

NOTE: SEE SHEET 2A FOR PLAN SHEET LAYOUT AT TIME OF INVESTIGATION

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

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R-2237C	1	259
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34402.1.1		PE	
34402.2.6		R/W	
34402.3.7		CONST.	

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

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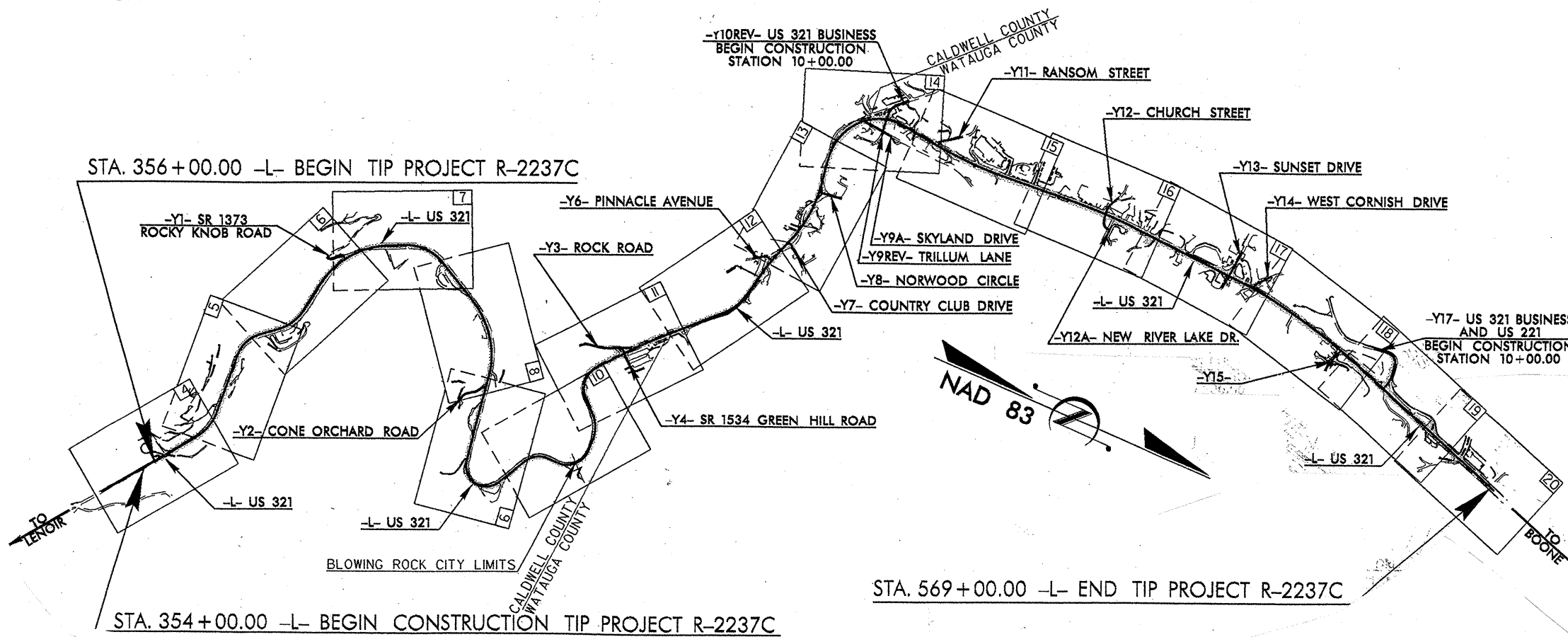
ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. 34402.1.1 R-2237C F.A. PROJ. NHF-321(I)
COUNTY CALDWELL/WATAUGA
PROJECT DESCRIPTION US 321 FROM SR 1500 (BLACKBERRY ROAD)
TO US 221 AT BLOWING ROCK

INVENTORY

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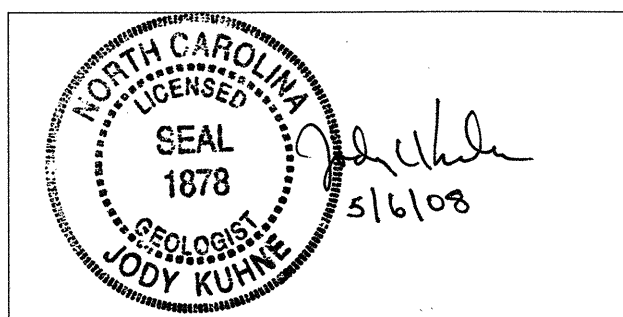
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DATE



CONTRACT: C202585 ID: R-2237C

DRAWN BY: JC KUHNE WT WILLIAMS

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

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NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

PROJECT REFERENCE NO. **R-2237C** SHEET NO. **2 OF 259**

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

SOIL DESCRIPTION			GRADATION			ROCK DESCRIPTION			TERMS AND DEFINITIONS		
SOIL IS CONSIDERED TO BE THE UNCONSOLIDATED, SEMI-CONSOLIDATED, OR WEATHERED EARTH MATERIALS THAT CAN BE PENETRATED WITH A CONTINUOUS FLIGHT POWER AUGER, AND YIELD LESS THAN 100 BLOWS PER FOOT ACCORDING TO STANDARD PENETRATION TEST (AASHTO T206, ASTM D-1586). SOIL CLASSIFICATION IS BASED ON THE AASHTO SYSTEM. BASIC DESCRIPTIONS GENERALLY SHALL INCLUDE: CONSISTENCY, COLOR, TEXTURE, MOISTURE, AASHTO CLASSIFICATION, AND OTHER PERTINENT FACTORS SUCH AS MINERALOGICAL COMPOSITION, ANGLE, STRUCTURE, PLASTICITY, ETC. EXAMPLE: <i>VERY STIFF, GRAY, SILTY CLAY, MOIST WITH INTERBEDDED FINE SAND LAYERS, HIGHLY PLASTIC, A-7-6</i>			WELL GRADED - INDICATES A GOOD REPRESENTATION OF PARTICLE SIZES FROM FINE TO COARSE. UNIFORM - INDICATES THAT SOIL PARTICLES ARE ALL APPROXIMATELY THE SAME SIZE. (ALSO POORLY GRADED). GAP-GRADED - INDICATES A MIXTURE OF UNIFORM PARTICLES OF TWO OR MORE SIZES. THE ANGULARITY OR ROUNDNESS OF SOIL GRAINS IS DESIGNATED BY THE TERMS: <u>ANGULAR</u> , <u>SUBANGULAR</u> , <u>SUBROUNDED</u> , OR <u>ROUNDED</u> .			HARD ROCK IS NON-COASTAL PLAIN MATERIAL THAT IF TESTED, WOULD YIELD SPT REFUSAL, AN INFERRED ROCK LINE INDICATES THE LEVEL AT WHICH NON-COASTAL PLAIN MATERIAL WOULD YIELD SPT REFUSAL. SPT REFUSAL IS PENETRATION BY A SPLIT SPOON SAMPLER EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. IN NON-COASTAL PLAIN MATERIAL, THE TRANSITION BETWEEN SOIL AND ROCK IS OFTEN REPRESENTED BY A ZONE OF WEATHERED ROCK. ROCK MATERIALS ARE TYPICALLY DIVIDED AS FOLLOWS:			ALLUVIUM (ALLUV.) - SOILS THAT HAVE BEEN TRANSPORTED BY WATER. AQUIFER - A WATER BEARING FORMATION OR STRATA. ARGILLACEOUS - APPLIED TO ROCKS THAT HAVE BEEN DERIVED FROM SAND OR THAT CONTAIN SAND. ARGILLACEOUS - APPLIED TO ALL ROCKS OR SUBSTANCES COMPOSED OF CLAY MINERALS, OR HAVING A NOTABLE PROPORTION OF CLAY IN THEIR COMPOSITION, AS SHALE, SLATE, ETC. ARTESIAN - GROUND WATER THAT IS UNDER SUFFICIENT PRESSURE TO RISE ABOVE THE LEVEL AT WHICH IT IS ENCOUNTERED, BUT WHICH DOES NOT NECESSARILY RISE TO OR ABOVE THE GROUND SURFACE. CALCAREOUS (CALC.) - SOILS THAT CONTAIN APPRECIABLE AMOUNTS OF CALCIUM CARBONATE. COLLUVIUM - ROCK FRAGMENTS MIXED WITH SOIL DEPOSITED BY GRAVITY ON SLOPE OR AT BOTTOM OF SLOPE. CORE RECOVERY (REC) - TOTAL LENGTH OF ALL MATERIAL RECOVERED IN THE CORE BARREL DIVIDED BY TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. DIKE - A TABULAR BODY OF IGNEOUS ROCK THAT CUTS ACROSS THE STRUCTURE OF ADJACENT ROCKS OR CUTS MASSIVE ROCK. DIP - THE ANGLE AT WHICH A STRATUM OR ANY PLANAR FEATURE IS INCLINED FROM THE HORIZONTAL. DIP DIRECTION (DIP AZIMUTH) - THE DIRECTION OR BEARING OF THE HORIZONTAL TRACE OF THE LINE OF DIP, MEASURED CLOCKWISE FROM NORTH. FAULT - A FRACTURE OR FRACTURE ZONE ALONG WHICH THERE HAS BEEN DISPLACEMENT OF THE SIDES RELATIVE TO ONE ANOTHER PARALLEL TO THE FRACTURE. FISSILE - A PROPERTY OF SPLITTING ALONG CLOSELY SPACED PARALLEL PLANES. FLOAT - ROCK FRAGMENTS ON SURFACE NEAR THEIR ORIGINAL POSITION AND DISLODGED FROM PARENT MATERIAL. FLOOD PLAIN (FP) - LAND BORDERING A STREAM, BUILT OF SEDIMENTS DEPOSITED BY THE STREAM. FORMATION (FM) - A MAPPABLE GEOLOGIC UNIT THAT CAN BE RECOGNIZED AND TRACED IN THE FIELD. JOINT - A FRACTURE IN ROCK ALONG WHICH NO APPRECIABLE MOVEMENT HAS OCCURRED. LEDGE - A SHELF-LIKE RIDGE OR PROJECTION OF ROCK WHOSE THICKNESS IS SMALL COMPARED TO ITS LATERAL EXTENT. LENS - A BODY OF SOIL OR ROCK THAT THINS OUT IN ONE OR MORE DIRECTIONS. MOTTLED (MOT.) - IRREGULARLY MARKED WITH SPOTS OF DIFFERENT COLORS, MOTTLING IN SOILS USUALLY INDICATES POOR AERATION AND LACK OF GOOD DRAINAGE. PERCHED WATER - WATER MAINTAINED ABOVE THE NORMAL GROUND WATER LEVEL BY THE PRESENCE OF AN INTERVENING IMPERVIOUS STRATUM. RESIDUAL (RES.) SOIL - SOIL FORMED IN PLACE BY THE WEATHERING OF ROCK. ROCK QUALITY DESIGNATION (RQD) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF CORE RUN AND EXPRESSED AS A PERCENTAGE. SAPROLITE (SAP.) - RESIDUAL SOIL THAT RETAINS THE RELIC STRUCTURE OR FABRIC OF THE PARENT ROCK. SILL - AN INTRUSIVE BODY OF IGNEOUS ROCK OF APPROXIMATELY UNIFORM THICKNESS AND RELATIVELY THIN COMPARED WITH ITS LATERAL EXTENT, THAT HAS BEEN EMPLACED PARALLEL TO THE BEDDING OR SCHISTOSITY OF THE INTRUDED ROCKS. SLICKENSIDE - POLISHED AND STRIATED SURFACE THAT RESULTS FROM FRICTION ALONG A FAULT OR SLIP PLANE. STANDARD PENETRATION TEST (PENETRATION RESISTANCE) (SPT) - NUMBER OF BLOWS IN OR BPF OF A 148 LB. HAMMER FALLING 30 INCHES REQUIRED TO PRODUCE A PENETRATION OF 1 FOOT INTO SOIL WITH A 2 INCH OUTSIDE DIAMETER SPLIT SPOON SAMPLER. SPT REFUSAL IS PENETRATION EQUAL TO OR LESS THAN 0.1 FOOT PER 60 BLOWS. STRATA CORE RECOVERY (SREC) - TOTAL LENGTH OF STRATA MATERIAL RECOVERED DIVIDED BY TOTAL LENGTH OF STRATUM AND EXPRESSED AS A PERCENTAGE. STRATA ROCK QUALITY DESIGNATION (SROQ) - A MEASURE OF ROCK QUALITY DESCRIBED BY TOTAL LENGTH OF ROCK SEGMENTS WITHIN A STRATUM EQUAL TO OR GREATER THAN 4 INCHES DIVIDED BY THE TOTAL LENGTH OF STRATA AND EXPRESSED AS A PERCENTAGE. TOPSOIL (TS) - SURFACE SOILS USUALLY CONTAINING ORGANIC MATTER.		
SOIL LEGEND AND AASHTO CLASSIFICATION			MINERALOGICAL COMPOSITION			WEATHERING			WEATHERING		
GENERAL CLASS. GRANULAR MATERIALS (<= 35% PASSING #200) SILT-CLAY MATERIALS (> 35% PASSING #200) ORGANIC MATERIALS			MINERAL NAMES SUCH AS QUARTZ, FELDSPAR, MICA, TALC, KAOLIN, ETC. ARE USED IN DESCRIPTIONS WHENEVER THEY ARE CONSIDERED OF SIGNIFICANCE.			WEATHERED ROCK (WR) NON-COASTAL PLAIN MATERIAL THAT WOULD YIELD SPT N VALUES > 100 BLOWS PER FOOT IF TESTED.			CRISTALLINE ROCK (CR) FINE TO COARSE GRAIN (IGNEOUS AND METAMORPHIC) ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES GRANITE, GNEISS, GABBRO, SCHIST, ETC.		
GROUP CLASS. A-1-0, A-1-1, A-1-2, A-1-3, A-2-1, A-2-2, A-2-3, A-2-4, A-2-5, A-2-6, A-2-7, A-4, A-5, A-6, A-7, A-7-5, A-7-6, A-8, A-9			COMPRESSIBILITY SLIGHTLY COMPRESSIBLE LIQUID LIMIT LESS THAN 31 MODERATELY COMPRESSIBLE LIQUID LIMIT EQUAL TO 31-50 HIGHLY COMPRESSIBLE LIQUID LIMIT GREATER THAN 50			NON-CRYSTALLINE ROCK (NCR) FINE TO COARSE GRAIN (METAMORPHIC AND NON-COASTAL PLAIN) SEDIMENTARY ROCK THAT WOULD YIELD SPT REFUSAL IF TESTED. ROCK TYPE INCLUDES PHYLLITE, SLATE, SANDSTONE, ETC.			COASTAL PLAIN SEDIMENTARY ROCK (CP) COASTAL PLAIN SEDIMENTS CEMENTED INTO ROCK, BUT MAY NOT YIELD SPT REFUSAL. ROCK TYPE INCLUDES LIMESTONE, SANDSTONE, CEMENTED SHELL BEDS, ETC.		
SYMBOL			PERCENTAGE OF MATERIAL			FRESH ROCK FRESH, CRYSTALS BRIGHT, FEW JOINTS MAY SHOW SLIGHT STAINING, ROCK RINGS UNDER HAMMER IF CRYSTALLINE.			VERY SLIGHT (V.SL.) ROCK GENERALLY FRESH, JOINTS STAINED, SOME JOINTS MAY SHOW THIN CLAY COATINGS IF OPEN, CRYSTALS ON A BROKEN SPECIMEN FACE SHINE BRIGHTLY, ROCK RINGS UNDER HAMMER BLOWS IF OF A CRYSTALLINE NATURE.		
Z% PASSING: * 10 (50 MX), * 40 (30 MX, 50 MX, 51 MN), * 200 (15 MX, 25 MX, 10 MX)			ORGANIC MATERIAL GRANULAR SOILS SILT-CLAY SOILS OTHER MATERIAL TRACE OF ORGANIC MATTER 2-3%, LITTLE ORGANIC MATTER 3-5%, MODERATELY ORGANIC 5-10%, HIGHLY ORGANIC >10%			SLIGHT (SL.) ROCK GENERALLY FRESH, JOINTS STAINED AND DISCOLORATION EXTENDS INTO ROCK UP TO 1 INCH, OPEN JOINTS MAY CONTAIN CLAY. IN GRANITOID ROCKS SOME OCCASIONAL FELDSPAR CRYSTALS ARE DULL AND DISCOLORED, CRYSTALLINE ROCKS RING UNDER HAMMER BLOWS.			MODERATE (MOD.) SIGNIFICANT PORTIONS OF ROCK SHOW DISCOLORATION AND WEATHERING EFFECTS. IN GRANITOID ROCKS, MOST FELDSPARS ARE DULL AND DISCOLORED, SOME SHOW CLAY. ROCK HAS DULL SOUND UNDER HAMMER BLOWS AND SHOWS SIGNIFICANT LOSS OF STRENGTH AS COMPARED WITH FRESH ROCK.		
LIQUID LIMIT PLASTIC INDEX GROUP INDEX			GROUND WATER WATER LEVEL IN BORE HOLE IMMEDIATELY AFTER DRILLING STATIC WATER LEVEL AFTER 24 HOURS PERCHED WATER, SATURATED ZONE, OR WATER BEARING STRATA SPRING OR SEEP			SEVERE (MOD. SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED. IN GRANITOID ROCKS, ALL FELDSPARS DULL AND DISCOLORED AND A MAJORITY SHOW KAOLINIZATION. ROCK SHOWS SEVERE LOSS OF STRENGTH AND CAN BE EXCAVATED WITH A GEOLOGIST'S PICK. ROCK GIVES "CLUNK" SOUND WHEN STRUCK. IF TESTED, WOULD YIELD SPT REFUSAL			SEVERE (SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC CLEAR AND EVIDENT BUT REDUCED IN STRENGTH TO STRONG SOIL. IN GRANITOID ROCKS ALL FELDSPARS ARE KAOLINIZED TO SOME EXTENT, SOME FRAGMENTS OF STRONG ROCK USUALLY REMAIN. IF TESTED, YIELDS SPT N VALUES > 100 BPF		
USUAL TYPES OF MAJOR MATERIALS: STONE FRAGS, GRAVEL, AND SAND; FINE SAND; SILTY OR CLAYEY GRAVEL AND SAND; SILTY SOILS; CLAYEY SOILS			MISCELLANEOUS SYMBOLS ROADWAY EMBANKMENT (RE) WITH SOIL DESCRIPTION SOIL SYMBOL ARTIFICIAL FILL (AF) OTHER THAN ROADWAY EMBANKMENT INFERRED SOIL BOUNDARY INFERRED ROCK LINE ALLUVIAL SOIL BOUNDARY DIP & DIP DIRECTION OF ROCK STRUCTURES SOUNDING ROD			VERY SEVERE (V.SEV.) ALL ROCK EXCEPT QUARTZ DISCOLORED OR STAINED, ROCK FABRIC ELEMENTS ARE DISCERNIBLE BUT THE MASS IS EFFECTIVELY REDUCED TO SOIL STATUS, WITH ONLY FRAGMENTS OF STRONG ROCK REMAINING. SAPROLITE IS AN EXAMPLE OF ROCK WEATHERED TO A DEGREE SUCH THAT ONLY MINOR VESTIGES OF THE ORIGINAL ROCK FABRIC REMAIN. IF TESTED, YIELDS SPT N VALUES < 100 BPF			COMPLETE ROCK REDUCED TO SOIL. ROCK FABRIC NOT DISCERNIBLE, OR DISCERNIBLE ONLY IN SMALL AND SCATTERED CONCENTRATIONS. QUARTZ MAY BE PRESENT AS DIKES OR STRINGERS. SAPROLITE IS ALSO AN EXAMPLE.		
GEN. RATING AS A SUBGRADE: EXCELLENT TO GOOD FAIR TO POOR FAIR TO POOR POOR UNSUITABLE			PI OF A-7-5 SUBGROUP IS <= LL - 30; PI OF A-7-6 SUBGROUP IS > LL - 30			ROCK HARDNESS VERY HARD CANNOT BE SCRATCHED BY KNIFE OR SHARP PICK. BREAKING OF HAND SPECIMENS REQUIRES SEVERAL HARD BLOWS OF THE GEOLOGIST'S PICK.			HARD CAN BE SCRATCHED BY KNIFE OR PICK ONLY WITH DIFFICULTY. HARD HAMMER BLOWS REQUIRED TO DETACH HAND SPECIMEN.		
CONSISTENCY OR DENSENESS			ABBREVIATIONS			FRACTURE SPACING			BEDDING		
PRIMARY SOIL TYPE COMPACTNESS OR CONSISTENCY RANGE OF STANDARD PENETRATION RESISTANCE (N-VALUE) RANGE OF UNCONFINED COMPRESSIVE STRENGTH (TONS/FI ²)			AR - AUGER REFUSAL BT - BORING TERMINATED CL - CLAY CPT - CONE PENETRATION TEST CSE - COARSE DMT - DILATOMETER TEST DPT - DYNAMIC PENETRATION TEST e - VOID RATIO F - FINE FOSS. - FOSSILIFEROUS FRAC. - FRACTURED, FRACTURES FRAGS. - FRAGMENTS HL - HIGHLY MED. - MEDIUM MICA - MICACEOUS MOD. - MODERATELY NP - NON PLASTIC ORG. - ORGANIC PMT - PRESSUREMETER TEST SAP. - SAPROLITIC SD. - SAND, SANDY SL. - SILT, SILTY SLI. - SLIGHTLY TCR - TRICONE REFUSAL w - MOISTURE CONTENT v - VERY VST - VANE SHEAR TEST WEA. - WEATHERED U - UNIT WEIGHT U _d - DRY UNIT WEIGHT			VERY WIDE MORE THAN 10 FEET WIDE 3 TO 10 FEET MODERATELY CLOSE 1 TO 3 FEET CLOSE 0.16 TO 1 FEET VERY CLOSE LESS THAN 0.16 FEET			VERY THICKLY BEDDED > 4 FEET THICKLY BEDDED 1.5 - 4 FEET THINLY BEDDED 0.16 - 1.5 FEET VERY THINLY BEDDED 0.03 - 0.16 FEET THICKLY LAMINATED 0.008 - 0.03 FEET THINLY LAMINATED < 0.008 FEET		
U.S. STD. SIEVE SIZE OPENING (MM)			Boulder (BLDR.) Cobble (COB.) Gravel (GR.) Coarse Sand (CS.SD.) Fine Sand (F.SD.) Silt (SL.) Clay (CL.)			INDURATION FOR SEDIMENTARY ROCKS, INDURATION IS THE HARDENING OF THE MATERIAL BY CEMENTING, HEAT, PRESSURE, ETC.			FRIABLE RUBBING WITH FINGER FREES NUMEROUS GRAINS; GENTLE BLOW BY HAMMER DISINTEGRATES SAMPLE.		
TEXTURE OR GRAIN SIZE			EQUIPMENT USED ON SUBJECT PROJECT			INDURATION			BENCH MARK		
GRAIN SIZE			DRILL UNITS: MOBILE B- BK-51 CME-45C CME-558 PORTABLE HOIST			MODERATELY INDURATED GRAINS CAN BE SEPARATED FROM SAMPLE WITH STEEL PROBE; BREAKS EASILY WHEN HIT WITH HAMMER.			ELEVATION: FT.		
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION			ADVANCING TOOLS: CLAY BITS 6' CONTINUOUS FLIGHT AUGER 8' HOLLOW AUGERS HARD FACED FINGER BITS TUNG-CARBIDE INSERTS CASING w/ ADVANCER TRICONE STEEL TEETH TRICONE TUNG-CARB. CORE BIT			INDURATED GRAINS ARE DIFFICULT TO SEPARATE WITH STEEL PROBE; DIFFICULT TO BREAK WITH HAMMER.			NOTES:		
SOIL MOISTURE SCALE (ATTERBERG LIMITS) FIELD MOISTURE DESCRIPTION GUIDE FOR FIELD MOISTURE DESCRIPTION			HAMMER TYPE: AUTOMATIC MANUAL CORE SIZE: B NXL H HAND TOOLS: POST HOLE DIGGER HAND AUGER SOUNDING ROD VANE SHEAR TEST			EXTREMELY INDURATED SHARP HAMMER BLOWS REQUIRED TO BREAK SAMPLE; SAMPLE BREAKS ACROSS GRAINS.					
SOIL MOISTURE - CORRELATION OF TERMS			PLASTICITY								
LL - LIQUID LIMIT PL - PLASTIC LIMIT OM - OPTIMUM MOISTURE SL - SHRINKAGE LIMIT			PLASTICITY INDEX (PI) DRY STRENGTH								
NONPLASTIC LOW PLASTICITY MED. PLASTICITY HIGH PLASTICITY			0-5 6-15 16-25 26 OR MORE VERY LOW SLIGHT MEDIUM HIGH								
COLOR											
DESCRIPTIONS MAY INCLUDE COLOR OR COLOR COMBINATIONS (TAN, RED, YELLOW-BROWN, BLUE-GRAY). MODIFIERS SUCH AS LIGHT, DARK, STREAKED, ETC. ARE USED TO DESCRIBE APPEARANCE.											

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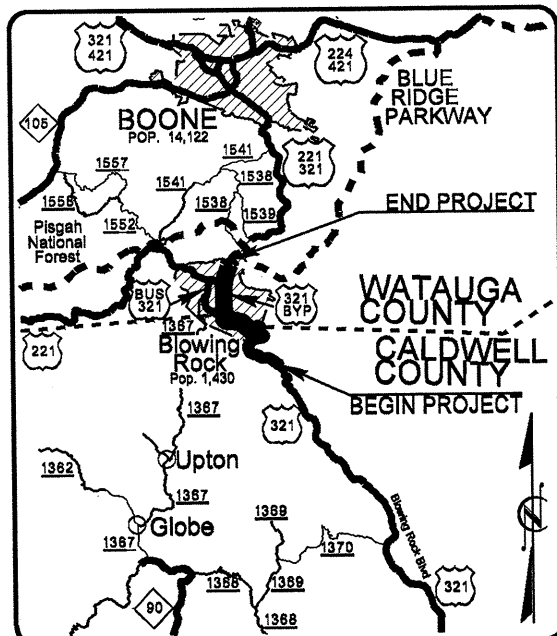
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CALDWELL & WATAUGA COUNTIES

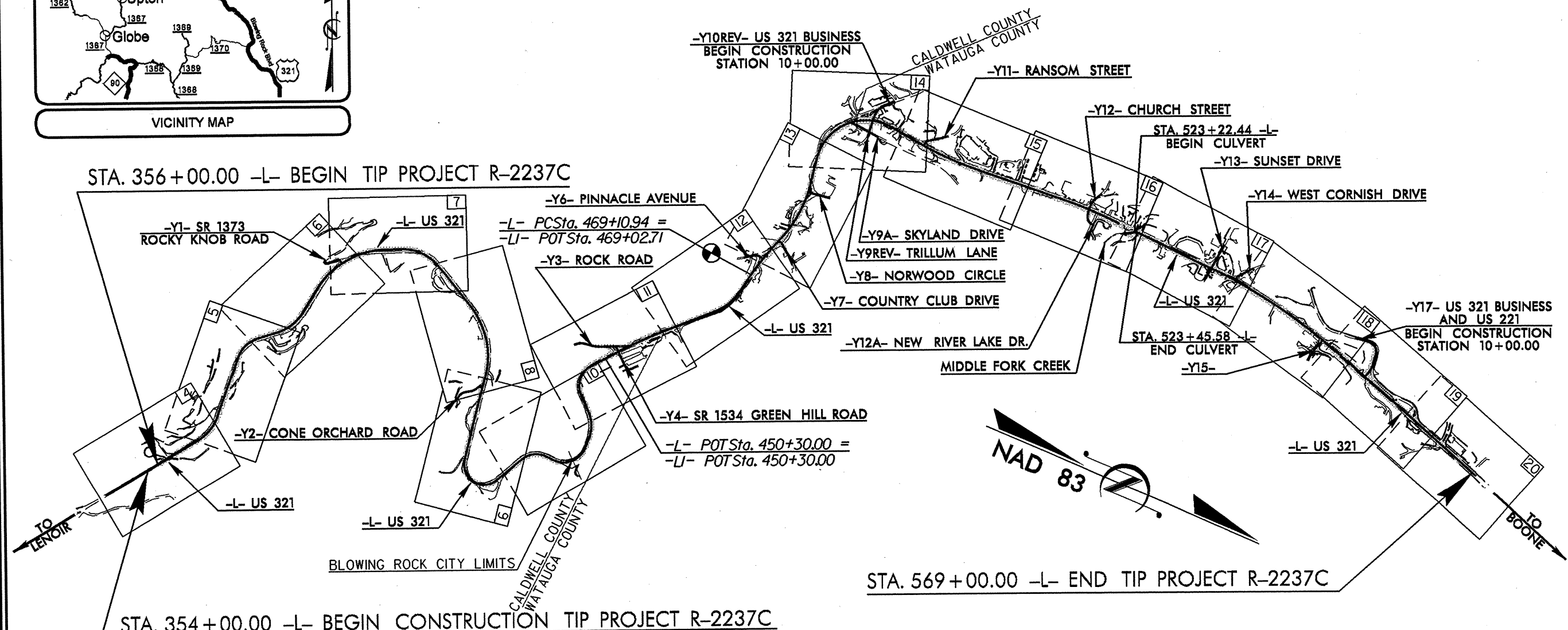
LOCATION: US 321 FROM SR 1500 (BLACKBERRY ROAD)
TO US 221 AT BLOWING ROCK

TYPE OF WORK: GRADING, DRAINAGE, PAVING, CULVERT, RETAINING WALLS,
AND SIGNALS

See Sheet 1-A For Index of Sheets

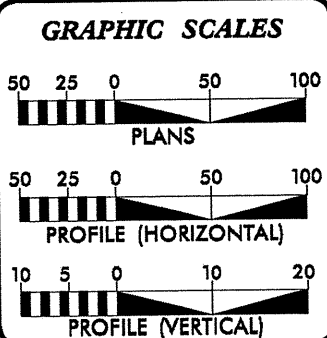


VICINITY MAP



TIP PROJECT: R-2237C

CONTRACT: C202585



DESIGN DATA

ADT 2011 =	17,052
ADT 2035 =	23,100
DHV =	12 %
D =	55 %
T =	9 % *
V =	40 MPH
* TTST 3% + DUAL 6%	
STATEWIDE TIER	
FUNCTIONAL CLASSIFICATION	
ARTERIAL	

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2237C	=	4.029 MILES
LENGTH STRUCTURE TIP PROJECT R-2237C	=	0.005 MILES
TOTAL LENGTH OF TIP PROJECT R-2237C	=	4.034 MILES

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

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE: JUNE 27, 2008	G. E. BREW, PE PROJECT ENGINEER
LETTING DATE: SEPTEMBER 20, 2011	W. T. BEST PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: _____ P.E.

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

STATE HIGHWAY DESIGN ENGINEER

18-AUG-2011 07:51 R:\Roadway\Projects\2237c_rdy_tsh.dgn \$\$\$USERNAME\$\$\$



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

Michael F. Easley
GOVERNOR

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

Lyndo Tippett
SECRETARY

6 May, 2008

STATE PROJECT: R-2237C, 34402.1.1
COUNTY: Caldwell/Watauga
DESCRIPTION: US 321 from SR 1500 (Blackberry Road) to US 221 at Blowing Rock
SUBJECT: Geotechnical Report – Inventory

PROJECT DESCRIPTION

The project consists of widening 4.03 miles of existing 2-lane to 4-lane. Widening occurs generally along existing alignment with curve straightening, y-line and driveway improvements. This section continues improvements of the R-2237 A and B segments. The project will complete improvements up the final grade of the Blue Ridge escarpment, with steep grades from stations 356+00 to 452+00, planes out onto the Boone plateau from 452+00 to 493+00 and then grades downward through the commercial corridor of Blowing Rock to the ending station and existing improved four-lane at station 569+00.

Business US 321 intersects the project at station 493+00. Business US 321 and US 221 merge back into the alignment at station 553+00. -Y- line and driveways with retaining walls and/or significant cuts or fills were individually investigated and include: -Y1-, -Y2-, Drive 1 and -Y17-.

The following survey lines were investigated:

<u>Line</u>	<u>Stations</u>
- L -	356+00 – 569+00
-L1-	458+00 – 467+00
-Y1-	All
-Y2-	All
-DR1-	All
-Y17-	All

AREAS OF SPECIAL GEOTECHNICAL INTEREST

STRUCTURES

There are 37 retaining walls on the project. These will be covered in separate Structure Reports. Preliminary Recommendations were issued during the investigation that sought to eliminate the walls at 549+50 – 542+00 LT, 556+00 – 559+50 RT and 565+00 – 566+50, unless reasons exist other than geotechnically for their design. No bridge structures are included and it is assumed that existing culverts will be lengthened.

POTENTIALLY UNSUITABLE SUBSURFACE CONDITIONS

Rock- Overburden is not well developed throughout the project. Rock can be expected within 6' of grade in most areas. Outcropping has been noted on the plan sheets and cross sections. The depth of subgrade blasting for existing or proposed ditchlines is not known and can be expected to be shallow.

Colluvium- The only mapped colluvium deposit is at Stations 402+50 – 405+00 RT. The proposed fill is slated to bury or toe in the stable graded section of this deposit. The expected fill material is not markedly different from the colluvial deposit and it does not appear unstable. Thin veneers of colluvium exist from 356+00 – 452+00 but generally not large enough to be addressed beyond standard benching of the proposed fills.

Soft alluvial soils were encountered in the vicinity of Stations 443+00 – 450+00 RT. The entire section is not suspect but small areas will probably require geotextile and select material replacement due to the fill expansion and stream relocation.

GROUNDWATER

Groundwater is noticeably absent over most of the project. The coarse sandy nature of the soils and jointed nature of the rocks contribute to high permeability. Borings were dry unless otherwise noted on the cross sections.

High groundwater exists in the wall borings at the following station interval probably due to leakage from landscaping ponds on the property and the damming effect of the roadway:

520+00 – 521+00 RT

The fill will toe in a private pond at 528+50 – 530+50 LT.

PHYSIOGRAPHY AND GEOLOGY

R-2237C will complete improvements to US 321 as it completes the final steep graded section up the Blue Ridge escarpment. The town and area of Blowing Rock are noted for tourism, vacation homes and other factors related to their prominent location in the

rugged terrain. US 321 serves this industry and is widely used as a through route to the mountains from the Piedmont areas of NC. The terrain is defined by the underlying bedrock which is present in most locations and has not generated a deep soil weathering horizon.

The corridor is geologically complex as it traverses the Blowing Rock Gneiss unit and several variations of heavy mineral gneisses. These have been tectonically altered in places to schists and mylonites, which generally make the rock finer grained and weaker. Outcropping rock up to station 452+00 is more schistose and has smaller block sizing with numerous intersecting and continuous joint planes. Rock from station 452+00 to the end of the project is generally more massive and competent.

Colluvium is present at the toe of many existing fills from stations 356+00 to 452+00. This is generally not well enough developed to be of concern and generate volumes of undercut. Several generations of highway have been abandoned below the existing fill which make the colluvium difficult to differentiate from previous highway construction. Despite the steep terrain, there were not notable areas of fill failure or colluvium slides below the existing highway grade.

SOIL PROPERTIES

Soils are poorly developed throughout the project. Few samples were taken, mostly to confirm visual drilling log reports that reflect silty coarse sand to sand soils in the categories of AASHTO A-1, A-2 and A-2-4. A few samples were noted and tested as silt, A-4, probably generated by schistose zones in the bedrock. Any borrow soils will generally be very competent and suitable for project use. There are organic silty soils in the narrow stream valleys which constitute a very small percentage of the project volume. The vast majority of the soils were white to gray sands which reflect their direct weathering from the shallow bedrock.

ROCK PROPERTIES

The underlying bedrock, as noted in the Geology, is predominately feldspar with less quartz than other high grade gneisses common to the Blue Ridge, making it weaker. This leads to deep weathering profiles and thicknesses of weathered rock. From station 452+00 to the end of the project the rock is generally more massive with fewer joint sets. Drilling data reveals competent rock strengths as noted in the cross sections but the borings in many cases were able to auger several runs into defined hard rock.

Core borings almost universally reflect low Recovery and RQD values. Rock Quality Designations rarely achieve values above zero until several 5.0' runs in a given boring. All core borings were advanced in fill areas, cut areas were able to be evaluated in the field due to reasonable amounts of natural outcrop and existing cut sections.

GROUNDWATER

As described in Areas of Special Geotechnical Interest, groundwater is generally not

present in cuts or foundation areas. The granular nature of the soils and jointed nature of the rock are highly permeable. Natural springs are not abundant in existing fills from stations 356+00 to 452+00. This area does receive abundant and frequent rainfall that causes typical deep incised and steep channels in mountainous terrain. Water in thin colluvial areas appears to be free draining and does not generate slope failures in the short term.

GEOTECHNICAL DESCRIPTIVE ANALYSIS

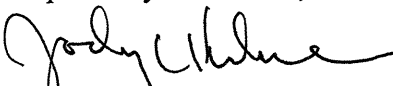
Stations 356+00 – 452+00

As noted in previous sections this length of the project is defined by steeper terrain, steep highway grades and geology that reflects weaker rock, more complexly jointed rock and minor colluvium development. Rock is not competent enough to incorporate steeper slopes or pre-split blasting. Retaining walls will be placed in deep rock embankments, as noted on the cross sections. Most of the existing fills consist of shot rock material in cobble and boulder size with coarse granular soil infilling. There is not evidence of existing embankment failure or instability despite the material and terrain. This is probably due to the competent fill material and lack of constant groundwater.

Stations 452+00 – 569+00

This section reflects less grade across a plateau of more competent rock and soil material. Most walls will be constructed in natural ground or on existing fills with shot rock material consisting of cobbles, boulders and granular soil infilling. Rock at 556+00 – 559+50 RT, is competent to be pre-split blasted with anchor support.

Respectfully Submitted,


Jody C. Kuhne

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT R-2237C

Caldwell &
COUNTY: Watauga

DATE:

14-Jun-11

COMPILED BY: JPM / JBT

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SHEET 1 OF 4

AREA II STATION	STATION	EXCAVATION				EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK +25%	EARTH		EMBANK. +15%	ROCK	SUITABLE	UNSUIT.
SUMMARY No. 1														
-L- LT 354+00 TO 385+50		119,194	57,928			61,266	6,368	5,094	5,094		52,834	61,266		114,100
-L- RT 354+00 TO 385+50		1,040	1			1,039	52,664	1	60,563	59,523				
-DRIVE5- & -DRIVE6- 10+20 TO 11+29.82		3,233				3,233						3,233		3,233
-DRIVE7- 10+30 TO 12+85.33		653				653	126		126			508		508
-DRIVE8- 11+00 TO 12+23.69		436				436	2		2			434		434
SUMMARY No. 1 TOTAL		124,556	57,929			66,627	59,160	5,095	52,791	65,805	59,523	52,834	65,441	118,274
SUMMARY No. 2														
-L- LT 385+50 TO 421+50		67,534	16,489			51,045	8,270	6,616	6,616		9,873	51,045		60,918
-L- RT 385+50 TO 421+50		7,050	1,934			5,116	34,831	1,934	32,414	32,160				
-L- RT TEMP PVMT 385+50 TO 390+50		72				72	27,222		27,222	31,233				
-L- LT TEMP PVMT 388+50 TO 392+00		178				178			19	22		178		178
-L- LT TEMP PVMT 395+50 TO 397+00		758				758	19		108	124		736		736
-L- LT TEMP PVMT 402+50 TO 406+50		168				168	108		178	205		44		44
-L- LT TEMP PVMT 410+50 TO 417+00		45				45	178		178	205	160			
-Y2- 10+24 TO 12+80		168				168	1,586		1,586	1,824	1,656			
SUMMARY No. 2 TOTAL		75,973	18,423			57,550	72,214	8,550	61,527	79,305	65,208	9,873	52,003	61,876
SUMMARY No. 3														
-L- LT 421+50 TO 454+00		3,366	631			2,735	2,040	631	1,251	2,070		1,296		1,296
-L- RT 421+50 TO 454+00		4,178	1,054			3,124	11,269	1,054	9,952	12,498	8,320			
-L- RT TEMP PVMT 422+00 TO 427+00		37				37	118		118	136	99			
-L- LT TEMP PVMT 422+50 TO 440+50		853	572			281	21	17		17		555	281	836
-L- LT TEMP PVMT 446+00 TO 453+50		285				285	1,266		1,266	1,456	1,171			
-Y3- 12+00 TO 14+90		2,496				2,496						2,496		2,496
-Y4- 10+22.03 TO 11+25		120				120	237		237	273	153			
-DRIVE1- 10+34 TO 11+90		87				87	631		631	726	639			
-DRIVE2- 10+46.46 TO 11+55		102				102	335		335	385	283			
SUMMARY No. 3 TOTAL		11,524	2,257			9,267	15,917	1,702	13,790	17,560	10,664	555	4,073	4,628
SHEET TOTAL		212,053	78,609			133,444	147,291	15,347	128,107	162,670	135,396	63,262	121,517	184,779

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT R-2237C

Caldwell &
COUNTY: Watauga

DATE:

14-Jun-11

COMPILED BY: JPM / JBT

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SHEET 2 OF 4

AREA II STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE				
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK +25%	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL	
SUMMARY No. 4																
-L- LT 454+00 TO 485+00		7,552	606			6,946	11,165	606	10,408	12,575	5,023					
-L- RT 454+00 TO 485+00		15,406	8,536			6,870	7,111	5,689		5,689		2,847	6,870			9,717
-L- LT TEMP PVMT 457+00 TO 459+50		212	11			201	321	11	307	364	152					
-L- RT TEMP PVMT 459+00 TO 470+00		244				244	168		168	193			51			51
-L- LT TEMP PVMT 459+50 TO 470+00		6,230				6,230	73		73	84			6,146			6,146
-L- LT TEMP PVMT 472+00 TO 474+00		15				15	56		56	64	49					
-L- LT TEMP PVMT 475+00 TO 476+50		35				35	53		53	61	26					
-L- LT TEMP PVMT 478+50 TO 481+93		24				24	303		303	348	324					
-L- LT TEMP PVMT 483+50 TO 485+00		73				73	127		127	146	73					
-Y6- 10+50 TO 12+00.16							159		159	183	183					
-Y7- 10+24 TO 11+25		84				84	154		154	177	93					
-Y8- 10+24.03 TO 11+30							228		228	262	262					
-DRIVE10- 10+25.81 TO 10+90		5				5	114		114	131	126					
SUMMARY No. 4 TOTAL		29,880	9,153			20,727	20,032	6,306	12,150	20,278	6,312	2,847	13,067			15,914
AREA I																
SUMMARY No. 5																
-L- LT 485+00 TO 519+00		384				384	9,343		9,343	10,744	10,360					
-L- RT 485+00 TO 519+00		44,876	21,376			23,500	2,386	1,909		1,909		19,467	23,500			42,967
-L- LT TEMP PVMT 485+00 TO 486+50		67				67	116		116	133	66					
-L- LT TEMP PVMT 490+50 TO 504+00		157				157	817		817	940	783					
-Y9REV- 10+32.49 TO 11+76.95		270				270	555		555	638	368					
-Y9A- 10+50 TO 11+34.25		166				166	61		61	70			96			96
-Y9A- 11+58.15 TO 12+50		139				139	78		78	90			49			49
-Y10REV- 10+64.40 TO 13+08.42		514				514	65		65	75			439			439
-Y11- 10+50 TO 12+69.40		116				116	1,170		1,170	1,346	1,230					
-Y12- 11+00 TO 12+01.45							170		170	196	196					
-Y12A- 10+32.65 TO 12+00		1,468				1,468	106		106	122			1,346			1,346
-DRIVE3- 10+70 TO 11+63.46		52				52	24		24	28			24			24
SUMMARY No. 5 TOTAL		48,209	21,376			26,833	14,891	1,909	12,505	16,290	13,003	19,467	25,455			44,922
SHEET TOTAL		78,089	30,529			47,560	34,923	8,215	24,655	36,568	19,315	22,314	38,522			60,836

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT R-2237C

Caldwell &
COUNTY: Watauga

DATE: 14-Jun-11

COMPILED BY: JPM /JBT

3D / 259
SHEET 3 OF 4

AREA I STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE				
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK +25%	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL	
SUMMARY No. 6																
	-L- LT 519+00 TO 548+00	433				433	6,824		6,824	7,848	7,415					
	-L- RT 519+00 TO 548+00	14,103	5,968			8,135	4,409	3,527		3,527		2,441	8,135			10,576
	-L- LT TEMP PVMT 522+50 TO 524+00	11				11	18		18	21	10					
	-L- LT TEMP PVMT 528+00 TO 536+00	76				76	534		534	614	538					
	-L- LT TEMP PVMT 541+00 TO 548+00	206				206	203		203	233	27					
	-Y13- 10+50 TO 12+64	54				54	485		485	558	504					
	-Y13- 13+28.05 TO 14+00	6				6	33		33	38	32					
	-Y14- 10+50 TO 12+17.81	53				53	517		517	595	542					
	-Y15- 10+32 TO 11+75	101				101	47		47	54			47			47
	-DRIVE4- 10+50 TO 11+10.51	7				7	31		31	36	29					
SUMMARY No. 6 TOTAL		15,050	5,968			9,082	13,101	3,527	8,692	13,523	9,096	2,441	8,182			10,623
SUMMARY No. 7																
	-L- LT 548+00 TO 569+00	454				454	3,900		3,900	4,485	4,031					
	-L- RT 548+00 TO 569+00	14,297	8,586			5,711	1,762	1,410		1,410		7,176	5,711			12,887
	-L- LT TEMP PVMT 548+00 TO 556+00	3,297				3,297	2,055		2,055	2,363			934			934
	-Y17- LT 10+50 TO 15+65.63	173				173	3,167		3,167	3,642	3,469					
	-Y17- RT 10+50 TO 15+65.63	14,278	269			14,009	2,496	269	2,160	2,753			11,525			11,525
	-Y17- TMP PVMT RT 11+00 TO 15+00	168	80			88	3	2		2		78	88			166
	-PARKINGLOT- 10+00 TO 11+22.81	159				159	38		38	44			115			115
SUMMARY No. 7 TOTAL		32,826	8,935			23,891	13,421	1,681	11,320	14,699	7,500	7,254	18,373			25,627
SHEET TOTAL		47,876	14,903			32,973	26,522	5,208	20,012	28,222	16,596	9,695	26,555			36,250

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

Earthwork Balance Sheet

Volumes in Cubic Yards

PROJECT: R-2237C

Caldwell &
COUNTY: Watauga

DATE:

14-Jun-11

COMPILED BY: JPM / JBT

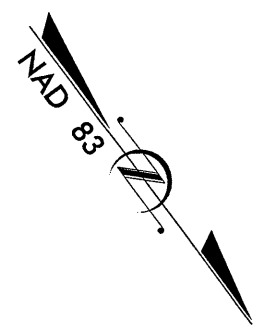
3E / 259
SHEET 4 OF 4

STATION	STATION	EXCAVATION					EMBANKMENT				BORROW	WASTE			
		TOTAL UNCLASS.	ROCK	UNDERCUT	UNSUIT. UNCLASS.	SUITABLE UNCLASS.	TOTAL	ROCK +25%	EARTH	EMBANK. +15%		ROCK	SUITABLE	UNSUIT.	TOTAL
AREA II	TOTAL FROM SHEET 1	212,053	78,609			133,444	147,291	15,347	128,107	162,670	135,396	63,262	121,517		184,779
AREA II & AREA I	TOTAL FROM SHEET 2	78,089	30,529			47,560	34,923	8,215	24,655	36,568	19,315	22,314	38,522		60,836
AREA I	TOTAL FROM SHEET 3	47,876	14,903			32,973	26,522	5,208	20,012	28,222	16,596	9,695	26,555		36,250
TOTAL		338,018	124,041			213,977	208,736	28,770	172,774	227,460	171,306	95,271	186,594		281,865
LOSS DUE TO CLEARING & GRUBBING		-13,000				-13,000							-13,000		-13,000
ROCK WASTE TO REPLACE BORROW								95,271	-95,271		-95,271	-95,271			-95,271
ADJUST FOR ROCK WASTE									-23,818	-23,818	-23,818				
ELIMINATE EARTH SHRINKAGE FACTOR ON ROCK WASTE IN LIEU OF BORROW										-17,863	-17,863				
PROJECT TOTAL		325,018	124,041			200,977	208,736	124,041	53,685	185,778			139,240		139,240
GRAND TOTAL		325,018	124,041			200,977	208,736	124,041	53,685	185,778			139,240		139,240
SAY		325,500													
ESTIMATED SHOULDER BORROW		2,320													
ESTIMATED EXCAVATION FOR DRAINAGE DITCHES		5,550													
ESTIMATED UNDERCUT		1,200													
ESTIMATED SHALLOW UNDERCUT		500													

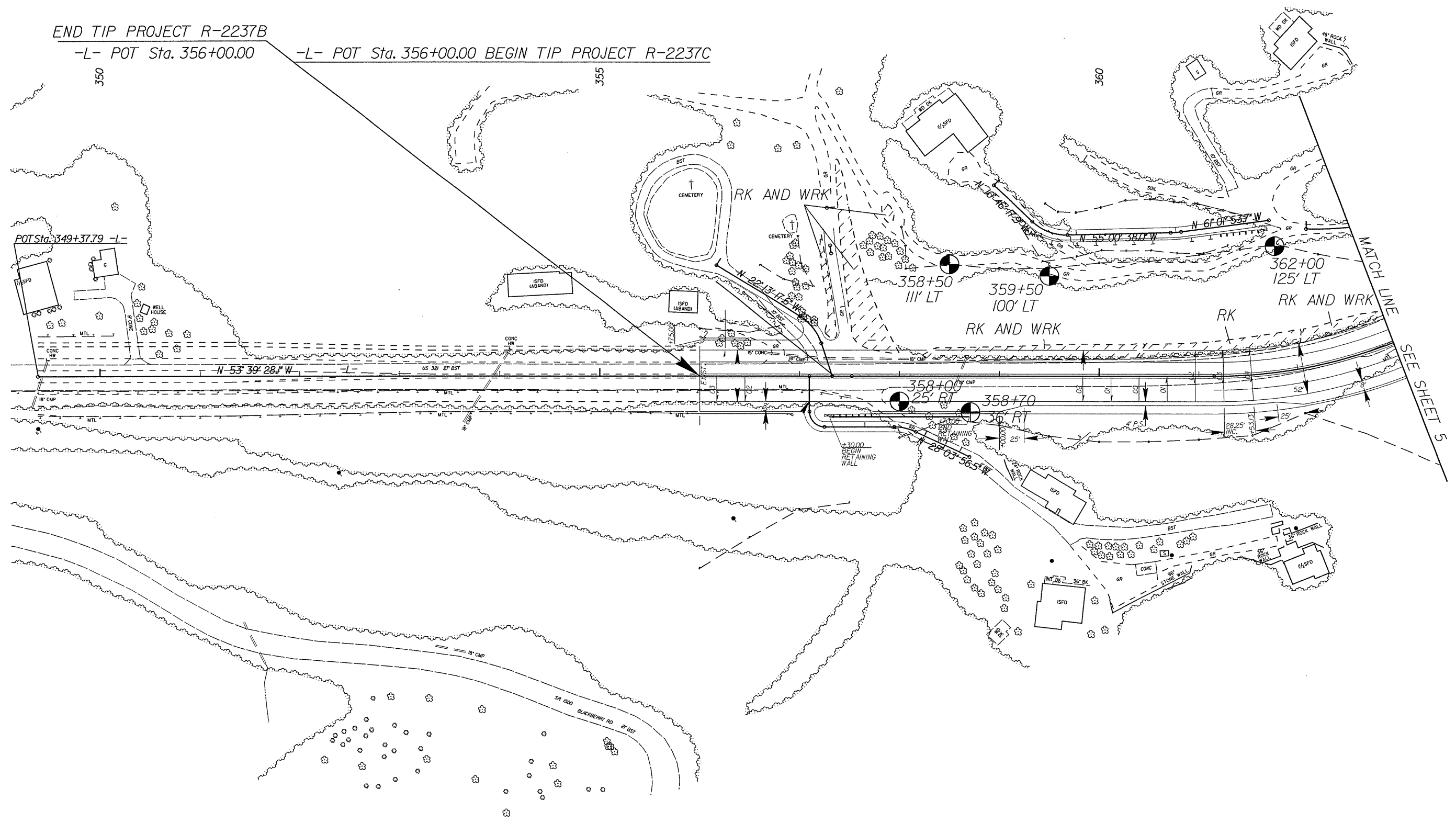
Quantities are approximate only. The Resident Engineer will re-cross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

NOTE: EARTHWORK QUANTITIES ARE CALCULATED BY THE ROADWAY DESIGN UNIT. THESE EARTHWORK QUANTITIES ARE BASED IN PART ON SUBSURFACE DATA PROVIDED BY THE GEOTECHNICAL ENGINEERING UNIT.

PROJECT REFERENCE NO. R-2237C	SHEET NO. 4 259
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



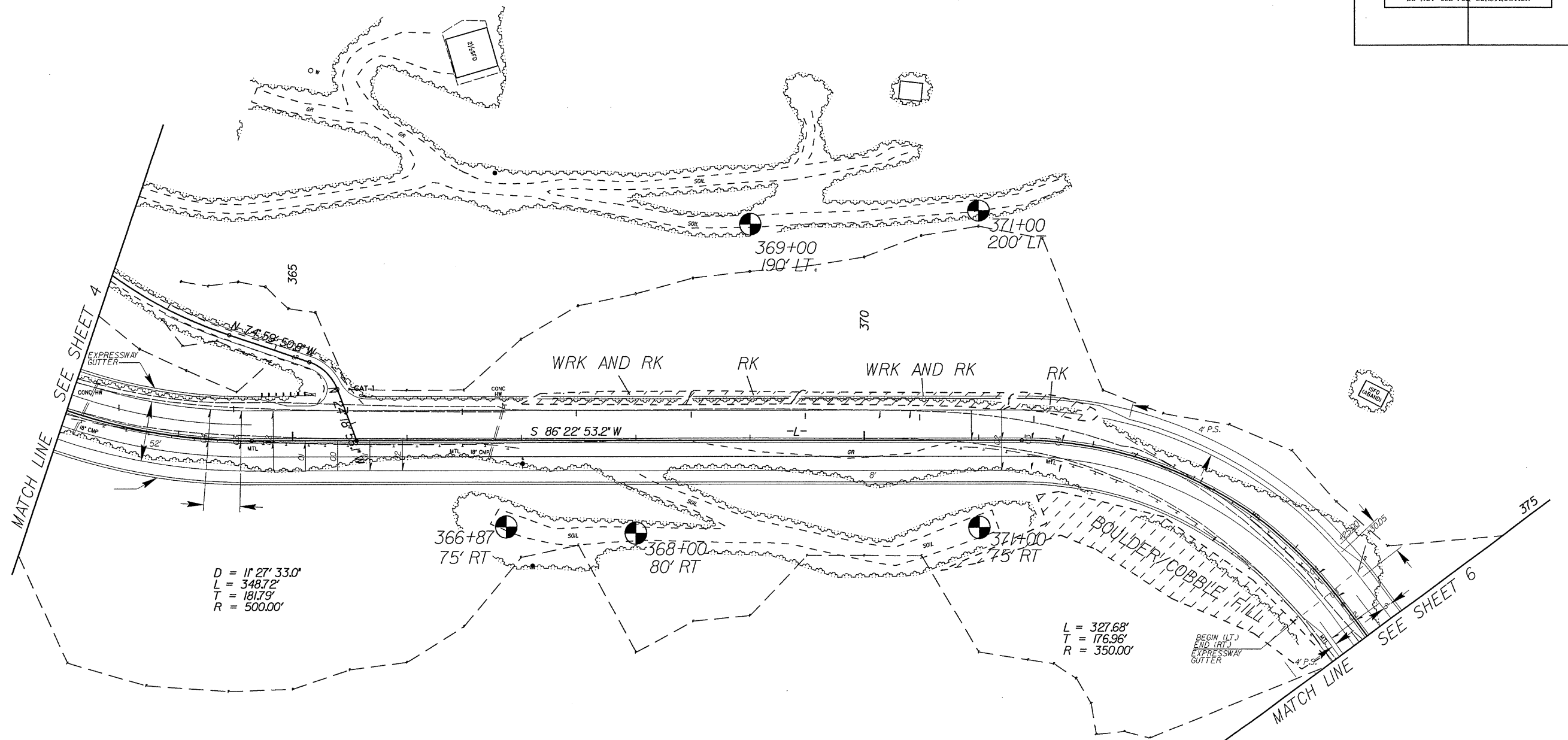
END TIP PROJECT R-2237B
 -L- POT Sta. 356+00.00 -L- POT Sta. 356+00.00 BEGIN TIP PROJECT R-2237C



5/14/95
 SYSTEMS DESIGN CONSULTANTS
 4000 WEST 10TH AVENUE
 DENVER, CO 80202
 TEL: 303.733.1100
 FAX: 303.733.1101

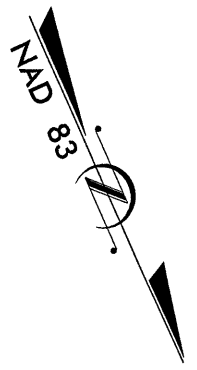
5/14/91
UNIVERSITY MICROFILMS
SERIALS ACQUISITION
300 N ZEEB RD
ANN ARBOR MI 48106-1500

PROJECT REFERENCE NO. <i>R-2237C</i>	SHEET NO. 5 of 259
RW SHEET NO. 1	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

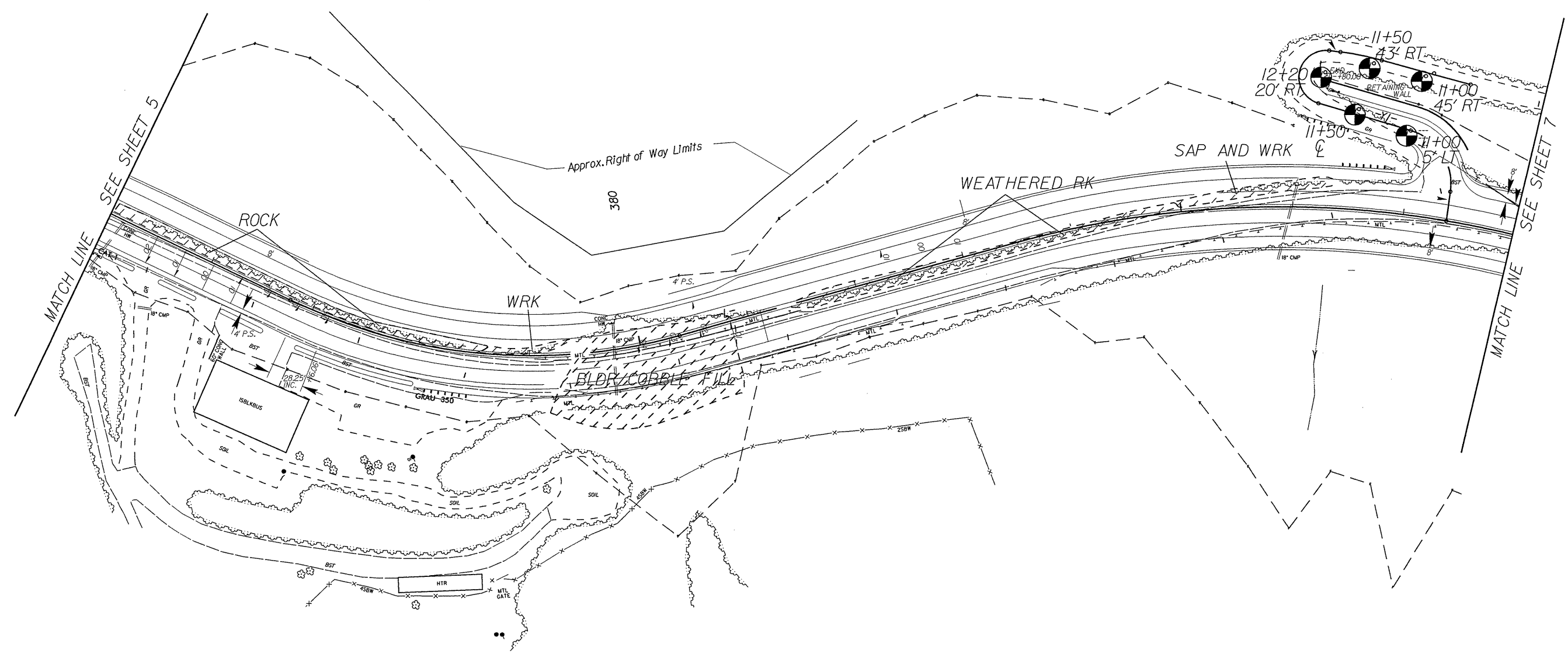


5/14/91

PROJECT REFERENCE NO. R-2237C		SHEET NO. 6/254
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		



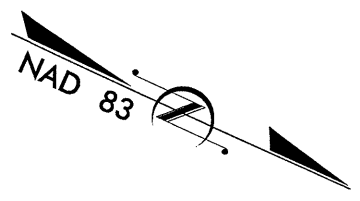
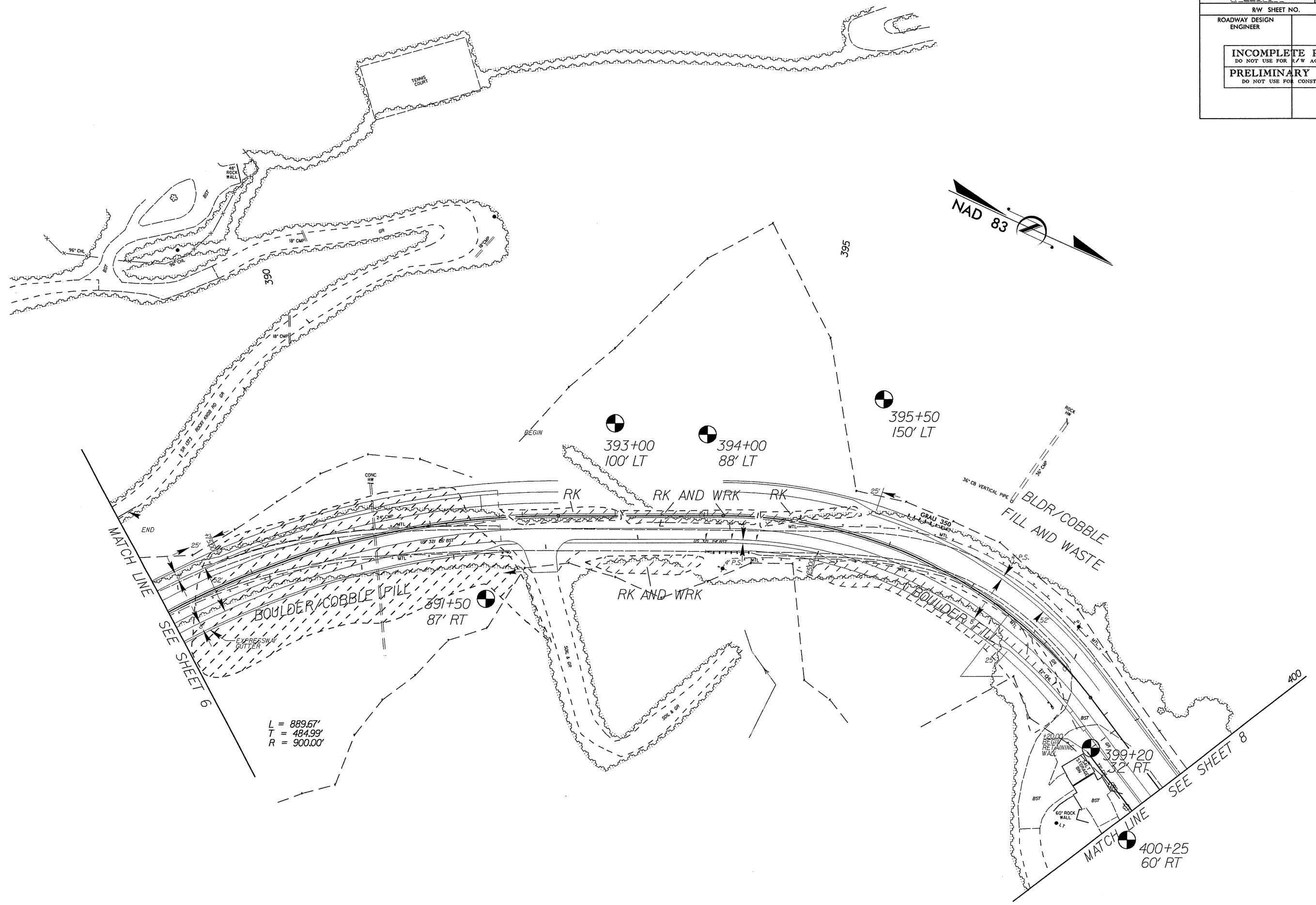
385



DATE PLOTTED: 5/14/91 10:30 AM
PLOTTER: HP-GL/2
SCALE: 1"=10'
SHEET: 6 OF 254
PROJECT: R-2237C
DRAWN BY: JLD
CHECKED BY: JLD
APPROVED BY: JLD

PROJECT REFERENCE NO. R-2237C	SHEET NO. 7/259
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

5/14/95



$L = 889.67'$
 $T = 484.99'$
 $R = 900.00'$

MATCH LINE
SEE SHEET 6

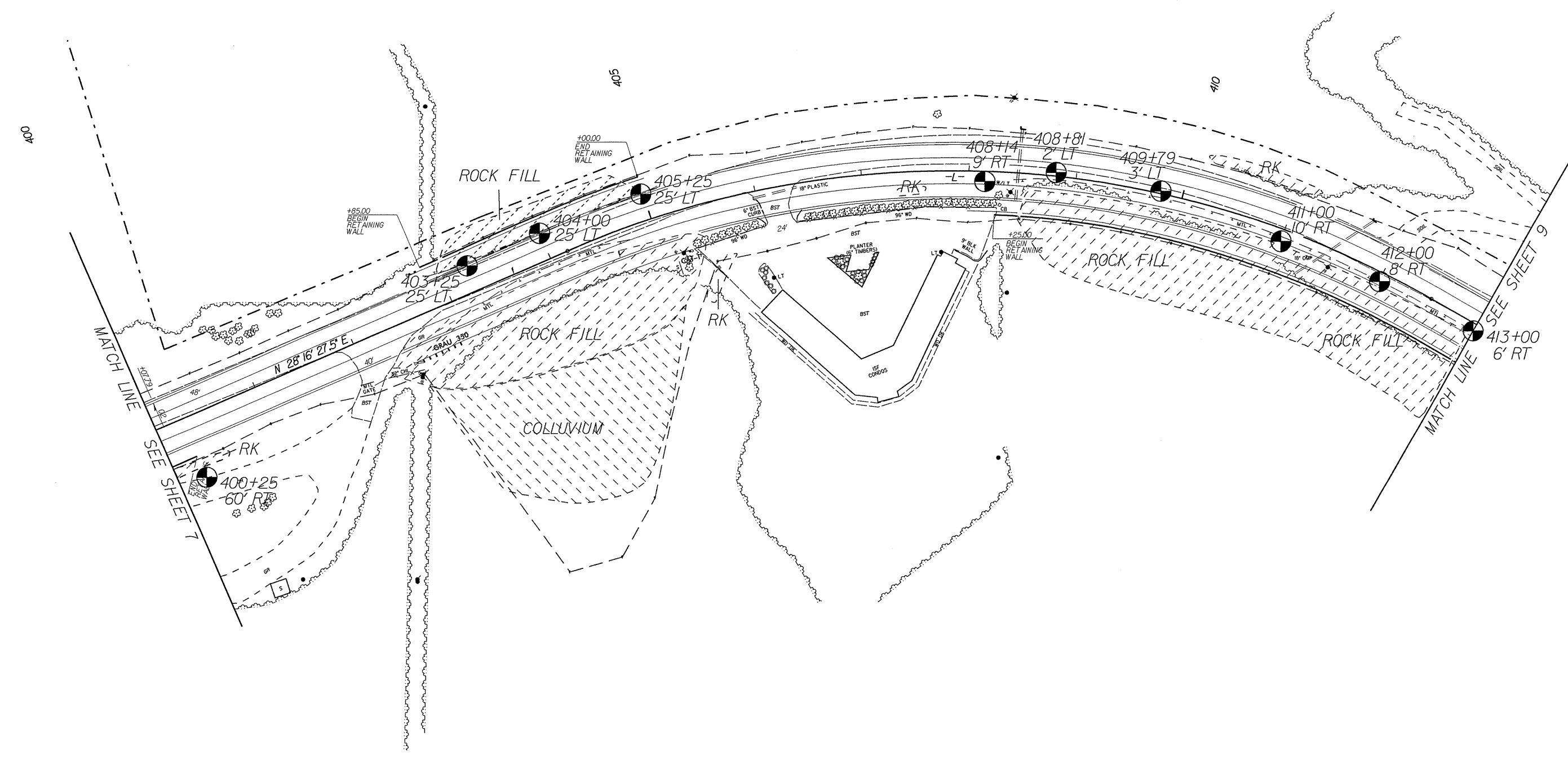
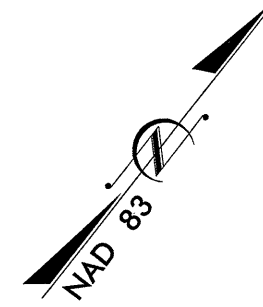
MATCH LINE
SEE SHEET 8

END

BEGIN

5/14/90

PROJECT REFERENCE NO.	SHEET NO.
R-2237C	8/269
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



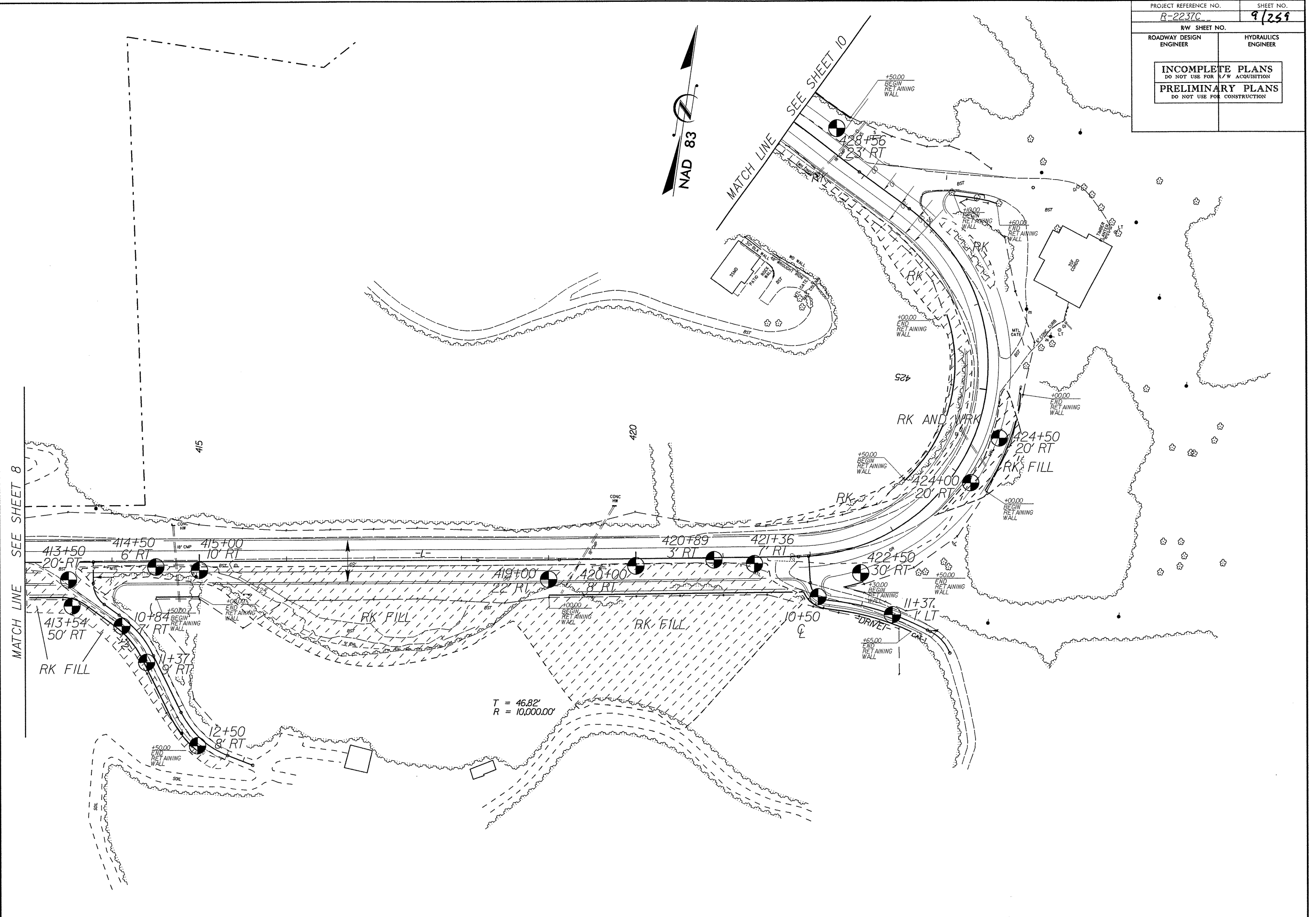
MATCH LINE
SEE SHEET 7

MATCH LINE
SEE SHEET 9

DATE PLOTTED: 10/12/90

PROJECT REFERENCE NO. R-2237C	SHEET NO. 9/259
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

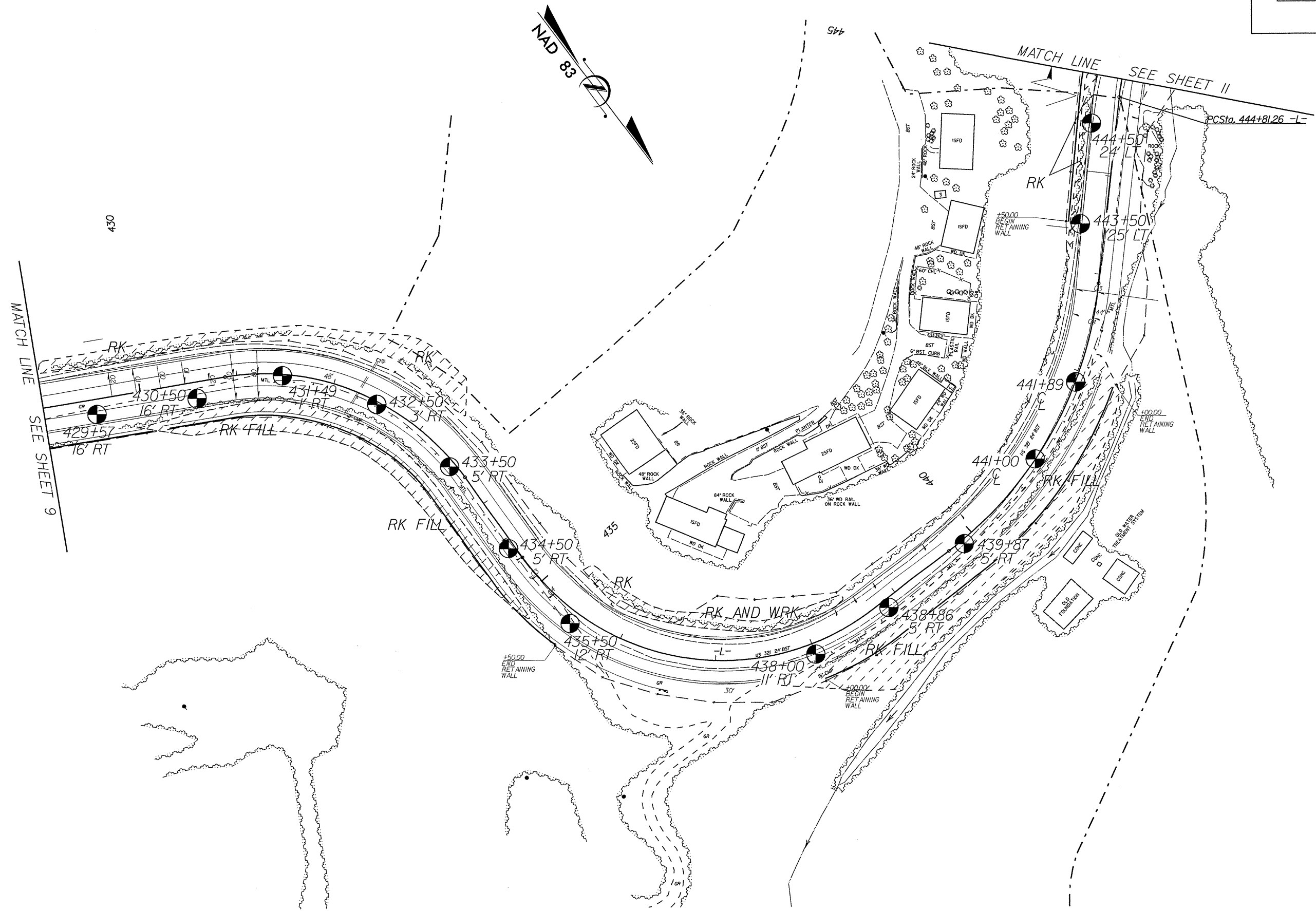
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SYSTEMS TIME DESIGN

PROJECT REFERENCE NO. R-2237C	SHEET NO. 10 / 249
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

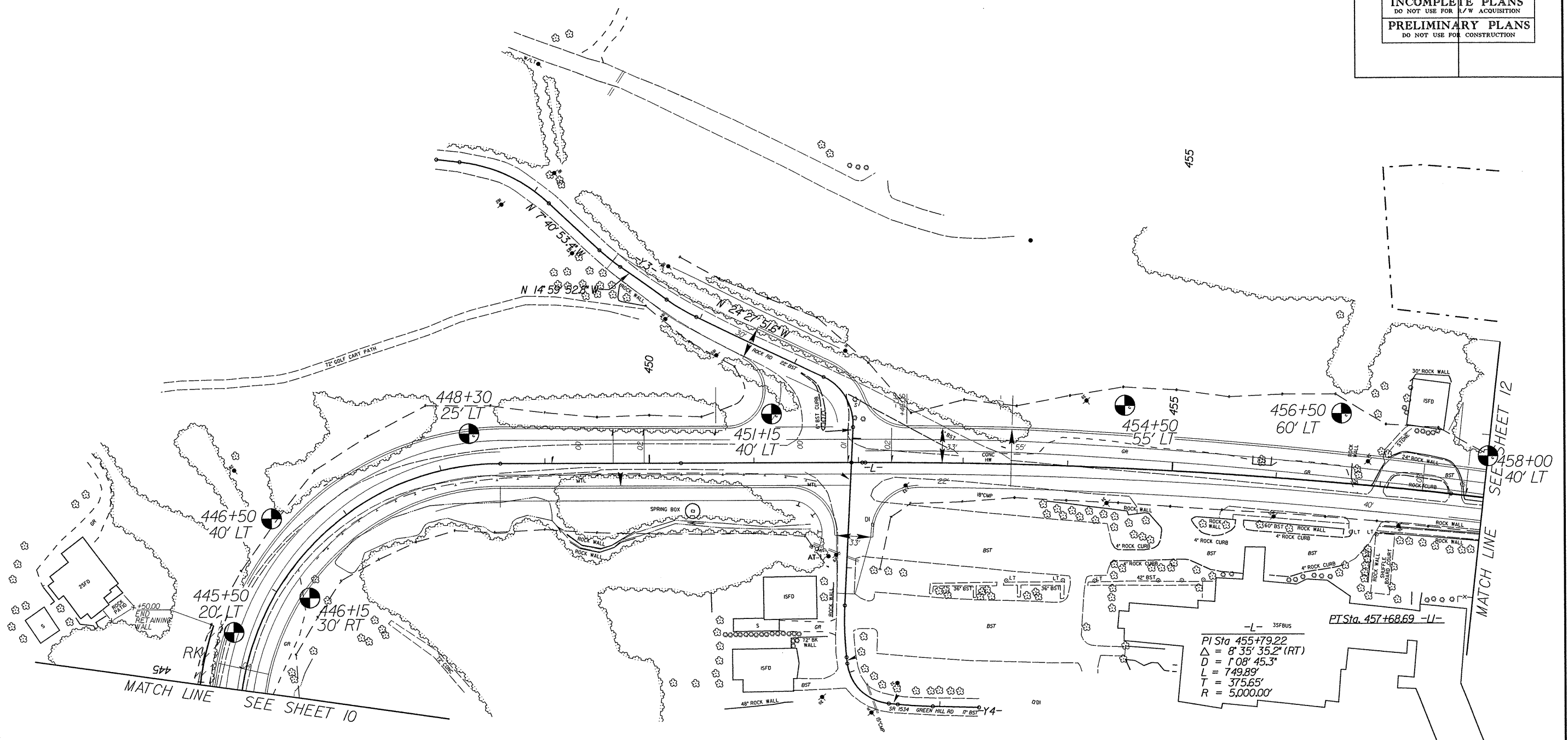
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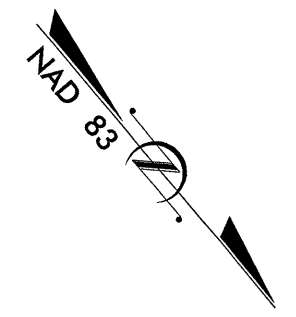
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 *****DGN*****

5/14/91

PROJECT REFERENCE NO. R-2237C	SHEET NO. 11/259
RDW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS <small>DO NOT USE FOR R/W ACQUISITION</small> PRELIMINARY PLANS <small>DO NOT USE FOR CONSTRUCTION</small>	

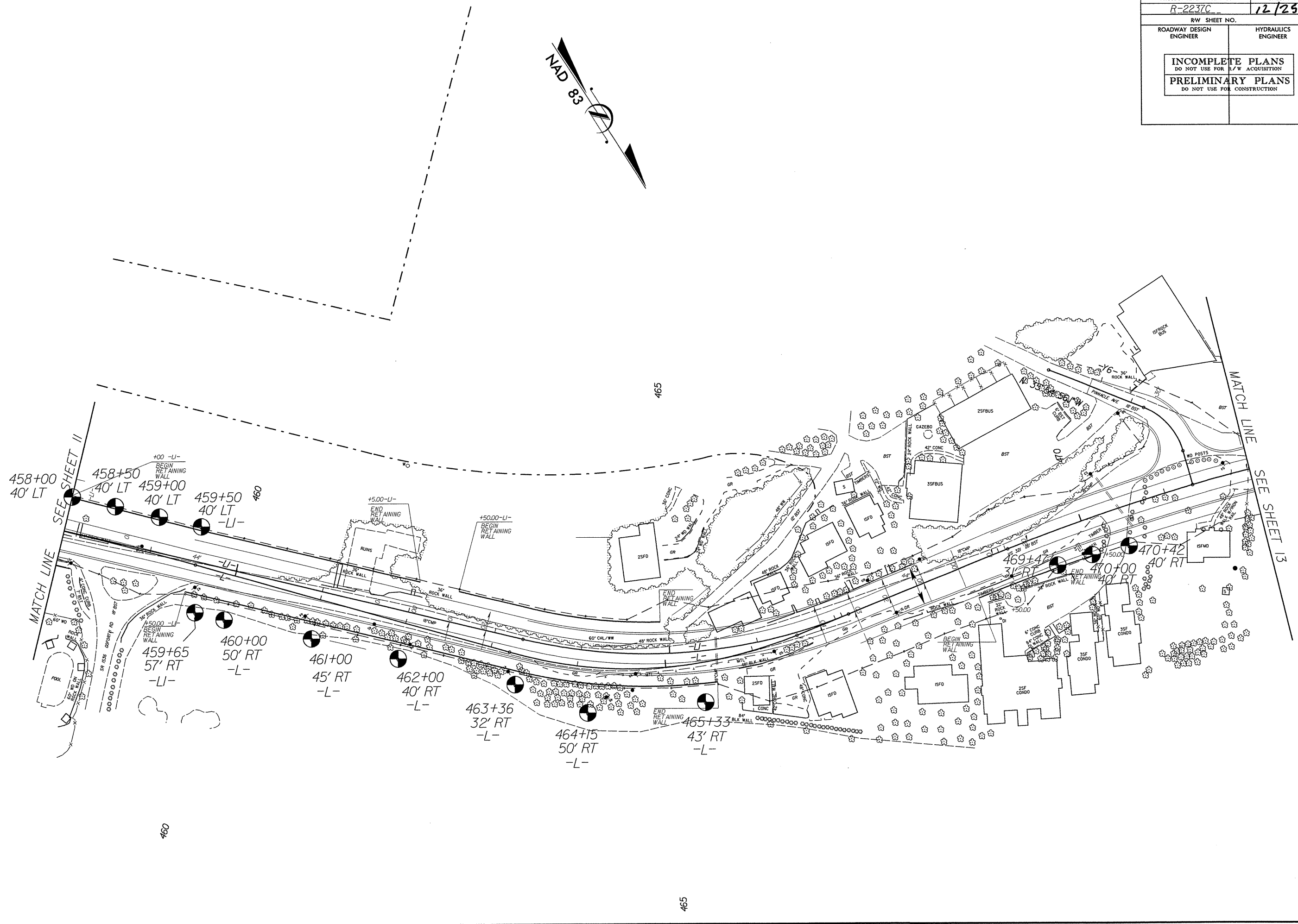
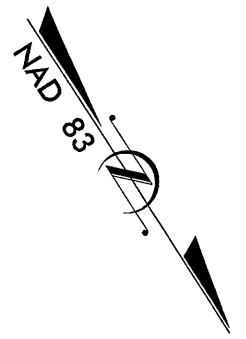


-L- 35FBUS
PT Sta. 457+68.69 -11-
 PI Sta 455+79.22
 $\Delta = 8^{\circ} 35' 35.2" (RT)$
 $D = 1^{\circ} 08' 45.3"$
 $L = 749.89'$
 $T = 375.65'$
 $R = 5,000.00'$

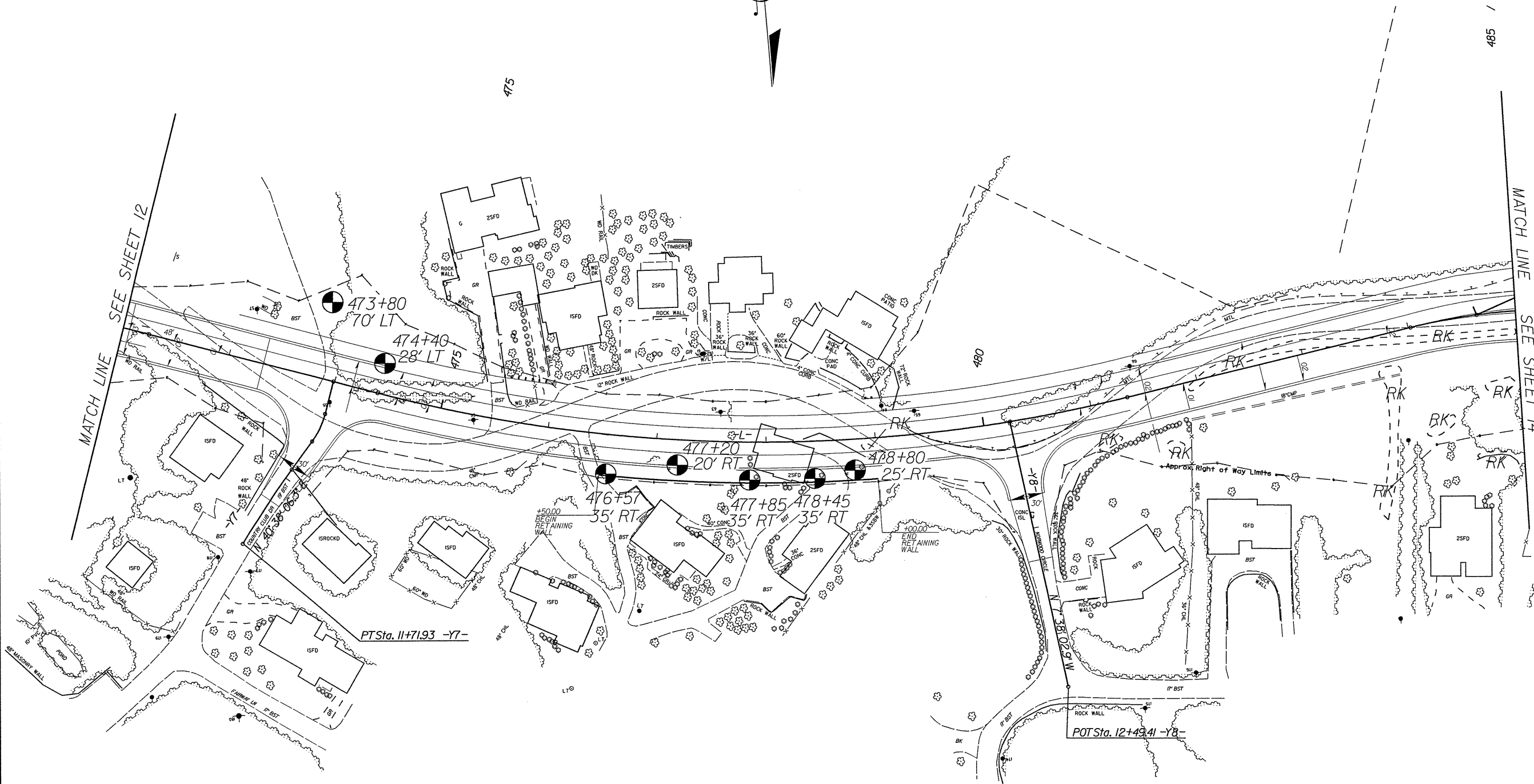


SYTIME...
 11/15/2004
 11:00 AM
 11/15/2004

PROJECT REFERENCE NO. R-2237C	SHEET NO. 12/239
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



5/14/99
SYSTEMS DESIGN CONSULTANTS



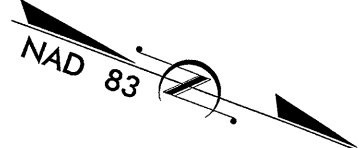
MATCH LINE SEE SHEET 12

MATCH LINE SEE SHEET 14

5/14/99

SYTIME
LONDON
PLAN

PROJECT REFERENCE NO. R-2237C	SHEET NO. 14/259
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



MATCH LINE SEE SHEET 13

485

BEGIN RETAINING WALL

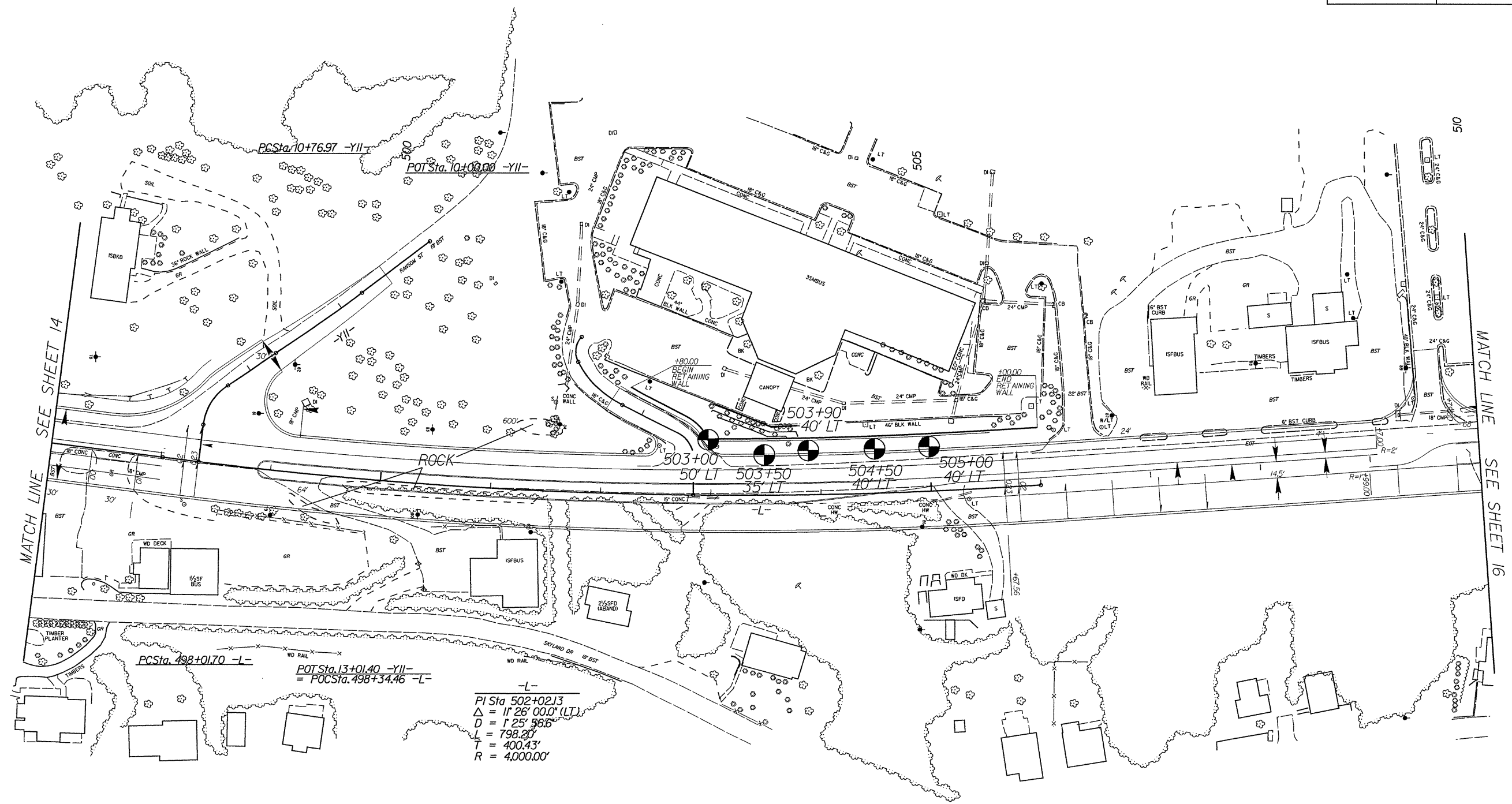
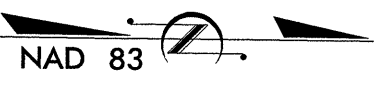
STONE PATIO

BT Sta. 11+59.67

MATCH LINE SEE SHEET 15

5/14/21
 THESE ARE PRELIMINARY PLANS AND NOT TO BE USED FOR CONSTRUCTION

PROJECT REFERENCE NO. R-2237C	SHEET NO. 15/259
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



MATCH LINE SEE SHEET 14

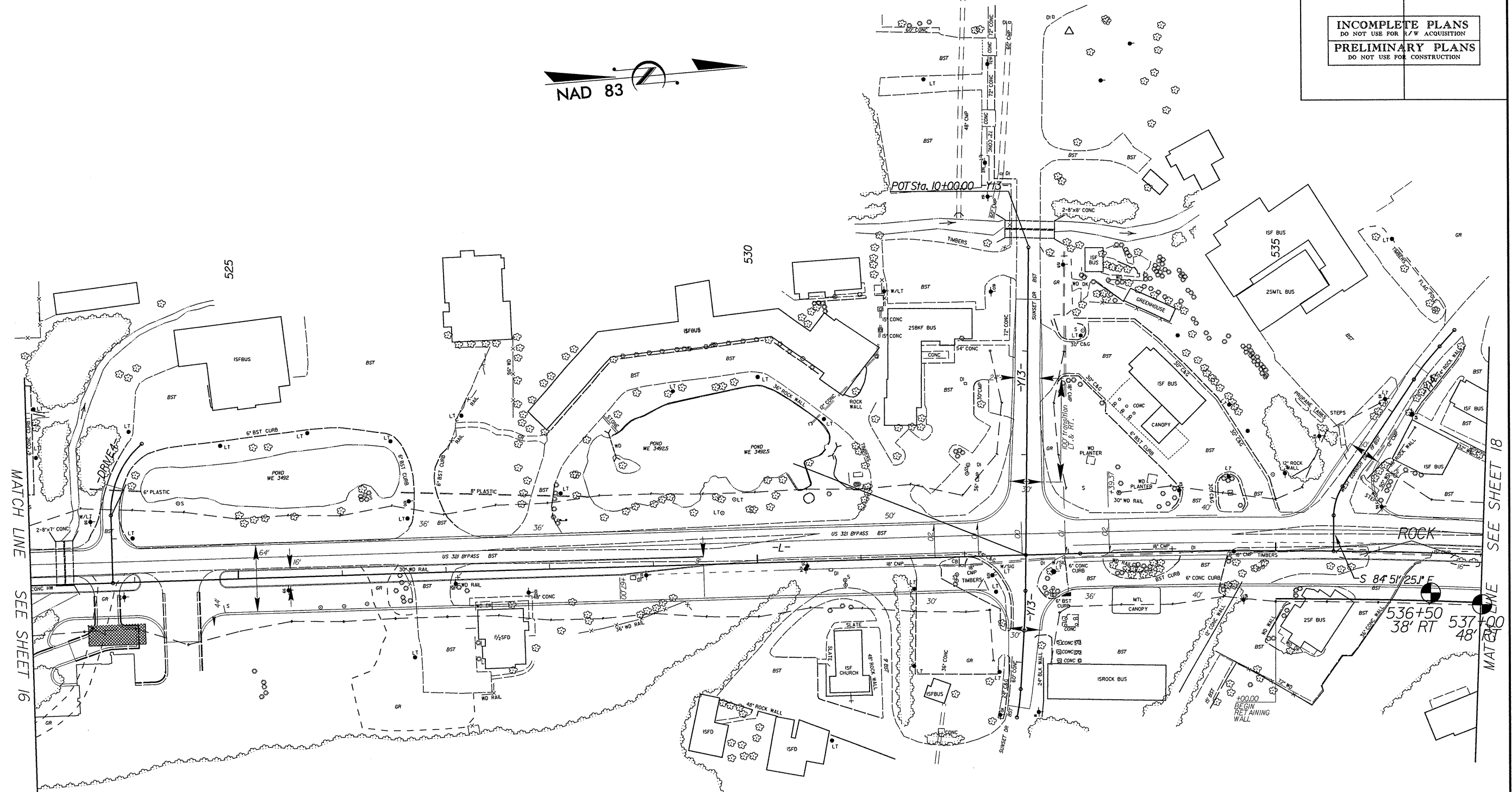
MATCH LINE SEE SHEET 16

PCSta. 498+01.70 -L-
 POTSta. 13+01.40 -YII-
 = POCSta. 498+34.46 -L-

-L-
 PI Sta 502+02.13
 Δ = 11° 26' 00.0" (LT)
 D = 1° 25' 58.6"
 L = 798.20'
 T = 400.43'
 R = 4,000.00'

 SYSTEMS

PROJECT REFERENCE NO.		SHEET NO.	
R-2237C		17/259	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<p>INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION</p> <p>PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION</p>			



MATCH LINE SEE SHEET 16

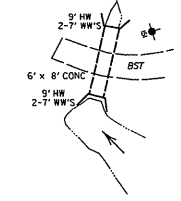
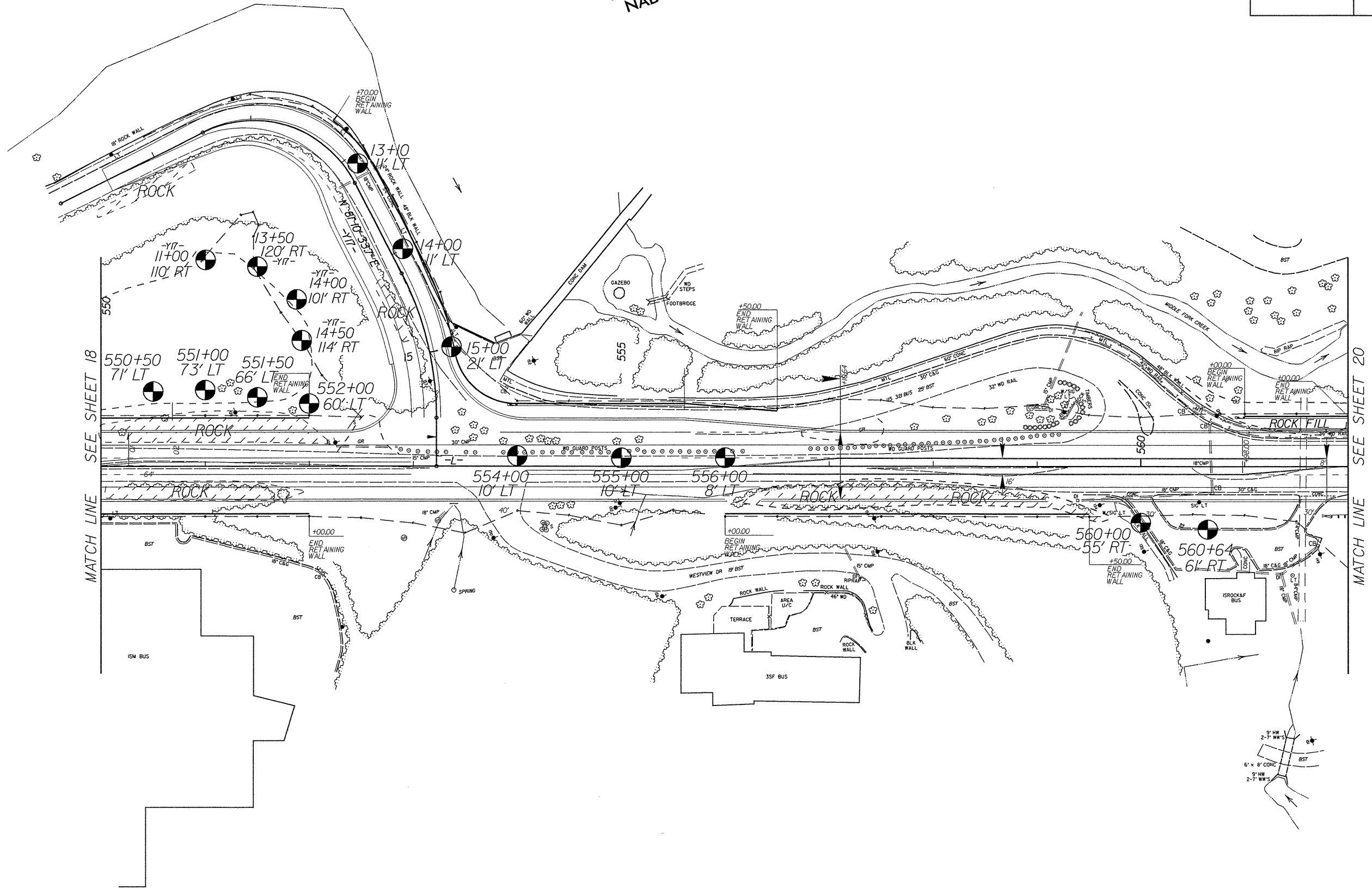
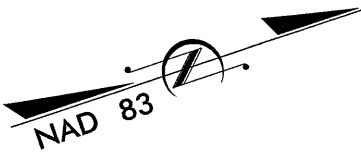
MATCH LINE SEE SHEET 18

5/14/09
SYTIME
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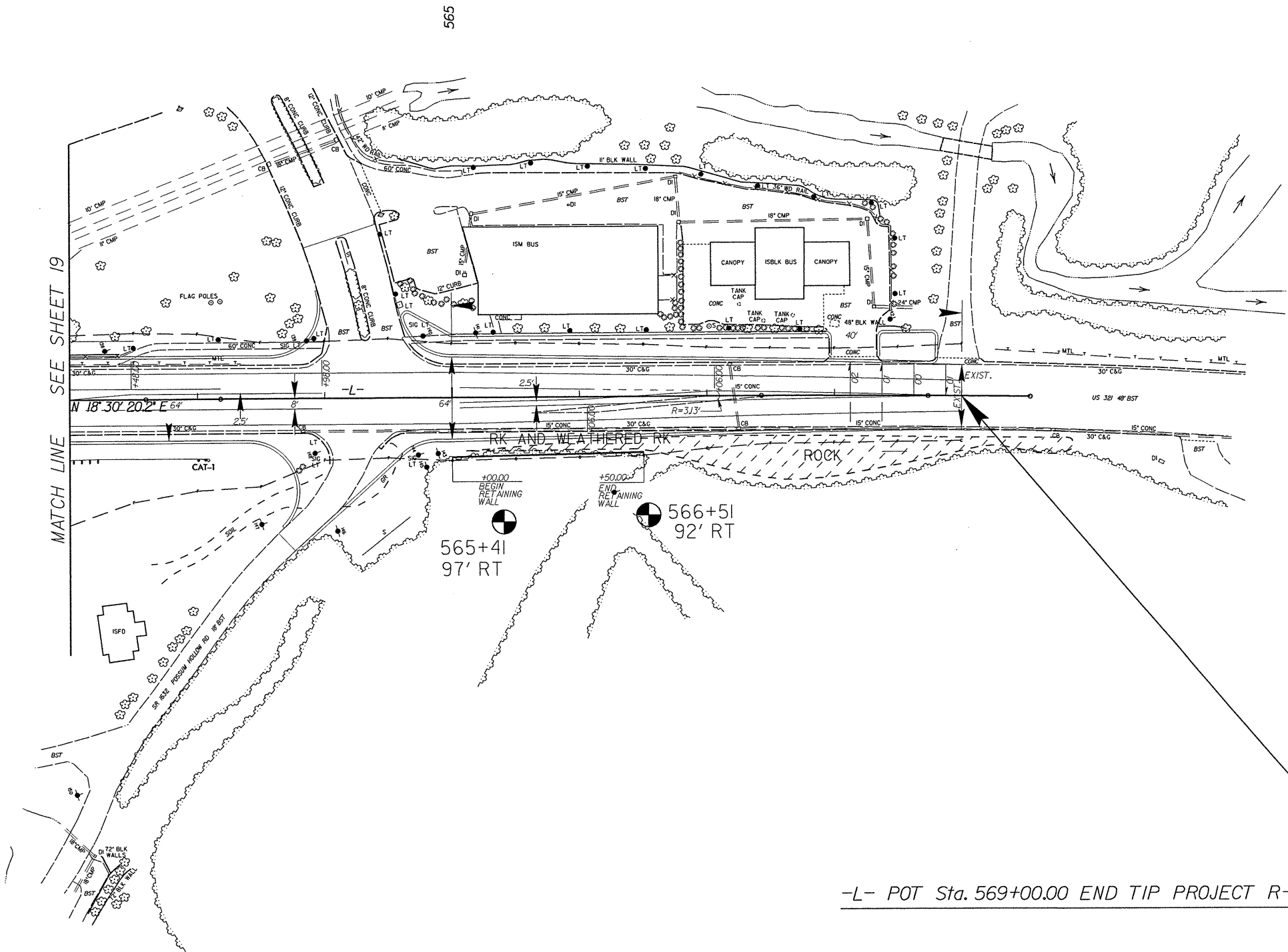
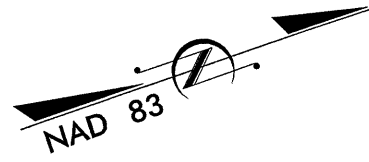
5/14/90

TIME \$\$\$\$\$\$
DATE \$\$\$\$\$\$
DRAWN \$\$\$\$\$\$
CHECKED \$\$\$\$\$\$
DATE \$\$\$\$\$\$
SCALE \$\$\$\$\$\$
PROJECT \$\$\$\$\$\$
SHEET \$\$\$\$\$\$

PROJECT REFERENCE NO. R-2237C	SHEET NO. 19/259
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	



PROJECT REFERENCE NO.	SHEET NO.
R-2237C	20/259
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION	

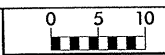


-L- POT Sta. 569+00.00 END TIP PROJECT R-2237C

5/14/91

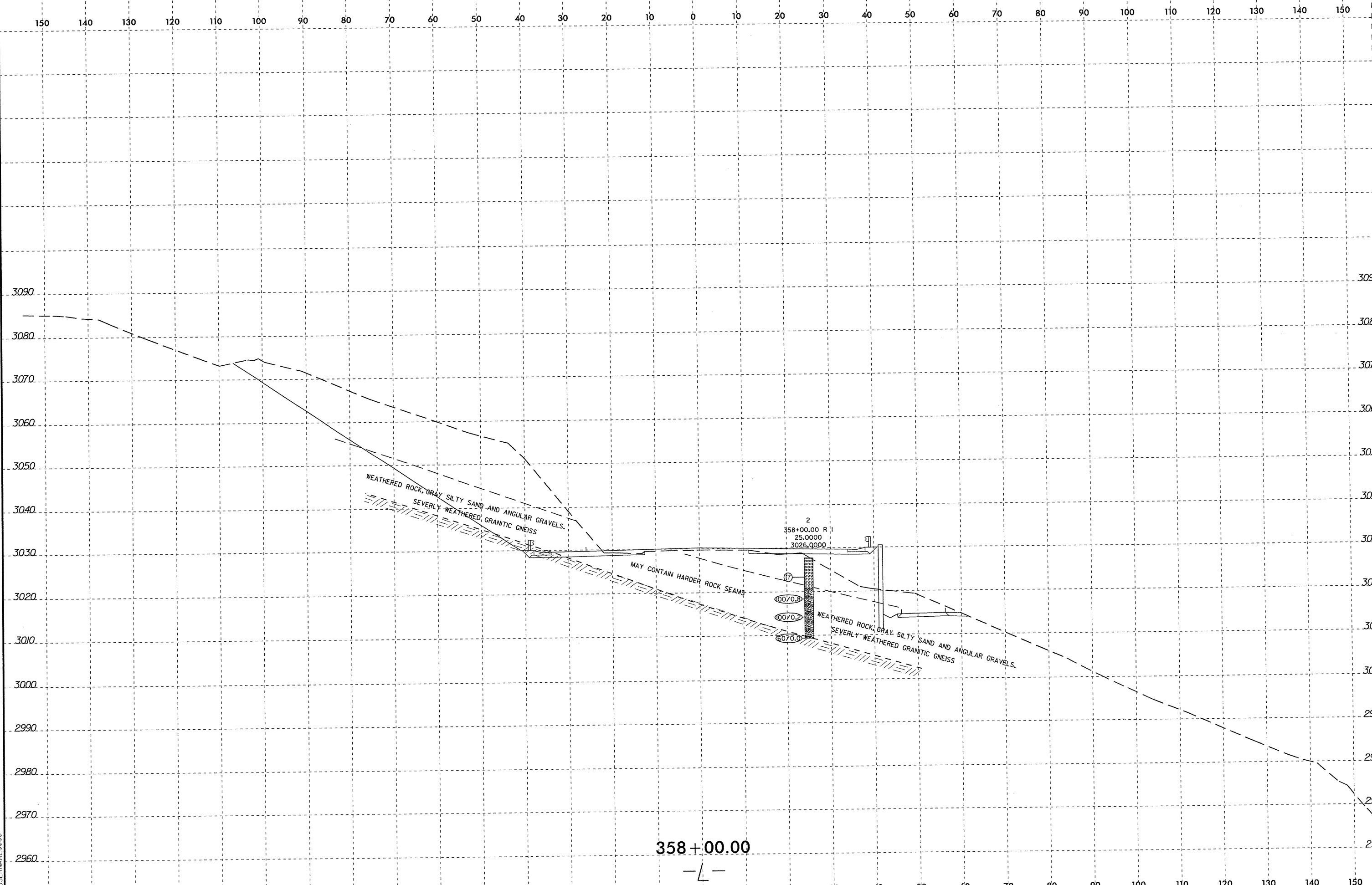
DATE PLOTTED: 11/14/91
 PLOTTER: PLOTTER
 SCALE: 1"=100'
 SHEET NO.: 20/259
 PROJECT NO.: R-2237C
 DRAWN BY: [unclear]
 CHECKED BY: [unclear]
 DATE: 11/14/91

8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
21/259

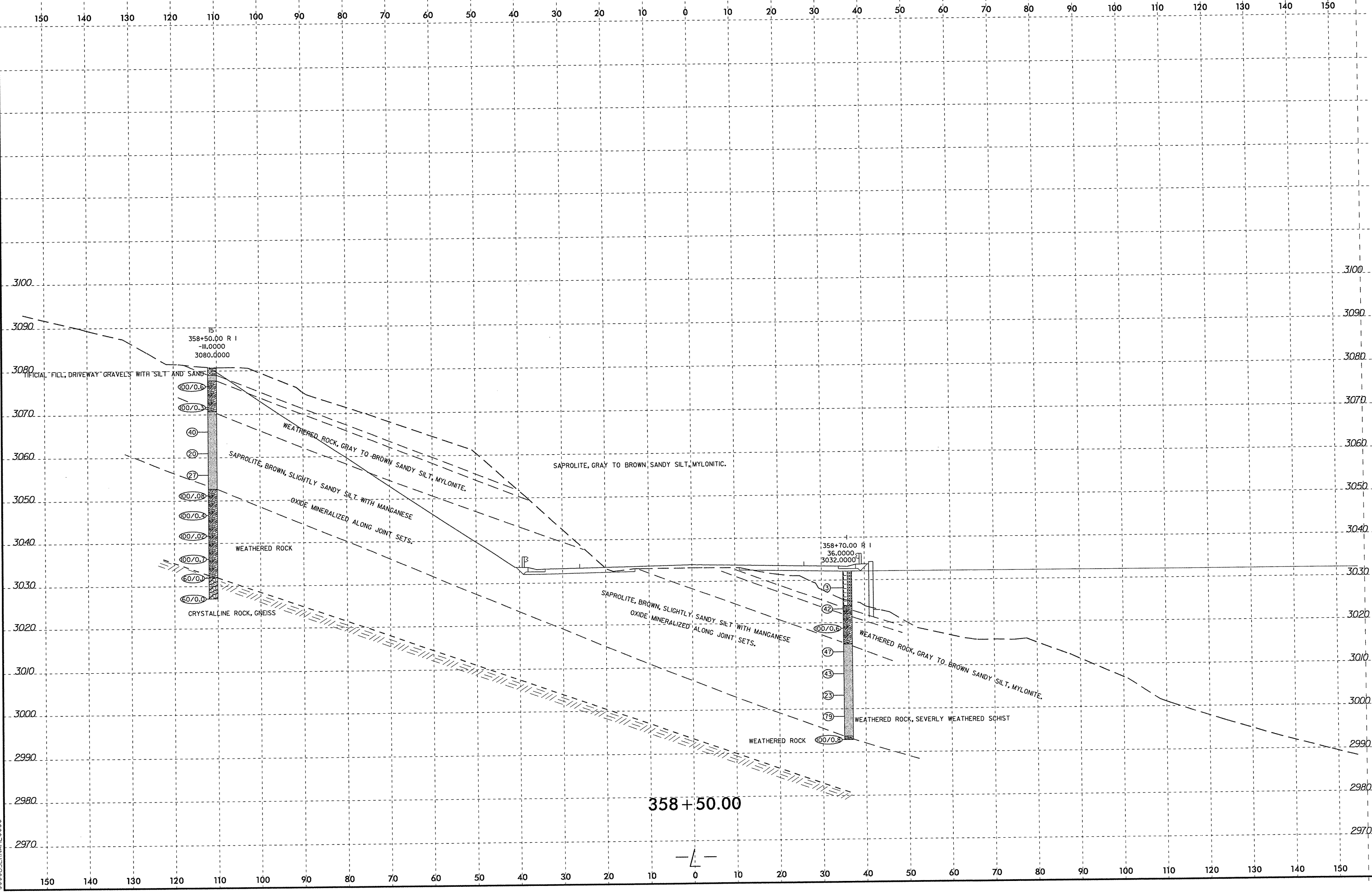
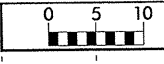


358+00.00

-L-

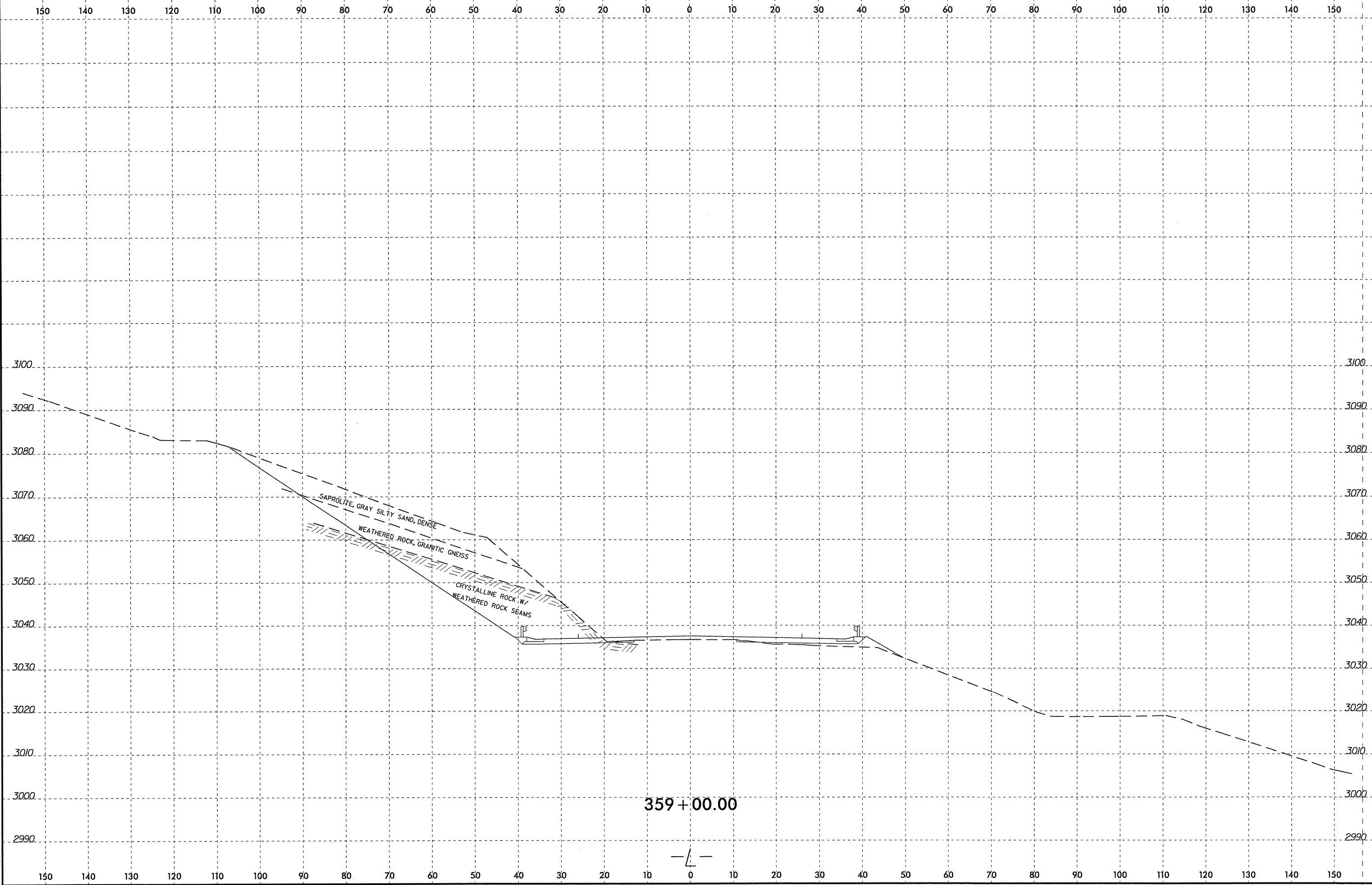
SYSTEM CONDITION
SURNAME

8/23/99

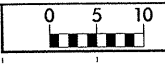


SYTIME
DGN
SURNAME

8/23/11
SYSTEM TIME
USER NAME



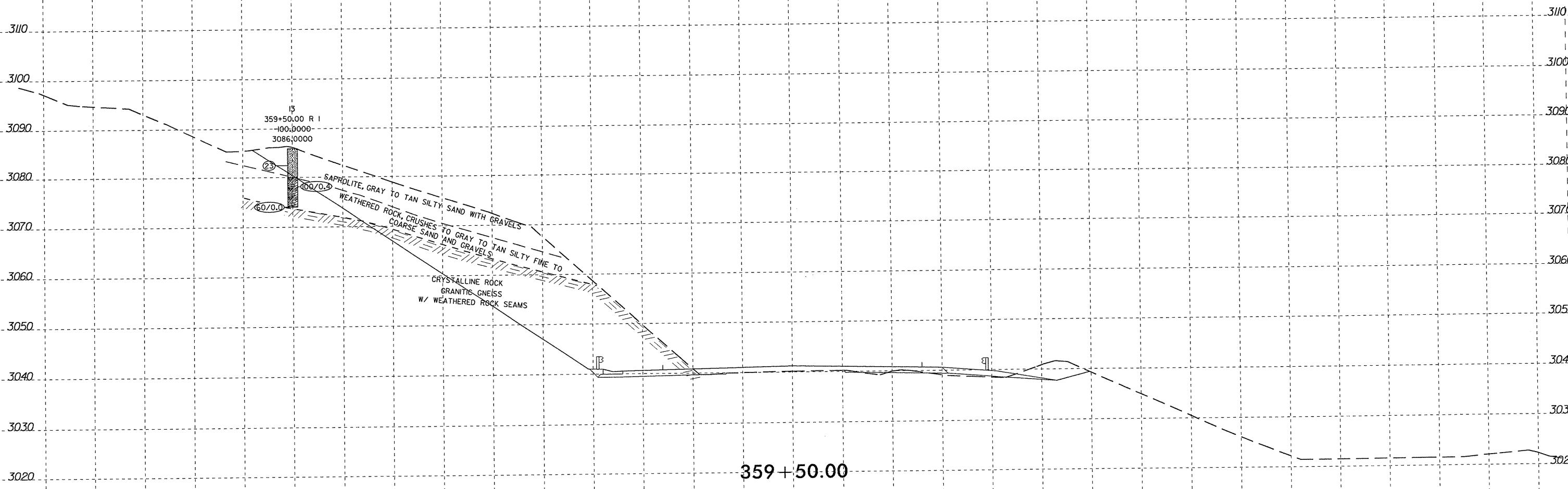
8/23/99



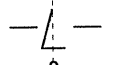
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
24/259

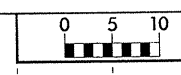
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UNCLASSIFIED
UNCONTROLLED
UNREVIEWED

