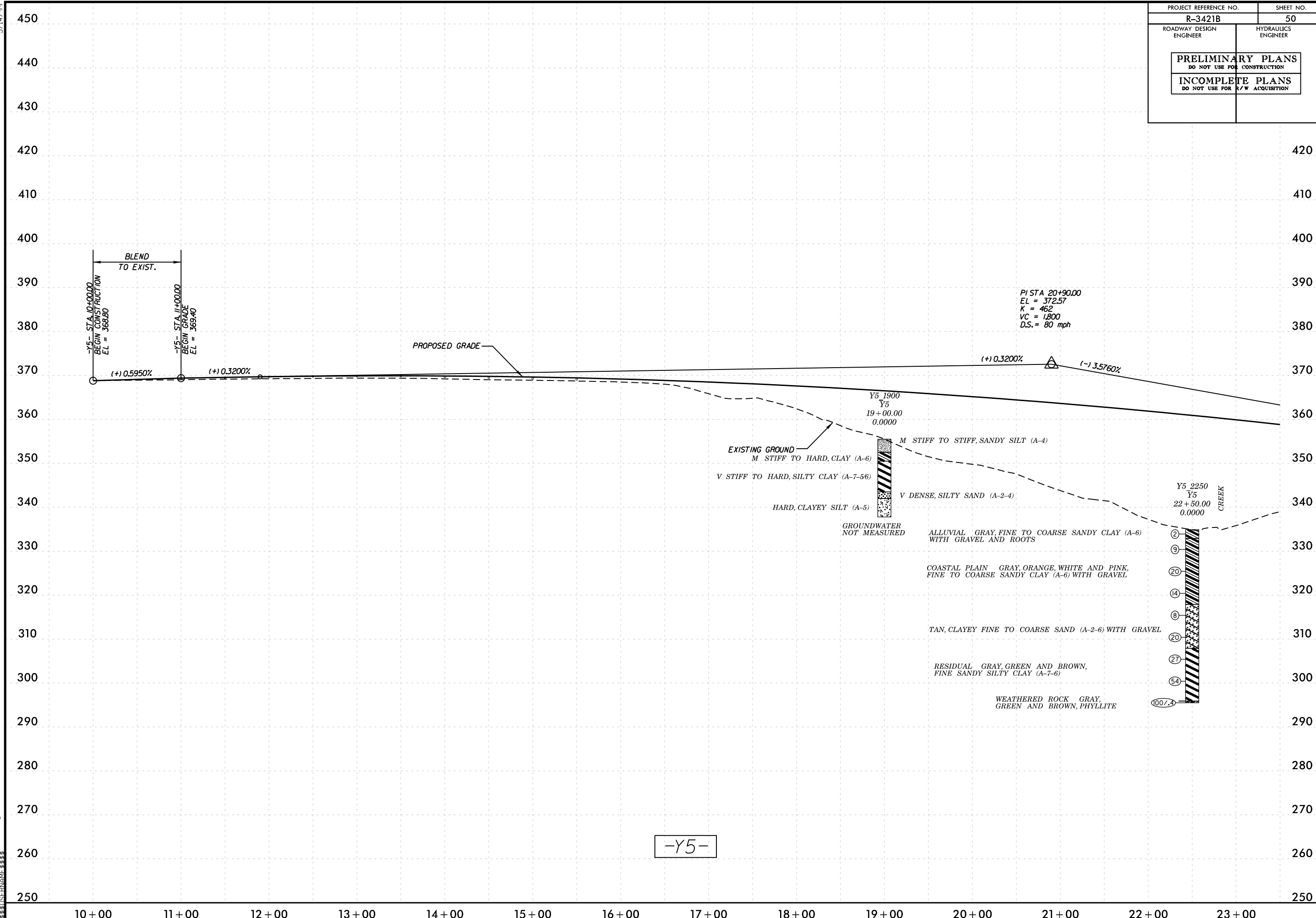


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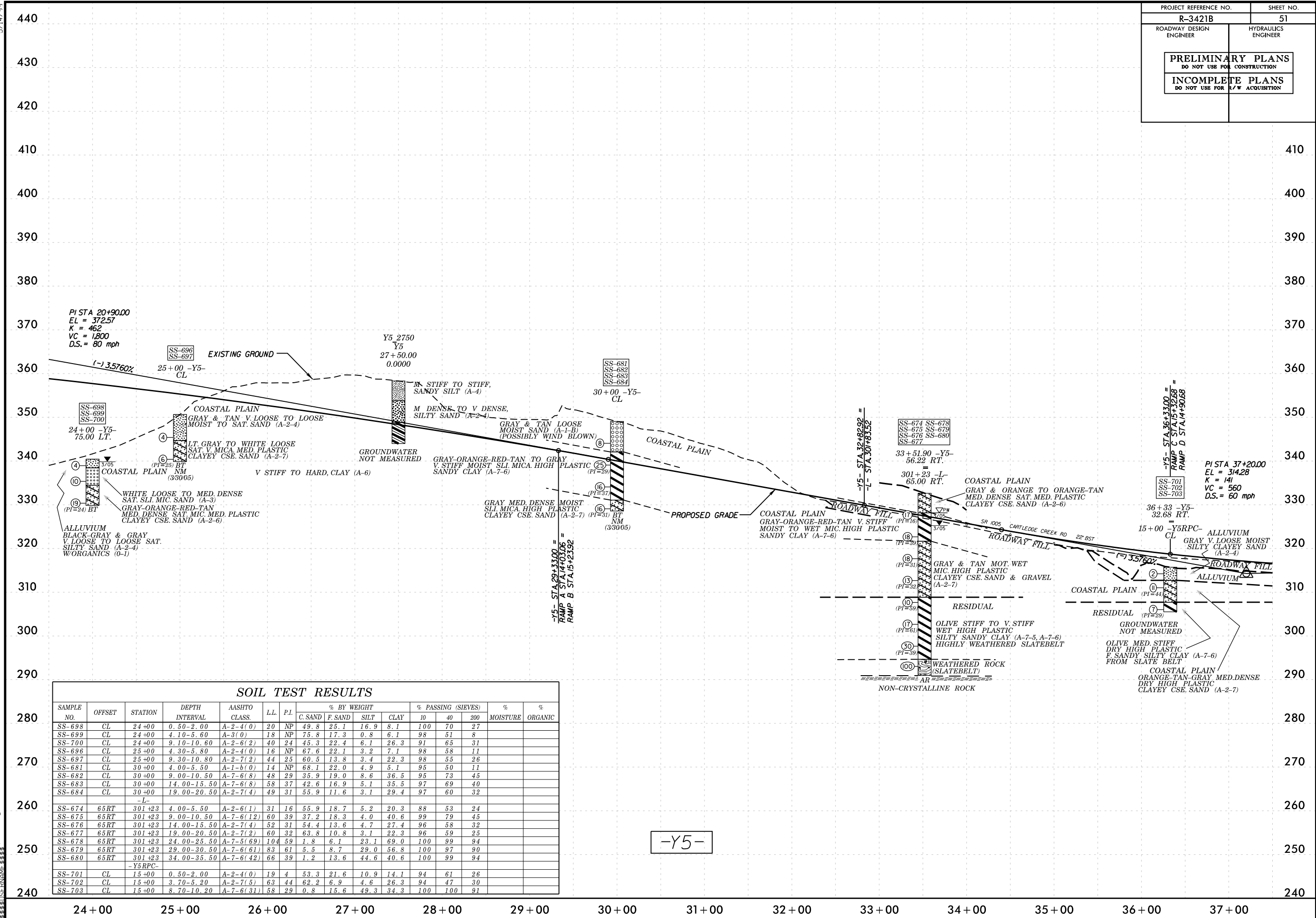
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5/14/99

PROJECT REFERENCE NO. R-3421B	SHEET NO. 50
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



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SOIL TEST RESULTS

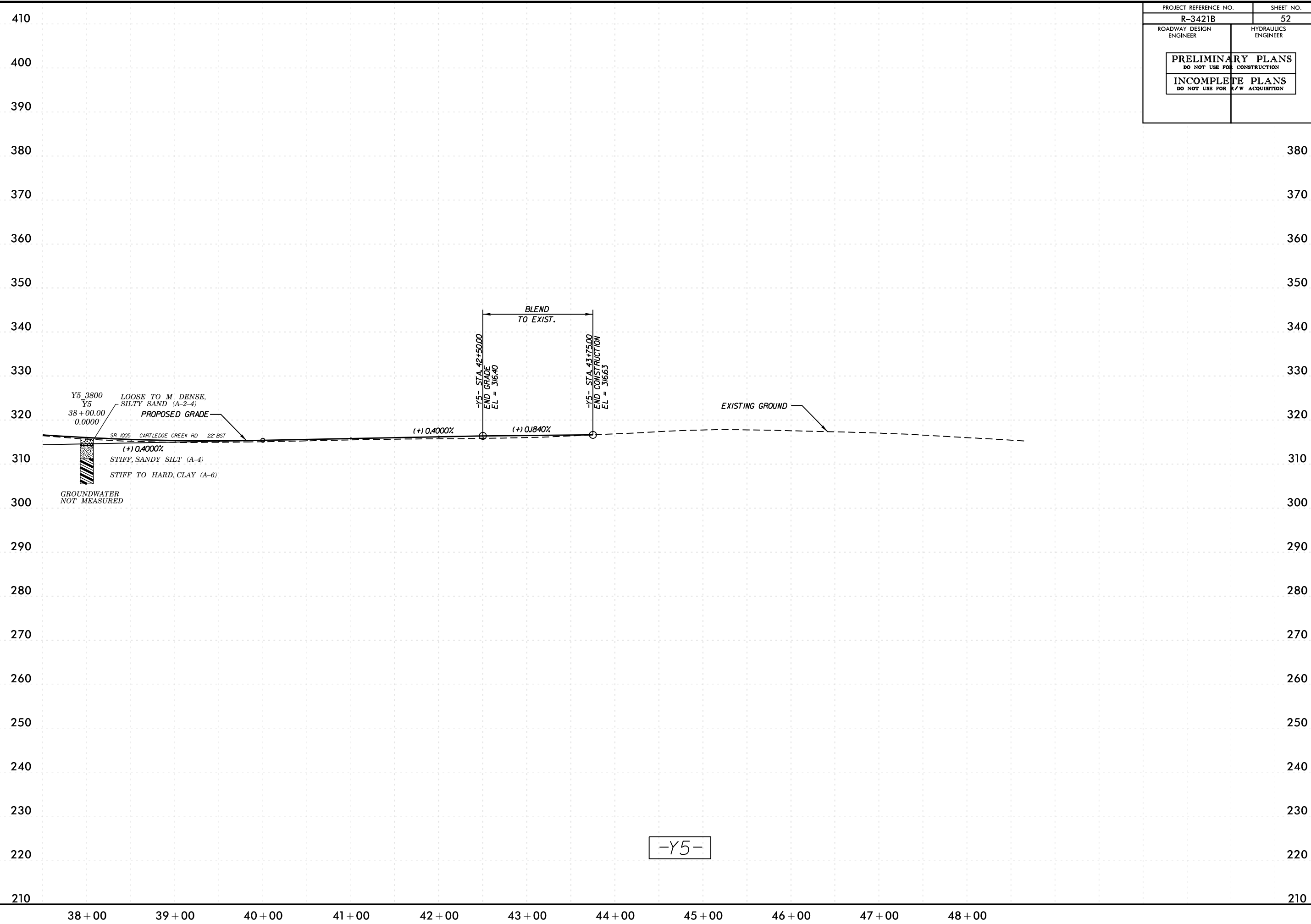
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	LL	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-698	CL	24+00	0.50-2.00	A-2-4(0)	20	NP	49.8	25.1	16.9	8.1	100	70	27		
SS-699	CL	24+00	4.10-5.60	A-3(0)	18	NP	75.8	17.3	0.8	6.1	98	51	8		
SS-700	CL	24+00	9.10-10.60	A-2-6(2)	40	24	45.3	22.4	6.1	26.3	91	65	31		
SS-696	CL	25+00	4.30-5.80	A-2-4(0)	16	NP	67.6	22.1	3.2	7.1	98	58	11		
SS-697	CL	25+00	9.30-10.80	A-2-7(2)	44	25	60.5	13.8	3.4	22.3	98	55	26		
SS-681	CL	30+00	4.00-5.50	A-1-6(0)	14	NP	68.1	22.0	4.9	5.1	95	50	11		
SS-682	CL	30+00	9.00-10.50	A-7-6(8)	48	29	35.9	19.0	8.6	36.5	95	73	45		
SS-683	CL	30+00	14.00-15.50	A-7-6(8)	58	37	42.6	16.9	5.1	35.5	97	69	40		
SS-684	CL	30+00	19.00-20.50	A-2-7(4)	49	31	55.9	11.6	3.1	29.4	97	60	32		
SS-674	65RT	301+23	4.00-5.50	A-2-6(1)	31	16	55.9	18.7	5.2	20.3	88	53	24		
SS-675	65RT	301+23	9.00-10.50	A-7-6(12)	60	39	37.2	18.3	4.0	40.6	99	79	45		
SS-676	65RT	301+23	14.00-15.50	A-2-7(4)	52	31	54.4	13.6	4.7	27.4	96	58	32		
SS-677	65RT	301+23	19.00-20.50	A-2-7(2)	60	32	63.8	10.8	3.1	22.3	96	59	25		
SS-678	65RT	301+23	24.00-25.50	A-7-5(69)	104	59	1.8	6.1	23.1	69.0	100	99	94		
SS-679	65RT	301+23	29.00-30.50	A-7-6(61)	83	61	5.5	8.7	29.0	56.8	100	97	90		
SS-680	65RT	301+23	34.00-35.50	A-7-6(42)	66	39	1.2	13.6	44.6	40.6	100	99	94		
SS-701	CL	15+00	0.50-2.00	A-2-4(0)	19	4	53.3	21.6	10.9	14.1	94	61	26		
SS-702	CL	15+00	3.70-5.20	A-2-7(5)	63	44	62.2	6.9	4.6	26.3	94	47	30		
SS-703	CL	15+00	8.70-10.20	A-7-6(31)	58	29	0.8	15.6	49.3	34.3	100	100	91		

-Y5-

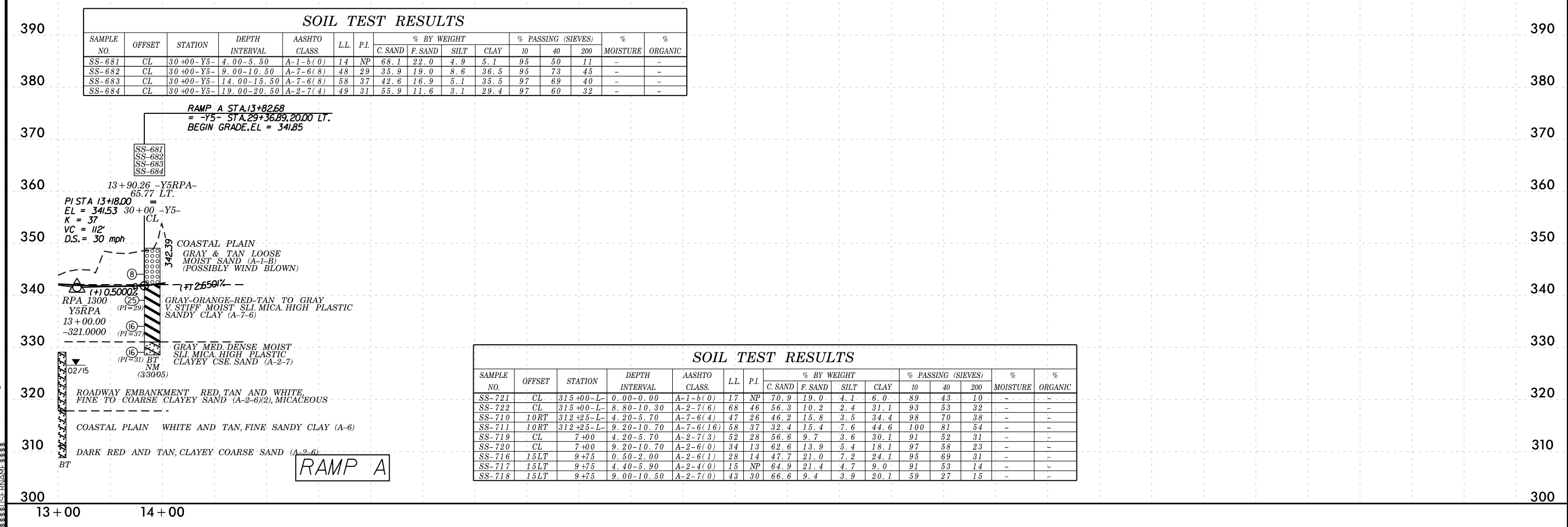
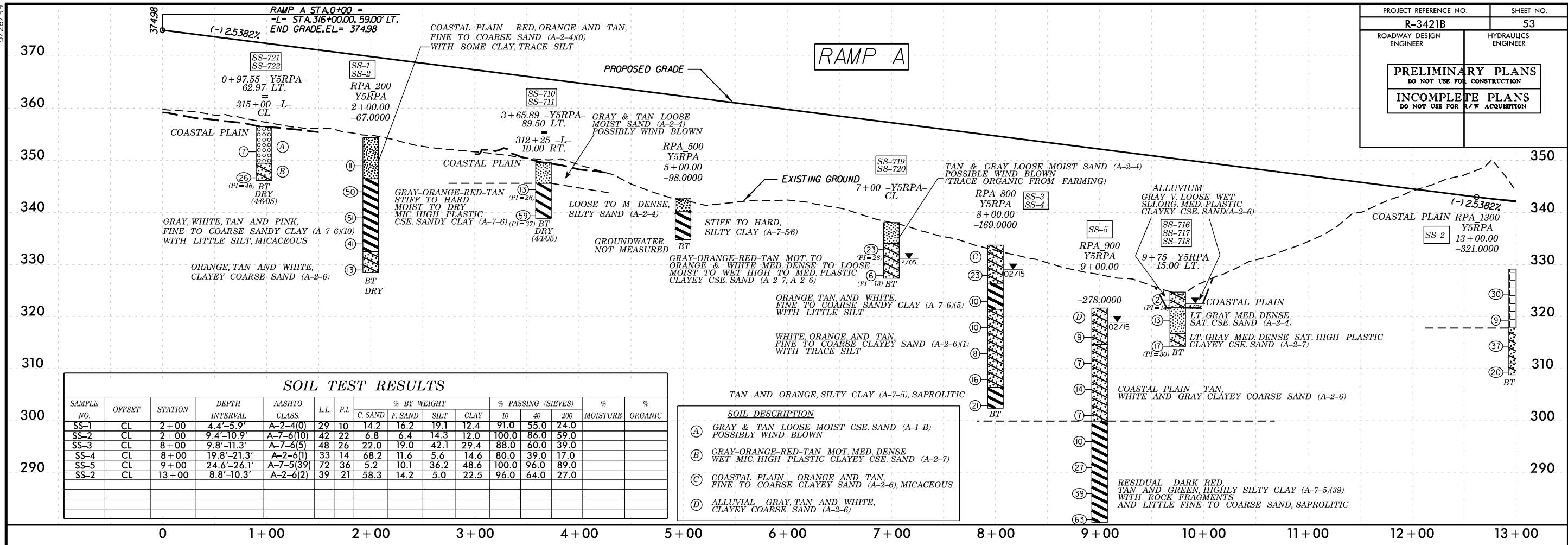
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5/14/99

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	52
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

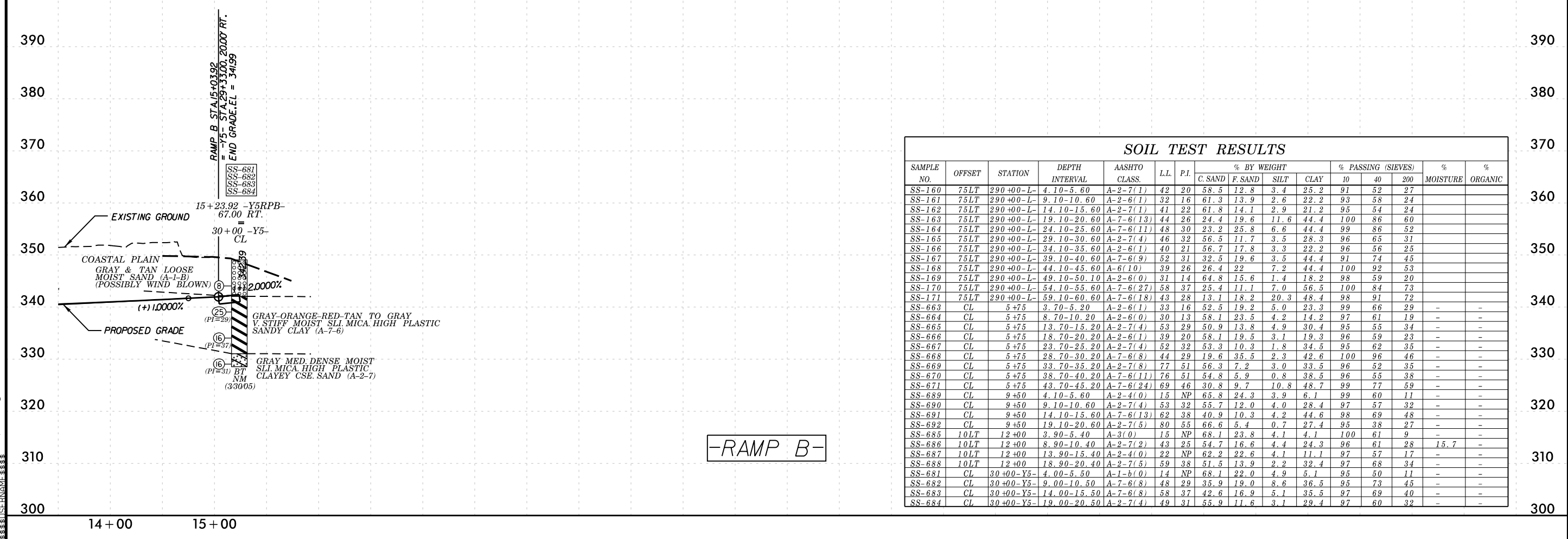
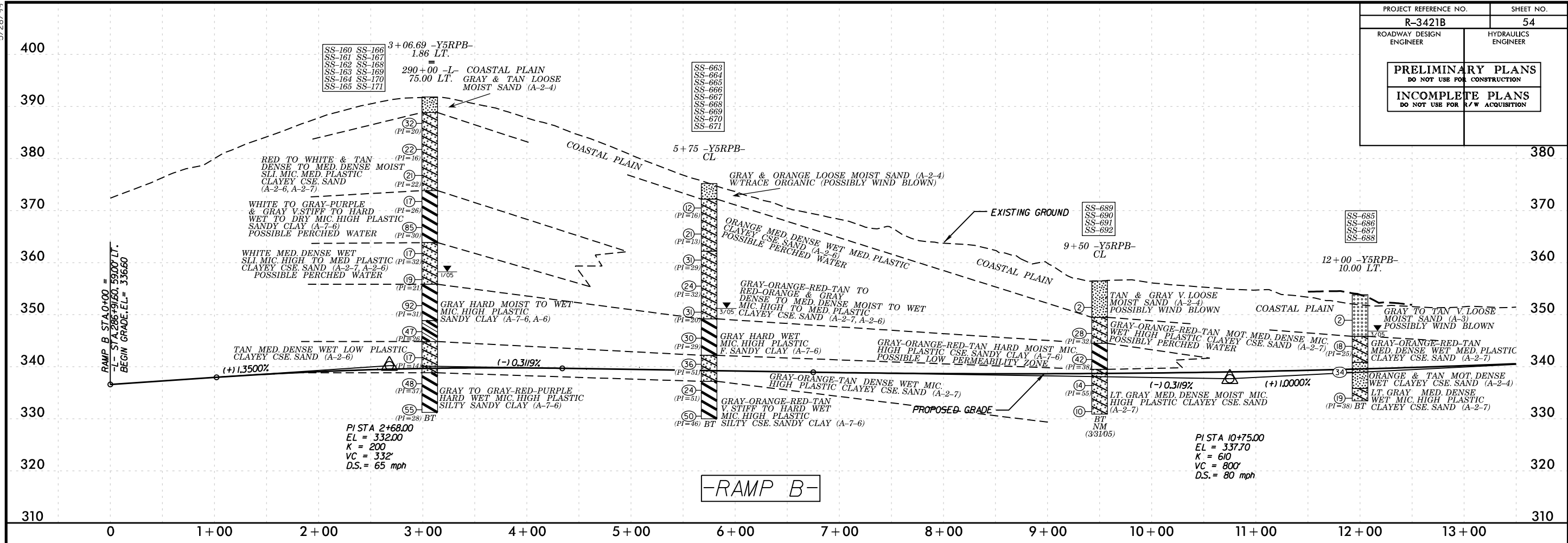


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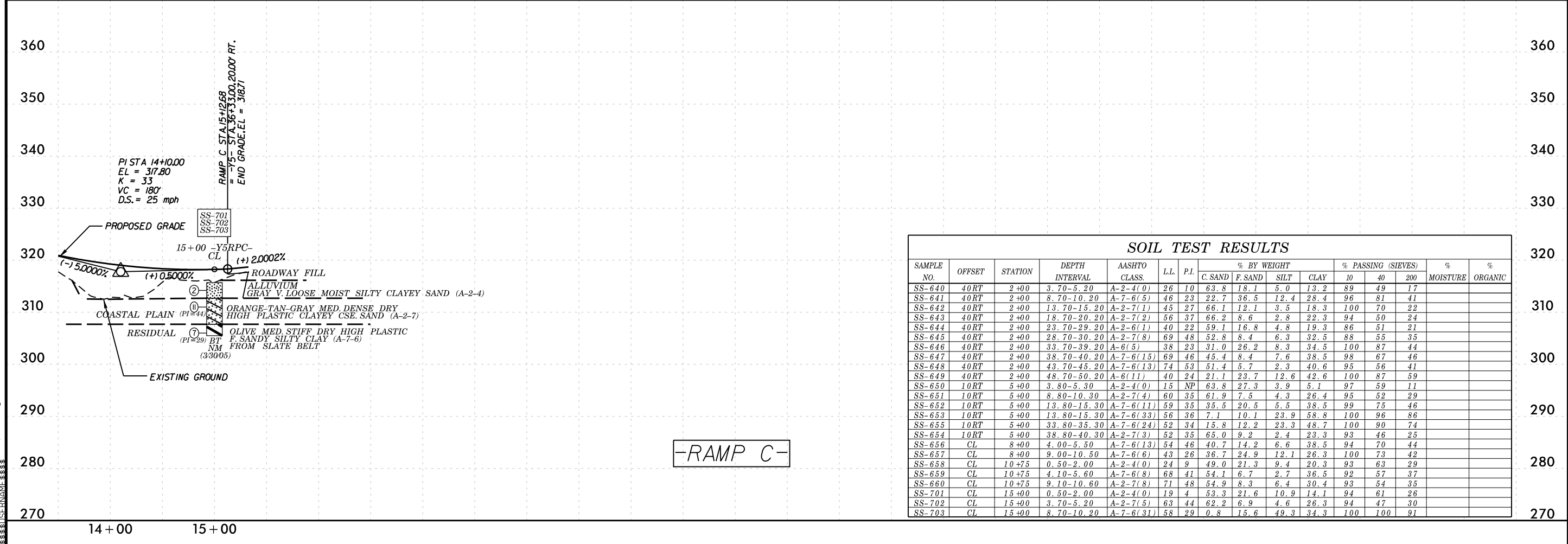
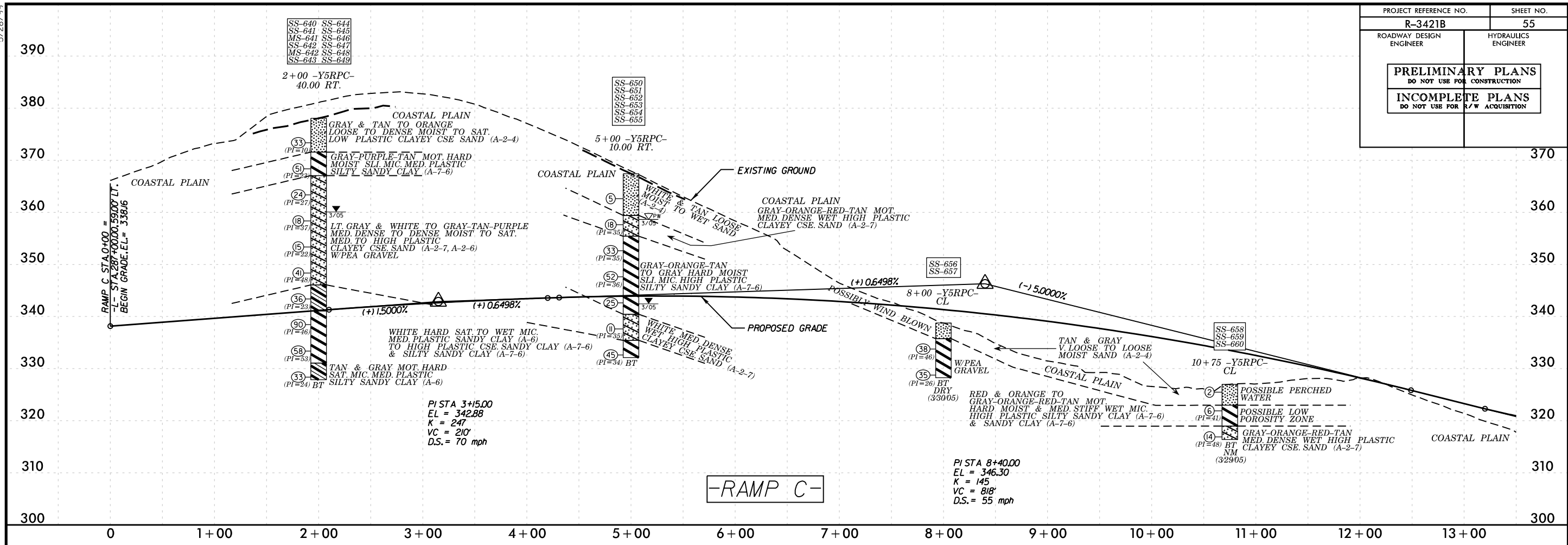
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R-3421B.dwg
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5/28/99

PROJECT REFERENCE NO. R-3421B	SHEET NO. 55
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	



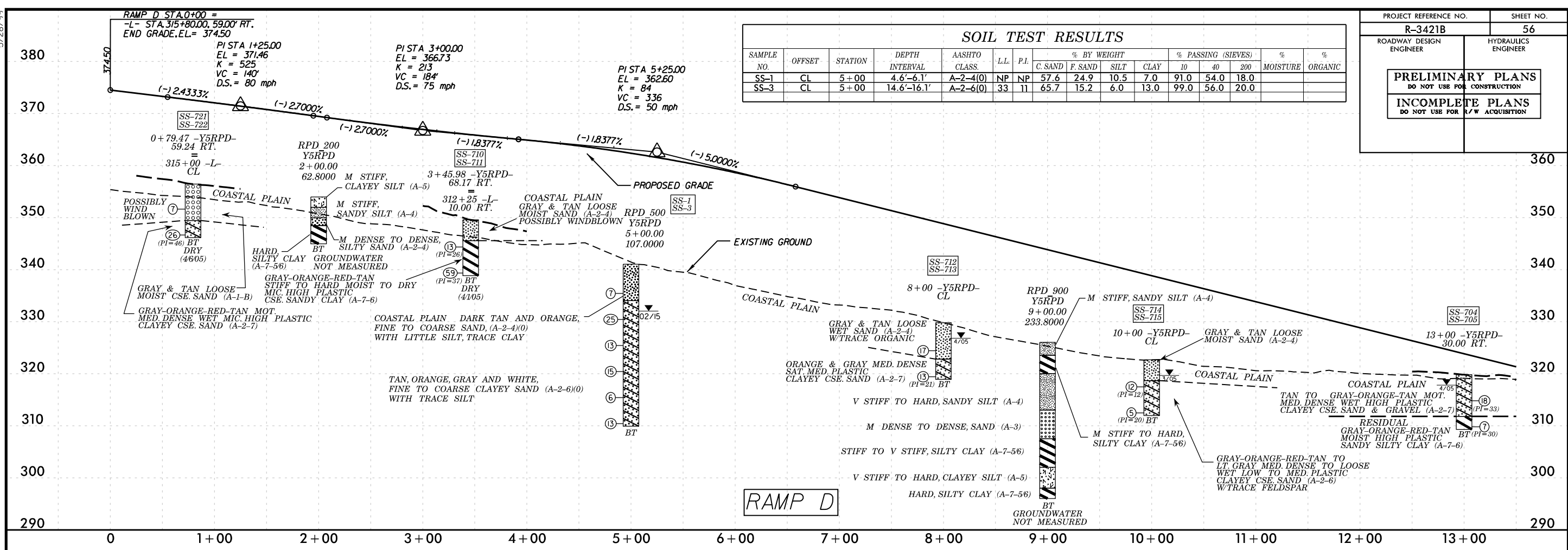
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-640	40RT	2+00	3.70-5.20	A-2-4(0)	26	10	63.8	18.1	5.0	13.2	89	49	17		
SS-641	40RT	2+00	8.70-10.20	A-7-6(5)	46	23	22.7	36.5	12.4	28.4	96	81	41		
SS-642	40RT	2+00	13.70-15.20	A-2-7(1)	45	27	66.1	12.1	3.5	18.3	100	70	22		
SS-643	40RT	2+00	18.70-20.20	A-2-7(2)	56	37	66.2	8.6	2.8	22.3	94	50	24		
SS-644	40RT	2+00	23.70-29.20	A-2-6(1)	40	22	59.1	16.8	4.8	19.3	86	51	21		
SS-645	40RT	2+00	28.70-30.20	A-2-7(8)	69	48	52.8	8.4	6.3	32.5	88	55	35		
SS-646	40RT	2+00	33.70-39.20	A-6(5)	38	23	31.0	26.2	8.3	34.5	100	87	44		
SS-647	40RT	2+00	38.70-40.20	A-7-6(15)	69	46	45.4	8.4	7.6	38.5	98	67	46		
SS-648	40RT	2+00	43.70-45.20	A-7-6(13)	74	53	51.4	5.7	2.3	40.6	95	56	41		
SS-649	40RT	2+00	48.70-50.20	A-6(11)	40	24	21.1	23.7	12.6	42.6	100	87	59		
SS-650	10RT	5+00	3.80-5.30	A-2-4(0)	15	NP	63.8	27.3	3.9	5.1	97	59	11		
SS-651	10RT	5+00	8.80-10.30	A-2-7(4)	60	35	61.9	7.5	4.3	26.4	95	52	29		
SS-652	10RT	5+00	13.80-15.30	A-7-6(11)	59	35	35.5	20.5	5.5	38.5	99	75	46		
SS-653	10RT	5+00	13.80-15.30	A-7-6(33)	56	36	7.1	10.1	23.9	58.8	100	96	86		
SS-655	10RT	5+00	33.80-35.30	A-7-6(24)	52	34	15.8	12.2	23.3	48.7	100	90	74		
SS-654	10RT	5+00	38.80-40.30	A-2-7(3)	52	35	65.0	9.2	2.4	23.3	93	46	25		
SS-656	CL	8+00	4.00-5.50	A-7-6(13)	54	46	40.7	14.2	6.6	38.5	94	70	44		
SS-657	CL	8+00	9.00-10.50	A-7-6(6)	43	26	36.7	24.9	12.1	26.3	100	73	42		
SS-658	CL	10+75	0.50-2.00	A-2-4(0)	24	9	49.0	21.3	9.4	20.3	93	63	29		
SS-659	CL	10+75	4.10-5.60	A-7-6(8)	68	41	54.1	6.7	2.7	36.5	92	57	37		
SS-660	CL	10+75	9.10-10.60	A-2-7(8)	71	48	54.9	8.3	6.4	30.4	93	54	35		
SS-701	CL	15+00	0.50-2.00	A-2-4(0)	19	4	53.3	21.6	10.9	14.1	94	61	26		
SS-702	CL	15+00	3.70-5.20	A-2-7(5)	63	44	62.2	6.9	4.6	26.3	94	47	30		
SS-703	CL	15+00	8.70-10.20	A-7-6(31)	58	29	0.8	15.6	49.3	34.3	100	100	91		

