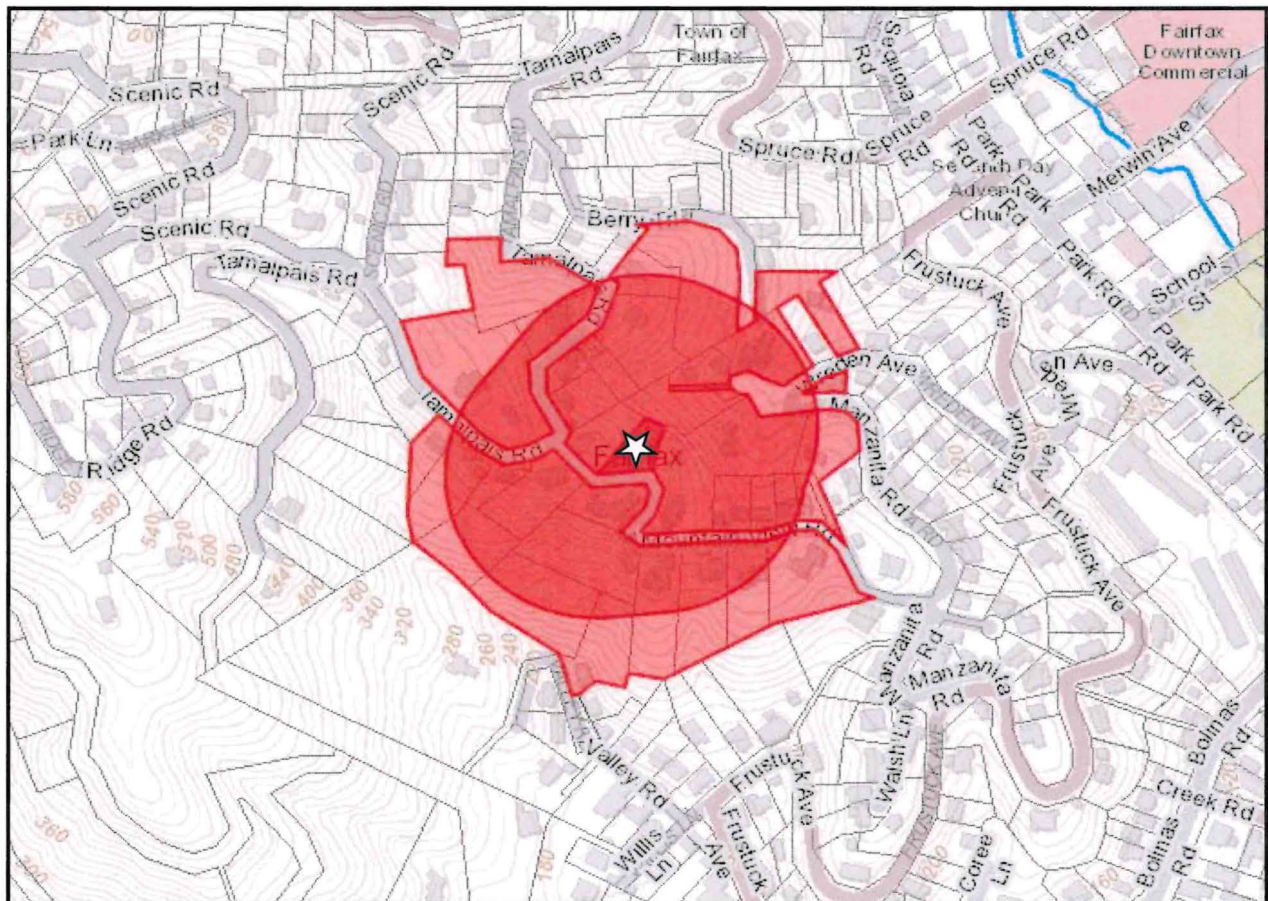


# TOWN OF FAIRFAX STAFF REPORT

## Department of Planning and Building Services

**TO:** Fairfax Planning Commission  
**DATE:** March 16, 2023  
**FROM:** Linda Neal, Principal Planner  
**LOCATION:** 64 Mountain View Rd.; APN # 002-011-31  
**ZONING:** RS-6 Residential Single-family Zone  
**PROJECT:** Remodel/expansion of existing single-family residence  
**ACTION:** Hill Area Residential Development Permit, Design Review Permit, Revocable Encroachment Permit, Driveway Width Variance, Compact Parking Space Variance, Minimum and Combined Side-yard Setback Variances; Application # 23-08  
**APPLICANT:** Dennis Ludlow, Designer  
**OWNER:** Lydia Lerrigo  
**CEQA STATUS:** Categorically exempt, § 15301(e)(1) and 15305(a) and (b).



**64 MOUNTAIN VIEW ROAD**

**AGENDA # 5**

## **DESCRIPTION**

The project encompasses the following:

Remodeling and expanding the south side of the upper living level to relocate the kitchen, add a family room and small dining area and a half bathroom, and remodeling and expanding the north side of the upper floor to add an office, closet and to install an interior stairway to the first floor that was improved as 2-bedrooms and a bathroom that were not internally connected to the upper floor and an outdoor laundry area without the benefit of required planning or building permits by a previous owner. Work proposed on the first floor includes the interior stairway installation and remodel and expansion to enlarge the northern most bedroom, enclose the laundry area and add closets for both bedrooms and provide an additional bathroom. The permitted 521 square-foot house will be expanded by 797 square-feet (includes legalization of 360 square-feet of unpermitted living space on the first floor) bringing the total permitted floor area and height of the structure from 521 square-feet and one story to 1,318 square feet and two stories. The overall height of the structure will not change. A 64-square foot slab will be poured in the crawlspace beneath the first floor to support the heating/cooling and water heater appliances.

Site improvements will include legalizing the two, standard, 9-foot by 19-foot parking spaces and the one compact 8-foot by 16-foot, uncovered parking space built without permits by a previous owner at the front of the site by the terracing and construction of three supporting walls, varying in height from 1 to approximately 4-feet in height. One stairway leads from the parking area to a split stairway that leads to both the south side and west side of the house where the existing front door is located and will remain. The existing stairway leading the south side of the house will be removed and a new retaining wall will replace the existing one and be straightened to create an expanded level area where the family room addition will be constructed and a small patio will be created around the west, south and southeast corner of the house. A new deck will be constructed on the rear second floor of the residence around the new office room, and on top of the rear addition on the first floor. This second-floor deck can also be accessed from the second floor living room by a French door. A smaller deck will be built on the north side of the first floor off one of the bedrooms which will also be accessed by a French door. New windows of varying sizes and shapes will be installed throughout the house but the clere story windows on the south side of the living room and the rectangular window in the south wall of what will become the internal stairway will be retained (see page 4 of the plan set elevation 3). Construction will require the excavation of approximately 17 cubic yards of material, so the project is not subject to obtaining an excavation permit from the Planning Commission as part of this project.

## **BACKGROUND**

The irregularly shaped, 6000 square-foot site slopes down from Mountain View Road with an average slope of 47%. The site is developed with a 1-bedroom, 1-bathroom, 521 square-foot single-family residence that was built in 1934. A past owner constructed unpermitted improvements below the house and another built three parking spaces along the property frontage without permits. The unpermitted construction of what is

now the first floor of the structure was built without permits some time prior to 2001 and was identified in a 2001 Resale Report for the property. A 2019 Resale Report for the property identified the construction of the unpermitted parking spaces and retaining walls creating the parking spaces along the property frontage.

Because this is a developed site there are numerous site improvements including existing access paths, retaining walls, fences and a storage shed. The storage shed will be removed as a part of the project, but the rest of the yard improvements will be retained including a flagstone path on the west side of the house and a stairway leading to the lower floor where it will connect with the new lower floor rear deck.

**DISCUSSION**

The project compliance with the requirements of the RS-6 Single-family Residential Zone is documented in the following table and demonstrates that the project structure complies with all the required setbacks, the height limit, and the floor area ratio (FAR) and lot coverage limitation for the RS-6 Residential Single-family Zone:

	Front Setback	Rear Setback	Combined Front/rear Setback	Side Setbacks	Combined Side Setbacks	FAR	Coverage	Height
<b>Required/ Permitted</b>	6 ft.	12 ft.	35 ft.	5 ft. & 5 ft.	20 ft.	.40	.35	35 ft., 3 stories
<b>Existing</b>	12 ft.	58 ft.	70 ft.	5 ft. & 34 ft.	39 ft.	.11	.09	25 ft., 1 story (legal)
<b>Proposed</b>	No change	55 ft.	67 ft.	5 ft. & 29 ft.	34 ft.	.22	.15	No 25 ft., 2 stories

Note: These setbacks do not apply to the parking.

The project will require the approval of the following discretionary permits:

**Hill Area Residential Development Permit (Town Code Chapter 17.072)**

In accordance with Town Code § 17.072.020(B) and 17.072.050(A) the site is in a landslide hazard zone and the project constitutes a 50% remodel so the project is subject to the approval of a Hill Area Residential Development Permit (HRD).

The purpose of the HRD permit is; (1) to encourage maximum retention of natural topographic features such as drainage ways, streams, slopes, ridgelines, rock outcroppings, vistas and natural plant formations and trees; (2) to minimize grading of hillside areas; (3) to provide safe ingress and egress for vehicular and pedestrian traffic; (4) minimize water run-off and soil erosion during and after construction; (5) prevent loss of life, minimize the potential of injuries, property damage and economic dislocations from geologic hazards; and, (6) to ensure that infill development on

hillsides sites is of a size and scale appropriate to the property and consistent with other properties in the vicinity under the same zone classification [Town Code sections 17.072.010(B)(1) through (6)].

To approve a Hill Area Residential Development, permit the Commission must be able to make the following findings about the project 1) It is consistent with the general plan, other adopted codes, and policies of the Town, and is consistent with the purpose and intent of the HRD title; 2) The site planning preserves identified natural features; 3) Based on the soils report finding, the site can be developed without geologic, hydrologic, or seismic hazards; 4) Vehicular access and parking are adequate; and, 5) The proposed development harmonizes with the surrounding residential development, meets the design review criteria, and does not result in the deterioration of significant view corridors.

### **Foundation Type/Slope Stability**

Although the site did not experience landsliding from the severe 1982, 1997 or 1998 storms, regional mapping by Theodore Smith, Salem Rice and Rudolph Strand in 1976 documents the site is located on the southwestern margin of a large earthflow landslide. The project engineer's observations of the site have identified that the existing structure and decks appear to be supported on spread footings which show signs of being affected by soils creep movement and differential settling (Attachment B- May 25, Herzog Geotechnical Report, page 2, last paragraph). The project soils report previously referenced recommends that the house foundation be a drilled, cast in place, reinforced concrete pier system, or spread footings which extend into bedrock and can resist lateral forces of the creeping soils above that bedrock. The spread footing foundation system will only be acceptable along the upslope side of the proposed lower living level well away from downslopes, while the drilled pier and grade beam system should be used elsewhere within the structure footprint.

The preliminary grading plan shows piers drilled 6-feet into bedrock at the rear east side of the structure and a slab on grade with spread footings set into bedrock beneath the west, front portion of the structure. This has been approved by the project geotechnical engineer, Craig Herzog (Attachment B- 03/6/2023 e-mail from Craig Herzog).

### **Drainage**

The subsurface drainage and run-off from the hillside above and beside the structure and from the roof of the newly expanded structure will be collected in two, separate, below grade, closed systems with the run-off sent to an energy dissipation system located below the development. The final design of the drainage system must be designed to control the amount of moisture in the weak and potentially unstable, on-site soils.

The Commission should note that the project soils report suggests that it would be desirable to obtain permission to conduct outlet piping across downslope properties and to a suitable outlet at a street or a storm drain below (Attachment B – Herzog Geotechnical Consulting Engineers, page 7, paragraph 1). If this were a new

development, and not maintenance/improvement of an existing developed site built in 1934, staff would be requiring this or delaying the project processing for the applicant to explore other alternative solutions. The fact is, the house has withstood three significant past storm years without experiencing significant damage.

**Neighborhood Context**

The table below compares the size of similar sized and sloped properties in the Mountain View/Tamalpais neighborhood as well as the property sizes and floor area ratios maintained by the residences in the immediate vicinity to the proposed project and project site.

64 Mtn. View Rd. – COMPARABLE SITE AND NEIGHBORHOOD HOUSE SIZES							
APN #	ADDRESS	LOT SIZE	HOUSE SIZE	# BEDROOMS	# BATHS	GARAGE	FAR
001-054-01	245 Tamalpais Rd.	11,000	2,268	3	2.5	400	.21
001-054-08	225 Tamalpais Rd.	10,450	1,692	3	2	0	.16
001-054-18	239 Tamalpais Rd.	4,950	1,574	3	2	442	.32
001-063-28	67 Mtn. View Rd.	13,000	1,649	3	2.5	200	
001-063-39	75 Mtn. View Rd.	19,000	2,375 (2 units)	3	2	0	.13
002-011-33	16 Mtn. View Rd.	7,200	1,802	3	2	240	.25
002-011-38	30 Mtn. View Rd.	4,704	1,052	2	2	0	.22
002-011-39	28 Mtn. View Rd.	4,840	1,358	3	2	0	.28
002-011-40	24 Mtn. View Rd.	4,620	1,344	3	2	0	.28
002-011-33	16 Mtn. View Rd.	7,200	1,802	3	2	240	.25
002-015-04	33 Mtn. View Rd.	16,463	2,195 (2 units)	3	3	440	.13
Project site							
002-011-31	64 Mtn. View Rd.	6,000	1,318	2	2.5	0	.22

The proposed house is similar in size and mass to other residences in the neighborhood and in scale with the size of the 6,000 square-foot site.

