

September 2020

**CEQA Memorandum
400 SURMONT DRIVE
TOWN OF LOS GATOS, SANTA CLARA COUNTY**

Project Location and Description

The 15.1-acre site is located at 400 Surmont Drive, within the Town of Los Gatos, Santa Clara County, California. The project site is located on Surmont Drive, west of Belgatos Lane and south of Blossom Hill Road, a major arterial road that runs east to west in the Town of Los Gatos. The project site can be accessed via the existing Surmont Drive. See Figure 1, *Local Vicinity Map* for a local context of the site location.

The project site (Assessor's Parcel Number 527-20-003) is currently occupied by an existing single-family home. There are two additional existing residential homes to the north and west of the project site on adjacent lots. The project site is within a relatively sloped hillside area (approximately 27.3% average slope). The project site's Zoning designation is Hillside Residential (HR-2 ½) with an allowed density range of 2.5 to 10 acres per dwelling unit. The site's Land Use designation is Hillside Residential.

The proposed project is requesting approval of a minor subdivision to divide one residential lot (APN 527-20-003) into three lots (approximate lot sizes 1.4 acres, and 1.3 acres, with an existing single-family residence to remain on a remainder parcel of approximately 12 acres) and to construct a driveway connecting the two new lots to the existing Surmont Drive. See the attached Figure 2, *Parcel Map* for the proposed site plan. The proposed project is consistent with the existing land use and zoning designations. While there is no construction currently planned on the two new lots, the proposed project would allow for future construction of one single-family residence on each of the two new lots.

CEQA Class 3 Categorical Exemption

The proposed project is categorically exempt from the provisions of the California Environmental Quality Act (CEQA) pursuant to State CEQA Guidelines Section 15303, Class 3. The project qualifies for a CEQA Class 3 Categorical Exemption, which allows for construction and location of limited number of new structures, including construction of up to three single-family residences in an urbanized area [14 California Code of Regulations (CCR) § 15303]. An urbanized area is defined as a central city or a group of contiguous cities with a population of 50,000 or more, together with adjacent densely populated areas having a population density of at least 1,000 persons per square mile (14 CCR § 15387). The Town of Los Gatos has a population density greater than 1,000 persons per square mile, and the Town of Los Gatos and the City of San Jose are contiguous, and together have a population exceeding 1 million people. Therefore, the project would be within an urbanized area. Because the project would allow for the future creation of two new single-family residences within an urbanized area, the project would qualify for a Class 3 CE.

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CEQA Class 15 Categorical Exemption

The proposed project is also categorically exempt from the provisions of the CEQA pursuant to State CEQA Guidelines Section 15315, Class 15. The project qualifies for a CEQA Class 15 Categorical Exemption, which allows for the division of property into four or fewer parcels when the division is in conformance with the general plan and zoning, no other variances or exceptions requiring environmental review are required, and all required services and access to the proposed parcels per local standards are available. The proposed project would divide one residential lot (APN 527-20-003) into three lots (approximate lot sizes 1.4 acres, and 1.3 acres, with an existing single-family residence to remain on a remainder parcel of approximately 12 acres), which is less than the allowed maximum of four parcels. The project is in conformance with the general plan and zoning requirements for the project site. No other exceptions requiring environmental review are required, and all required services and access to the new lots would be available. Therefore, the project would qualify for a Class 15 CE.

Technical Analyses

Several technical memoranda were prepared for the project to understand the potential environmental effects, and they are attached to the end of this memorandum. Specifically, the following reports and memoranda were prepared:

- Biological Resources Report (Attachment A)
- Arborist Report (Attachment B)
- Geotechnical Investigation (Attachment C)
- Geologic Report (Attachment D)

The applicant will be required to obtain any required review or permits from applicable water agencies.

Categorical Exemption Exceptions

The project does not meet any of the exceptions to Categorical Exemptions, which are listed in CEQA Section 15300.2. The analysis below identifies the exceptions with a discussion that substantiates how the project does not meet those exceptions.

- a) *Location. Classes 3, 4, 5, 6, and 11 are qualified by consideration of where the project is to be located – a project that is ordinarily insignificant in its impact on the environment may in a particularly sensitive environment be significant. Therefore, these classes are considered to apply in all instances, except where the project may impact an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.*

The project site is in an urbanized area and largely consists of undeveloped ruderal grassland with small

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areas coast live oak woodland. The project site is not located in an area mapped or designated as critical habitat or as containing hazardous resources. Further, no critical habitat was identified on the project site and there are no hazardous resources on the project site. The project, with implementation of the Town's standard conditions of approval (including requirements to address potential impacts to birds, bats, or rats), would not result in damages to critical habitat.

