STATE OF COLORADO

Eschberger - DNR, Amy <amy.eschberger@state.co.us>

HRR

Paul Kos <PKos@norwestcorp.com> Mon, Mar 26, 2018 at 2:27 PM
To: "Eschberger - Dnr, Amy" <amy.eschberger@state.co.us>

Amy
Attached is the response to the third adequacy letter.
Paul

2 attachments

attachment 1.pdf
12733K

ATT00001.txt
1K

Transit Mix Concrete Co.

HITCH RACK RANCH QUARRY

M-2017-049

Permit Application Package

Submitted to

Colorado Division of Reclamation Mining and Safety

In Compliance with the

Mineral Rules and Regulations

of the

Colorado Mined Land Reclamation Board

for the

Extraction of Construction Materials

And Section 34-32.5-102 of the Colorado Land Reclamation Act for the Extraction of Construction Materials

March 26, 2018

Transit Mix Concrete Co.

March 23, 2018

Ms. Amy Eschberger
Colorado Division of Reclamation, Mining and Safety
1313 Sherman, Suite 215
Denver, CO 80203

Subject: **Responses to Adequacy Review No. 2 for Transit Mix Concrete Co.'s 112 Permit Application for Hitch Rack Ranch Quarry, M-2017-049**

Dear Ms. Eschberger,

Transit Mix Concrete Co. (TMCC) would like to amend their response to the Division's second adequacy review for the Applicant's 112 permit application for the proposed Hitch Rack Ranch Quarry operation (M-2017-049). Please do not hesitate to contact me or our Norwest consultant, Paul Kos, if you have any questions.

Sincerely,

Jerald Schnabel

Jerald Schnabel
President
Transit Mix Concrete Company

Attachments:
Original copy of application exhibits
Copies (2) of application exhibits

Transit Mix Concrete Co.

RESPONSE TO ADEQUACY REVIEW No. 2
Hitch Rack Ranch Quarry, M-2017-049 DRMS COMMENTS - Elliott Russell - Adequacy Review of Wildlife Information

6.4.8 Exhibit H – Wildlife Information

2. Within the response to Adequacy Item No. 3, the Applicant states no further Mexican spotted owl (MSO) surveys are required because no MSOs were documented during the three consecutive years of MSO surveys. Please address if the periodic migratory bird and raptor surveys, which will be conducted prior to starting each mining phase, will identify MSOs and MSO nests, if present on the affected lands. If so, the response to Adequacy Item No. 3 is adequate. However, in accordance with Rule 3.1.8(1), if these future surveys cannot determine the presence of MSOs and MSO nests on the affected lands, please also commit to conducting additional MSO surveys prior to starting each mining phase.

Response: Transit Mix commits to monitoring for MSO prior to starting each mining phase as an extension of the raptor surveys. The MSO survey will be conducted in the subsequent phase area over a single event. Transit Mix commits to coordinating with CPW and USFWS should any MSO or MSO nest be identified. Transit Mix also commits to submitting the survey results to the Division.

Transit Mix Concrete Co.

RESPONSE TO THIRD ADEQUACY REVIEW
Hitch Rack Ranch Quarry, M-2017-049

Hitch Rack Ranch Pit Wall Geotechnical Assessment:

1. In response to Item #31 of the Adequacy Review of Exhibit 6.5 – Geotechnical Stability Memorandum dated December 28, 2017, the Applicant states a map showing the L-E section lines has been included as an attachment to the geotechnical analysis and report. The Division did not receive the L-E section lines map with the Applicant's adequacy response. Please provide a map indicating the cross-section profile locations for the Geotechnical Model Analysis for the Slope L-E models.

Response: Transit Mix has included with this response a memorandum from Norwest Corporation to supplement the Pit Wall Geotechnical Assessment. This memorandum provides a map showing the L-E section lines and provides the Slope/W model reports and a summary of the analysis and results.

2. In response to Item #32 of the Adequacy Review of Exhibit 6.5 – Geotechnical Stability Memorandum dated December 28, 2017, the Applicant states the Slope/W model files have been exported as DXF files and Point Cloud CSV files. The Division received the CSV files from the Applicant via email on March 19, 2018. The Division did not receive the DXF files for the Slope/W models. Please provide the SLOPE/W stability analysis model cross-sections with all material profiles labeled for the Geotechnical Model Analysis for the Bench L-E and Slope L-E models to allow the Division to duplicate the analysis with Clover Technology's Galena software for verification purposes.

Response: Transit Mix has provided via email the DXF files and excel file containing point and material property information for the cross-sections.

EXHIBIT R
PROOF OF FILING WITH COUNTY CLERK AND RECORDER

Transit Mix Concrete Co.

NOTICE OF FILING APPLICATION
FOR COLORADO MINED LAND RECLAMATION PERMIT
FOR REGULAR (112) CONSTRUCTION MATERIALS EXTRACTION OPERATION

NOTICE TO THE COUNTY CLERK
EL PASO COUNTY

Chuck Broerman
1675 West Garden of the Gods
Colorado Springs, CO 80907

Transit Mix Concrete Company (the "Applicant/Operator") has applied for a Regular (112) reclamation permit from the Colorado Mined Land Reclamation Board (the "Board") to conduct the extraction of construction materials operations in El Paso County.

The attached amendment application is being provided to you to allow for public review of the location and nature of the proposed amended operations. We request that you place the entire application in a place for public review but not be recorded. This request is made pursuant to C.R.S. §34-32-112(10)(a) and §1.6.2(1)(c) of the Hard Rock/Metal Mining Rules and Regulations of the Colorado Mined Land Reclamation Board.

Transit Mix Concrete Company

Acknowledgement of Receipt:

By: _____

Title: _____

Date: _____

EXHIBIT 6.5
GEOTECHNICAL EXHIBIT

Transit Mix Concrete Co.

Certification Statement

I, Paul Kos, Colorado P.E. 40848 herby certify that the information contained in the March 26, 2018 Exhibit 6.5 was reviewed by me and that the information is complete and accurate to the best of my knowledge.

NORWEST
CORPORATION

Suite 1830, 1066 W. Hastings Street
Vancouver, BC V6E 3X2
Tel: (604) 602-8992
www.norwestcorp.com

Memorandum

To	Transit Mix Concrete Company	**Project #**	591-6
CC	Paul Kos, Norwest – Denver Office	**Date**	March 26, 2018
From	Sean Ennis		
Subject	Hitch Rack Ranch Pit Wall Geotechnical Assessment – Supplemental CDRMS Response		

1. INTRODUCTION

Norwest Corporation (Norwest) was retained by Transit Mix Concrete Co. (Transit Mix) to provide design and engineering support for the proposed Hitch Rack Ranch (HRR) granite quarry in Colorado, USA. The proposed quarry is located approximately 15 miles south of Colorado Springs, CO, in El Paso County. The site is currently unimproved with relatively steep hills rising to the north and south. The proposed quarry development lies south of Little Turkey Creek (see Figure 1).