The Town Engineer has performed a site inspection and reviewed the following plans and report pertaining to the project:

1. Project Plan Set received by the Town on February 22, 2023, including the preliminary development plans and approved VMP by Dennis Ludlow, Designer, the preliminary record of survey and topographic survey pages by L.A. Stevens and Associates, Inc., Professional Land Surveyors, and the grading and stormwater management, erosion and erosion and sediment control plan and drainage plans by Orion Agnew, Registered Professional Engineer.
2. May 25, 2022, Geotechnical Report by Craig Herzog.

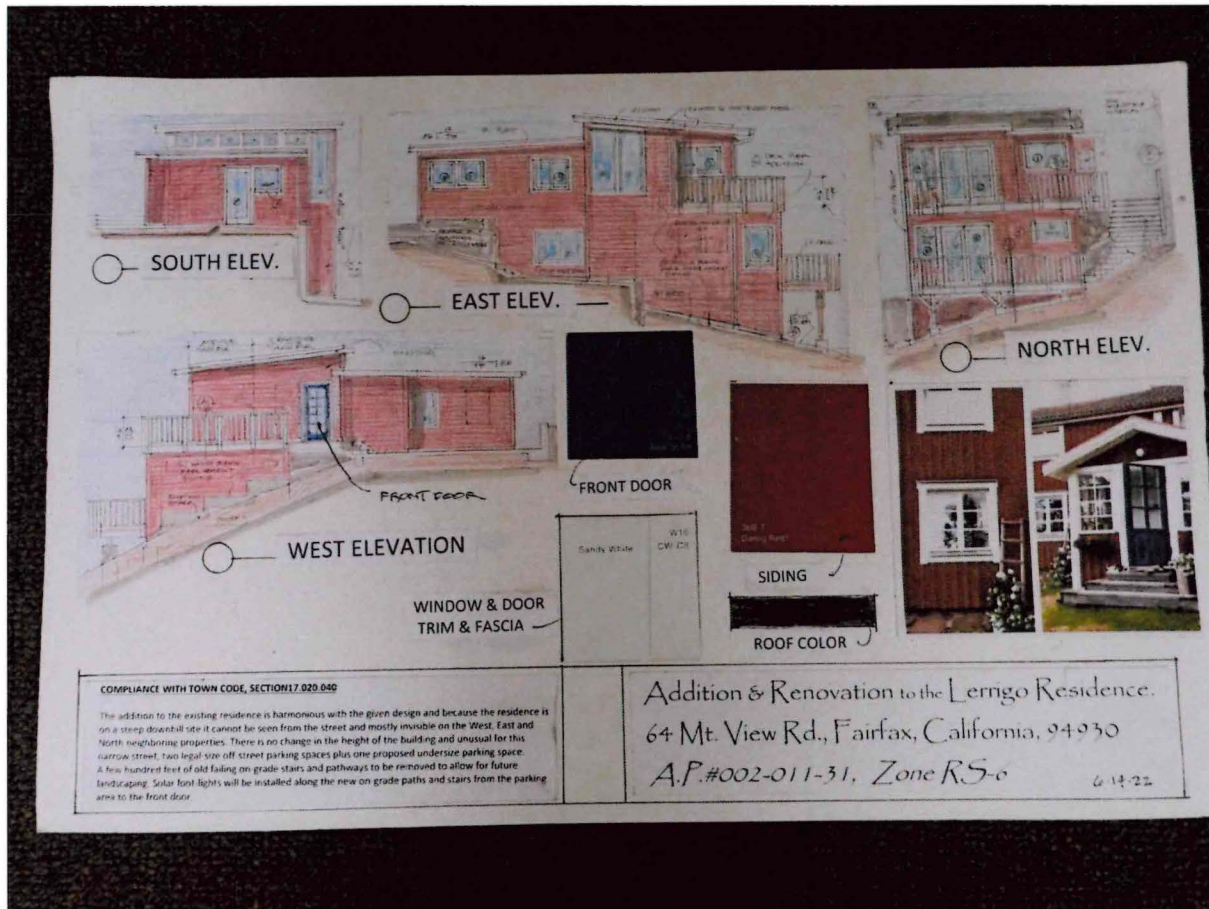
After performing their review of the project plans and body of information and performing a site inspection, Town Engineer has determined that the project can be engineered and constructed to avoid geologic, hydrologic, or seismic hazards (Attachment C – Town Engineer’s final report dated 2/28/23).

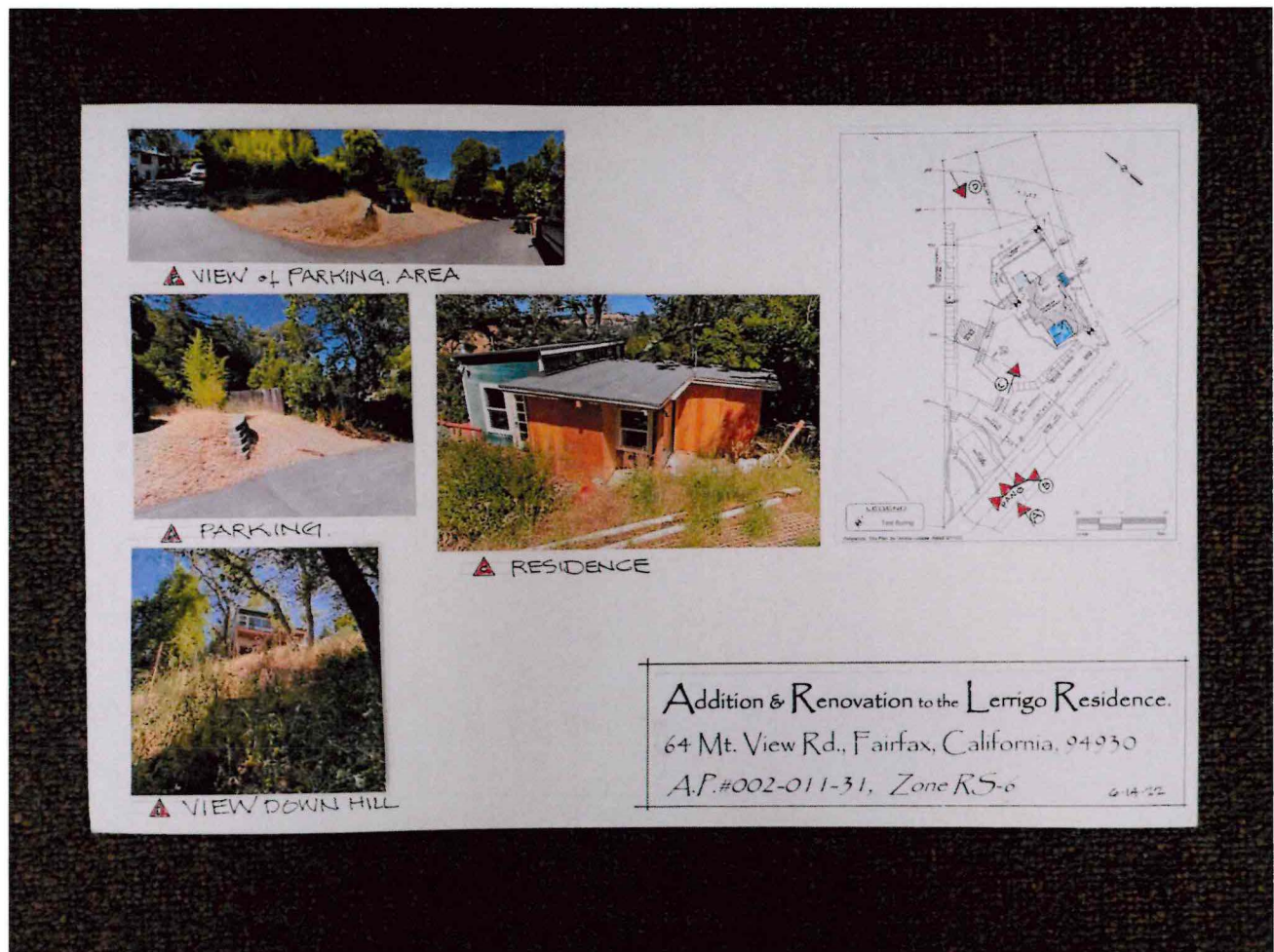
### Design Review Permit

The existing portions of the house and the new additions will be resided with Hardi-plank horizontal fiber cement siding, the trim and fascia will be wood to match the existing windows that will be retained and the deck railings will also be wood.

The siding will be painted red (Clark and Kensington, Daring Red, # 06B-7), the trim and fascia will be off-white (Clark and Kensington, Sandy White, # W16 CW-C8), and the front door will be painted blue (Clark and Kensington, Work of Art, # 36D-5). The roof will be black asphalt shingles.

The applicants plan to retain all the existing trees on the site and the site will be retained in its existing natural state as the owner is not planning to install any landscaping as a part of this project.





## Landscaping Plan

The applicant has no plans to landscape the site at this time but does plan to retain all the trees on the site and maintain the naturally vegetated areas in compliance with the approved VMP (page 9 of the project plan set). Staff has included the following condition of approval in the resolution approving the project, Attachment A, to this staff report:

The site must be maintained in compliance with the VMP approved by the Ross Valley Fire Department (RVFD) on 8/12/22. Any future landscaping must comply with Fire Safe Marin's "Fire-Resistant Plants Common to Marin County, CA." list and Marin Municipal Water District's (MMWD's) "Landscape Your Lawn, Turf Replacement Program" which includes low and very low water use plants and trees from the University of California at Davis "Water Use Classification of Landscape Species (WUCOLS)" list.

## **Lighting Plan**

Page 1A of the project plan set shows eight exterior lights fixtures, Westley 8 ½ Inch High Black LED Outdoor Wall lights that will be affixed to the exterior walls in various locations around the exterior of the building. Chaleur 3W LED Landscape Lights will light the access pathways/stairs in various locations also depicted on page 1A of the project plan set. Both light fixture cut sheets staff viewed online indicated these lights are Dark Sky compliant but we have included the Commission's standard Dark Sky lighting condition as follows in the Resolution for approval to alert the Building Department of the condition should changes be made to the plans during the building permit review process:

All the exterior fixtures must be dark sky compliant (fully shielded and emit no light above the horizontal plane with no sag or drop lenses, side light panels or uplight panels) as well as compliance with color temperature to minimize blue rich lighting. The lighting plan shall be submitted with the building permit application and be approved by the Planning Department prior to issuance of the project building permit. The lighting shall not emit direct offsite illumination and shall be the minimum necessary for safety.

## **Variations – To allow for one Compact Parking Space and for the three parking spaces to partially be located in the Minimum and Combined Side-Yard Setbacks**

This project constitutes a 50% remodel of a non-conforming structure and site and as such, Town Code § 17.016.040(C)(2)(a) requires that part of the project include providing all the required parking or to obtain a variance from the Planning Commission for an exception to the parking requirements.

Town Code §17.052.030(A)(1) and (2) requires that each residence be provided with three parking spaces and Town Code § 17.052.040(B)(1) and (2) require that the spaces be a minimum of 9-feet by 19-feet in size. Town Code § 17.052.010(B) prohibits locating required parking spaces within the side-yard setback. The applicants are requesting a variance from the above sections of the code to legalize the three parking spaces which require an exception to the above mentioned sections of the code due to their existing locations and the compact size of the western most parking space. The exceptions being requested are to allow portions of the three spaces to continue to exist within the minimum and combined side-yard setbacks and to have one of the spaces be a compact 8-foot by 16-foot space. Note that a small portion of the compact parking space and the retaining wall that was built to create the compact parking space extends into the public right-of-way and the applicants are requesting a revocable encroachment permit for the wall that extend into the right-of-way. Guest parking spaces often extend into or are entirely located within the right-of-way and the code only requires revocable encroachment permits to be granted for the structures built in the right-of-way to accommodate the parking if it is located on grade as this one is.

Due to the steep irregular slope, irregular shape, and narrow width of the site, the three unpermitted, uncovered, parking spaces on this down-sloping site have been located as close to the public road as possible. The moderately sloped front of the site was graded



and retained with walls not exceeding 4-feet in height perpendicular to the public roadway, creating the parking area. In viewing the site, the location of the parking is the only sensible place for it because building the parking elsewhere along the frontage would have required more filled area or the construction of a parking structure and more disruption of the natural topography. No covered parking is required because the site has more than a 15% slope and is exempt from the covered parking requirement per Town Code § 17.052.020(C).

Suggested Findings for Granting the Variance to the minimum parking space size and parking location within the combined side-yard setback [Town Code §§ 17.028.070(A)(1) through 4 and (B)(1) through (3):

The strict application of the standard parking stall size requirement and the prohibition of parking within the minimum and combined side-yard setbacks would prohibit the owner from restoring and expanding the residence into a livable condition. The irregular shape, steep slope and narrow width of the site are the property features that make it difficult to comply with the regulations without causing further site disturbance and/or requiring the construction of new parking improvements and possibly a parking structure.

