



# Converse Consultants

Geotechnical Engineering, Environmental & Groundwater Science, Inspection & Testing Services

July 27, 2017

Ms. Rebecca Mitchell  
Mt. San Antonio College  
Facilities Planning & Management  
1100 North Grand Avenue  
Walnut, California 91789-5611

Subject: **WEST PARCEL - LANDSLIDE TOE TEST PIT TRENCH STUDY**  
**Mt. San Antonio College West Parcel Solar Project**  
1100 North Grand Avenue  
Walnut, California 91789  
Converse Project No. 13-31-339-30

Reference: Converse Consultants, Geotechnical Study Report, Proposed Fill Placement at the West Parcel, Mount San Antonio College, Walnut, California, dated December 19, 2014, Converse Project No. 13-31-339-01

Dear Ms. Mitchell,

## INTRODUCTION

Converse Consultants (Converse) presents this preliminary report to summarize the findings of four (4) exploratory test pit trenches excavated along the toe of an existing road cut landslide that occurred during previous grading work to widen Grand Avenue in the late 1970's. The road cut landslide is located on a natural hillside slope on the central portion of the West Parcel site along Grand Avenue. The road cut landslide has continued to enlarge and creep downslope to Grand Avenue during the past 38 years. The unstable landslide deposits threaten Grand Avenue with slope instability and sudden ground movement. The unstable landslide deposits will be completely removed and replaced with engineered compacted fills keyed and benched into the underlying undisturbed bedrock materials during grading for the West Parcel Solar Project.

The purpose of the four (4) exploratory test pit trenches was to determine the depth and extent of landslide deposits along the toe of the landslide along Grand Avenue and to evaluate the sedimentary bedrock structure and material properties. The four (4) exploratory test pit trenches were excavated with a Kobelco SK210-9 track-mounted excavator on June 9 and June 12, 2017. The approximate location of the four (4) exploratory test pit trenches are shown on Drawing No. 1, *Road Cut Landslide Evaluation*. The four (4) test pit trench logs are presented on Drawing Nos. 1a through 1d, *Road Cut Landslide Toe - Test Pit No. 1, No. 2, No. 3, and No. 4*. This preliminary report provides information and data for the Draft Environmental Impact Report (DEIR).

## BACKGROUND

The road cut landslide occurred in the late 1970's as a result of previous grading activity by others to widen Grand Avenue. Evidence of the landslide on the road cut slope above Grand Avenue is visible in historic aerial photographs starting in 1979. No drainage control devices (brow ditches, terrace drains, down drains, catch basins, etc.) were observed or constructed on the hillside cut slope at the time it was graded to collect and control surface runoff on the slope face. The landslide was likely triggered by three (3) years of above normal rainfall between 1977 and 1980. Dozer cuts were made at the top of the hillside which directed surface runoff directly into the head scarp of the landslide.

The landslide was not repaired or restored. The unrepaired landslide has gradually grown over the past 38 years since it occurred. The landslide growth over the years has caused significant damage to the West Parcel property. The landslide deposits are vulnerable to further sliding and ground movement. The landslide presents a continued hazard of slope instability and has a potential for sudden ground movement following wet weather periods to Grand Avenue.

## TEST PIT TRENCH FINDINGS

The four (4) exploratory test pit trenches excavated along the toe of the existing landslide were used to identify the depths and limits of the landslide toe along the west side of Grand Avenue. As shown in Drawing Nos. 1a through 1d, *Road Cut Landslide Toe – Test Pit No. 1, No. 2, No. 3, and No. 4*, the landslide slip plane generally occurs between elevations 715 feet and 720 feet along the toe of the landslide deposits. These elevations are at or near the same elevations as the west side of Grand Avenue. The proposed keyway excavations with a minimum width of 25 feet and a minimum embedment depth of approximately 5 feet should completely remove the landslide deposits and slip plane along the toe of the landslide.

The width of the proposed keyway excavations will likely be increased westward into the property from the minimum 25-foot width to keyways that are 30 to 40 feet wide. The depth of the proposed keyway of approximately 5 feet below ground surface should not impact stability of Grand Avenue during excavation. Safe setbacks will need to be maintained for buried utility lines located along Grand Avenue during keyway excavations.

