
PRELIMINARY GEOTECHNICAL REPORT

PETERS RESIDENCE

WOODACRE, CA 94973

APN 172-041-04

Client:
Andrew Peters
andrew@petersdesignbuild.com

12 May 2021
20-190301-02

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12 May 2021
Project No. 20-190301-02

Andrew Peters
andrew@petersdesignbuild.com

Subject: Preliminary Geotechnical Report
Peters Residence
Woodacre, CA 94973
APN 172-041-04

Dear Mr. Peters,

This letter transmits our preliminary geotechnical report for a residence located in Woodacre, California. The work described in this report was performed in accordance with our professional service agreement 13 July 2020. We previously performed a study regarding the impact of a leach field system on the subject parcel.

Our understanding of the proposed improvements is based on a site visit, a review of the project documents, and our communication with you. We understand that plans are to construct a new residence at the site. Construction will require grading activities to construct a new drive to the residence, minor site grading for the proposed building pad and construction of new foundations for the proposed residence.

Currently, the parcel is vacant; however, a relatively level area exists at the proposed home site. The purpose of our studies at this time is to: provide a preliminary geotechnical report attesting to the suitability and geological feasibility of the proposed construction (cutting and filling) and identify any drainage or soils problems that the design of the project must accommodate.

We appreciate the opportunity to be involved with this project. If you have any questions, please call.

Yours Sincerely,
DIVIS CONSULTING, INC.

A handwritten signature in blue ink that reads "Christian J. Divis". The signature is fluid and cursive, written over a light blue horizontal line.

Christian J. Divis, GE
Principal Engineer

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Prepared by:

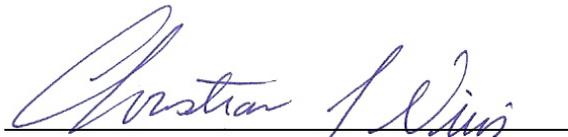

Christian J. Divis, PE, GE
Geotechnical Engineer #GE2694



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**PRELIMINARY GEOTECHNICAL REPORT
PETERS RESIDENCE
WOODACRE, CA 94973
APN 172-041-04**

1.0 INTRODUCTION

This report presents the results of our preliminary geotechnical and geologic studies for the subject project. Our studies are based on our knowledge of the site vicinity, a review of available published geologic maps and a geologic site reconnaissance. The property is identified by the County of Marin with Assessors Parcel Number (APN) 172-041-04. The approximate site location is shown on Figure 1.

2.0 PROPOSED DEVELOPMENT

Our understanding of the proposed development is based on the drawing set titled “Peters Residence - APN 172-041-04, Woodacre, CA 94973”, prepared by Peters Design-Build Inc. and dated 12 May 2021 as referenced on Figure 2 Site Plan and Geology Map.

We understand plans are to construct a 3,489 square foot single family residence over a garage, a new pool and site grading for a new driveway, guest parking and landscaping. Site retaining walls will be required to construct the proposed driveways.

3.0 SCOPE OF WORK

Our services were performed in accordance with professional service agreement dated 13 July 2020. Our services included reviewing available published geologic maps and hazard maps for the site vicinity. Our field program included a site reconnaissance by a licensed professional geologist. A final geotechnical report based on a site-specific investigation should be performed to develop final geotechnical design parameters for foundation design and other geotechnical aspects of the proposed construction.

4.0 REGIONAL GEOLOGY

The site is located in the Coast Ranges geomorphic province of California that is characterized by rugged northwest-trending mountain chains, valleys and ridges. The predominant geologic structure and these topographic features are controlled by folds and faults that resulted from the collision of the Farallon

plate and North American plate and subsequent strike-slip faulting along the San Andreas fault system. The San Andreas fault is more than 600 miles long from Point Arena in the north to the Gulf of California in the south. The Coast Ranges province is bounded on the east by the Great Valley and on the west by the Pacific Ocean.

The bedrock in the area is mapped as of Jurassic- to late Cretaceous-age [$\sim 200 - 65$ million years ago (Ma)] Franciscan Complex Melange consisting of sandstone, shale, chert, greenstone and serpentinite (Wagner et al, 1990). Locally, bedrock is overlain by Quaternary-age (1.8 Ma to the present) colluvium, alluvium, landslide deposits and artificial fill.