The granting of the exceptions to allow the required parking to extend into the minimum and combined side-yard setbacks and for one of the spaces to be a compact parking space results in a parking configuration similar to those found throughout the hillsides of Fairfax along steep roadways.

The strict application of the setback and parking regulations would result in increased, unnecessary, site disruption on the long-neglected property which would be an unreasonable hardship for the owner.

Granting the variance to allow the parking to extend into the minimum and combined side-yard setbacks and for one of the spaces to be a compact space, will legalize the on-site parking that has been in existence since at least 2019 without generating any complaints from neighbors to Town Hall and allow the area to continue to provide parking for the residents of 64 Mtn. View Road without negatively impacting neighboring properties.

Anticipated future traffic volumes generated by the use of the site for the expanded residence are not such that a strict or literal interpretation and enforcement of the parking regulations is required.

Granting of the variance will not result in the parking or loading of vehicles on public streets in a manner as to interfere with the free flow of traffic on the streets.

Granting of the variance will not create a safety hazard or any other condition inconsistent with the objectives of the Zoning Ordinance.

### **Driveway Width Variance**

The access driveway to the three parking spaces is approximately 55-feet wide and surfaced with permeable pavers with plantings and is the minimum required to allow for access to the three retaining walls built to allow the parking spaces to step up the hillside and to accommodate the two standard 9-foot by 19-foot parking spaces and the third compact 8-foot by 16-foot parking space.

### **Revocable Encroachment Permit**

A small portion of the middle unpermitted parking retaining wall encroaches approximately 1-foot, 3-inches into the Mountain View right-of-way and requires the approval of a revocable encroachment permit by the Planning Commission [Town Code § 12,32,919(A)]. The granting of the revocable encroachment permit by the Planning Commission to legalize the small portion of wall to create the required parking is warranted because it is the only way to legalize the on-site parking required for a single-family residence in accordance with Town Code sections 17.052.030(A)(1)(b), 17.052.030(A)(2) and 17.052.040(B)(1) and (2).

### **Northern Spotted Owl**

The site is not located within ¼ mile of any known Northern Spotted Owl nesting site.

### **Tree Removal**

All proposed construction will occur in areas already disturbed by the existing development so no trees will have to be removed to facilitate the project construction.

### **Other Agency/Department Comments/Conditions**

#### **Ross Valley Fire Department (RVFD)**

Ross Valley Fire Department had the following specific conditions for the project:

1. No landscaping is allowed within 5-feet of the structure.
2. All dead plants, grass and weeds will be removed within the 30-foot zone around the structure and this area will be covered with a weed barrier and then with mulch.
3. Vegetation must be kept trimmed so that the site address numbers are visible when the site is being accessed traveling east or west on Mountain View Road (a two-way street).
4. Any future landscaping within the 30-foot zone will have to be irrigated in compliance with Fire Protection Standard 220.
5. The approved vegetative management plan lasts the life of the property and must be complied with at all times as the site is located in a high fire danger area as required by Fire Inspector Derrik Shaw on 8/12/22.
6. A 20-foot by 40-foot section of the Mtn. View Road along the property frontage must be paved to all weather surface standards in accordance with RVFD Fire Protection Standard 210.
7. The site is in the Wildland Urban Interface (WUI) Zone and the structure will be required to have a sprinkler system installed throughout the building that

complies with the requirements of the National Fire Protection Association 13-D standard and local standards.

For a complete list of the RVFD conditions including the standard fire conditions see the attached Resolution No. 2023-06 (Attachment A). Please note that the project already has an approved vegetative management plan (see project plan set, page A2.0.1).

#### **Ross Valley Sanitary District (RVSD)**

The Ross Valley Sanitary District did not comment on this project, but Town records indicate that this property was connected to the sewer system and the septic system was abandoned with a permit in 1987. Since there is no other record that the sewer line has been checked or replaced since then, staff has included the Ross Valley Sanitary District standard conditions in the attached resolution. If any of the standard conditions are not applicable to the project, the owner can obtain documentation from RVSD prior to submitting for the project building permit and the conditions will be waived by staff.

#### **Marin Municipal Water District, Fairfax Police, Public Works, and Building Departments**

No other agencies or departments had any specific comments, or conditions, for the project approval but staff have included their standard conditions, if they have any, in the resolution approving the project.

#### **RECOMMENDATION**

Conduct the public hearing.

Move to approve application # 23-08 by adopting Resolution # 2023-06 setting forth the findings and the conditions for the project approval.

#### **ATTACHMENTS**

A – Resolution No 2023-06

B – Soils report by Craig Herzog dated 5/25/22 and e-mail dated 3/6/23.

C – Town Engineer's report dated 2/28/23



## RESOLUTION NO. 2023-06

### **A Resolution of The Fairfax Planning Commission Approving Application No. 23-08 for a Hill Area Residential Development (HRD) Permit, Design Review Permit, Revocable Encroachment Permit, Driveway Width Variance, Compact Parking Space Variance, and Minimum and Combined Side Yard Setback Variances for the Remodel and Expansion of the Existing Single-family Residence at 64 Mountain View Road including Legalization of Unpermitted Work**

**WHEREAS**, the Town of Fairfax received an application from Lydia Lerrirgo to remodel and expand a 521 square-foot, one-story, one bedroom, one bathroom, single-family residence into a 1,318 square-foot, two story, two bedroom, two bathroom residence and legalize the existing uncovered parking and associated retaining wall on September 12, 2022; and

**WHEREAS**, the application was deemed complete on February 28, 2023; and

**WHEREAS**, the Commission held a duly noticed public hearing on the proposed project on March 16, 2023; and

**WHEREAS**, after holding the public hearing the Planning Commission determined that the project complies with the Hill Area Residential Development Overlay Ordinance and the Design Review Ordinance and that findings can be made to grant the requested HRD Permit, Design Review Permit, Revocable Encroachment Permit, Driveway Width Variance, Compact Parking Space Variance, and Minimum and Combined Side-yard Setback Variances; and

**WHEREAS**, the Commission has made the following findings:

The project is consistent with the 2010-2030 Fairfax General Plan as follows:

Policy LU-1.2.3: New and renewed development shall be designed and located to minimize the visual mass. The Town will require exterior materials and colors that blend the exterior appearance of structures with the surrounding natural landscape, allowing for architectural diversity.

Policy LU-4.1.4: New and renewed development shall be designed to minimize run-off in a manner that does not cause undue hardship on neighboring properties.

Policy LU-7.1.5: New and renewed residential development shall preserve and enhance the existing character of the Town's neighborhoods in diversity, architectural character, size, and mass.

Policy LU-7.2.2: To the extent feasible natural features including the existing grade, mature trees and vegetation shall be preserved for new and renewed development.

**ATTACHMENT A**

**Hill Area Residential Development Permit (Town Code § 17.072.110)**

1. The proposed development is consistent with the General Plan (see above) and consistent with the purpose and intent of the Zoning Ordinance, Title 17, of the Fairfax Town Code.
2. The site planning preserves identified natural features as much as possible while also legalizing and bringing the property more into conformance with the Town parking regulations than previously existed, providing three parking spaces while the previously existing structure provided only one, on-street parking space.
3. Based on the soils report findings, the site can be developed without increasing geologic, hydrologic, or seismic hazards;
4. Vehicular access and parking are adequate.
5. The proposed development harmonizes with the surrounding residential development, meets the design review criteria, and does not result in the deterioration of significant view corridors.

**Revocable Encroachment Permit ((Town Code Title 12, Chapter 12.32))**

The portion of the driveway that projects into the Mountain View Road right-of-way will not use or obstruct any developed section of the road and the area is not currently being used by the public.

**Design Review Permit (Town Code § 17.020.040)**

1. The project depicted in the plans submitted to the Town on February 22, 2023, complies with the Design Review Criteria set forth in Town Code § 17.020.040.

**Minimum/Combined Side-Yard Setback Variance to Locate Parking Within Those Setbacks [Town Code § 17.028.070 and 17.052.040(B)]**

1. The steep, 47% slope of the site and its irregular shape are the site features that warrant granting the requested Minimum and Combined Side Yard Setback Variances to construct the project. The proposed development will provide much needed parking on the site while evenly distributing the mass of portions of the structure located five feet from the east and west side property lines. The strict enforcement of the combined twenty-foot side yard setback regulations would impact one of the neighboring homes more than the other.
2. There are other properties in the vicinity that maintain only the minimum five-foot side yard setbacks. Therefore, the granting of this variance will not be a grant of special privilege.
3. The strict application of the setback regulations would result in unreasonable hardship for the applicants because they would be unable to bring the property more into compliance with the Town parking regulations without more disruption

to the site and possibly without having to build a structure to accommodate the parking.

4. The proposed parking has been in existence for at least four years without creating any problems along Mountain View Road. Therefore, the granting of the variance to legalize the existing parking will not be detrimental to the public welfare or injurious to other property in the vicinity in which the property is situated.

**WHEREAS**, the Commission has approved the project subject to the applicant's compliance with the following conditions:

The project is approved based on the following plans and reports:

1. Project Plan Set received by the Town on February 22, 2023 including the preliminary development plans and approved VMP by Dennis Ludlow, Designer, the preliminary record of survey and topographic survey pages by L.A. Stevens and Associates, Inc., Professional Land Surveyors, and the grading and stormwater management, erosion and erosion and sediment control plan and drainage plans by Orion Agnew, Registered Professional Engineer.
2. May 25, 2022 Geotechnical Report by Craig Herzog.
3. The project is subject to the following conditions of approval:
  - a) Prior to issuance of any of the building permit for the project the applicant or his assigns shall submit a detailed Construction Management and Staging Plan to the Public Works Department for their approval. The amended plan shall include but is not limited to the following:
    - Construction delivery routes approved by the Department of Public Works.
    - Construction schedule (deliveries, worker hours, etc.)
    - Notification to area residents
    - Emergency access routes
    - Construction worker staging area
4. The applicant shall prepare, and file with the Public Works Director, a video of the roadway conditions on the public construction delivery routes (routes to be pre-approved by Public Works Director).
5. Submit a cash deposit, bond, or letter of credit to the Town in an amount that will cover the cost of grading, weatherization, and repair of possible damage to public roadways. The applicant shall submit contractor's estimates for any grading, site weatherization and improvement plan for approval by the Town Engineer. Upon

approval of the contract costs, the applicant shall submit a cash deposit, bond or letter of credit equaling 100% of the estimated construction costs.

6. The foundation and retaining elements shall be designed by a structural engineer certified as such in the state of California. Plans and calculations of the foundation and retaining elements shall be stamped and signed by the structural engineer and submitted to the satisfaction of the Town Structural Engineer.
7. The grading, foundation, retaining, and drainage elements shall also be stamped and signed by the project geotechnical engineer as conforming to the recommendations made by the project Geotechnical Engineer. The design of the run-off energy dissipater shall be accompanied by 100-year stormwater run-off calculations which must be reviewed and approved by the Town Engineer prior to issuance of the building permit.
8. Prior to submittal of the building permit plans, the applicant shall secure written approval from the Ross Valley Fire Department, Marin Municipal Water District and the Ross Valley Sanitary District noting the development conformance with their recommendations.
9. Submit 3 copies of the recorded record of survey with the building permit plans.
10. Prior to the removal of any trees subject to the Town Tree Ordinance, Town Code Chapter 8.36, the applicant shall secure a tree cutting permit.
11. Prior to the start of construction, the surveyor shall mark the side property lines and submit a signed and stamped letter to the Building Department indicating that side property line locations are marked per the boundary survey.
12. During the construction process the following shall be required:
  - a. The geotechnical engineer and/or the Civil Engineer shall be on-site during the grading process and that engineer shall submit written certification to the Town Staff that the grading has been completed as recommended prior to installation of foundation and/or retaining forms and drainage improvements, piers, and supply lines.
  - b. Prior to the concrete form inspection by the building official, the Civil Engineer shall field check the forms of the foundations and retaining elements and provide written certification to the Town staff that the work to this point has been completed in conformance with the geotechnical report recommendations and the approved building plans.
  - c. The Building Official shall field check the concrete forms prior to the foundation pour.



- d. All construction-related vehicles including equipment delivery, cement trucks and construction materials shall always be situated off the travel lane of the adjacent public right(s)-of-way. This condition may be waived by the Building Official on a case-by-case basis with prior notification from the project sponsor.
- e. Any proposed temporary closures of a public right-of-way shall require prior approval by the Fairfax Police Department and any necessary traffic control, signage or public notification shall be the responsibility of the applicant or his/her assigns. Any violation of this provision will result in a stop work order being placed on the property and issuance of a citation.

13. Prior to issuance of an occupancy permit the following shall be completed:

- a. The geotechnical engineer shall field check the completed project and submit written certification to the Town Staff that the foundation, retaining, grading and drainage elements have been installed in conformance with the approved building plans and the recommendations of the soils report. Additionally, the project engineer shall review the construction schedule and plans at each phase of the project construction to determine the best order for each phase to occur including the hillside retention/drainage phases.
- b. The Planning Department and Town Engineer shall field check the completed project to verify that all staff, agency, and planning commission conditions and required engineering recommendations have been complied with prior to issuance of the certificate of occupancy.

14. Excavation shall not occur between October 1st and April 1<sup>st</sup> of any year. The Town Engineer has the authority to waive this condition depending upon the weather.