The four (4) exploratory test pit trench excavations provided information on the undisturbed bedrock structure and materials beneath the landslide deposits. The trench excavations permitted direct field measurements of the strike and dip of the underlying undisturbed bedrock formations. As shown on the test pit logs, the strike of the bedding attitudes ranged from North 52 degrees East to North 88 degrees West with bedding dips ranging from 12 degrees North to 22 degrees Northwest. These bedding attitudes are similar to the previously measured bedding attitudes measured on the project site for



undisturbed bedrock materials. These bedding attitudes will produce neutral to favorable orientations with respect to proposed temporary and permanent cut slopes.

The four (4) exploratory test pit excavations provided information on the disturbed bedrock materials above the landslide slip plane within the landslide deposits. The bedding structure above the landslide slip plane were disturbed by landslide movement, displacement and rotation. The disturbed landslide deposits exhibited localized eastward dipping bedding planes. The landslide deposits were found to be loose, disturbed, broken and unstable.

### **PROPOSED GRADING OF WEST PARCEL**

The unstable landslide deposits will be completely removed and replaced with engineered compacted fills that are keyed and benched into the underlying undisturbed bedrock materials during grading for the West Parcel Solar Project.

The proposed grading for the West Parcel Solar Project will remove and lower the hilltop and landslide down approximately 54 feet to the solar project pad level at elevation 761 feet. The earth materials excavated from the hilltop removal will be placed as engineered compacted fills within the intervening valleys of the West Parcel.

The eastern slope face of the hillside that remains above Grand Avenue will be laid back as a 2:1 (horizontal : vertical) fill slope for the proposed access road and terrace drains. The fill slope will be buttressed with engineered compacted fills that are keyed and benched into undisturbed bedrock materials. The size, width and depth of the keyways and bench cuts will be increased during grading to remove all the disturbed landslide deposits and support the new compacted fill soils on undisturbed bedrock materials. Subdrain systems will be installed in the bottom of the keyways and along the backslope to provide subsurface drainage and prevent build-up of hydrostatic pressure behind the compacted fills. The landslide deposits will be completely removed and replaced with engineered compacted fills keyed and benched into the underlying undisturbed bedrock materials during grading of the West Parcel Solar Project.

Grading will be performed in accordance with current grading codes. Compacted fill soils will not be placed over the landslide deposits. All disturbed landslide deposits will be removed and replaced with compacted fills. Grading observations and monitoring will be performed during project grading to verify that suitable bottom materials are reached and that the compacted fills are placed in accordance with project plans and specifications.

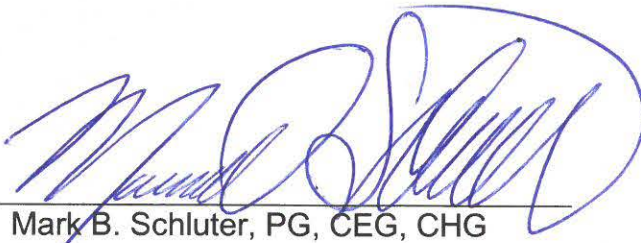
The graded slope areas will be constructed with non-erosive drainage control devices (including brow ditches, terrace drains, down drains, catch basins, etc.) to control surface runoff, reduce infiltration into slopes and direct surface runoff to suitable disposal points.

The graded slope areas will be landscaped to control surface erosion and improve slope appearances.

The proposed grading of the West Parcel Solar Project will improve the overall slope stability along the west side of Grand Avenue and for the adjacent offsite properties and homes along the west side of the property.

