PL-77-1173
Canyon Cove Lot 262

AGRA
Earth & Environmental

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July 31, 1997
Job No. 7-817-001126

Mr. DeWayne Iverson
3760 South Highland Drive, Suite 509
Salt Lake City, Utah 84106

Dear Mr. Iverson:

Re: Report
Fault Rupture Hazard Study
Canyon Cove Lot 262
6394 South Canyon Cove Drive
Salt Lake County, Utah

1. INTRODUCTION

1.1. GENERAL

Presented in this report are the results of our fault rupture hazard study performed at Lot 262 within the Canyon Cove Subdivision in Salt Lake County, Utah. The general location of the site with respect to major topographic features and general conditions, as of 1975, is shown on Figure 1, Vicinity Map. A more detailed layout of the site showing roads and lot boundaries is presented on Figure 2, Site Plan. The location of the exploration trench excavated in conjunction with this study is also shown on Figure 2.

During the course of this study, many of the conclusions and recommendations summarized herein were transmitted verbally to Mr. DeWayne Iverson.

1.2. OBJECTIVES AND SCOPE

The objectives and scope of this study were planned during discussions between Mr. DeWayne Iverson and Dr. Greg Schlenker of AGRA Earth & Environmental, Inc. (AGRA).

The objectives of this study were to:

1. Determine if faults that represent a potential fault rupture hazard exist at the site, which is located within the Wasatch fault zone Special Study Area.

2. If such faults are found, determine the extent of faulting and deformation across the site.

In accomplishing these objectives, our scope included the following:

1. An initial office program including a review of the geologic literature, land-use ordinances and maps, and an examination of stereoscopic aerial photographs.

2. A field program consisting of a general geologic reconnaissance and the excavation and logging of an exploratory trench.

3. Preparation of this summary report.

1.3. AUTHORIZATION

Authorization was provided by Mr. DeWayne Iverson by signing our Professional Service Agreement dated July 9, 1997.

1.4. PROFESSIONAL STATEMENTS

Supporting data upon which our recommendations are based are presented in subsequent sections of this report. Recommendations presented herein are governed by the geologic conditions encountered in the exploration trench, our reconnaissance data, and the projected layout and design data discussed in Section 2, Proposed Construction, of this report. If subsurface conditions inconsistent with those described in this report are encountered, and/or if design and layout changes are implemented, we must be notified immediately so that our recommendations can be reviewed and modifications can be made to this report, if necessary.

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted engineering principles and practices used at this time.

2. PROPOSED CONSTRUCTION

We understand that a single-family residence is proposed to be constructed on the site. The structure is expected to be two to three levels in height, and may include a partial or full basement. Below grade, the structure will be of reinforced concrete construction. Above grade, the structure will be wood-frame construction with some brick, stone, or stucco veneer. Structural loads will be transmitted through bearing walls and columns to supporting foundations. We project that the maximum wall and column loads will be on the order of 2 to 3 kips per lineal foot and 20 to 25 kips, respectively. The below-grade foundation walls may

also act as retaining structures. Cutting and filling on the order of three to four feet may be required during site development.

3. SITE DESCRIPTION

The site consists of a roughly rectangular-shaped lot having maximum dimensions on the order of 330 feet in the east-west direction and 200 feet in the north-south direction. The boundaries of the site are shown on Figure 2. The site is bounded by Canyon Cove Drive on the east, and by existing single-family home sites to the north, south, west, and across Canyon Cove Drive to the east. As shown on Figure 2 easements for the Salt Lake Aqueduct and the Big Cottonwood Conduit occupy the western portion of the site.

Site elevation is approximately 4960 feet, and the site surface slopes gently to moderately toward the west. Present vegetation consists of weeds and scrub oak, with a small amount of landscaping encroaching the southeast lot boundary from the adjacent lot to the south. The western part of the lot, occupied by the aqueduct and conduit easements, generally is covered by moderately dense scrub oak.

4. INVESTIGATION

4.1. FIELD PROGRAM

The initial stage of our field program included a review of literature and aerial photography and a general site reconnaissance. The location of the exploration trench was selected on the basis of the buildable area on the lot, the expected orientation of faults, and our own evaluation of aerial photographs taken in 1952.

The field portion of our study was under the direct control and continuous supervision of Ms. Jennifer Helm from our geological staff.

4.2. TRENCHING

Our field program included the excavation of one exploratory trench. The trench was excavated using a JCB 214S backhoe and extended to depths of five to nine feet. The trench was excavated on July 14, 1997. A log of the trench is presented on Figure 3.