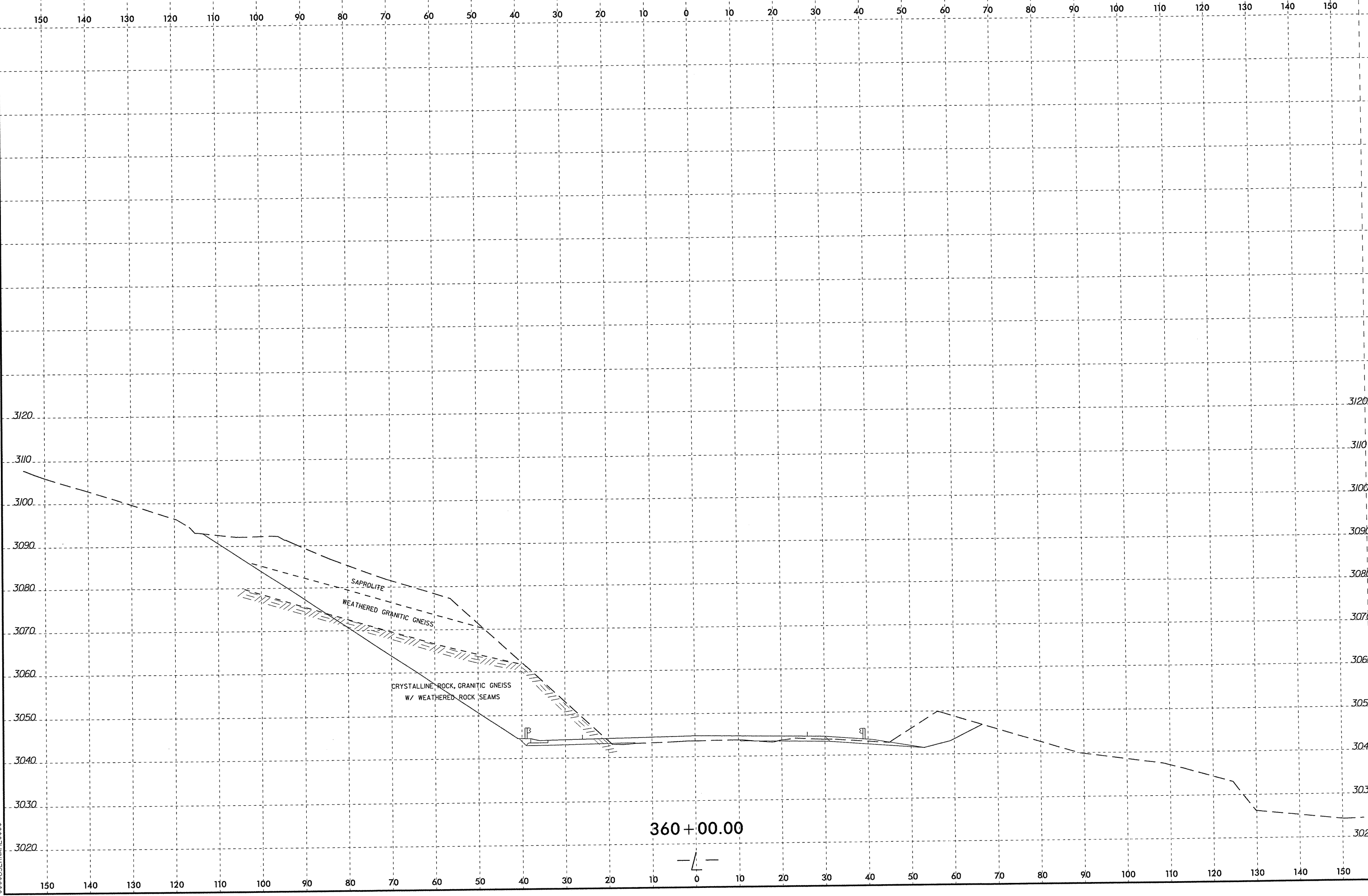


8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
25/259

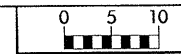


SECTION
NAME

360+00.00



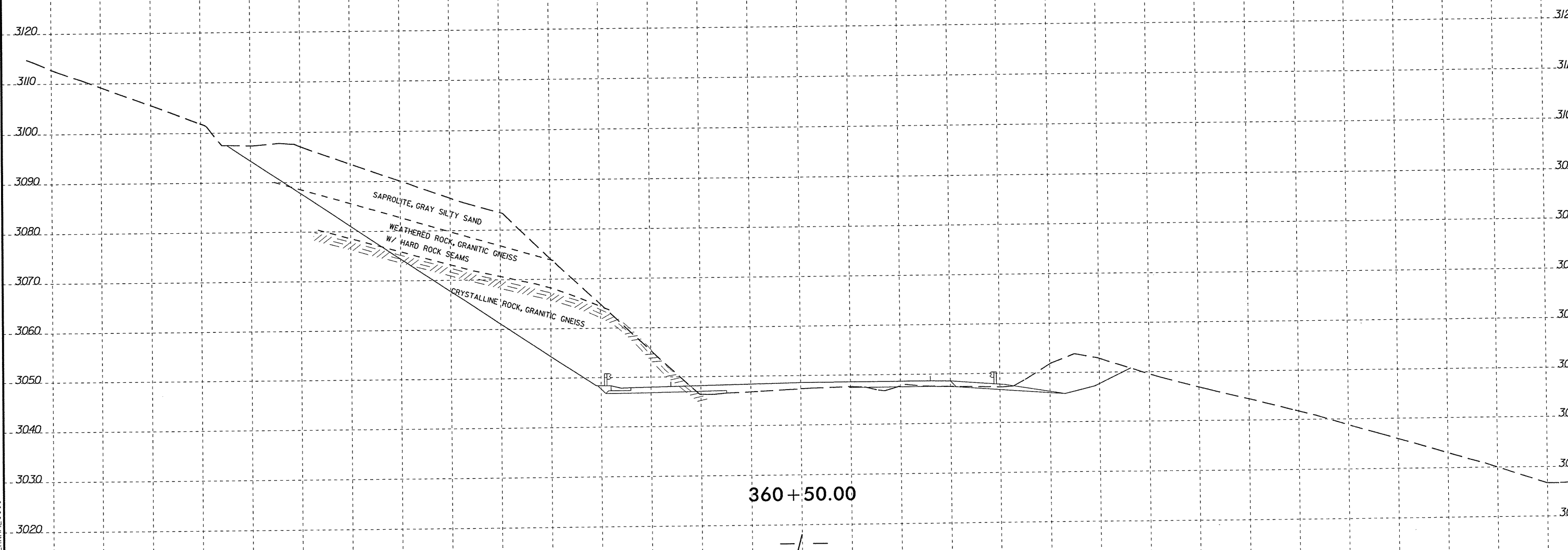
8/23/99



PROJ. REFERENCE NO.
R-2237C

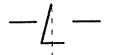
SHEET NO.
26/259

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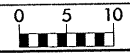
CRYSTALLINE ROCK, GRANITIC GNEISS
WEATHERED ROCK, GRANITIC GNEISS
W/ HARD ROCK SEAMS
SAPROLITE, GRAY SILTY SAND

360+50.00



150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

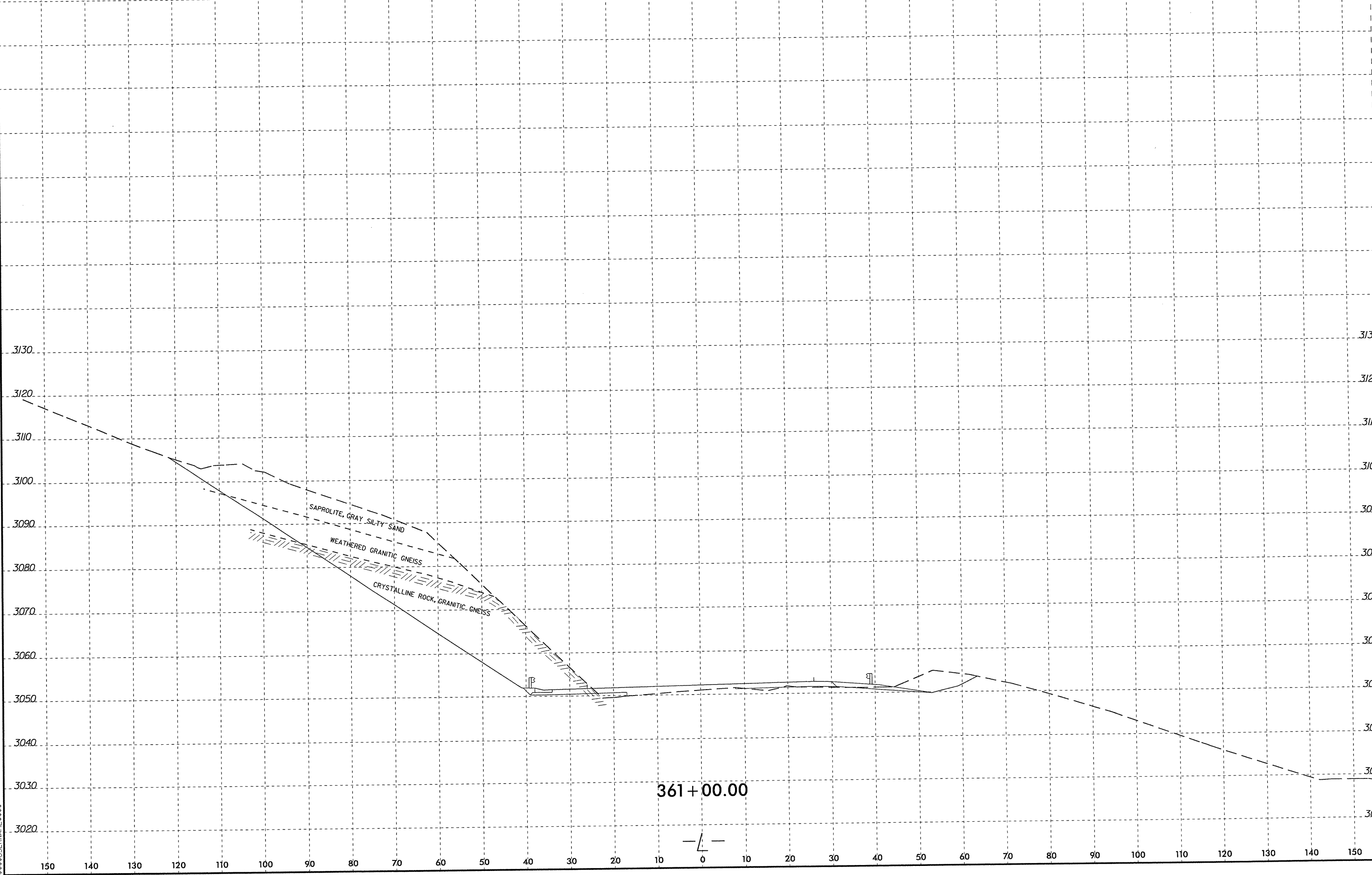
8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
27 / 259

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



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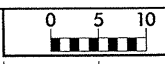
SAPROLITE, GRAY SILTY SAND
WEATHERED GRANITIC GNEISS
CRYSTALLINE ROCK, GRANITIC GNEISS

361+00.00



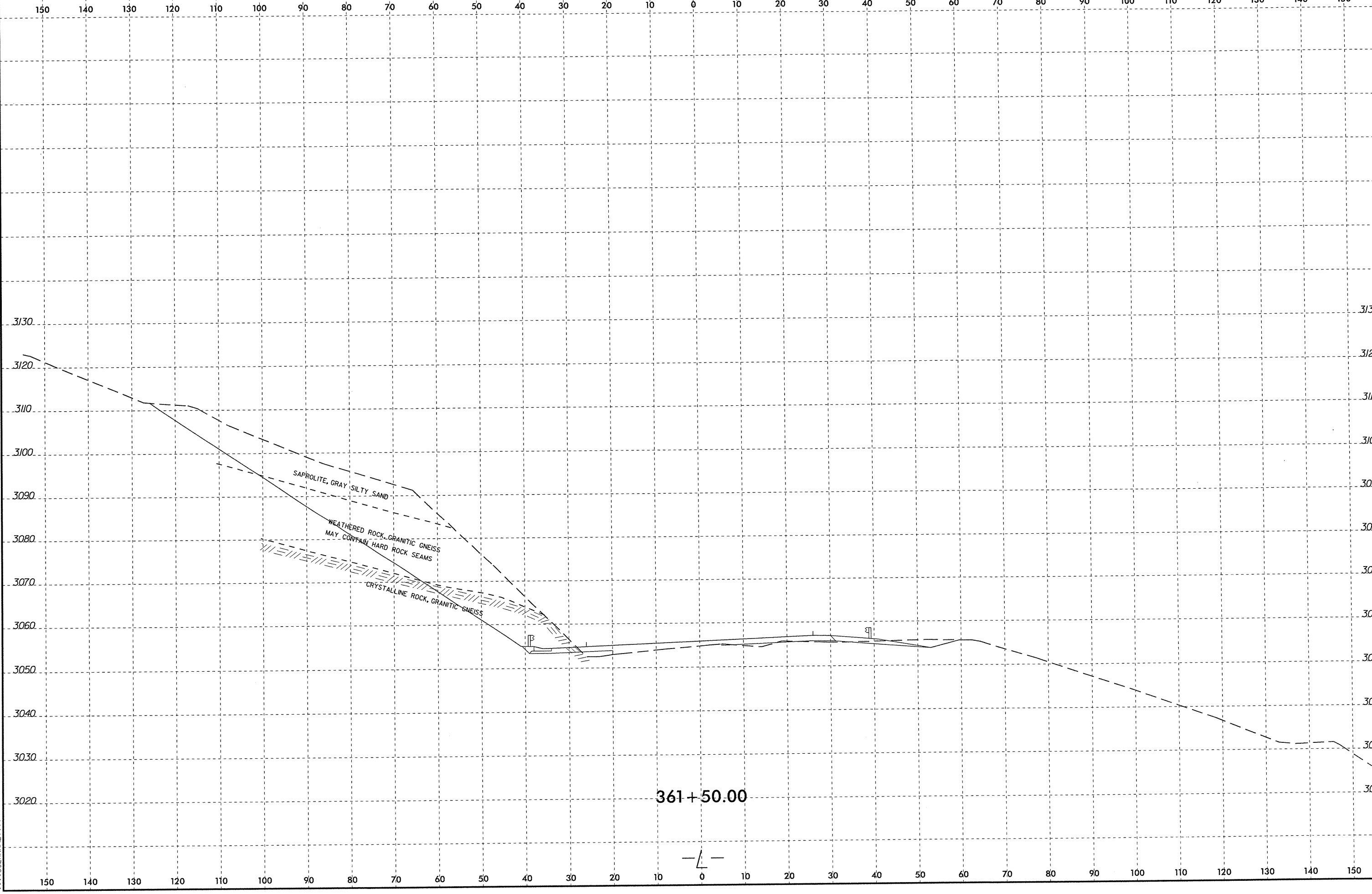
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PROJ. REFERENCE NO.
R-2237C

SHEET NO.
28/259



SYSTEM TIME 8/23/99 10:00:00
 USER: JLN
 PROJECT: R-2237C
 SHEET: 28/259

361+50.00



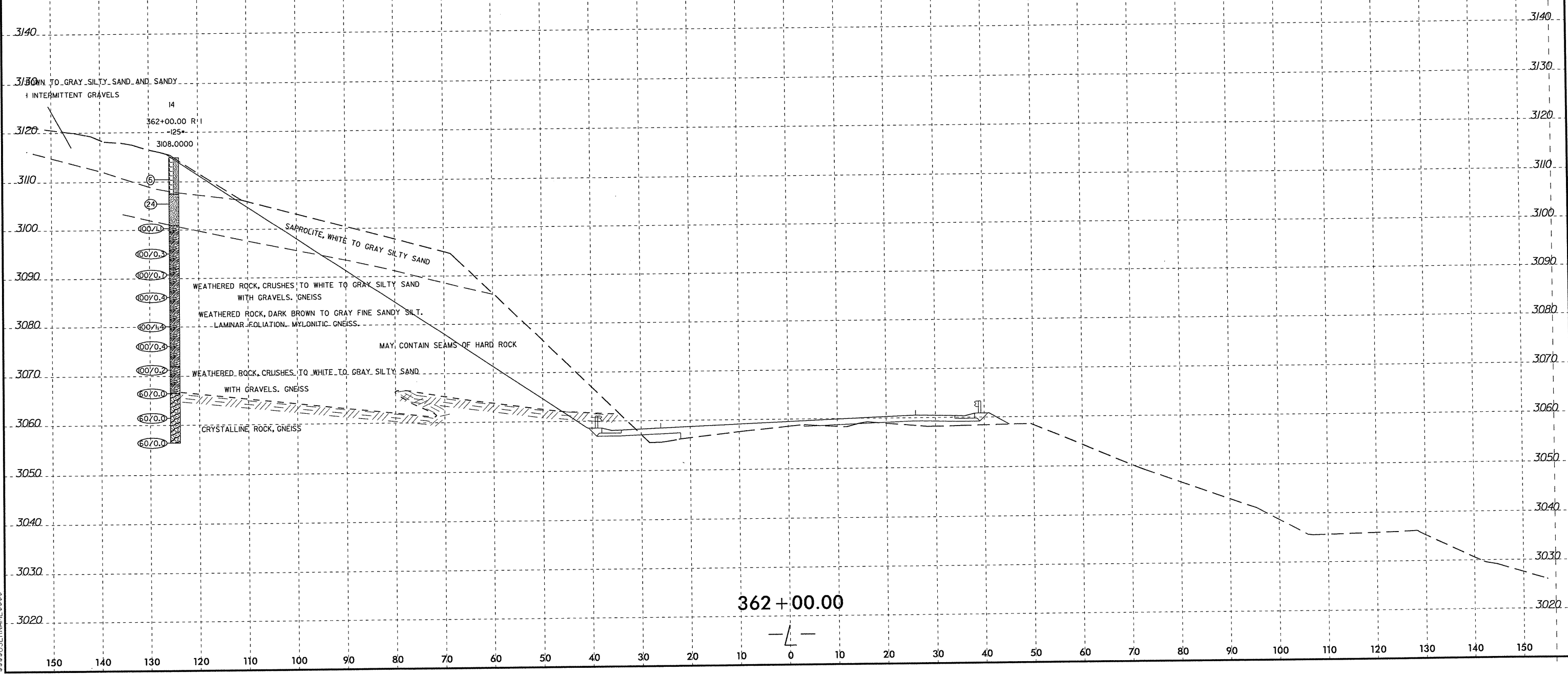
8/23/99



PROJ. REFERENCE NO.
R-2237C

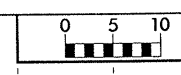
SHEET NO.
29/259

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



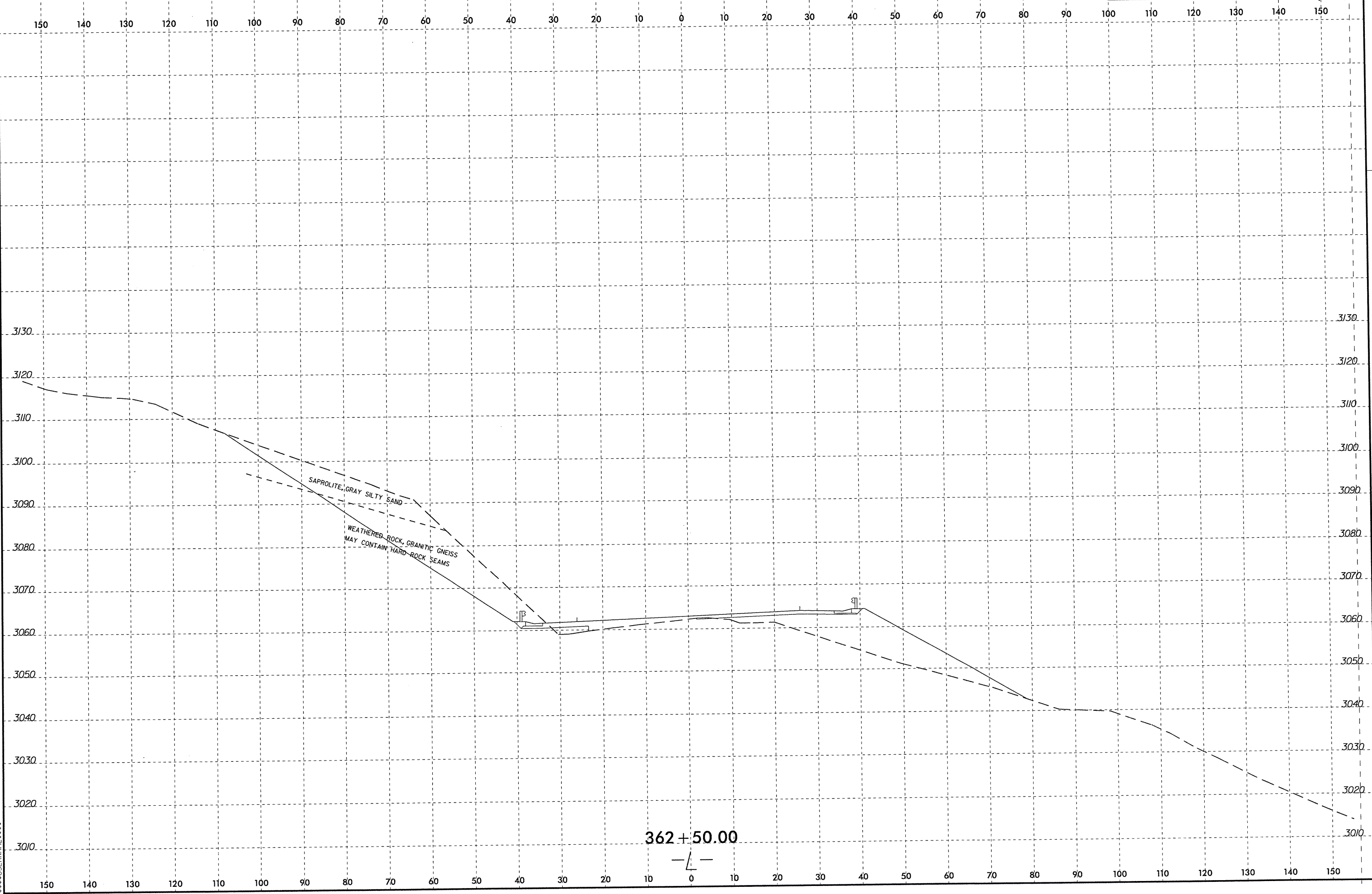
SYSTEMS
DRAWING
REVISIONS

8/23/99



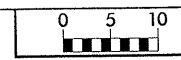
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
30/259



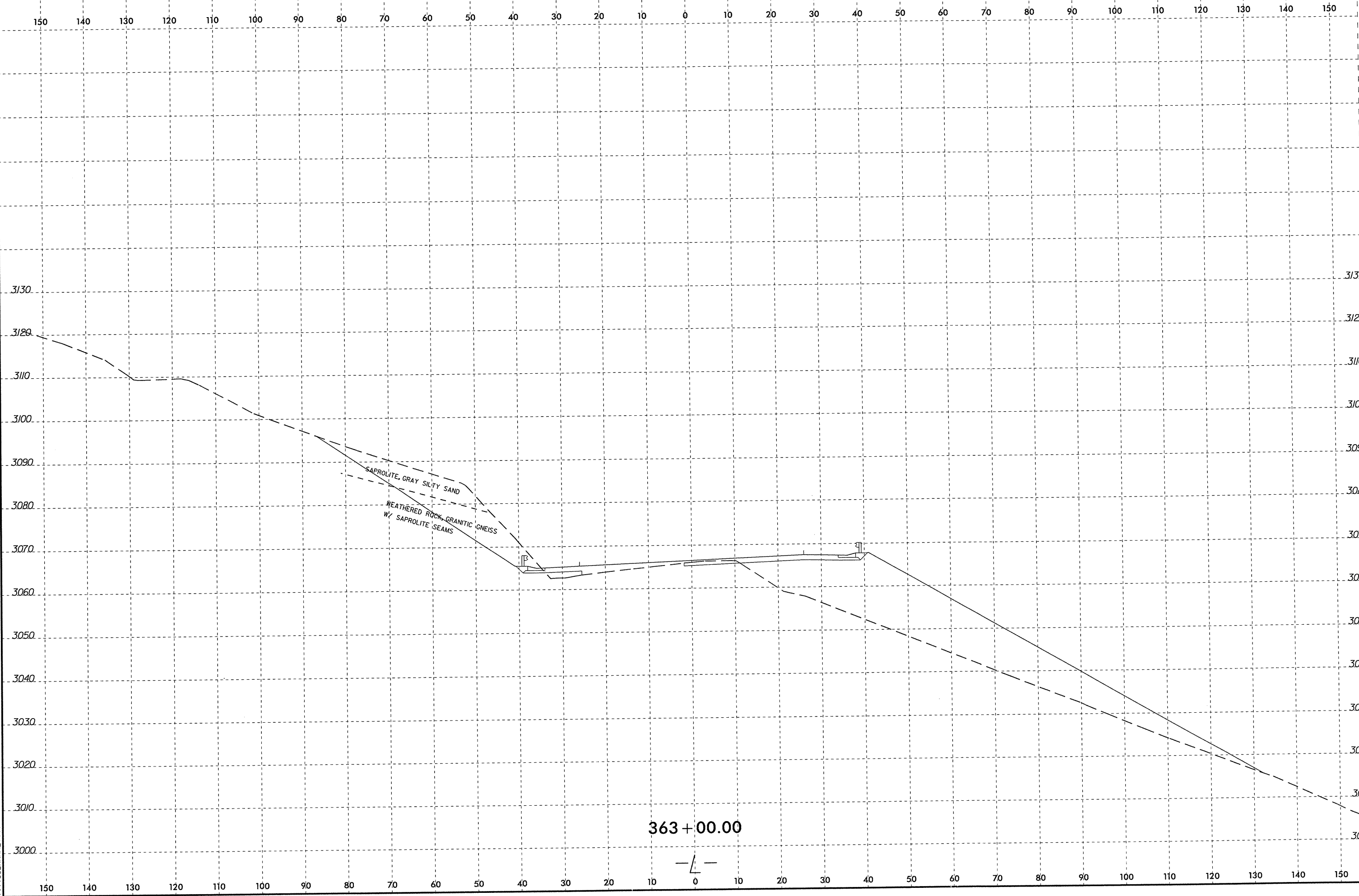
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PROJ. REFERENCE NO.
R-2237C

SHEET NO.
31/259

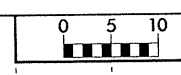


SYSTEM TIME: 8/23/99 10:00:00 AM
USER: J. W. BROWN
JOB: R-2237C
SHEET: 31/259

363+00.00

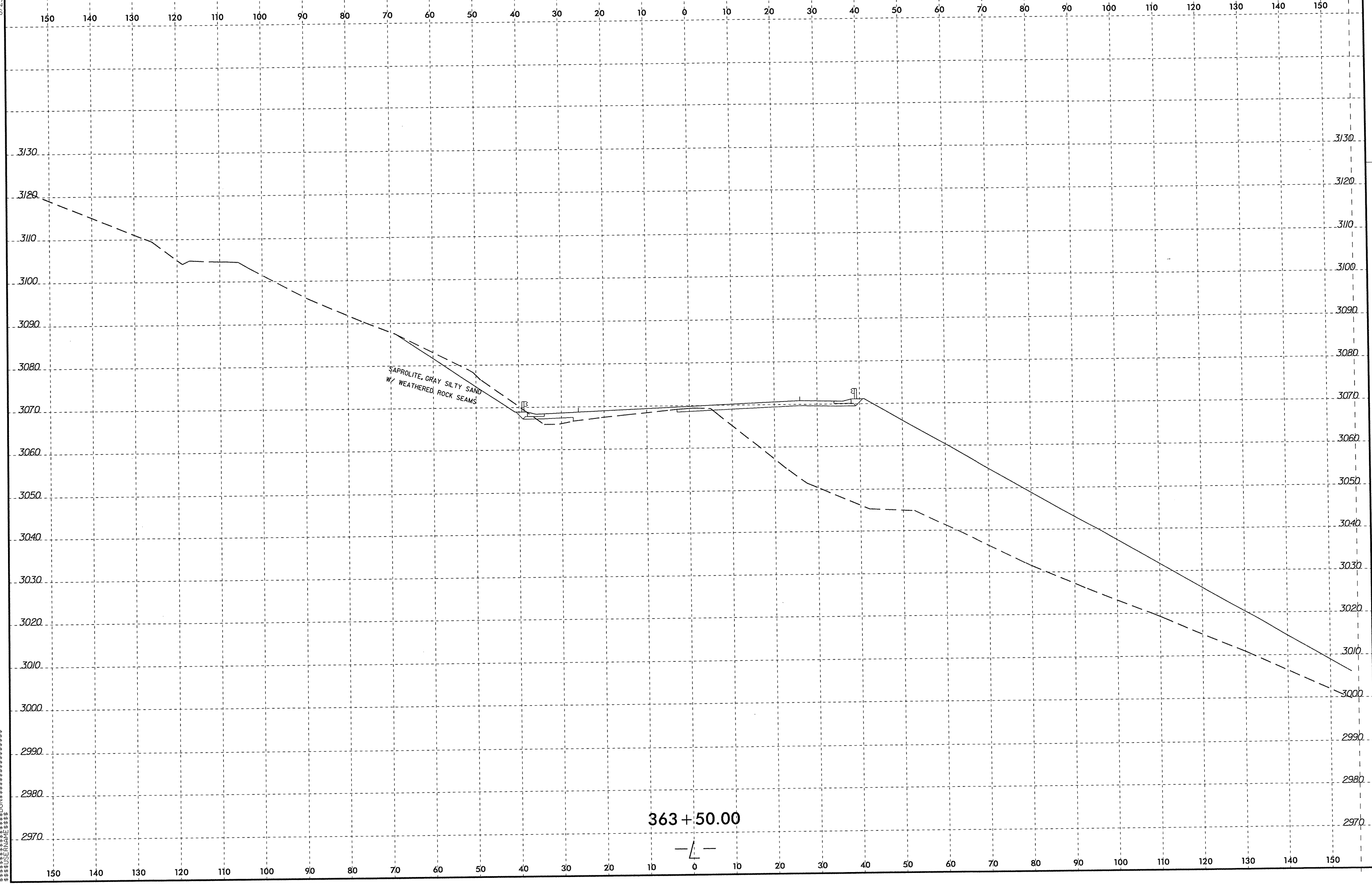


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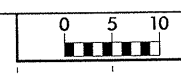
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
32/259

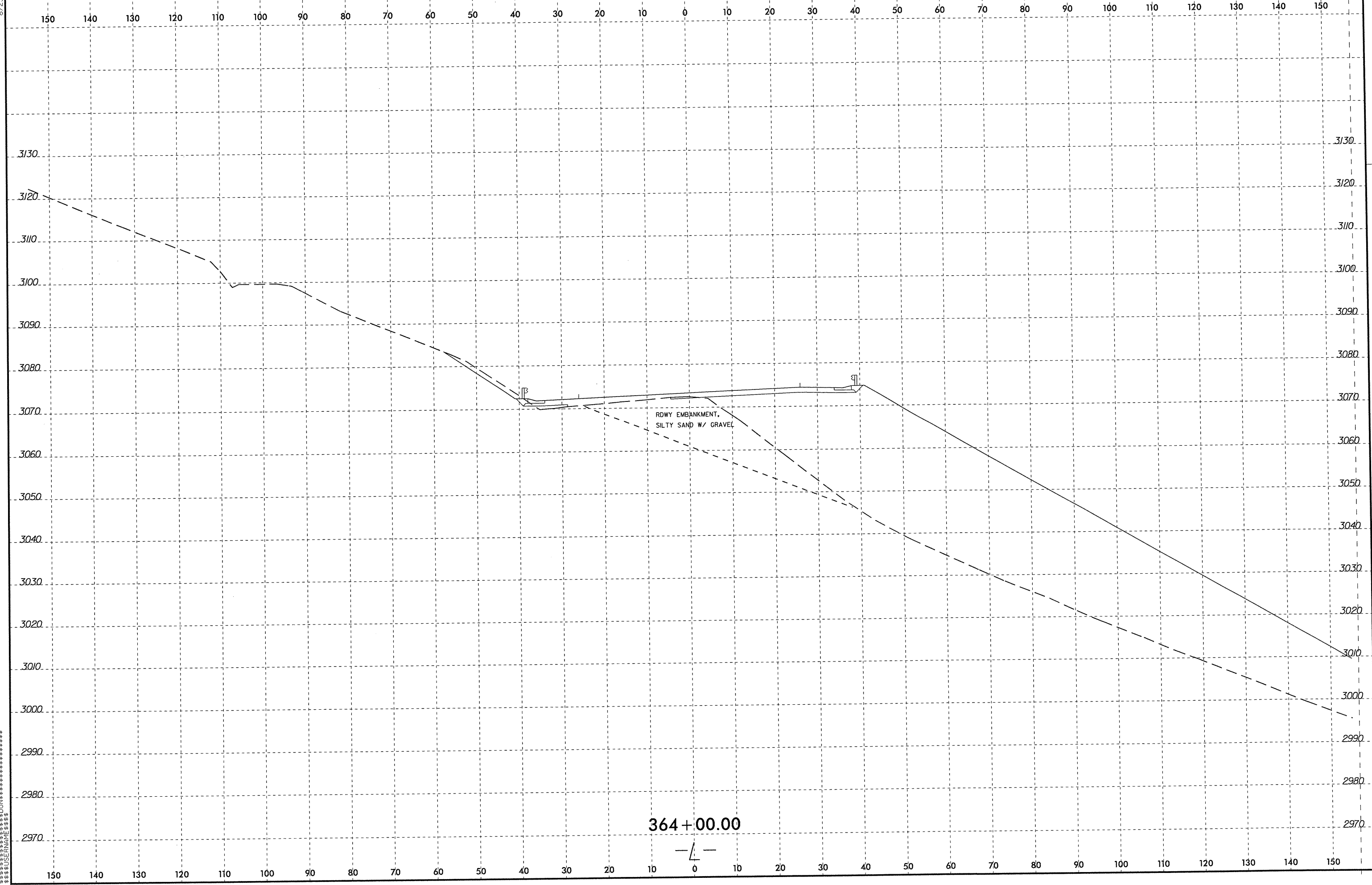


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PROJ. REFERENCE NO.	SHEET NO.
R-2237C	33/259

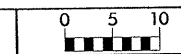


364+00.00



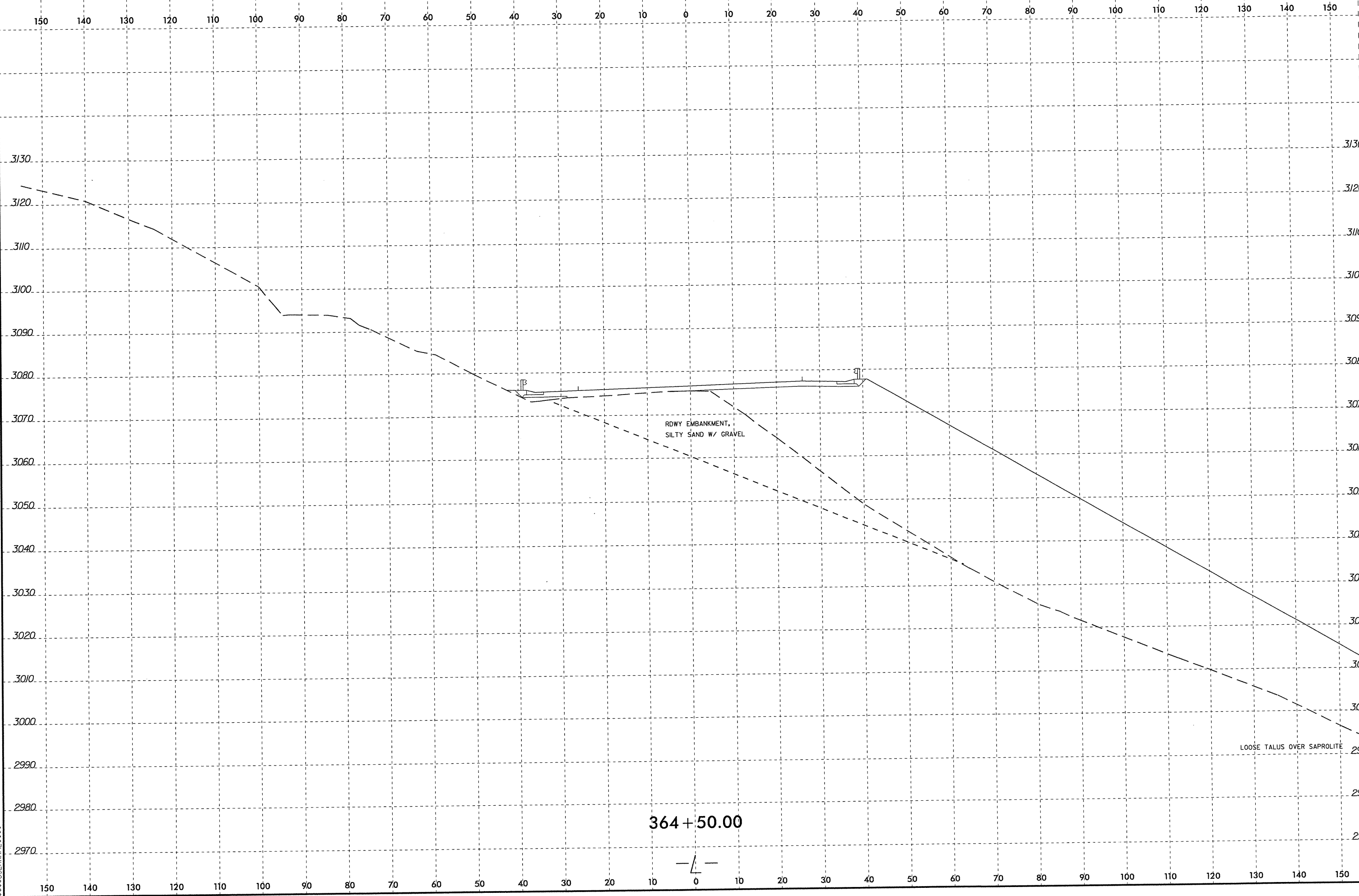
CUSTOMER USE ONLY
 PROJECT NAME
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8/23/99



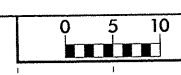
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
34/259



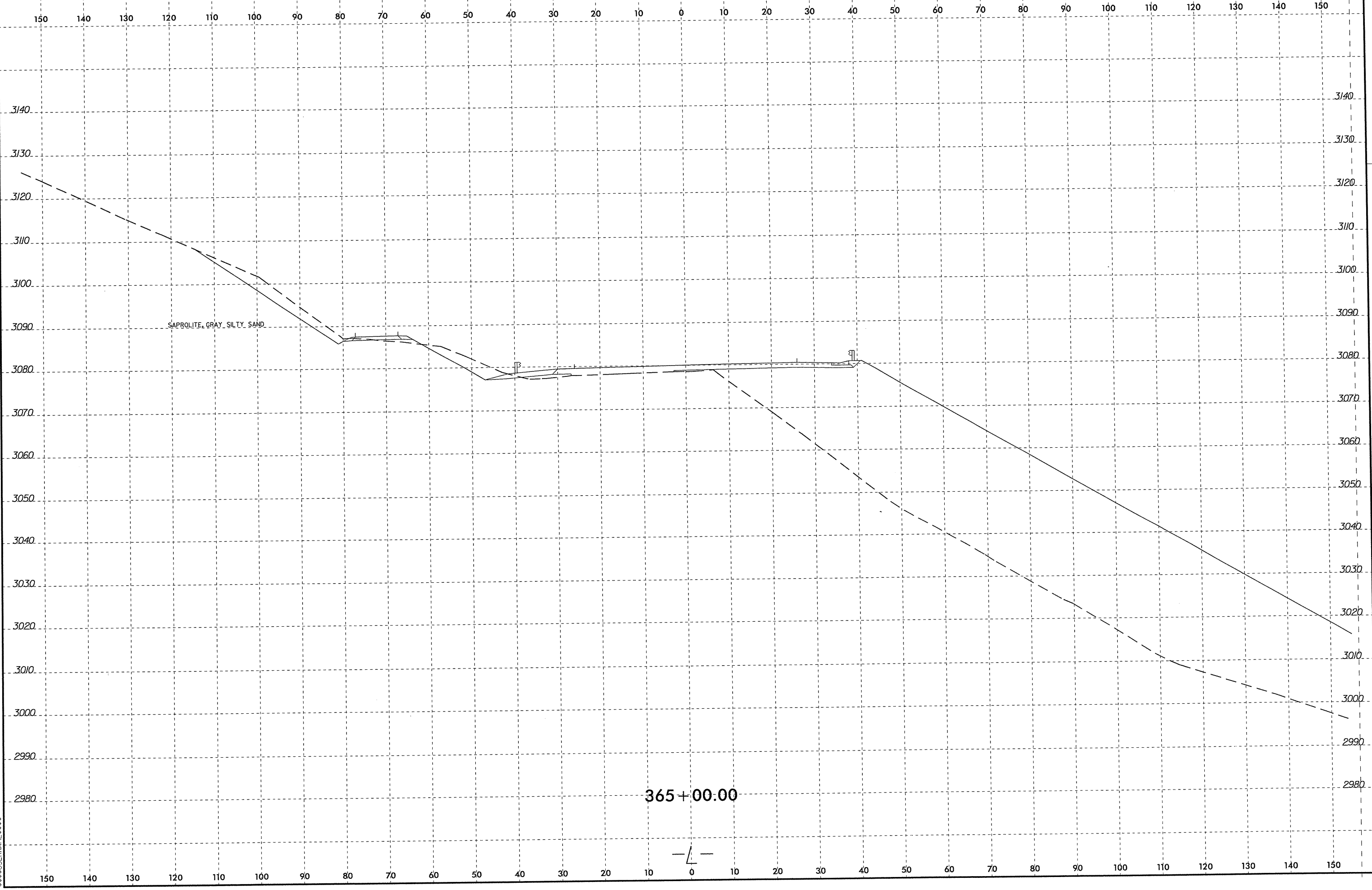
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PROJ. REFERENCE NO.
R-2237C

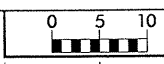
SHEET NO.
35 / 251



SECTION CUTTING PLANE

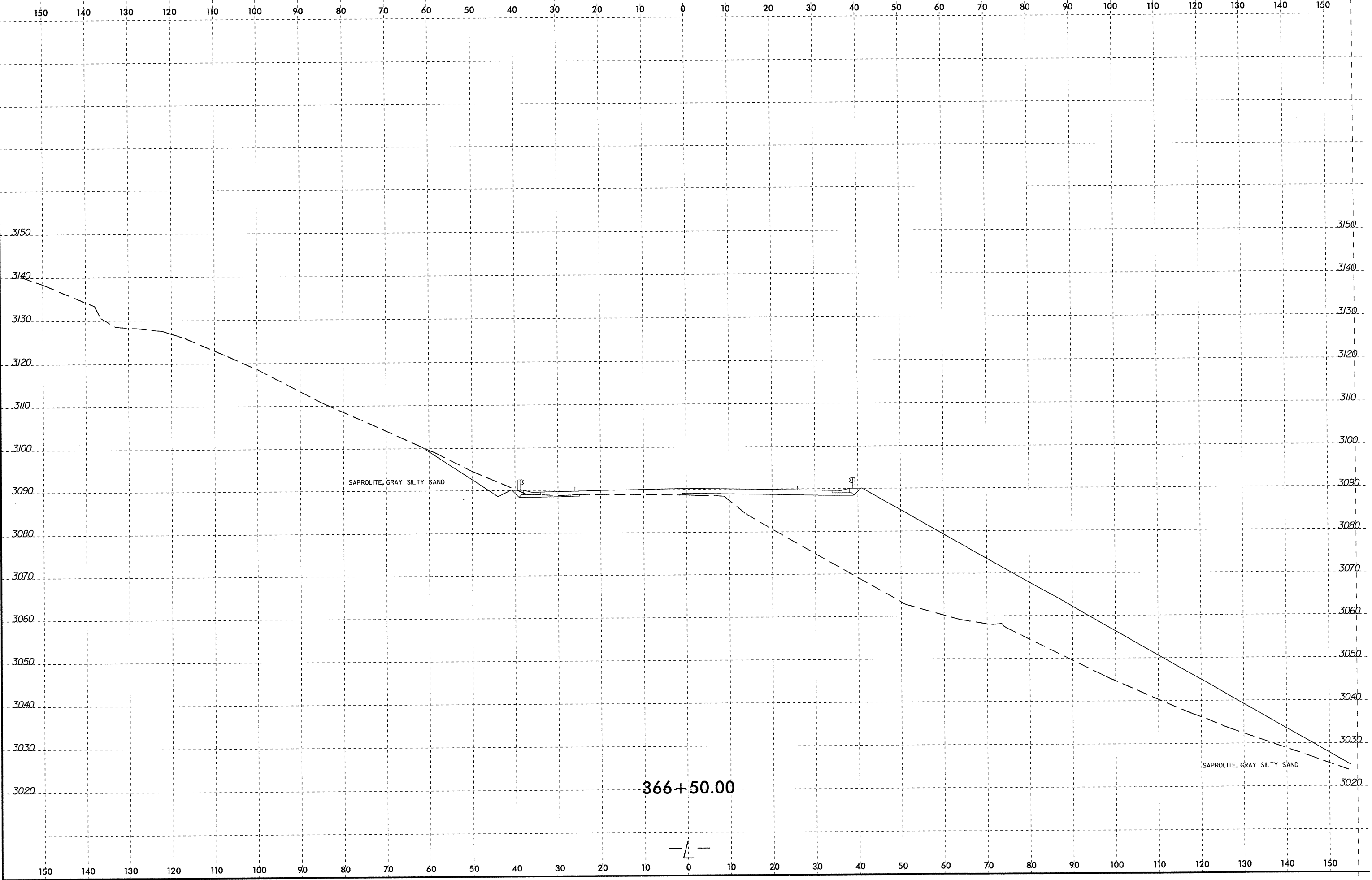


8/23/99



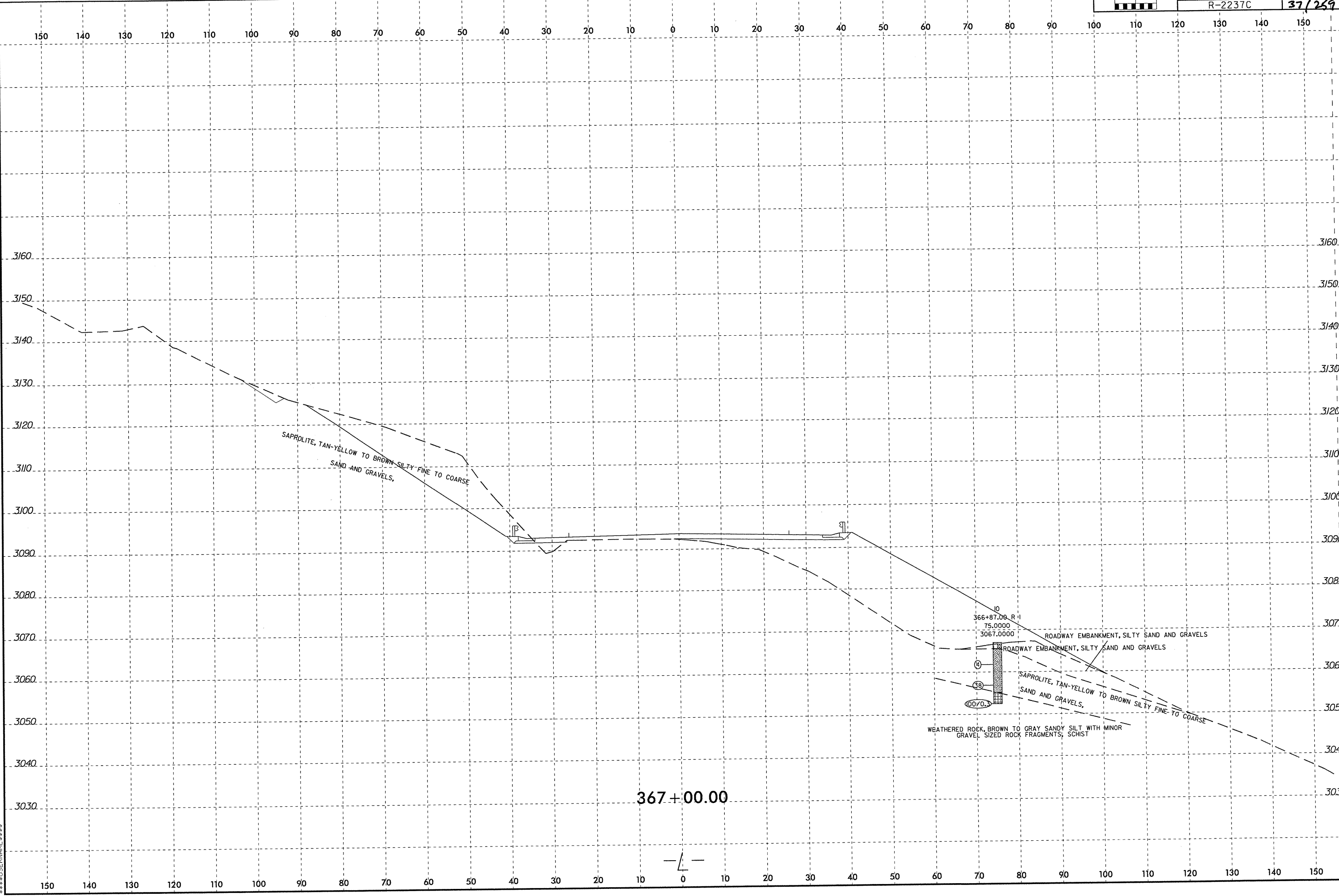
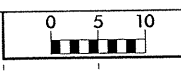
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
36/259



SYSTEM TIME: 8/23/99 10:00:00
 USER: JBL
 PROJECT: R-2237C
 SHEET: 36/259

8/23/99



SAPROLITE, TAN-YELLOW TO BROWN SILTY FINE TO COARSE SAND AND GRAVELS

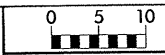
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 ROADWAY EMBANKMENT, SILTY SAND AND GRAVELS
 ROADWAY EMBANKMENT, SILTY SAND AND GRAVELS
 SAPROLITE, TAN-YELLOW TO BROWN SILTY FINE TO COARSE SAND AND GRAVELS
 WEATHERED ROCK, BROWN TO GRAY SANDY SILT WITH MINOR GRAVEL SIZED ROCK FRAGMENTS, SCHIST

367+00.00



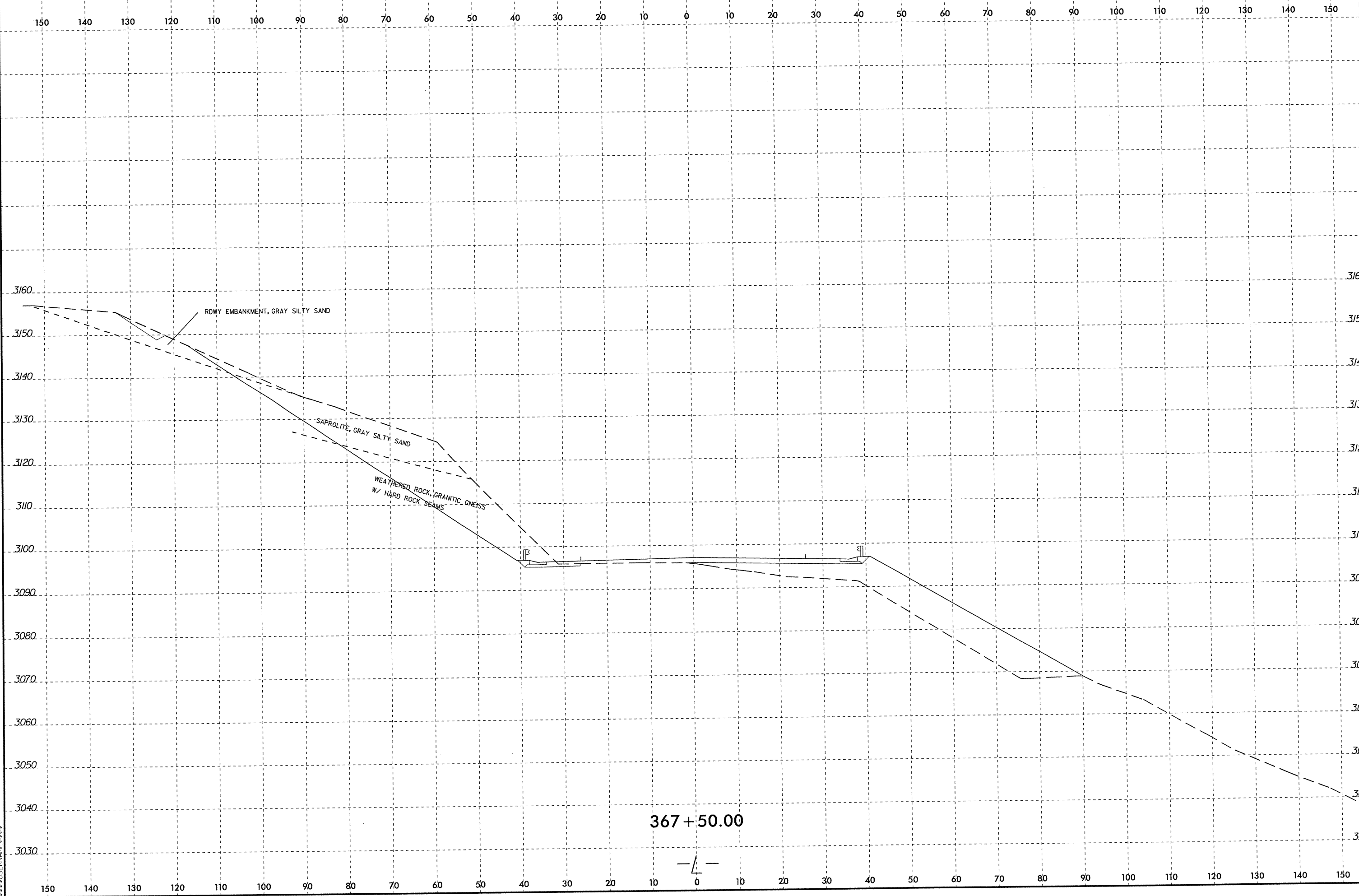
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8/23/99



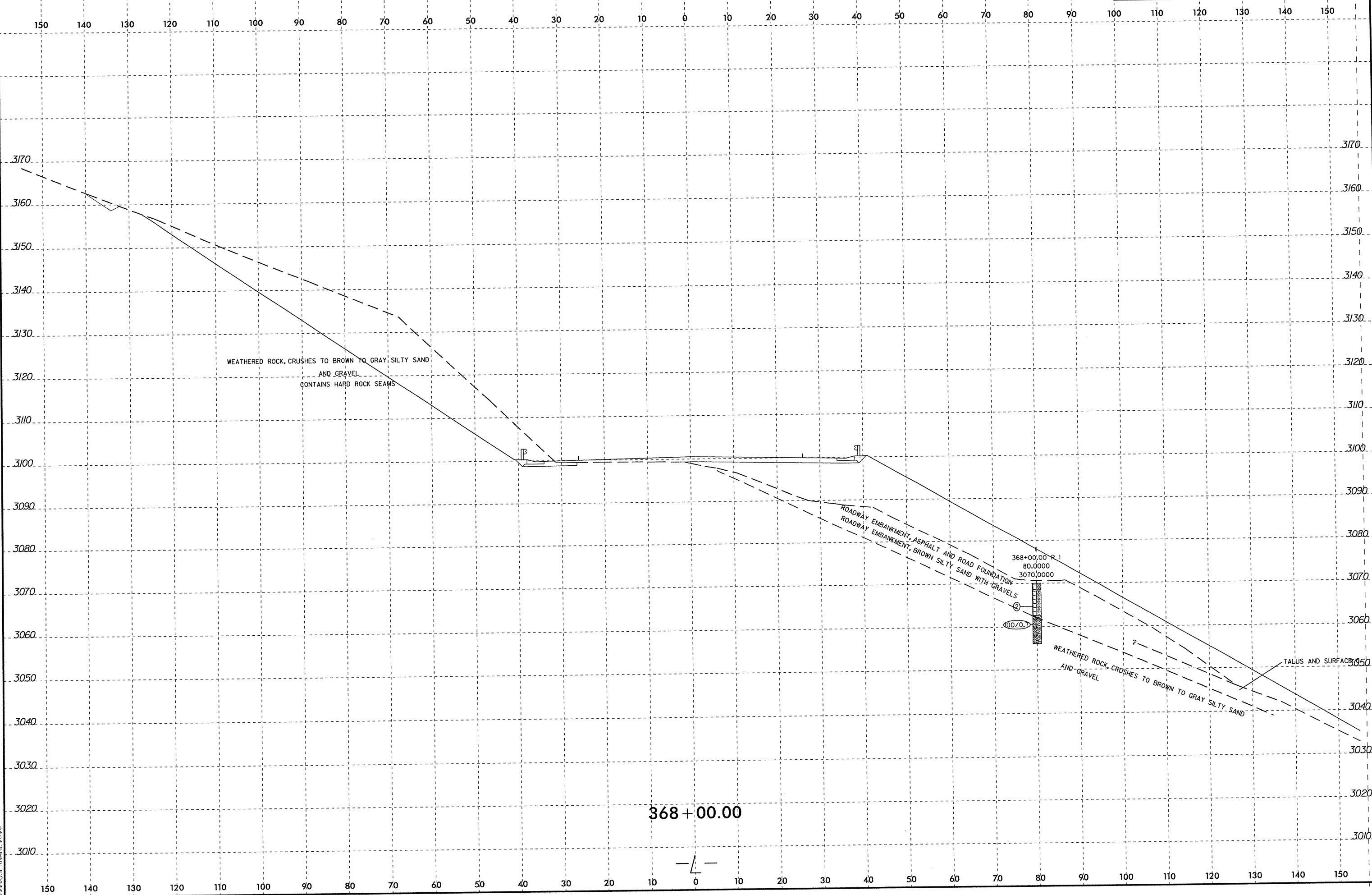
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
38/259



 SYSTEMS
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 10:51 AM

8/23/99

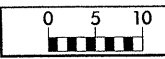


368+00.00



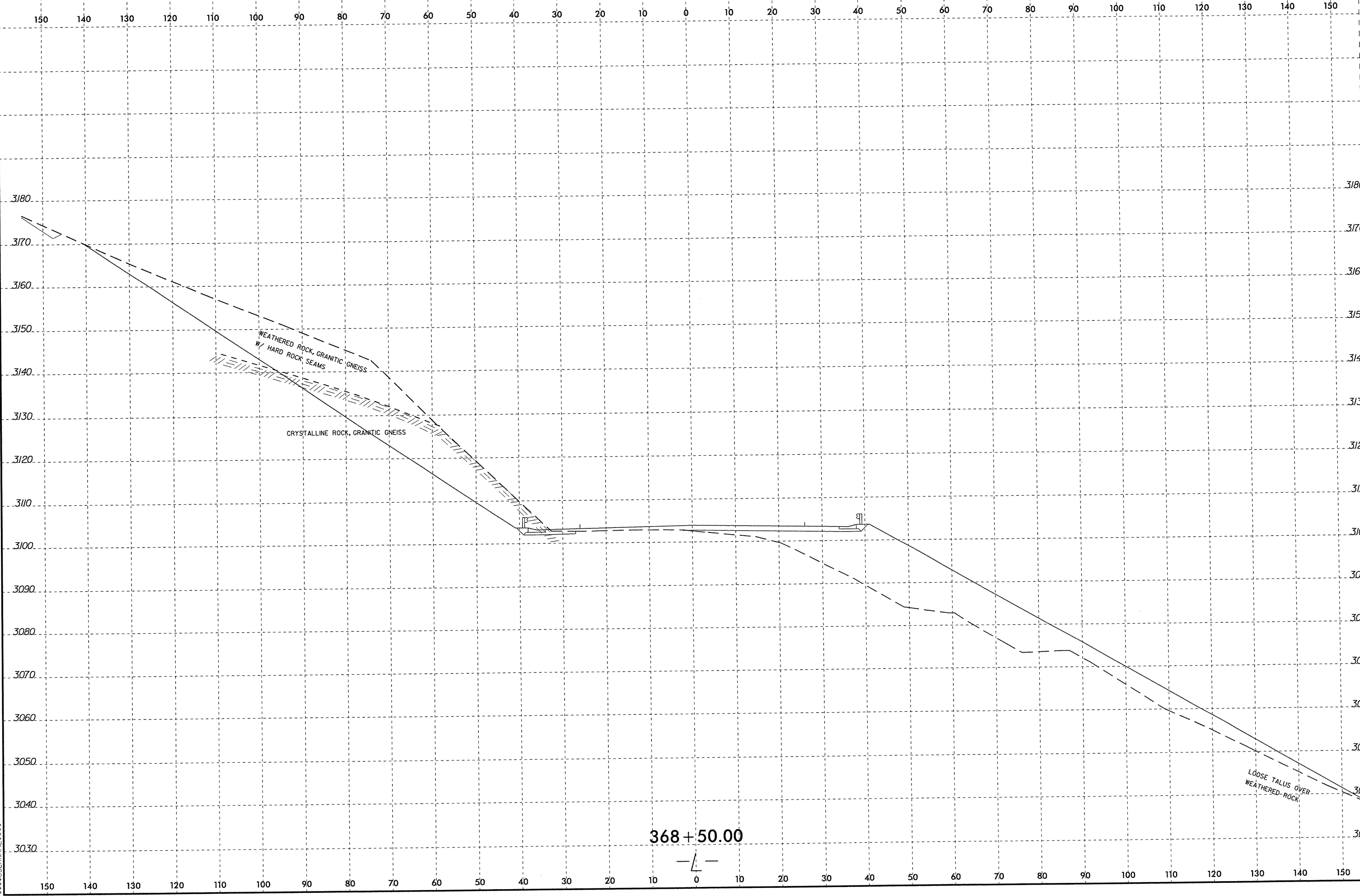
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8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
40/259



WEATHERED ROCK, GRANITIC GNEISS
w/ HARD ROCK SEAMS

CRYSTALLINE ROCK, GRANITIC GNEISS

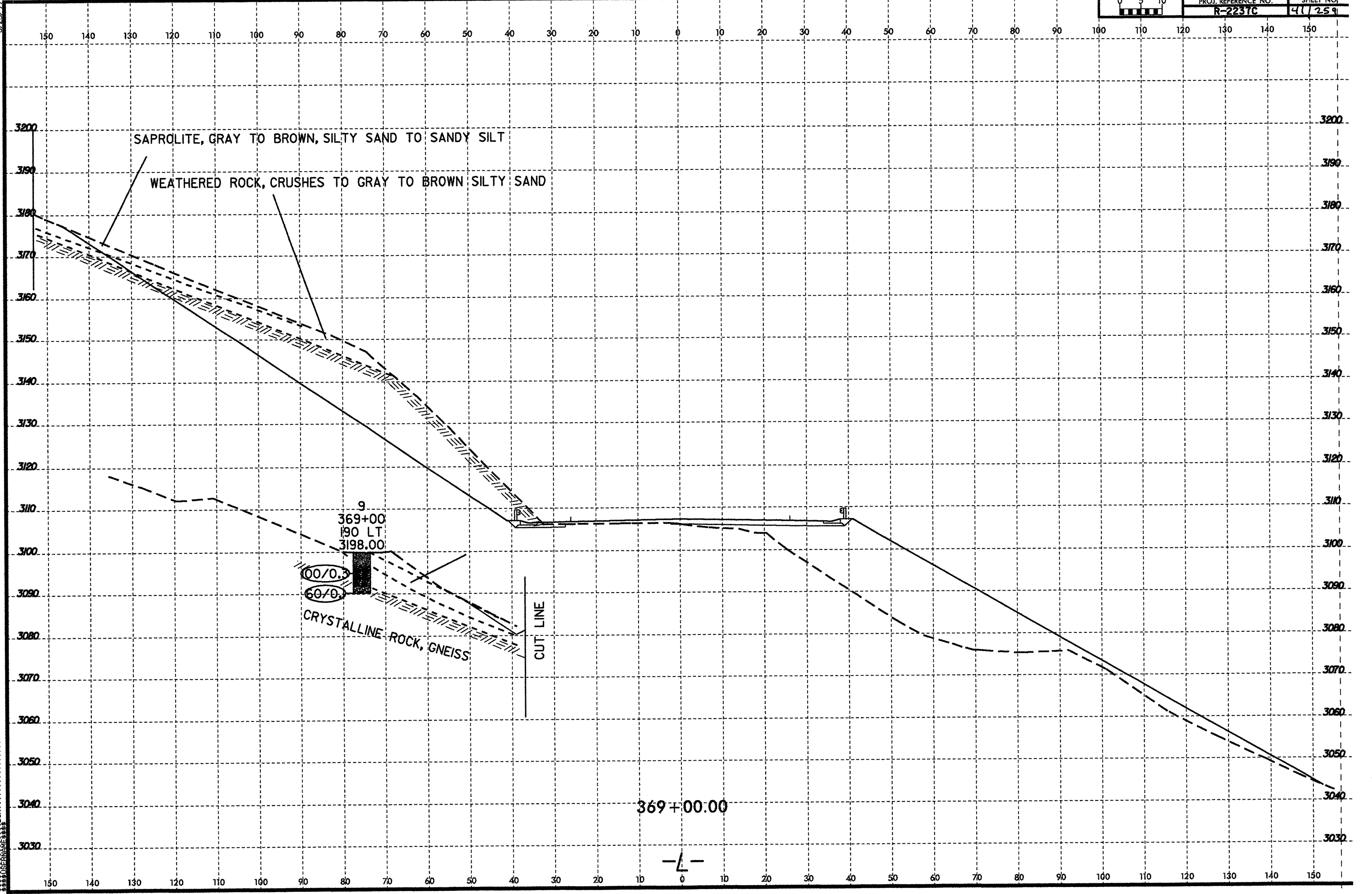
LOOSE TALUS OVER
WEATHERED ROCK

368+50.00



SECTION NAME
SUBURBAN
CONNECTION

B/23/99



SAPROLITE, GRAY TO BROWN, SILTY SAND TO SANDY SILT

WEATHERED ROCK, CRUSHES TO GRAY TO BROWN SILTY SAND

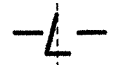
9
369+00
190 LT
3198.00

100/0.3
60/0

CRYSTALLINE ROCK, GNEISS

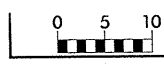
CUT LINE

369+00.00

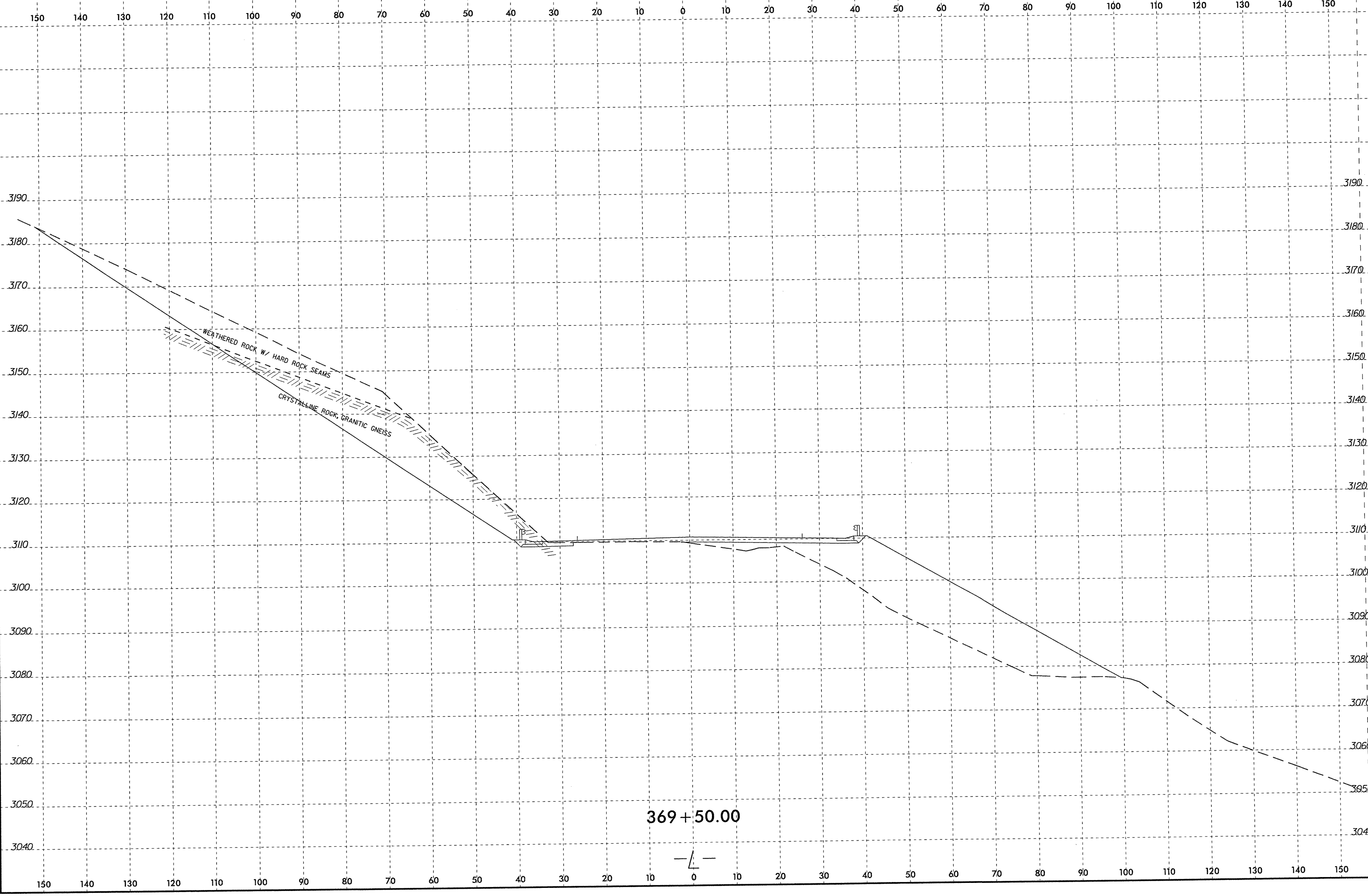


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8/23/99

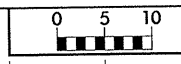


PROJ. REFERENCE NO. R-2237C	SHEET NO. 42/259
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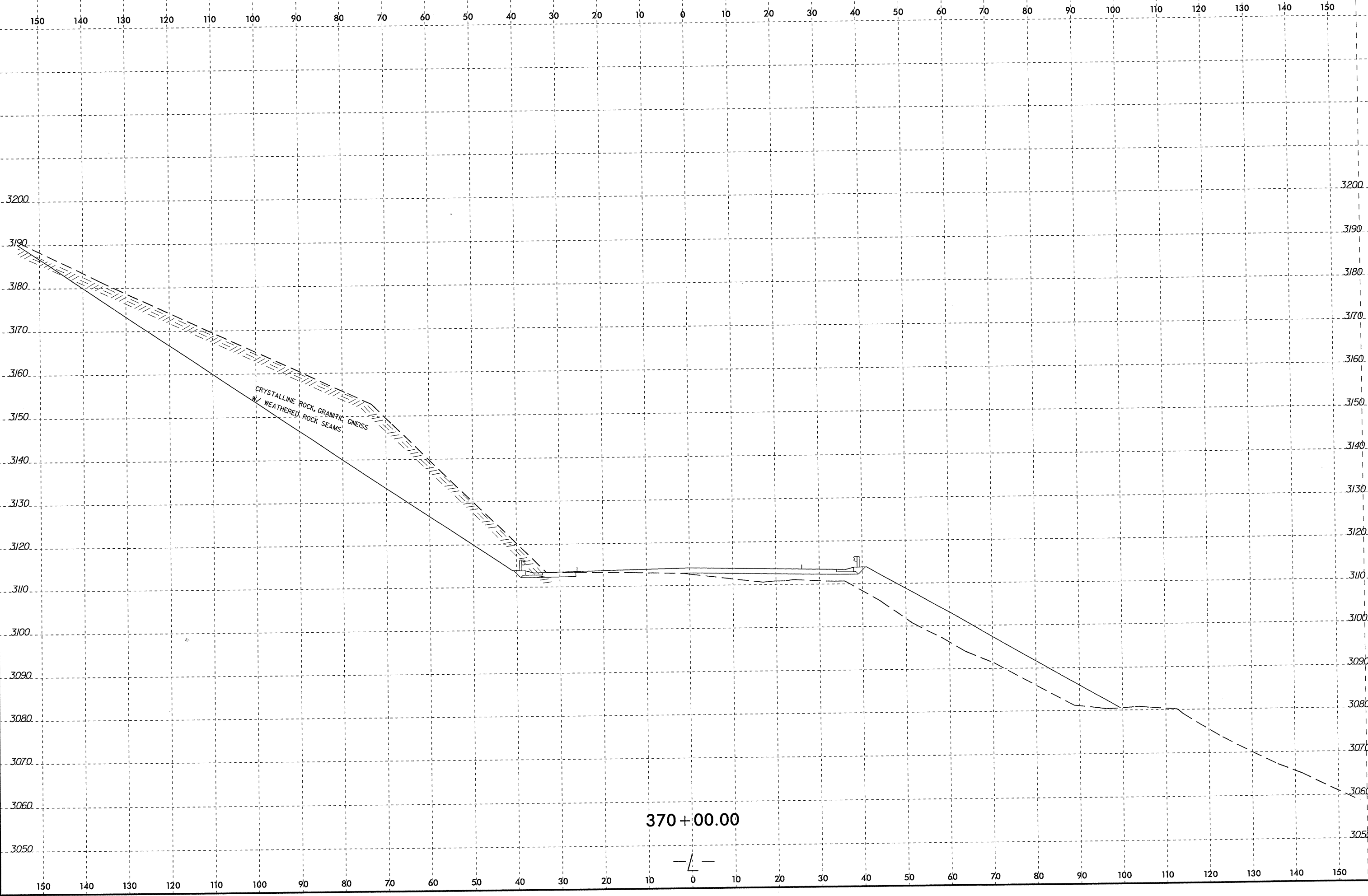


SYSTEM TIME: 8/23/99 10:00:00
 USER: J...
 PROJECT: R-2237C
 SHEET: 42/259

8/23/99

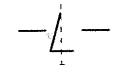


PROJ. REFERENCE NO. R-2237C SHEET NO. 43/259

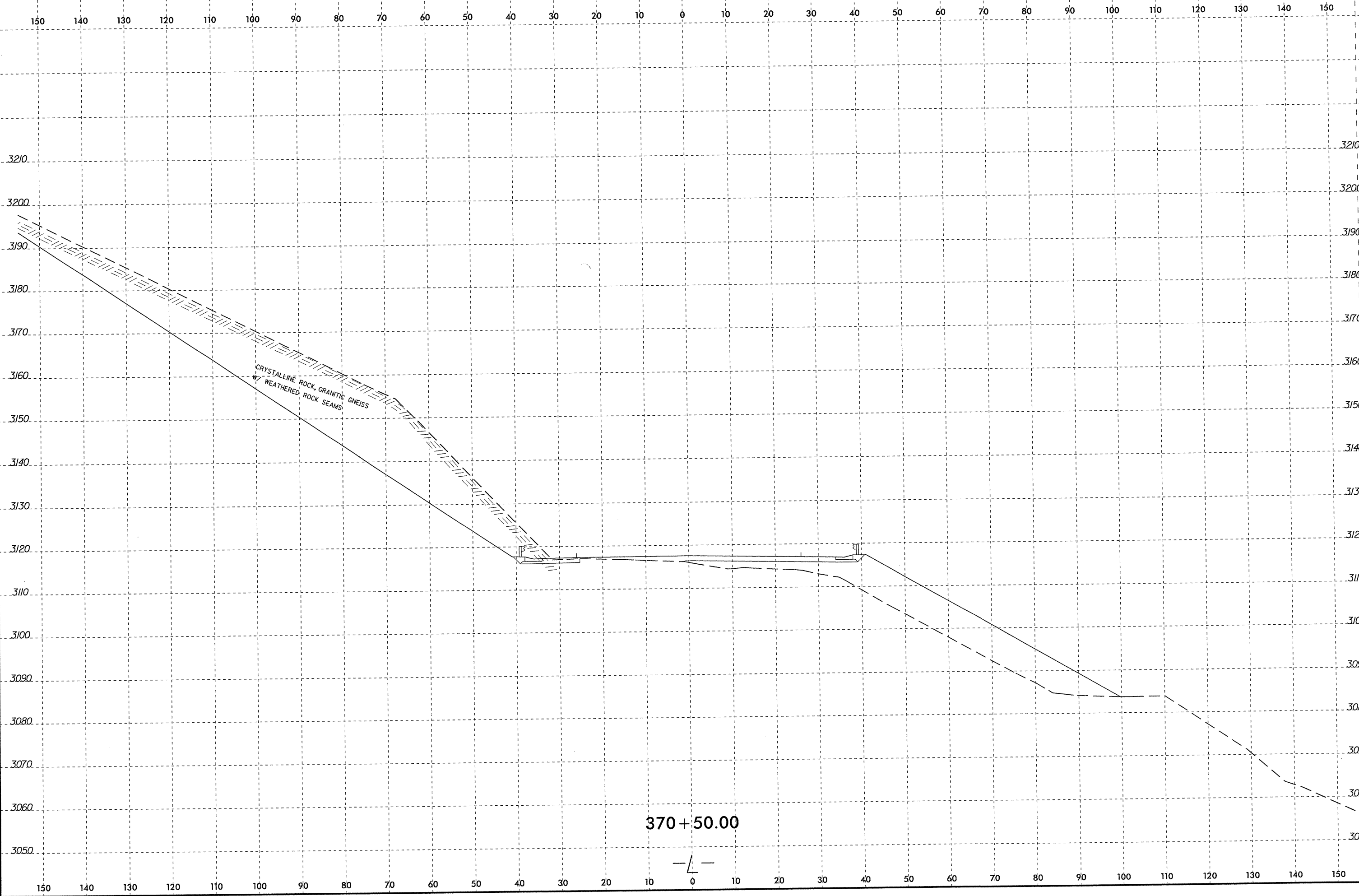
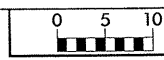


CRYSTALLINE ROCK, GRANITIC GNEISS
W/ WEATHERED, ROCK SEAMS

370+00.00

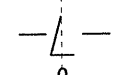


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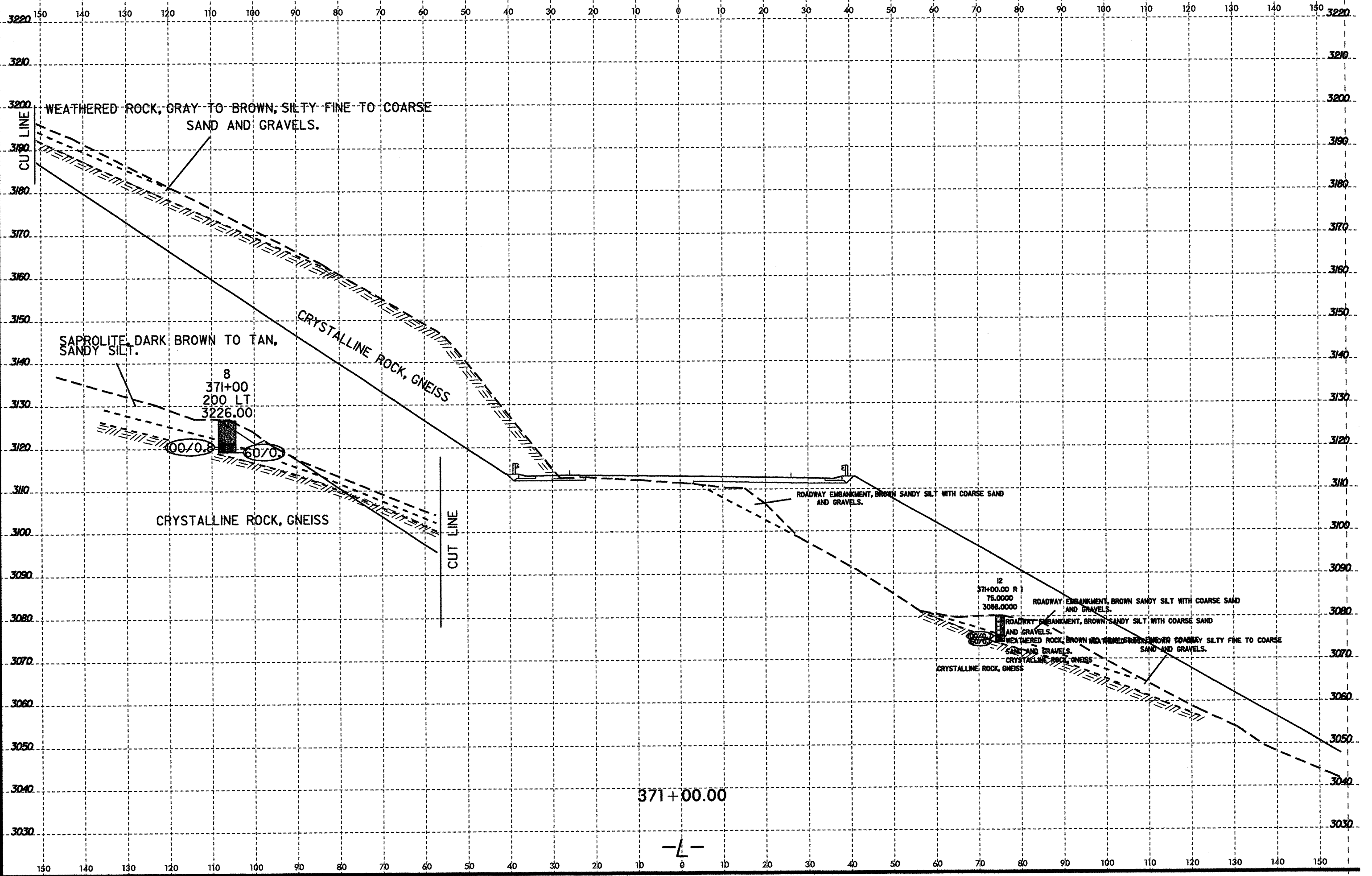
CRYSTALLINE ROCK, GRANITIC GNEISS
W/ WEATHERED ROCK SEAMS

370+50.00



SYSTEMS
SERVICES
INC.

8/23/99



WEATHERED ROCK, GRAY TO BROWN, SILTY FINE TO COARSE SAND AND GRAVELS.

SAPROLITE, DARK BROWN TO TAN, SANDY SILT.

CRYSTALLINE ROCK, GNEISS

CRYSTALLINE ROCK, GNEISS

CUT LINE

ROADWAY EMBANKMENT, BROWN SANDY SILT WITH COARSE SAND AND GRAVELS.

ROADWAY EMBANKMENT, BROWN SANDY SILT WITH COARSE SAND AND GRAVELS.

ROADWAY EMBANKMENT, BROWN SANDY SILT WITH COARSE SAND AND GRAVELS.

WEATHERED ROCK, BROWN TO REDDISH BROWN TO COARSE SILTY FINE TO COARSE SAND AND GRAVELS.

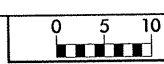
CRYSTALLINE ROCK, GNEISS

371+00.00

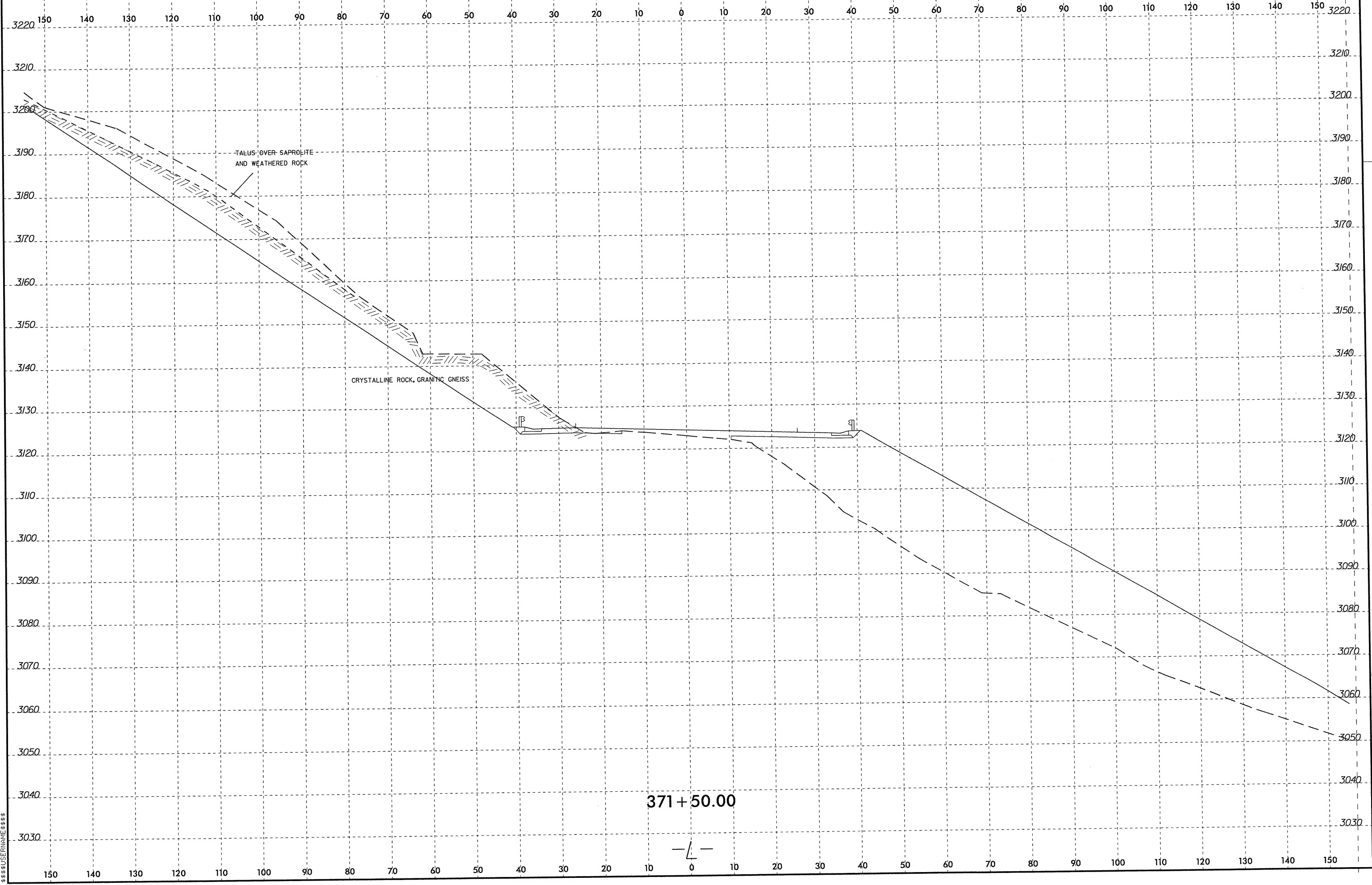
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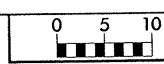


PROJ. REFERENCE NO. R-2237C	SHEET NO. 46/259
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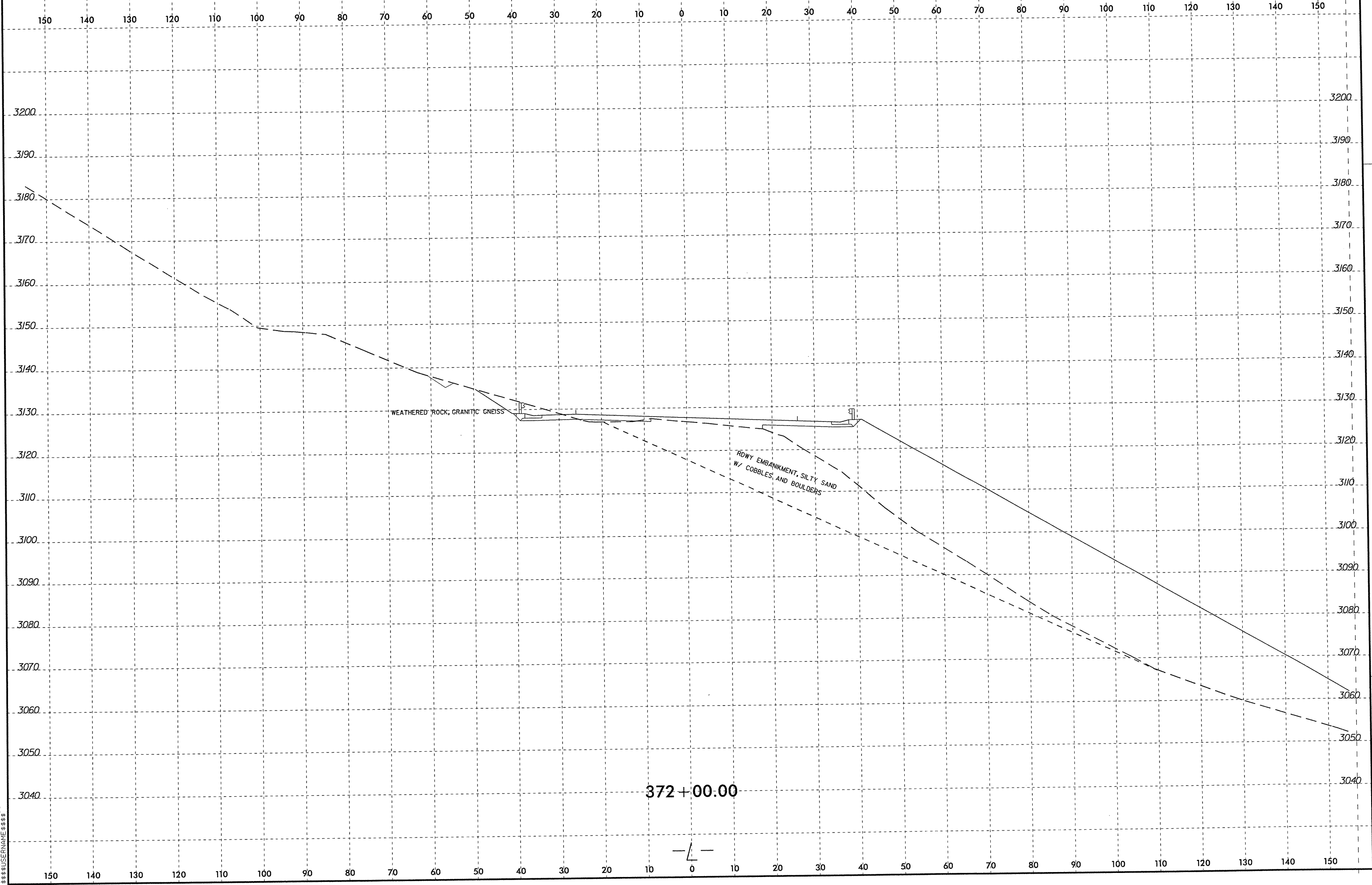


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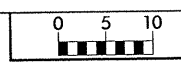


PROJ. REFERENCE NO.	SHEET NO.
R-2237C	47/259

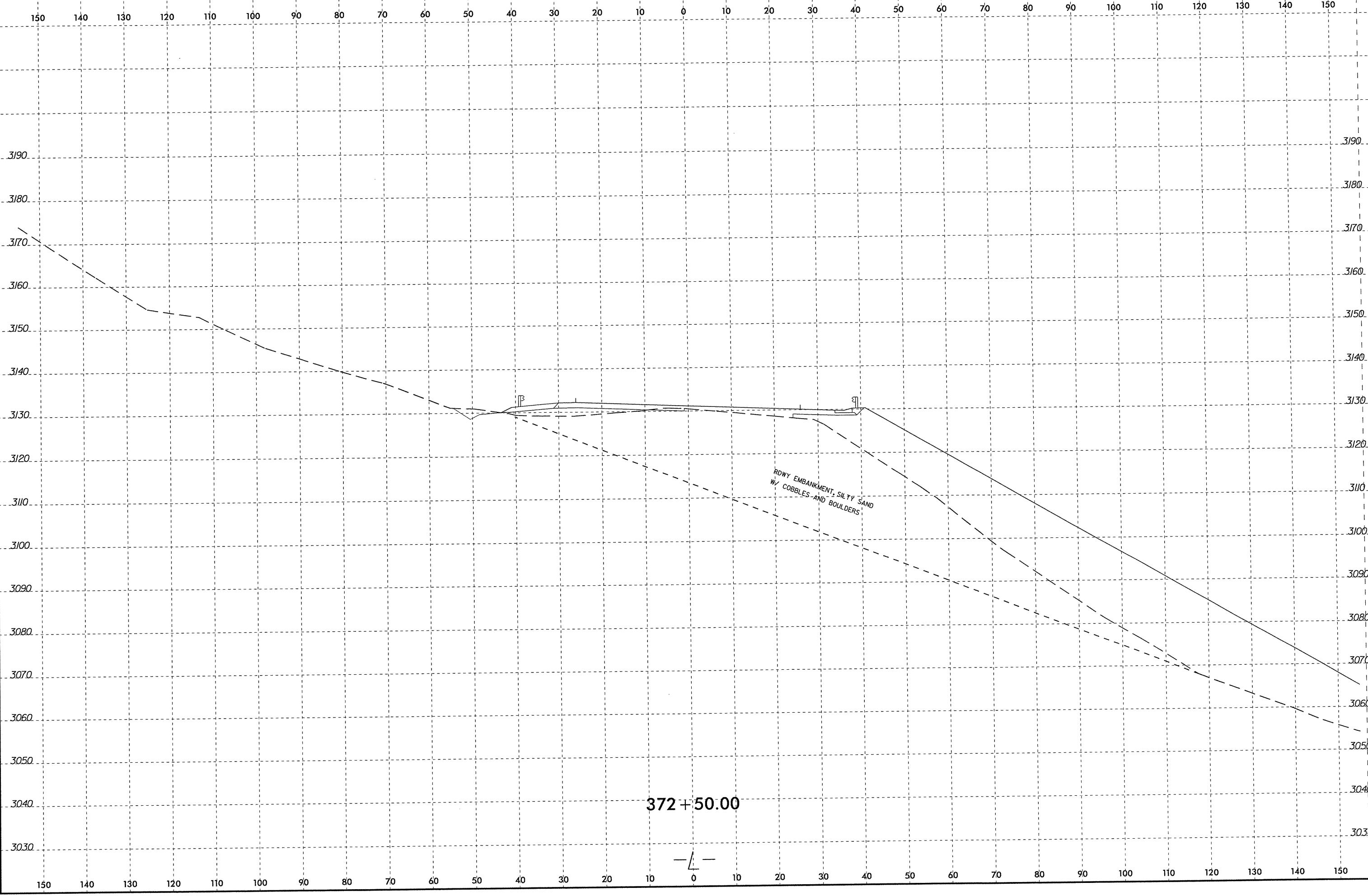


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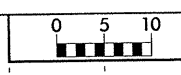


PROJ. REFERENCE NO. R-2237C	SHEET NO. 48/259
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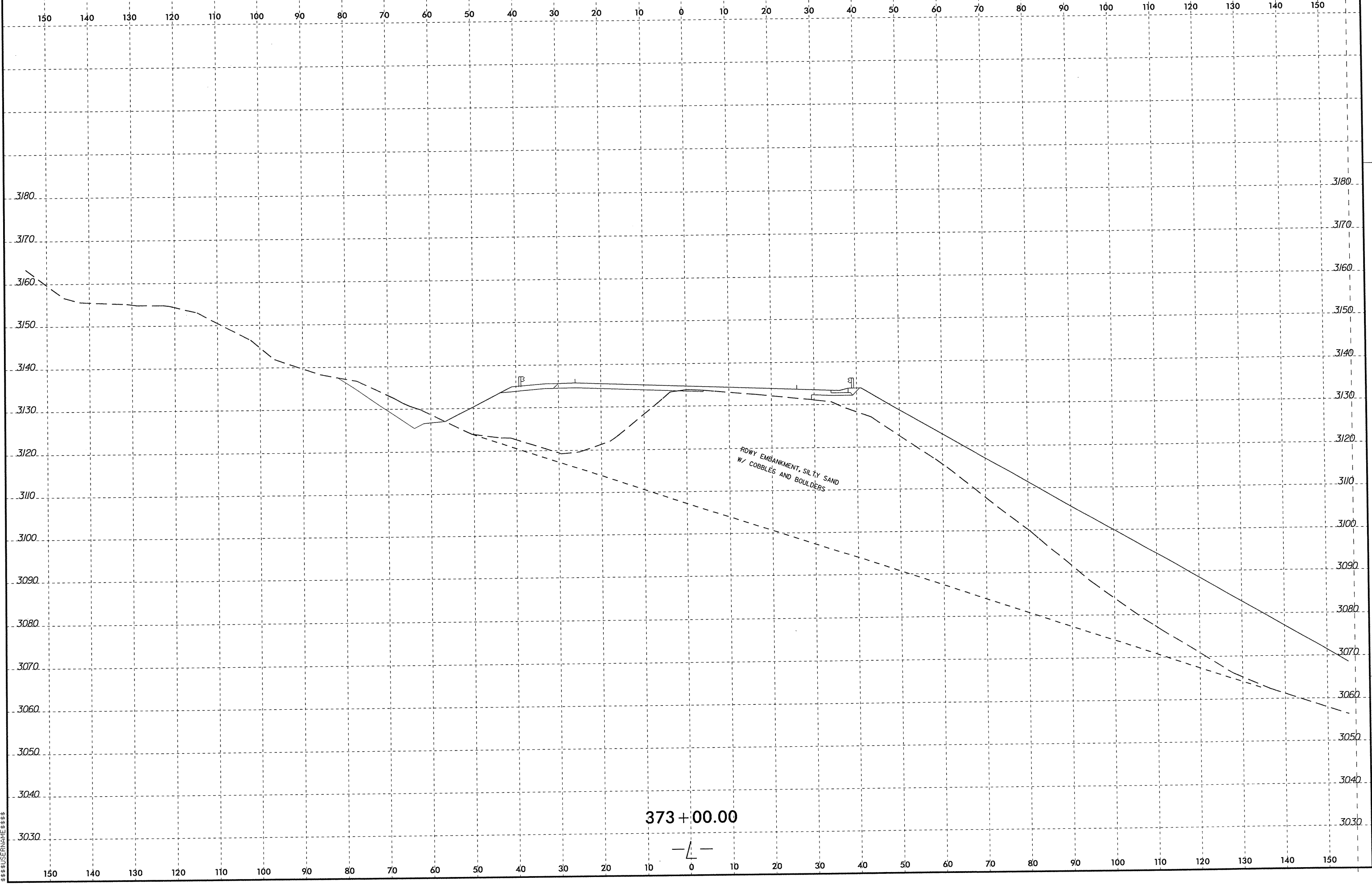


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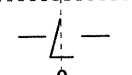
8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-2237C	49/239



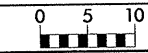
373+00.00



 SYSTEMS

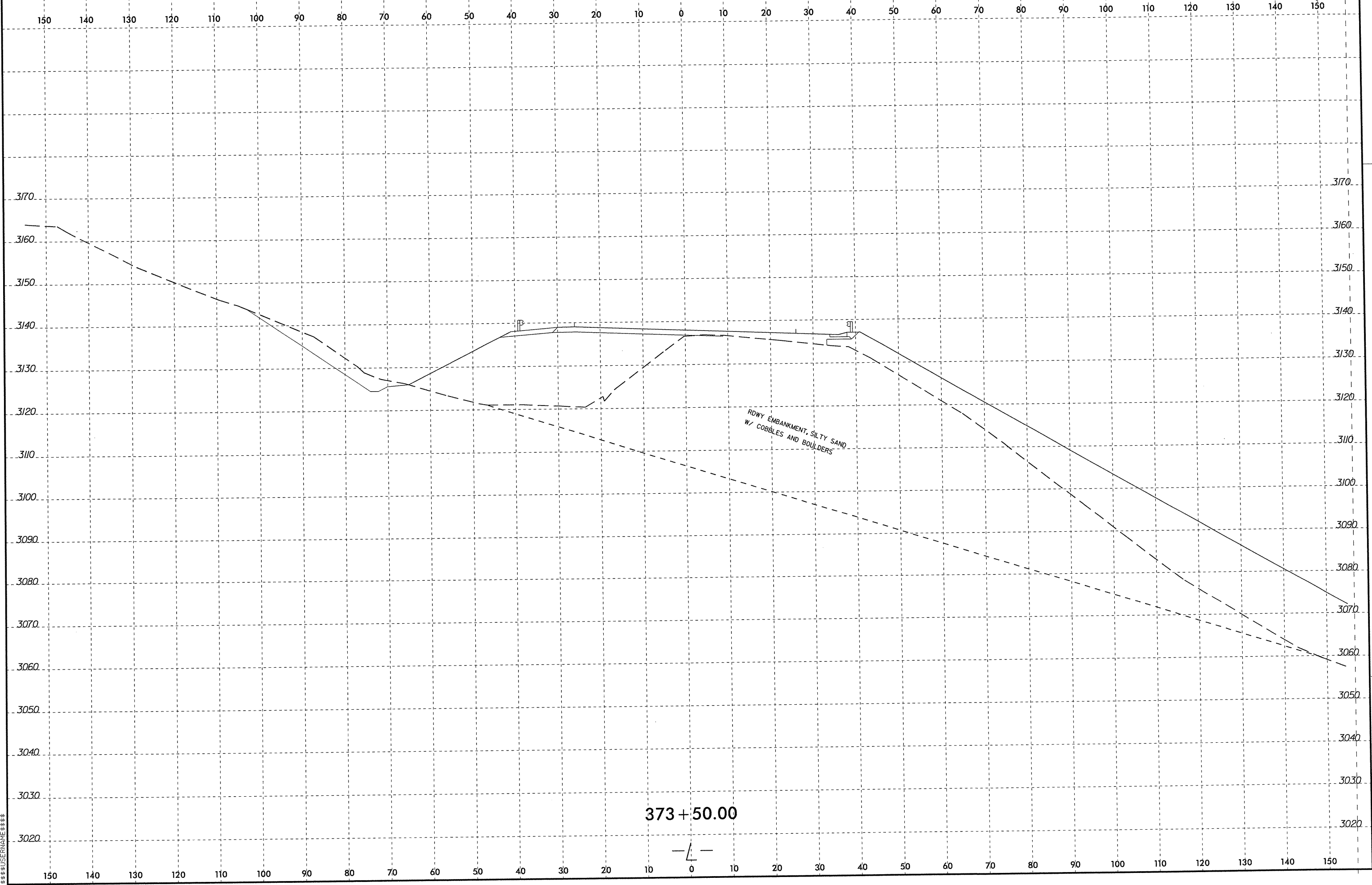
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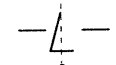
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
50/259

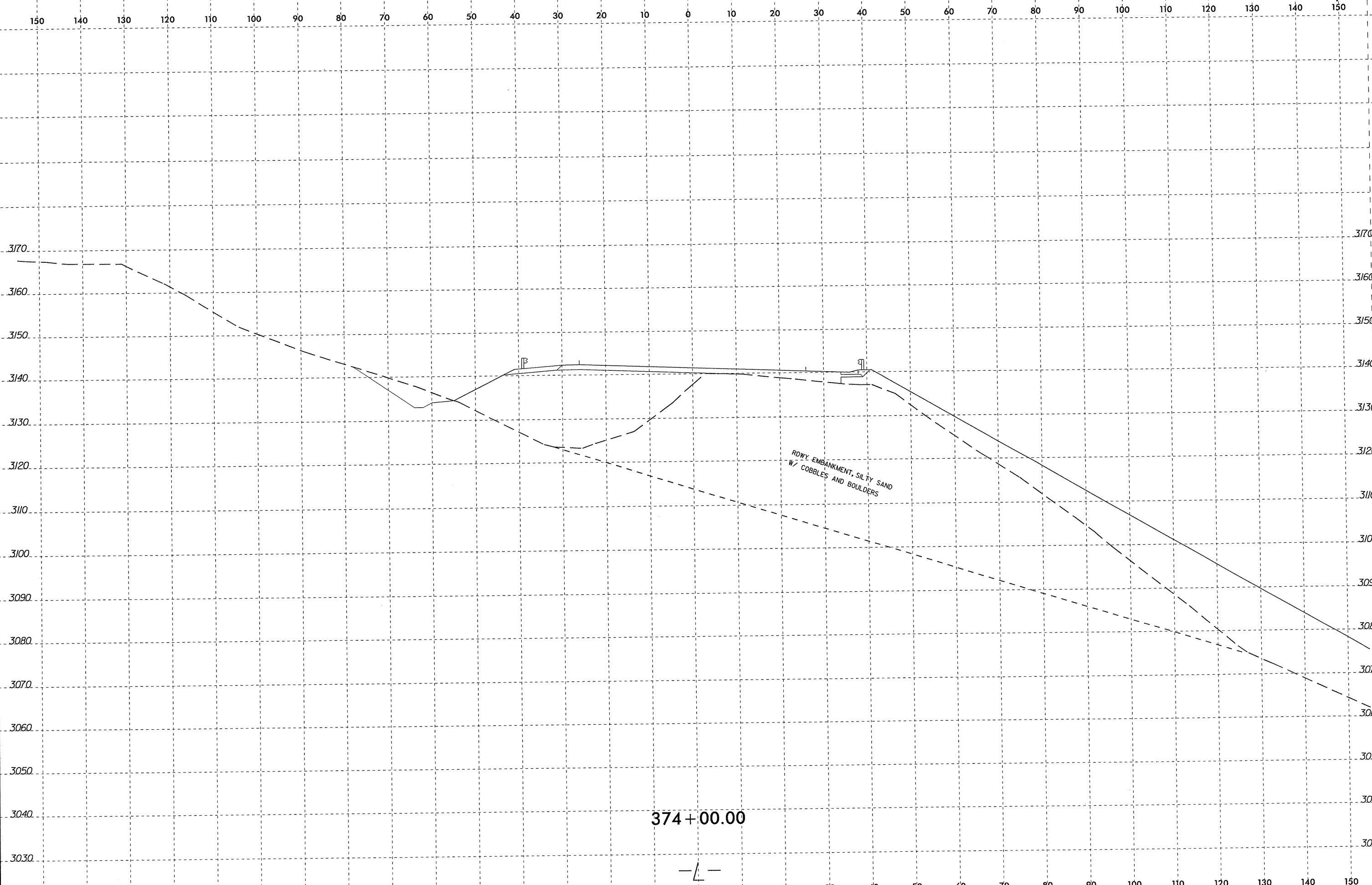
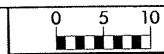


RDWY EMBANKMENT, SILTY SAND
W/ COBBLES AND BOULDERS

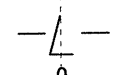
373+50.00



SYSTEMS
SUBSTRATE

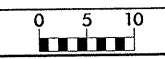


374+00.00

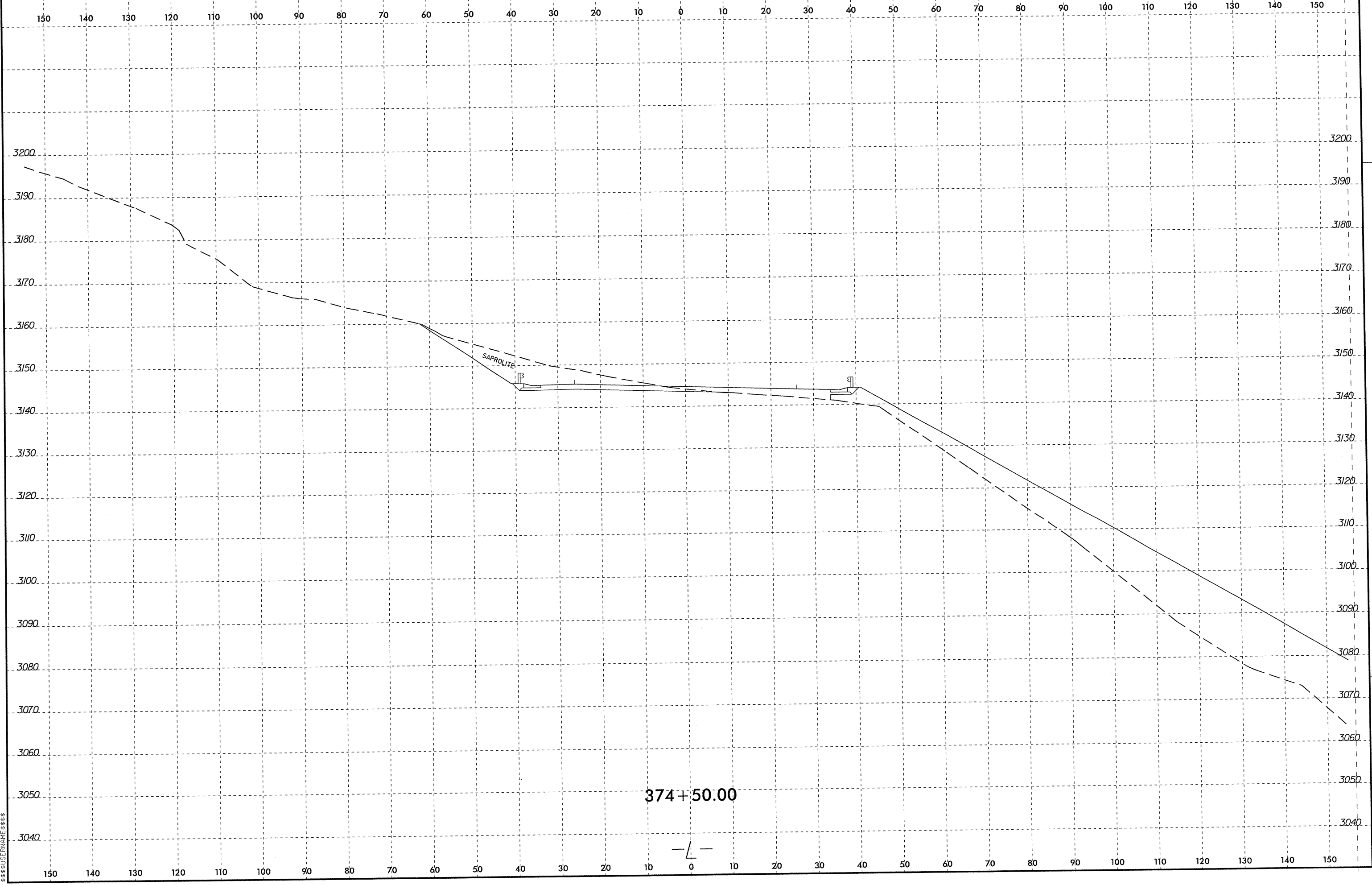


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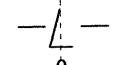


PROJ. REFERENCE NO. R-2237C	SHEET NO. 52/259
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374+50.00

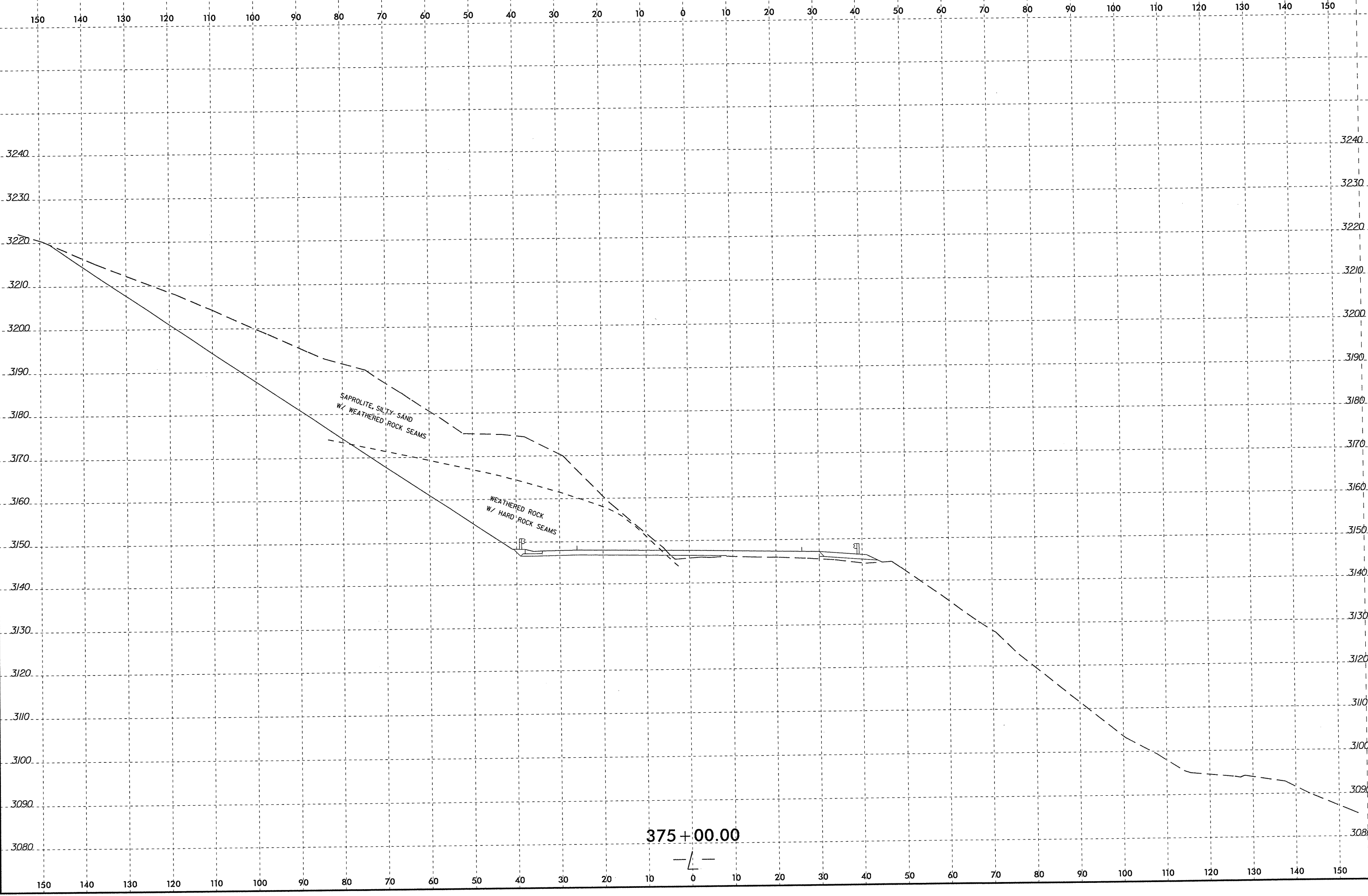


8/23/99



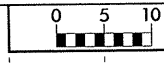
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
53/259

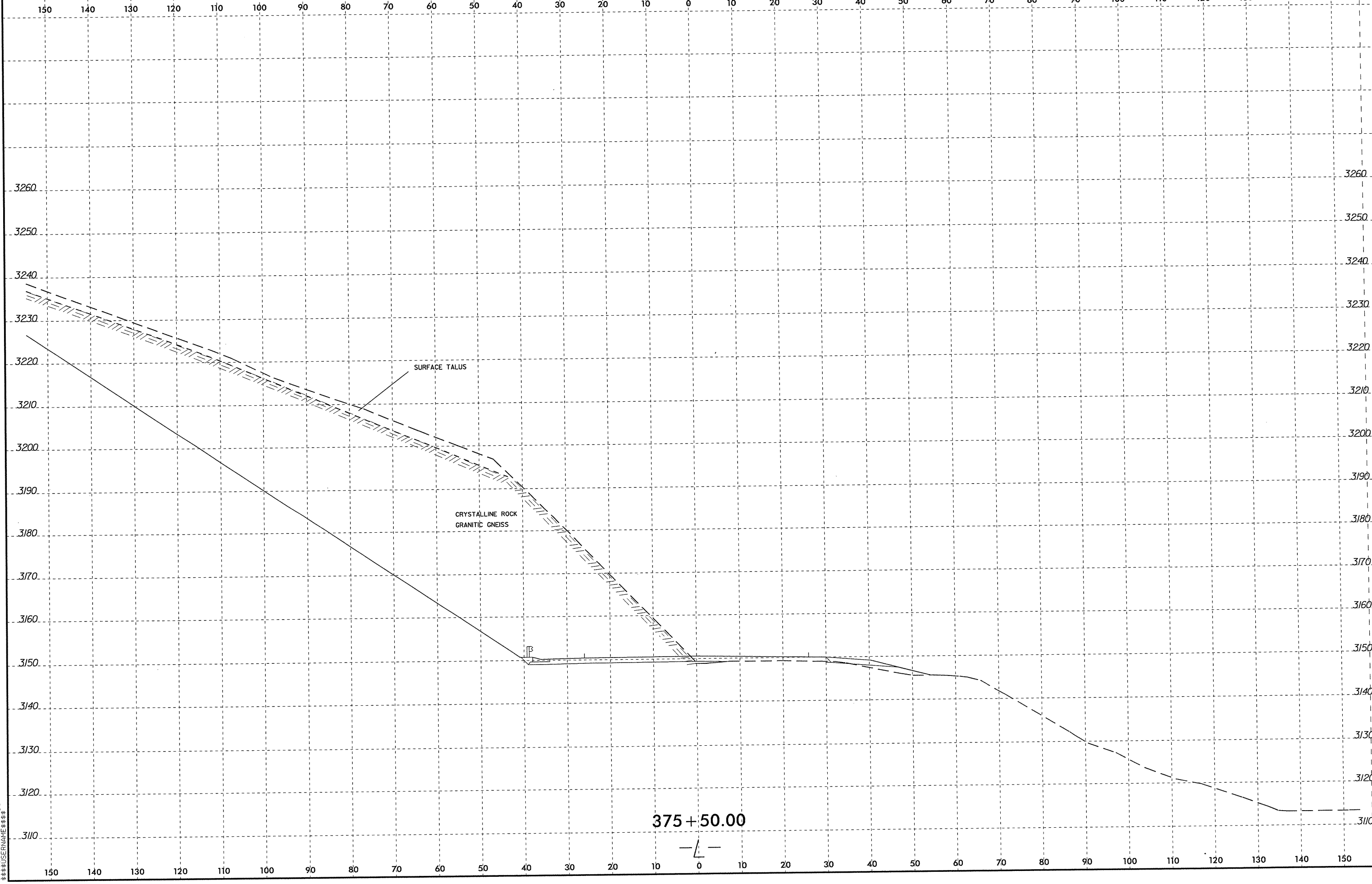


SYSTEMS
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8/23/99

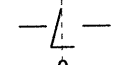


PROJ. REFERENCE NO. R-2237C	SHEET NO. 54/259
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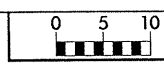


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375+50.00

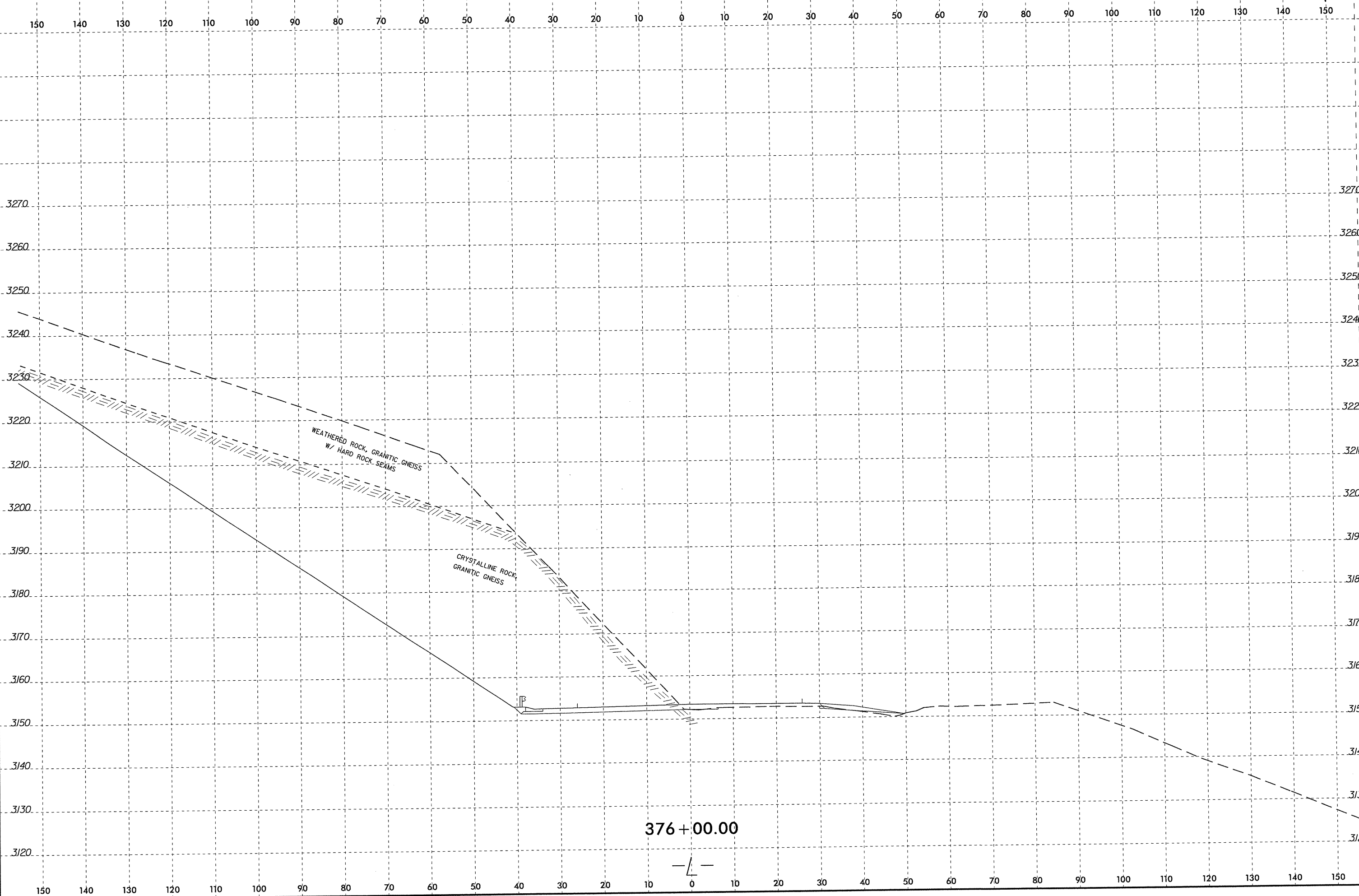


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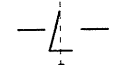
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
55/259

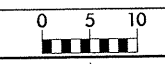


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\$\$\$\$\$DATE\$\$\$\$\$
\$\$\$\$\$DRAWN BY\$\$\$\$\$
\$\$\$\$\$CHECKED BY\$\$\$\$\$

376+00.00

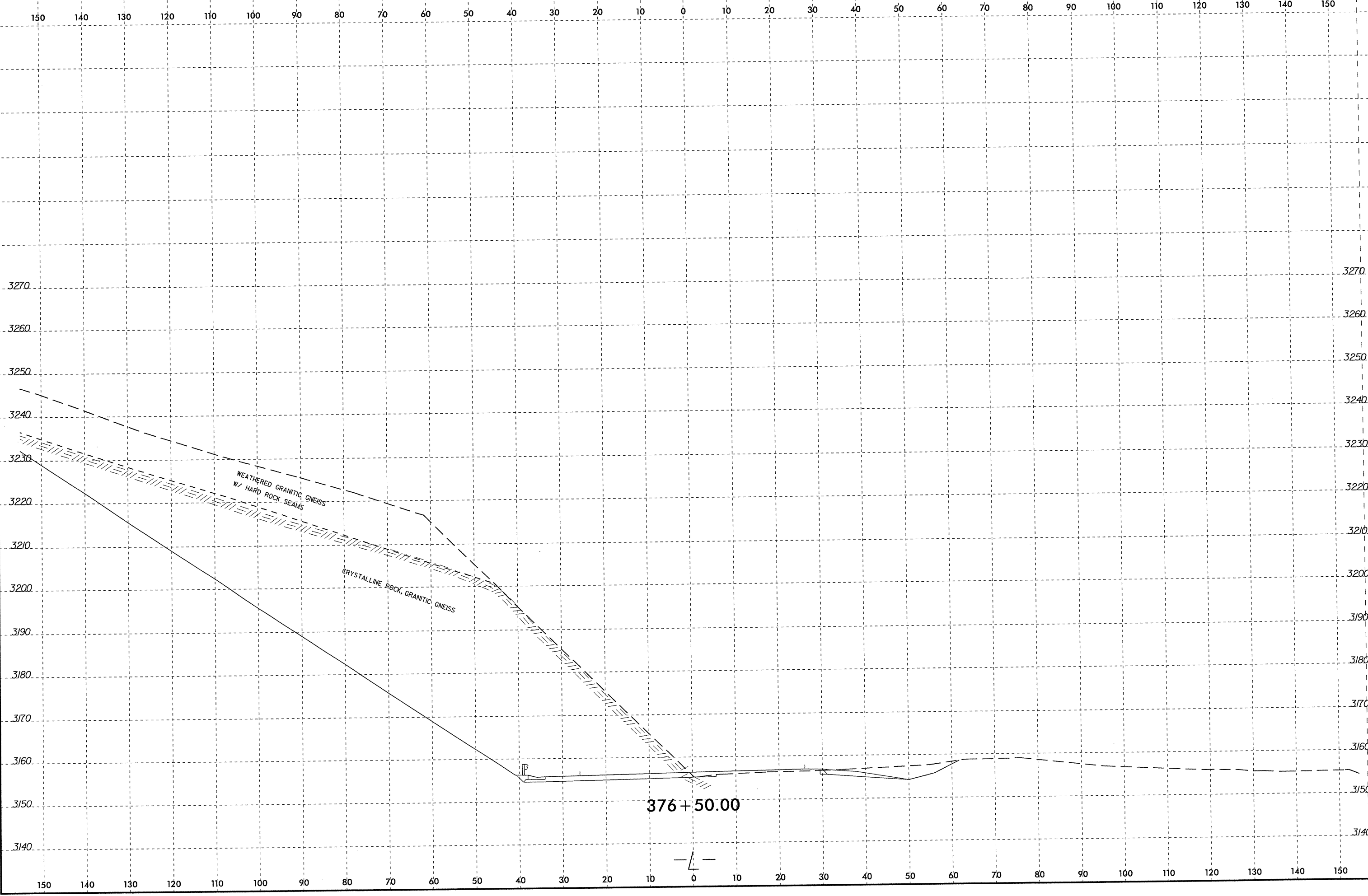


8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
56/259



SYTIME
DCM
US
SERIALS

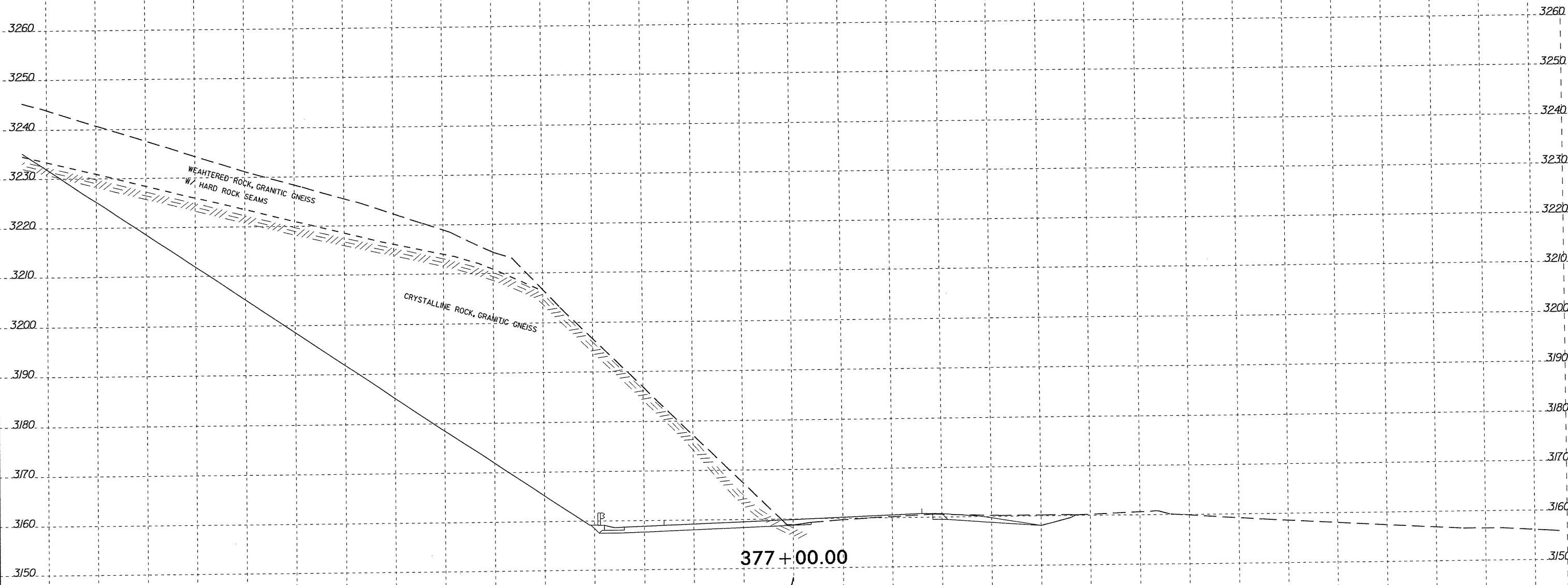
8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
57/259