Norwest 's current work scope includes support for Transit Mix's regulatory submission for the quarry. This memorandum is intended to provide supplemental information related to the pit wall stability analyses completed for the proposed quarry. A more detailed memorandum summarizing Norwest's site characterization and pit wall design was submitted in 2017 (Hitch Rack Ranch Pit Wall Geotechnical Assessment, Sept. 11, 2017) and this memorandum uses information from that document.

2. Site Conditions

Norwest carried out a site investigation on the Hitch Rack Ranch property between August 2 and October 4, 2015. A total of seven (7) boreholes were advanced to depths between 200ft and 800ft below existing grades. Drilling was completed by Major Drilling Inc. of Salt Lake City, Utah. Six (6) of these boreholes were advanced in the area north of Little Turkey Creek, and one (1) borehole was advanced in the area south of Little Turkey Creek where the proposed quarry is located. There are six (6) new monitoring wells and one piezometer installed by Norwest representatives in July 2017. These wells are primarily intended to provide information on groundwater levels around Little Turkey Creek but they do provide information on rock types, rock quality, and other geotechnical information in the area.

2.1. Groundwater Conditions

The groundwater conditions were assumed to be dry for rock mass characterization purposes. This is common practice as groundwater effects will be added during stability analyses and the assumption is not meant to imply there is no groundwater within the rock mass. Sensitivity of pit

slope to the groundwater level was evaluated as part of Norwest's analyses by varying the defined groundwater level during the stability analyses. Norwest evaluated a conservative case which included the assumption of full saturation of the pit slopes as discussed in a later section.

2.2. Structure

This section describes the major structural information available for the portion of the HRR property north of South Turkey Creek. Limited data is available for the proposed pit area, but some aspects of the structural conditions are expected to be similar to the areas north of the creek given the similar rock mass conditions, however additional drilling will be required to characterize the structure of the ultimate quarry pit footprint.

2.2.1. Faulting

The current understanding of major fault structures in the area is based on surface mapping, borehole intercepts and regional information. Surface traces of major faults are shown on Figure 1. Regional information and the intercept from borehole HC003-15 indicate that these faults dip near vertical, except the easternmost fault which exhibits a listric (curved) type orientation with high angles encountered within the proposed mining pits followed by gradual shallowing of dip to around 35 degrees dip at lower elevations east of the proposed mining area. Steeply dipping faults that do not undercut the pit walls are not expected to lead to large scale slope failures. The rock within these fault zones is generally more broken (RQD < 50%) with slickensides and some clay infill present on the discontinuity surfaces.

Several seams of sand-like material were intercepted in HC004-15 at varying depths. These zones ranged from 0.2 up to 2ft in thickness. It is possible that these seams are related to unmapped, shallower-dipping faults. Borehole HC004-15 is located north of Little Turkey Creek where no mining will occur; however, if similar seams were encountered in the southern quarry area they could impact interim or overall pit slopes. Additional mapping and drilling is a requirement as the quarry design is advanced in order to confirm the orientation and quality of these seams/potential faults and their effect on pit wall design through the various pit phases. However, given the Phase 1 pit configuration (relatively shallow highwalls during initial mining of Phase 1 as shown in the cross-section inset in Figure 1) it is expected that adverse dips can be addressed by adjusting the mining sequence and direction.

3. OVERALL SLOPE STABILITY

A Limit Equilibrium "L-E" analysis has been carried out for a cross-section for the highest section of the Phase 1 pit wall which is approximately 200ft in height. The analysis was carried out using GeoStudio software SLOPE/W Version 8.4 to evaluate the static and pseudo-static factor of safety for a pit wall

constructed from the major rock types based on the block model geology. This analysis conservatively considers saturated groundwater conditions (disturbance factor = 0). The alignment of the selected cross-section is shown in Appendix A.

Currently, the available drillhole data is limited to the vicinity of the Phase 1 pit slopes. The ultimate wall heights for the proposed quarry range from approximately 300ft to 500ft. A preliminary overall pit wall angle of 45° has been considered and consequently modelled to confirm that factor of safety requirements as highlighted in Table are satisfied.

Table 1
Design Criteria, Overall Slope

Analysis	Condition	Criteria*
Limit Equilibrium	Static	FOS ≥ 1.5
	Pseudo-Static	FOS ≥ 1.1

*FOS = Factor of Safety.

Limit equilibrium analyses shows the proposed 45 degree pit slopes for Phase 1 pit have FOS values greater than 2 for both static and pseudo-static conditions even assuming fully saturated wall conditions (conservative groundwater assumption). Appendix 1 contains printouts of the stability analysis results. Note that both circular failure and block specified failure surface were examined to determine the sensitivity of the results to the shape of the failure surface. In all cases examined, the FOS exceed the design criteria.

Pit walls constructed at 45° from horizontal are adequate to satisfy the above design criteria for the Phase 1 cross-section under the conditions considered. The use of a 45 degree inter-ramp wall configuration can also be used as a design guideline for the ultimate pit slopes in order to determine the disturbance area for reclamation bonding. Detailed design of the Phase 2 and subsequent quarry walls can be completed as additional geotechnical drilling and rock mass characterization is completed in the proposed quarry area. Pit walls in excess of 250-300 feet may have slightly shallower overall slopes as ramps or a wider inter-stack catch bench configurations are incorporated into the wall design.

4. CONCLUSIONS AND RECOMMENDATIONS

4.1. Overall Pit Slope Design

A cross-section through the highest area of the Phase 1 pit wall was analyzed using slope stability software to check the factors of safety for both static and pseudo-static conditions. An overall pit wall angle of 45° was considered under saturated conditions and results show that this configuration satisfies the design criteria.

For preliminary design purposes, it is recommended that overall quarry pit slopes do not exceed 45° from horizontal. The current drillhole data supports the development of the Phase 1 pit slopes.

Additional drilling and geotechnical assessments are required to allow detailed designs to be completed for the ultimate pit walls which will be significantly higher than the Phase 1 pit walls.