Mr. Brian Bryant, Salt Lake County Geologist, visited the site during the trenching and observed exposures in the trench.

5. SUBSURFACE CONDITIONS

The geology exposed by the trenching consists of lacustrine deposits overlain by colluvium.

The lacustrine deposits consist of tan massive gravelly silt with some sand, overlain by light gray-tan massive clayey silt/silty clay. Toward the west the clayey silt/silty clay "pinches out," while the gravelly silt grades to interbedded silt, gravelly silt, clean gravel, and, in the westernmost part of the trench, cobbly and bouldery deposits. Calcium carbonate Stage II accumulations were noted on the undersides of gravel clasts in the lacustrine deposits. Bedding in the lacustrine deposits dips gently toward the west and is slightly irregular and discontinuous. The lacustrine deposits are believed to have been emplaced prior to 14,000 years ago when the level of Lake Bonneville fell below the elevation of the site (Currey and Oviatt, 1985).

The colluvial deposits overlying the lacustrine deposits consist of tan massive gravelly silt with some sand. The contact between the colluvial and lacustrine deposits is irregular and varies from sharp to somewhat gradational. The colluvium is younger than 14,000 years old. A dark brown, silty soil "A" horizon on the order of 4 to 8 inches thick has developed on the surface of the colluvial deposits.

No groundwater was encountered during excavation of the exploratory trench.

6. DISCUSSIONS AND RECOMMENDATIONS

6.1. GENERAL

The site is located within "Seismic Zone 3" as defined by the Seismic Zone Map of the United States in the Uniform Building Code (UBC) 1994 edition. Seismic Zone 3 is expected to experience moderately frequent, potentially damaging earthquakes. In terms of damage potential, Seismic Zone 3 is second only to Zone 4, which includes parts of California, Nevada, and Alaska. As a minimum, the criteria for lateral forces stated within the UBC for Seismic Zone 3 should be incorporated into the design of the proposed structure.

6.2. FAULTING

No evidence of surface rupture or deformation associated with fault rupture was observed in the trench. The absence of rupture or deformation indicates that active faulting is not present where the trench is located. We believe that faulting and fault rupture hazards may be concentrated west of the site along the mapped trace of the Wasatch fault (Personius and Scott, 1992). The Wasatch fault zone is considered active and capable of generating

earthquakes as large as magnitude 7.3 (Arabasz et al., 1992). Surface faulting commonly occurs in conjunction with events of magnitude 6 or larger.

The Salt Lake County Natural Hazards Ordinance, Chapter 19.75, Section 19.75.080, specifies that no structures designed for human occupancy shall be built astride an active fault. Active earthquake faults are generally considered to be faults which have disrupted the ground surface within the past 10,000 years of earth history (the Holocene epoch). Implied with this definition is that such faults are relatively likely to disrupt the ground surface in the relatively near future. We believe that the site is not exposed to hazards related to fault rupture and deformation.

7. REFERENCES

Arabasz, W.J., Pechmann, J.C., and Brown, E.D., 1992, Observational seismology and the evaluation of earthquake hazards and risk in the Wasatch Front area, Utah, *in* Gori, P.L., and Hays, W.W., eds., Assessment of regional earthquake hazards and risk along the Wasatch Front, Utah: U.S. Geological Survey Professional Paper 1500-D, 36 p.

Currey, D.R., and Oviatt, C.G., 1985, Durations, average rates, and probable causes of Lake Bonneville expansion, still-stands, and contractions during the last deep-lake cycle, 32,000 to 10,000 years ago, in Kay, P.A., and Diaz, H.F., eds., Problems of and prospects for predicting Great Salt Lake levels - Processing of a NOAA Conference, March 26-28, 1985: Salt Lake City, Utah, University of Utah, Center for Public Affairs and Administration, p. 9-24.

Personius, Stephen F., and Scott, William E., 1992, Surficial geologic map of the Salt Lake City segment and parts of adjacent segments of the Wasatch fault zone, Davis, Salt Lake, and Utah Counties, Utah: U.S. Geological Survey, Miscellaneous Investigations Series, Map I-2106, scale 1:50,000.

We appreciate the opportunity of providing this service for you. If you have any questions concerning this report or require additional information, please do not hesitate to contact the undersigned.

Respectfully submitted,

AGRA Earth & Environmental, Inc.

