



Ray Pyle  
Chief Facilities Planner  
Contra Costa Community College District  
500 Court Street  
Martinez, CA 94553

July 13, 2017

**Subject: Engineering Geology and Seismology Review for  
Contra Costa Community College – Campus Safety Center  
2600 Mission Bell Drive, San Pablo, CA  
CGS Application No. 01-CGS2861**

Dear Mr. Pyle:

In accordance with your request and transmittal of documents received on April 12, 2017, the California Geological Survey has reviewed the engineering geology and seismology aspects of the consulting report prepared for Contra Costa Community College in San Pablo. It is our understanding that this project involves construction of a police services campus safety center. This review was performed in accordance with Title 24, California Code of Regulations, 2016 California Building Code (CBC) and followed CGS Note 48 guidelines. We reviewed the following reports:

**Geotechnical Investigation Report, Campus Safety Center, Contra Costa Community College, 2600 Mission Bell Drive, San Pablo, California:** Kleinfelder, 2882 Prospect Park Dr., Suite 200, Rancho Cordova, CA 95670; company Project No. 20164720.001A, report dated March 17, 2017, 29 pages, 4 appendices.

**Geologic and Seismic Hazards Assessment Report, Planned Campus Safety Center, Contra Costa Community College, 2600 Mission Bell Drive, San Pablo, California:** Kleinfelder, 2882 Prospect Park Dr., Suite 200, Rancho Cordova, CA 95670; company Project No. 20164720.001A, report dated March 30, 2017, 17 pages, 5 appendices.

CGS wrote a letter on December 9, 2016 that addressed the consultants' characterization of fault rupture hazards for this site (project 01-CGS2588). In that letter we noted that the amended map showing habitable zones on campus seemed reasonable.

Based on our review, the consultants provide a thorough and well-documented assessment of engineering geology and seismology issues with respect to the proposed improvements. The principal concerns identified by the consultants are the potential for strong ground shaking and expansive soils. The consultants recommend design spectral acceleration parameters of **S<sub>Ds</sub> = 1.308g** and **S<sub>D1</sub> = 1.614g**, which are considered reasonable. Their evaluation indicates

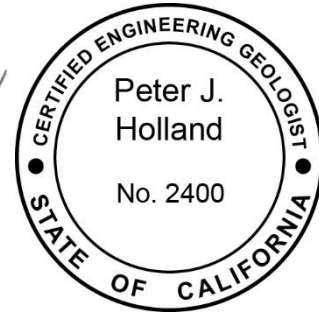
liquefaction, dynamic settlement, and deep-seated slope instability are not design concerns for the project.

In conclusion, ***the engineering geology and seismology issues at this site are adequately assessed in the referenced reports and no additional information is needed.*** If you have any further questions about this review letter, please contact the reviewer at (916-322-9993).

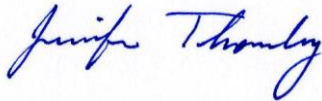
*Respectfully submitted,*



Peter J. Holland  
*Engineering Geologist*  
PG 7994, CEG 2400  
peter.holland@conservation.ca.gov



*Concur:*



Jennifer Thornburg  
*Senior Engineering Geologist*  
PG 5476, CEG 2240



***Enclosures:***

Note 48 Checklist Review Comments

Keyed to: *Note 48 - Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings*

***Copies to:***

Sadek Derrega, *Certified Engineering Geologist*

Kleinfelder, 6700 Koll Center Parkway, Suite 120, Pleasanton, CA 94566

Rebecca Money, *Registered Geotechnical Engineer*

Kleinfelder, 2882 Prospect Park Dr., Ste 200, Rancho Cordova, CA 95670

Troy Pennington, *Architect*

LPAS Architecture + Design, 2484 Natomas Park Drive, Suite 100, Sacramento, CA 95833

Karen Van Dorn, *Senior Architect*

Division of State Architect, 1515 Clay Street, Suite 1201, Oakland, CA 94612

## **Note 48 Checklist Review Comments**

In the numbered paragraphs below, this review is keyed to the paragraph numbers of California Geological Survey Note 48 (October, 2013 edition), *Checklist for the Review of Engineering Geology and Seismology Reports for California Public Schools, Hospitals, and Essential Services Buildings*.