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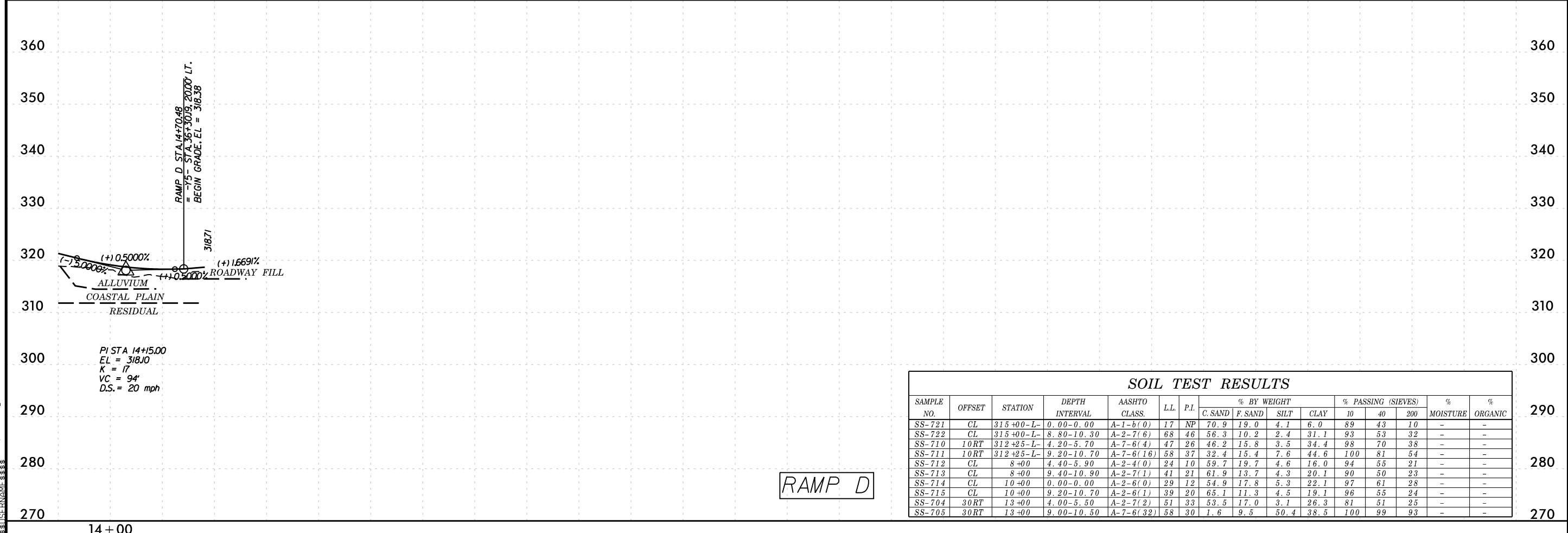
5/28/99

PROJECT REFERENCE NO.	SHEET NO.
R-3421B	56
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-1	CL	5+00	4.6'-6.1'	A-2-4(0)	NP	NP	57.6	24.9	10.5	7.0	91.0	54.0	18.0		
SS-3	CL	5+00	14.6'-16.1'	A-2-6(0)	33	11	65.7	15.2	6.0	13.0	99.0	56.0	20.0		



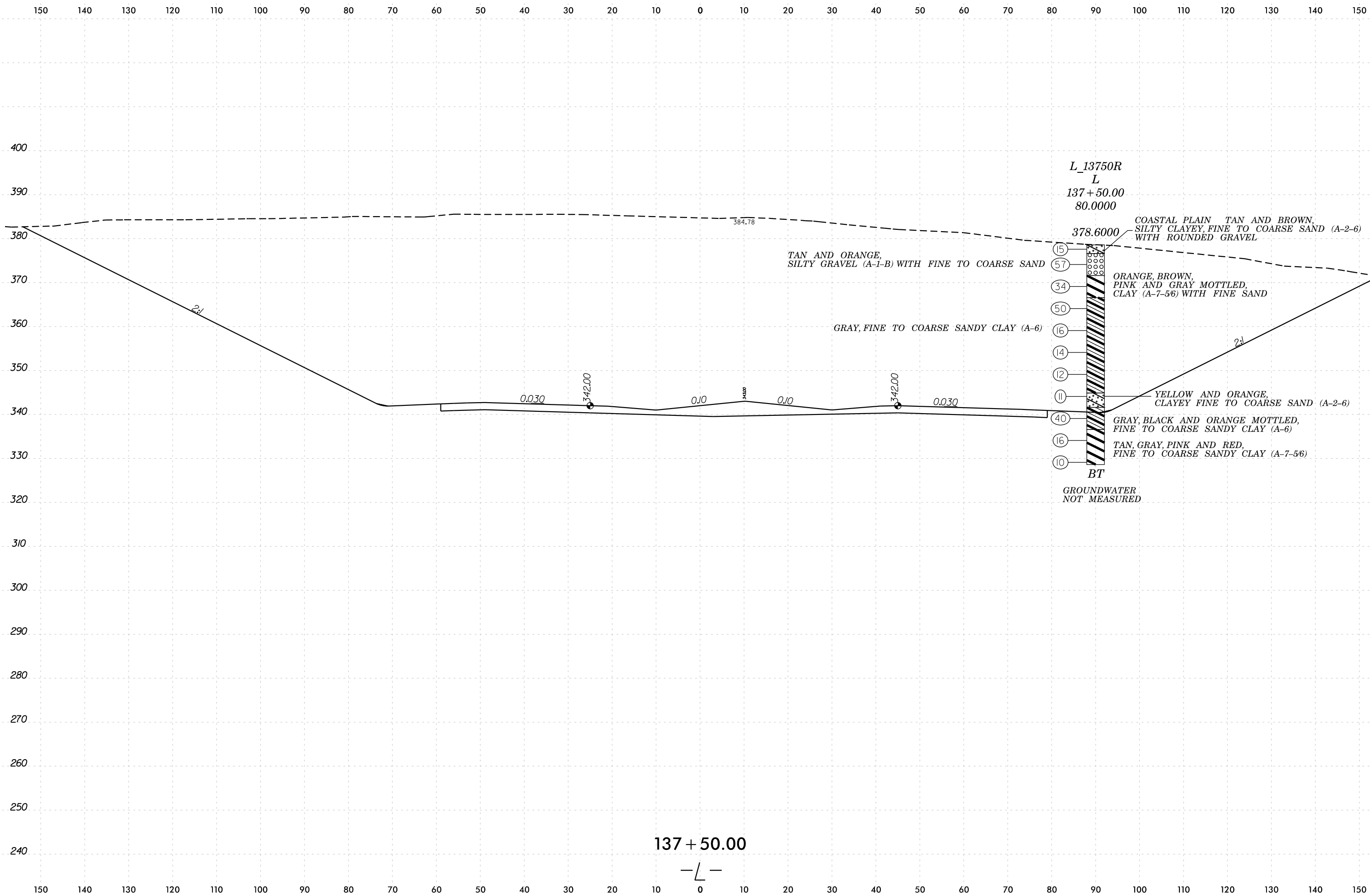
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SOIL TEST RESULTS															
SAMPLE NO.	OFFSET	STATION	DEPTH INTERVAL	AASHTO CLASS.	L.L.	P.I.	% BY WEIGHT				% PASSING (SIEVES)			% MOISTURE	% ORGANIC
							C. SAND	F. SAND	SILT	CLAY	10	40	200		
SS-721	CL	315+00-L	0.00-0.00	A-1-b(0)	17	NP	70.9	19.0	4.1	6.0	89	43	10	-	-
SS-722	CL	315+00-L	8.80-10.30	A-2-7(6)	68	46	56.3	10.2	2.4	31.1	93	53	32	-	-
SS-710	10RT	312+25-L	4.20-5.70	A-7-6(4)	47	26	46.2	15.8	3.5	34.4	98	70	38	-	-
SS-711	10RT	312+25-L	9.20-10.70	A-7-6(16)	58	37	32.4	15.4	7.6	44.6	100	81	54	-	-
SS-712	CL	8+00	4.40-5.90	A-2-4(0)	24	10	59.7	19.7	4.6	16.0	94	55	21	-	-
SS-713	CL	8+00	9.40-10.90	A-2-7(1)	41	21	61.9	13.7	4.3	20.1	90	50	23	-	-
SS-714	CL	10+00	0.00-0.00	A-2-6(0)	29	12	54.9	17.8	5.3	22.1	97	61	28	-	-
SS-715	CL	10+00	9.20-10.70	A-2-6(1)	39	20	65.1	11.3	4.5	19.1	96	55	24	-	-
SS-704	30RT	13+00	4.00-5.50	A-2-7(2)	51	33	53.5	17.0	3.1	26.3	81	51	25	-	-
SS-705	30RT	13+00	9.00-10.50	A-7-6(32)	58	30	1.6	9.5	50.4	38.5	100	99	93	-	-

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378.6000 COASTAL PLAIN TAN AND BROWN,
SILTY CLAYEY, FINE TO COARSE SAND (A-2-6)
WITH ROUNDED GRAVEL

TAN AND ORANGE,
SILTY GRAVEL (A-1-B) WITH FINE TO COARSE SAND

ORANGE, BROWN,
PINK AND GRAY MOTTLED,
CLAY (A-7-56) WITH FINE SAND

GRAY, FINE TO COARSE SANDY CLAY (A-6)

YELLOW AND ORANGE,
CLAYEY FINE TO COARSE SAND (A-2-6)

GRAY, BLACK AND ORANGE MOTTLED,
FINE TO COARSE SANDY CLAY (A-6)

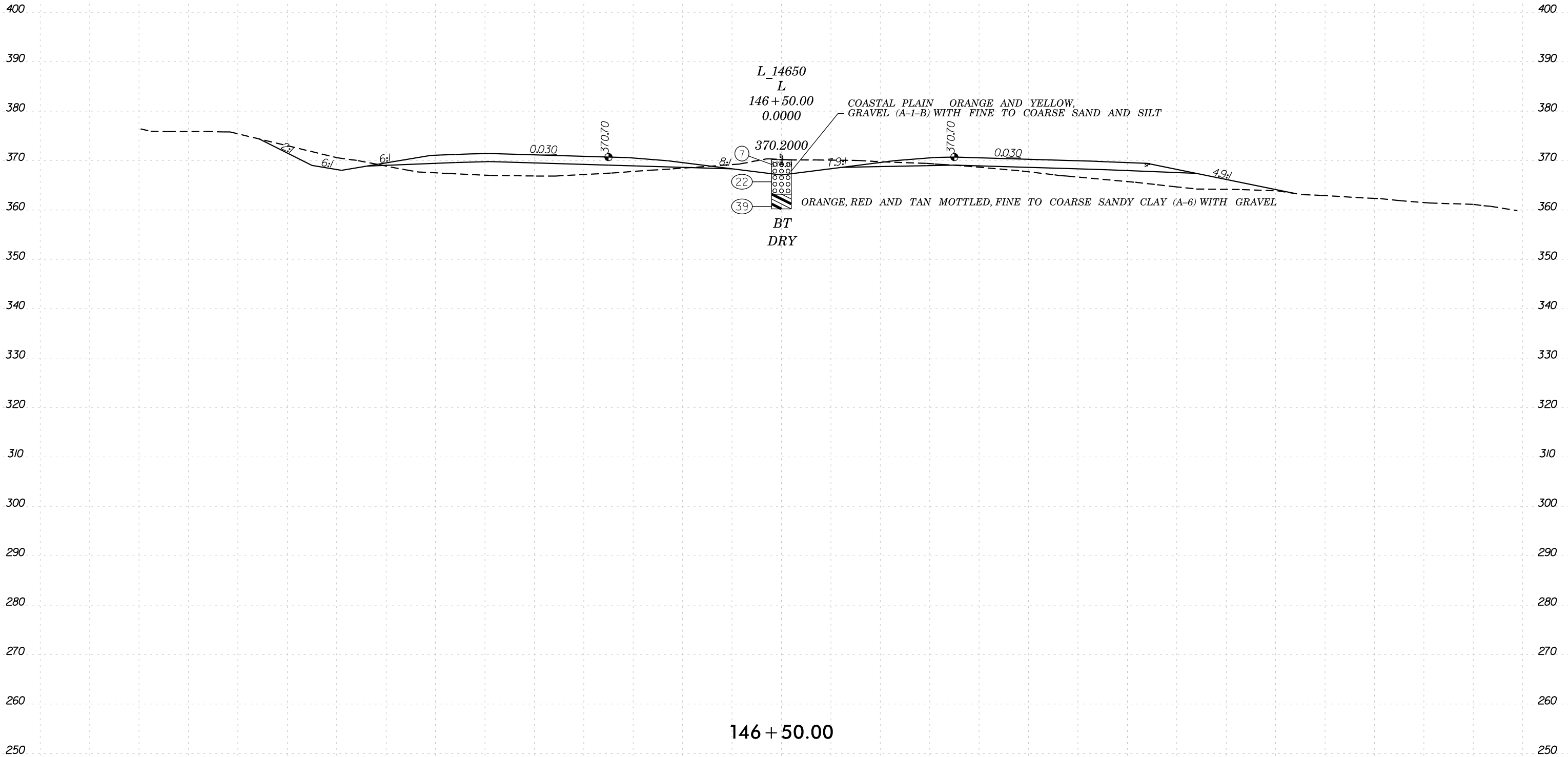
TAN, GRAY, PINK AND RED,
FINE TO COARSE SANDY CLAY (A-7-56)

BT
GROUNDWATER
NOT MEASURED

137 + 50.00

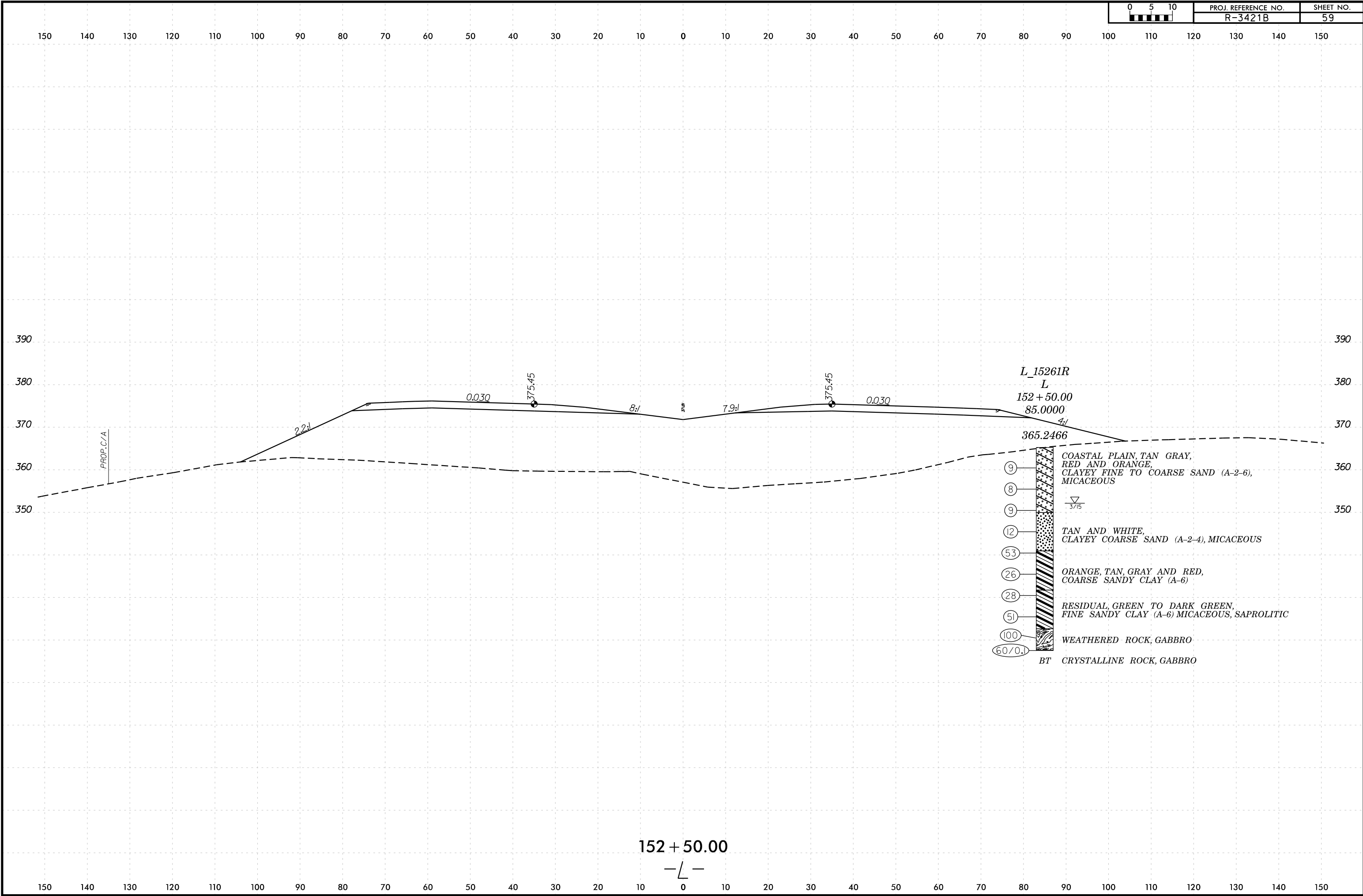
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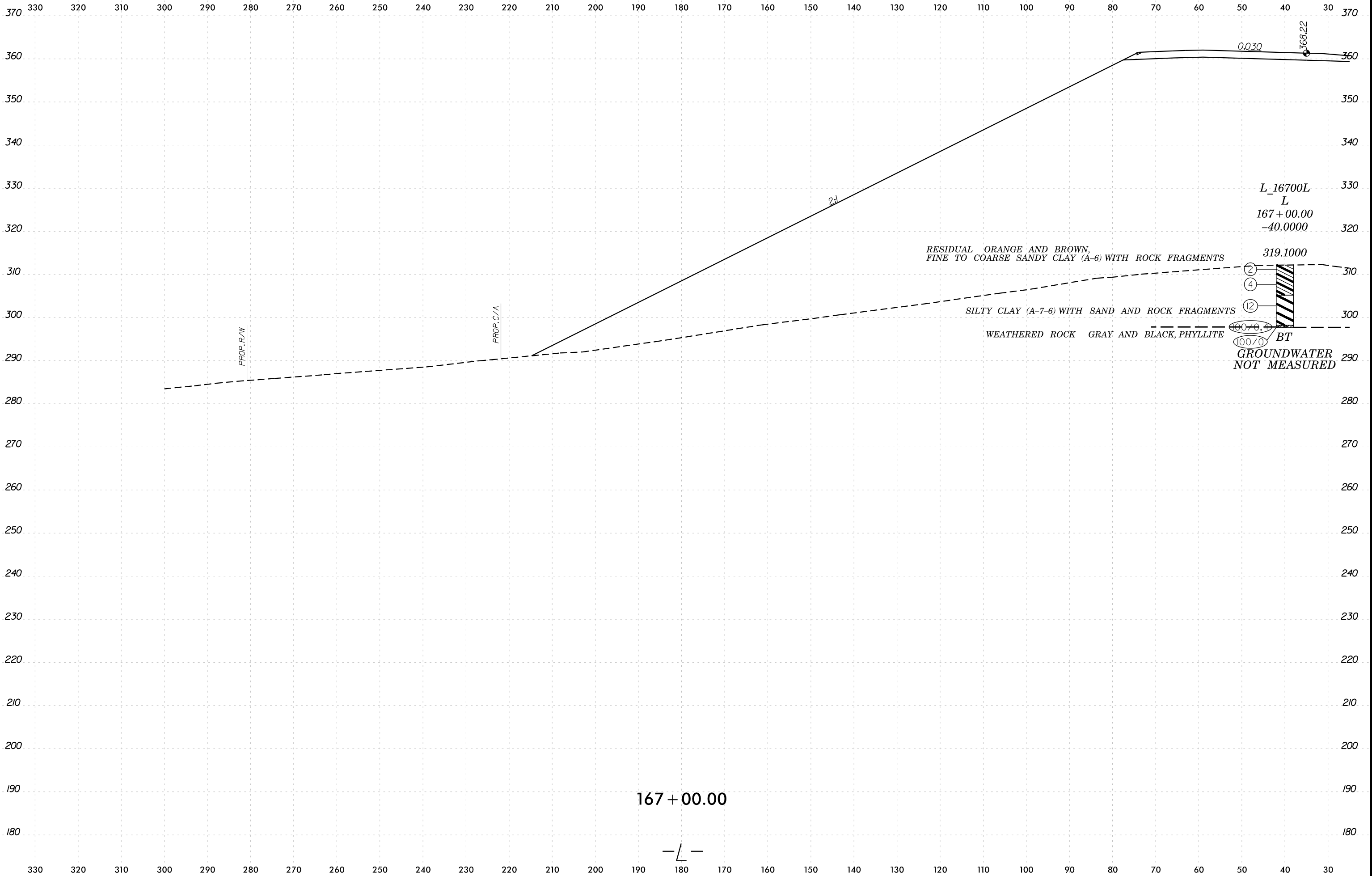
146 + 50.00

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152 + 50.00
-L-

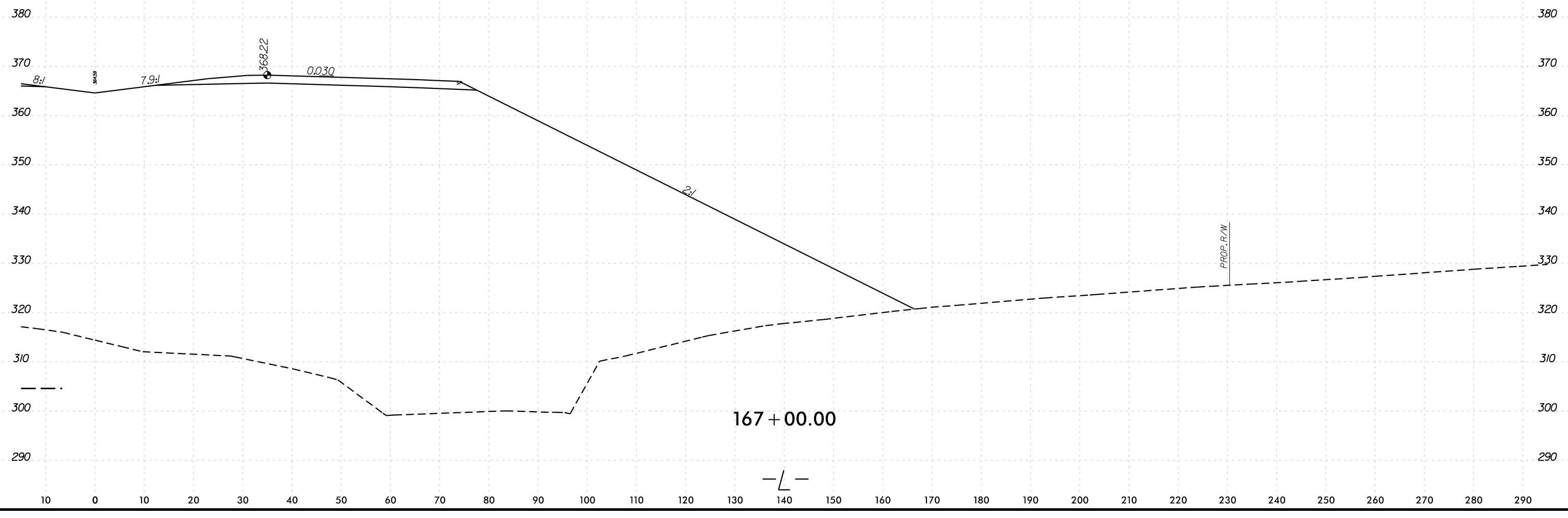


8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-3421B	61

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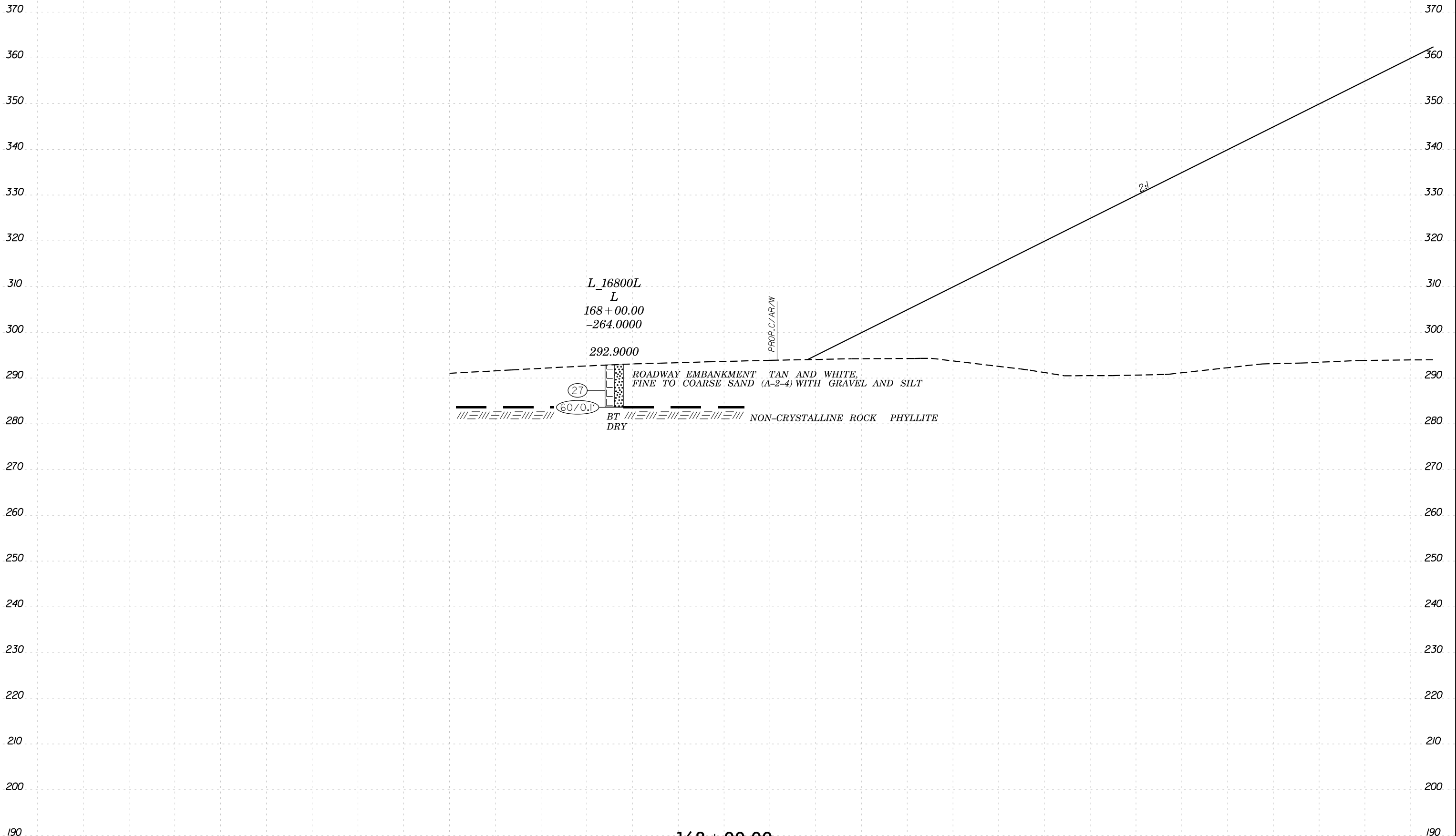
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8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-3421B	62

390 380 370 360 350 340 330 320 310 300 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90



L_16800L
L
168+00.00
-264.0000

292.9000

ROADWAY EMBANKMENT TAN AND WHITE,
FINE TO COARSE SAND (A-2-4) WITH GRAVEL AND SILT

BT NON-CRYSTALLINE ROCK PHYLLITE
DRY

PROP. C./AR/W

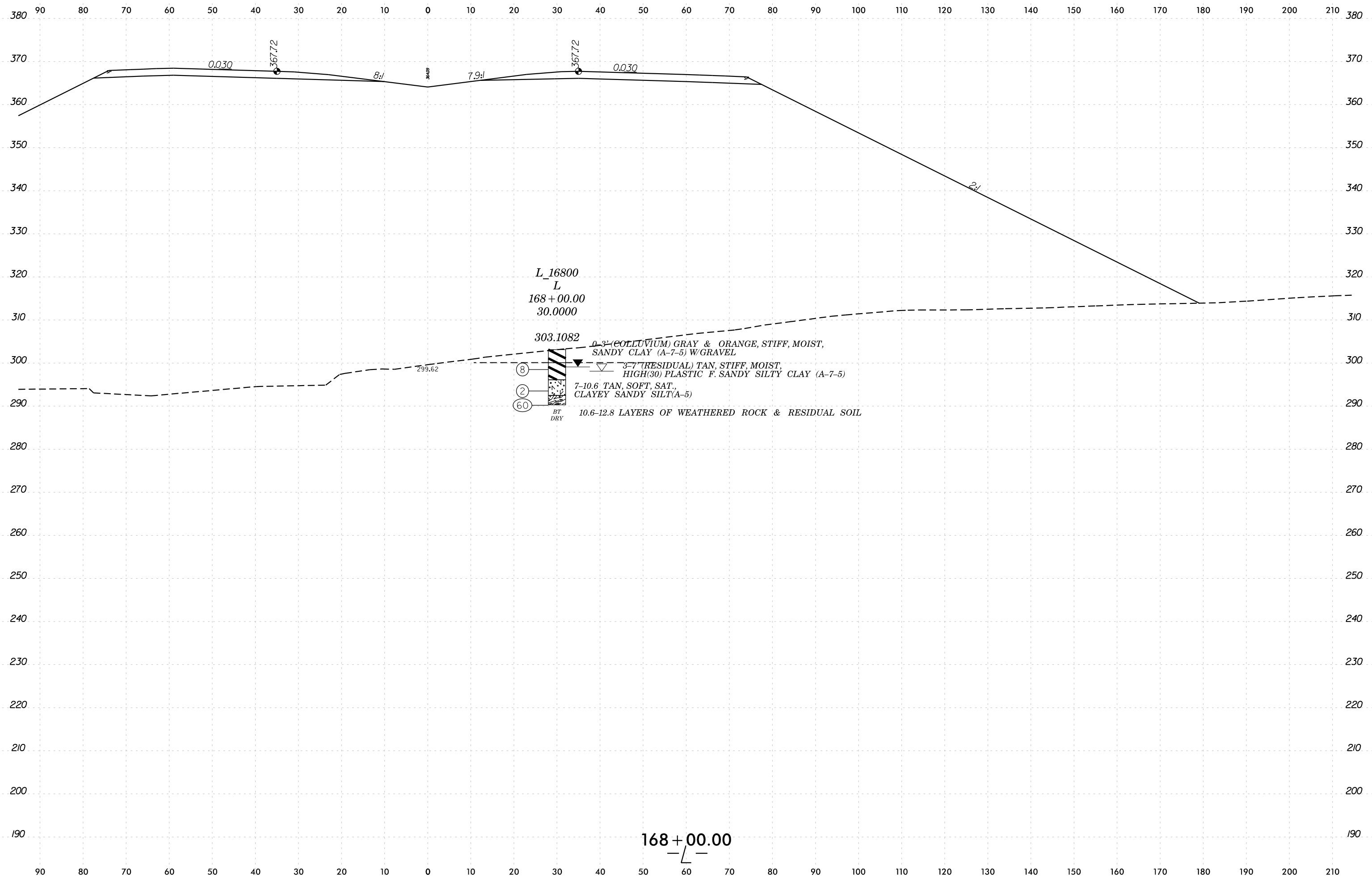
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(27)
60/0.1'

168+00.00

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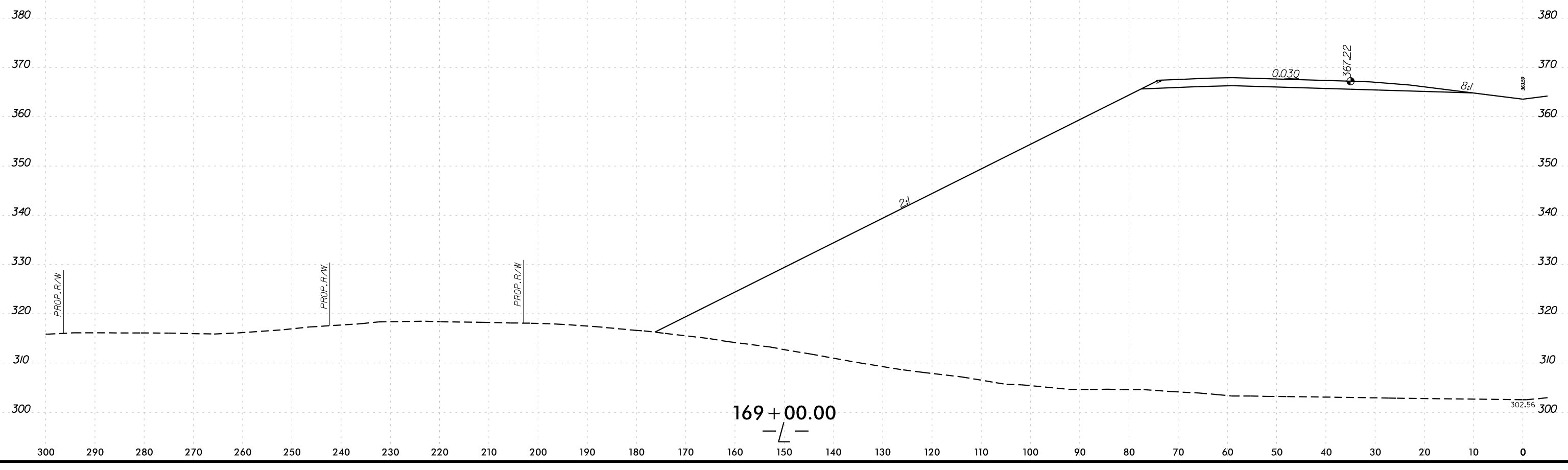
168+00.00

