Categorical Exemption Appeal

617 Sanchez Street

DATE:	August 3, 2020
TO:	Angela Calvillo, Clerk of the Board of Supervisors
FROM:	Lisa Gibson, Environmental Review Officer – (415) 575-9032
	Elizabeth White – elizabeth.white@sfgov.org - (415) 575-6813
RE:	Planning Record No. 2019-000650APL
	Appeal of Categorical Exemption for 617 Sanchez Street
HEARING DATE:	Tuesday, August 18, 2020
ATTACHMENT(S):	A – Geotechnical Investigation for 617 Sanchez Street

PROJECT SPONSOR: Robert Edmonds, on behalf of Sammie Host
APPELLANT(S): Sue Hestor, on behalf of Joerg Rathenberg

INTRODUCTION

This memorandum and the attached documents are a response to the letter of appeal to the board of supervisors (the board) regarding the planning department's (the department) issuance of a categorical exemption under the California Environmental Quality Act (CEQA determination) for the proposed 617 Sanchez Street project.

The department, pursuant to Article 19 of the CEQA Guidelines, issued a categorical exemption for the project on April 8, 2019 finding that the proposed project is exempt from the California Environmental Quality Act (CEQA) as a Class 3 categorical exemption.

The decision before the board is whether to uphold the department's decision to issue a categorical exemption and deny the appeal, or to overturn the department's decision to issue a categorical exemption and return the project to the department staff for additional environmental review.

This memorandum responds to all of the issues raised in the March 23, 2020 letter of appeal. However, many of the appellant's claims are irrelevant to the decision before the board on this CEQA appeal. Issues that are unrelated to the department's April 8, 2019 determination that the proposed project is categorically exempt from CEQA are addressed for informational purposes only.

SITE DESCRIPTION AND EXISTING USE

The approximately 2,600-square-foot project site (Assessor's Block 3600 and Lot 055) is located on Sanchez Street between 19th and Cumberland streets in the Castro/Upper Market neighborhood. This block of Sanchez Street is a dead end with no vehicle access to 19th Street; the Sanchez Street stairs provides pedestrian access from this block of Sanchez Street to 19th Street. The surrounding area is characterized by residential properties. Two- to three-story residential buildings on sloping lots are located on either side of the subject property.

The subject site is a 105-foot by 25-foot lateral and down sloping lot that contains a two-story, single-family home in the rear portion of the lot and a free-standing, one-story garage structure at the front. Built in 1906, the 1,100-square-foot, two-bedroom home is not a historic resource[1]. The height of the free-standing garage at the front of the building is approximately 8 feet and the height of the two-story home at the rear of the lot is approximately 22 feet from grade to top of the roof. The subject parcel is not located in a state-designated seismic hazard zone and the slope of the lot is approximately 17.7 percent. Portions of the site are identified on a city map as potentially having greater than 25 percent slope and as such may be subject to the San Francisco's Slope and Seismic Hazards Protection Act requirements. The San Francisco Department of Building Inspection (building department) would determine the extent to which that act is applicable to the project during the building permit review process.

PROJECT DESCRIPTION

The proposed project consists of the demolition of the existing two-story, single-family home and free-standing garage, and the construction of an approximately 4,200-square-foot, single-family home. The proposed four-bedroom home would be approximately 27 feet in height at the front of the lot and 41-feet tall from grade to the top of the uppermost roof at the rear of the lot. The proposed project contains one off-street parking space and one bicycle parking space and involves excavation to a depth of 16 feet resulting in approximately 650 cubic yards of soil removal.

BACKGROUND

On January 15, 2019, Robert Edmonds on behalf of Sammie Host (hereinafter project sponsor) filed an application with the planning department (hereinafter department) for CEQA evaluation.

On April 8, 2019, the department determined that the project was categorically exempt under CEQA Class 3 – New Construction or Conversion of Small Structures, and that no further environmental review was required.

On February 20, 2020, the planning commission declined to take discretionary review on the proposed project.

On March 23, 2020, Sue Hestor on behalf of Joreg Rathenerg (hereinafter appellant) filed an appeal of the categorical exemption determination.

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[1] San Francisco Planning, *Preservation Team Review Form for 617 Sanchez Street (Case No. 2019-000650ENV)*, March 25, 2019.

CEQA GUIDELINES

Categorical Exemptions

In accordance with CEQA section 21084 CEQA Guidelines sections 15301 through 15333 list classes of projects that have been determined not to have a significant effect on the environment and are exempt from further environmental review.

CEQA Guidelines section 15303. New Construction or Conversion of Small Structures, or Class 3, consists of construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures; and the conversion of existing small structures from one use to another where only minor modifications are made in the exterior of the structure. CEQA Guidelines section 15303 provides examples of the types of projects that are exempt under Class 3, including but not limited to: "[i]n urbanized areas, up to three single-family residences may be constructed or converted under this exemption."

In determining the significance of environmental effects caused by a project, CEQA Guidelines section 15064(f) states that the decision as to whether a project may have one or more significant effects shall be based on substantial evidence in the record of the lead agency. CEQA Guidelines section 15064(f)(5) offers the following guidance: "Argument, speculation, unsubstantiated opinion or narrative, or evidence that is clearly inaccurate or erroneous, or evidence that is not credible, shall not constitute substantial evidence. Substantial evidence shall include facts, reasonable assumption predicated upon facts, and expert opinion supported by facts."