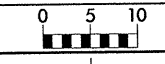
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SYTIME
USER

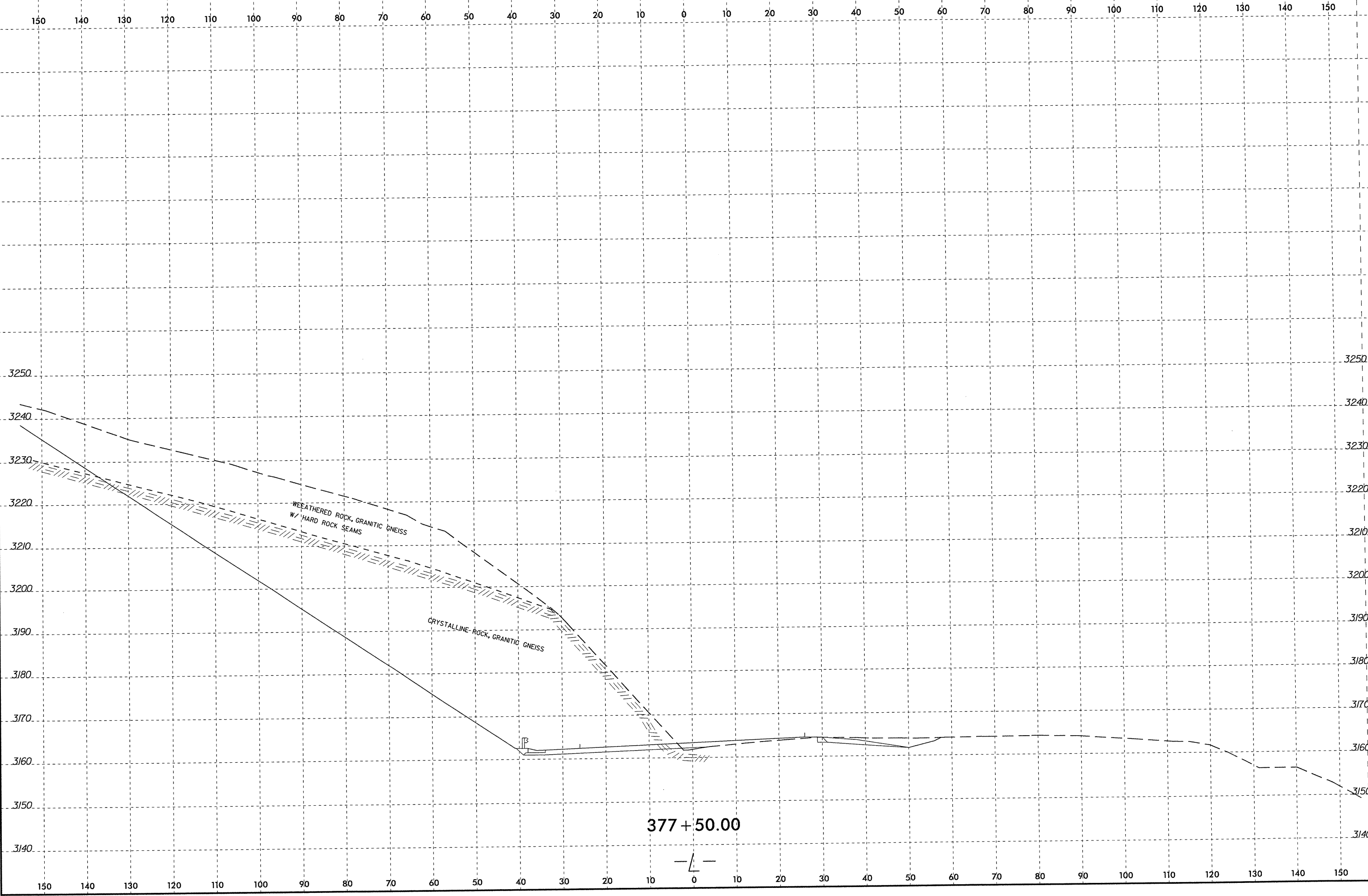
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PROJ. REFERENCE NO.
R-2237C

SHEET NO.
58/259



WEATHERED ROCK, GRANITIC GNEISS
W/ HARD ROCK SEAMS

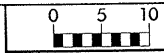
CRYSTALLINE ROCK, GRANITIC GNEISS

377 + 50.00



SYSTEM TIME 8/23/99 10:00:00 AM
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PLOT DATE 8/23/99 10:00:00 AM
PLOT TIME 8/23/99 10:00:00 AM

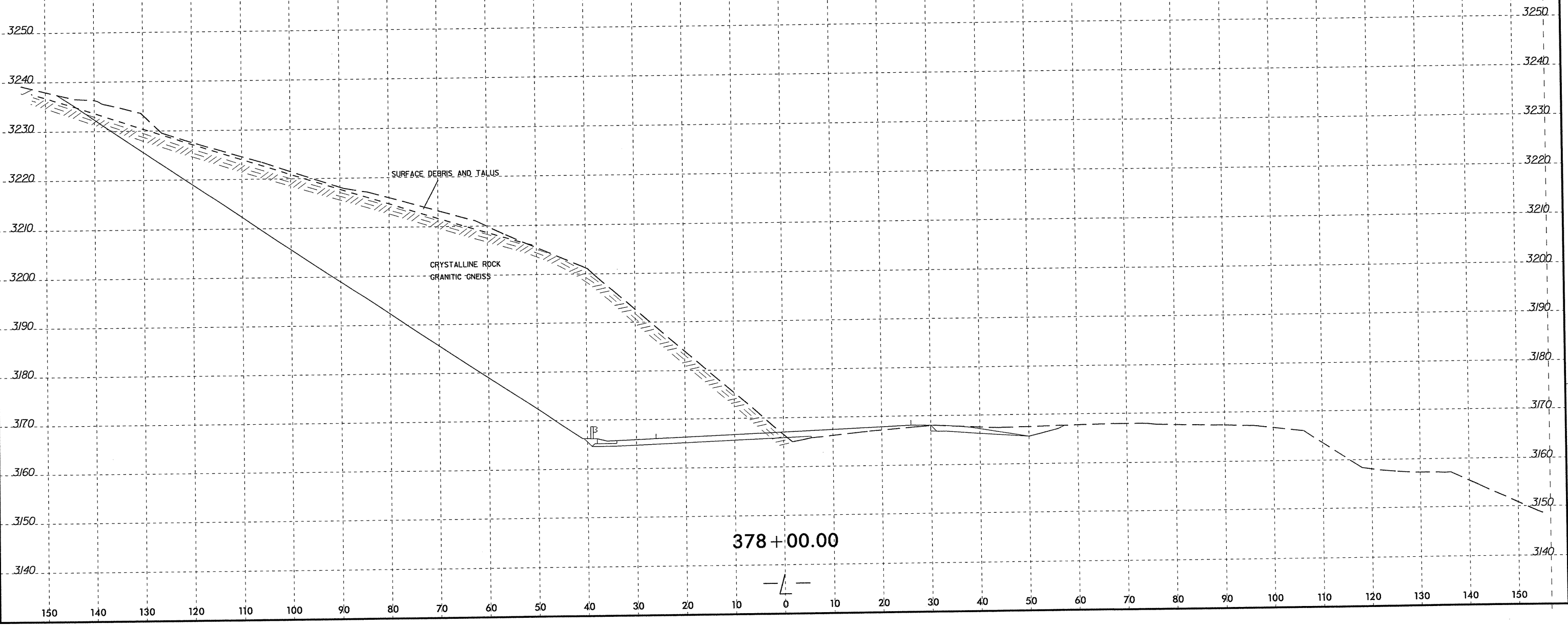
8/23/99



PROJ. REFERENCE NO.
R-2237C

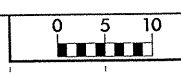
SHEET NO.
59/259

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

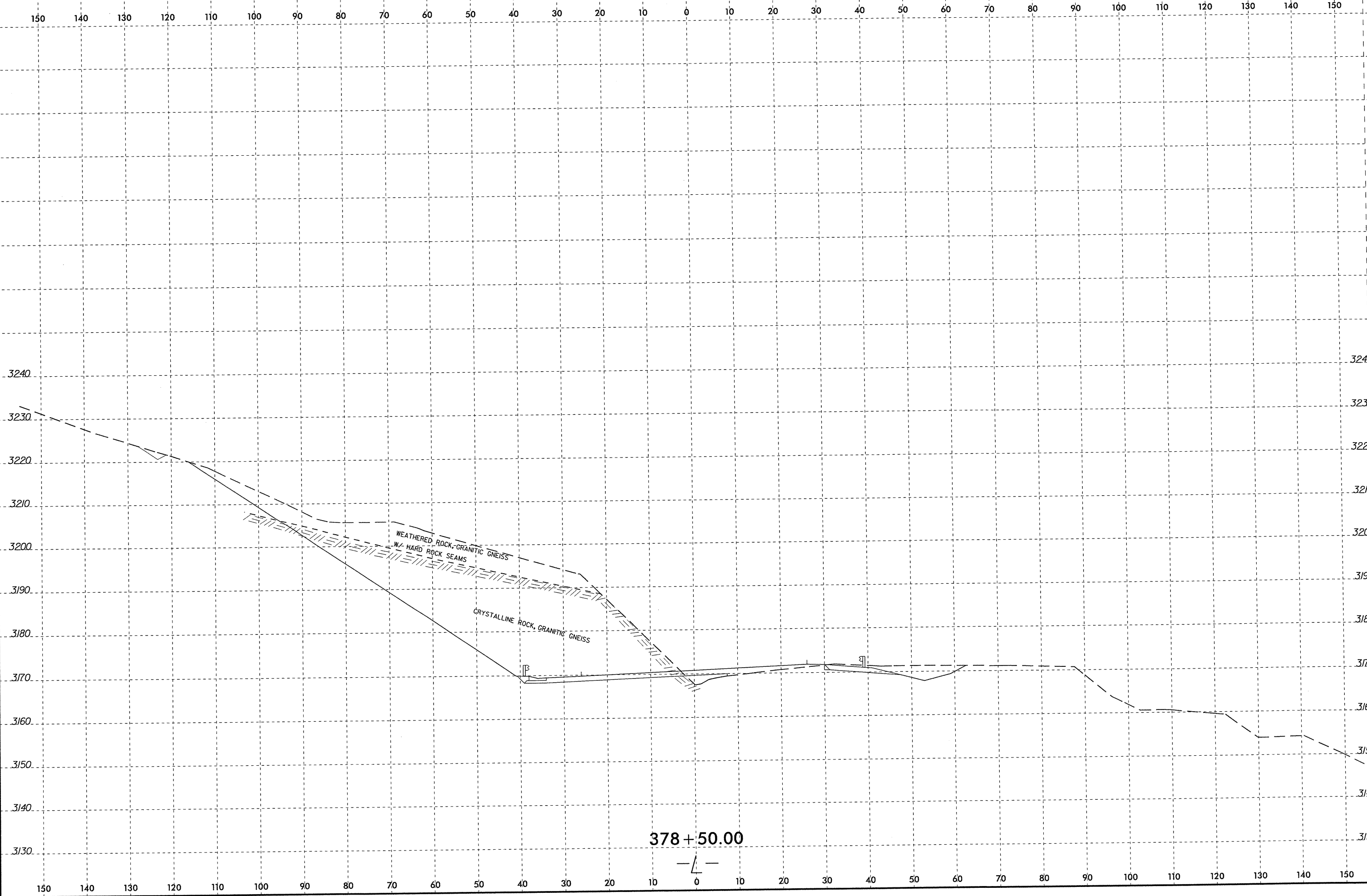


\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$USERNAME\$\$\$\$\$

8/23/99



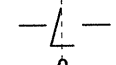
PROJ. REFERENCE NO. R-2237C	SHEET NO. 60/259
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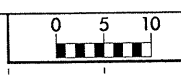
 SYSTEM TIME *****

 USER *****

378+50.00

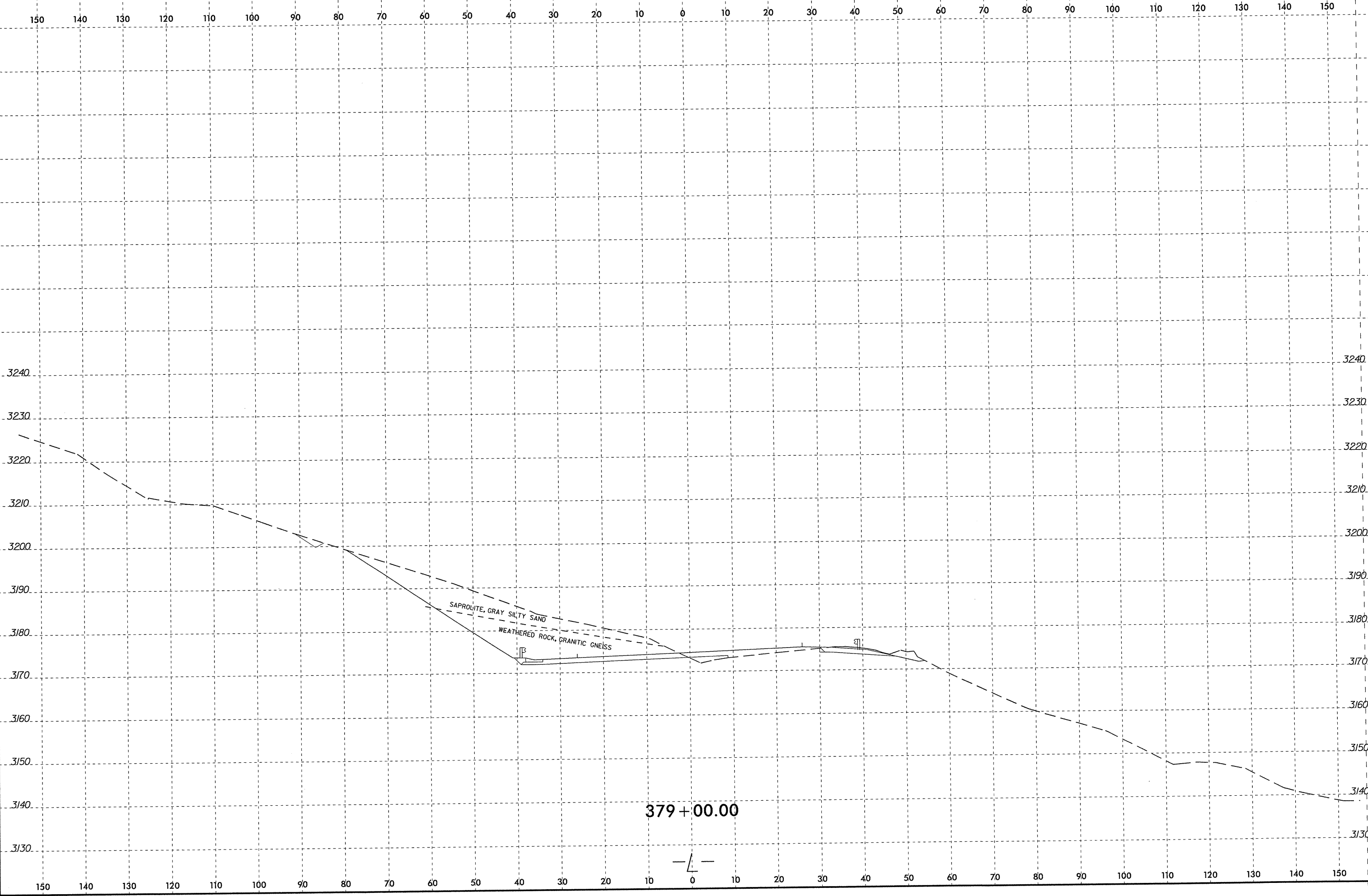


8/23/99

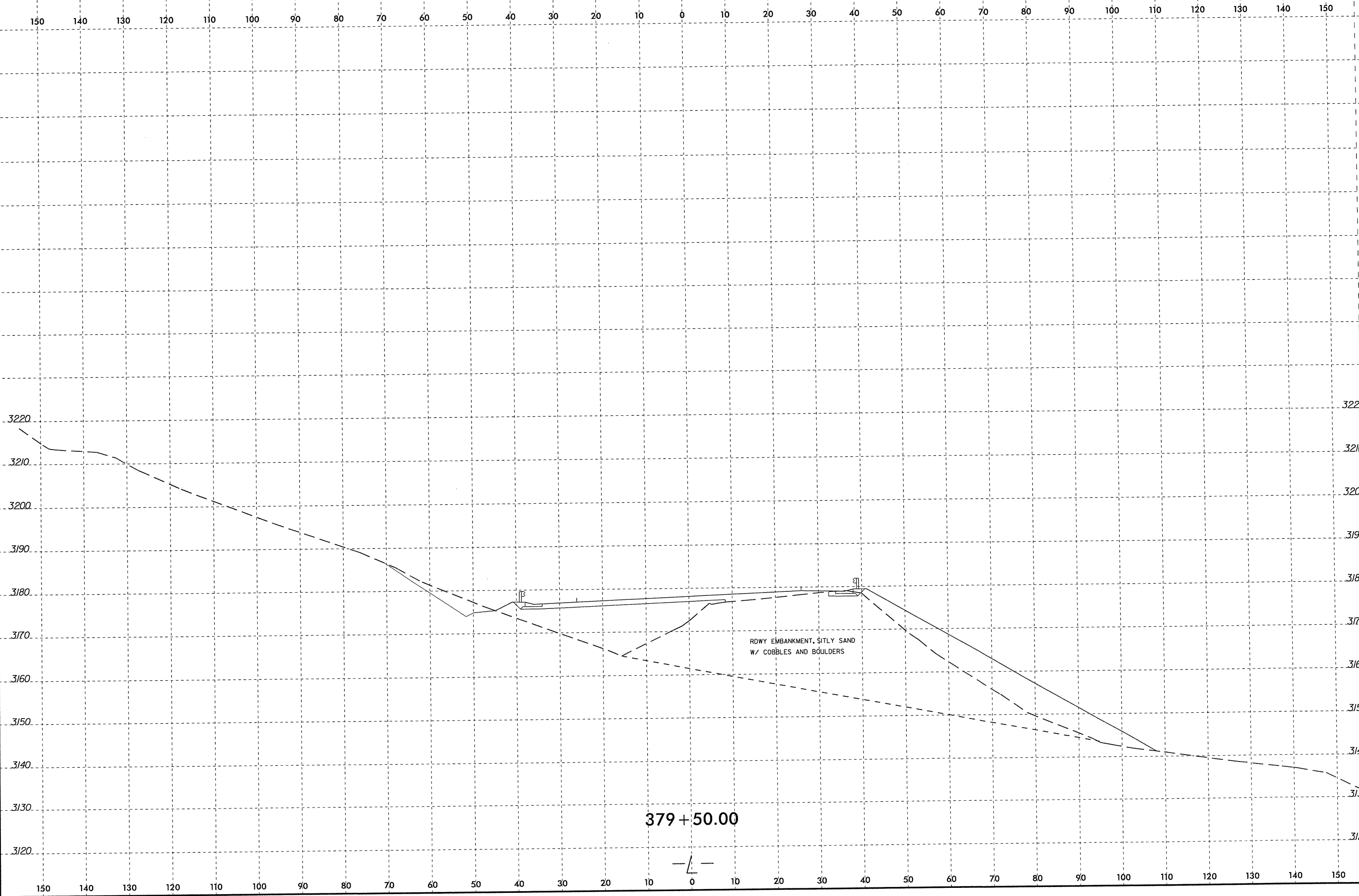
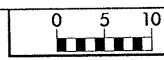


PROJ. REFERENCE NO.
R-2237C

SHEET NO.
61/259

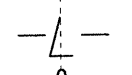


SYSTEM TIME
DATE
USER



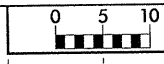
RDWY EMBANKMENT, SILTY SAND
W/ COBBLES AND BOULDERS

379 + 50.00



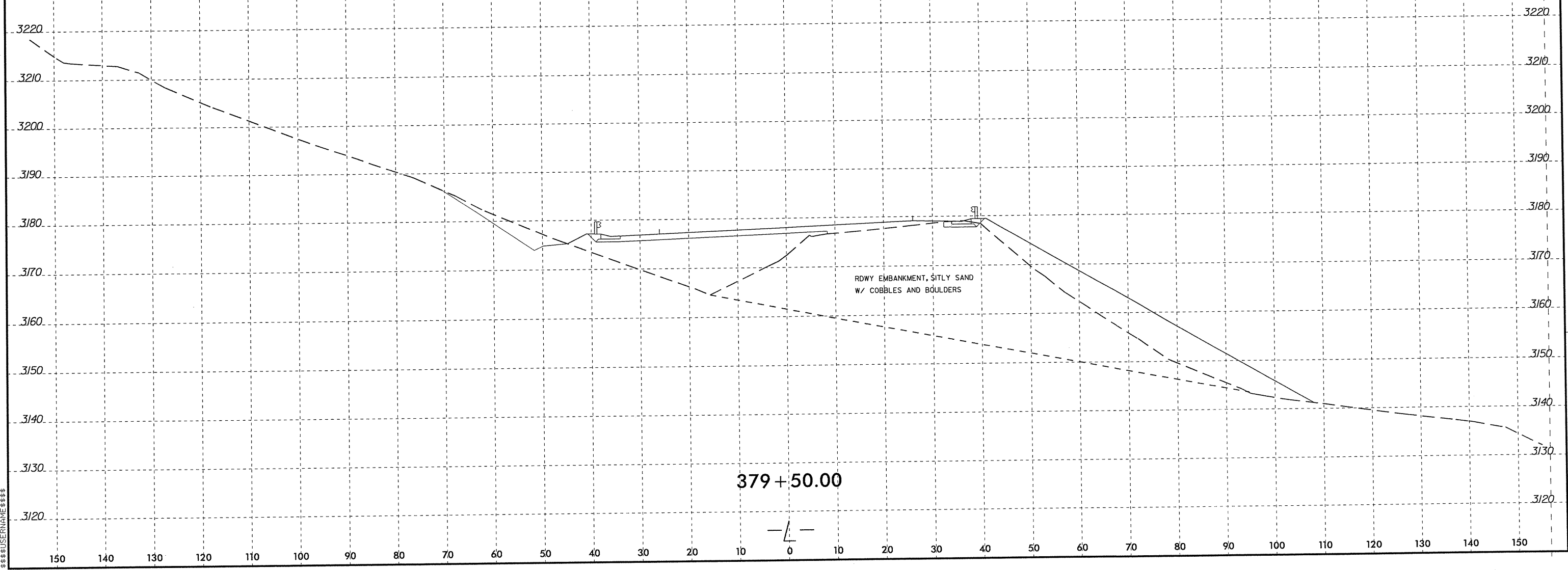
*****SYTIME*****
*****USERS*****
*****DGN*****

8/23/99



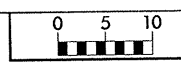
PROJ. REFERENCE NO. R-2237C	SHEET NO. 63/259
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150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

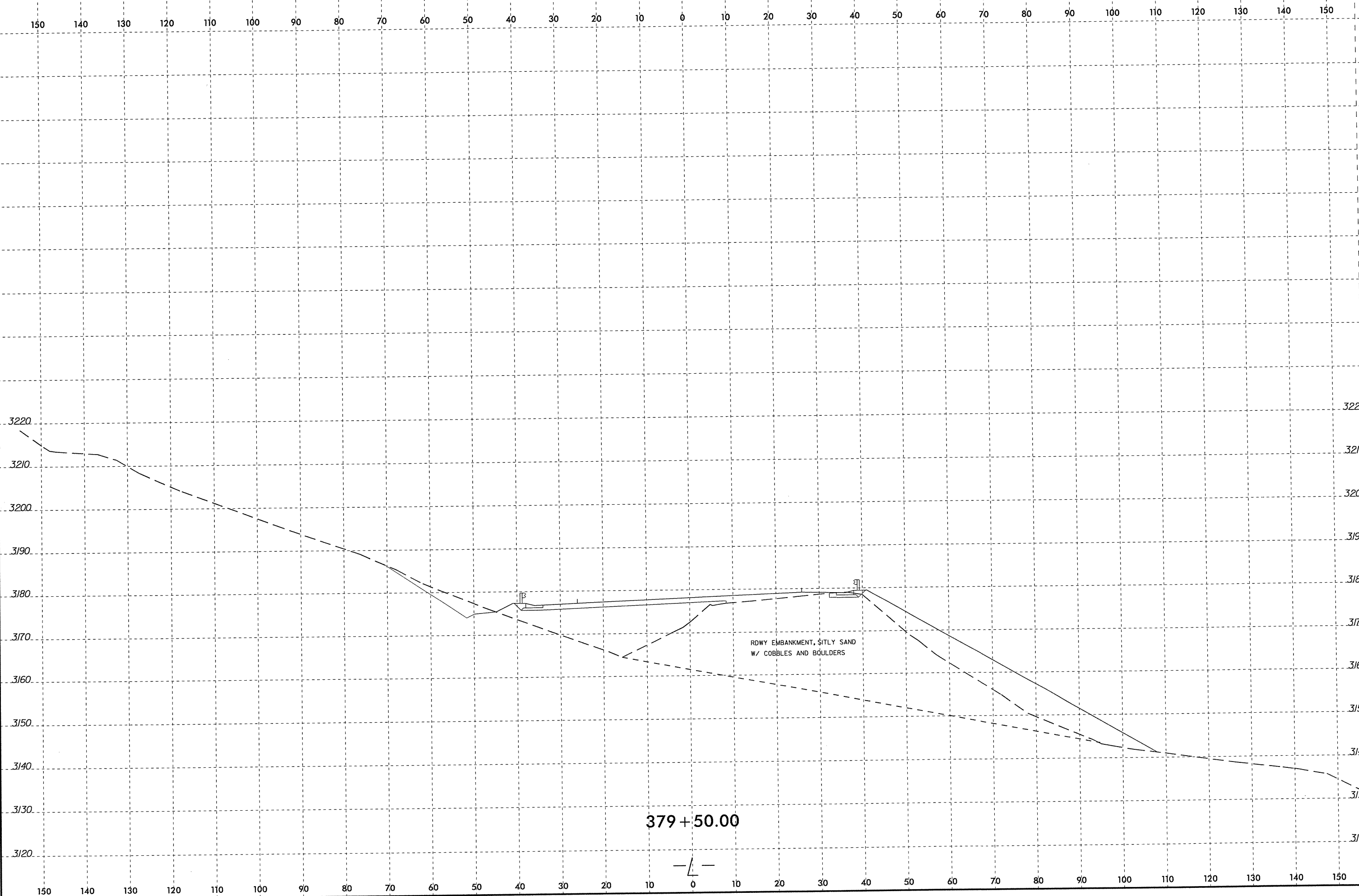


*****SYTIME*****
*****DGN*****
*****SRIN*****

B/23/99

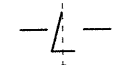


PROJ. REFERENCE NO.	SHEET NO.
R-2237C	64/259

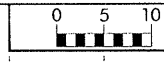


\$\$\$\$\$\$SYTIME\$\$\$\$\$\$
 \$\$\$\$\$\$DGN\$\$\$\$\$\$
 \$\$\$\$\$\$PURVIEW\$\$\$\$\$\$

379 + 50.00

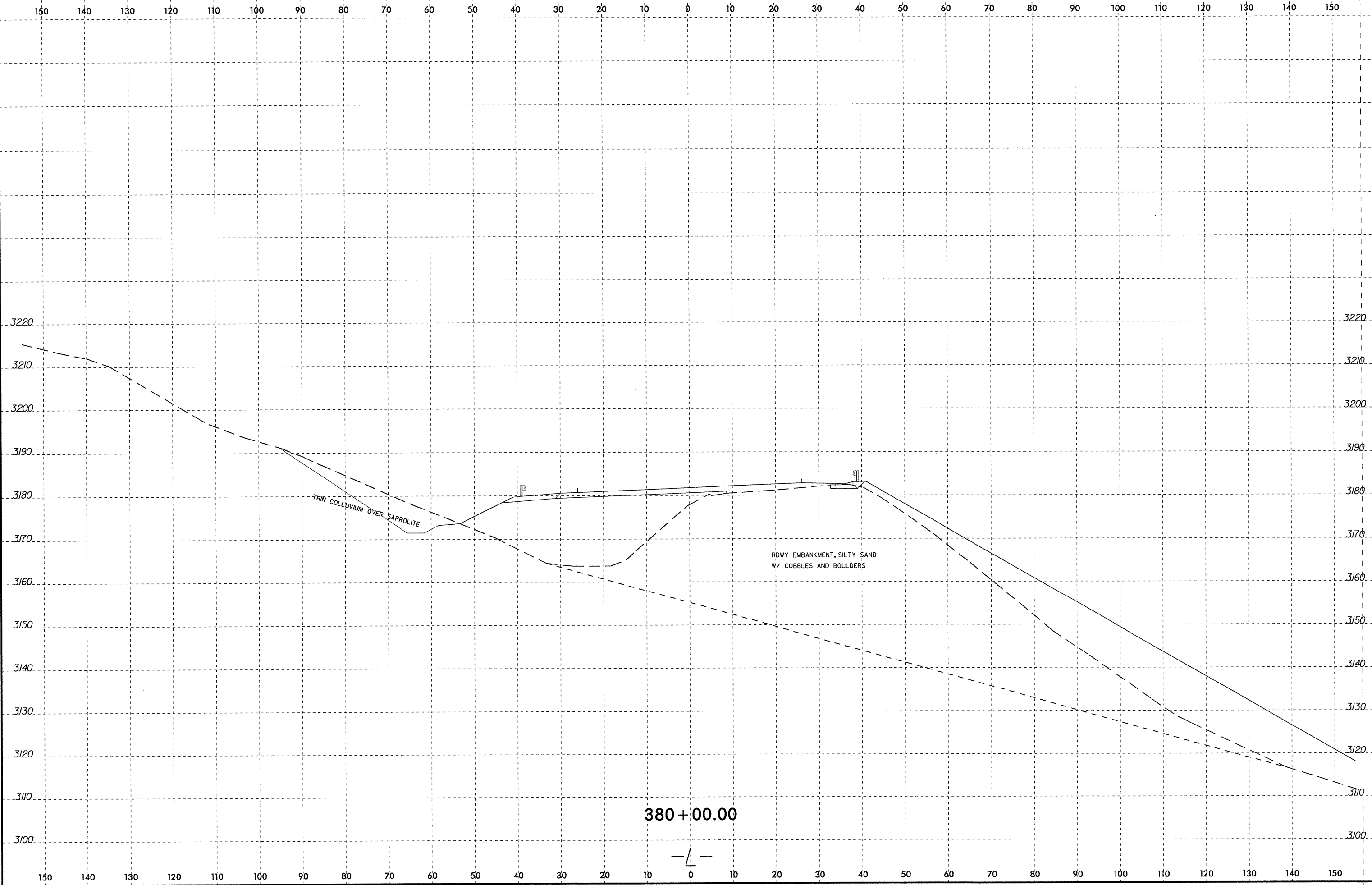


8/23/11



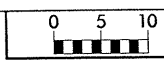
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
65/259



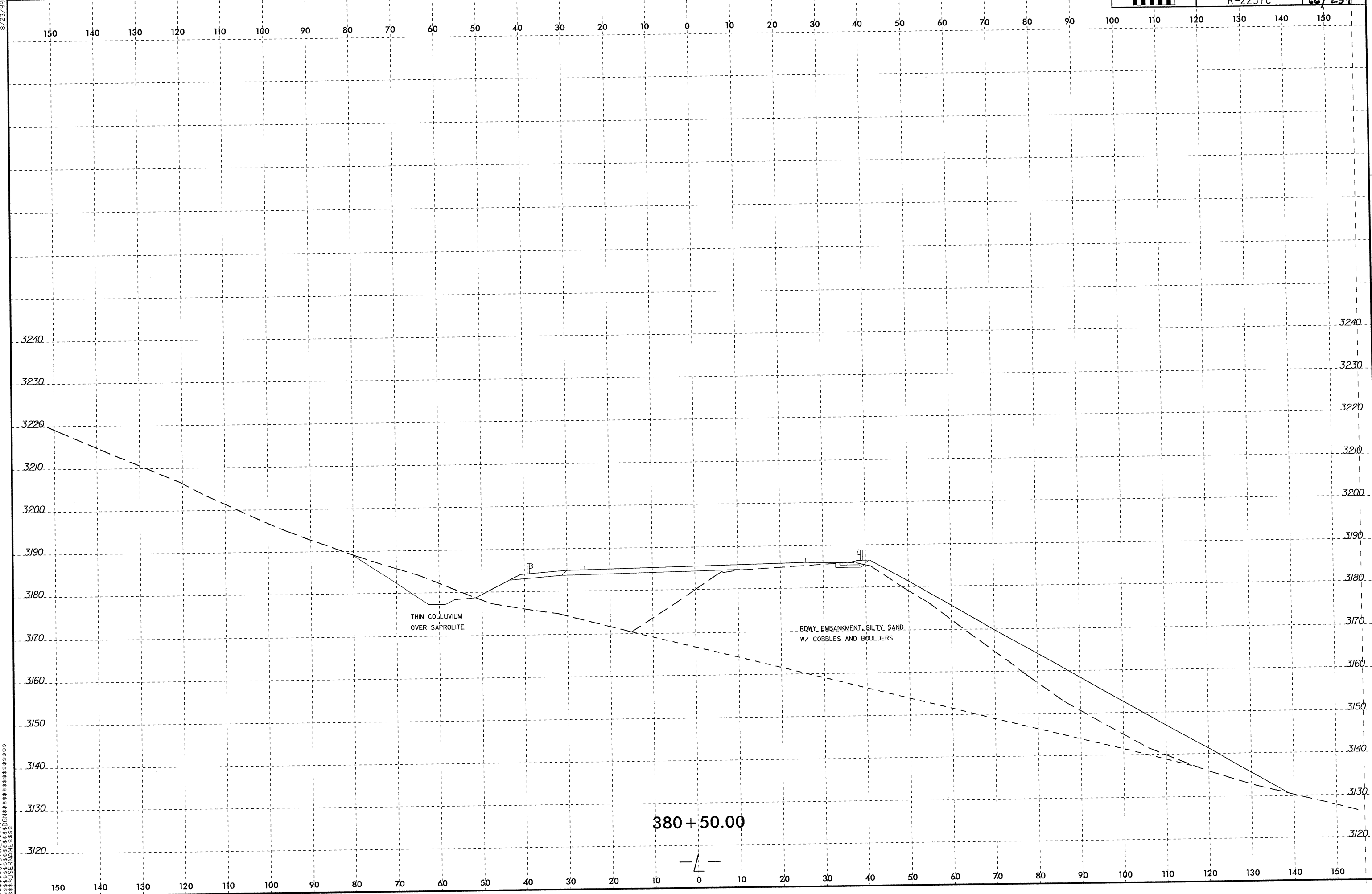
SYSTEMS
DGN
US
L

8/23/99



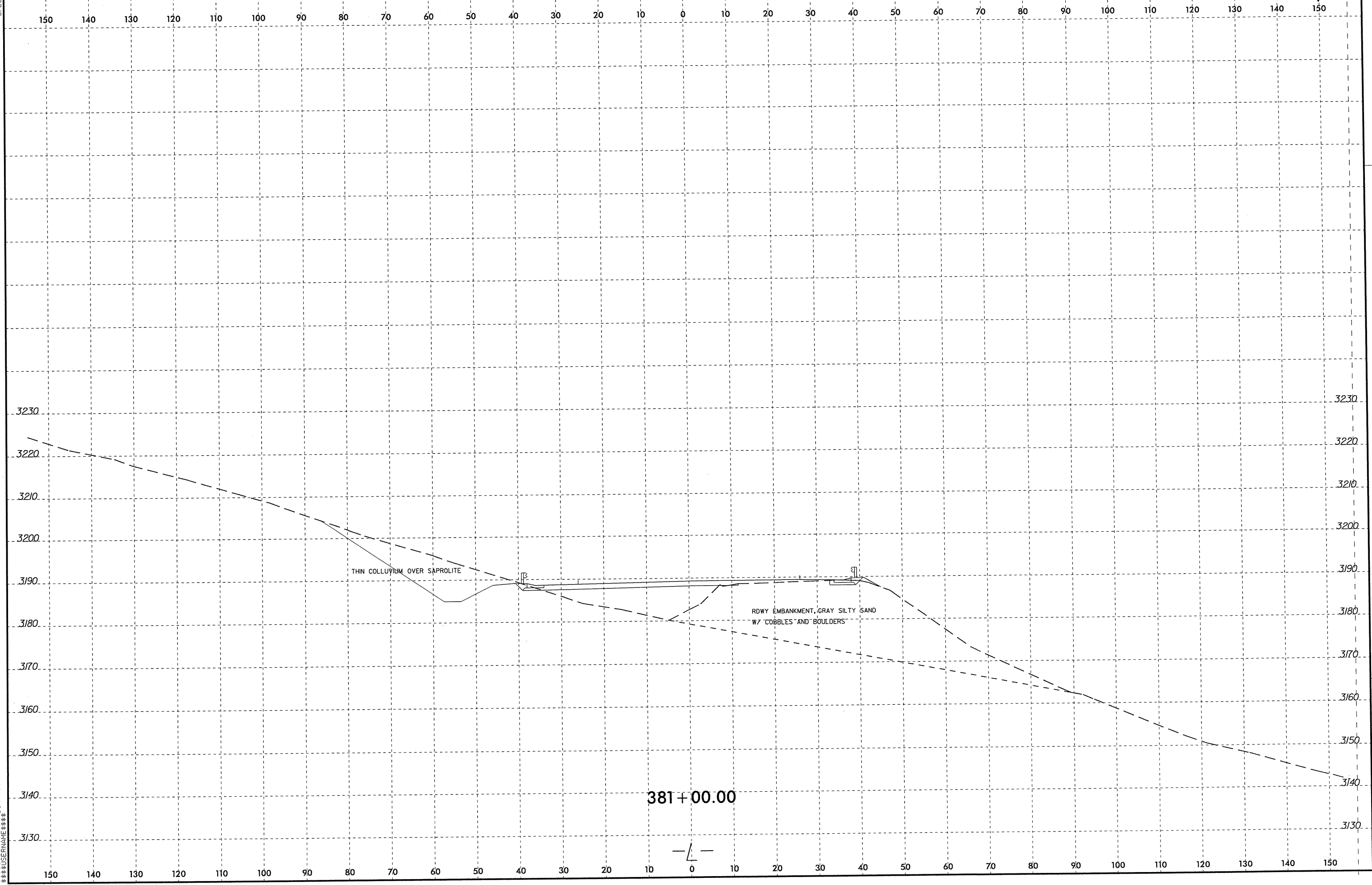
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
66/259

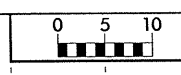


*****SYTIME*****
*****USPER*****

8/23/99
SYTIME
C:\USBR\PROJECTS\823\823.DWG

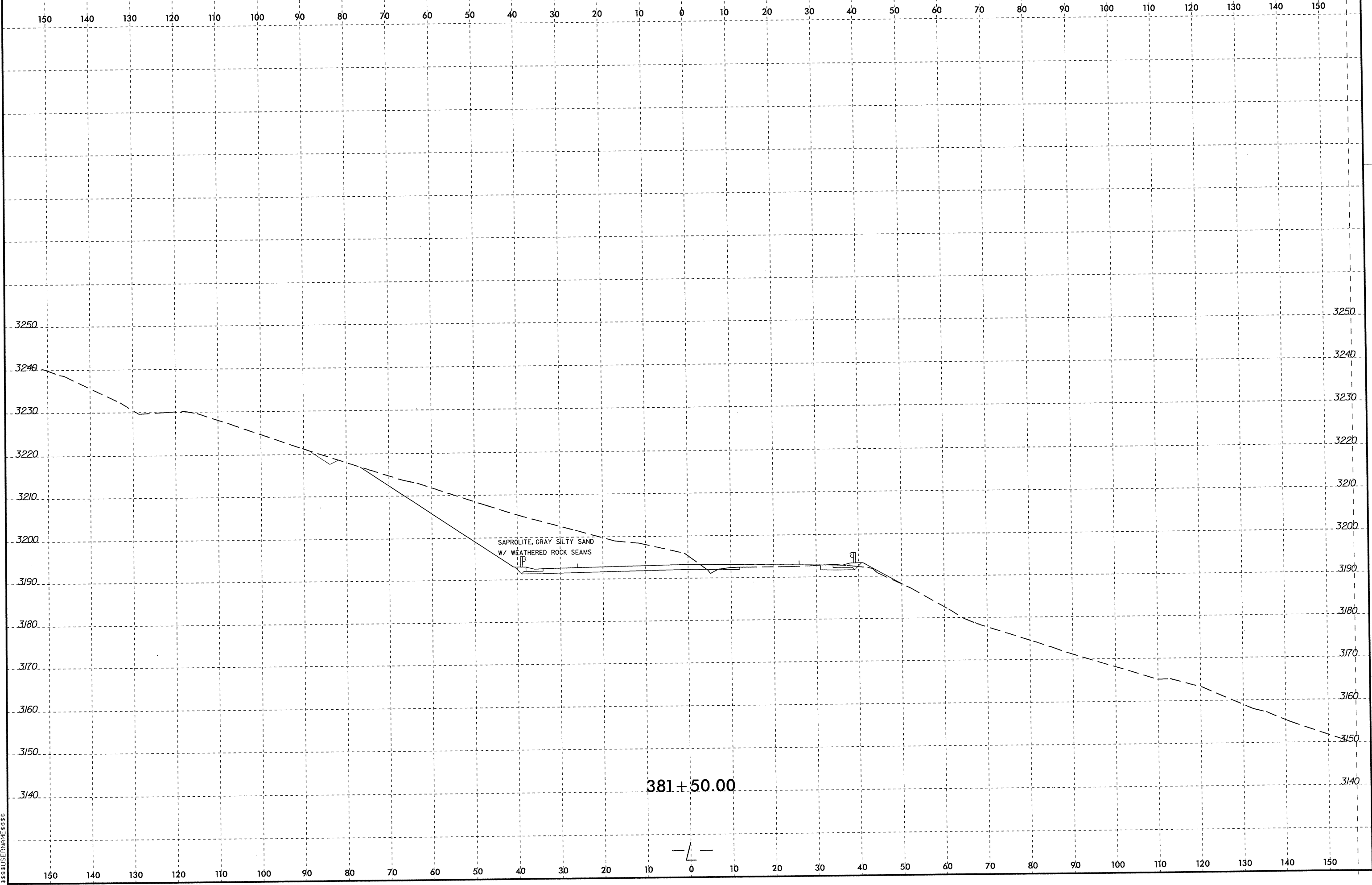


8/23/99



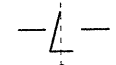
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
68/259



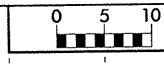
SAPROLITE, GRAY SILTY SAND
W/ WEATHERED ROCK SEAMS

381+50.00

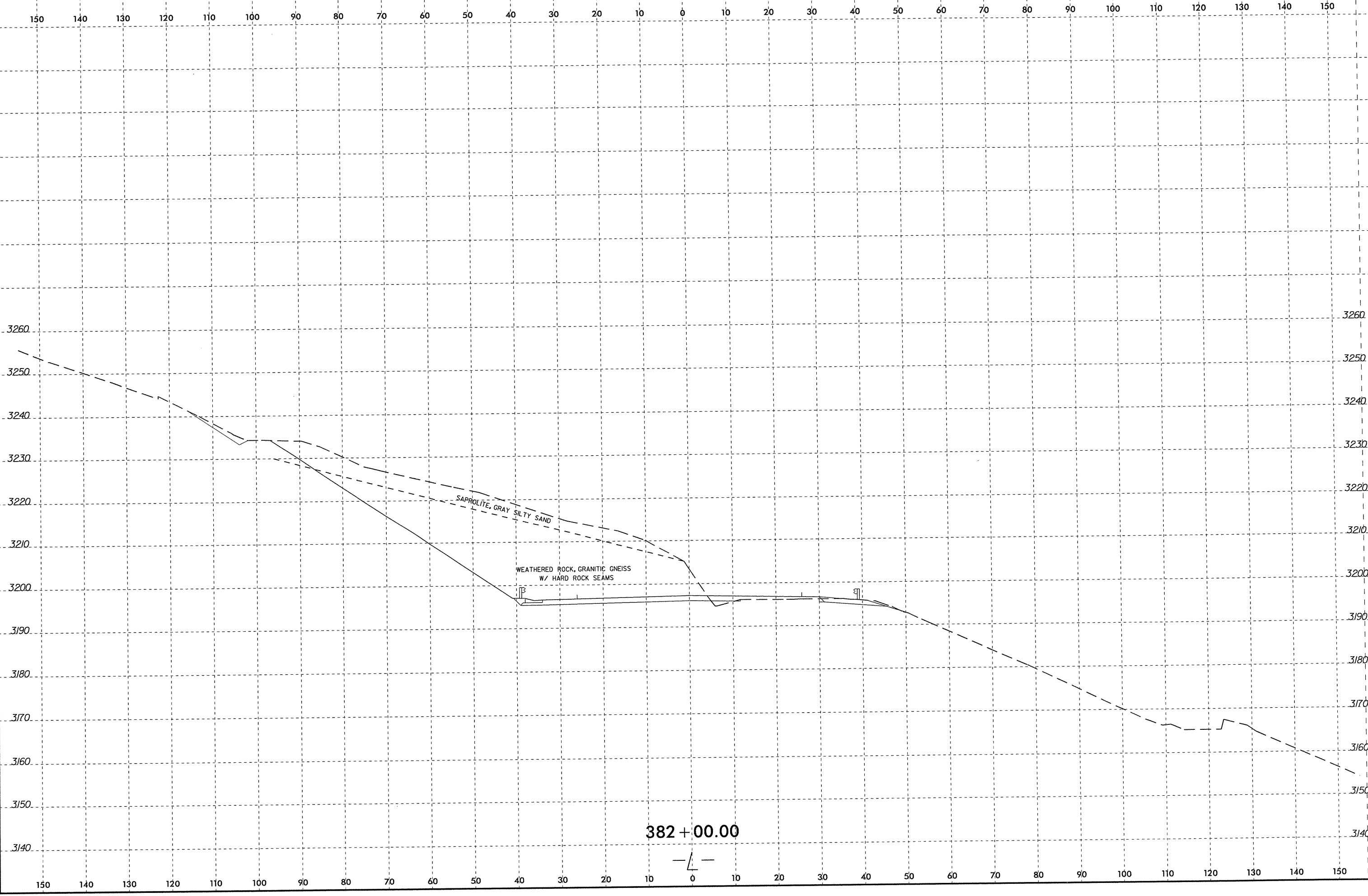


*****SYTIME*****
*****USPRIME*****

8/23/99

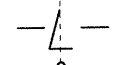


PROJ. REFERENCE NO. R-2237C	SHEET NO. 69/959
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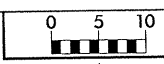


\$\$\$\$SYTIME\$\$\$\$
 \$\$\$USPERM\$\$\$

382 + 00.00

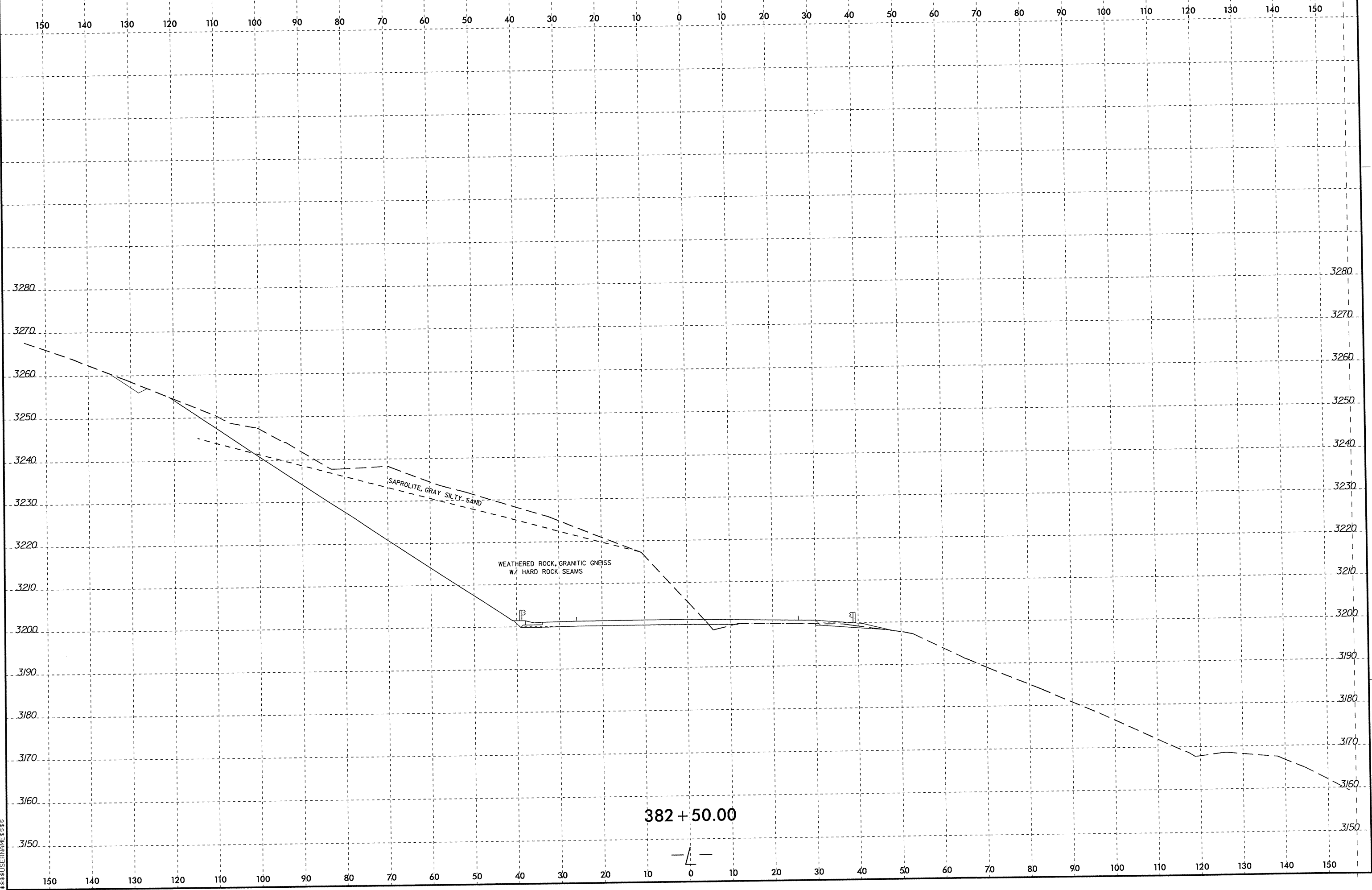


8/23/99



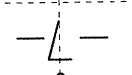
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
70/259

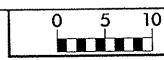


SYSTEM TIME: 8/23/99 10:00:00
USER: JLD
JOB: R-2237C
SHEET: 70/259

382 + 50.00

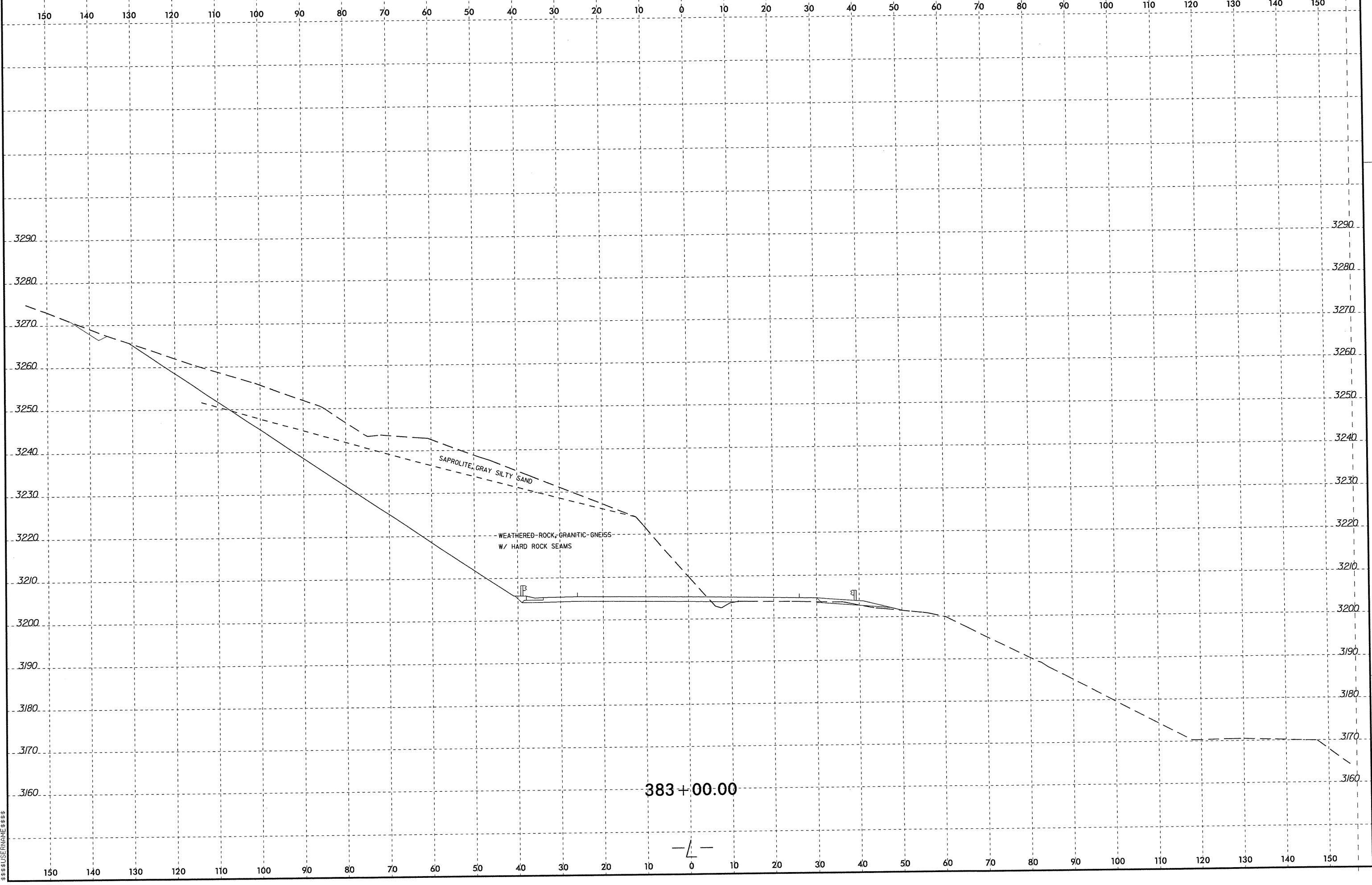


8/23/99



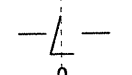
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
71/259

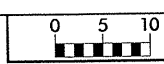


\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$USINER\$\$\$\$\$
\$\$\$\$\$DOWNE\$\$\$\$\$

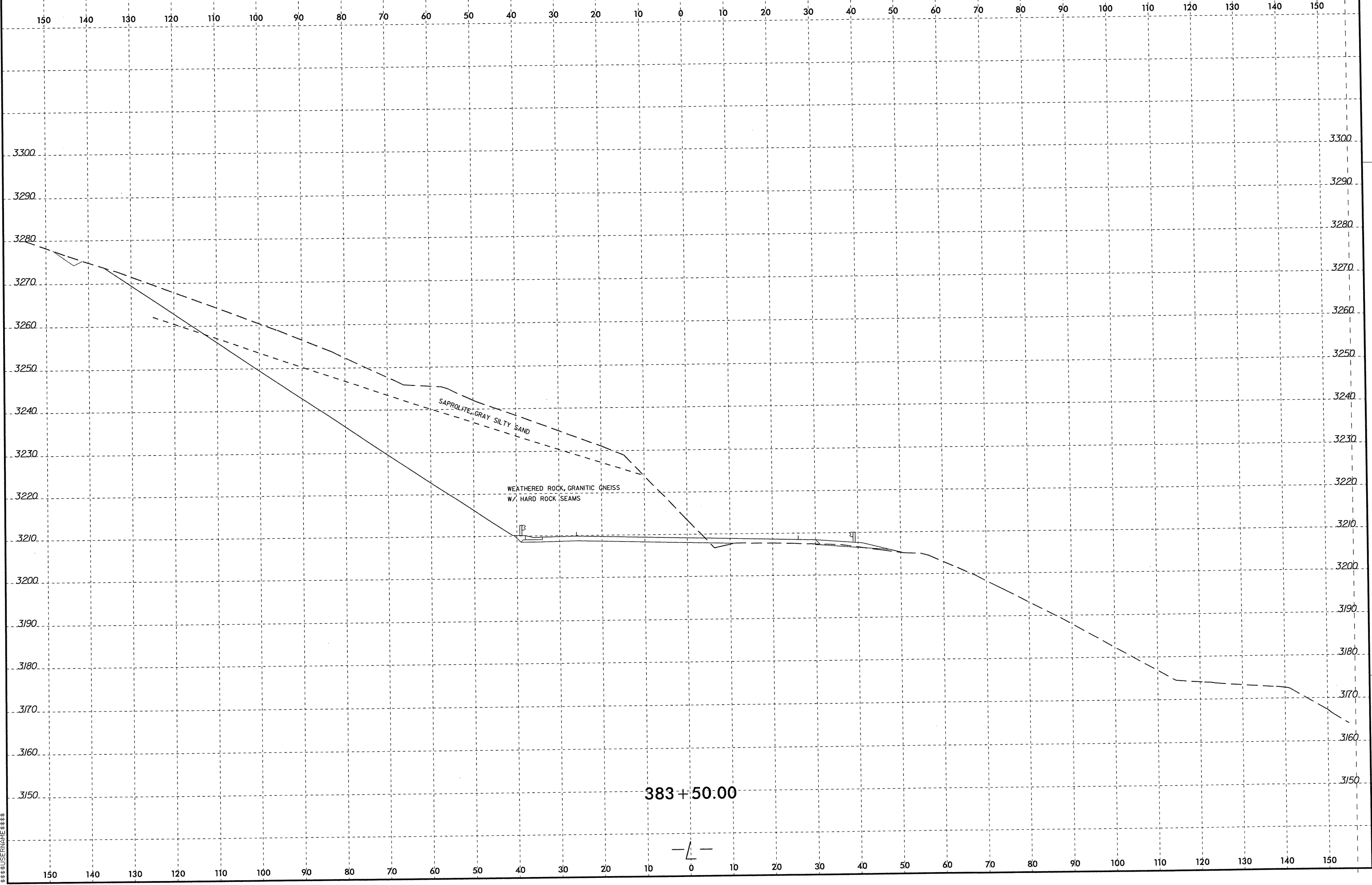
383+00.00



8/23/99

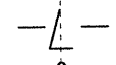


PROJ. REFERENCE NO. R-2237C	SHEET NO. 72 / 259
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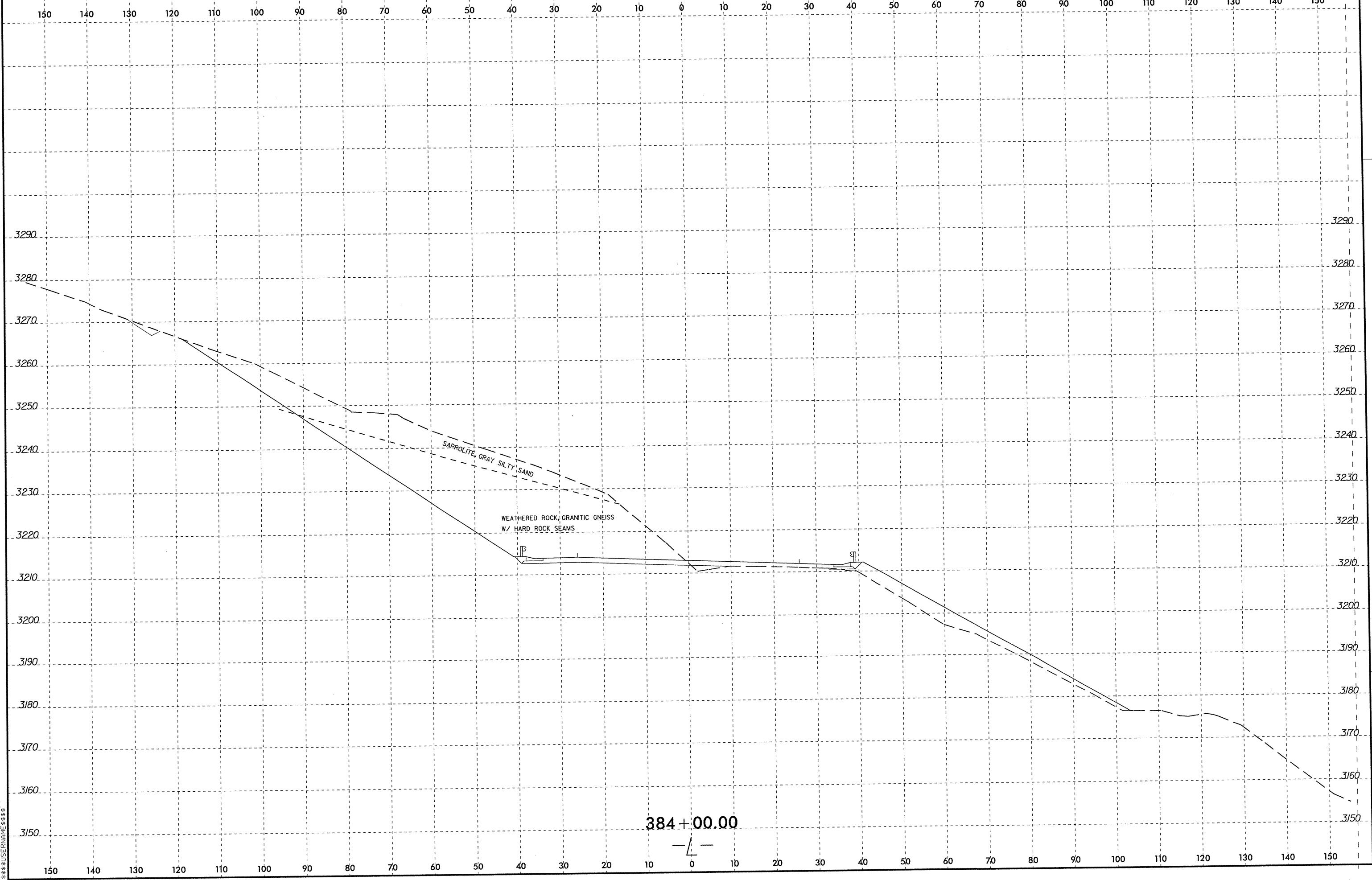


\$\$\$\$SYTIME\$\$\$\$
 \$\$\$USPRIME\$\$\$
 \$\$\$USPRIME\$\$\$

383+50.00

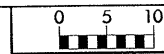


8/23/99



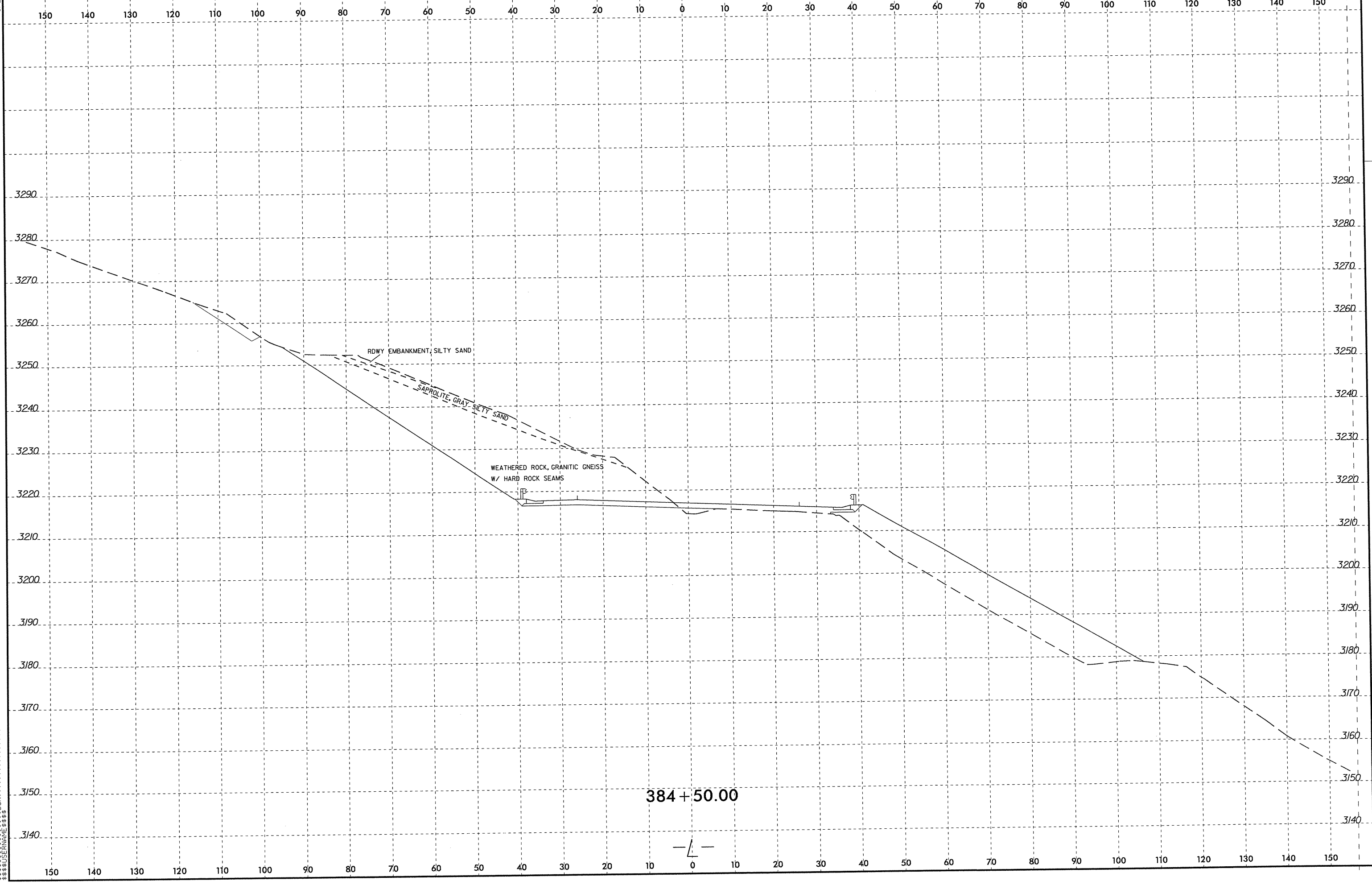
SYSTEM TIME: 8/23/99 10:30:15 AM
USER: J. W. DAVIS
PROJECT: R-2237C
SHEET: 73/259

8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
74/259

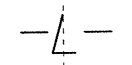


RDWY EMBANKMENT, SILTY SAND

SAPROLITE, GRAY SILTY SAND

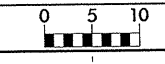
WEATHERED ROCK, GRANITIC GNEISS
W/ HARD ROCK SEAMS

384+50.00

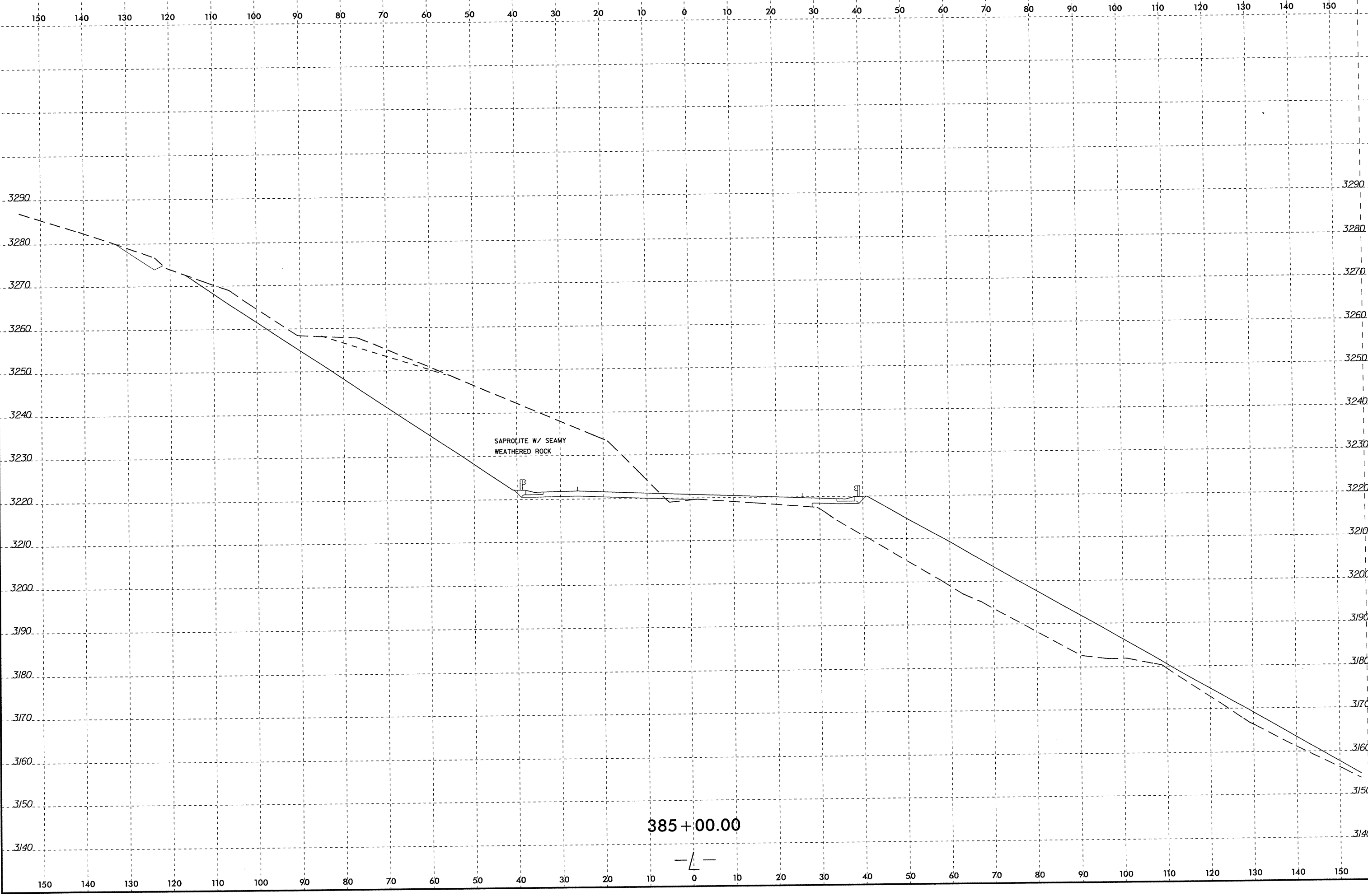


SYSTEM: \$\$\$\$\$\$
USER: \$\$\$\$\$\$
DATE: \$\$\$\$\$\$

8/23/99



PROJ. REFERENCE NO. R-2237C	SHEET NO. 75/259
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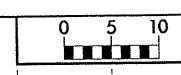
SAPROLITE W/ SEAMY WEATHERED ROCK

385+00.00

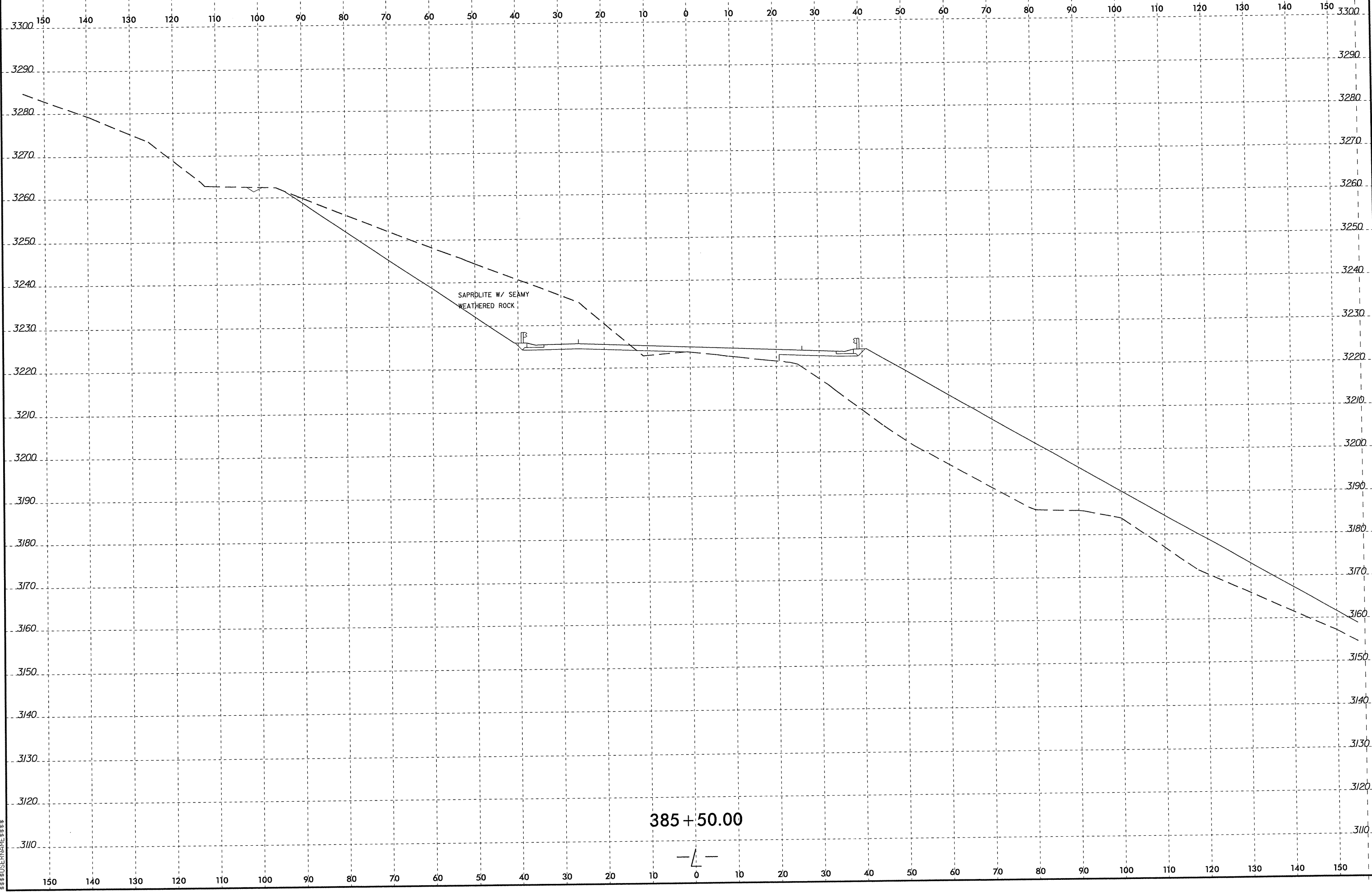


SYSTEMS
 DESIGN
 CONSULTANTS
 INC.
 10000
 WILSON
 AVENUE
 SUITE 100
 BOSTON
 MASSACHUSETTS
 02118

8/23/99

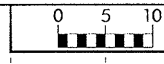


PROJ. REFERENCE NO. R-2237C	SHEET NO. 76/259
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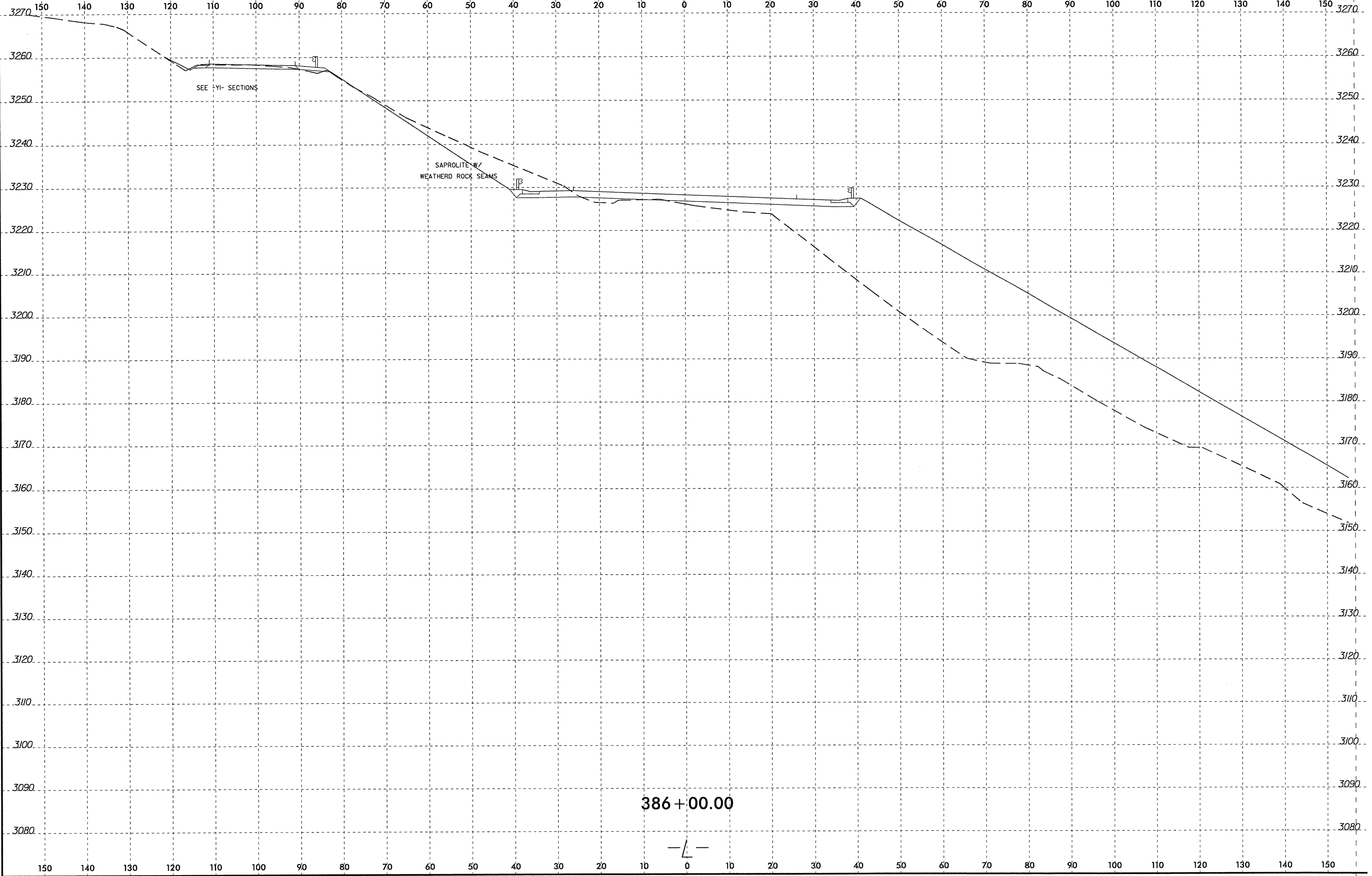
SYNOPSIS OF
 SECTION
 SURFACE
 NAME

8/23/11



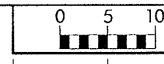
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
77/259



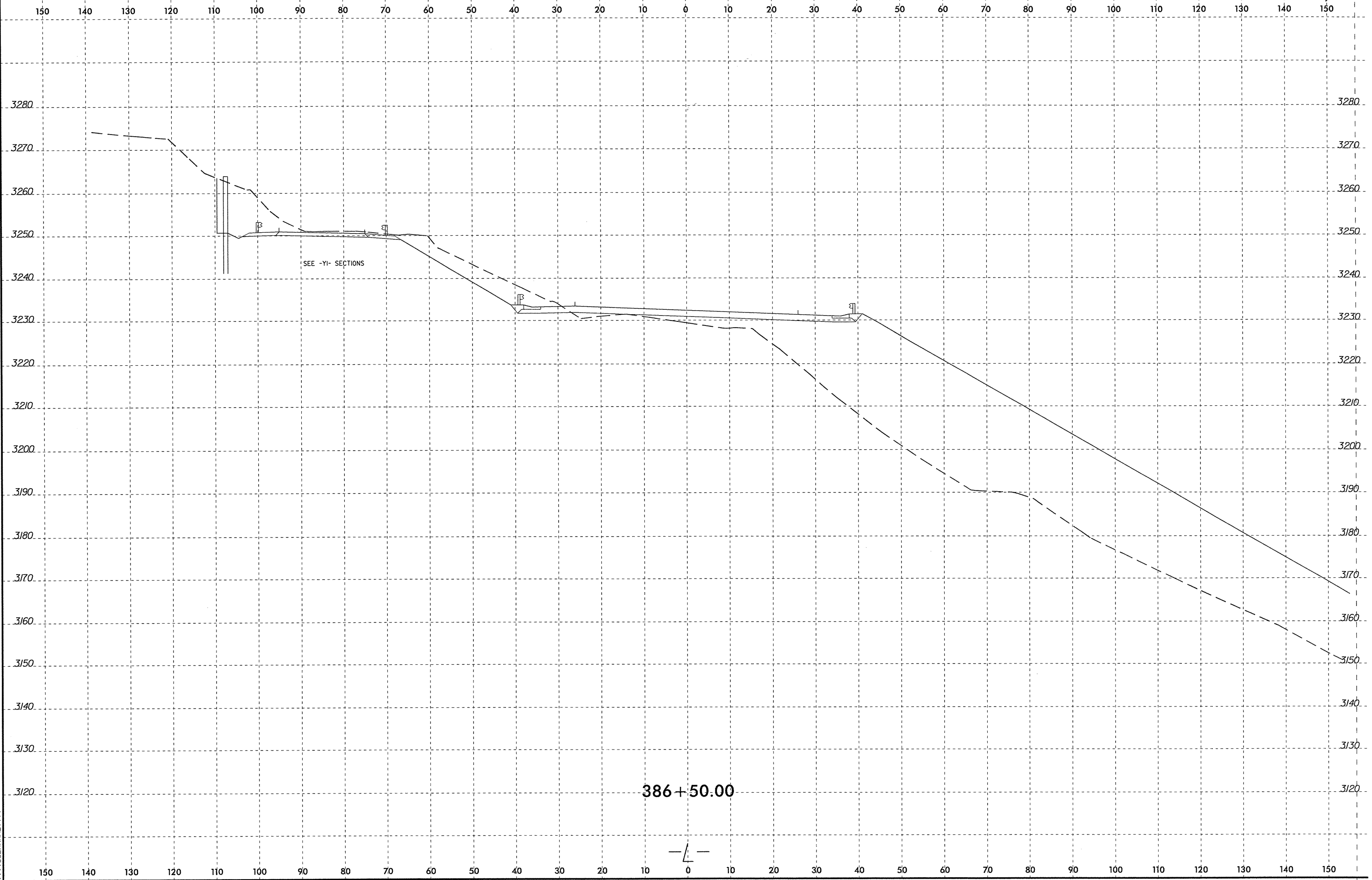
SYSTEM TIME
USERNMILE

8/23/11



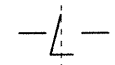
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
78/259

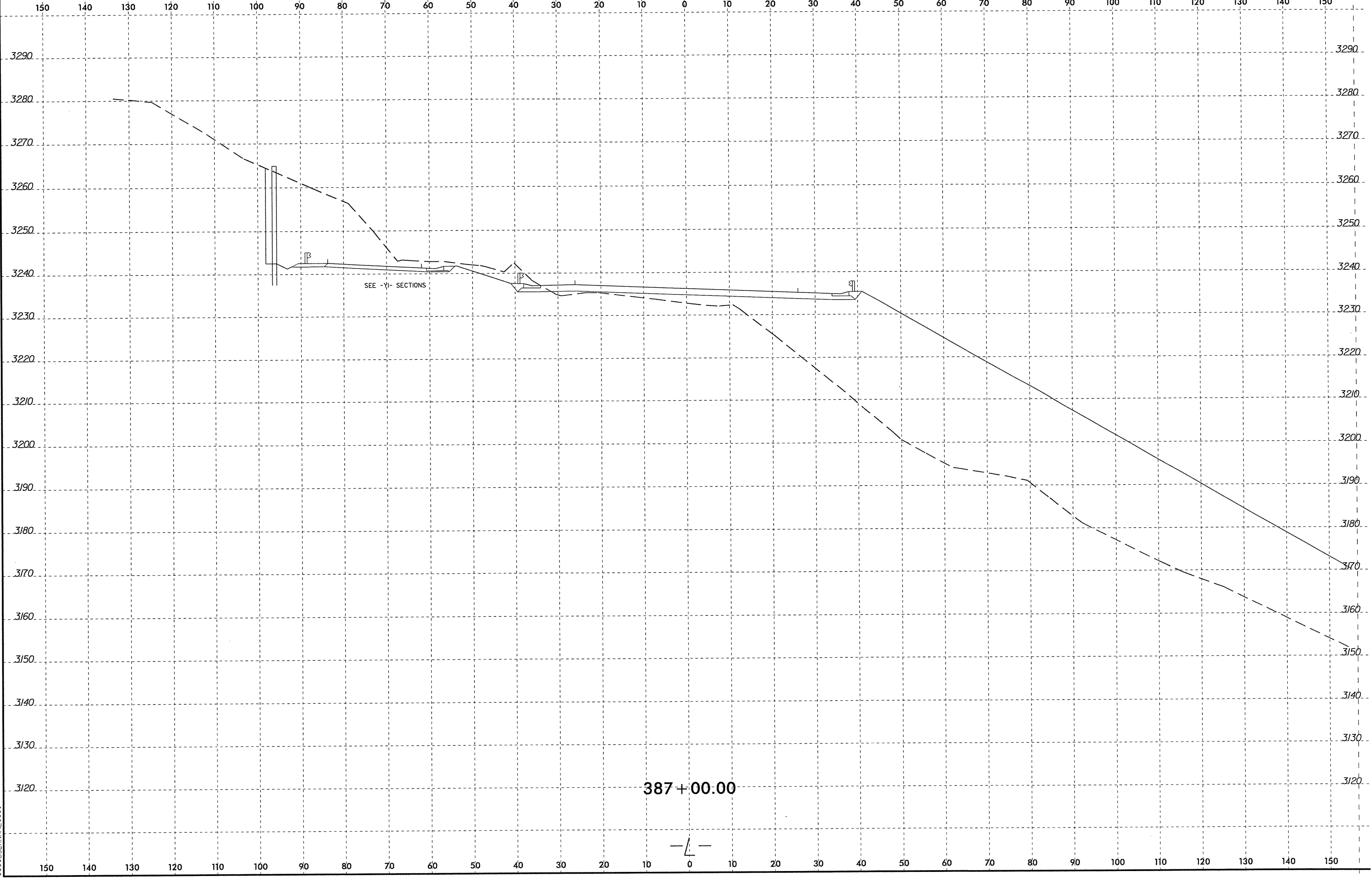


 LUSTIME

386+50.00



8/23/99



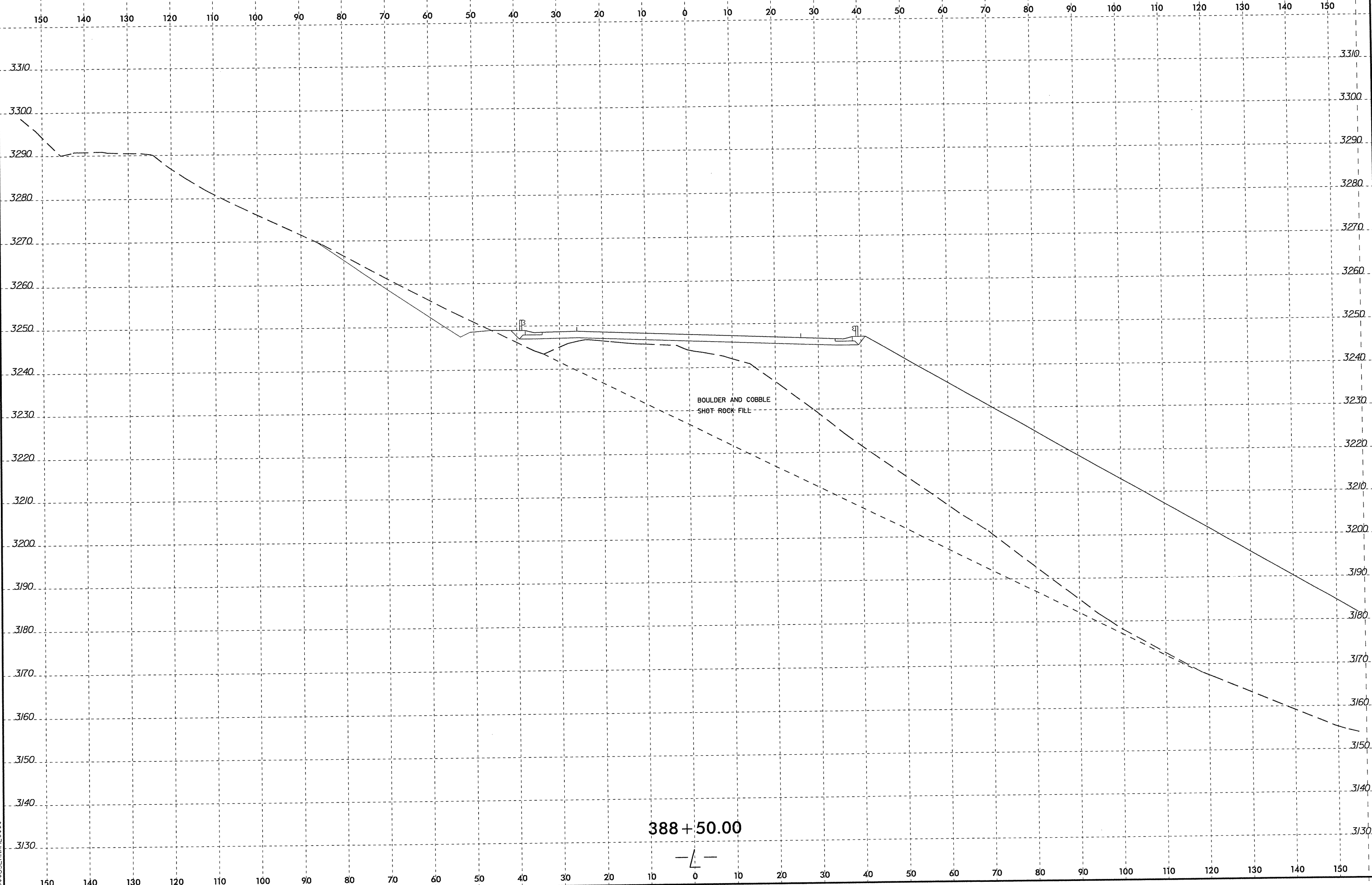
SEE -YI- SECTIONS

387+00.00



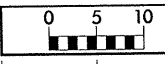
SYSTEM
DONS
US
NAME

8/23/99



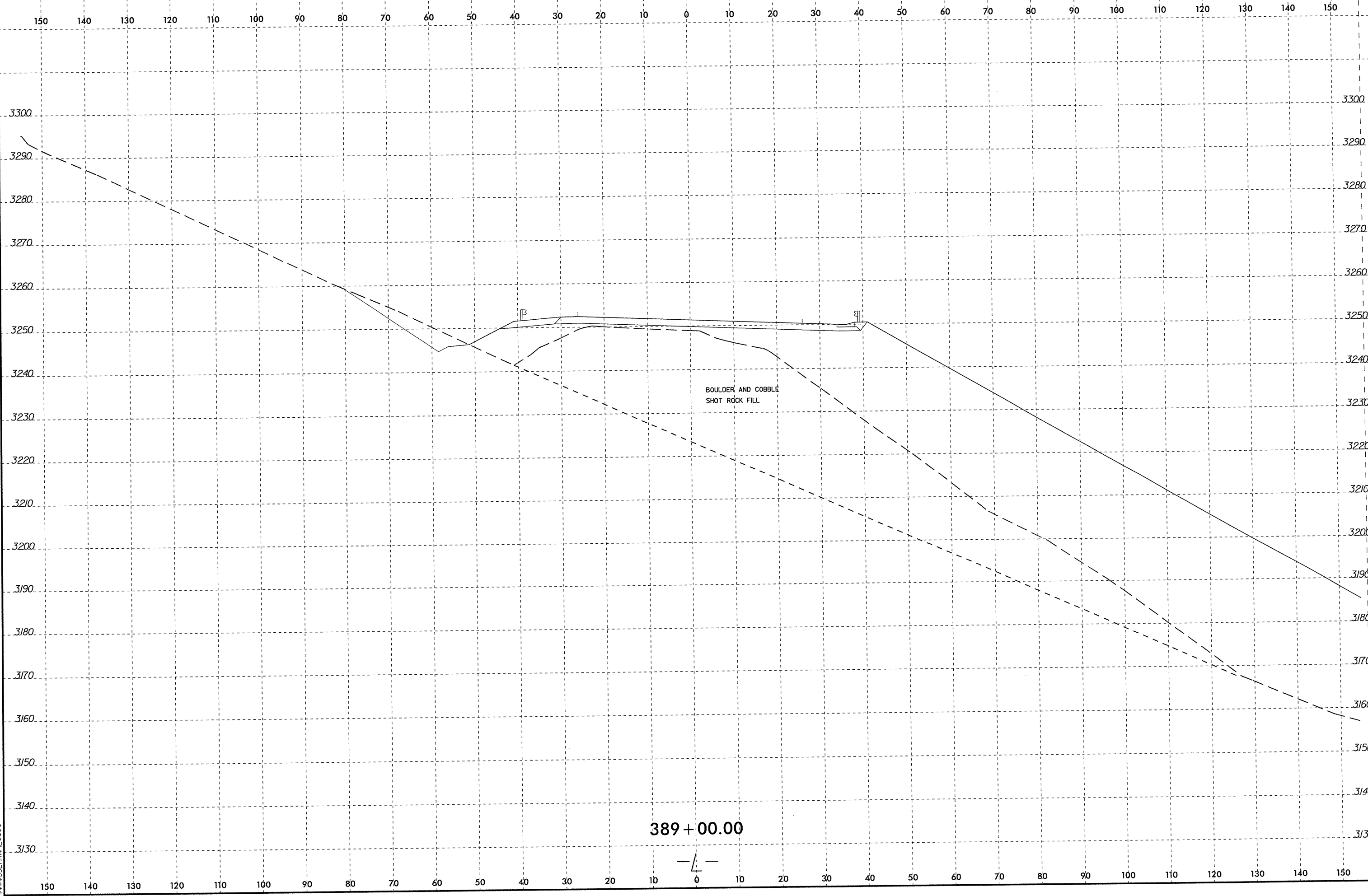
SYSTEMS
SECTION
SURNAME

8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
21/259



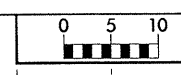
BOULDER AND COBBLE
SHOT ROCK FILL

389+00.00



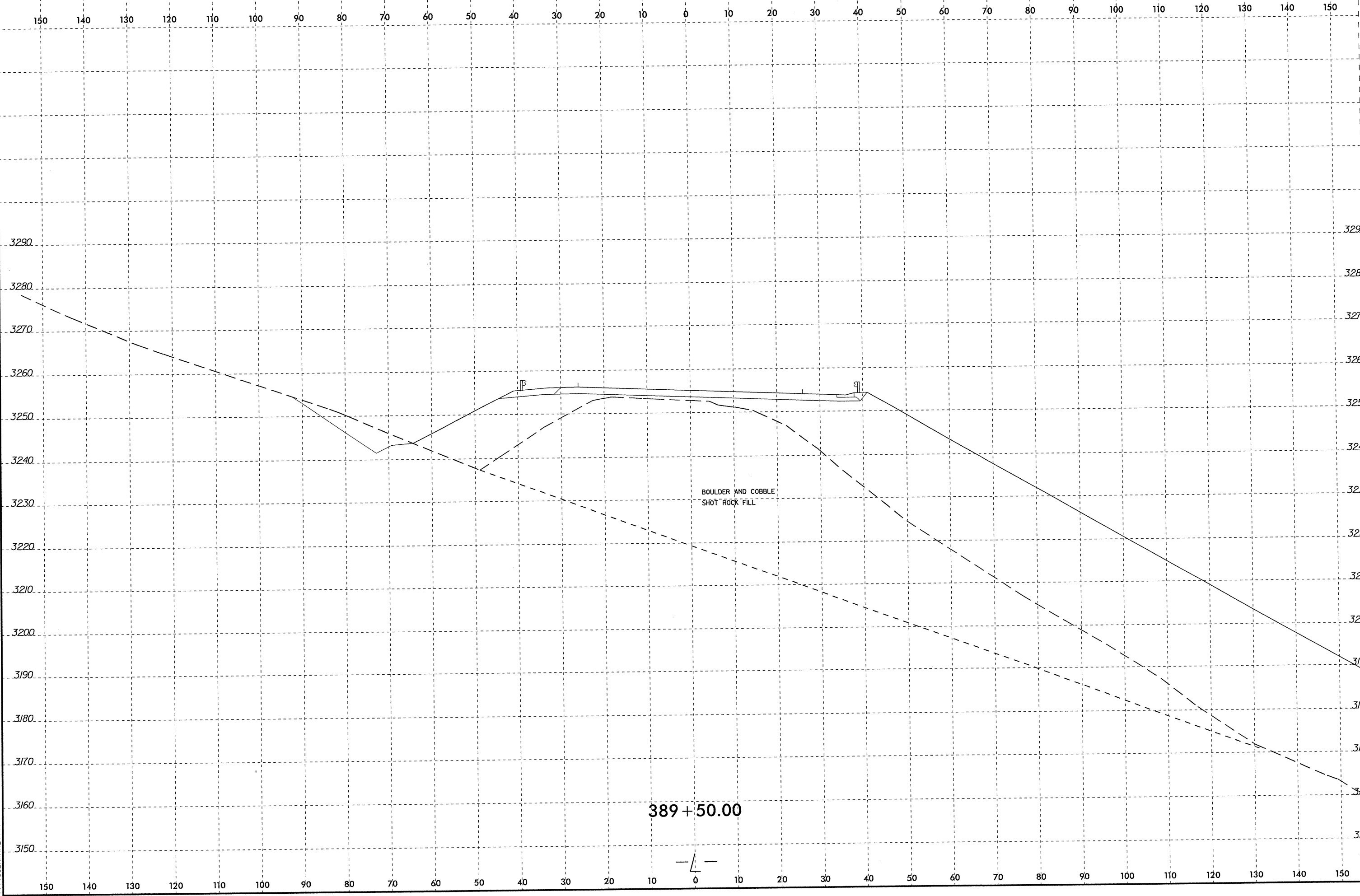
SECTION 389+00.00
SUBGRADE

8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
82/259



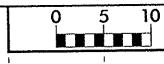
BOULDER AND COBBLE
SHOT ROCK FILL

389 + 50.00

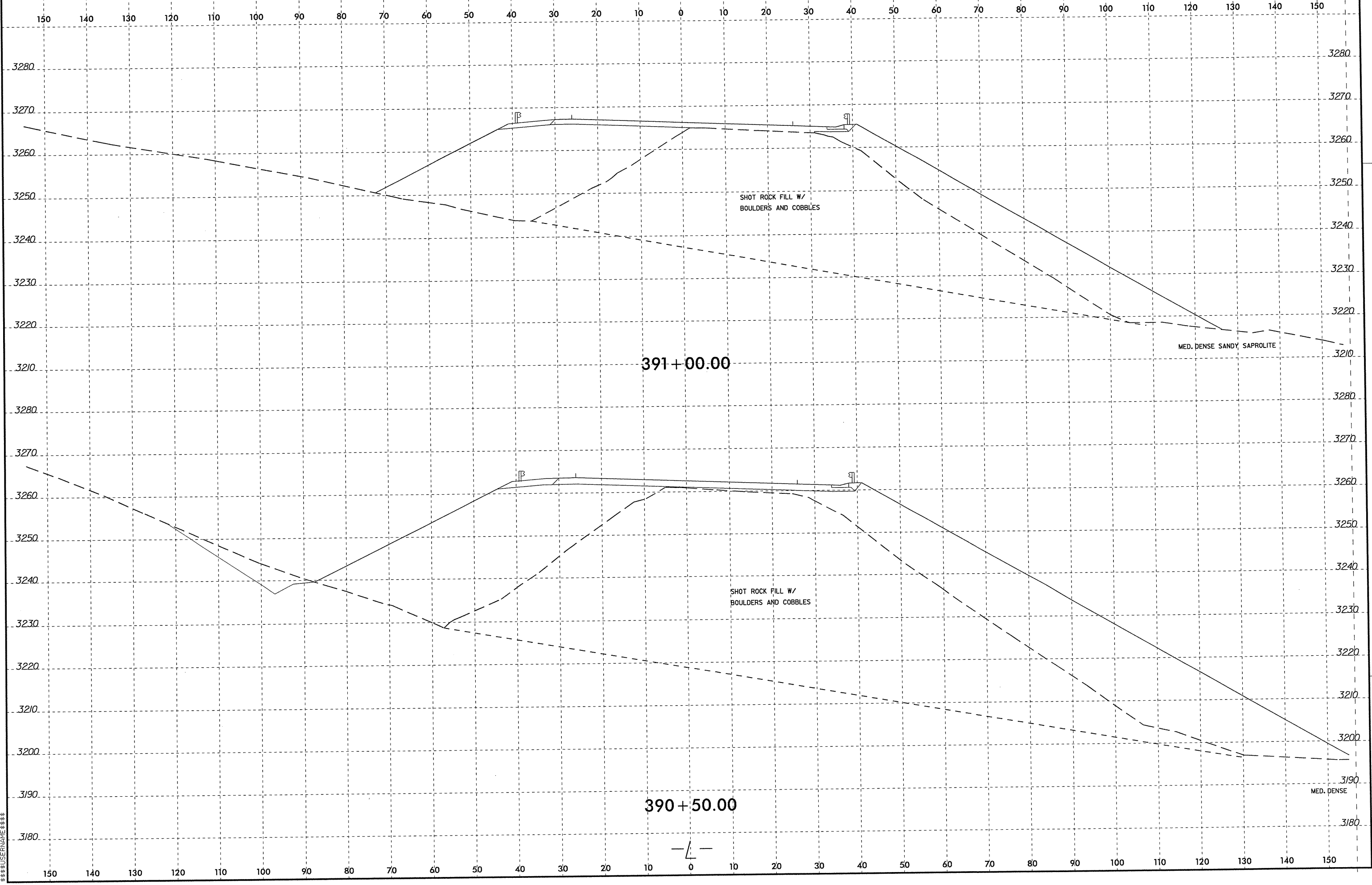


SYSTEMS
DESIGN
SERVICES

8/23/99

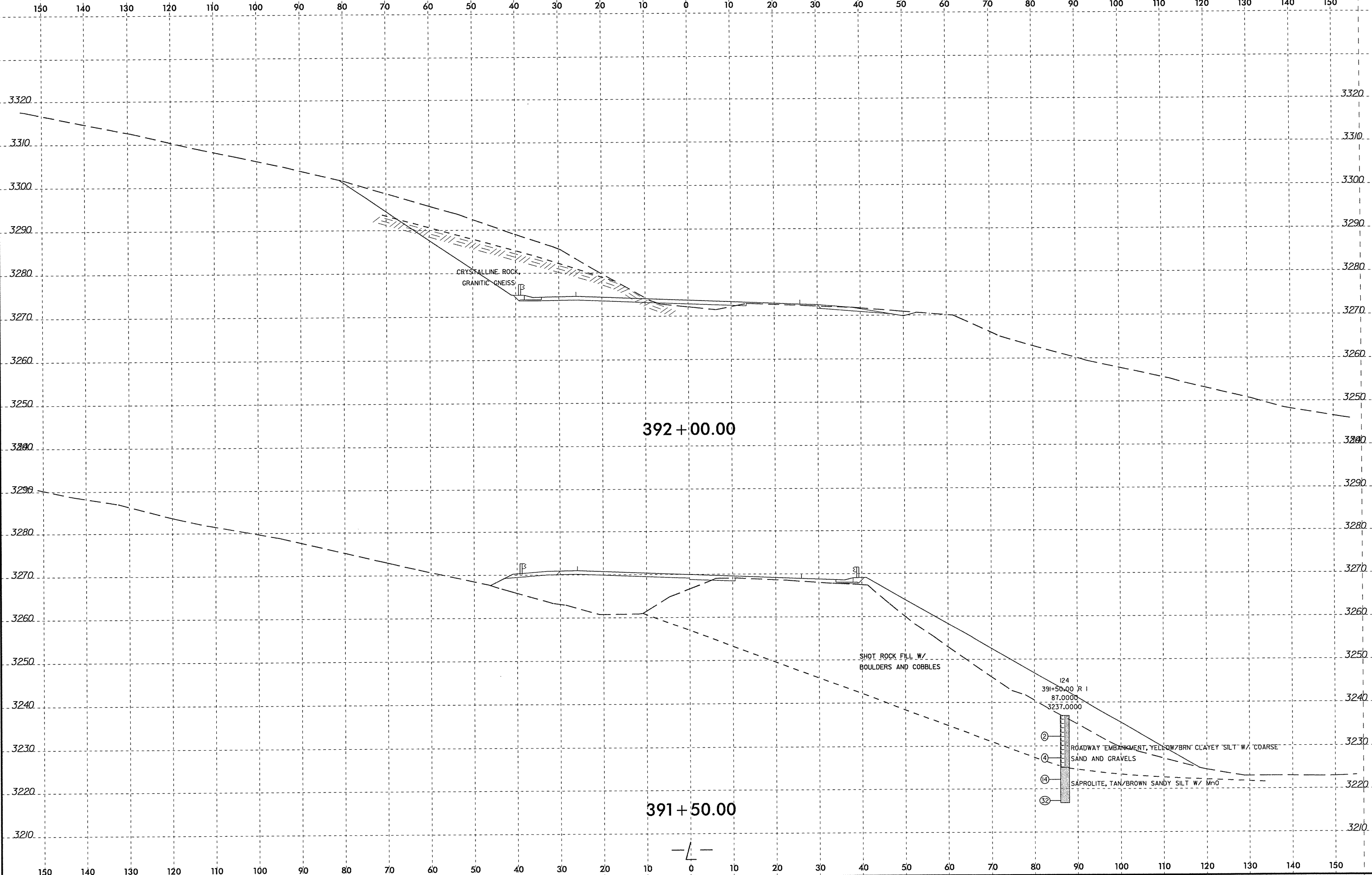


PROJ. REFERENCE NO. R-2237C	SHEET NO. 83/258
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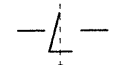


SYTIME

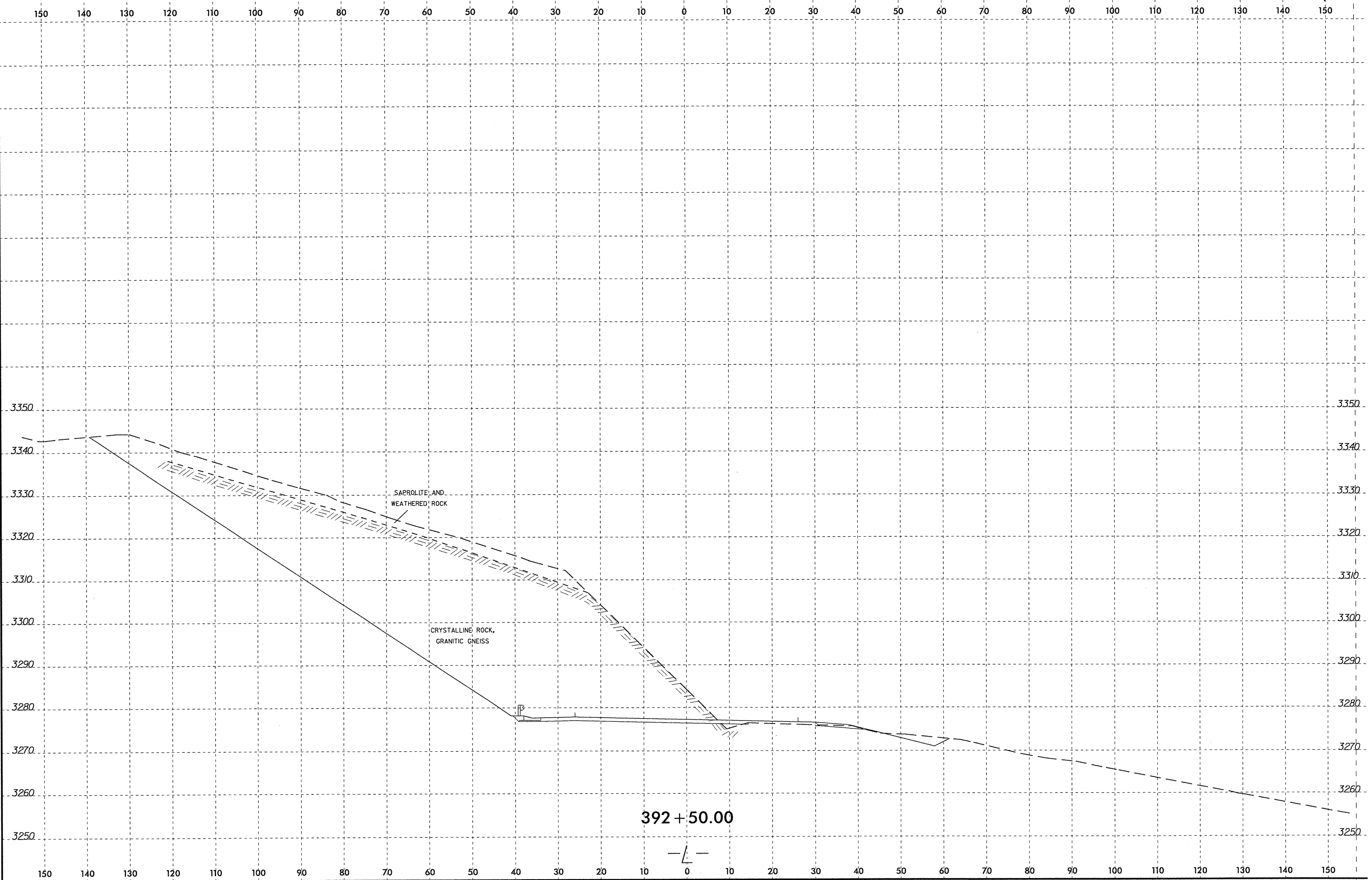
8/23/99



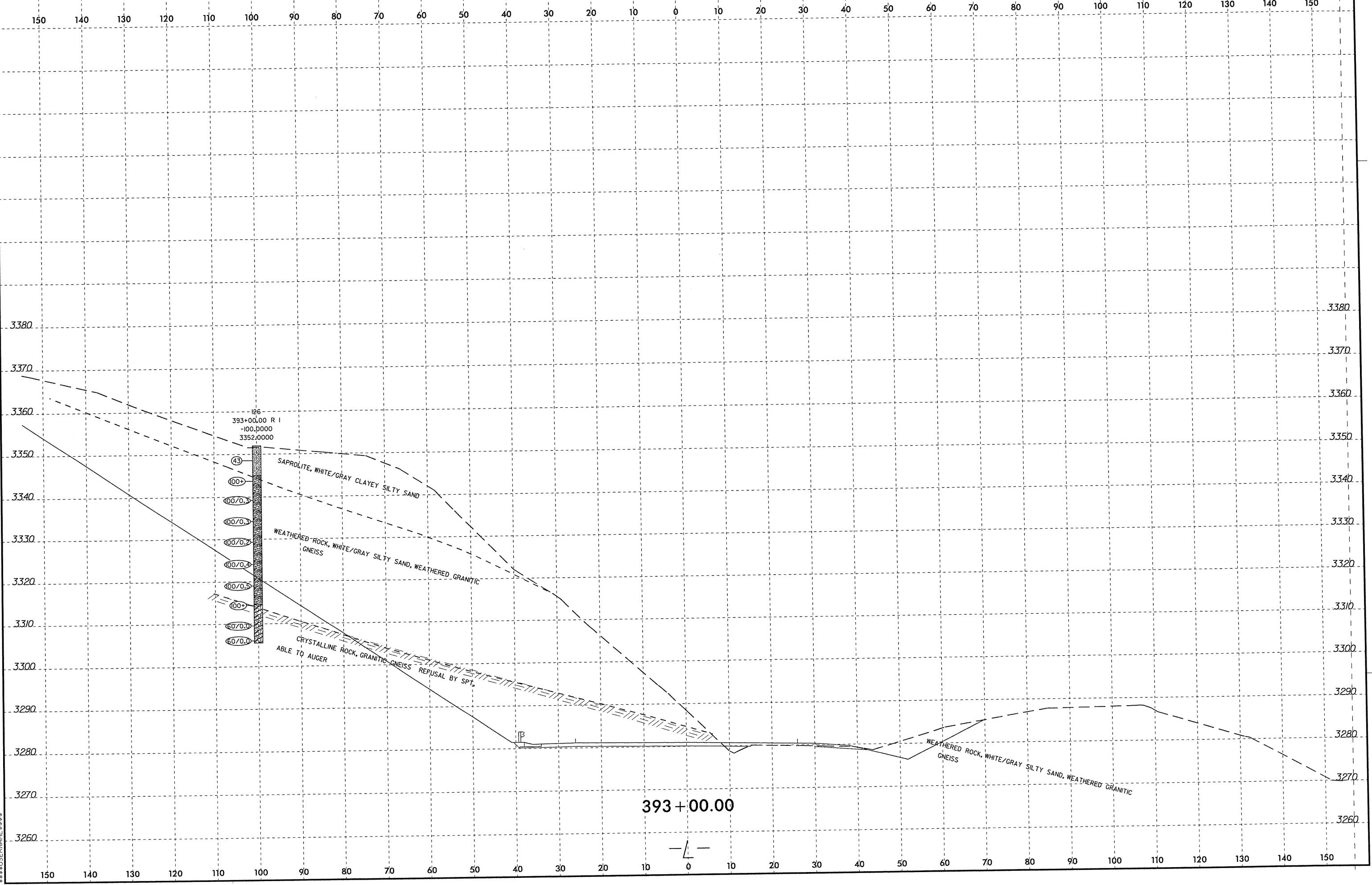
SYSTEMS DOWN DRAINAGE



8/23/91
SYSTEMS
DESIGN
BUSINESS



8/23/99



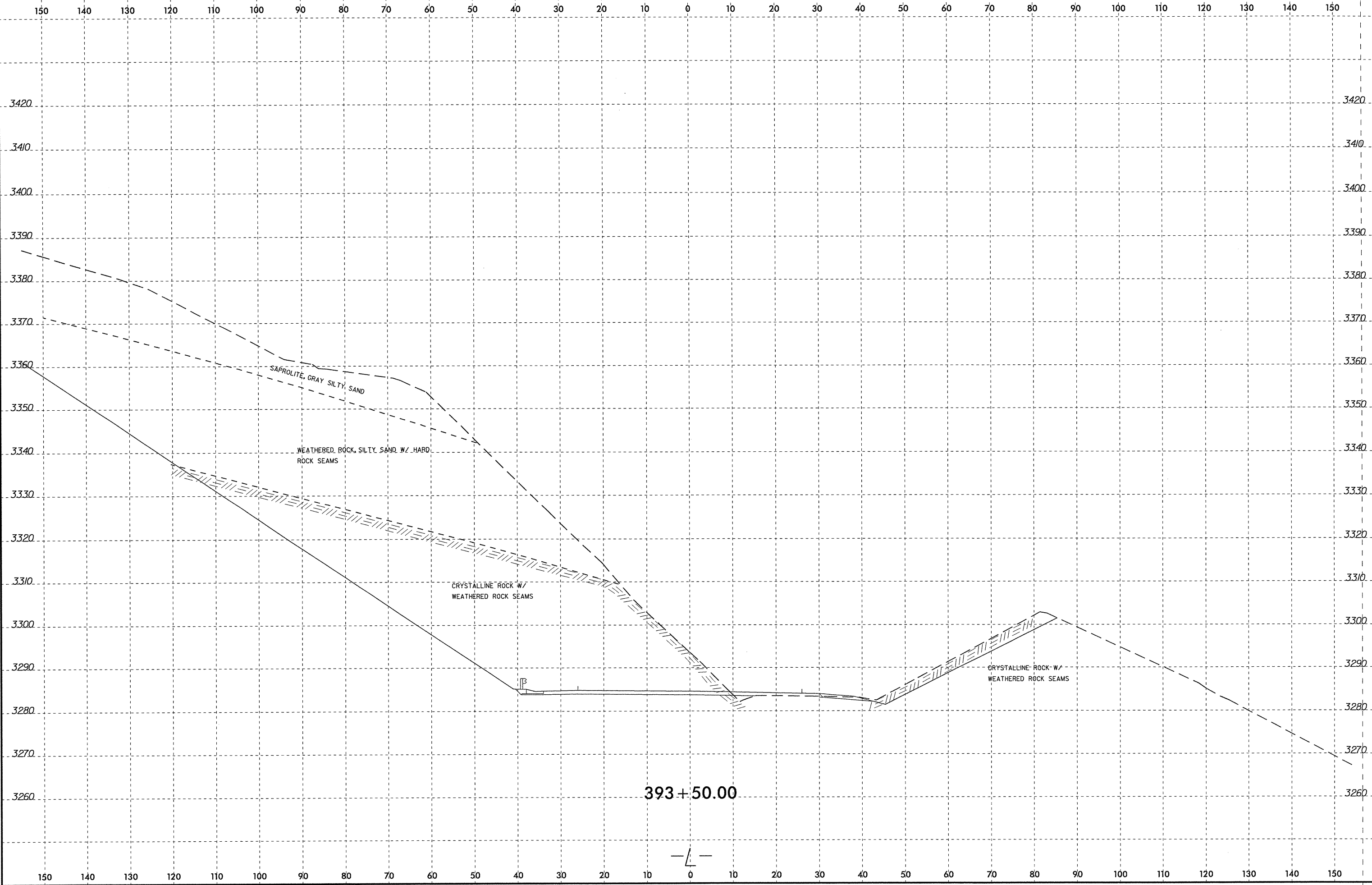
SYTIME
12/12/92
10:00 AM

8/23/11



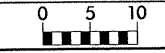
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
87/259

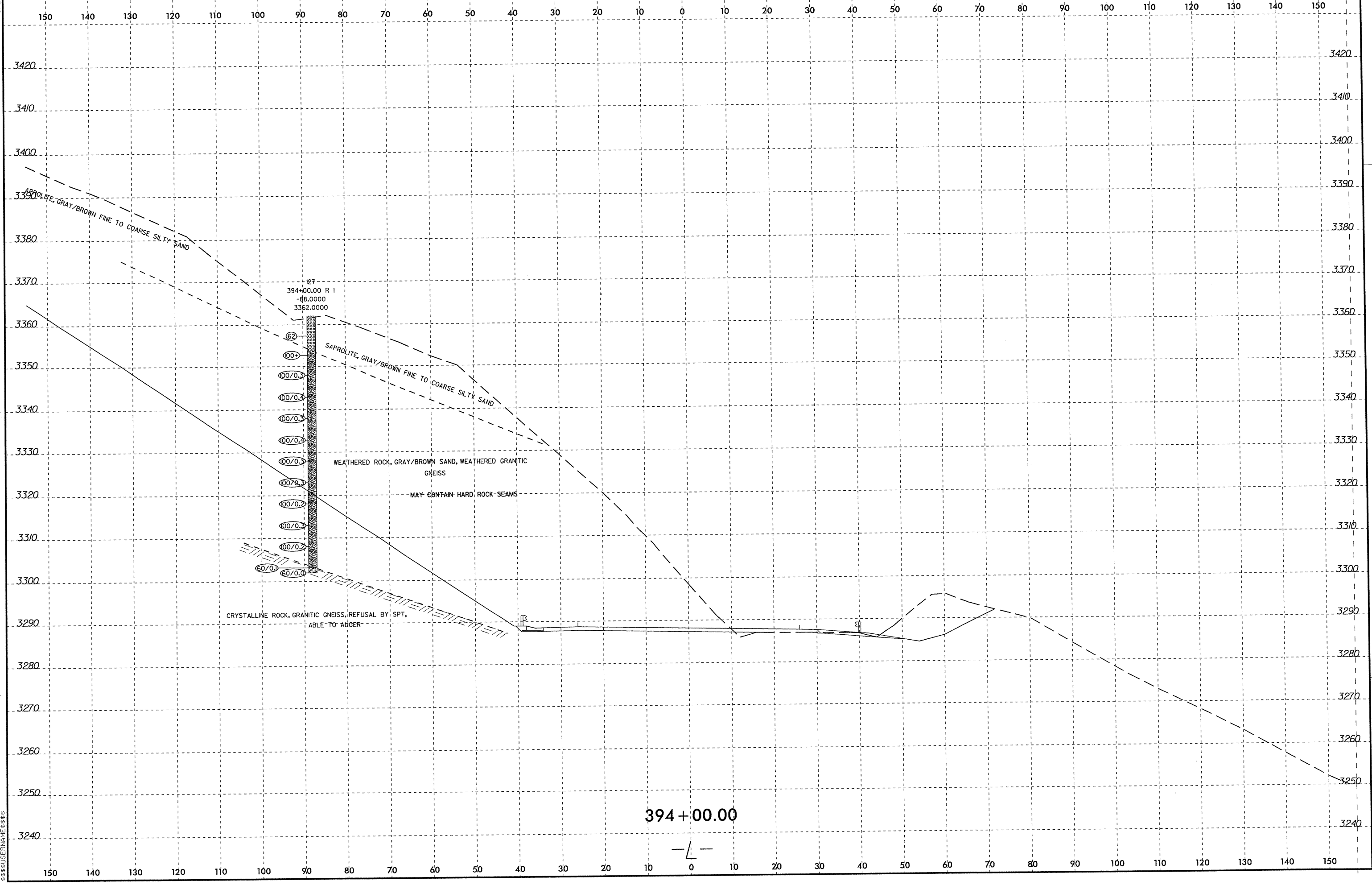


SYSTEMS
DYNAMIC
USERS

8/23/99



PROJ. REFERENCE NO. R-2237C SHEET NO. 88/259



127
394+00.00 R I
-88.0000
3362.0000

SAPROLITE, GRAY/BROWN FINE TO COARSE SILTY SAND

SAPROLITE, GRAY/BROWN FINE TO COARSE SILTY SAND

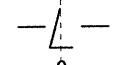
WEATHERED ROCK, GRAY/BROWN SAND, WEATHERED GRANITIC GNEISS

MAY CONTAIN HARD ROCK SEAMS

CRYSTALLINE ROCK, GRANITIC GNEISS, REFUSAL BY SPT, ABLE TO AUGER

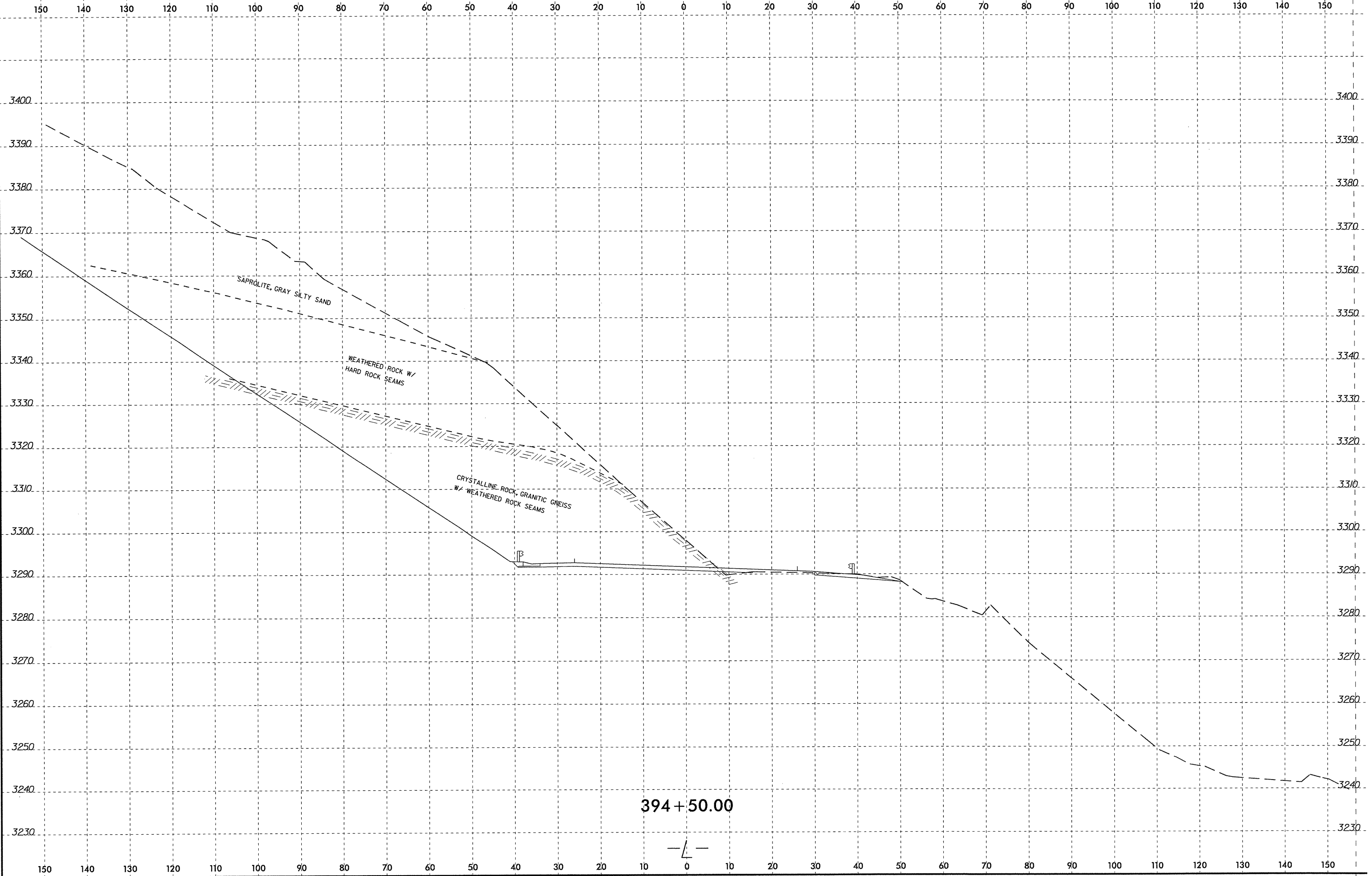
- (62)
- (100)
- (100/0.3)
- (100/0.4)
- (100/0.3)
- (100/0.4)
- (100/0.3)
- (100/0.3)
- (100/0.2)
- (100/0.3)
- (100/0.2)
- (100/0.2)
- (60/0.1)
- (60/0.0)