5. CLOSURE

This memorandum has been prepared for Transit Mix Concrete Co. to provide them with a supplemental information related to the geotechnical pit wall design in support of the development of the proposed Hitch Rack Ranch Granite Quarry. As mutual protection to Transit Mix Concrete Co., the public, and ourselves, this memorandum and its figures are submitted for exclusive use by Transit Mix Concrete Co. to support their regulatory submission. We specifically disclaim any responsibility for losses or damages incurred through the use of our work for a purpose other than as described in this memorandum. Our memorandum and recommendations should not be reproduced in whole or in part without our express written permission unless it is to support regulatory submissions.

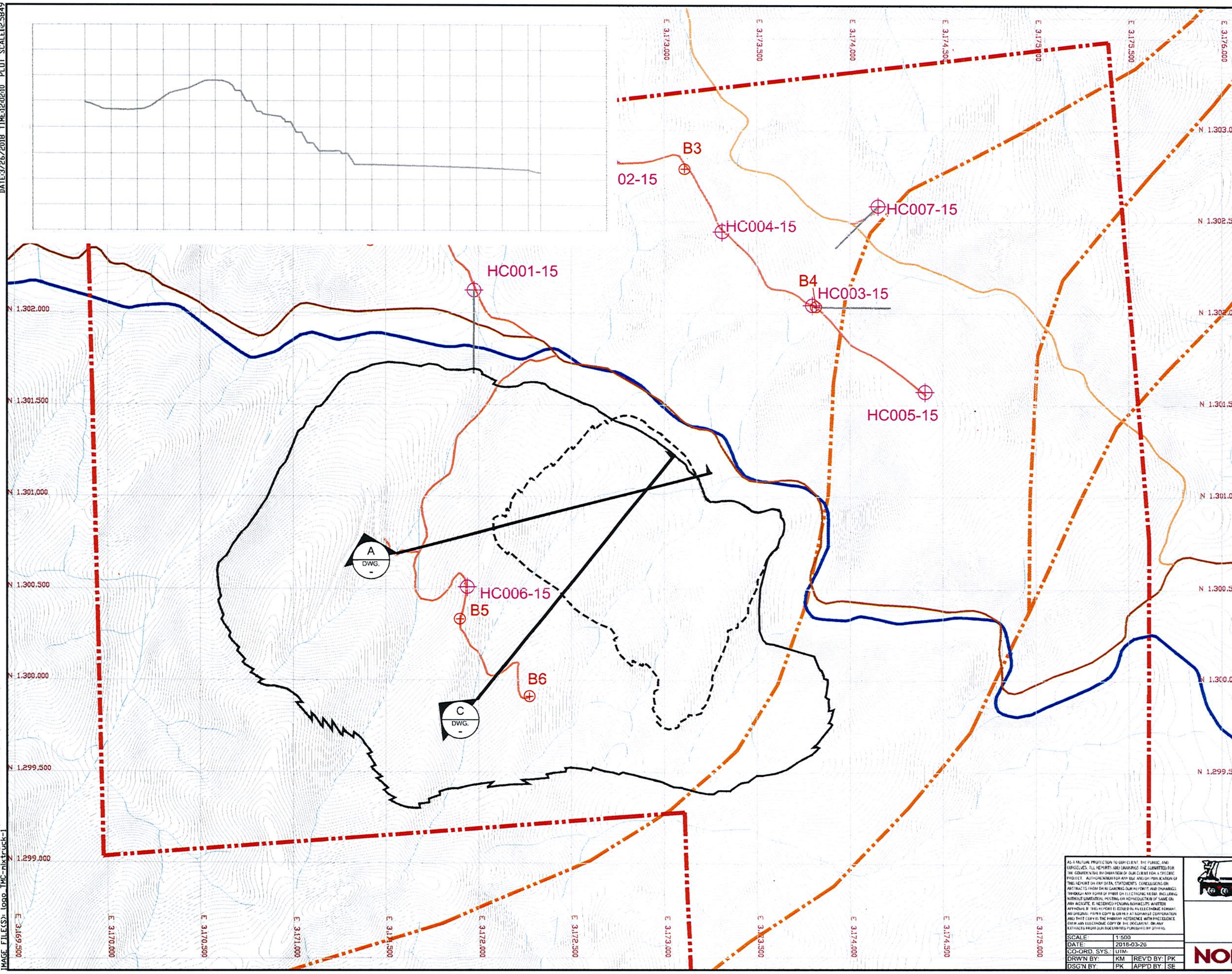
NORWEST CORPORATION

Sean Ennis, P. E.
Vice President, Mining

Attachments

Figure 1: Hitch Rack Ranch Pit Wall – Plan View with Cross-section Location

Appendix A: Slope Stability Analyses Results



LEGEND:

- PROPERTY BOUNDARY
- PHASE 1 PIT CREST AREA
- ULTIMATE PIT CREST AREA
- B1 ⊕ EXISTING BOREHOLES
- HC001-15 2015 BOREHOLES
- PROJECTED FAULT TRACE
- LITTLE TURKEY CREEK ROAD
- EXISTING DRILLING ACCESS ROADS
- LITTLE TURKEY CREEK
- EPHEMERAL STREAMS
- SURFACE TOPOGRAPHY (10ft INTERVAL)

NOTES:

1. GRID COORDINATES SYSTEM IS COLORADO CENTRAL PLATE NAD 83 T16S, R62W, SECTION 16

0 100 200 400 600 800 1000ft

SCALE: 1" = 500'