PLANNING DEPARTMENT RESPONSES

The concerns raised in the appeal letter are addressed in the responses below.

Response 1: The environmental review of the proposed project appropriately and adequately analyzed the potential physical environmental effects of the proposed project, including the impacts associated with the proposed project's excavation activities.

The appellant alleges that the categorical exemption ignores impacts associated with the proposed project's excavation activities. This allegation is incorrect; the department correctly concluded that there are no unusual circumstances regarding the proposed project, and that excavation activities would not result in significant geology or soils impacts. The appellant does not specify what impacts are not addressed in the project's environmental review and does not provide new information to support the claim. A summary of the physical environmental impacts related to the proposed project's excavation activities is provided below.

As noted in the project description, the proposed project involves excavation to a depth of 16 feet below grade and the removal of approximately 650 cubic yards of soil. The requirements for a site-specific geotechnical report are articulated in Building Code section 1803 and building department Information Sheet S-05, Geotechnical Report Requirements. Accordingly, the project sponsor submitted a geotechnical report prepared by a licensed geotechnical engineer to the planning and building departments. The function of a geotechnical report is to provide recommendations by a licensed geotechnical professional to a project's engineer of record, who must incorporate those recommendations into building permit-level drawings and construction documents, to ensure that the proposed structure can be supported on the proposed foundation system. In compliance with these building code requirements, the geotechnical report prepared for the project investigated site, soil, geologic, and groundwater conditions of the subject project and made geotechnical recommendations for the proposed project's construction. These recommendations pertain to site preparation and grading, seismic design, foundation types, retaining walls, slab-on-grade floors, and site drainage. The report also includes geotechnical recommendations to minimize impacts on adjacent properties. The California Building Code also includes specific provisions, including Protection of Adjoining Properties (section 3307) and requirements that site drainage not be directed onto adjacent properties (sections 1503 and J109.5). The geotechnical report is included as Attachment A of this appeal response.

As part of the building permit process, the building department will review the 617 Sanchez Street building plans, prior to the issuance of a building permit. At that time, the building department will determine if the parcel is subject to the Slope and Seismic Hazard Zone Protection Act[2]. Building department Information Sheet S-19, Properties Subject to the Slope and Seismic Hazard Zone Protection Act Ordinance, provides detailed guidelines for review and analysis of projects subject to this act.

In addition, the building department's Administrative Bulletin 082 (AB 082), Guidelines and Procedures for Structural Design Review, is part of the San Francisco Building Code and specifies the guidelines and procedures for independent structural and geotechnical design review during the application review process for a building permit, if the director of the building department determines it is appropriate. AB 082 describes what types of projects may require this review, the qualifications of the structural design reviewer, the scope of the structural design review, and how the director of the building department as the building official would resolve any disputes between the structural design reviewer and the project's structural and geotechnical engineers of record.

The building department will review the final building plans (construction documents) for conformance with recommendations in the site-specific, design-level geotechnical investigation to ensure compliance with state and local building code provisions related to structural safety, as outlined above. This building permit application review pursuant to the building department's implementation of state and local codes must ensure that the proposed project will have no significant geology and soils impacts from the proposed project's excavation activities.

Additionally, as part of the environmental review, a planning department staff archeologist conducted a preliminary archeology review[3] and concluded that the project would not affect significant archeological resources.

[2] The Slope and Seismic Hazard Zone Protection Act requires construction of new buildings or structures on applicable properties to undergo additional review for structural integrity and effect on slope stability.
[3] San Francisco Planning Department. January 7, 2019. Preliminary Archeology Review for 617 Sanchez Street.

Response 2: The 617 Sanchez Street Project meets the criteria identified in CEQA Guidelines section 21099. Modernization of Transportation Analysis for Transit-Oriented Infill Projects. The environmental review correctly identified that the project's aesthetic impacts are not a significant impact on the environment.

The appellant correctly states that the environmental review does not evaluate the proposed project's impacts to public corridor views. CEQA section 21099 provides that "aesthetic and parking impacts of a residential, mixed-use residential, or employment center project on an infill site within a transit priority area shall not be considered significant impacts on the environment." The 617 Sanchez Street project is a residential project on an infill site and is located within 0.5 mile of the Castro station, a major transit station. Therefore, pursuant to CEQA section 21099, aesthetic impacts of the 617 Sanchez Street project are not considered significant impacts on the environment.

Response 3: The letter of appeal raises several issues that are not relevant to the board's decision to either reject or uphold this appeal of the department's CEQA determination for the proposed project. The department's responses to these issues are provided below for informational purposes only.

The appellant correctly states that the environmental review does not include analysis explicitly related to San Francisco Planning Code section 317 Loss of Residential and Unauthorized Units Through Demolition, Merger, and Conversion. Environmental review in and of itself does not require a section 317 analysis. The appellant does not provide substantial evidence demonstrating how a section 317 analysis would produce information about new physical environmental effects not evaluated in the project's categorical exemption under CEQA.

The appellant describes the proposed project's site and immediate surroundings in the appeal letter, specifically identifying vehicular and pedestrian access routes to the project site, as well as the steep nature of the site. These observations do not demonstrate that the proposed project would result in significant effects on the environment due to unusual circumstances. Development on steep slopes is very common in San Francisco and is not an unusual circumstance that distinguishes this project or site from other residential properties in the immediate vicinity or from the development on steep slopes that is characteristic of San Francisco. Moreover, the appellant does not provide evidence that the proposed project would result in significant environmental impacts due to its location on a steep slope or due to vehicular or pedestrian access. Therefore, the appellant does not provide substantial evidence that the project would have significant impacts on the environment due to unusual circumstances.