15. The roadways shall be kept free of dust, gravel, and other construction materials by sweeping them daily, if necessary.

16. Any changes, modifications, additions, or alterations made to the approved set of plans will require a modification of Application # 23-08. Modifications that do not significantly change the project, the project design or the approved discretionary permits *may* be approved by the Planning Director or the Planning Commission. Any construction based on job plans that have been altered without the benefit of an approved modification of Application 23-08 by the Planning Commission or the Planning Director will result in the job being immediately stopped and red tagged.

17. Any damages to the public portions Mountain View Road, Tamalpais Road, Scenic Road, Manzanita Road, Wreden Avenue, Frustuck Avenue, or other

public roadway used to access the site resulting from construction activities shall be the responsibility of the property owner.

18. The applicant and its heirs, successors, and assigns shall, at its sole cost and expense, defend with counsel selected by the Town, indemnify, protect, release, and hold harmless the Town of Fairfax and any agency or instrumentality thereof, including its agents, officers, commissions, and employees (the "Indemnitees") from any and all claims, actions, or proceedings arising out of or in any way relating to the processing and/or approval of the project as described herein, the purpose of which is to attack, set aside, void, or annul the approval of the project, and/or any environmental determination that accompanies it, by the Planning Commission, Town Council or Planning Director or any other department or agency of the Town. This indemnification shall include, but not be limited to, suits, damages, judgments, costs, expenses, liens, levies, attorney fees or expert witness fees that may be asserted or incurred by any person or entity, including the applicant, third parties and the Indemnitees, arising out of or in connection with the approval of this project, whether or not there is concurrent, passive, or active negligence on the part of the Indemnitees. Nothing herein shall prohibit the Town from participating in the defense of any claim, action, or proceeding. The parties shall use best efforts, acting in good faith, to select mutually agreeable defense counsel. If the parties cannot reach agreement, the Town may select its own legal counsel and the applicant agrees to pay directly, or timely reimburse on a monthly basis, the Town for all such court costs, attorney fees, and time referenced herein, provided, however, that the applicant's duty in this regard shall be subject to the Town's promptly notifying the applicant of any said claim, action, or proceeding.
19. The applicant shall comply with all applicable local, county, state and federal laws and regulations. Local ordinances which must be complied with include, but are not limited to: the Noise Ordinance, Chapter 8.20, Polystyrene Foam, Degradable and Recyclable Food Packaging, Chapter 8.16, Garbage and Rubbish Disposal, Chapter 8.08, Urban Runoff Pollution Prevention, Chapter 8.32 and the Americans with Disabilities Act and Best Management Practices for Stormwater Pollution Prevention.
20. Conditions placed upon the project by outside agencies, Town departments or by the Town Engineer may be eliminated or amended with that agency, department, or the Town Engineer's written notification to the Planning Department prior to issuance of the building permit.
21. The building permit plans shall be reviewed and approved by the Town Engineer, at the expense of the applicant, prior to issuance of the building permit.

#### **Town Engineer's Conditions**

22. The project shall be inspected by the Town Engineer prior to issuance of the occupancy permit for the residential structure for compliance with the engineering plans.

23. The applicant shall obtain an revocable encroachment permit from the Public Works Department prior to performing any construction related work within the public road easement.
24. A detailed Construction Management and Staging Plan shall be submitted along with the building permit application (for review and approval by the Building Official/Public Works Manager).
25. The exact location of the stormwater energy dissipater shall be shown on the construction engineering plans and be accompanied by 100 year storm water run-off calculations at the time of submittal for a building permit and shall be subject to approval by the Town Engineer/Building Official prior to issuance of the building permit

**Ross Valley Fire Department**

26. No landscaping is allowed within 5-feet of the structure
27. All dead plants, grass and weeds will be removed within the 30-foot zone around the structure and this area will be covered with a weed barrier and then with mulch.
28. Vegetation must be kept trimmed so that the site address numbers are visible when the site is being accessed traveling east or west on Mountain View Road (a two way street).
29. Any future landscaping within the 30-foot zone will have to be irrigated in compliance with Fire Protection Standard 220.
30. The approved vegetative management plan lasts the life of the property and must be complied with at all times as the site is located in a high fire danger area as required by Fire Inspector Derrik Shaw on 8/12/22.
31. A 20-foot by 40-foot section of the Mtn. View Road along the property frontage must be paved to all weather surface standards in accordance with RVFD Fire Protection Standard 210.
32. The site is in the Wildland Urban Interface (WUI) Zone and the structure will be required to have a sprinkler system installed throughout the building that complies with the requirements of the National Fire Protection Association 13-D standard and local standards.
33. The project requires installation of a fire sprinkler system that complies with the National Fire Protection Association regulation 13-D and local standards. The system will require a permit from the Fire Department and the submittal of plans and specifications for a system submitted by an individual or firm licensed to design and/or design-build sprinkler systems.

34. All vegetation and construction materials are to be maintained away from the residence during construction.
35. Address numbers at least 4 inches tall must be in place adjacent to the front door. If not clearly visible from the street, additional numbers must be placed in a location that is visible from the street. The numbers must be internally illuminated or illuminated by an adjacent light controlled by a photocell that can be switched off only by a breaker so it will remain illuminated all night.
36. Alternative materials or methods may be proposed for any of the above conditions in accordance with Section 104.9 of the Fire Code.
37. All approved alternatives requests, and their supporting documentation, shall be included in the plan sets submitted for final approval by the Fire Department.

**Marin Municipal Water District (MMWD)**

38. A copy of the building permit must be provided to the district along with the required applications and fees.
39. The foundation must be completed within 120 days of the date of application.
40. All indoor and outdoor requirements of District Code Title 13, Water Conservation must be complied with.
41. Any landscaping plans must be reviewed and approved by the district.
42. Backflow prevention requirements must be met.
43. Ordinance 420, requiring installation of a grey water recycling system when practicable, must be incorporated into the project building permit plans or an exemption letter from the district must be provided to the Town.
44. All the District's rules and regulations in effect at the time service is requested must be complied with.

**Ross Valley Sanitary District (RVSD)**

45. A sewer connection permit and a side sewer connection permit are required for all work outside the new building footprint unless the sewer was upgraded upon the recent sale of the property.
46. Fees will include sewer capacity charges as well as permit fees.
47. Test the sewer lateral(s) from the outer face of the building to the connection at the existing sewer main, in accordance with RVSD Ordinance 100 and Standards.

48. Include a sewer cleanout and backwater protection device within 2-feet of the building foundation, the Ross Valley Sanitary Standard Notes shall be shown and are found in Subsection L of Section 3 of the Design and Construction Standards and demonstrate that all materials used in the construction of the sewer improvements are from the approved materials list.
49. A hold will be placed on the property when the building permit is issued and will not be released for occupancy until the District permit and sewer requirements have been fulfilled.
50. A Certificate of Compliance for the lateral must be obtained from the RVSD prior to the project final inspection by the Fairfax Building Department.

#### **Fairfax Public Works Department**

51. All large trucks with more than 2 axles accessing the site for construction will be limited daily to the hours between 9 AM to 3 PM.
52. Complete road closures will be limited to concrete pours and steel placement and will be coordinated with the Fairfax Police Department and Ross Valley Fire Department.

#### **Miscellaneous**

53. A drainage system maintenance agreement including a system location plan and required maintenance schedule shall be approved by the Town Engineer and then be recorded at the Marin County Recorder's Office setting forth the required maintenance schedule to ensure the drainage system continues to function as designed. A copy shall be provided to the Town prior to issuance of the building permit.
54. All the exterior lighting fixtures must be dark sky compliant (fully shielded and emit no light above the horizontal plane with no sag or drop lenses, side light panels or uplight panels) as well as compliance with color temperature to minimize blue rich lighting. The lighting shall not emit direct offsite illumination and shall be the minimum necessary for safety.

**NOW, THEREFORE BE IT RESOLVED**, the Planning Commission of the Town of Fairfax hereby finds and determines as follows:

The approval of the Hill Area Residential Development Permit, Design Review Permit, Revocable Encroachment Permit, Driveway Width Variance, Compact Parking Space Variance, and Minimum and Combined Side-yard Setback Variances to allow the remodel and expansion of the proposed house, parking spaces and associated retaining walls are approved and the findings have been made to grant the requested discretionary permits. Therefore, the project is in conformance with the 2010 – 2030 Fairfax General Plan, the Fairfax Town Code and the Fairfax Zoning Ordinance, Town Code Title 17; and

Construction of the project can occur without causing significant impacts on neighboring residences and the environment.

The foregoing resolution was adopted at a regular meeting of the Planning Commission held in said Town, on the 16 day of March, 2023, by the following vote:

AYES:  
NOES:  
ABSENT:

\_\_\_\_\_  
Chair Cindy Swift

Attest:

\_\_\_\_\_  
Linda Neal, Principal Planner

## Linda Neal

---

**From:** Craig Herzog <herzog@herzog-geotechnical.com>  
**Sent:** Monday, March 6, 2023 1:02 PM  
**To:** Linda Neal  
**Cc:** Dennis Ludlow8; 'Craig Herzog'; Lydia Lerrigo  
**Subject:** 64 Mountain View Road, Fairfax

Hi Linda,

It was good talking with you - here is a quick summary of the items we discussed:

1. It is my opinion that construction of the foundation underpinning outlined in my report will be feasible from a geotechnical standpoint. This can be accomplished with drilled piers or spread footings which meet the bedrock embedment and lateral confinement requirements outlined in my report. It will be necessary for slabs to be designed to structurally span between bedrock supported elements. The foundations and slabs should be designed by the structural engineer, and the plans submitted for our review prior to building permit submittal.

2. Due to the potential landslide hazard at the site, it would be desirable to obtain permission to conduct outlet piping across downslope properties and to a suitable outlet at a street or storm drain. If permission is denied by the neighbors, the civil engineer should design surface dissipation facilities for this project to result in no net increase in runoff onto downslope properties.

Please call me with any questions.

### Craig Herzog, G.E.

---

**Herzog Geotechnical**  
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Mill Valley, California 94941  
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**HERZOG**  
**GEOTECHNICAL**  
**CONSULTING ENGINEERS**

May 25, 2022  
Project Number 4147-01-22

Lydia Lerrigo  
64 Mountain View Road  
Fairfax, California 94939

RE: Report  
Geotechnical Investigation  
64 Mountain View Road  
Fairfax, California

This presents the results of our geotechnical investigation for the proposed additions and renovations at 64 Mountain View Road in Fairfax, California. The scope of our investigation was to review selected geologic references, observe exposed site conditions, drill three test borings in the project area, conduct engineering analyses, and develop geotechnical recommendations for the design and construction of the project. Our scope of work was outlined in our professional services agreement dated March 29, 2022.

**PROJECT DESCRIPTION**

We understand that the project will consist of adding onto the downslope side of the existing residence and excavating additional living space beneath the structure. Retained cuts for the project are anticipated to range to about 8 feet high. The project is shown on the plans by Dennis Ludlow dated March 17, 2022.

**WORK PERFORMED**

Prior to performing our investigation, we reviewed selected geologic references. We explored the subsurface conditions in the project area on May 12, 2022 to the extent of three test borings ranging between approximately 4 and 8-1/2 feet deep, and extending into bedrock. Due to limited access, the test borings were drilled with portable drilling equipment. The approximate locations of the test borings are shown on the attached *Site Plan*, Plate 1.

Our personnel observed the drilling, logged the subsurface conditions encountered, and collected soil samples for visual examination. Samples were retrieved using Sprague and Henwood and Standard Penetration Test samplers driven with a 70-pound hammer. Penetration resistance blow counts were obtained by dropping the hammer through a 30-inch free fall. The number of blows was recorded for each 6 inches of sampler penetration. These blow counts were then correlated to equivalent standard penetration resistance blow counts. The blows per foot



recorded on the boring logs represent the accumulated number of correlated standard penetration blows that were required to drive the sampler the last 12 inches or fraction thereof.

Logs of the test borings are presented on Plates 2 through 4. The soils encountered are described in accordance with the criteria presented on Plate 5. Bedrock is described in accordance with the *Engineering Geology Rock Terms* presented on Plate 6. The logs depict our interpretation of subsurface conditions on the date and at the depths indicated. The stratification lines on the logs represent the approximate boundaries between soil types; the actual transitions may be gradational.

Selected samples were laboratory tested to determine their moisture content and dry density. Laboratory test results are posted on the boring logs in the manner described on the *Key to Test Data*, Plate 5.

## FINDINGS

### Site Conditions

The site is located on the northern (downslope) side of Mountain View Road in Fairfax, California. The southwestern portion of the site slopes down towards the northeast at about 3:1 (horizontal:vertical), and has been terraced with modular walls to create level parking spaces. A detached shed is situated immediately northeast of the parking area. We understand that the parking area and shed are not being modified as part of the current project. The existing residence is situated within the eastern portion of the site on a hillside which extends down towards the northeast at between approximately 2:1 and 1-1/2:1. The building is wood-framed structure with a partial basement level excavated below. Cuts for a basement area beneath the downslope portion of the structure are supported by concrete retaining wall ranging to about 8 feet high. The structure and adjoining decks appears to be supported on spread footings which have experienced differential settlement and downslope creep movement. Roof downspouts for the building discharge into conduits which extend to unknown outlets. Cuts and fills adjacent and downslope of the structure are supported by yielding timber bulkheads and failing concrete retaining walls. The hillside downslope the project displays topography suggestive of previous landsliding, and an abandoned structure downslope of the house has experienced severe damage as a result of slope and wall movement.