A regional geologic map is presented as Figure 3.

5.0 GEOLOGIC RECONNAISSANCE

We visited the site on 30 October 2020 a geologic reconnaissance of the conditions at the ground surface. A summary of our findings is presented as Figure 2.

6.0 GEOLOGIC HAZARDS

A geologic hazard may be defined as an adverse geologic condition capable of causing damage or loss of property and life. In general, the geologic hazards present in the San Francisco Bay Area include, but are not limited to seismic activity, liquefaction and associated land movements, landslides and rock falls, expansive soil, soil creep, and soil densification due to earthquake shaking.

A discussion regarding potential geologic hazards at the site follows.

6.1 Ground Shaking

We judge the seismicity of the site is governed by the activity of the San Andreas Fault, although ground shaking from future earthquakes on other faults, would also be felt at the site. The intensity of earthquake ground motion at the site will depend upon the characteristics of the generating fault, distance to the earthquake epicenter, magnitude and duration of the earthquake, and subsurface conditions beneath the site (Site Class). We judge that strong to very strong ground shaking could occur at the site during a large earthquake on one of the nearby faults.

6.2 Fault Rupture

No active Alquist-Priolo Fault traces have been mapped within the site or site vicinity.

6.3 Slope Stability

On the basis of our site reconnaissance and understanding of the proposed home-site, we judge that the potential for slope instability to impact a properly designed and constructed foundation system and associated improvements is low. We anticipate a properly designed and constructed foundation system will bear on competent bedrock. We further anticipate that site grading activities may be required to mitigate the potential for settlement and creep of existing on-site undocumented fill. The grading required for such activities should be minor as we anticipate the artificial fill at the home site is generally less than 4 feet thick and soil creep was not observed at the proposed home site. We judge that slope stability will not impact the feasibility of the proposed construction

6.4 Soil Creep

Soil creep is the slow downslope movement of soil with an annual cycle of wetting and drying under the influence of gravity. Soil creep typically occurs along geologic contacts and is exacerbated by the presence of water. Clayey soil on steep natural slopes is subject to creep. Artificial fill placed on sloping ground that has not been properly keyed or benched into competent foundation soil/bedrock, is also subject to creep.

Our geologist observed evidence of soil creep as indicated on Figure 2. Where observed, soil creep was outside the bounds of the proposed home site and likely associated with either steep slopes and/or drainage channels. We judge that soil creep will not impact the feasibility of the proposed construction

6.5 Expansive Soil

Expansive surface soil is subject to high volume changes during seasonal fluctuations in moisture content. These volume changes can cause cracking of foundations, floor slabs, and retaining walls. High plasticity in soil is a good indication of high to very high expansive soil behavior.

To resist the effects of expansive soil, interior and exterior slabs can be constructed on a layer of select, non-expansive fill over moisture conditioned native soil; new foundations can also bear on select fill, or they can be deepened to gain support below the zone of seasonal moisture change or in bedrock.

Expansive soils may be present at the site and if encountered, this hazard should be evaluated based during preparation of a final geotechnical report. We judge that expansive soils will not impact the feasibility of the proposed construction.

6.6 Liquefaction and Associated Hazards

When a saturated, cohesionless soil liquefies, it experiences a temporary loss of shear strength created by a transient rise in excess pore pressure generated by strong ground motion. Soil susceptible to liquefaction includes loose to medium dense sand and gravel, low-plasticity silt, and some low-plasticity clay deposits. Flow failure, lateral spreading, differential settlement, loss of bearing strength, ground fissures, and sand boils are evidence of excess pore pressure generation and liquefaction.

Based on the site conditions, we judge that the potential for liquefaction to impact the site development is nil.

7.0 CONCLUSIONS

From a geotechnical standpoint, we conclude the site can be developed as planned, provided a final geotechnical report is prepared based on further site-specific geotechnical studies. The primary geotechnical considerations for the site are:

- Presence of undocumented artificial fill and weak native soil
- Site Grading
- Foundation support
- Potential for seasonal groundwater and surface runoff

7.1 Undocumented Artificial Fill

Undocumented fill was observed during our site reconnaissance. We anticipate the undocumented fill is on the order of 2 to 4 feet thick and it appears relatively stable in its current conditions; however, undocumented fill should not be relied upon for foundation support and may require re-working where it underlies pavements or other on-grade improvements. We judge that the presence of undocumented artificial fill will not impact the feasibility of the proposed construction.