Jennifer M. Helm
Staff Geologist

Reviewed by:

Greg C. Schlenker, Ph.D.
Project Manager

And

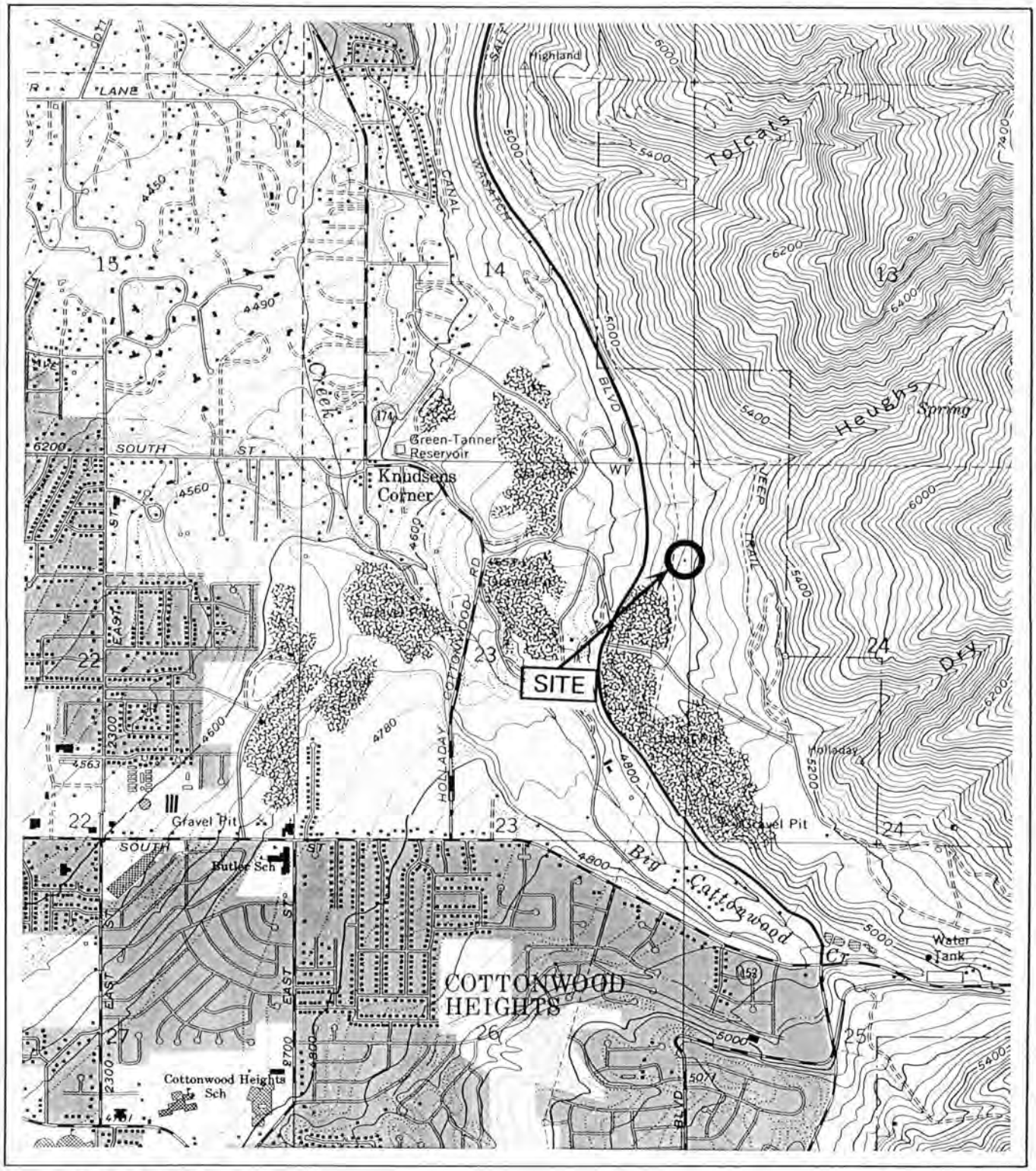
William J. Gordon, State of Utah No. 146417
Professional Engineer

JH:GS:WJG/ps:sn (97-13c)

Encl. Figure 1, Vicinity Map
Figure 2, Site Plan
Figure 3, Log of Trench

Addressee (3)