- b) Cumulative Impact. All exemptions for these classes are inapplicable when the cumulative impact of successive projects of the same type in the same place, over time is significant.*

The proposed project is a minor subdivision to divide one residential lot into three lots with an existing single-family residence to remain on a remainder parcel and for the future construction of two single-family residences, and construction of a driveway to connect the two new lots to the existing Surmont Drive. The project site is located in an existing residential neighborhood and is zoned for residential uses. Surrounding lots, adjoining the project site, would not be impacted by the proposed improvements to the project site. No significant adverse impacts would occur as a result of the proposed project. Therefore, the proposed project would not contribute to or cause a cumulative impact based on successive projects of the same type in the same place.

- c) Significant Effect. A categorical exemption shall not be used for an activity where there is a reasonable possibility that the activity will have a significant effect on the environment due to unusual circumstances.*

Based on the substantial evidence described below and contained in the whole of the project record, the Town finds that there are no unusual circumstances related to this project or project site. As such, the proposed project would not have a significant effect on the environment due to unusual circumstances.

The terrain and vegetation of the project site do not constitute unusual circumstances in Los Gatos, particularly within the setting of the surrounding area. There are existing residential dwellings located immediately adjacent to the north, south, and west of the proposed new lots. These existing, surrounding residential dwellings are subject to similar terrain and biological conditions as the project site. Therefore, there is nothing unusual about the terrain or vegetation of the project site.

In the same vein, the seismic conditions of the project site do not constitute unusual circumstances in Los Gatos, and particularly as compared to the immediate project vicinity, because the risk for strong seismic-induced ground shaking exists throughout Los Gatos and is identical at the immediately adjacent properties that are already developed with residential dwellings. Further, the risk for strong seismically-induced ground shaking is present throughout most of the greater San Francisco Bay Area due to the many active fault lines located throughout the San Francisco Bay Area. As such, the project site's proximity to a fault line and potential to experience strong ground shaking during a seismic event are not unusual circumstances.

Given the project site's proximity to a fault line and the site topography, the project site is located in an area mapped as an earthquake-induced landslide hazard zone, which indicates the potential for seismically-induced landslides to occur in these mapped areas. However, a site-specific Geotechnical

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Report and geologic Report were prepared and signed by a licensed Geotechnical Engineer and a Certified Engineering Geologist, respectively (See Attachment C and D). These reports were also peer reviewed, and the peer reviews are included in Attachment C and D. The Geotechnical Report concluded that the project site is suitable for the proposed dwellings from a geotechnical standpoint and that the Geologic Report concluded that the landslide risk for the project site is negligible. The mapped *potential* for landslide risk is superseded by the site-specific study indicating there is negligible landslide risk on the project site. Therefore, the geologic and geotechnical considerations for the project are not unusual circumstances. Further, while no construction is proposed at this time, should future construction proceed, the design of the dwellings will require site-specific engineering to obtain a building permit.

The Town of Los Gatos has determined, based on substantial evidence, that there are no unusual circumstances related to this project. Notwithstanding, for the purposes of transparency and context, the following analysis evaluates the potential for environmental impacts as result of the project (not as a result of unusual circumstances).

The proposed project is a minor subdivision to divide one residential lot into three lots with construction of a driveway to connect the two new lots to the existing Surmont Drive, and future construction of two single family residential homes. A biologist from H.T. Harvey & Associates conducted a single-day site visit to the project site in October 2019 to identify habitats present onsite and determine if the site supports potentially suitable habitat for any special-status plant or animal which are known to occur regionally. The results of the field survey are compiled in memo attached to this notice (Attachment A). The biologists found that no special-status plant species have the potential to occur on the project site and the project, with implementation of the Town's standard conditions of approval, would not have a significant effect on special status animal species.

The Town of Los Gatos receives its utility services from: San Jose Water Company; West Valley Sanitation District; Guadalupe Landfill; and the San Jose/Santa Clara Water Pollution Control Plant. The existing buildings on the project site have been adequately serviced and the project site will continue to be adequately serviced with the new development. Therefore, the project would not require construction of any new public service or utility facilities that would result in environmental impacts.