### Subsurface Conditions

The site is within the Coast Range Geomorphic Province which includes San Francisco Bay and the northwest-trending mountains that parallel the coast of California. These features were formed by tectonic forces resulting in extensive folding and faulting of the area. Previous geologic mapping by Rice (1976) indicates that the site is blanketed by landslide deposits. Underlying bedrock in the vicinity has been mapped as consisting of sandstone and shale of the Franciscan Assemblage.

Our test borings encountered fill and colluvial soil overlying bedrock. The fill encountered generally consists of soft to medium stiff sandy silt, and the colluvium generally consists of soft to medium stiff gravelly clay which washed down from upslope areas. The soils encountered are relatively weak and compressible, are of low expansion potential, and are subject to downslope creep on hillsides. Bedrock encountered in the borings generally consists of firm to moderately hard shale and sandstone.

The approximate locations of the test borings are shown on the *Site Plan* (Plate 1). The test borings encountered the following profiles:

<b>Boring</b>	<b>Depth (feet)</b>		
	<b>Fill</b>	<b>Colluvial Soil</b>	<b>Bedrock</b>
B-1	0-6.5	6.5-8.0	8.0-8.5+
B-2	0-1.5	1.5-4.5	4.5-5.5+
B-3	0-1.8	1.8-3.0	3.0-4.0+

Descriptions of the subsurface conditions encountered are presented on the boring logs.

### **Groundwater**

Free groundwater did not develop in the borings prior to backfilling. Groundwater levels at the site are expected to fluctuate over time due to variations in rainfall and other factors. Rainwater percolates through the relatively porous surface soils. On hillsides, the water typically migrates downslope in the form of seepage within the porous soils, at the interface of the soil/bedrock contact, and within the upper portions of the weathered and fractured bedrock.

## **GEOLOGIC AND SEISMIC HAZARDS**

### **Landsliding**

Regional mapping by Wentworth and Frizell (1975) does not indicate the presence of previous landsliding at the site, and maps of slope failures resulting from the severe 1982 storms (Davenport, 1984) and of slope failures resulting from the heavy 1997/1998 storms (USGS, 1999) do not indicate that sliding was reported at the site at either of those times. However, regional mapping by Rice (1976) indicates that the site lies on the southwestern margin of a large earthflow landslide. The mapping indicates the slide to range to about 300 feet wide, and depicts the slide to originate along the approximate alignment of Mountain View Road and to toe out at the base of the hillside approximately 1000 horizontal feet downslope of the site.

The Rice mapping indicates that the site lies near a boundary separating Slope Stability Zone 2 to the southwest from Zone 4 to the northeast. Zone 2 includes narrow ridge and spur crests that are underlain by relatively competent bedrock, but which are flanked by steep, potentially

unstable slopes. Zone 4 includes areas of existing active or inactive landslides, and areas subject to downslope creep. The zones range from 1 to 4, with Zone 4 being least stable.

During our investigation we noted topography indicative of old slide deposits on the hillside immediately downslope of the project. In addition, our test borings indicate that the fills at the site are relatively poorly compacted, are not benched into bedrock, and are inadequately retained. We therefore judge that the site may be subject to instability, particularly as a result of earthquake shaking, heavy rainfall and/or time-dependent loss of material strength.

**Fault Rupture**

The property is not within a current Alquist-Priolo Earthquake Fault Zone (EFZ), and we did not observe geomorphic features that would suggest the presence of active faulting at the site. As such, we judge that the risk of ground rupture along a fault trace is low at this site.

**Ground Shaking**

The San Francisco Bay Region has experienced several historic earthquakes from the San Andreas and associated active faults. Mapped active faults (those experiencing surface rupture within the past 11,000 years) nearest the site are summarized in the following table.

Fault	Distance		Moment Magnitude <sup>1</sup>	Acceleration (g) <sup>2</sup>	
	Miles	Kilometers		M <sup>3</sup>	M+1 <sup>3</sup>
San Andreas (Northern)	6.8	11.0	8.0	0.36	0.65
Seal Cove/San Gregorio	7.6	12.3	7.4	0.29	0.52
Hayward	11.4	18.3	7.3	0.21	0.38
Healdsburg/Rodgers Creek	14.7	23.7	7.3	0.17	0.31

- (1) Estimated maximum magnitudes from Caltrans Fault Database (Version 2A).
- (2) Peak ground acceleration (RotD50) averaged from New Generation Attenuation (NGA-West 2) relationships by Abrahamson, Silva and Kamai (2104), Boore, Stewart, Seyhan and Atkinson (2014), Campbell and Bozorgnia (2014), and Chiou and Youngs (2014). Estimated shear wave velocity (V<sub>S30</sub>) = 525 m/s.
- (3) M = mean value; M+1 = mean+1 standard deviation value.

Deterministic information generated for the site considering the proximity of active faults and estimated ground accelerations are presented in the table above. The estimated ground accelerations were derived from the above-referenced mean attenuation relationships, and are based on the published estimated maximum earthquake moment magnitudes for each fault, the shortest distance between the site and the respective fault, the type of faulting, and the estimated shear wave velocities of the on-site geologic materials. The deterministic evaluation of the potential for ground shaking assumes that the anticipated maximum magnitude earthquake

produces fault rupture at the closest proximity to the site, and does not take recurrence intervals or other probabilistic effects into consideration. This evaluation also does not consider directivity effects, topographic amplification, or other phenomena which may act to amplify ground motions.

Data presented by the U.S. Geological Survey (2016) estimates the chance of one or more large earthquakes (Magnitude 6.7 or greater) in the San Francisco Bay region before the year 2043 to be 72 percent. Consequently, we judge that the site will likely be subject to strong earthquake shaking during the life of the improvements.

### **Liquefaction**

During ground shaking from earthquakes, liquefaction can occur in saturated, loose, cohesionless sands. The occurrence of this phenomenon is dependent on many factors, including the intensity and duration of ground shaking, soil density, particle size distribution, and position of the ground water table (Idriss and Boulanger, 2008). The soils encountered in our test borings contain a high percentage of fine grained materials (silt and clay). Thus, we judge that the likelihood of liquefaction during ground shaking is low.

### **Densification**

Densification can occur in low density, uniformly-graded sandy soils above the groundwater table. We judge that significant densification is unlikely to occur in the areas explored because of the high silt and clay content of the soils encountered in the test borings.

## **CONCLUSIONS**

### **Foundation and Slab Support**

Our test borings indicate that the project area is blanketed by varying thicknesses of weak and compressible fill and native soils which are subject to settlement, downslope creep, and possible instability. We therefore conclude that foundation support should be derived from drilled, cast-in-place, reinforced concrete piers and/or spread footings which extend into bedrock and which are designed to resist lateral forces imposed by the creeping soils above the bedrock. Spread footings will only be feasible where cuts for retaining walls along the upslope side of the lower level addition expose bedrock well away from downslopes, while drilled piers can be used everywhere. Hard drilling or coring will likely be necessary to achieve required penetrations into bedrock. We estimate that differential settlements of foundations designed in accordance with the recommendations contained in this report will be on the order of half an inch.

To avoid differential settlement, interior and other movement sensitive slabs not founded on bedrock should be structural slabs designed to span between bedrock supported foundations.

Existing foundations not supported in competent material will be subject to settlement under new loads and to continuing settlement, creep and possible instability. It will be necessary to underpin or replace existing foundations with drilled piers or helical piers extending into competent material to reduce the risk of damaging differential movement.

### **Excavation and Shoring**

If non-yielding (i.e. rigidly braced) support is not provided during excavation or wall removal, underpinning will be necessary where excavations will extend below a 1-1/2:1 line extended down from the ground surface adjacent to existing foundations and walls. Underpinning may consist of hand-excavated pit footings or drilled piers extending into bedrock located below a 1-1/2:1 line projected up from the base of the planned excavations. Underpinning should be designed or braced to resist anticipated lateral forces including lateral earth pressures.

Our investigation indicates that excavations and wall removal will expose weak soils and highly weathered bedrock which are subject to instability. It will therefore be necessary to shore excavations in order to maintain lateral support for adjacent areas. Shoring should be designed to resist lateral earth pressures as well as surcharge loads from foundations and retaining walls using the design criteria presented in this report. Shoring, underpinning, and the stability of excavations and existing structures should be contractually established as solely the responsibility of the Contractor and is excluded from our scope of work.

### **Retaining Walls**

It will be necessary to fully retain new cuts and fills with engineered retaining walls. Retaining walls should be supported on foundations which extend into undisturbed bedrock, and which are designed to resist lateral forces imposed by the soils above the rock. Piers supporting portions of walls downslope of settlement sensitive areas should be closely spaced to reduce ground loss and settlement of wall backfill. Walls should be provided with adequate backdrainage to prevent hydrostatic buildup.

We judge that yielding of the existing site walls will continue, and that these walls are subject to failure, particularly as a result of earthquake shaking and/or heavy rainfall. It will therefore be necessary to replace existing walls with engineered retaining walls.

### **Exterior Slabs**

Exterior slabs-on-grade and other elements supported on the ground surface will be subject to differential movement. Settlement of exterior slabs can be reduced, but not eliminated, by overexcavating at least the upper 18 inches of soils beneath and within 3 horizontal feet of planned slab or pavement subgrade, scarifying and recompacting the soils exposed by overexcavation, and replacing the excavated materials as properly compacted engineered fill which is retained along the downslope side. Improved performance may be obtained by deepening the depth of overexcavation and recompaction.

### Geotechnical Drainage

It is important that surface and subsurface water be controlled to reduce moisture variations in the weak and potentially unstable on-site soils. Perimeter subdrains should be provided to reduce water infiltration beneath the structure, and roofs should be provided with gutters and downspouts. All drains and downspouts should be collected in new closed conduits and discharged at an approved erosion resistant outlet well away from improvements or potentially unstable slopes. It would be desirable to obtain permission to conduct outlet piping across downslope properties and to a suitable outlet at a street or storm drain.

### Site Stability

We judge that design and construction of the project utilizing the criteria presented this report will reduce the risk of damage as a result of soil creep and shallow instability. However, the project lies within a large mapped landslide. We judge that the proposed project will not adversely affect overall site stability. However, it will be necessary for the owner to accept the risk of irreparable slide-related damage in the event of reactivated large-scale sliding in the area.

## RECOMMENDATIONS

### Seismic Design

Based on the results of our investigation, the following seismic design criteria were developed in accordance with the *2019 California Building Code* and *ASCE 7-16*:

Site Class	C
Site Coefficient $F_a$	1.2
Site Coefficient $F_v$	1.4
0.2 sec Spectral Acceleration $S_s$	1.50
1.0 sec Spectral Acceleration $S_1$	0.60
0.2 sec Max Spectral Response $S_{MS}$	1.80
1.0 sec Max Spectral Response $S_{M1}$	0.84
0.2 sec Design Spectral Response $S_{DS}$	1.20
1.0 sec Design Spectral Response $S_{D1}$	0.56
Design Category	D

### Site Preparation

Designated walls and flatwork should be removed, and areas to be developed should be cleared of vegetation, roots and deleterious material, and then stripped of the upper soils containing root growth and organic matter. The cleared materials and strippings should be removed from the

site. Pipes, vaults, foundations, and other buried objects should be removed, and the resultant voids cleaned and backfilled with approved fill.

### **Underpinning and Shoring**

Unless non-yielding (i.e. rigidly-braced) shoring is provided, underpinning should be installed where excavations or wall removal will extend below a 1-1/2:1 line projected down from the ground surface adjacent to existing foundations. Underpinning support should be derived in approved bedrock located below a 1-1/2:1 line projected up from the base of planned excavations, and should consist of drilled piers or deepened pit footings which are designed in accordance with the recommendations presented in the *Foundations* section of this report.

The Contractor should install shoring as the excavation proceeds in order to maintain lateral support. All underpinning, temporary slopes and shoring should be contractually established as solely the responsibility of the Contractor. Shoring should be designed to resist lateral earth pressures and surcharge loading from structures and retaining walls as outlined in the *Retaining Walls* section of this report.

Cantilevered soldier piers and lagging should be designed to resist an active lateral earth pressure equivalent to a fluid weighing 45 pounds per cubic foot (pcf) where the backslope is level, and 60 pcf for backfill at a 2:1 slope. If rigid bracing or tiebacks are used with the soldier piers, the walls should be designed to resist a uniform lateral earth pressure of  $25xH$  psf (where H is the height of the wall in feet) where the backslope is level, and  $35xH$  psf for a 2:1 backslope. For intermediate slopes, interpolate between these values. Shoring should be designed for additional surcharge loading from structures and walls as outlined in the *Retaining Walls* section of this report.

Soldier piers should consist of drilled, cast-in-place, reinforced concrete piers or hand-excavated pit footings which are designed in accordance with the *Foundations* section of this report. Lagging should be installed promptly as the excavation progresses. Voids behind the lagging should be tightly backfilled with free-draining crushed rock or gravel (drain rock) to prevent yielding behind the shoring. Spacers should be provided between the lagging to allow seepage through the face of the shoring.