TRANSIT MIX CONCRETE

HITCH RACK RANCH

PLAN VIEW AND CROSS SECTION LOCATIONS

NORWEST

SCALE:	1:500		
DATE:	2018-03-26		
CO-ORD. SYS.:	UTM		
DRW'N BY:	KM	REV'D BY:	PK
DSG'N BY:	PK	APP'D BY:	SE

PROJECT NO.	FIG. NO.	REV.
591-6	1	C

FILENAME:\PROJECTDATA\TRANSIT MIX 591\591-6 HRR 2017CDRMS\DISC\DRAFTING\CDRMS SUPPLIMENT\FIGURE 1 - PLAN VIEW AND CROSS SECTION LOCATIONS.DWG
XREF FILE(S): Surface Drainage; Topo with Roads; Property Boundary
IMAGE FILE(S): logo TMC-mixtruck-1
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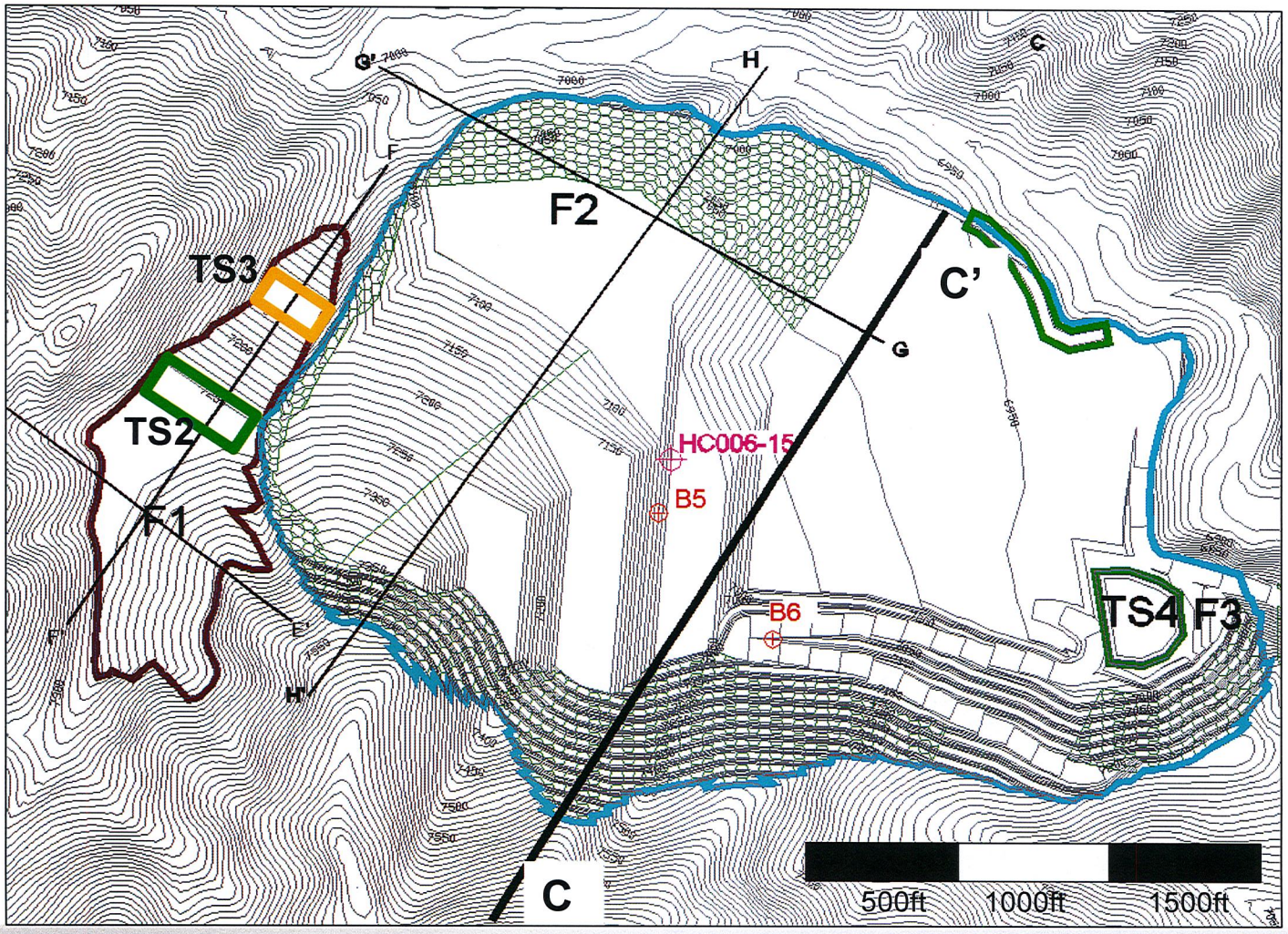
APPENDIX A
SLOPE STABILITY ANALYSES RESULTS

Cross-section Location C – C’



Note: Contours show final pit configuration.

Section C – Static, Full Height, Circular

NORWEST CORPORATION
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Phi-B: 0 °
Piezometric Line: 1

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Unit Weight: 170 pcf
Strength Function: 50-Granite Gneiss
Phi-B: 0 °
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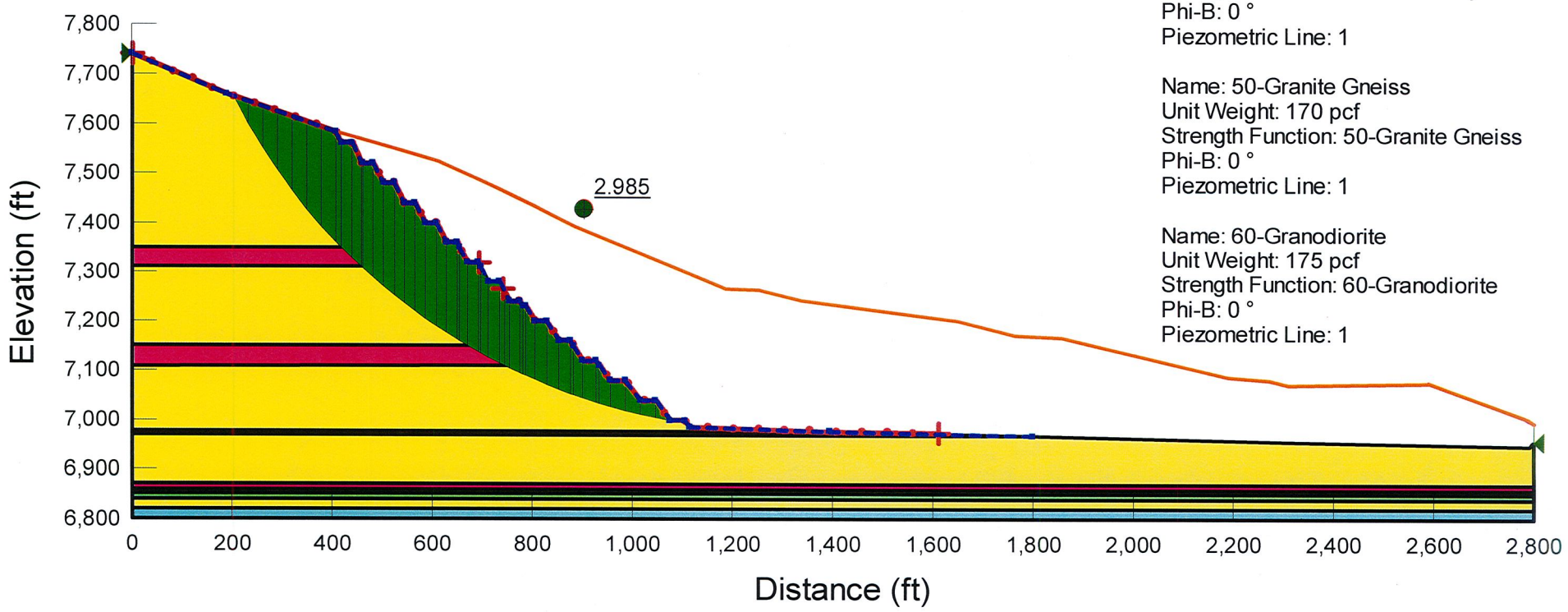