The project entails construction of a new driveway to connect the two new lots to the existing Surmont Drive, which would ensure sufficient access to the proposed parcels. As noted in Attachment A, the proposed driveway would be located adjacent to an ephemeral drainage feature, which is potentially a jurisdictional drainage feature. Portions of the proposed driveway would be located within the required 20-foot slope stability protection area for the ephemeral drainage feature on the site (Santa Clara Valley Water District's Guidelines and Standards for Land Use Near Streams). To prevent indirect impacts on water quality within the drainage and in the downslope watershed, the project will construct a two-foot tall retaining wall in between the driveway and the drainage feature for the 30-foot portion of the driveway closest to the drainage feature. The retaining wall will be constructed just above the top of bank to protect the bank and avoid any erosion from the construction of the driveway into the ephemeral drainage feature. No project work will be inside the bed and bank of the ephemeral drainage feature. A slope stability analysis was also conducted and peer reviewed for the proposed site work encroaching into the slope stability protection area (Attachment C). However, as detailed in Attachment A, with

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implementation of the Town's standard conditions of approval for water quality, the project would not have a significant effect on any jurisdictional waters or on water quality.

The project would not have a reasonable potential to have any significant effects on the environment. Therefore, the proposed project, with standard conditions of approval, would not have a significant effect on the environment due to unusual circumstances.

- d) Scenic Highways. A categorical exemption shall not be used for a project which may result in damage to scenic resources, including but not limited to, trees, historic buildings, rock outcroppings, or similar resources, within a highway officially designated as a state scenic highway. This does not apply to improvements which are required as mitigation by an adopted negative declaration or certified EIR.*

There are no state designated scenic highways on the project site or in the near vicinity of the project site. The nearest highway to the project site is State Route (SR) 17, located approximately 2.68 miles west of SR 17. However, SR 17 is not a designated scenic highway within the Town of Los Gatos and the project site is not visible from SR 17, or any other public rights-of-way that are designated as a scenic resource. Therefore, the proposed project does not have the potential to affect a scenic resource.

- e) Hazardous Waste Sites. A categorical exemption shall not be used for a project located on a site which is included on any list compiled pursuant to Section 65962.5 of the Government Code.*

Per Figure 8.7-1, *Hazardous Materials Sites* in the Los Gatos General Plan 2040 Background Report, there are no hazardous waste sites located at or within the local vicinity of the project site. According to the Geotracker Website, administered by the California State Water Quality Control Board, there are no listed sites within 1,500 feet of the project site. Therefore, the site is not included on a hazardous materials list.

- f) Historical Resources. A categorical exemption shall not be used for a project which may cause a substantial adverse change in the significance of a historical resource.*

Per the Town of Los Gatos Interactive GIS Map, the project site is not a designated historic site and is not located within an historic district. According to records, the existing single family residential home on-site was built in 1929, and is therefore potentially historical, absent any evaluation from the Town determining the structure has no significance. However, the two new single family residential homes allowed by the project would be located on separate lots from the existing single-family residence to remain on the remainder parcel. Construction of the two new single family structures would not effect the existing residential structure, and no modifications to the existing structure are proposed as part of the project. As such, the project would not cause any substantial adverse changes to the significance of a potential historical resource. As previously mentioned, the site's zoning is Hillside Residential, with no Historic Preservation Overlay.

There are no known archaeological resources or human remains on the project site, however ground disturbance associated with any future construction would have the potential to inadvertently discover previously unknown archaeological resources or human remains.

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The Town's standard condition of approval regarding inadvertent discovery of archaeological resources and human remains, would ensure any potential impacts to previously unknown archaeological resources and human remains would be less than significant.

Conclusion

The proposed project is categorically exempt from CEQA pursuant to State CEQA Guidelines Section 15303, Class 3 and Section 15315, Class 15. The proposed project characterizes the new construction allowed by the Class 3 CE and the minor land division allowed by the Class 15 CE. The proposed project complies with the Town's general plan designation and zoning for the project site, utilities and public services would not be impacted, and the proposed project does not fall within the exceptions listed in CEQA Guidelines Section 15300.2.

The project, with standard conditions of approval, would not have a significant effect on the environment.