Sincerely,

**CONVERSE CONSULTANTS**



Mark B. Schluter, PG, CEG, CHG  
Senior Engineering Geologist

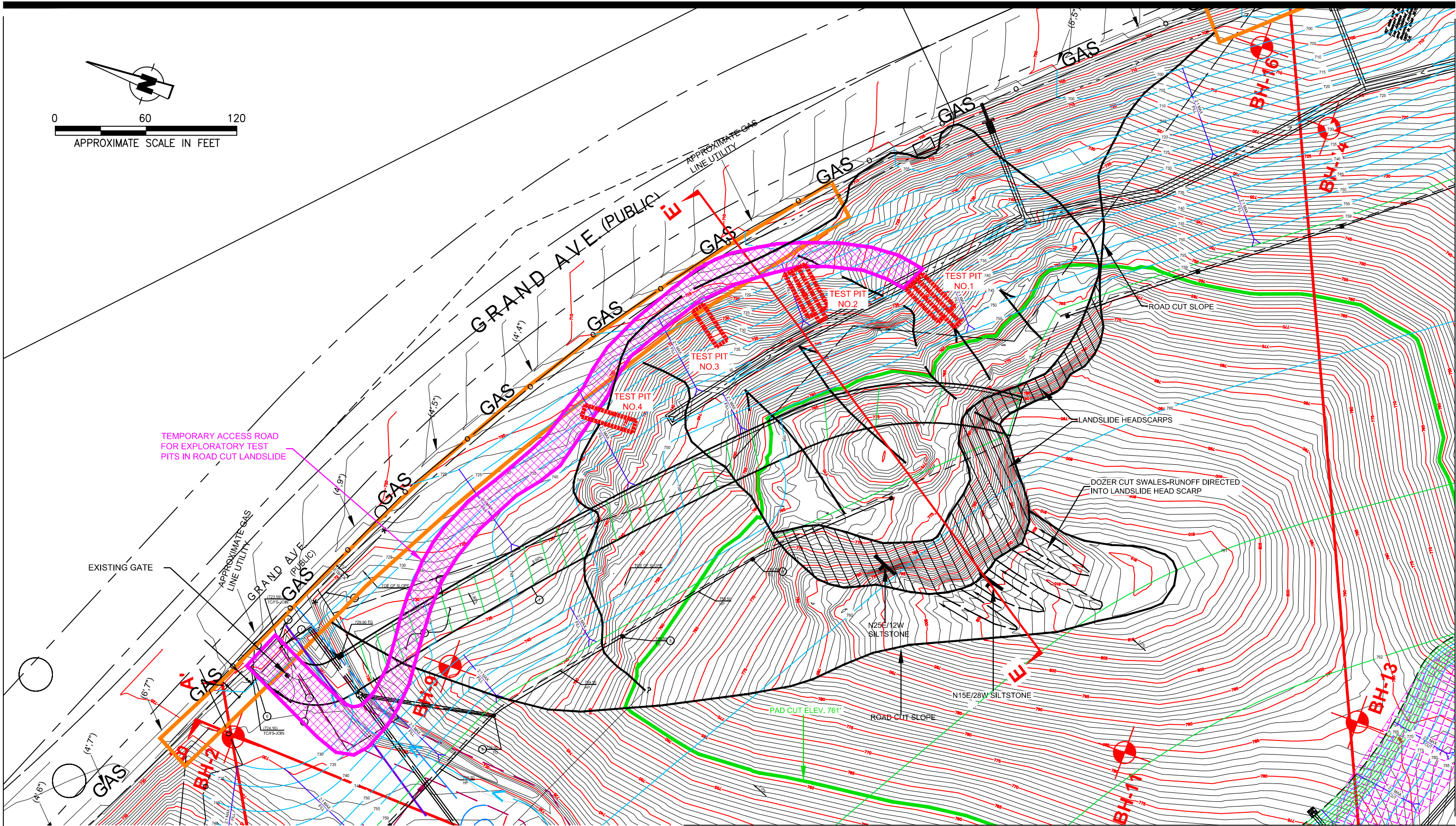
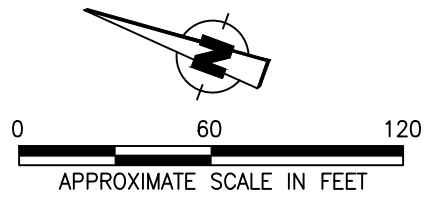


Dist: 1/Addressee  
Encl: Drawing No. 1, Road Cut Landslide Evaluation  
Drawing No. 1a, Road Cut Landslide Toe - Test Pit No. 1  
Drawing No. 1b, Road Cut Landslide Toe - Test Pit No. 2  
Drawing No. 1c, Road Cut Landslide Toe - Test Pit No. 3  
Drawing No. 1d, Road Cut Landslide Toe - Test Pit No. 4