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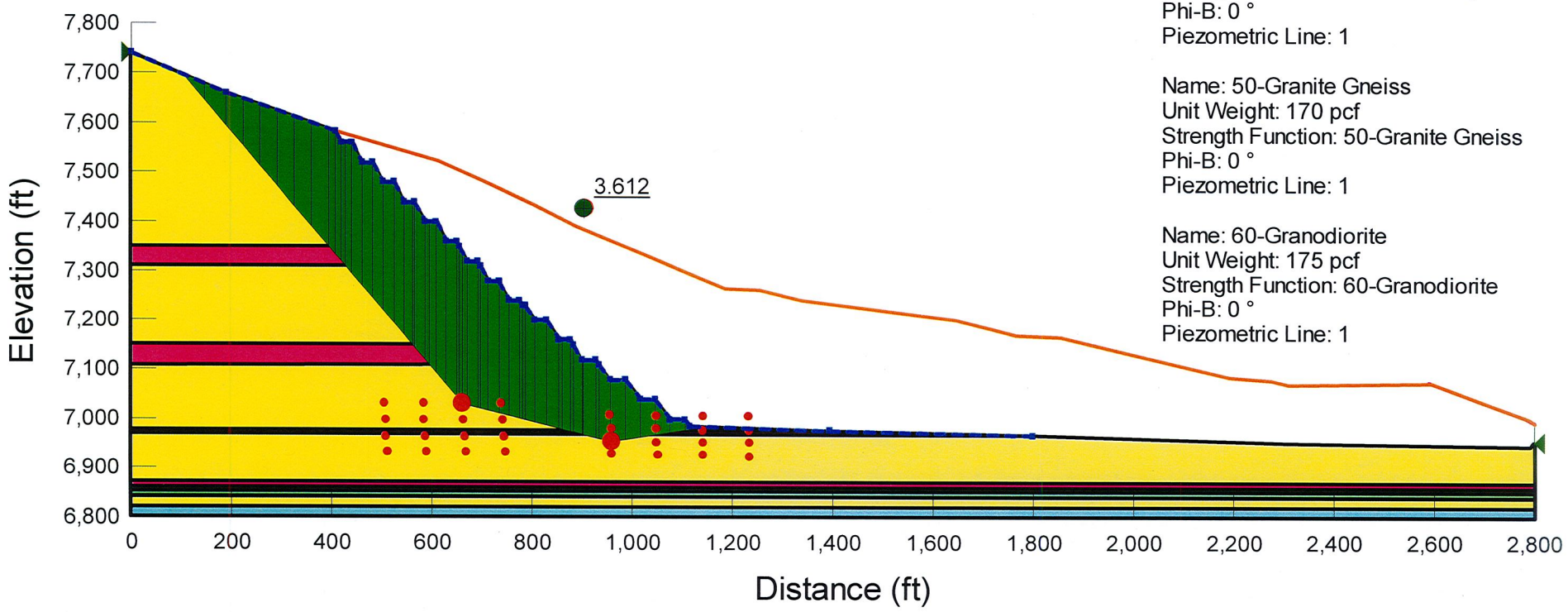

Section C – Static, Shallow Depth Gneiss, Circular

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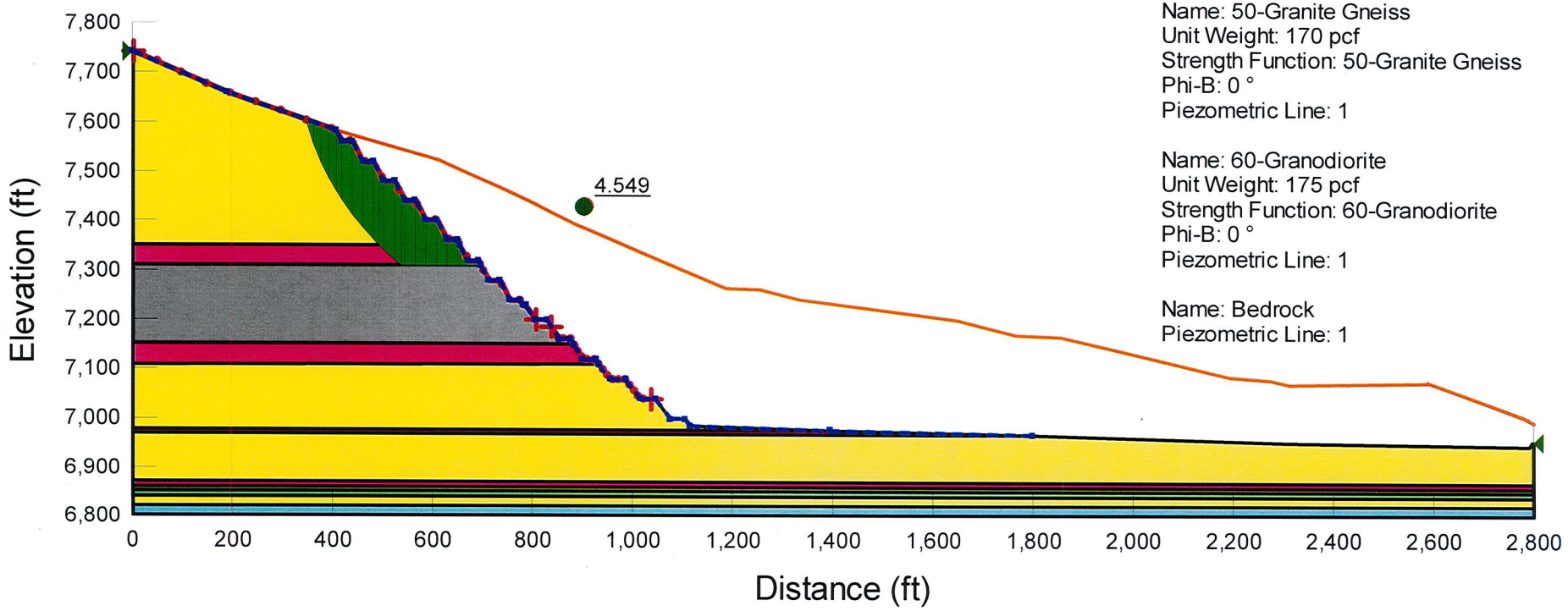