CONCLUSION

The department has determined that the proposed project is categorically exempt from environmental review under CEQA on the basis that: (1) the project meets the definition of one or more of the classes of projects that the Secretary of the Natural Resources Agency has found do not have a significant effect on the environment, and (2) none of the exceptions specified in CEQA Guidelines section 15300.2 prohibiting the use of a categorical exemption are applicable to the project. The appellant has not demonstrated that the department's determination is not supported by substantial evidence in the record.

For the reasons stated above and in the April 8, 2019 CEQA categorical exemption determination, the CEQA determination complies with the requirements of CEQA and the project is appropriately exempt from environmental review pursuant to the cited exemption. The department therefore respectfully recommends that the board uphold the CEQA categorical exemption determination and deny the appeal of the CEQA determination.

Attachment A

REPORT
GEOTECHNICAL INVESTIGATION
Planned Residence At
617 Sanchez Street
San Francisco, California

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Prepared by:

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Project Number: 18-4836

REGISTERED PROFESSIONAL ENGINEER
H. ALLEN GRUEN
GE2147
Exp. 12-31-2018
GEOTECHNICAL
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October 1, 2018

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INTRODUCTION

Purpose

A geotechnical investigation has been completed for the proposed residence at 617 Sanchez Street in San Francisco, California. The purposes of this study have been to gather information on the nature, distribution, and characteristics of the earth materials at the site, assess geologic hazards, and to provide geotechnical design criteria for the planned residence.

Scope

The scope of my services was outlined in the Proposal and Professional Service Agreement dated August 30, 2018. My investigation included a reconnaissance of the site and surrounding vicinity; sampling and logging one test boring to practical refusal at a maximum depth of 9-½ feet below the ground surface; laboratory testing conducted on selected samples of the earth materials recovered from the boring; a review of published geotechnical and geologic data pertinent to the project area; geotechnical interpretation and engineering analyses; and preparation of this report.

This report contains the results of my investigation, including findings regarding site, soil, geologic, and groundwater conditions; conclusions pertaining to geotechnical considerations such as weak soils, settlement, and construction considerations; conclusions regarding exposure to geologic hazards, including faulting, ground shaking, liquefaction, lateral spreading, and slope stability; and geotechnical recommendations for design of the proposed project including site preparation and grading, foundations, retaining walls, slabs on grade, and geotechnical drainage.

Pertinent exhibits appear in Appendix A. The location of the test boring is depicted relative to site features on Plate 1, Boring Location Map. The log of the test boring is displayed on Plate 2. Explanations of the symbols and other codes used on the log are presented on Plate 3, Soil Classification Chart and Key to Test Data.

References consulted during the course of this investigation are listed in Appendix B. Details regarding the field exploration program appear in Appendix C.

Proposed Residence

It is my understanding that the project will consist of the design and construction of a new, 3-story with basement, single-family house. No other project details are known at this time.

FINDINGS

Site Description

The subject site is located east of Sanchez Street, between Cumberland and 19th Streets in San Francisco, California. At the time of my investigation, the subject site was occupied by a garage in the front portion of the site and a residence in the rear portion of the site. The middle portion of the site was occupied by flatwork and yard areas.

Geologic Conditions

The site is within the Coast Ranges Geomorphic Province, which includes the San Francisco Bay and the northwest-trending mountains that parallel the coast of California. Tectonic forces resulting in extensive folding and faulting of the area formed these features. The oldest rocks in the area include sedimentary, volcanic, and metamorphic rocks of the Franciscan Complex. This unit is Jurassic to Cretaceous in age and forms the basement rocks in the region.

Locally, the site lies within the USGS San Francisco North Quadrangle. Schlocker (1958) has mapped the site area as being underlain by Greenstone bedrock.

Earth Materials

My boring at the subject site encountered about 5 feet of very stiff to hard, sandy lean clay overlying dense, clayey sand to the maximum depth explored of 9-½ feet. Detailed descriptions of the materials encountered as well as test results are shown on the Boring Log, Plate 2.

Groundwater

Free groundwater was not encountered in the boring drilled at the subject site to the maximum depth explored of 9-½ feet. It is my opinion that the free groundwater table will be below the planned site excavations. I anticipate that the depth to the free water table will vary with time and that zones of seepage may be encountered near the ground surface following rain or irrigation upslope of the subject site.

CONCLUSIONS

General

On the basis of my investigation and literature review, I conclude that the site is suitable for support of the planned improvements. The primary geotechnical concerns are founding improvements in competent earth materials, excavation of bedrock, support of temporary slopes and adjacent improvements, and seismic shaking and related effects during earthquakes. These items are addressed below.

Foundation Support

It is my opinion that the planned residence may be supported on a conventional spread footing foundation bearing in competent earth materials. If the spread footings would cover a substantial portion of the building area, a mat foundation may be used as an alternative to reduce forming and steel bending costs. The Structural Engineer may also choose to use drilled piers to support improvements, or for shoring and underpinning, if required. Detailed foundation design criteria are presented later in this report.

I estimate that improvements supported on foundations designed and constructed in accordance with my recommendations will experience post-construction total settlements from static loading of less than 1 inch with differential settlements of less than ½ inch over a 50-foot span.