8/23/99

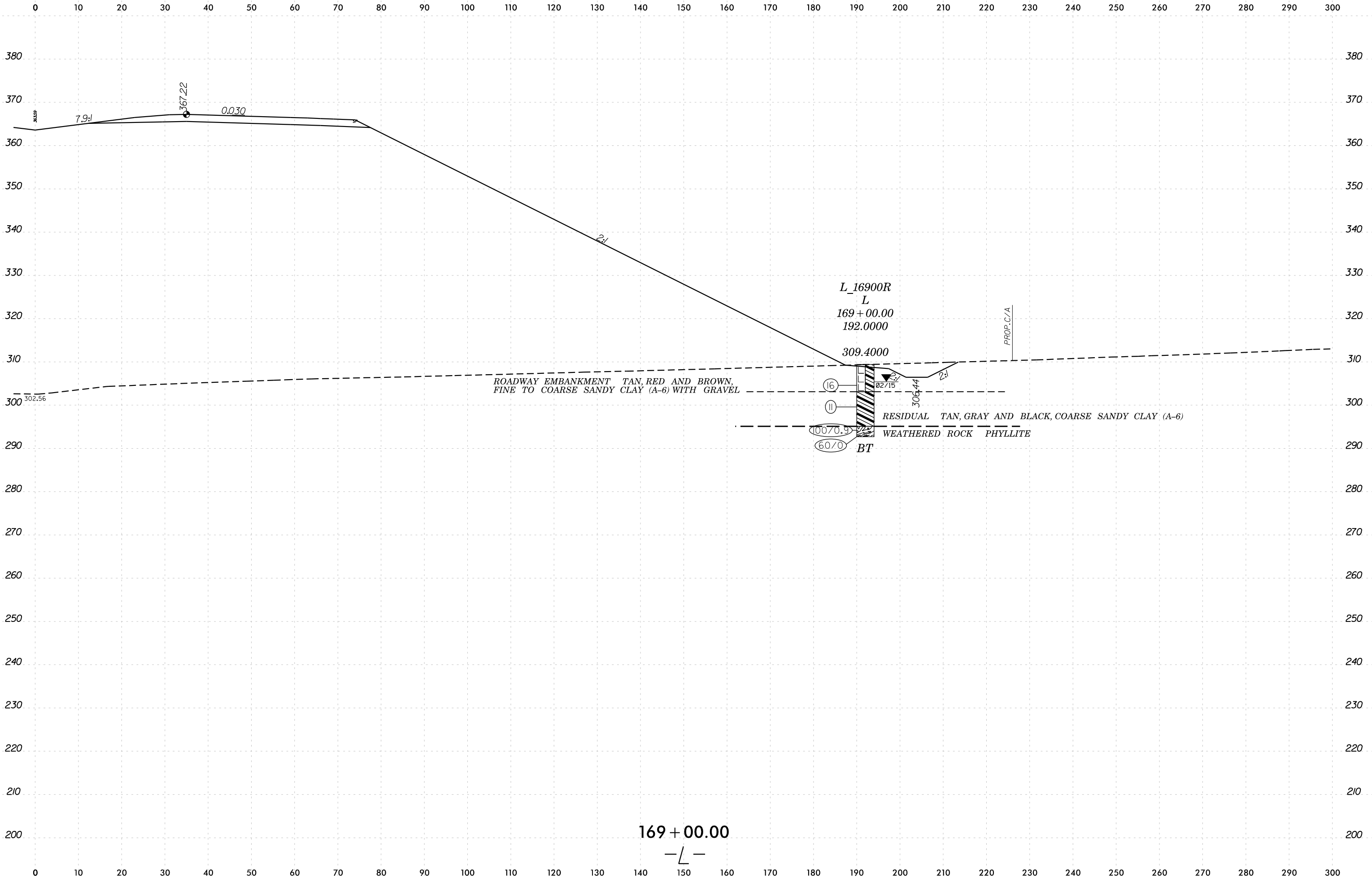


PROJ. REFERENCE NO.	SHEET NO.
R-3421B	64

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2:03:42 PM
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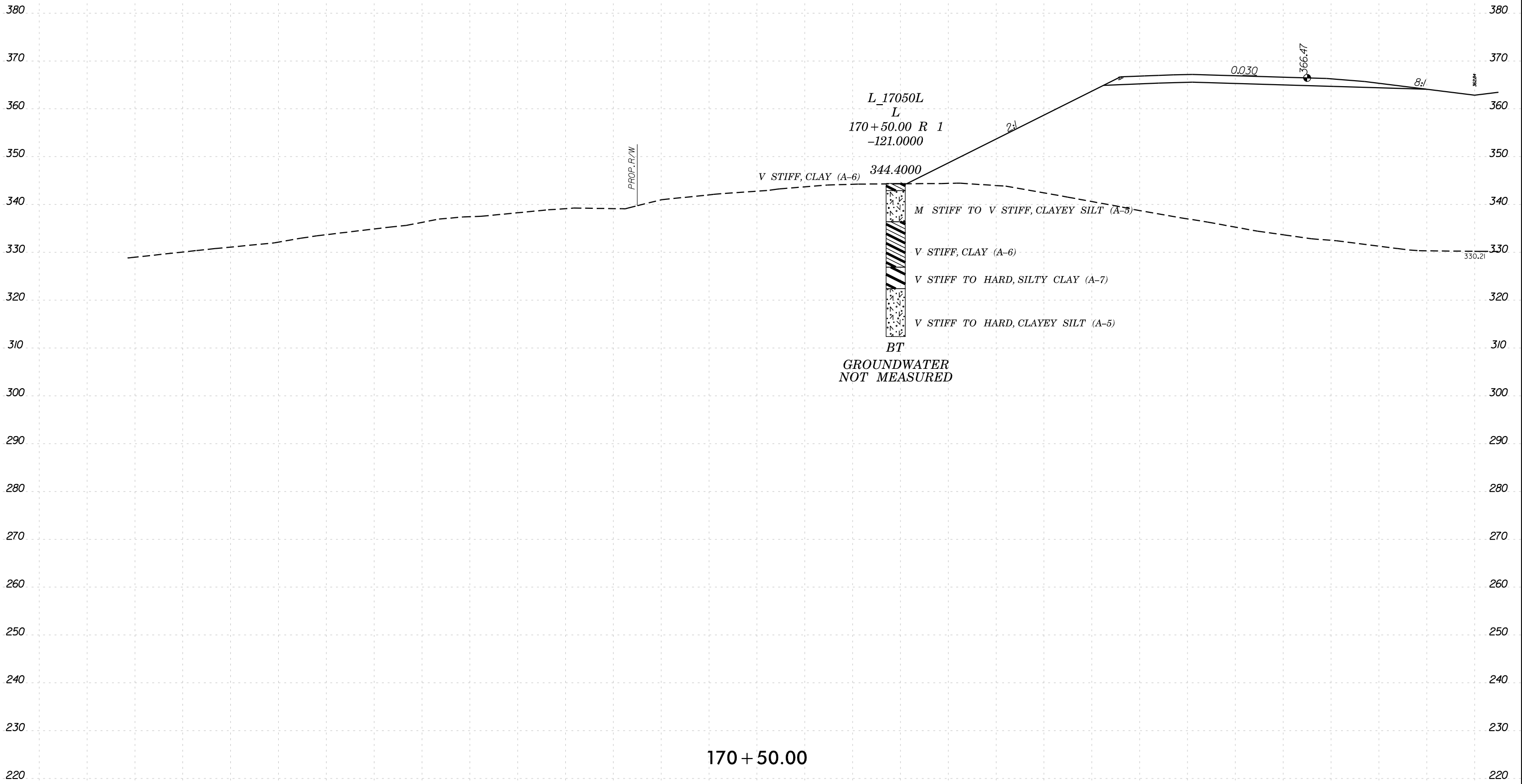
169 + 00.00
-L-

8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-3421B	66

300 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0



L_17050L
L
170+50.00 R 1
-121.0000

PROP. R/W

V STIFF, CLAY (A-6) 344.4000

M STIFF TO V STIFF, CLAYEY SILT (A-5)

V STIFF, CLAY (A-6)

V STIFF TO HARD, SILTY CLAY (A-7)

V STIFF TO HARD, CLAYEY SILT (A-5)

BT

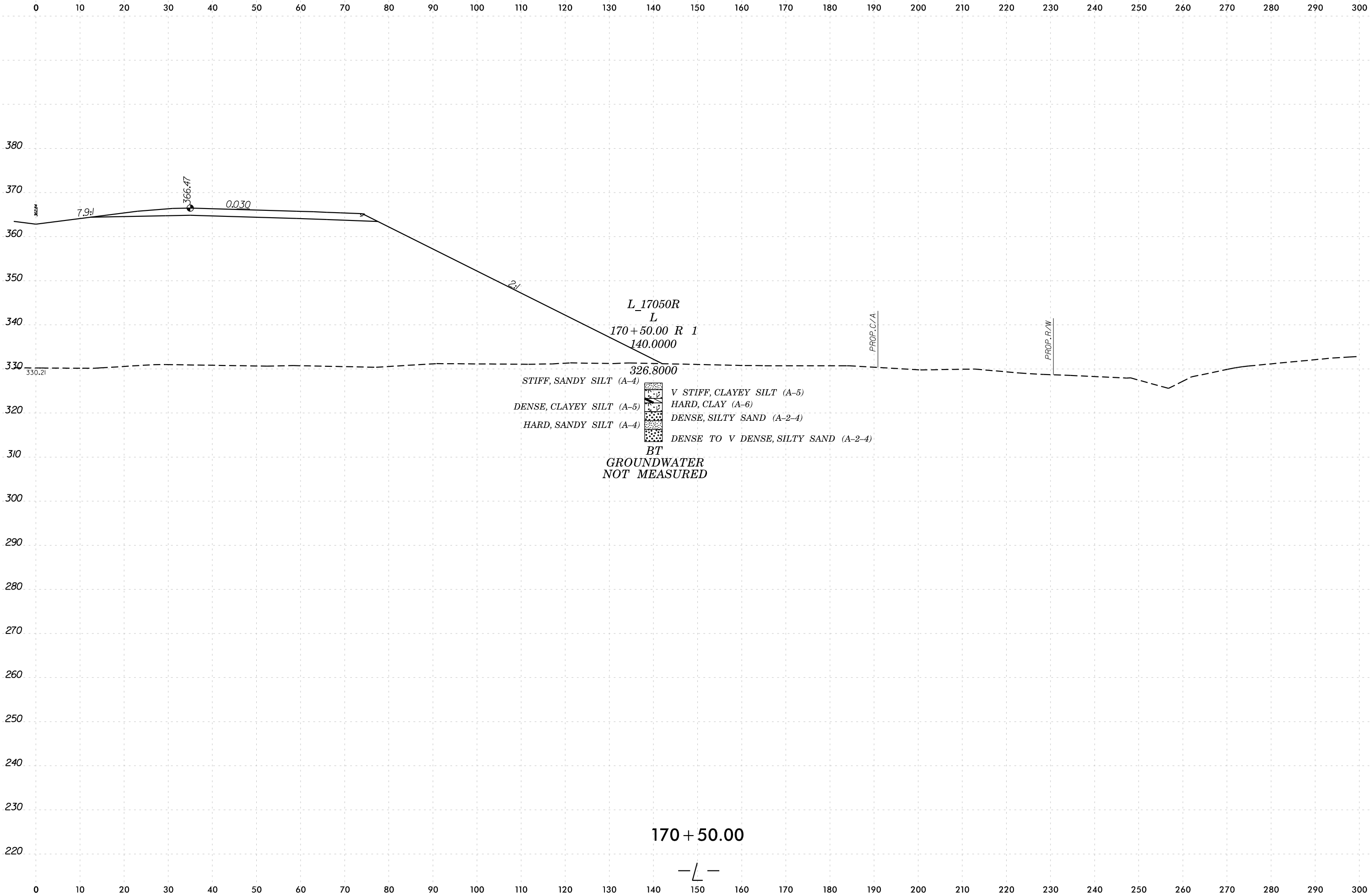
GROUNDWATER
NOT MEASURED

170 + 50.00

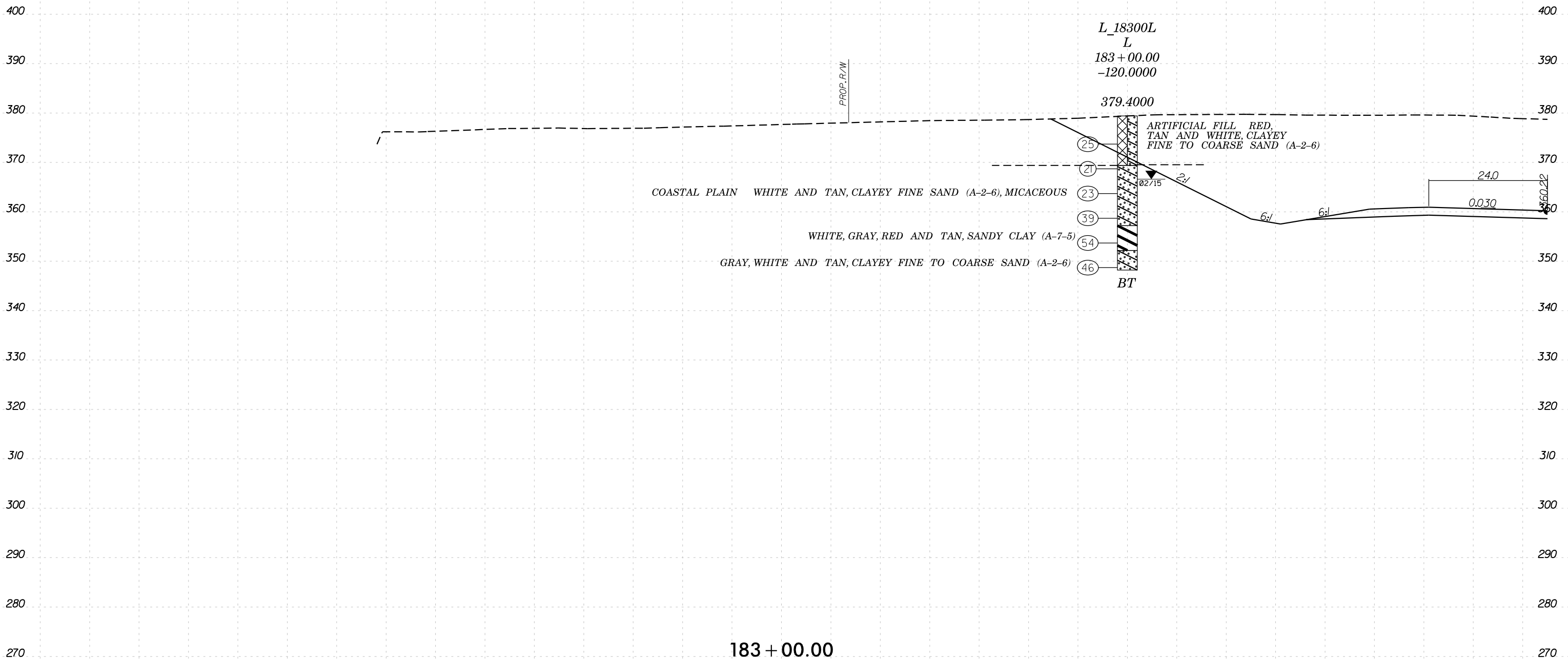
-L-

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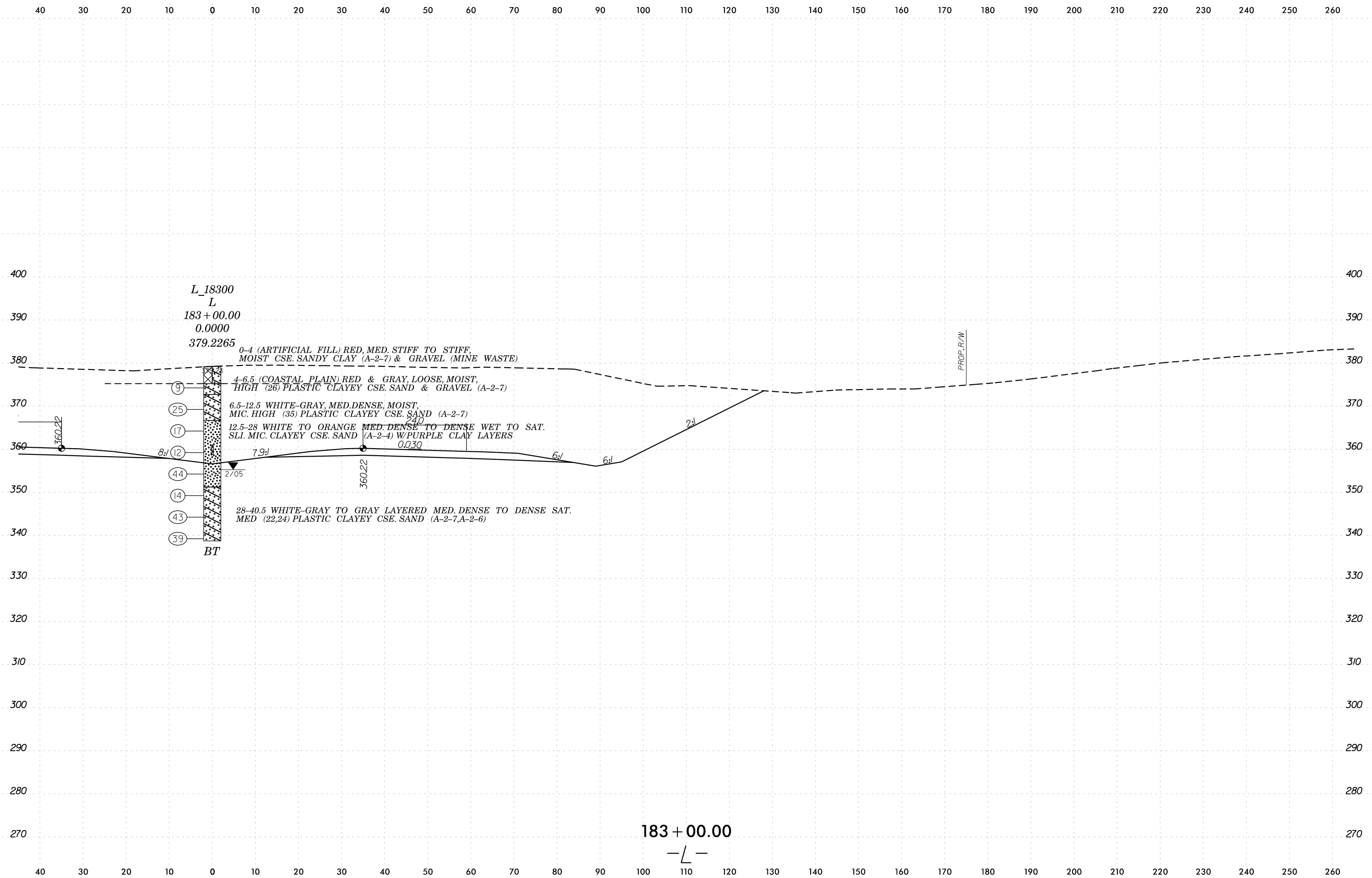
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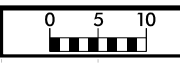


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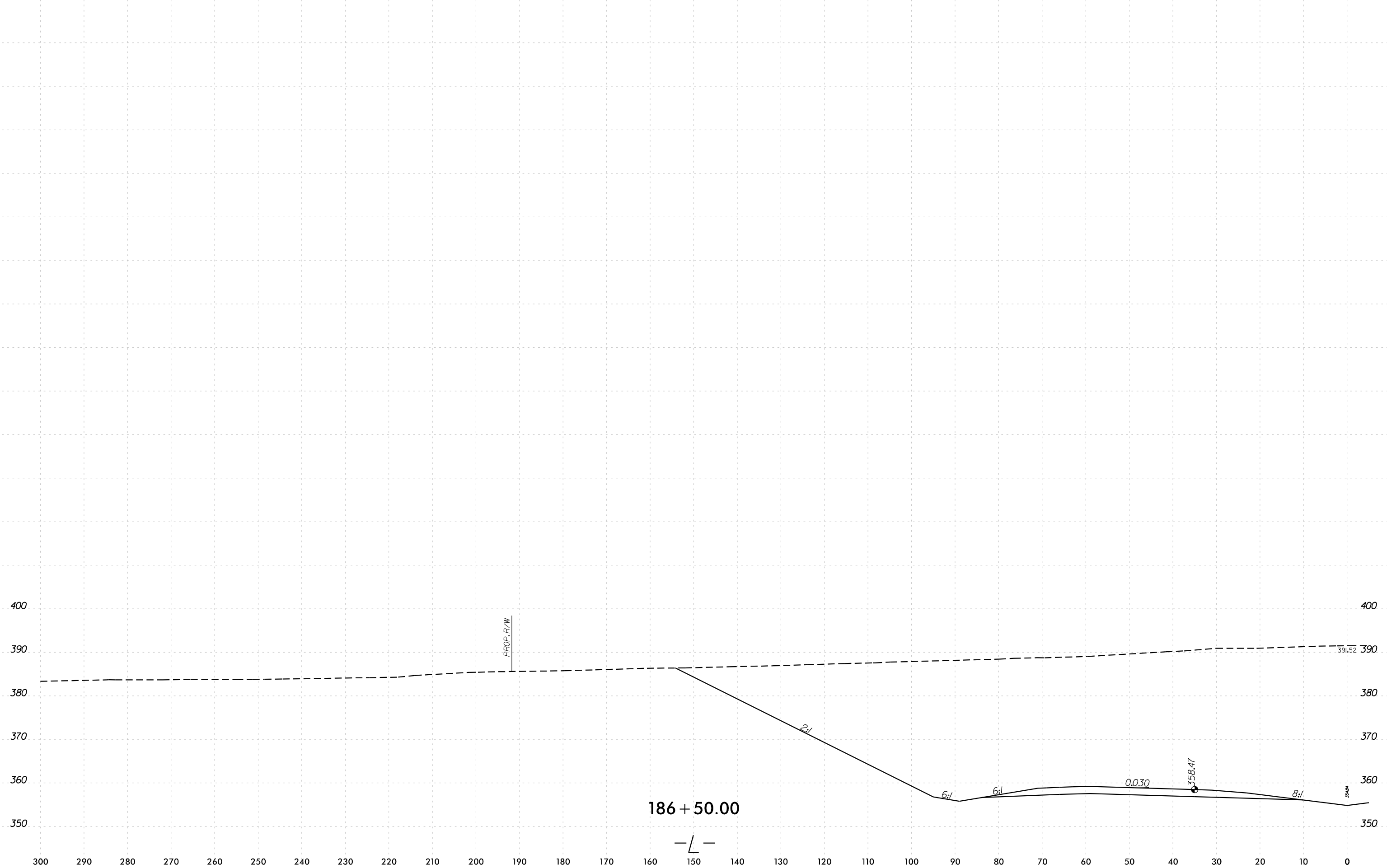


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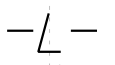
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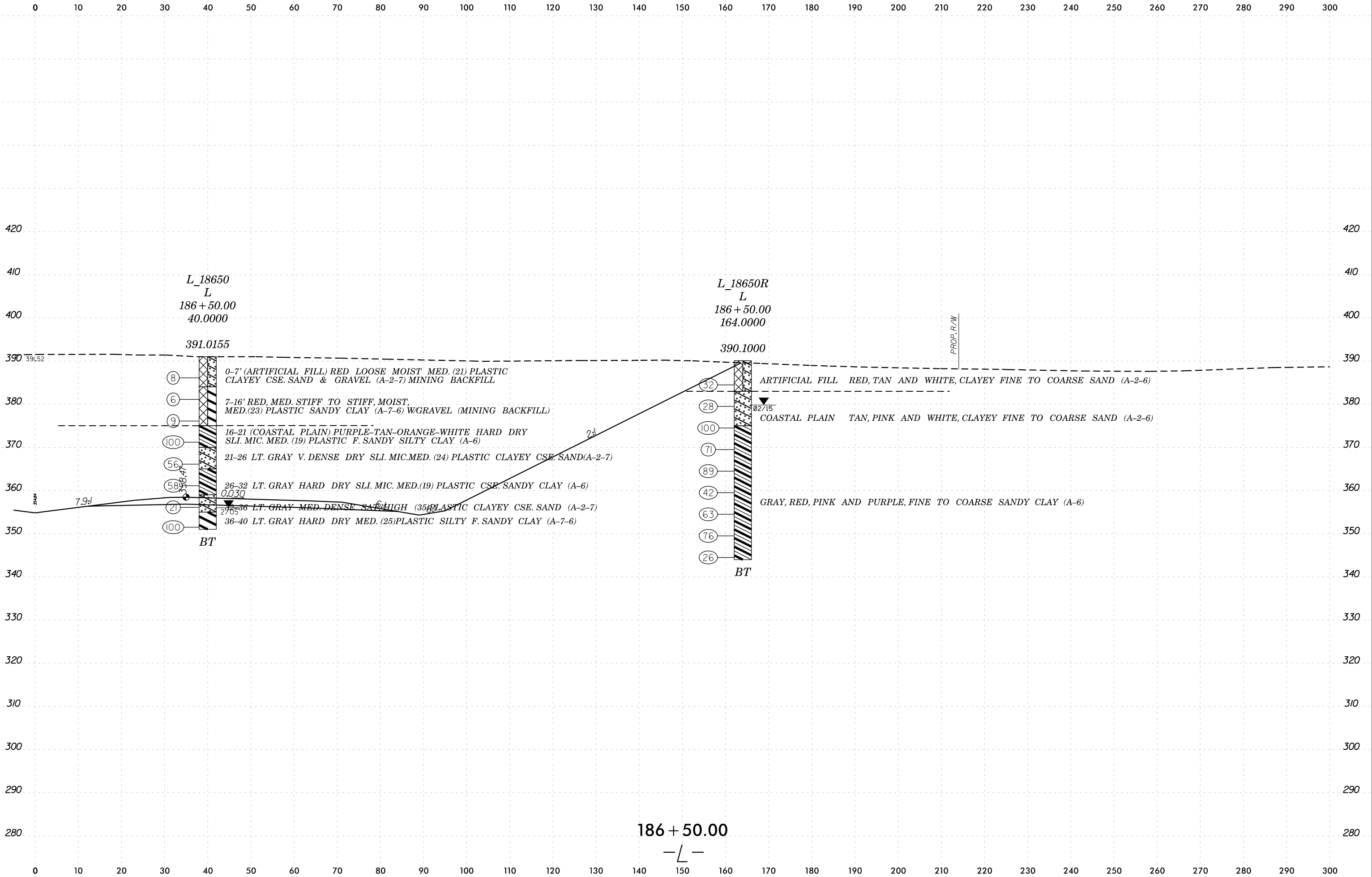
400
390
380
370
360
350

PROP. R/W

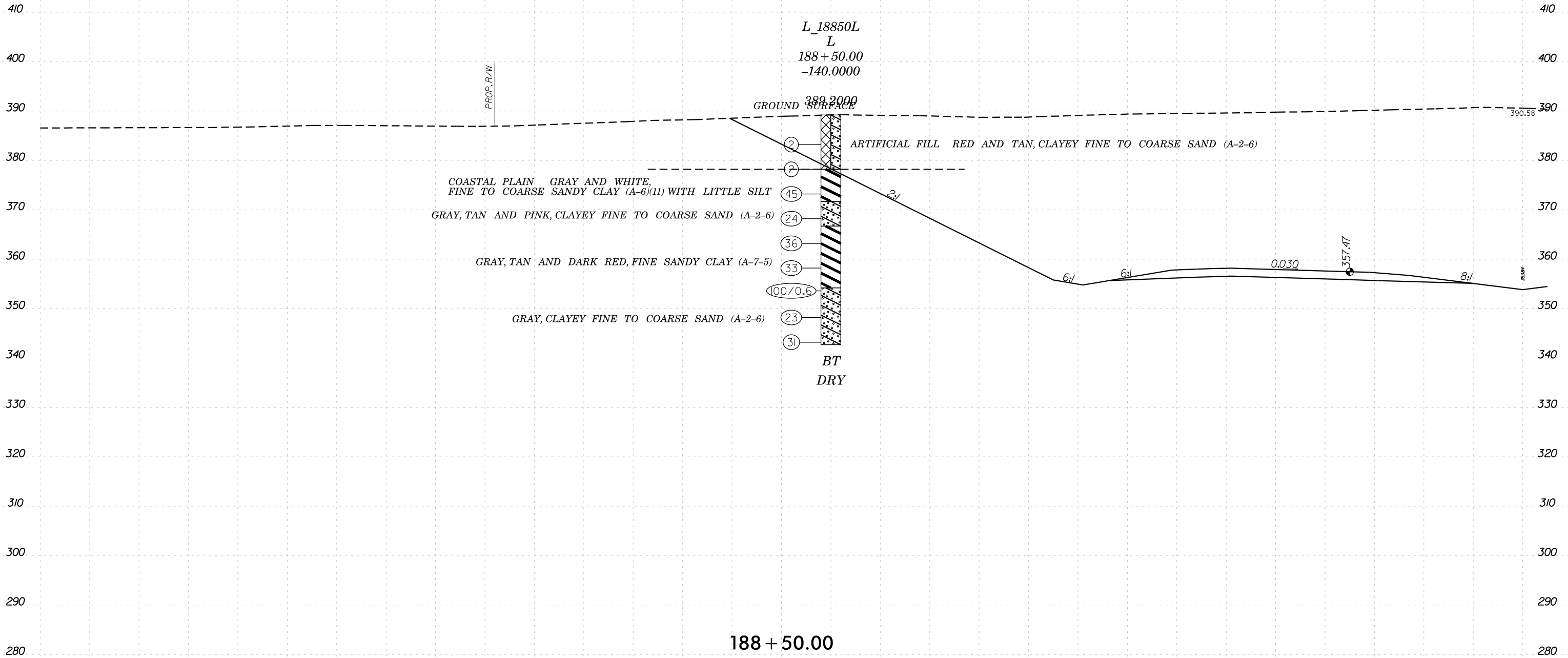
186 + 50.00



300 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0



300 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0

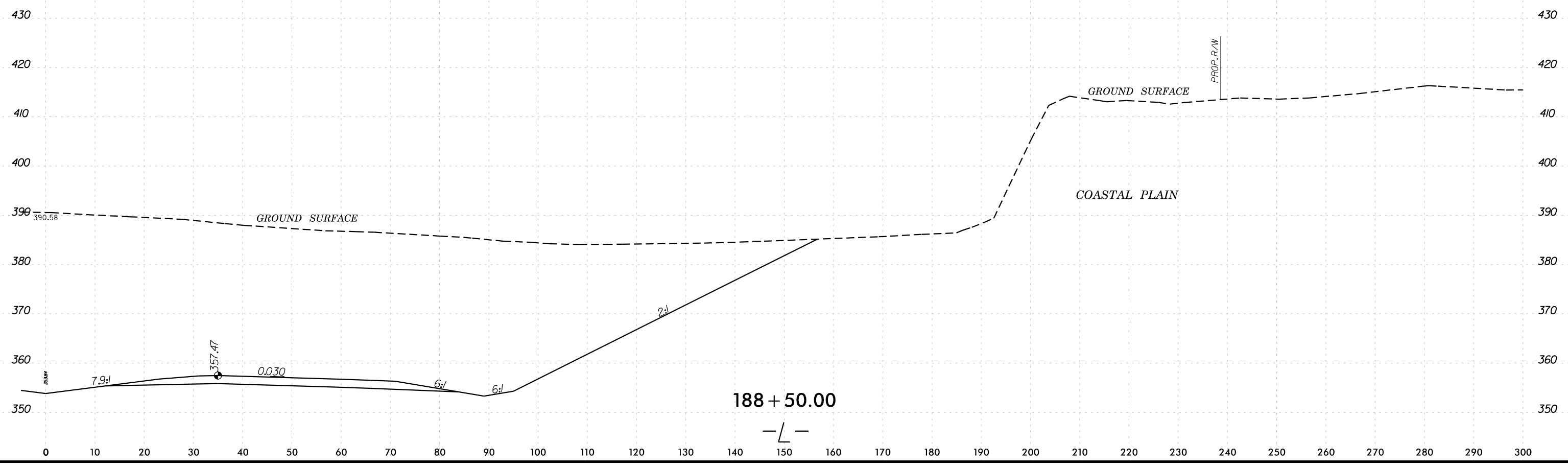


8/23/99



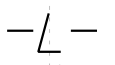
PROJ. REFERENCE NO.	SHEET NO.
R-3421B	73

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188 + 50.00

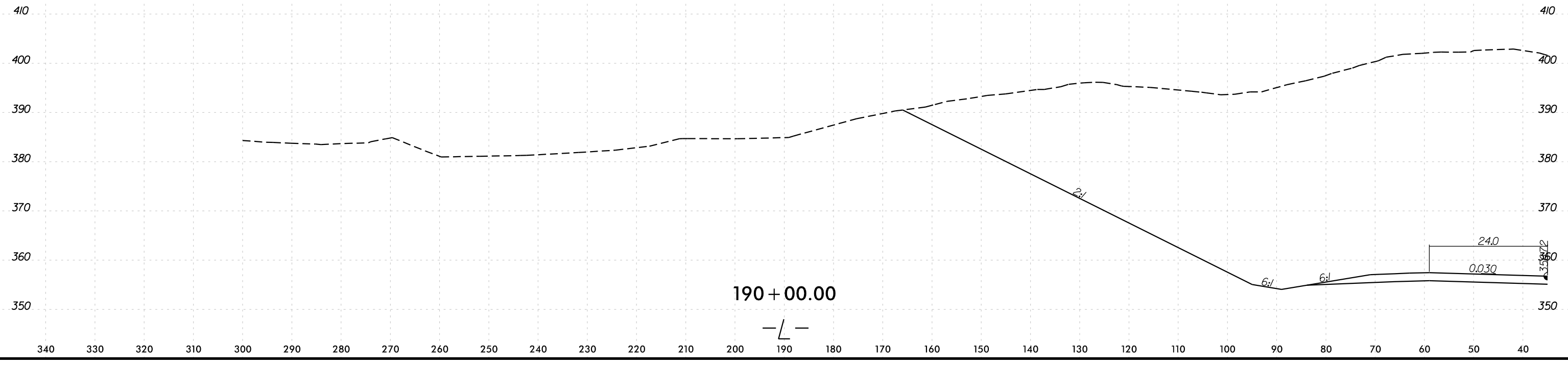


8/23/99

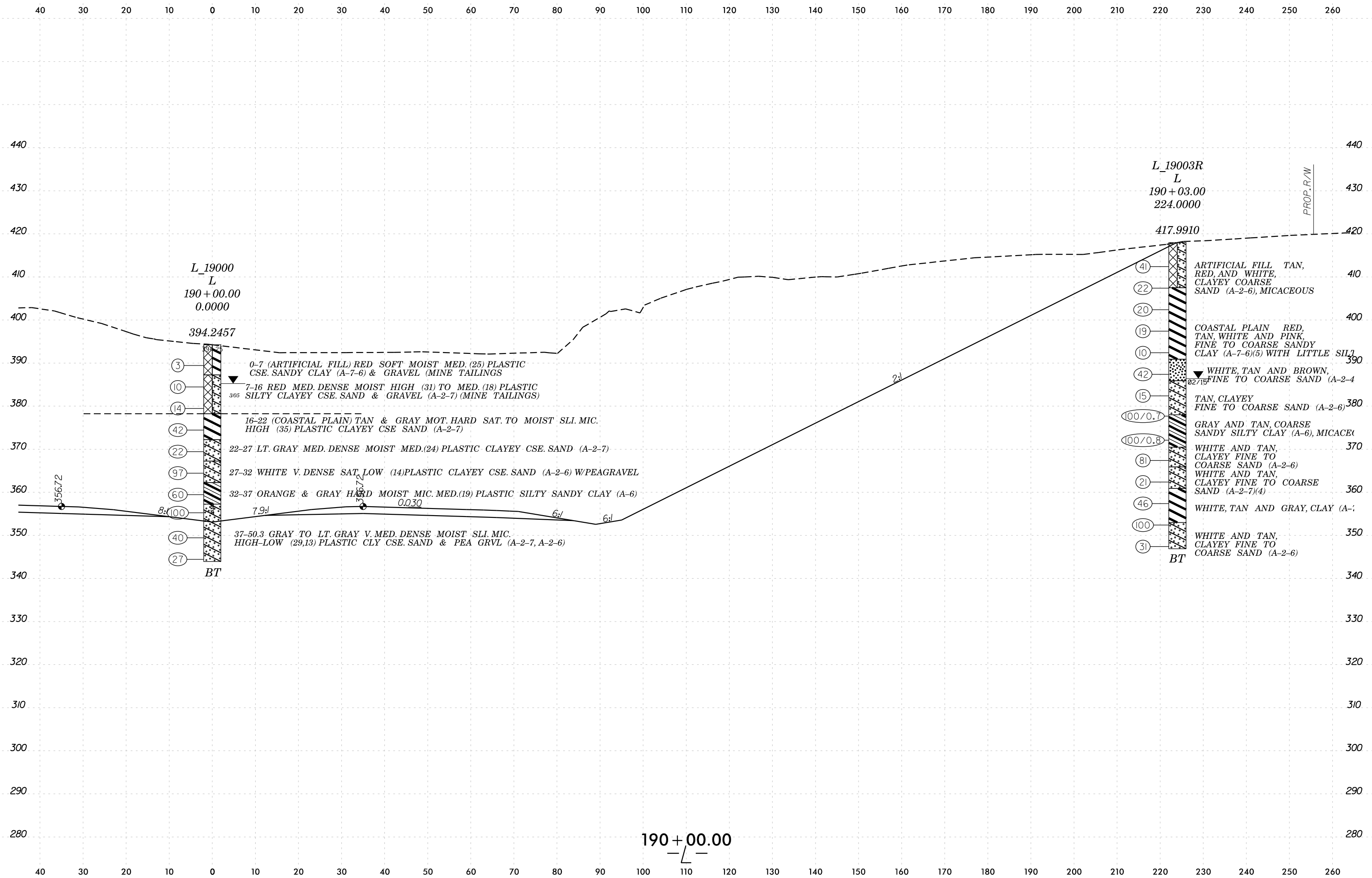


PROJ. REFERENCE NO.	SHEET NO.
R-3421B	74

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L_19000
L
190 + 00.00
0.0000