394 + 00.00



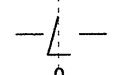
SYSTEM TIME: 8/23/99 10:00:00 AM
USER: JLN

8/23/91

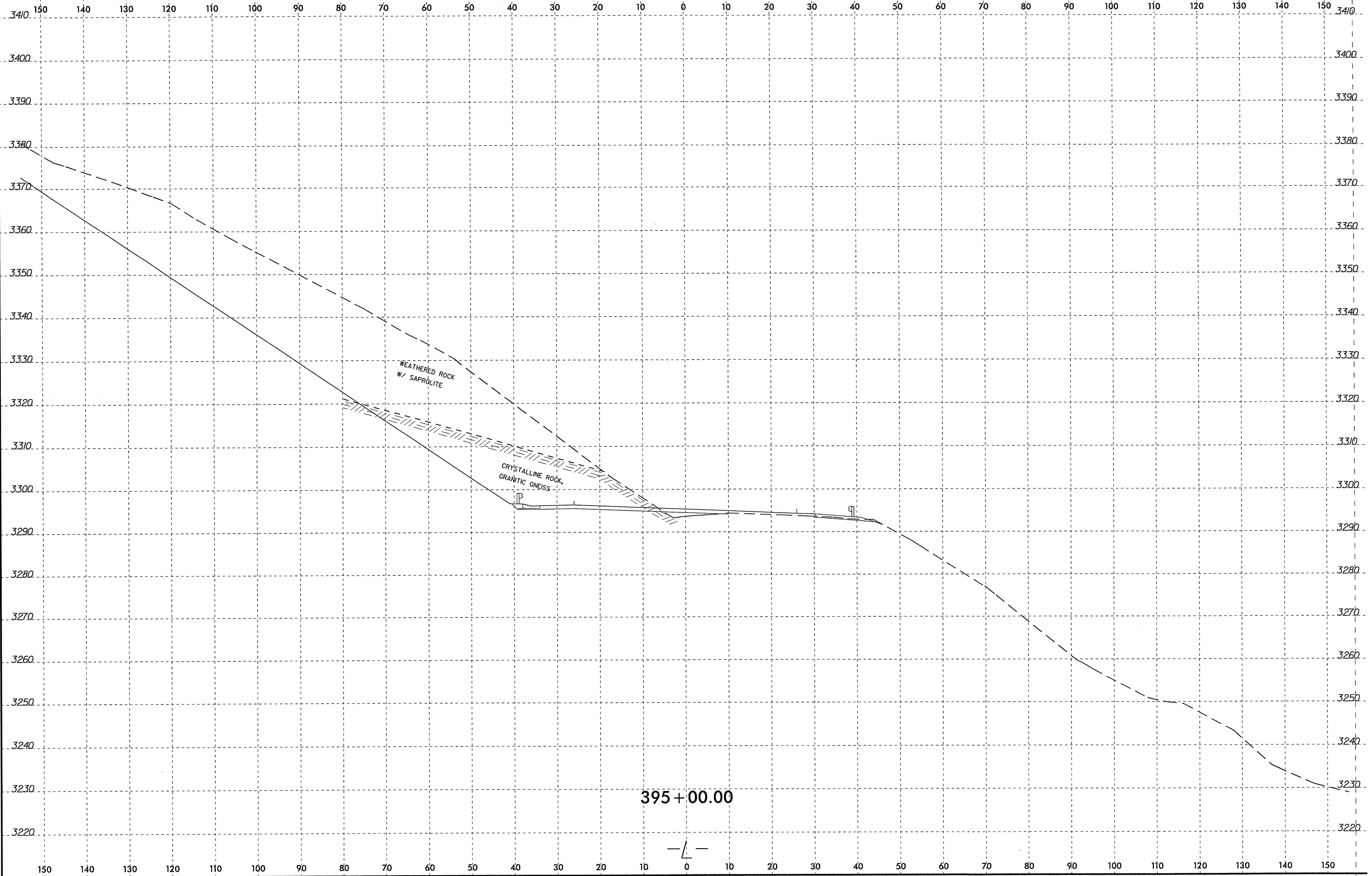


8/23/91

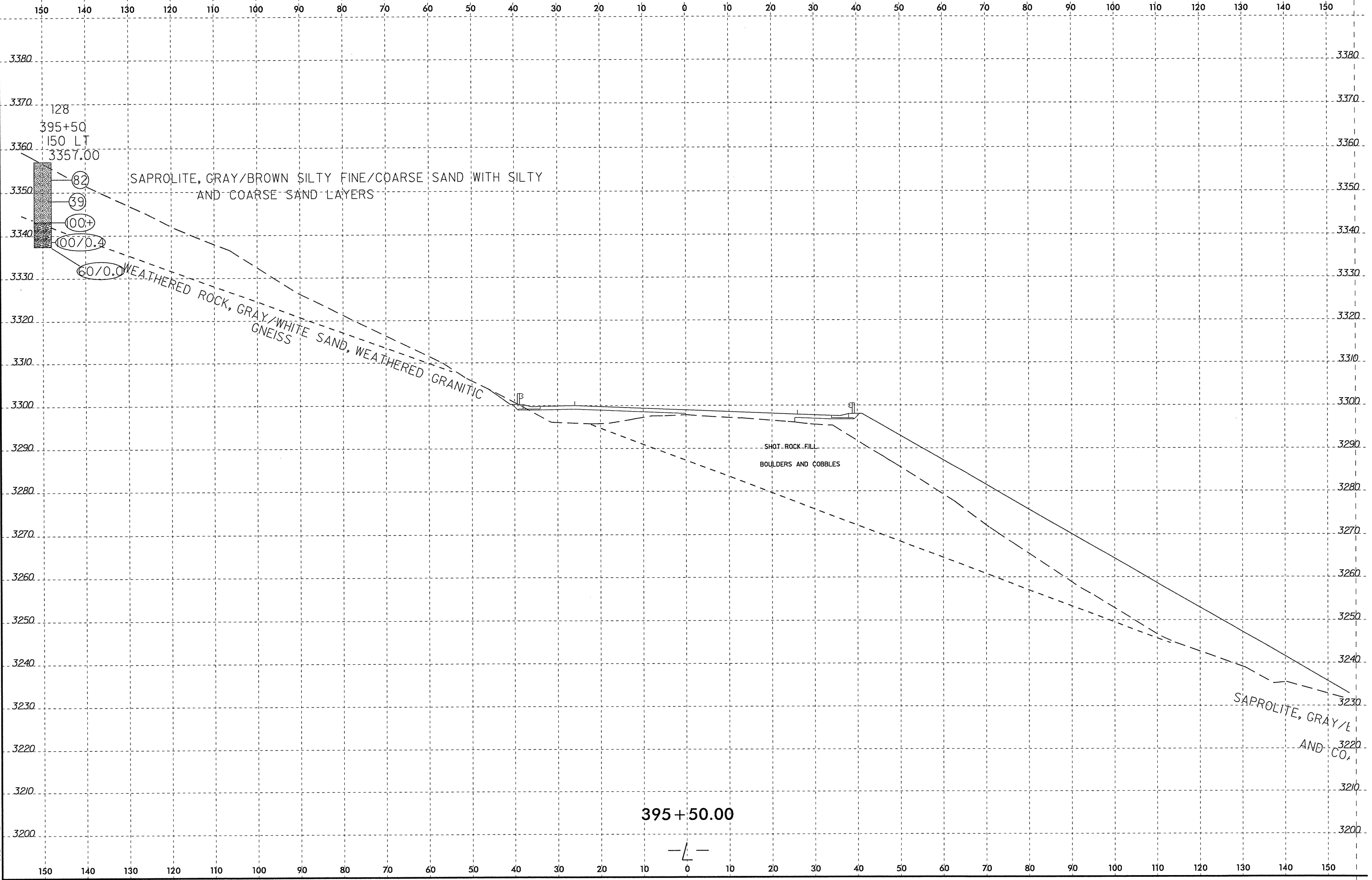
394 + 50.00



8/23/91
SYTIME
VSDGN
BUSPERNAME

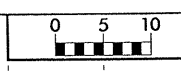


8/23/



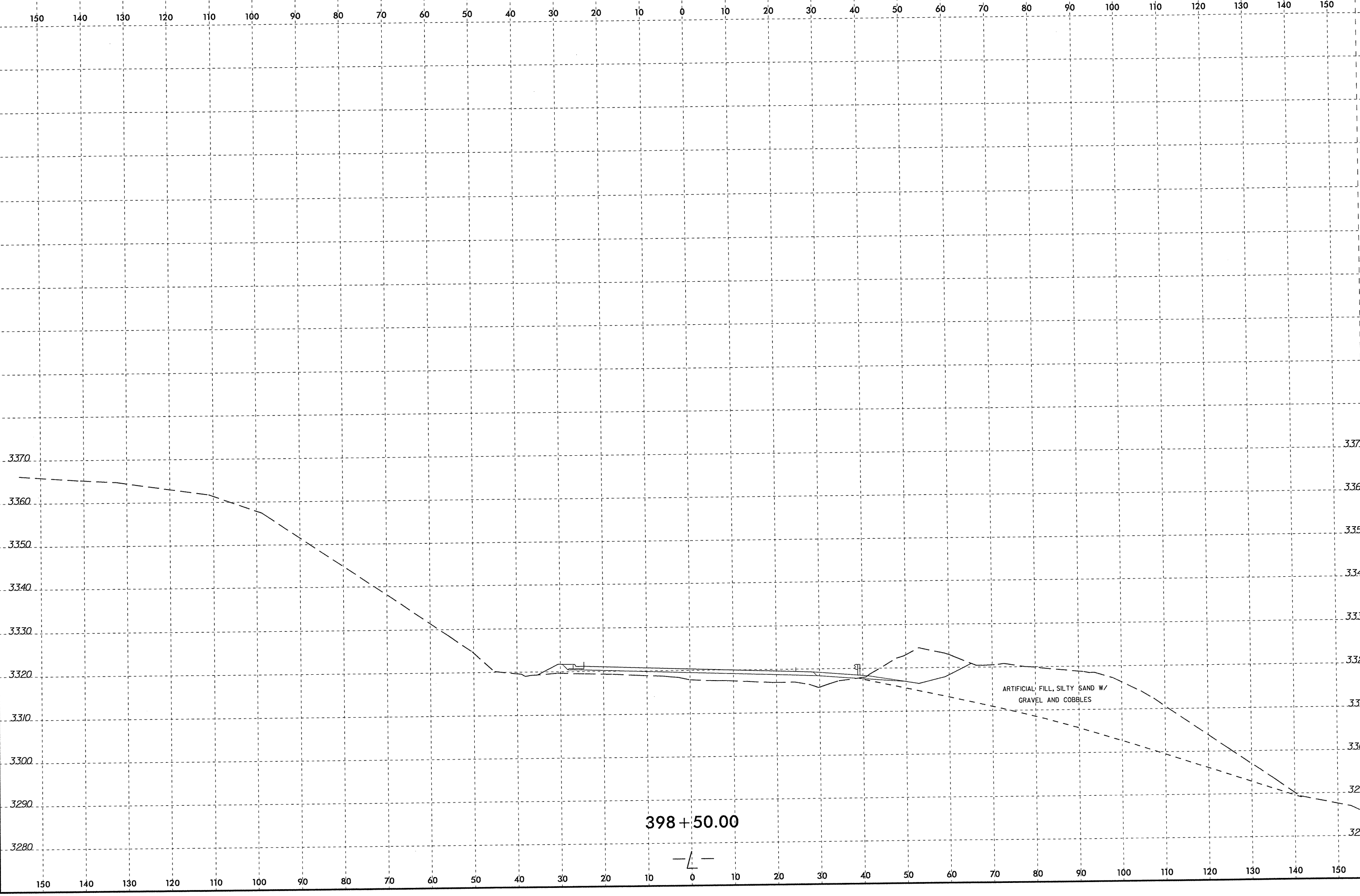
SYSTEM TIME
USER NAME

8/23/99



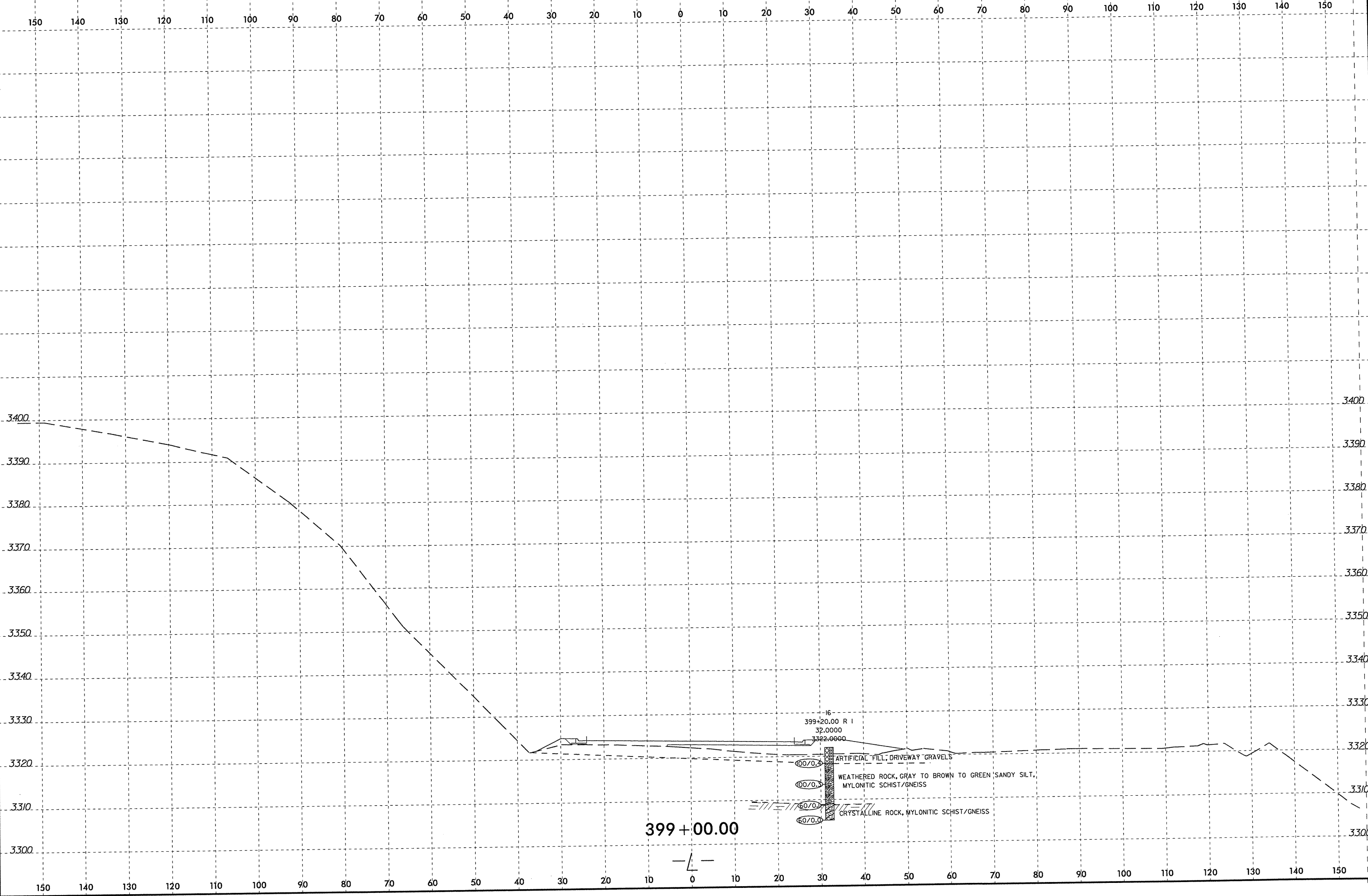
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
92/259

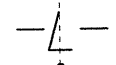


*****SYTIME*****
*****SERIAL*****

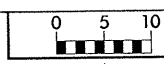
8/23/99
SYSTEM TIME
SUBSERIAL



399+00.00

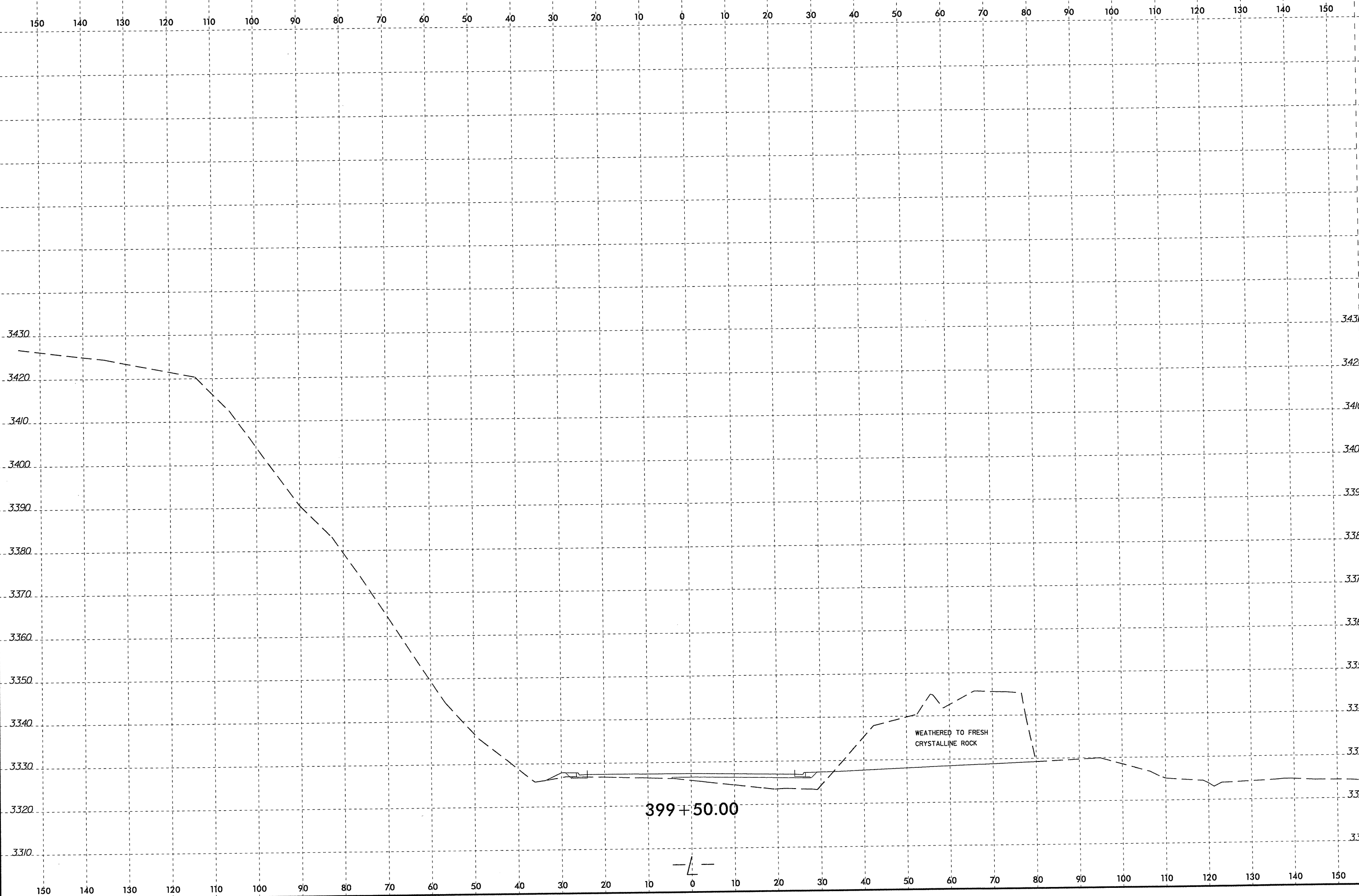


8/23/99



PROJ. REFERENCE NO.
R-2237C

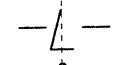
SHEET NO.
94/251



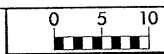
 SYSTEMS

399+50.00

WEATHERED TO FRESH
CRYSTALLINE ROCK

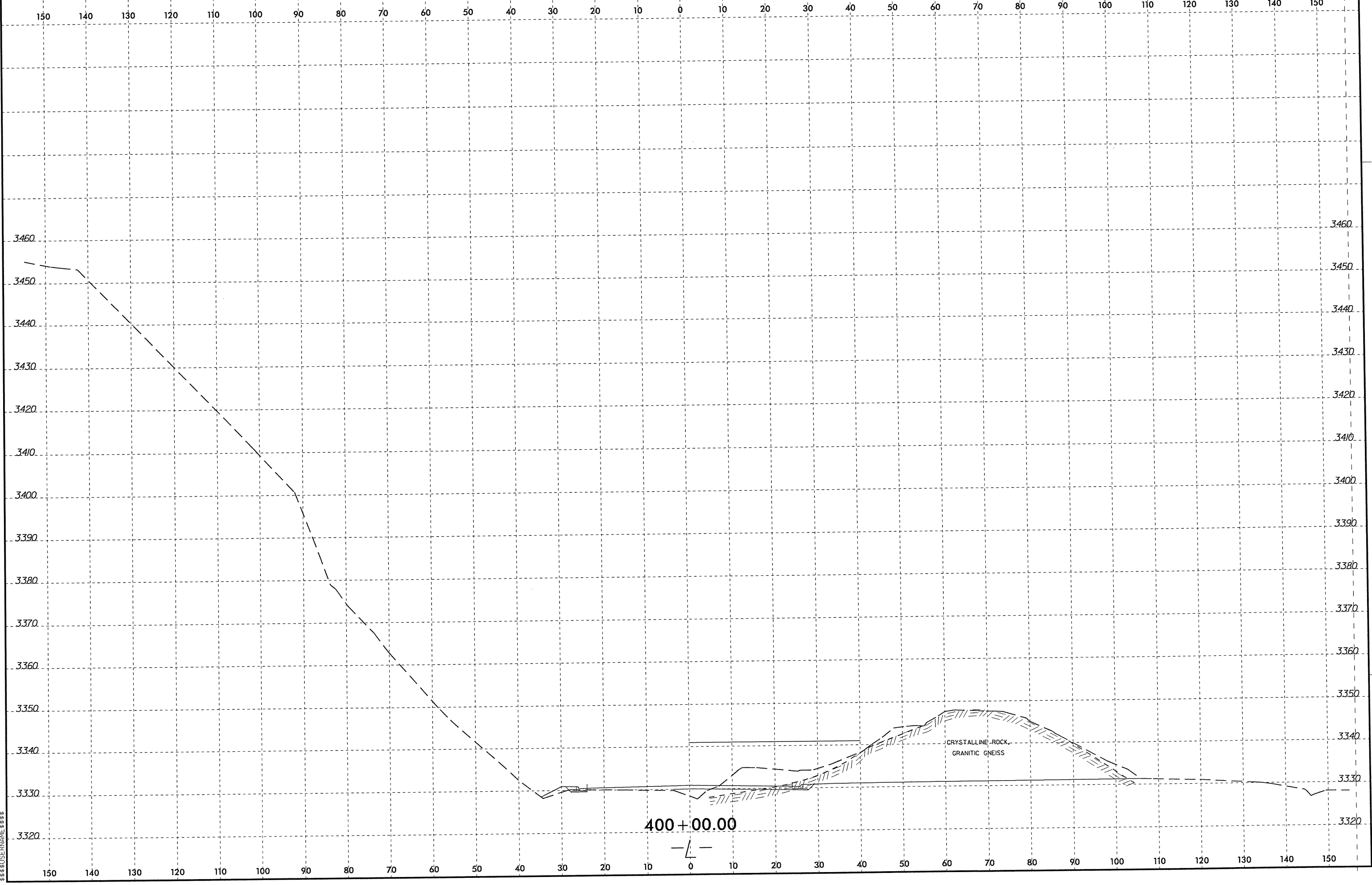


8/23/99



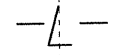
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
95/259



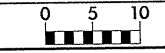
SYTIME
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ENV

400+00.00



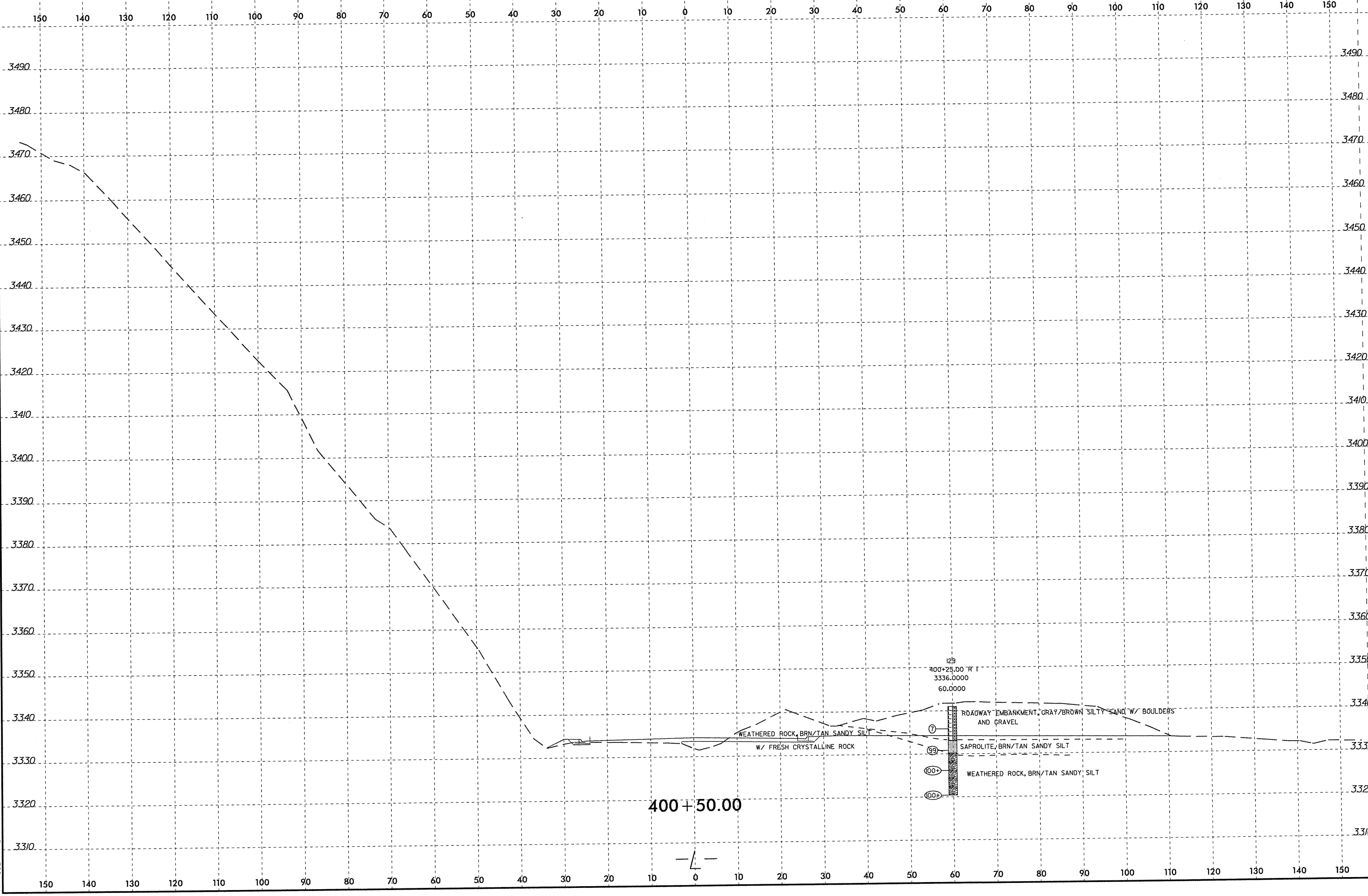
CRYSTALLINE ROCK,
GRANITIC GNEISS

8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
96/259



125
400+25.00 R I
3336.0000
60.0000

WEATHERED ROCK, BRN/TAN SANDY SILT
W/ FRESH CRYSTALLINE ROCK

ROADWAY EMBANKMENT, GRAY/BROWN SILTY SAND W/ BOULDERS
AND GRAVEL

SAPROLITE, BRN/TAN SANDY SILT

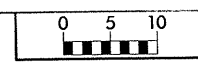
WEATHERED ROCK, BRN/TAN SANDY SILT

400+50.00

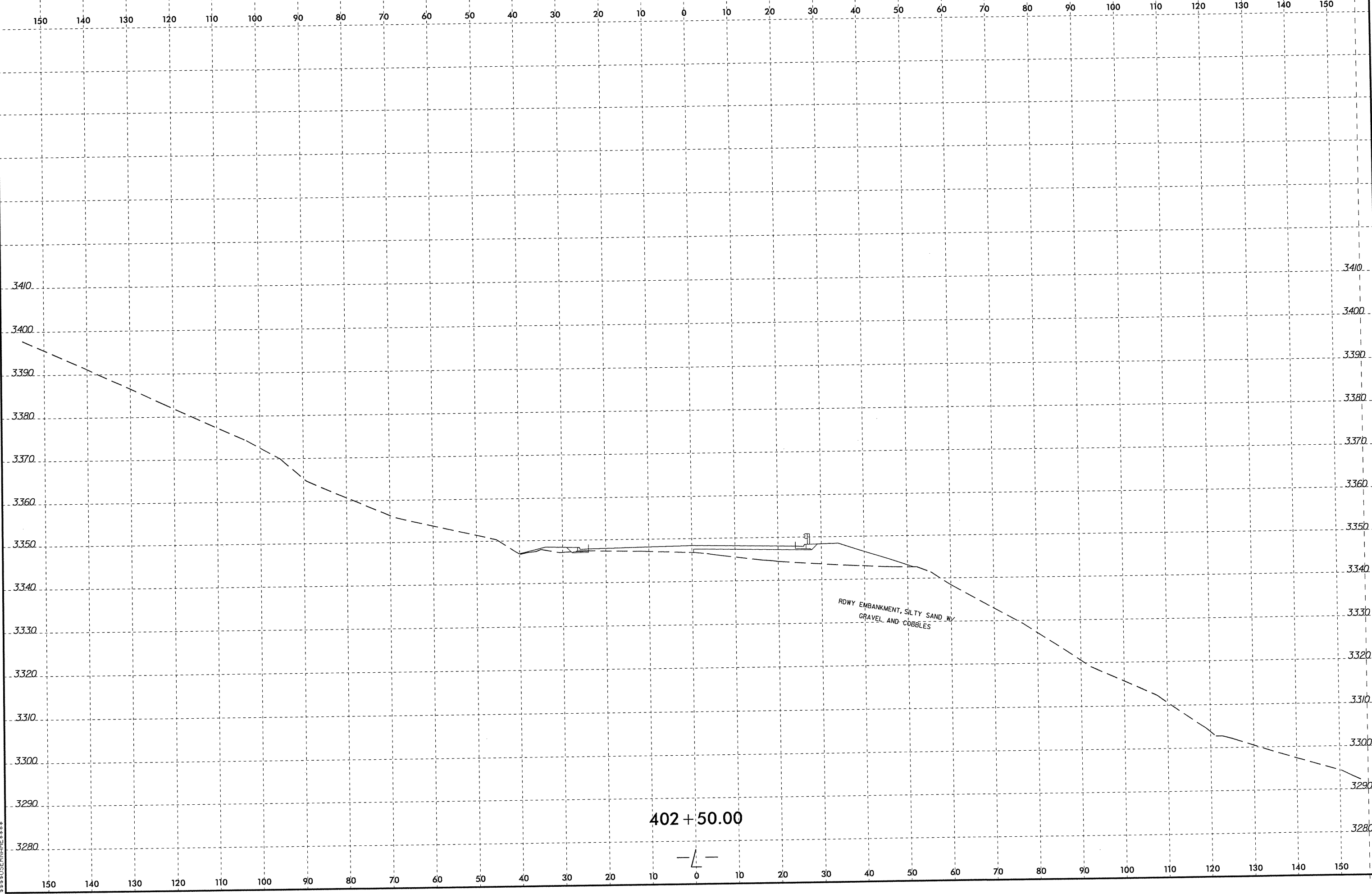


SYSTEM TIME: 8/23/99 10:00:00 AM
DRAWN BY: JLD
USER NAME: JLD

8/23/99

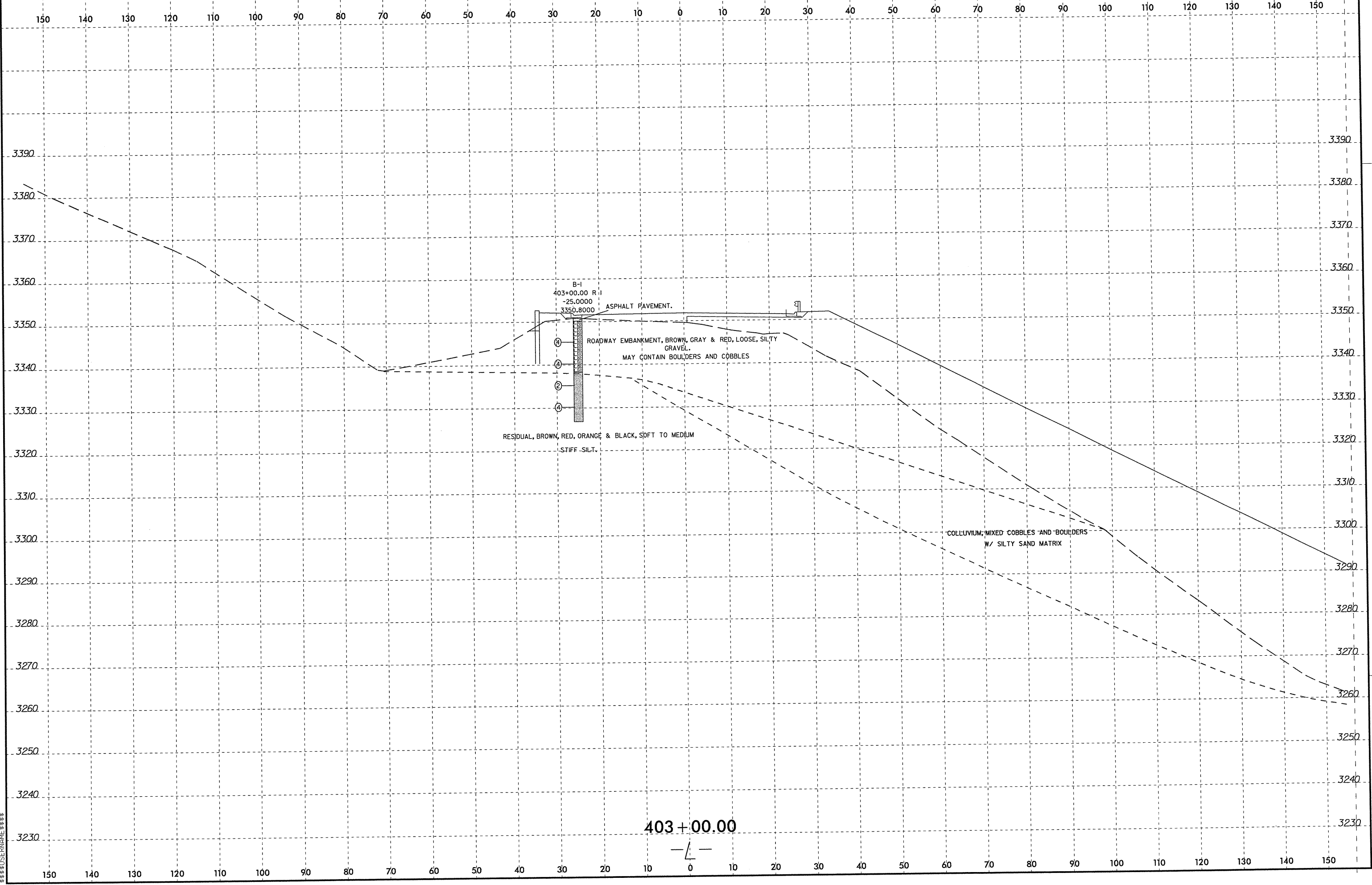
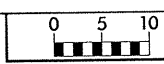


PROJ. REFERENCE NO. R-2237C	SHEET NO. 97/259
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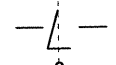


SYSTEMS CONNECTIONS

8/23/99

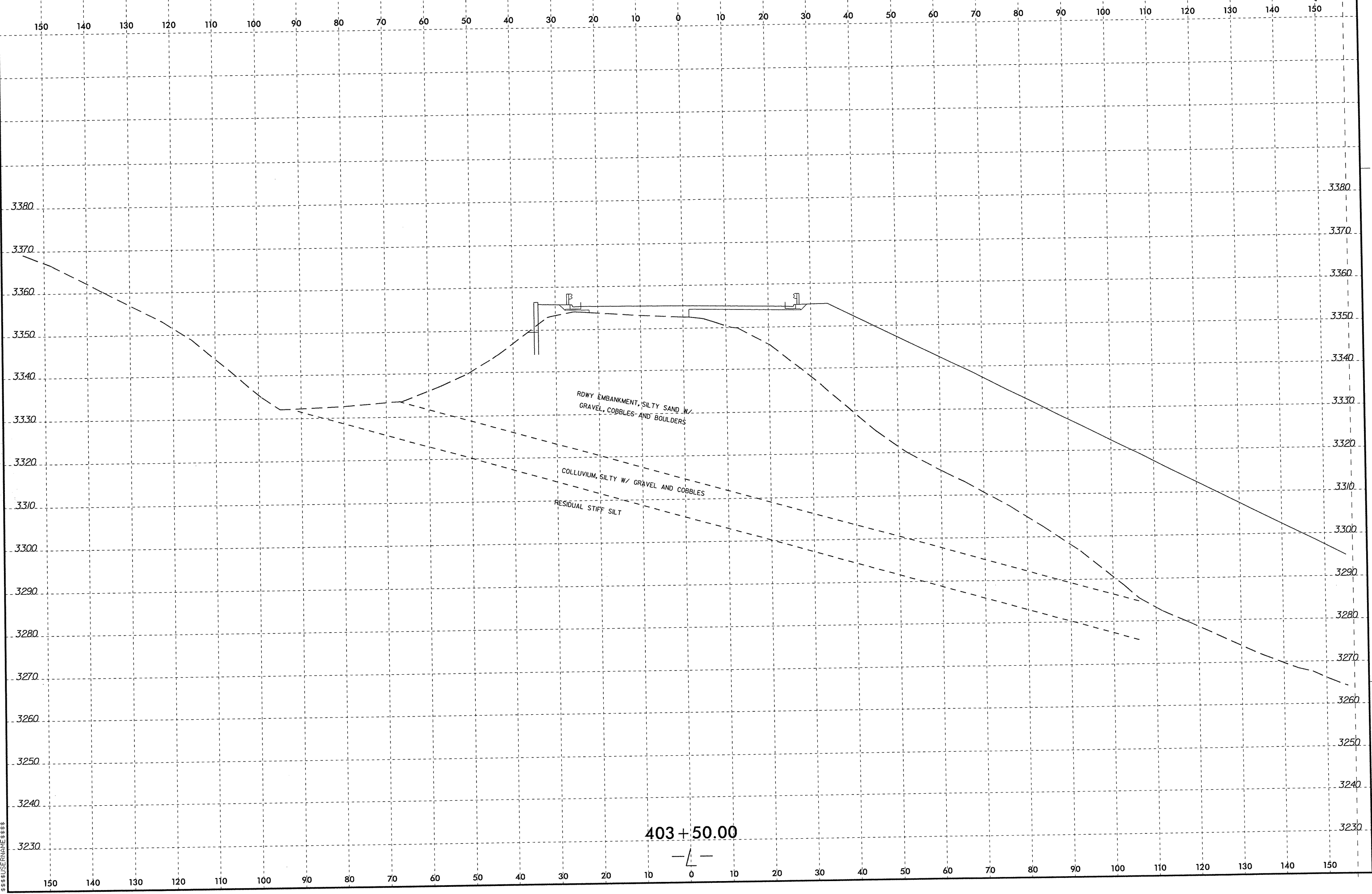


403+00.00

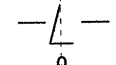


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8/23/99

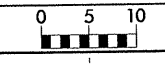


403 + 50.00



SYTIME\$\$\$\$
USPERM\$\$\$\$

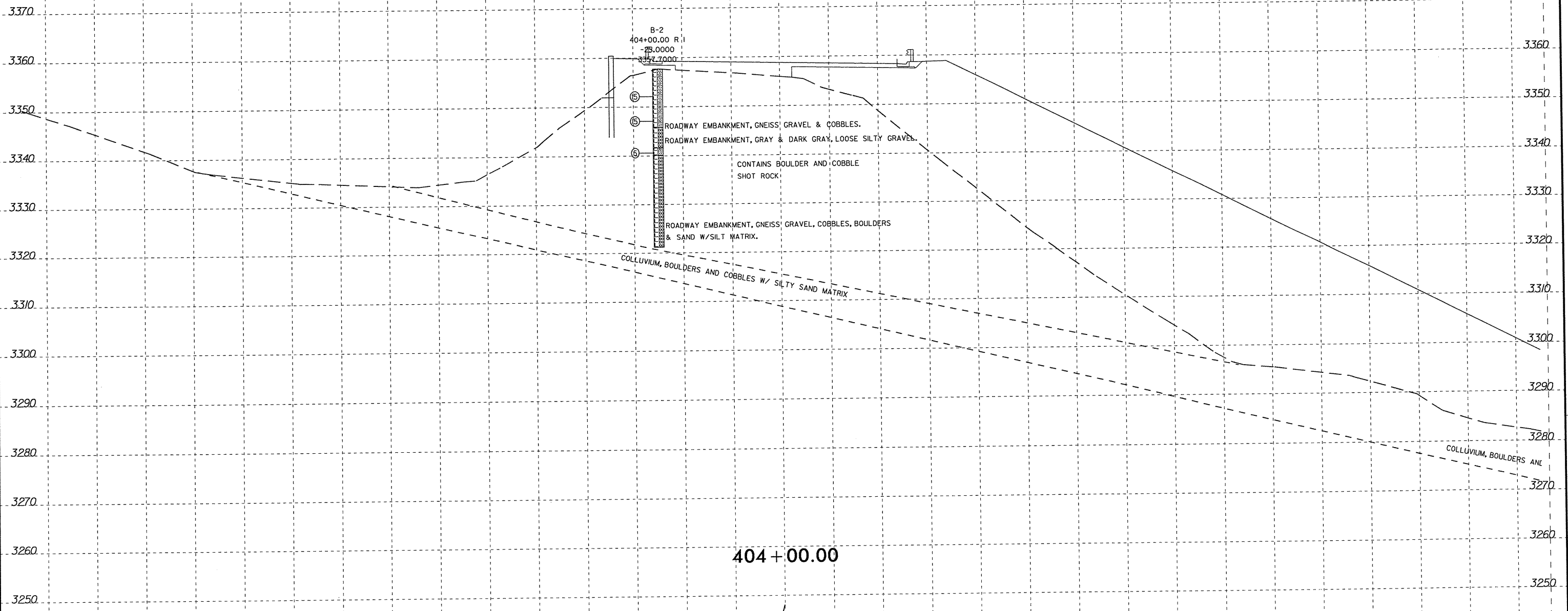
B723.99



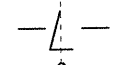
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
100/259

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



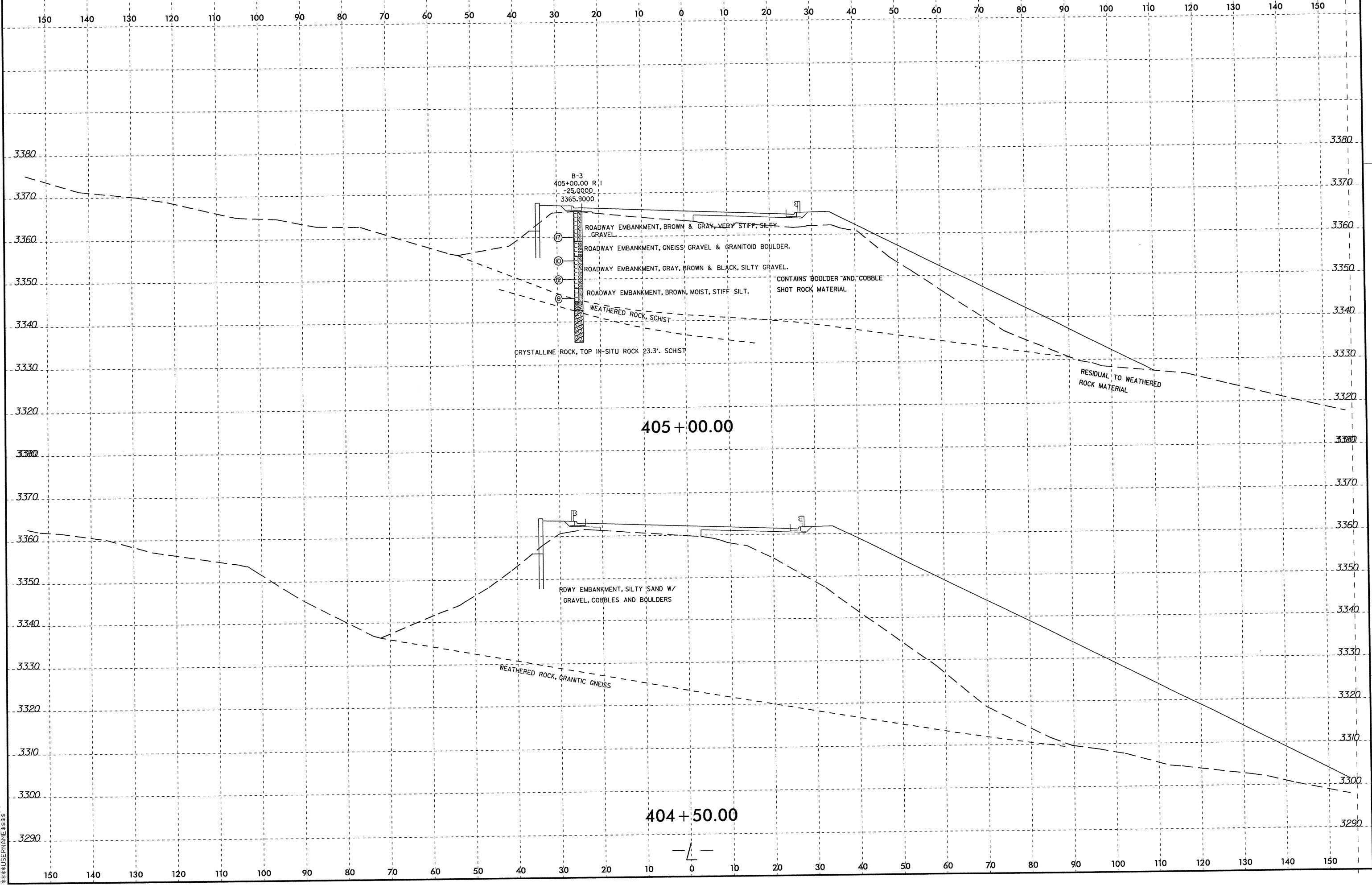
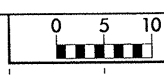
404 + 00.00



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*****OFPR*****

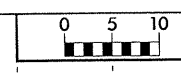
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8/23/99

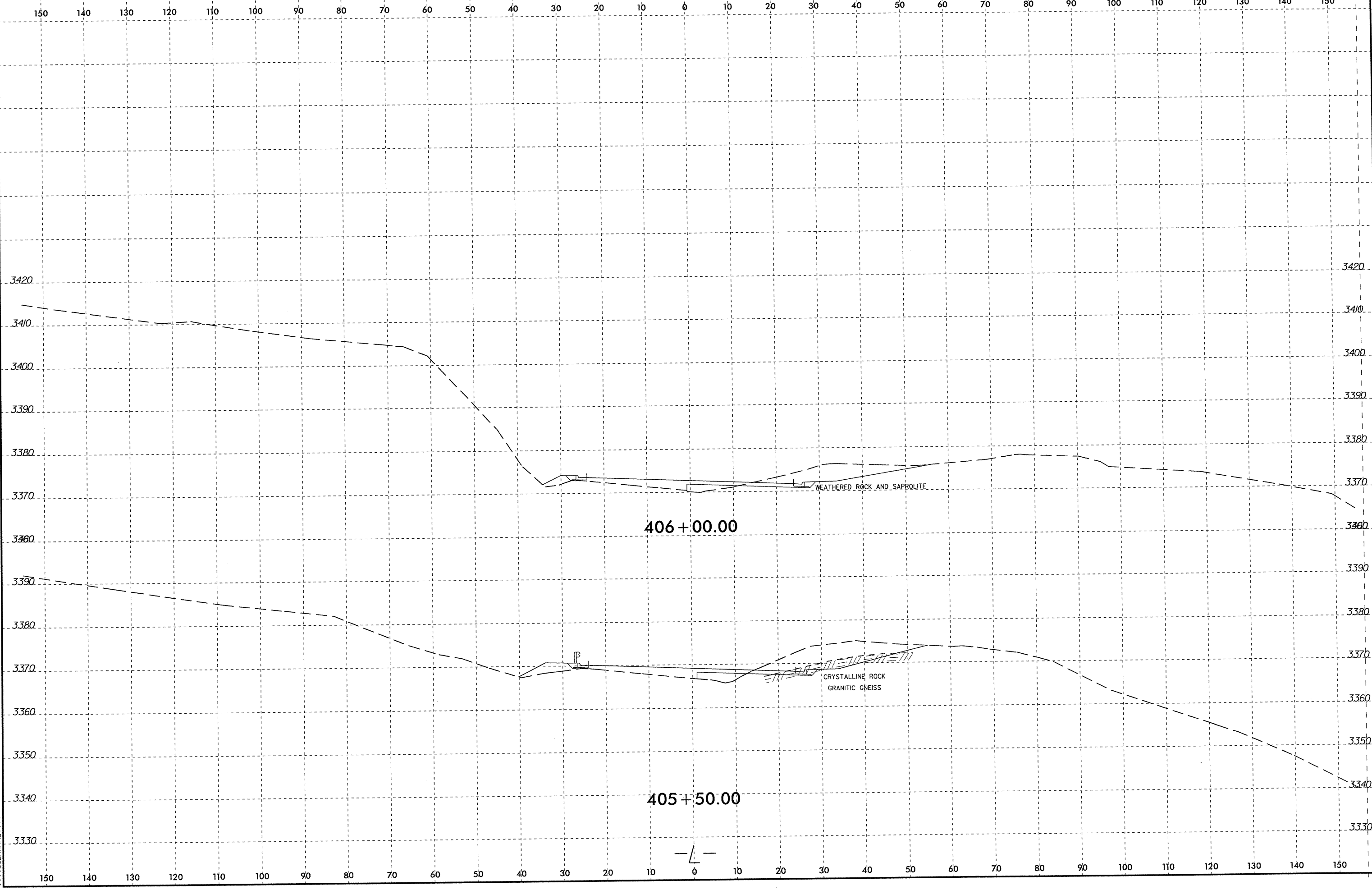


SYSTEMS
SERVICES

8/23/99

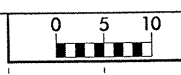


PROJ. REFERENCE NO. R-2237C	SHEET NO. 102/251
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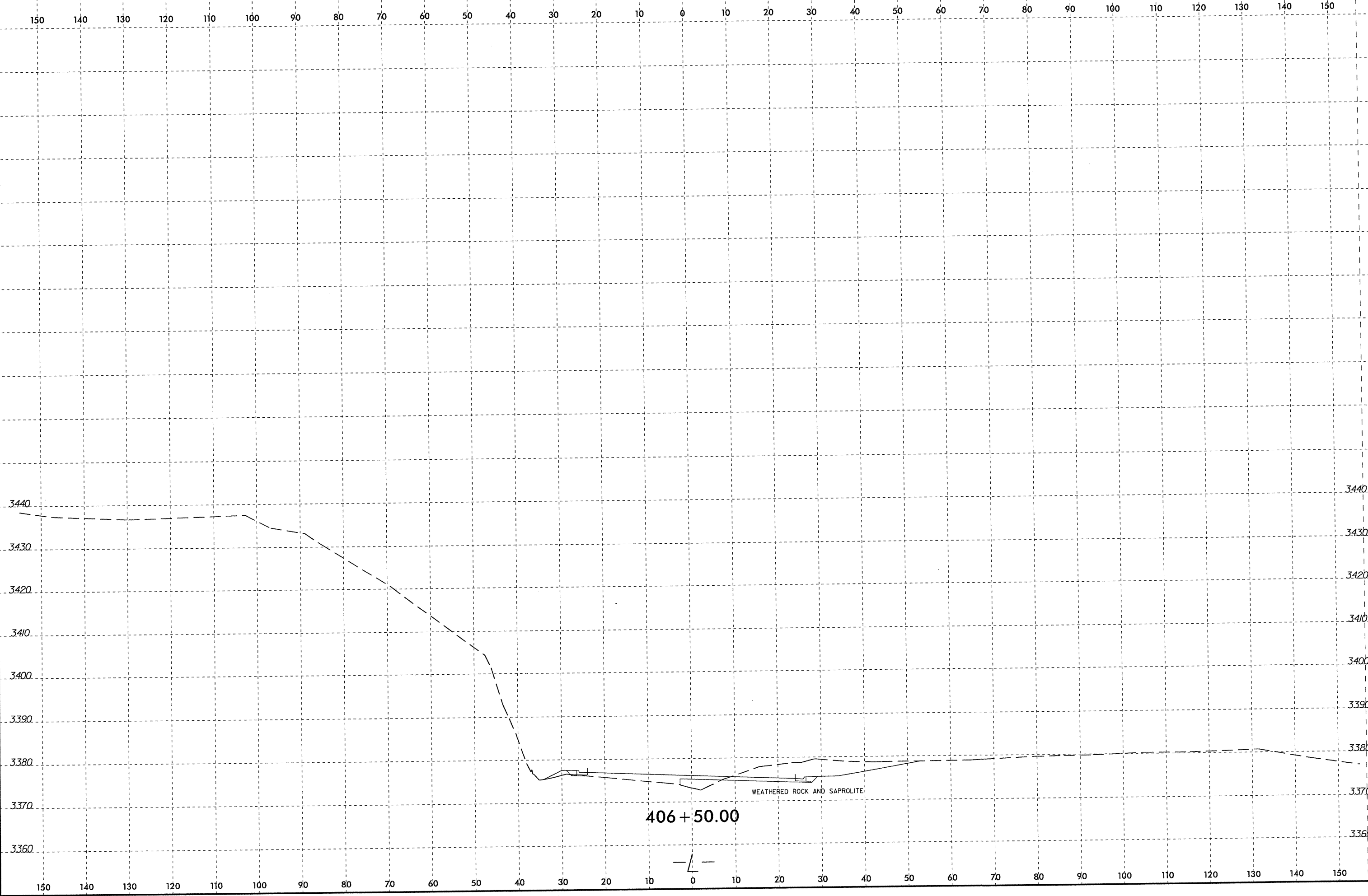
SECTION TIME
DRAWN BY
CHECKED BY
DATE

8/23/99



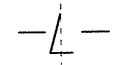
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
103/259



406 + 50.00

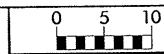
WEATHERED ROCK AND SAPROLITE



SYSTEM TIME#####

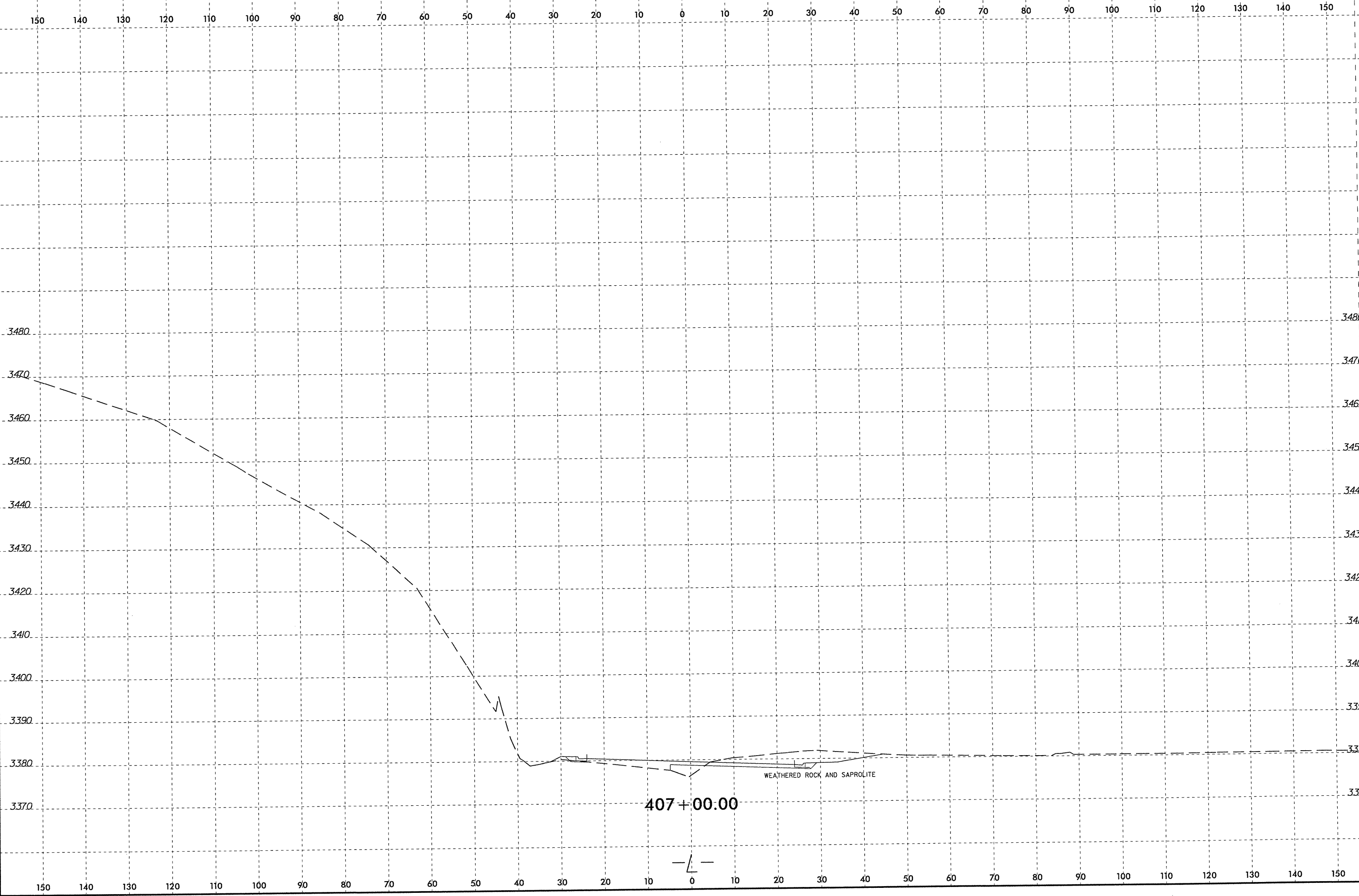
DUPLICATE#####
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8/23/99



PROJ. REFERENCE NO.
R-2237C

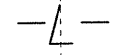
SHEET NO.
104/259



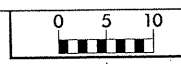
\$\$\$\$SYTIME\$\$\$\$
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407+00.00

WEATHERED ROCK AND SAPROLITE

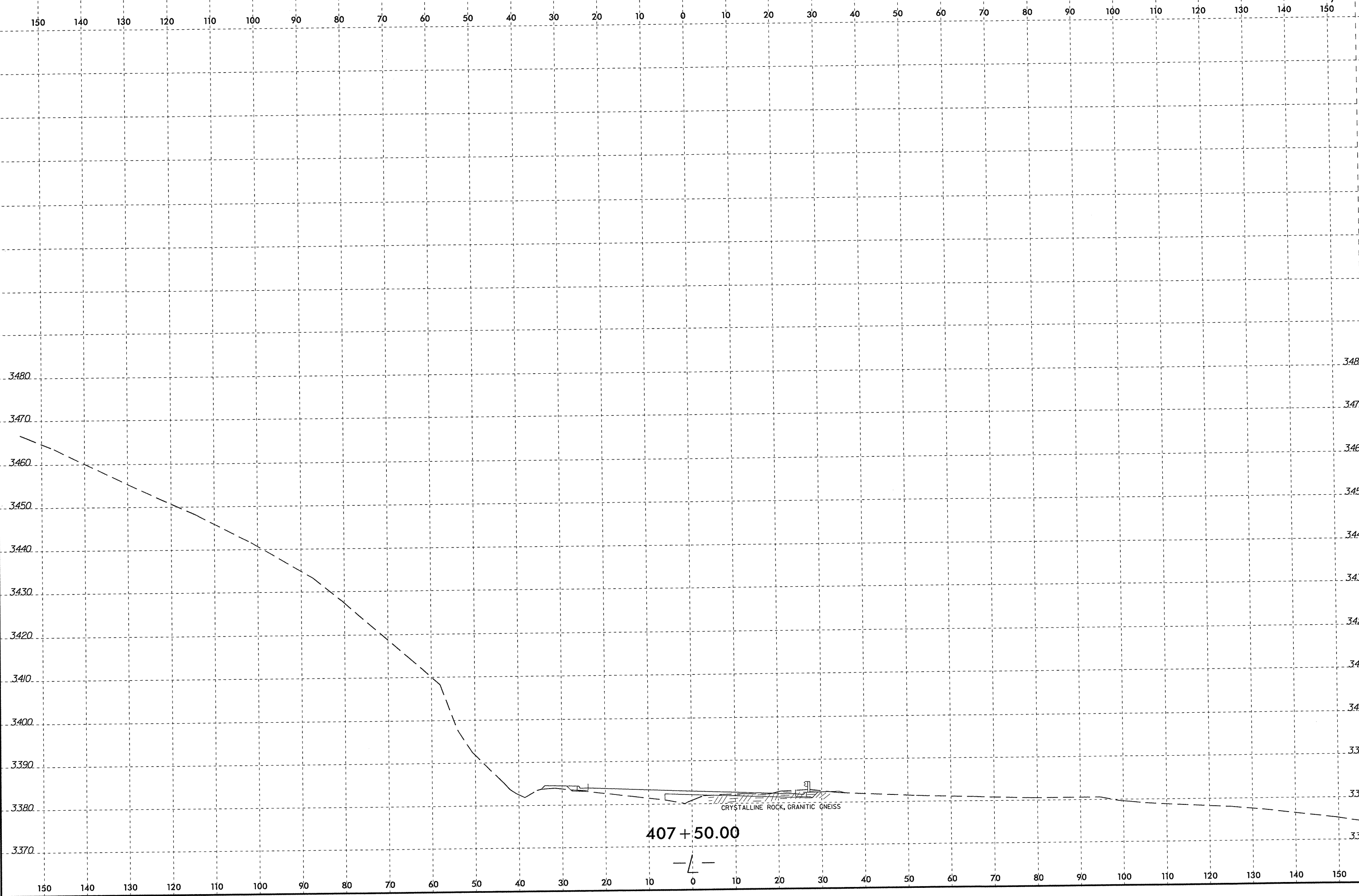


8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
105/259

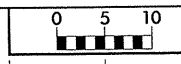


407 + 50.00

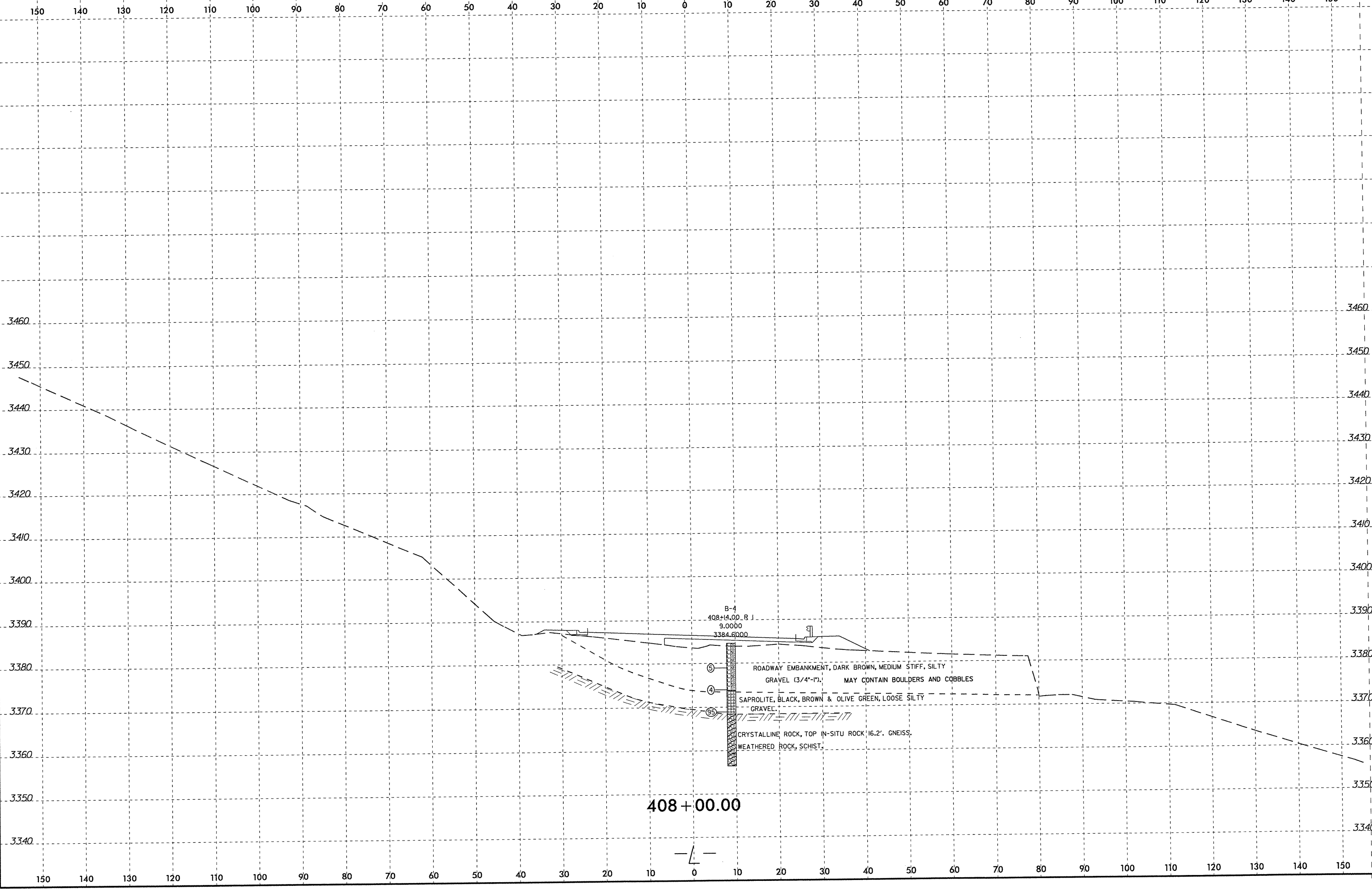
CRYSTALLINE ROCK, GRANITIC GNEISS

SYSTEM TIME: 8/23/99 10:00:00 AM
USER: JAMES

8/23/99

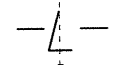


PROJ. REFERENCE NO. R-2237C SHEET NO. 106/259

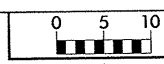


SYTIME
C:\PROJECTS\823\823.DWG
8/23/99 10:00 AM

408+00.00

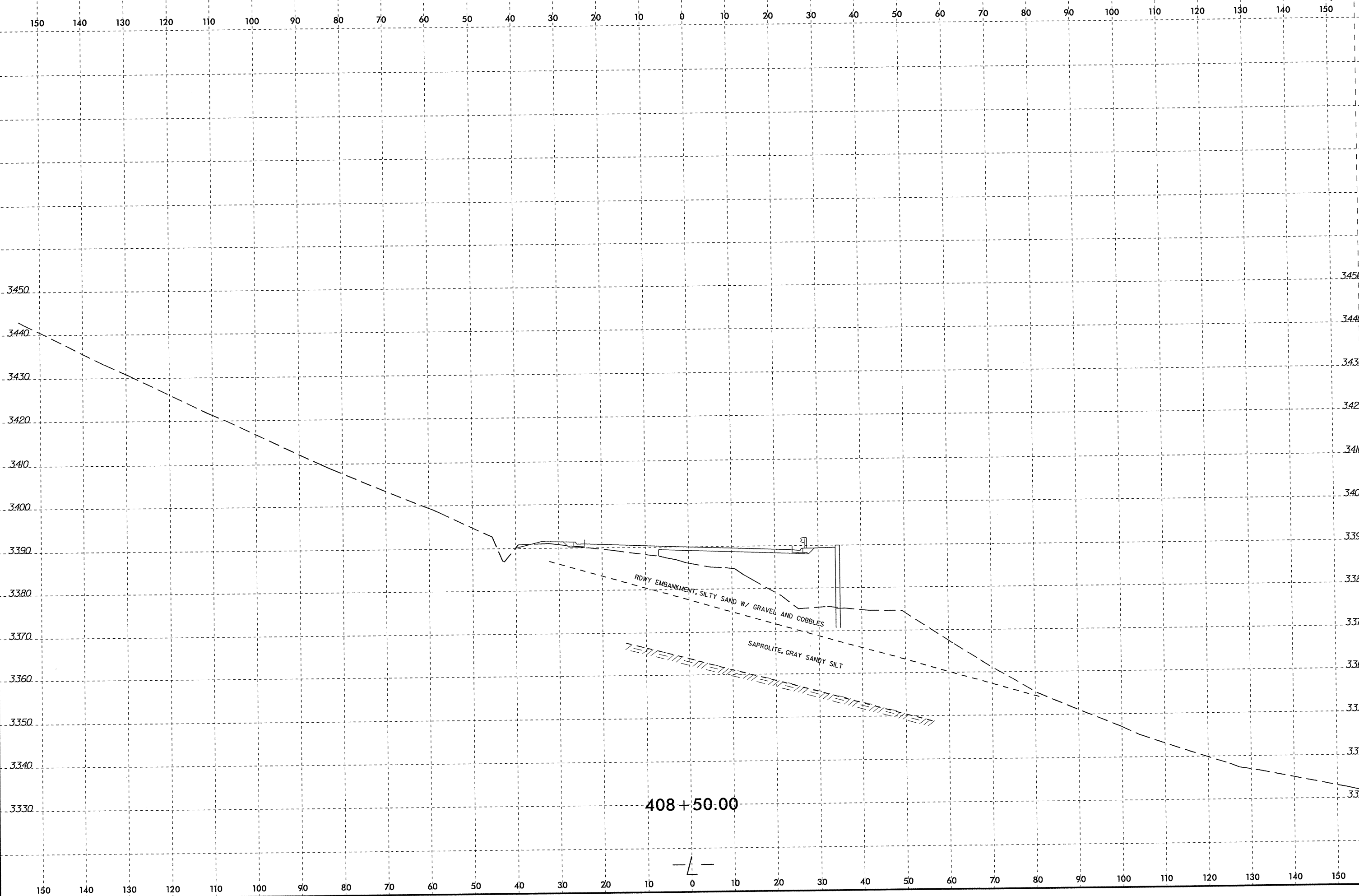


8/23/99



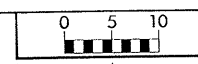
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
107/259



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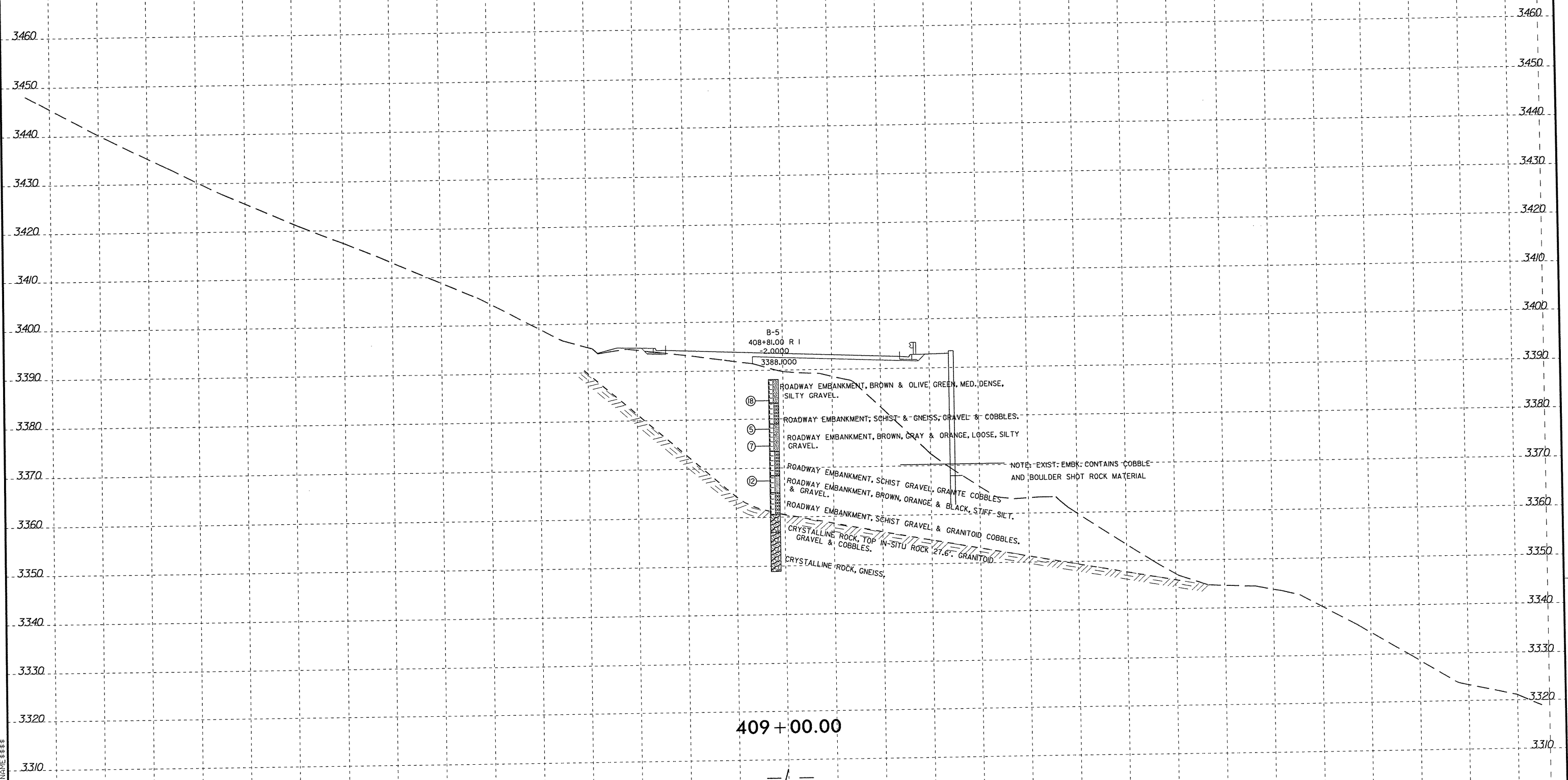
8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
108/259

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

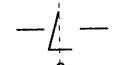


B-5'
408+81.00 R 1
-2.0000
3388.1000

- (18) ROADWAY EMBANKMENT, BROWN & OLIVE, GREEN, MED. DENSE, SILTY GRAVEL.
- (8) ROADWAY EMBANKMENT, SCHIST & GNEISS, GRAVEL & COBBLES.
- (7) ROADWAY EMBANKMENT, BROWN, GRAY & ORANGE, LOOSE, SILTY GRAVEL.
- (12) ROADWAY EMBANKMENT, SCHIST GRAVEL, GRANITE COBBLES & GRAVEL.
- ROADWAY EMBANKMENT, BROWN, ORANGE & BLACK, STIFF-SILT.
- ROADWAY EMBANKMENT, SCHIST GRAVEL & GRANITOID COBBLES.
- CRYSTALLINE ROCK, TOP IN-SITU ROCK 27.6' GRANITOID GRAVEL & COBBLES.
- CRYSTALLINE ROCK, GNEISS.

NOTE: EXIST. EMBK. CONTAINS COBBLE AND BOULDER SHOT ROCK MATERIAL

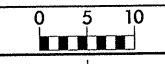
409 + 00.00



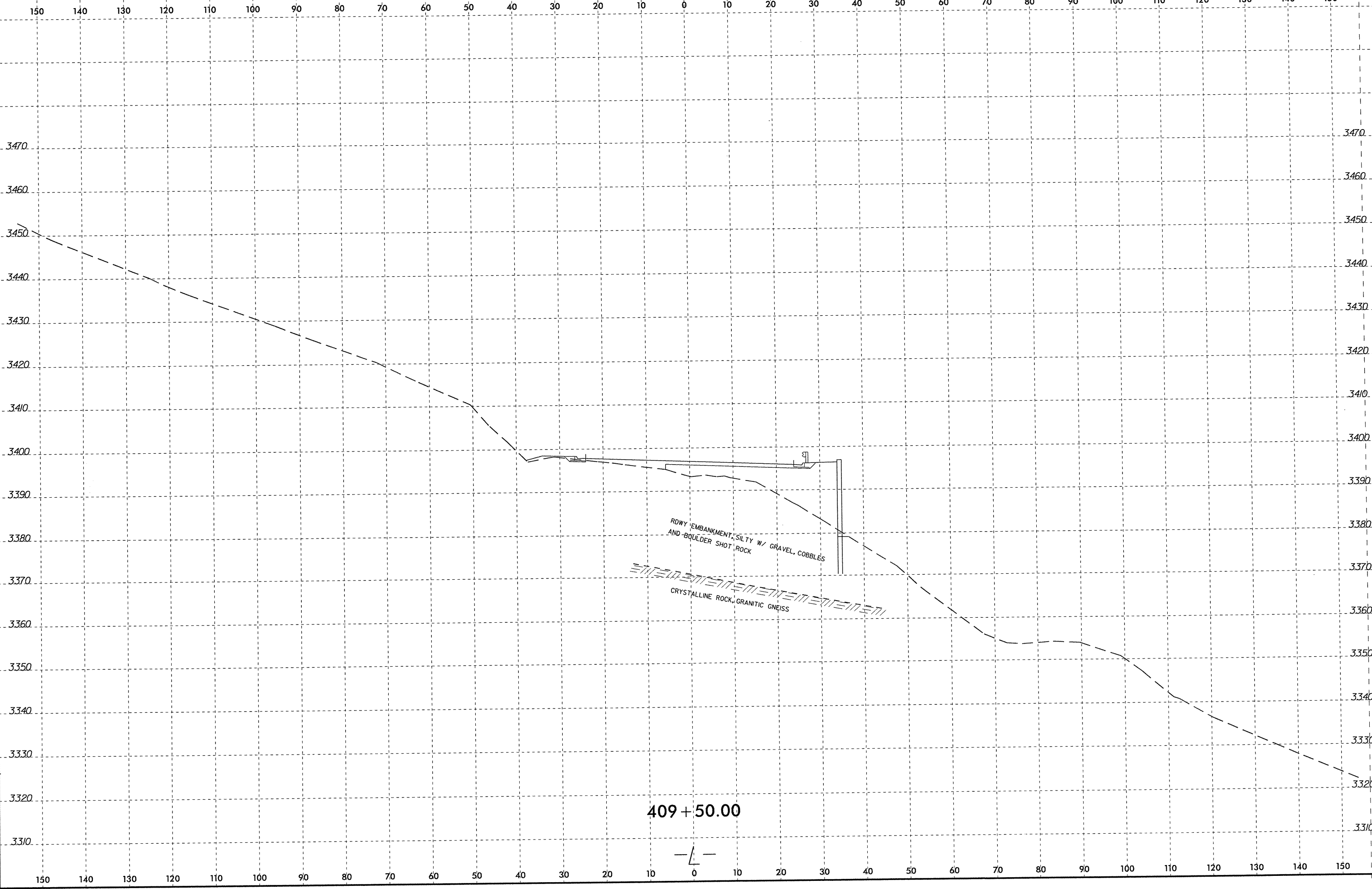
SYSTEMS TIME
SERVICES

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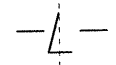
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PROJ. REFERENCE NO.	SHEET NO.
R-2237C	109/259

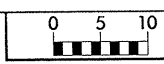


409+50.00

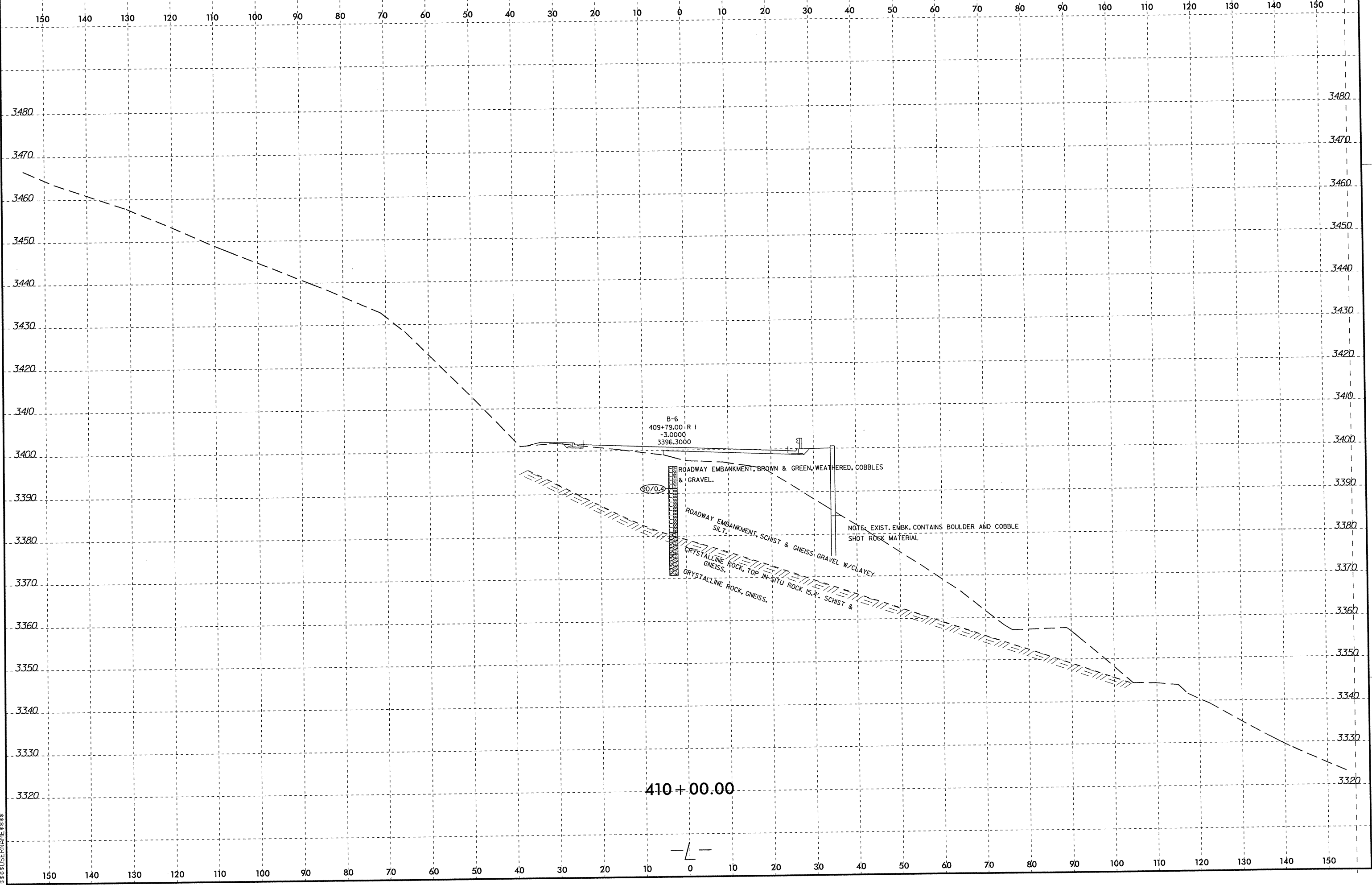


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8/23/99

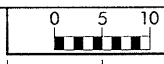


PROJ. REFERENCE NO.	SHEET NO.
R-2237C	110/259



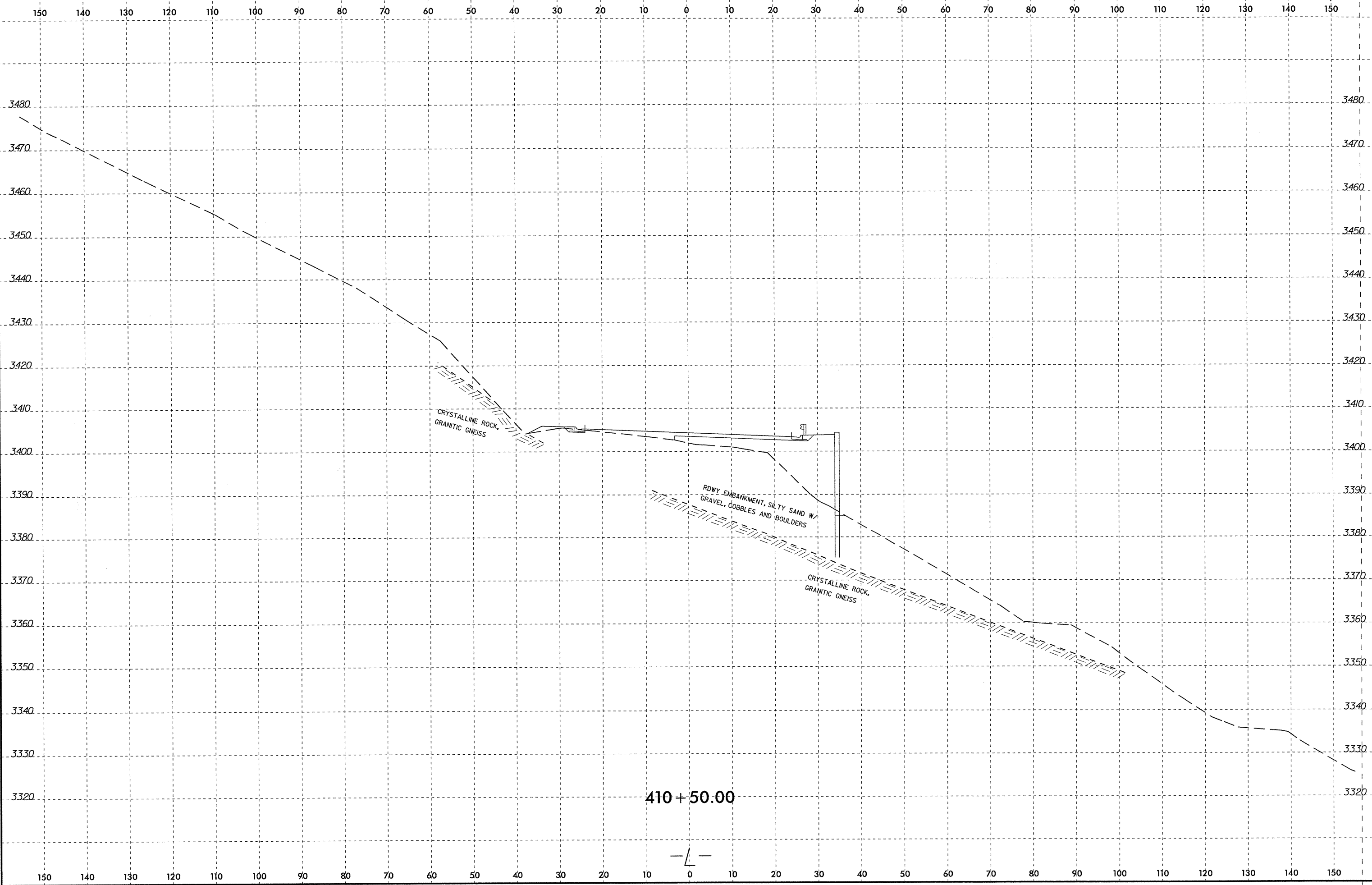
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8/23/01



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
110/259



CRYSTALLINE ROCK,
GRANITIC GNEISS

RDWY EMBANKMENT, SILTY SAND W/
GRAVEL, COBBLES AND BOULDERS

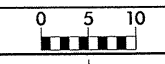
CRYSTALLINE ROCK,
GRANITIC GNEISS

410 + 50.00

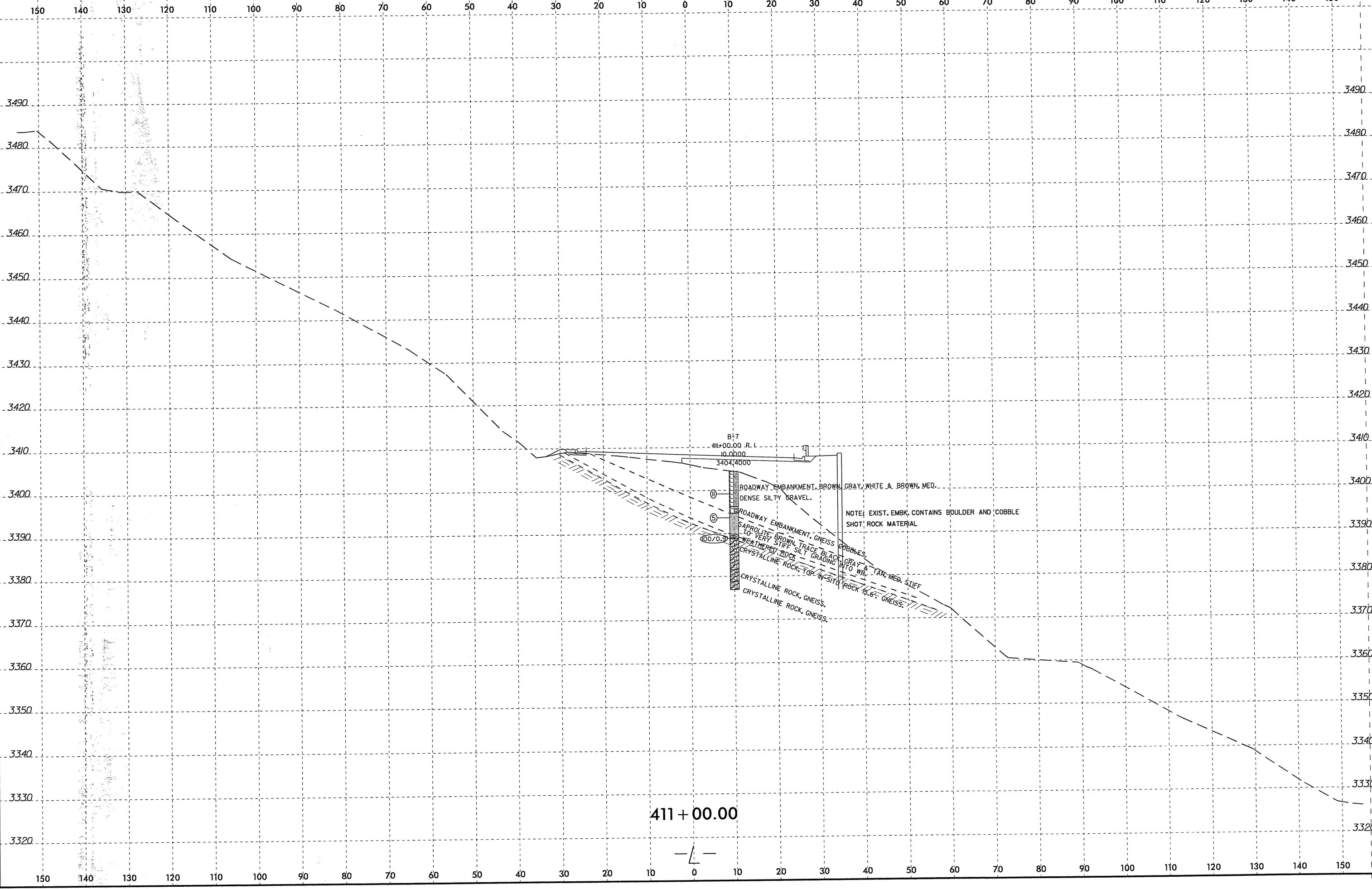


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\$\$\$\$VIRGINIA\$\$\$\$
\$\$\$\$USERNM\$\$\$\$

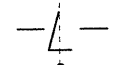
8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-2237C	112/259



411 + 00.00



\$\$\$\$\$SYTIME\$\$\$\$\$
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\$\$\$\$\$SERIAL\$\$\$\$\$

B+7
411+00.00 R.L.
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3404.4000

ROADWAY EMBANKMENT, BROWN, GRAY, WHITE & BROWN, MED.
DENSE SILTY GRAVEL.

ROADWAY EMBANKMENT, GNEISS

SAPROLITE, BROWN, TRACE BLACK
TO VERY STIFF SILTY GRADING INTO WR.

WEATHERED ROCK
CRYSTALLINE ROCK, TOP IN-SITU

CRYSTALLINE ROCK, GNEISS.
CRYSTALLINE ROCK, GNEISS.

NOTE: EXIST. EMBK. CONTAINS BOULDER AND COBBLE
SHOT ROCK MATERIAL

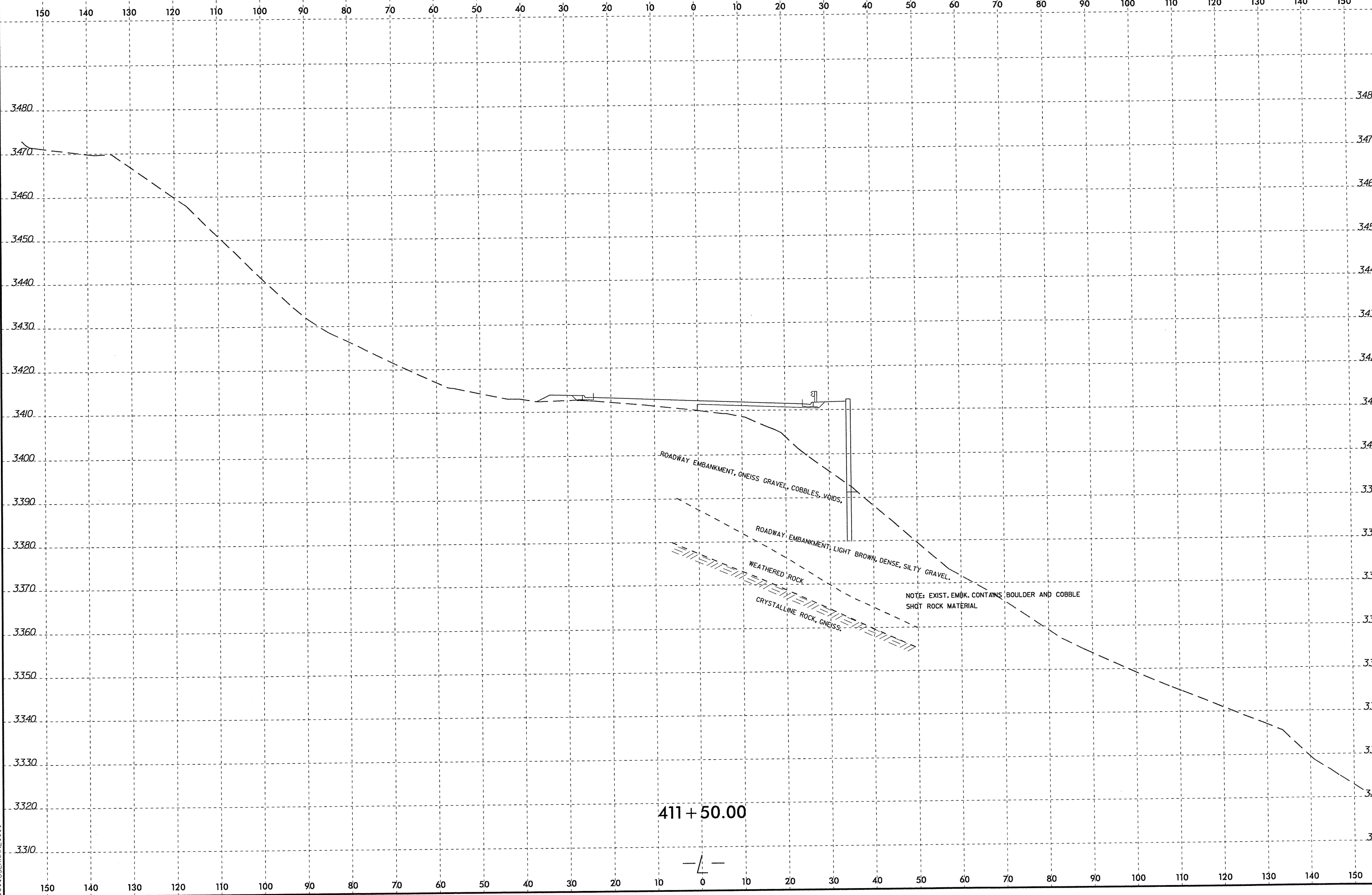
COBBLES
GRAY & TAN, MED. STIFF
CRYSTALLINE ROCK, GNEISS.

8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
113/269



411 + 50.00

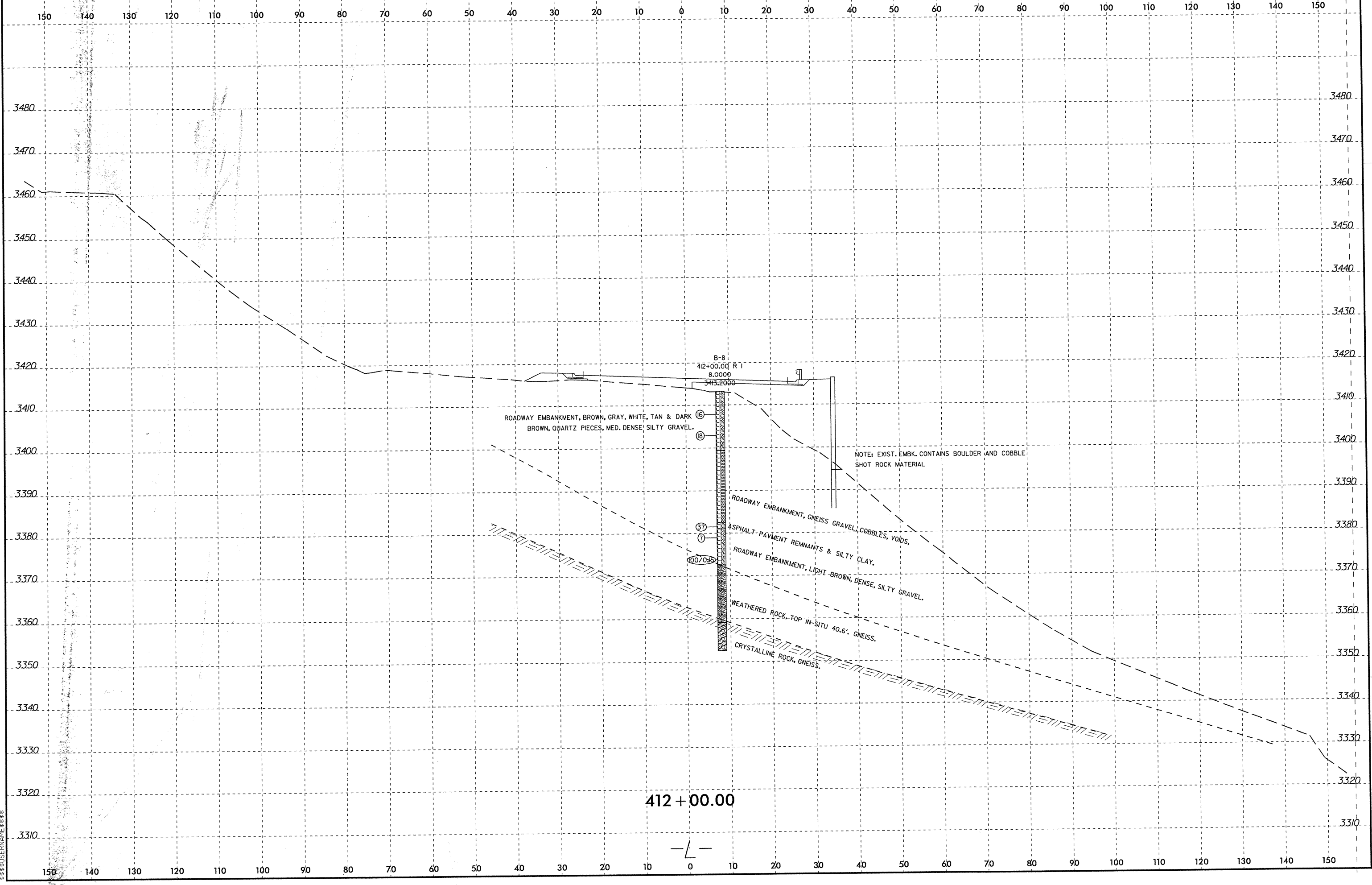


SYSTEM TIME: 8/23/99 10:00:00 AM
USER: J...
PROJECT: R-2237C
SHEET: 113/269

8/23/99



PROJ. REFERENCE NO. R-2237C SHEET NO. 114/259



ROADWAY EMBANKMENT, BROWN, GRAY, WHITE, TAN & DARK BROWN, QUARTZ PIECES, MED. DENSE SILTY GRAVEL.

NOTE: EXIST. EMBK. CONTAINS BOULDER AND COBBLE SHOT ROCK MATERIAL.

ROADWAY EMBANKMENT, GNEISS GRAVEL, COBBLES, VOIDS,

ASPHALT-PAVEMENT REMNANTS & SILTY CLAY.

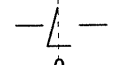
ROADWAY EMBANKMENT, LIGHT BROWN, DENSE, SILTY GRAVEL.

WEATHERED ROCK, TOP IN-SITU 40.6' GNEISS.

CRYSTALLINE ROCK, GNEISS.

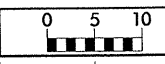
B-8
412+00.00 R 1
8.0000
3415.2000

412 + 00.00

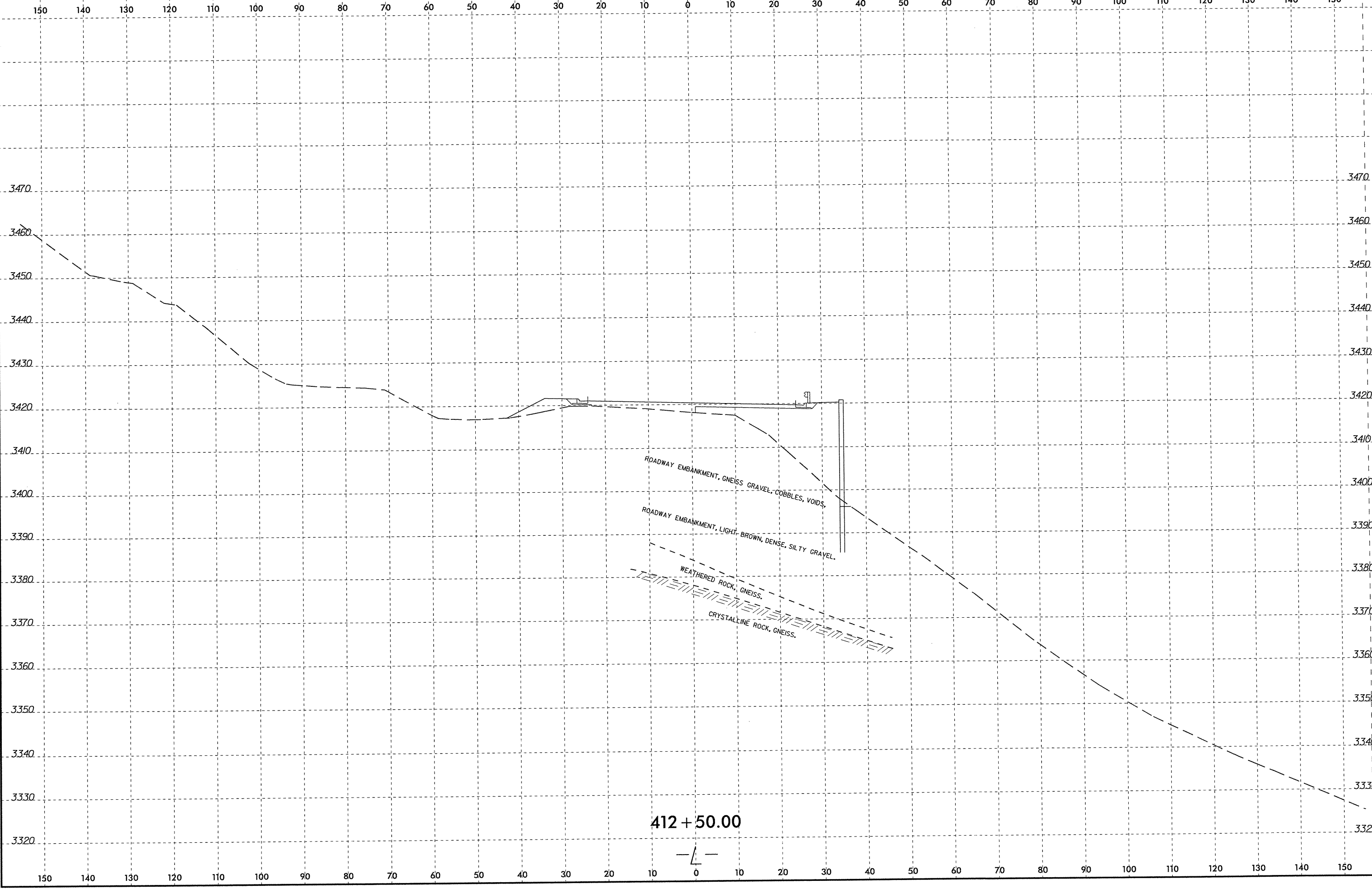


SYSTEM TIME: 8/23/99 10:00:00 AM
USER: JLD
JOB: R-2237C
SHEET: 114/259

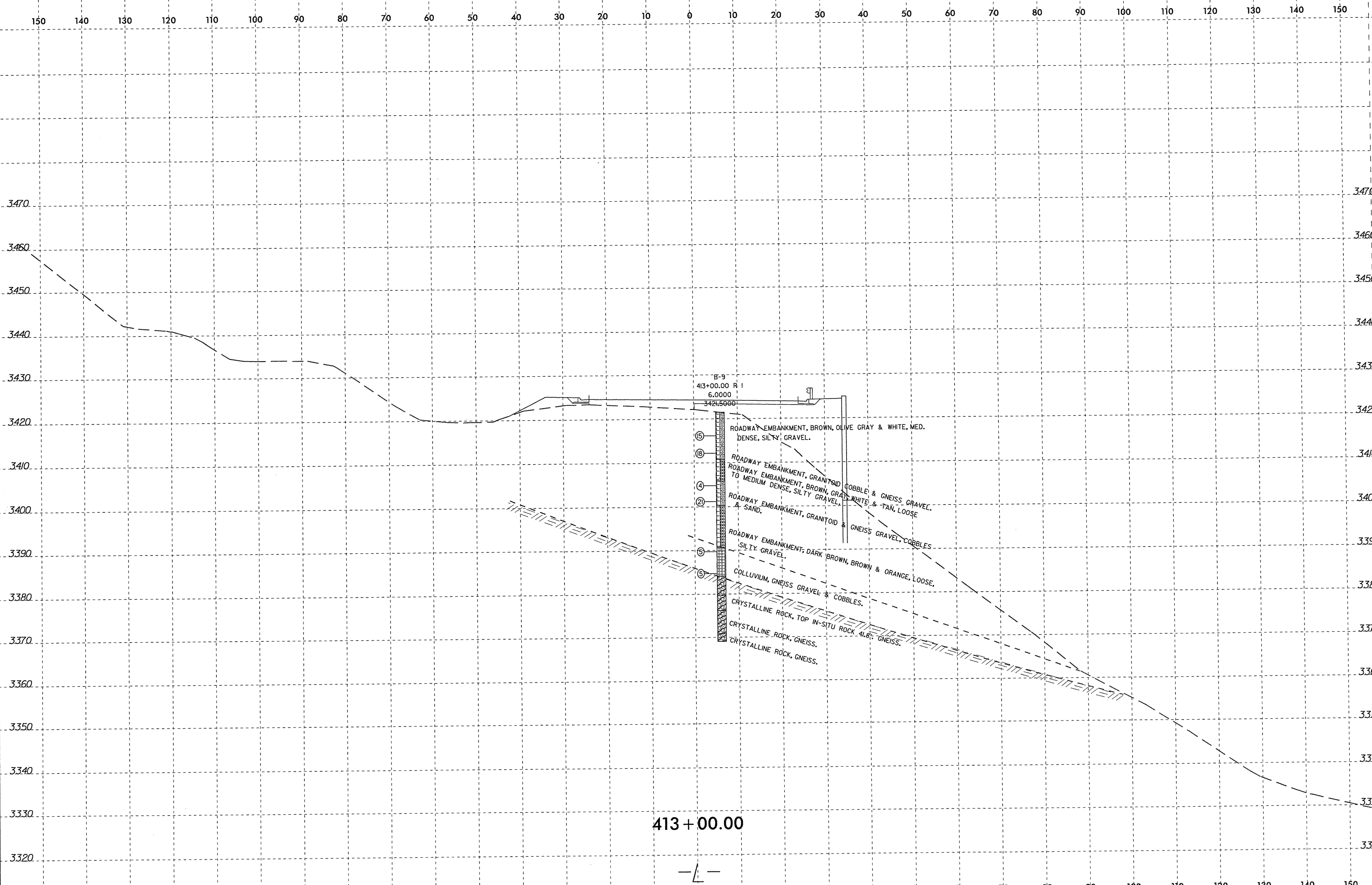
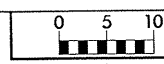
8/23/99



PROJ. REFERENCE NO.	SHEET NO.
R-2237C	115/257



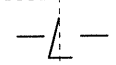
SYTIME
 US
 BUREAU



B-9
413+00.00 R 1
6.0000
3421.5000

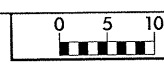
- (15) ROADWAY EMBANKMENT, BROWN, OLIVE GRAY & WHITE, MED. DENSE, SILTY, GRAVEL.
- (16) ROADWAY EMBANKMENT, GRANITOID COBBLE & GNEISS GRAVEL.
- (4) ROADWAY EMBANKMENT, BROWN, GRAY WHITE & TAN, LOOSE TO MEDIUM DENSE, SILTY GRAVEL.
- (2) ROADWAY EMBANKMENT, GRANITOID & GNEISS GRAVEL COBBLES & SAND.
- (5) ROADWAY EMBANKMENT, DARK BROWN, BROWN & ORANGE, LOOSE, SILTY GRAVEL.
- (6) COLLUVIUM, GNEISS GRAVEL & COBBLES.
- CRYSTALLINE ROCK, TOP IN-SITU ROCK 4L8' GNEISS.
- CRYSTALLINE ROCK, GNEISS.
- CRYSTALLINE ROCK, GNEISS.

413 + 00.00



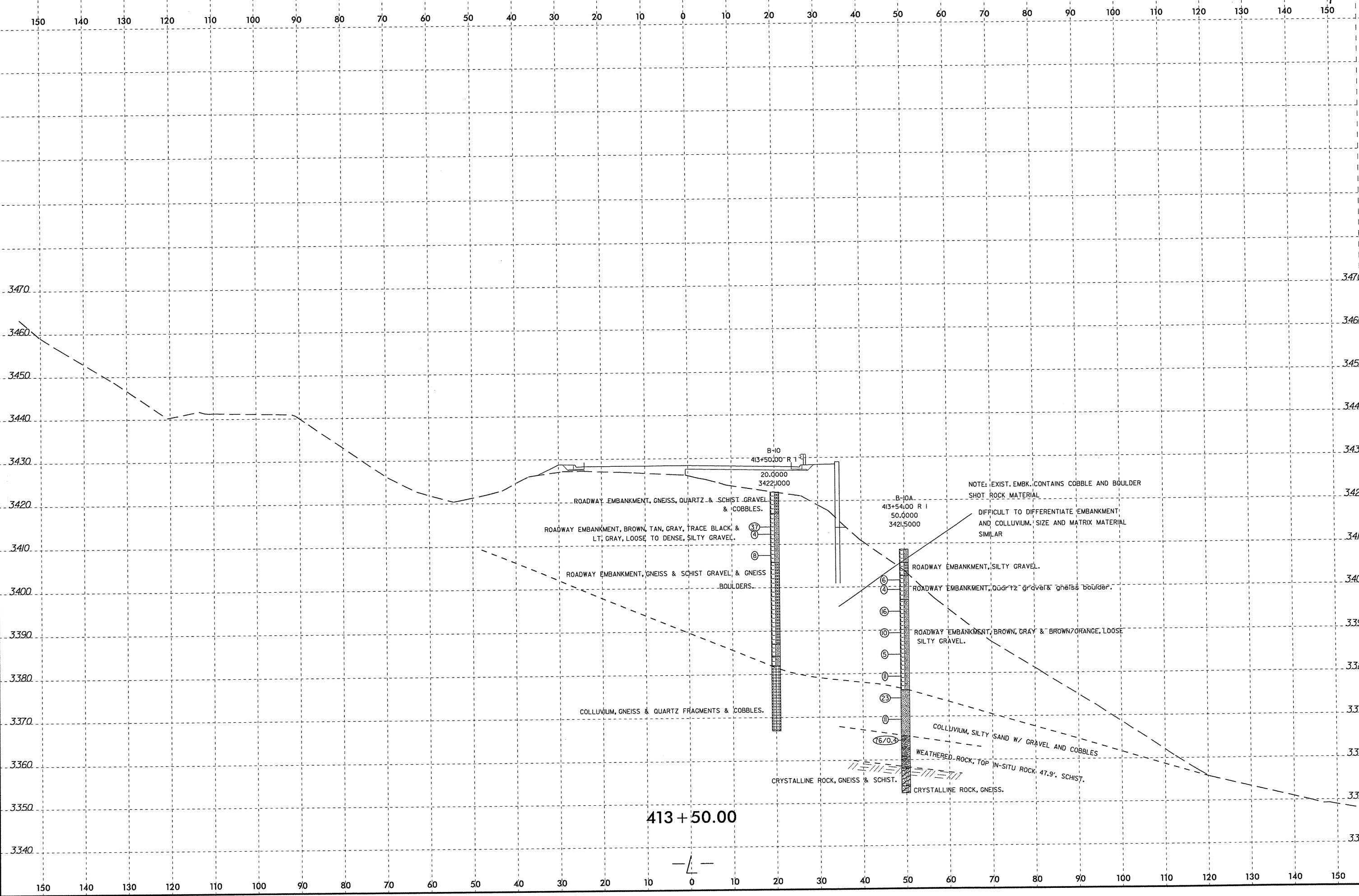
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\$\$\$\$\$DATE\$\$\$\$\$
\$\$\$\$\$USER\$\$\$\$\$

8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
117/259



413 + 50.00

ROADWAY EMBANKMENT, GNEISS, QUARTZ & SCHIST GRAVEL & COBBLES.

ROADWAY EMBANKMENT, BROWN, TAN, GRAY, TRACE BLACK, & LT. GRAY, LOOSE TO DENSE, SILTY GRAVEL.

ROADWAY EMBANKMENT, GNEISS & SCHIST GRAVEL & GNEISS BOULDERS.

COLLUVIUM, GNEISS & QUARTZ FRAGMENTS & COBBLES.

B-10
413+50.00 R 1
20.0000
3422.0000

37
4
8

B-10A
413+54.00 R 1
50.0000
3421.5000

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16
10
5
10
23
10

ROADWAY EMBANKMENT, SILTY GRAVEL.

ROADWAY EMBANKMENT, QUARTZ GRAVEL & GNEISS BOULDER.

ROADWAY EMBANKMENT, BROWN, GRAY & BROWN/ORANGE, LOOSE SILTY GRAVEL.

COLLUVIUM, SILTY SAND W/ GRAVEL AND COBBLES

WEATHERED ROCK, TOP IN-SITU ROCK, 47.9' SCHIST.

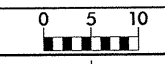
CRYSTALLINE ROCK, GNEISS.

NOTE: EXIST. EMBK. CONTAINS COBBLE AND BOULDER SHOT ROCK MATERIAL

DIFFICULT TO DIFFERENTIATE EMBANKMENT AND COLLUVIUM. SIZE AND MATRIX MATERIAL SIMILAR

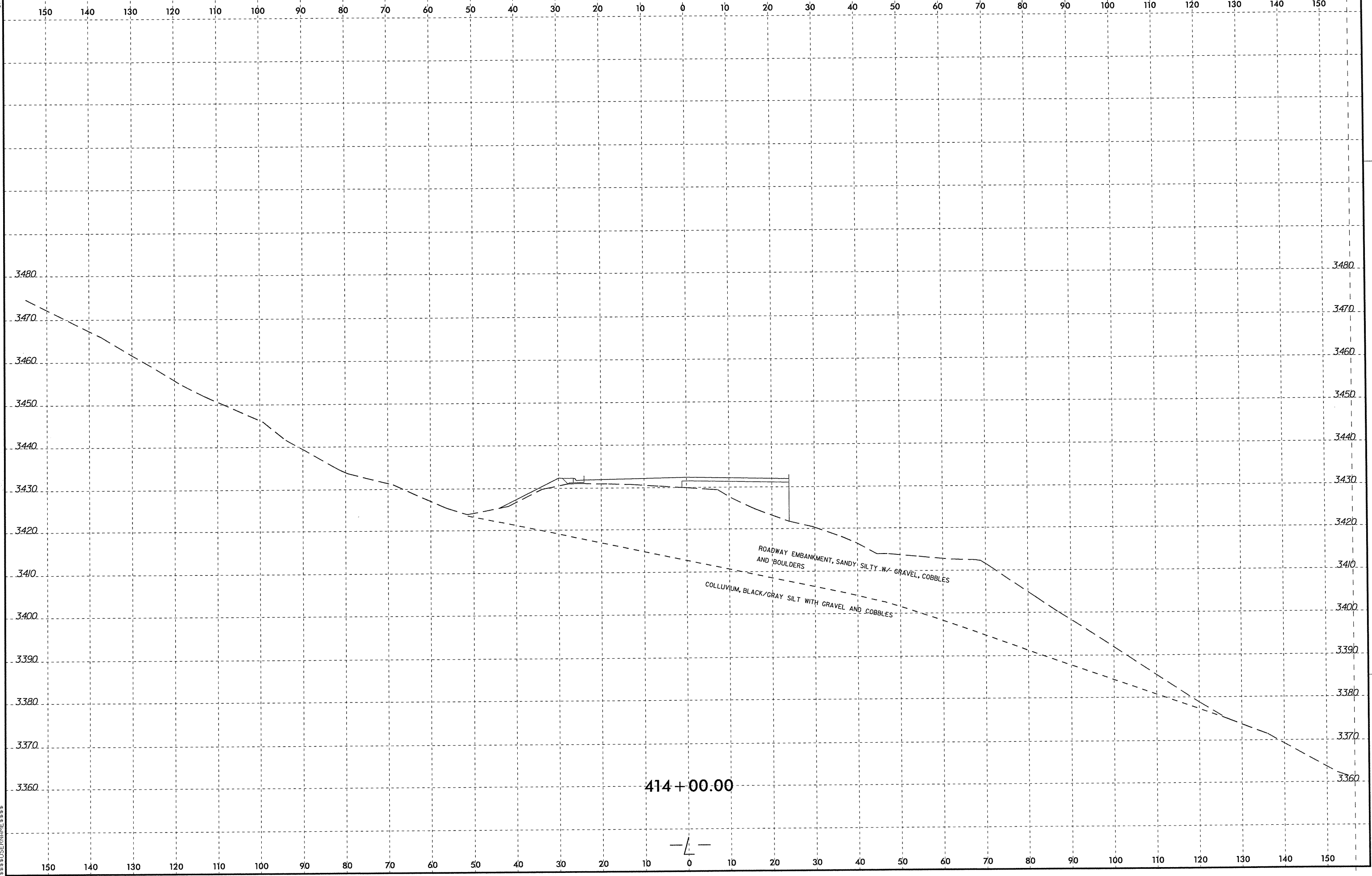
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8/23/99

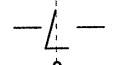


PROJ. REFERENCE NO.
R-2237C

SHEET NO.
119/259

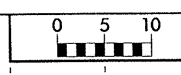


414 + 00.00



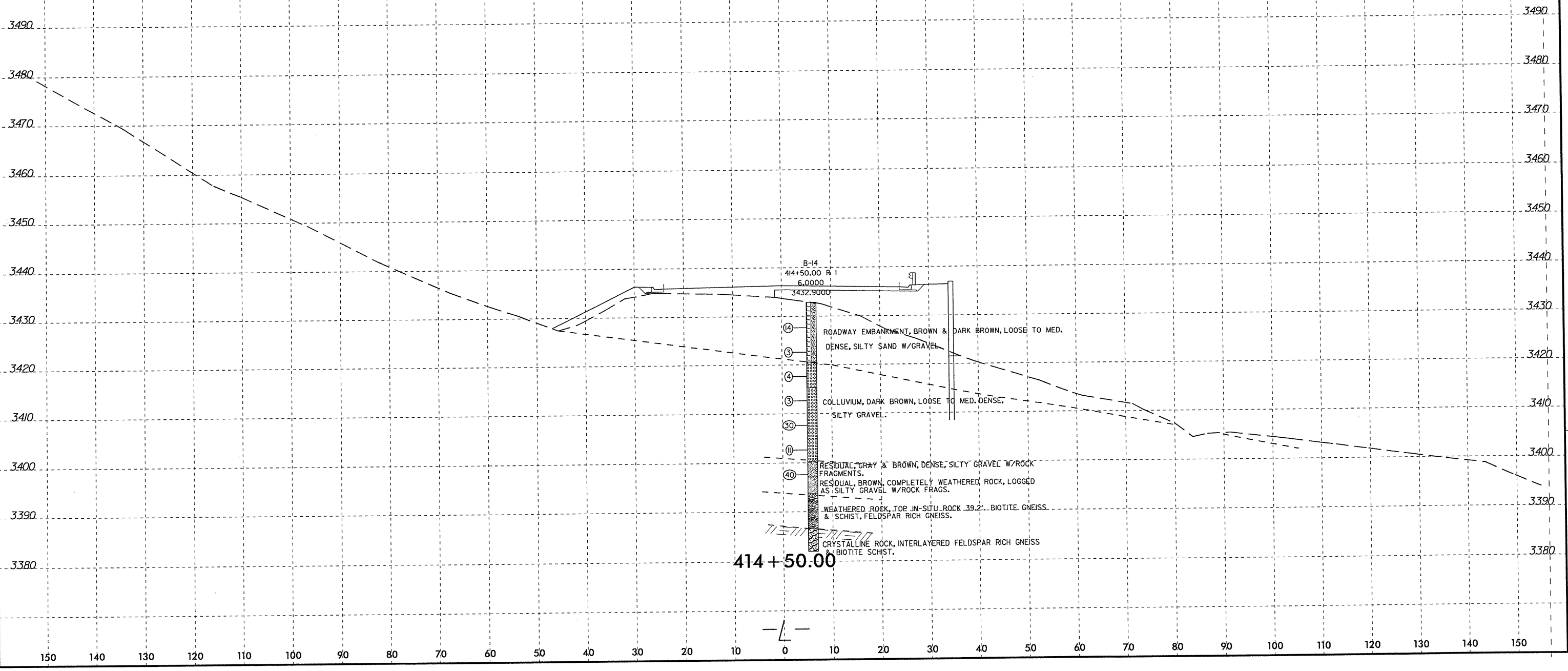
\$\$\$\$SYTIME\$\$\$\$
\$\$\$\$SYSDON\$\$\$\$
\$\$\$\$SYTIME\$\$\$\$
\$\$\$\$SYSDON\$\$\$\$

8/23/99



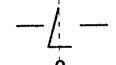
PROJ. REFERENCE NO. R-2237C SHEET NO. 119/259

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

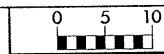


SYSTEM TIME DOWN

414 + 50.00

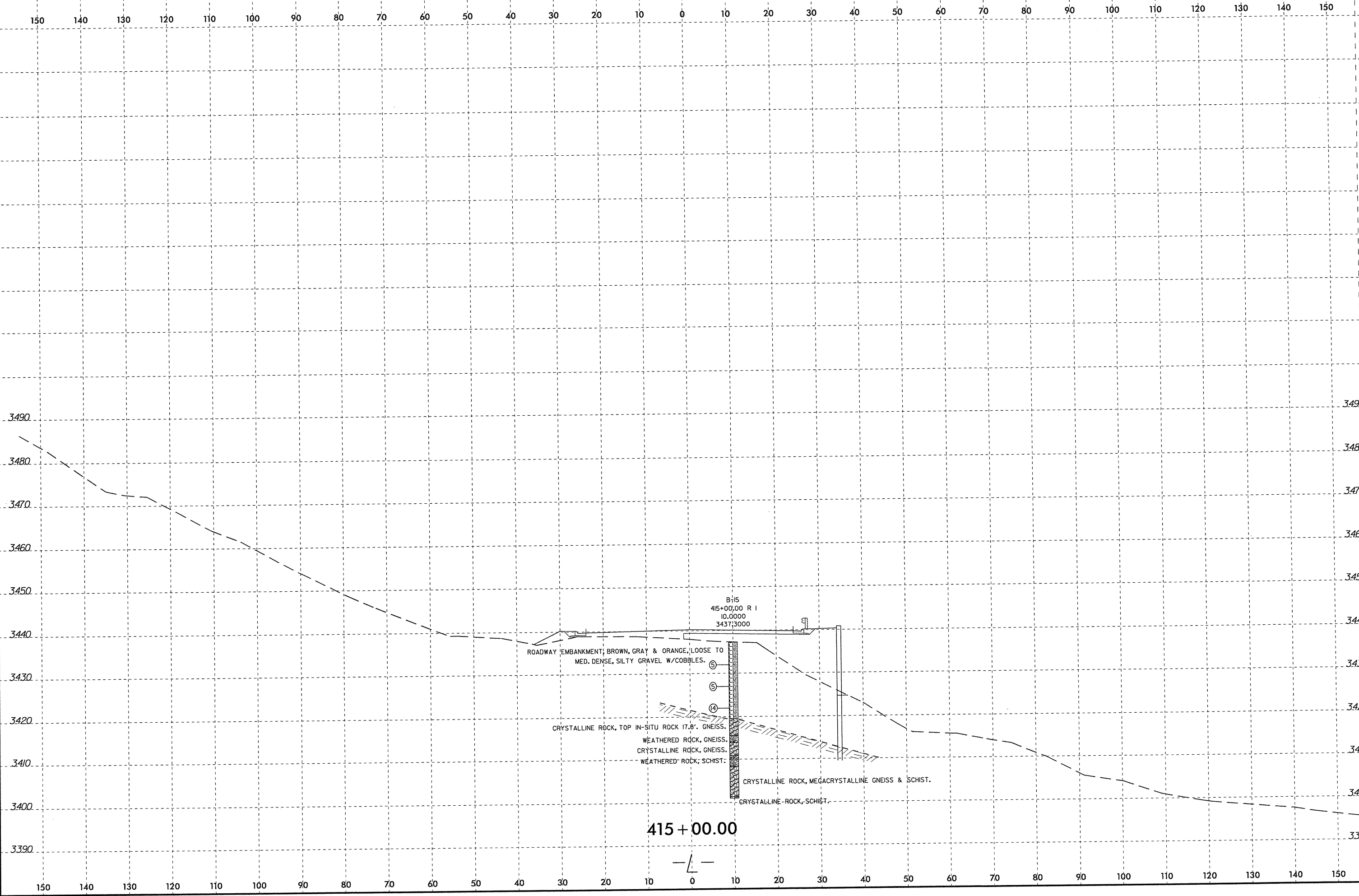


8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
120/259



ROADWAY EMBANKMENT, BROWN, GRAY & ORANGE, LOOSE TO MED. DENSE, SILTY GRAVEL W/COBBLES.