# Drawings





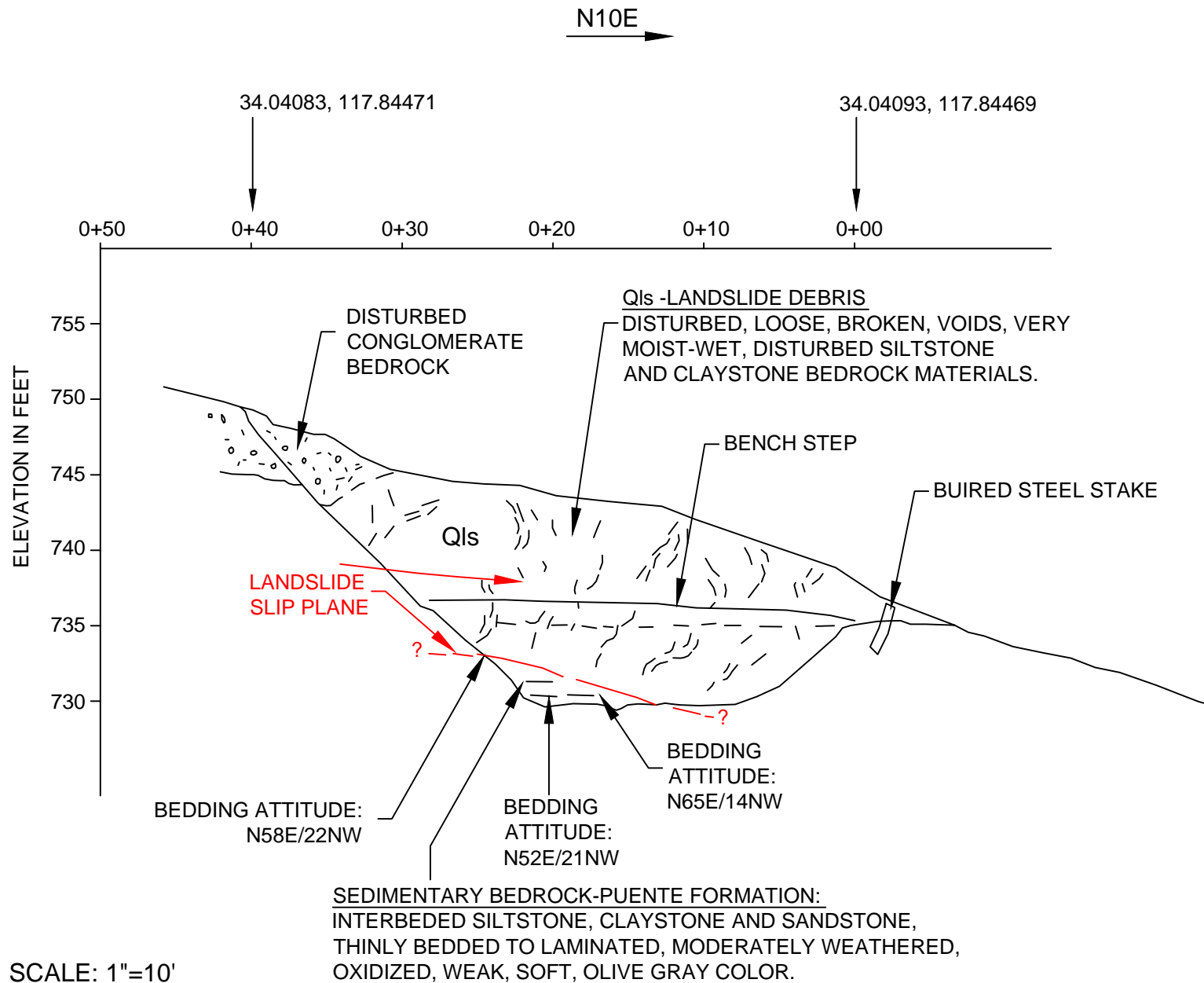
## ROAD CUT LANDSLIDE EVALUATION



WEST PARCEL  
 MT. SAN ANTONIO COLLEGE  
 WALNUT, CALIFORNIA