394.2457

- (3)
- (10)
- (14)
- (42)
- (22)
- (97)
- (60)
- (100)
- (40)
- (27)

0-7 (ARTIFICIAL FILL) RED SOFT MOIST MED. (25) PLASTIC CSE. SANDY CLAY (A-7-6) & GRAVEL (MINE TAILINGS)

7-16 RED MED. DENSE MOIST HIGH (31) TO MED. (18) PLASTIC SILTY CLAYEY CSE. SAND & GRAVEL (A-2-7) (MINE TAILINGS)

16-22 (COASTAL PLAIN) TAN & GRAY MOT. HARD SAT. TO MOIST SLI. MIC. HIGH (35) PLASTIC CLAYEY CSE. SAND (A-2-7)

22-27 LT. GRAY MED. DENSE MOIST MED. (24) PLASTIC CLAYEY CSE. SAND (A-2-7)

27-32 WHITE V. DENSE SAT. LOW (14) PLASTIC CLAYEY CSE. SAND (A-2-6) W/PEAGRAVEL

32-37 ORANGE & GRAY HARD MOIST MIC. MED. (19) PLASTIC SILTY SANDY CLAY (A-6)

37-50.3 GRAY TO LT. GRAY V. MED. DENSE MOIST SLI. MIC. HIGH-LOW (29.13) PLASTIC CLY CSE. SAND & PEA GRVL (A-2-7, A-2-6)

BT

L_19003R
L
190 + 03.00
224.0000

417.9910

- (41)
- (22)
- (20)
- (19)
- (10)
- (42)
- (15)
- (100/0.7)
- (100/0.8)
- (8)
- (21)
- (46)
- (100)
- (31)

ARTIFICIAL FILL, TAN, RED, AND WHITE, CLAYEY COARSE SAND (A-2-6), MICACEOUS

COASTAL PLAIN RED, TAN, WHITE AND PINK, FINE TO COARSE SANDY CLAY (A-7-6)(5) WITH LITTLE SILT

WHITE, TAN AND BROWN, FINE TO COARSE SAND (A-2-4)

TAN, CLAYEY FINE TO COARSE SAND (A-2-6)

GRAY AND TAN, COARSE SANDY SILTY CLAY (A-6), MICACEOUS

WHITE AND TAN, CLAYEY FINE TO COARSE SAND (A-2-6)

WHITE AND TAN, CLAYEY FINE TO COARSE SAND (A-2-7)(4)

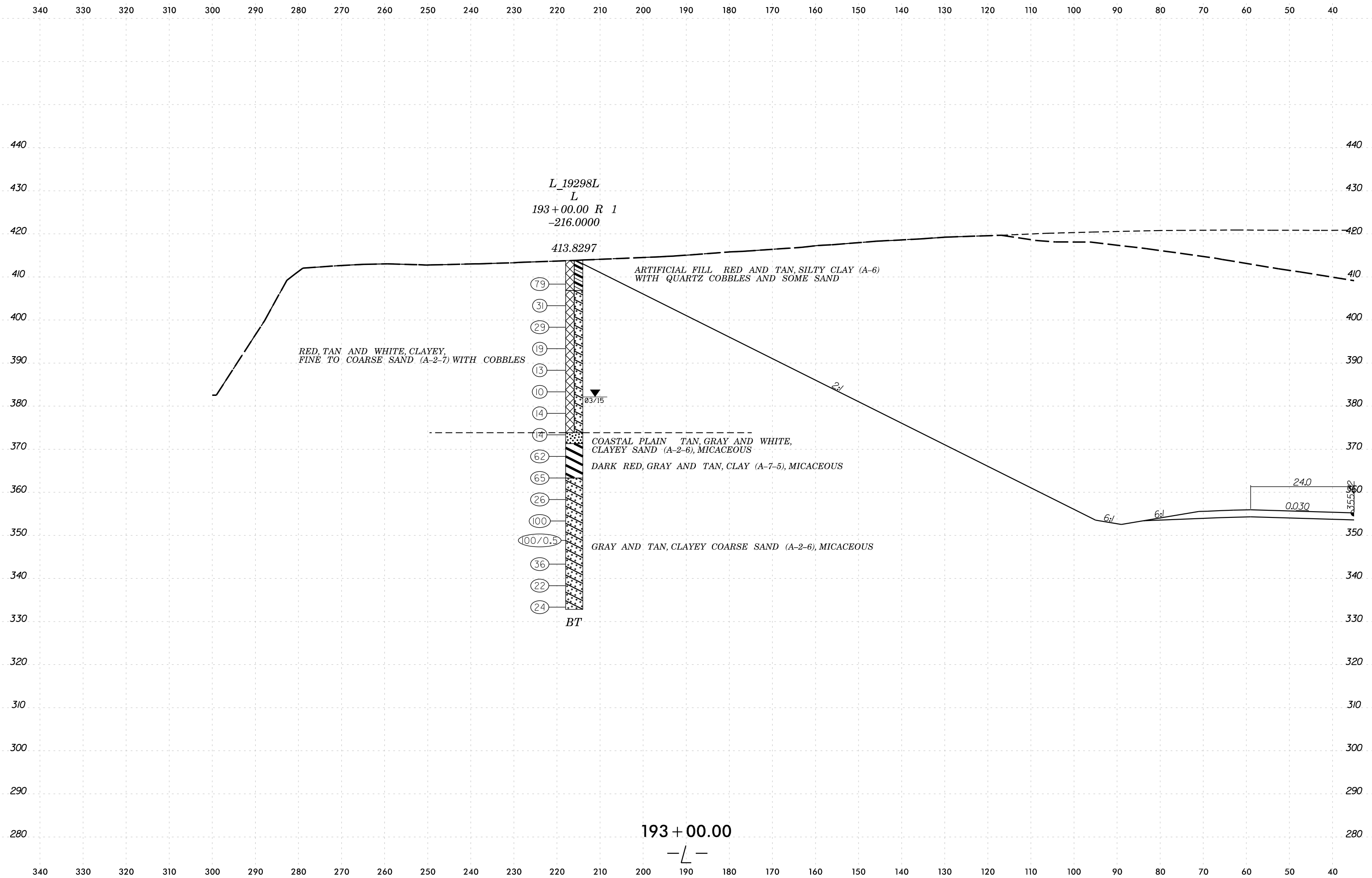
WHITE, TAN AND GRAY, CLAY (A-2-7)

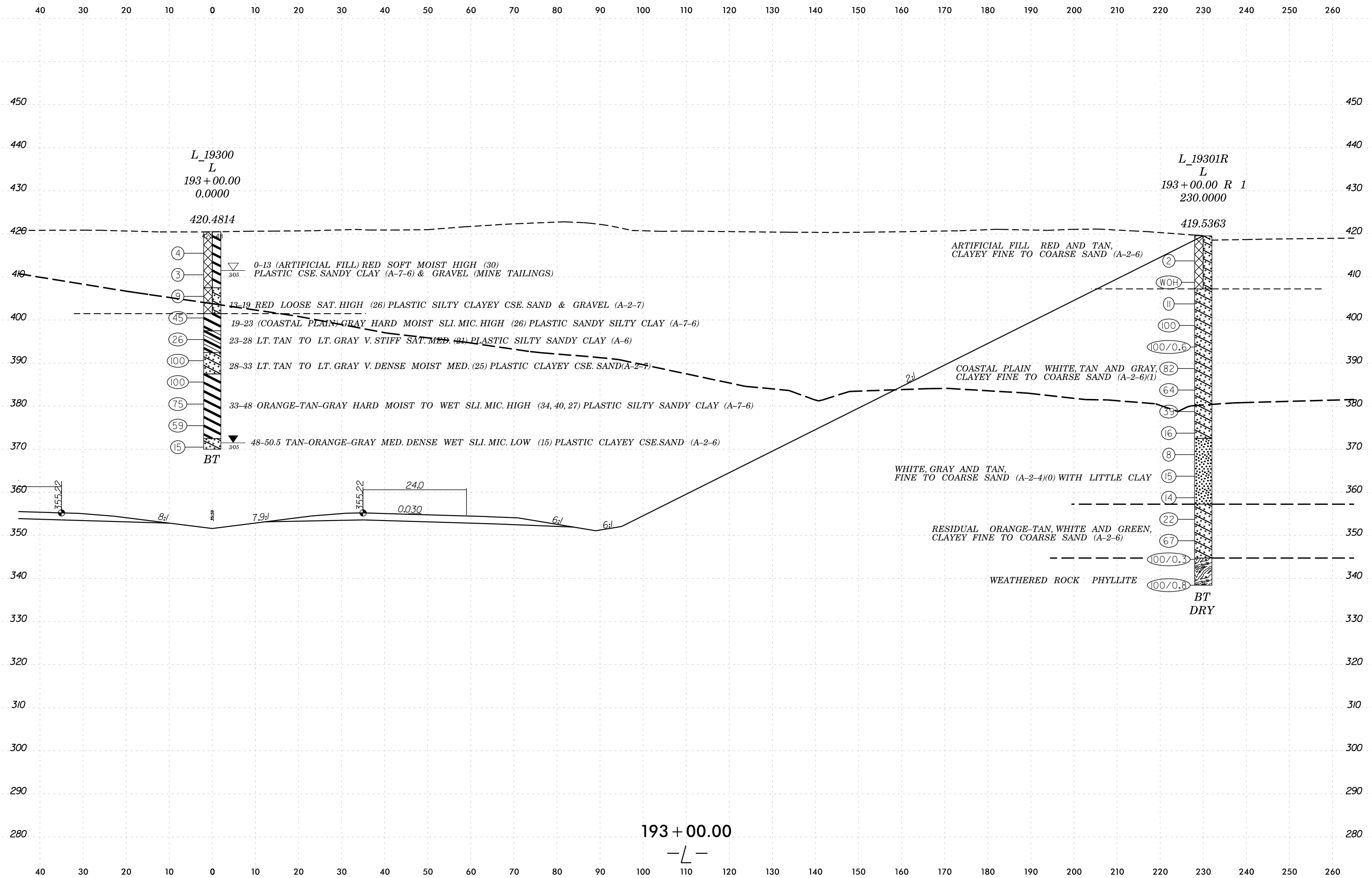
WHITE AND TAN, CLAYEY FINE TO COARSE SAND (A-2-6)

BT

PROP. R/W

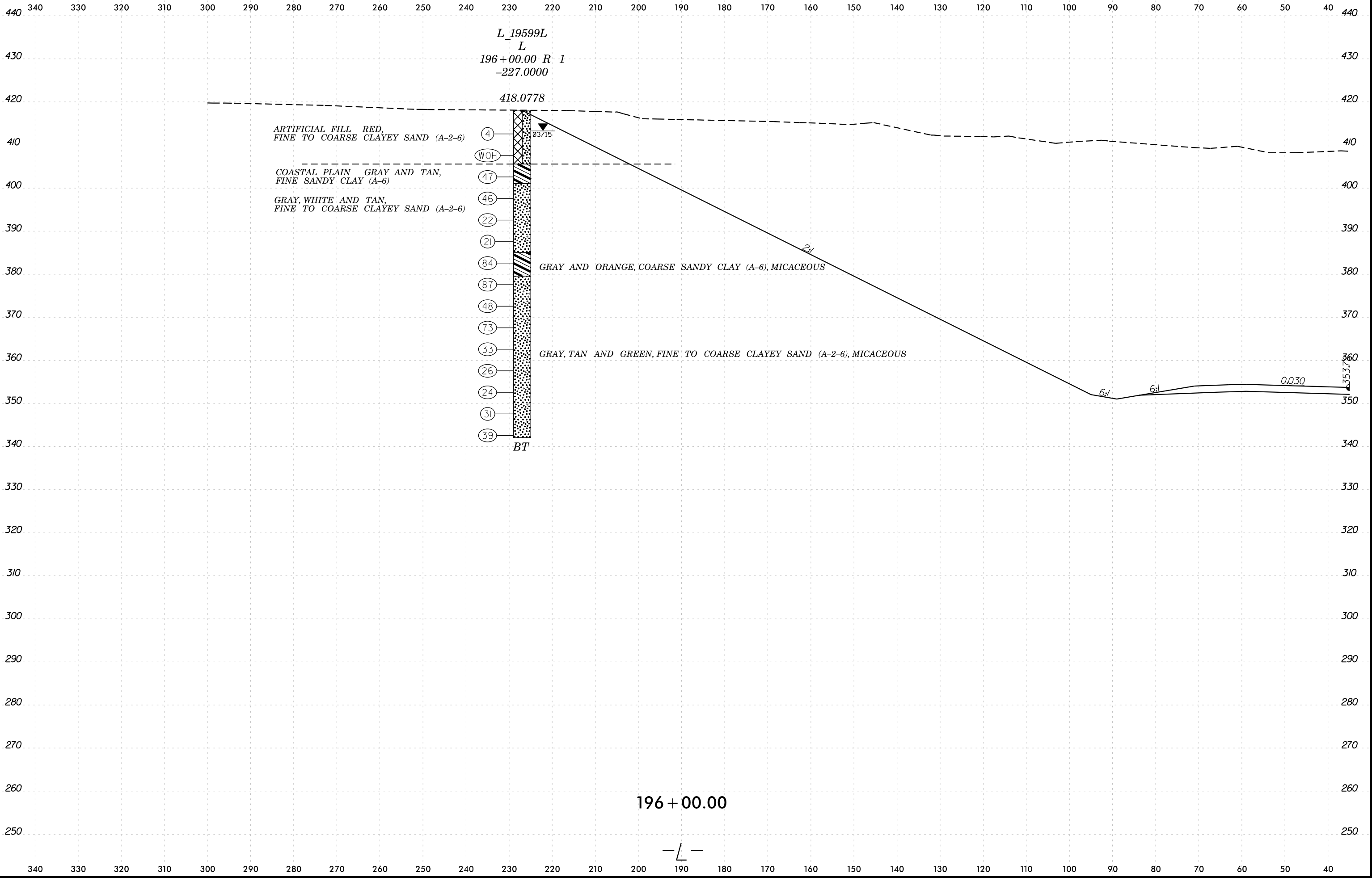
190 + 00.00

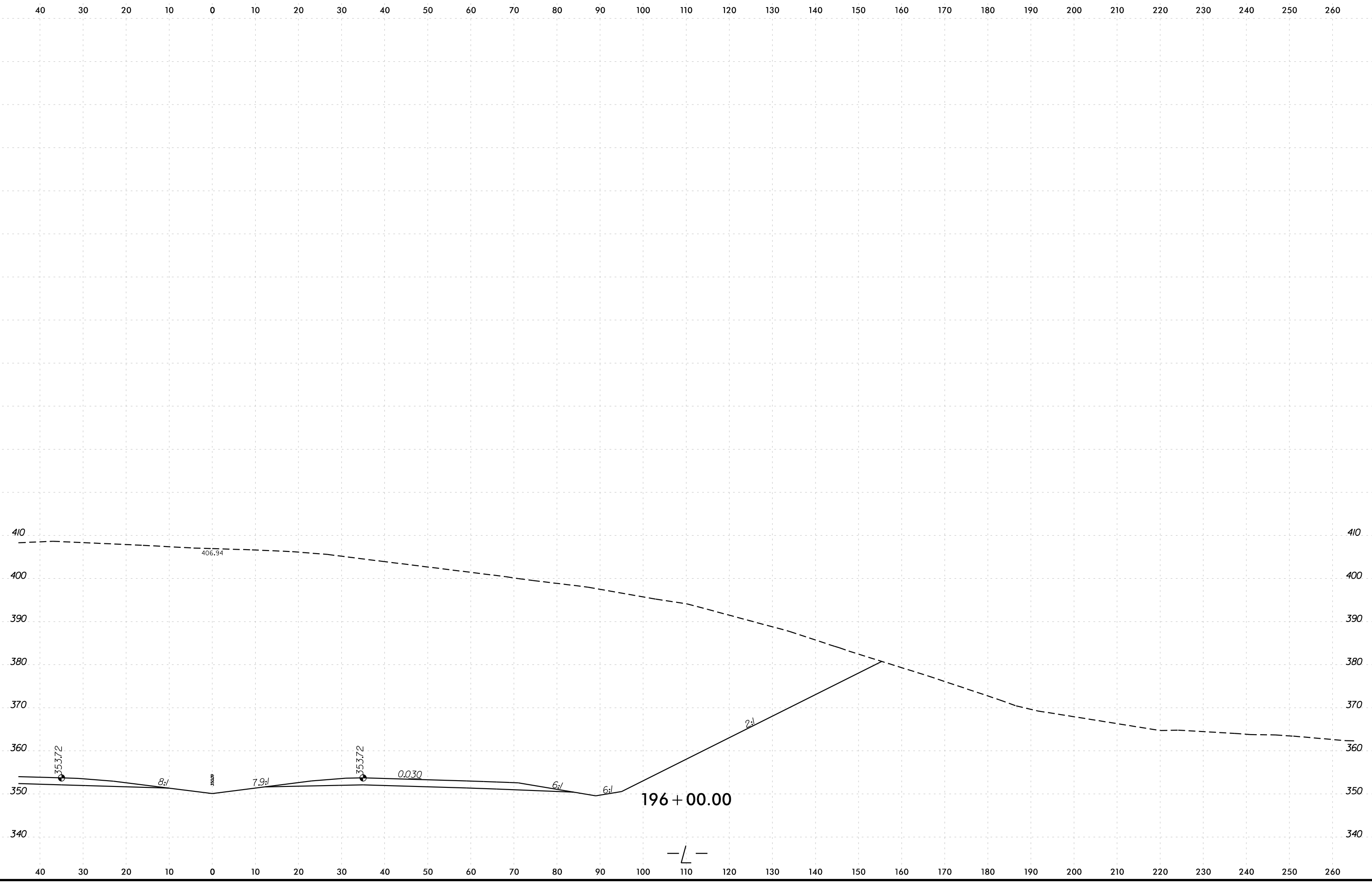


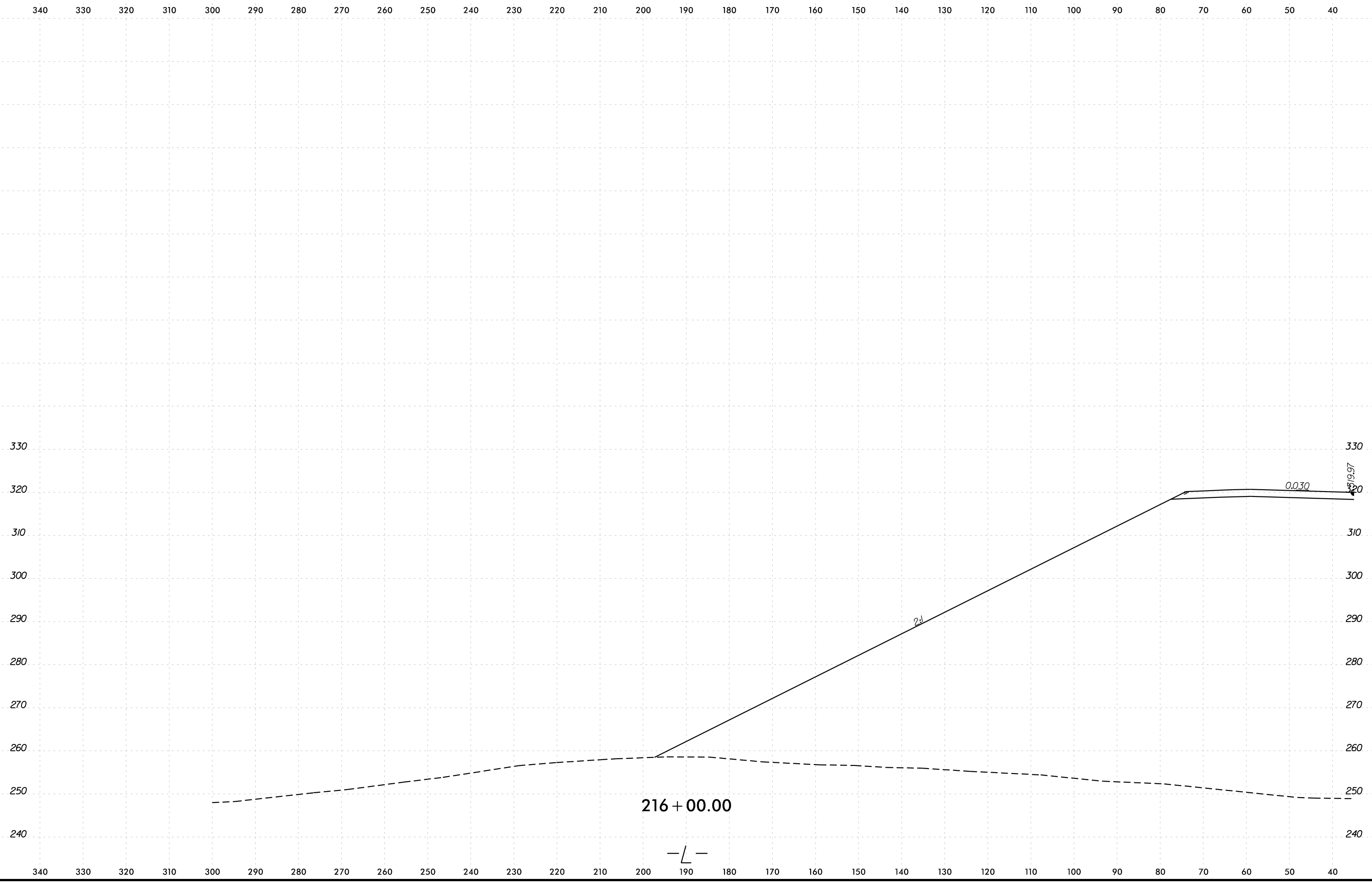


2007-06 PM
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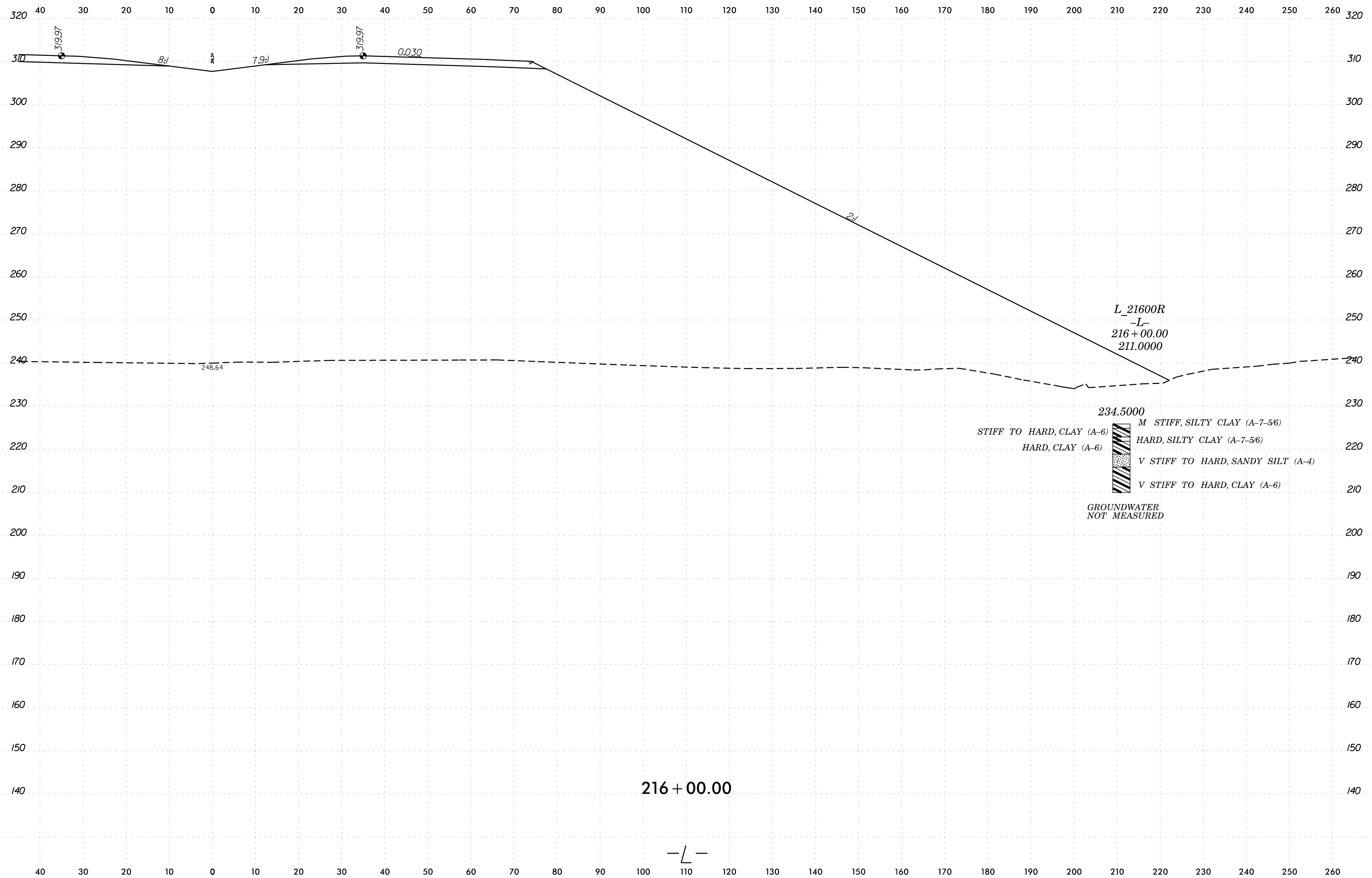
193 + 00.00
-L-