CANYON COVE LOT 262
AGRA JOB NO. 7-817-001126



SCALE IN FEET
1000 0 1000 2000

FIGURE 1
VICINITY MAP

REFERENCE:
U.S.G.S. TOPOGRAPHIC MAPS TITLED "SUGAR HOUSE, UTAH," AND "DRAPER, UTAH," 1963, PHOTOREVISED 1969 AND 1975

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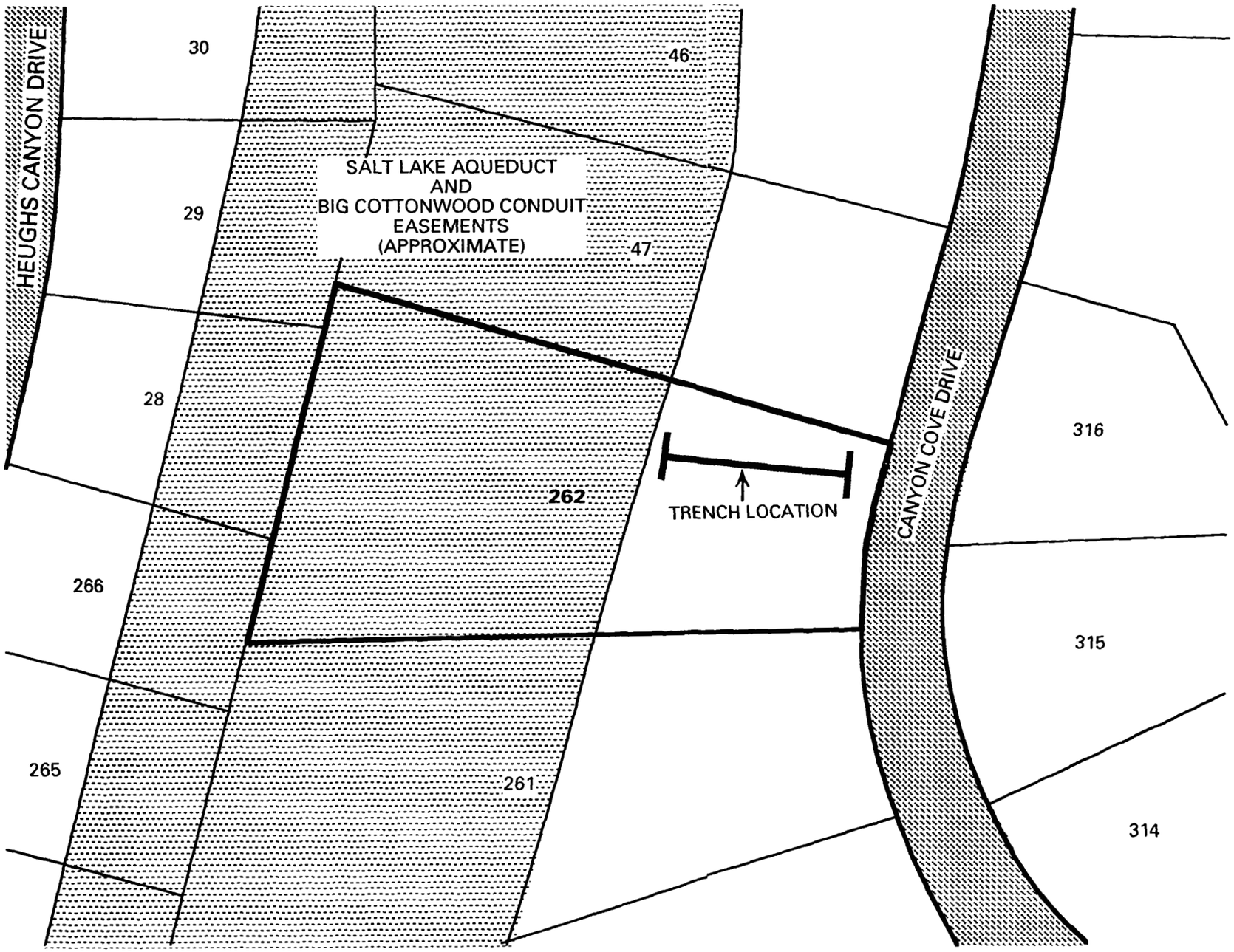