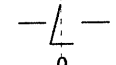
B+15
415+00.00 R 1
10.0000
3437.3000

CRYSTALLINE ROCK, TOP IN-SITU ROCK 17.8'. GNEISS.
WEATHERED ROCK, GNEISS.
CRYSTALLINE ROCK, GNEISS.
WEATHERED ROCK, SCHIST.

CRYSTALLINE ROCK, MEGACRYSTALLINE GNEISS & SCHIST.

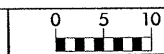
CRYSTALLINE ROCK, SCHIST.

415 + 00.00



\$\$\$\$SYTIME\$\$\$\$
\$\$\$\$USERS\$\$\$\$
\$\$\$\$\$\$\$\$\$\$\$\$

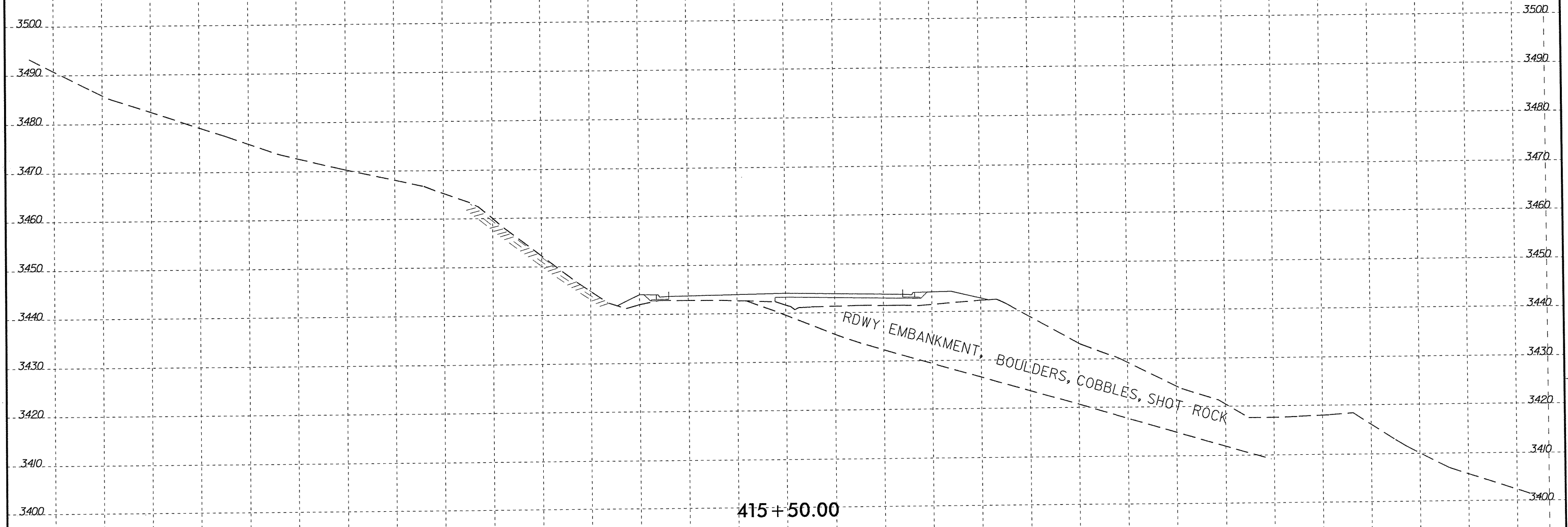
8/23/99



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
121/259

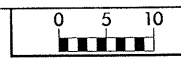
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



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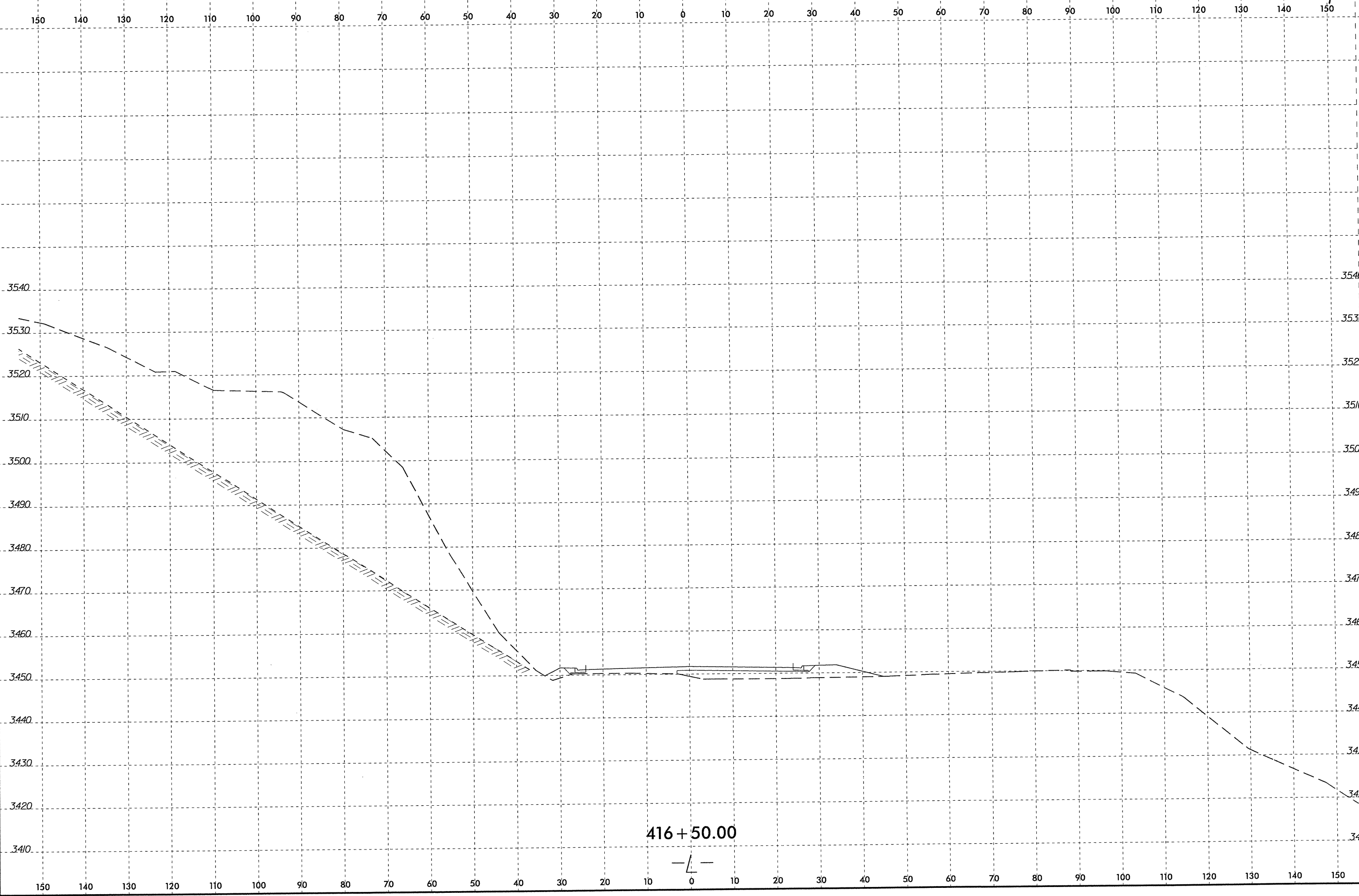
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

8/23/99



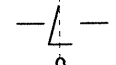
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
122/259

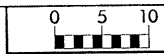


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\$\$\$\$\$LINE\$\$\$\$\$

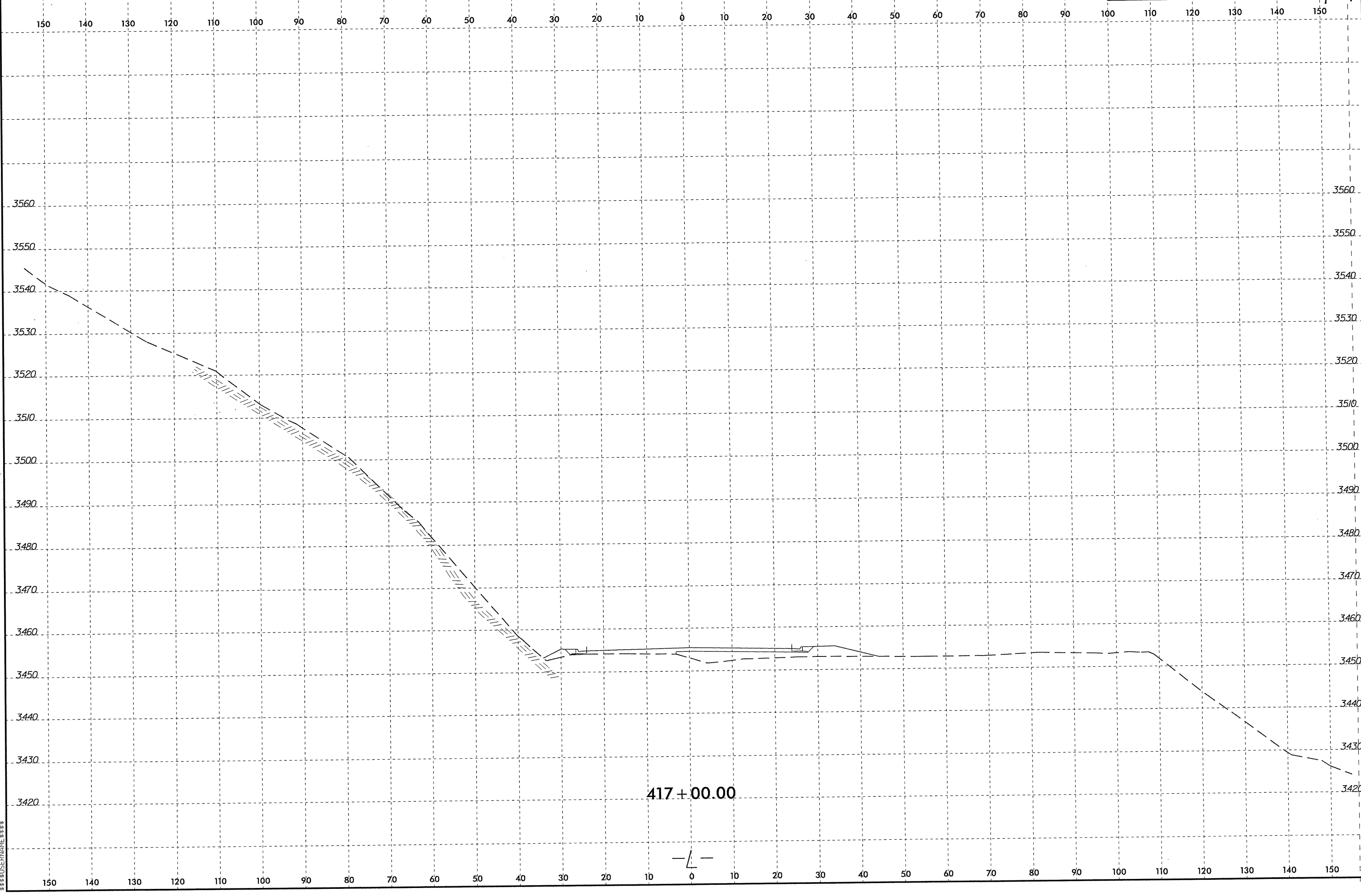
416 + 50.00



8/22/99

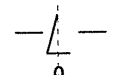


PROJ. REFERENCE NO.	SHEET NO.
R-2237C	123/259

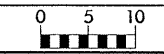


SYSTEM TIME
 DATE
 USER
 DEVICE

417 + 00.00

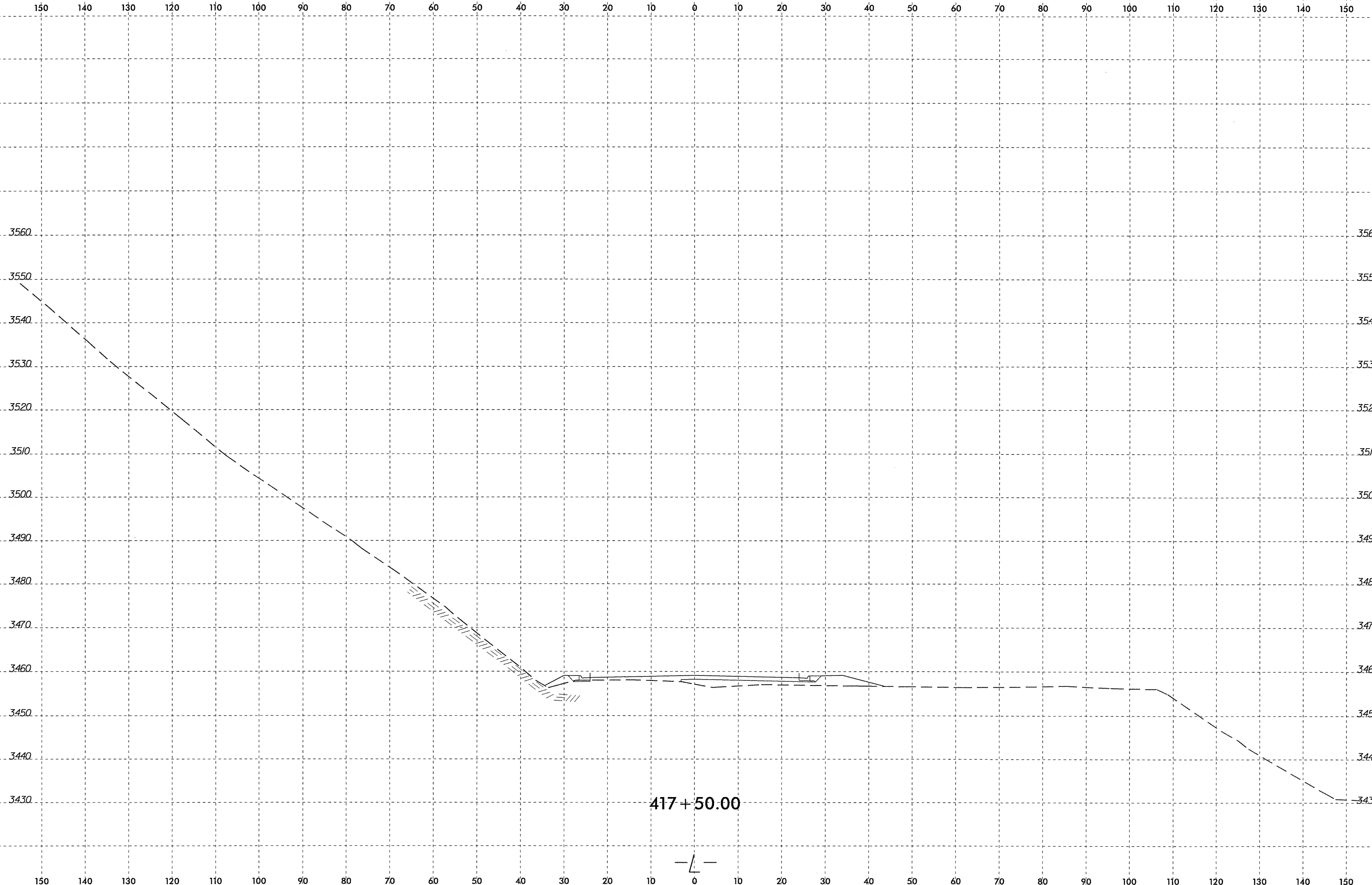


8/23/12



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
124/259

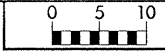


\$\$\$\$SYTIME\$\$\$\$
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\$\$\$\$ELEV\$\$\$\$

417+50.00

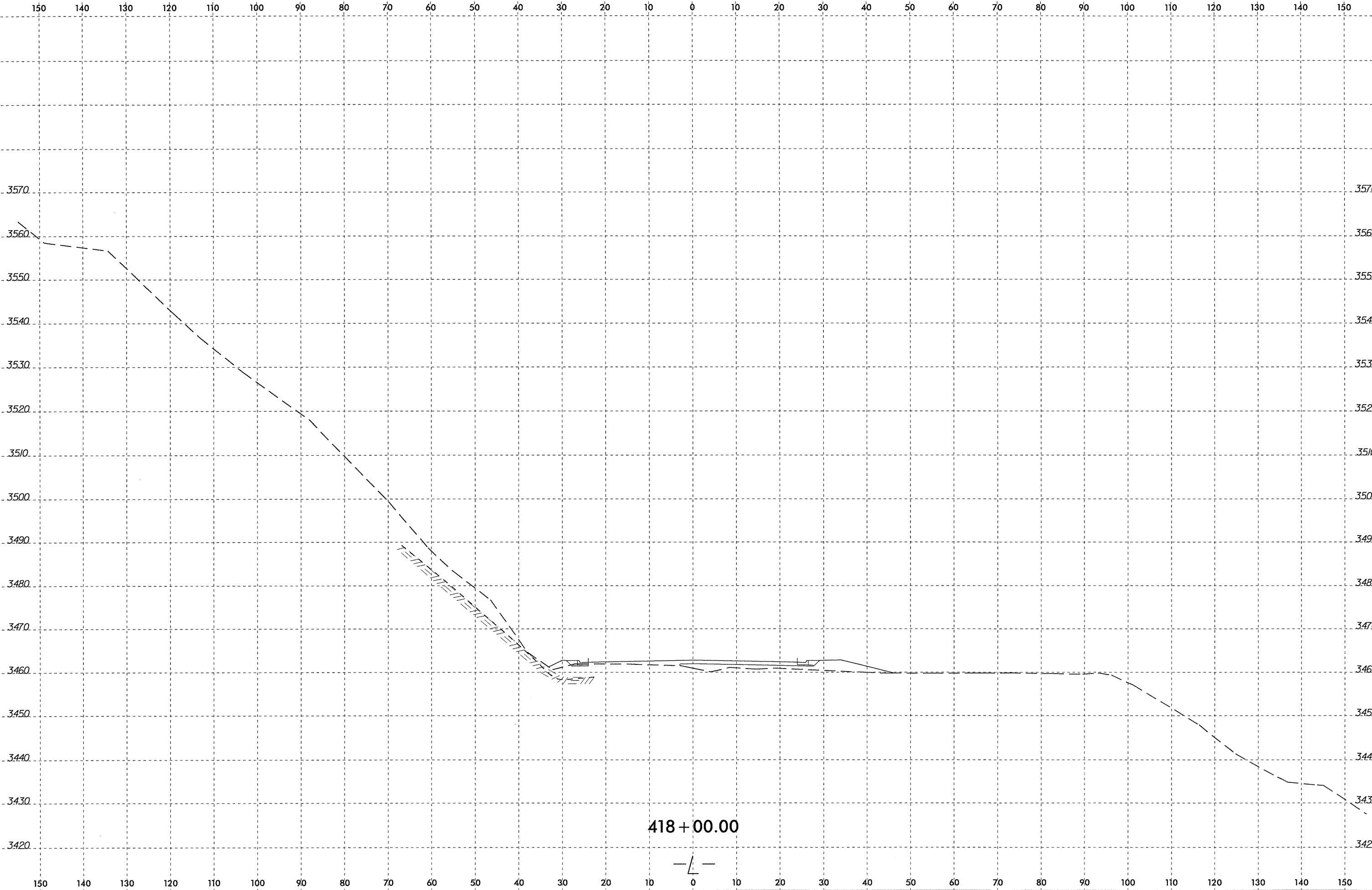
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8/23/04



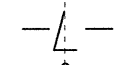
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
125/359

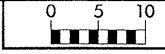


 C:\TEMP*****
 07/23/04 10:00 AM

418 + 00.00

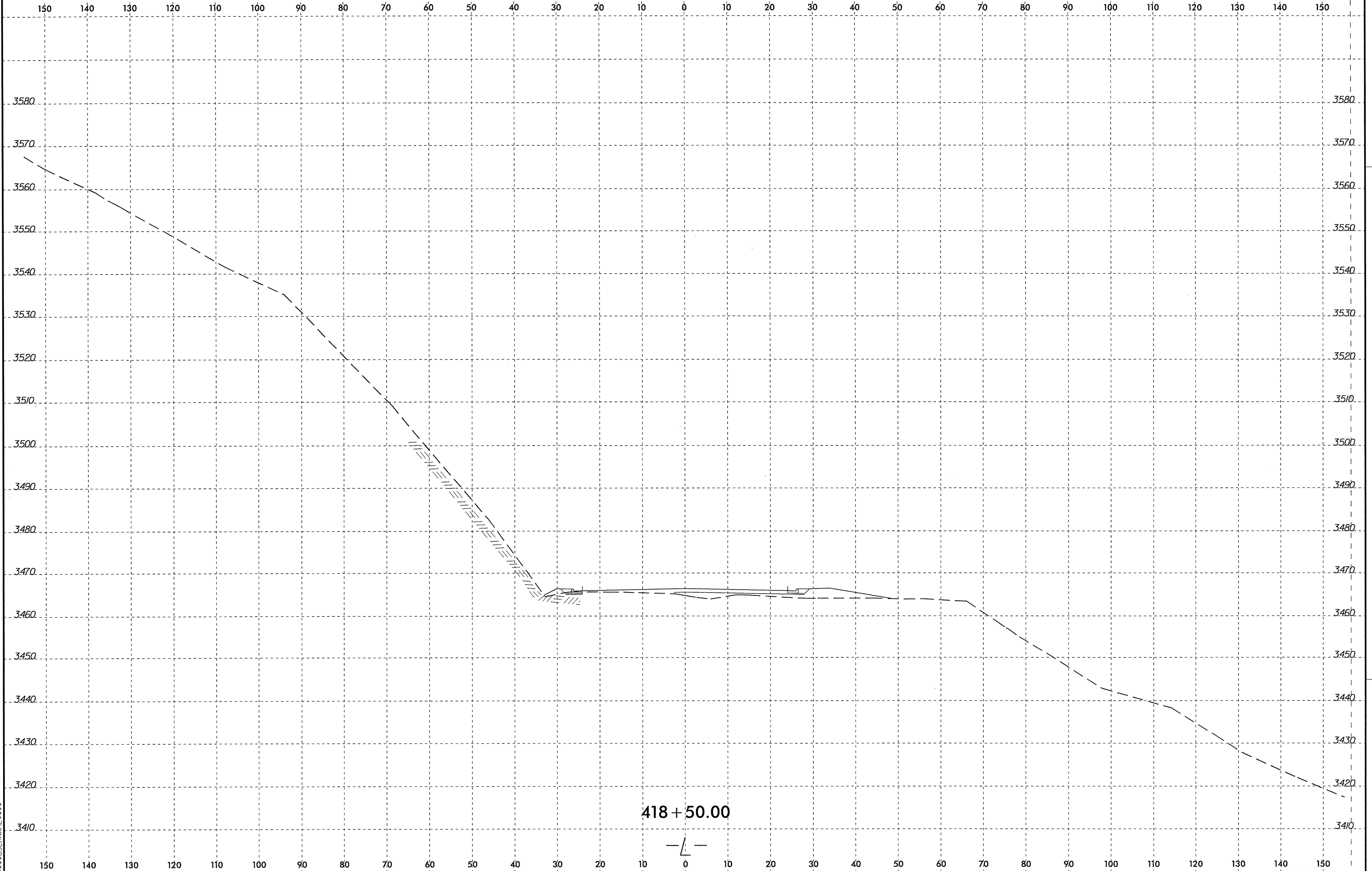


B/23/4

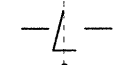


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R-2237C

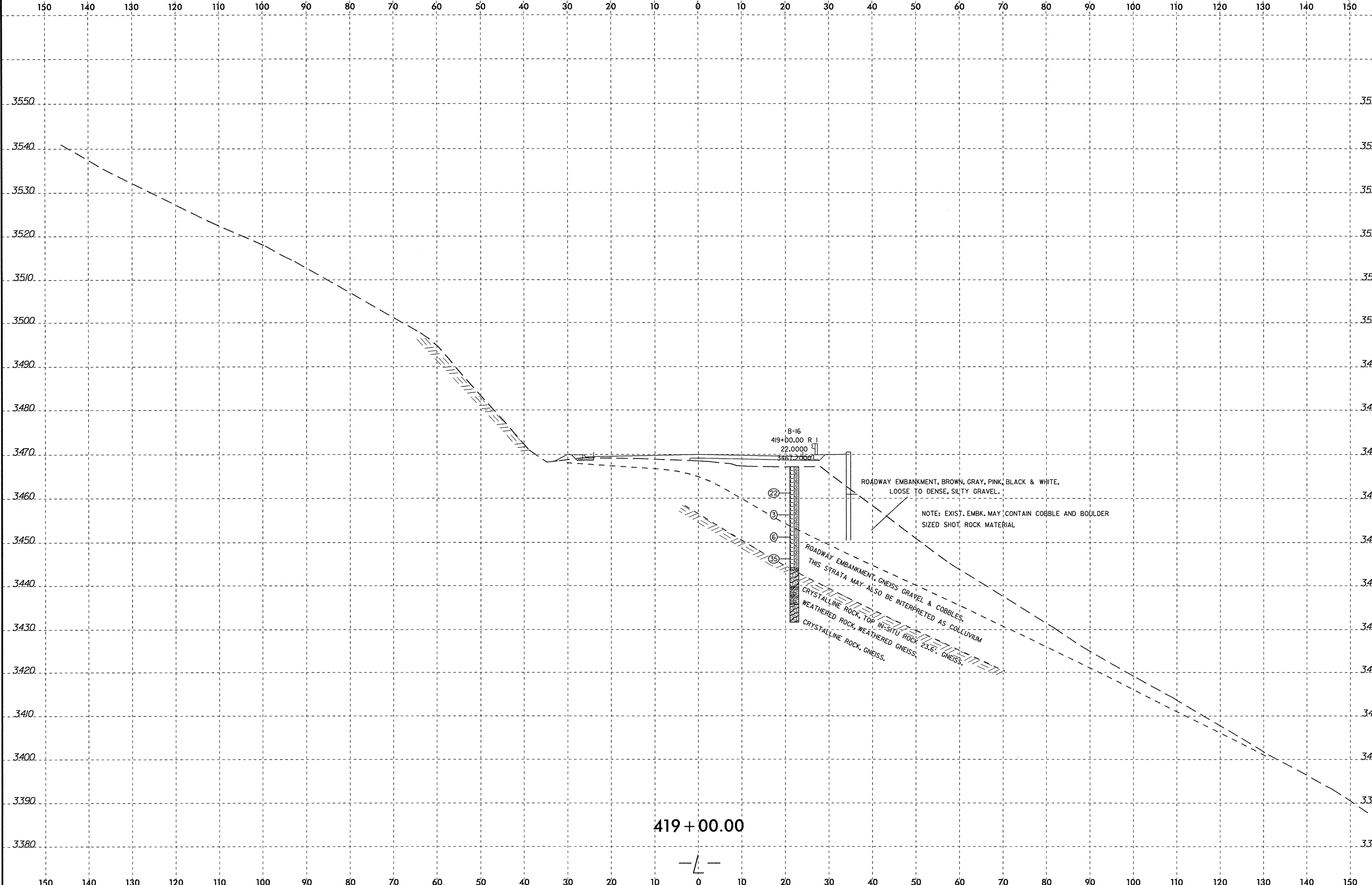
SHEET NO.
126/259



418 + 50.00

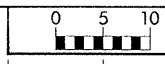


SECTION NAME



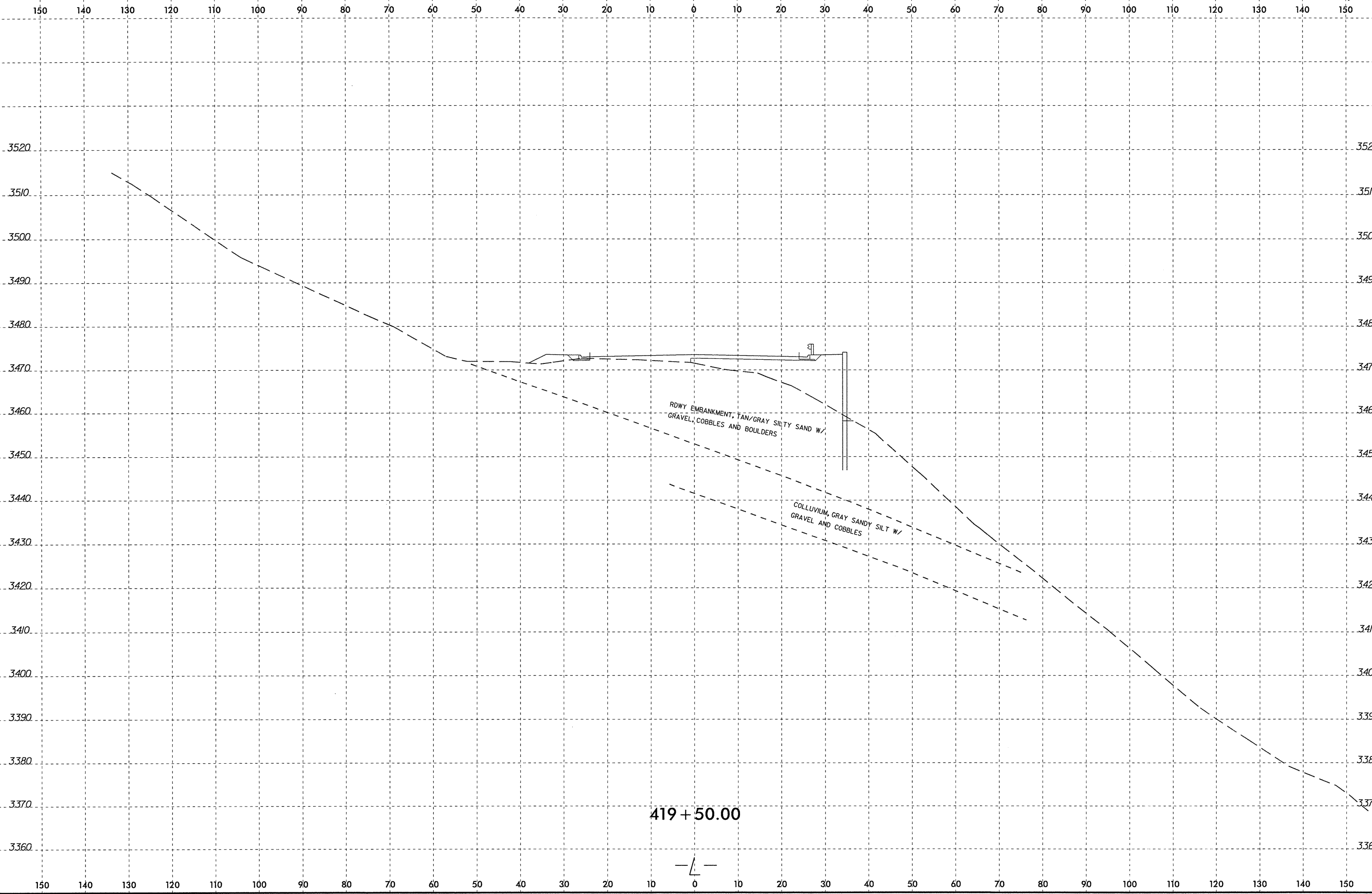
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\$\$\$CDON\$\$\$
\$\$\$USERNAME\$\$\$

8/23/17

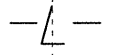


PROJ. REFERENCE NO.
R-2237C

SHEET NO.
128/259

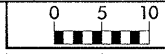


419 + 50.00



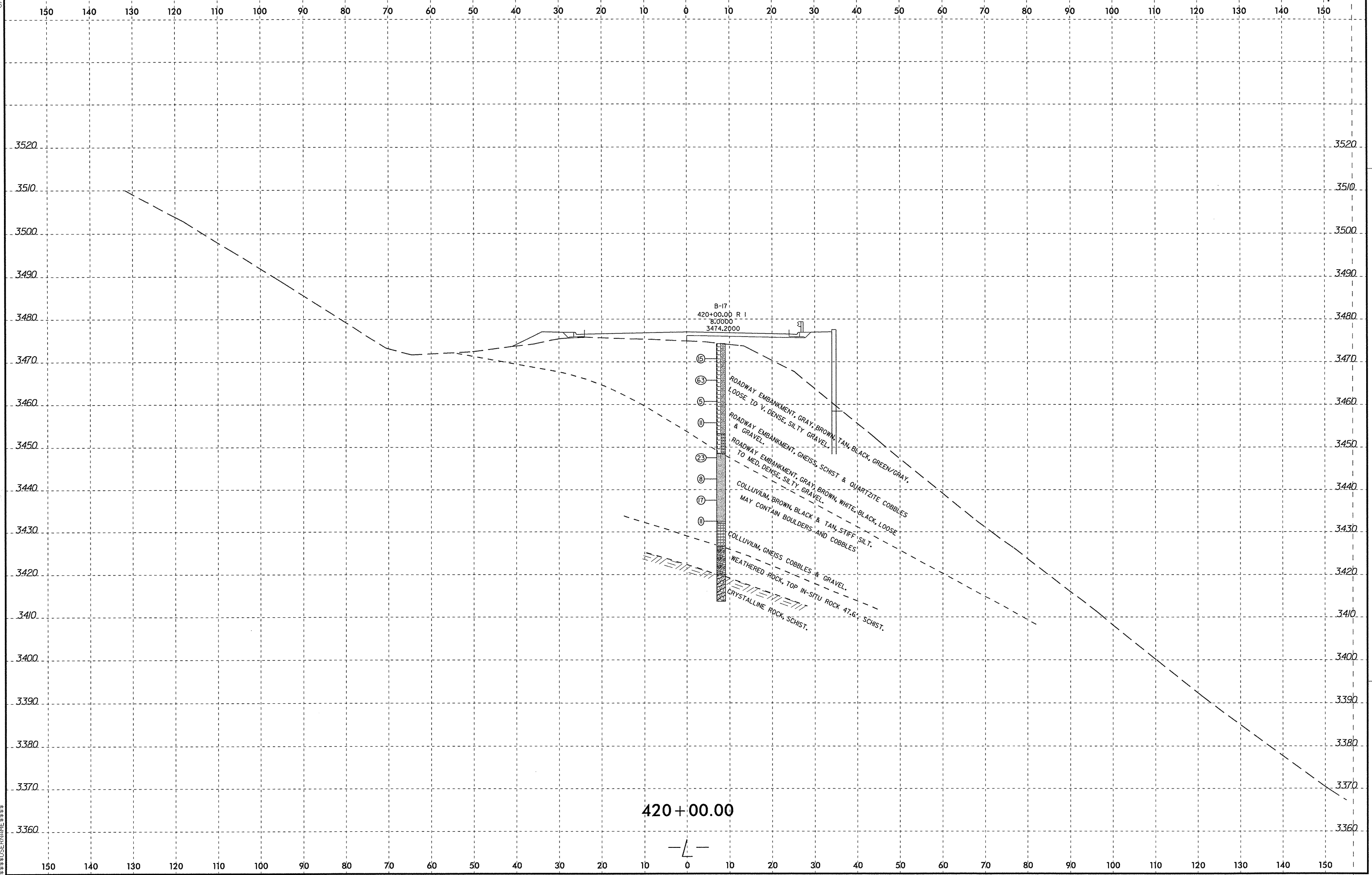
SYSTEMS TIME DOWN

8/23/11



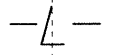
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
129/259



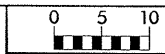
B-17
420+00.00 R 1
8.0000
3474.2000

420+00.00

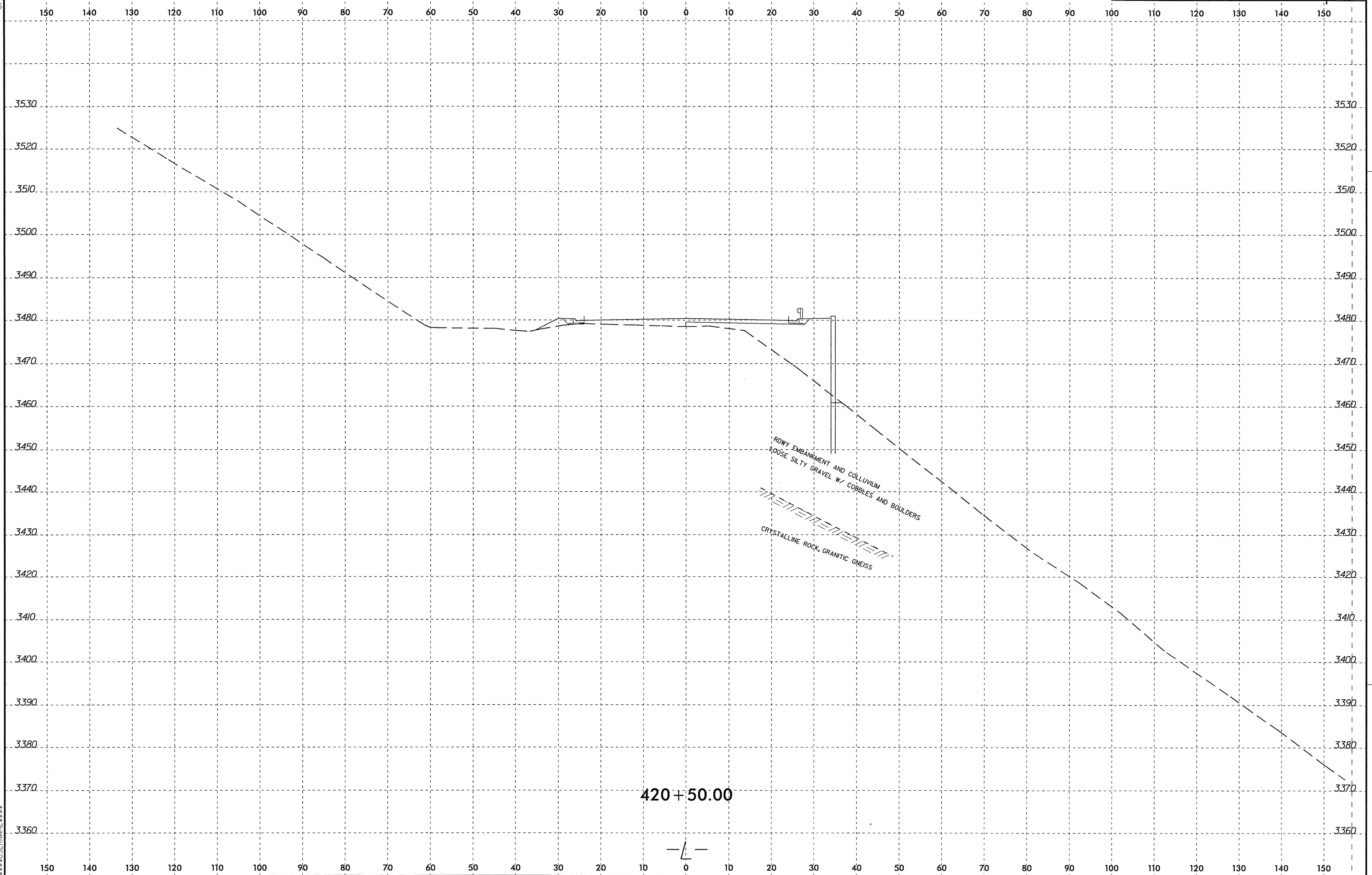


SYSTEM TIME: 8/23/11 10:00:00 AM
USER: JLM
PROJECT: R-2237C
SHEET: 129/259

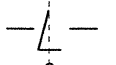
8/23/11



PROJ. REFERENCE NO. R-2237C	SHEET NO. 130/259
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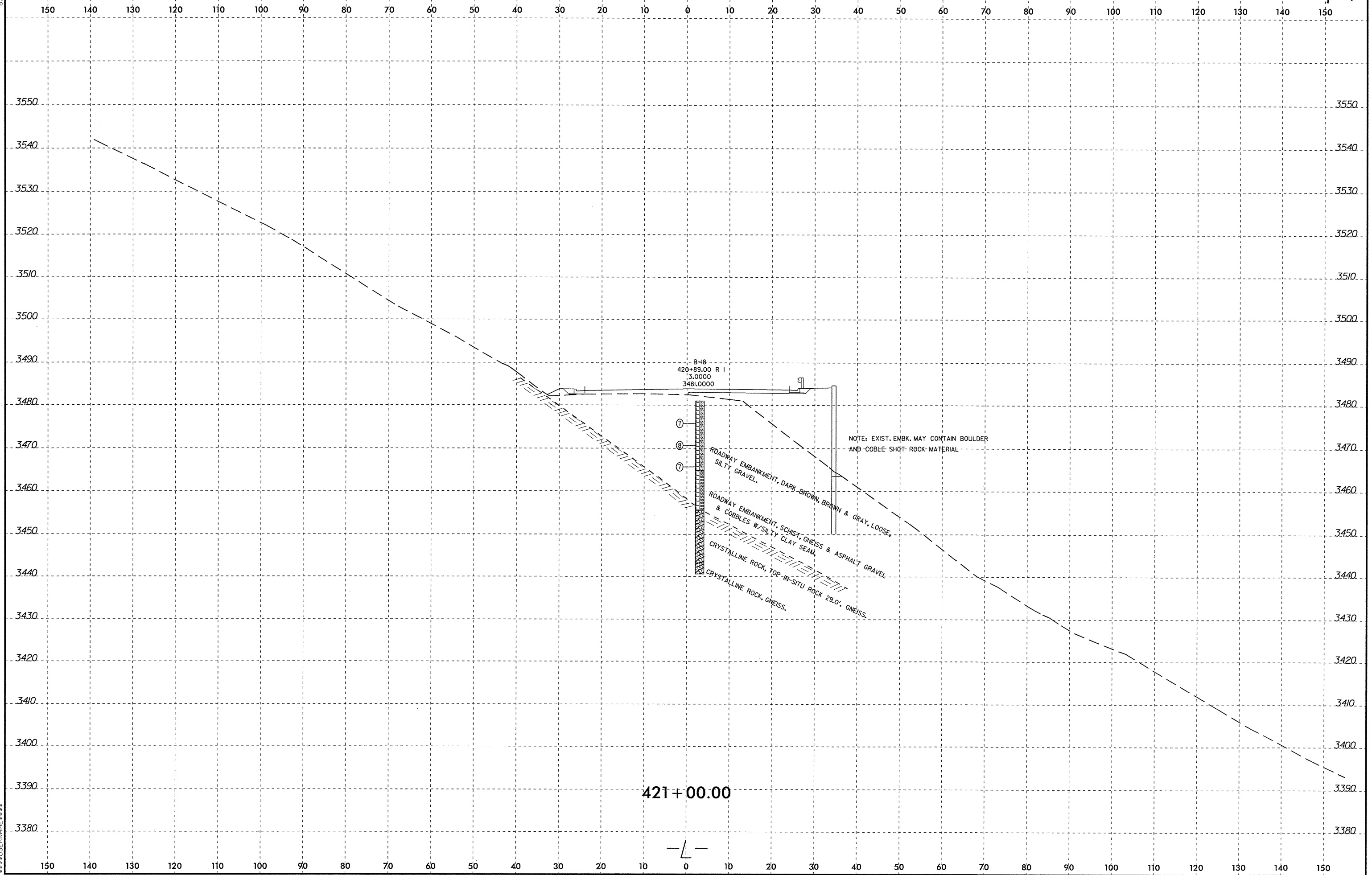
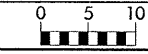


420+50.00

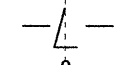


 TIME *****

B/233

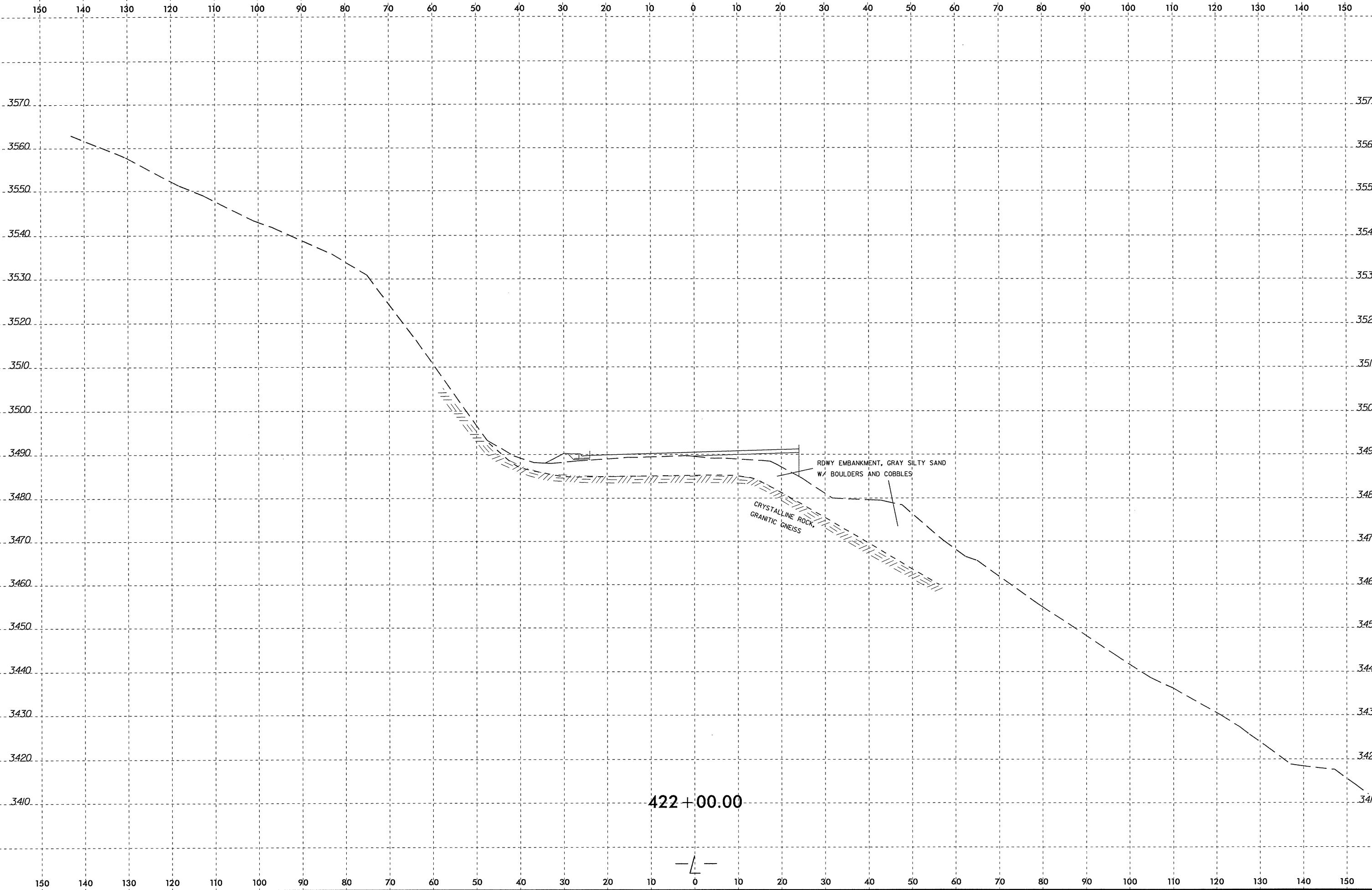


421+00.00

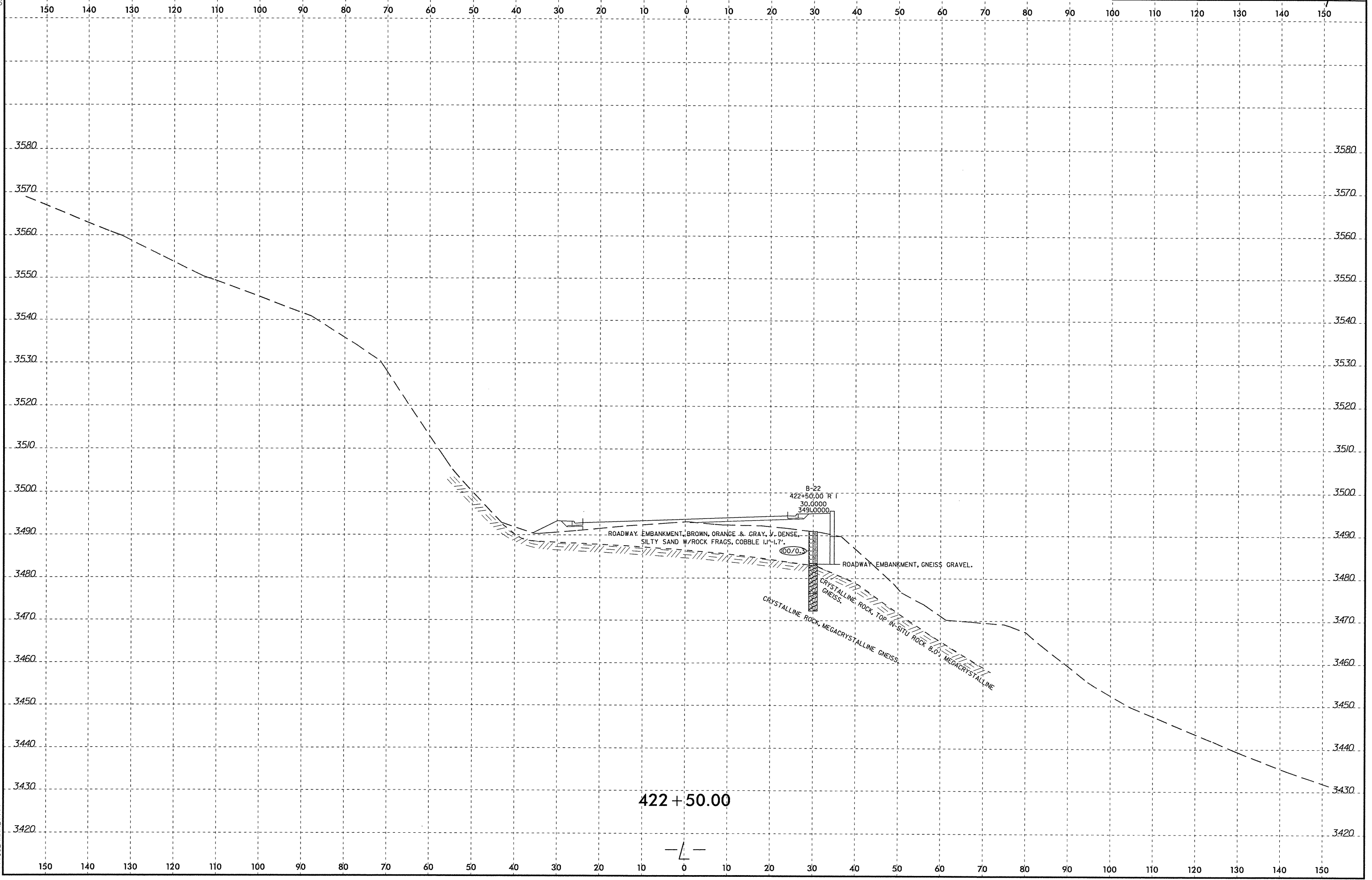
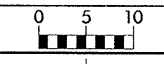


SYTIME
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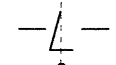
8/23/09
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8/23/



422 + 50.00



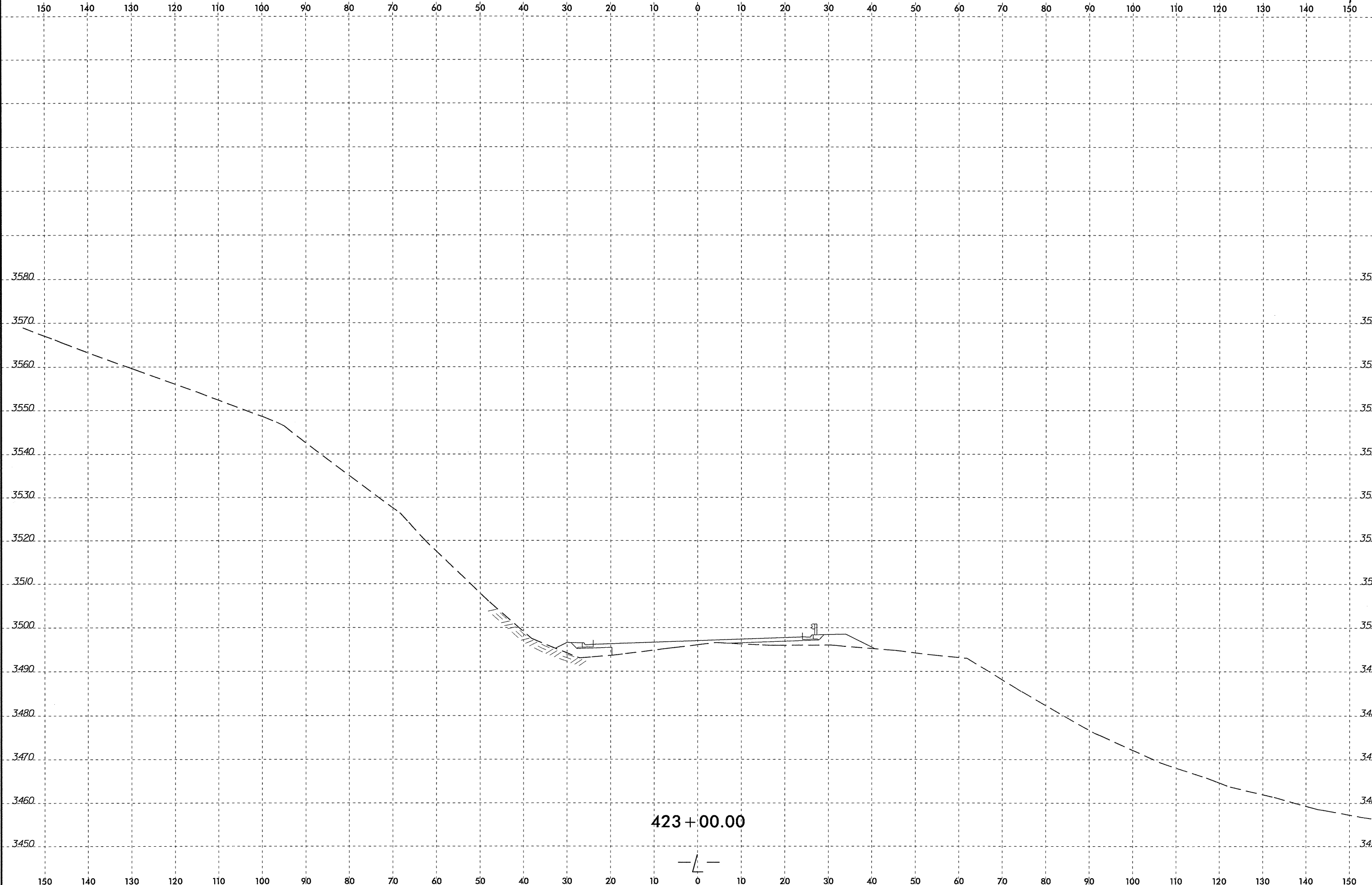
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8/23/14



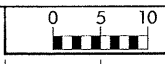
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
135/251



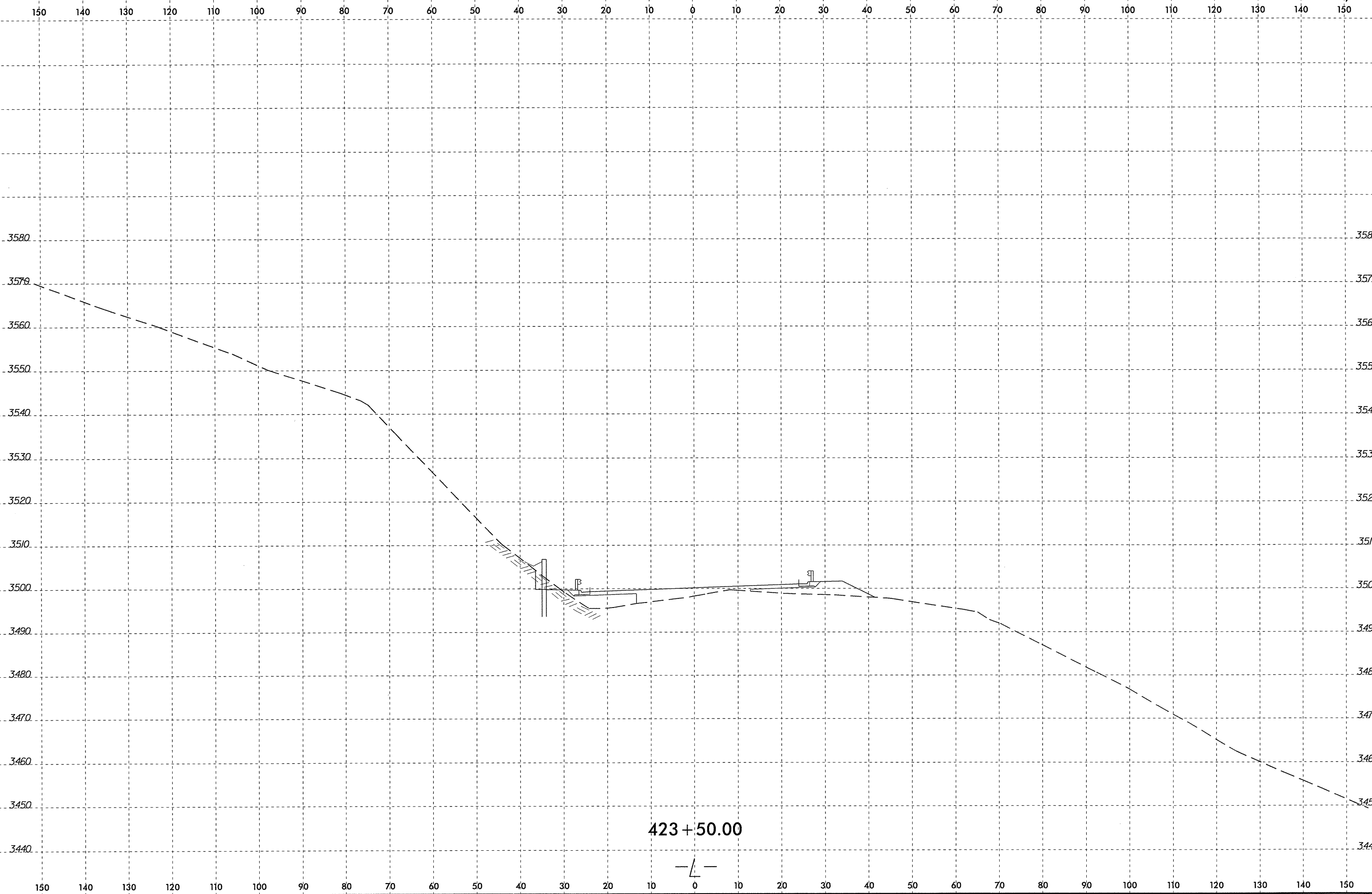
SYSTEM TIME: 8/23/14 10:00:00
 USER: JLN
 PROJECT: R-2237C
 SHEET: 135/251

8/23/11

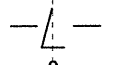


PROJ. REFERENCE NO.
R-2237C

SHEET NO.
136/259

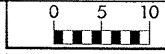


423+50.00



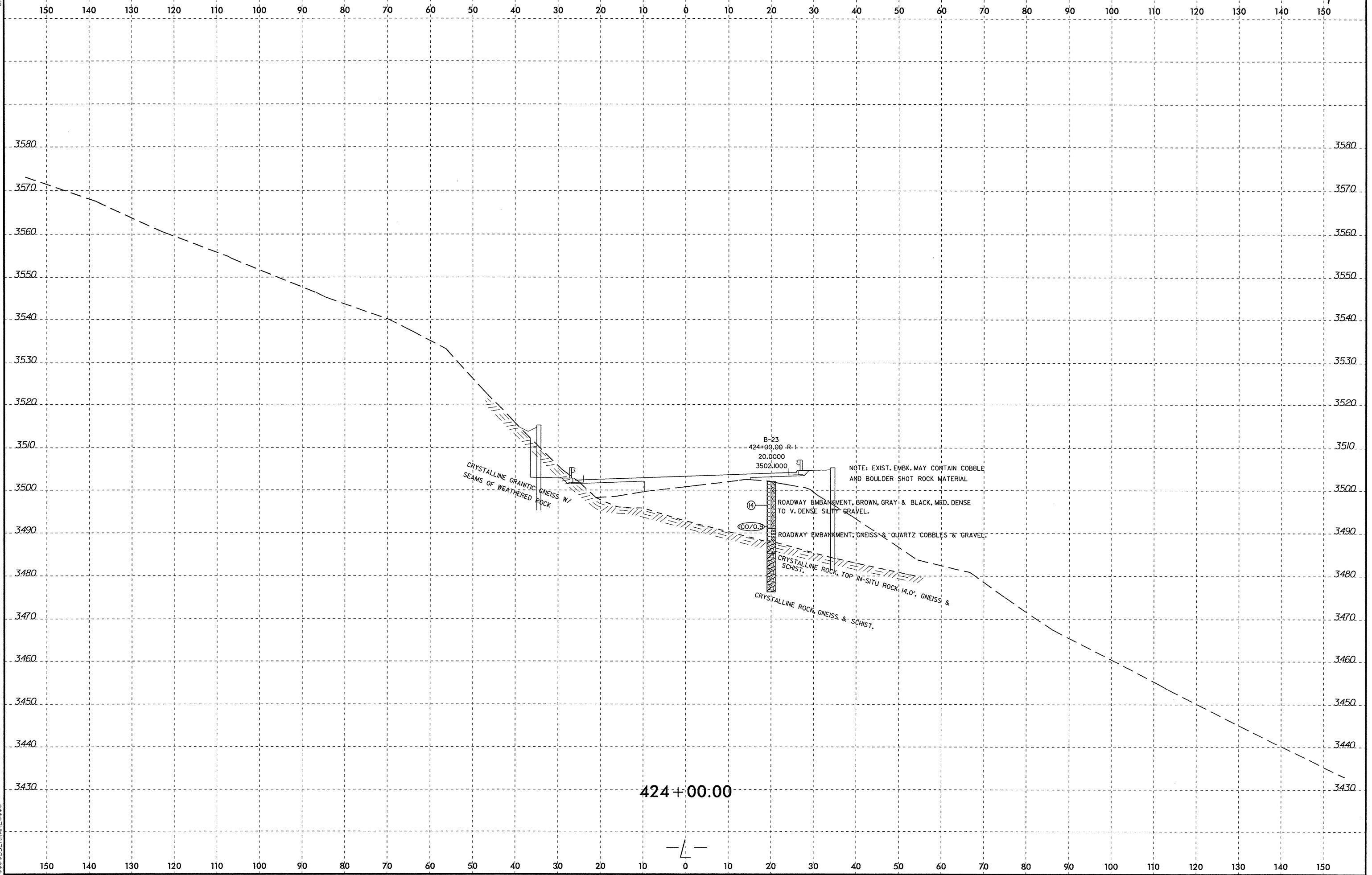
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8/23/17



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
137 / 239



424+00.00



CRYSTALLINE GRANITIC GNEISS W/ SEAMS OF WEATHERED ROCK

CRYSTALLINE GRANITIC GNEISS W/ SEAMS OF WEATHERED ROCK

B-23
424+00.00 R-1
20.0000
3502.0000

NOTE: EXIST. EMBK. MAY CONTAIN COBBLE AND BOULDER SHOT ROCK MATERIAL

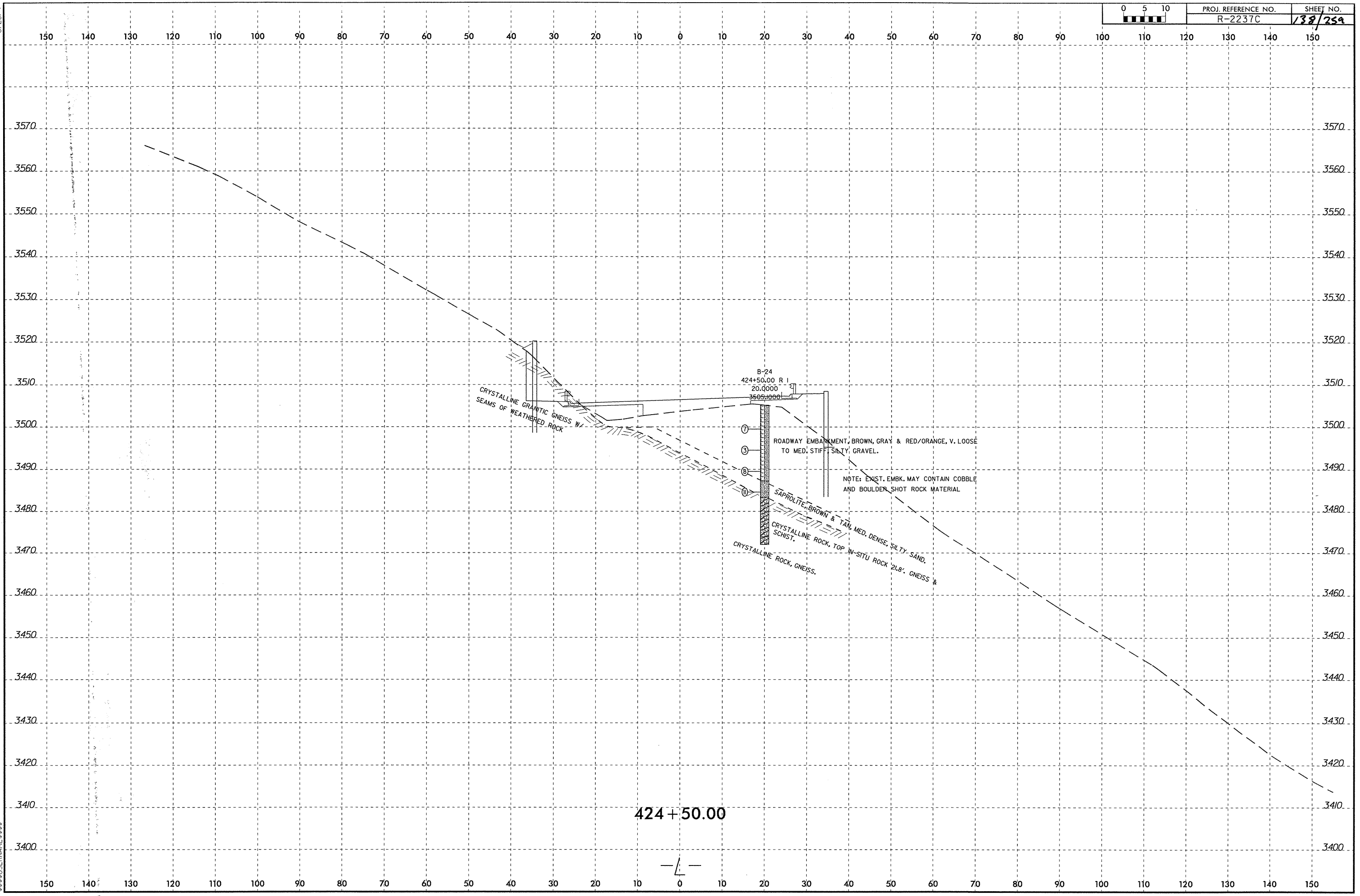
ROADWAY EMBANKMENT, BROWN, GRAY & BLACK, MED. DENSE TO V. DENSE SILTY GRAVEL.

ROADWAY EMBANKMENT, GNEISS & QUARTZ COBBLES & GRAVEL.

CRYSTALLINE ROCK, TOP IN-SITU ROCK, 14.0', GNEISS & SCHIST.

CRYSTALLINE ROCK, GNEISS & SCHIST.

8/23/09
TIME
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BY
PROJECT
SHEET NO.

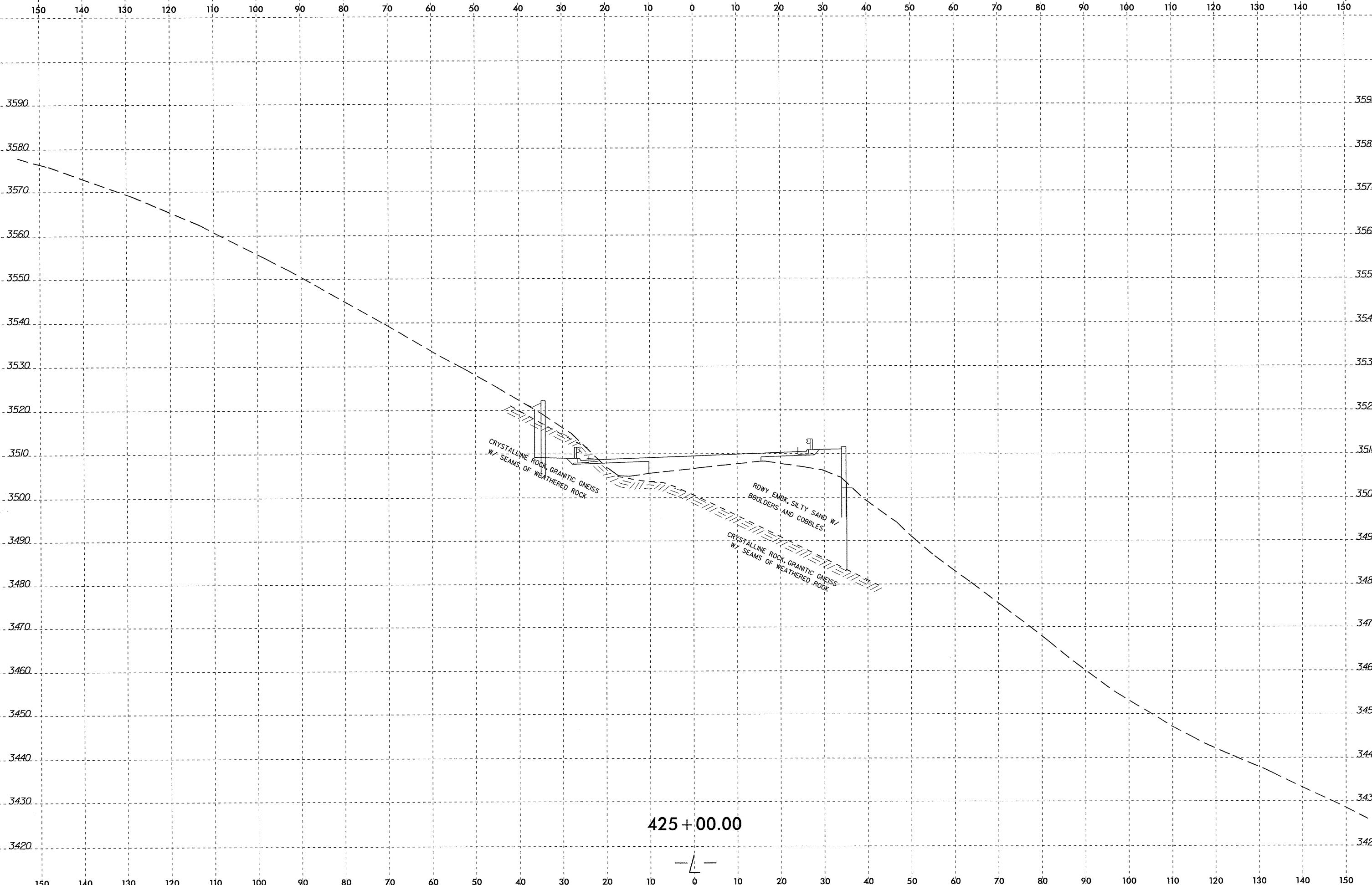


8/23/04

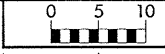


PROJ. REFERENCE NO.	SHEET NO.
R-2237C	139/259

SHEET NO.
139/259



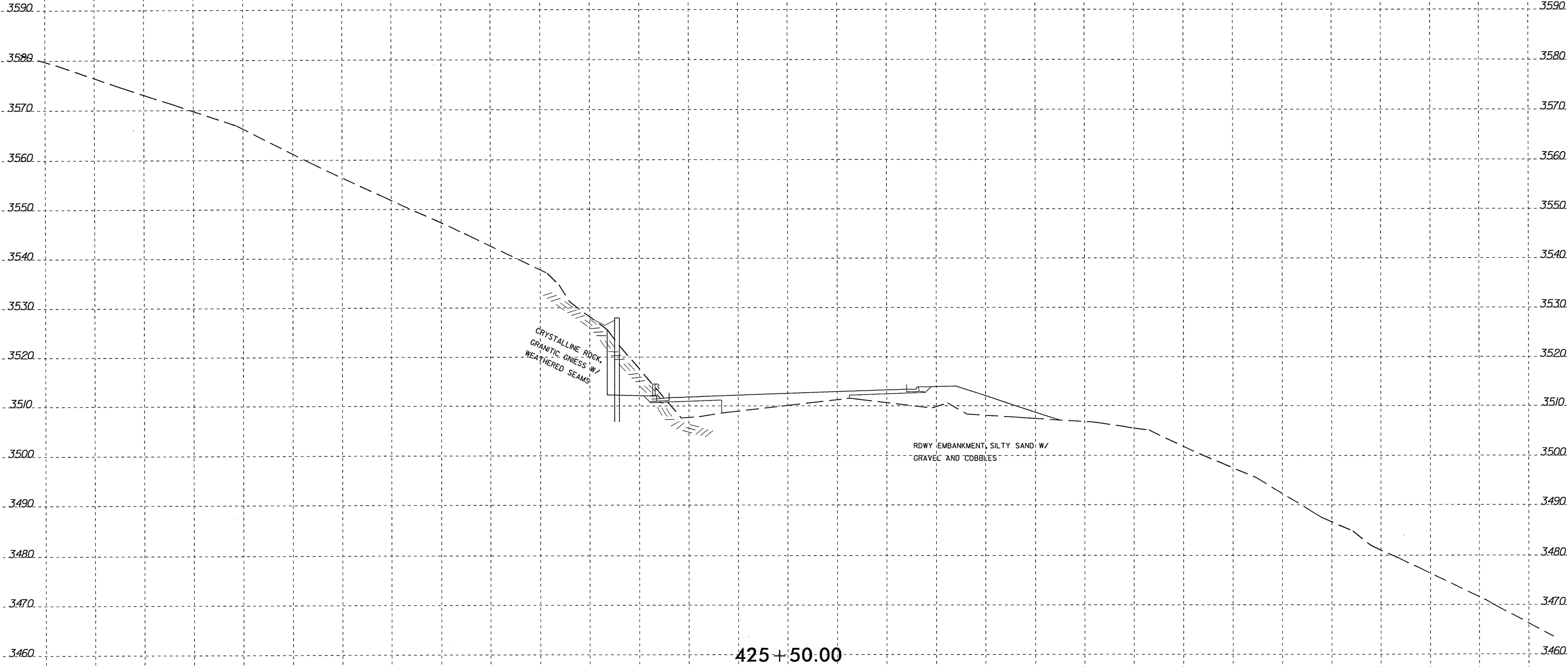
8/23/00



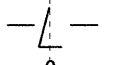
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
140/259

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

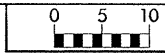


SECTION INFORMATION

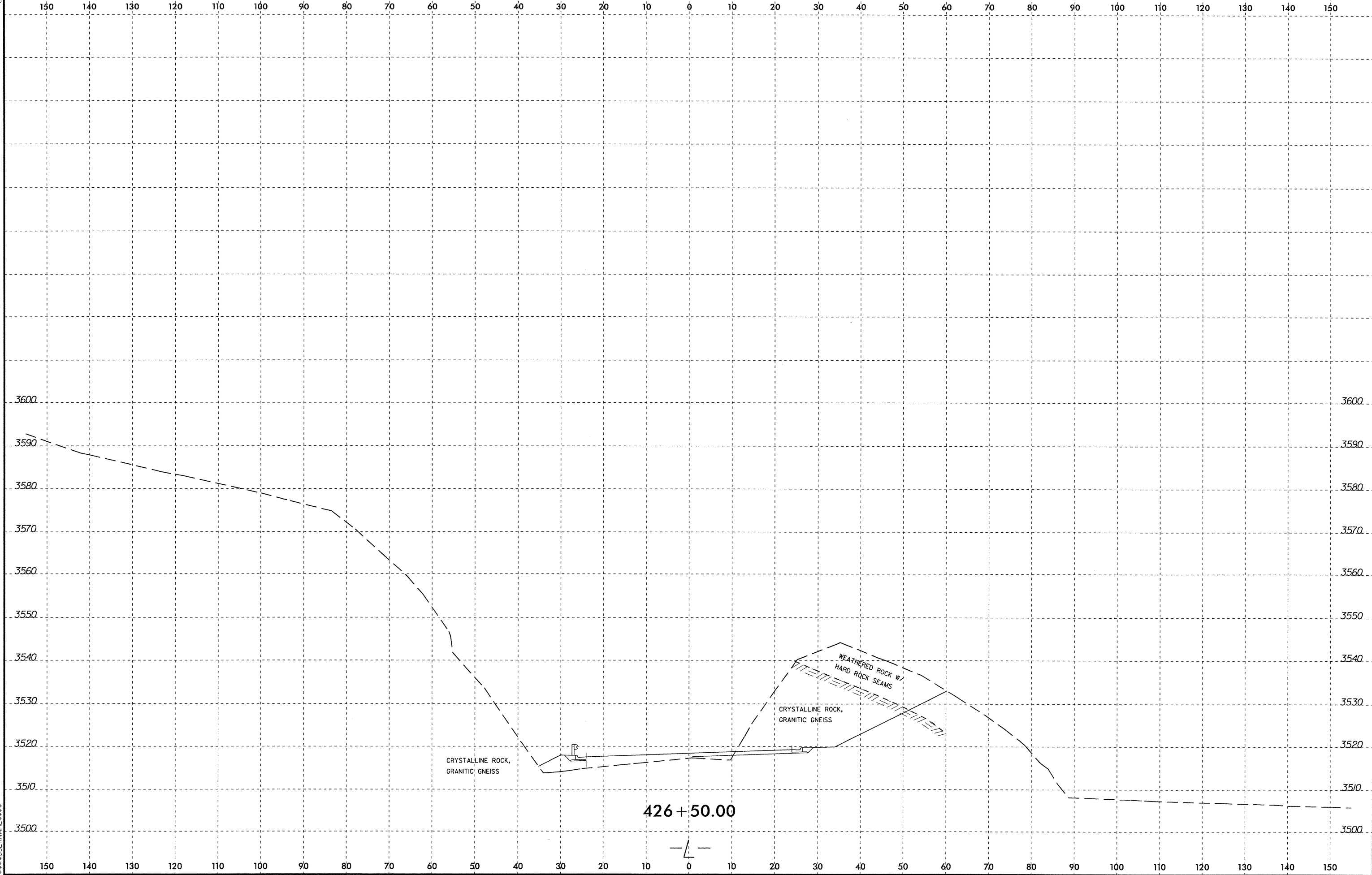


150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

8/23/15

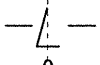


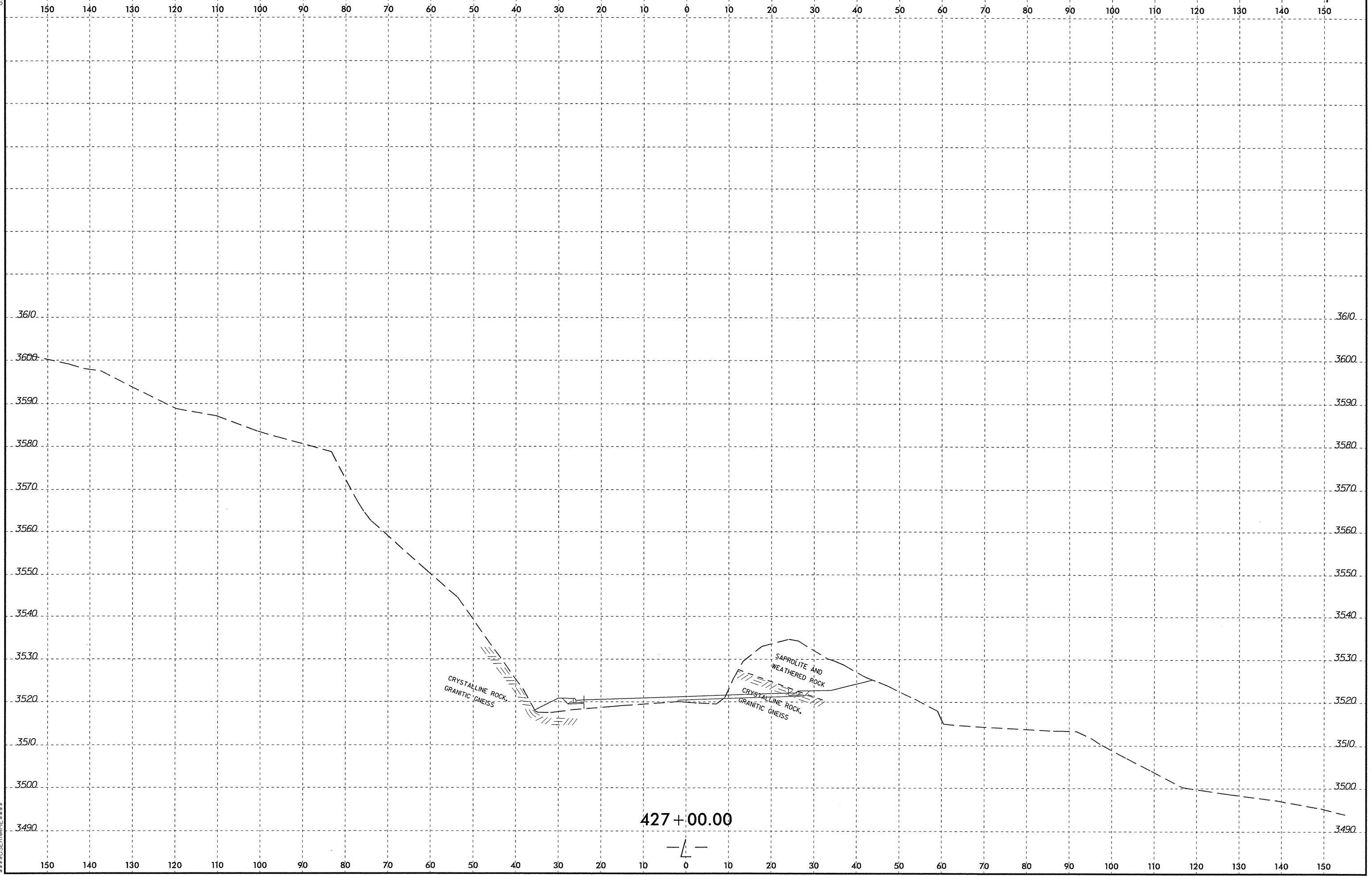
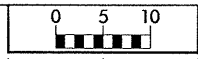
PROJ. REFERENCE NO. R-2237C	SHEET NO. 142/259
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CRYSTALLINE ROCK, GRANITIC GNEISS
 WEATHERED ROCK W/ HARD ROCK SEAMS
 CRYSTALLINE ROCK, GRANITIC GNEISS

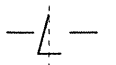
426+50.00



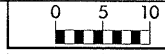


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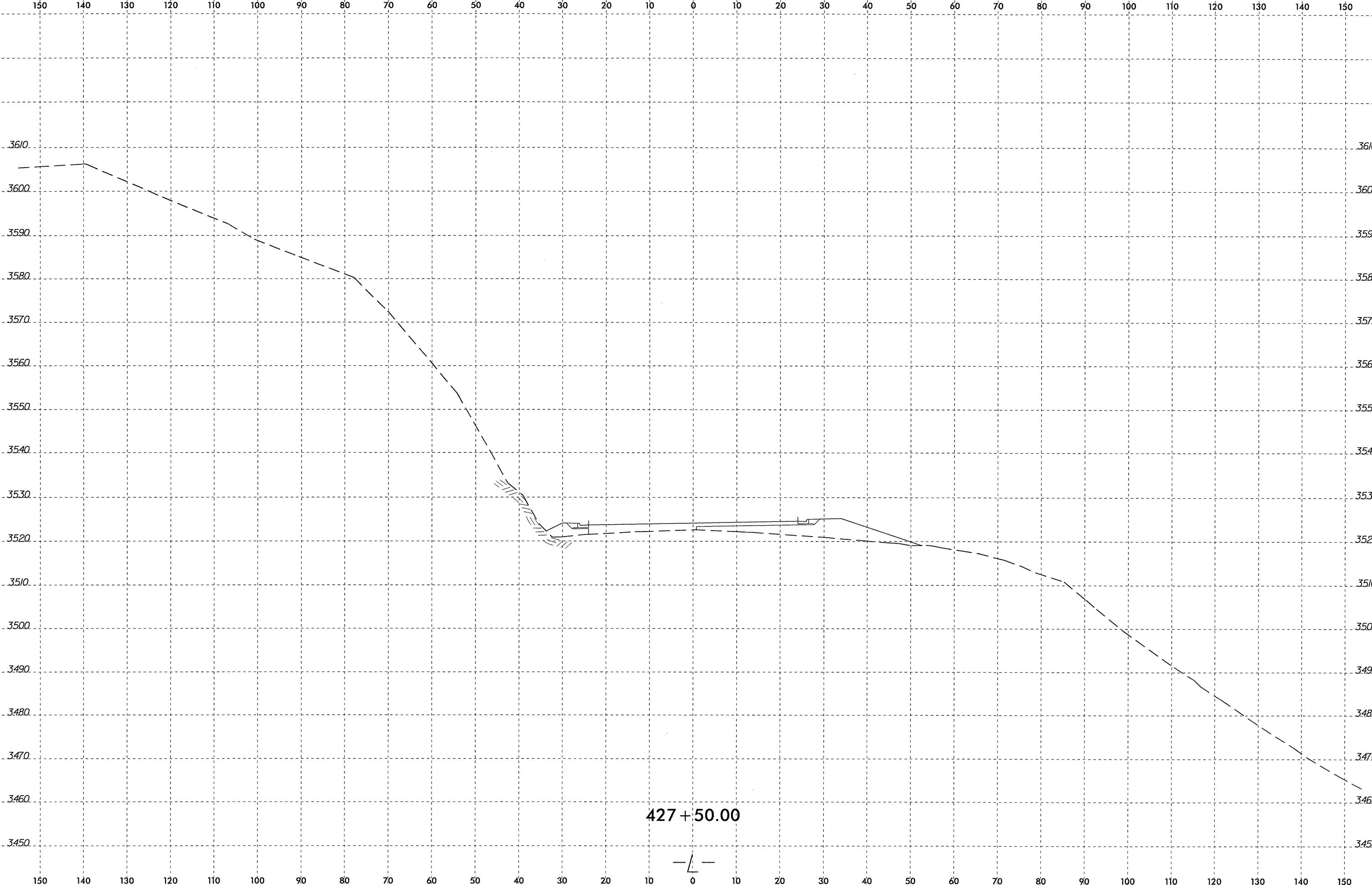
427+00.00



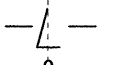
8/23/77



PROJ. REFERENCE NO.	SHEET NO.
R-2237C	144/259

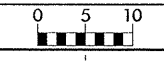


427+50.00



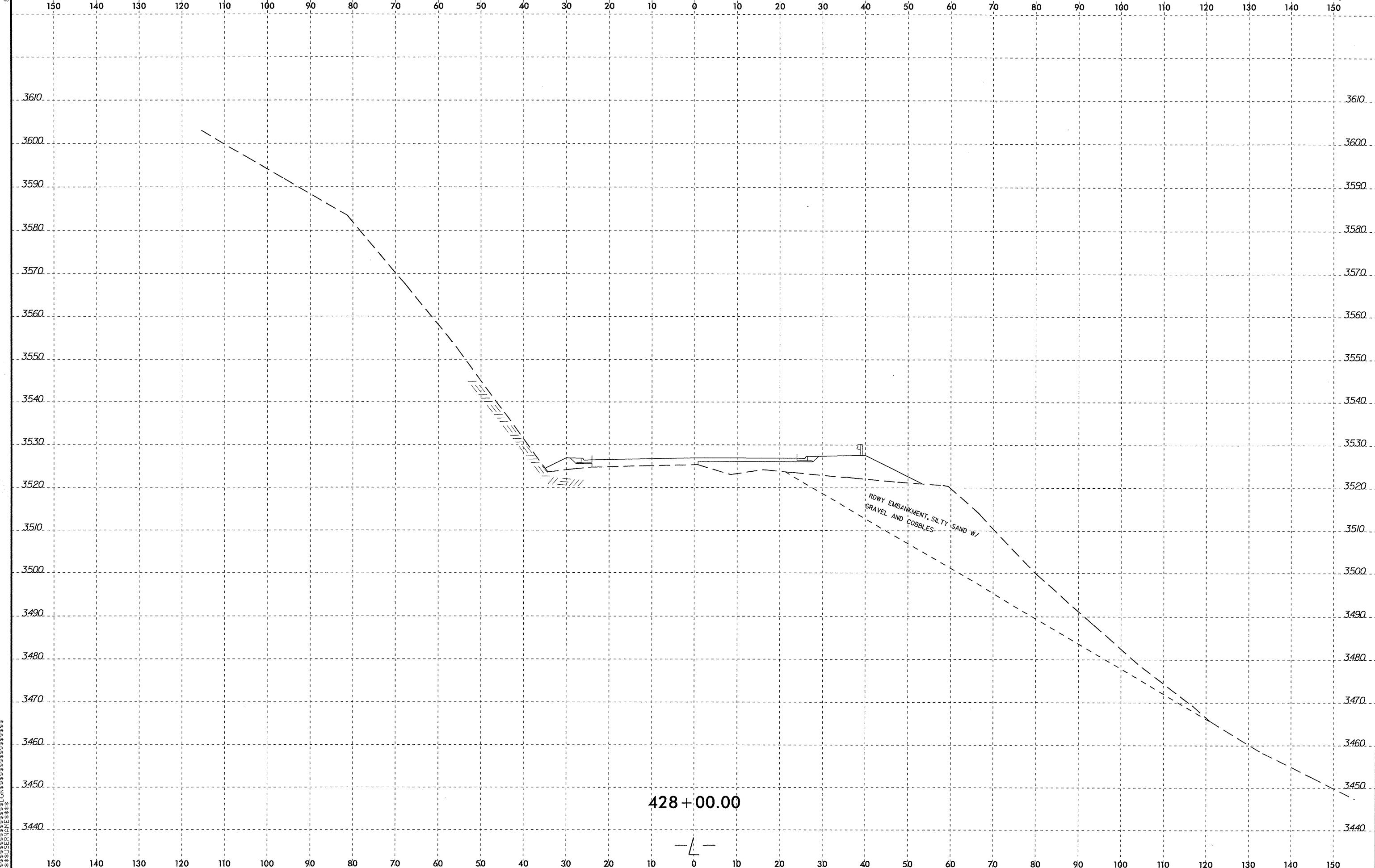
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8/23/17

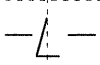


PROJ. REFERENCE NO.
R-2237C

SHEET NO.
176/259

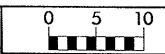


428+00.00



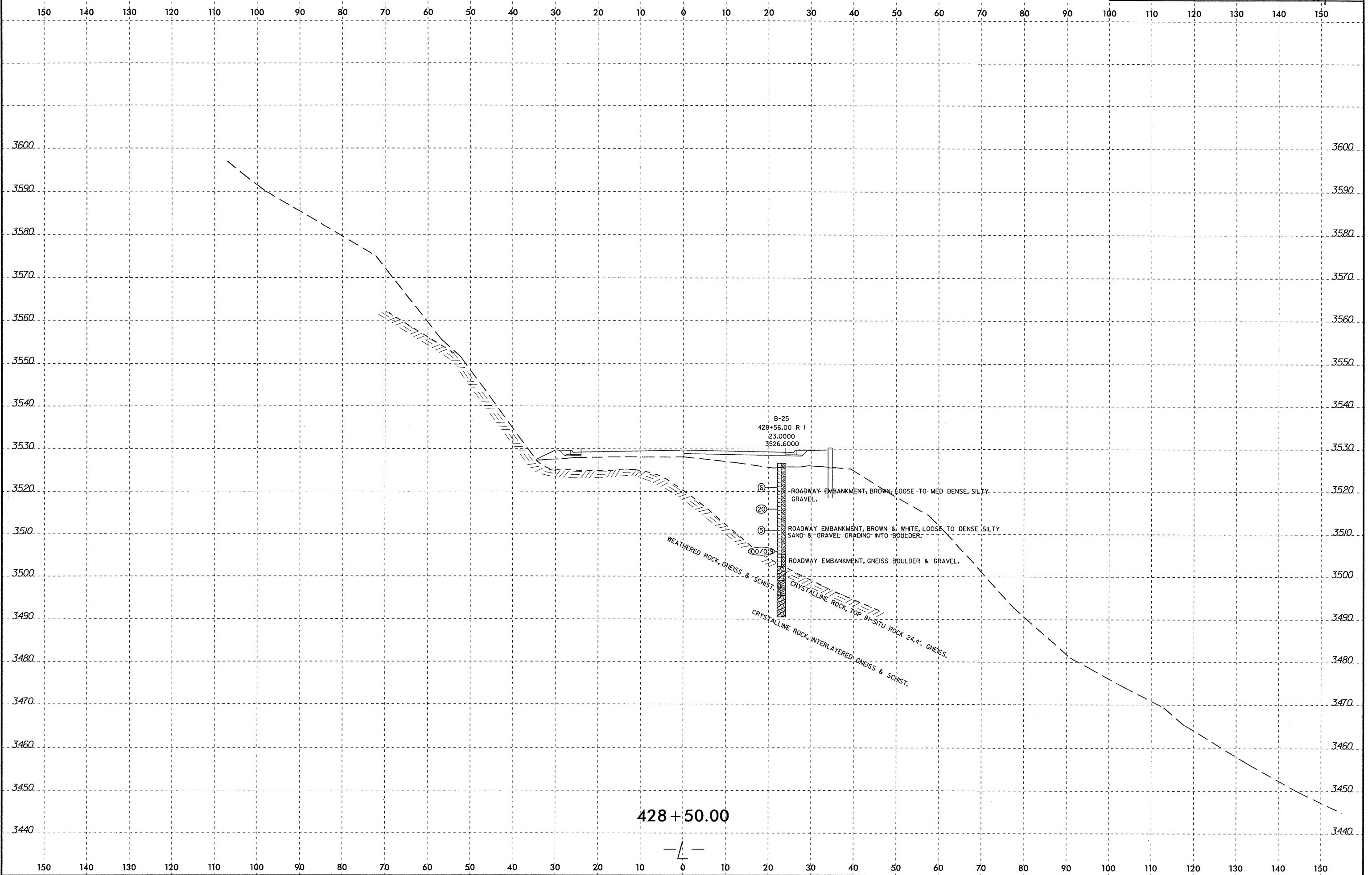
SECTION 176/259
CROSS SECTION
DRAINAGE
CONSTRUCTION

8/23/14



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
146 / 259

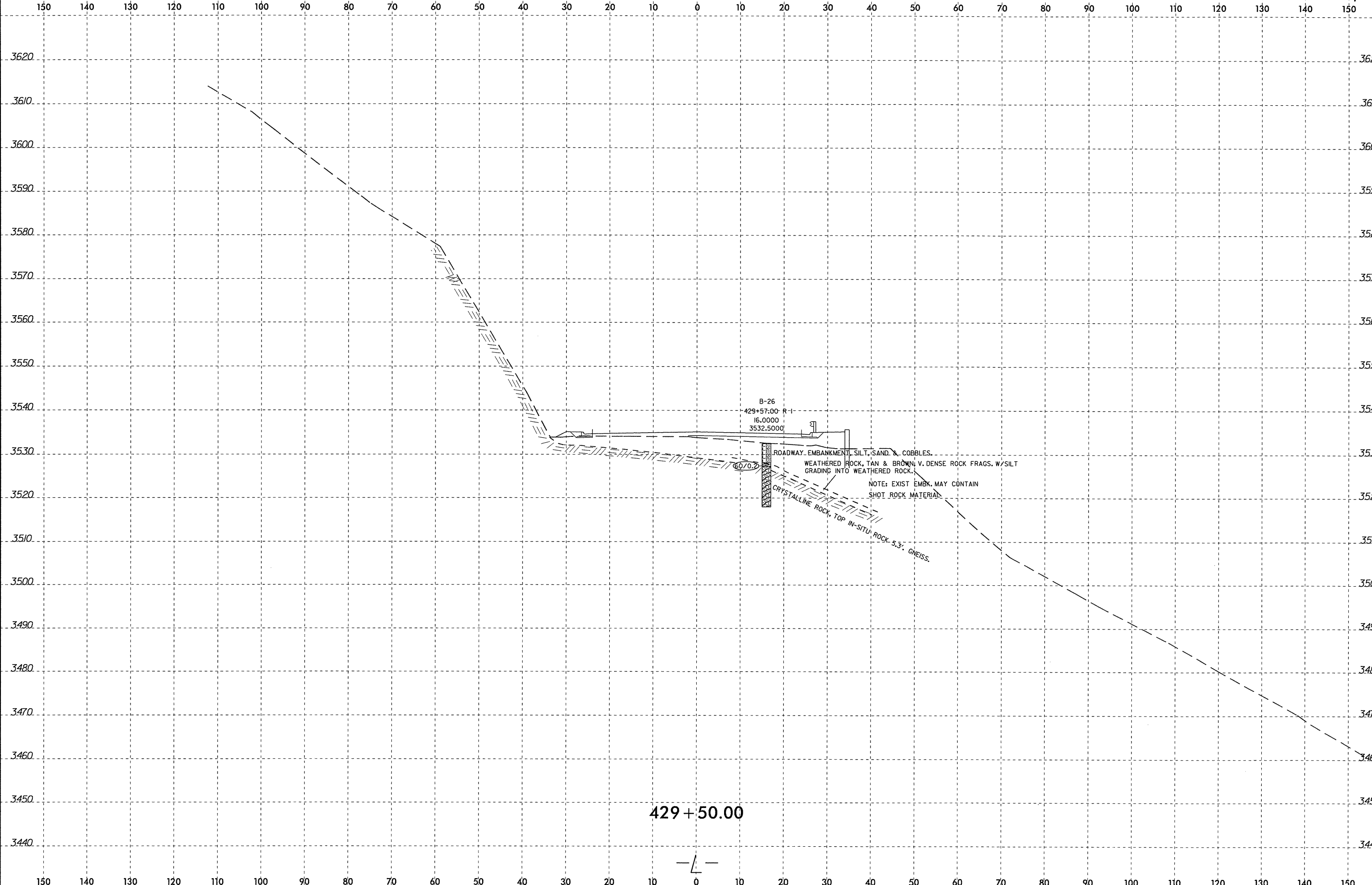


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PROJ. REFERENCE NO.	SHEET NO.
R-2237C	147/259



B-26
 429+57.00 R-1
 16.0000
 3532.5000

ROADWAY EMBANKMENT, SILT, SAND & COBBLES.
 WEATHERED ROCK, TAN & BROWN, V. DENSE ROCK FRAGS. W/ SILT
 GRADING INTO WEATHERED ROCK.

NOTE: EXIST EMBK. MAY CONTAIN
 SHOT ROCK MATERIAL

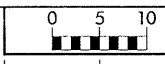
CRYSTALLINE ROCK, TOP IN-SITU, ROCK 5.3' GNEISS.

429+50.00

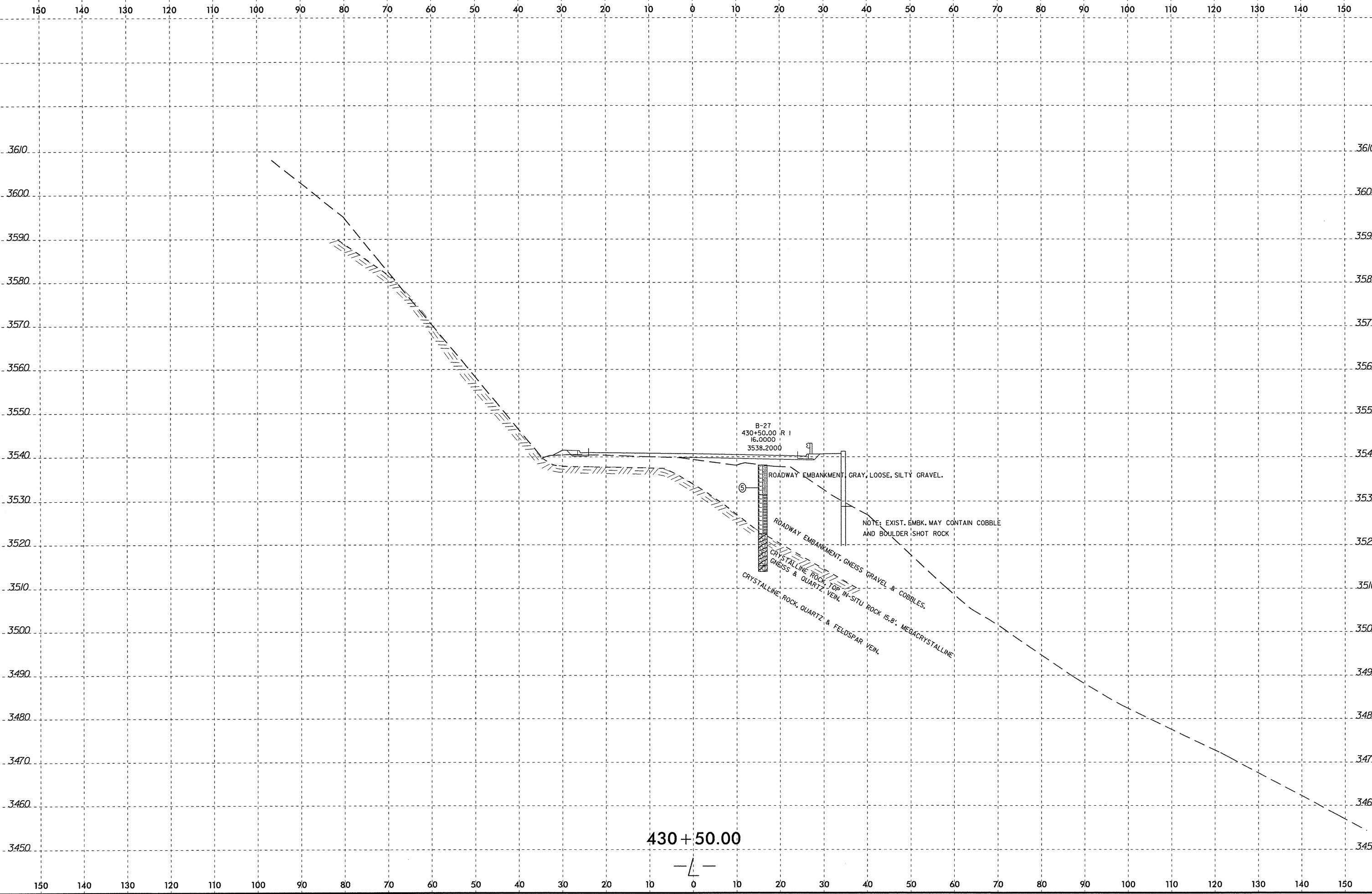


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PROJ. REFERENCE NO.	SHEET NO.
R-2237C	148/259



B-27
430+50.00 R 1
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3538.2000

ROADWAY EMBANKMENT, GRAY, LOOSE, SILTY GRAVEL.

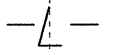
NOTE: EXIST. EMBK. MAY CONTAIN COBBLE
AND BOULDER SHOT ROCK

ROADWAY EMBANKMENT, GNEISS GRAVEL & COBBLES.

CRYSTALLINE ROCK TOP IN-SITU ROCK 15.8' MEGACRYSTALLINE
GNEISS & QUARTZ VEIN.

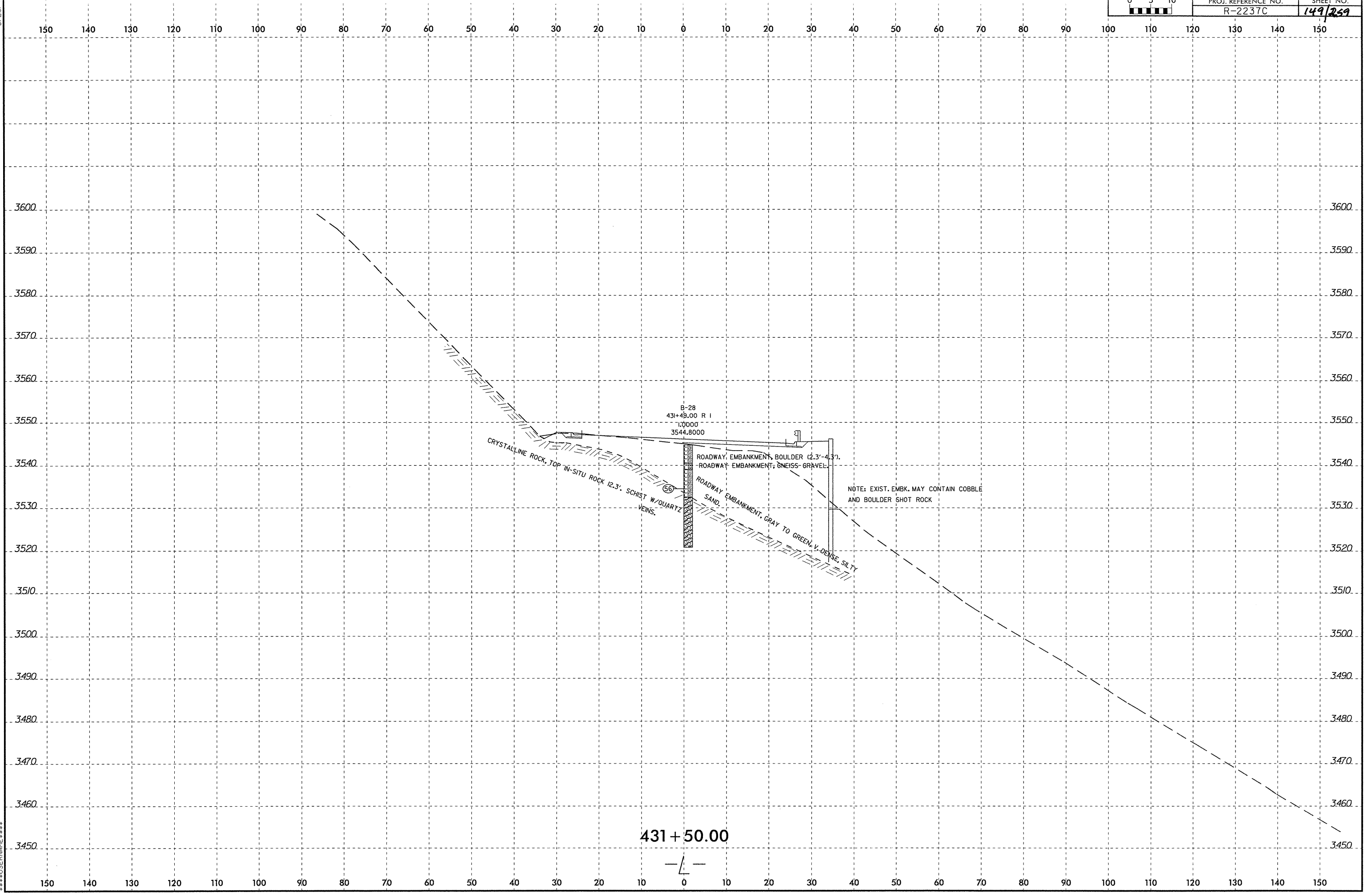
CRYSTALLINE ROCK, QUARTZ & FELDSPAR VEIN.

430+50.00



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SHEET: 148/259

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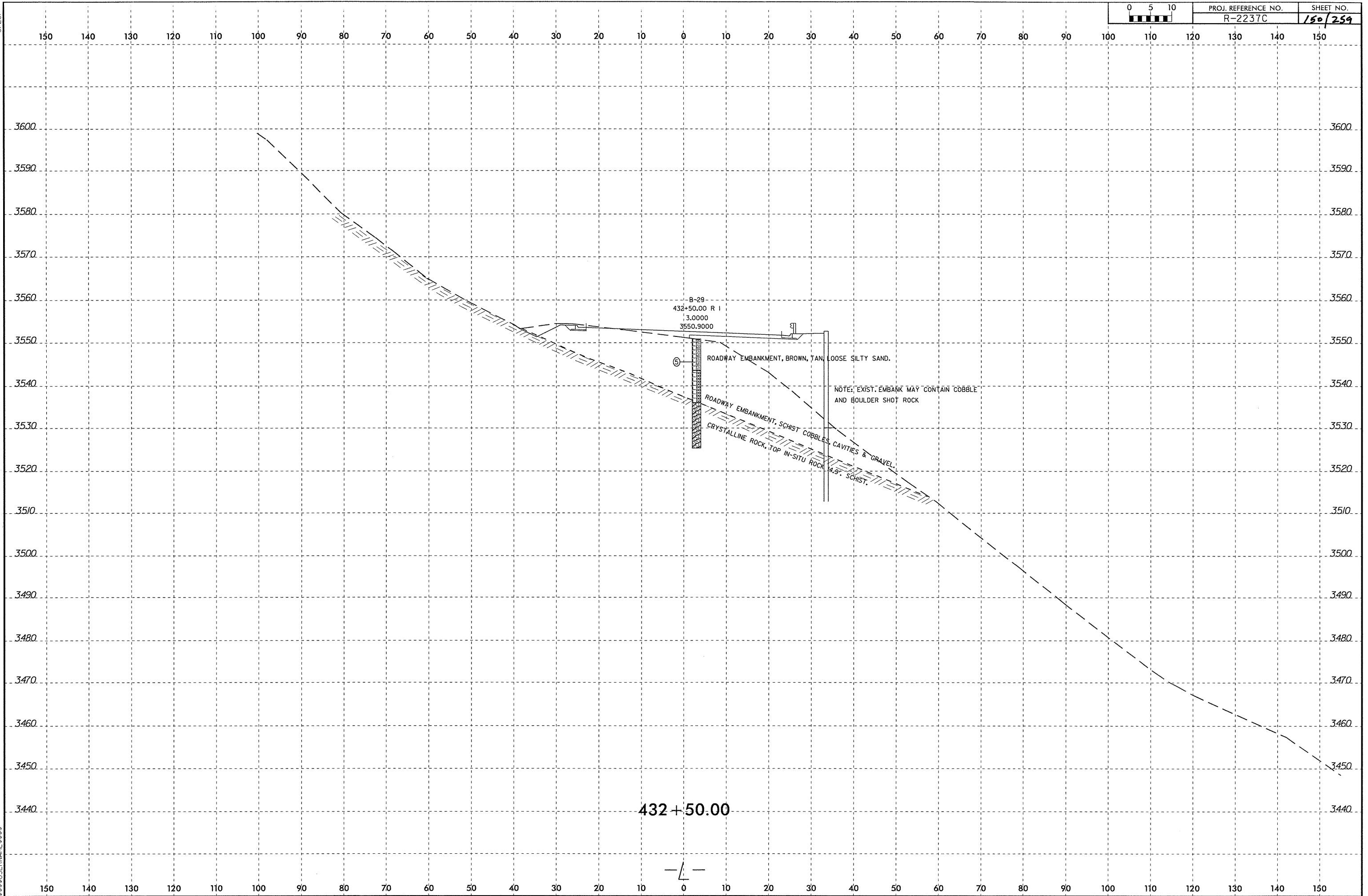
B-28
431+49.00 R I
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3544.8000

CRYSTALLINE ROCK, TOP IN-SITU ROCK 12.3' SCHIST W/QUARTZ VEINS.
ROADWAY EMBANKMENT, BOULDER (2.3'-4.3').
ROADWAY EMBANKMENT, GNEISS-GRAVEL.
ROADWAY EMBANKMENT, SAND.
ROADWAY EMBANKMENT, GRAY TO GREEN, V. DENSE, SILTY

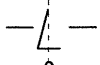
NOTE: EXIST. EMBK. MAY CONTAIN COBBLE AND BOULDER SHOT ROCK

431+50.00

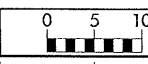
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432+50.00

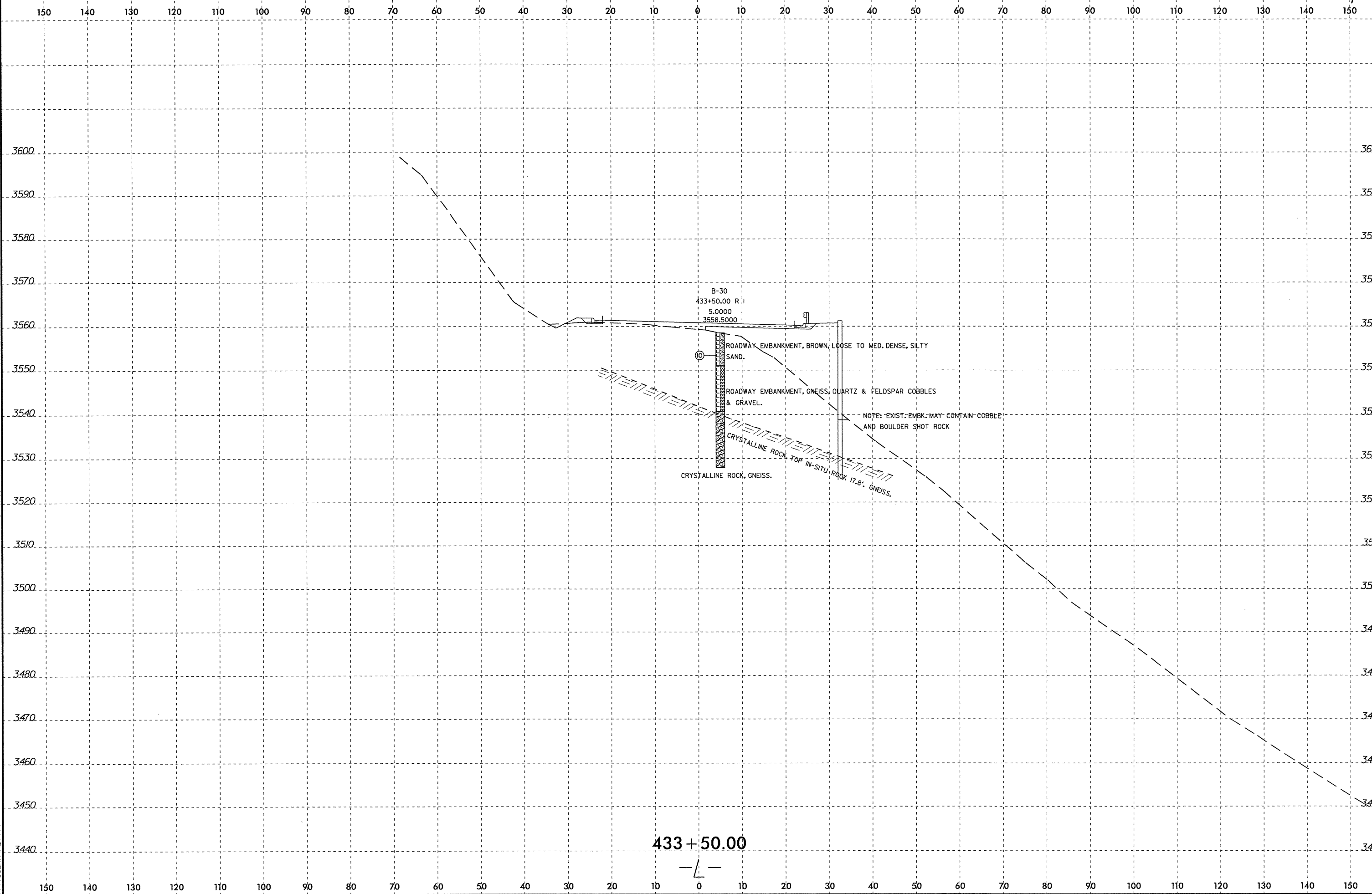


8/23/15



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
151/259



B-30
433+50.00 R.I.
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3558.5000

ROADWAY EMBANKMENT, BROWN, LOOSE TO MED. DENSE, SILTY SAND.

ROADWAY EMBANKMENT, GNEISS, QUARTZ & FELDSPAR COBBLES & GRAVEL.

CRYSTALLINE ROCK, GNEISS.
CRYSTALLINE ROCK, TOP IN-SITU ROCK 17.8' GNEISS.

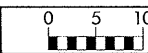
NOTE: EXIST. EMBK. MAY CONTAIN COBBLE AND BOULDER SHOT ROCK

433 + 50.00

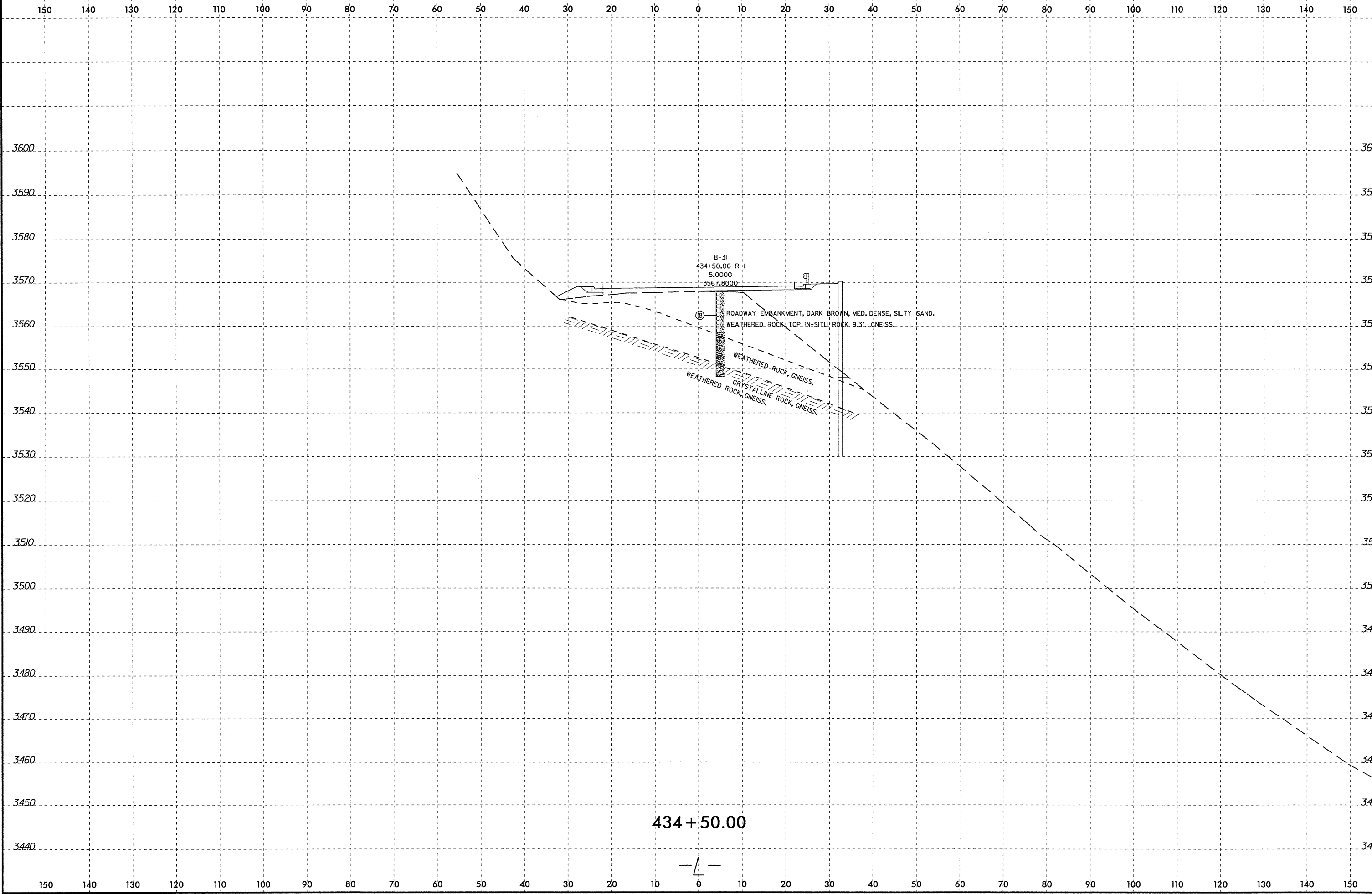


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PROJ. REFERENCE NO. R-2237C SHEET NO. 152/259



B-31
434+50.00 R=1
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3567.8000

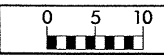
ROADWAY EMBANKMENT, DARK BROWN, MED. DENSE, SILTY SAND.
WEATHERED ROCK, TOP. IN-SITU ROCK 9.3' GNEISS.
WEATHERED ROCK, GNEISS.
CRYSTALLINE ROCK, GNEISS.
WEATHERED ROCK, GNEISS.