### **Foundations**

#### **Drilled Piers**

Drilled piers should be at least 18 inches in diameter and should extend at least 8 feet into bedrock. Design pier depths and diameters should be calculated by the Project Structural Engineer using the criteria presented below. The materials encountered during pier drilling should be evaluated by our representative in the field. Drill spoils should be removed from the site or placed as retained engineered backfill. The sidewalls of pier holes allowed to remain open may be subject to desiccation and deterioration which adversely impacts skin friction

capacity. If concrete is not placed in pier holes within 72 hours of drilling, we should be notified to reevaluate the holes to determine if they need to be reamed or re-drilled.

Piers should be interconnected with grade beams to support structural loads and to redistribute stresses imposed by the creeping soils. Piers supporting retaining walls should be designed to resist soil pressures as outlined in the *Retaining Walls* section of this report. Remaining piers and grade beams should be designed and reinforced to resist lateral soil forces acting from the ground surface to the top of the rock, and exerting an active equivalent fluid pressure of 60 pounds per cubic foot (pcf). For piers, this pressure should be assumed to act on 2 pier diameters.

The portion of the piers extending into bedrock can impose a passive equivalent fluid pressure of 400 pcf acting over 2 pier diameters, and vertical dead plus real live loads of 1000 pounds per square foot (psf) in skin friction. These values may be increased by 1/3 for seismic and wind loads, but should be decreased by 1/3 for determining uplift resistance. The portion of piers designed to impose passive pressures should have at least 7 feet of horizontal confinement from the face of the nearest slope or wall. Confining overburden for passive pressure calculations should be assumed to begin at the bedrock surface. End bearing should be neglected due to the uncertainty of mobilizing end bearing and skin friction simultaneously.

If groundwater is encountered, it may be necessary to dewater the holes and/or to place concrete by the tremie method. If caving soils are encountered, it will be necessary to case the holes. Hard drilling or coring will be required to achieve the required bedrock penetrations.

### Spread Footings

Spread footings should only be used where excavations for the upslope side of the lower level addition expose bedrock well away from downslopes. Spread footings should be at least 16 inches wide, and should be bottomed at least 12 inches into bedrock. Footings should be stepped as necessary to produce level tops and bottoms, and should be deepened as necessary to provide at least 5 feet of horizontal clearance in rock between the portion of footings designed to impose passive pressures and the face of the nearest slope or wall. Spread footings extending into competent bedrock can be designed to impose dead plus code live load bearing pressures of 4000 pounds per square foot (psf), and total design load bearing pressures of 5300 psf.

Resistance to lateral pressures can be obtained in rock from passive pressures against the sides of footings poured neat against rock and from friction along the base of footings. We recommend the following criteria for design:

Passive Pressures*	=	400 pounds per cubic foot (pcf) equivalent fluid pressure
Friction Factor	=	0.40 times net vertical dead load

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\* Neglect passive pressure in the top 12 inches where the surface is not confined by slabs.



### Retaining Walls

Retaining walls should be designed to resist active lateral earth pressures equivalent to those exerted by a fluid weighing 45 pounds per cubic foot (pcf) where the backslope is level, and 60 pcf for backfill at a 2:1 slope. For intermediate slopes, interpolate between these values. Wall facing should extend at least 12 inches below undisturbed downslope grade. Foundation piers for portions of walls located downslope of settlement sensitive areas should be spaced no more than 3 pier diameters (measured center-to-center) and should have a clear spacing of no more than 3 feet. The active pressures acting on wall systems supported by closely spaced piers should be assumed to act on the wall and piers down to the bedrock surface, and to act over the entire length of the wall and pier line. Active pressures on walls where piers are not closely spaced should be assumed to act on the wall facing, and over two diameters of the portion of piers located above the bedrock. A minimum factor of safety against instability of 1.5 should be used to evaluate static stability of retaining walls.

Seismic wall stability should be evaluated based on a uniform lateral earth pressure of  $12xH$  psf (where  $H$  is the height of the wall in feet). This pressure is in addition to the active equivalent fluid pressures presented in this report. For restrained walls, seismic pressures may be assumed to act in combination with active rather than at-rest earth pressures. The factor of safety against instability under seismic loading should be at least 1.1.

In addition to lateral earth pressures, retaining walls must be designed to resist horizontal pressures that may be generated by uphill retaining walls and foundation loads. Where an imaginary 1-1/2:1 (horizontal:vertical) plane projected downward from the base of an upslope retaining wall intersects the downslope wall, that portion of the downslope wall below the intersection should be designed for an additional horizontal uniform pressure equivalent to the maximum calculated lateral earth pressure at the base of the upslope wall. Where an imaginary 1-1/2:1 plane projected downward from the outermost edge of a surcharge load or footing intersects a retaining wall, we should be contacted to provide appropriate surcharge criteria.

Retaining walls should be fully backdrained. The backdrains should consist of 4-inch diameter, rigid perforated pipe surrounded by a drainage blanket. The top of the drain pipe should be at least 8 inches below lowest adjacent downslope grade. The pipe should be PVC Schedule 40 or ABS with an SDR of 35 or better, and the pipe should be sloped to drain at least 1 percent by gravity to an approved outlet. Frequent cleanout risers should be provided for the drain, and sweeps or sanitary wyes should be used to allow for future inspection and maintenance of the drains. The drainage blanket should consist of clean, free-draining crushed rock or gravel wrapped in a filter fabric such as Mirafi 140N. Alternatively, the drainage blanket could consist of Caltrans Class 2 "Permeable Material", in which case the filter fabric may be omitted. A prefabricated drainage structure such as Mirafi Miradrain may also be used provided that the backdrain pipe is embedded in permeable material or fabric-wrapped crushed rock. The drainage blanket should be continuous, at least 1 horizontal foot thick, and should extend to within 1 foot of the surface. The uppermost 1 foot should be backfilled with compacted soil to exclude surface water. Where migration of moisture through retaining walls would be detrimental or

undesirable, retaining walls should be waterproofed as specified by the Architect or Structural Engineer.

With the exception of organic material, we anticipate that on-site soils will be suitable for reuse as wall backfill. However, considerable moisture conditioning of materials may be required. Lumps greater than 4 inches in largest dimension and perishable materials should be removed, and the fill materials should be approved by Herzog Geotechnical prior to use. Imported fill should have a plasticity index of 15 or less, a liquid limit of 40 or less, and should be free of organic matter and of rocks larger than 4 inches. Herzog Geotechnical should observe and approve fill materials prior to importing.

Wall backfill should be placed on level benches excavated in relatively undisturbed soils below the fills. The depth and extent of required bench excavation should be approved in the field by the geotechnical engineer prior to placement of fill. If desired, backfill settlement may be reduced by extending the depth of bench overexcavation. Soils exposed by required excavations should be scarified to a depth of at least 8 inches, moisture conditioned to near optimum moisture content, and recompacted to at least 90 percent relative compaction with light equipment. Relative compaction refers to the in-place dry density of a soil expressed as a percentage of the maximum dry density of the same material, as determined by the ASTM D1557 test procedure. Optimum moisture content is the water content of the soil (percentage by dry weight) corresponding to the maximum dry density.

Retaining walls will yield slightly during backfilling. Therefore, walls should be backfilled prior to building onto or adjacent to the walls, and should be properly braced during the backfilling operations. Backfilling adjacent to walls should be performed only with hand-operated equipment to avoid over-stressing the walls.

Finished backfill slopes should be constructed at an inclination no steeper than 2:1. Backfill slopes should be overbuilt and trimmed back as necessary to expose a well-compacted surface. Routine maintenance of slopes should be anticipated. Fill slopes and areas disturbed during construction should be planted with vegetation to resist erosion. If vegetation is not established prior to rains, exposed slopes should be protected with an erosion control matting such as North American Green SC150, or equivalent. Erosion that occurs must be repaired promptly before it can enlarge.

Even well compacted backfill will settle about 1 percent of its thickness. Therefore, non-structural slabs and other improvements crossing the backfill should be designed to span or to accommodate this settlement.

### **Interior Slabs**

In areas where interior slab subgrade excavations do not expose bedrock, slabs should be designed to structurally span between bedrock supported elements.

Interior slab subgrade should be sloped to drain into a 12 inch deep trench excavated beneath the middle of each slab. The trenches should be lined completely with a filter fabric such as Mirafi 140N, or equivalent. A 4-inch diameter rigid-perforated PVC or ABS (Schedule 40, SDR 35 or equivalent) pipe should be placed on a 1-inch layer of drain rock at the bottom of the trenches with perforations down. The trenches should be backfilled with drain rock up to slab subgrade elevation. The filter fabric should be wrapped over the top of the drain rock. The pipes should be sloped to drain by gravity to a non-perforated pipe which discharges at an approved outlet. The trench for the non-perforated pipe should be backfilled with properly compacted soil.

Interior slabs should be underlain by a capillary moisture break consisting of at least 4 inches of free-draining, crushed rock or gravel (slab base rock) at least 1/4 inch, and no larger than 3/4 inch, in size. Moisture vapor detrimental to floor coverings or stored items will condense on the undersides of slabs. A moisture vapor barrier should therefore be installed over the capillary break. The barrier should be specified by the slab designer. It should be noted that conventional concrete slab-on-grade construction is not waterproof. The local standard under-slab construction of crushed rock and vapor barrier will not prevent moisture transmission through slab-on-grade. Where moisture sensitive floor coverings are to be installed, a waterproofing expert and/or the flooring manufacturer should be consulted for recommended moisture and vapor protection measures, including moisture barriers, concrete admixtures and/or sealants.

### Exterior Slabs

Movement sensitive exterior slabs should be supported on foundations founded in bedrock. Alternatively, if a few inches of differential settlement will be acceptable, exterior upslope of new engineered retaining walls may be founded on properly recompacted fill. Overexcavation in and within 3 horizontal feet of non-structural exterior slabs should extend at least 18 inches below both existing grade and the planned subgrade elevation. Additional overexcavation may be required depending on conditions observed by our representative in the field during construction. The depth and extent of required overexcavations should be approved in the field by Herzog Geotechnical prior to placement of fill or improvements. If desired, slab performance may be improved by increasing the depth of overexcavation.

Soils exposed by required excavations should be scarified to a depth of at least 8 inches, moisture conditioned to near optimum moisture content, and recompacted to at least 90 percent relative compaction. Approved fill material should be placed in lifts not exceeding 8 inches in uncompacted thickness, moisture conditioned to within 3 percent of optimum moisture content, and recompacted to at least 90 percent relative compaction. Finished slab subgrade should be smooth and non-yielding.

Non-structural exterior slabs should be at least 5 inches thick and should be reinforced with at least #4 reinforcing bars spaced no more than 12 inches on-center each way to control cracking due to differential movement. Control joints should be provided as determined by the Structural Engineer. Reinforcement should be continuous across joints. Slabs-on-grade will experience

differential movement and should be structurally separated or hinged from pier supported elements to accommodate significant differential settlements. All slabs should be as designed by the project structural engineer.

### Geotechnical Drainage

Positive drainage should be provided away from foundations, walls and slopes. Ponding of surface water should not be allowed. Provisions should be made to intercept runoff upslope of improvements, and provisions should be made for fail-safe drainage around the house to prevent flooding in the event that the drains become clogged. All roofs should be provided with gutters and downspouts. All downspouts and surface drains should be connected to non-perforated conduits which discharge at approved outlets. It would be desirable to obtain permission to conduct outlet piping across downslope properties and to a suitable outlet at a street or storm drain. If this cannot be achieved, drains should be conducted to approved erosion resistant outlets well away from walls or potentially unstable slopes. Flow from the outlets should be dissipated and spread as much as practical. New conduit should consist of rigid PVC or ABS pipe which is Schedule 40, SDR 35 or equivalent. Downspouts, surface drains and subsurface drains should be checked for blockage and cleared and maintained on a regular basis. Surface drains and downspouts should be maintained entirely separate from wall backdrains.

Foundation drains should be installed adjacent to new perimeter foundations. Perimeter retaining wall backdrains may be substituted for foundation drains. The drains should consist of trenches which extend 18 inches deep, or 12 inches below lowest adjacent interior grade, whichever is deeper, and which are sloped to drain at least 1 percent by gravity. The trenches should be lined completely with a filter fabric such as Mirafi 140N, or equivalent. A 4-inch diameter rigid perforated PVC or ABS pipe (Schedule 40, SDR 35 or equivalent) should be placed on a 1-inch thick layer of drain rock at the bottom of the trenches with perforations down. Frequent cleanout risers should be provided for the drain, and sweeps or sanitary wyes should be used to allow for future inspection and maintenance of the drain. The pipes should be sloped to drain at least 1 percent by gravity to a non-perforated pipe (Schedule 40, SDR 35 or equivalent) which discharges at an approved erosion resistant outlet. The trench for the perforated pipe should be backfilled to within 6 inches of the ground surface with drain rock. The filter fabric should be wrapped over the top of the drain rock. The upper 6 inches of the trenches should be backfilled with compacted clayey soil to exclude surface water. The trench for the non-perforated outlet pipe should be completely backfilled with compacted soil.