Temporary Slopes and Undermining of Existing Structures

Temporary slopes will be necessary during the planned site excavations. In order to safely develop the site, temporary slopes will need to be laid back in conformance with OSHA standards at safe inclinations, or temporary shoring will have to be installed. The contractor may choose to excavate test pits to evaluate site earth materials and the need for temporary shoring.

If excavations undermine or remove support from the existing or adjacent structures, it may be necessary to underpin those structures. Care should be taken to provide adequate shoring or underpinning to support the affected residence as a result of the loss of support.

Temporary slopes and support of structures during construction are the responsibility of the contractor. H. Allen Gruen, Geotechnical Engineer is available to provide geotechnical consultation regarding stability of excavations and support of residence.

Geologic Hazards

Faulting

The property does not lie within an Alquist-Priolo Earthquake Fault Zone as defined by the California Division of Mines and Geology. The closest mapped active fault in the vicinity of the site is the San Andreas Fault, located about 6 miles southwest of the site (CDMG, 1998). No active faults are shown crossing the site on reviewed published maps, nor did I observe evidence of active faulting during my investigation. Therefore I conclude that the potential risk for damage to residence at the site due to surface rupture from faults to be low.

Earthquake Shaking

Earthquake shaking results from the sudden release of seismic energy during displacement along a fault. During an earthquake, the intensity of ground shaking at a particular location will depend on a number of factors including the earthquake magnitude, the distance to the zone of energy release, and local geologic conditions. I expect that the site will be exposed to strong earthquake shaking during the life of the residence. The recommendations contained in the applicable Building Code should be followed for reducing potential damage to the residence from earthquake shaking.

Liquefaction

Liquefaction results in a loss of shear strength and potential volume reduction in saturated granular soils below the groundwater level from earthquake shaking. The occurrence of this phenomenon is dependent on many factors, including the intensity and duration of ground shaking, soil density and particle size distribution, and position of the groundwater table (Seed and Idriss, 1982). The site does not lie within a liquefaction potential zone as mapped by the California Division of Mines and Geology for the City and County of San Francisco (CDMG, 2000). In addition, the earth materials encountered in the borings have a low potential for liquefaction due to the lack of free groundwater and high fines content. Therefore, it is my opinion that there is a low potential for damage to the planned residence from liquefaction.

Lateral Spreading

Lateral spreading or lurching is generally caused by liquefaction of marginally stable soils underlying gentle slopes. In these cases, the surficial soils move toward an unsupported face, such as an incised channel, river, or body of water. Because the site has a low potential for liquefaction, I judge that there is a low risk for damage of the residence from seismically-induced lateral spreading.

Densification

Densification can occur in clean, loose granular soils during earthquake shaking, resulting in seismic settlement and differential compaction. It is my opinion that earth materials subject to seismic densification do not exist beneath the site in sufficient thickness to adversely impact the planned residence.

Landsliding

The site is mapped within an area of potential landslide hazard by URS/John A. Blume & Associates (1974). Qualifying projects may be subject to the Slope Protection Act (San Francisco Building Code 106A.4.1.4). The San Francisco Building Code (106A.4.1.4.3) states construction work that is subject to these requirements includes the construction of new buildings or structures having over 1000 square feet of new projected roof area and horizontal or vertical additions having over 1000 square feet of new projected roof area. In addition, these requirements apply to the following activity or activities, if, in the opinion of the Director, the proposed work may have a substantial impact on the slope stability of any property: shoring, underpinning, excavation or retaining wall work; grading, including excavation or fill, of over 50 cubic yards of earth materials; or any other construction activity.

The geologic map of the site vicinity reviewed for this study (Schlocker, 1958) did not show landslides at the subject site. In addition, a map prepared by the California Division of Mines and Geology for the City and County of San Francisco (CDMG, 2000) does not indicate that the subject site lies within an area of potential earthquake-induced landsliding. During my site reconnaissance, I did not observe evidence of active slope instability at the subject site. Therefore, it is my opinion that the potential for damage to the residence from slope instability at the site is low provided the recommendations presented in this report are incorporated into the design and construction of the project.

RECOMMENDATIONS

Site Preparation and Grading

General

I assume that the planned residence will be constructed at or below existing site grades. If site grades are raised by filling more than about 1 foot, I should be retained to calculate the impact of filling on slope stability, site settlements, and foundations.

Clearing

Areas to be graded should be cleared of debris, deleterious materials, and vegetation, and then stripped of the upper soils containing root growth and organic matter. I anticipate that the required depth of stripping will generally be less than 2 inches. Deeper stripping may be required to remove localized concentrations of organic matter, such as tree roots. The cleared materials should be removed from the site; strippings may be stockpiled for reuse as topsoil in landscaping areas or should be hauled off site.

Overexcavation

Loose, porous soils and topsoil, if encountered, should be overexcavated in areas designated for placement of future engineered fill or support of residence. Difficulty in achieving the recommended minimum degree of compaction described below should be used as a field criterion by the geotechnical engineer to identify areas of weak soils that should be removed and replaced as engineered fill. The depth and extent of excavation should be approved in the field by the geotechnical engineer prior to placement of fill or residence.

Subgrade Preparation

Exposed soils designated to receive engineered fill should be cut to form a level bench, scarified to a minimum depth of 6 inches, brought to at least optimum moisture content, and compacted to at least 90 percent relative compaction, in accordance with ASTM test designation D 1557.