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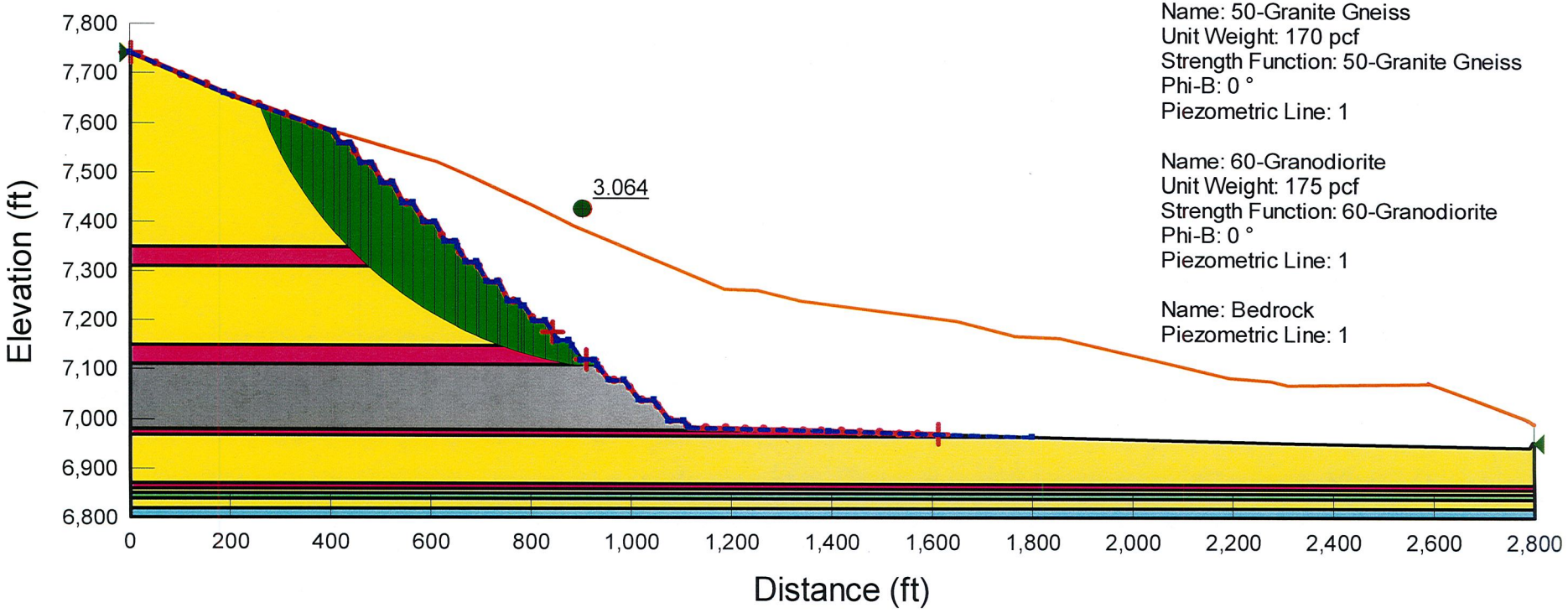

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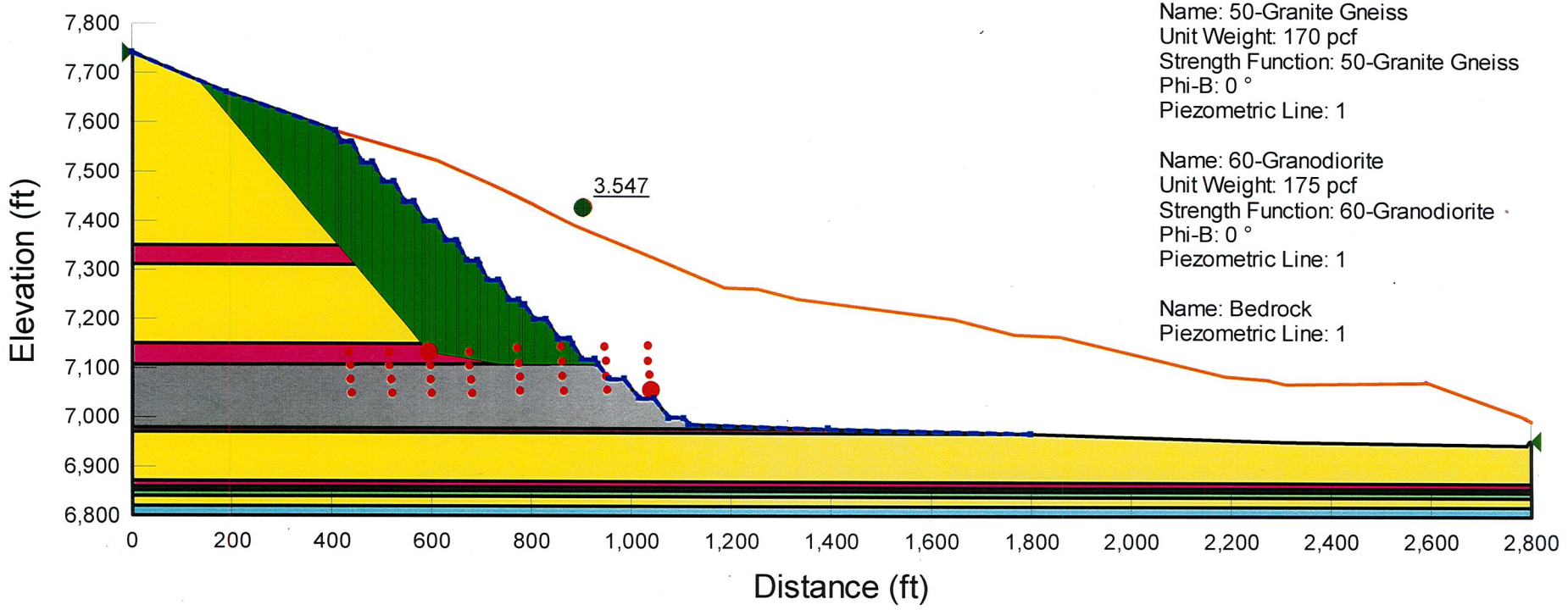

