

NOTE: SEE SHEET 1A 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. | B-3377 | 1 | 7 |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 33025.1.1 | BRZ-1217(3) | PE | |
| 33025.2.2 | BRZ-1217(3) | RW & UTILITIES | |
| 33025.3.1 | BRZ-1217(3) | CONSTRUCTION | |

CONTENTS

| LINE | STATION | PLAN | PROFILE | XSECT |
|------|-------------------|------|---------|-------|
| -L- | 14+75 TO 23+50 | 4 | N/A | 5 - 7 |
| -Y- | 10.00 TO 11+39.15 | 4 | N/A | N/A |

ROADWAY
SUBSURFACE INVESTIGATION

PROJ. REFERENCE NO. B-3377 F.A. PROJ. 33025.1.1
COUNTY WATAUGA
PROJECT DESCRIPTION BRIDGE NO. 302 ON SR 1233 OVER COVE CREEK

INVENTORY

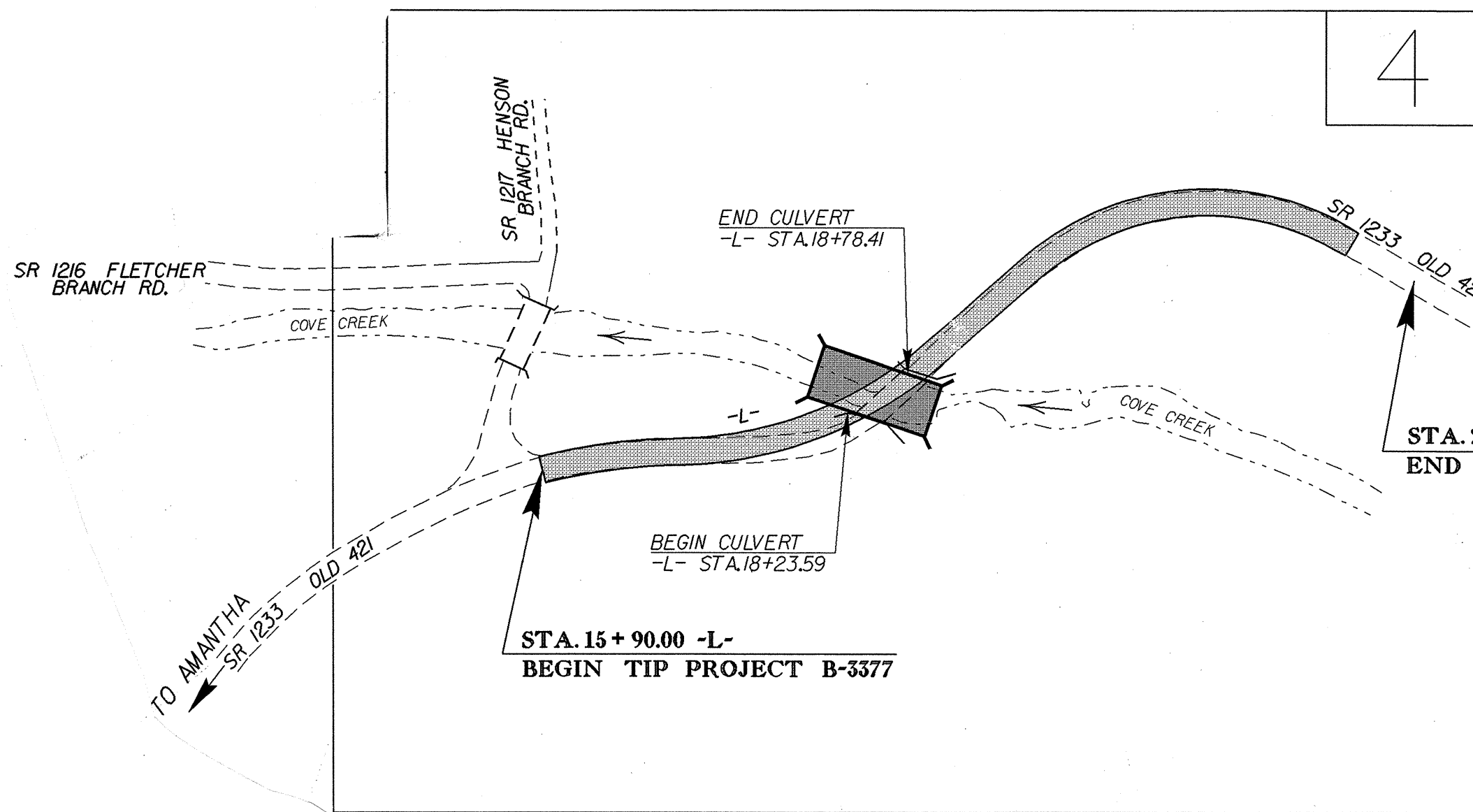
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ID: B-3377