Material for Fill

It is anticipated that the on-site soil will be suitable for reuse as fill provided that lumps greater than 6 inches in largest dimension and perishable materials are removed, and that the fill materials are approved by the geotechnical engineer prior to use.

Fill materials brought onto the site should be free of vegetative mater and deleterious debris, and should be primarily granular. The geotechnical engineer should approve fill material prior to trucking it to the site.

Compaction of Fill

Fill should be placed in level lifts not exceeding 8 inches in loose thickness. Each lift should be brought to at least the optimum moisture content and compacted to at least 90 percent relative compaction, in accordance with ASTM test designation D 1557.

Underpinning

During excavations adjacent to existing structures or footings, care should be taken to adequately support the existing structures. When excavating below the level of foundations supporting existing structures, some form of underpinning may be required where excavations extend below an imaginary plane sloping at 1:1 downward and outward from the edge of the existing footings. All temporary underpinning design and construction are the responsibility of the contractor. Earth Mechanics is available to provide consultation regarding underpinning adjacent residence.

Temporary Slopes

Temporary slopes will be necessary during the planned site excavations. In order to safely develop the site, temporary slopes will need to be laid back in conformance with OSHA standards at safe inclinations, or temporary shoring will have to be installed. All temporary slopes and shoring design are the responsibility of the contractor. Earth Mechanics is available to provide consultation regarding stability and support of temporary slopes during construction. The contractor may choose to excavate test pits to evaluate site earth materials and the need for temporary shoring.

Finished Slopes

In general, finished cut and fill slopes in soil should be constructed at an inclination not exceeding 2:1 (horizontal:vertical). Routine maintenance of slopes should be anticipated. The tops of cut slopes should be rounded and compacted to reduce the risk of erosion. Fill and cut slopes should be planted with vegetation to resist erosion, or protected from erosion by other measures, upon completion of grading. Surface water runoff should be intercepted and diverted away from the tops and toes of cut and fill slopes by using berms or ditches.

Seismic Design

If the residence are designed using the 2013 California Building Code, the following parameters apply using 2010 ASCE 7 with July 2013 errata:

Site Class B
Risk Category I/II/III
$S_s = 1.530$, $S_1 = 0.701$
Fa = 1.0, Fv = 1.0
$S_{Ms} = 1.530$, $S_{M1} = 0.701$
$S_{Ds} = 1.020$, $S_{D1} = 0.468$

Foundations

General

It is our opinion that the planned residence may be supported on a conventional spread footing foundation bearing in competent earth materials. If the spread footings would cover a substantial portion of the building area, a mat foundation may be used as an alternative to reduce forming and steel bending costs. The Structural Engineer may also choose to use drilled piers to support residence, or for shoring and underpinning, if required. Design criteria for each foundation type are presented below.

Spread Footings

Spread footings should extend into competent earth materials. Footings should be stepped to produce level tops and bottoms and should be deepened as necessary to provide at least 7 feet of horizontal clearance between the portions of footings designed to impose passive pressures and the face of the nearest slope or retaining wall.

Spread footings bottomed in competent earth materials can be designed to impose dead plus code live load bearing pressures and total design load bearing pressures of 3,000 and 4,500 psf, respectively.

Resistance to lateral pressures can be obtained from passive earth pressures against the face of the footing and friction along the base of footings. In competent earth materials, we recommend that an allowable passive uniform pressure of 2,500 psf and a friction factor of 0.4 times the net vertical dead load be used for design. These values include a safety factor of 1.5 and may be used in combination without reduction. Passive pressures should be neglected within 12 inches of the ground surface in areas not confined by slabs or pavements and in areas with less than 7 feet of horizontal confinement.

Mat Foundation

A mat foundation bottomed in competent earth materials may be used to support the planned residence. The mat can be designed for an average allowable bearing pressure over the entire mat of 3,000 psf for combined dead plus sustained live loads, and 4,500 psf for total loads including wind or seismic forces. The weight of the mat extending below current site grade may be neglected in computing bearing loads. Localized increases in bearing pressures of up to 5,000 psf may be utilized. For elastic design, a modulus of subgrade reaction of 200 kips per cubic foot may be used.

Resistance to lateral pressures can be obtained from passive earth pressures against the face of the mat and friction along the base of the mat. In competent earth materials, we recommend that an allowable passive uniform pressure of 2,500 psf and a friction factor of 0.4 times the net vertical dead load be used for design. These values include a safety factor of 1.5 and may be used in combination without reduction. Passive pressures should be neglected within 12 inches of the ground surface in areas not confined by slabs or pavements and in areas with less than 7 feet of horizontal confinement.

Drilled Piers

Drilled, cast-in-place, reinforced concrete piers designed to carry axial loading should be at least 14 inches in diameter and extend at least 5 feet into competent earth materials, or to practical drilling refusal. Piers should be designed for a maximum allowable skin friction of 1,000 psf for combined dead plus sustained live loads. The above values may be increased by one-third for total loads, including the effect of seismic or wind forces. The weight of the foundation concrete extending below grade may be disregarded.

Resistance to lateral displacement of individual piers will be generated primarily by passive earth pressures acting on the pier. Passive pressures in competent earth materials should be assumed equivalent to those generated by a uniform pressure of 2,500 psf acting on 1.5 pier diameters. Passive pressures should be neglected within 12 inches of the ground surface in areas not confined by slabs or pavements and in areas with less than 7 feet of horizontal confinement.

