

Marcos Rodriguez
Director of Construction
Rowland Unified School District
1018 South Otterbein Avenue
Rowland Heights, CA 91748

August 17, 2021

**Subject: Engineering Geology and Seismology Review for
Rowland High School – New Storage Building
2000 South Otterbein Avenue, Rowland Heights, CA
CGS Application No. 03-CGS5021**

Dear Mr. Rodriguez:

In accordance with your request and transmittal of documents received on June 14, 2021, the California Geological Survey (CGS) has reviewed the engineering geology and seismology aspects of the consulting reports prepared for the subject project at Rowland High School in Rowland Heights. It is our understanding that this project involves construction of a new one-story steel-framed storage building. This review was performed in accordance with Title 24, California Code of Regulations, 2019 California Building Code (CBC) and followed CGS Note 48 guidelines. We reviewed the following reports:

Geotechnical Investigation for Design and Construction of New Auto Shop Storage Building (M-10), Rowland High School, 2000 Otterbein Avenue, Rowland Heights, CA: Harrington Geotechnical Engineering, Inc., 1590 N. Brian Street, Orange, California 92867; company Project No. 21-01-4178, report dated June 1, 2021, 22 pages, 2 appendices.

Geologic Hazards Report, Proposed Auto Shop Expansion Project, John A. Rowland High School, 2000 South Otterbein Avenue, Rowland Heights, Los Angeles County, California: Terra Geosciences, P.O. Box 1090, Loma Linda, CA 92354; company Project No. 152781-3, report dated April 29, 2021, 11 pages, 4 plates, 2 appendices (included as Appendix C in the above-referenced report).

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 $S_{DS} = 1.24g$ and $S_{D1} = 0.87g$, which are considered reasonable. Their evaluation indicates liquefaction 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 further information is requested.*** If you have any further questions about this review letter, please contact the primary reviewer at (213) 239-0884 or michael.defrisco@conservation.ca.gov.

Respectfully submitted,



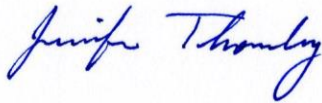
Michael J. DeFrisco
Engineering Geologist
PG 8624, CEG 2574



Chase White
Senior Geotechnical Engineer
PG 8530, CEG 2489, PE 73664, GE 2938



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:

Joseph L. Welch, *Registered Geotechnical Engineer*
Harrington Geotechnical Engineering, Inc., 1590 N. Brian Street, Orange, CA 92867

Donn C. Schwartzkopf, *Certified Engineering Geologist*
Terra Geosciences, P.o. Box 1090, Loma Linda, CA 92354

Dustin Rosepink, *Architect*
4 S.T.E.L. Engineering, Inc., 26030 Acero, Mission Viejo, CA 92691

Douglas Humphrey, *Regional Manager*
Division of State Architect, 355 South Grand Avenue, Suite 2100, Los Angeles, CA 90071

Note 48 Checklist Review Comments

In the numbered paragraphs below, this review is keyed to the paragraph numbers of California Geological Survey Note 48 (November, 2019 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: 33.98345°N, 117.88468°W

Engineering Geology/Site Characterization

4. Regional Geology and Regional Fault Maps: Adequately addressed.
5. Geologic Map of Site: Not provided and therefore not reviewed.
6. Geologic Hazard Zones: Adequately addressed. The consultants report the site is not located within an Alquist-Priolo Earthquake Fault Zone or a zone with potential for earthquake-induced landsliding. However, they report the site is located within a potential liquefaction hazard zone mapped by CGS.
7. Subsurface Geology: Adequately addressed. Based on regional mapping and two borings drilled at the site, the consultants report the site is underlain by late Pleistocene-age older alluvial deposits consisting predominantly of interbedded sandy clay/clayey sand and silty sand, which overlie Miocene-age sedimentary bedrock of the Puente Formation. Groundwater was reportedly encountered at a depth of 35 feet.
8. Geologic Cross Sections: Not provided and therefore not reviewed.
9. Geotechnical Testing of Representative Samples: Adequately addressed.
10. Consideration of Geology in Geotechnical Engineering Recommendations: Adequately addressed. The consultants recommend the proposed storage building be supported by shallow perimeter footings and slab-on-grade bearing on compacted fill. They recommend the upper 3 feet of existing soils be overexcavated and recompacted throughout the building footprint.
11. Conditional Geotechnical Topics:
 - A. Basement and Retaining Wall Design: Adequately addressed. The consultants indicate there are existing retaining walls on the north and west sides of the proposed new storage building that are intended to be incorporated into the new building. They report **the existing retaining wall can be used as perimeter wall for the new storage building provided the only new load applied to the wall is masonry required to raise the wall to finish height, and provided that structural analysis of surcharge load upon the existing wall is performed.** The consultants recommend reasonable values of surcharge load and static and seismic lateral earth pressures that should be considered in analysis of the existing retaining wall.