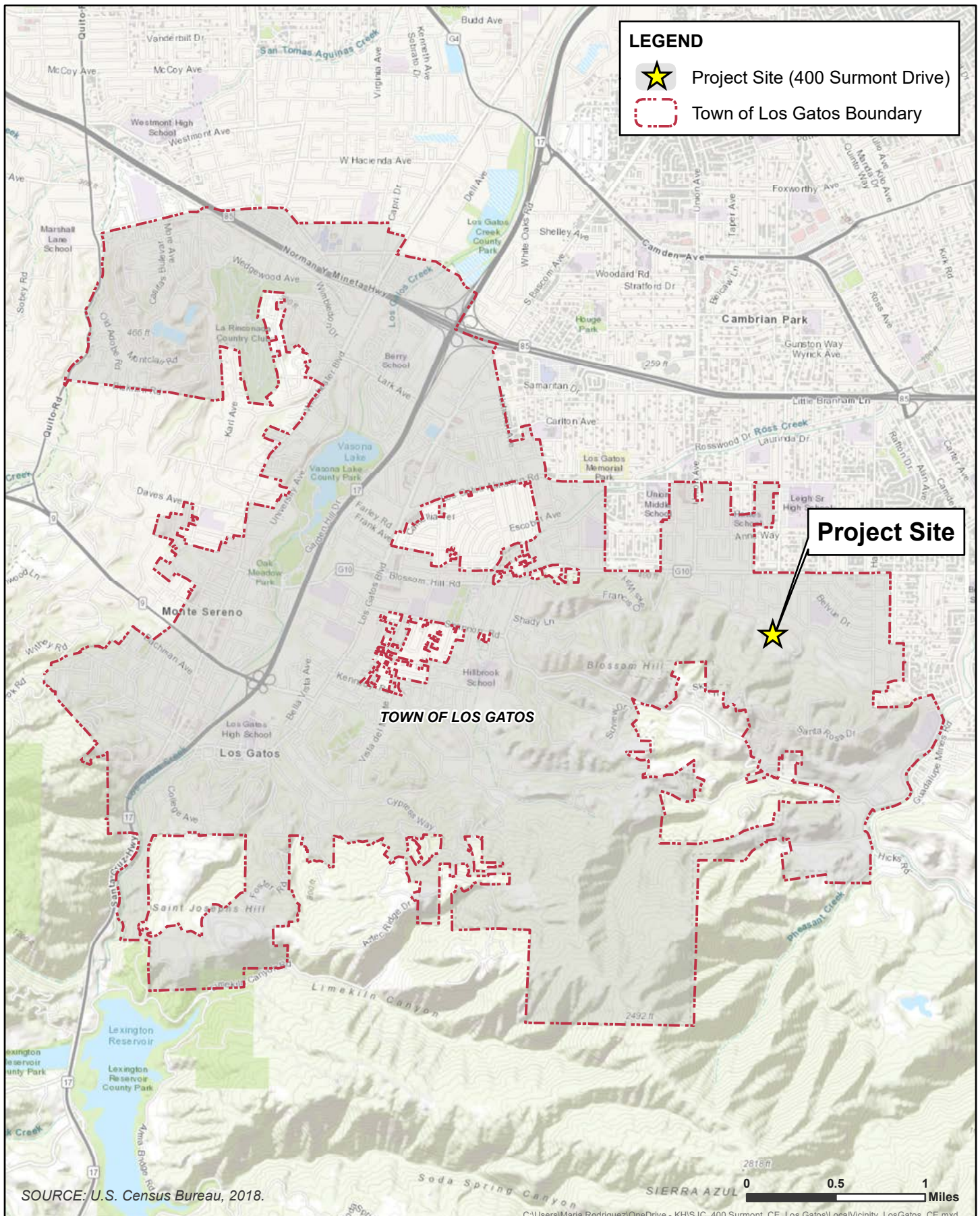


FIGURE 1: Local Vicinity Map
 400 Surmont Drive, Town of Los Gatos, Santa Clara County

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FIGURE 2: Parcel Map

400 Surmont Drive, Town of Los Gatos, Santa Clara County

Attachment A: Biological Resources Report



H. T. HARVEY & ASSOCIATES

Ecological Consultants



**400 Surmont Drive
Biological Resources Report**

Project #4374-01



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Section 1. Introduction

This report describes the biological resources present within and adjacent to the proposed 400 Surmont Drive project site, as well as the potential impacts of the proposed development on biological resources under the California Environmental Quality Act (CEQA). This report was prepared to facilitate CEQA review of the project.

1.1 Project Description

The approximately 2.8-acre project site is located at 400 Surmont Drive in Los Gatos, California (Figure 1), and the site is bounded by residential development to the north and mown fields surrounding residential development to the east, west, and south (Figure 2). The project site currently consists of undeveloped grasslands with a number of trees. A private residence and horse facility is located approximately 180 feet south of the site within the existing parcel.

The proposed project entails the subdivision of the existing parcel to create two new lots, as well as the future development of two new single-family residences on the site (one on each new lot) at a later date.

1.2 Standard Conditions

The project will comply with standard conditions to protect nesting birds, roosting bats, San Francisco dusky-footed woodrats (*Neotoma fuscipes annectens*), and water quality on the project site, as described below.