434+50.00



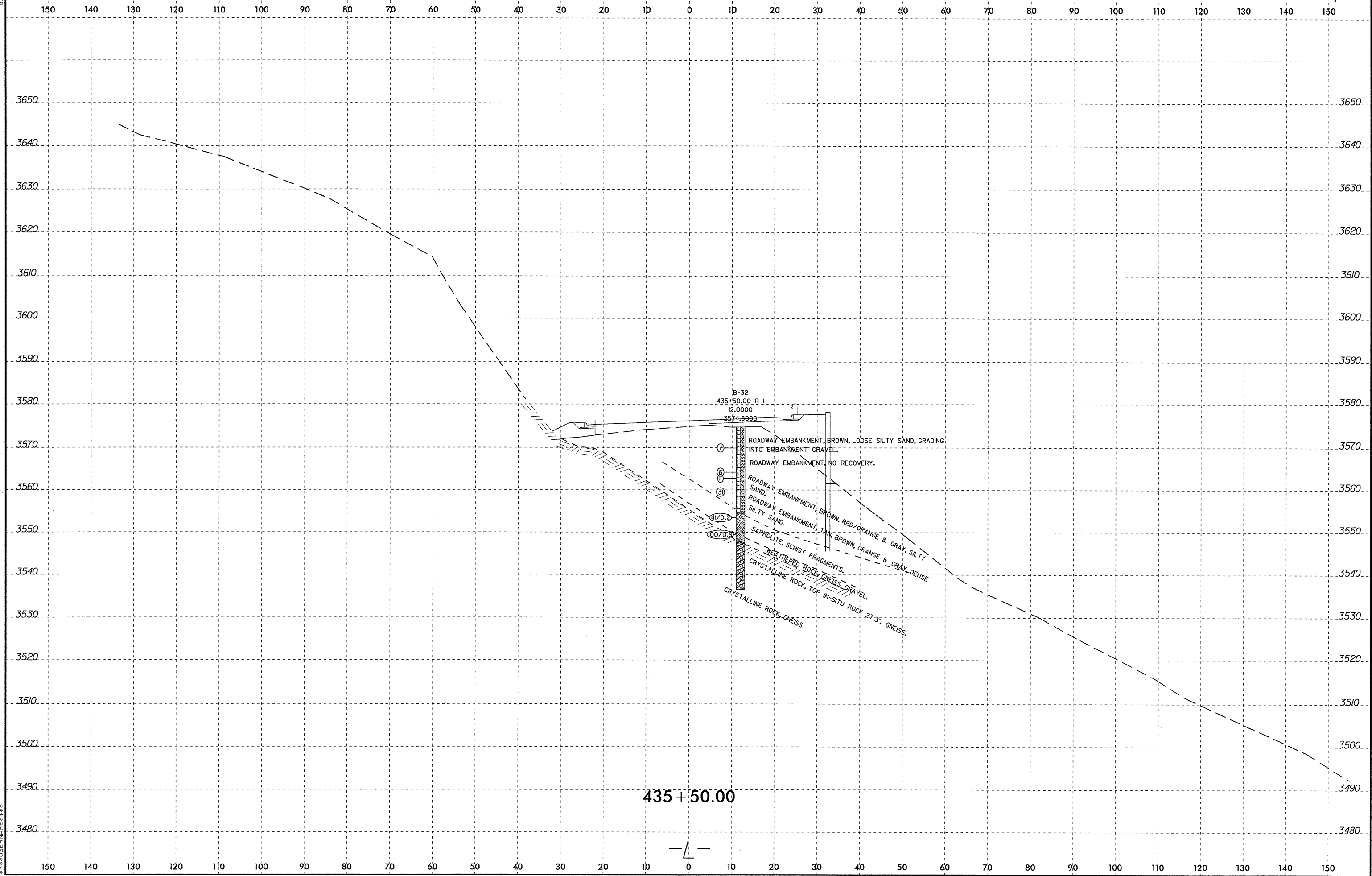
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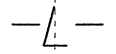


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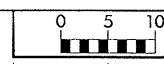


435+50.00



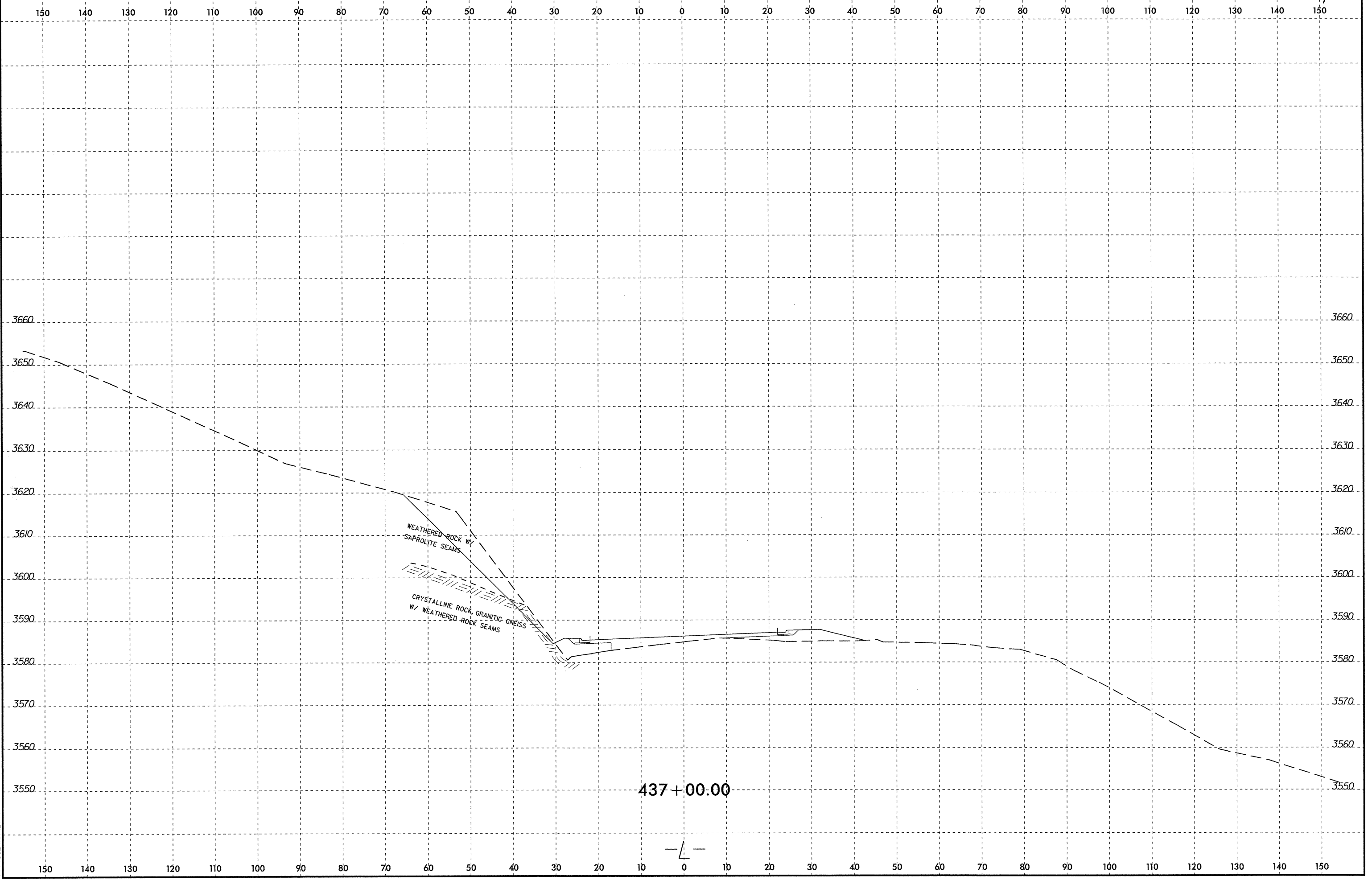
STANDARD CONSTRUCTION

8/23/12



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
154/259

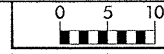


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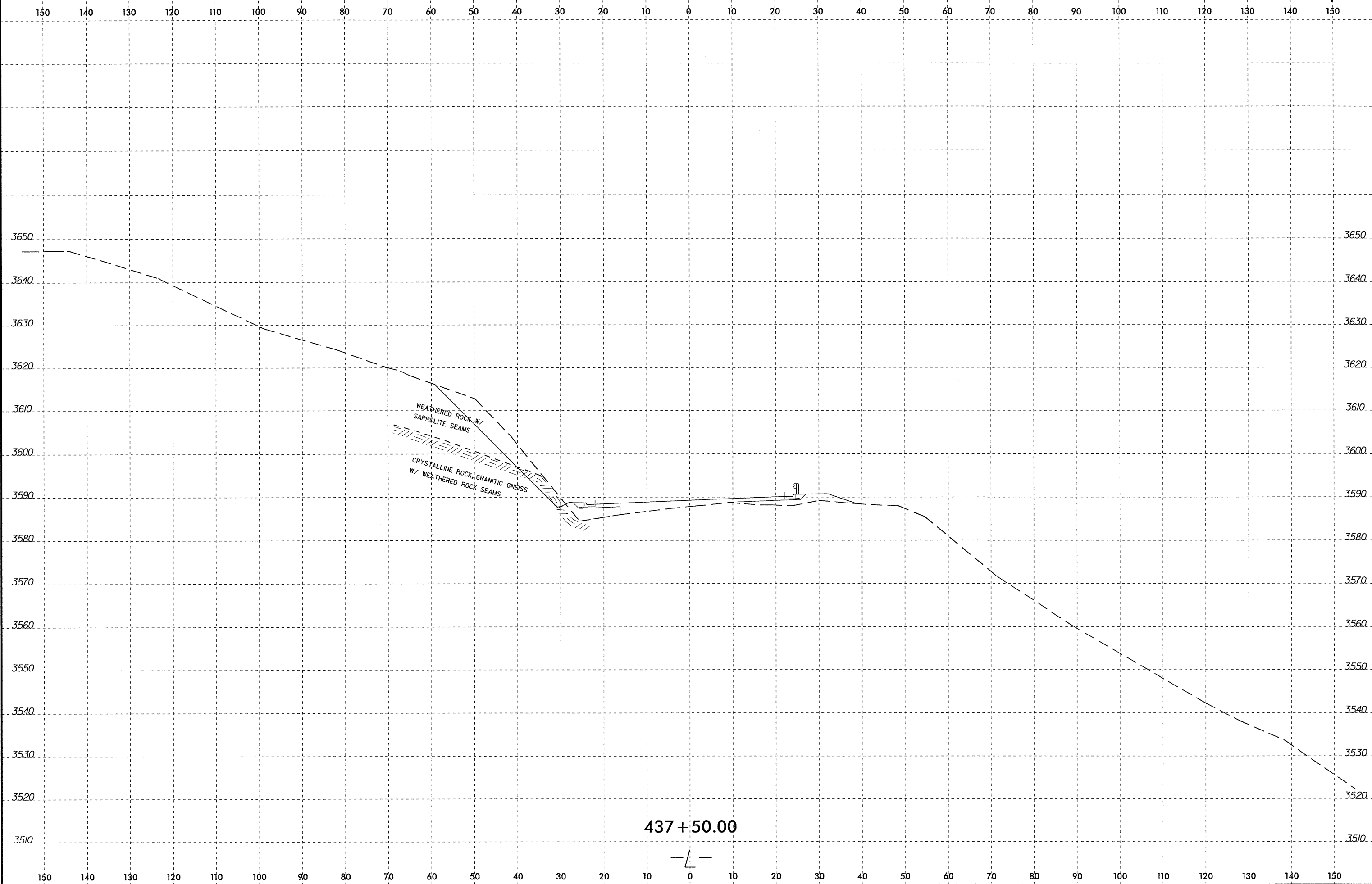
437+00.00



8/23/16



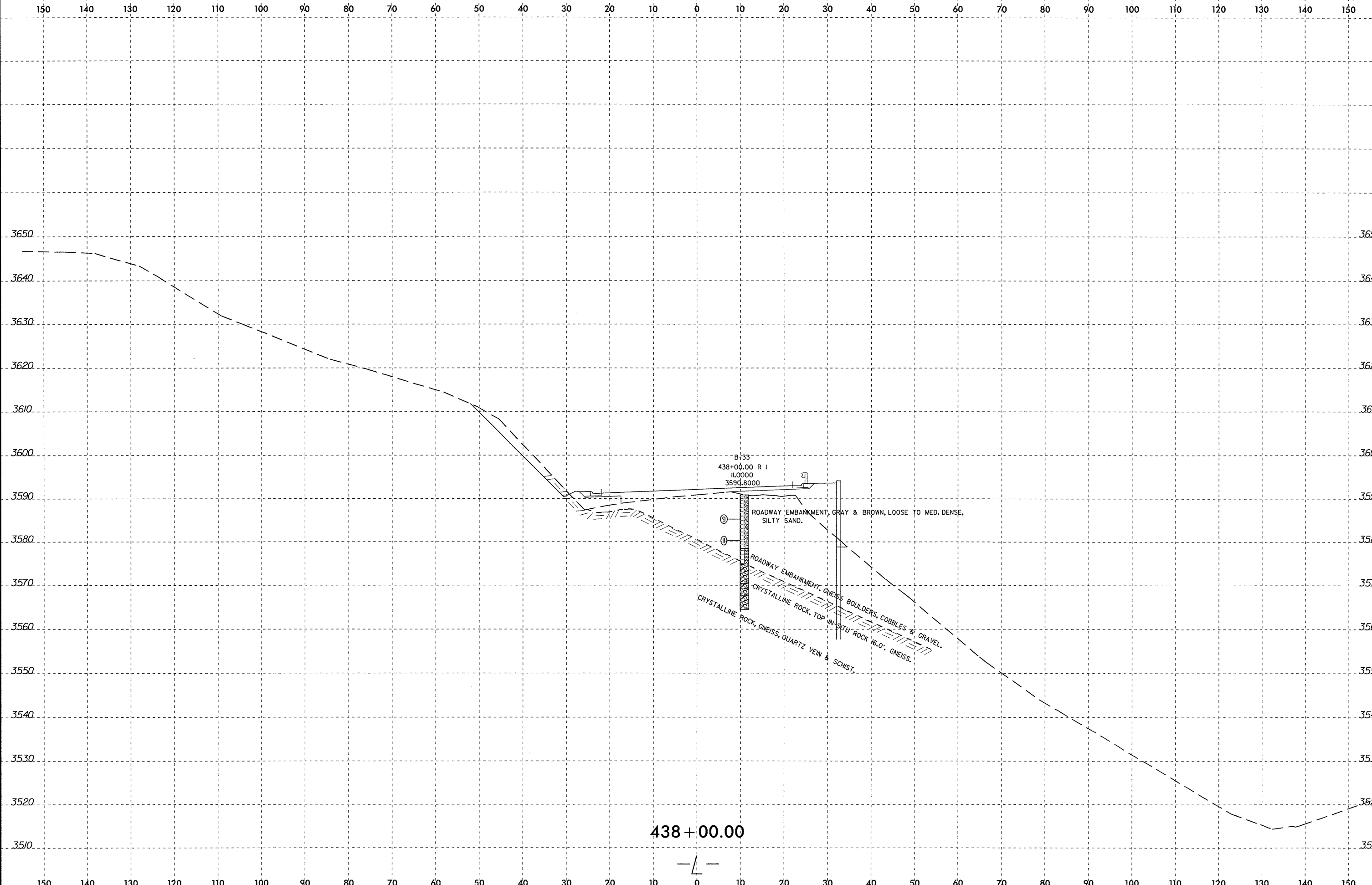
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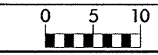
437+50.00



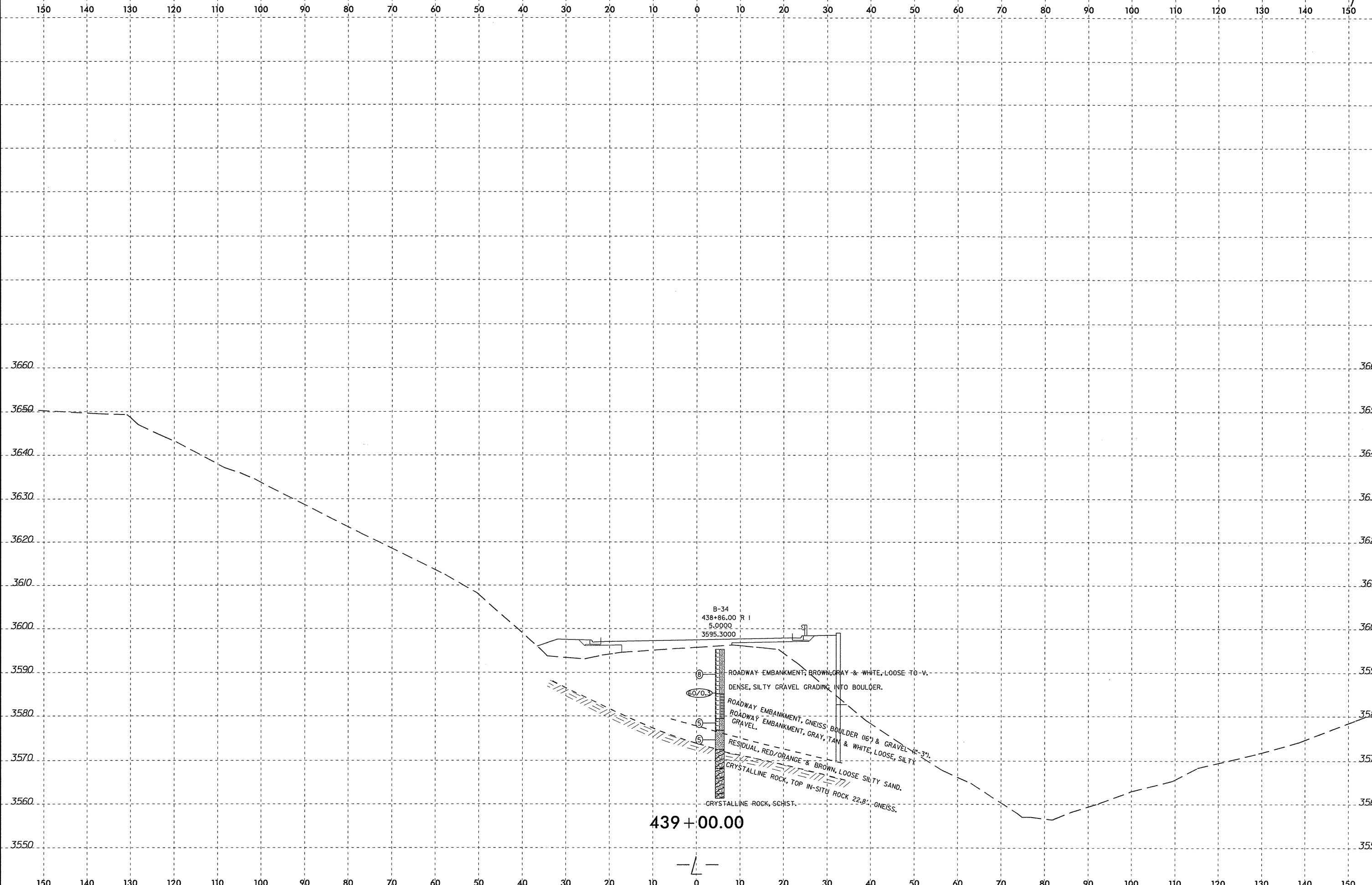


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438+86.00 R I
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3595.3000

ROADWAY EMBANKMENT, BROWN, GRAY & WHITE, LOOSE TO V. DENSE, SILTY GRAVEL GRADING INTO BOULDER.

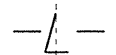
ROADWAY EMBANKMENT, GNEISS, BOULDER (6') & GRAVEL (4-3'). ROADWAY EMBANKMENT, GRAY, TAN & WHITE, LOOSE, SILTY GRAVEL.

RESIDUAL, RED/ORANGE & BROWN, LOOSE SILTY SAND.

CRYSTALLINE ROCK, TOP IN-SITU ROCK 22.8' GNEISS.

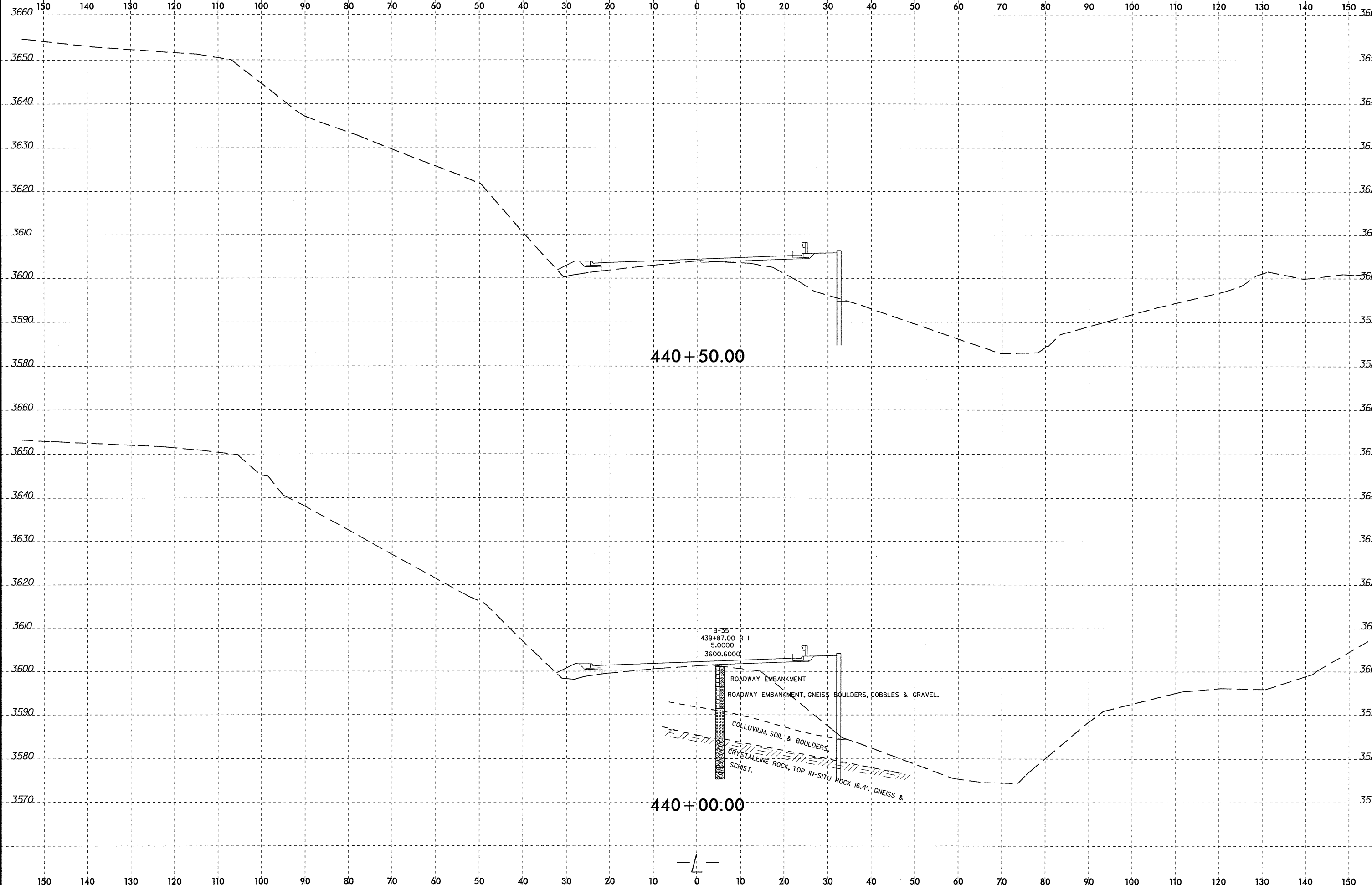
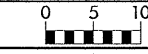
CRYSTALLINE ROCK, SCHIST.

439+00.00



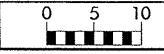
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8/23/15

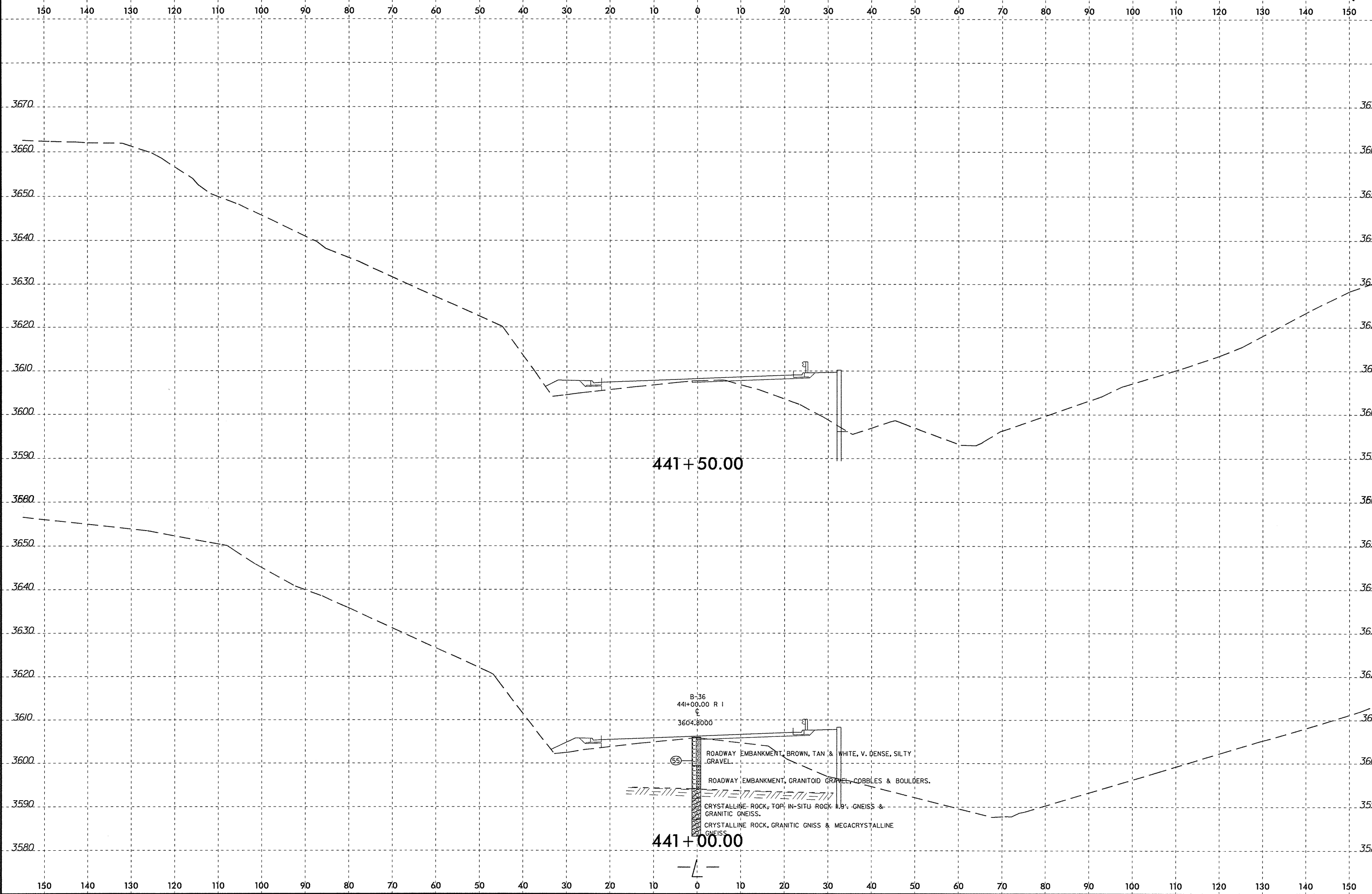


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PROJ. REFERENCE NO. R-2237C SHEET NO. 159/259



441+50.00

441+00.00

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441+00.00 R 1
3604.8000

ROADWAY EMBANKMENT, BROWN, TAN & WHITE, V. DENSE, SILTY GRAVEL.

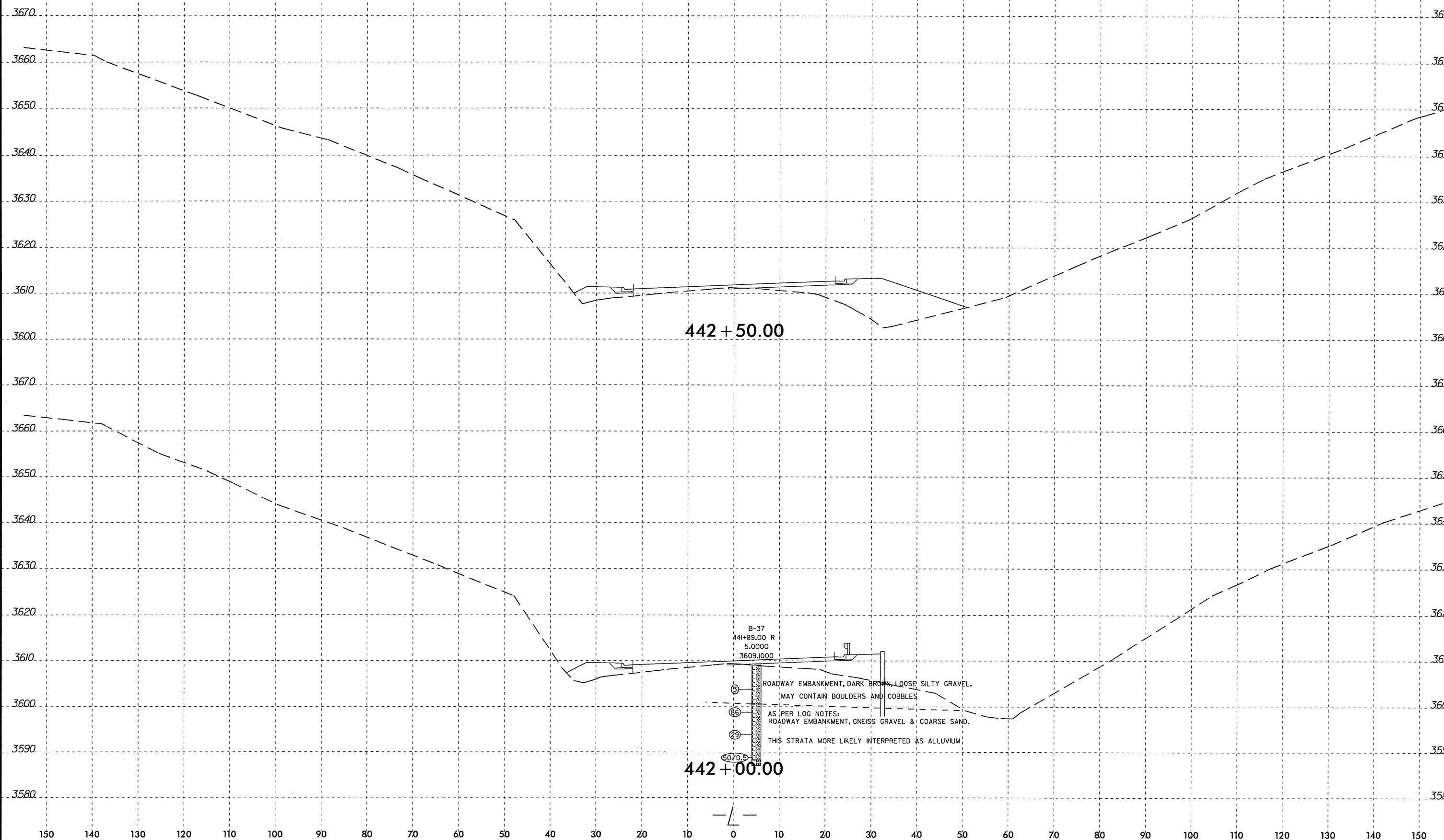
ROADWAY EMBANKMENT, GRANITOID GRAVEL, COBBLES & BOULDERS.

CRYSTALLINE ROCK, TOP, IN-SITU ROCK, 1.8' GNEISS & GRANITIC GNEISS.

CRYSTALLINE ROCK, GRANITIC GNEISS & MEGACRYSTALLINE GNEISS.

SYSTEM TIME: 8/23/11 10:00:00 AM
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442 + 50.00

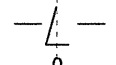
442 + 00.00

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441+89.00 R
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3609.1000

9 ROADWAY EMBANKMENT, DARK BROWN, LOOSE SILTY GRAVEL.
MAY CONTAIN BOULDERS AND COBBLES

66 AS PER LOG NOTES:
ROADWAY EMBANKMENT, GNEISS GRAVEL & COARSE SAND.

29 THIS STRATA MORE LIKELY INTERPRETED AS ALLUVIUM

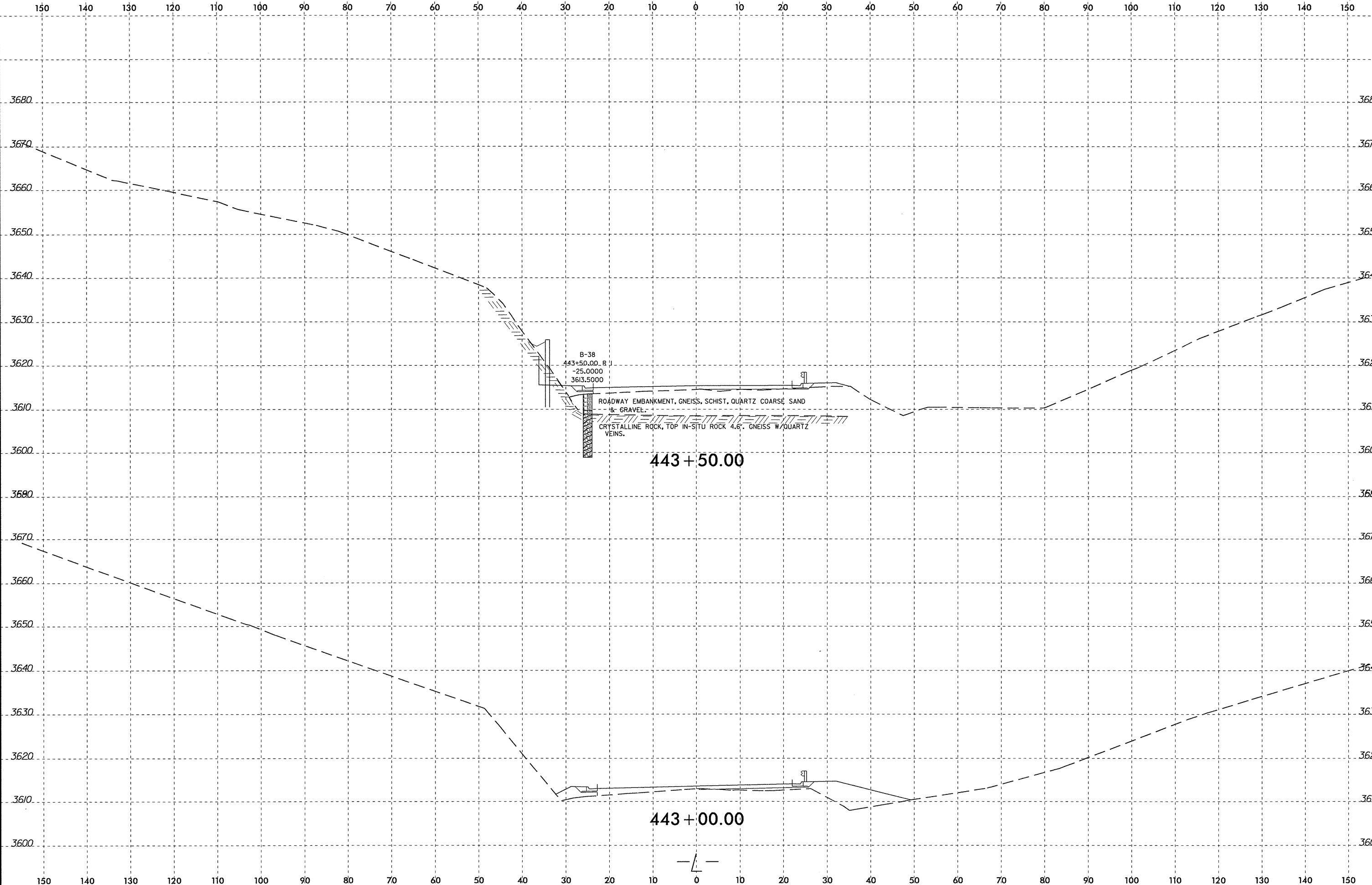


SYSTEMS

8/23/11

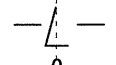


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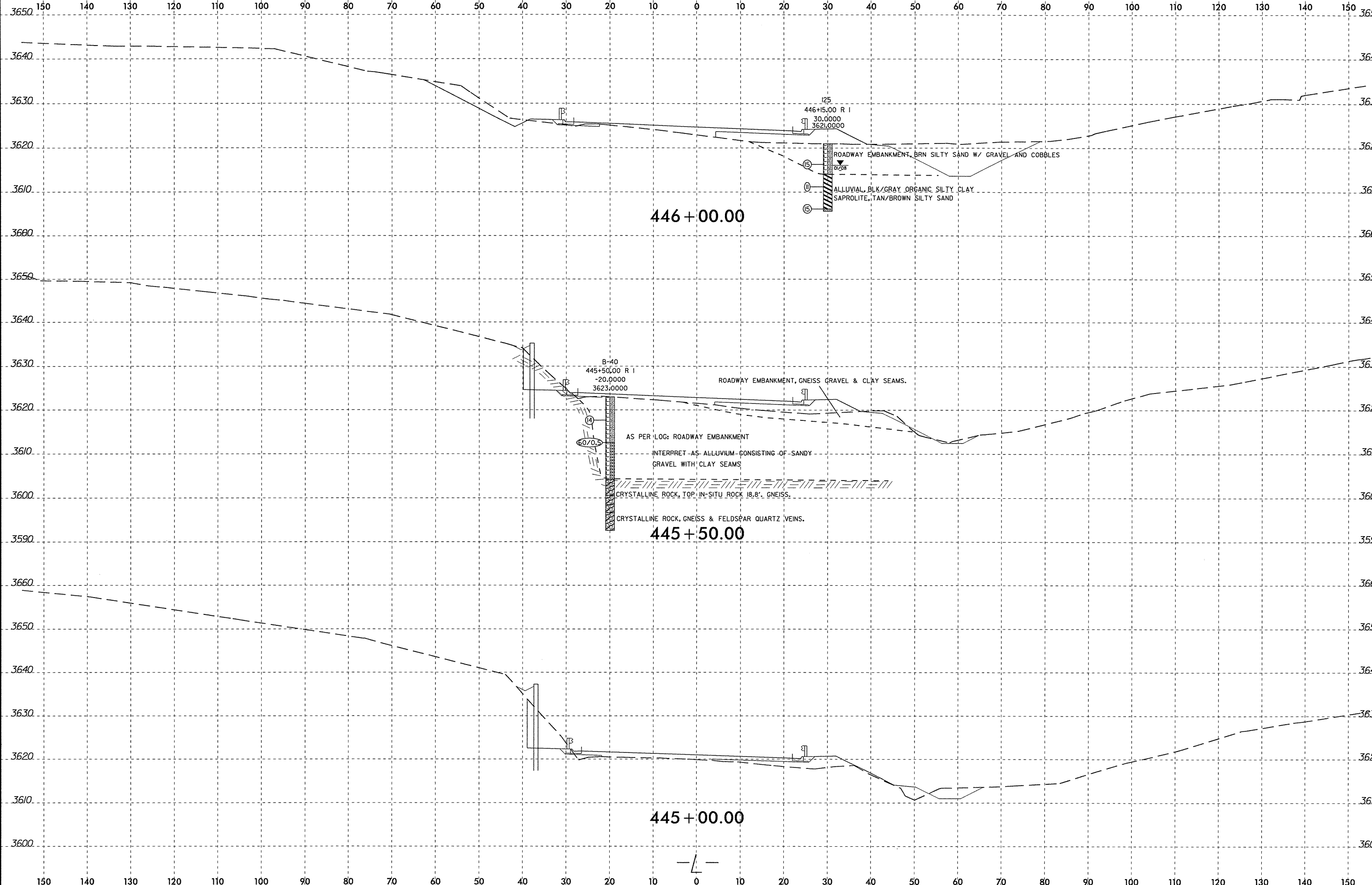
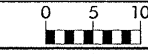
443 + 50.00

443 + 00.00



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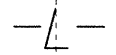
8/23/7



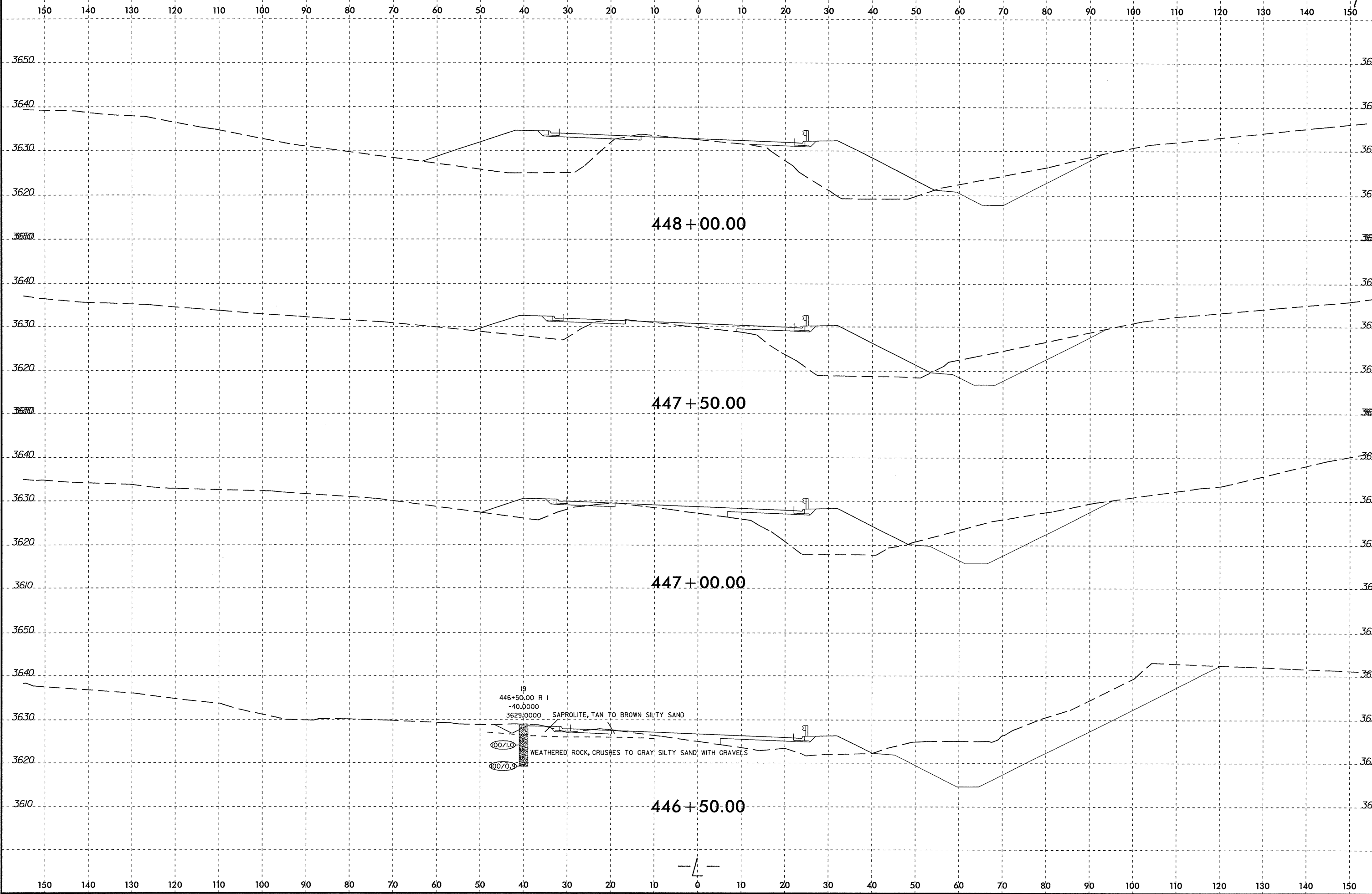
446 + 00.00

445 + 50.00

445 + 00.00

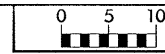


SYSTEM TIME 8/23/7 10:00:00 AM

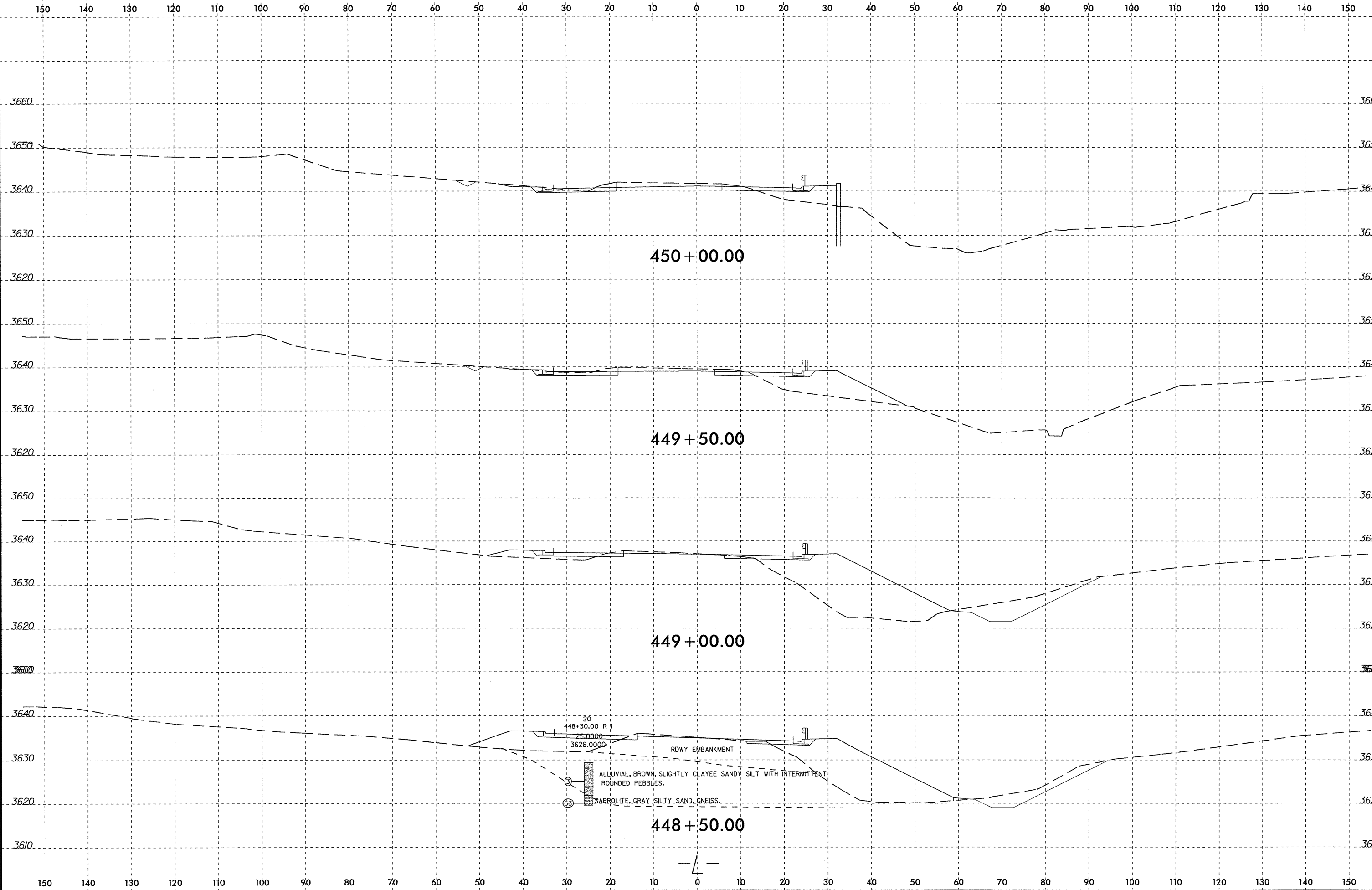


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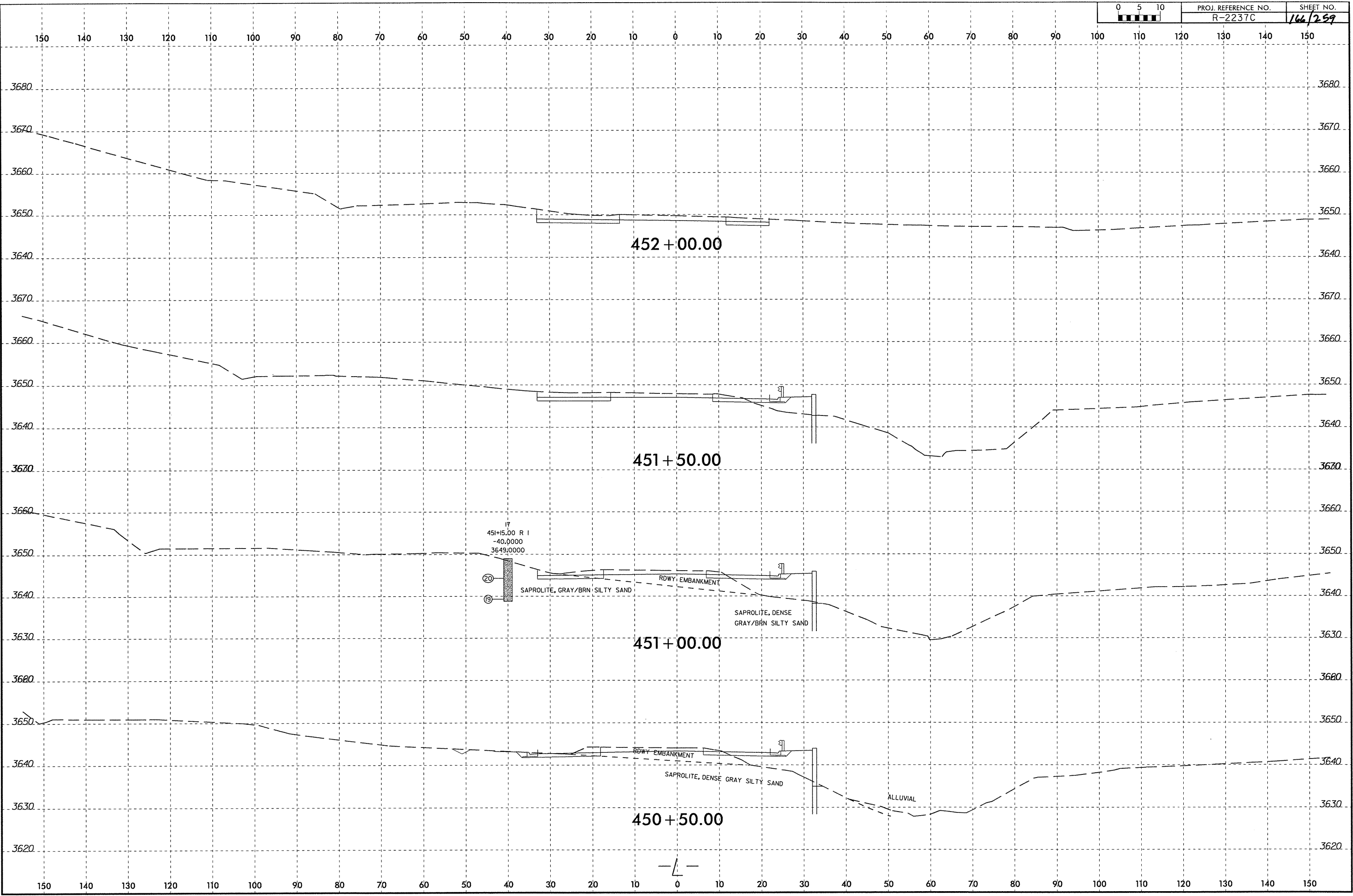


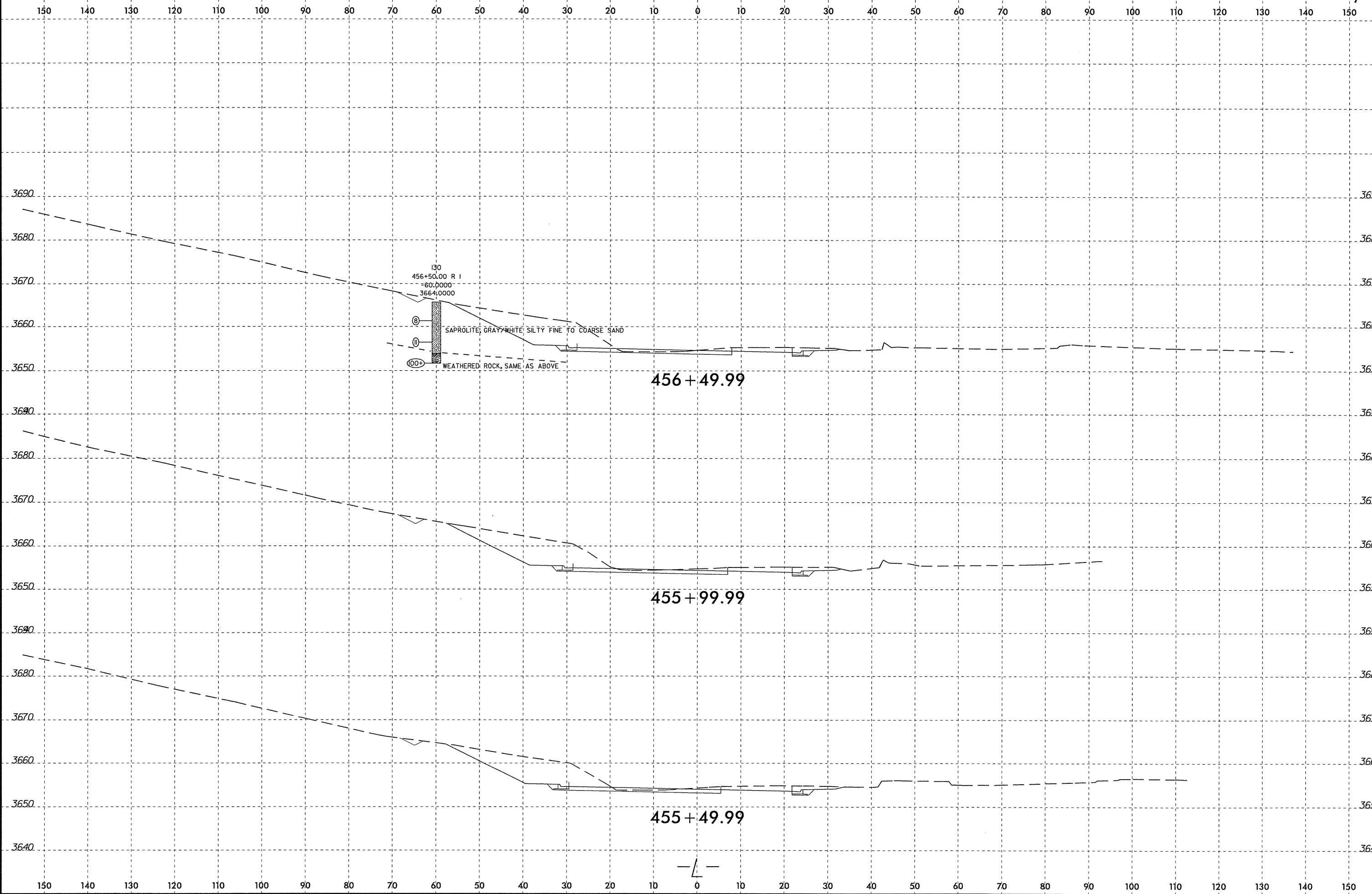
PROJ. REFERENCE NO.	SHEET NO.
R-2237C	165/259



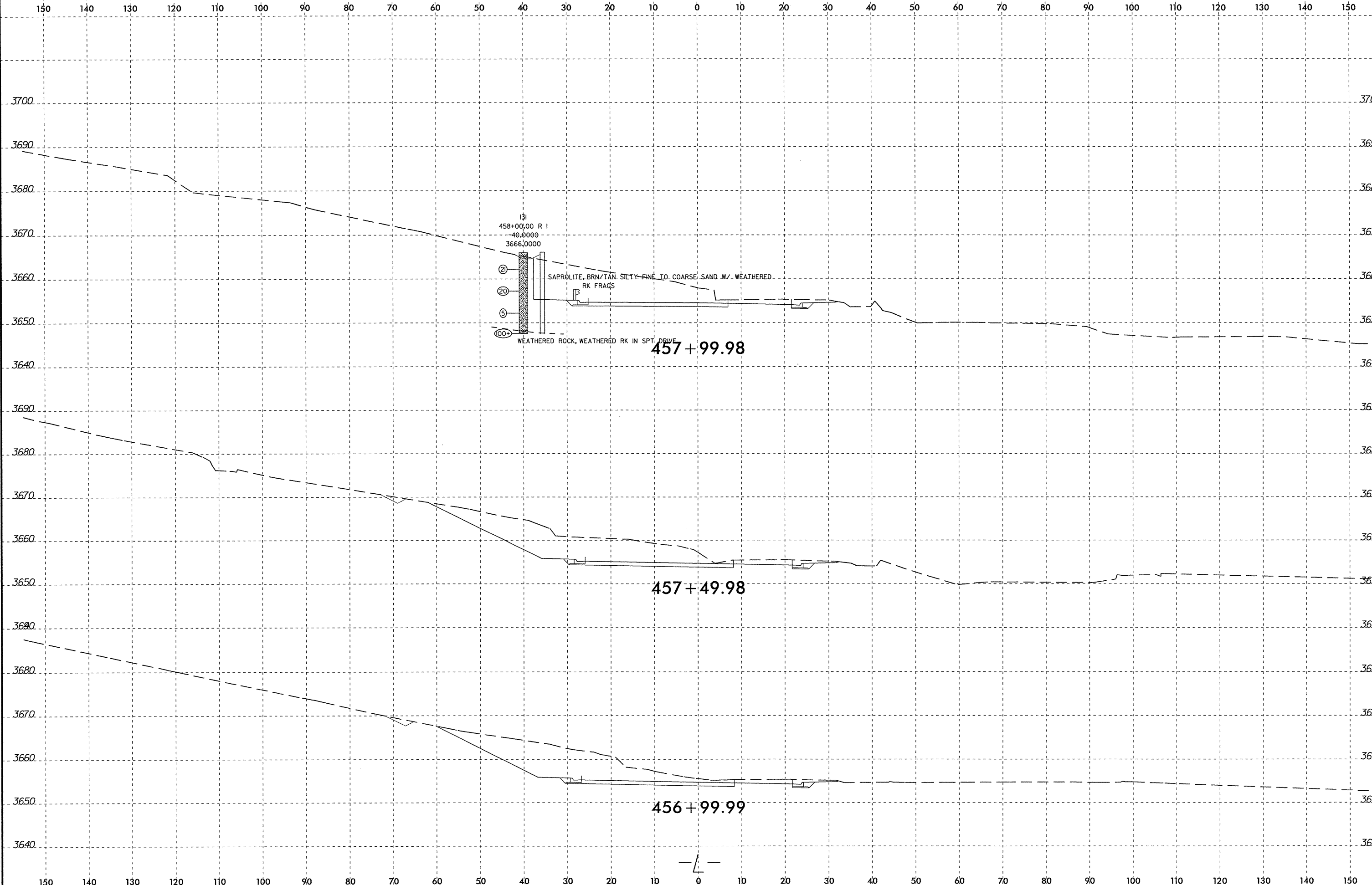
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8/23/94
SYSTEMS
DESIGN
GROUP



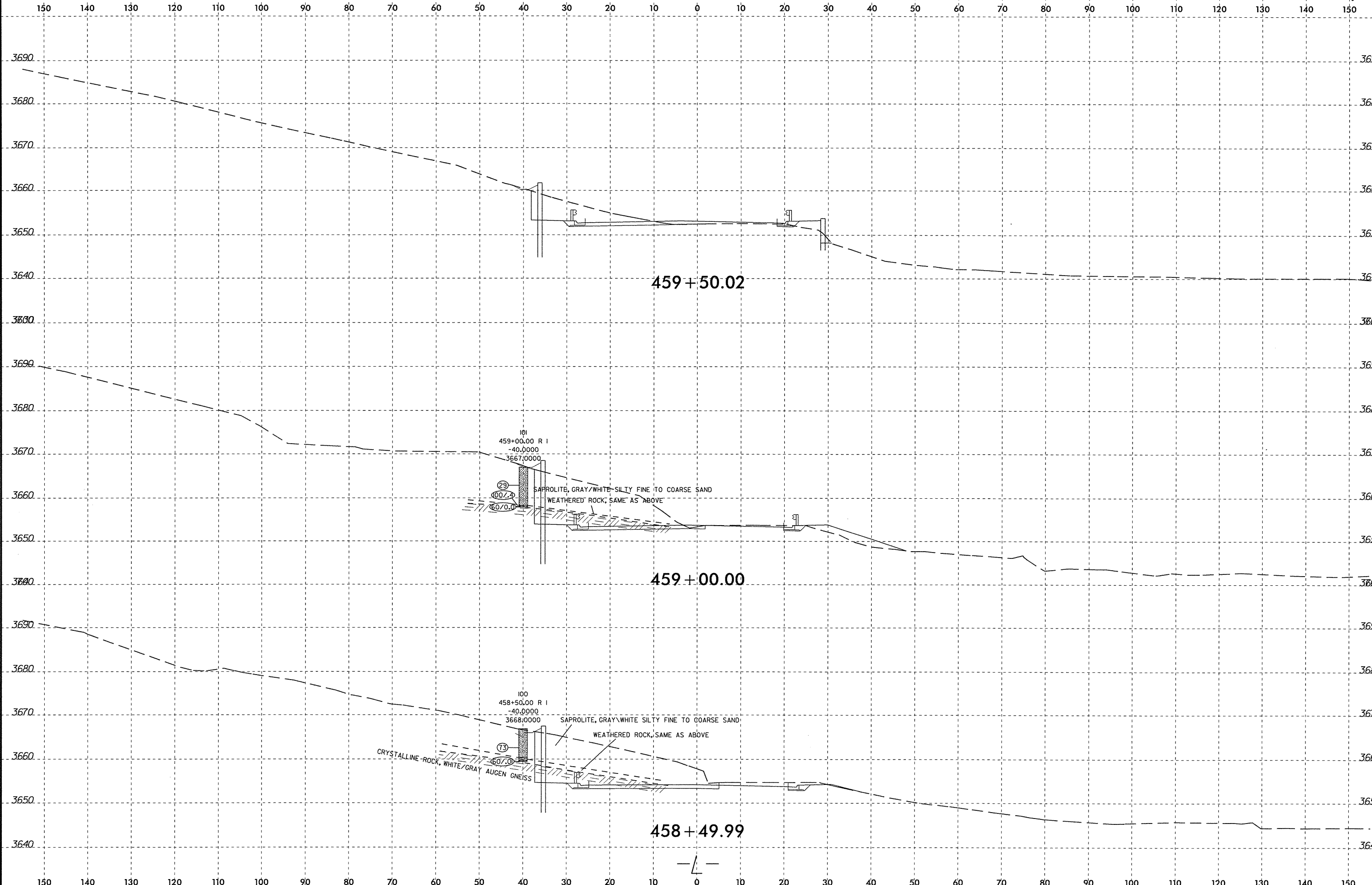


SYSTEMS



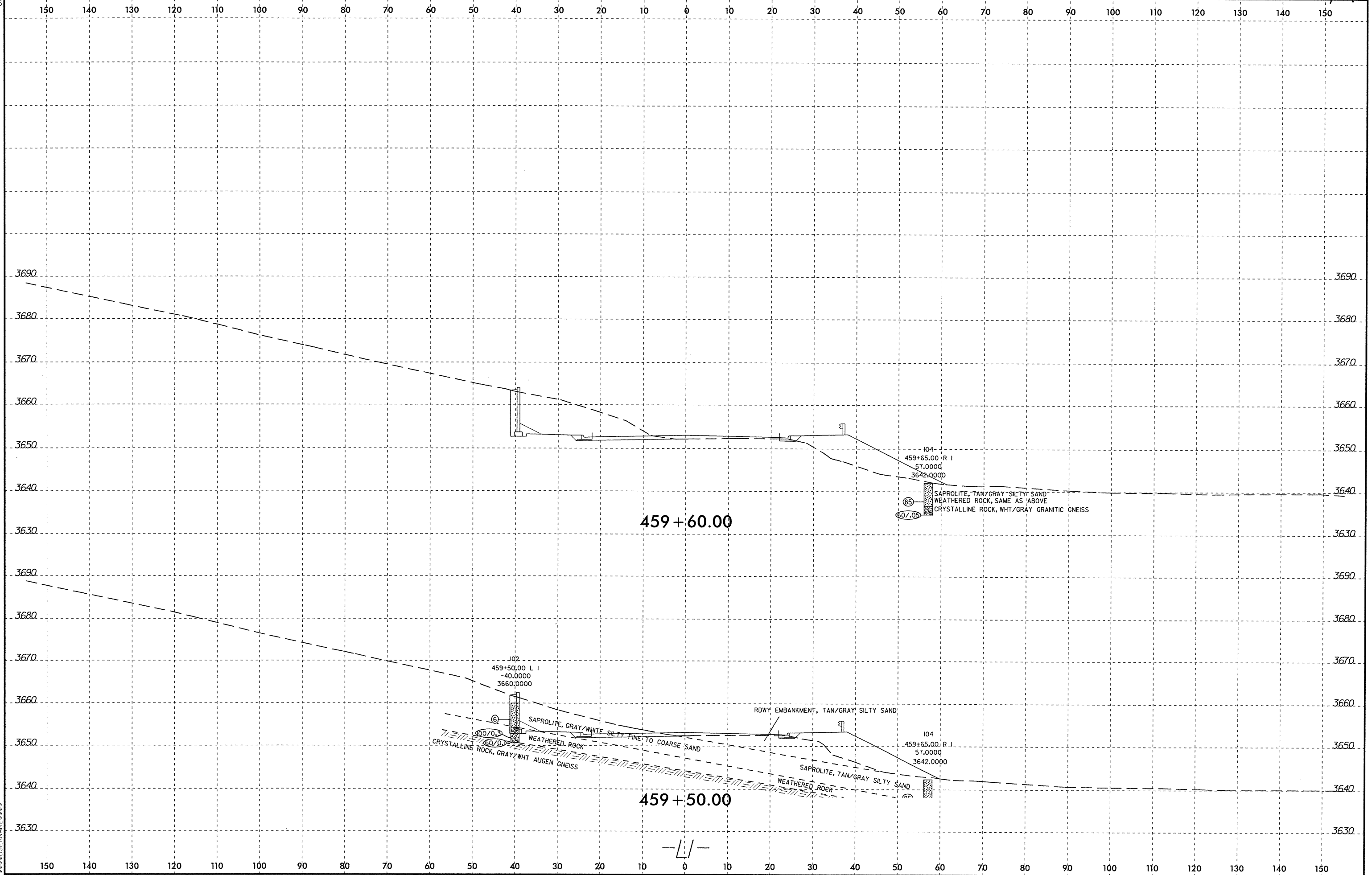
SYTIME
CON
USERRANKS

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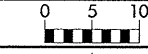
SYTIME:DCM:USGRN:10/10/10

8/23/17



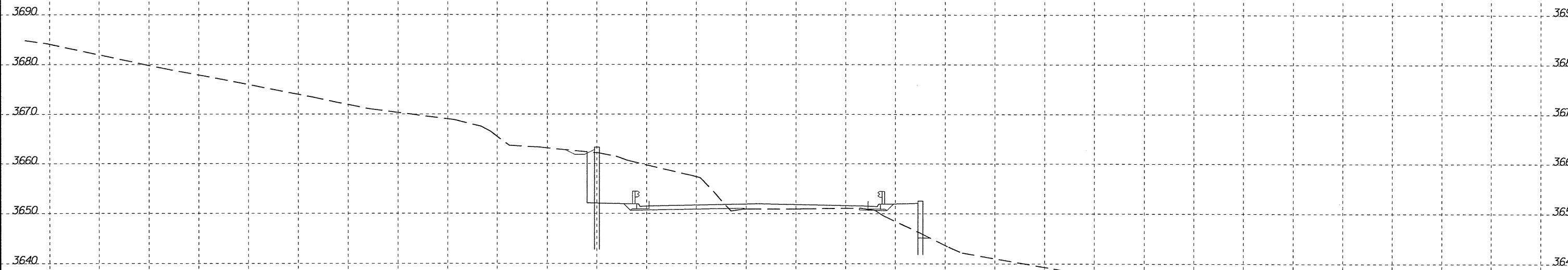
SYTIME 8/23/17

B.237

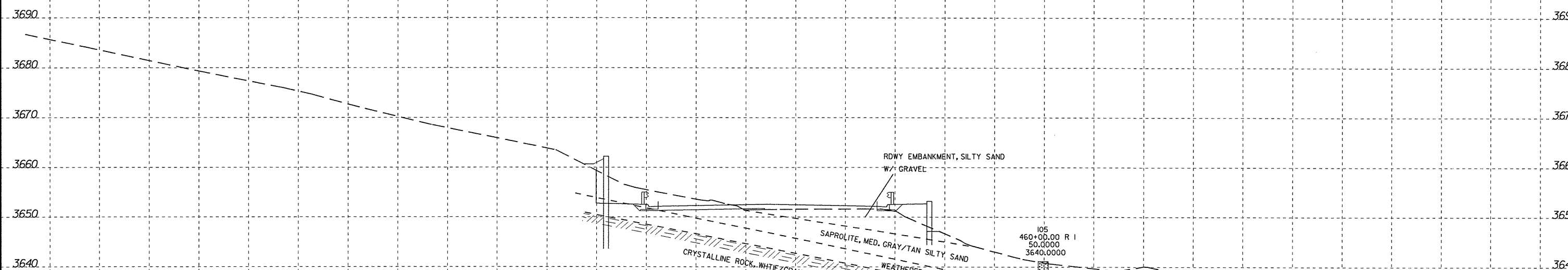


PROJ. REFERENCE NO. R-2237C SHEET NO. 171/259

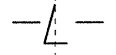
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



460+50.09



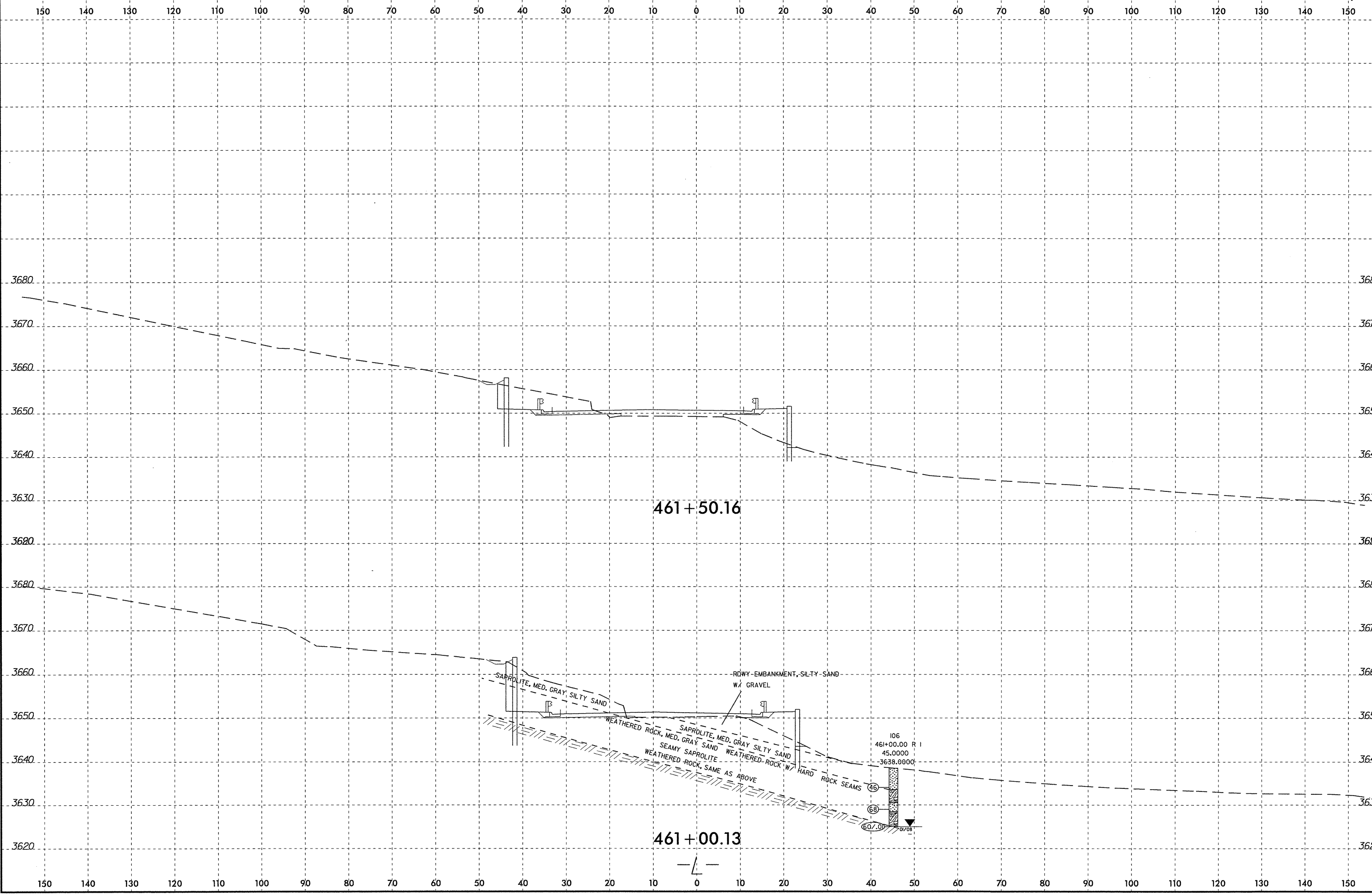
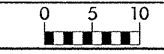
460+00.06



SYSTEM TIME: 08/23/17 10:00:00 AM
USER: J. W. BROWN
PROJECT: R-2237C
SHEET: 171/259

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

8/23/00



SYSTEM TIME: 8/23/00 10:00:00
DRAWN BY: J. W. BROWN
CHECKED BY: J. W. BROWN
DATE: 8/23/00

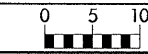
461+50.16

461+00.13

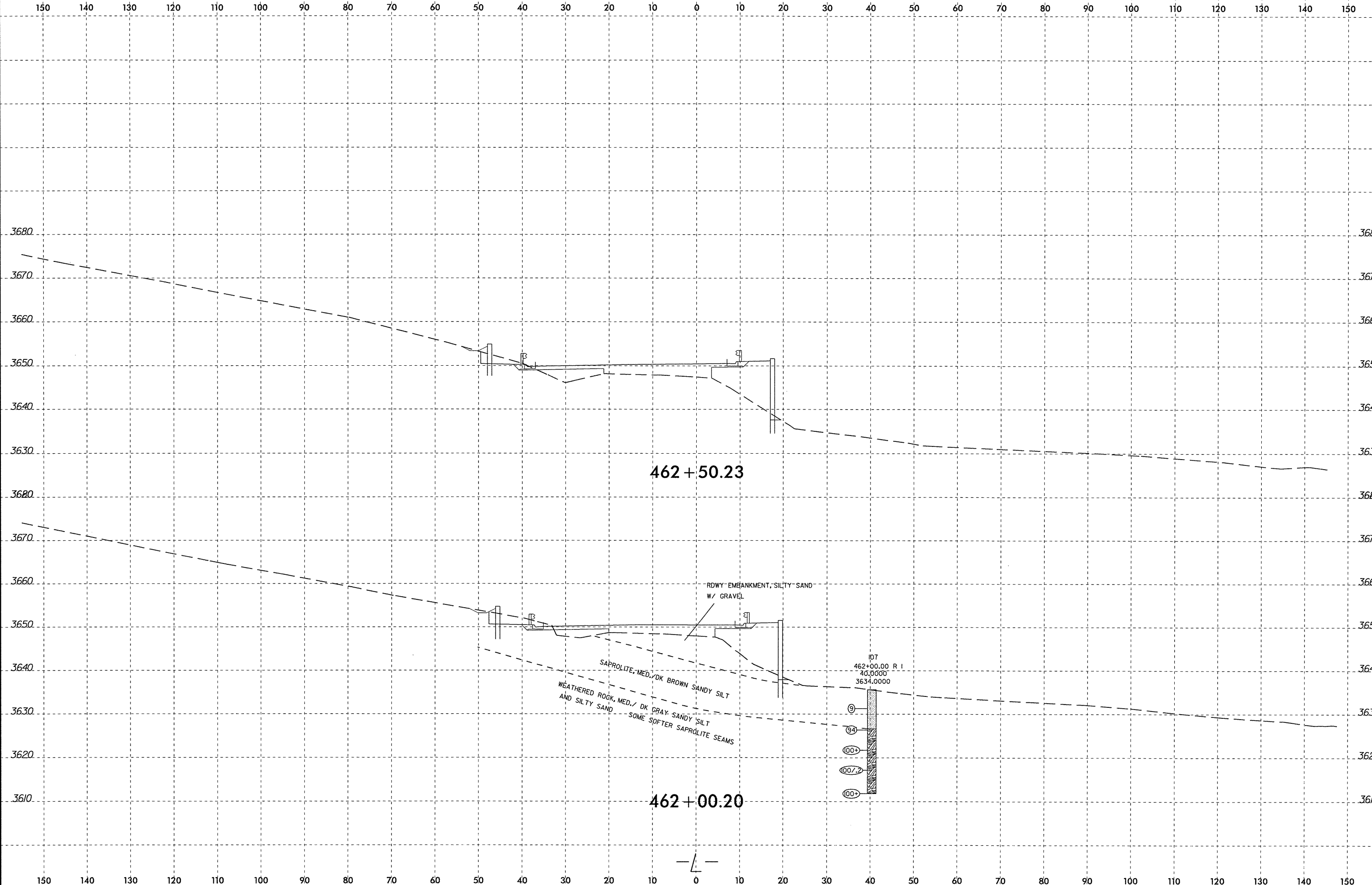
SAPROLITE, MED. GRAY, SILTY SAND
 WEATHERED ROCK, MED. GRAY SAND
 SEAMY SAPROLITE
 WEATHERED ROCK, SAME AS ABOVE
 ROADWAY EMBANKMENT, SILTY SAND W/ GRAVEL
 WEATHERED ROCK W/ HARD ROCK SEAMS

106
 461+00.00 R I
 45.0000
 -3638.0000
 607.00
 0.008

8/23/11



PROJ. REFERENCE NO. R-2237C SHEET NO. 173/259

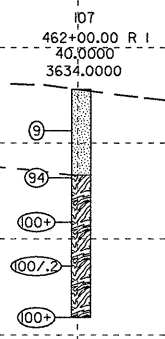


462+50.23

462+00.20

ROWY EMBANKMENT, SILTY SAND W/ GRAVEL

SAPROLITE, MED./DK BROWN SANDY SILT
WEATHERED ROCK, MED./ DK GRAY SANDY SILT AND SILTY SAND
SOME SOFTER SAPROLITE SEAMS

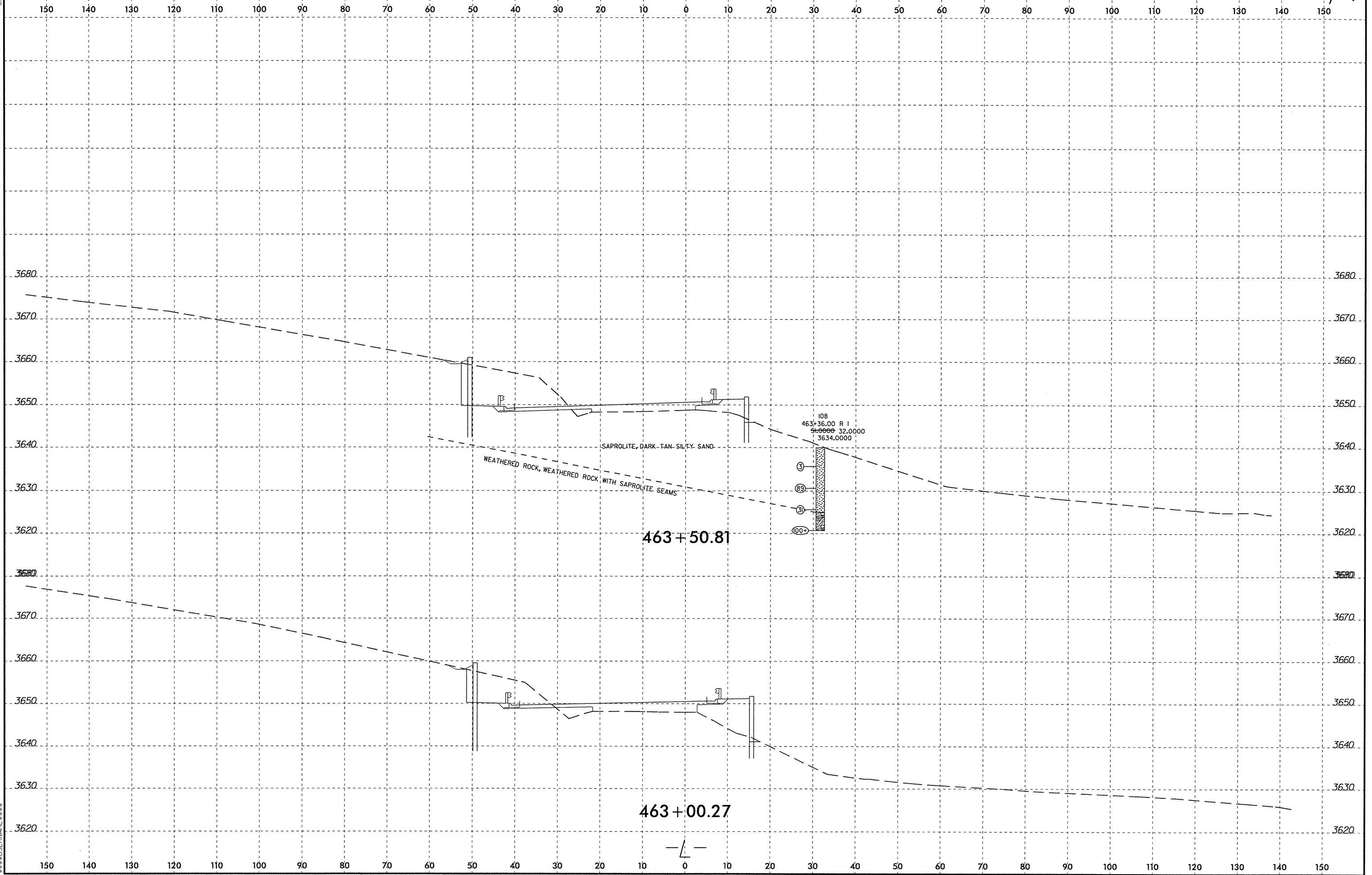


SYSTEM TIME: 8/23/11 10:00:00 AM
USER: JENKINS
JOB: R-2237C
SHEET: 173/259

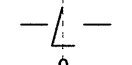
8/23/11



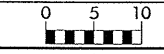
PROJ. REFERENCE NO. R-2237C SHEET NO. 174/259



SYNTHETIC
SECTIONS
NOT TO BE
USED FOR
CONSTRUCTION

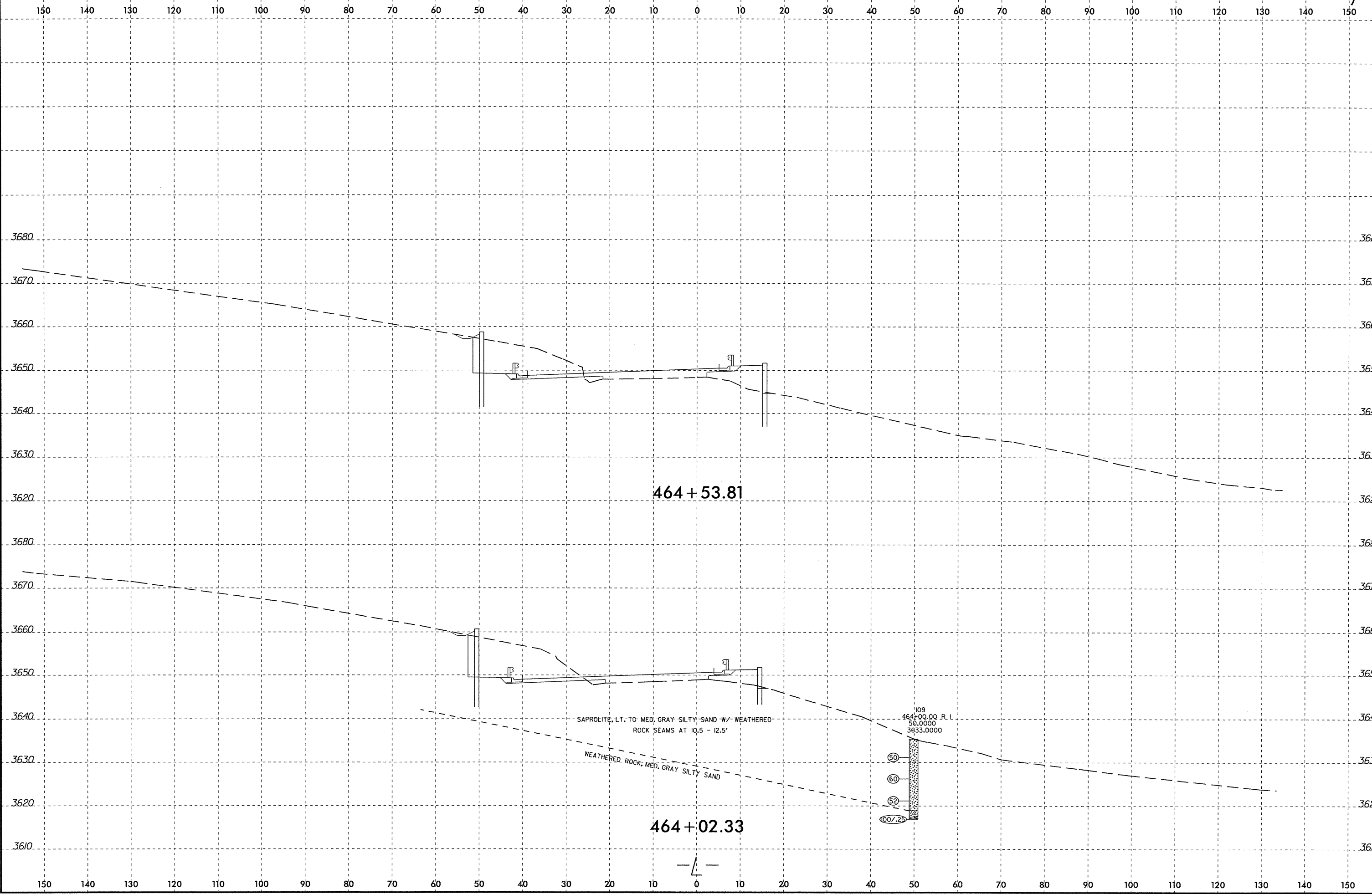


8/23/17



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
175/259



464+53.81

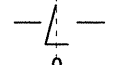
464+02.33

SAPROLITE, LT. TO MED. GRAY SILTY SAND W/ WEATHERED
ROCK SEAMS AT 10.5 - 12.5'

WEATHERED ROCK, MED. GRAY SILTY SAND

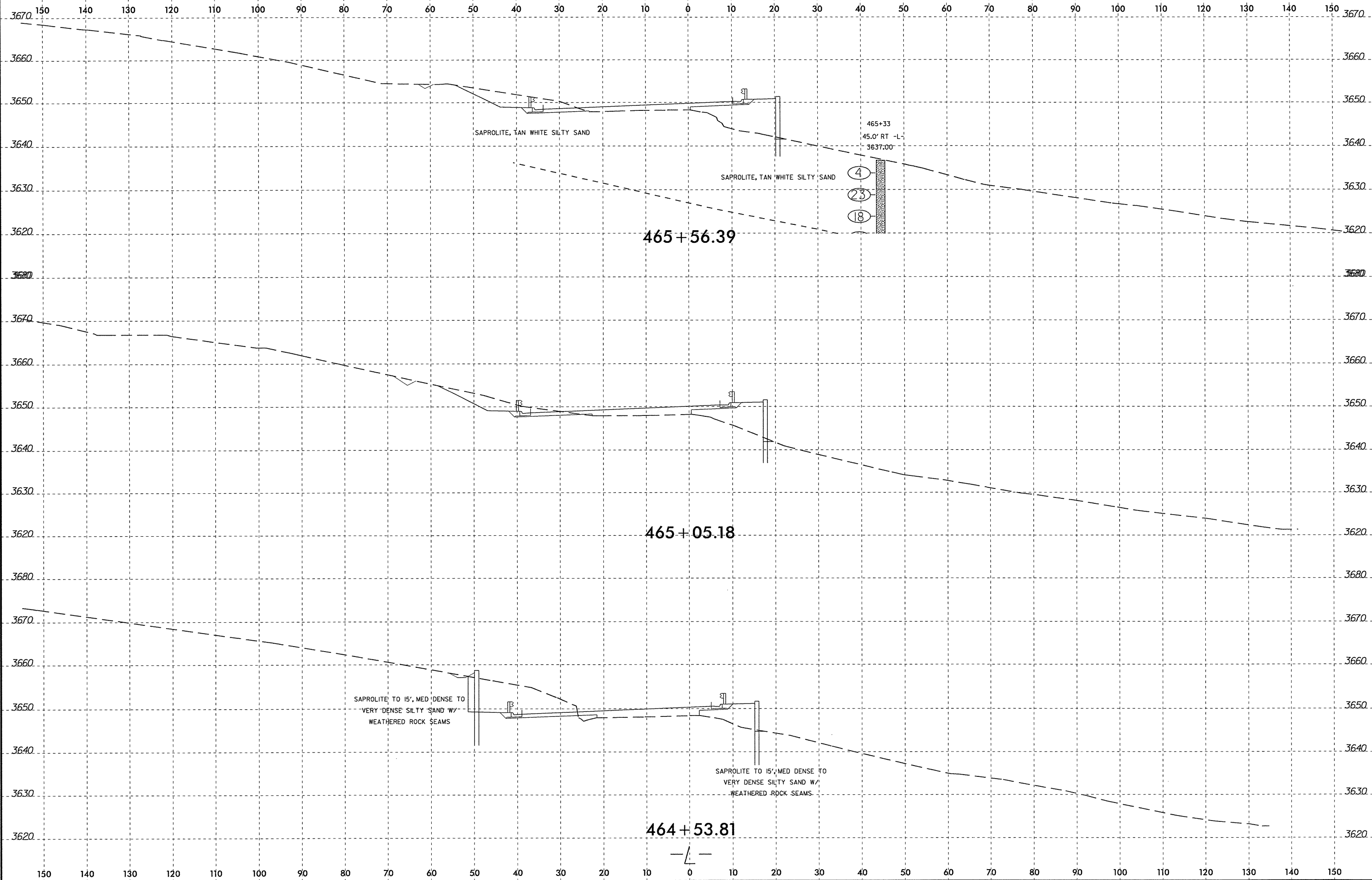
109
464+00.00 R.L.
50.0000
3633.0000

50
60
52
100/25

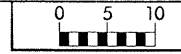


SYSTEMS TIME DONOR DUE TO

8/23/94
SYTIME
DGN
US
NAME

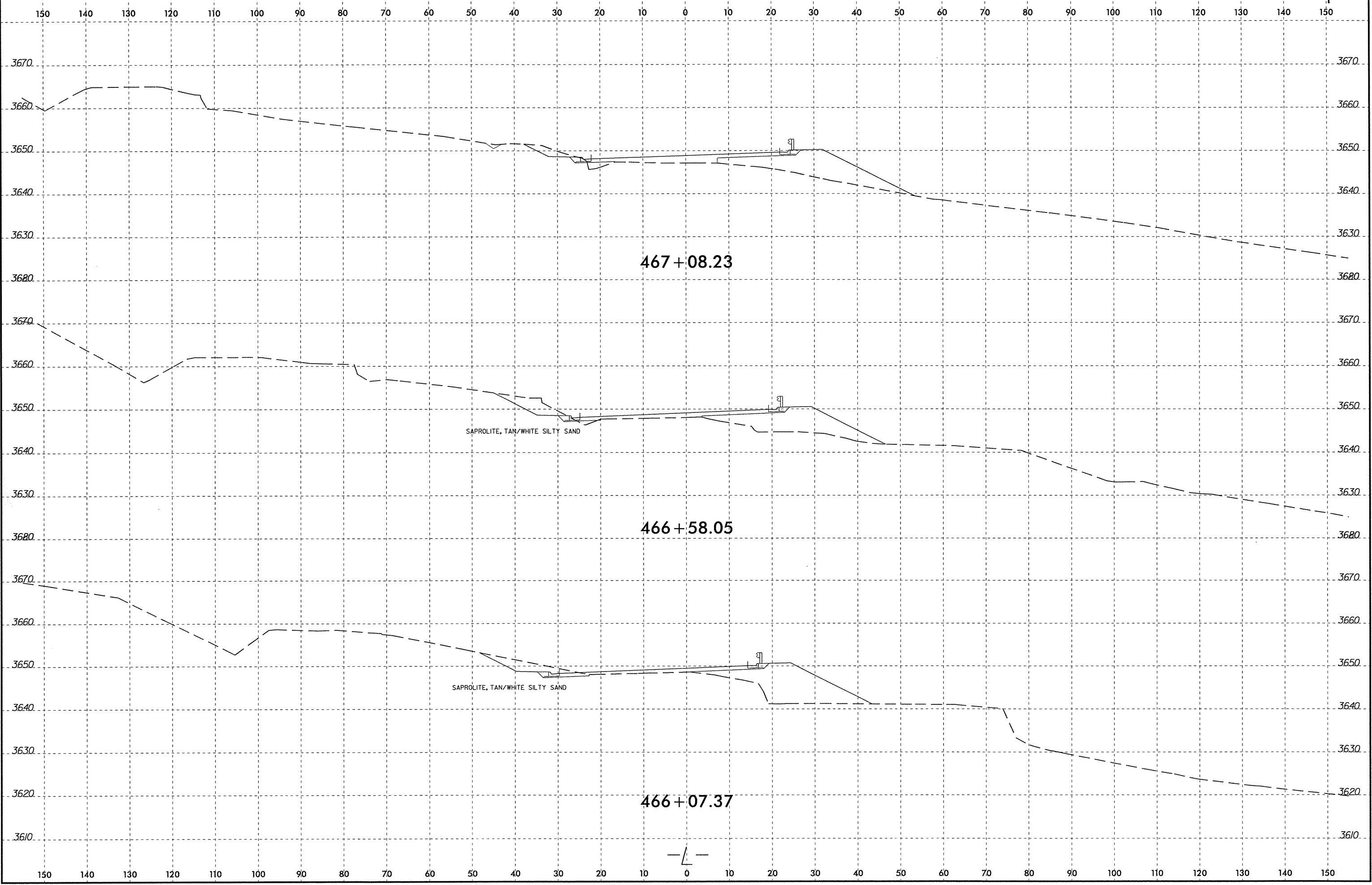


8/23/19



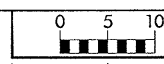
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
177/259



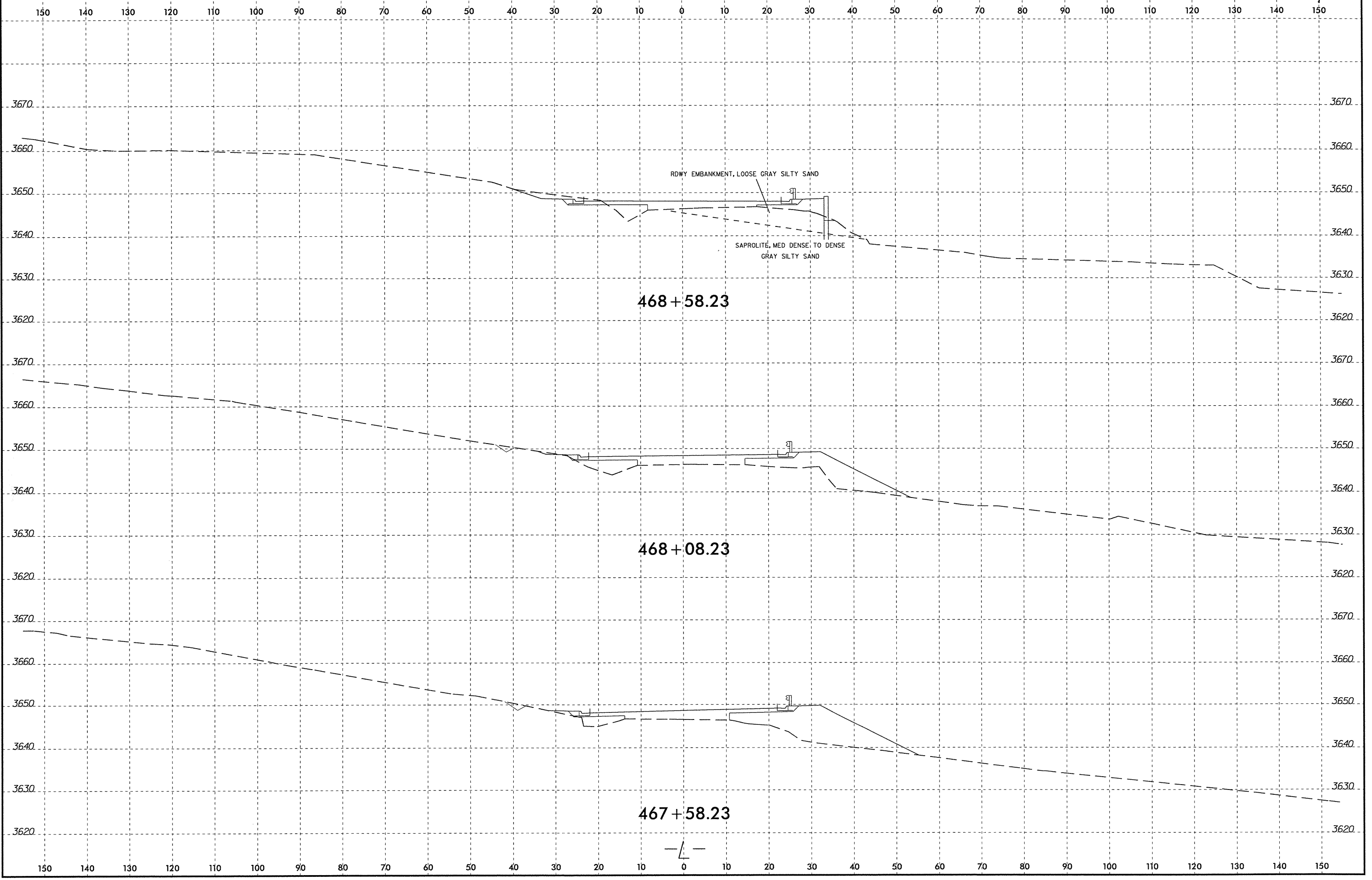
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DRAWN BY: J. [unreadable]
CHECKED BY: [unreadable]

8/23/19



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
178/259



468 + 58.23

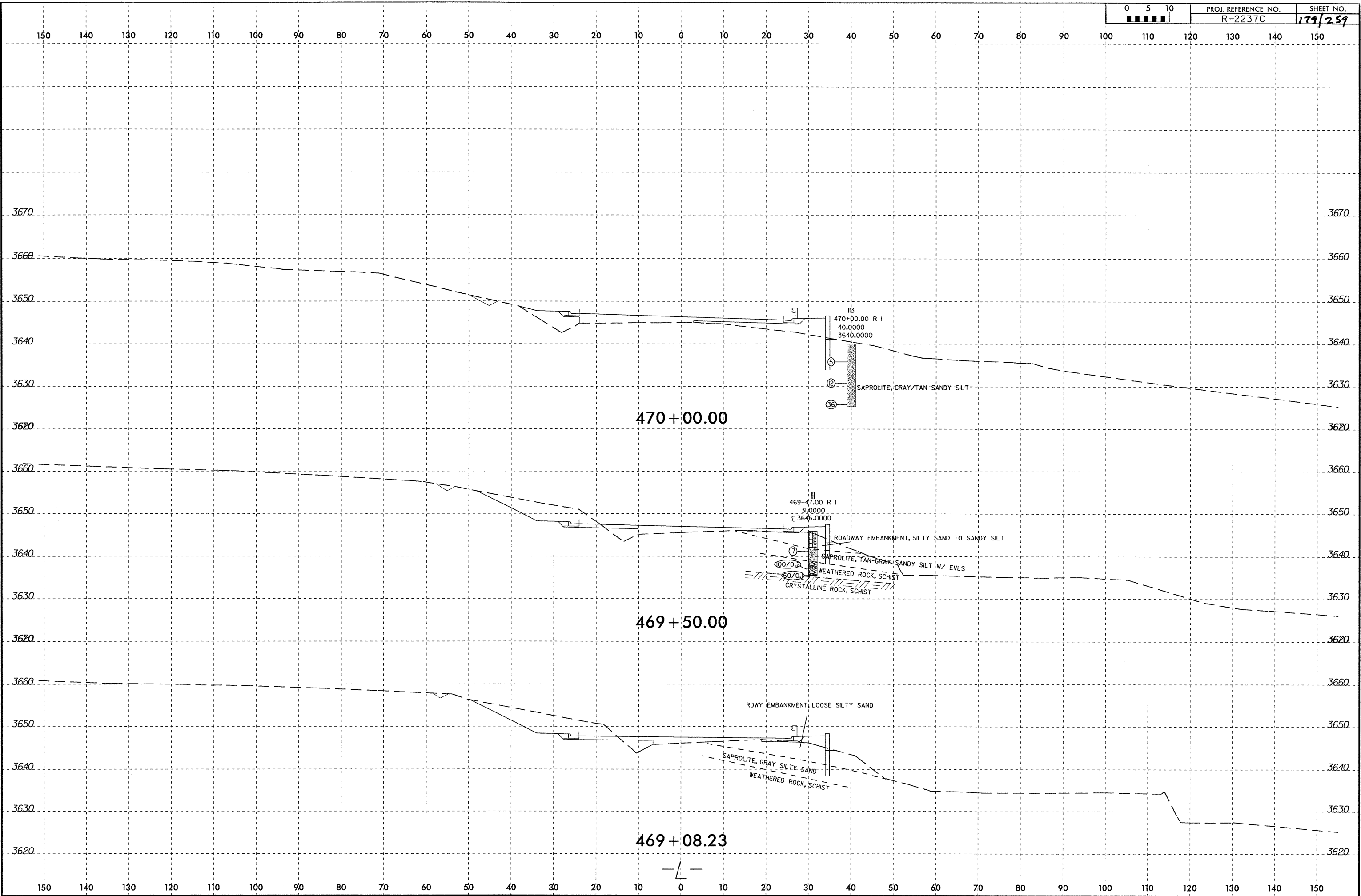
468 + 08.23

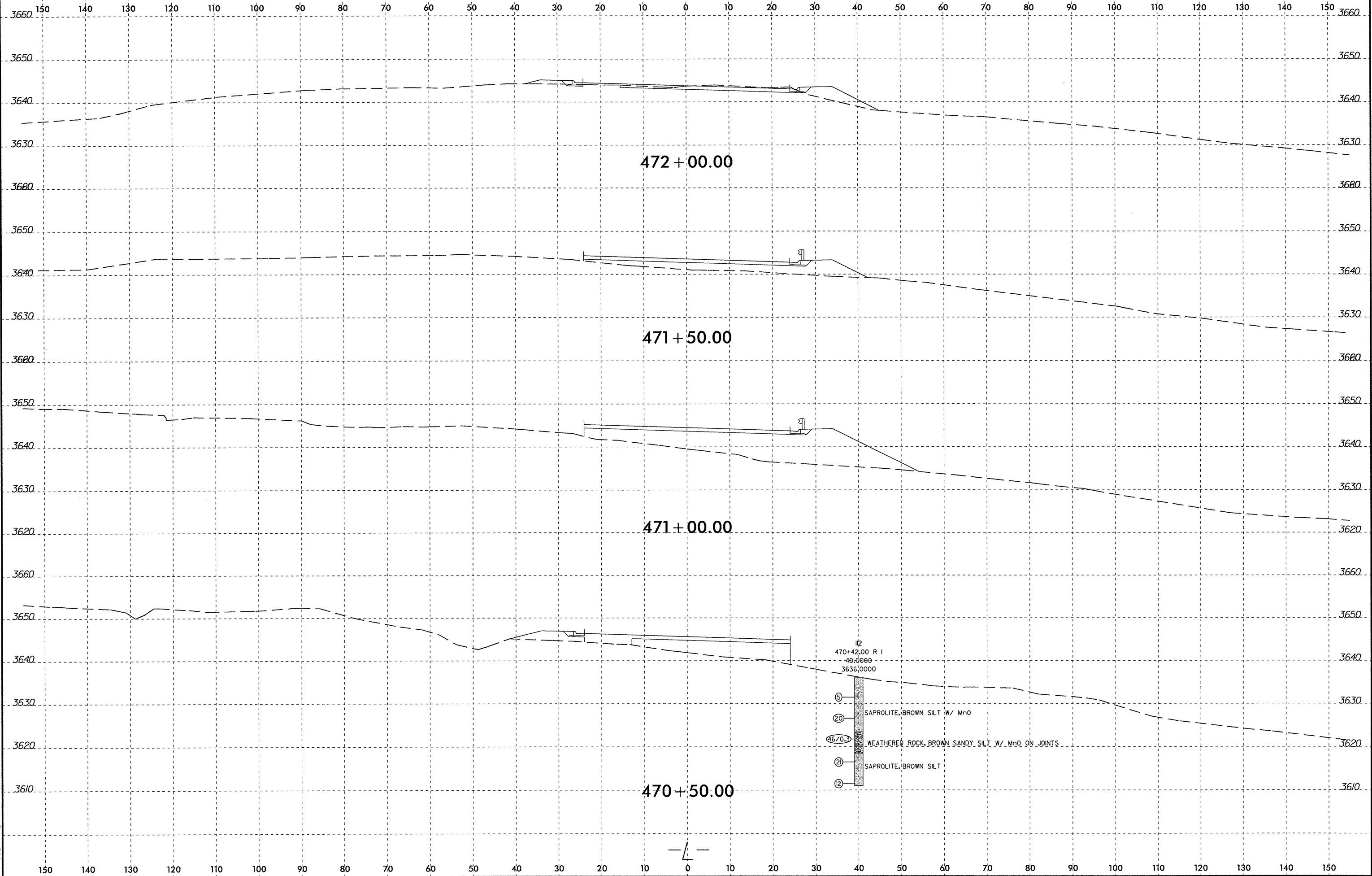
467 + 58.23



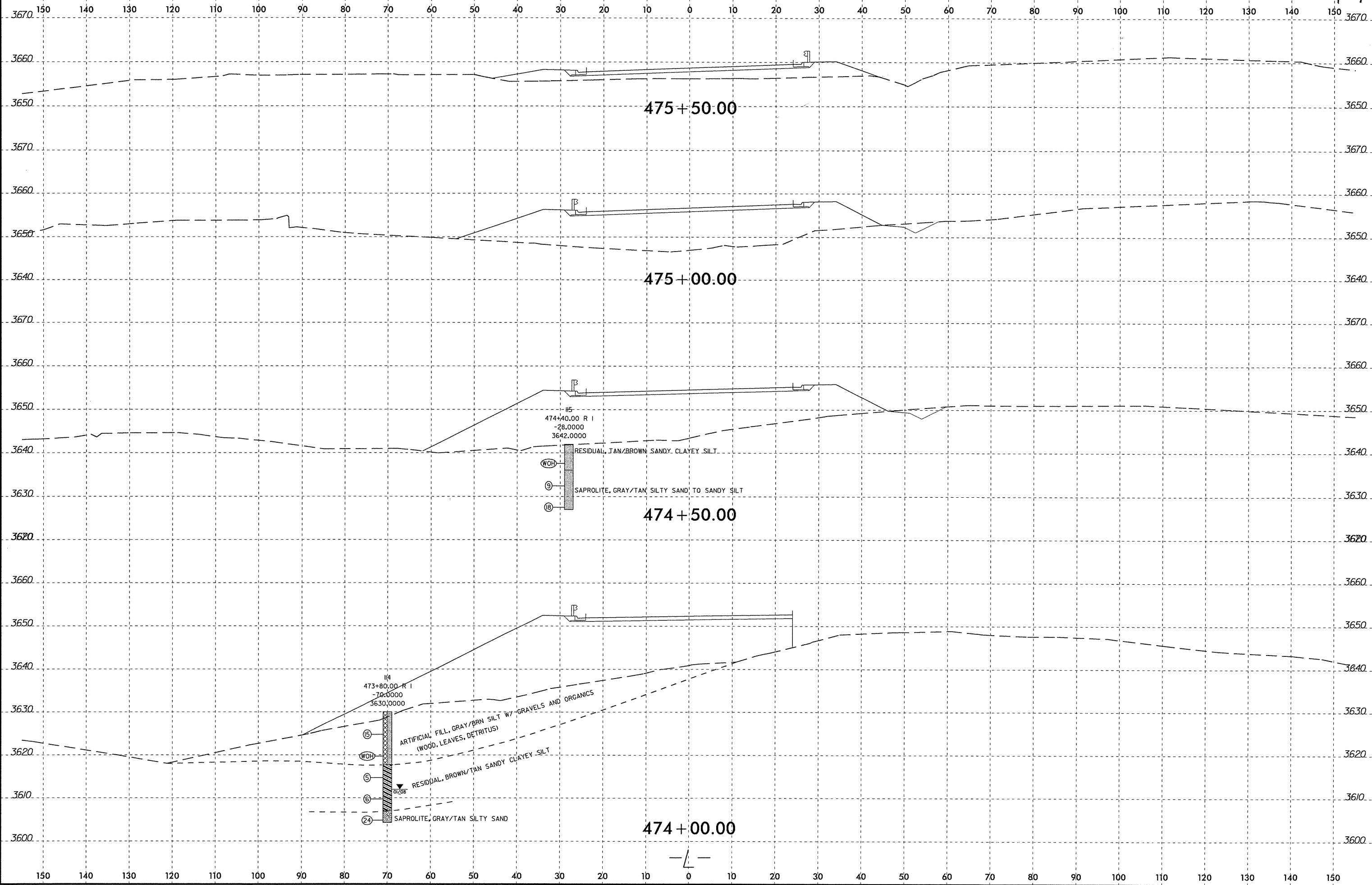
SYTIME
SECTION
US
SCALE

8/23/14
SYSTEM TIME
USER NAME



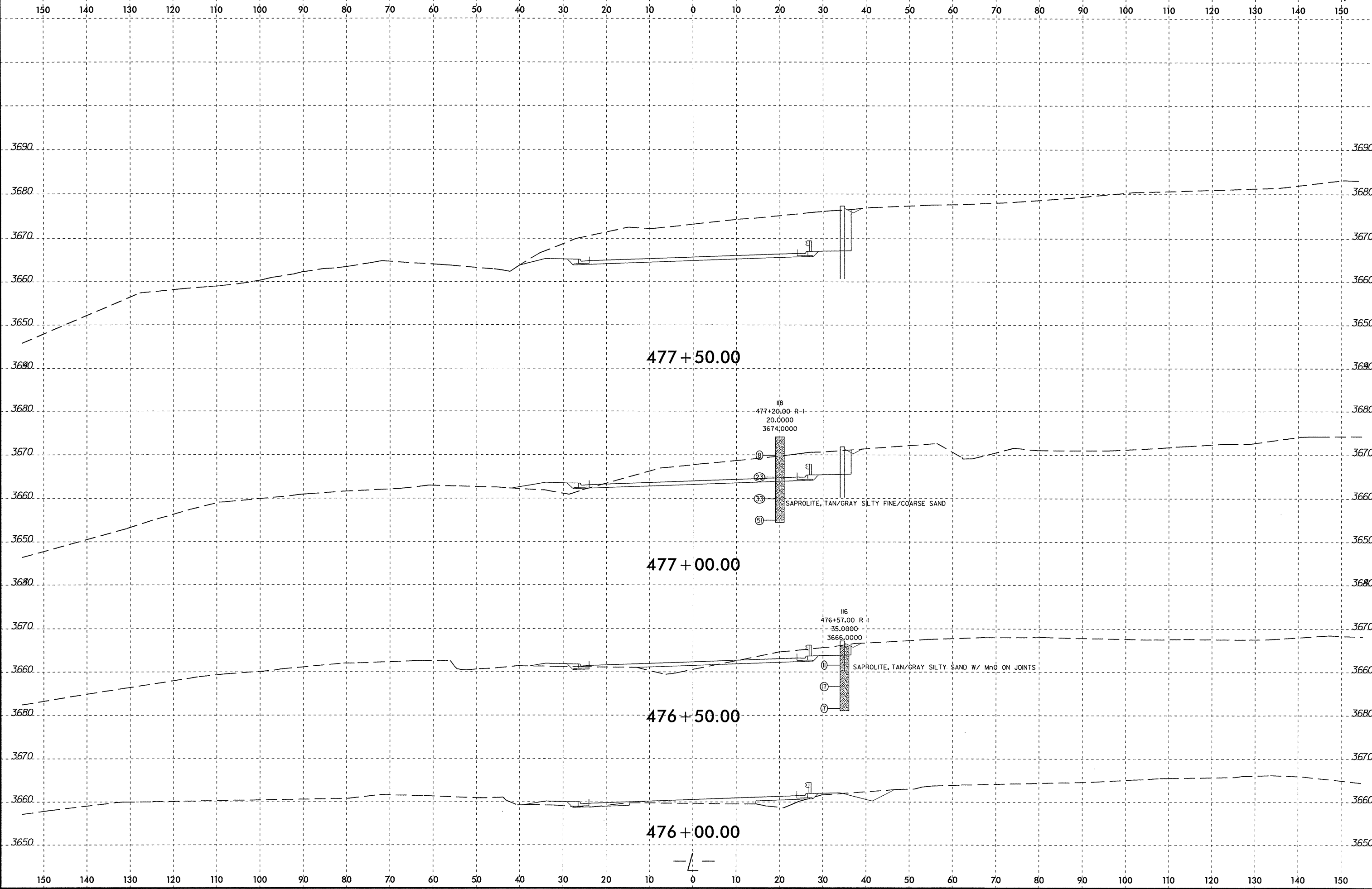
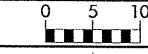


SYSTEM TIME
DRAWN BY
CHECKED BY
DATE



SYSTEM TIME
USER NAME

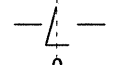
B/22/1/1

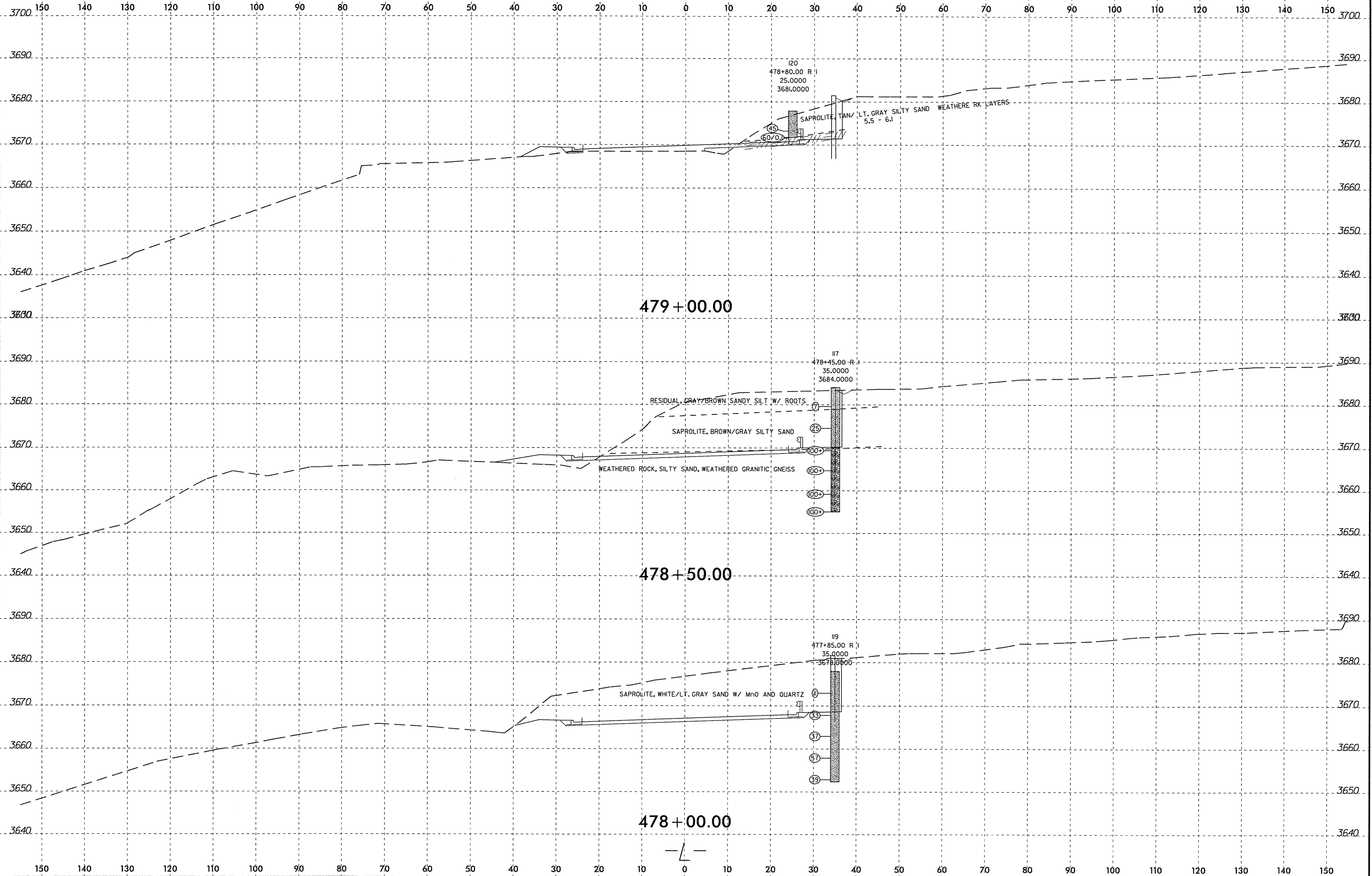


IIB
 477+20.00 R-1
 20.0000
 3674.0000
 ⑥
 ②③
 ③③
 ⑤
 SAPROLITE, TAN/GRAY SILTY FINE/COARSE SAND

IIE
 476+57.00 R-1
 35.0800
 3666.0000
 ①
 ⑦
 ⑦
 SAPROLITE, TAN/GRAY SILTY SAND W/ MnO ON JOINTS

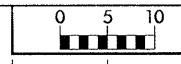
SYSTEMS
LENS
DOWN





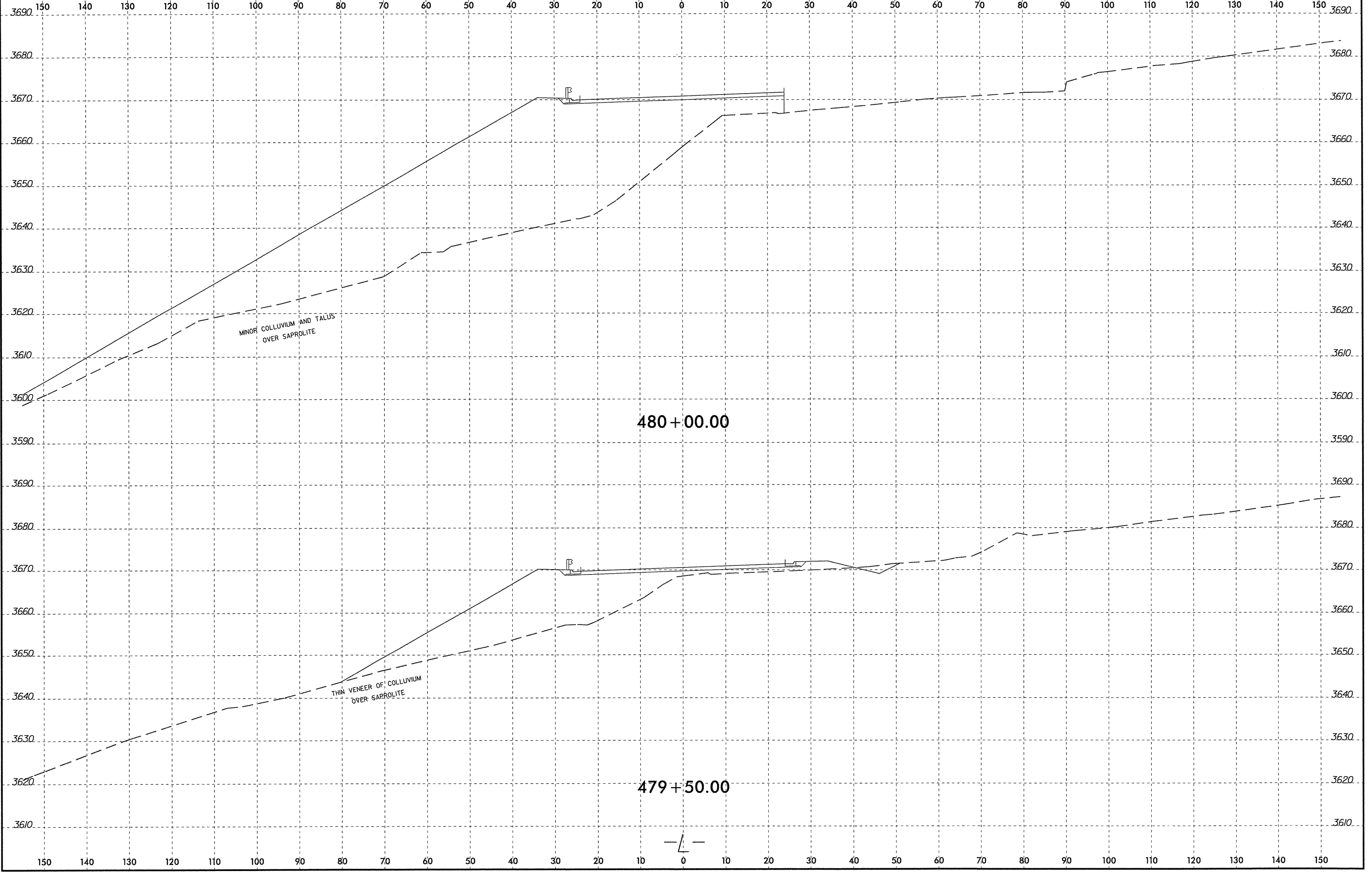
SYSTEMS

8/23/91

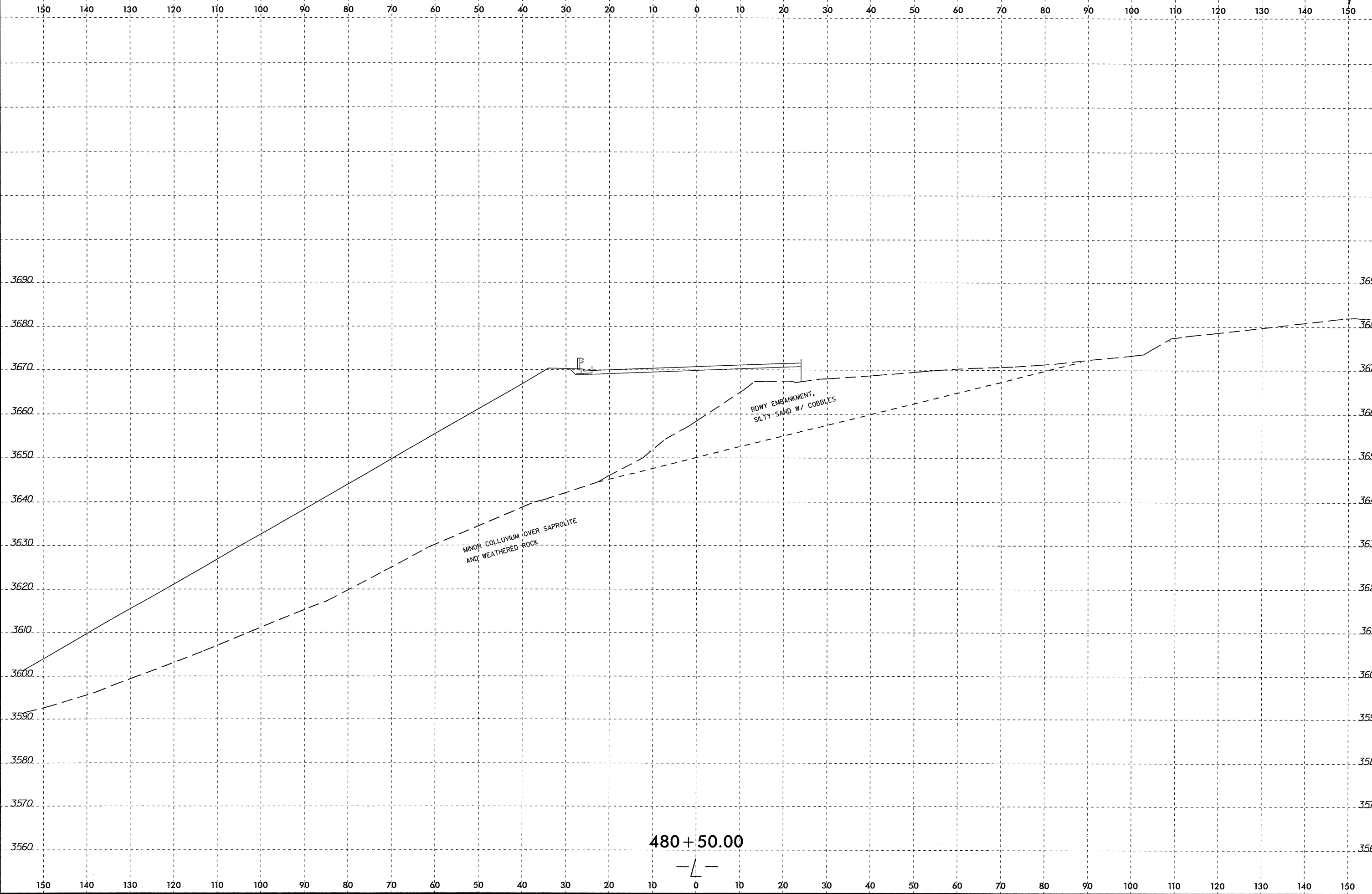
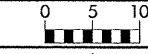


PROJ. REFERENCE NO.
R-2237C

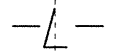
SHEET NO.
184/259



B.237

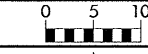


480+50.00



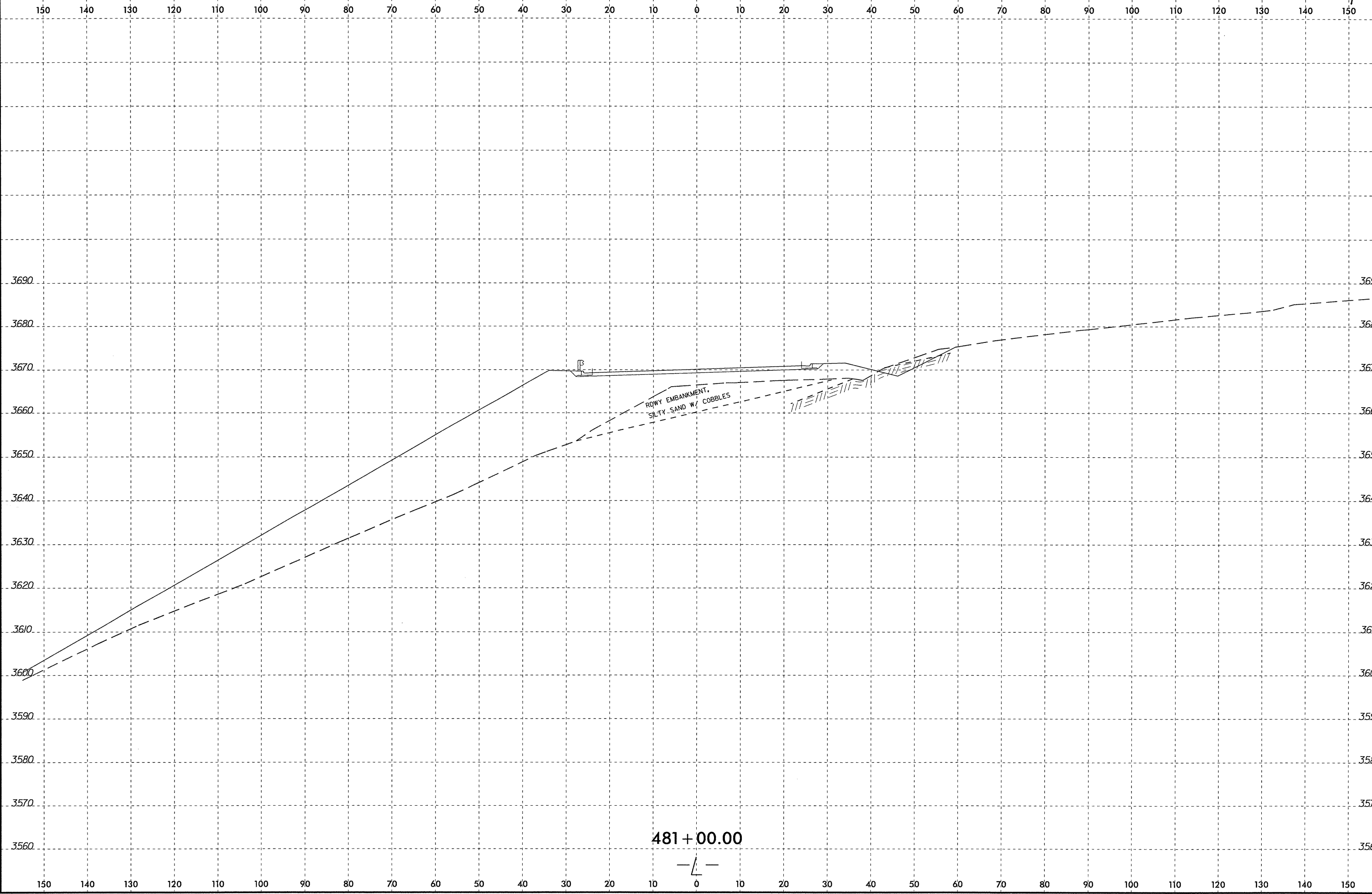
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*****USLINE*****

8/23/11

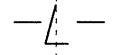


PROJ. REFERENCE NO.
R-2237C

SHEET NO.
186/259



481+00.00



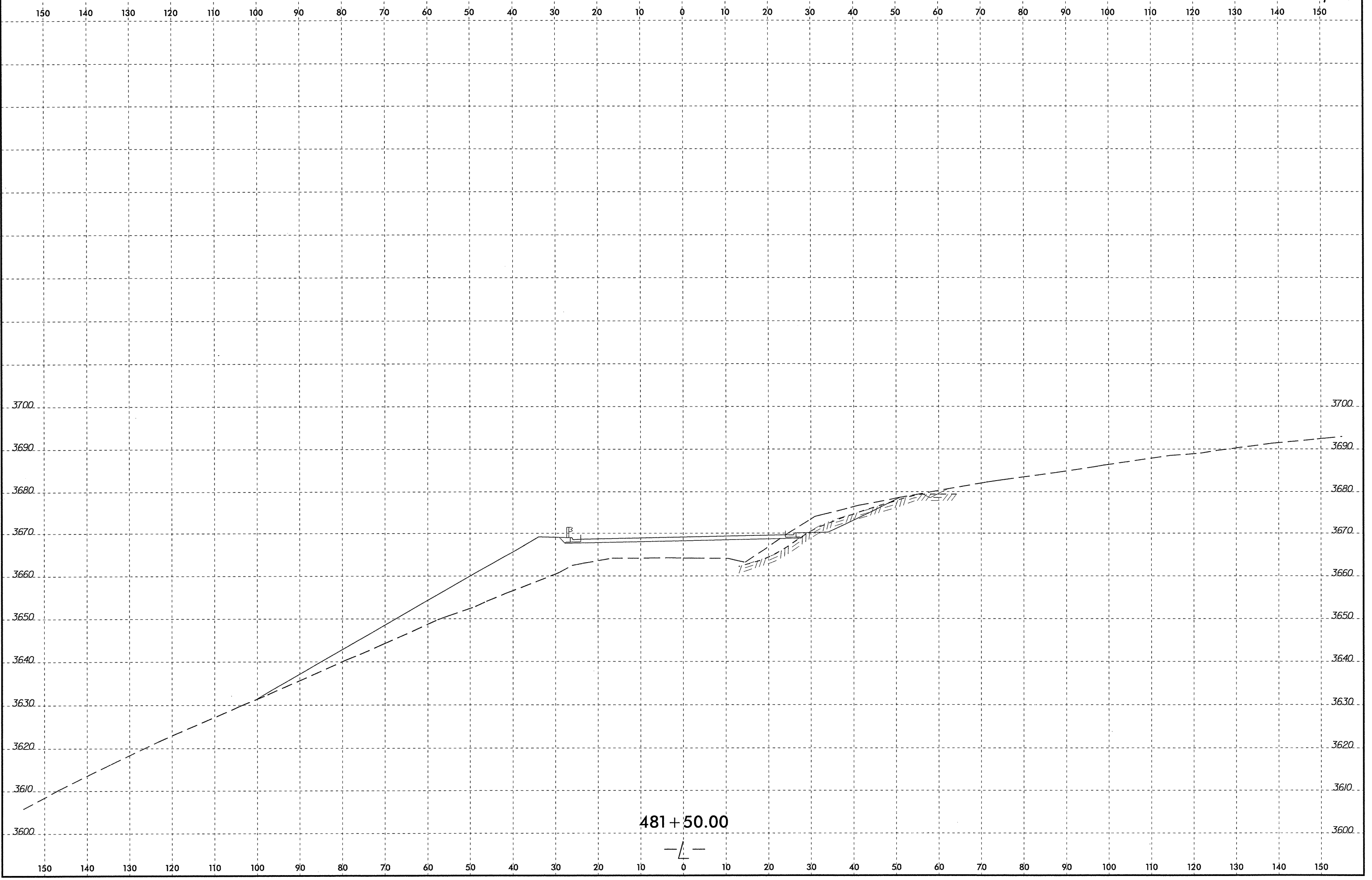
SYSTEMS
DESIGN
INC.