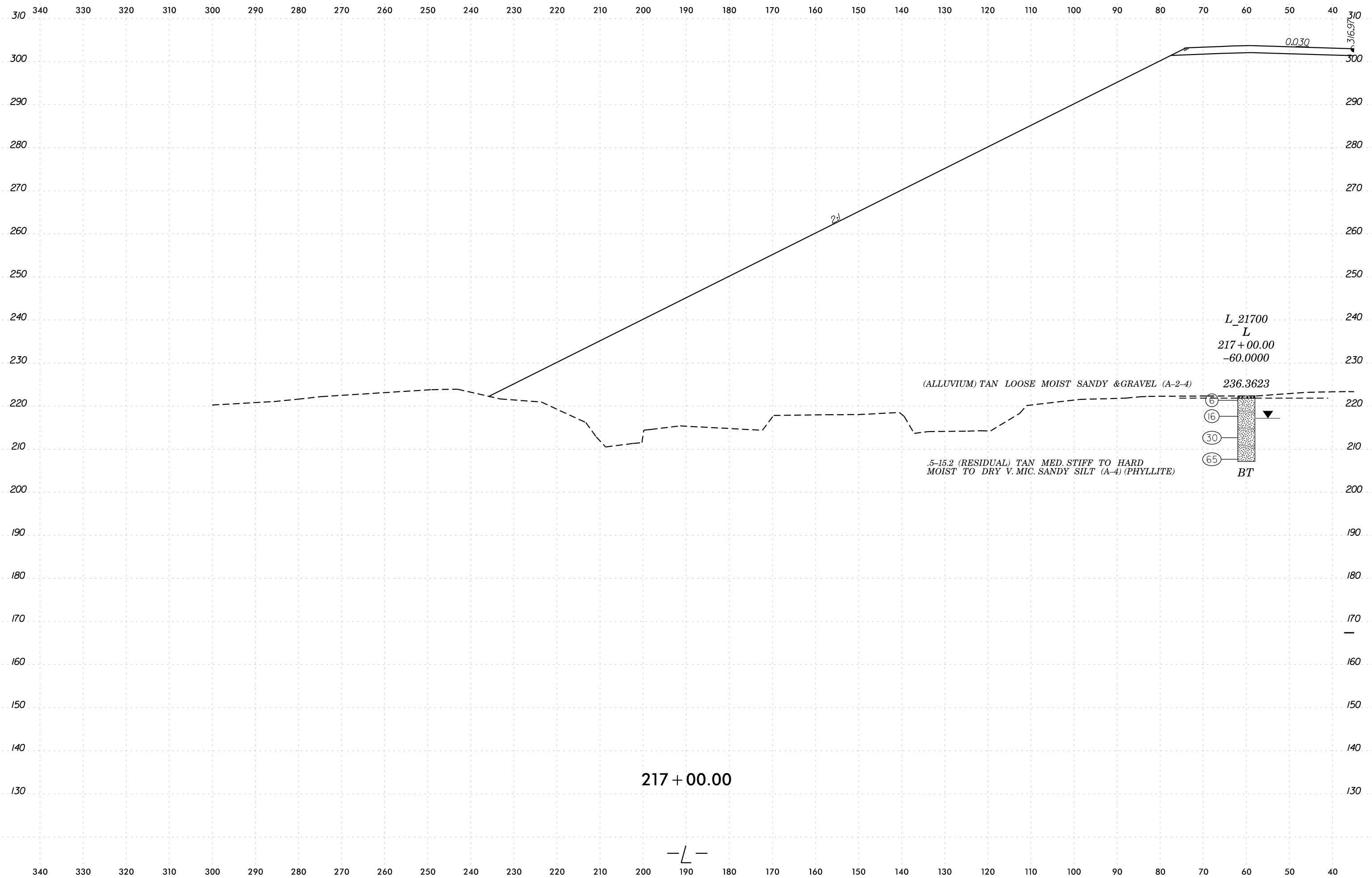


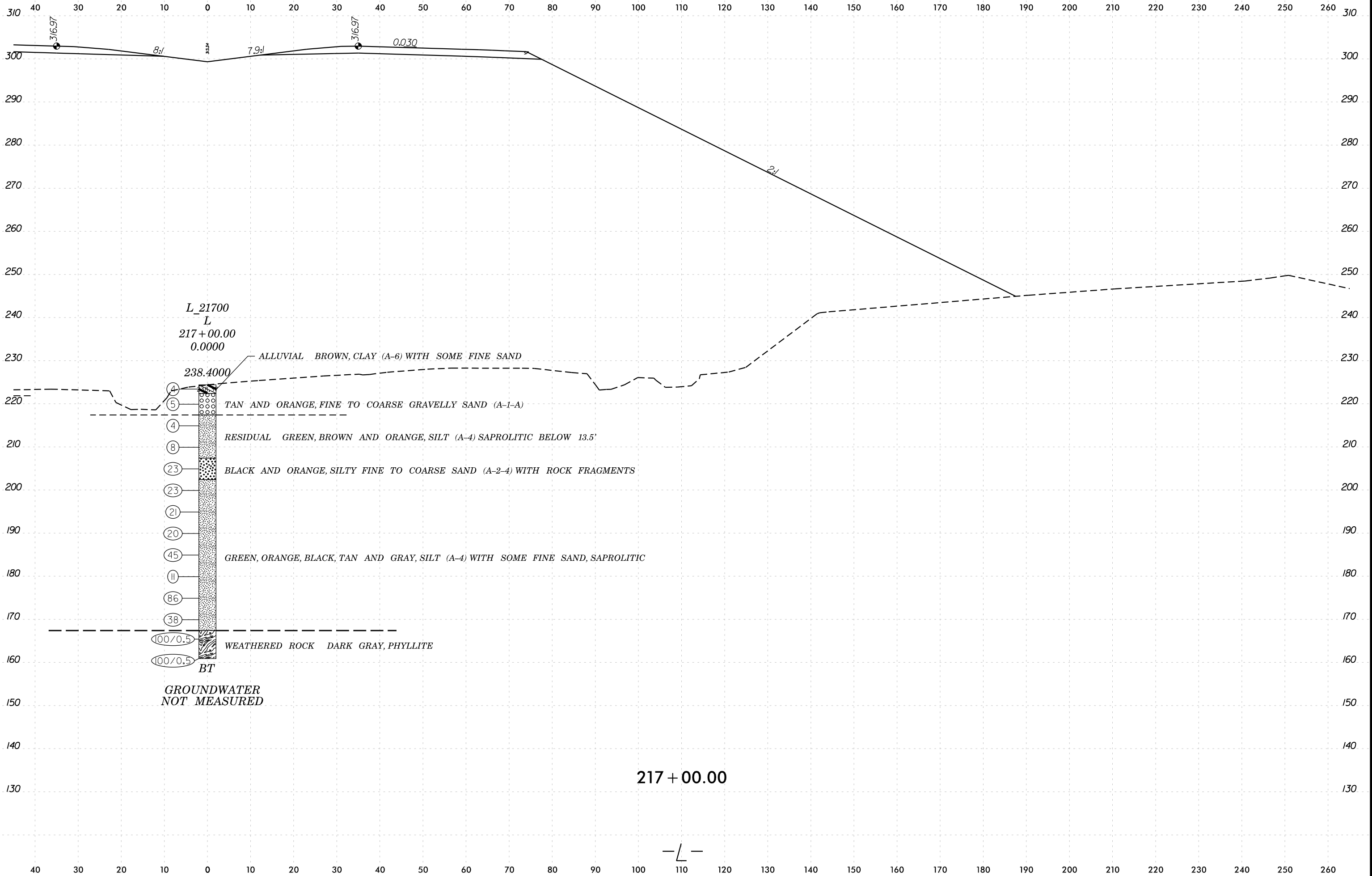


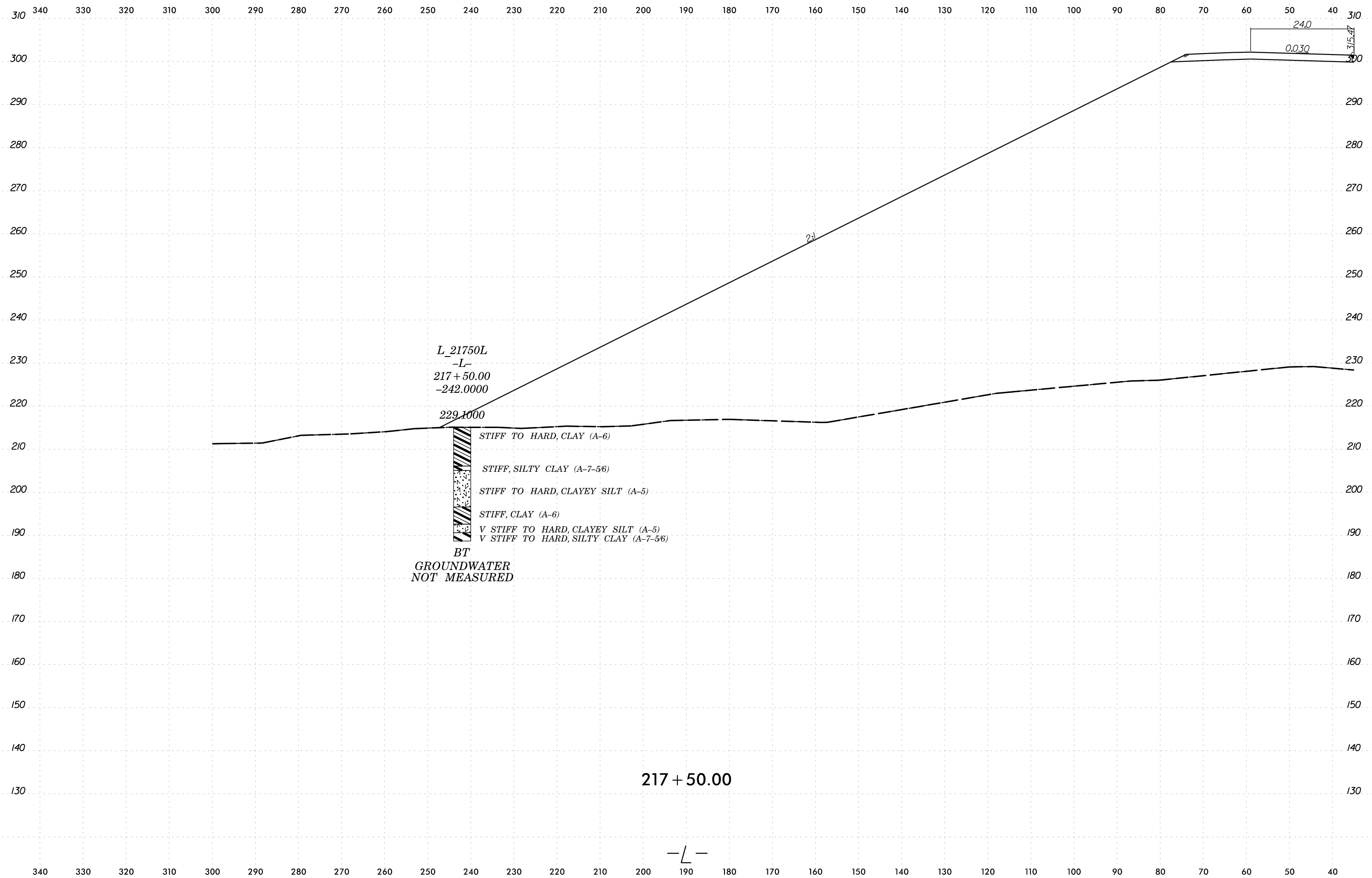
8/23/99



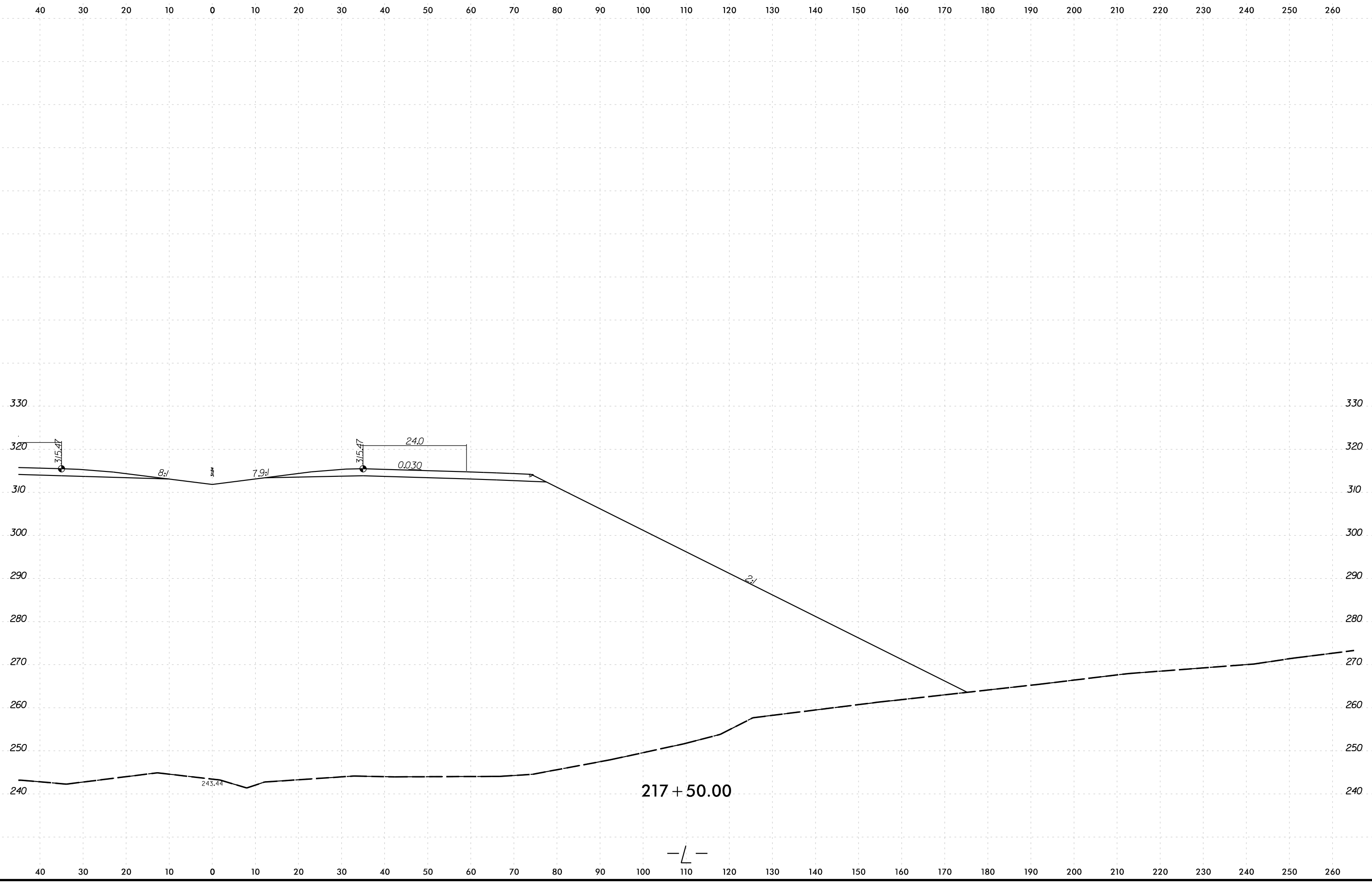
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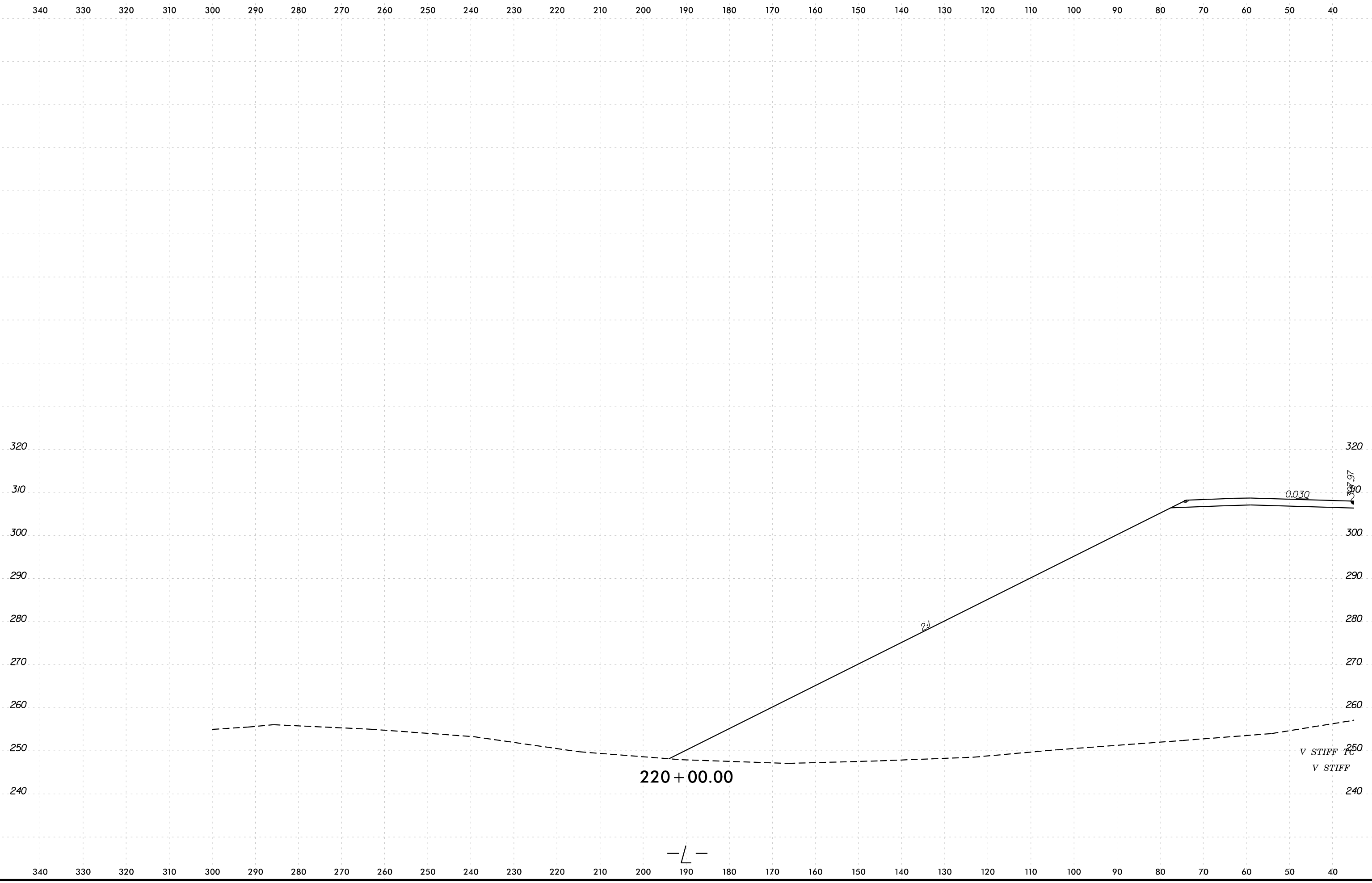


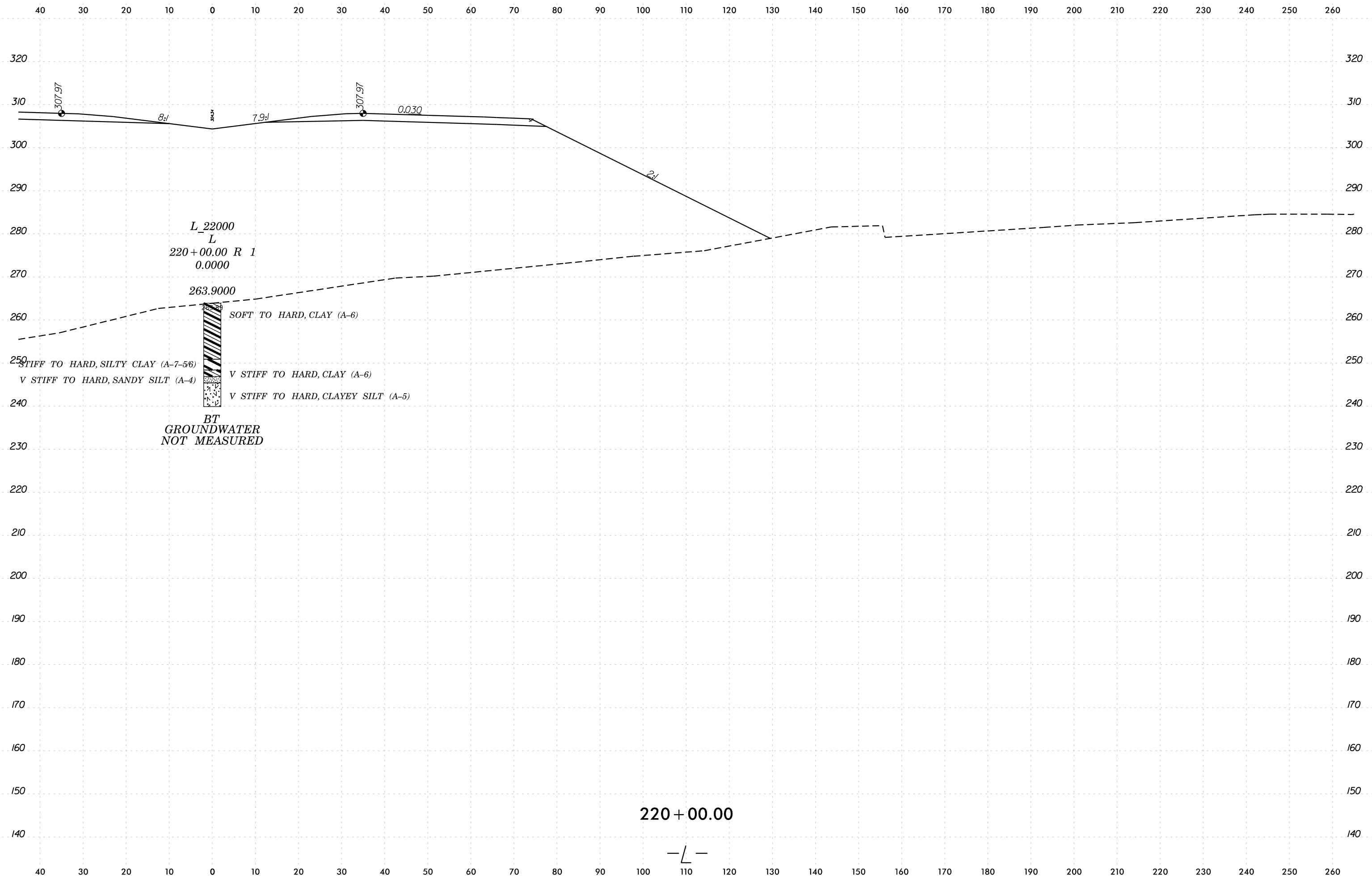


8/23/99



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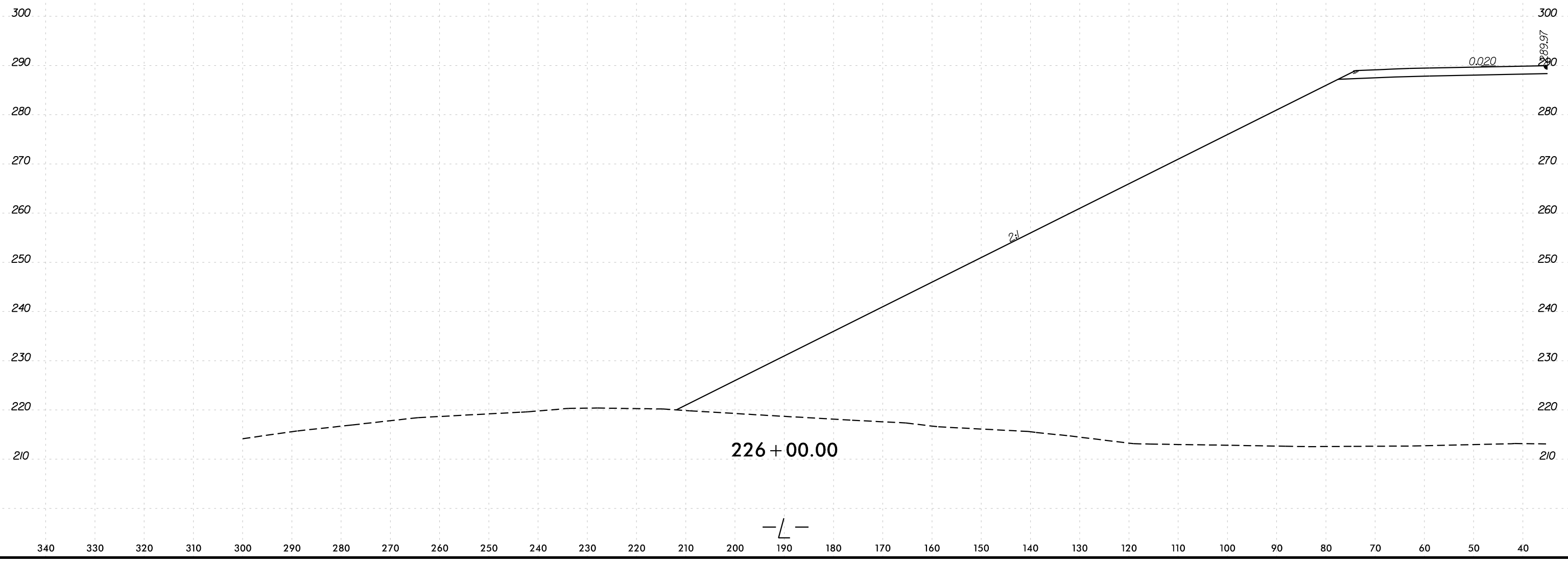


8/23/99



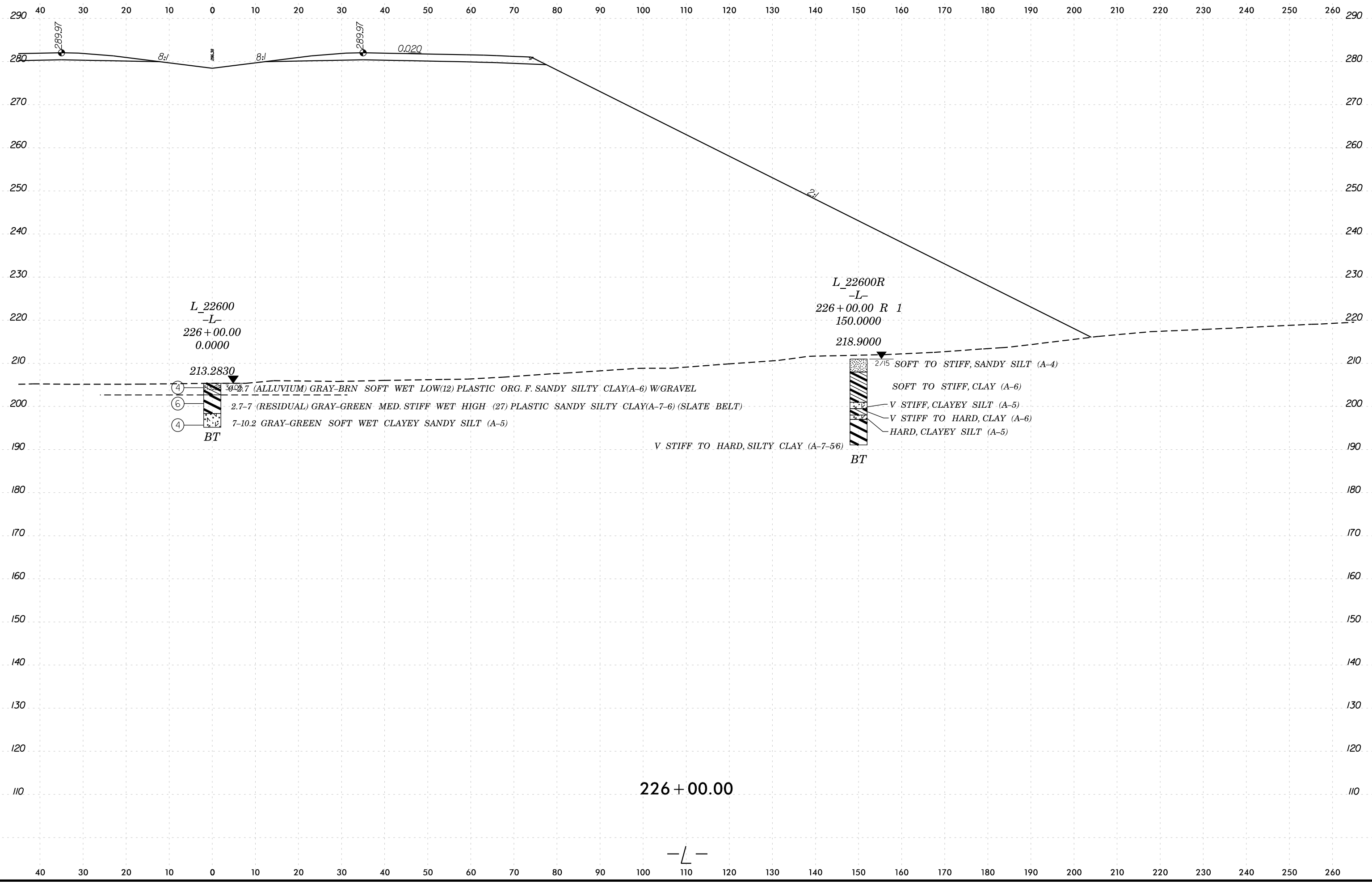
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R-3421B	88

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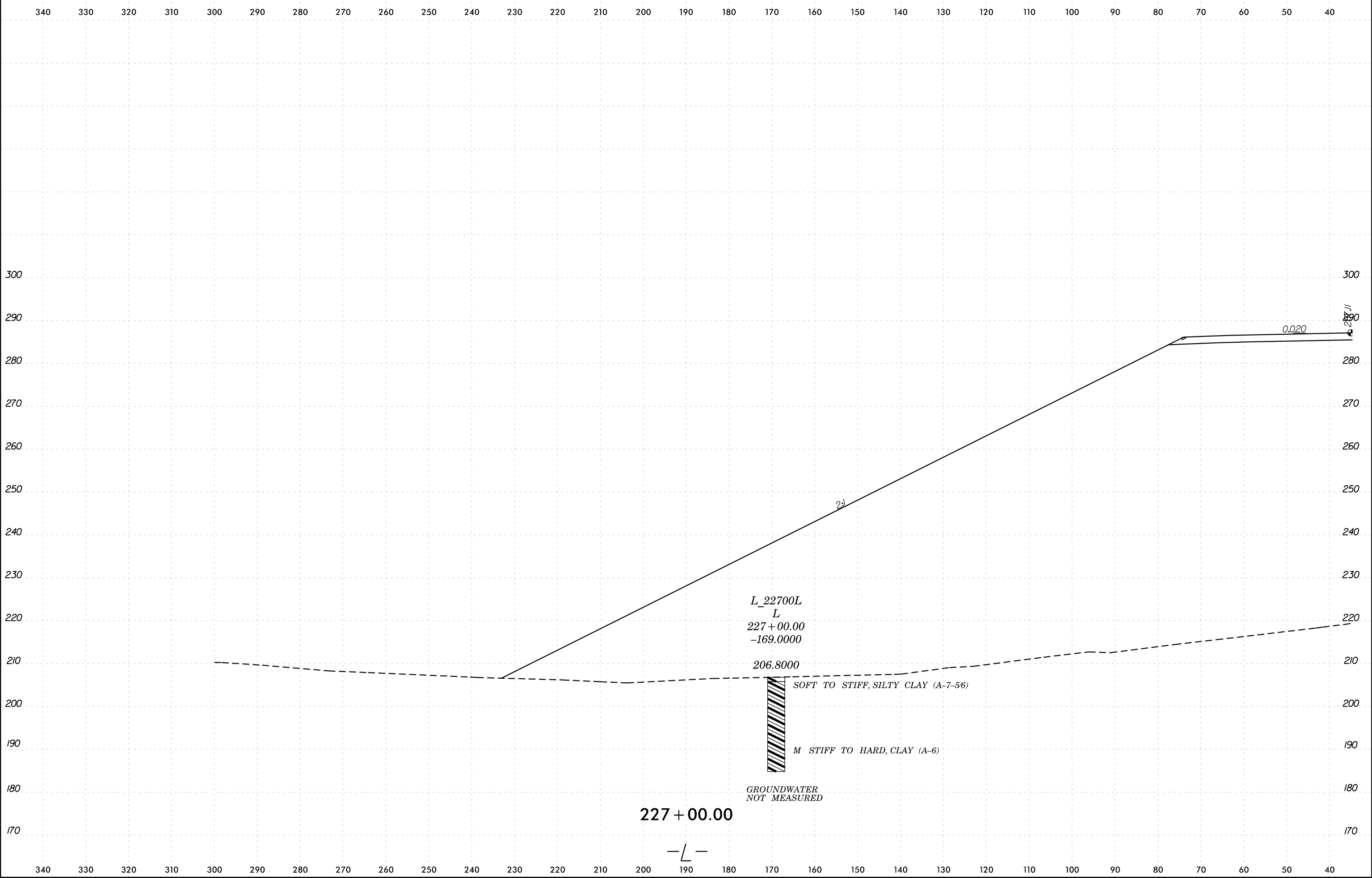


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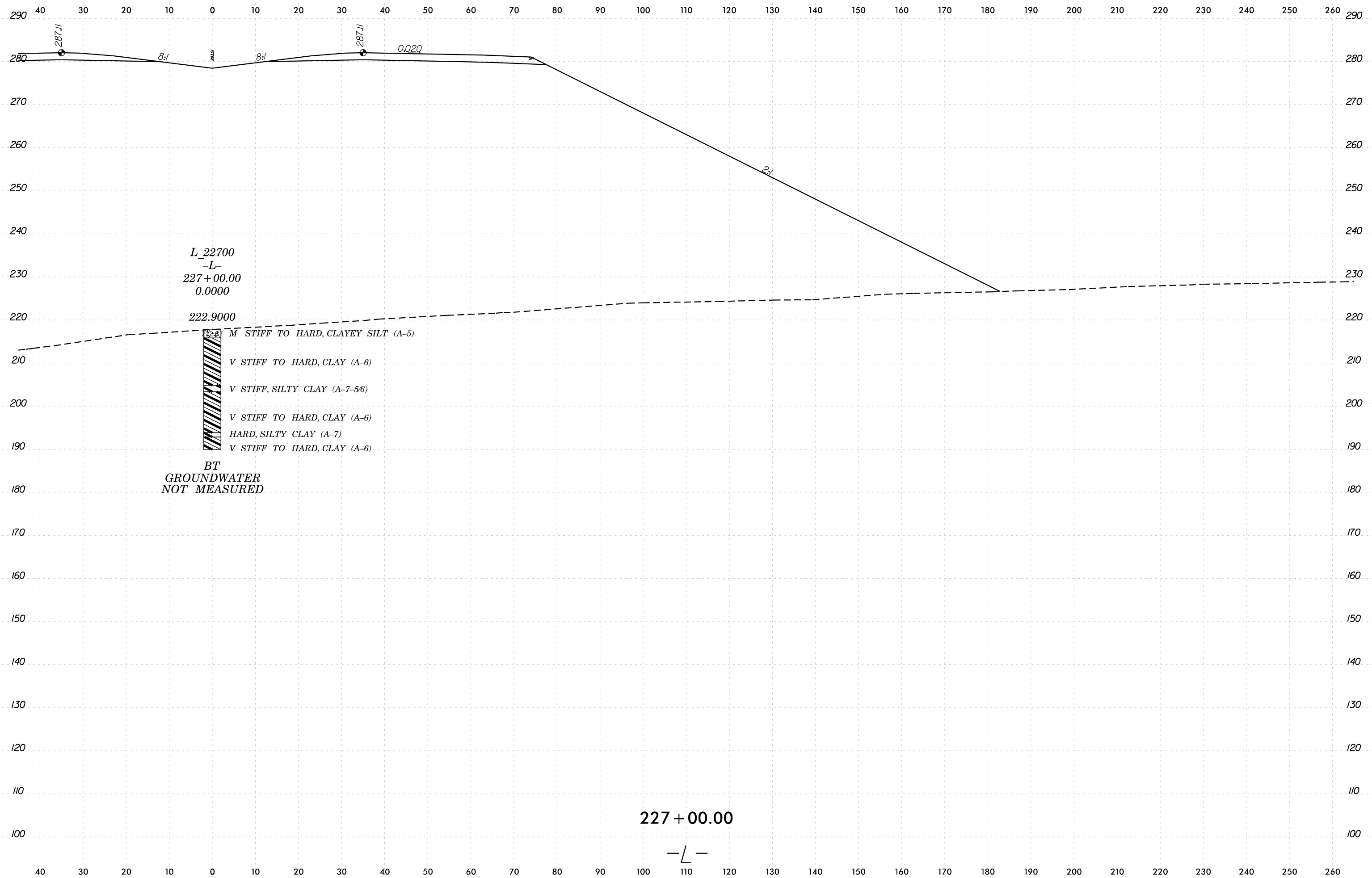
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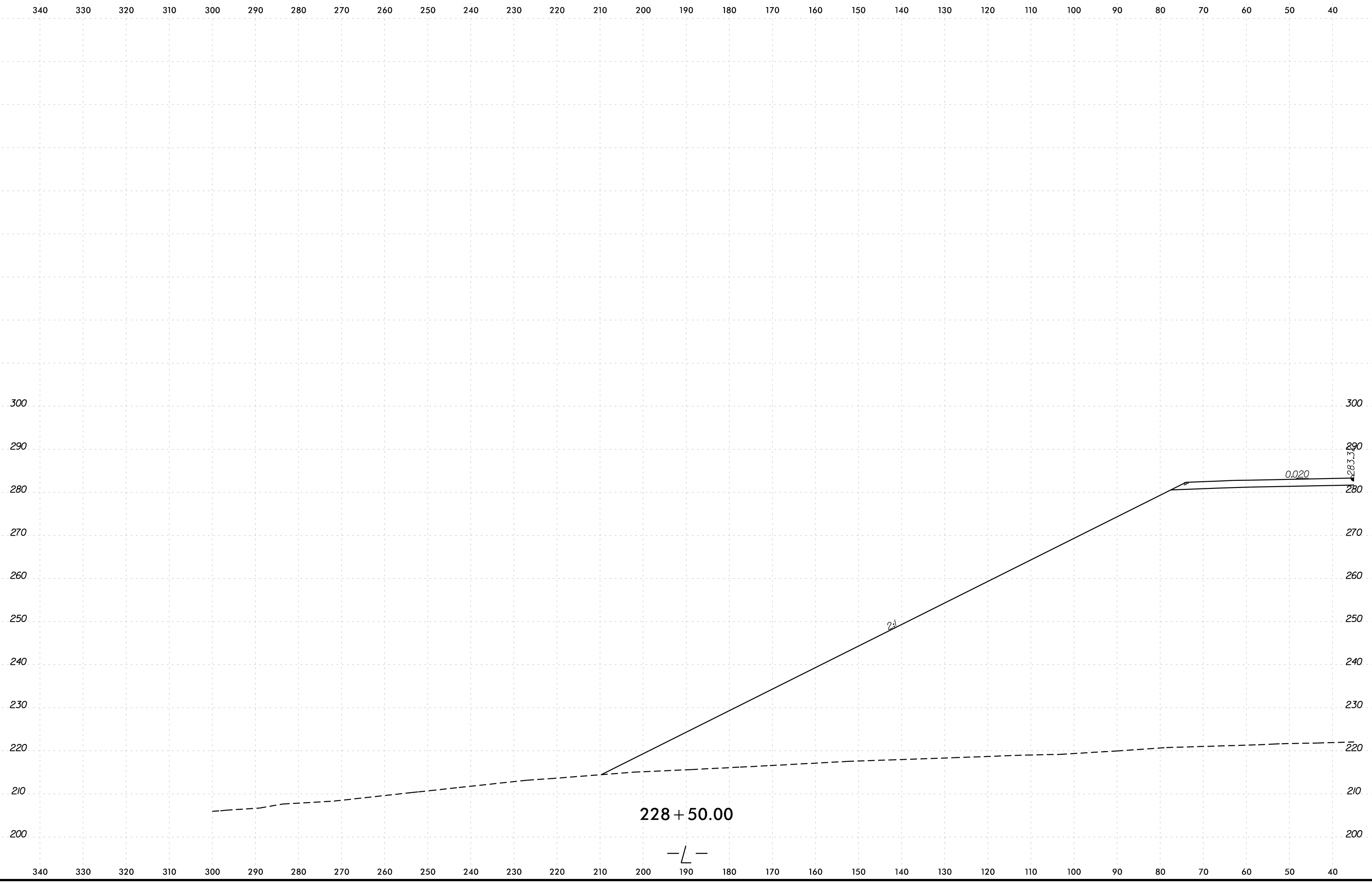


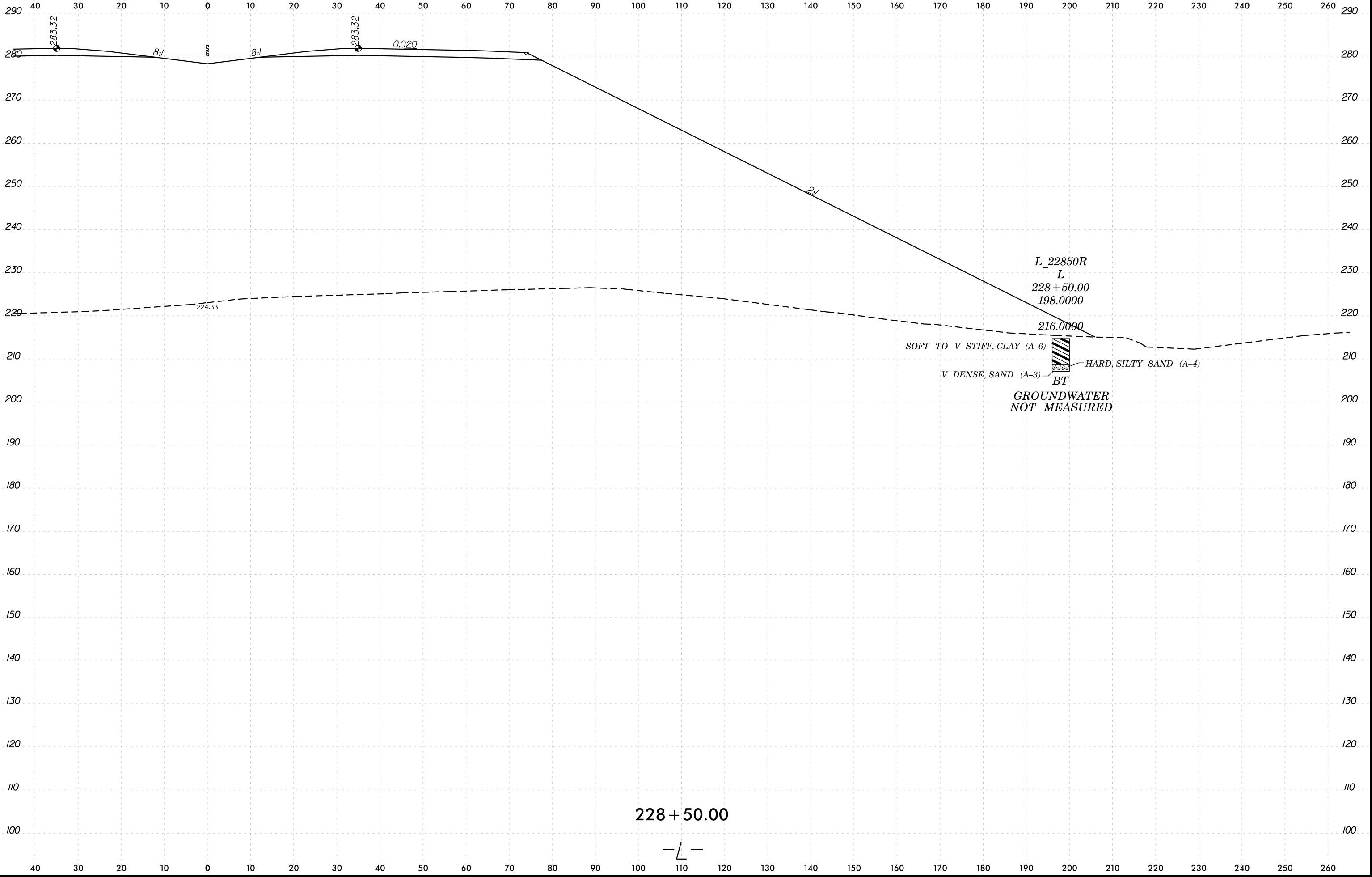
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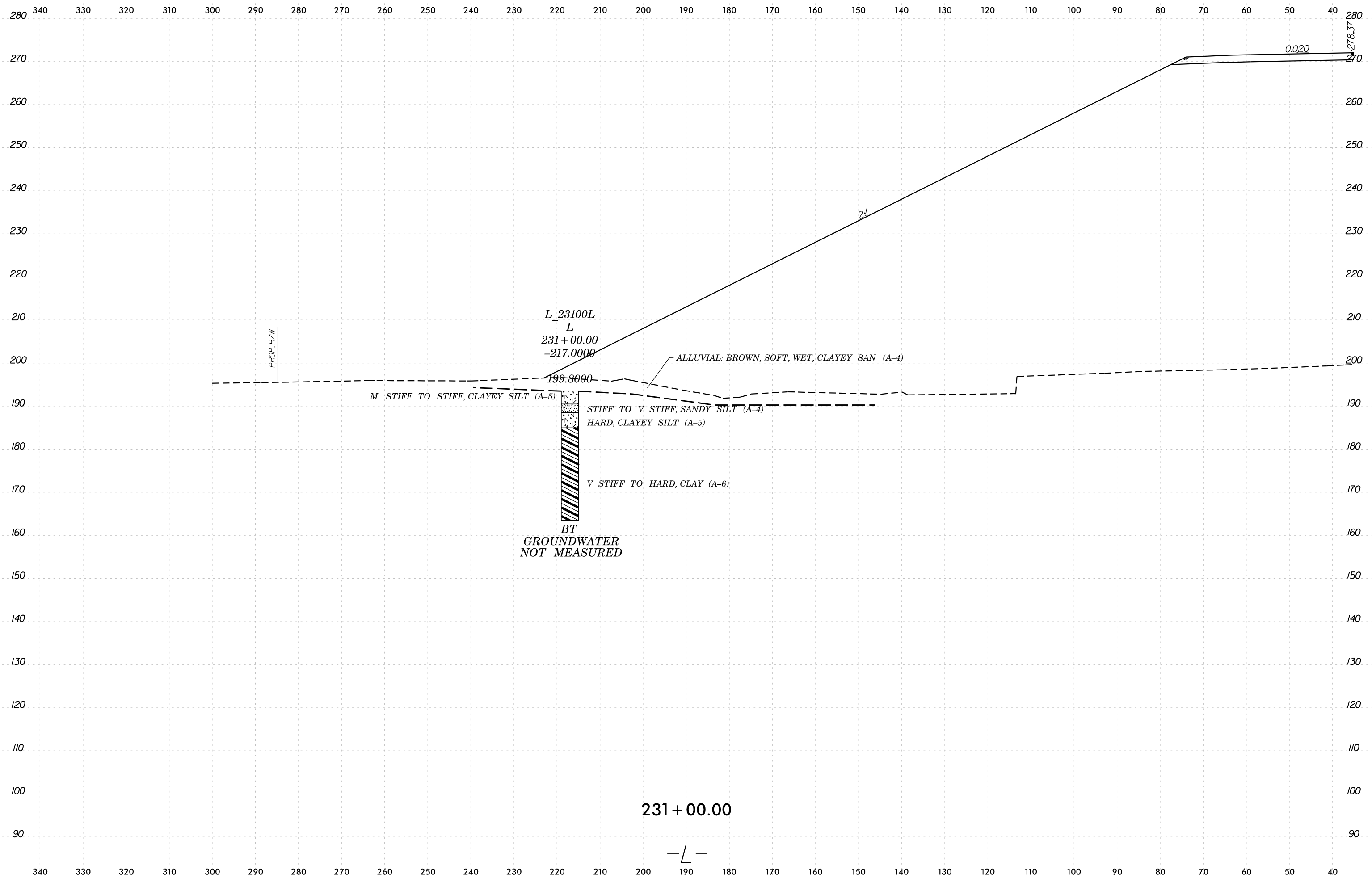