Hard drilling in competent earth materials may be required to reach the desired penetrations. Where groundwater is encountered during pier shaft drilling, it should be removed by pumping, or the concrete must be placed by the tremie method. If the pier shafts will not stand open, temporary casing may be necessary to support the sides of the pier shafts until concrete is placed. Concrete should not be allowed to free fall more than 5 feet to avoid segregation of the aggregate.

Retaining Walls

The thickness of soil blanketing the site and the depth to bedrock can vary across the site. Design criteria are provided for retaining walls in soil and rock. We anticipate that bedrock will be within about 6 feet across most of the site. We recommend using the rock values for design. However, if during construction, more than 6 feet of soil is being retaining by subsurface walls, the portions of walls supporting soil will need to be designed using the lateral earth pressures for soil conditions.

Retaining walls should be fully backdrained. The backdrains should consist of at least a 3-inch-diameter, rigid perforated pipe, or equivalent such as a "high profile collector drain", surrounded by a drainage blanket. The pipe should be sloped to drain by gravity to appropriate outlets. Accessible subdrain cleanouts should be provided and maintained on a routine basis. 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" or a prefabricated drainage structure such as Mirafi Miradrain. The bottom of the collector drainpipe should be at least 12 inches below lowest adjacent grade. Aggregate drainage blankets should be at least 1 foot in width and extend to within 1 foot of the surface. The uppermost 1-foot should be backfilled with compacted native soil to exclude surface water.

Vertical retaining walls that are free to rotate at the top should be designed to resist active lateral soil pressures equivalent to those exerted by a fluid weighing 40 pcf where the backslope is level, and 60 pcf for backfill at a 2:1 (horizontal:vertical) slope. In areas where bedrock is exposed and backfill is placed behind the wall, the structural engineer may use active lateral earth pressures equivalent to those exerted by a fluid weighing 30 pcf where the backslope is level, and 45 pcf for backfill at a 2:1 (horizontal:vertical) slope. If the retaining wall is constructed directly against the bedrock with no backfill, the structural engineer may use active lateral earth pressures equivalent to those exerted by a fluid weighing 20 pcf where the backslope is level, and 26 pcf for backfill at a 2:1 (horizontal:vertical) slope. For intermediate slopes, interpolate between these values. I should be consulted to calculate lateral pressures on retaining walls that are tied-back or braced.

In addition to lateral earth pressures, retaining walls must be designed to resist horizontal pressures that may be generated by surcharge foundation loads applied at or near the ground surface. If a footing surcharge is located above a retaining wall within a horizontal distance of 0.4•H, where H is the height of soil retained by the wall, then a horizontal lateral resultant force equal to 0.55•Q_L should be applied to the retaining wall at a height above the base of the wall equal to 0.6•H. Q_L equals the equivalent resultant footing line load. This footing surcharge load applies equally to walls that are fixed or free to rotate. As an example, a retaining wall supporting 10 feet of soil has a footing 2 feet away from the top of the wall carrying a line load of 1,000 pounds per lineal foot. This footing is within 0.4•H =4 feet of the retaining wall. The resultant horizontal force on the retaining wall from the footing surcharge load would be 0.55x1,000=550 pounds acting 0.6•H =6 feet above the base of the retaining wall.

In addition to lateral earth pressures and adjacent footing loads, retaining walls must be designed to resist horizontal pressures that may be generated by surcharge loads applied at or near the ground surface. Where an imaginary 1:1 (H:V) plane projected downward from the outermost edge of a surcharge load intersects a retaining wall, that portion of the wall below the intersection should be designed for an additional horizontal thrust from a uniform pressure equivalent to one-third the maximum anticipated surcharge pressure in soil and one-fourth the maximum anticipated surcharge pressure in rock. In some cases, this value yields a conservative estimate of the actual lateral pressure imposed. I should be contacted if a more precise estimate of lateral loading on the retaining wall from surcharge pressures is desired.

Rigid retaining walls constrained against such movement could be subjected to "at-rest" lateral earth pressures equivalent to those exerted by the fluid pressures listed above plus a uniform load of 6•H pounds per square foot in soil and of 4•H pounds per square foot in rock, where H is the height of the backfill above footing level. Where an imaginary 1:1 (H:V) plane projected downward from the outermost edge of a surcharge load intersects a lower retaining wall, that portion of the constrained wall below the intersection should be designed for an additional horizontal thrust from a uniform pressure equivalent to one-half the maximum anticipated surcharge pressure in soil and one-third the maximum anticipated surcharge pressure in rock. In some cases, this value yields a conservative estimate of the actual lateral pressure imposed. I should be contacted if a more precise estimate of lateral loading on the retaining wall from surcharge pressures is desired.

If retaining walls are designed using the 2013 California Building Code, a seismic pressure increment equivalent to a rectangular pressure distribution of 10•H pounds per square foot may be used, where H is the height of the soil retained in feet. The seismic pressure increment does not need to be applied to constrained walls where at-rest lateral earth pressure is applied.

Wall backfill should consist of soil that is spread in level lifts not exceeding 8 inches in thickness. Each lift should be brought to at least optimum moisture content and compacted to not less than 90 percent relative compaction, per ASTM test designation D 1557. Retaining walls may yield slightly during backfilling. Therefore, walls should be properly braced during the backfilling operations.