Section C – Pseudo-Static, Full Height, Circular

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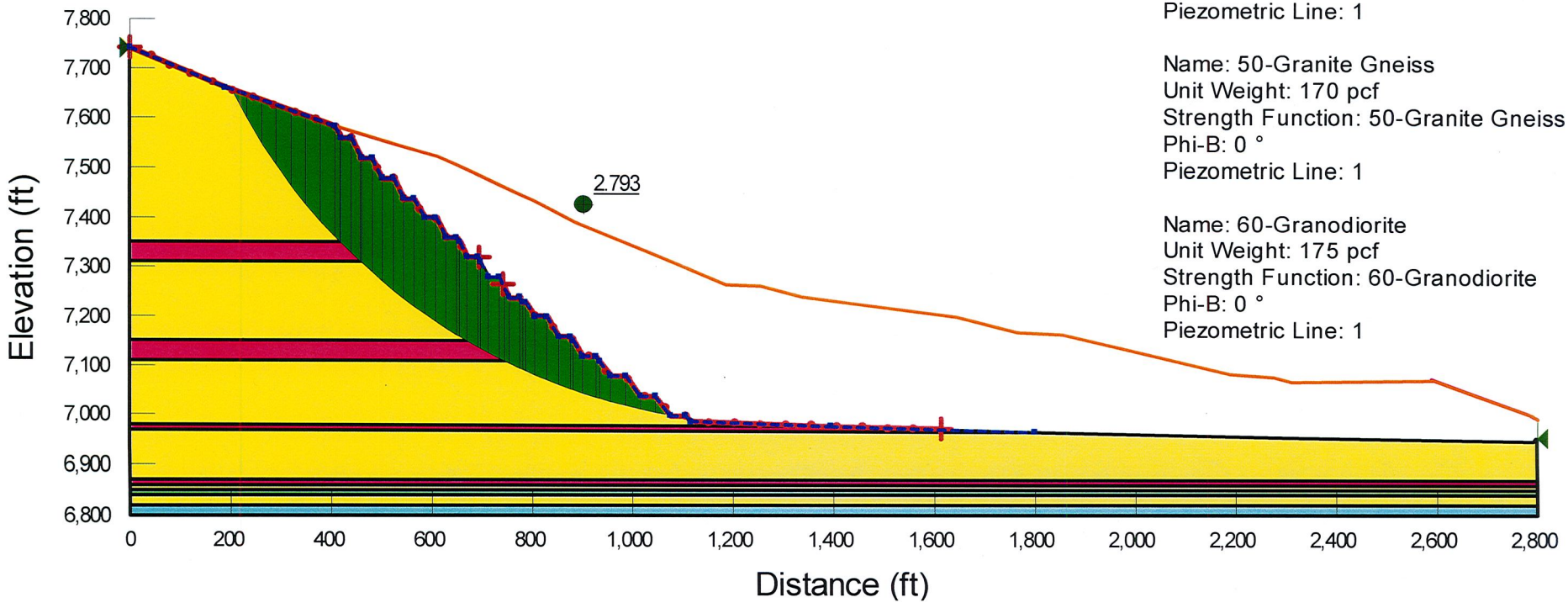

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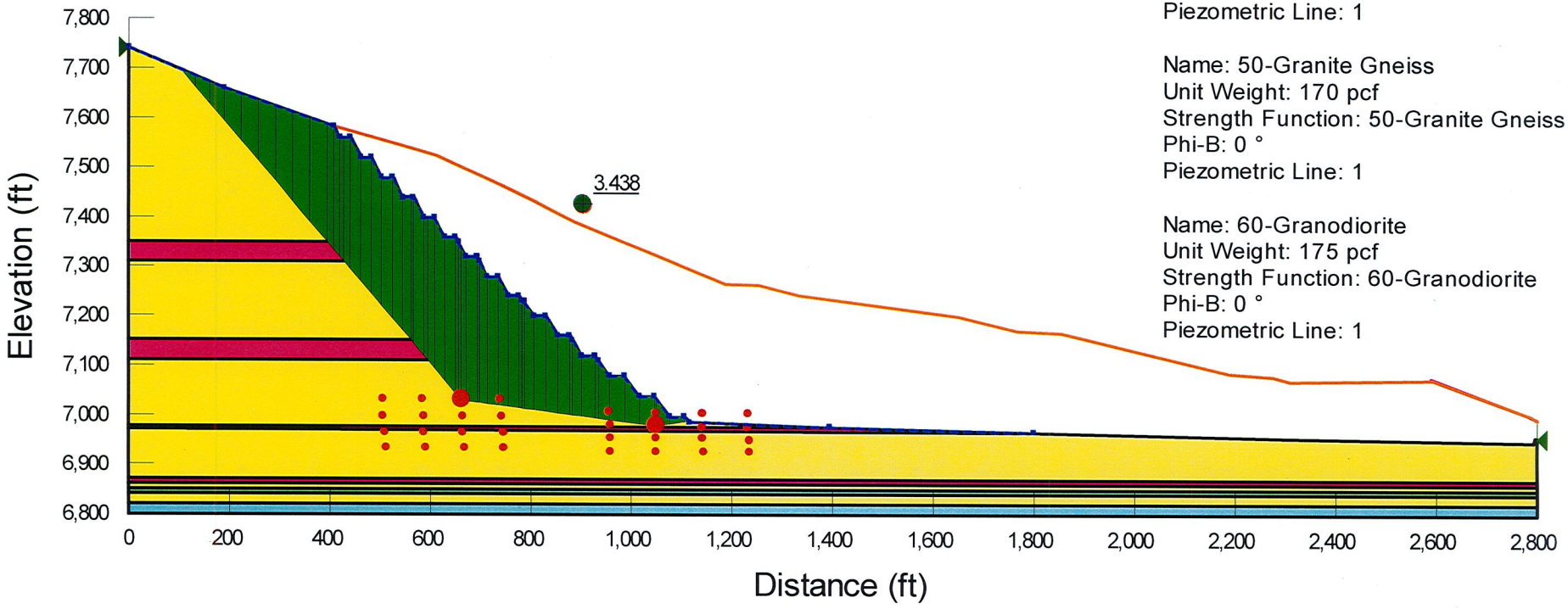