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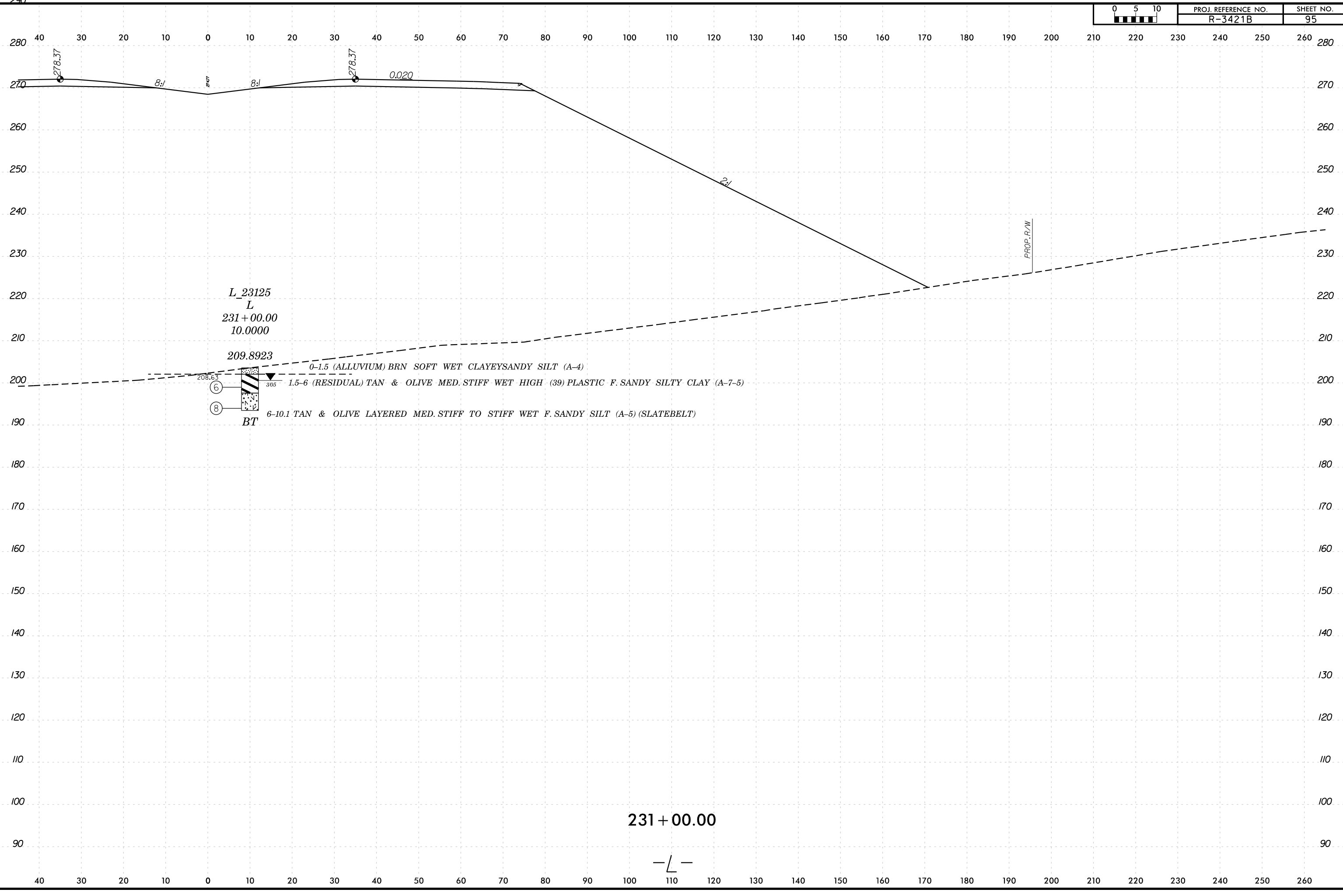


231 + 00.00

—L—

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-3421B	95



L 23125
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231+00.00
10.0000

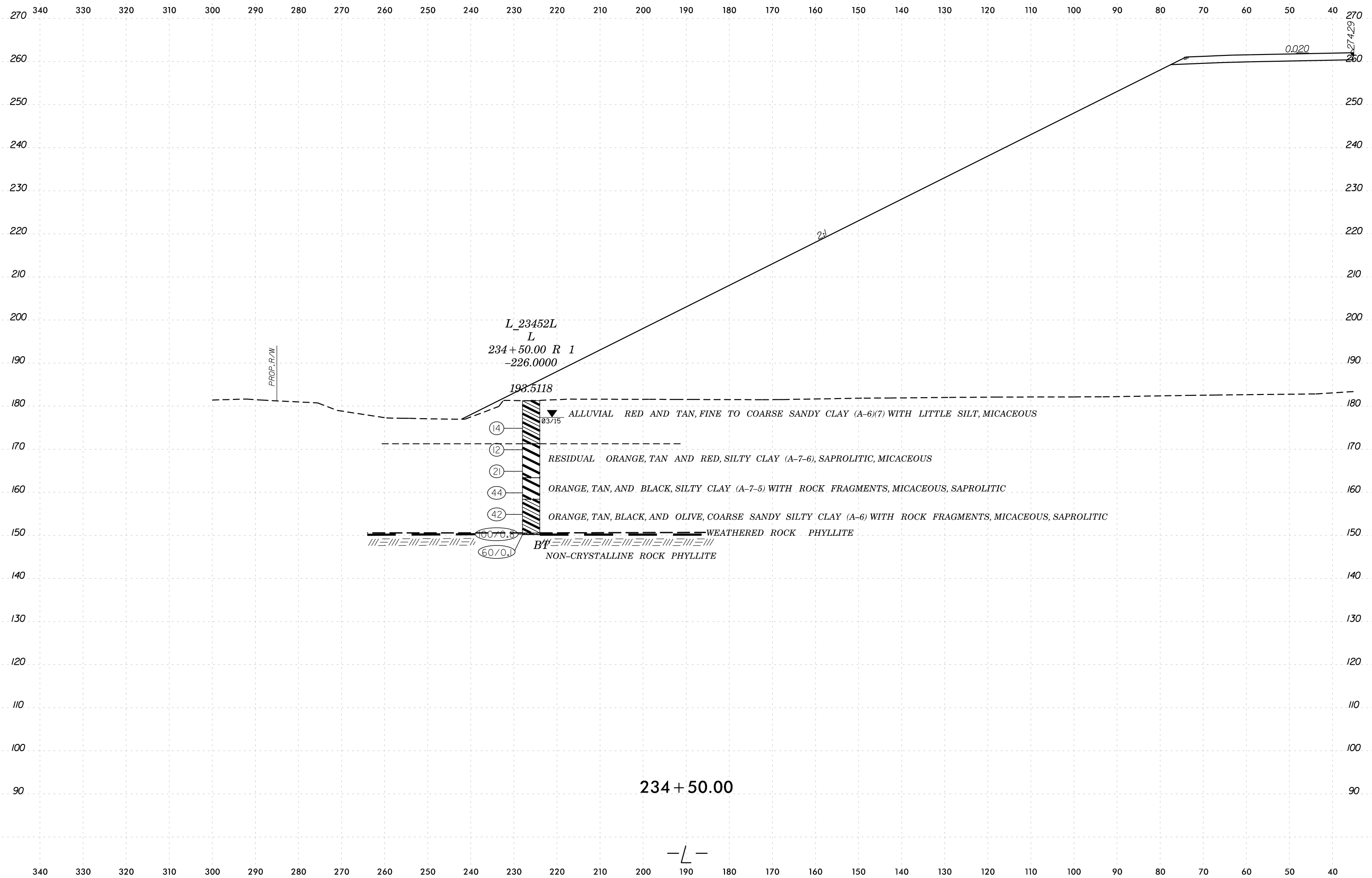
209.8923

0-1.5 (ALLUVIUM) BRN SOFT WET CLAYEYSANDY SILT (A-4)
 1.5-6 (RESIDUAL) TAN & OLIVE MED. STIFF WET HIGH (39) PLASTIC F. SANDY SILTY CLAY (A-7-5)
 6-10.1 TAN & OLIVE LAYERED MED. STIFF TO STIFF WET F. SANDY SILT (A-5) (SLATEBELT)

231 + 00.00

-L-

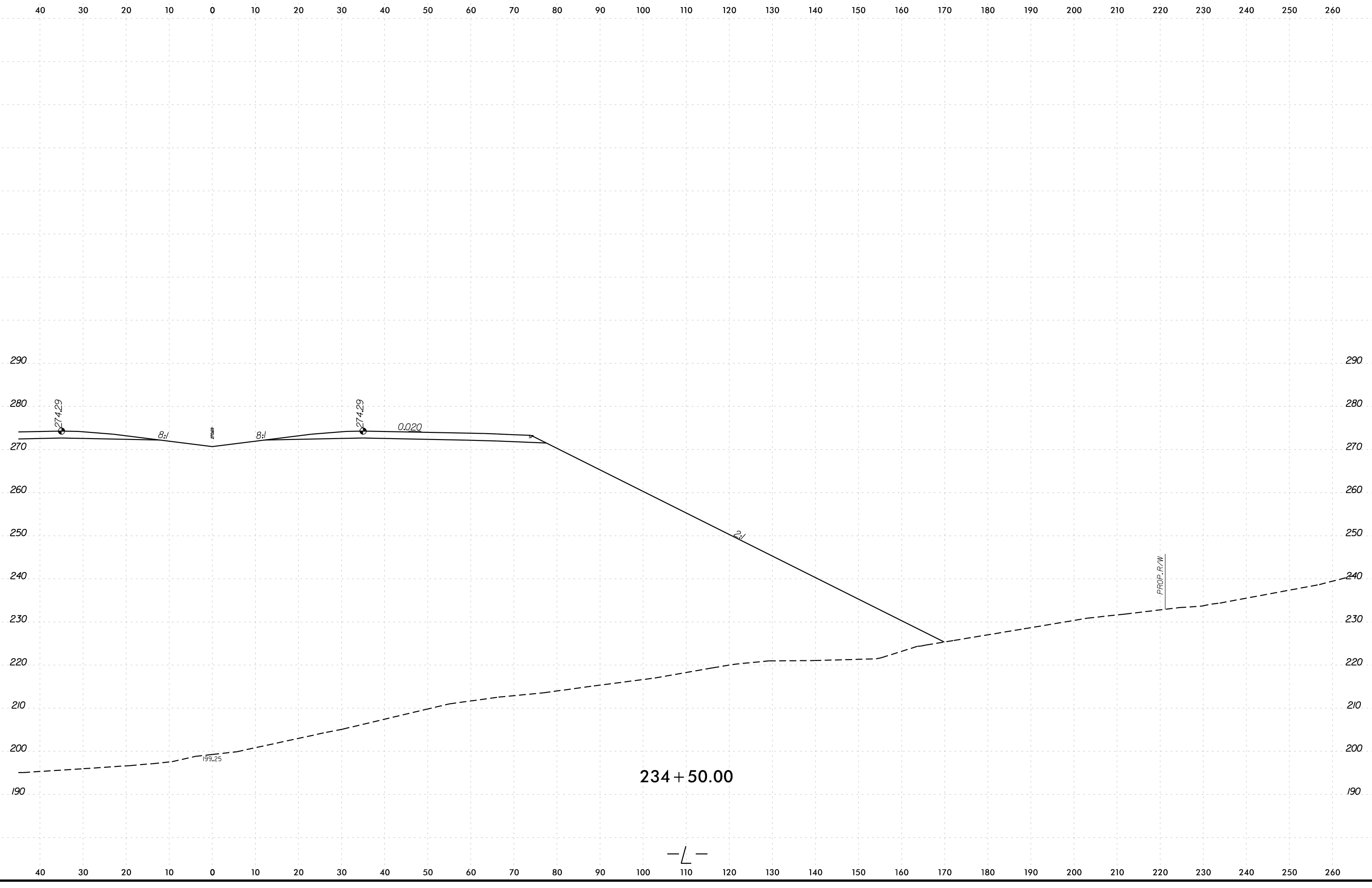
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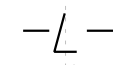
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PROJ. REFERENCE NO.	SHEET NO.
R-3421B	97



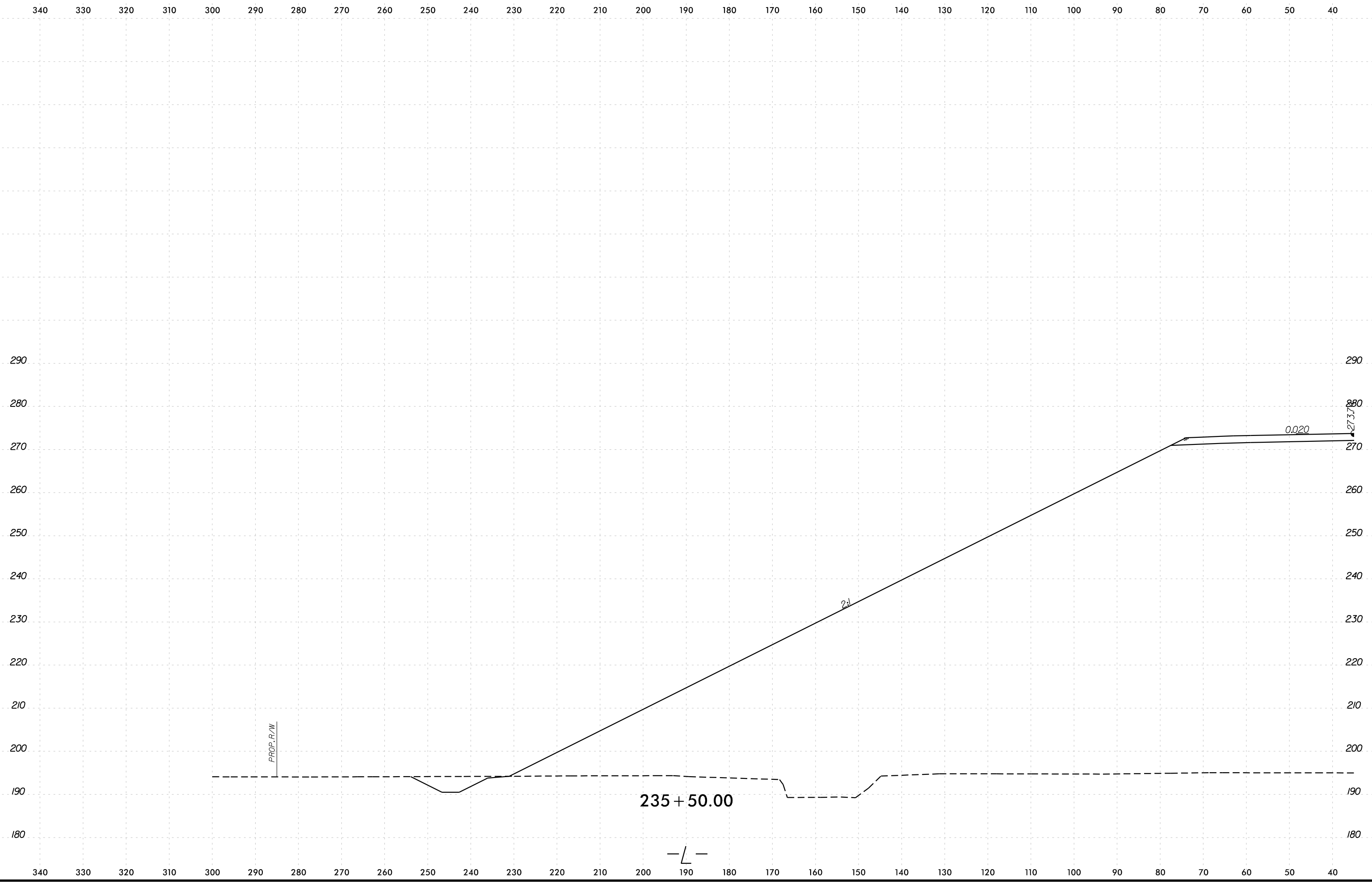
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8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-3421B	98



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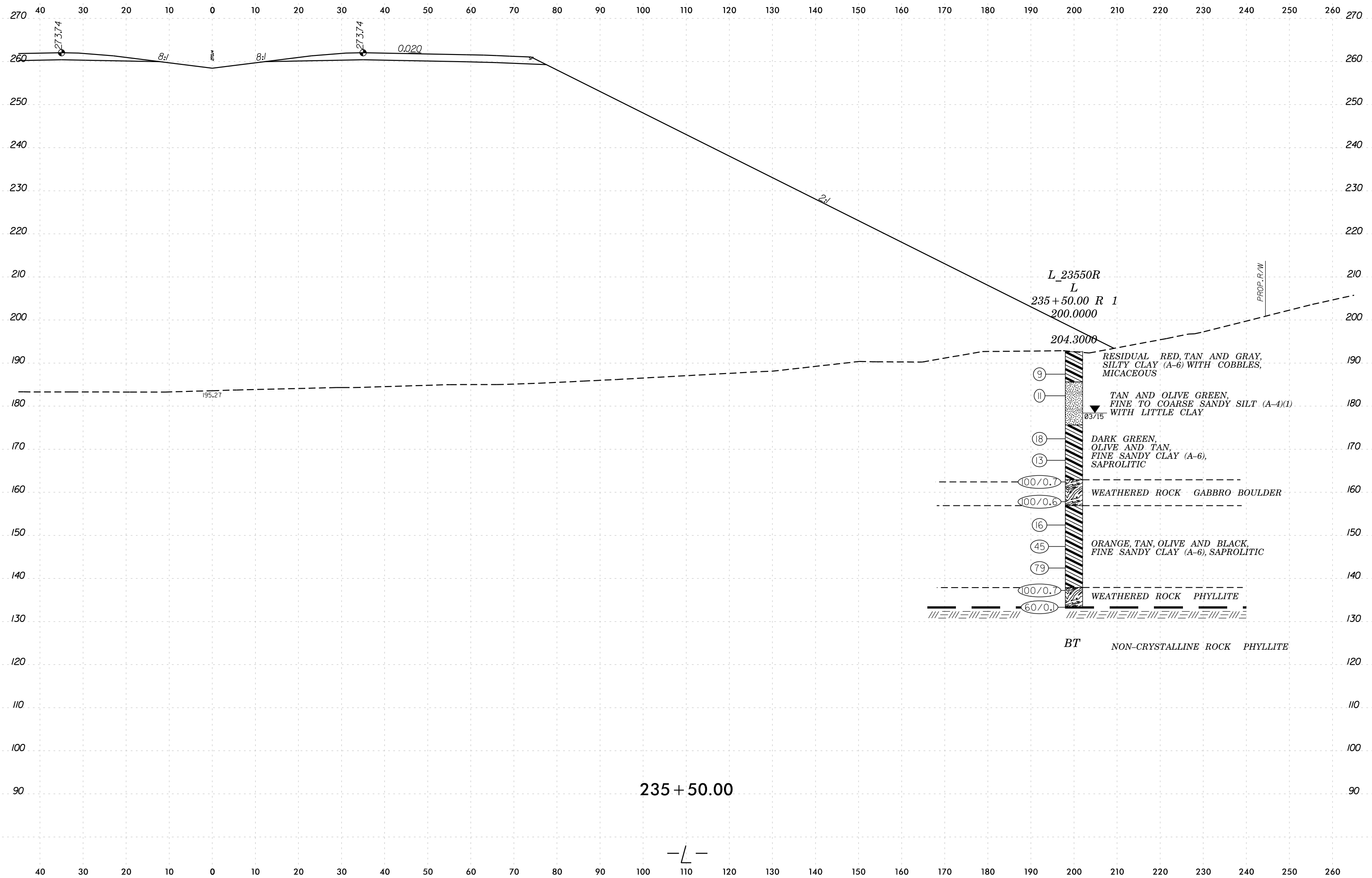
235 + 50.00

0.020

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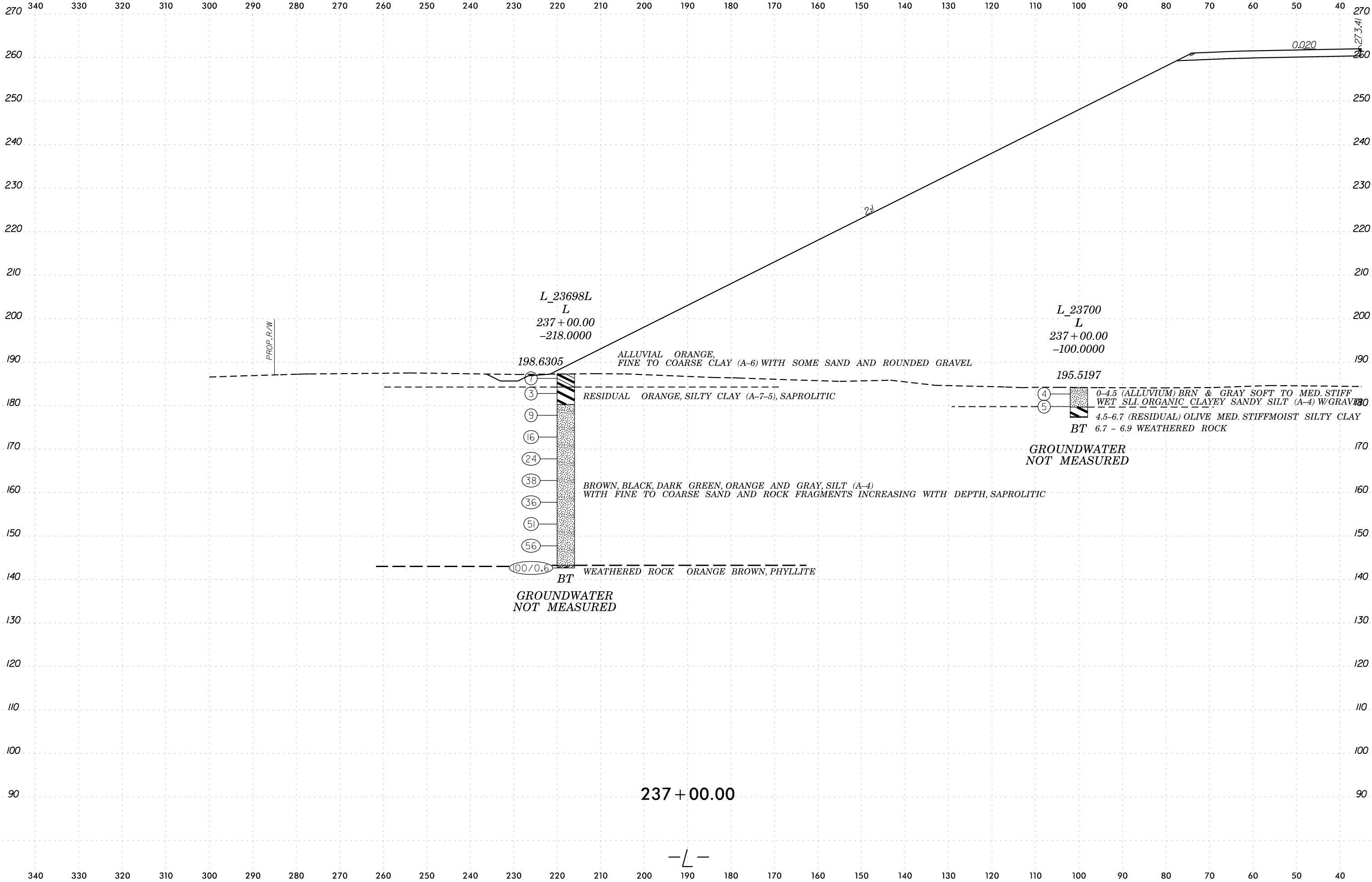
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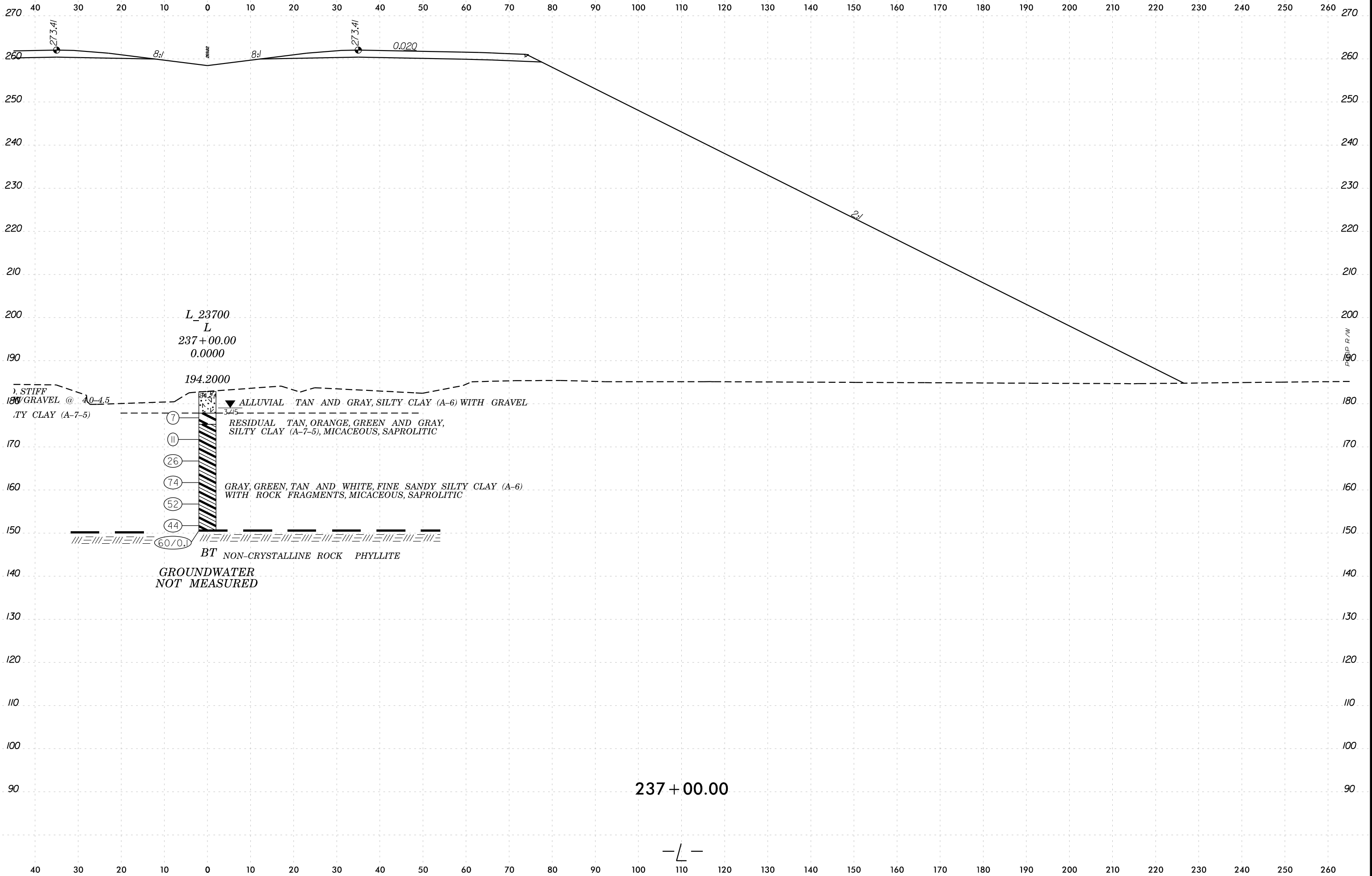
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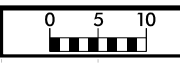
235 + 50.00

-L-



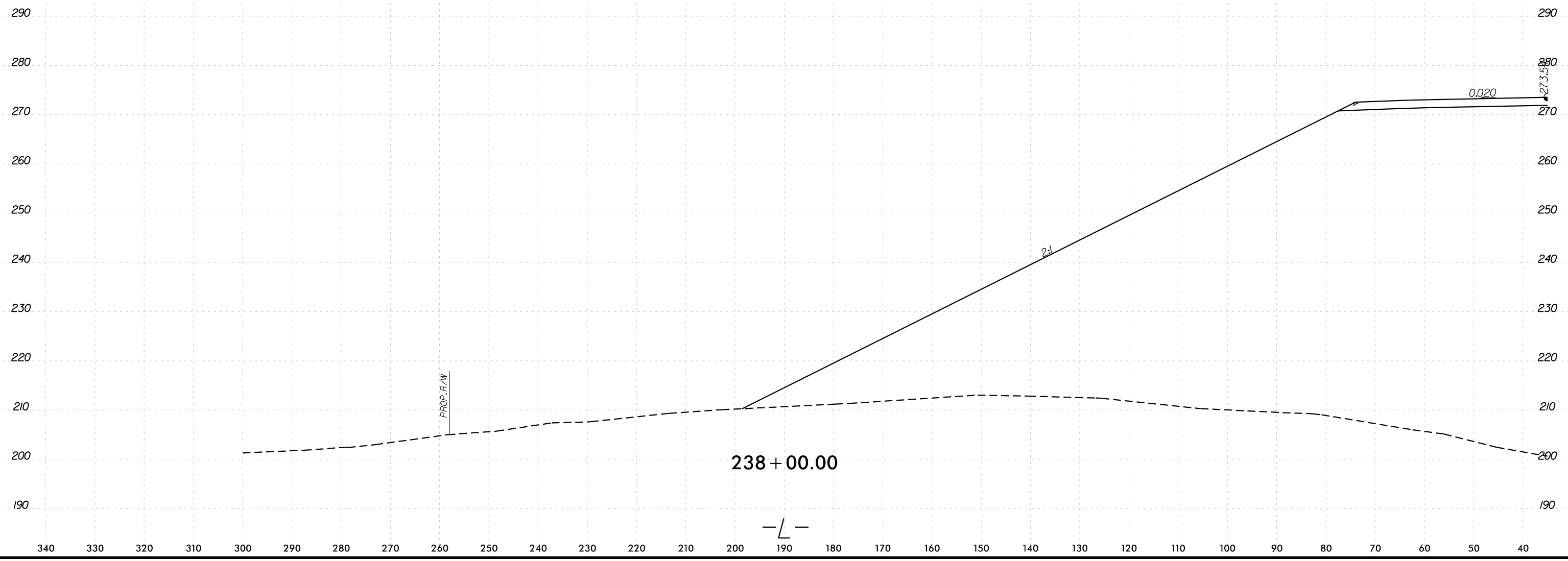


8/23/99

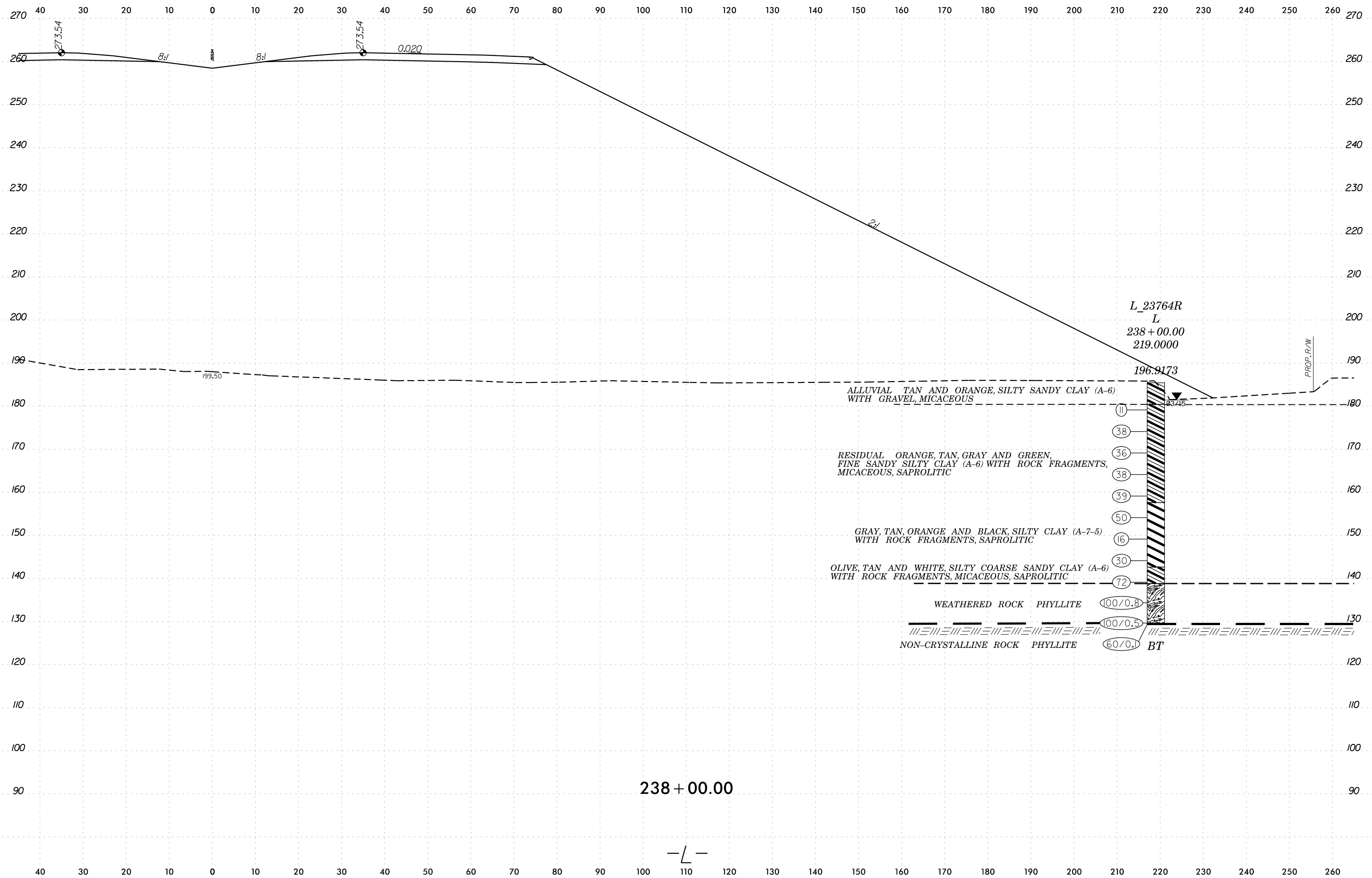


PROJ. REFERENCE NO.	SHEET NO.
R-3421B	102

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2:03:54 PM
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238 + 00.00