CONTRACT:



PERSONNEL
P.Q. LOCKAMY
M.M. HAGER
J.T. WILLIAMS

INVESTIGATED BY **P.Q. LOCKAMY**
CHECKED BY **W.D. FRYE**
SUBMITTED BY **W.D. FRYE**
DATE **8/27/07**

DRAWN BY: **J.T. WILLIAMS**

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NOTE - BY HAVING REQUESTED THIS INFORMATION THE CONTRACTOR SPECIFICALLY WAIVES ANY CLAIMS FOR INCREASED COMPENSATION OR EXTENSION OF TIME BASED ON DIFFERENCES BETWEEN THE CONDITIONS INDICATED HEREIN AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

NORTH CAROLINA
LICENSED
SEAL
1907
GEOLOGIST
Patrick Q. Lockamy
8-27-07

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS
GEOTECHNICAL ENGINEERING UNIT

SUBSURFACE INVESTIGATION

SOIL AND ROCK LEGEND, TERMS, SYMBOLS, AND ABBREVIATIONS

Table containing SOIL DESCRIPTION, GRADATION, ROCK DESCRIPTION, TERMS AND DEFINITIONS, SOIL LEGEND AND AASHTO CLASSIFICATION, MINERALOGICAL COMPOSITION, COMPRESSIBILITY, PERCENTAGE OF MATERIAL, GROUND WATER, MISCELLANEOUS SYMBOLS, ABBREVIATIONS, SOIL MOISTURE - CORRELATION OF TERMS, PLASTICITY, COLOR, EQUIPMENT USED ON SUBJECT PROJECT, FRACTURE SPACING, BEDDING, and INDURATION.



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

DAVID MCCOY
SECRETARY

August 28, 2007

STATE PROJECT: 33025.1.1 (B-3377)
FEDERAL PROJECT: BRZ - 1217 (3)
COUNTY: Watauga

DESCRIPTION: Bridge No. 302 over Cove Creek on SR 1233

SUBJECT: Geotechnical Report – Inventory Revised

Project Description

This project has been revised from new location back to existing location. Line -L- now goes up the middle of existing SR-1233. This Inventory Report considers a small area along the new -L- Line where a five foot deep, 2:1 cut is proposed. Earthwork on the rest of the project involves smaller cuts and fills.

The previous subsurface investigation, conducted in January of 2003, used a CME-550 ATV mounted drill. This investigation used rod soundings to determine the depth to crystalline rock line in the cut of concern. Soils and weathered rock were not sampled here and are described as undifferentiated. Two Standard Penetration Tests along with two soil samples and one moisture sample from the 2003 investigation and six recent rod soundings are utilized here.

Nomenclature describing rock, particularly hard rock as used in the 2003 Inventory Report has been replaced by the term of crystalline rock in this report where applicable.

This project is comprised of the following alignments:

- L- Stations 14+75.00 to 23+50.00
- Y- Stations 10+00.00 to 11+39.15

Areas of Special Geotechnical Interest

1. The following section was found to have crystalline rock within 6 feet of grade:

| <u>Station</u> | <u>Offset</u> |
|---------------------------|---------------|
| -L-Station 16+50 to 18+00 | Right of -L- |

Physiography

The area is in a high mountain valley formed by erosion along the contact of an intrusion. Mass wasting events have shaped the slopes.

Rock types include sheared metamorphosed granite and the local country rock.

Soil Properties

These soil descriptions are taken from the February 2003 Inventory Report. Soils were not sampled during the bridge rod soundings conducted during this inventory.

The soils on this project are chiefly colluvial and alluvial, in addition to small amounts of embankment, saprolite, weathered rock, and crystalline rock.

Toe slope colluvium occupies the surface of the natural slopes to the right of -L- between Stations 14+75 to 18+20. Toe slope colluvial deposits consist of 3 to 6 feet of sandy silt and sandy, clayey silt with a few small rock fragments.