### **Project Location**

1. Site Location Map, Street Address, County Name: Adequately addressed.
2. Plot Plan with Exploration Data with Building Footprint: Adequately addressed.
3. Site Coordinates: Adequately addressed. Latitude and Longitude provided in report: 37.96805°N, 122.34102°W

### **Engineering Geology/Site Characterization**

4. Regional Geology and Regional Fault Maps: Adequately addressed.
5. Geologic Map of Site: Adequately addressed.
6. Subsurface Geology: Adequately addressed. The consultants report clay-rich Holocene basin deposits were encountered below a layer of artificial fill. Groundwater was observed at approximately 13 feet below ground surface.
7. Geologic Cross Sections: Adequately addressed.
8. Active Faulting & Coseismic Deformation Across Site: Adequately addressed. The consultants performed a fault trench investigation. No faults were observed in the trenches within 50 feet of the proposed campus safety center building footprint. For further discussion see CGS's December 9, 2016 letter for project 01-CGS2588.
9. Geologic Hazard Zones (Liquefaction & Landslides): Adequately addressed. The consultants note that this area is not yet zoned by CGS.
10. Geotechnical Testing of Representative Samples: Adequately addressed.
11. Geological Consideration of Grading Plans and Foundation Plans: Adequately addressed.

### **Seismology & Calculation of Earthquake Ground Motion**

12. Evaluation of Historic Seismicity: Adequately addressed. The consultants provide a summary of historical seismicity in the region.
13. Classify the Geologic Subgrade (Site Class): Adequately addressed. The consultants classify the site soil profile as Site Class D, Stiff Soil.
14. General Procedure Seismic Parameters: Adequately addressed. The consultants report the following parameters derived from a map-based analysis:  
 $S_S = 2.452$  and  $S_1 = 1.019$   
 $S_{DS} = 1.634$  and  $S_{D1} = 1.019$
15. Seismic Design Category: The consultants refer to 2016 CBC Tables 1613.3.5 (1) and (2) in determining Seismic Design Category. However, Section 1613.3.5 of the 2016 CBC states

structures “**located where the mapped spectral response acceleration parameter at 1-second period,  $S_1$  is greater than or equal to 0.75 shall be assigned to Seismic Design Category E.**”

16. Site-Specific Ground Motion Analysis: Adequately addressed. The consultants’ deterministic and probabilistic MCE spectra appear reasonable based on comparison with results from the State-Wide Model (from Petersen and others, 2008). The consultants report their site-specific seismic design parameters are:  $S_{DS} = 1.308g$  and  $S_{D1} = 1.614g$ . Alternatively,  $S_a$  values presented in the middle column of Table E-4 may be used with the equivalent lateral force procedure, per ASCE 21.4. The site-specific ground motion analysis presented appears to be reasonable and in accordance with ASCE 7-10.
17. Deaggregated Seismic Source Parameters: Not applicable.
18. Time-Histories of Earthquake Ground Motion: Not applicable.

### **Liquefaction/Seismic Settlement Analysis**

19. Geologic Setting for Occurrence of Liquefaction: Adequately addressed. The consultants report “interbedded layers of firm to hard fine-grained clayey soils” from this and previous investigations. They conclude liquefaction potential is considered minimal due to soil types and anticipated to be less than 1-inch.
20. Seismic Settlement Calculations: Not applicable.
21. Other Liquefaction Effects: Not applicable.
22. Mitigation Options for Liquefaction: Not applicable.

### **Slope Stability Analysis**

23. Geologic Setting for Occurrence of Landslides: Adequately addressed. The consultants report the site is relatively flat and the potential for landslides is considered low. This seems reasonable based on the information provided.
24. Determination of Static and Dynamic Strength Parameters: Not applicable.
25. Determination of Pseudo-Static Coefficient ( $K_{eq}$ ): Not applicable.
26. Identify Critical Slip Surfaces for Static and Dynamic Analyses: Not applicable.
27. Dynamic Site Conditions: Not applicable.
28. Mitigation Options/Other Slope Failure: Not applicable.

### **Other Geologic Hazards or Adverse Site Conditions**

29. Expansive Soils: Adequately addressed. The consultants report “**highly expansive**” soils and provide mitigation recommendations.
30. Corrosive/Reactive Geochemistry of the Geologic Subgrade: Adequately addressed. The consultants report soil corrosion test results.
31. Conditional Geologic Assessment: Selected geologic hazards addressed by the consultant are listed below:
  - E. Radon-222 gas: Adequately addressed. The consultants indicate a radon specialist may be considered.

## **Report Documentation**

32. Geology, Seismology, and Geotechnical References: Adequately addressed.
33. Certified Engineering Geologist: Adequately addressed.  
Sadek Derrega, Certified Engineering Geologist #2175
34. Registered Geotechnical Engineer: Adequately addressed.  
Rebecca Money, Registered Geotechnical Engineer #2776