8/23/95



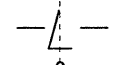
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
197/259

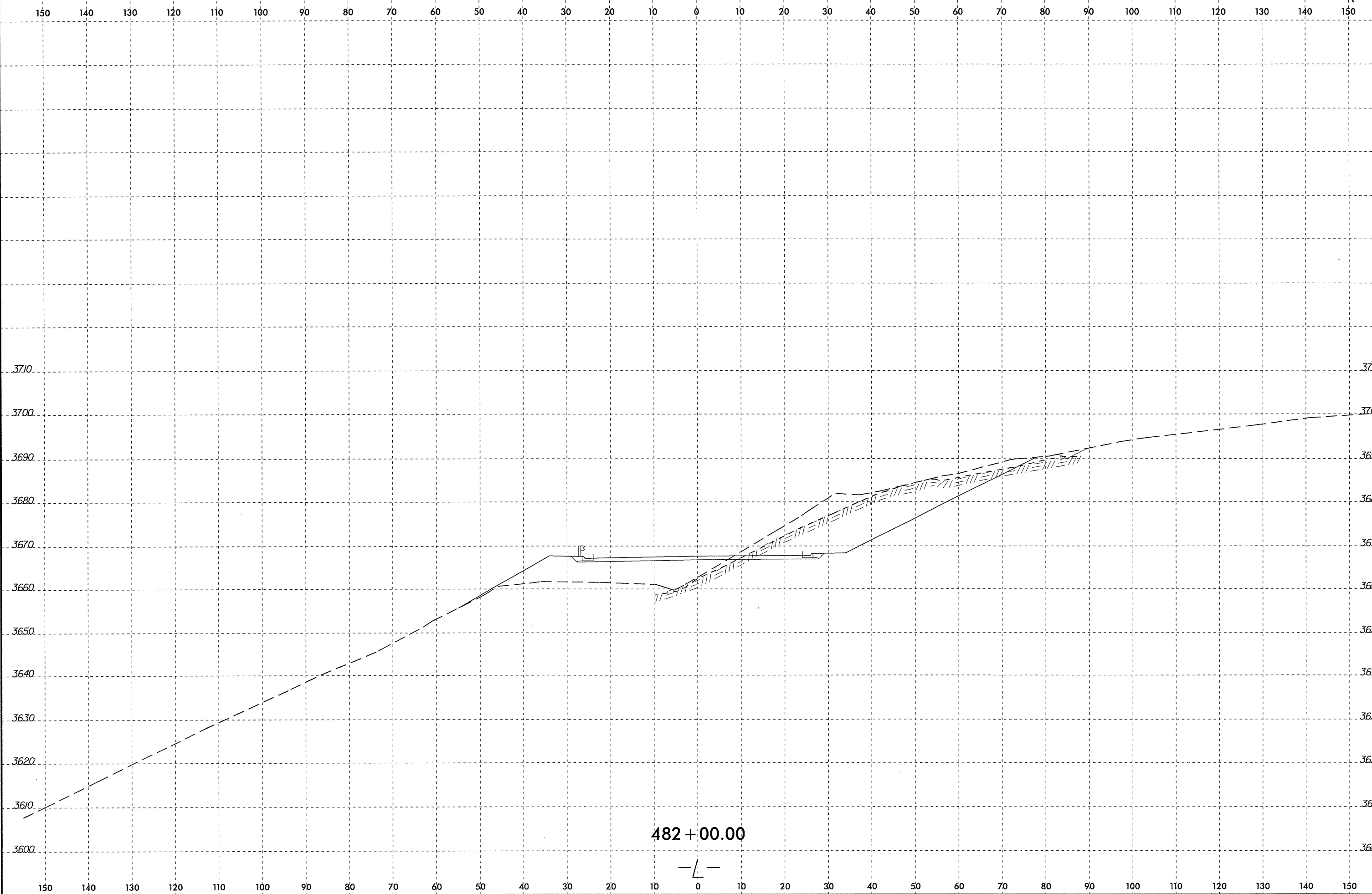


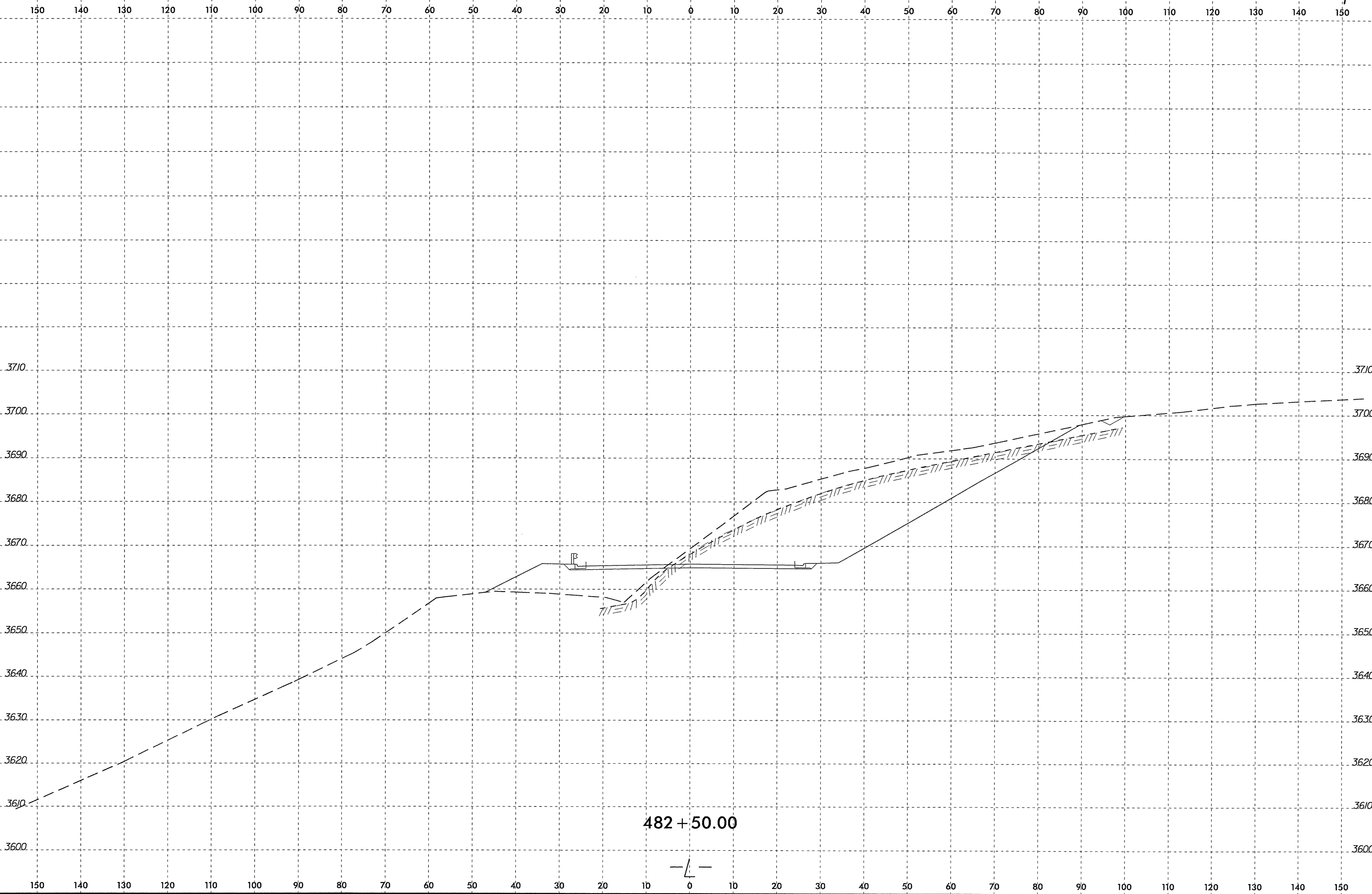
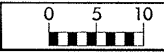
\$\$\$SYTIME\$\$\$\$
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481+50.00

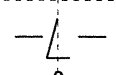


8/23/11
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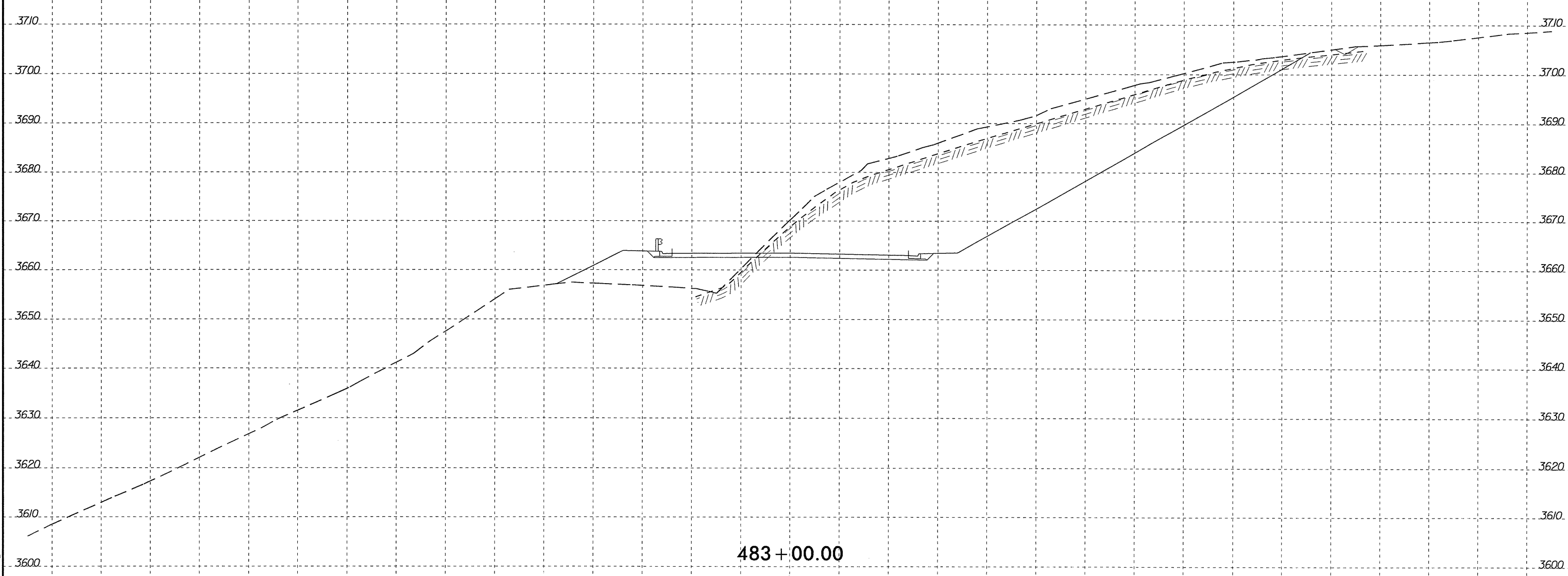


482 + 50.00

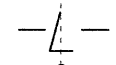


SYSTEMS
CONNECTIONS
SERVICES

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



483+00.00

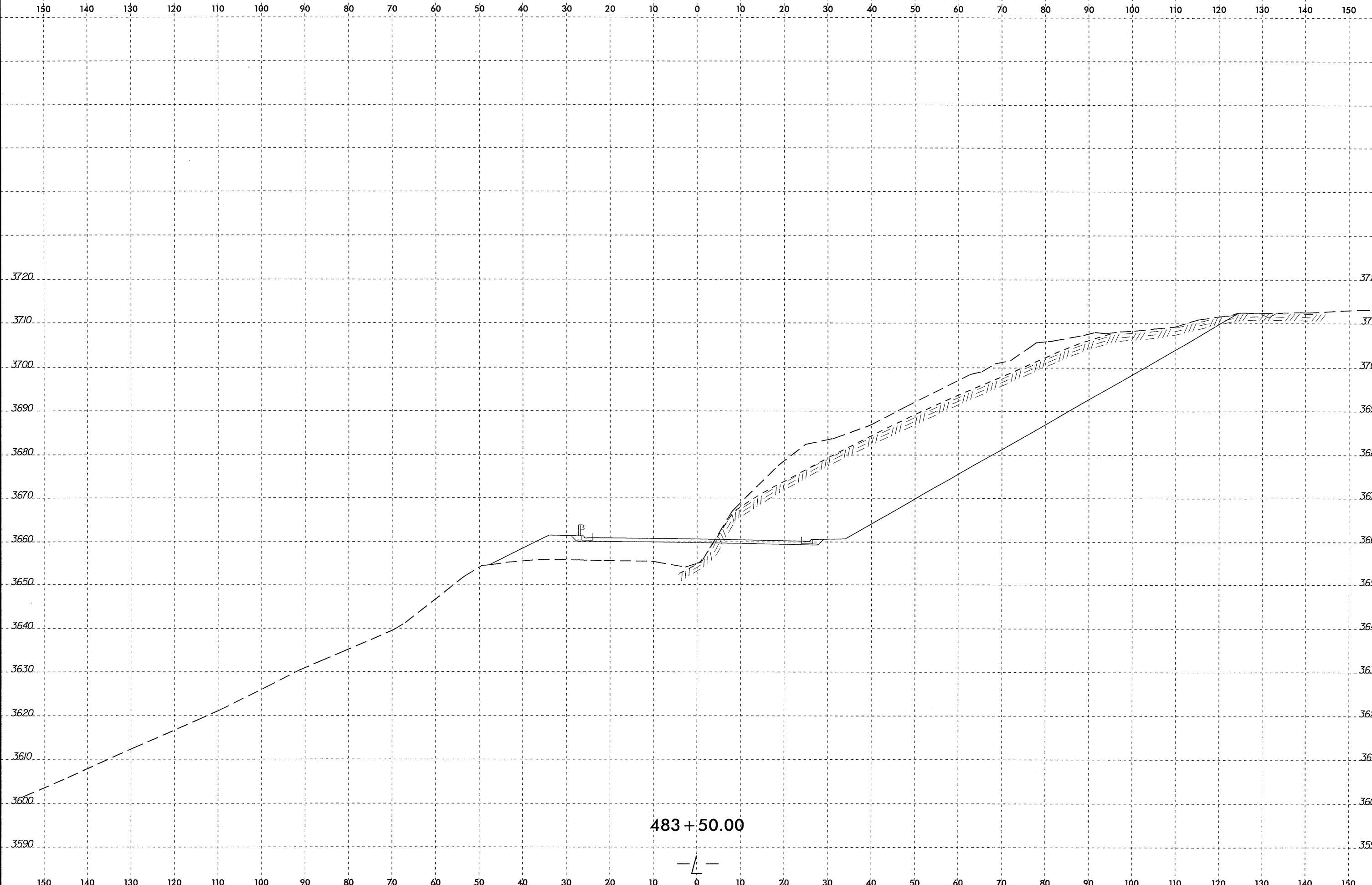


SYSTEM TIME: 8/23/14 10:10:10 AM
DRAWING: R-2237C
USER: JLM

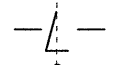
8/23/99



PROJ. REFERENCE NO. R-2237C	SHEET NO. 191/259
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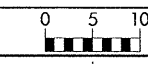


483 + 50.00

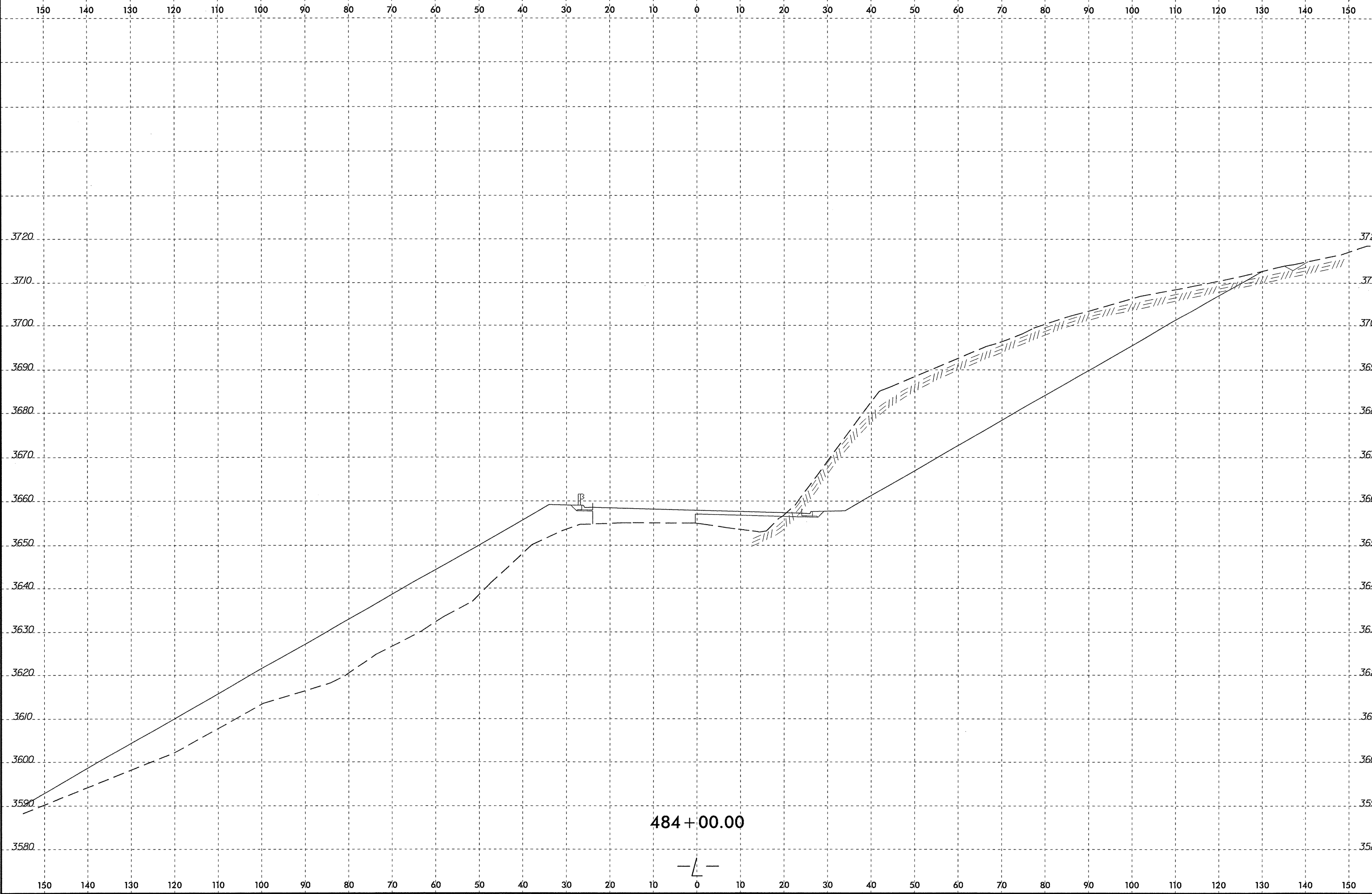


SYSTEMS
 DESIGN
 GROUP
 INC.
 1000
 W. 10th
 ST.
 SUITE 100
 DENVER, CO 80202
 (303) 733-8800
 WWW.SYSDG.COM

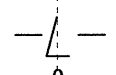
8/23/11



PROJ. REFERENCE NO. R-2237C SHEET NO. 192/259



484+00.00

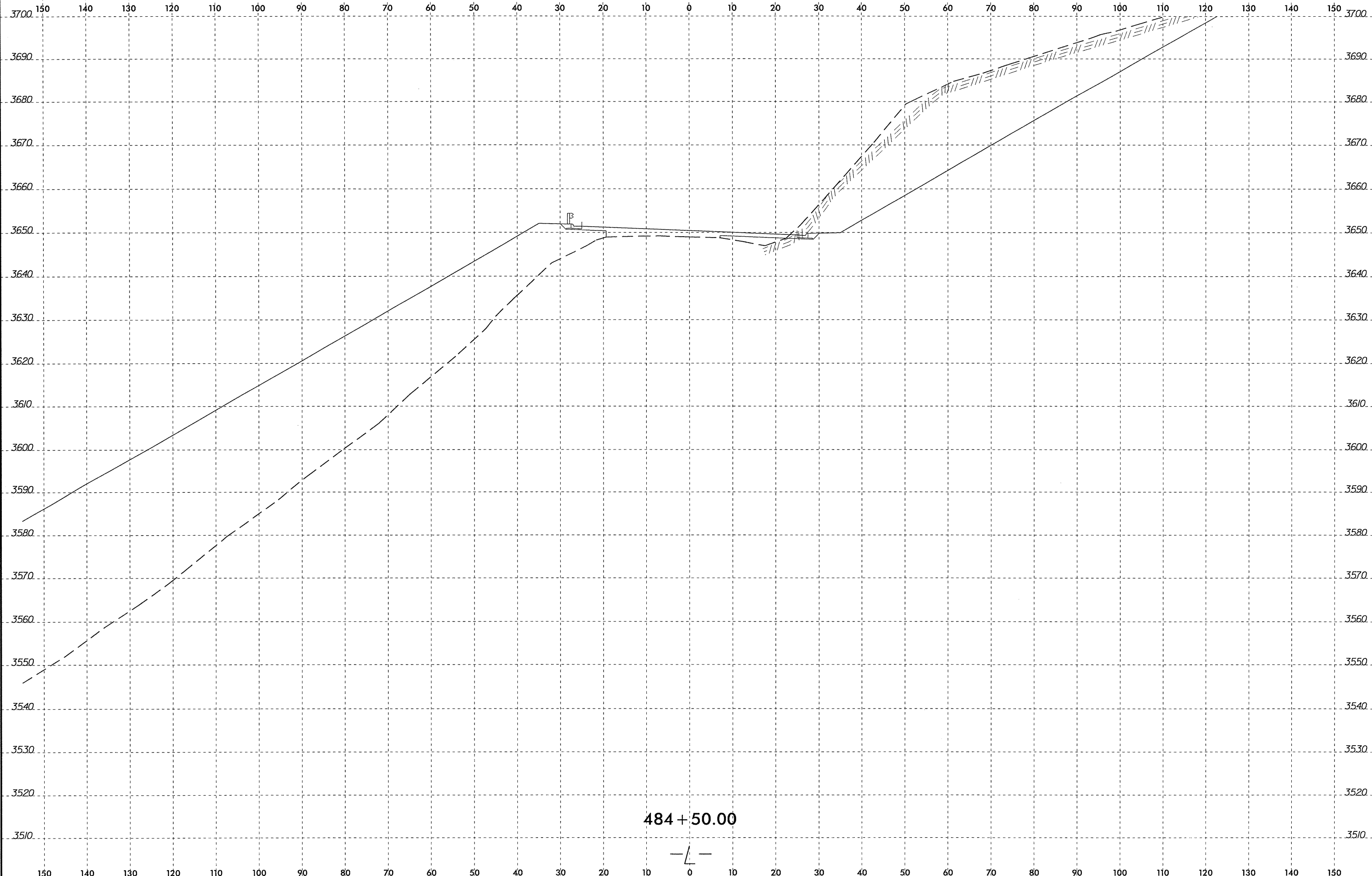


SYSTEMS
CONNECTIONS
DEFINITIONS

8/23/09



PROJ. REFERENCE NO.	SHEET NO.
R-2237C	193/259

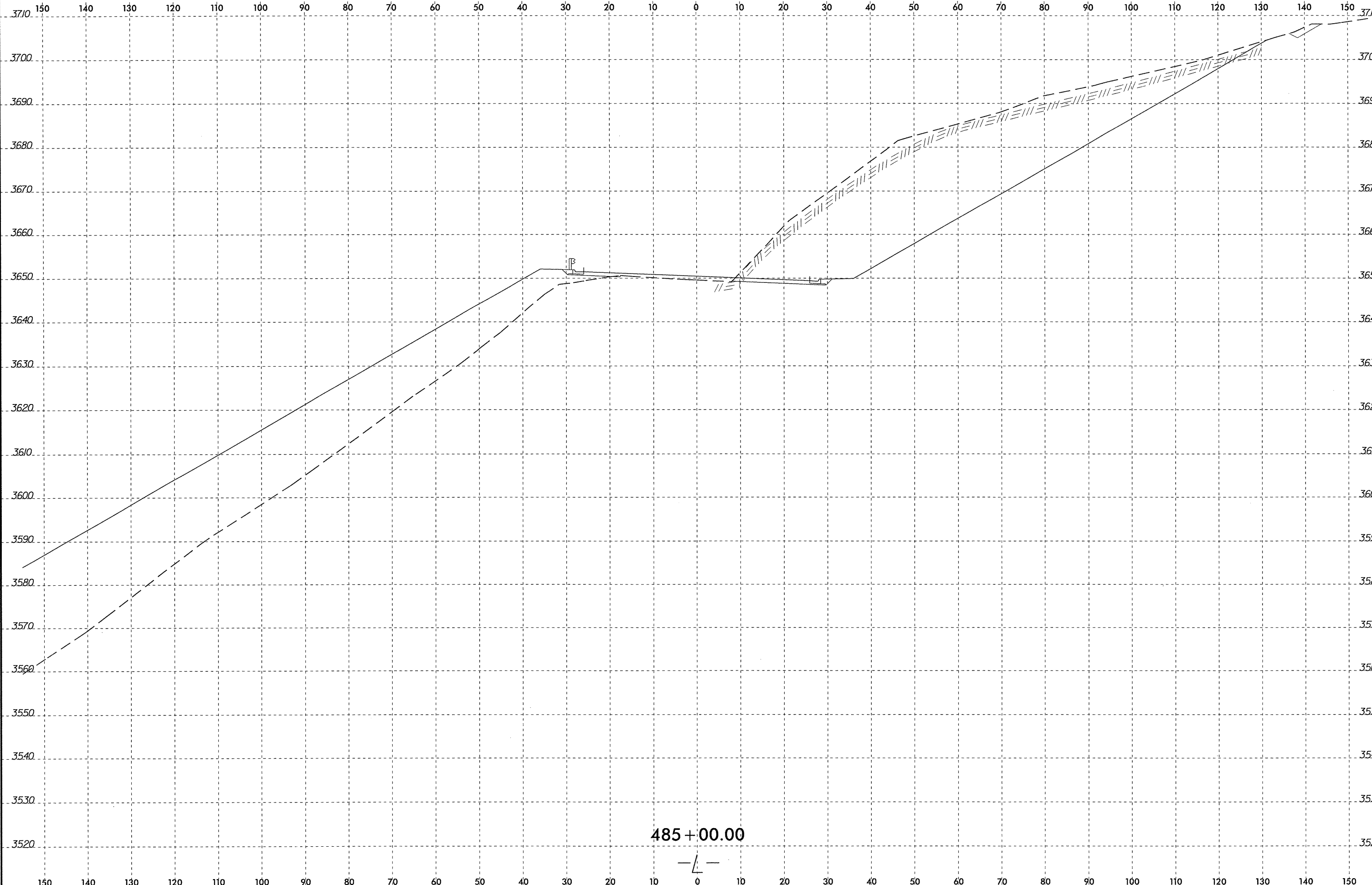


\$\$\$\$SYTIME\$\$\$\$
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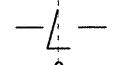
8/23/11



PROJ. REFERENCE NO. R-2237C	SHEET NO. 194/259
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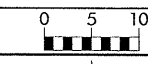


485+00.00



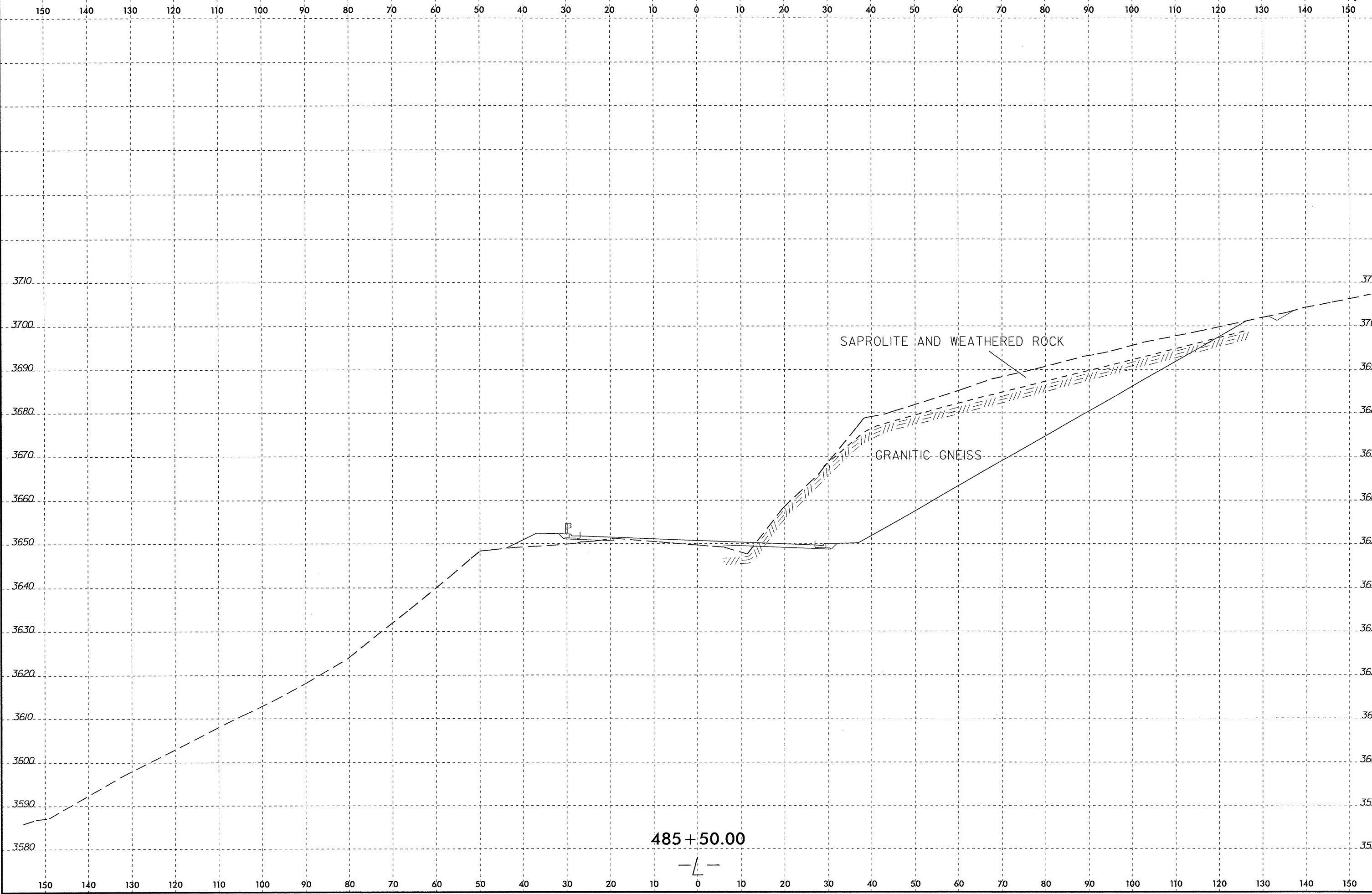
\$\$\$SYTIME\$\$\$
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8/23/11



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
195/269



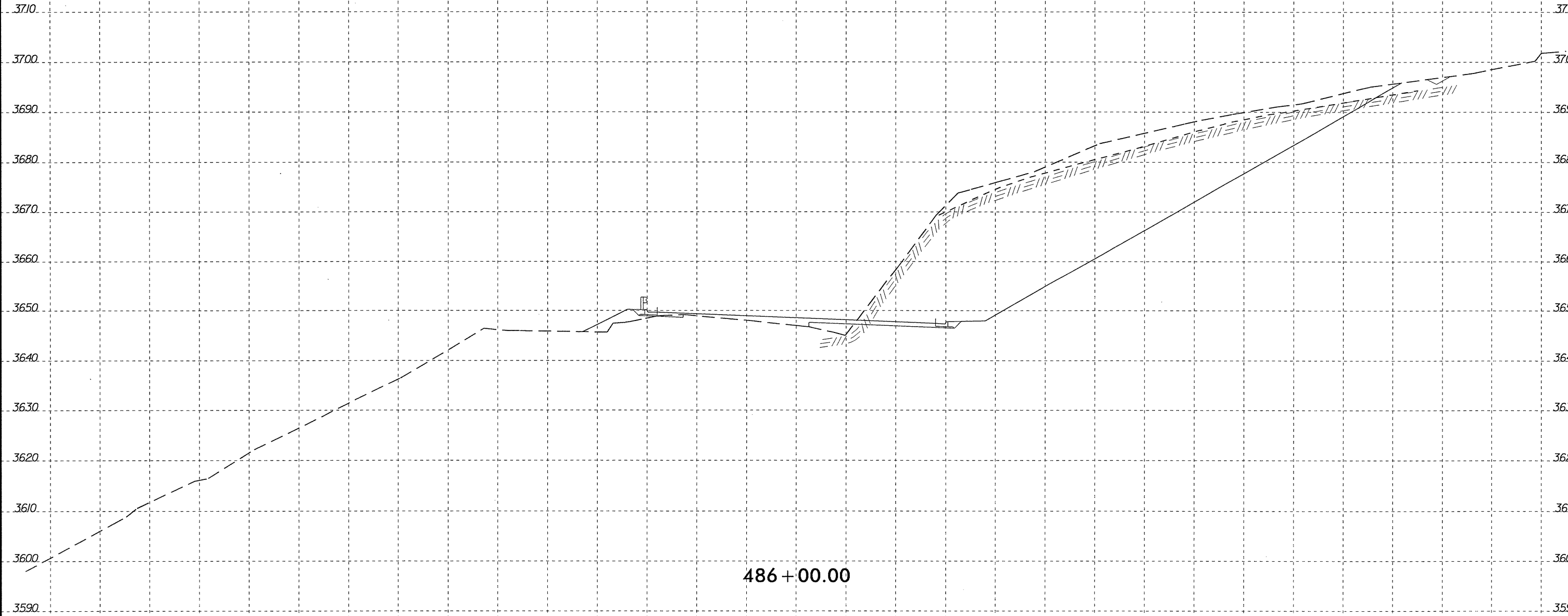
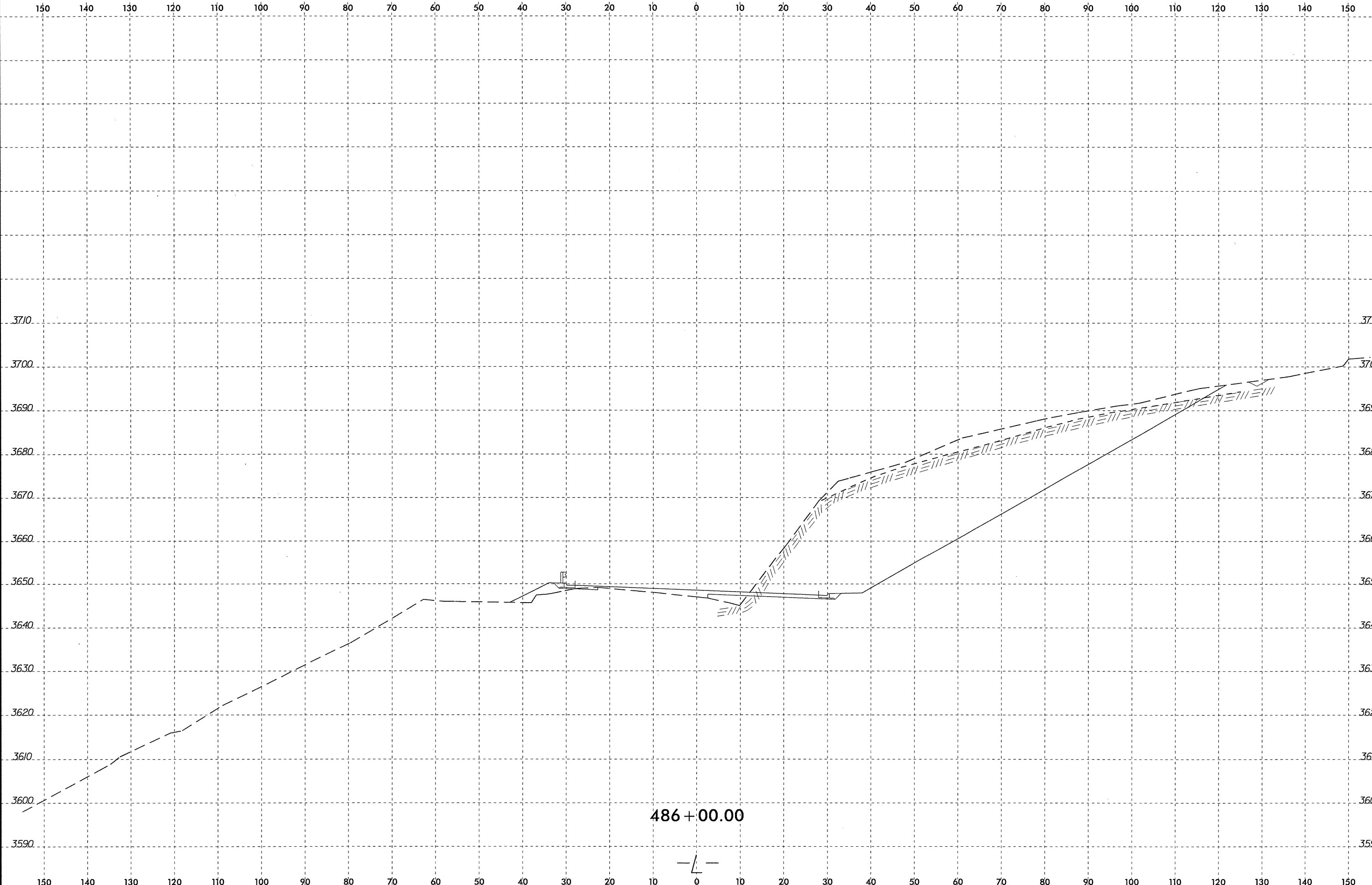
SYSTEM
DC
USER
NAME

8/23/91



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
196/259

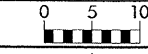


486 + 00.00

-L-

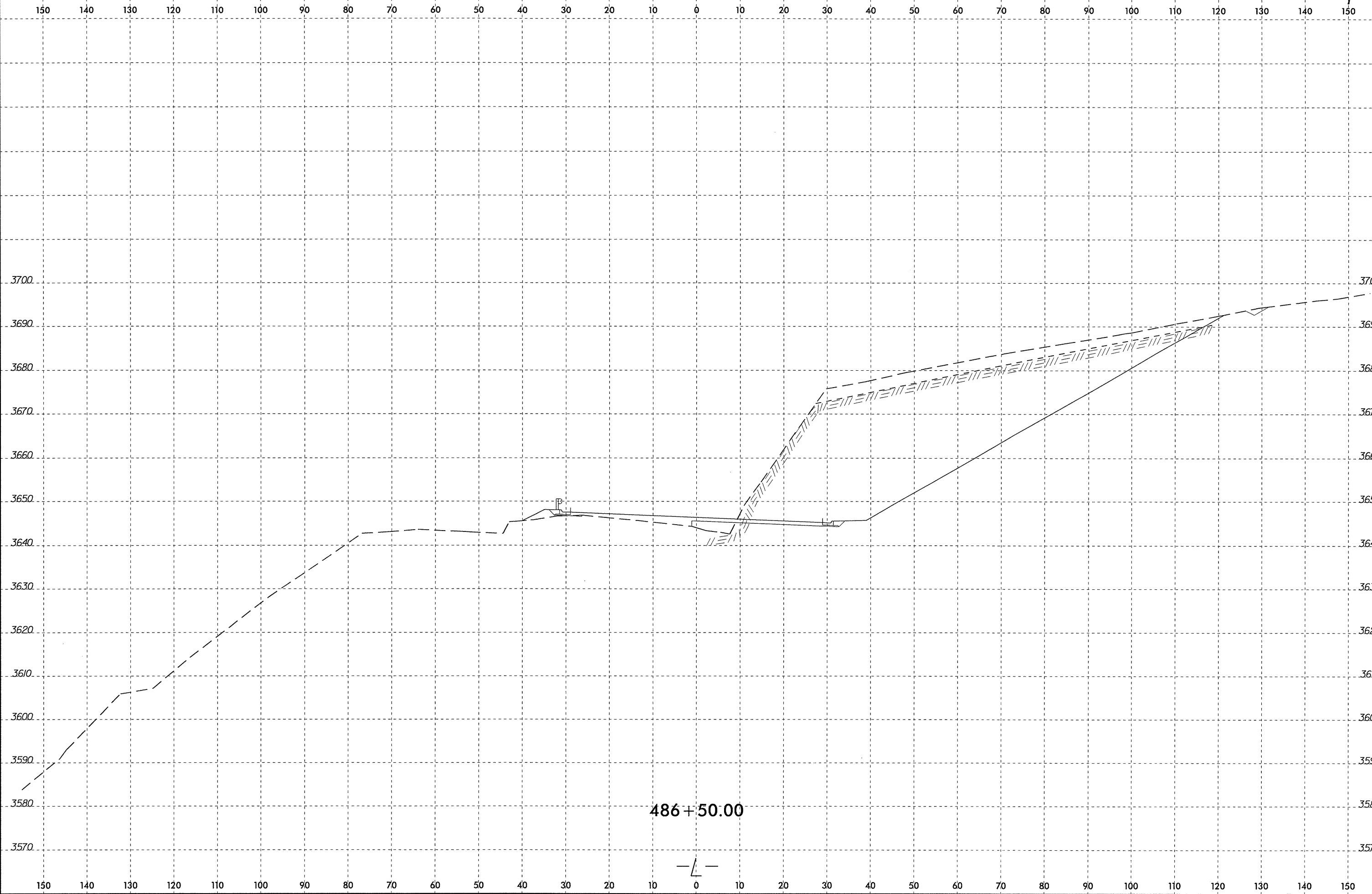
\$\$\$\$\$
SYSTEMS
\$\$\$\$\$

B/23/1

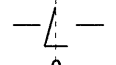


PROJ. REFERENCE NO.
R-2237C

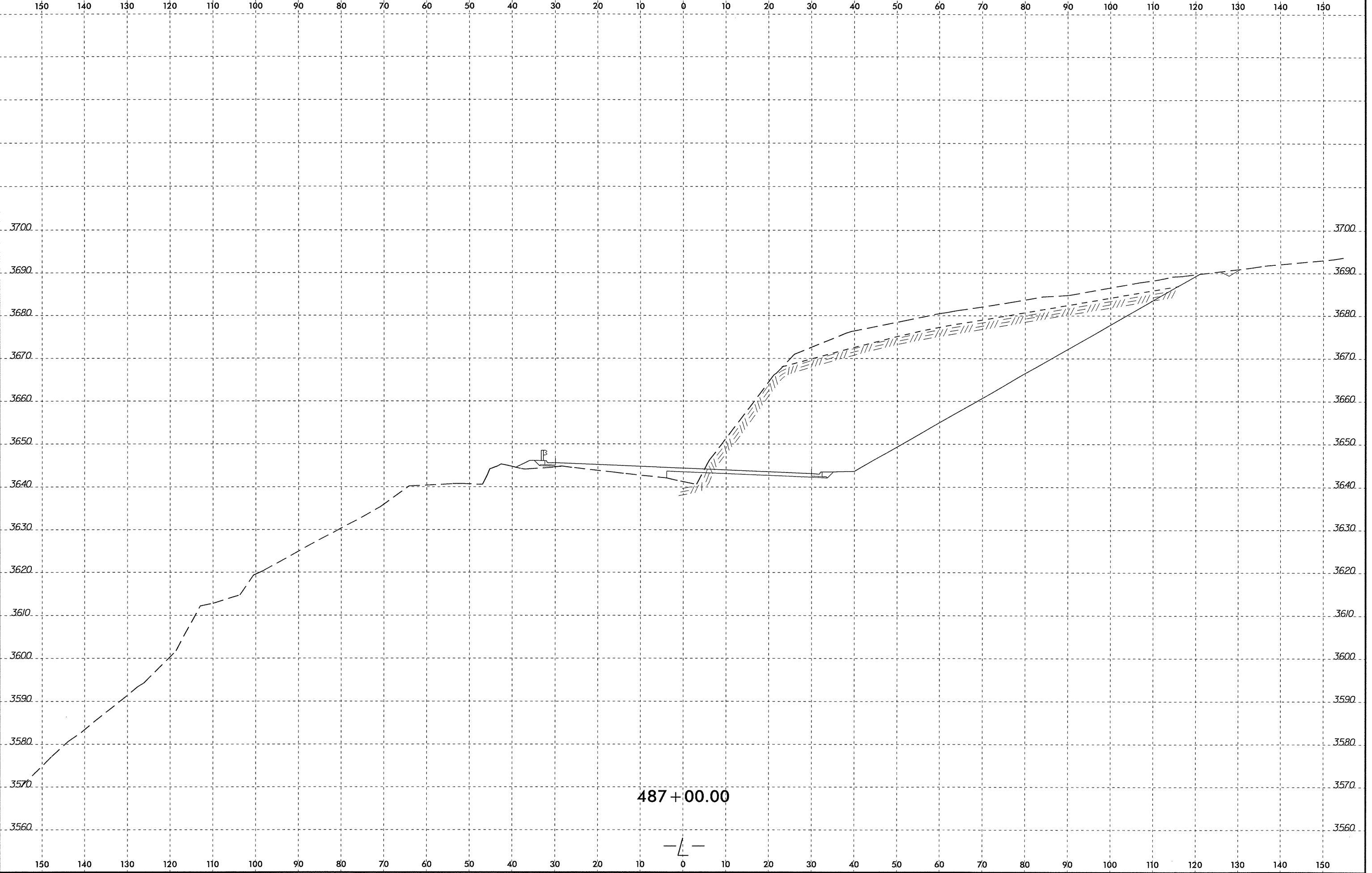
SHEET NO.
197/259



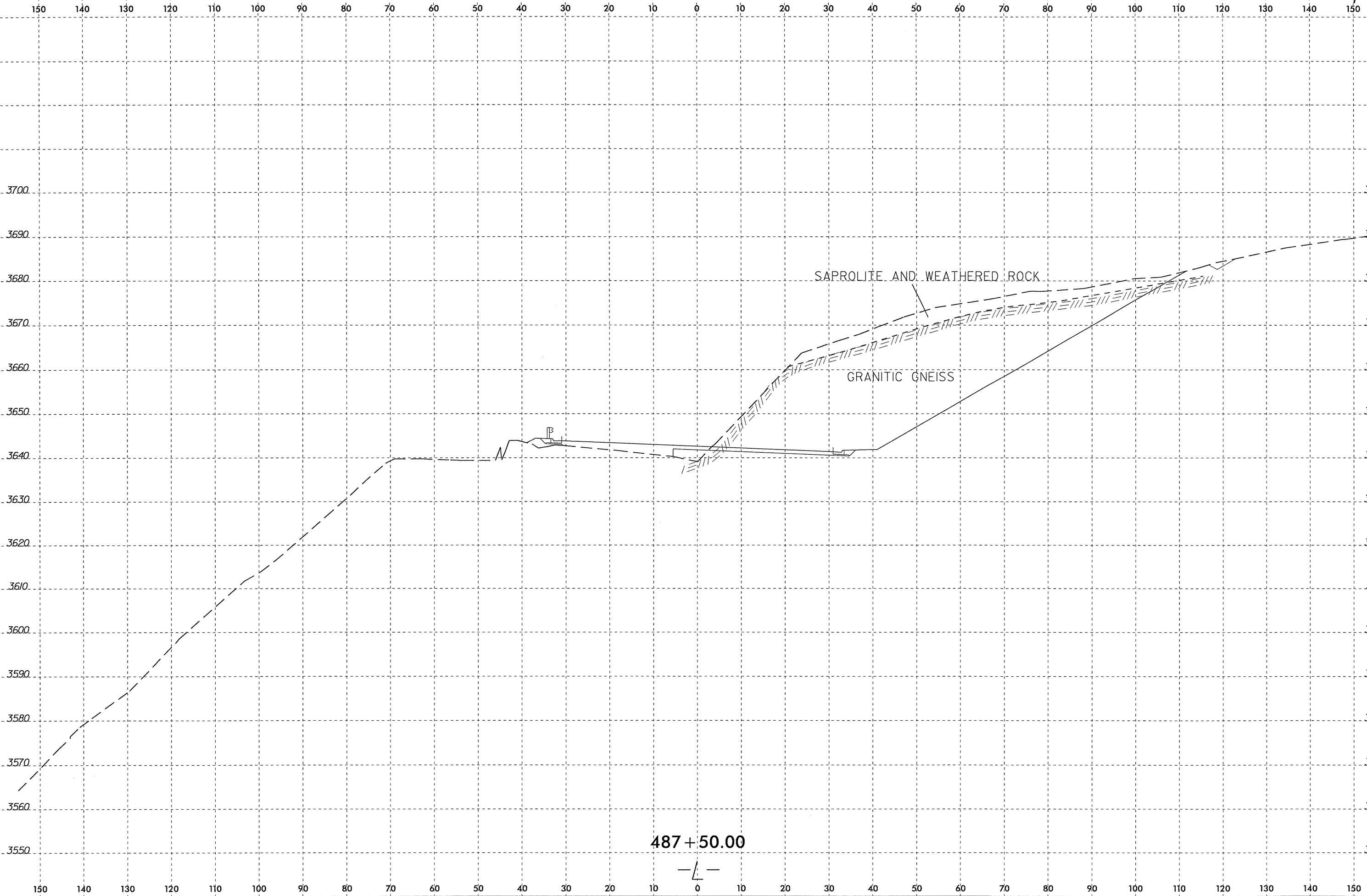
486+50.00



\$\$\$\$SYTIME\$\$\$\$
\$\$\$\$USERSNAME\$\$\$\$
\$\$\$\$DATE\$\$\$\$



\$\$\$\$SYTIME\$\$\$\$
\$\$\$\$USLINE\$\$\$\$
\$\$\$\$DLINE\$\$\$\$

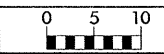


487+50.00

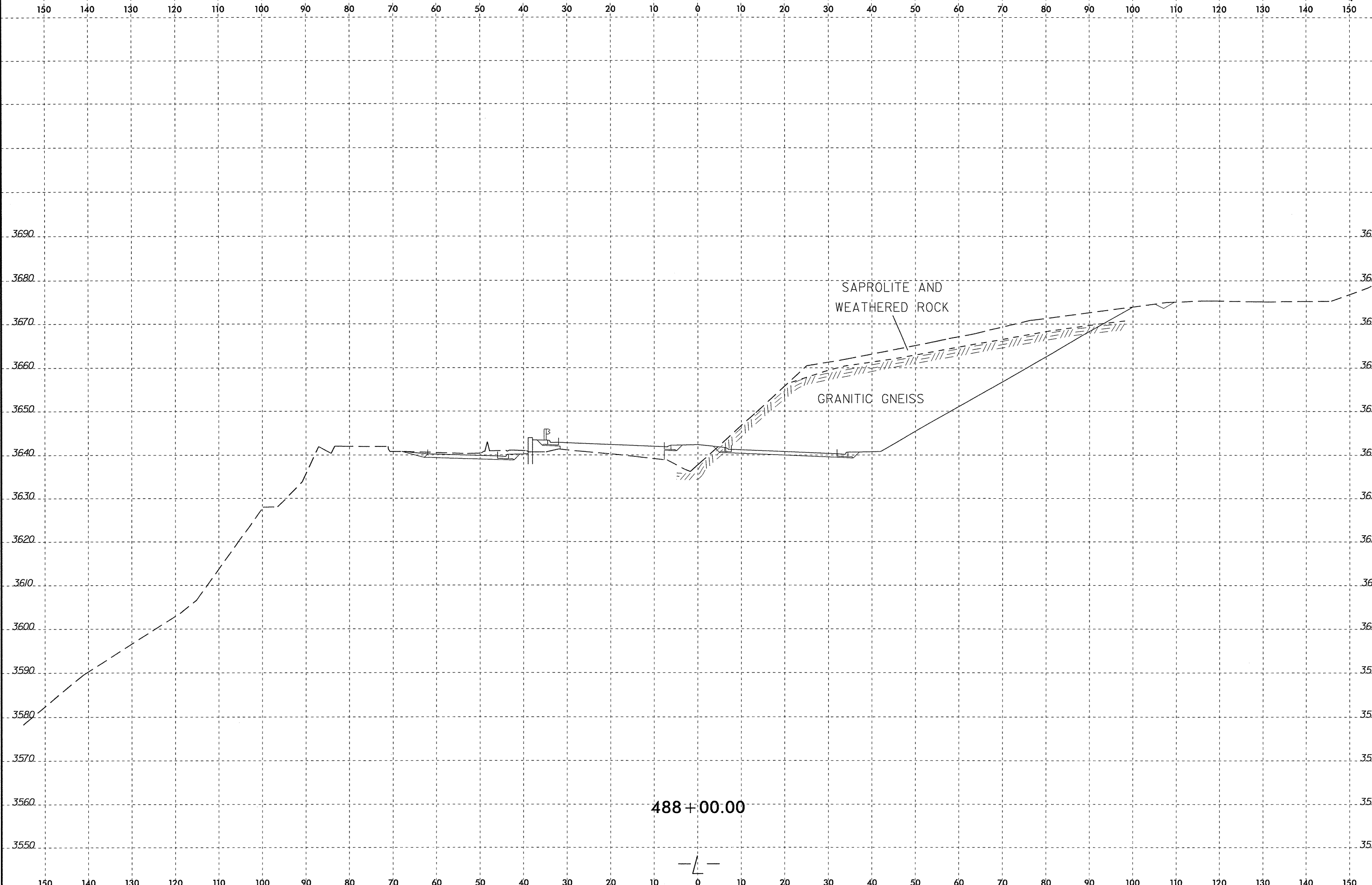


SYSTEM
BOUND
US
NAME

8/23/90



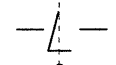
PROJ. REFERENCE NO. R-2237C SHEET NO. 200/259



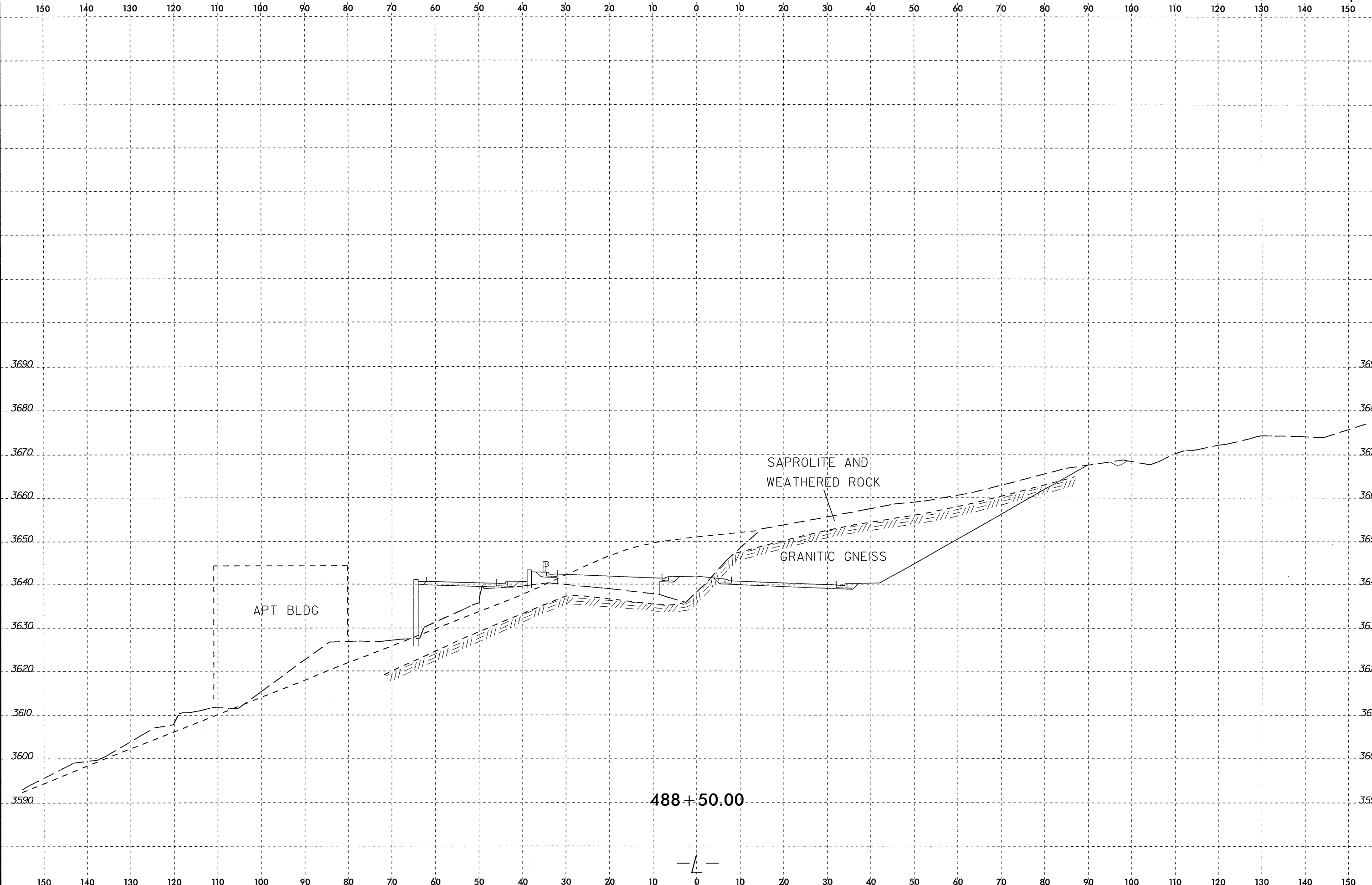
SAPROLITE AND WEATHERED ROCK

GRANITIC GNEISS

488 + 00.00



SYTIME
VOLUME
USER NAME

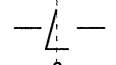


APT BLDG

SAPROLITE AND WEATHERED ROCK

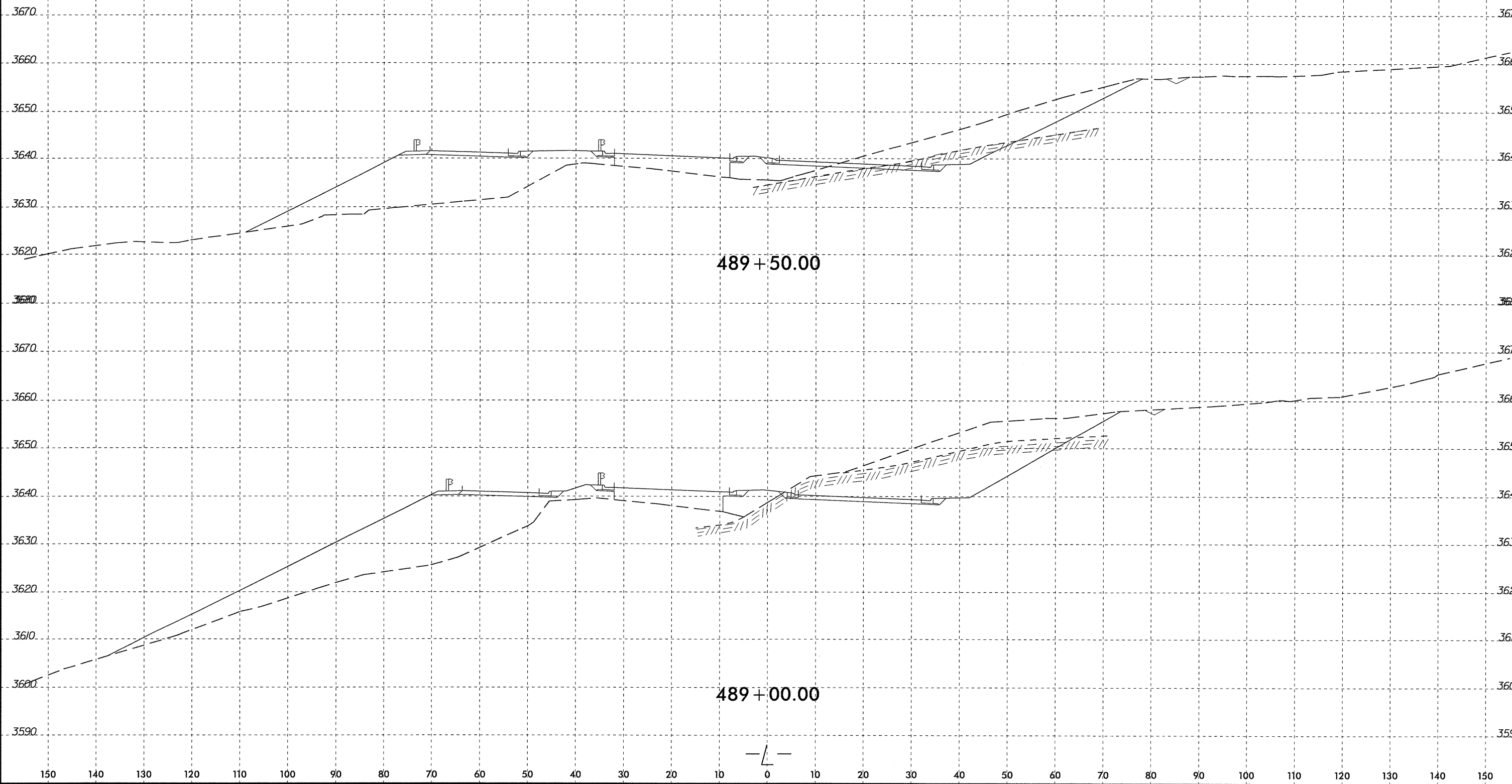
GRANITIC GNEISS

488+50.00



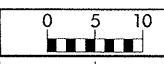
SYTIME
US
D

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



SYSTEMS

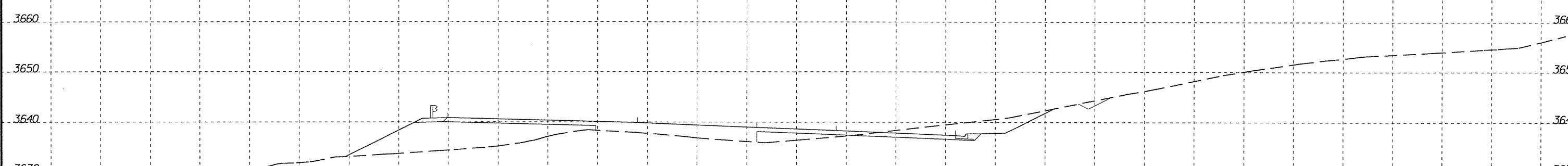
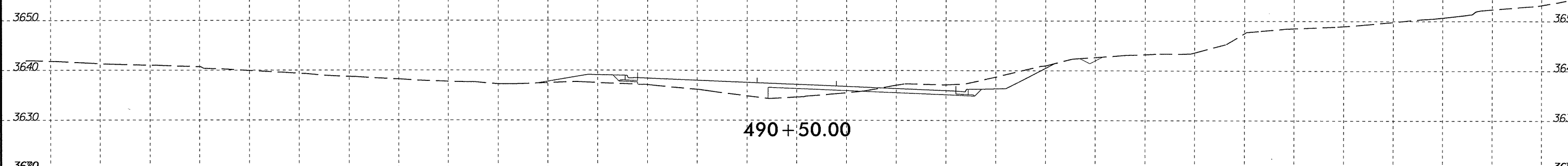
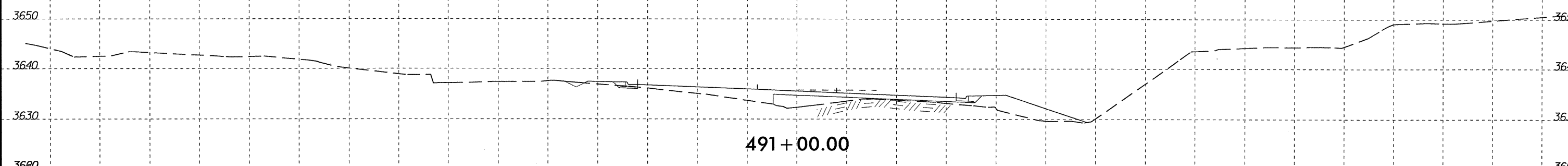
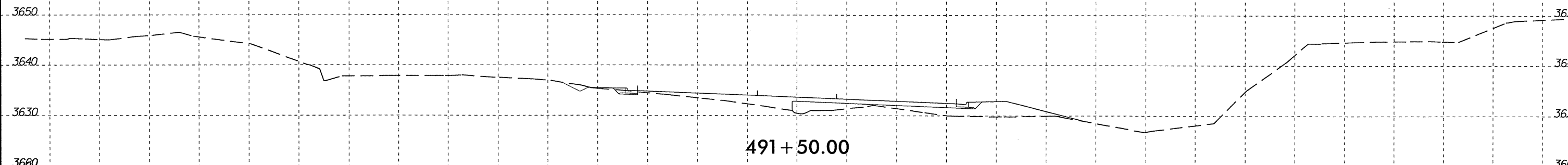
8/23/11



PROJ. REFERENCE NO.
R-2237C

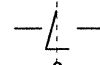
SHEET NO.
203/259

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

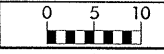


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SYSTEMS DESIGN SUBMITTAL

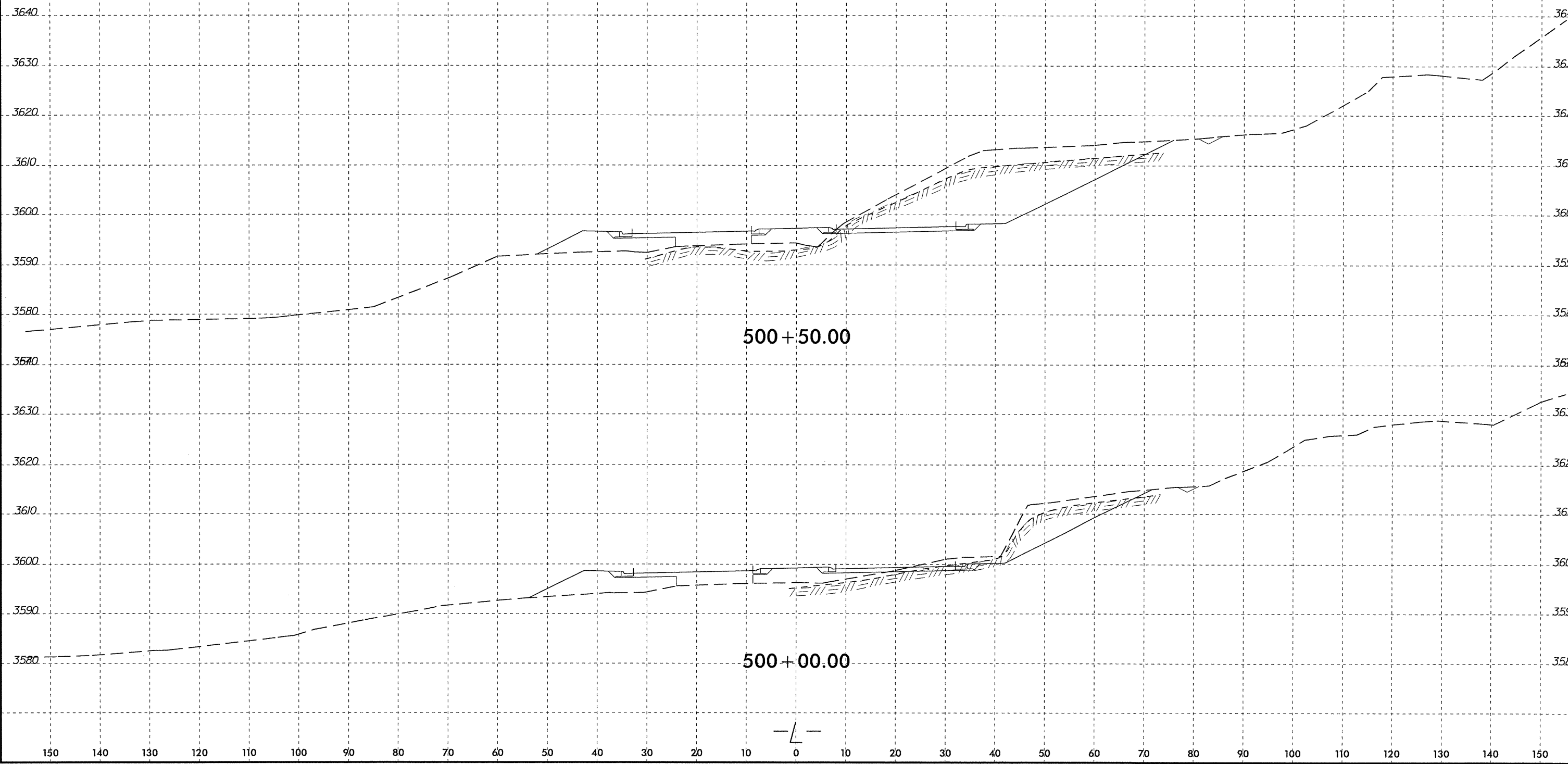


8/23/11



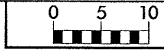
PROJ. REFERENCE NO. R-2237C SHEET NO. 206/259

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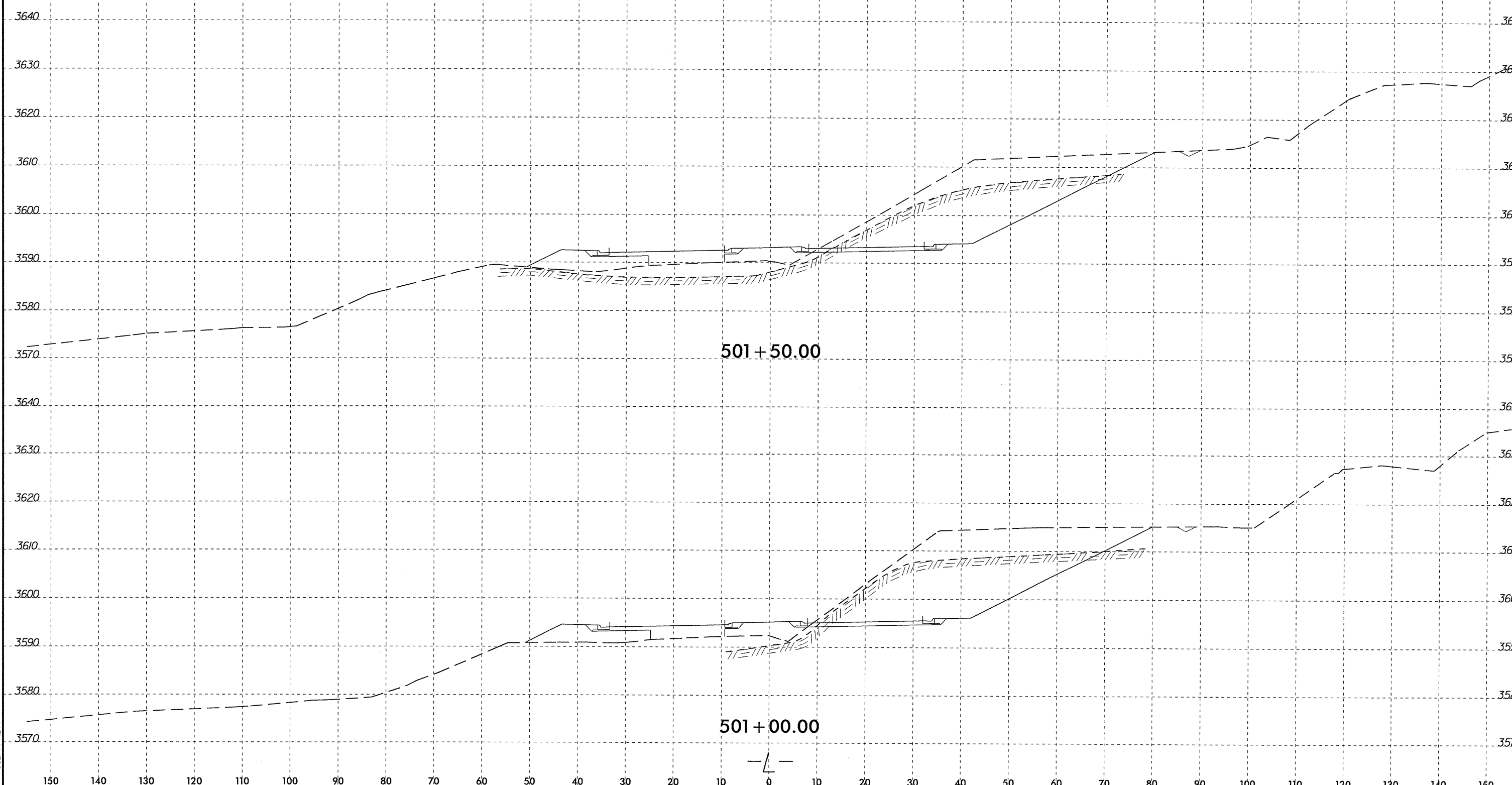
SYSTEMS
DESIGN
INCORPORATED

8/23/09



PROJ. REFERENCE NO. R-2237C	SHEET NO. 207/259
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150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



SYTIME
D:\USURNAME

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

3640 3640

3630 3630

3620 3620

3610 3610

3600 3600

3590 3590

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3600 3600

3590 3590

3580 3580

3570 3570

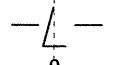
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502 + 50.00

502 + 00.00

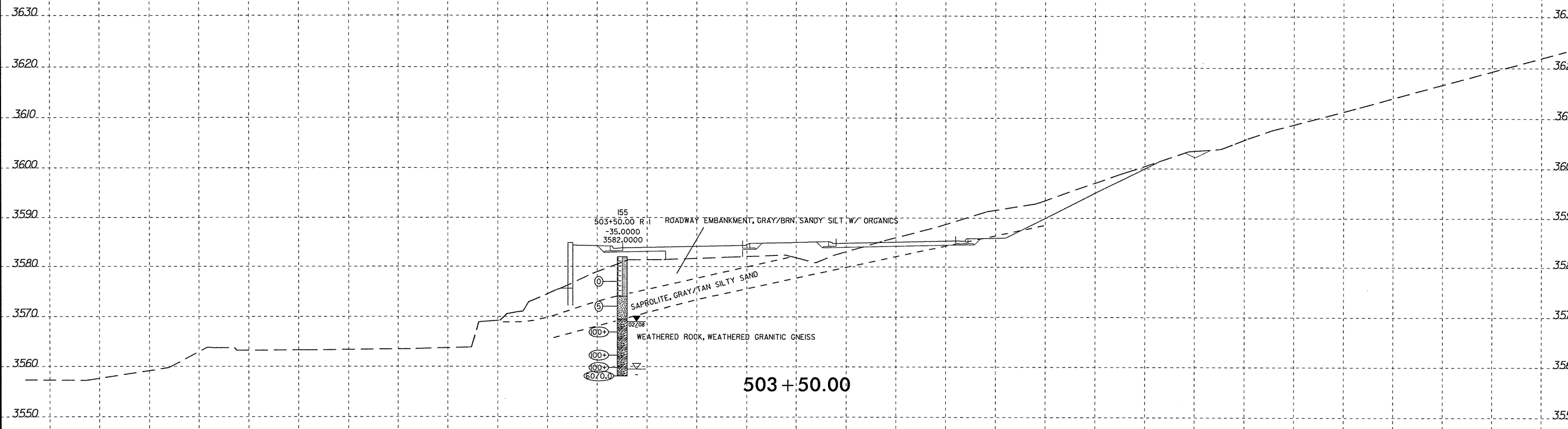
SAPROLITE AND WEATHERED GRANITIC GNEISS



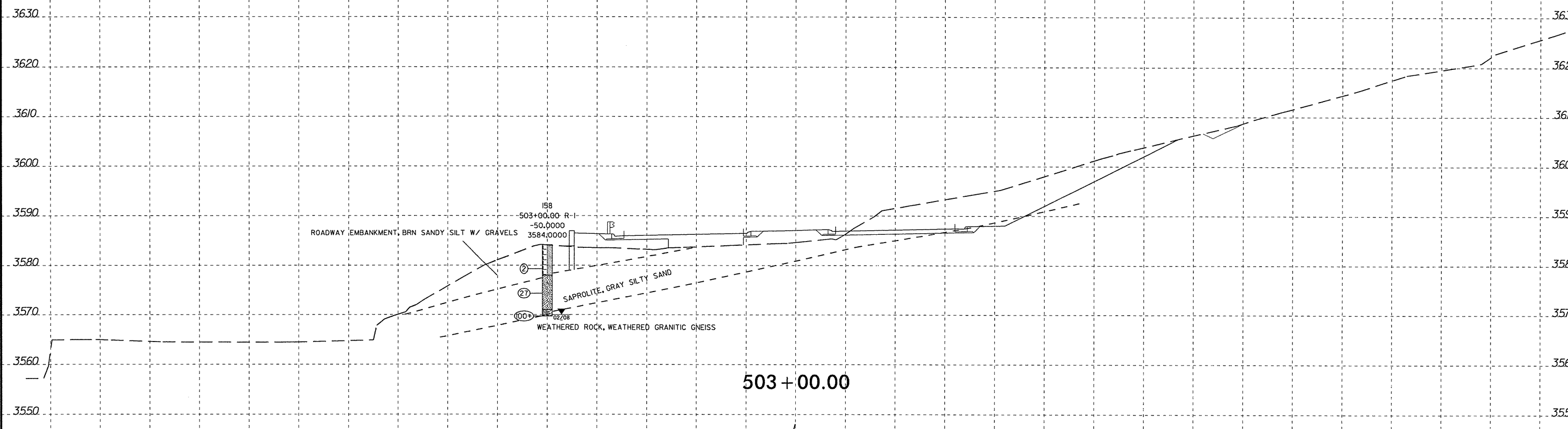
SYSTEM TIME
USE FRAME
DODON

8/23/...

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



503+50.00



503+00.00

—L—

SYSTEM TIME 8/23/2009 10:00:00 AM
 USER: J. B. GIBSON
 PROJECT: R-2237C
 SHEET: 209/299

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

3620 3620

3610 3610

3600 3600

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3560 3560

3550 3550

3620 3620

3610 3610

3600 3600

3590 3590

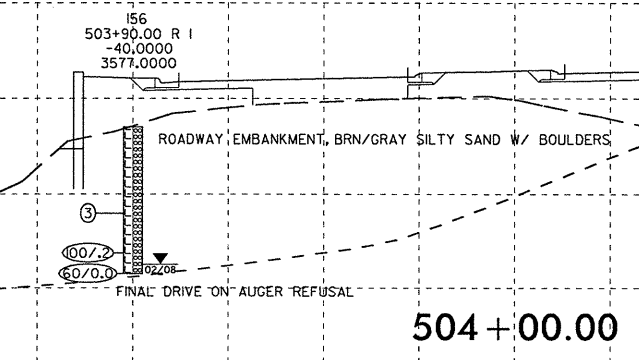
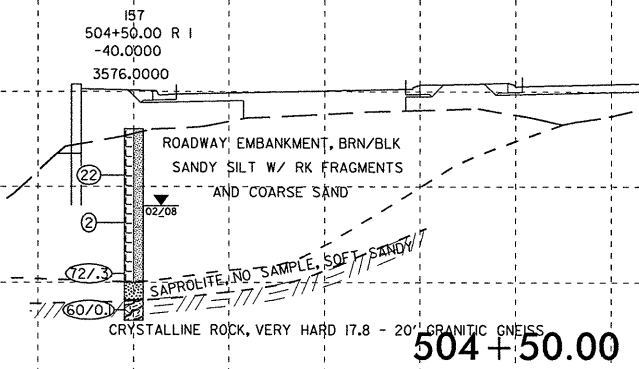
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3570 3570

3560 3560

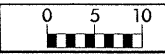
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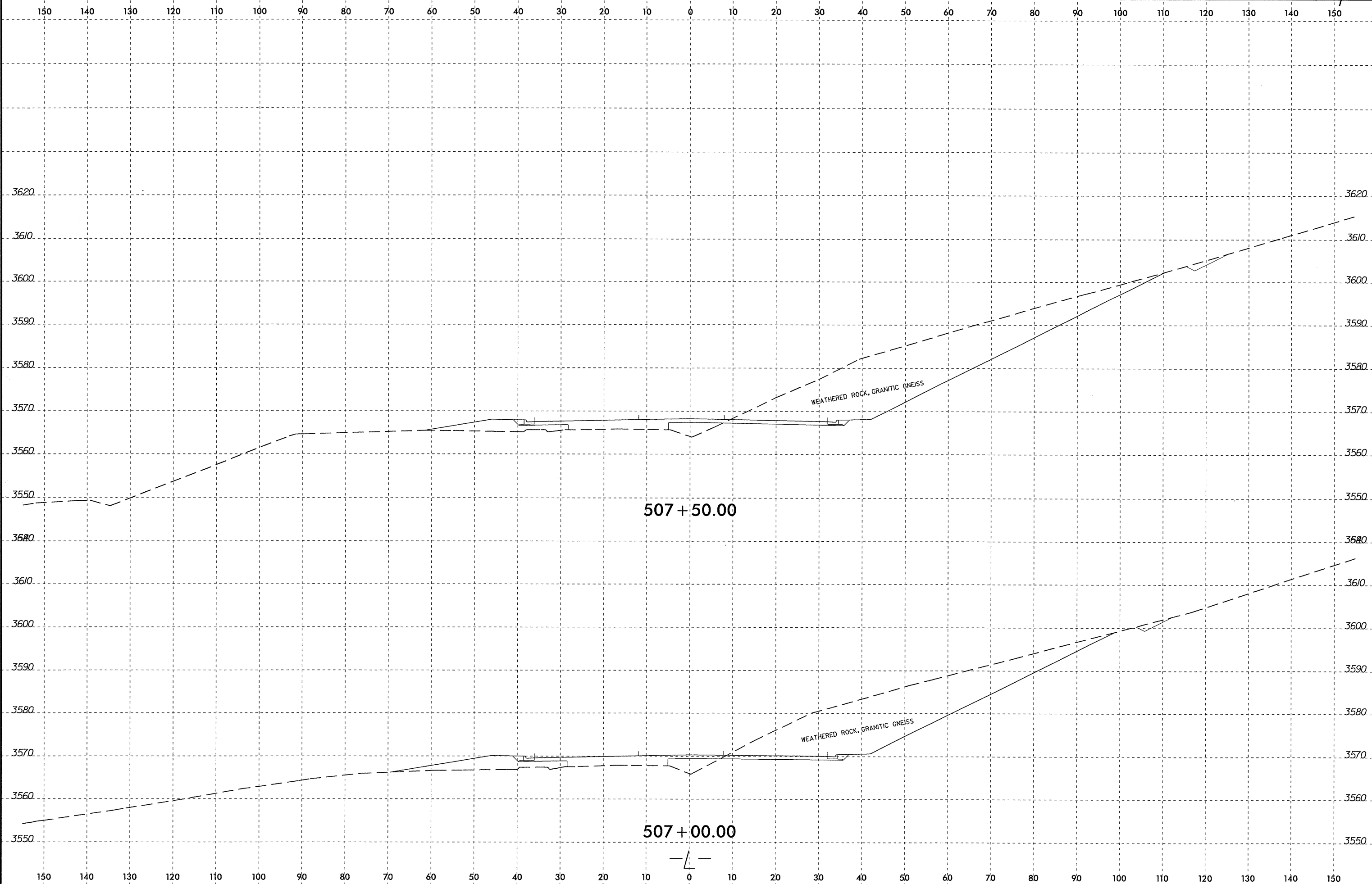
SYSTEMS TIME 8/23/11 10:00:00 AM

8/23/11



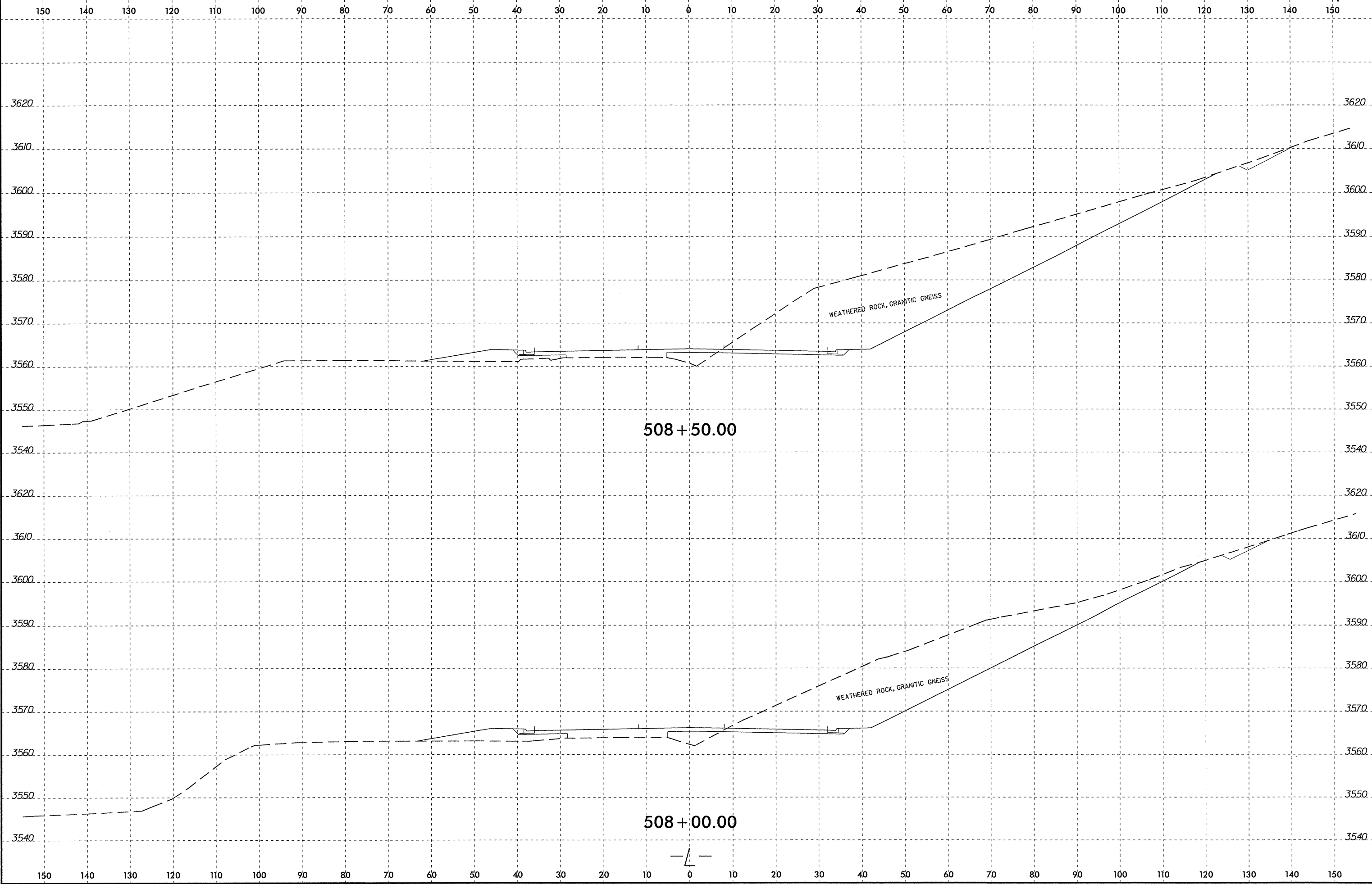
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
213

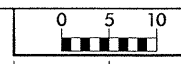


\$\$\$\$SYTIME\$\$\$\$
\$\$\$\$USGRNFILE\$\$\$\$

8/23/14
SYSTEM TIME: 8/23/14 10:00:00 AM
USER: JUS

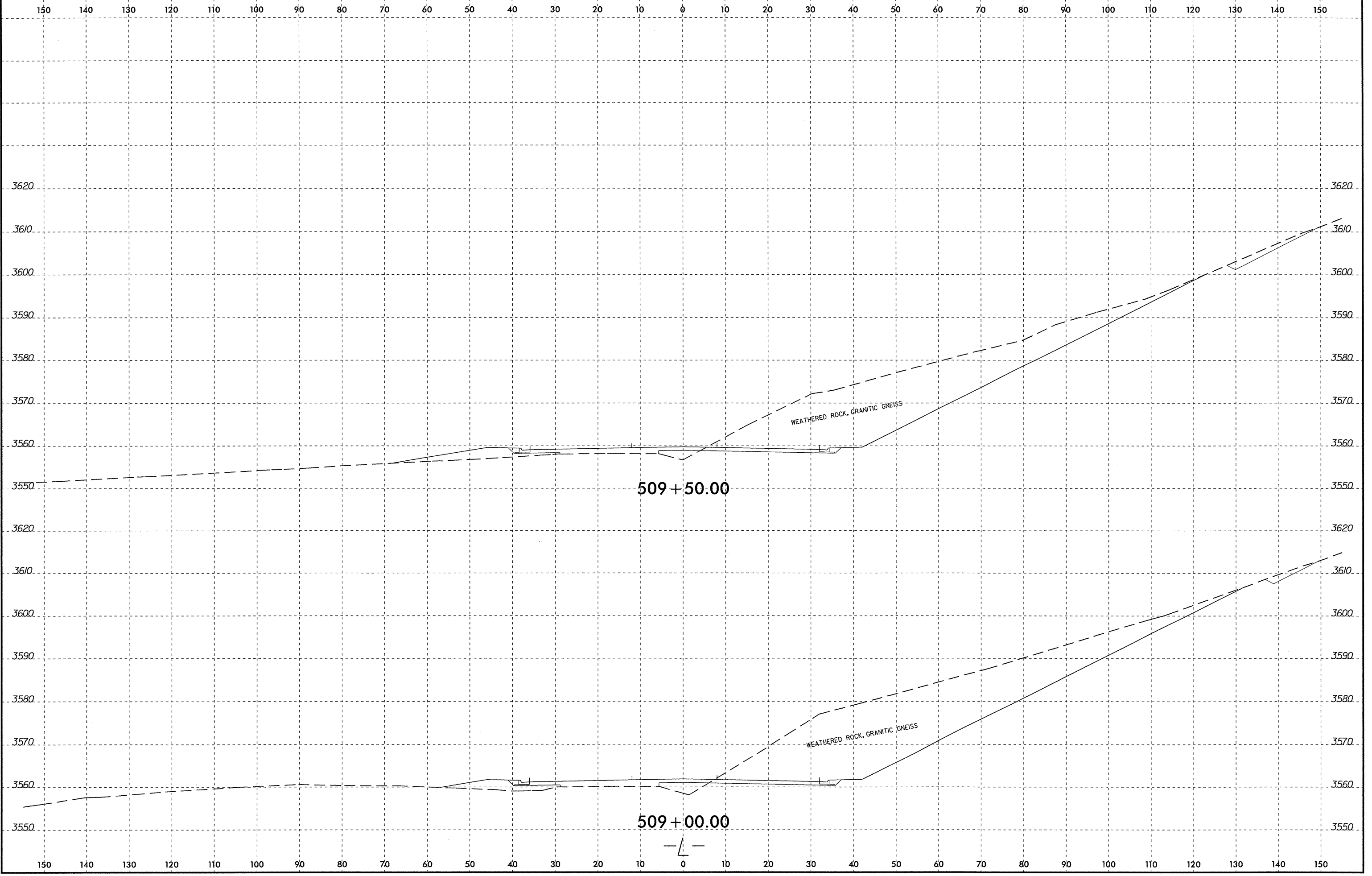


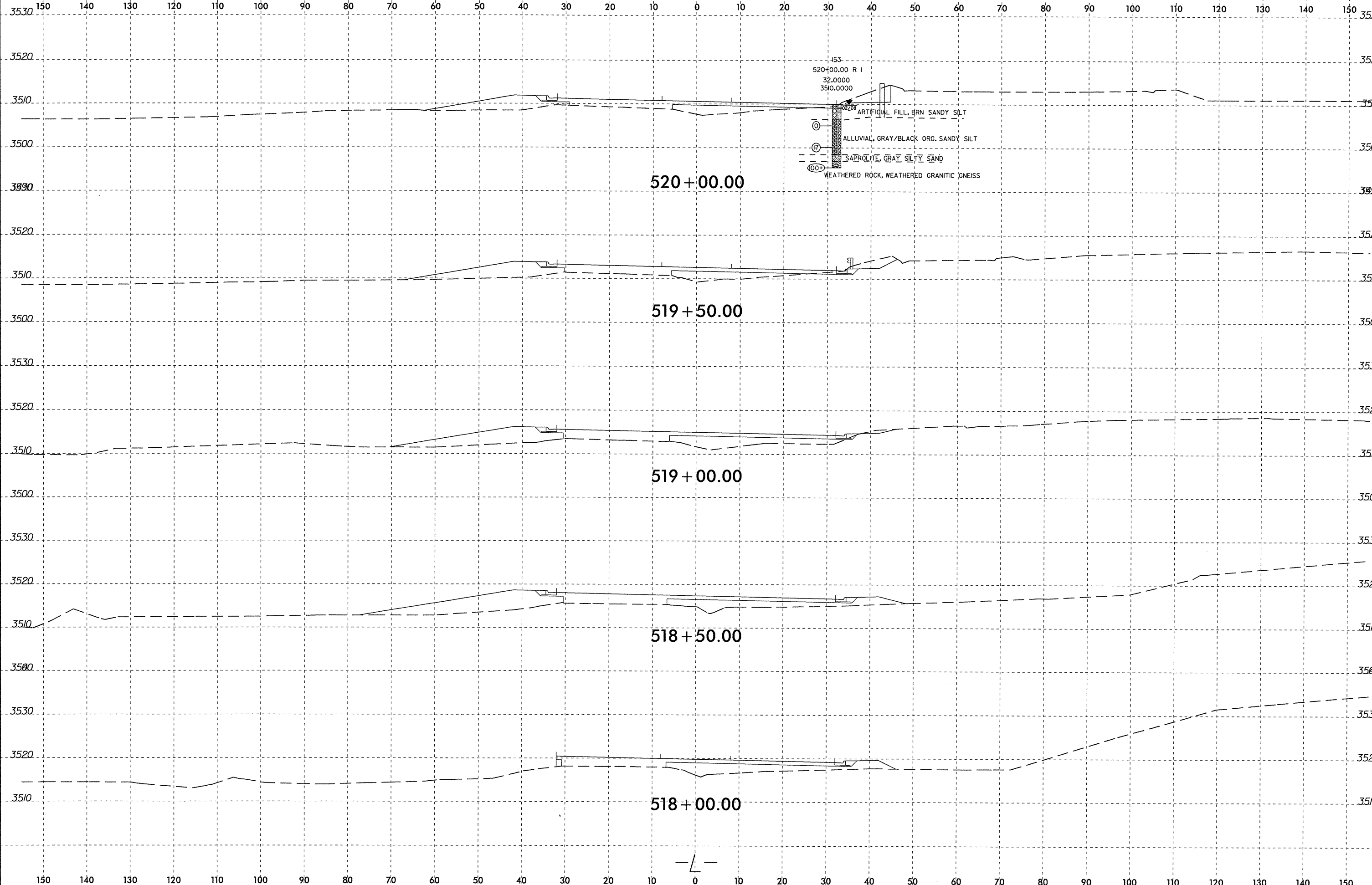
8/23/99



PROJ. REFERENCE NO.
R-2237C

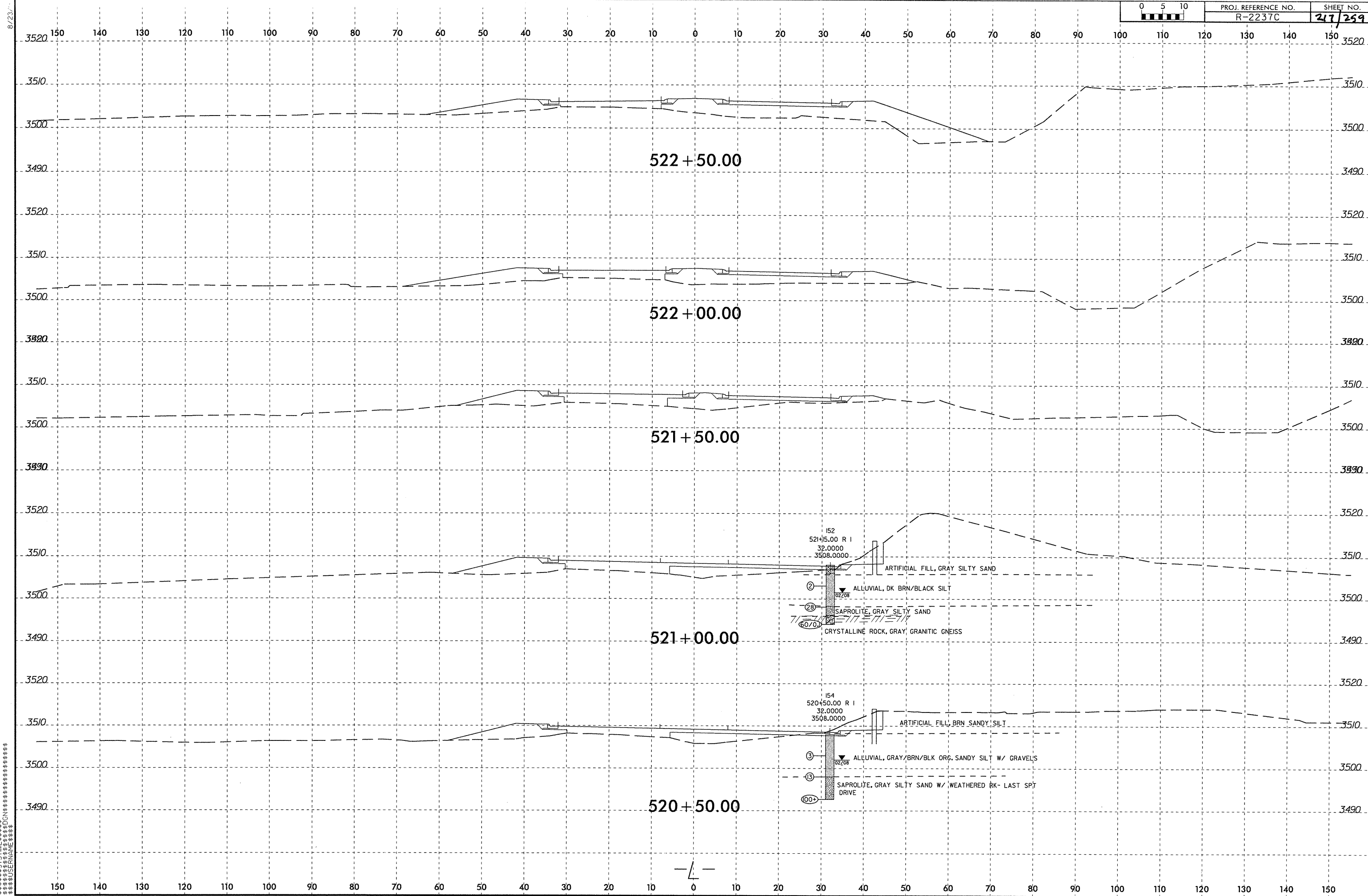
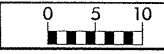
SHEET NO.
215/259





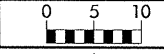
SYSTEM TIME: 8/23/11 10:00:00 AM
USER: J53
PROJECT: R-2237C
SHEET: 216/299

—L—



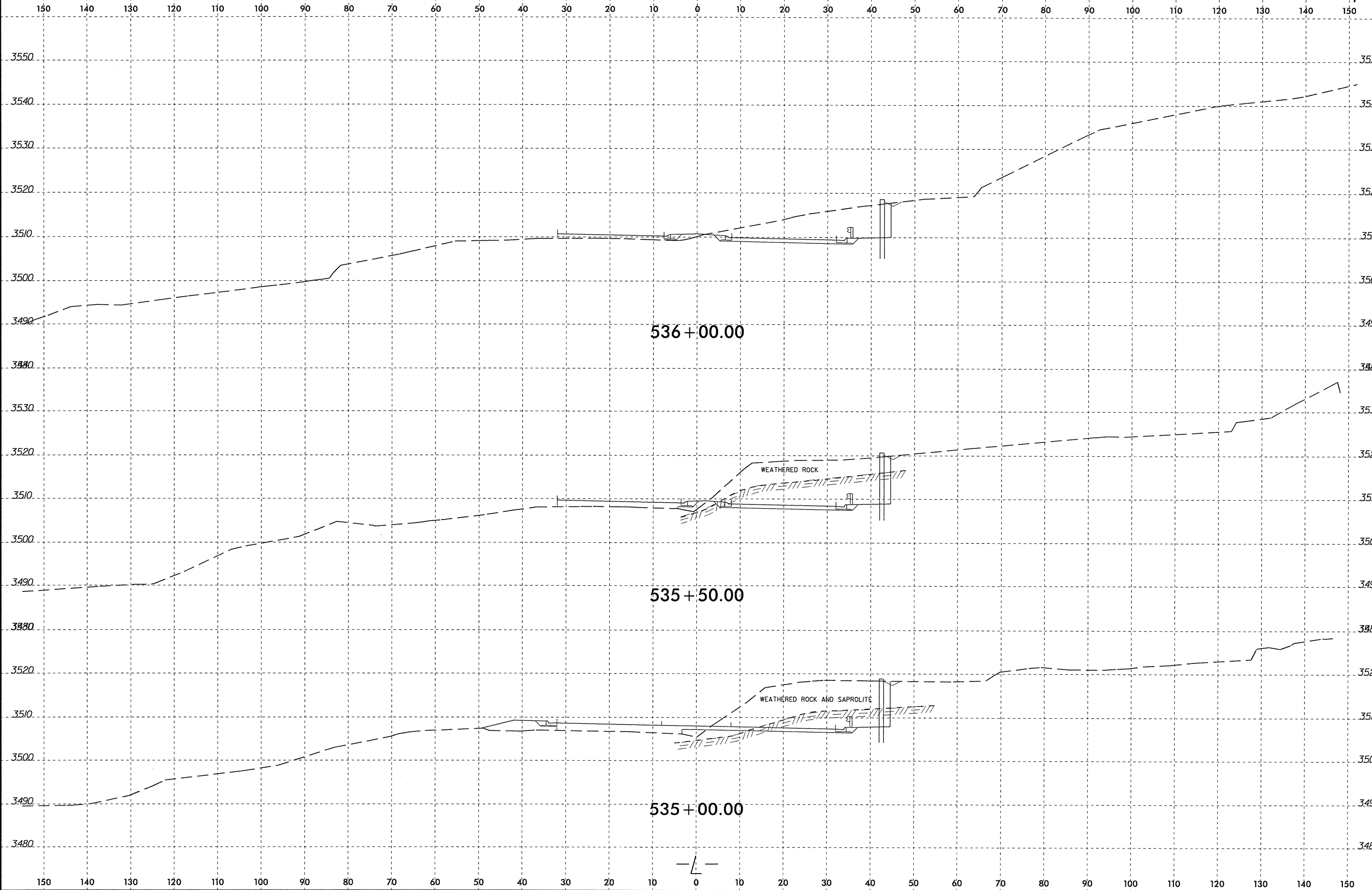
SYSTEMS

8/23/11



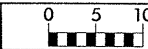
PROJ. REFERENCE NO.
R-2237C

SHEET NO.
218/259



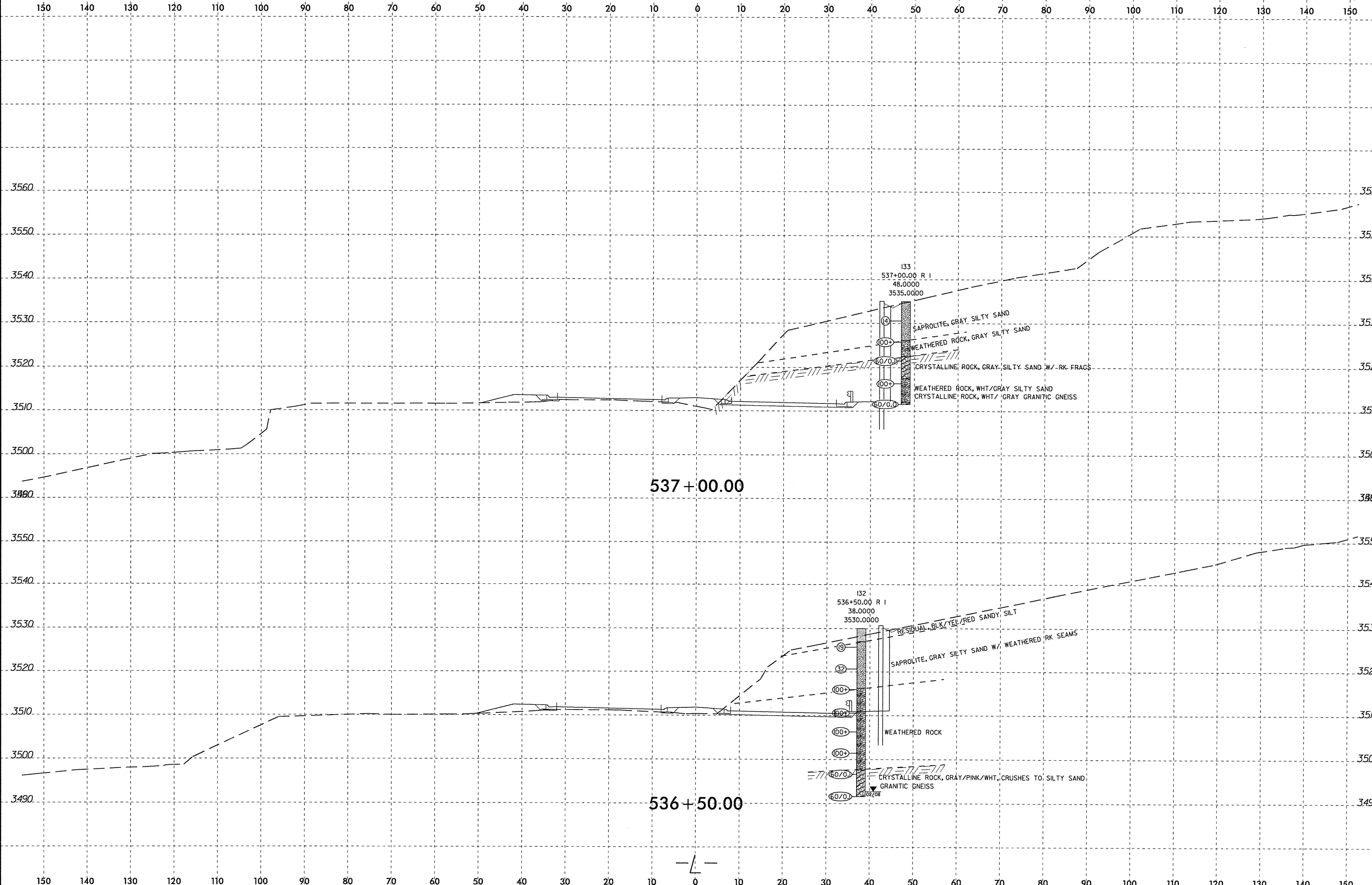
SYSTEMS
DESIGN
INC.

8/23/14



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
219/259



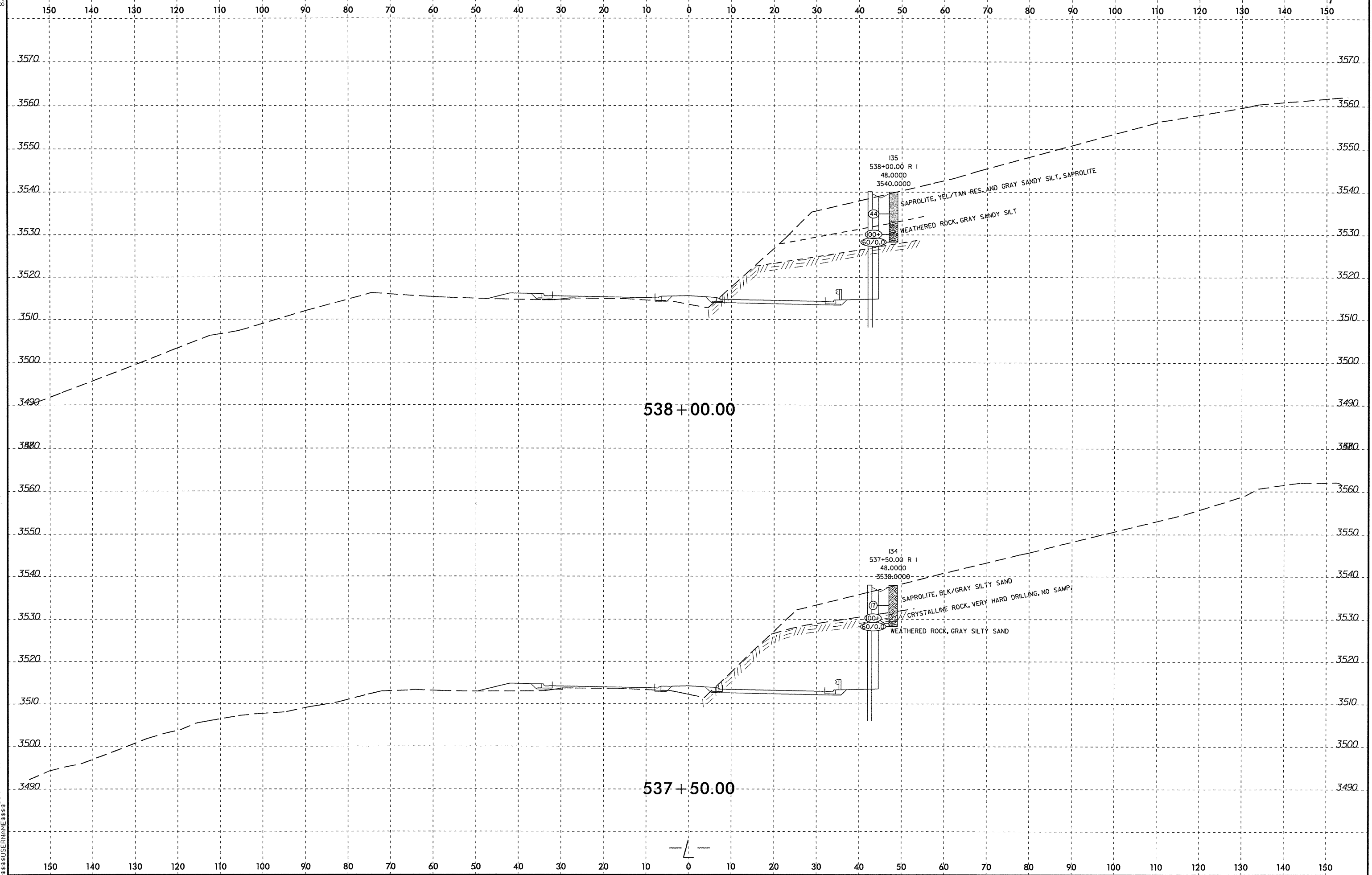
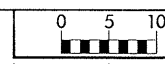
537+00.00

536+50.00

-L-

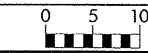
\$\$\$\$\$SYTIME\$\$\$\$\$
\$\$\$\$\$USERSNAME\$\$\$\$\$

8/23/17



SYSTEM TIME: 8/23/17 10:00:00 AM
USER: JMW

8/23/11



150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

3560 3560

3550 3550

3540 3540

3530 3530

3520 3520

3510 3510

3500 3500

3490 3490

3480 3480

539+00.00

137
539+00.00 R |
54.0000
3536.0000

- ⑨ SAPROLITE, YEL/TAN/GRAY SILTY SAND
- ⑩ WEATHERED ROCK, GREEN/GRAY SILTY SAND W/ RK FRAGS
- ⑪ CRYSTALLINE ROCK, GRAY RK FRAGS W/ SILTY SAND
- ⑫ WEATHERED ROCK, GRAY SILTY SAND W/ RK FRAGS
- ⑬ CRYSTALLINE ROCK, HARD DRILLING @ 20.3

3560 3560

3550 3550

3540 3540

3530 3530

3520 3520

3510 3510

3500 3500

3490 3490

3480 3480

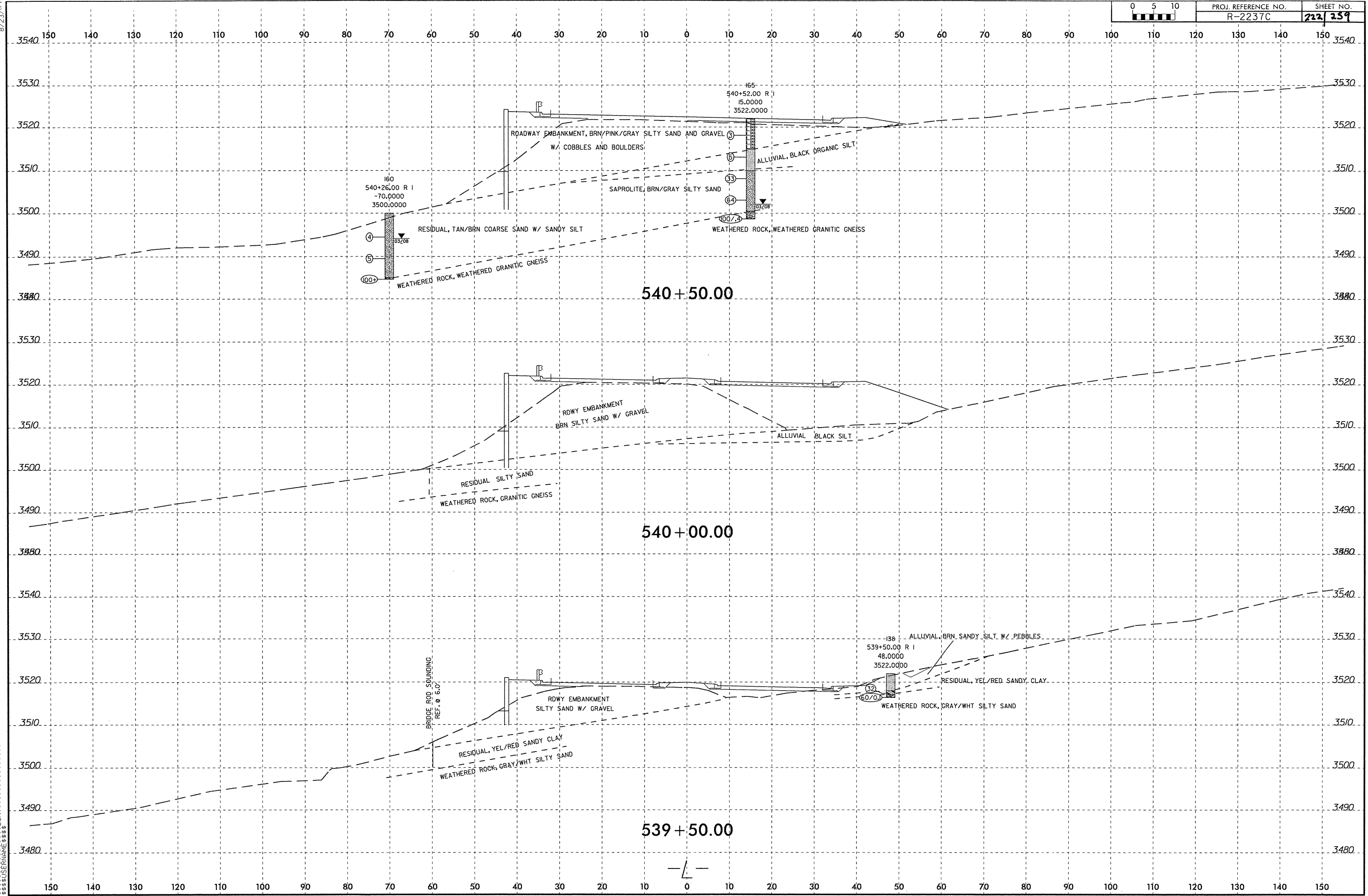
538+50.00

136
538+50.00 R |
55.0000
3542.0000

- ⑭ SAPROLITE, BRN/BLK/GRAY SILTY SAND W/ MnO
- ⑮ WEATHERED ROCK, GRAY SILTY SAND W/ RK FRAGS
- ⑯ CRYSTALLINE ROCK, HARD DRILLING, CRYSTALLINE ROCK
- ⑰ WEATHERED ROCK, GRAY SILTY SAND, GRANITIC GNEISS
- ⑱ CRYSTALLINE ROCK, HARD @ 20', REFUSAL @ 22.5'

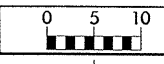
SYSTEMS TIME
 DESIGN
 CONSTRUCTION
 SURVEYING
 ENGINEERING
 INC.