Colluvial fan deposits are present left of -L- from near Station 20+00 to the end of the project. Fan deposits here are layered with a mature cap of 3 to 5 feet of stiff silty clay over approximately 8 feet of gravelly sand with cobbles and small boulders underlain by crystalline rock.

Thin saprolitic silts are found beneath toe slope colluvium. Saprolite grades rapidly to a thin rind of weathered rock. Crystalline rock is shallow.

Alluvial soils present have a few feet of sandy silt and silty sand overlying silty, coarse sand and gravel.

Alluvial terrace deposits are a few feet higher in elevation than the recent alluvium and are present right of -L- from the northeast end of Bridge No. 302 to the end of the project. Terrace alluvium has weak layering with a thin cap of sandy silt and silty sand overlying

about 3 feet of coarse sand and gravel. In places, the terrace is overlain by fan colluvium and the silty alluvial cap has been plugged with clay.

Embankment consists of medium stiff sandy silt.

Groundwater

Groundwater was encountered at an elevation of 2,725 feet in the SPT boring 35 feet right of -L- Station 15+85.

Respectfully Submitted,

P. Q. Lockamy
PQ Lockamy, LG

EARTHWORK BALANCE SHEET

Volumes in Cubic Yards

PROJECT TIP # B-3377

COUNTY Watauga

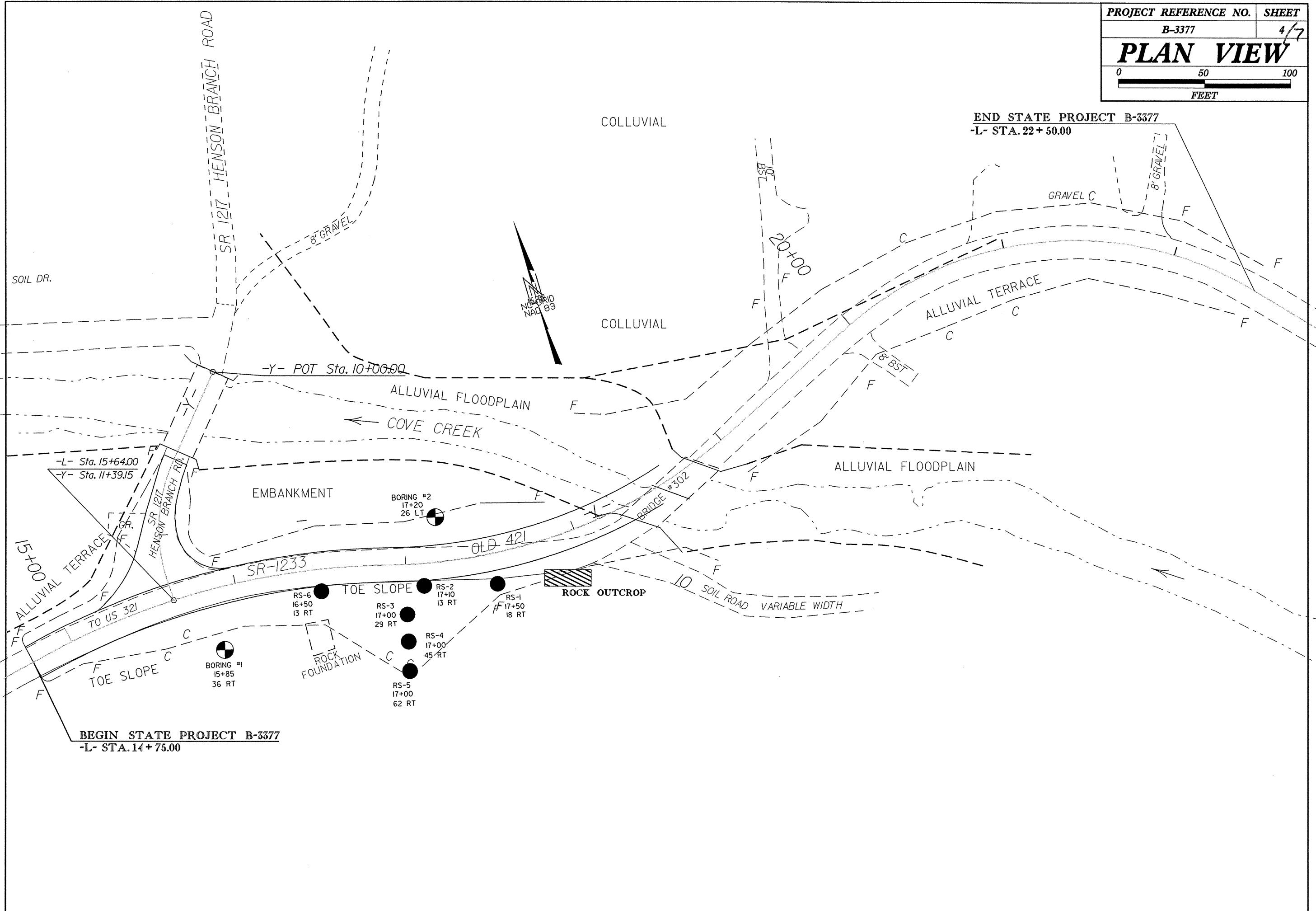
DATE 9/26/2008

SHEET 3C OF 7 SHEETS

| LINE | STATION | STATION | TOTAL EXCAV. (UNCL.) | ROCK EXCAV. | UNDERCUT EXCAV. | UNSUIT. EXCAV. | SUITABLE EXCAV. | TOTAL EMB. | ROCK EMB. | UNDERCUT EMB. | EARTH EMB. | EMB. + % | BORROW | SUITABLE WASTE | UNSUIT. WASTE | TOTAL WASTE |
|------------------------------------------|----------|----------------------------|----------------------|-------------|-----------------|----------------|-----------------|------------|-----------|---------------|------------|----------|--------|----------------|---------------|-------------|
| L | 15+90.00 | 18+50.00 CENTER CULVERT | 431 | 66 | | | 365 | 1,597 | 66 | | 1,514 | 1,807 | 1,376 | | | |
| SUBTOTAL 1 | | | 431 | 66 | | | 365 | 1,597 | 66 | | 1,514 | 1,807 | 1,376 | | | |
| L | 18+50.00 | 23+10.00 CENTER CULVERT | 57 | | | | 57 | 2,153 | | | 2,153 | 2,476 | 2,419 | | | |
| SUBTOTAL 2 | | | 57 | | | | 57 | 2,153 | | | 2,153 | 2,476 | 2,419 | | | |
| PROJECT SUBTOTAL | | | 488 | 66 | | | 422 | 3,750 | 66 | | 3,667 | 4,283 | 3,795 | | | |
| LOSS DUE TO CLEARING & GRUBBING | | | -100 | | | | -100 | | | | | | 100 | | | |
| EMB. ADJ. FOR CULVERT (100'x42'x10.5') | | | | | | | | -1,633 | | | -1,633 | -1,878 | -1,878 | | | |
| PROJECT TOTAL | | | 388 | 66 | | | 322 | 2,117 | 66 | | 2,034 | 2,405 | 2,017 | | | |
| EST 5% TO REPLACE TOP SOIL ON BORROW PIT | | | | | | | | | | | | | 101 | | | |
| GRAND TOTAL | | | 388 | 66 | | | | | | | | | 2,118 | | | |
| SAY | | | 450 | | | | | | | | | | 2,150 | | | |
| EST. UNDERCUT EXCAVATION = 50 CY | | | | | | | | | | | | | | | | |
| EST. DDE = 100 CY | | | | | | | | | | | | | | | | |
| PAVEMENT STRUCTURE VOLUME = 50 CY | | | | | | | | | | | | | | | | |

*** 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.**

END STATE PROJECT B-3377
 -L- STA. 22 + 50.00



BEGIN STATE PROJECT B-3377
 -L- STA. 14 + 75.00



- RS-6
16+50
13 RT
- RS-3
17+00
29 RT
- RS-4
17+00
45 RT
- RS-5
17+00
62 RT
- RS-2
17+10
13 RT
- RS-1
17+50
18 RT

BORING #1
15+85
36 RT

BORING #2
17+20
26 LT

-L- Sta. 15+64.00
 -Y- Sta. 11+39.15

-Y- POT Sta. 10+00.00

SOIL DR.

COLLUVIAL

COLLUVIAL

ALLUVIAL FLOODPLAIN

EMBANKMENT

ALLUVIAL FLOODPLAIN

← COVE CREEK

ALLUVIAL TERRACE

ROCK OUTCROP

ROCK FOUNDATION

SOIL ROAD VARIABLE WIDTH

OLD 421

BRIDGE #302

TO US 321

SR-1233

SR 1217 HENSON BRANCH ROAD

8' GRAVEL

20+00

GRAVEL C

8' GRAVEL

8' BST

8' BST

15+00 ALLUVIAL TERRACE

TOE SLOPE

TOE SLOPE

C

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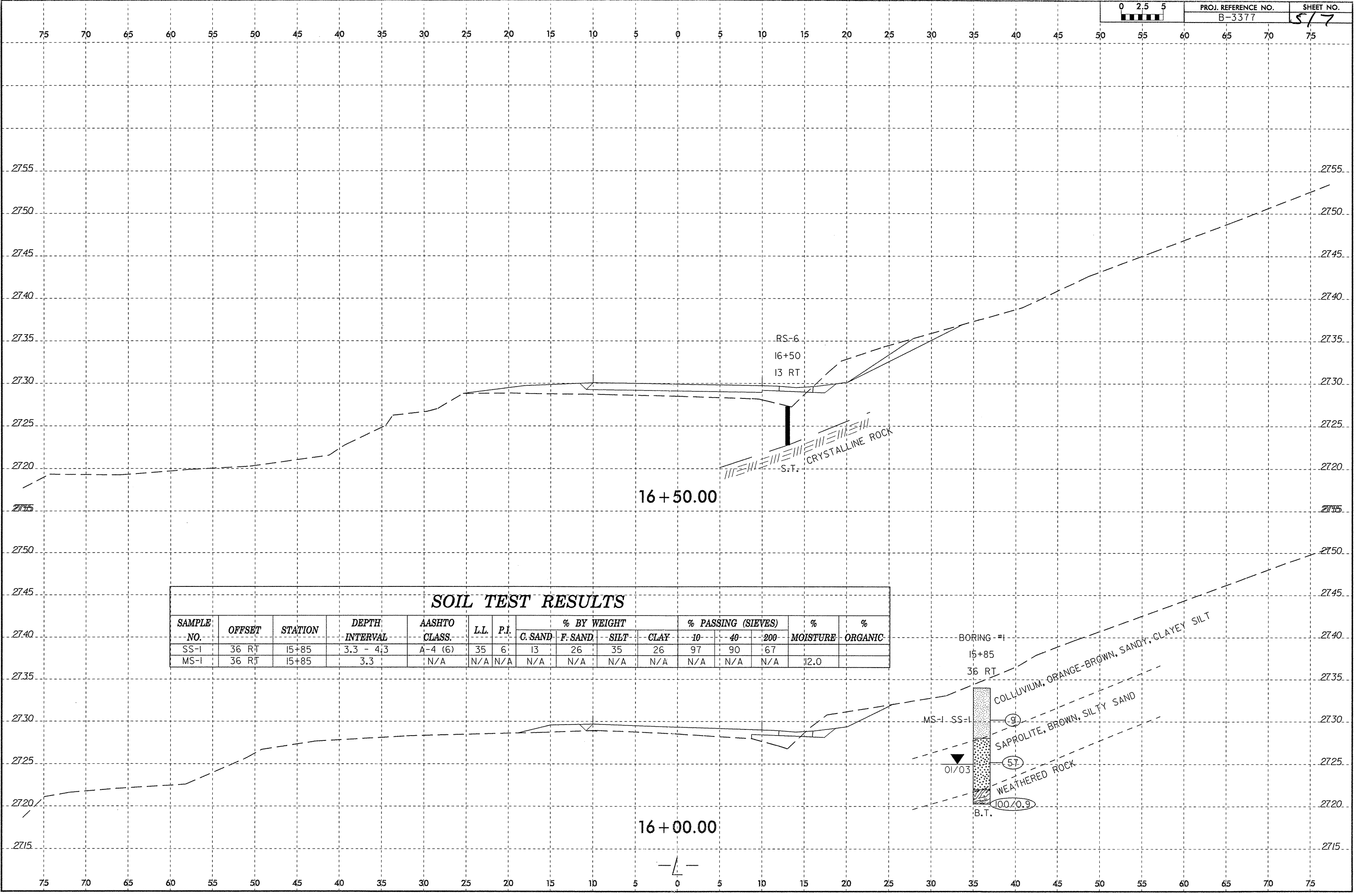
C

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B:23/9: \$\$\$USERNAME\$\$\$



