



January 25, 2021
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City of San Rafael
P.O. Box 151560
San Rafael, California 94915-1560

Attn: Mr. Dan Fitzgerald

Re: Geotechnical Peer Review
52-54 Fremont Road
San Rafael, California

Introduction

In response to your request and in accordance with our on-call agreement with the City of San Rafael, we have performed a peer review of the geotechnical design reports¹² for the planned remodel of one existing residential structure at (54 Fremont), and construction of a new residence located (52 Fremont Road) in San Rafael, California. The purpose of the peer review is to provide an independent, objective review of the geotechnical conditions at the project site, and to provide a professional opinion of the suitability of the project's geotechnical data and recommendations for the planned design and construction of the residence, and for conformance with the San Rafael General Plan 2020, Appendix F.

The scope of our geotechnical services includes:

- site reconnaissance,
- review of the provided geotechnical report and project plans,
- geotechnical evaluations required to form our opinions,
- professional opinion whether the recommendations are appropriate for the site conditions, and
- summary of our peer review in a brief written report.

It should be noted that the scope of our review is limited solely to geologic, geotechnical, and civil portions of the project, and does not include review of structural, architectural, mechanical, or other items beyond the scope of our qualifications. We recommend that non-geotechnical aspects of the plans be reviewed by suitably qualified professionals.

Project Description

Based on review of plans, the proposed project includes remodel of the existing, single family residence accessed from Fremont Road with the addition of an accessory dwelling unit on the lower level, and a new single family residence on the lower portion of the relatively steep lot with access from Marquard Avenue.

¹Geoengineering, Inc., "Report, Geotechnical Evaluation, Two Downslope Residential Sites, 54 Fremont Road, San Rafael, California," File Number 1-077-jm; dated June 26, 2007.

² Reese & Associates, "Report, Soils Investigation, Fremont Road Residence, 54 Fremont Road, San Rafael, California," Job No. 736.8.1, June 5, 2019.

Based on provided architectural plans³, it appears that minor grading will be required for the proposed remodel and associated improvements at 54 Fremont. Civil plans and structural plans have not been provided.

The new lower structure (52 Fremont) would be constructed primarily by excavation into the hillside. Retained walls are planned to support cuts from roughly 10 to 20 feet. Civil plans are preliminary and structural plans have not been provided.

Site Reconnaissance

We performed a site reconnaissance on January 11, 2021 to observe surface conditions in the project area. The residences will be located on an east facing hillside with slopes that range from about 2:1 to 3:1 (horizontal:vertical). A relatively steep ravine is present in the northeast portion of the property which appears to have been the original drainage path for the topographic swale located on the upslope side of Fremont Road. Storm water drainage appears to have been re-routed with the roadway improvements and currently flows downhill along the west side of the property in CMP pipes and wood culvert. A public access path with wood steps border the western side of the property. An existing neighboring, residential structure is located near the eastern property line.

The existing structure at 54 Fremont is in poor condition. The foundation system appears to be a combination of brick foundations and pre-cast concrete pedestals. Many are cracked, laterally displaced and leaning. The residence also appears to be leaning in the downhill direction. Many of the wood retaining walls around the residence have rotted away causing localized erosion which has undermined some of the existing site improvements.

The topography at the proposed new building site includes the old drainage ravine on the east side and a knoll or lobe of fill / old debris flow material on the west side. The site is vegetated with grasses, bushes, and mature redwood, bay and oak trees.

Report Review

We reviewed the soils investigation report for the project prepared by Reese and Associates. The report provides a description of the site and subsurface conditions, geologic hazards including landslides and slope instability (specifically debris flows and soil creep), expansive soils, settlement, fault rupture, and seismic ground shaking. Recommendations were provided in the report for site preparation and grading, drilled pier foundation design, retaining wall criteria, wall drainage, shallow footings in bedrock, concrete slabs, underslab and foundation drainage. Subsurface exploration included five test pits excavated to a maximum depth of 10 feet excavated in the lower portion of the property.

We previously reviewed the preliminary geotechnical report for the project prepared by Geoengineering, Inc. Geoengineering subsurface exploration included five exploratory borings. Borings A through E were excavated to a maximum depth of 26 feet and were located in the upper and middle portion of the property.

³Arterberry, "New Residence, Residence Remodel with New ADU & Lot Line Adjustment for: A.P.N. 012-043-11&12, 52-54 Fremont Road, San Rafael, California, 94901; APN 012-43-01; dated July 5, 2007.