Where migration of moisture through retaining walls would be detrimental or undesirable, retaining walls should be waterproofed as specified by the project architect or structural engineer.

Retaining walls should be supported on footings designed in accordance with the recommendations presented above. A minimum factor of safety of 1.5 against overturning and sliding should be used in the design of retaining walls.

Slab-on-Grade Floors

The subgrade soil in slab and flatwork areas should be proof rolled to provide a firm, non-yielding surface. If moisture penetration through the slab would be objectionable, slabs should be underlain by a capillary moisture break consisting of at least 4 inches of clean, free-draining crushed rock or gravel graded such that 100 percent will pass the 1-inch sieve and less than 5 percent will pass the No. 4 sieve. Further protection against slab moisture penetration can be provided by means of a moisture vapor retarder membrane, placed between the drain rock and the slab. The membrane may be covered with 2 inches of damp, clean sand to protect it during construction.

Additional protection against moisture infiltration into finished basement areas may be provided by installing a slab underdrain system. Retaining wall back drains should be separated from under slab drains. If selected, the slab underdrain system would consist of trenches, which are at least 12 inches deep and 6 inches wide, spaced no further than 10 feet apart beneath the floor slab. The bottoms of the trenches should slope to drain to a low-point by gravity. A 3-inch diameter, rigid perforated pipe should be placed near the bottom of the trench which is fully encapsulated in drain rock. The drainrock should be fully encapsulated in an approved filter fabric. The perforated pipes should be tied to closed conduits which outlet at appropriate discharge points.

Site Drainage

Positive drainage should be provided away from the residence. Roof downspouts should discharge into closed conduits that drain into the site storm drain system. Surface drainage facilities (roof downspouts and drainage inlets) should be maintained entirely separate from subsurface drains (retaining wall backdrains and under slab drains). In addition, retaining wall back drains should be separated from under slab drains. Drains should be checked periodically, and cleaned and maintained as necessary to provide unimpeded flow.

Supplemental Services

H. Allen Gruen, Geotechnical Engineer recommends that he be retained to review the project plans and specifications to determine if they are consistent with his recommendations. In addition, he should be retained to observe geotechnical construction, particularly site excavations, placement of retaining wall backdrains, fill compaction, and excavation of foundations, as well as to perform appropriate field observations and laboratory tests.

If, during construction, subsurface conditions different from those described in this report are observed, or appear to be present beneath excavations, I should be advised at once so that these conditions may be reviewed and my recommendations reconsidered. The recommendations made in this report are contingent upon my notification and review of the 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, I recommend that I 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.

These services are performed on an as-requested basis and are in addition to this geotechnical investigation. I cannot accept responsibility for conditions, situations or stages of construction that I am not notified to observe.

LIMITATIONS

This report has been prepared for the exclusive use of JW Sanchez, LLC and their 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, our site reconnaissance, review of published data, 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.

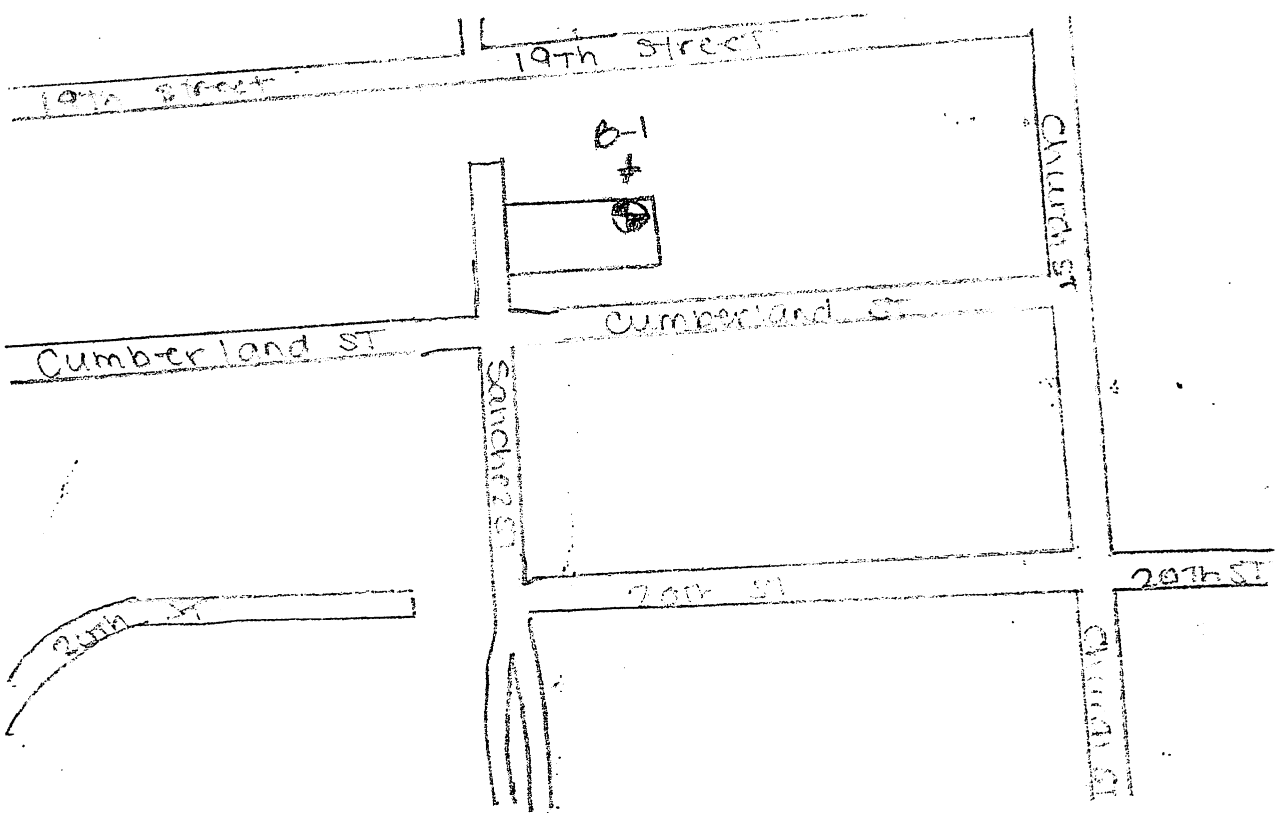
The test boring log represents subsurface conditions at the location and on the date indicated. It is not warranted that it is representative of such conditions elsewhere or at other times. Site conditions and cultural features described in the text of this report are those existing at the time of our field exploration, conducted on September 4, 2018, and may not necessarily be the same or comparable at other times.