16 + 50.00

16 + 00.00

SOIL TEST RESULTS

| SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.I. | % BY WEIGHT | | | | % PASSING (SIEVES) | | | % MOISTURE | % ORGANIC |
|------------|--------|---------|----------------|---------------|------|------|-------------|---------|------|------|--------------------|-----|------|------------|-----------|
| | | | | | | | C. SAND | F. SAND | SILT | CLAY | 10 | 40 | 200 | | |
| SS-1 | 36 RT | 15+85 | 3.3 - 4.3 | A-4 (6) | 35 | 6 | 13 | 26 | 35 | 26 | 97 | 90 | 67 | | |
| MS-1 | 36 RT | 15+85 | 3.3 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 12.0 | | |

BORING #1

15+85

36 RT

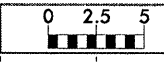
MS-1-SS-1

01/03

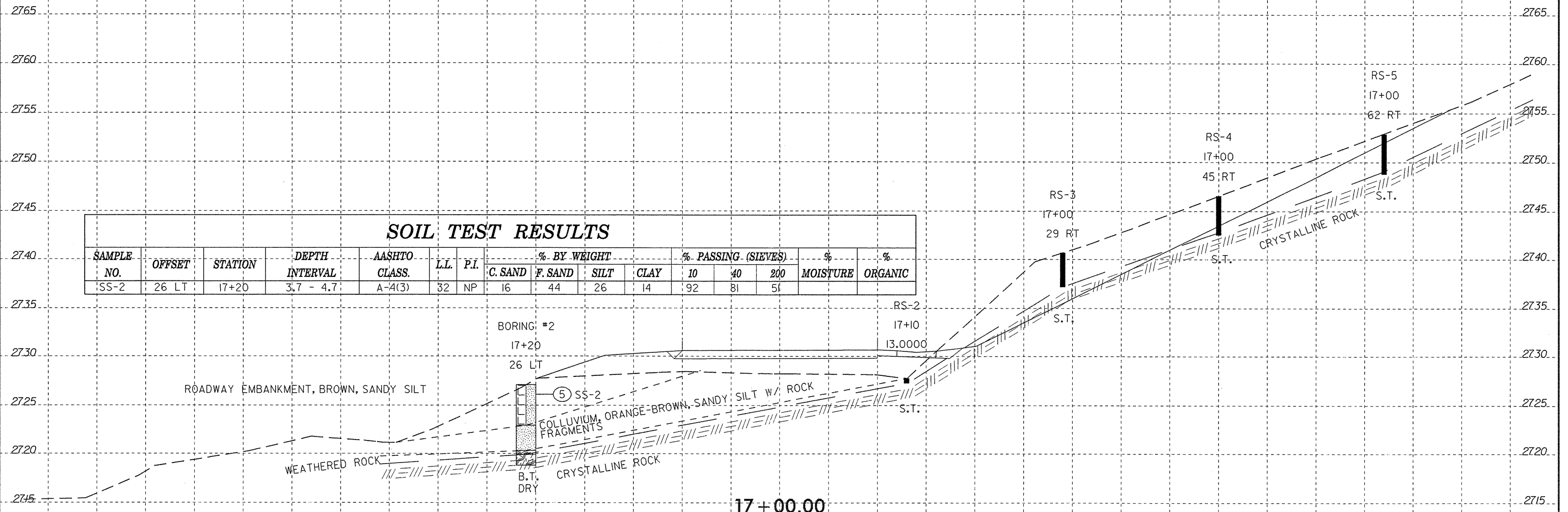
B.T.

COLLUVIUM, ORANGE-BROWN, SANDY, CLAYEY SILT
 (9)
 SAPROLITE, BROWN, SILTY SAND
 (57)
 WEATHERED ROCK
 (100/0.9)

8/23/91



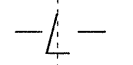
75 70 65 60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75



SOIL TEST RESULTS

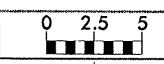
| SAMPLE NO. | OFFSET | STATION | DEPTH INTERVAL | AASHTO CLASS. | L.L. | P.I. | % BY WEIGHT | | | | % PASSING (SIEVES) | | | % MOISTURE | % ORGANIC |
|------------|--------|---------|----------------|---------------|------|------|-------------|---------|------|------|--------------------|----|-----|------------|-----------|
| | | | | | | | C. SAND | F. SAND | SILT | CLAY | 10 | 40 | 200 | | |
| SS-2 | 26 LT | 17+20 | 3.7 - 4.7 | A-4(3) | 32 | NP | 16 | 44 | 26 | 14 | 92 | 81 | 51 | | |

17+00.00

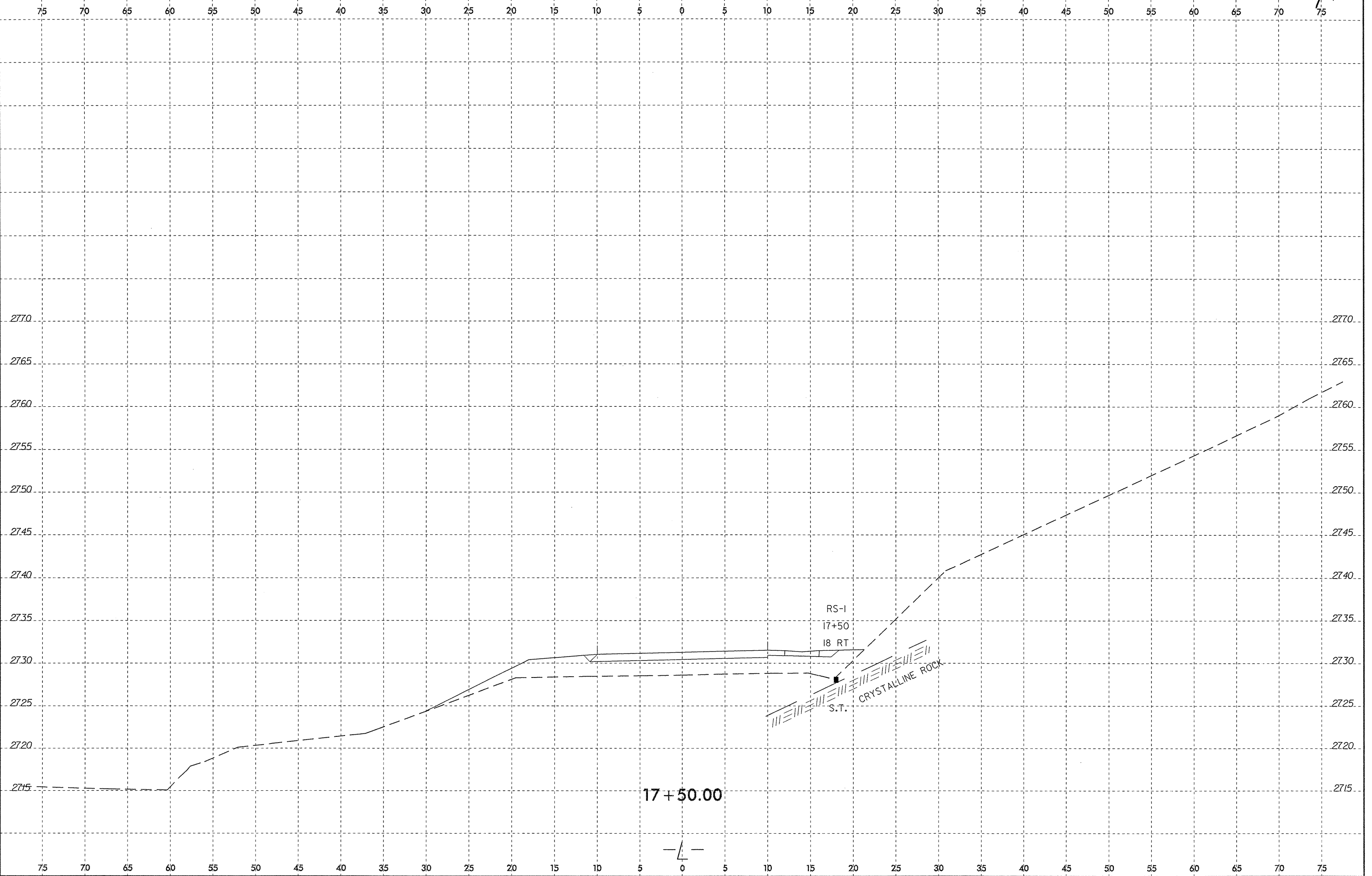


*****SYTIME*****
*****DCON*****
*****LE*****

8/23/91



| | |
|-------------------------------|------------------|
| PROJ. REFERENCE NO. B-3377 | SHEET NO. 7/7 |
|-------------------------------|------------------|



*****SYTIME*****
*****DOWNS*****
*****PLOT*****

17+50.00