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, based on shear wave velocity measurements at the school campus. The data presented appear to support this conclusion.
14. General Procedure Ground Motion Analysis: Adequately addressed. The consultants report the following parameters derived from a map-based analysis:
 $S_S = 1.843$ and $S_1 = 0.649$
 $S_{DS} = 1.229$ (and $S_{D1} = 0.736$, for the purpose of calculating T_S)
 $T_S = 0.599$
15. Site-Specific Ground Motion Hazard Analysis: Adequately addressed. The consultants' probabilistic MCE spectra appears reasonable based on comparison with results from the National Seismic Hazard Model (from Petersen and others, 2014). CGS notes that the consultants' deterministic MCE spectrum is lower than expected at short periods, and that they appear to have developed the deterministic spectrum for the Whittier Fault without considering the northeast dip of the fault or hanging-wall factor of the site. However, these discrepancies have a trivial effect on the consultants' MCE_R and site-specific design response spectra in this case. The consultants report their site-specific seismic design parameters are: $S_{DS} = 1.24g$ and $S_{D1} = 0.87g$, which are reasonable.
16. Deaggregated Seismic Source Parameters: Not applicable.
17. Time Histories of Earthquake Ground Motion: Not applicable.

Fault Rupture Hazard Evaluation

18. Active Faulting & Coseismic Deformation Across Site: Marginally adequate. The consultants report the nearest active fault is the Whittier Fault located approximately 2.6 miles southwest of the site. They conclude the probability of ground surface rupture at the site is considered very low since no known active faults are believed to traverse the site. For future projects, the consultants should provide geologic, geomorphic, and/or seismological arguments for assessing potential fault rupture hazard.

Liquefaction/Seismic Settlement Analysis

19. Geologic Setting for Occurrence of Liquefaction: Adequately addressed. The consultants report there may be potential for liquefaction based on a groundwater depth of 35 feet encountered in the borings and historical high groundwater depth of 25 feet.
20. Seismic Settlement Calculations: Adequately addressed. The consultants provide results of liquefaction/dry sand settlement analysis considering reasonable input parameters. Their analysis indicates potential for 1.67 inches of dry sand settlement at the location of boring B-1 and 1.28 inches at B-2. The data presented appear to support this conclusion.
21. Other Liquefaction Effects: Adequately addressed.
22. Mitigation Options for Liquefaction/Seismic Settlement: Not applicable.

Slope Stability Analysis

23. Geologic Setting for Occurrence of Landslides: Adequately addressed. The consultants consider the potential for landsliding due to seismic shaking to be nil based on the relatively low relief of the site, which appears reasonable based on the data 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 for Landsliding/Other Slope Failure: Not applicable.

Other Geologic Hazards or Adverse Site Conditions

29. Expansive Soils: Adequately addressed. The consultants provide results of an Expansion Index test which indicates that site soils have “low” expansion potential.
30. Corrosive/Reactive Geochemistry of the Geologic Subgrade: Adequately addressed. The consultants provide results of corrosivity tests and recommend that a corrosion engineer review the results and provide recommendations for corrosion protection, as necessary.
31. Conditional Geologic Assessment: Adequately addressed. No significant conditional hazards of potential concern were identified by the consultants.

Report Documentation

32. Geology, Seismology, and Geotechnical References: Adequately addressed.
33. Certified Engineering Geologist: Adequately addressed.
Donn C. Schwartzkopf, Certified Engineering Geologist #1459
34. Registered Geotechnical Engineer: Adequately addressed.
Joseph L. Welch, Registered Geotechnical Engineer #2239