Opinion and Recommendations

Based on our site reconnaissance and document review, it is our opinion that the geotechnical exploration and design recommendations are generally appropriate for the site conditions. However, we recommend that the project geotechnical engineer provide a written response regarding the following geotechnical issues:

- 1) The geotechnical report appears to have been prepared for the development of the new residential structure (52 Fremont Road) in the lower portion of the property. However, the project plans also include reuse and remodel of the existing upslope structure. The geotechnical report should be updated to include evaluation and recommendations for the existing structure. Based on our site reconnaissance, the existing structure will likely require a new foundations system.
- 2) The report includes test pits to a depth of about 10 feet. The previous report includes borings up to 26 feet. There is a discrepancy in the depth to bedrock in the vicinity of Test Pit 2 of the Reese report and Boring D of the previous report. Reese should be provided and should review the previous geotechnical report for the project. Discrepancies in the subsurface data should be evaluated and response provided. In addition, the proposed plan indicates excavations for the new structure on the order of 20 feet below grade, but current test pit exploration has maximum depth of 10 feet. Typically, exploration should extent at least to the planned depth of excavation. Geotechnical Engineer should comment on the need for deeper exploration.
- 3) The recommended mitigation measure for upslope debris flow hazard is to use the existing residence as partial protection and to provide catchment/debris walls in areas beyond the lateral limits of the structure. Considering the existing structure is not being proposed as sacrificial and is planned to be remodeled and re-used, the debris flow hazard mitigation should be re-evaluated and supplemental recommendations provided.
- 4) Considering the presence of neighboring structures and improvements, the planned excavation poses a risk of damage to adjacent structures. The geotechnical report should include a description of expected excavation conditions with Cal-OSHA soil type for temporary shoring. Also, considering the required shoring heights, the geotechnical report should include recommendations for both temporary and permanent tiebacks for lateral support of the walls.
- 5) Seismic design criteria provided in the report is for the 2016 California Building Code (CBC). The 2019 CBC would apply to this project and thus the report should be updated to reflect current CBC criteria.
- 6) The retaining wall criteria does not appear to include any surcharge pressure for soil creep. Drilled pier foundation criteria do include soil creep pressures. The geotechnical engineer should comment whether the retaining wall should have soil creep surcharge loads applied, and if needed, should provide the design criteria.
- 7) Utility trench shoring and backfill recommendations should be provided in the report.
- 8) Recommended minimum pavement sections (asphalt-concrete and/or concrete) should be provided for pavement subject to vehicular loads.
- 9) The project geotechnical engineer should review the grading and structural plans for conformance with the design recommendations. A letter with the results of the plan review should be submitted to the City prior to issuance of a building permit.

Plans

We understand that at this time architectural plans have been submitted for planning level review and include preliminary civil plans showing preliminary grading, drainage, and utility plans. The submittal did not include structural plans. The civil plans appear to be for the new residential development at 52 Fremont. Current plans are suitable for planning level only. Prior to obtaining a

building permit, a full set of civil and structural plans will be needed for review. Preliminary comments regarding submitted plans are presented below:

Civil plans should be updated to include planned work at 54 Fremont in addition to 52 Fremont, and at minimum include; demolition, site grading, new retaining walls, debris fence, surface and subsurface drainage, erosion control, etc.

It appears site grading will be primarily excavation. Cut and fill volumes should be provided with net export or import quantified. Considering the limited site access, a construction management plan including planned truck routes, staging areas, and project schedule should also be provided.

A temporary shoring plan should be provided showing how the excavation will be accomplished and shored without encroachment into off-site properties.

Structural plans should be provided showing the foundation and retaining wall design. Considering several of the retaining walls will be adjacent living space, subsurface drainage and water-proofing information should be included.

Recommendations

We recommend that the following item be responded to at the planning level of the project.

- 1) Clarification should be made that the project includes both the upgrade/remodel of the existing residence and the new structure. If both are included, the geotechnical report should be updated to include recommendations both structures and updated debris flow hazard mitigation measures. The civil plans should also be updated to include preliminary grading, drainage, and existing utility connection for 54 Fremont.

Other items, including response to all the comments above and review of design-level geotechnical report, grading, drainage, structural, and construction management plans, can be handled as part of the Building Permit submittal.

We trust that this letter contains the information required at this time. If you have any questions, please call. We will directly discuss our comments with the applicant's consultants if they wish to do so.

Yours very truly,
MILLER PACIFIC ENGINEERING GROUP



Scott Stephens
Geotechnical Engineer No. 2398
(Expires 6/30/21)