1.2.1 Nesting Birds

To avoid impacts to nesting birds, the removal of trees and shrubs shall be minimized to the greatest extent feasible. Construction activities that include any tree removal, pruning, grading, grubbing, or demolition shall be conducted outside of the bird nesting season (January 15 through September 15) to the greatest extent feasible. If this type of construction starts, if work is scheduled to start or if work already occurring during the nesting season stops for at least two weeks and is scheduled to resume during the bird nesting season, then a qualified biologist shall conduct a pre-construction surveys for nesting birds to ensure that no nests would be disturbed during project construction. If project-related work is scheduled during the nesting season (February 15 to August 30 for small bird species such as passerines; January 15 to September 15 for owls; and February 15 to September 15 for other raptors), a qualified biologist shall conduct nesting bird surveys. Two surveys for active nests of such birds shall occur within 14 days prior to start of construction, with the second survey conducted with 48 hours prior to start of construction. Appropriate minimum survey radius surrounding each work area is typically 250 feet for passerines, 500 feet for smaller raptors, and 1,000 feet for larger raptors. Surveys shall be conducted at the appropriate times of day to observe nesting activities. If the qualified biologist documents active nests within the project site or in nearby surrounding areas, an appropriate buffer between each nest and active construction shall be established. The buffer shall be clearly marked and maintained until

the young have fledged and are foraging independently. Prior to construction, the qualified biologist shall conduct baseline monitoring of each nest to characterize “normal” bird behavior and establish a buffer distance, which allows the birds to exhibit normal behavior. The qualified biologist shall monitor the nesting birds daily during construction activities and increase the buffer if birds show signs of unusual or distressed behavior (e.g. defensive flights and vocalizations, standing up from a brooding position, and/or flying away from the nest). If buffer establishment is not possible, the qualified biologist or construction foreman shall have the authority to cease all construction work in the area until the young have fledged and the nest is no longer active.

1.2.2 Roosting Bats

Approximately 14 days prior to tree removal, a qualified biologist shall conduct a habitat assessment for bats and potential roosting sites in trees to be removed and in trees within 50 feet of the development footprint. These surveys will include a visual inspection of potential roosting features (bats need not be present) and a search for presence of guano within the project site, construction access routes, and 50 feet around these areas. Cavities, crevices, exfoliating bark, and bark fissures that could provide suitable potential nest or roost habitat for bats shall be surveyed. Assumptions can be made on what species is present due to observed visual characteristics along with habitat use, or the bats can be identified to the species level with the use of a bat echolocation detector such as an “Anabat” unit. Potential roosting features found during the survey shall be flagged or marked.

If no roosting sites or bats are found, a letter report confirming absence will be prepared and no further measures are required.

If bats or roosting sites are found, a letter report and supplemental documents will be prepared prior to grading permit issuance and the following monitoring, exclusion, and habitat replacement measures will be implemented:

- a. If bats are found roosting outside of the nursery season (May 1 through October 1), they will be evicted as described under (b) below. If bats are found roosting during the nursery season, they will be monitored to determine if the roost site is a maternal roost. This could occur by either visual inspection of the roost bat pups, if possible, or by monitoring the roost after the adults leave for the night to listen for bat pups. If the roost is determined to not be a maternal roost, then the bats will be evicted as described under (b) below. Because bat pups cannot leave the roost until they are mature enough, eviction of a maternal roost cannot occur during the nursery season. Therefore, if a maternal roost is present, a 50-foot buffer zone (or different size if determined in consultation with the California department of Fish and Wildlife [CDFW]) will be established around the roosting site within which no construction activities including tree removal or structure disturbance will occur until after the nursery season.
- b. If a non-breeding bat hibernaculum is found in a tree or snag scheduled for removal or on any structures scheduled to be disturbed by project activities, the individuals will be safely evicted, under the direction of a qualified bat biologist. If pre-construction surveys determine that there are bats present in any trees to be

removed, exclusion structures (e.g. one-way doors or similar methods) shall be installed by a qualified biologist. The exclusion structures shall not be placed until the time of year in which young are able to fly, outside of the nursery season. Information on placement of exclusion structures shall be provided to the CDFW prior to construction.

If needed, other methods conducted under the direction of a qualified bat biologist could include: carefully opening the roosting area in a tree or snag by hand to expose the cavity and opening doors/windows on structures, or creating openings in walls to allow light into the structures. Removal of any trees or snags and disturbance of any structures will be conducted no earlier than the following day (i.e., at least one night will be provided between initial roost eviction disturbance and tree removal/structure disturbance). This action will allow bats to leave during dark hours, which increases their chance of finding new roosts with a minimum of potential predation.

1.2.3 San Francisco Dusky-Footed Woodrats

This project will implement the following standard measures to minimize impacts on woodrats and active woodrat nests on the project site.