Water will accumulate in depressed crawl spaces. Depressed crawl spaces should be graded to create a smooth sloping surface, and covered with an approved pre-fabricated drainage material such as Mirafi Miradrain 6000. A 4-inch diameter, perforated Schedule 40 or SDR 35 pipe should be provided in a trench at the base of the crawl space. The trench should extend 18 inches deep or 12 inches below lowest adjacent interior grade, whichever is deeper, and should be sloped to drain at least 1 percent by gravity. The trench should be completely lined with Mirafi 140N filter fabric, or equivalent. The perforated pipe should slope to drain at least

1 percent to a non-perforated Schedule 40 or SDR 35 pipe which discharges at an approved outlet. The slope and trench should then be covered with reinforced gunite.

### Supplemental Services

Our conclusions and recommendations are contingent upon Herzog Geotechnical being retained to review the project plans and specifications to evaluate if they are consistent with our recommendations, and being retained to provide observation and appropriate field and laboratory testing during site grading, pier drilling, footing excavation, foundation drain and slab underdrain installation, wall backdrain installation and wall backfilling. We should also be notified to observe the completed project. Steel, concrete, slab moisture barriers, corrosion protection and/or waterproofing should be inspected by the designer. Inspection of shoring and underpinning should be performed by the designers, and are specifically excluded from our scope of work.

If during construction subsurface conditions different from those described in this report are observed, or appear to be present beneath excavations, we should be advised at once so that these conditions may be reviewed and our recommendations reconsidered. The recommendations made in this report are contingent upon our being notified to review changed conditions.

If more than 18 months have elapsed between the submission of this report and the start of work at the site, or if conditions have changed because of natural causes or construction operations at or adjacent to the site, the recommendations of this report may no longer be valid or appropriate. In such case, we recommend that we review this report to determine the applicability of the conclusions and recommendations considering the time elapsed or changed conditions. The recommendations made in this report are contingent upon such a review.

We should be notified at least 48 hours before the beginning of each phase of work requiring our observation, and upon resumption after interruptions. These services are performed on an as-requested basis and are in addition to this geotechnical reconnaissance. We cannot provide comment on conditions, situations or stages of construction that we are not notified to observe.

### LIMITATIONS

This report has been prepared for the exclusive use of Lydia Lerrigo and her consultants for the proposed project described in this report.

Our services consist of professional opinions and conclusions developed in accordance with generally-accepted geotechnical engineering principles and practices. We provide no other warranty, either expressed or implied. Our conclusions and recommendations are based on the information provided us regarding the proposed construction, the results of our field exploration and laboratory testing programs, and professional judgment. Verification of our conclusions and recommendations is subject to our review of the project plans and specifications, and our observation of construction.

The test boring logs represents subsurface conditions at the locations and on the date indicated. It is not warranted that they are representative of such conditions elsewhere or at other times. Site conditions and cultural features described in the text of this report are those existing at the time of our field exploration, and may not necessarily be the same or comparable at other times. The locations of the test borings were established in the field by reference to existing features, and should be considered approximate only.

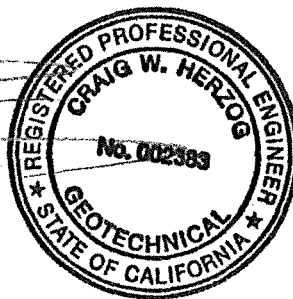
There is an inherent risk of instability associated with all hillside construction, and the risk of slope instability at this site is higher than for typical Marin County hillsides due to the presence of mapped landsliding. We recommend that the owner obtains the appropriate landslide and earthquake insurance. We judge that the measures outlined in this report will reduce the risk of settlement and creep-related damage to proposed improvements as a result of soil creep and shallow instability. However, development of this project will necessitate the owner accepting the risk of possible unrepairable damage in the event of reactivated large-scale sliding in the area.

Our work only addressed the proposed additions and renovations, and did not include an evaluation of the parking area, shed, or other items/areas. Our scope of services did not include an environmental assessment or an investigation of the presence or absence of hazardous, toxic or corrosive materials in the soil, surface water, ground water or air, on or below, or around the site, nor did it include an evaluation or investigation of the presence or absence of wetlands. Our work also did not include an evaluation of any potential mold hazard at the site.

We appreciate the opportunity to be of service to you. If you have any questions, please call.

Sincerely,  
HERZOG GEOTECHNICAL

Craig Herzog, G.E.  
Principal Engineer



Attachments: References  
Plate 1 - 6

## REFERENCES

Boore, D.M., Stewart, J.P., Seyhan, E. and Atkinson, G.M., 2014, *NGA-West2 Equations for Predicting PGA, PGV, and 5% Damped PSA for Shallow Crustal Earthquakes*, Earthquake Spectra 30:3, 1057-1085.

Caltrans, 2012, *Implementation of the 2012 Caltrans Fault Database (Version 2A and Acceleration Response Spectra Online (Version 2.0.4))*.

Campbell, K.W., and Bozorgnia, Y., 2014, *NGA-West2 Ground Motion Model for the Average Horizontal Components of PGA, PGV, and 5% Damped Linear Acceleration Response Spectra*, Earthquake Spectra 30:3, 1087-1115.

Chiou, B. and Youngs, R.R., 2014, *Update of the Chiou and Youngs NGA Model for the Average Horizontal Component of Peak Ground Motion and Response Spectra*, Earthquake Spectra 30:3, 1117-1153.

Davenport, C.W., 1984, *An Analysis of Slope Failures in Eastern Marin County, California, Resulting From the January 3 & 4, 1982 Storm*, California Department of Conservation, Division of Mines and Geology DMG Open-File Report 84-22.

Gregor, N., Abrahamson, N.A., Atkinson, G.M., Boore, D.M., Bozorgnia, Y., Campbell, K.W., Chiou, B., Idriss, I.M., Kamai, R., Seyhan, E., Silva, W., Stewart, J.P., and Youngs, R., 2014 *Comparison of NGA-West2 GMPEs*, Earthquake Spectra 30:3, 1179-1197.

Idriss, I.M., and Boulanger, R.W., 2008, *Soil Liquefaction During Earthquakes*, Earthquake Engineering Research Institute, Monograph No. MNO-12.

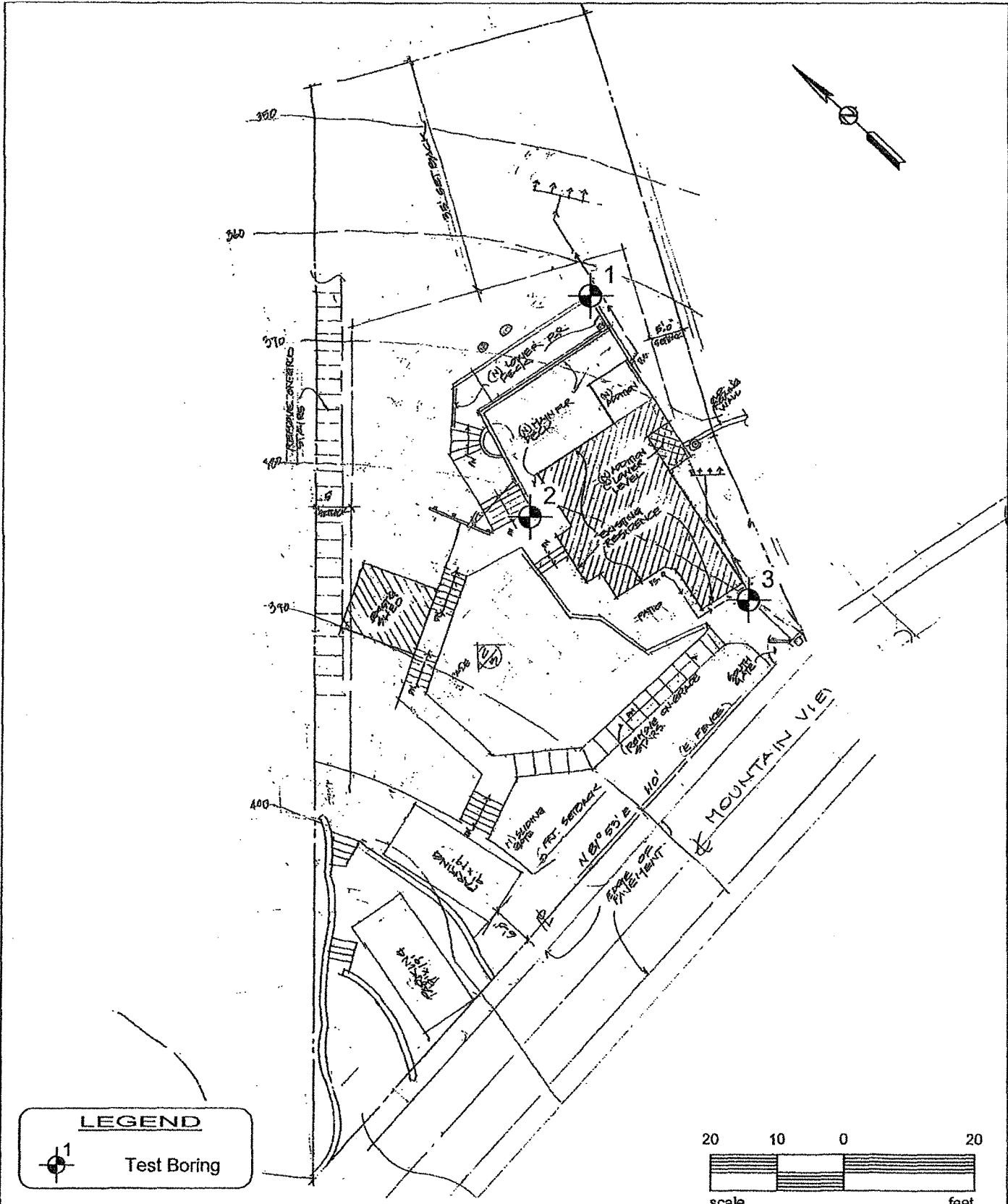
Petersen, et. al., 1996, *Probabilistic Seismic Hazard Assessment for the State of California*, California Department of Conservation, Division of Mines and Geology, Open File Report 96-08.

Rice, S.J., Smith, T.C., and Strand, R.G., 1976, *Geology for Planning: Central and Southeastern Marin County, California*, California Division of Mines and Geology, OFR 76-2.

Sanaz Rezaeian, Mark D. Petersen, Morgan P. Moschetti, Peter Powers, Stephen C. Harmsen and Arthur D. Frankel, 2014, *Implementation of NGA-West2 Ground Motion Models in the 2014 U.S. National Seismic Hazard Maps*, Earthquake Spectra 30:3, 1319-1333.

U.S. Geologic Survey, August 2016, *Earthquake Outlook for the San Francisco Bay Region 2014-2043*, USGS Fact Sheet 2016-3020, ver. 1.1.

Wentworth, C.M. and Frizell, V.A., 1975, *Reconnaissance Landslide Map of Parts of Marin and Sonoma Counties, California*, U.S. Geological Survey OFM 75-281.



Reference: Site Plan by Dennis Ludlow, dated 3/17/22.

**HERZOG**  
**GEOTECHNICAL**  
 CONSULTING ENGINEERS

Job. No: 4147-01-22  
 Appr: CH  
 Drwn: LPDD  
 Date: MAY 2022

**SITE PLAN**  
 64 Mountain View Road  
 Fairfax, California

PLATE  
 1



Other Laboratory Tests	Pocket Penetrometer (ksf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200 sieve	Blows/Foot * Sample	DEPTH (FEET)	EQUIPMENT: 4" Flight Auger LOGGED BY: G.M.	ELEVATION: ** START DATE: 5-12-22 FINISH DATE: 5-12-22
		15.6	90		8	0 - 1	BROWN SANDY SILT (ML), soft to medium stiff, moist, with gravel and roots (Fill)	
		14.8	104		17	1 - 2		
					12	2 - 3		
					21	3 - 4		
					34	4 - 5		
					33/6"	5 - 6		
						6 - 7	MOTTLED ORANGE-BROWN GRAVELLY CLAY (CL), stiff, moist	
						7 - 8	YELLOW-DARK GRAY SHALE, moderately hard, weak, highly weathered	

BOTTOM OF BORING 1 @ 8.5 FEET  
No Free Water Encountered

\* Converted to equivalent standard penetration blow counts.  
 \*\* Existing ground surface at time of investigation.



Job No: 4147-01-22  
 Apr: CH  
 Drwn: LPDD  
 Date: MAY 2022

**LOG OF BORING 1**  
 64 Mountain View Road  
 Fairfax, California

PLATE  
 2

Other Laboratory Tests	Pocket Penetrometer (ksf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200 sieve	Blows/Foot * Sample	DEPTH (FEET)	EQUIPMENT: 4" Flight Auger LOGGED BY: G.M.	ELEVATION: ** START DATE: 5-12-22 FINISH DATE: 5-12-22
						0	1" Flagstone	
						0.5	BROWN SAND (SP), loose, moist (Fill)	
						1.0	BROWN SANDY SILT (ML), soft, moist (Fill)	
					5	1.5		
						2.0	ORANGE-BROWN SANDY CLAY (CL), soft, moist	
						3.0		
						4.0		
					54	4.5	YELLOW-BROWN SANDSTONE, firm, friable to weak, highly weathered	
						5.0		

BOTTOM OF BORING 2 @ 5.5 FEET  
No Free Water Encountered

- \* Converted to equivalent standard penetration blow counts.
- \*\* Existing ground surface at time of investigation.