-L-

ALLUVIAL TAN AND ORANGE, SILTY SANDY CLAY (A-6)
WITH GRAVEL, MICACEOUS

RESIDUAL ORANGE, TAN, GRAY AND GREEN,
FINE SANDY SILTY CLAY (A-6) WITH ROCK FRAGMENTS,
MICACEOUS, SAPROLITIC

GRAY, TAN, ORANGE AND BLACK, SILTY CLAY (A-7-5)
WITH ROCK FRAGMENTS, SAPROLITIC

OLIVE, TAN AND WHITE, SILTY COARSE SANDY CLAY (A-6)
WITH ROCK FRAGMENTS, MICACEOUS, SAPROLITIC

WEATHERED ROCK PHYLLITE

NON-CRYSTALLINE ROCK PHYLLITE

L_23764R
L
238 + 00.00
219.0000

196.9173

(11)

(38)

(36)

(38)

(39)

(50)

(16)

(30)

(72)

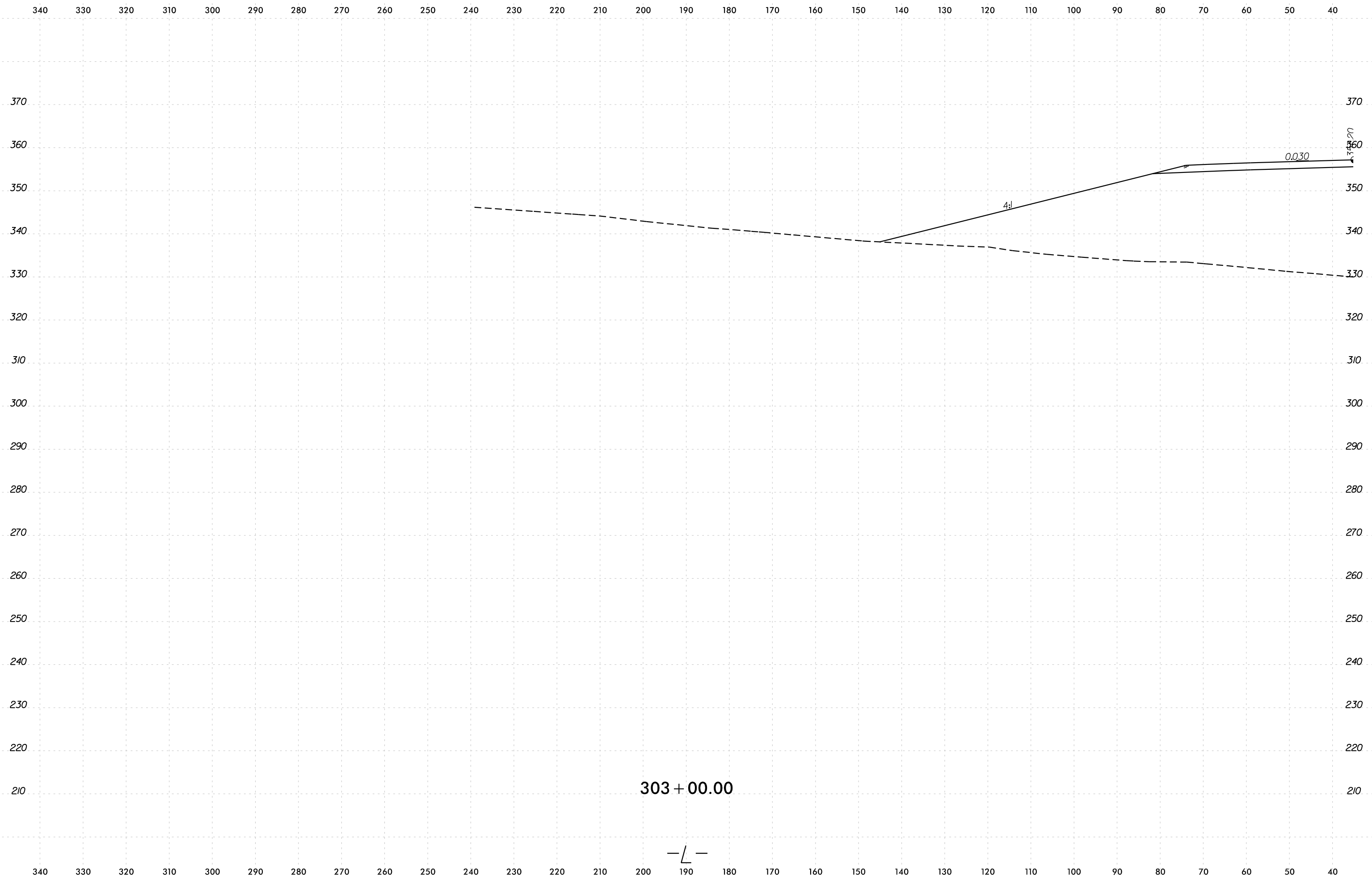
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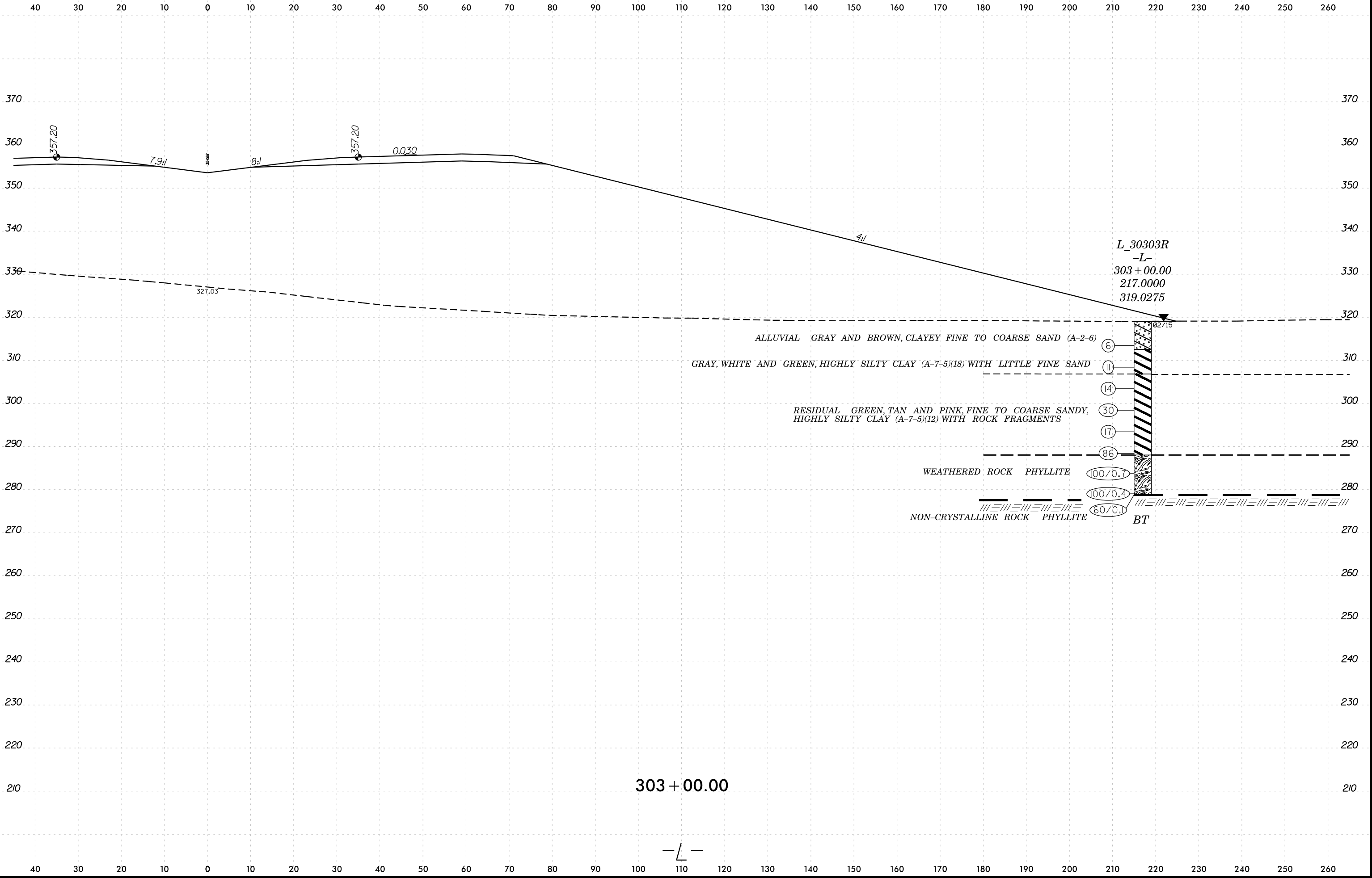
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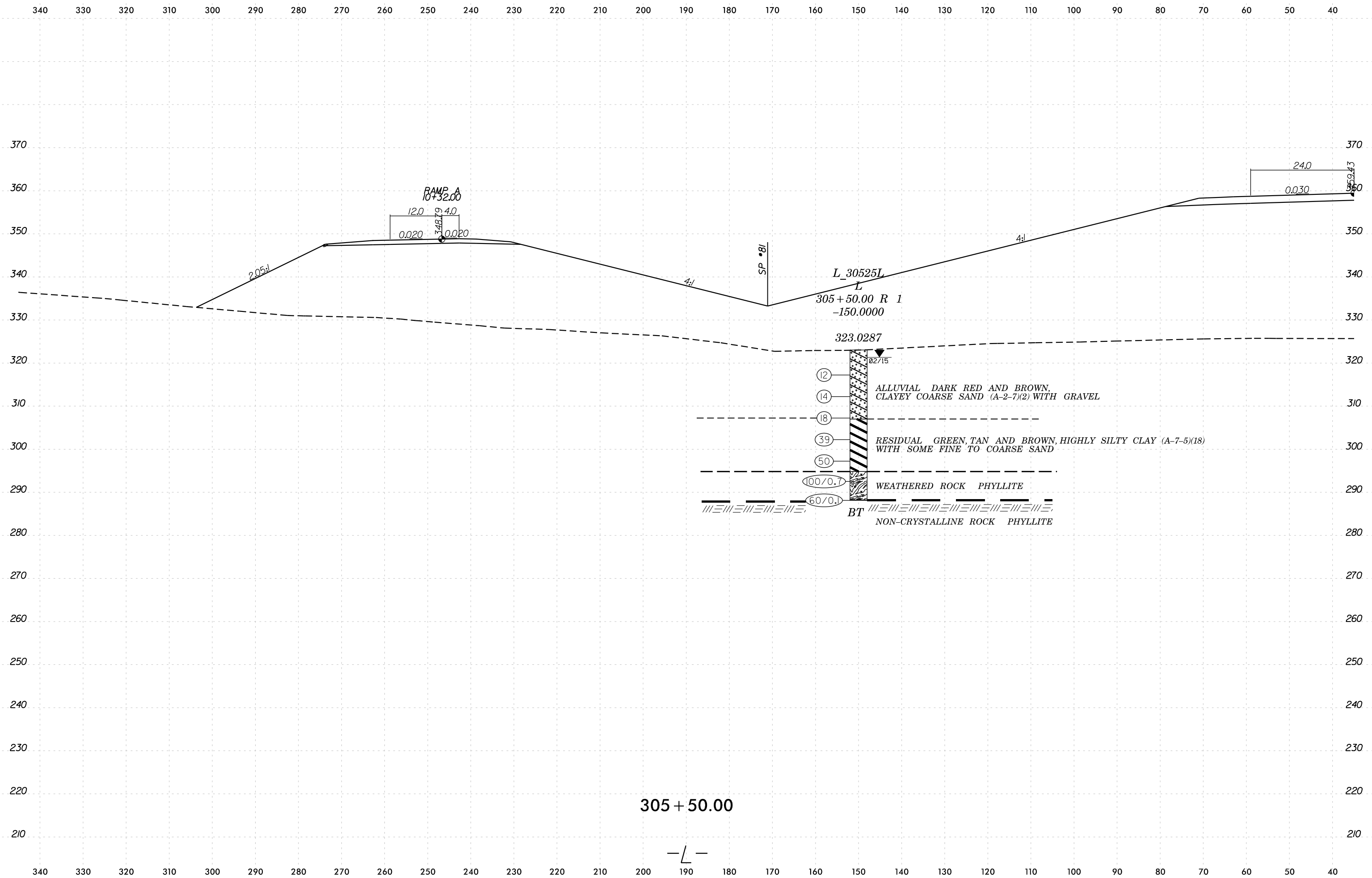
(60/0.1)

BT

PROP. R/W







305 + 50.00

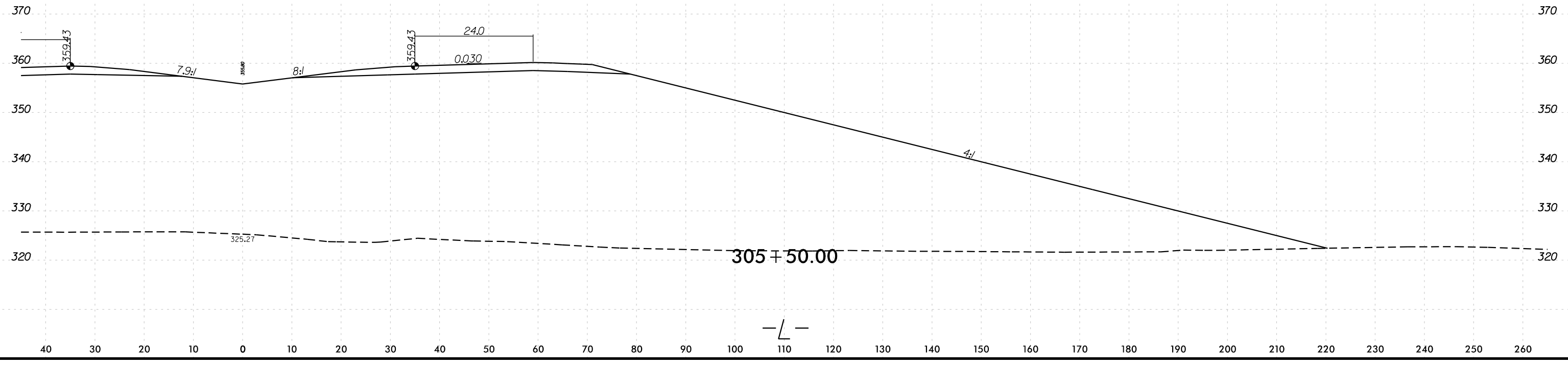
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8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-3421B	107

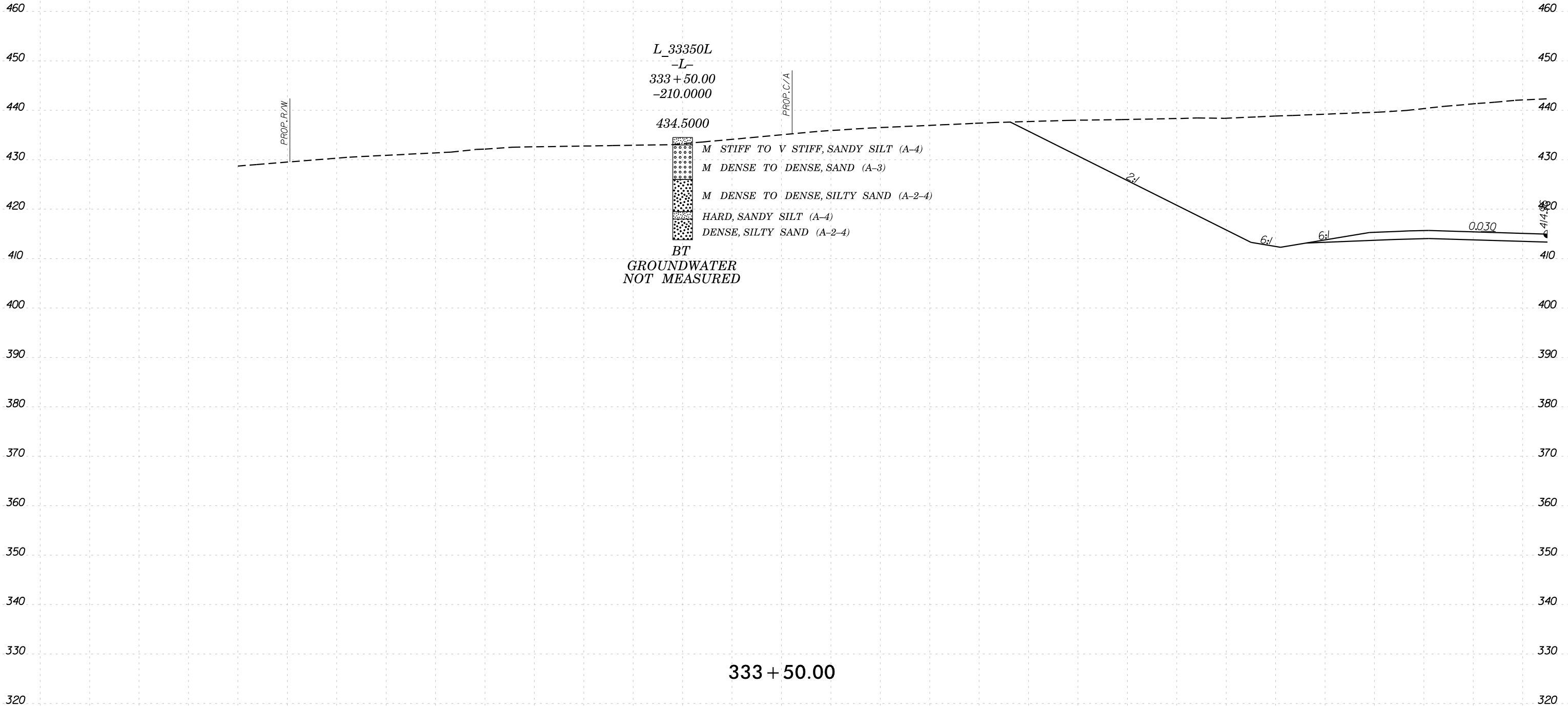
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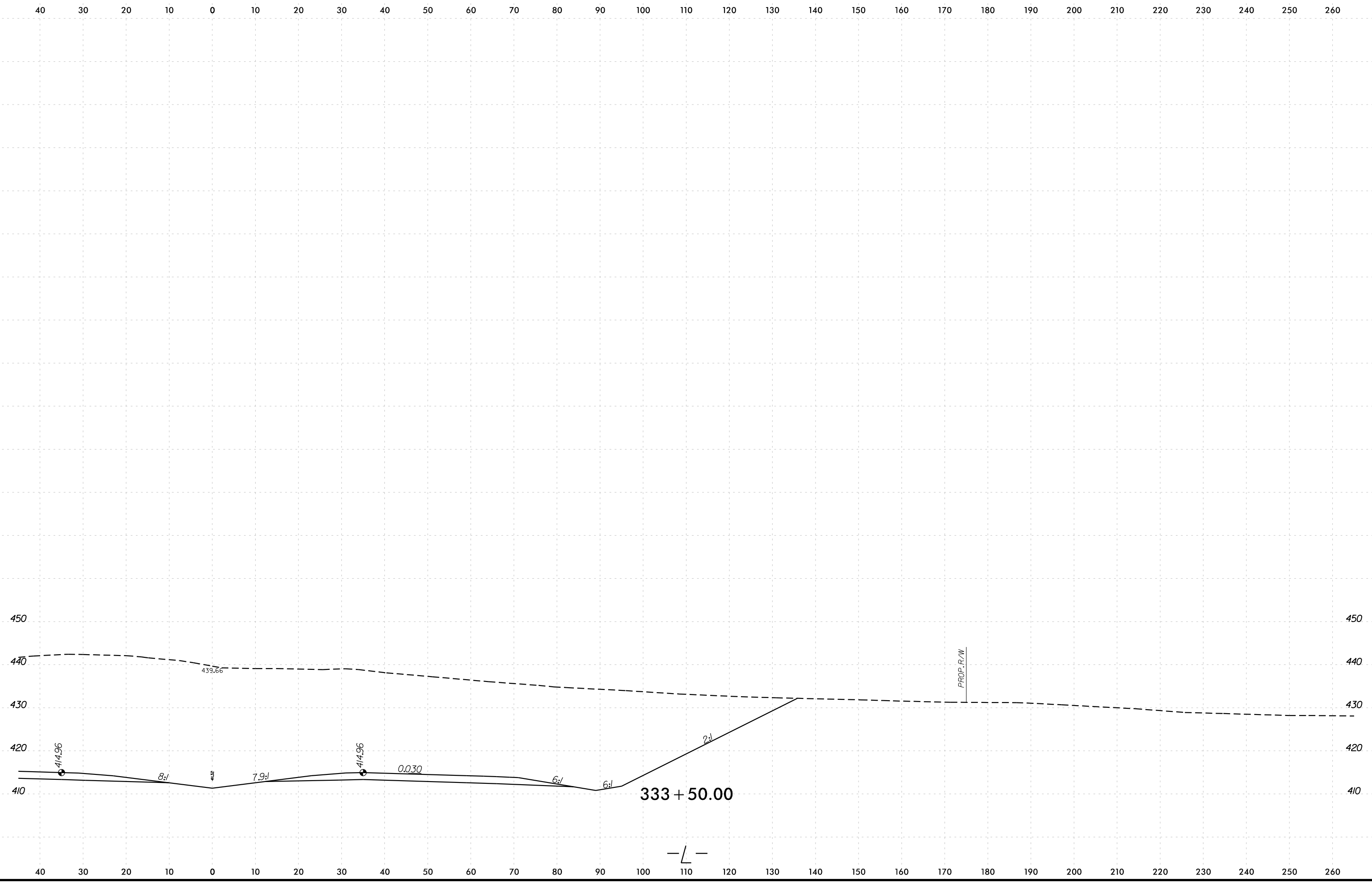


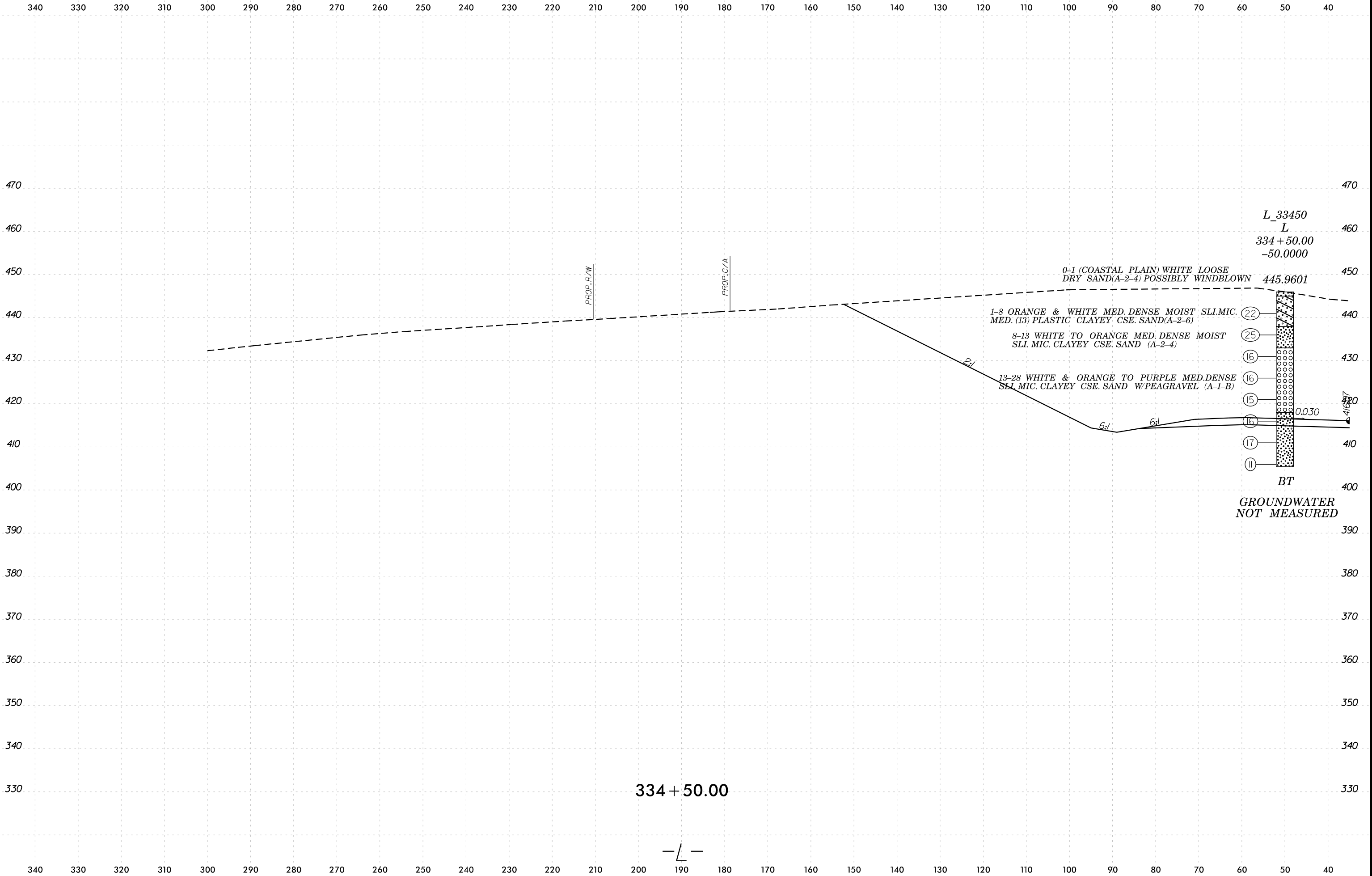
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 USER:NAME

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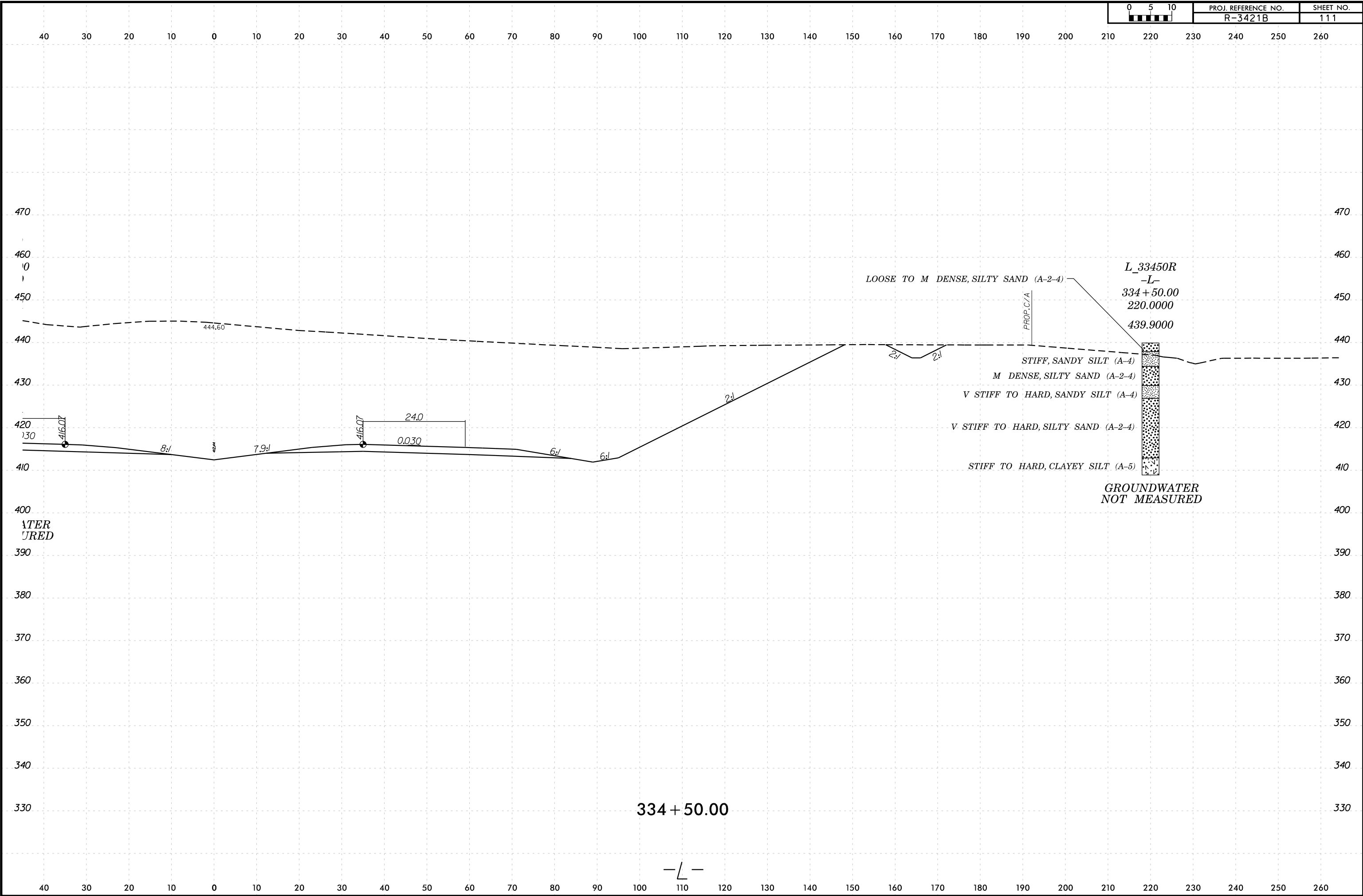




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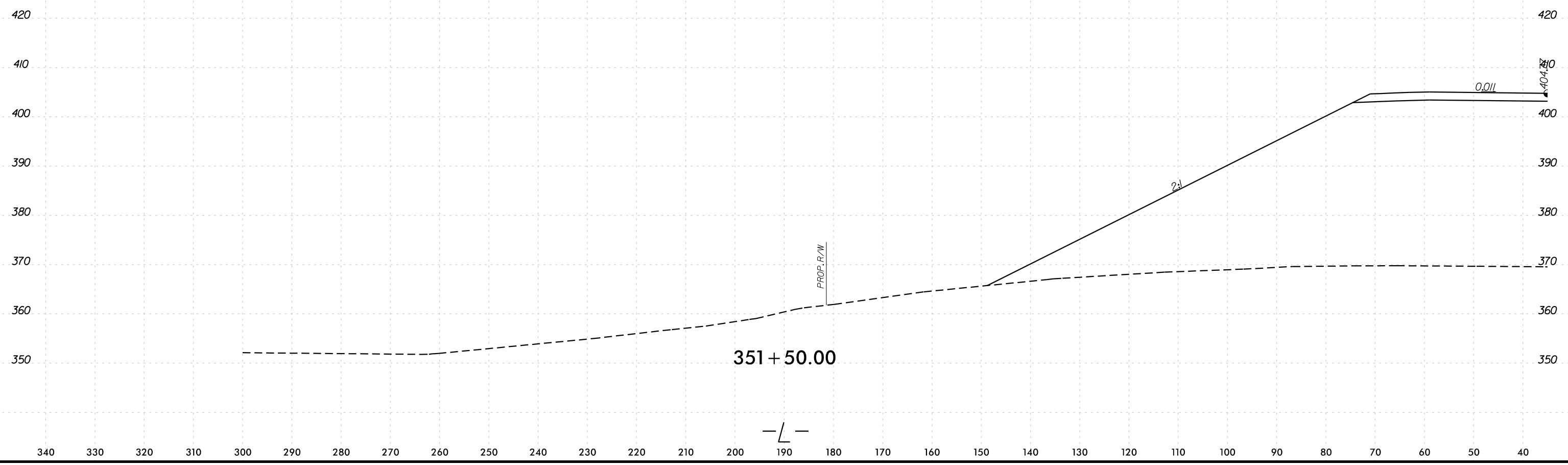
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R-3421B	111