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

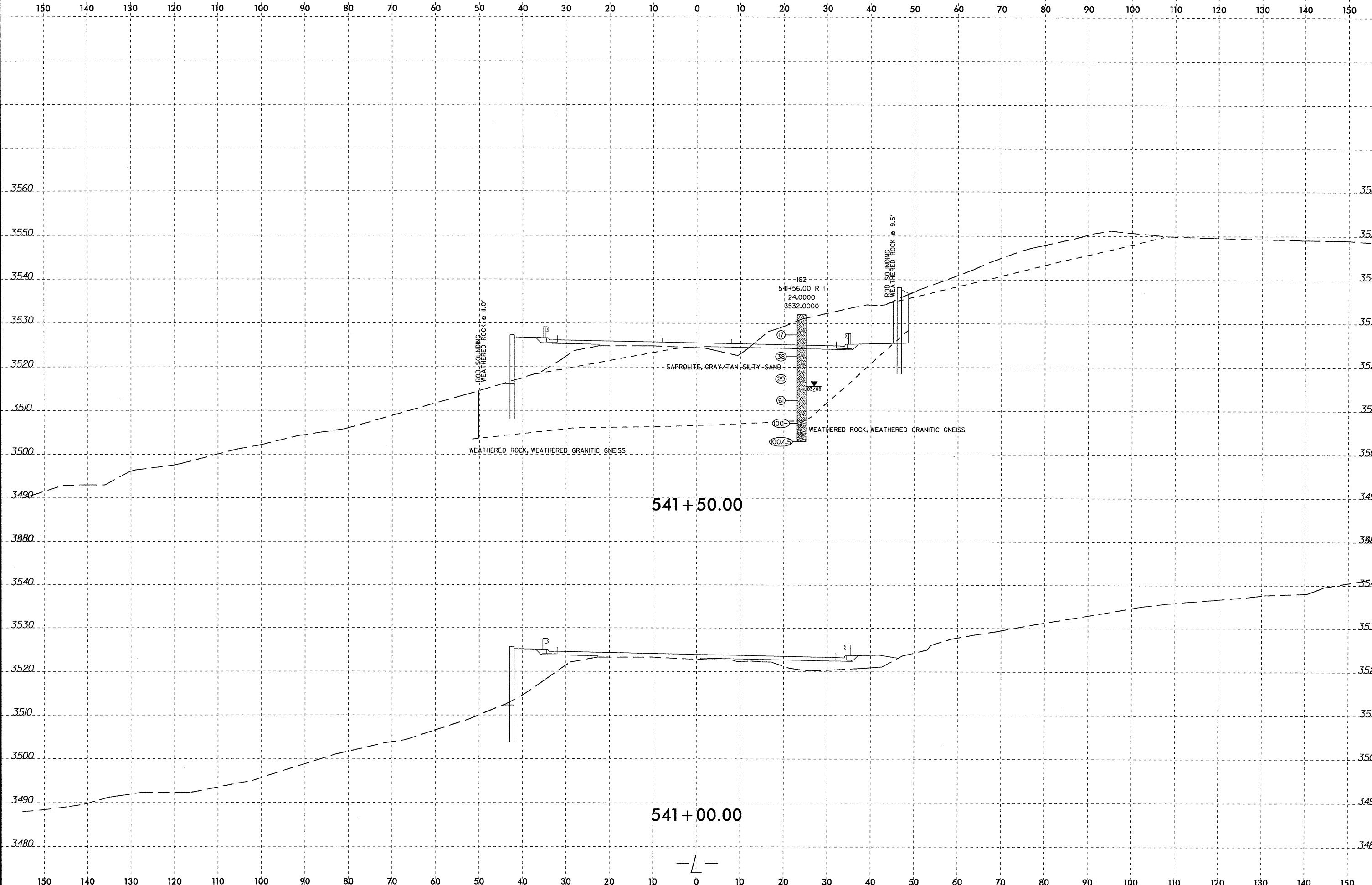


8/23/11
SYSTEMS
SERVICES

8/23/00

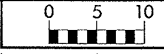


PROJ. REFERENCE NO. R-2237C	SHEET NO. 223/259
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\$\$\$\$\$SYTIME\$\$\$\$\$
 \$\$\$USERNM\$\$\$
 \$\$\$USERNM\$\$\$

B.237



150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

3570 3570

3560 3560

3550 3550

3540 3540

3530 3530

3520 3520

3510 3510

3500 3500

3490 3490

3560 3560

3550 3550

3540 3540

3530 3530

3520 3520

3510 3510

3500 3500

3490 3490

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

542 + 50.00

542 + 00.00

ROD SOUNDING REFUSAL @ 15'

ROD SOUNDING REFUSAL @ 3.8'

SAPROLITE, SILTY SAND

CRYSTALLINE ROCK AND WEATHERED ROCK

CRYSTALLINE ROCK AND WEATHERED ROCK

SAPROLITE, SILTY SAND

ARTIFICIAL FILL

ROD SOUNDING REFUSAL @ 15'

ROD SOUNDING REFUSAL @ 13.7'

ROW EMBANKMENT

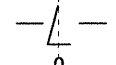
SAPROLITE, SILTY SAND

WEATHERED ROCK AND ROCK

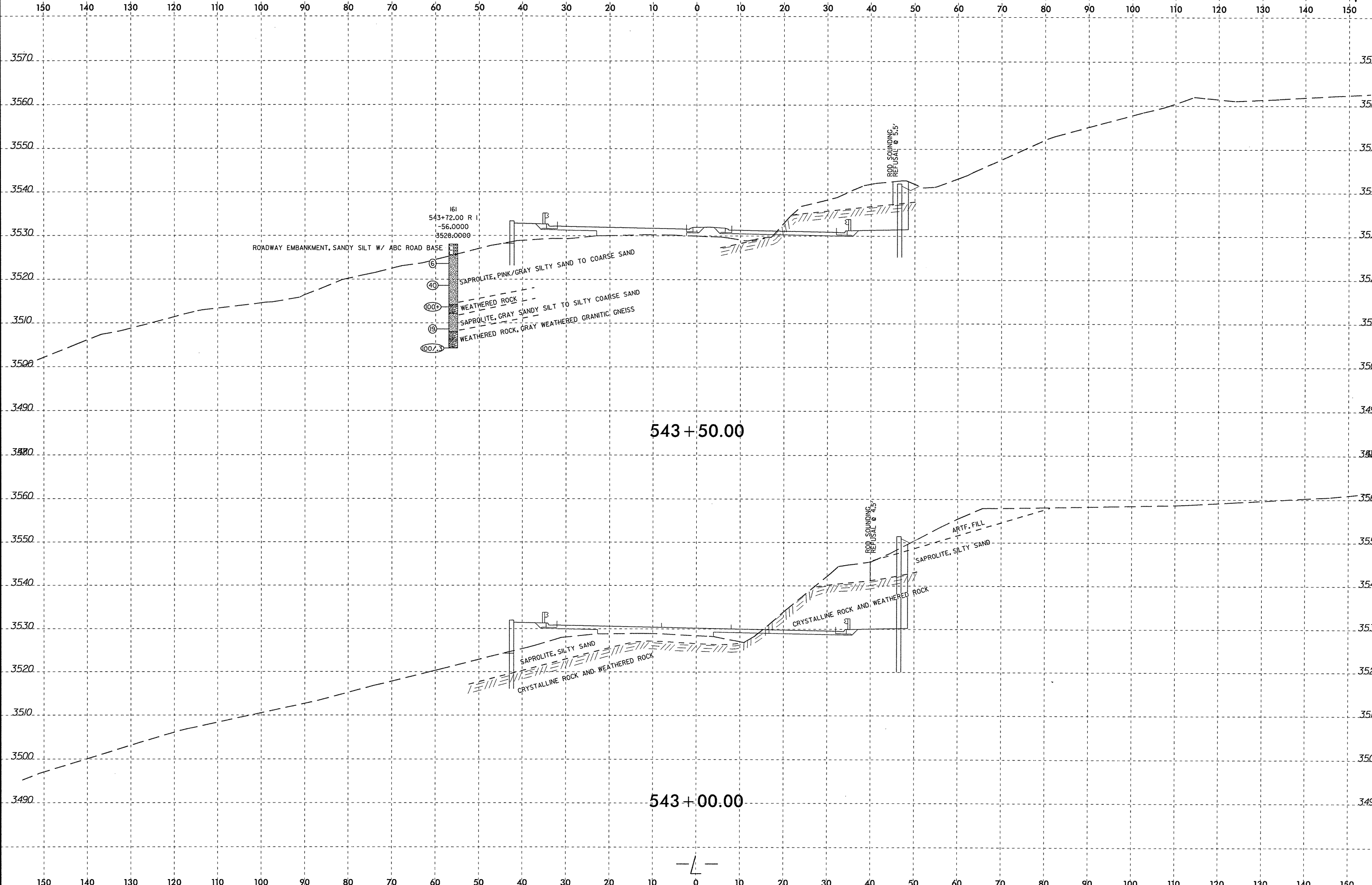
SAPROLITE, SILTY SAND

WEATHERED ROCK AND ROCK

ARTIFICIAL FILL

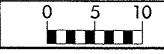


SYSTEM TIME: 11/15/2011 10:00:00 AM
DRAWN BY: J. D. GONZALES
CHECKED BY: J. D. GONZALES
USER NAME: J. D. GONZALES



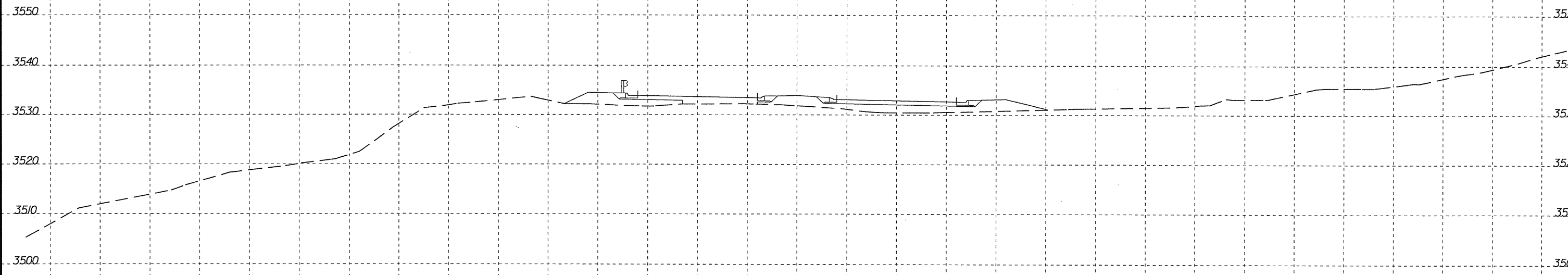
SYTIME

8/23/17

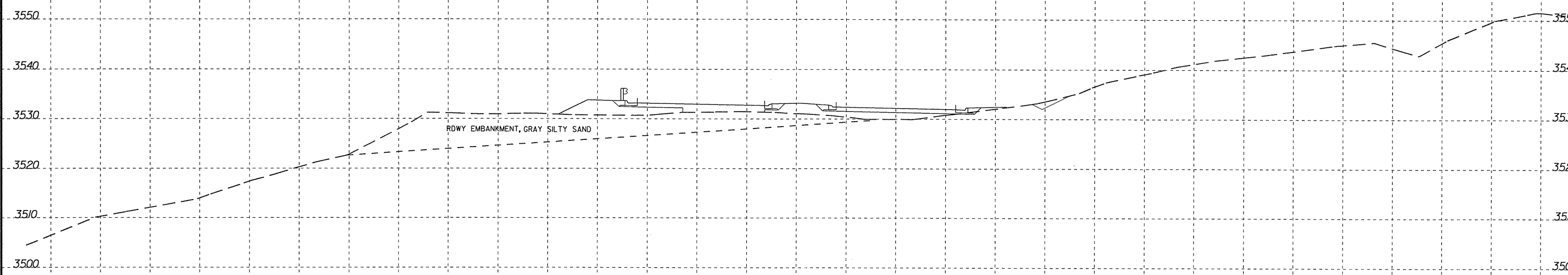


PROJ. REFERENCE NO. R-2237C SHEET NO. 226/259

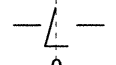
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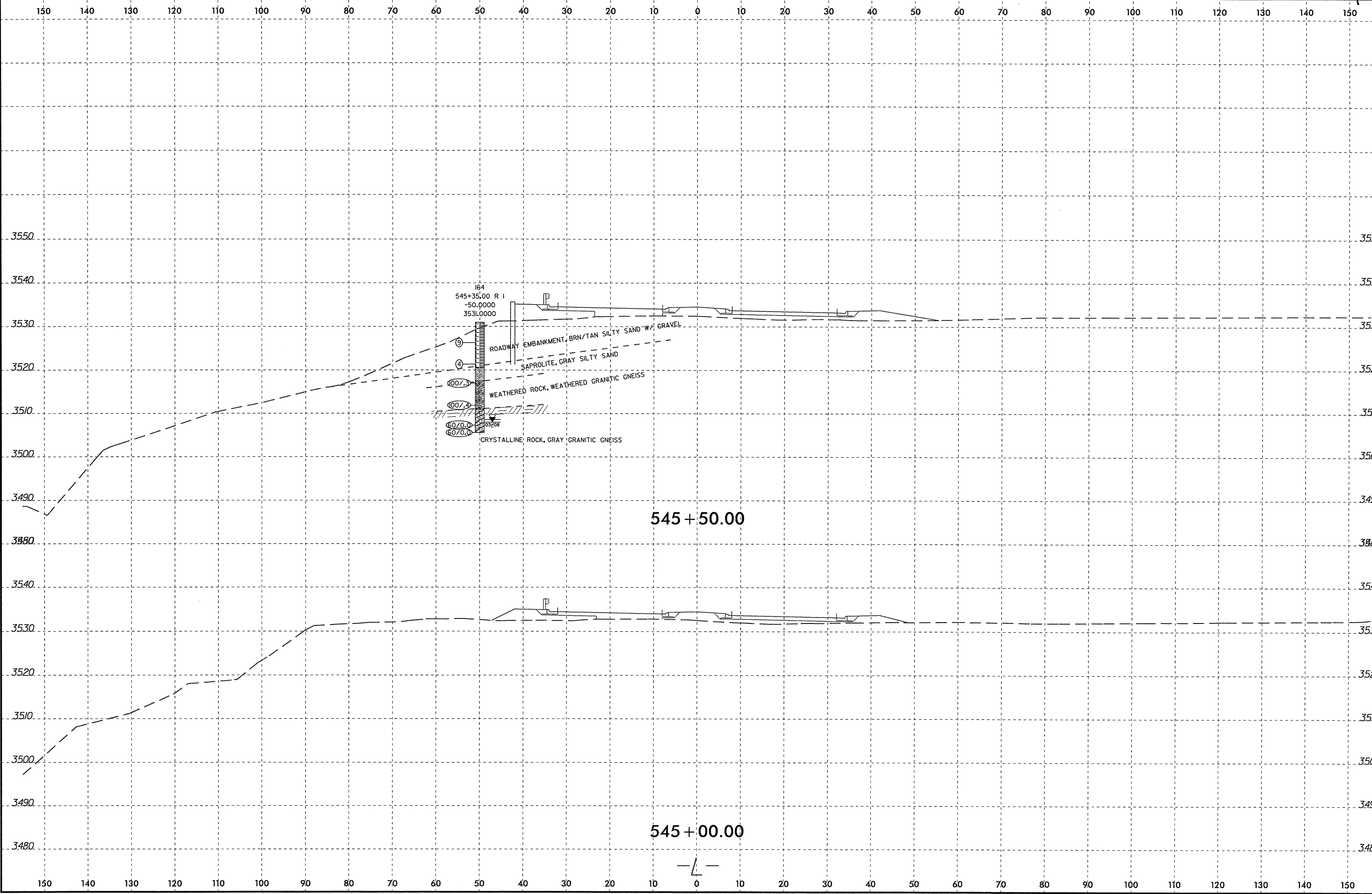
544 + 50.00



544 + 00.00



SYSTEMS TIME \$\$\$\$\$\$
\$\$\$\$\$ USER NAME \$\$\$\$\$\$
\$\$\$\$\$ DATE \$\$\$\$\$\$



164
545+35.00 R I
-50.0000
3531.0000

ROADWAY EMBANKMENT, BRN/TAN SILTY SAND W/ GRAVEL

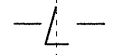
SAPROLITE, GRAY SILTY SAND

WEATHERED ROCK, WEATHERED GRANITIC GNEISS

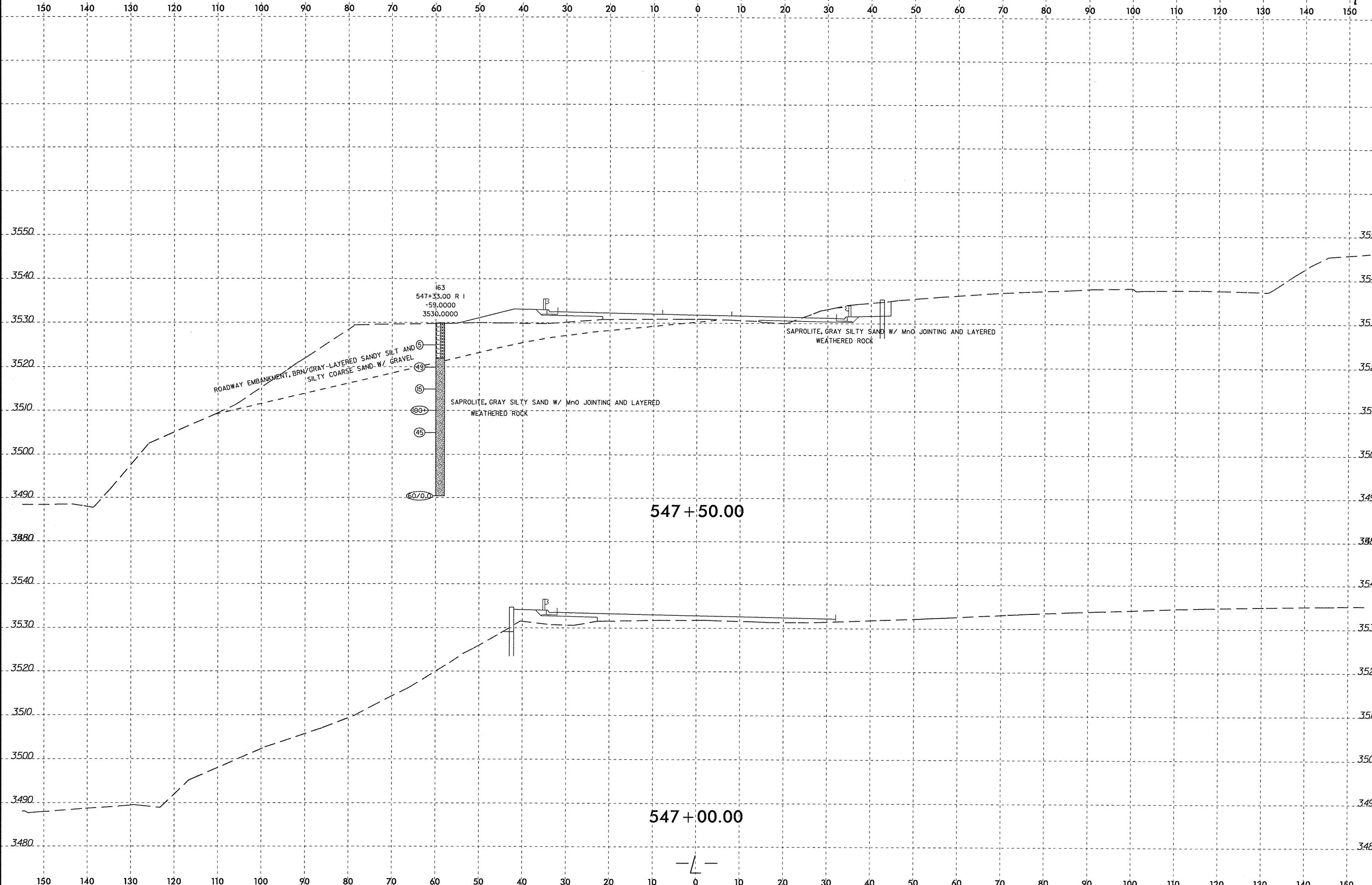
CRYSTALLINE ROCK, GRAY GRANITIC GNEISS

545 + 50.00

545 + 00.00



SYSTEM TIME
USER NAME



ROADWAY EMBANKMENT, BRN/GRAY-LAYERED SANDY SILT AND SILTY COARSE SAND W/ GRAVEL

163
547+33.00 R I
-59.0000
3530.0000

⑤
④
③
②
①
①
②
③
④
⑤
⑥
⑦
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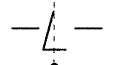
SAPROLITE, GRAY SILTY SAND W/ MnO JOINTING AND LAYERED

WEATHERED ROCK

SAPROLITE, GRAY SILTY SAND W/ MnO JOINTING AND LAYERED
WEATHERED ROCK

547+50.00

547+00.00



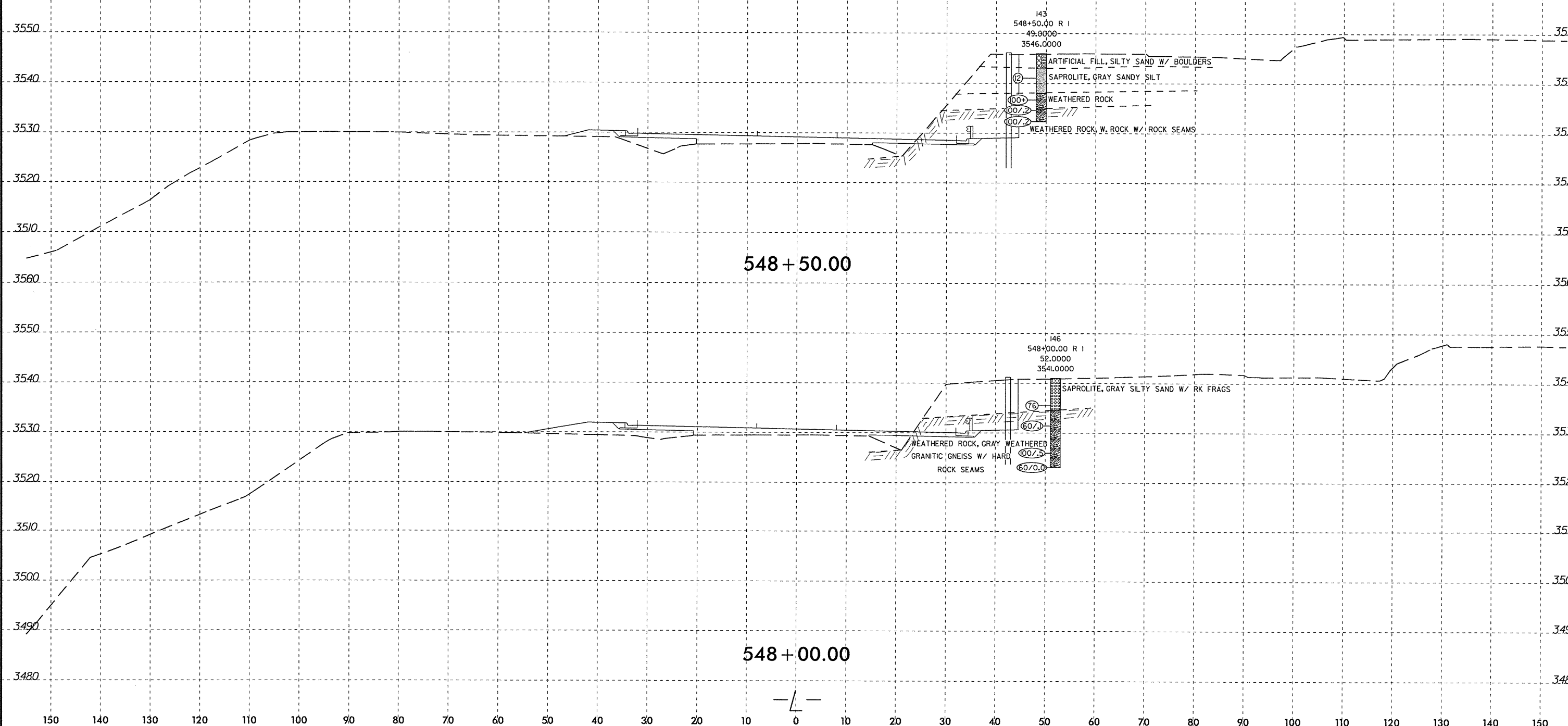
8/23/14



PROJ. REFERENCE NO.	SHEET NO.
R-2237C	229/259

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

3560 3550 3540 3530 3520 3510 3500 3490 3480



143
548+50.00 R I
49.0000
3546.0000

ARTIFICIAL FILL, SILTY SAND W/ BOULDERS
SAPROLITE, GRAY SANDY SILT
WEATHERED ROCK
WEATHERED ROCK, W. ROCK W/ ROCK SEAMS

548+50.00

146
548+00.00 R I
52.0000
3541.0000

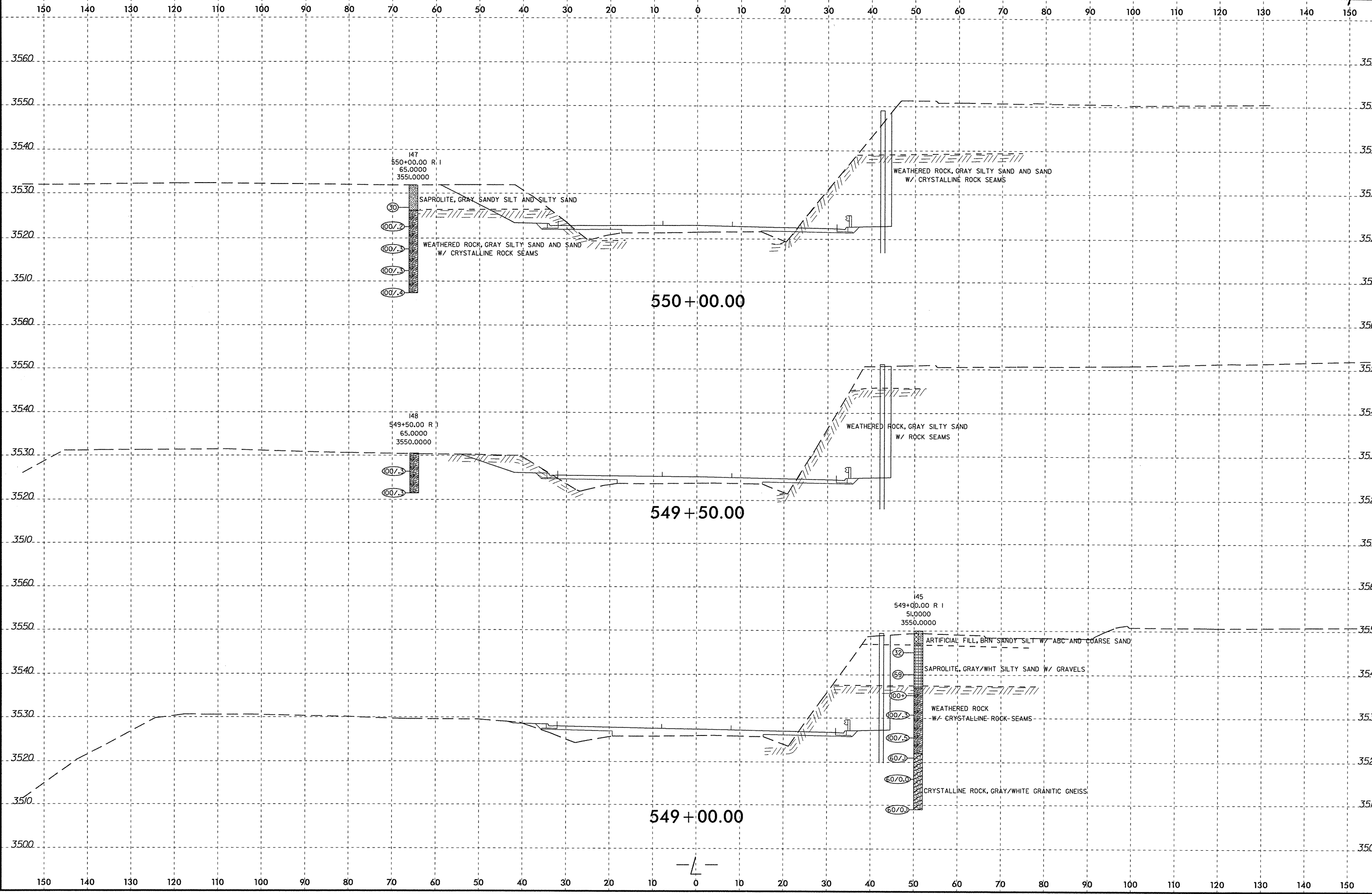
SAPROLITE, GRAY SILTY SAND W/ RK FRAGS
WEATHERED ROCK, GRAY WEATHERED
GRANITIC GNEISS W/ HARD
ROCK SEAMS

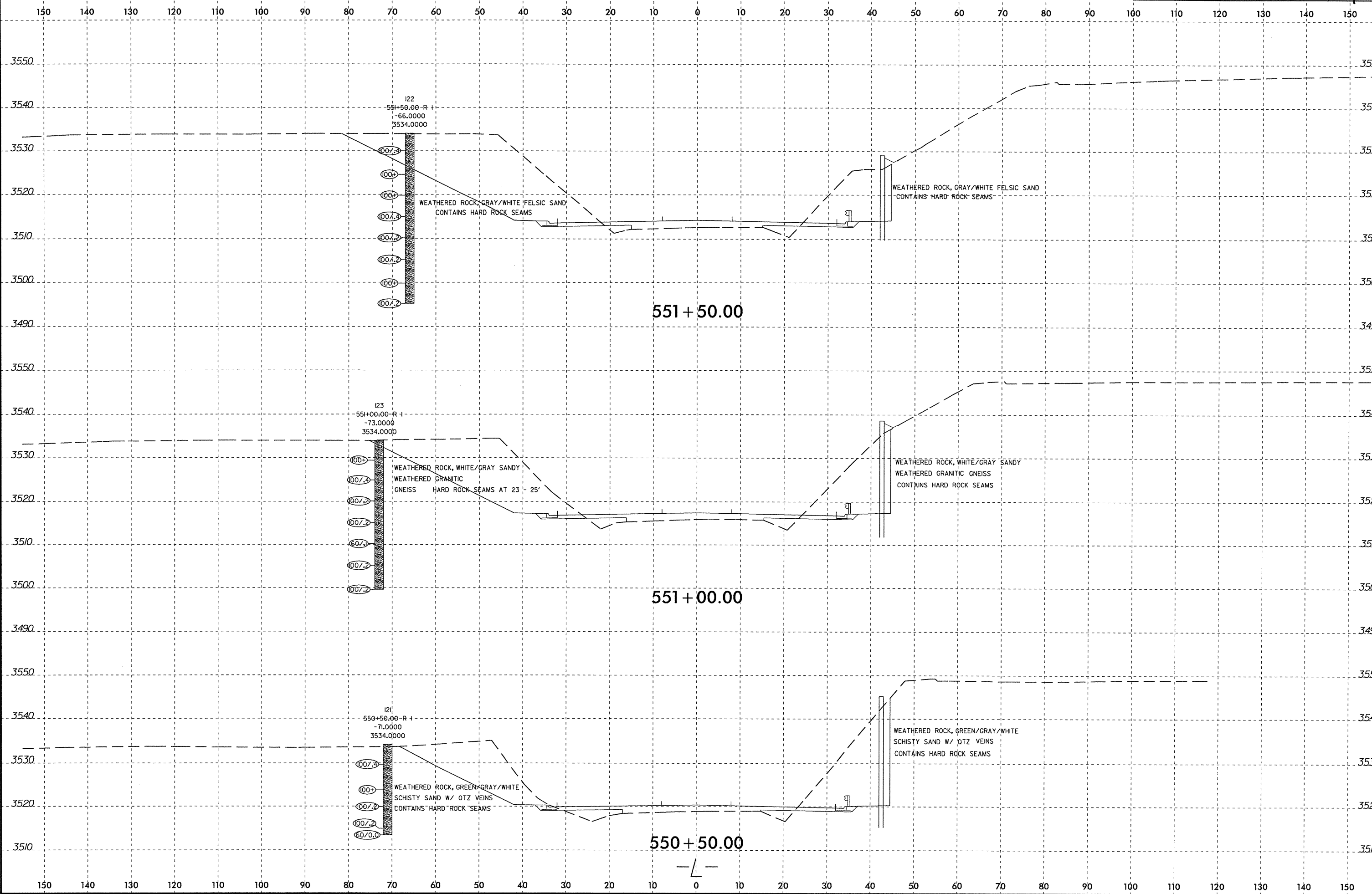
548+00.00

-L-

SYSTEMS TIME DOWN

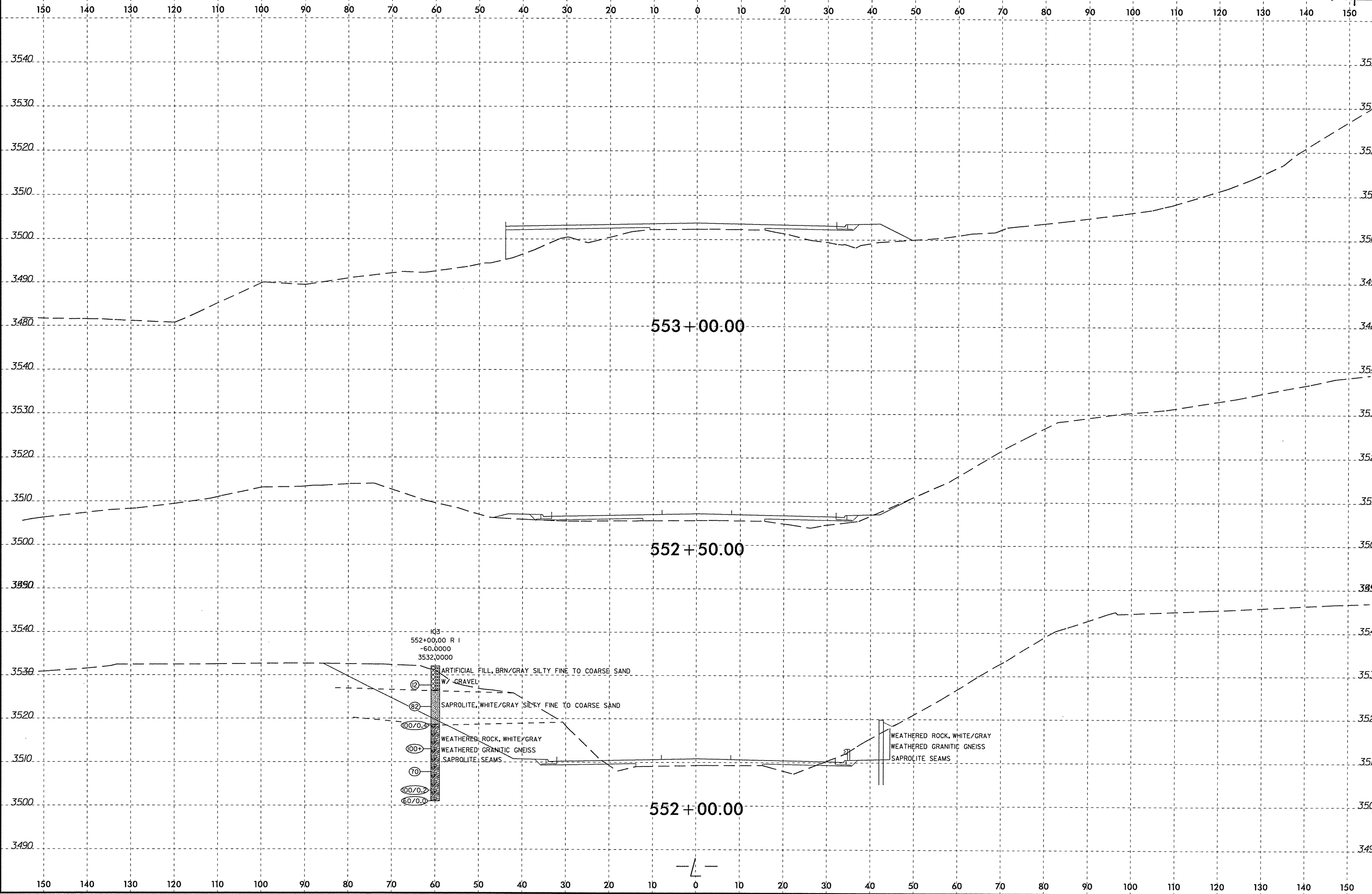
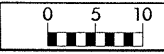
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150





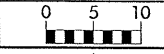
SYSTEMS

8/23/11

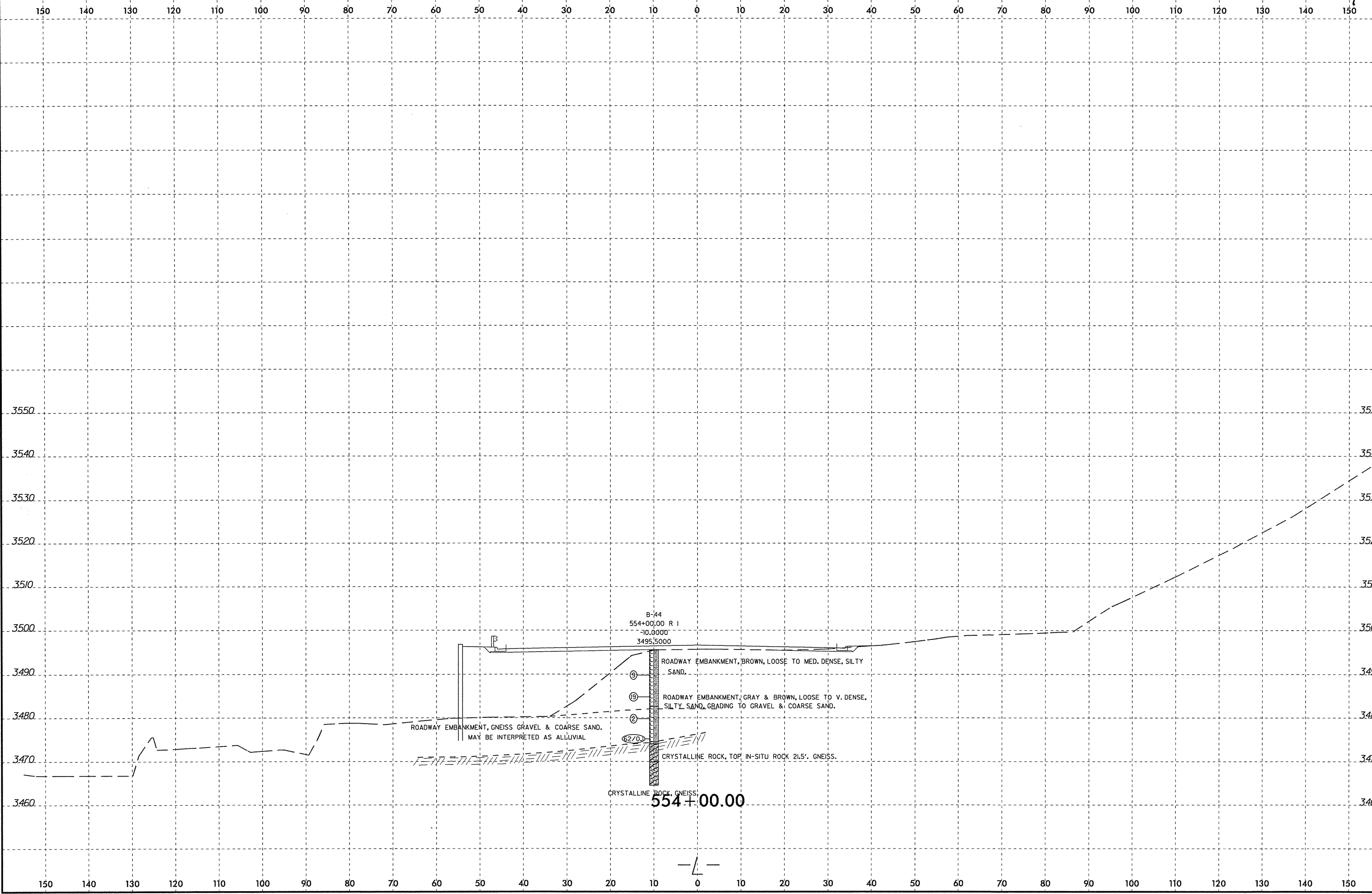


SYSTEM TIME: 8/23/11 10:00:00 AM
USER: J. W. DODSON

8/23/11



PROJ. REFERENCE NO. R-2237C SHEET NO. 233/259



B-44
554+00.00 R 1
-10.0000
3495.5000

ROADWAY EMBANKMENT, BROWN, LOOSE TO MED. DENSE, SILTY SAND.

ROADWAY EMBANKMENT, GRAY & BROWN, LOOSE TO V. DENSE, SILTY SAND, GRADING TO GRAVEL & COARSE SAND.

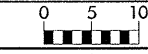
ROADWAY EMBANKMENT, GNEISS GRAVEL & COARSE SAND. MAY BE INTERPRETED AS ALLUVIAL

CRYSTALLINE ROCK, TOP, IN-SITU ROCK 21.5'. GNEISS.

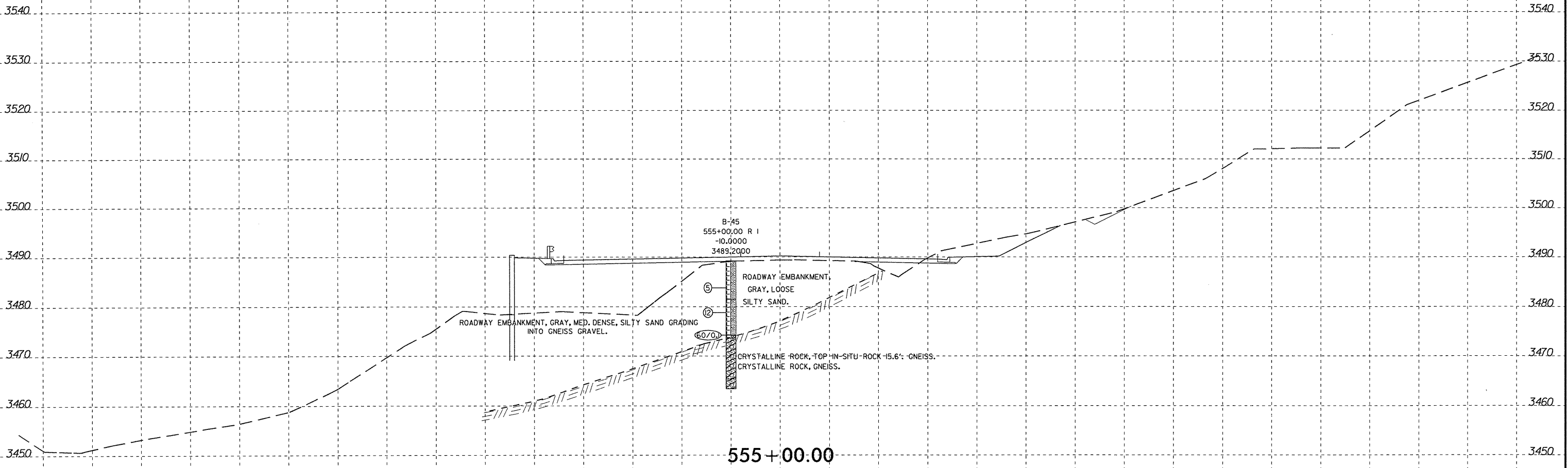
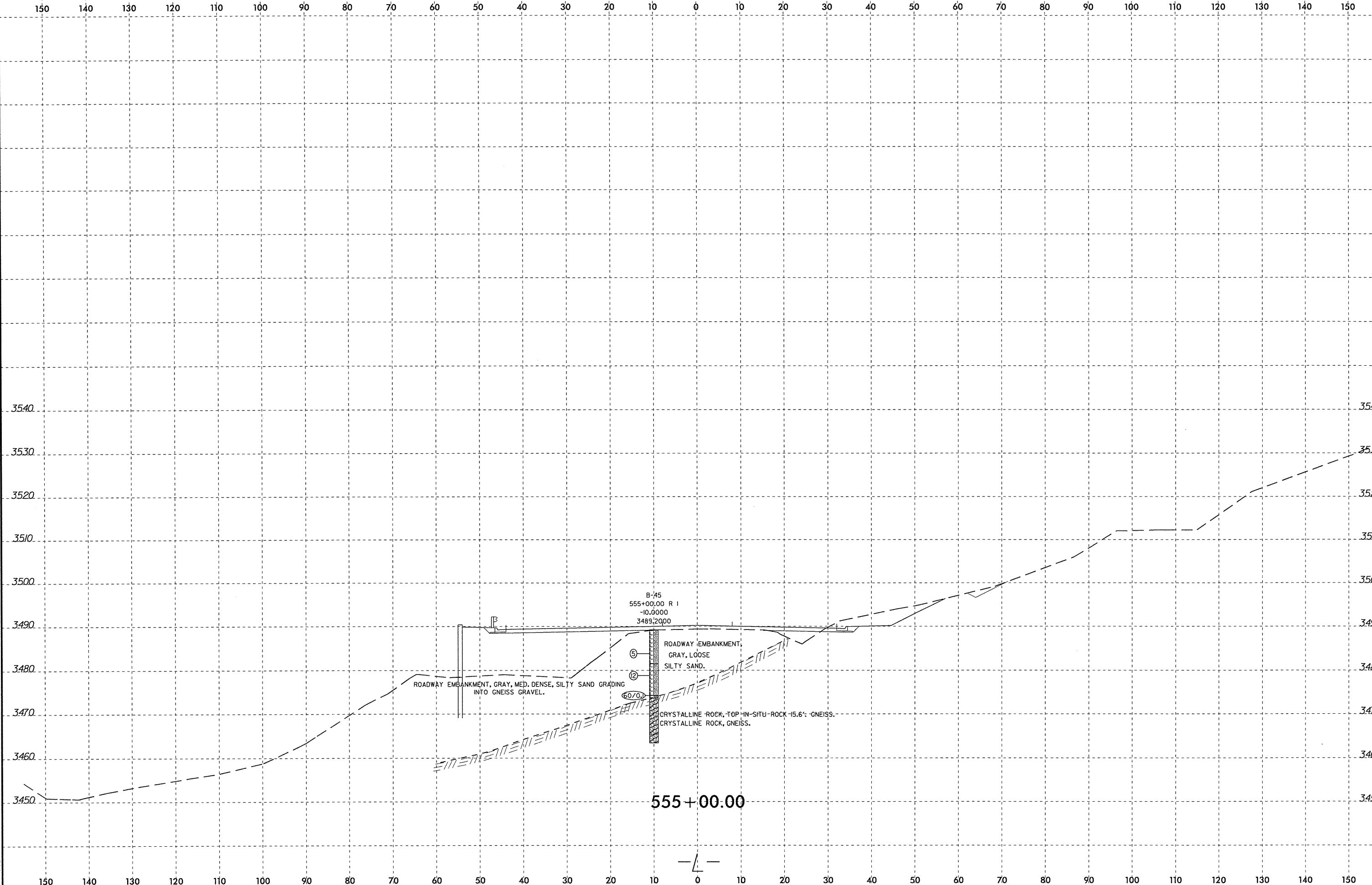
CRYSTALLINE ROCK, GNEISS
554+00.00

SYSTEM TIME
DRAWN BY
USER NAME

8/23/11



PROJ. REFERENCE NO. R-2237C SHEET NO. 234/259



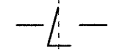
B-45
555+00.00 R 1
-10.0000
3489.2000

ROADWAY EMBANKMENT,
GRAY, LOOSE
SILTY SAND.

ROADWAY EMBANKMENT, GRAY, MED. DENSE, SILTY SAND GRADING
INTO GNEISS GRAVEL.

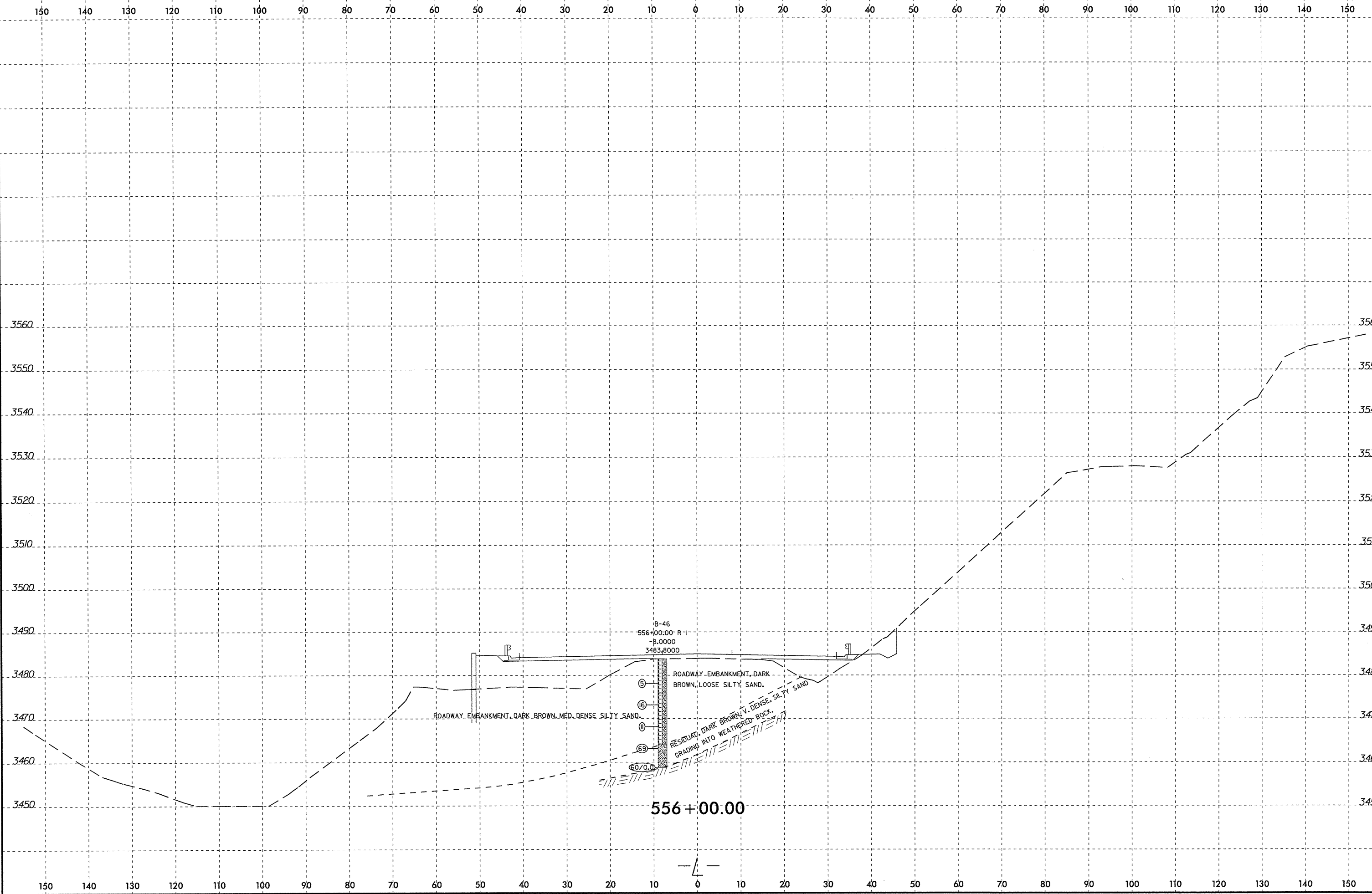
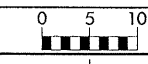
CRYSTALLINE ROCK, TOP IN-SITU ROCK 15.6% GNEISS.
CRYSTALLINE ROCK, GNEISS.

555+00.00



SYTIME
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8/23/15
SYSTEM TIME
USER NAME



B-46
556+00.00 R-1
B.0000
3483.8000

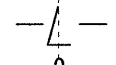
ROADWAY EMBANKMENT, DARK BROWN, LOOSE SILTY SAND.

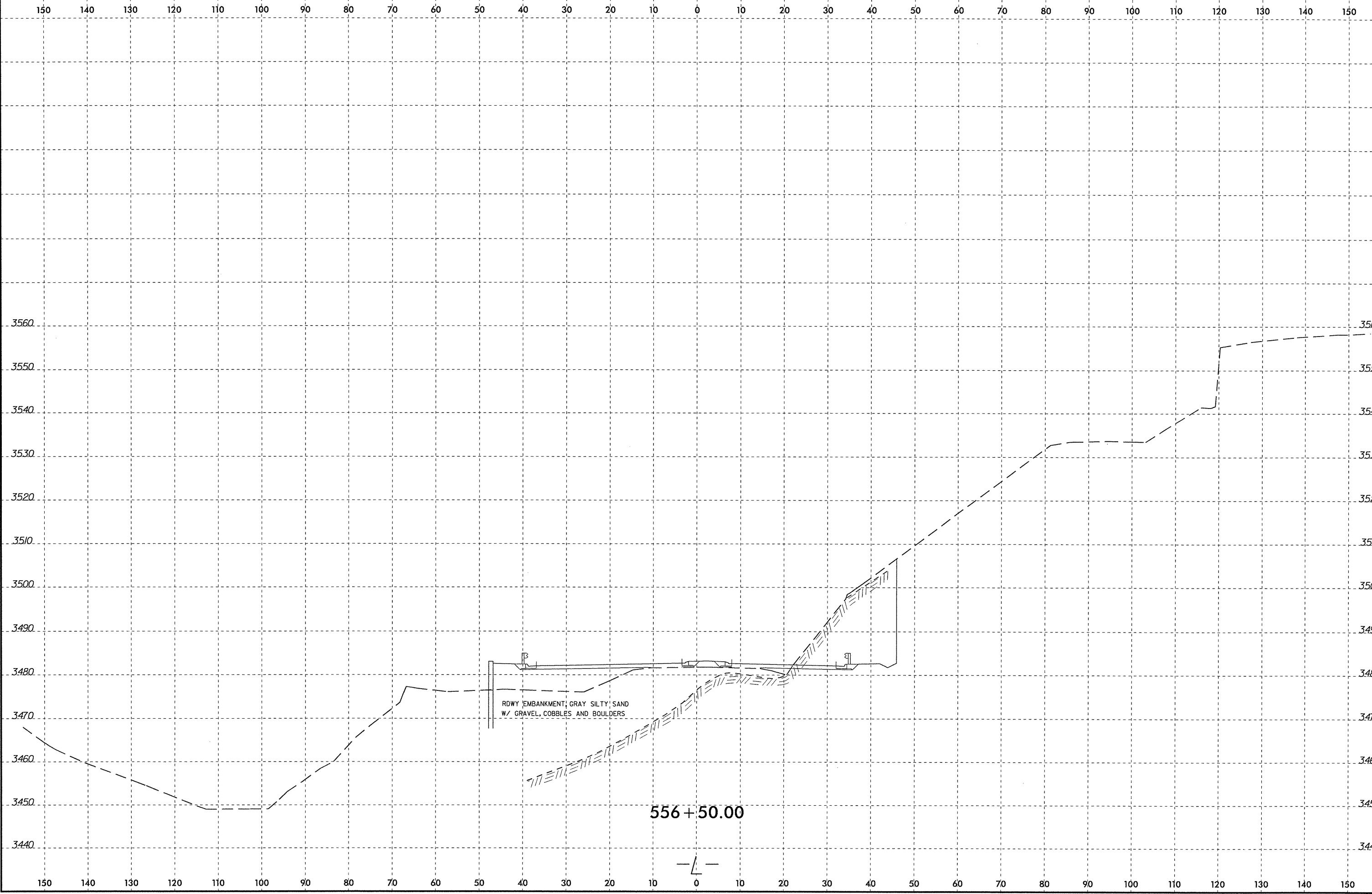
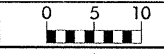
ROADWAY EMBANKMENT, DARK BROWN, MED. DENSE SILTY SAND.

RESIDUAL, DARK BROWN, V. DENSE, SILTY SAND.

GRADING INTO WEATHERED ROCK.

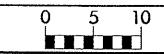
556+00.00



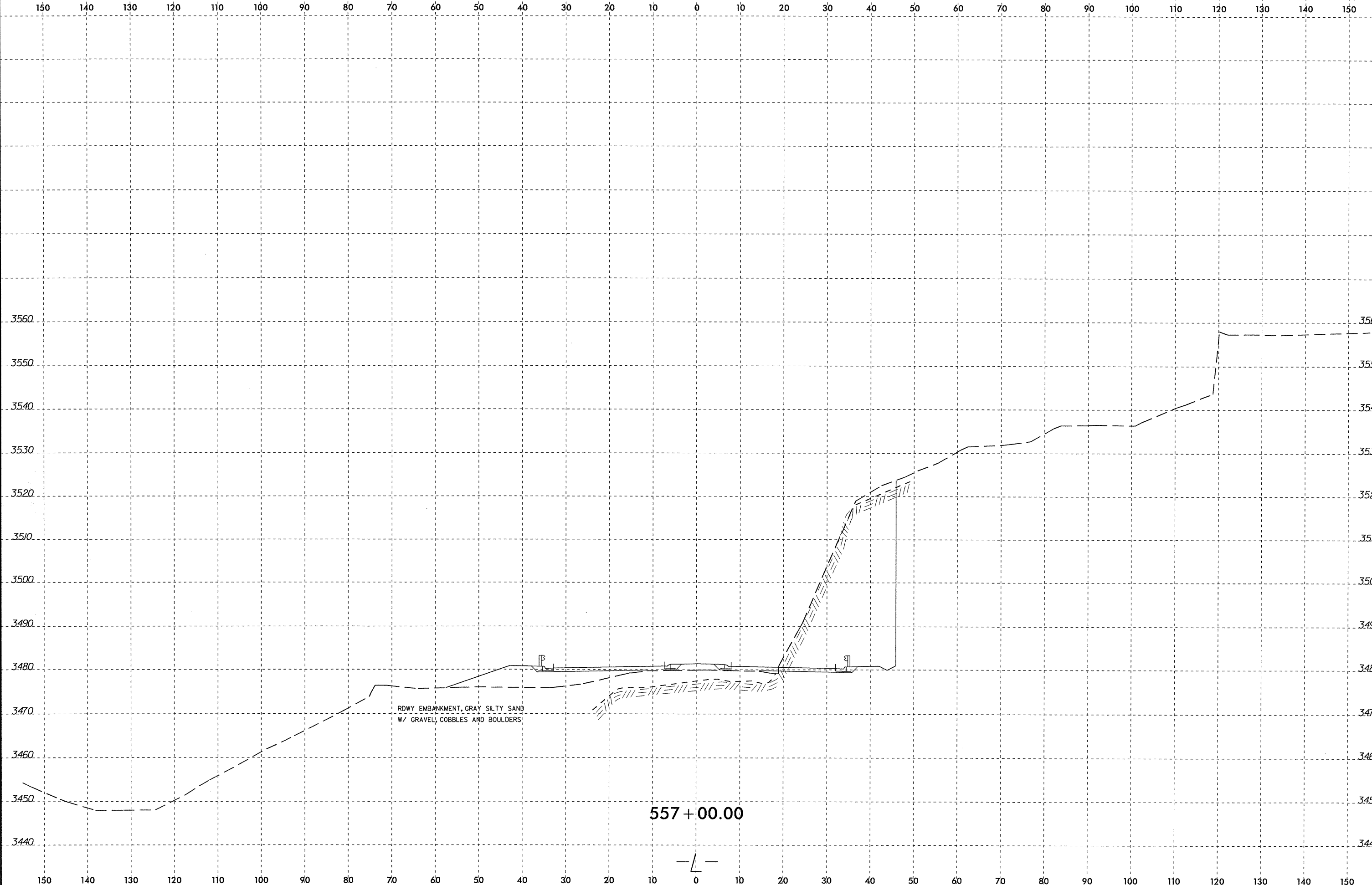


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8/23/15

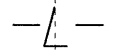


PROJ. REFERENCE NO.	SHEET NO.
R-2237C	237/259



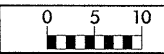
RDWY EMBANKMENT, GRAY SILTY SAND
W/ GRAVEL, COBBLES AND BOULDERS

557+00.00

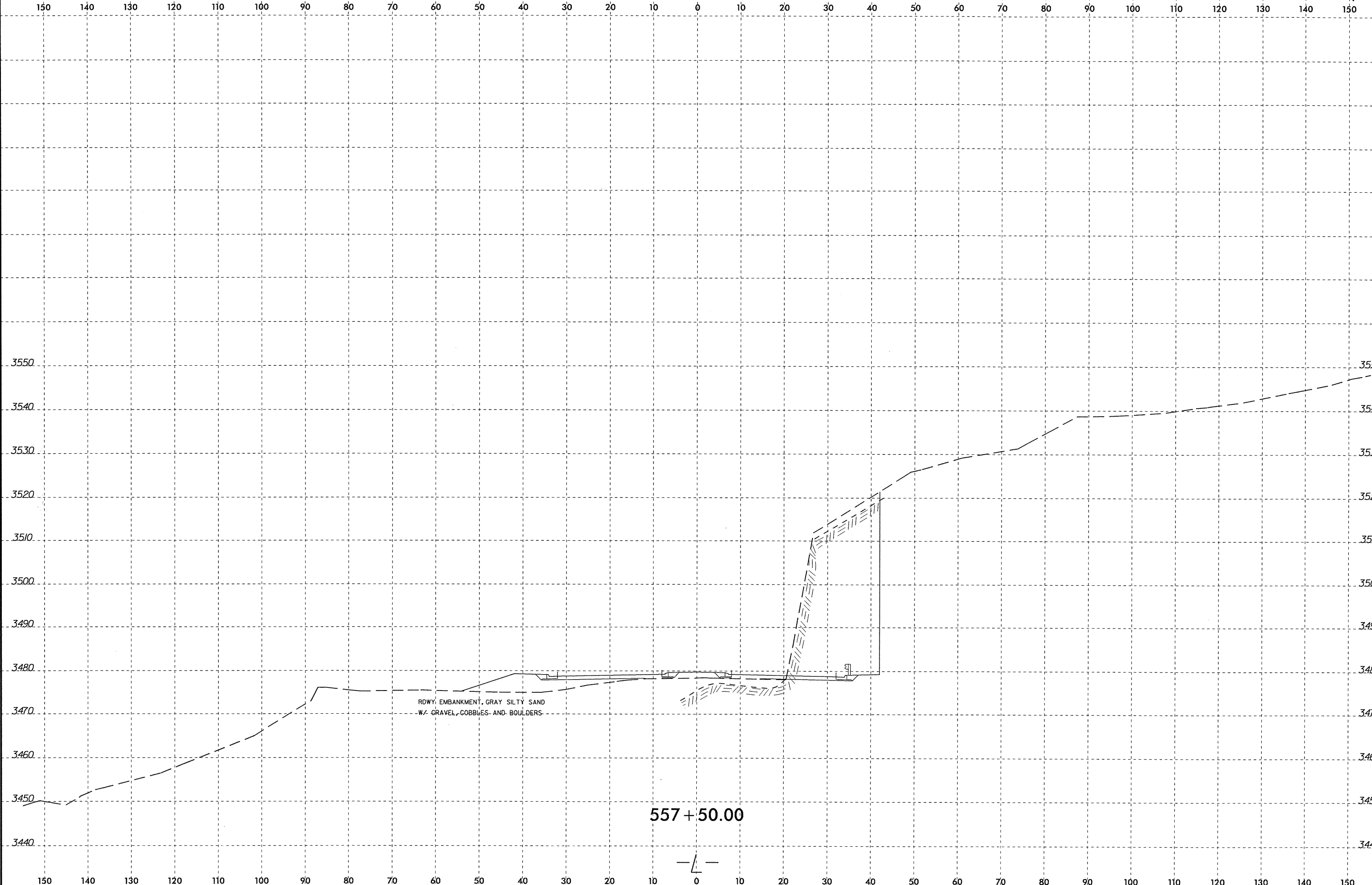


***** SYSTEMS *****
***** DON *****
***** PERUS *****
***** ENGINEER *****

8/23/01



PROJ. REFERENCE NO.	SHEET NO.
R-2237C	238/259



SYSTEMS
DESIGN
INC.

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

3520 3510 3500 3490 3480 3470 3460 3450

3520 3510 3500 3490 3480 3470 3460 3450

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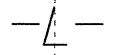
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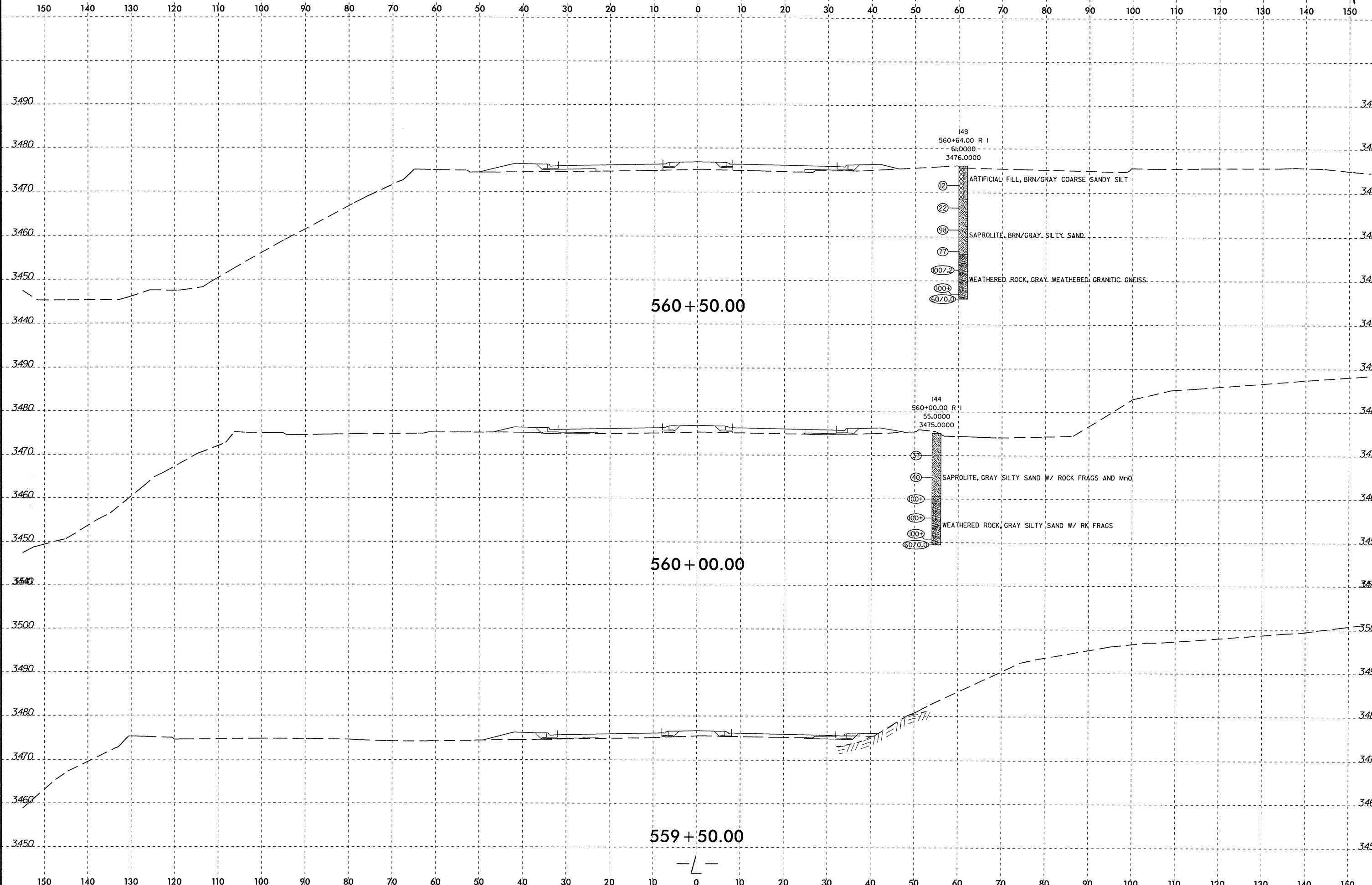
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559+00.00

558+50.00



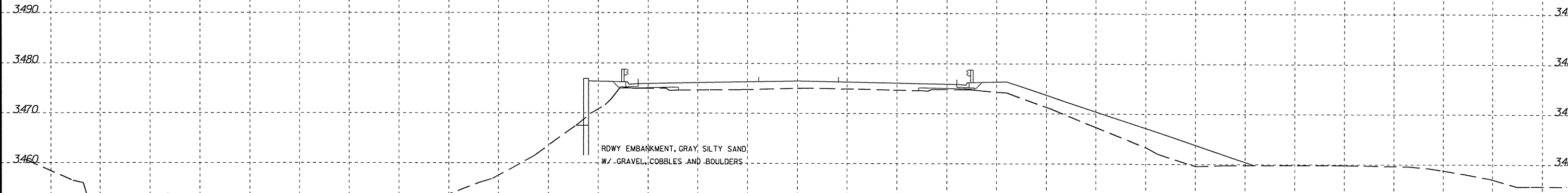
SYSTEM TIME
USER NAME



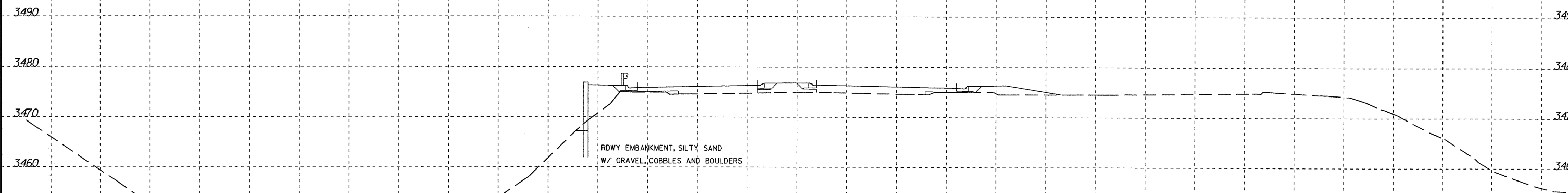
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USER: JLN

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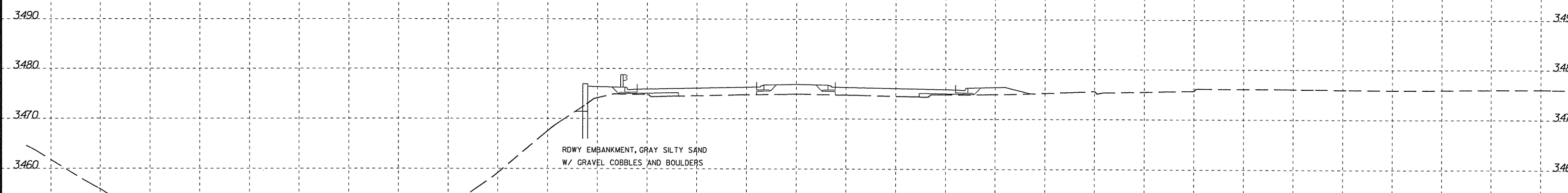
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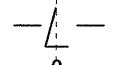
562 + 00.00



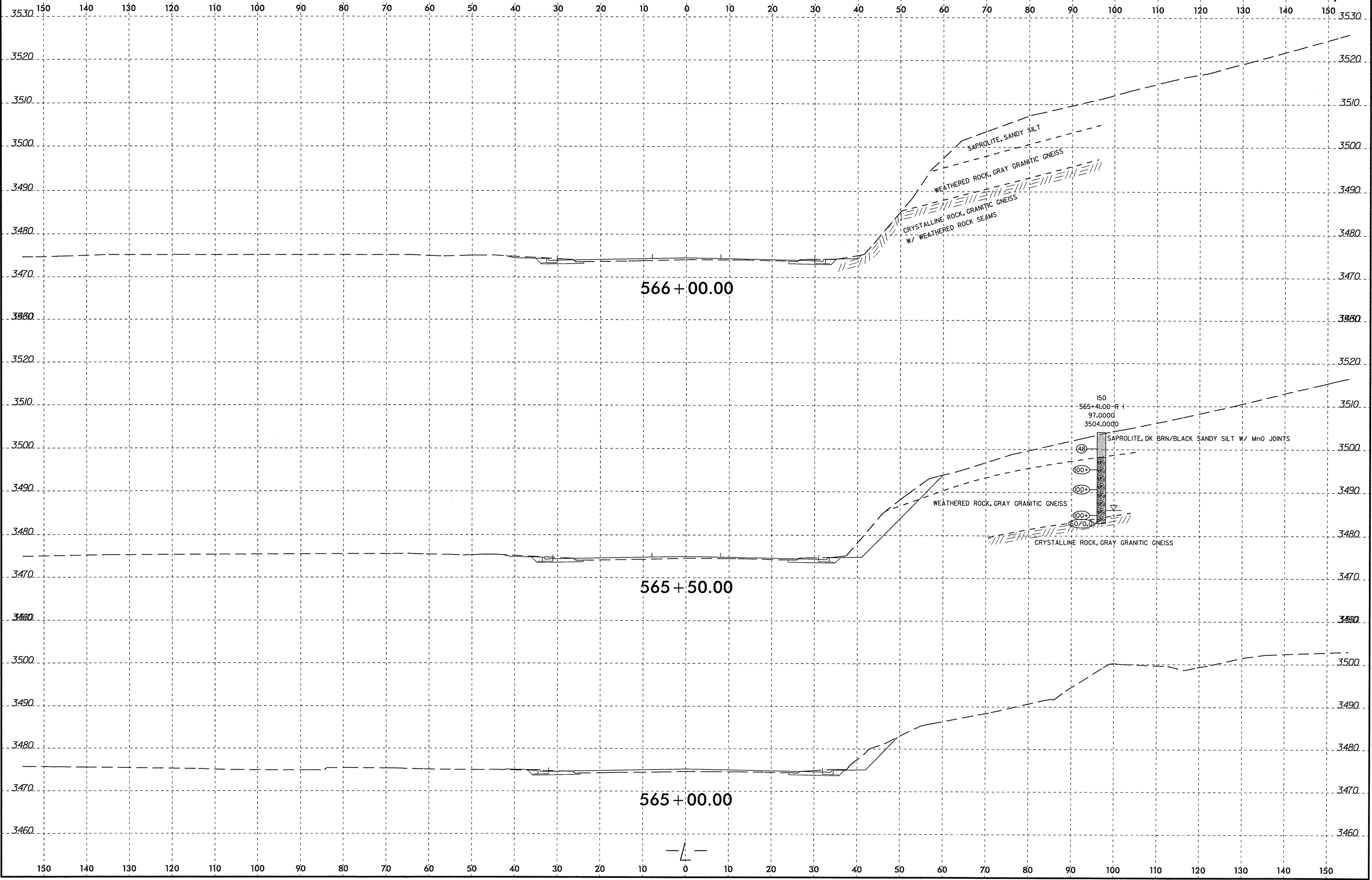
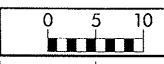
561 + 50.00



561 + 00.00

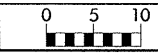


SYSTEM TIME: 8/23/11 10:00:00 AM
DRAWN BY: J. B. BROWN
CHECKED BY: J. B. BROWN
DATE: 8/23/11



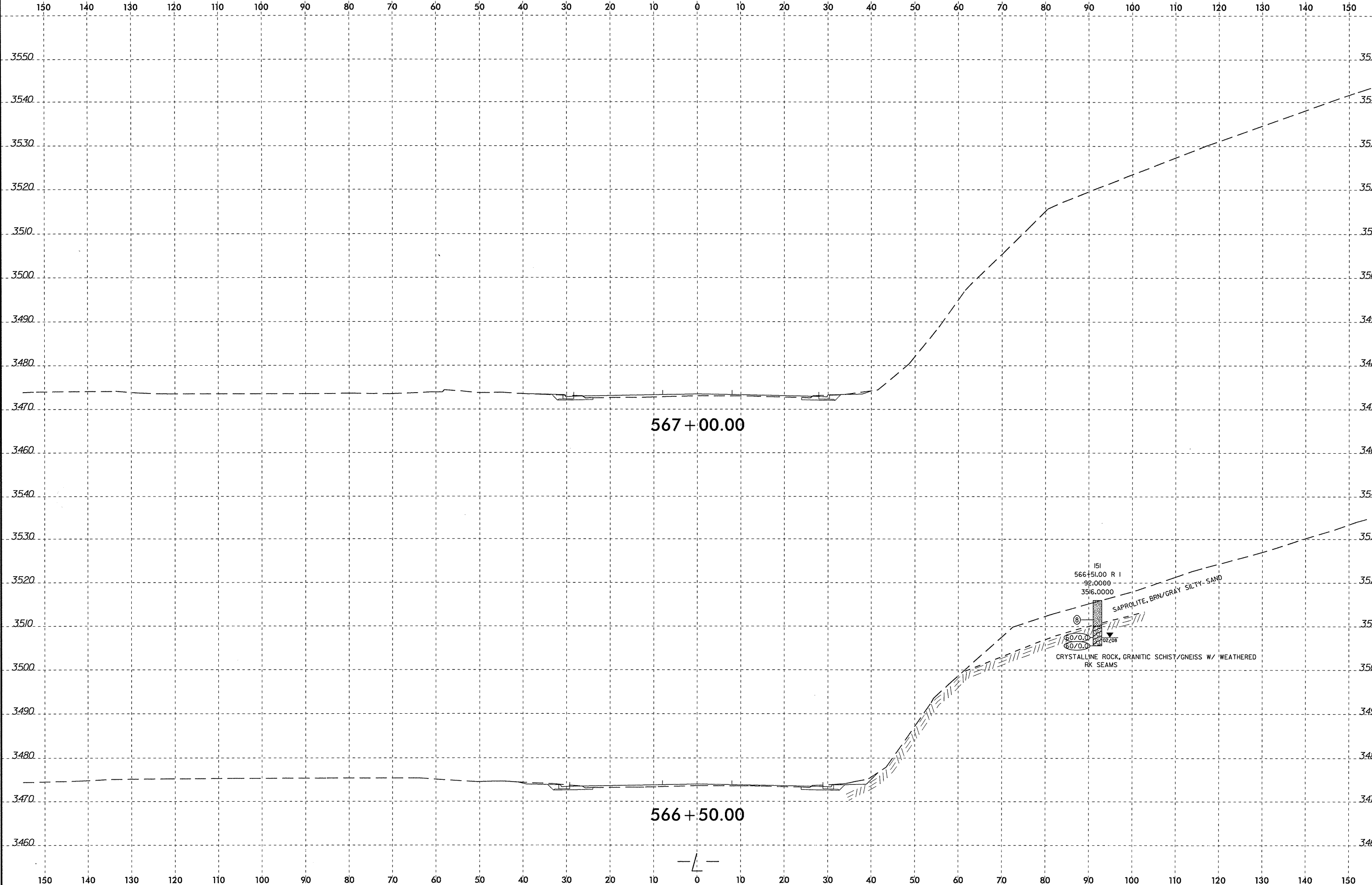
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8/23/91



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
244/259



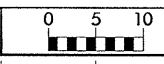
567 + 00.00

566 + 50.00

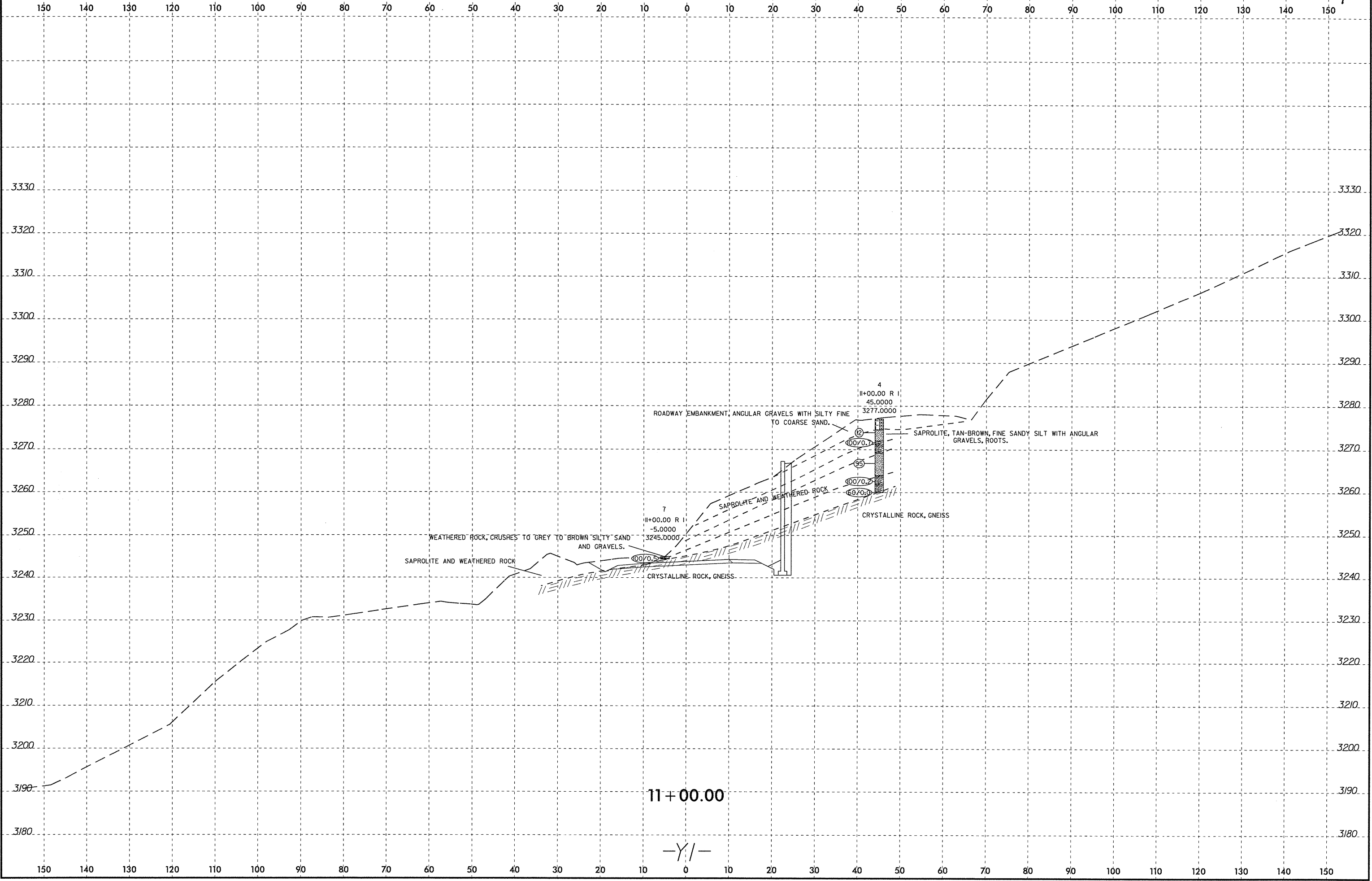
151
566+51.00 R 1
92.0000
3516.0000
SAPROLITE, BRN/GRAY SILTY SAND
CRYSTALLINE ROCK, GRANITIC SCHIST/GNEISS W/ WEATHERED
RK SEAMS

SYSTEM TIME
DATE
USER NAME

8/23/11



PROJ. REFERENCE NO. R-2237C	SHEET NO. 245/251
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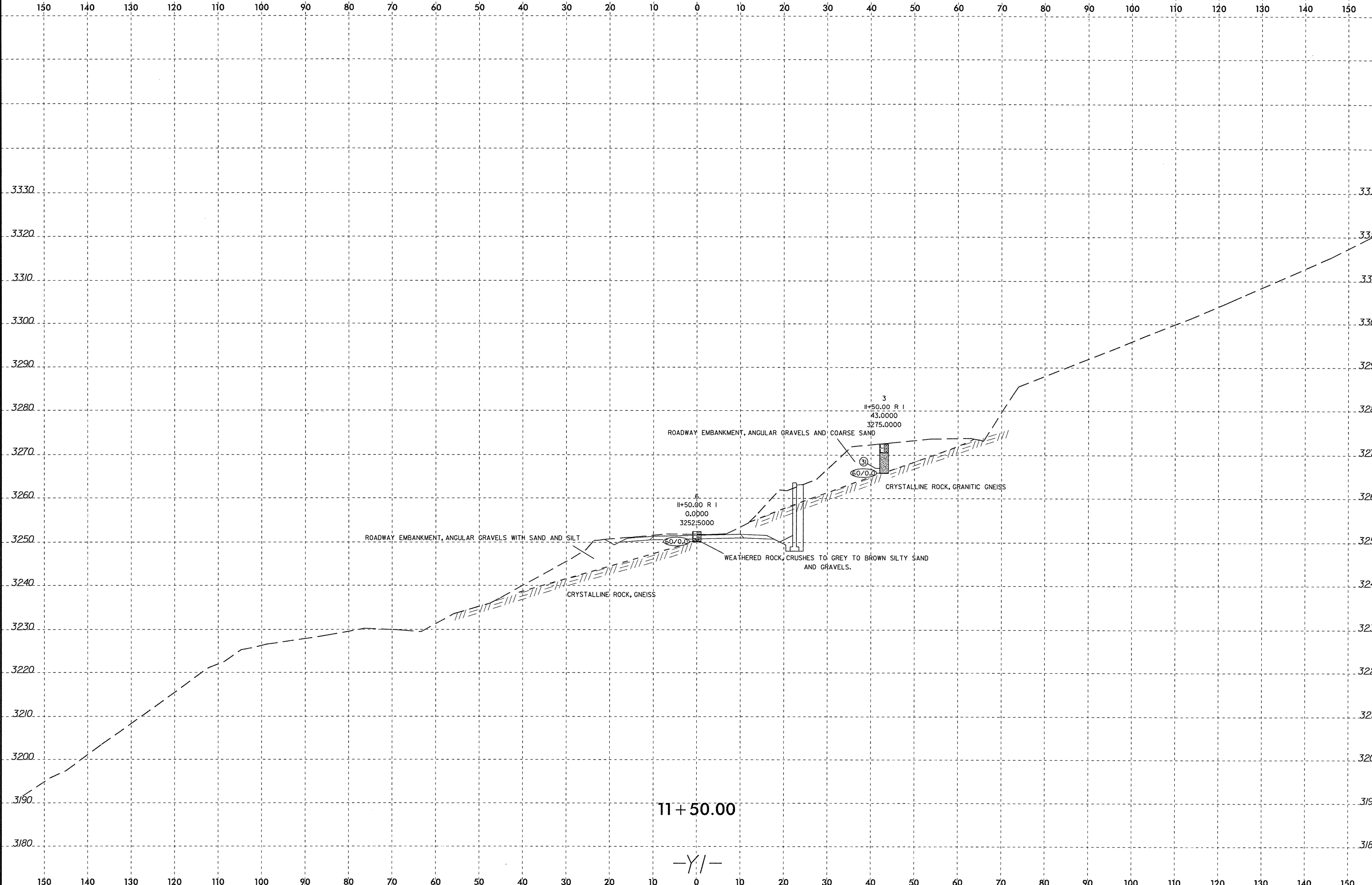
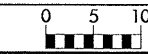


11 + 00.00

-Y/-

SYSTEM TIME: 8/23/11 10:00:00 AM

8/23/14

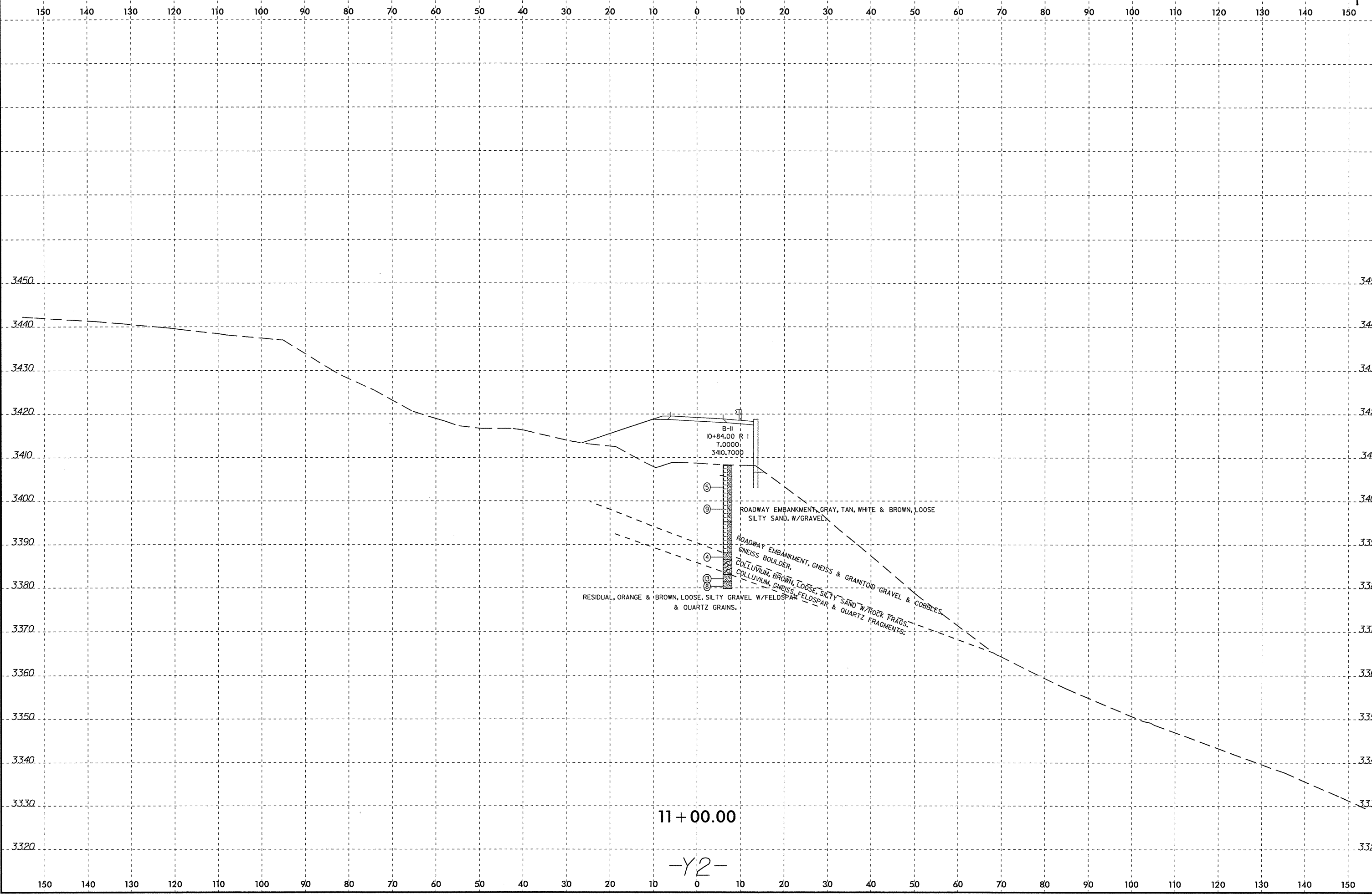


11 + 50.00

-Y/-

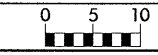
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USER: JRM

8/23/11

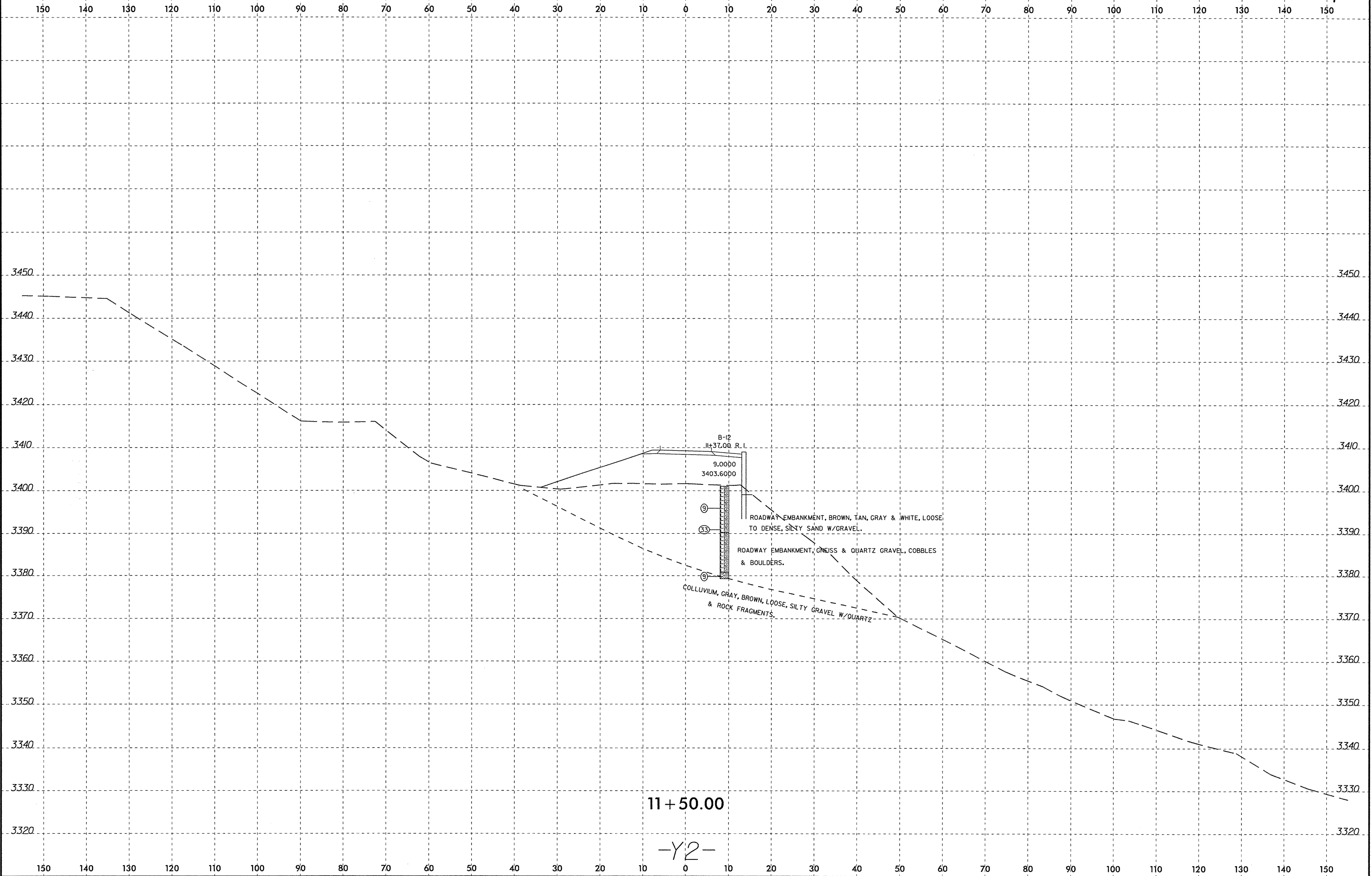


SYSTEMS
DOWN
USE NAME

8/23/14



PROJ. REFERENCE NO. R-2237C	SHEET NO. 248 259
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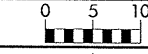


11 + 50.00

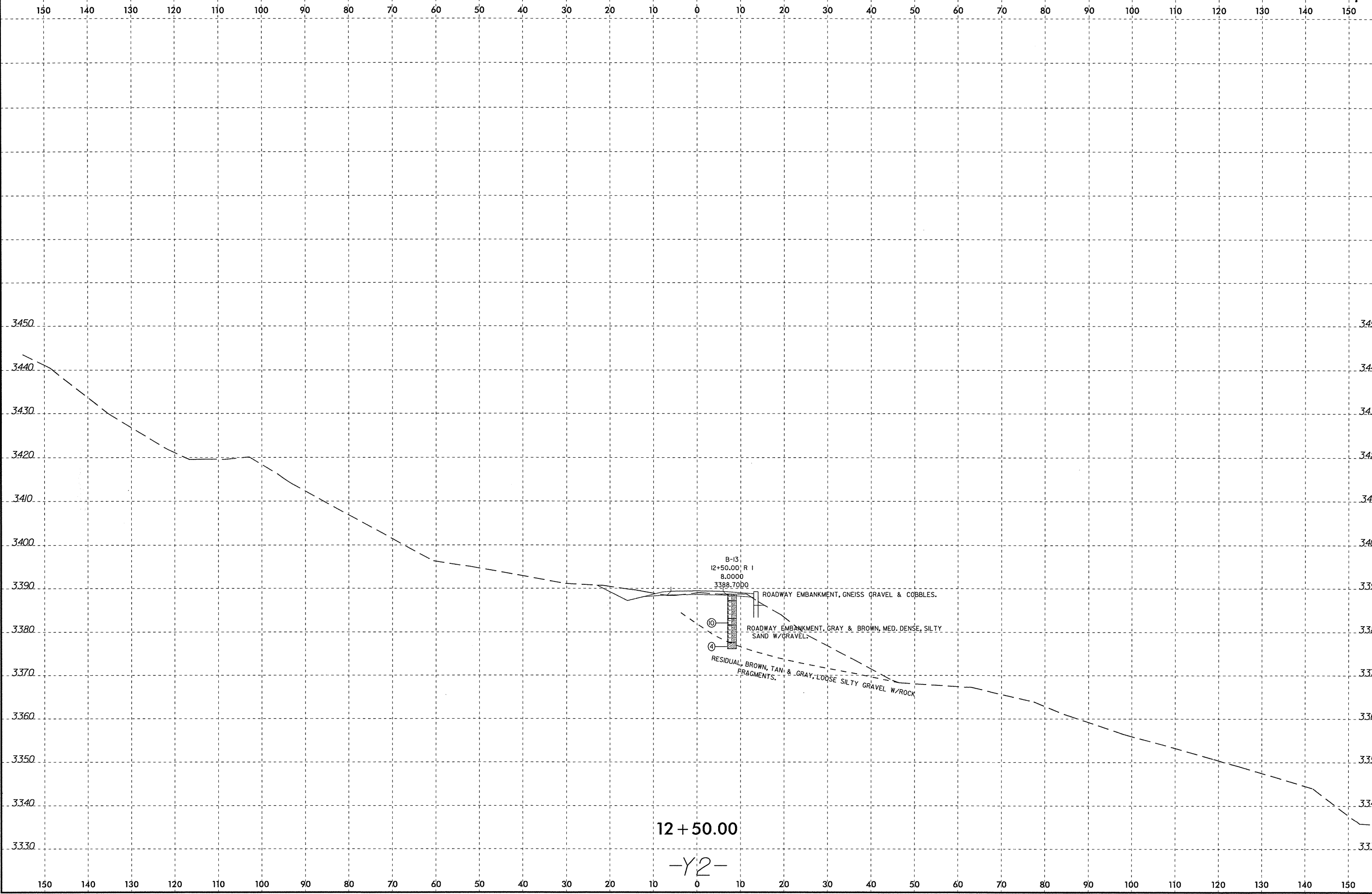
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\$\$\$\$\$\$SYTIME\$\$\$\$\$\$
 \$\$\$\$\$\$USERSNAME\$\$\$\$\$\$
 \$\$\$\$\$\$DATE\$\$\$\$\$\$
 \$\$\$\$\$\$TIME\$\$\$\$\$\$
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8/23/11



PROJ. REFERENCE NO. R-2237C SHEET NO. 249/259

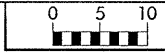


12 + 50.00

-Y2-

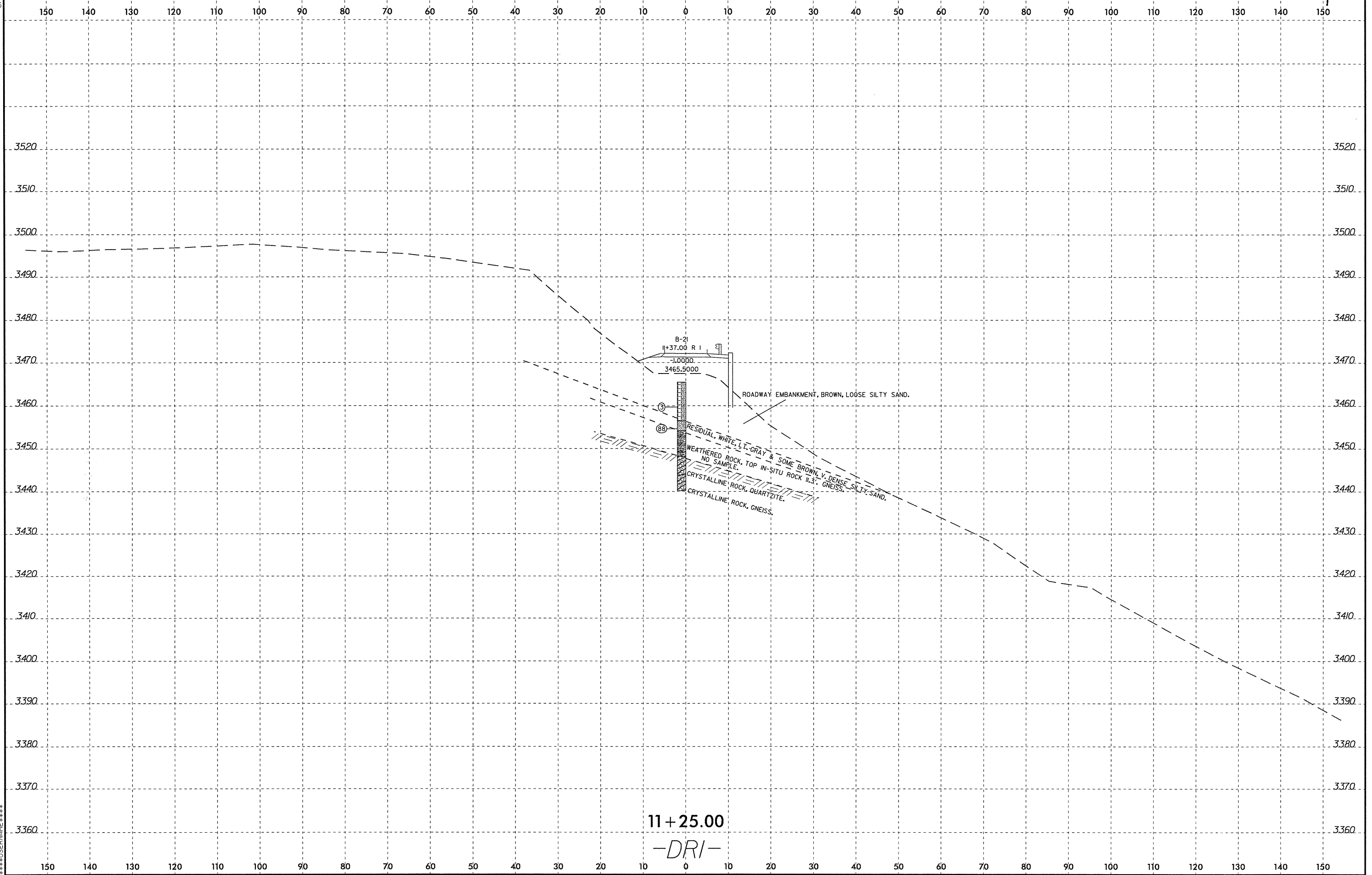
SYSTEM TIME
DATE
USER NAME

87237



PROJ. REFERENCE NO.
R-2237C

SHEET NO.
252/269



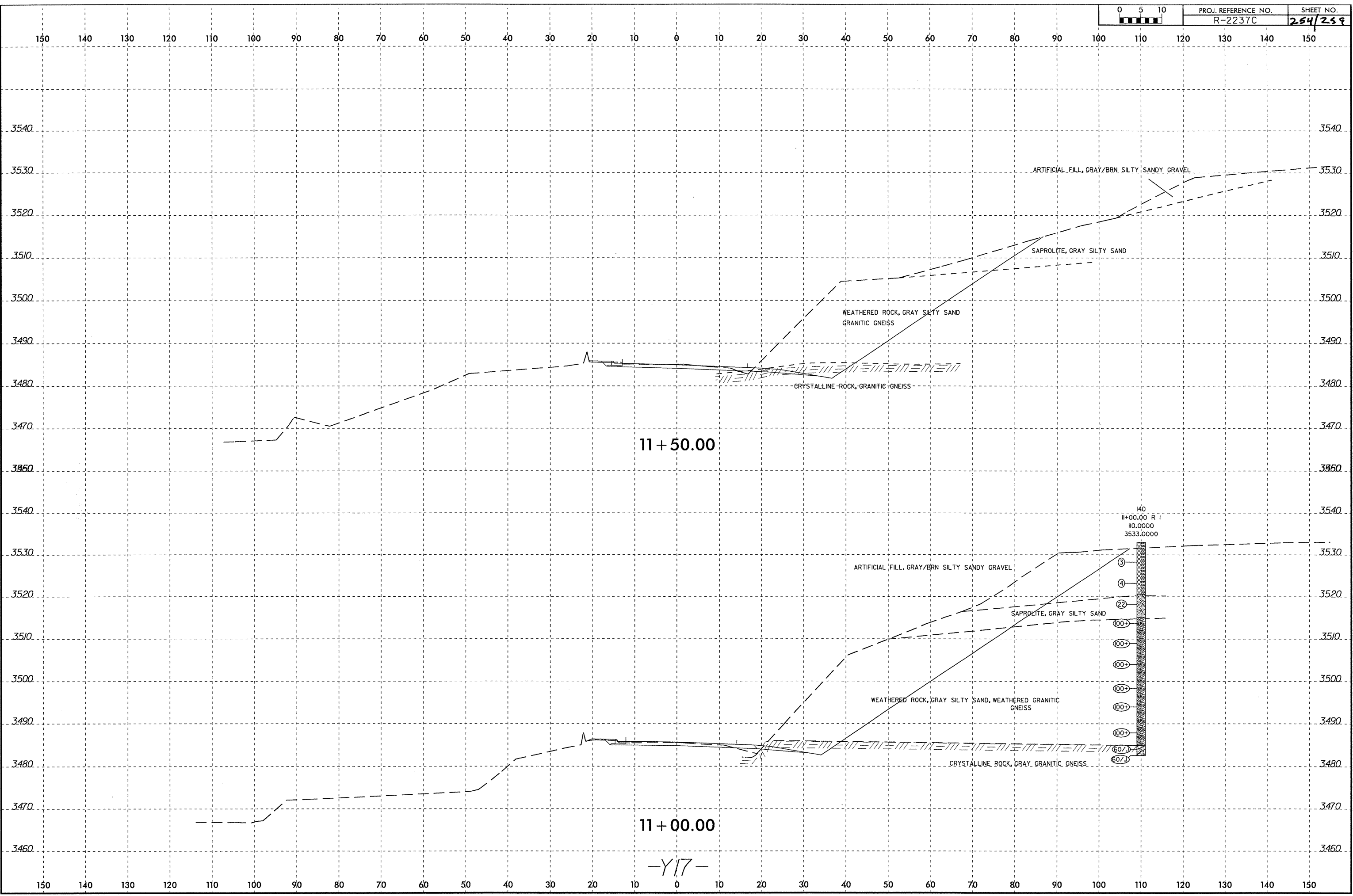
B-21
11+37.00 R I
-1.0000
3465.5000

ROADWAY EMBANKMENT, BROWN, LOOSE SILTY SAND.

RESIDUAL, WHITE, LT. GRAY & SOME BROWN, V. DENSE SILTY SAND.
WEATHERED ROCK, TOP IN-SITU ROCK IL. GNEISS.
CRYSTALLINE ROCK, QUARTZITE.
CRYSTALLINE ROCK, GNEISS.

11+25.00
-DRI-

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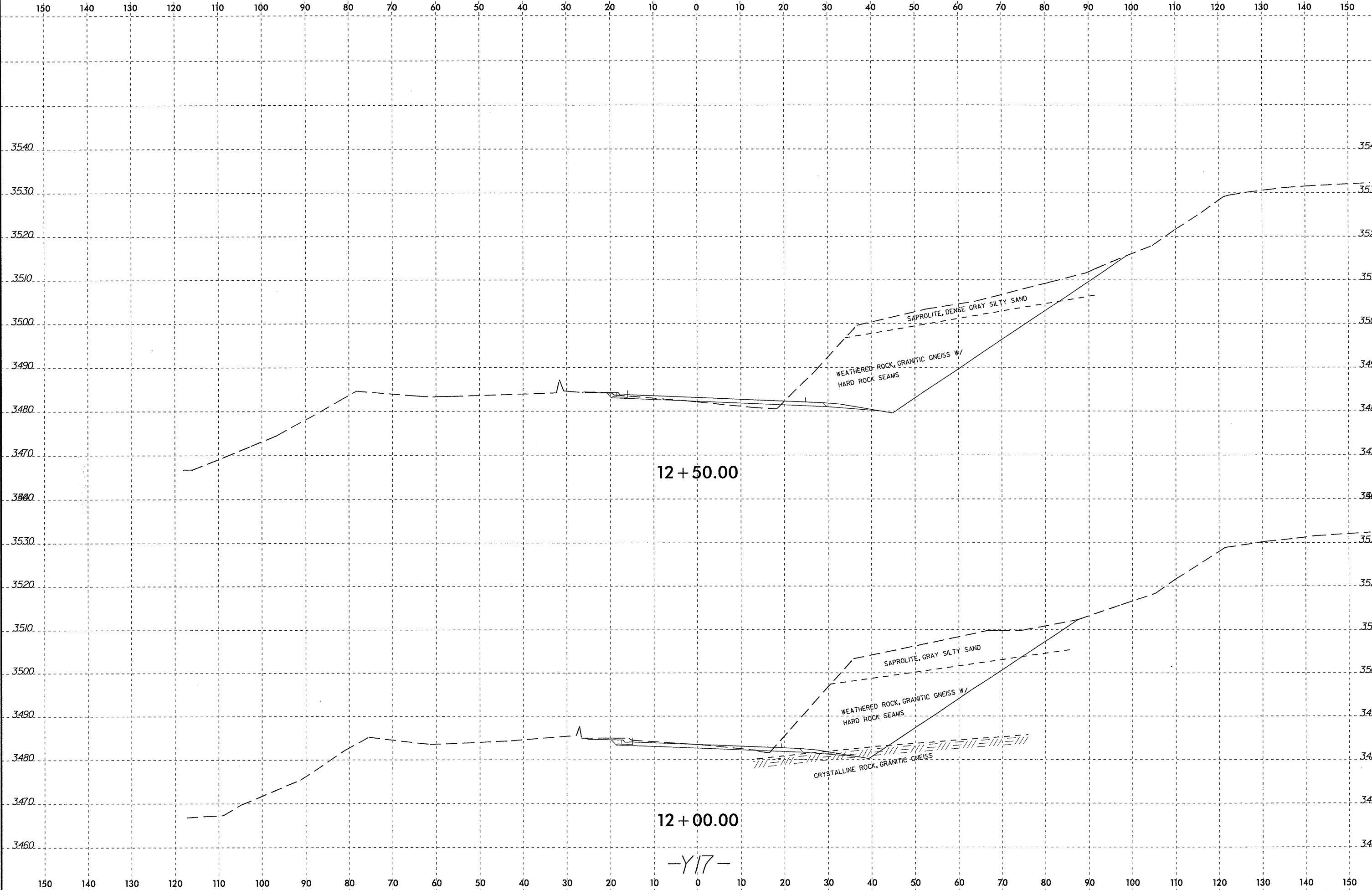
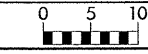
11 + 50.00

11 + 00.00

-Y17-

SYSTEM TIME
 USER NAME

8/23/01



12 + 50.00

12 + 00.00

-Y17-

SAPROLITE, DENSE GRAY SILTY SAND

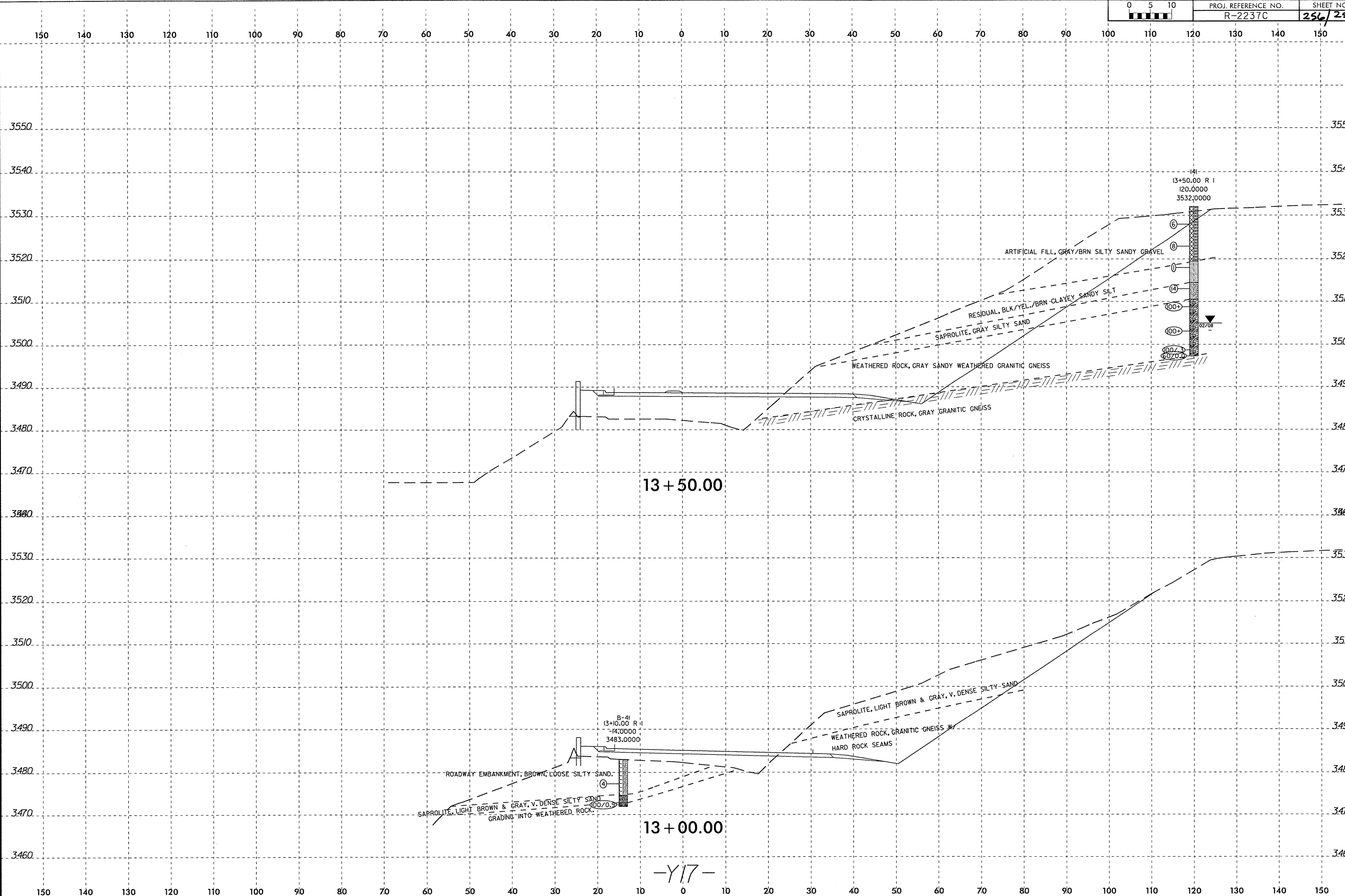
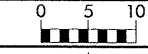
WEATHERED ROCK, GRANITIC GNEISS W/
HARD ROCK SEAMS

SAPROLITE, GRAY SILTY SAND

WEATHERED ROCK, GRANITIC GNEISS W/
HARD ROCK SEAMS

CRYSTALLINE ROCK, GRANITIC GNEISS

SYTIME
US
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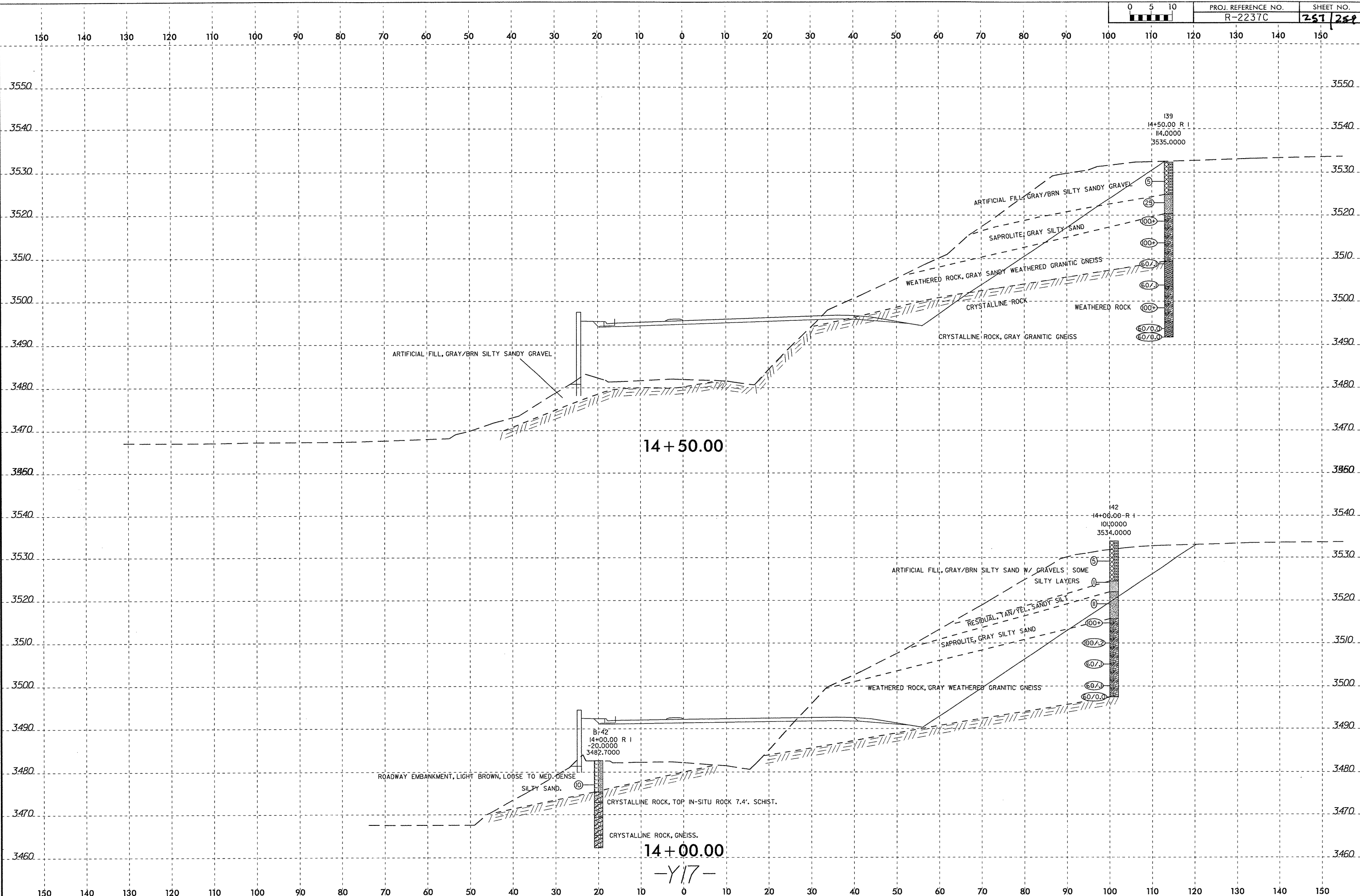
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13 + 00.00

-Y17-

SYSTEMS
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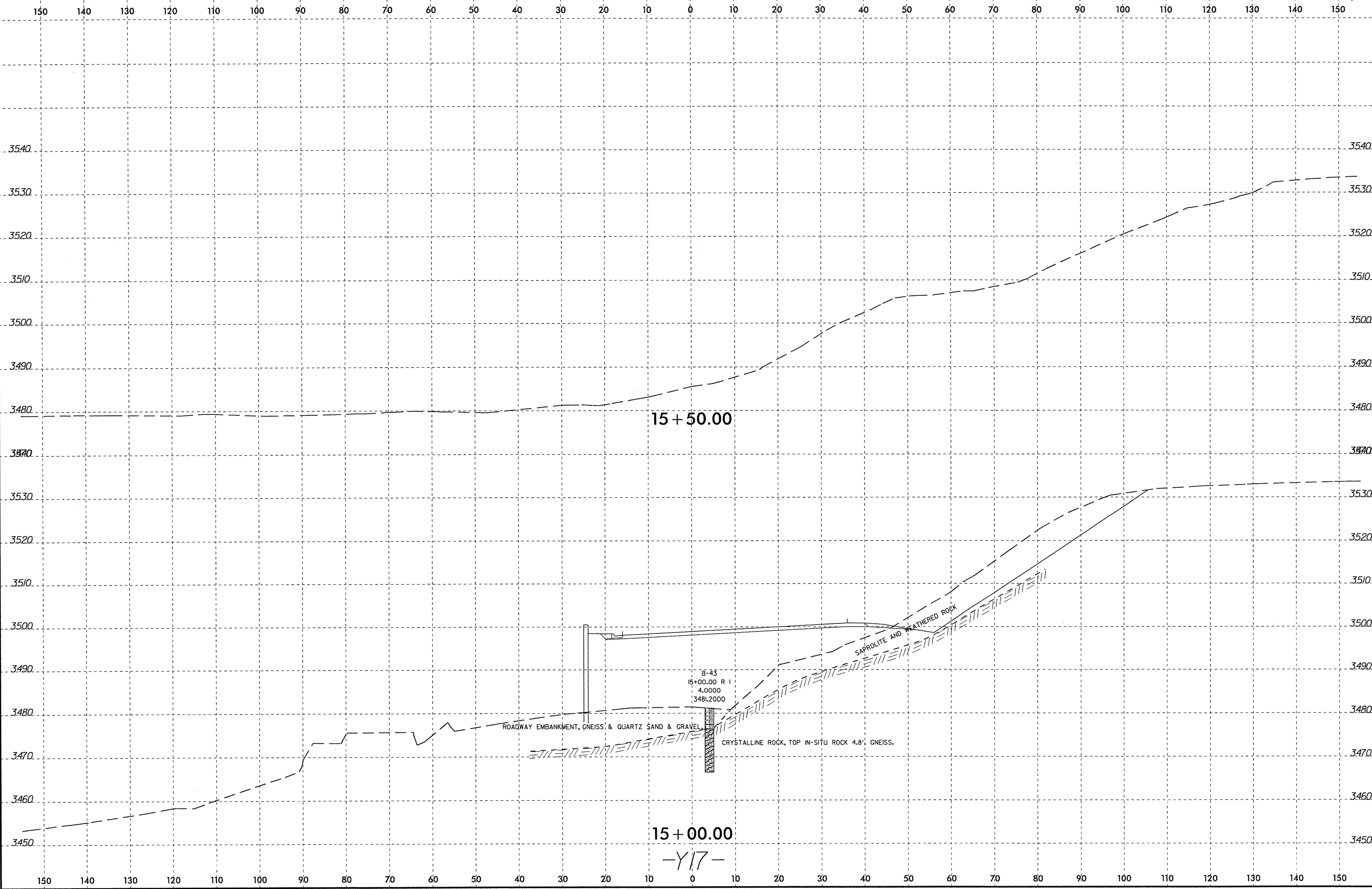


14 + 50.00

14 + 00.00

-Y17-

8/23/74
SYTIME



15 + 50.00

15 + 00.00

-Y17-

JCS
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
 SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #: --

REPORT ON SAMPLES OF: Soils for Quality

PROJECT:	34402.1.1	COUNTY:	Haywood/Jackson	Owner:	
DATE SAMPLED:	1.14.08	DATE RECEIVED:	2.5.08	DATE REPORTED:	2.12.08
SAMPLED FROM:	US 321	SAMPLED BY:	J. C. Kuhne		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-1	SS-2	SS-3	SS-4	SS-5	SS-7	SS-8	SS-9
Lab Sample No. A	156944	156945	156946	156947	156948	156949	156950	156951
HiCAMS Sample #	--	--	--	--	--	--	--	--
Retained #4 Sieve %	0.0	0.0	0.0	0.0	14.1	0.0	0.0	0.0
Passing #10 Sieve %	83	79	96	90	62	93	80	84
Passing #40 Sieve %	74	63	91	77	49	75	67	63
Passing #200 Sieve %	51	34	70	39	27	35	44	31

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	19	30	10	23	32	30	25	35
Fine Sand - Ret. #270	20	35	28	42	29	40	24	38
Silt 0.05-0.005 mm %	41	29	54	27	21	20	35	25
Clay < 0.005 mm %	20	6	8	8	18	10	16	2
Passing # 40 Sieve %	--	--	--	--	--	--	--	--
Passing # 200 Sieve %	--	--	--	--	--	--	--	--

Liquid Limit	40	30	39	30	28	28	29	32
Plastic Index	NP	NP	NP	NP	NP	NP	NP	NP
AASHTO Classification	A-4 (3)	A-2-4 (0)	A-4 (7)	A-4 (1)	A-2-4 (0)	A-2-4 (0)	A-4 (2)	A-2-4 (0)
Quantity								
Texture								
Station	358+70	358+70	358+70	358+70	12+20	366+87	368+00	358+50
Hole No.								
Depth (ft) From:	1'	1'	1'	1'	1'	1'	1'	1'
To:								

Remarks:
 A-156944 - 156951

CC:
 J. C. Kuhne
 File

SOILS ENGINEER:

JCS
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS-MATERIALS AND TESTS UNIT
 SOILS TEST REPORT-SOILS LABORATORY

T.I.P. ID #: --

REPORT ON SAMPLES OF: Soils for Quality

PROJECT:	34402.1.1 (cont)	COUNTY:	Haywood/Jackson	Owner:	--
DATE SAMPLED:	1.14.08	DATE RECEIVED:	2.5.08	DATE REPORTED:	2.12.08
SAMPLED FROM:	US 321	SAMPLED BY:	J. C. Kuhne		
SUBMITTED BY:	W. D. Frye	2002	STANDARD SPECIFICATION		
LABORATORY:	Asheville				

TEST RESULTS

Project Sample No.	SS-10	B-4						
Lab Sample No. A	156952	156953						
HiCAMS Sample #	--	--						
Retained #4 Sieve %	3.0	5.8						
Passing #10 Sieve %	89	77						
Passing #40 Sieve %	74	62						
Passing #200 Sieve %	40	40						

MINUS #10 FRACTION

Soil Mortar - 100%								
Coarse Sand -Ret. #60	26	29						
Fine Sand - Ret. #270	43	21						
Silt 0.05-0.005 mm %	29	38						
Clay < 0.005 mm %	2	12						
Passing # 40 Sieve %	--	--						
Passing # 200 Sieve %	--	--						

Liquid Limit	40	36						
Plastic Index	NP	NP						
AASHTO Classification	A-4 (1)	A-4 (1)						
Quantity								
Texture								
Station	358+50	11+00						
Hole No.								
Depth (ft) From:	1'	1'						
To:								

Remarks:
 A-156952 & 156953

CC:
 J. C. Kuhne
 File

SOILS ENGINEER: