

Adam Simmons -- Consulting Geologist
CERTIFIED ENGINEERING GEOLOGIST & HYDROGEOLOGIST-CEG #2015 PG #6234 HG #509

PRELIMINARY GEOLOGIC INVESTIGATION

*Riviera Partners Apartment Project
915 E Anapamu Street
Santa Barbara, California*

March 27, 2009

March 27, 2009

Riviera Partners, LLC
c/o Cearnal Andrulaitis LLP
521 12 State Street
Santa Barbara, CA 93101

Attn: Mr. Adam Cunningham

Re: *Preliminary Geologic Investigation*
13 apartment complex
915 E. Anapamu St
Santa Barbara, California

.....

Dear Mr. Cunningham:

1. INTRODUCTION

Pursuant to your request, we present herewith the results of our preliminary geologic investigation of the above captioned property. It is our understanding that you propose to construct a 13 unit apartment complex on the above described address. The existing single family residence, located on the eastern portion of the property, is to be demolished. Eleven units are proposed on the east side of the drainage swale and 2 units on the west. The location of the subject property and the general geologic conditions of the surrounding area are graphically shown on the attached map entitled **REGIONAL GEOLOGIC MAP** (see Figure 1).

2. FINDINGS

We have enclosed a geologic map for your review. Figure 1 is a **REGIONAL GEOLOGIC MAP** of the area prepared by Mr. Dibblee in 1986. This map indicates that the subject property is underlain by Older Alluvium (Fanglomerate) Deposits. The Fanglomerate Deposits (shown as "Qog" on Figure 1) is typically composed of unconsolidated to weakly consolidated boulders, gravels, sands, silts, and clays. The Alluvium material is normally considered suitable for construction of the multi unit dwellings, provided the site is properly graded and recompacted and other details of the development are appropriate for the area.

Bedding attitudes within the Fanglomerate, as observed in the vicinity of the subject property, strikes approximately North 65° to 80° West and dips to the south at approximately 5° to 23°. The bedding planes may be daylighted in some areas, however, the potential for bedding plane failure is remote due the discontinuous and ventricular nature of the Fanglomerate bedding.

Subsurface exploration of the subject property included the recent drilling of 2 borings conducted by John Carter, Inc. of Santa Barbara, California. Borings #1 and #2 had drilled through the soil profile and into firm Fanglomerate deposits to 20 & 43 feet, respectively.

The closest **known** fault to the subject property, according to review of the geologic maps of the area, shows the inferred trace of the Sycamore Fault, located approximately 2,000 feet north of the site (not

*Preliminary Investigation: Riviera Partners – 915 Anapamu S.B., CA
March 27, 2009*

shown on the Dibblee Geologic Map). The Sycamore fault is considered potentially active (11,000 to 1.6 million years old).

The closest known **significant** fault to the subject property is the east-west trending Arroyo Parida/Mission Ridge Fault system, located approximately 0.6 miles north of the subject property. Some local geologists classify the Arroyo Parida/More Ranch Fault as being "potentially active" based mainly on geomorphic and stratigraphic offset evidence. Potentially active faults have evidence for past movement in the time range of approximately 11,000 to 1,600,000 years before present. However, the California Department of Conservation Division of Mines and Geology suggests this fault may be "active". The State recommends that a fault be considered "active" if it shows evidence of surface displacement within Holocene time (about the last 11,000 years). The More Ranch/Arroyo Parida/Mission Ridge Fault system is listed as a Type B Fault within the Maps of Known Active Fault Near Source Zones in California (ICBO, 1998, Map J-31. It is our opinion that this site will likely be subject to seismic shaking that is consistent to the neighborhood as a whole from a regionally generated earthquake.

It is our preliminary opinion that the potential for liquefaction (the transformation of a granular material from a solid state to a liquefied state as a result of increased pore pressure) is unlikely, since the earth materials generally consist of firm Fanglomerate deposits and the groundwater table is inferred to be greater than 50 feet below the surface. This inference was confirmed with the recent exploratory borings showing no groundwater encountered to 43 feet.

Our office reviewed several historic aerial photographs of the area to determine if there is overt evidence of past slope instability or fault related features on or near the subject property. The photographs utilized for this study included the Fairchild (1938), and Pacific Western (1989, 1995, 1997, 2001, 2002 & 2003) photos, furnished by the Santa Barbara County, Planning and Development Department, as well as more recent aerial photographs from the internet. Based on review of these photographs, we did not observe any fault related topographic features (lineations) or evidence of landslide activity on or immediately adjacent to the proposed residential building sites.

Moderate to steep sloping hillsides that are underlain by the Fanglomerate deposits are generally considered to have low potential for deep seated slope instability along the South Coast. It is our opinion that the potential for any future landslide impacting the proposed residential structures is low to remote. However, minor erosion and shallow debris flows can occur, particularly if the slopes are poorly vegetated (annual grasses), or concentrated runoff water is allowed of flow onto the surrounding slopes. There is also a potential for shallow fill debris flows to block the existing 30 inch diameter concrete drainage pipe located below Lowena Drive within the north-south aligned drainage swale which bisects the two proposed residential structures. Such a blockage could cause mud and debris to wash over Lowena and fill in portions of the drainage swale on the subject property. While such a debris flow would not likely impact the proposed structures since they are proposed at elevations well above any future debris flows; periodic cleaning out of the drainage culverts may be required, particularly following periods of heavy rainfall. The

potential for erosion and debris flows affecting the structures on the property is considered low provided the recommendations within this report and those of the Soils Engineer are implemented.

Much of the rainfall that occurs in the area appears to percolate directly into the subsurface. However, there is some evidence that excess surface water runoff may pass down slope as sheet flow causing surface erosion. The soils, fill, and Fanglomerate deposits are susceptible to erosion when uncontrolled surface runoff water is allowed to flow over unprotected slopes. The potential for significant erosional damage will be relatively low provided proper drainage control measures are implemented during and after construction of the proposed residential structures. The proposed erosion and drainage control plan should illustrate the need to capture runoff from the proposed structures, driveway, and other impermeable surfaces (i.e. roofs, patios, decks, etc.).

3. CONCLUSIONS

Based on our preliminary findings, it is our conclusion that it is geologically feasible to construct the proposed 13 unit condominium complex on the property provided the recommendations provided by your Soils Engineer (Pacific Materials Laboratory) are implemented. Properly engineered foundations that fully penetrate the loose earth materials, coupled with good drainage control will eliminate the potential for settlement and significant cracking of the residential additions.

The above findings are the result of an approximate one-half day field investigation of the property and surrounding area, review of two deep borings and two older shallow borings (for the Santa Barbara Bowl), analyses of several historic aerial photographs, and review of relevant hydrologic, geologic, and soils literature, maps, and cross sections. Based on these findings, it is our conclusion that it is geologically feasible to construct the proposed residential structures provided the recommendations listed below and those to be provided by your Soils Engineer are implemented.

4. RECOMMENDATIONS

In order to reduce the potential for adverse geologic conditions that could affect the subject property, we make the following preliminary site geologic development recommendations:

The foundation design should incorporate the recommendations set forth within the *Foundation Exploration Report* prepared by Pacific Materials Laboratory. In general, the footings should penetrate any fill materials, soil, and loose materials and extend into firm Fanglomerate materials. The final depth of the footings shall be provided by the Soils Engineer. The final design and depth to the top of the firm materials can be made in the field during the excavaton process.

All runoff water from impervious areas such as roofs, patios, French Drains, and driveways should be captured and directed to an appropriate disposal. No surface water or captured subsurface water should be allowed to pass in an uncontrolled manner onto any sloping hillside. We recommend that the on site drain systems be inspected and cleaned on a regular basis to ensure they are functioning correctly. Minimizing runoff is essential in reducing ground saturation near the existing and proposed building

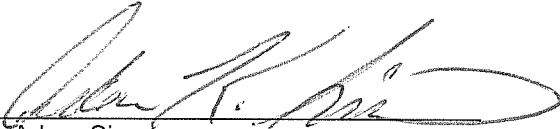
Preliminary Investigation: Riviera Partners – 915 Anapamu S.B., CA
March 27, 2009

additions and along the adjacent slopes. This, in turn, reduces the potential for slope failure, soil creep, or erosion difficulties.

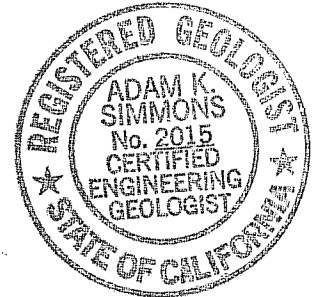
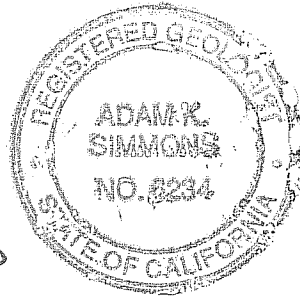
The use of deep rooted, drought tolerant plants in the landscaping of the moderate sloping areas around the property is recommended in order to minimize the potential for oversaturation and erosion. Thick and deep rooted plant varieties help to stabilize the slope and keep it in a state of undersaturation. The revegetation program (in areas where the existing vegetation is sparse or where grasses are present) should be implemented as soon as practical after the rough grading process. Minimize the planting of high water use plants (including lawn) on the property. We suggest that you contact a licensed arborist for any questions you may have regarding drought tolerant plant varieties and the revegetation program.

If we can be of any further service to you on this or other geologic matters, please do not hesitate to contact our office.

Sincerely,



Mr. Adam Simmons
Professional Geologist, Certified Engineering Geologist & Hydrogeologist
State of California PG #6234 EG #2015 HG #509



Enclosures

cc: Ms. Suzanne Elledge;
Mr. Ron Pike, Pacific Materials Laboratory, Inc.



1" = 2,000' North
 Qa = Younger Alluvium
 Qog = Fonglomerate

Regional Geologic Map