- **Preconstruction Survey.** A qualified biologist will conduct a preconstruction survey for San Francisco dusky-footed woodrat nests within 30 days of the start of work activities. If active woodrat nests are determined to be present in, or within 10 feet of the impact areas, the conditions below (Avoidance and/or Nest Relocation) will be implemented, as appropriate. If no active woodrat nests are present on or within 10 feet of impact areas, no further conditions are warranted.
- **Avoidance.** Active woodrat nests that are detected within the work area will be avoided to the extent feasible. Ideally, a minimum 10-foot buffer will be maintained between project activities and woodrat nests to avoid disturbance. In some situations, a smaller buffer may be allowed if, in the opinion of a qualified biologist, nest relocation (below) would represent a greater disturbance to the woodrats than the adjacent work activities.
- **Nest Relocation.** If avoidance of active woodrat nests within and immediately adjacent to (within 10 feet of) the work areas is not feasible, then nest materials will be relocated to suitable habitat as close to the project site as possible (ideally, within or immediately adjacent to the project site).

Relocation efforts will avoid the peak nesting season (February–July) to the maximum extent feasible. Prior to the start of construction activities, a qualified biologist will disturb the woodrat nest to the degree that all woodrats leave the nest and seek refuge outside of the construction area. Disturbance of the woodrat nest will be initiated no earlier than one hour before dusk to prevent the exposure of woodrats to diurnal predators. Subsequently, the biologist will dismantle and relocate the nest material by hand. During the deconstruction process, the biologist will attempt to assess if there are juveniles in the nest. If immobile juveniles are observed, the deconstruction process will be discontinued until a time when the biologist

believes the juveniles will be capable of independent survival (typically after 2 to 3 weeks). A no-disturbance buffer will be established around the nest until the juveniles are mobile. The nest may be dismantled once the biologist has determined that adverse impacts on the juveniles would not occur.

1.2.4 Water Quality

The project will implement best management practices (BMPs) as described in this section to avoid and minimize impacts on water quality in the ephemeral drainage on the project site.

It is our understanding that the project will maintain a 20-foot setback from the ephemeral drainage feature for avoidance purposes, with the exception of a driveway that will be constructed adjacent to the drainage. As a result, the project will not result in direct impacts on jurisdictional wetlands or waters.

Indirect impacts on water quality due the construction of single-family residences on the project site will be avoided and minimized by implementing erosion and sediment control measures, as well as BMPs for work near aquatic environments. Construction projects in California causing land disturbances that are equal to 1 acre or greater must comply with state requirements to control the discharge of stormwater pollutants under the National Pollutant Discharge Elimination System *General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities* (Construction General Permit; Water Board Order No. 2009-0009-DWQ). Prior to the start of construction, a Notice of Intent must be filed with the State Water Board describing the project. A Storm Water Pollution Prevention Plan must be developed and maintained during the project and it must include the use of BMPs to protect water quality until the site is stabilized. Standard permit conditions under the Construction General Permit require that the applicant utilize various measures including on-site sediment control BMPs, damp street sweeping, temporary cover of disturbed land surfaces to control erosion during construction, and utilization of stabilized construction entrances and/or wash racks, among other factors.

In many Bay Area counties, including Santa Clara County, projects must also comply with the *California Regional Water Quality Control Board, San Francisco Bay Region, Municipal Regional Stormwater NPDES Permit* (Water Board Order No. R2-2009-0074). This permit requires that all projects implement BMPs and incorporate Low Impact Development practices into the design that prevents stormwater runoff pollution, promotes infiltration, and hold/slows down the volume of water coming from a site after construction has been completed. In order to meet these permit and policy requirements, projects must incorporate the use of green roofs, impervious surfaces, tree planters, grassy swales, bioretention and/or detention basins, among other factors.

In April 2019, Live Oak Associates prepared a memorandum for the project proponent to evaluate the ephemeral drainage with respect to the Town of Los Gatos' stream setback guidance. As discussed below, the Town of Los Gatos has adopted guidance from the *Guidelines and Standards for Land Use Near Streams* (Valley Water 2006). In its evaluation, Live Oak Associates characterized the aquatic feature as an ephemeral channel, which only flows following storm events and has no other water source aside from storm water runoff from adjacent hillsides, which agrees with the determination made in this report. According to that evaluation, the

recommended minimum Slope Stability Protection Area (or setback for ephemeral aquatic features such as the drainage along the site's western boundary) for structures is between 10 to 20 feet, with the exact setback determined at the discretion of the local jurisdiction (Live Oak Associates 2019). Exceptions may be granted to allow a structure or driveway to be located within the slope stability protection area where a slope stability analysis is provided and maintenance or repair of the stream will be provided. In February 2020, Live Oak Associates conducted a follow-up survey to evaluate the location of the proposed wall adjacent the new driveway in relation to the bed and bank of the ephemeral drainage (Live Oak Associates 2020). This assessment confirmed that the wall and driveway will be outside the top of bank of the feature. Project measures as described below will ensure that indirect impacts to water quality downstream of the drainage will be avoided. H. T. Harvey & Associates concurs with the results and recommendations provided in the two memoranda prepared by Live Oak Associates.