7.2 Site Grading

The proposed home site is relatively level; however, we understand that grading will be required to level the proposed guest parking and to construct the proposed site access (driveways). We conclude that the grading required for the proposed home site, pool, parking and driveways (cuts and fills) will not impact the feasibility of the proposed construction or have a significant impact on the stability of the site.

7.3 Foundation Support

To provide uniform support and adequate resistance to lateral earth pressures, we preliminarily conclude new foundations for the proposed residence and other structural elements should extend into competent bedrock. We preliminarily conclude that the most economical foundation system for the proposed residence, pool and site retaining walls will be cast-in-place, drilled concrete piers. Piers should be interconnected with grade beams to distribute loads more evenly across the proposed improvements within the existing building envelope.

7.4 Seasonal Groundwater and Surface Runoff

Evidence of an existing culvert and drainage channels are evident at the site as presented on Figure 2. We anticipate any excavation on site may encounter seasonal springs at the interface between geologic units or trapped in fractures or along bedding planes in bedrock. Where groundwater or evidence of groundwater is encountered during construction, it should be addressed. The final geotechnical report should include final conclusions and recommendations regarding groundwater. We judge that, from a geotechnical perspective, groundwater and surface runoff will not impact the feasibility of the proposed construction.

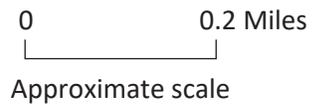
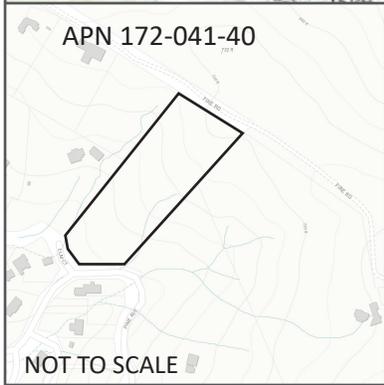
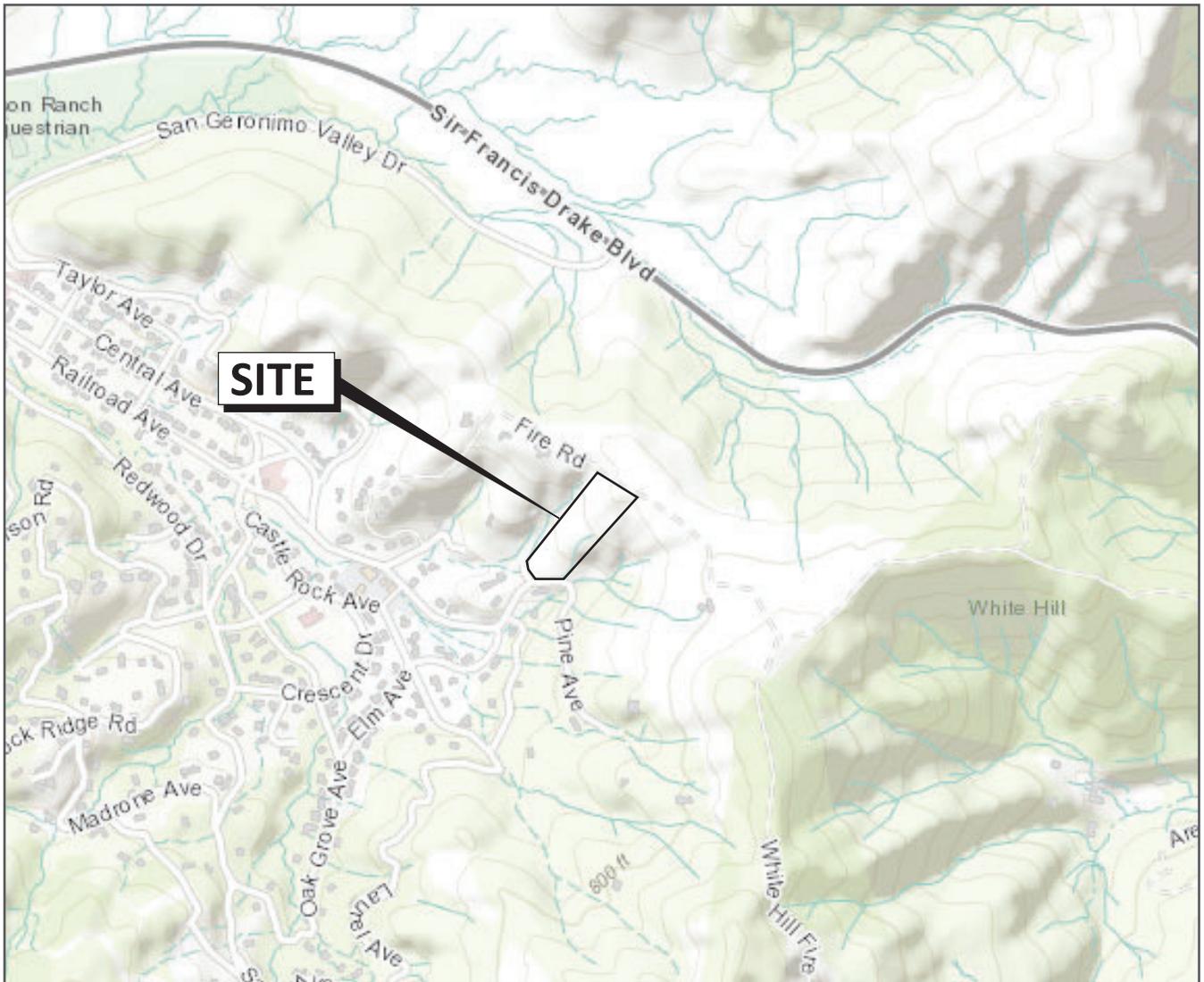
8.0 ADDITIONAL GEOTECHNICAL SERVICES