Other Laboratory Tests	Pocket Penetrometer (ksf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200 sieve	Blows/Foot * Sample	DEPTH (FEET)	EQUIPMENT: 4" Flight Auger	ELEVATION: **
							LOGGED BY: G.M.	START DATE: 5-12-22
						0	1" Flagstone	FINISH DATE: 5-12-22
						1	BROWN SANDY SILT (ML), soft, moist (Fill)	
						2	ORANGE-BROWN GRAVELLY CLAY (CL), medium stiff, moist	
						3	YELLOW-BROWN SANDSTONE, firm, friable, highly weathered	
						4	BOTTOM OF BORING 3 @ 4 FEET No Free Water Encountered	

- \* Converted to equivalent standard penetration blow counts.
- \*\* Existing ground surface at time of investigation.



Job No: 4147-01-22

Appr: CH

Drwn: LPDD

Date: MAY 2022

### LOG OF BORING 3

64 Mountain View Road

Fairfax, California

PLATE

4

MAJOR DIVISIONS				TYPICAL NAMES
COARSE GRAINED SOILS More than Half > #200 sieve	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW	WELL GRADED GRAVELS, GRAVEL-SAND
		GRAVELS WITH OVER 12% FINES	GP	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GM	SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
		GC	CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES	
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS WITH LITTLE OR NO FINES	SW	WELL GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SP	POORLY GRADED SANDS, GRAVELLY SANDS
			SM	SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
		SC	CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES	
FINE GRAINED SOILS More than Half < #200 sieve	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS		Pt	PEAT AND OTHER HIGHLY ORGANIC SOILS	

### UNIFIED SOIL CLASSIFICATION SYSTEM

		Shear Strength, psf Confining Pressure, psf	
Consol	Consolidation	Tx	2630 (240) Unconsolidated Undrained Triaxial
LL	Liquid Limit (in %)	Tx sat	2100 (575) Unconsolidated Undrained Triaxial, saturated prior to test
PL	Plastic Limit (in %)	DS	3740 (960) Unconsolidated Undrained Direct Shear
PI	Plasticity Index	TV	1320 Torvane Shear
Gs	Specific Gravity	UC	4200 Unconfined Compression
SA	Sieve Analysis	LVS	500 Laboratory Vane Shear
	Undisturbed Sample (2.5-inch ID)	FS	Free Swell
	2-inch-ID Sample	EI	Expansion Index
	Standard Penetration Test	Perm	Permeability
	Bulk Sample	SE	Sand Equivalent

### KEY TO TEST DATA

ROCK SYMBOLS



SHALE OR CLAYSTONE



CHERT



SERPENTINITE



SILTSTONE



PYROCLASTIC



METAMORPHIC ROCKS



SANDSTONE



VOLCANIC



DIATOMITE



CONGLOMERATE



PLUTONIC



SHEARED ROCKS

LAYERING

MASSIVE	Greater than 6 feet
THICKLY BEDDED	2 to 6 feet
MEDIUM BEDDED	8 to 24 inches
THINNLY BEDDED	2-1/2 to 8 inches
VERY THINNLY BEDDED	3/4 to 2-1/2 inches
CLOSELY LAMINATED	1/4 to 3/4 inches
VERY CLOSELY LAMINATED	Less than 1/4 inch

JOINT, FRACTURE, OR SHEAR SPACING

VERY WIDELY SPACED	Greater than 6 feet
WIDELY SPACED	2 to 6 feet
MODERATELY SPACED	8 to 24 inches
CLOSELY SPACED	2-1/2 to 8 inches
VERY CLOSELY SPACED	3/4 to 2-1/2 inches
EXTREMELY CLOSELY SPACED	Less than 3/4 inch

HARDNESS

SOFT - Pliable; can be dug by hand

FIRM - Can be gouged deeply or carved with a pocket knife

MODERATELY HARD - Can be readily scratched by a knife blade; scratch leaves heavy trace of dust and is readily visible after the powder has been blown away

HARD - Can be scratched with difficulty; scratch produces little powder and is often faintly visible

VERY HARD - Cannot be scratched with pocket knife; leaves a metallic streak

STRENGTH

PLASTIC - Capable of being molded by hand

FRIABLE - Crumbles by rubbing with fingers

WEAK - An unfractured specimen of such material will crumble under light hammer blows

MODERATELY STRONG - Specimen will withstand a few heavy hammer blows before breaking

STRONG - Specimen will withstand a few heavy ringing hammer blows and usually yields large fragments

VERY STRONG - Rock will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments

DEGREE OF WEATHERING

HIGHLY WEATHERED - Abundant fractures coated with oxides, carbonates, sulphates, mud, etc., thorough discoloration, rock disintegration, mineral decomposition

MODERATELY WEATHERED - Some fracture coating, moderate or localized discoloration, little to no effect on cementation, slight mineral decomposition

SLIGHTLY WEATHERED - A few stained fractures, slight discoloration, little or no effect on cementation, no mineral decomposition

FRESH - Unaffected by weathering agents, no appreciable change with depth



February 28, 2023  
File: 201.215cltr.doc

Town of Fairfax  
Planning and Building Services Department  
142 Bolinas Avenue  
Fairfax, California 94930

Attn: Ms. Linda Neal, Principal Planner

Re: Third Planning-Level Geologic, Geotechnical, and Civil Engineering Review  
New Additions and Renovations to Existing Residence  
64 Mountain View Road (APN 002-011-31)  
Fairfax, California

#### Introduction

In response to your request and in accordance with our agreement dated March 20, 2018, this letter summarizes our second planning-level review of project plans and supporting documentation for the planned new additions, interior renovations, and associated improvements to the existing single-family residence at 64 Mountain View Road (APN 002-011-31) in Fairfax, California. Our First Review comments were summarized in our letter dated October 4, 2022.

The purpose of our services is to review the submitted documents, comment on the completeness and adequacy of the submittal in consideration of Town requirements, and to provide a recommendation to Town Planning staff regarding project approval.

The scope of our services to date has included:

- A site reconnaissance to observe existing conditions and review proposed development features;
- Development of opinions regarding project compliance with applicable Town Hill Area Residential Development Overlay Zone requirements; and
- Development of recommendations to Town staff as to whether the project may be safely constructed in consideration of any geologic, hydrologic, or geotechnical hazards.

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

The originally-submitted plans discussed in our First Review letter included interior renovation and construction of a new 340 square-foot lower-floor addition on the north (downslope) side of the

existing two-story, approximately 650 square-foot residence, to create a new 1,035 square-foot home. The recently-submitted plans that are the subject of this Second Review now call for construction of 3 separate additions totaling 437 square-feet, to create a 1,318 square-foot residence. New decks on the upper and lower floors will total about 438 square feet. Ancillary improvements will include new site retaining walls, sewer lateral replacement, landscape lighting, and other “typical” residential improvements.

### Project Review

We performed a brief site reconnaissance on September 20, 2022 to observe existing conditions at the site. Additionally, we reviewed the following documents provided by the Town as part of our first review:

- Dennis Ludlow (2022), “Additions & Renovations to the Lerrigo Residence, 64 Mountain View Road, Fairfax, California 94930” (Preliminary Architectural and Structural Plans), Sheets 1 through 9, Permit Set dated January 10, 2022.
- Herzog Geotechnical (2022), “Report, Geotechnical Investigation, 64 Mountain View Road, Fairfax, California”, Project No. 4147-01-22, dated May 25, 2022.
- DOMA Title of California (2022), “Preliminary Title Report”, 64 Mountain View Road, Fairfax, CA, Order No. 95004-22-04435

We reviewed the following documents provided by the Town for the second review:

- Agnew Civil Engineering (2022), “Civil Design, 64 Mountain View Rd., Fairfax, CA 94930” (Preliminary Civil Plans), Sheets C-1 through C-4 (7 Sheets total), Job No. 242-1, dated December 29, 2022.
- Dennis Ludlow (2022), “Additions & Renovations to the Lerrigo Residence, 64 Mountain View Road, Fairfax, California 94930” (Preliminary Architectural and Structural Plans), Sheets 1 through 9 and S1 through S2, First Revision Set dated October 10, 2022.
- L.A. Stevens & Associates (2022), “Topographic Survey, Lerrigo Residence, 64 Mountain View Road, Fairfax, California”, dated November 18, 2022.

More recently, we reviewed the following documents provided by the Town for this third review:

- Dennis Ludlow (2022), “Additions & Renovations to the Lerrigo Residence, 64 Mountain View Road, Fairfax, California 94930” (Preliminary Architectural and Structural Plans), Sheets 1 through 9 and S1 through S3, Revision Set dated Feb 15, 2023.

Conclusions

Based on our site reconnaissance and document review, the following submittal items required by the Town of Fairfax Hill Area Residential Development Ordinance remain outstanding:

**Hill Area Residential Development Ordinance**

- Section 17.072.080(B) – Topographical and Boundary Survey
  - 1) The Site Plan, Drainage Plan and General Notes (Sheet 1) appears to use the L.A. Stevens survey as a background and this background is difficult to read and interpret. Sheet 1 should be revised such that critical information, including major topographic contours, top/bottom of wall elevations are clearly and legibly shown. It is noted that top of wall elevations refer to Sheet C-2, but Sheet C-2 does not appear to be updated.
  
- Section 17.072.080(C) – Site Plan
  - 2) The Lower Floor Plans on the Architectural Drawings and Sections (Sheet 5) now indicates an existing shotcrete retaining wall. The Structural Engineer should comment on stability of wall given the adjacent intended residential use.
  - 3) Preliminary Structural Plans (Sheet 6, Details 4 and 11) now read “10-foot min. embedment, 6-feet into rock”. It is unclear which is the minimum criteria. Plans should be revised to indicate whether 6-foot embedment into bedrock is required regardless of total embedment. For example, if a drilled pier encounters 8 feet of soil over bedrock, would pier depth be 10 or 14 feet? If bedrock is at 1 foot, is pier depth 10 or 7 feet?
  - 4) Preliminary structural plans indicate that the design conforms to the 2019 California Building Code, but do not reference the project Geotechnical Report (Sheet 7, Note 5). Reference to the geotechnical report should be added. The plans should also be signed and stamped by a licensed Structural Engineer.
  - 5) The Geotechnical Report (page 6) indicates that “yielding of the existing site walls will continue, and that these walls are subject to failure, particularly as a result of earthquake shaking and/or heavy rainfall. It will therefore be necessary to replace existing walls with engineered retaining walls”. The Geotechnical Engineer should review the current plans, comment on whether the existing walls pose a potential life-safety risk to building occupants, and comment on any other potential adverse impacts to adjoining properties, Town facilities, or other third parties. Plans should be revised to include replacement of any site retaining walls judged integral to site safety and overall stability.
  
- Section 17.072.080(E) – Geotechnical Report

The project geotechnical report was prepared by Herzog Geotechnical of Mill Valley, California on the basis of 3 exploratory soil borings extending to maximum depths between about 4.0- and 8.5-feet below the ground surface. Laboratory testing included determination of moisture content and dry density.



The report provides brief discussion of local geologic and slope-stability mapping and regional seismicity, and provides recommendations for seismic design, underpinning and shoring, shallow footing and drilled-pier foundations, retaining walls, concrete slabs on grade, fill compaction, and site drainage.

- Section 17.072.080(F) – Grading and Erosion-Control Plan
- 6) The provided Grading and Erosion-Control Plan does not show any proposed grading (cut and fill areas with finished grade contours) but indicates a total of 15 cubic yards of cut and 10 yards of off-haul. The Grading and Erosion-Control plan should be revised to show all proposed site grading and provide accurate/updated finished grade contours and quantities.
  - 7) The Grading and Drainage Plan Sheet C-2 shows site drainage will be discharged via a dissipator sited on sloping ground in the lower portion of the property. Given the geotechnical report's discussion regarding the site's susceptibility to instability under saturated conditions, the Geotechnical Engineer should review the details and proposed locations for all drainage dispersion facilities to confirm their conformance to the intent of his recommendations.
  - 8) Preliminary plans indicate that new retaining walls up to about 6-feet high will be required for the work, and the Geotechnical Report provides detailed and extensive recommendations for excavation shoring during construction. At the building level, detailed shoring plans designed or temporary cut slopes per OSHA requirements, should be prepared by a licensed Engineer and submitted for review prior to issuance of building permits.
- Section 17.072.110(C) – Geotechnical Report Adequacy
- 9) We judge that the geotechnical report is generally adequate to facilitate code-compliant design of the proposed improvements.
  - 10) As stated in the report, the Geotechnical Engineer should review the project Structural, Shoring, and Civil plans and provide a letter attesting to their compliance with his recommendations.

### Recommendations

It is our opinion that the most critical planning level comments have been addressed and we recommend that project processing continue at the planning level.

Remaining items, including review of design-level grading, drainage, structural, erosion control plans, drainage calculations, shoring plans, geotechnical plan review letter, and other materials can be handled at the Building Permit submittal level with minimal anticipated impact.

We are available to discuss our comments directly with the applicant, in the interest of efficiency for both parties, if the Town and/or Applicant would like to do so.

We trust that this letter contains the information you require at this time. If you have any questions, please call.

Yours very truly,  
MILLER PACIFIC ENGINEERING GROUP



Mike Jewett  
Town of Fairfax Contract Geologist  
Engineering Geologist No. 2610  
(Expires 1/31/25)

REVIEWED BY:



Scott Stephens  
Town of Fairfax Contract Engineer  
Geotechnical Engineer No. 2398  
(Expires 6/30/23)