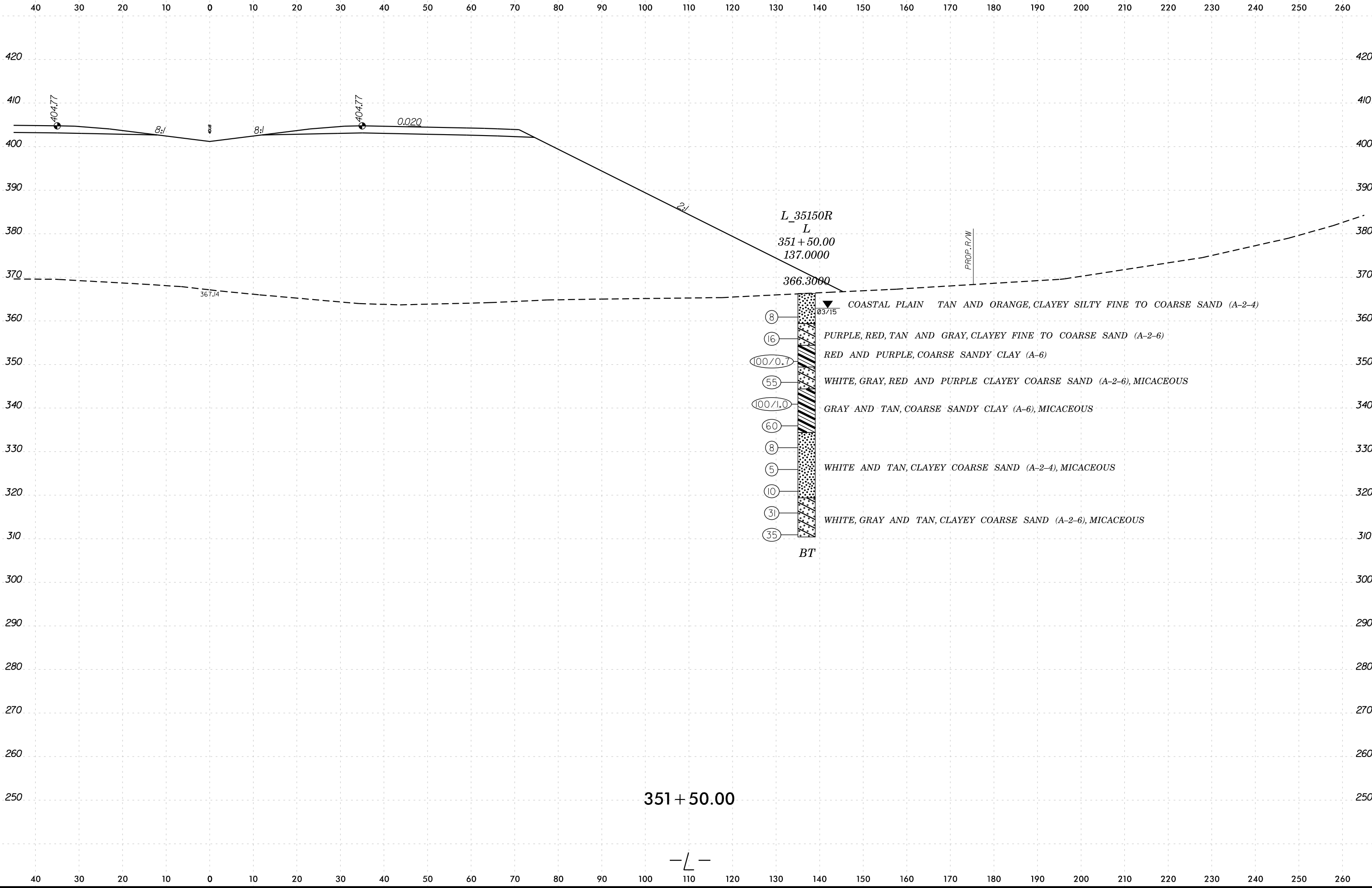
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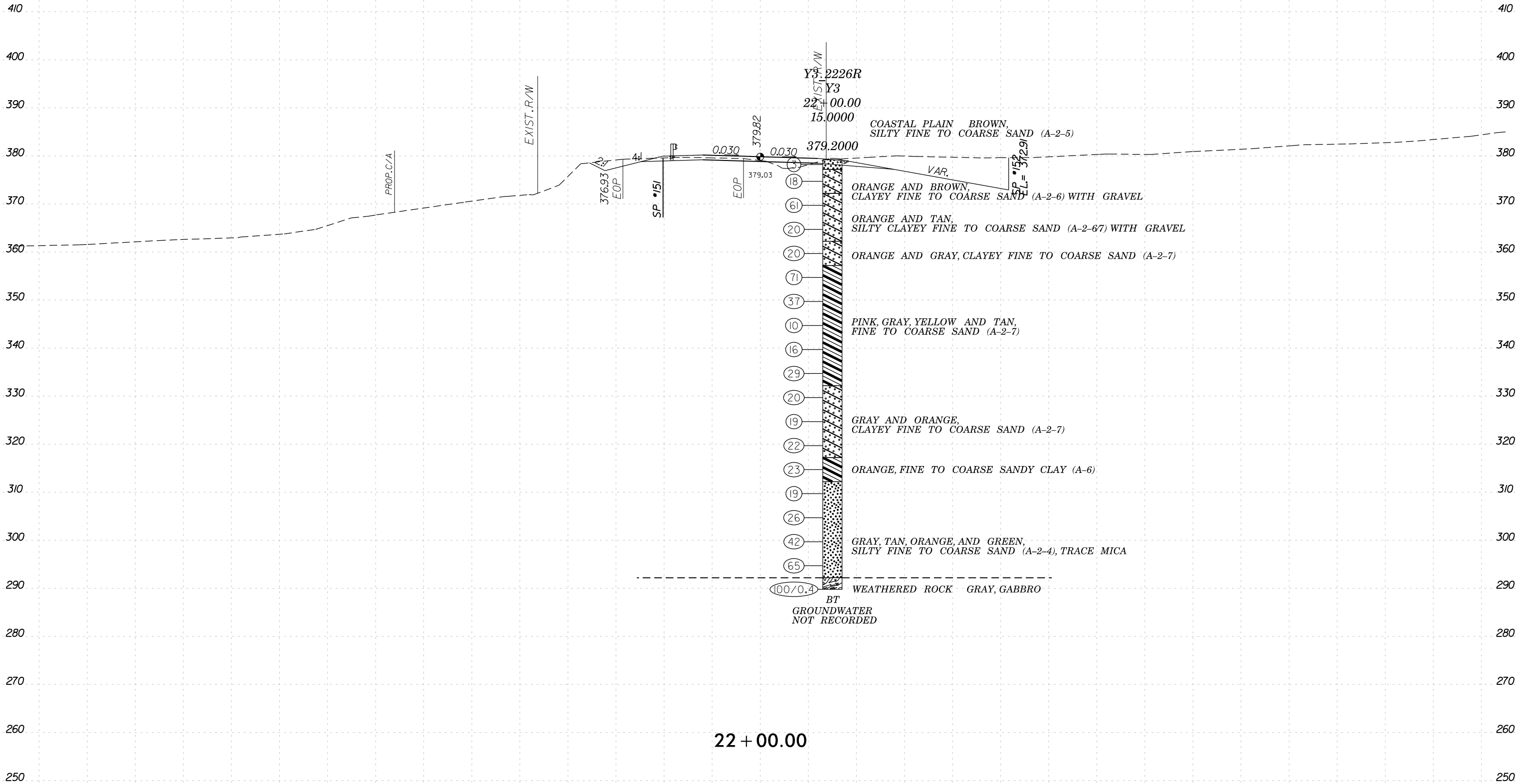
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- 16 PURPLE, RED, TAN AND GRAY, CLAYEY FINE TO COARSE SAND (A-2-6)
- 100/0.7 RED AND PURPLE, COARSE SANDY CLAY (A-6)
- 55 WHITE, GRAY, RED AND PURPLE CLAYEY COARSE SAND (A-2-6), MICACEOUS
- 100/1.0 GRAY AND TAN, COARSE SANDY CLAY (A-6), MICACEOUS
- 60
- 8
- 5 WHITE AND TAN, CLAYEY COARSE SAND (A-2-4), MICACEOUS
- 10
- 31
- 35 WHITE, GRAY AND TAN, CLAYEY COARSE SAND (A-2-6), MICACEOUS

BT

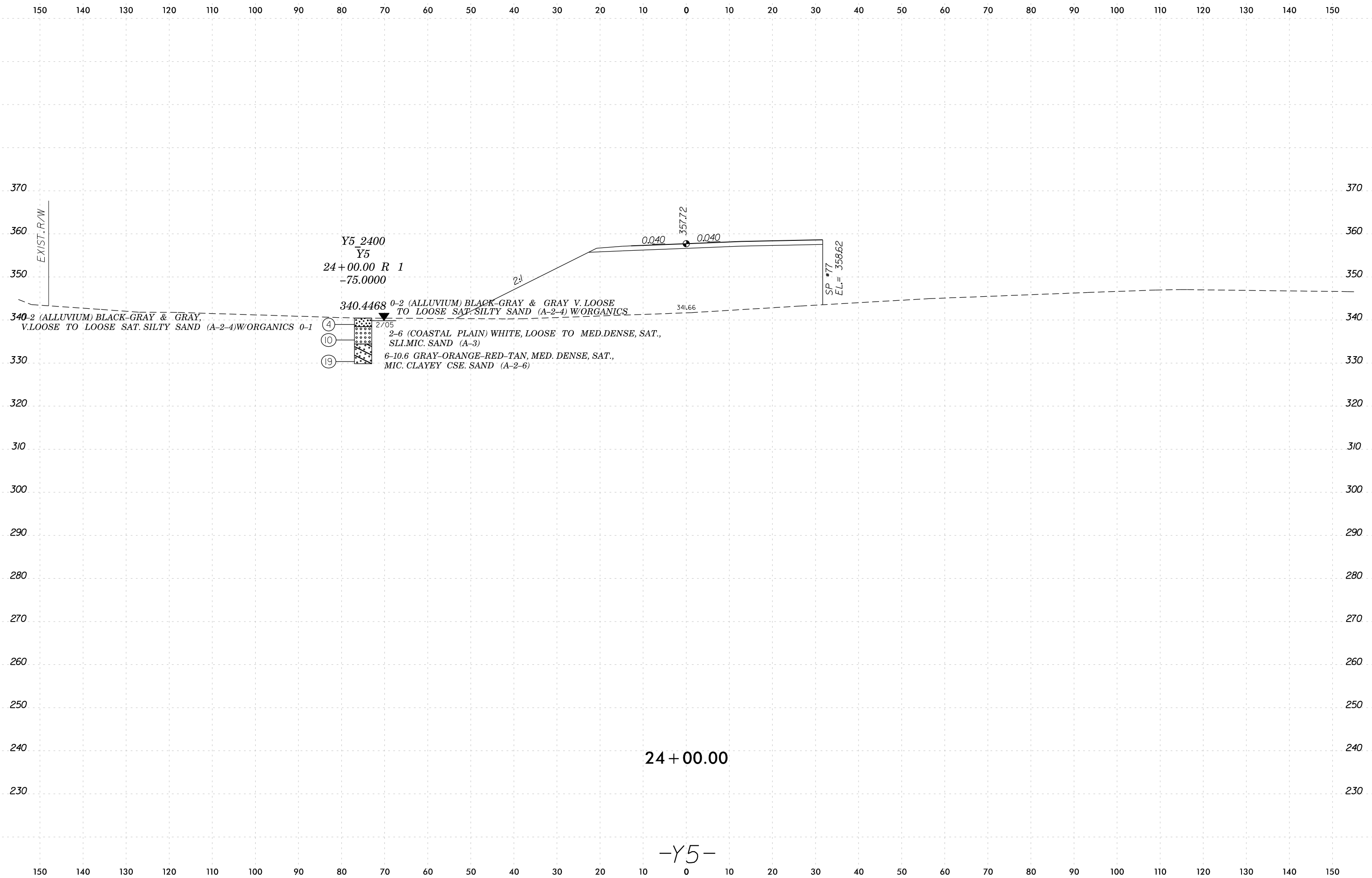
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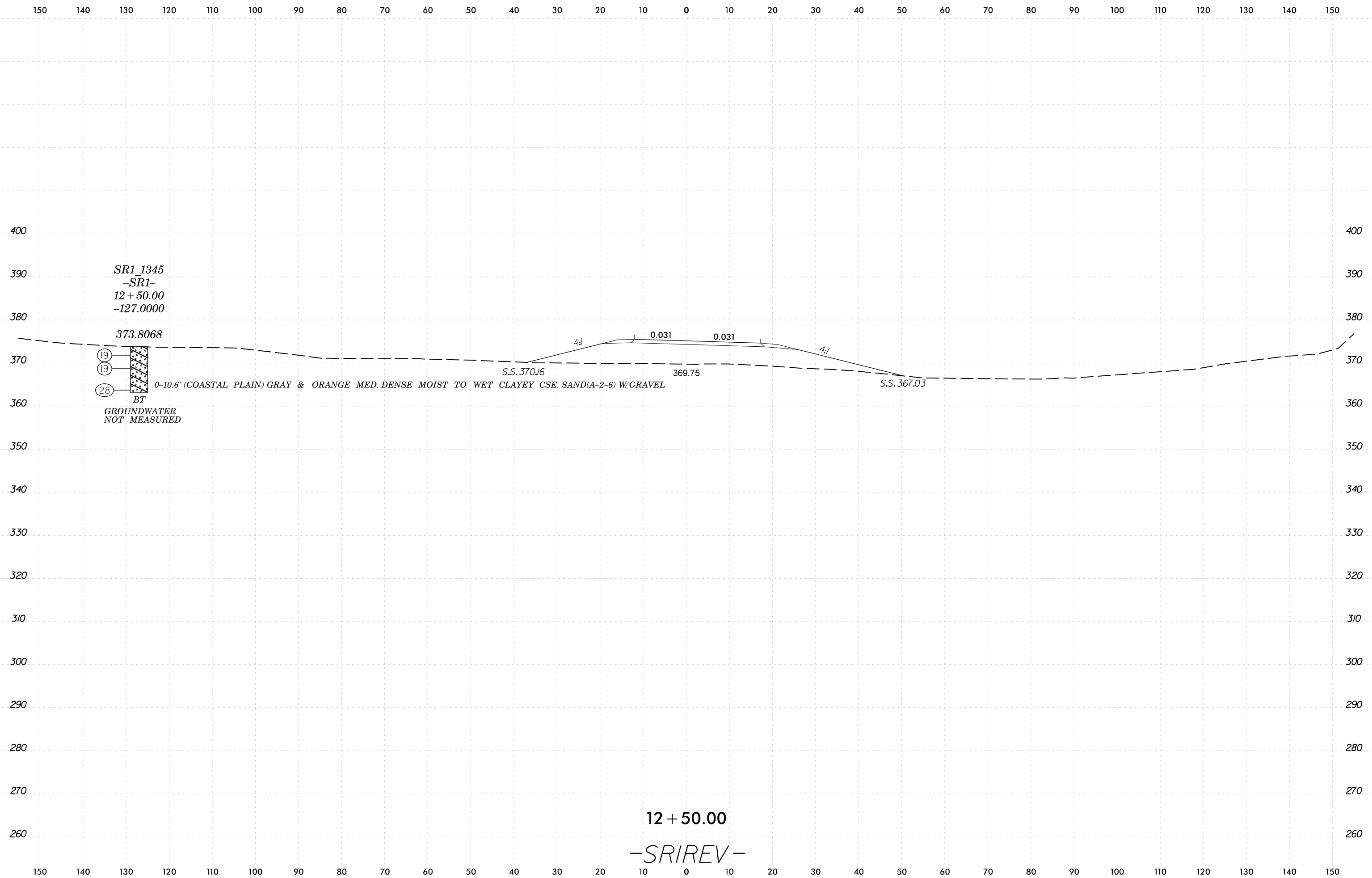
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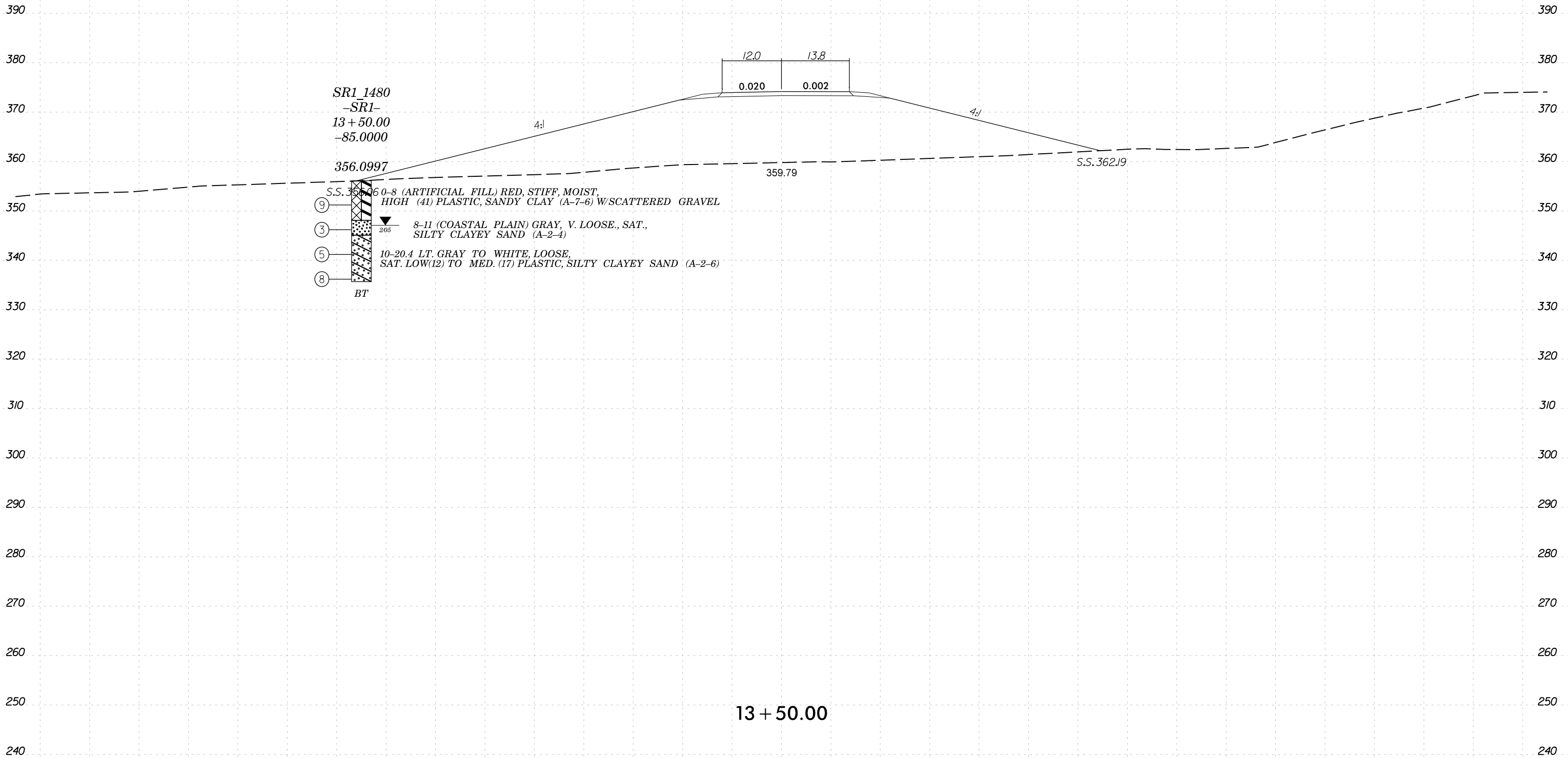


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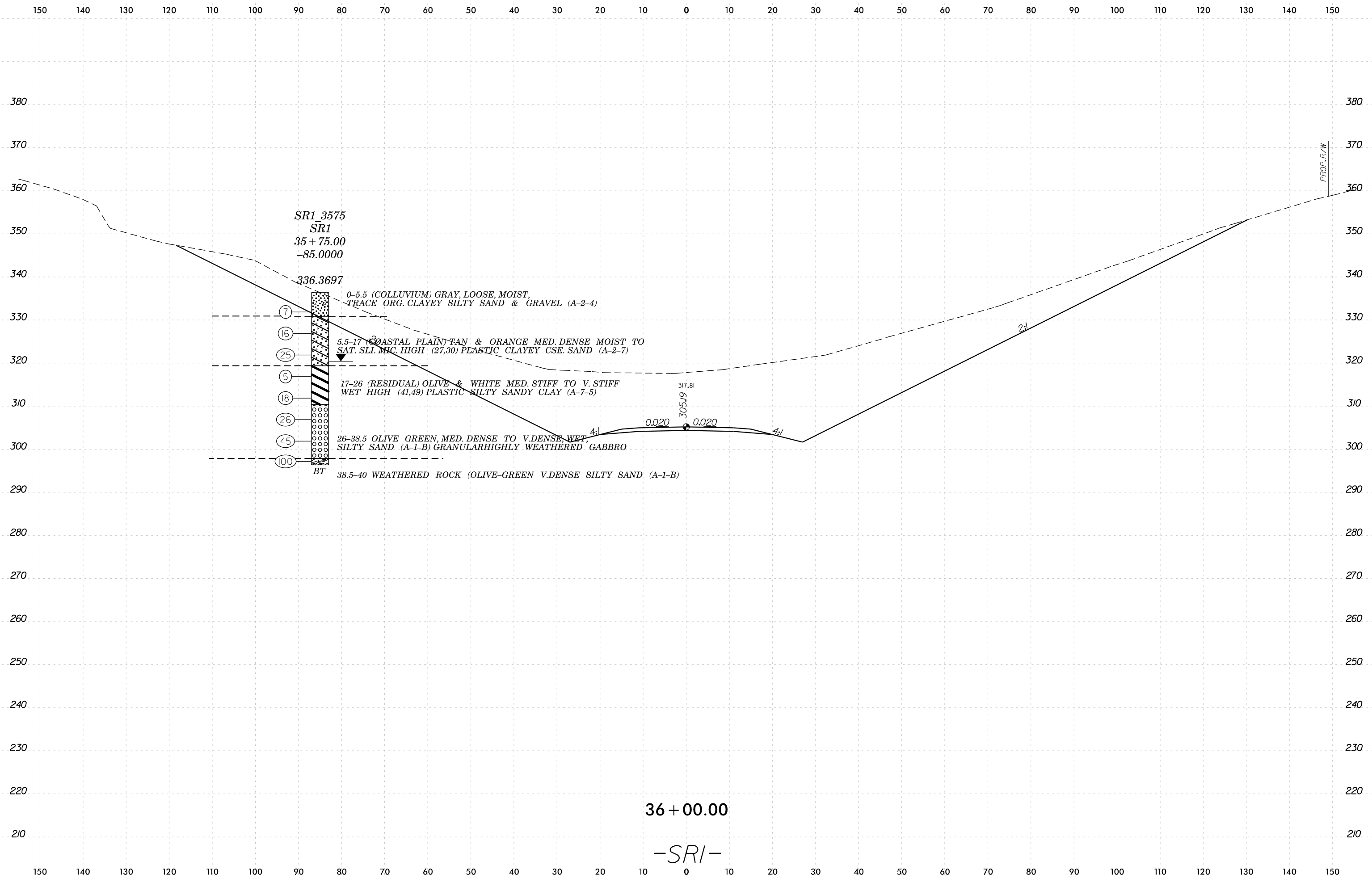


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APPENDIX



R-3421B

LABORATORY TEST RESULTS



**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
MATERIALS & TESTS UNIT
SOILS LABORATORY**

T. I. P. No. **R-3421B**

REPORT ON SAMPLES OF **SOILS FOR QUALITY**

Project **34542.1.FR3** County **Richmond** Owner _____
 Date: Sampled 2/9/15 - 2/21/15 Received 2/27/15 Reported 3/12/15
 Sampled from RDWY By R DeLost
 Submitted by K Bussey 1995 Standard Specifications

TEST RESULTS

Proj. Sample No.	SS-1	SS-3	SS-9	SS-34	SS-39	SS-2
Lab. Sample No.	1	2	3	4	5	6
Retained #4 Sieve %						
Passing #10 Sieve %	86	85	98	100	100	100
Passing #40 Sieve %	69	56	53	32	53	100
Passing #200 Sieve %	49	40	28	11	14	95

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	28.4	42.1	63.9	86.0	70.8	0.7
Fine Sand Ret - #270 %	18.0	12.7	8.3	3.6	15.6	13.0
Silt 0.05 - 0.005 mm %	21.8	11.5	2.3	1.2	3.6	70.4
Clay < 0.005 mm %	31.8	33.8	25.5	9.2	10.0	15.9
Passing #40 Sieve %						
Passing #200 Sieve %						

L. L.	61	50	53	34	27	50
P. I.	20	25	28	13	7	14
AASHTO Classification	A-7-5 (8)	A-7-6 (5)	A-2-7 (4)	A-2-6 (1)	A-2-4 (0)	A-7-5 (18)
Station	169+25	190+00	190+00	193+00	193+00	303+03
Offset	CL	150 RT	150 RT	150 RT	150 RT	
Alignment	L	L	L	L	L	L
Location	L_16925	L_19000R	L_19000R	L_19300R	L_19300R	L_30303
Depth (Ft)	4.60	14.60	54.60	14.80	49.80	9.60
to	6.10	16.10	56.10	16.30	51.30	11.10

cc: R DeLost
 B Keaney
 B Howey

 Soils Engineer

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
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SOILS LABORATORY**

T. I. P. No. **R-3421B**

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Project **34542.1.FR3** County **Richmond** Owner
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 Submitted by K Bussey 1995 Standard Specifications

TEST RESULTS

Proj. Sample No.	SS-3	SS-2	SS-4	SS-1	SS-3	SS-6
Lab. Sample No.	7	8	9	10	11	12
Retained #4 Sieve %						
Passing #10 Sieve %	100	66	100	100	99	100
Passing #40 Sieve %	94	23	94	88	52	97
Passing #200 Sieve %	65	11	77	63	21	82

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	12.4	76.9	9.4	21.9	68.8	4.3
Fine Sand Ret - #270 %	31.6	8.0	19.8	19.2	11.3	23.5
Silt 0.05 - 0.005 mm %	52.8	7.1	49.1	21.1	8.4	54.3
Clay < 0.005 mm %	3.2	8.0	21.7	37.8	11.5	18.0
Passing #40 Sieve %						
Passing #200 Sieve %						

L. L.	60	44	54	43	27	54
P. I.	16	20	20	19	3	22
AASHTO Classification	A-7-5 (12)	A-2-7 (2)	A-7-5 (18)	A-7-6 (10)	A-2-4 (0)	A-7-5 (21)
Station	303+03	305+25	305+25	310+50	310+50	310+50
Offset				CL	CL	CL
Alignment	L	L	L	L	L	L
Location	L_30303	L_30525	L_30525	L_31050	L_31050	L_31050
Depth (Ft)	14.60	9.80	19.80	4.90	14.90	34.90
to	16.10	11.30	21.30	6.40	16.40	36.40

cc: R DeLost
B Keaney
B Howey

Soils Engineer

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
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T. I. P. No. **R-3421B**

REPORT ON SAMPLES OF **SOILS FOR QUALITY**

Project **34542.1.FR3** County **Richmond** Owner
 Date: Sampled 2/7/15 - 2/9/15 Received 2/27/15 Reported 3/12/15
 Sampled from RDWY By R DeLost
 Submitted by K Bussey 1995 Standard Specifications

TEST RESULTS

Proj. Sample No.	SS-1	SS-2	SS-3	SS-1	SS-2	SS-2
Lab. Sample No.	13	14	15	16	17	18
Retained #4 Sieve %						
Passing #10 Sieve %	95	100	98	91	100	88
Passing #40 Sieve %	59	91	60	55	86	60
Passing #200 Sieve %	40	72	29	24	59	39

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	49.5	16.3	57.0	58.4	24.6	46.1
Fine Sand Ret - #270 %	9.8	15.2	14.2	16.2	19.1	12.4
Silt 0.05 - 0.005 mm %	13.8	17.6	6.8	6.4	14.3	12.0
Clay < 0.005 mm %	26.9	50.9	22.0	19.0	42.1	29.4
Passing #40 Sieve %						
Passing #200 Sieve %						

L. L.	48	46	42	29	42	48
P. I.	23	22	21	10	22	26
AASHTO Classification	A-7-6 (4)	A-7-6 (15)	A-2-7 (2)	A-2-4 (0)	A-7-6 (10)	A-7-6 (5)
Station	313+50	313+50	316+50	2+00	2+00	8+00
Offset	CL	CL	CL	CL	CL	CL
Alignment	L	L	L	RPA	RPA	RPA
Location	L_31350	L_31350	L_31650	RPA_200	RPA_200	RPA_800
Depth (Ft)	4.30	9.30	14.60	4.40	9.40	9.80
to	5.80	10.80	16.10	5.90	10.90	11.30

cc: R DeLost
B Keaney
B Howey

Soils Engineer

**NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAY
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SOILS LABORATORY**

T. I. P. No. **R-3421B**

REPORT ON SAMPLES OF **SOILS FOR QUALITY**

Project **34542.1.FR3** County **Richmond** Owner
 Date: Sampled 2/6/15 - 2/8/15 Received 2/27/15 Reported 3/12/15, 3/18/15
 Sampled from RDWY By R DeLost
 Submitted by K Bussey 1995 Standard Specifications

TEST RESULTS

Proj. Sample No.	SS-4	SS-5	SS-2	SS-1	SS-3	ST-1
Lab. Sample No.	19	20	21	22	23	24
Retained #4 Sieve %						
Passing #10 Sieve %	80	100	96	91	99	97
Passing #40 Sieve %	39	96	64	54	56	86
Passing #200 Sieve %	17	89	27	18	20	46

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	68.2	5.2	58.3	57.6	65.7	18.2
Fine Sand Ret - #270 %	11.6	10.1	14.2	24.9	15.2	44.1
Silt 0.05 - 0.005 mm %	5.6	36.2	5.0	10.5	6.0	33.7
Clay < 0.005 mm %	14.6	48.6	22.5	7.0	13.0	3.9
Passing #40 Sieve %						
Passing #200 Sieve %						

L. L.	33	72	39	NP	33	40
P. I.	14	36	21	NP	11	NP
AASHTO Classification	A-2-6 (1)	A-7-5 (39)	A-2-6 (2)	A-2-4 (0)	A-2-6 (0)	A-4 (0)
Station	8+00	9+00	13+00	5+00	5+00	169+25
Offset	CL		CL	CL	CL	CL
Alignment	RPA	RPA	RPA	RPD	RPD	L
Location	RPA 800	RPA 900	RPA 1300	RPD 500	RPD 500	L 16925
Depth (Ft)	19.80	24.60	8.80	4.60	14.60	11.20
to	21.30	26.10	10.30	6.10	16.10	12.70

cc: R DeLost
 B Keaney
 B Howey

 Soils Engineer

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SOILS LABORATORY**

T. I. P. No. R-3421B

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 34542.1.FR3 County Richmond Owner
 Date: Sampled 2/19/15 Received 2/27/15 Reported 3/18/15
 Sampled from RDWY By R DeLost
 Submitted by K Bussey 1995 Standard Specifications

TEST RESULTS

Proj. Sample No.		ST-2				
Lab. Sample No.		25				
Retained #4 Sieve	%					
Passing #10 Sieve	%	100				
Passing #40 Sieve	%	95				
Passing #200 Sieve	%	75				

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	%	9.4				
Fine Sand Ret - #270	%	18.6				
Silt 0.05 - 0.005 mm	%	16.2				
Clay < 0.005 mm	%	55.8				
Passing #40 Sieve	%					
Passing #200 Sieve	%					

L. L.		35				
P. I.		17				
AASHTO Classification		A-6 (11)				
Station		188+50				
Offset		140 LT				
Alignment		L				
Location		L 18850				
Depth (Ft)		12.00				
	to	13.00				

cc: R DeLost
B Keaney
B Howey

Soils Engineer

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T. I. P. No. R-3421B

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 34542.1.FR3 County Richmond Owner
 Date: Sampled 3/9/15 Received 3/12/15 Reported 4/1/15
 Sampled from RDWY By R DeLost
 Submitted by K Bussey 1995 Standard Specifications

TEST RESULTS

Proj. Sample No.	ST-5	ST-6				
Lab. Sample No.	27	28				
Retained #4 Sieve %						
Passing #10 Sieve %	95	100				
Passing #40 Sieve %	93	93				
Passing #200 Sieve %	73	77				

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	5.6	10.5				
Fine Sand Ret - #270 %	26.8	18.7				
Silt 0.05 - 0.005 mm %	54.9	58.6				
Clay < 0.005 mm %	12.7	12.2				
Passing #40 Sieve %						
Passing #200 Sieve %						

L. L.	29	28				
P. I.	6	2				
AASHTO Classification	A-4 (3)	A-4 (1)				
Station	234+00	235+22				
Offset	CL					
Alignment	L	L				
Location	L_23400	L_23550R				
Depth (Ft)	29.5	14.2				
to	29.8	14.7				
Moisture %	22.5	44.1				

cc: R DeLost
B Keaney
B Howey

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T. I. P. No. R-3421B

REPORT ON SAMPLES OF SOILS FOR QUALITY

Project 34542.1.FR3 County Richmond Owner _____
 Date: Sampled 3/9/15 Received 3/12/15 Reported 4/9/15
 Sampled from RDWY By R DeLost
 Submitted by K Bussey 1995 Standard Specifications

TEST RESULTS

Proj. Sample No.		ST-5				
Lab. Sample No.		26				
Retained #4 Sieve	%					
Passing #10 Sieve	%	99				
Passing #40 Sieve	%	89				
Passing #200 Sieve	%	53				

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60	%	29.5				
Fine Sand Ret - #270	%	20.5				
Silt 0.05 - 0.005 mm	%	17.3				
Clay < 0.005 mm	%	32.6				
Passing #40 Sieve	%					
Passing #200 Sieve	%					

L. L.		39				
P. I.		19				
AASHTO Classification		A-6 (7)				
Station		234+00				
Offset		CL				
Alignment		L				
Location		L_23400				
Depth (Ft)		4.5				
	to	5.0				
Moisture	%	19.8				

cc: R DeLost
 B Keaney
 B Howey

Soils Engineer

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SOILS LABORATORY**

T. I. P. No. **R-3421B**

REPORT ON SAMPLES OF **SOILS FOR QUALITY**

Project **34542.1.FR3** County **Richmond** Owner
 Date: Sampled **2/9/15 - 2/21/15** Received **2/27/15** Reported **5/7/15**
 Sampled from **RDWY** By **R DeLost**
 Submitted by **K Bussey** **1995** Standard Specifications

TEST RESULTS

Proj. Sample No.	SS-2	SS-5	SS-7	SS-11	SS-17	SS-3
Lab. Sample No.	29	30	31	32	33	34
Retained #4 Sieve %						
Passing #10 Sieve %	60	96	97	90	87	84
Passing #40 Sieve %	28	56	58	33	72	56
Passing #200 Sieve %	15	31	37	20	23	34

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	64.4	58.7	50.6	71.9	32.9	48.0
Fine Sand Ret - #270 %	11.3	10.2	13.1	7.3	47.9	12.4
Silt 0.05 - 0.005 mm %	14.3	3.0	10.6	4.9	16.3	7.8
Clay < 0.005 mm %	9.9	28.1	25.7	15.9	2.9	31.8
Passing #40 Sieve %						
Passing #200 Sieve %						

L. L.	30	59	40	50	NP	57
P. I.	13	36	20	29	NP	30
AASHTO Classification	A-2-6 (1)	A-2-7(5)	A-6(3)	A-2-7(4)	A-2-4 (0)	A-2-7(4)
Station	2226	2226	2226	2226	2226	2482
Offset	15 ft RT	15 ft RT	15 ft RT	15 ft RT	15 ft RT	29 ft RT
Alignment	-Y3-	-Y3-	-Y3-	-Y3-	-Y3-	-Y3-
Location	Y3_2226R	Y3_2226R	Y3_2226R	Y3_2226R	Y3_2226R	Y3_2482R
Depth (Ft)	3.50	18.50	28.50	48.50	78.50	8.50
to	5.00	20.00	30.00	50.00	80.00	10.00

cc: R DeLost
 B Keaney
 B Howey

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 Sampled from **RDWY** By **R DeLost**
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TEST RESULTS

Proj. Sample No.	SS-7	SS-9	SS-12	SS-16		
Lab. Sample No.	35	36	37	38		
Retained #4 Sieve %						
Passing #10 Sieve %	100	98	83	65		
Passing #40 Sieve %	99	57	43	45		
Passing #200 Sieve %	76	23	20	33		

MINUS NO. 10 FRACTION

SOIL MORTAR - 100%						
Coarse Sand Ret - #60 %	3.7	61.2	64.7	38.3		
Fine Sand Ret - #270 %	28.8	16.8	12.7	14.6		
Silt 0.05 - 0.005 mm %	36.8	3.4	4.9	27.2		
Clay < 0.005 mm %	30.6	18.6	17.7	19.9		
Passing #40 Sieve %						
Passing #200 Sieve %						

L. L.	36	37	42	51		
P. I.	15	17	25	18		
AASHTO Classification	A-6(10)	A-2-6(1)	A-2-7(3)	A-2-7(2)		
Station	2482	2482	2482	2482		
Offset	29 ft RT	29 ft RT	29 ft RT	29 ft RT		
Alignment	-Y3-	-Y3-	-Y3-	-Y3-		
Location	Y3 2482R	Y3 2482R	Y3 2482R	Y3 2482R		
Depth (Ft)	28.50	38.50	53.50	73.50		
to	30.00	40.00	55.00	75.00		

cc: R DeLost
B Keaney
B Howey

Soils Engineer