This preliminary report is based on a limited data review and site reconnaissance. Future geotechnical services should include a site-specific geotechnical report based on site specific geotechnical studies.

9.0 LIMITATIONS

This geotechnical study has been conducted in accordance with the standard of care commonly used as state-of-practice in the profession. No other warranties are either expressed or implied. No recommendations were made in this report and any conclusions should be considered preliminary.

FIGURES



Base map: (c) 2018 san francisco planning department



PETERS RESIDENCE
APN 172-041-04
 Woodacre, California

SITE LOCATION MAP

Date 05/12/21

20-190301-02

Figure 1

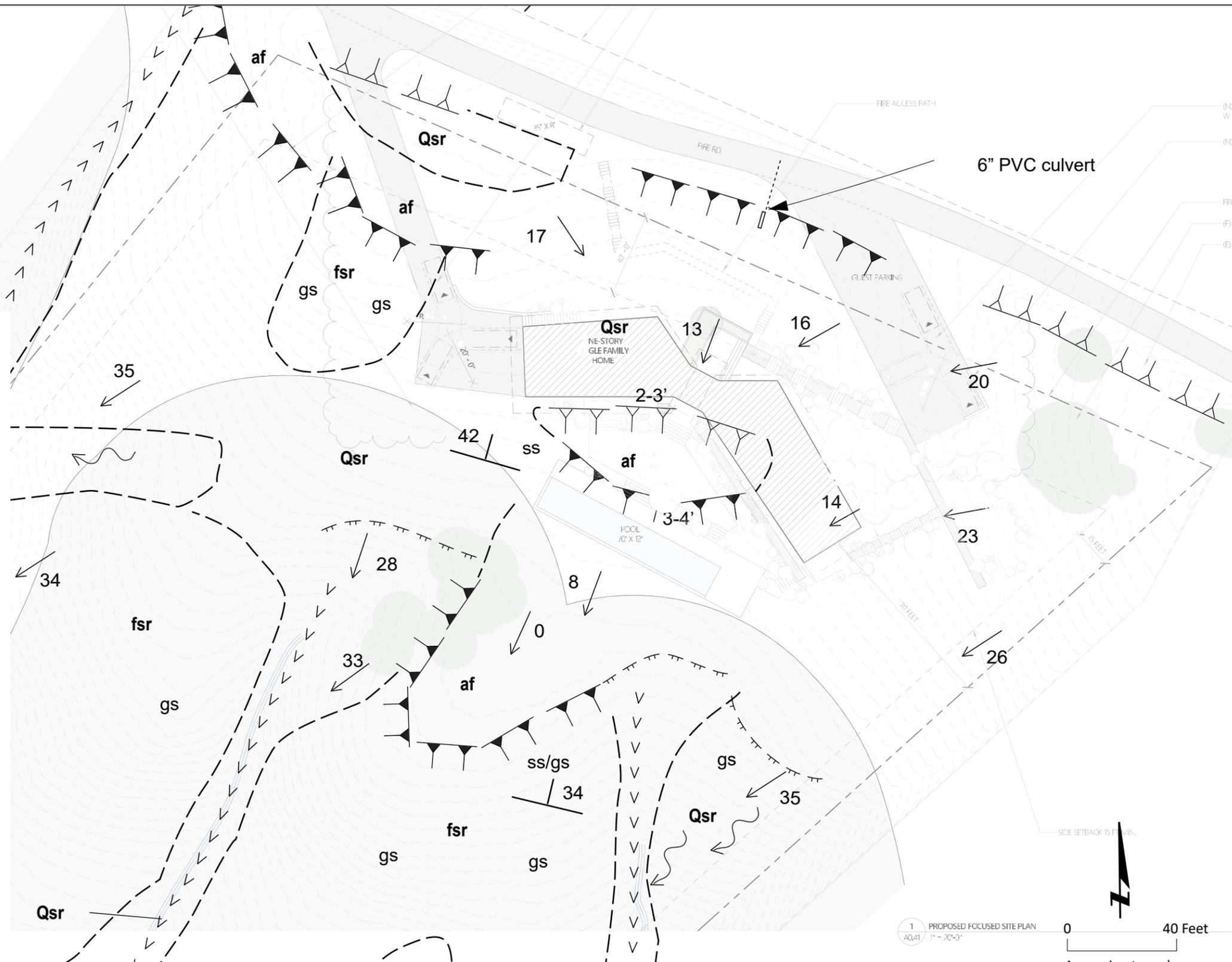
EXPLANATION

Key

- Geologic contact
- 3-4' interpreted depth to bedrock
- ↗ Break in slope (crest)
- 10 ↗ Slope direction (inclination in degrees)
- 35 ↗ Strike and dip of bedding
- >> Gully or ditch
- ~ Creep
- ∩∩ Cut slope
- ∩∩ Fill Slope