FIGURE 2
SITE PLAN

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REFERENCE:
BASED ON SALT LAKE COUNTY RECORDER'S PLAT MAP

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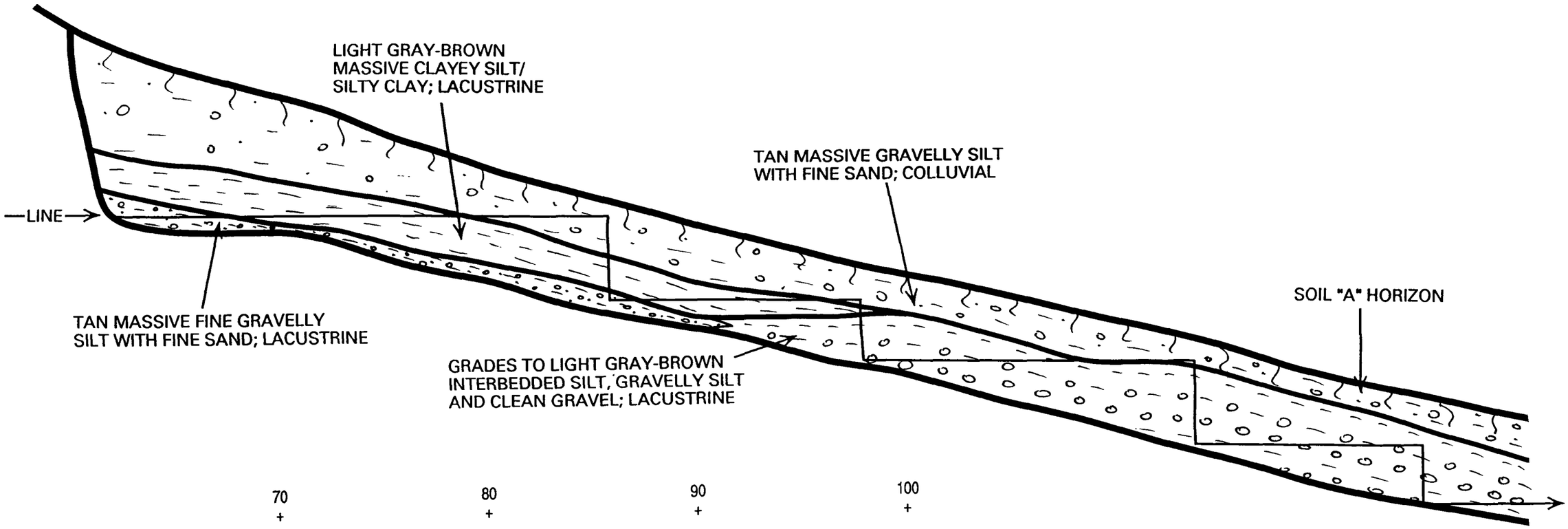
SOUTH SIDE OF TRENCH

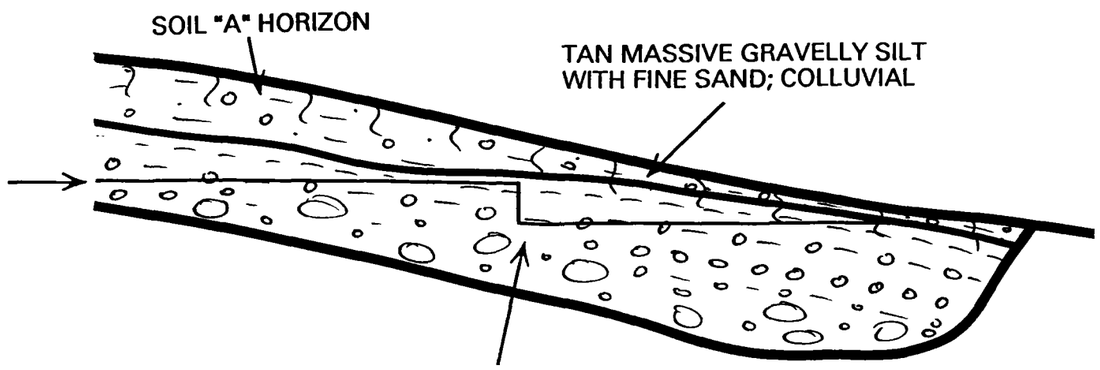
EAST

WEST

0 + 10 + 20 + 30 + 40 + 50 + 60 + 70 +



70 + 80 + 90 + 100 +



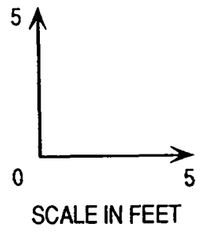


FIGURE 3
LOG OF TRENCH

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BY JMH DATE 7/11/17 CHECKED BY ____ DATE ____
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