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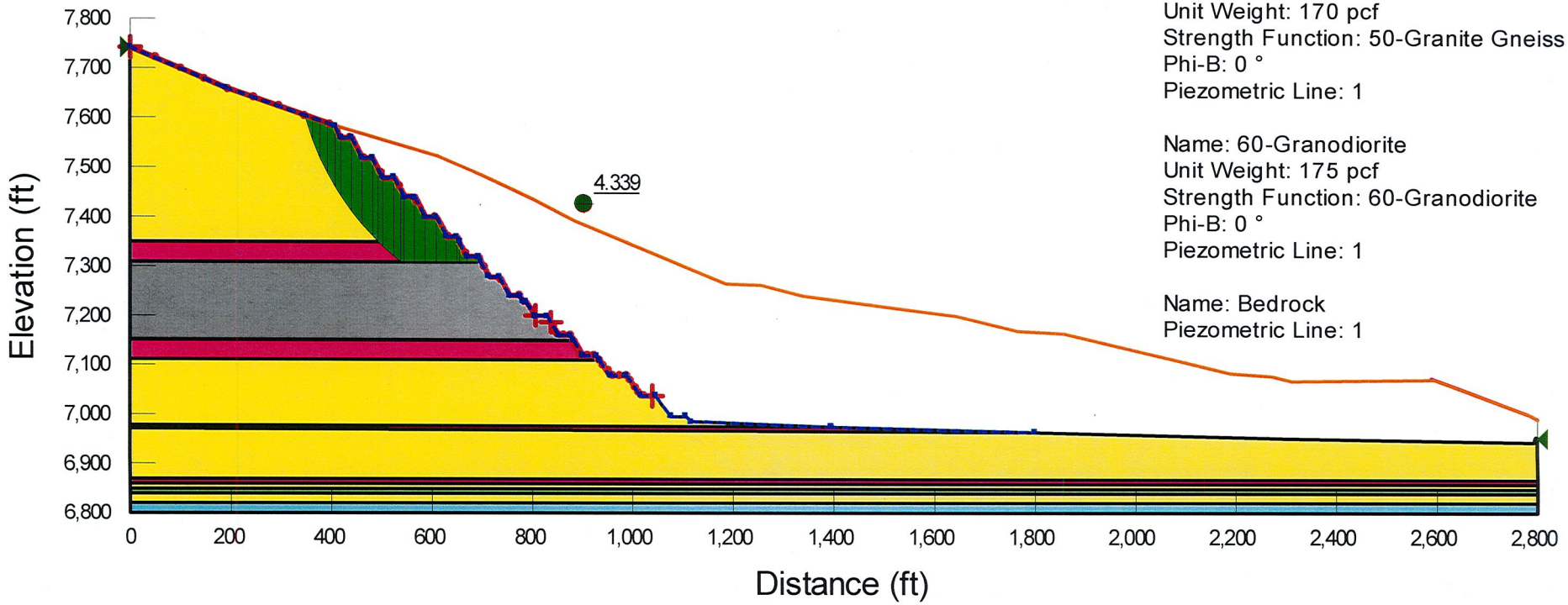

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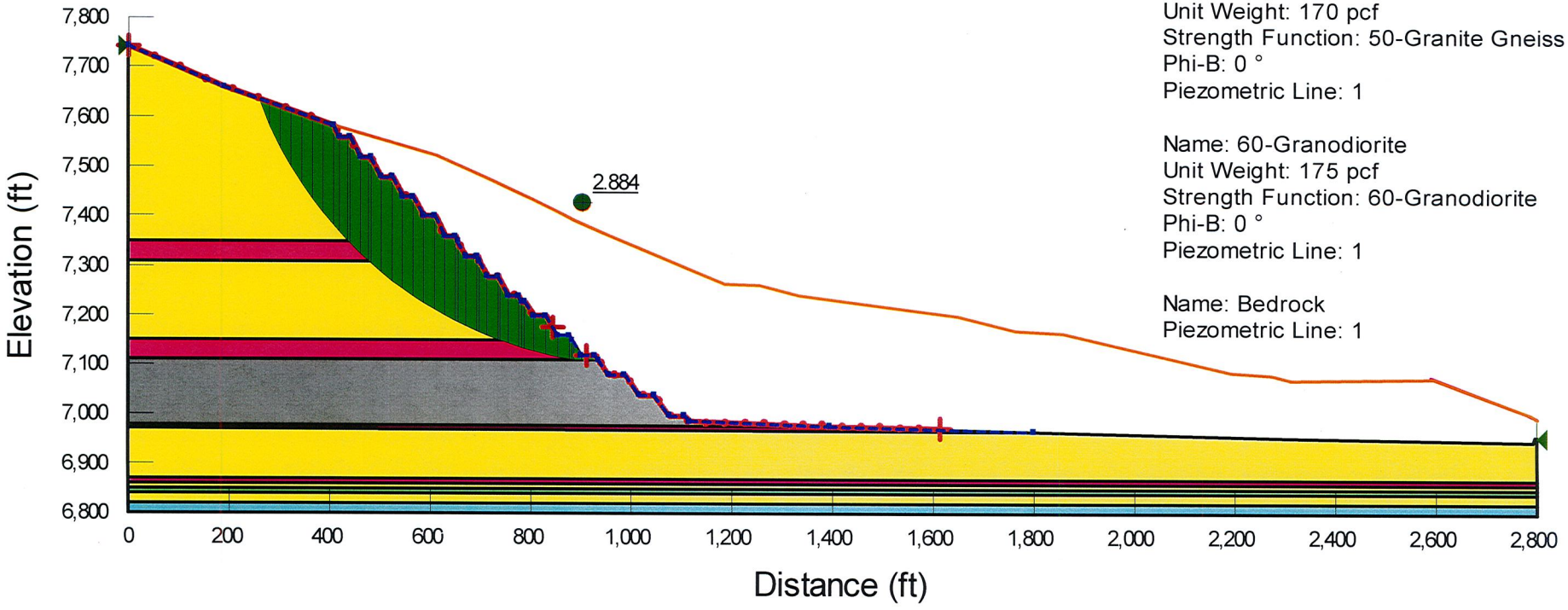

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Phi-B: 0 °
Piezometric Line: 1

Name: 30-Granite Syenite
Unit Weight: 165 pcf
Strength Function: 30-Granite Syenite
Phi-B: 0 °
Piezometric Line: 1

Name: 50-Granite Gneiss
Unit Weight: 170 pcf
Strength Function: 50-Granite Gneiss
Phi-B: 0 °
Piezometric Line: 1

Name: 60-Granodiorite
Unit Weight: 175 pcf
Strength Function: 60-Granodiorite
Phi-B: 0 °
Piezometric Line: 1

Name: Bedrock
Piezometric Line: 1