Project No.  
 13-31-339-02

Drawing No.  
 1

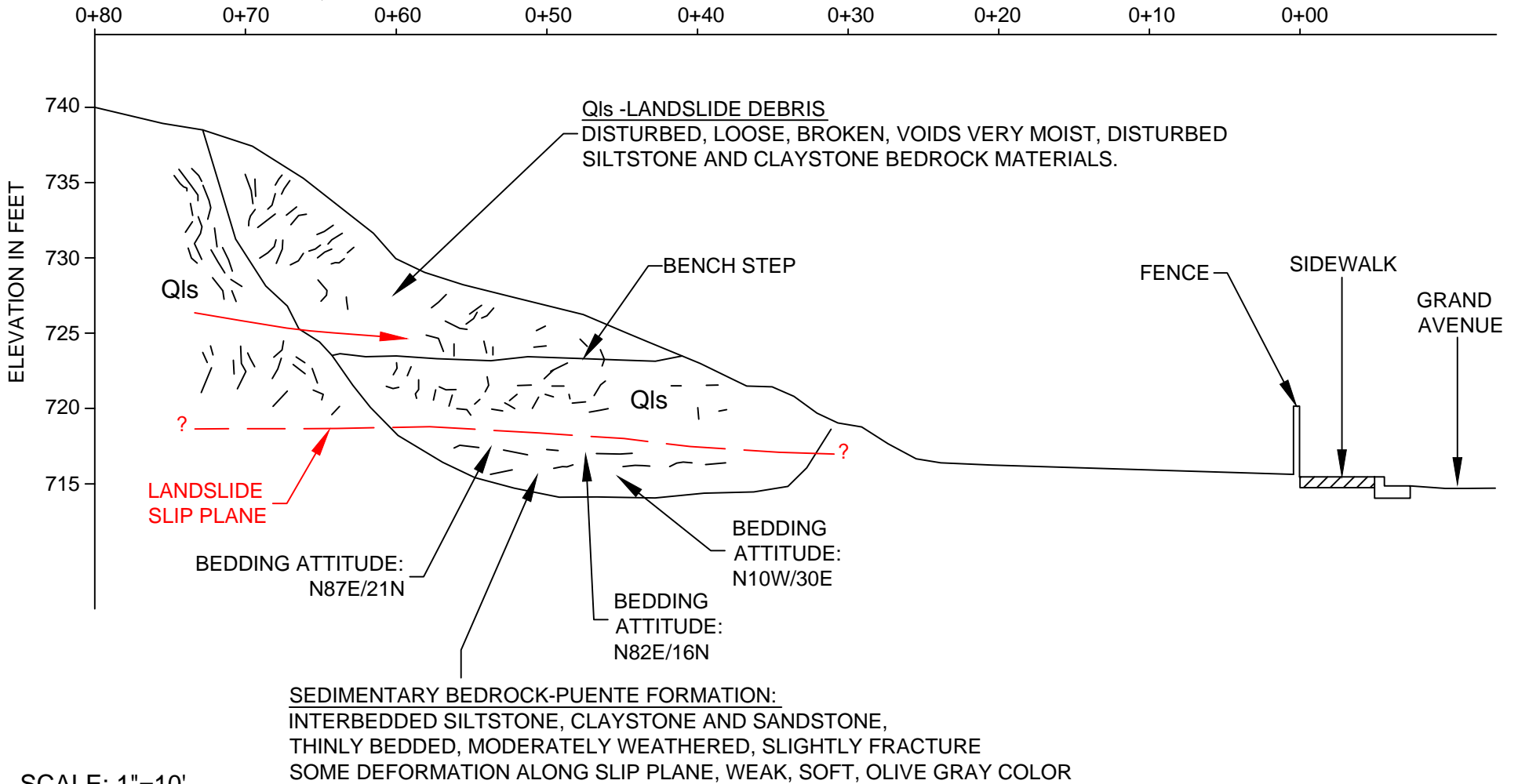


## ROAD CUT LANDSLIDE TOE - TEST PIT NO. 1

TRENCH WALL N40E