All project work will be outside the bed and bank of ephemeral drainage feature on the project site, though the proposed driveway will be directly adjacent and immediately outside the top of bank at its downslope end (i.e. in the northwest corner of the parcel). The project proposes a 30-foot long by 2-foot tall retaining wall to be constructed just above the top of bank to protect the bank and avoid any erosion from construction of the driveway into the ephemeral drainage. In addition, this project will implement the following conditions to minimize impacts on water quality within the ephemeral drainage (Note: many of these conditions are overlapping conditions with what will be required for compliance with the *California Regional Water Quality Control Board, San Francisco Bay Region, Municipal Regional Stormwater NPDES Permit* [Water Board Order No. R2-2009-0074] as described above).

- All construction activities in the ephemeral drainage shall be avoided. Within the Slope Stability Protection Area, grading will be minimized to the extent necessary and existing contours and slopes shall be maintained.
- Existing native vegetation adjacent the drainage shall be retained by removing only as much vegetation as necessary to accommodate the construction of the retaining wall. When possible, a vegetated buffer strip between staging/excavation areas and the drainage shall be maintained.
- Appropriate erosion control measures (e.g., fiber rolls, filter fences, vegetative buffer strips) shall be used on site to reduce siltation and runoff of contaminants into the ephemeral drainage. Fiber rolls used for erosion control will be certified as free of noxious weed seed. Filter fences and mesh will be of material that will not entrap reptiles and amphibians. Erosion control measures will be placed at the top of bank of the drainage or the edge of the Slope Stability Protection Area where possible. The erosion control measure should follow the approaches and details outlined in the Bank Protection/ Erosion Repair Design Guide in the Santa Clara Valley Water Resources Protection Collaborative's User Manual: Guidelines & Standards for Land Use Near Streams (Valley Water 2006).
- All disturbed soils shall be revegetated with native plants and/or grasses or sterile nonnative species suitable for the altered soil conditions upon completion of construction. Local watershed native plants will be used if available. If sterile nonnative species are used for temporary erosion control, native seed mixtures must

be used in subsequent treatments to provide long-term erosion control and slow colonization by invasive nonnatives. All disturbed areas that have been compacted shall be de-compacted prior to planting or seeding. Cut-and-fill slopes will be planted with local native or non-invasive plants suitable for the altered soil conditions. Again, revegetation of disturbed soils shall follow the recommendations of the Santa Clara Valley Water Resources Protection Collaborative's User Manual: Guidelines & Standards for Land Use Near Streams (Valley Water 2006).

- No stockpiling or placement of erodible materials shall be allowed within 20 feet of the ephemeral drainage or along areas of natural stormwater flow where materials could be washed into waterways.
- No equipment servicing shall be done within 20 feet of the ephemeral drainage, unless equipment stationed in these locations cannot be readily relocated (i.e., pumps, generators).
- Construction personnel shall prevent the accidental release of chemicals, fuels, lubricants, and non-storm drainage water into channels. Spill prevention kits shall always be in close proximity when using hazardous materials (e.g., crew trucks and other logical locations). Personnel shall implement measures to ensure that hazardous materials are properly handled, and all construction waste will be disposed of in designated areas to prevent stormwater from flowing onto or off of these areas.
- Potential contaminating materials must be stored in covered storage areas or secondary containment that is impervious to leaks and spills. Runoff pathways shall be free of trash containers or trash storage areas. Trash storage areas shall be screened or walled.
- Vehicles and equipment shall be parked on pavement, existing roads, and previously disturbed areas.