The location of the test boring was established in the field by reference to existing features and should be considered approximate only.

The scope of our 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, groundwater or air, on or below, or around the site, nor did it include an evaluation or investigation of the presence or absence of wetlands.

APPENDIX A

List of Plates



LEGEND

B-1 Boring Location and Number

NOT TO SCALE

H. Allen Gruen **Geotechnical Engineer**	Job. No: 18-4836 Appr: AG Drwn: VP Date: 10-1-18	**BORING LOCATION MAP** 617 Sanchez Street **San Francisco, California**	PLATE 1

Location of Boring:

Project: 617 Sanchez Street	Boring No.: 1
	Total Depth: 9.5
Job No.: 18-4836	Logged By: KJ
Proj. Mgr.: AG	Date: 9-4-18
Drilling Contractor: Access Drilling	
Hammer Wt.: 140lb	Drop: 30"
Water Depth (ft.):	
Time:	
Date:	
Backfilled, Time:	Date: By:
Surface Elev.:	Datum:
Conditions:	

Sample Depth	Sampler Type	Blows/Foot	Inches Driven	Inches Recovered	Sample Condition	Pocket Penetrometer Shear Strength (KSF)	Moisture Content (%)	Dry Density (PSF)	% Passing #200 Sieve	Depth in Feet	Graphic Log	Description
	SH											
		15								1		Brown Sandy lean CLAY (CL)
	SH									2		very stiff, moist
		30								3		
	2in									4		
		41								5		- Hard
	2"									6		Brown clayey SAND (SC)
		45								7		Dense, moist
	SPT									8		
		91								9		
										10		
										11		Refusal at 9.5 feet
										12		No free Ground water encountered
										13		
										14		
										15		
										16		
										17		
										18		
										19		
										20		

H. Allen Gruen
Geotechnical Engineer

Job No: 18-4836
Appr: AG
Date: 10-1-18

LOG OF BORING 1
617 Sanchez Street
San Francisco, California

PLATE
2

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
			GP		POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	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
			SP		POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM		SILTY SANDS, POOORLY 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

H. Allen Gruen
Geotechnical Engineer

Appr: AG

Date: 10-1-18

SOIL CLASSIFICATION CHART AND KEY TO TEST DATA

617 Sanchez Street

San Francisco, California

PLATE 3

APPENDIX B

List of References

1. California Department of Conservation, Division of Mines and Geology, 1998, *Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada.*

2. CDMG, 2000, State of California Seismic Hazards Zones, City and County of San Francisco, California Division of Mines and Geology, released November 17, 2000.

3. Schlocker, J., 1958, Geology of the San Francisco North Quadrangle, California, United States Geological Survey Professional Paper 782, scale 1:24,000.

4. Seed, H. B., and Idriss, E., 1982, *Ground Motion and Soil Liquefaction during Earthquakes*, Earthquake Engineering Research Institute Monograph.

5. United States Geological Survey, 1993, San Francisco North Quadrangle, 7.5 Minute Series, Scale 1:24,000.

6. URS/John A. Blume & Associates, Engineers, 1974, San Francisco Seismic Safety Investigation, Figure 4, June 1974.

APPENDIX C

Field Exploration

My field exploration consisted of a geologic reconnaissance and subsurface exploration by means of one test boring logged by my engineer on September 4, 2018. The test boring was drilled with hand-carried equipment utilizing continuous flight, 4-inch-diameter augers. The boring was drilled at the approximate location shown on Plate 1.

The log of the test boring is displayed on Plate 2. Representative undisturbed samples of the earth materials were obtained from the test boring at selected depth intervals with a 1.4-inch inside diameter, split-barrel Standard Penetration Test (SPT) sampler, a 2-inch inside diameter, split-barrel sampler, and a 2.5-inch inside diameter, modified California sampler.

Penetration resistance blow counts were obtained by dropping a 140-pound hammer through a 30-inch free fall. The sampler was driven 24 inches or less and the number of blows was recorded for each 6 inches of penetration. The blows per foot recorded on the Boring Log represent the accumulated number of equivalent SPT blows that were required to drive the sampler the last 12 inches of the sampler penetration or fraction thereof.

The soil classifications are shown on the Boring Log and referenced on Plate 3.

APPENDIX D

Distribution

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(4 wet signed and stamped originals)