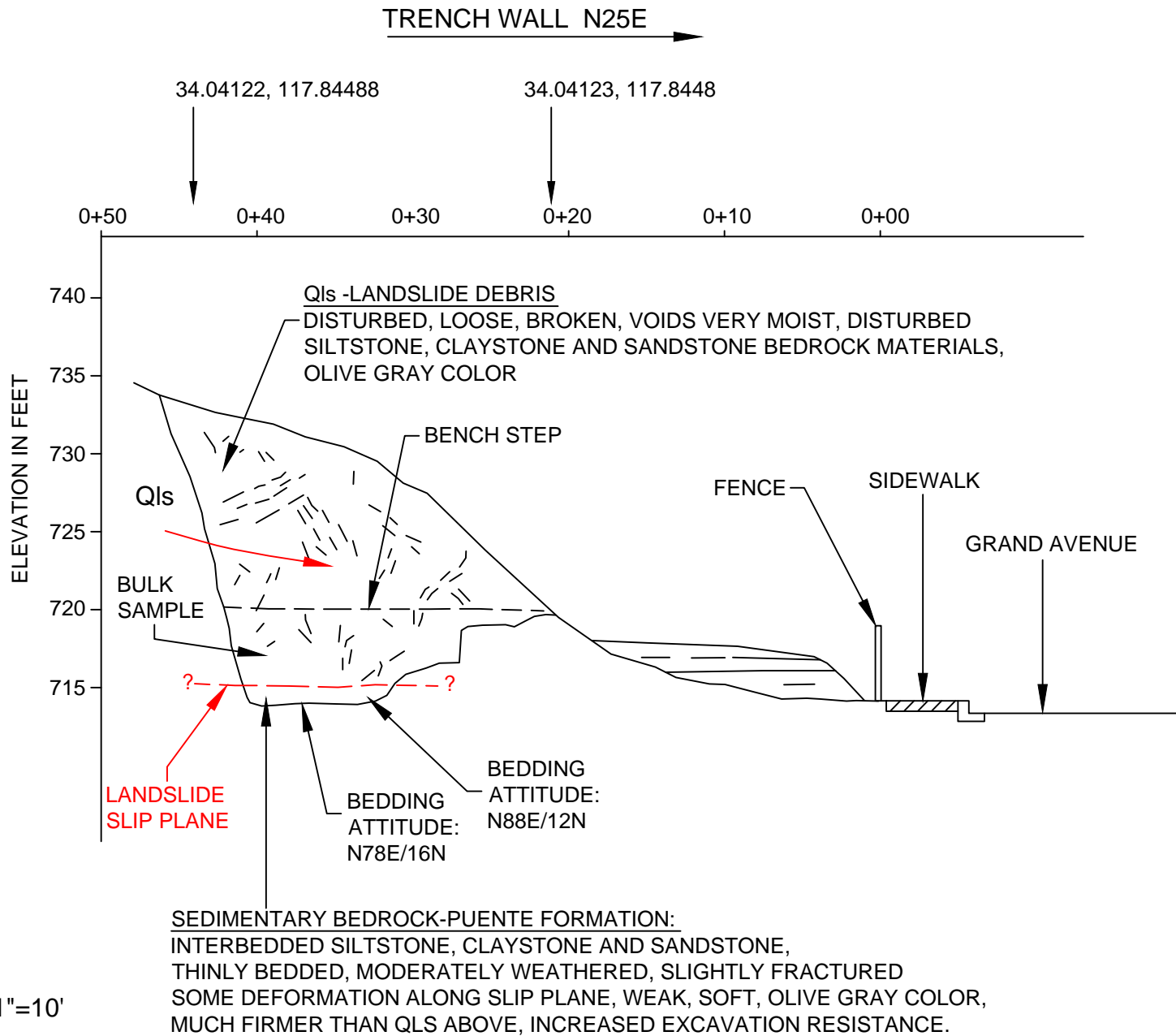
34.04108, 117.84478

34.04115, 117.84474



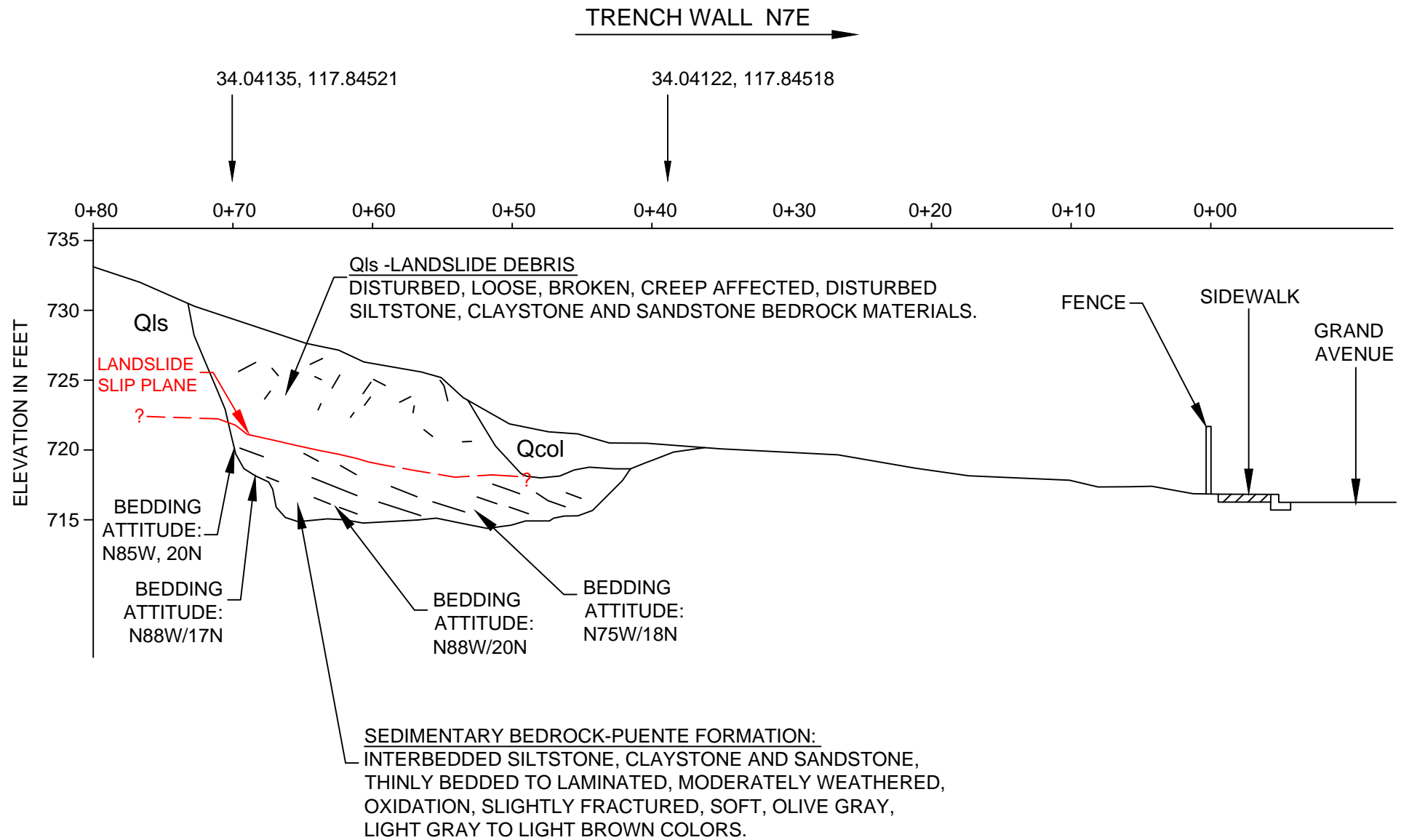
ROAD CUT LANDSLIDE TOE - TEST PIT NO. 2





SCALE: 1"=10'

### ROAD CUT LANDSLIDE TOE - TEST PIT NO. 3



SCALE: 1"=10'

### ROAD CUT LANDSLIDE TOE - TEST PIT NO. 4