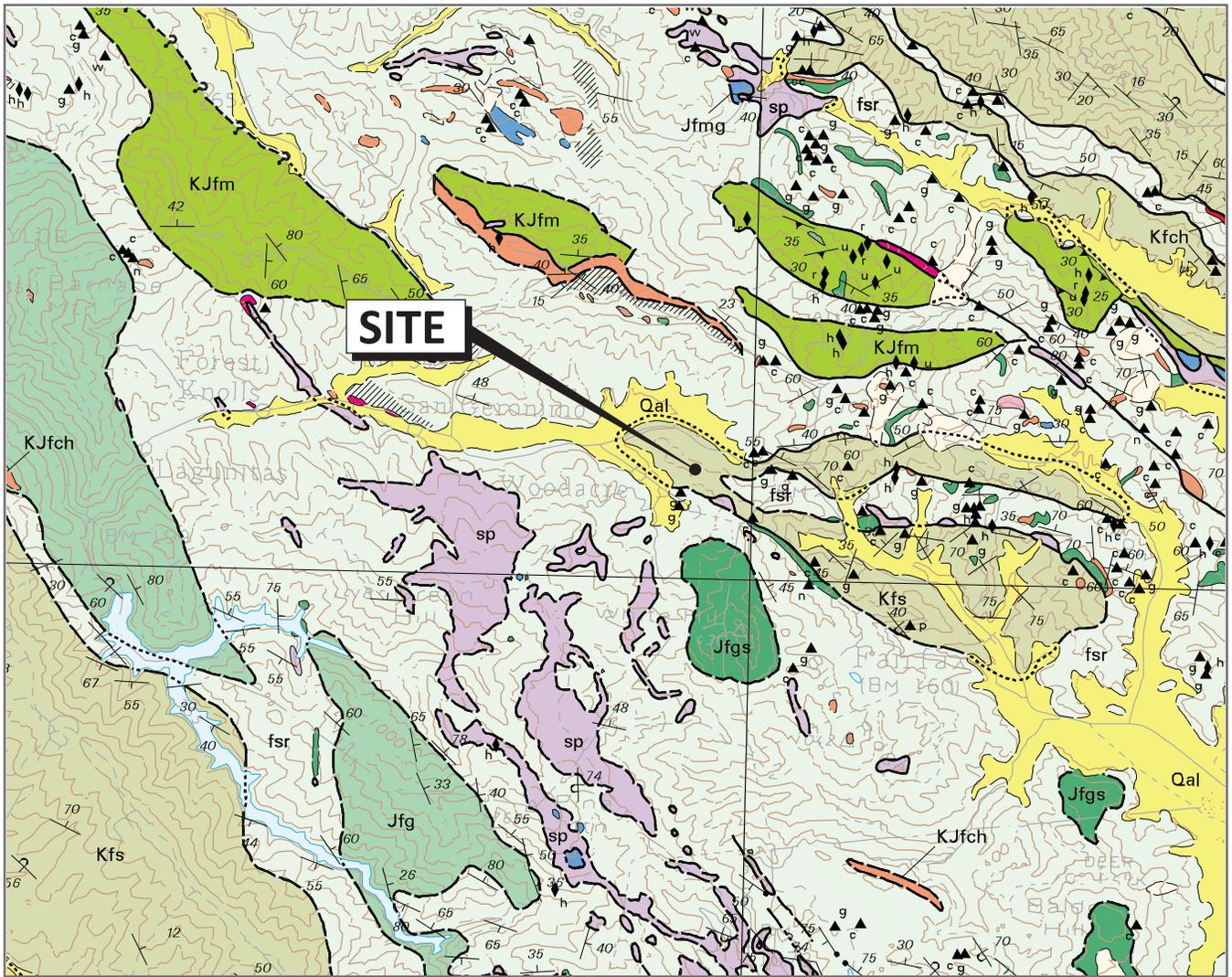
Geologic Units

- af** Fill
- Qsr** Slope Debris and Ravine Fill (Colluvium and Alluvium)
- fsr** Sandstone (ss), Greenstone (gs) (Franciscan Complex)

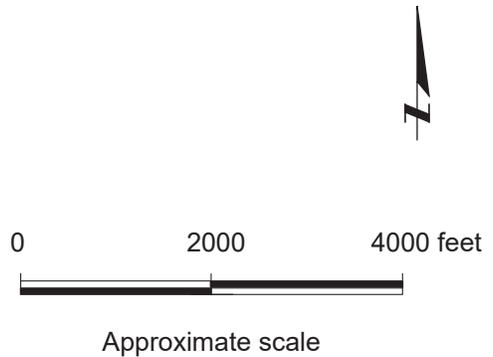


Notes: 1. Standard tape and compass mapping techniques, feature locations are approximate.
2. Reference: Proposed Site Plan, Sheet A0.50, APN 172-041-40, WOODACRE, CA 94973, prepared by Peters Design-Build, dated 05/12/21.

	PETERS RESIDENCE APN 172-041-04 Woodacre, California		SITE PLAN and GEOLOGY MAP	
	Date 05/12/21	20-190301-02	Figure 2	



- water
- Qaf Artificial fill
- Qsr Slope Debris and Ravine Fill (Quaternary)
- Qal Alluvium
- fsr Mélange
- Jfgs Greenstone
- Kfs Sandstone and Shale
- sp Serpentine
- Contact, approximately located



Reference: Geologic Map and Map Database of Parts of Marin, San Francisco, Alameda, Contra Costa and Sonoma Counties, California, prepared by M.C. Blake Jr., R.W. Graymer, and D.L. Jones, dated 2000



PETERS RESIDENCE
APN 172-041-04
 Woodacre, California

REGIONAL GEOLOGIC MAP

Date 05/12/21

20-190301-02

Figure 3