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H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 1. Vicinity Map

400 Surmont Drive Biological Resources Report and Constraints Analysis (4374-01)



N:\Projects\4300\4374-01\Reports\400 Surmont Drive BRR\Fig 2. Biological Study Area.mxd aka:saer



H. T. HARVEY & ASSOCIATES
Ecological Consultants

Figure 2. Project Site

400 Surmont Drive Biological Resources Report and Constraints Analysis (4374-01)

Section 2. Methods

2.1 Background Review

Prior to conducting field work, H. T. Harvey & Associates ecologists reviewed the project plans and description provided by Kimley-Horn in October 2019; aerial photos (Google Inc. 2020) and topographic maps; the California Department of Fish and Wildlife's (CDFW's) California Natural Diversity Database (CNDDDB) (2020); Calflora (2020); the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants of California (CNPS 2020); bird records from the project vicinity reported to the eBird database (Cornell Lab of Ornithology 2020), which has been established by the Cornell University Laboratory of Ornithology to archive records of birds seen worldwide; and other relevant scientific literature and technical databases in order to assess the current distribution of special-status plants and animals in the site vicinity. In addition, for plants we reviewed all species on the current California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) 1A, 1B, 2A, and 2B lists occurring in the *Los Gatos, California* 7.5-minute USGS quadrangle in which the project is located, as well as the surrounding eight quadrangles (*Cupertino, San Jose West, San Jose East, Castle Rock Ridge, Santa Teresa Hills, Felton, Laurel, and Loma Prieta, California*) using both the CNDDDB and CNPS databases. Quadrangle-level results are not maintained for CRPR 3 and 4 species, so we also conducted a search of CNPS Inventory records for these species occurring in San Mateo County (CNPS 2020). In addition, we queried the CNDDDB for natural communities of special concern that occur in the project vicinity. For the purposes of this report, the "project vicinity" encompasses a 5-mile radius surrounding the project site.

In addition, H. T. Harvey & Associates peer-reviewed two memoranda prepared by Live Oak Associates for the Town of Los Gatos. In April 2019, Live Oak Associates prepared a memorandum for the project proponent to evaluate the ephemeral drainage with respect to the Town of Los Gatos' stream setback guidance, and in February 2020, they produced a follow up memorandum to evaluate the location of the proposed wall adjacent the new driveway in relation to the bed and bank of the ephemeral drainage (Live Oak Associates 2019 and 2020). The findings of these memoranda were utilized in the impact analysis with respect to potential project impacts on jurisdictional waters and/or sensitive communities.

2.2 Site Visit

Following our background review, H. T. Harvey & Associates plant ecologist Jillian Pastick, M.S., and wildlife ecologists Christian Knowlton, B.S., and Robin Carle, M.S., conducted a reconnaissance-level survey of the project site on October 24, 2019. The purpose of this survey was to identify existing biological conditions and the site's potential to support special-status species of plants and animals, as well as sensitive/regulated habitats such as jurisdictional wetlands and other waters of the U.S. regulated under Section 404 of the Clean Water Act, potential waters of the state, and/or riparian habitats. The survey included an assessment of habitats for special-status species both on the site and in adjacent areas (e.g., in developed and landscaped areas on adjacent properties) that could be impacted either directly or indirectly by proposed activities, as well as an assessment

of adjacent habitats that could potentially support source populations of sensitive species that could then disperse onto the project site.

Section 3. Environmental Setting

3.1 General Project Area Description

Historical aerial imagery indicates that the project site was formerly agricultural, and appears to have been planted with orchard trees (Google Inc. 2020). The site currently consists of a disked field with several remnant orchard trees. A dirt access road is present along the western boundary of the site that leads to the residence and horse stable at the southern end of the existing parcel. An ephemeral drainage is present off-site just west of the dirt road, and this drainage runs south to north from the residence to a culvert and storm drain at Surmont Drive.

Elevation on the project site ranges from approximately 335 to 422 feet above sea level (Google Earth 2020). The Natural Resource Conservation Service has mapped two soil units on the project site: Alo-Altamont complex, 15 to 30% slopes and Alo-Altamont complex, 30 to 50% slopes (Natural Resource Conservation Service 2020). These soil types have a variable profile and are considered well-drained and not ideal for farmland.

3.2 General Habitat Conditions and Wildlife Use

The project site and surrounding areas have been heavily modified by anthropogenic activities as a result of residential development and agricultural impacts. The reconnaissance-level survey identified three habitat/land use types on the project site: ruderal grassland (2.3 acres), coast live oak woodland (0.5 acre), and ephemeral drainage (<0.1 acre). These habitat/land use types are described in detail below and are shown on Figure 3.



3.2.1 Ruderal Grassland

Vegetation. Ruderal (i.e. disturbed) grassland habitat is the most extensive vegetation community on the project site (Photo 1). At the time of the reconnaissance survey, this habitat was entirely disked (in open areas) or mowed and partially disked (beneath trees). Based on evaluation of the remaining stubble, it appears that prior to mowing and disking the vegetation was largely dominated by non-native grasses such as wild oat (*Avena fatua*) and various bromes (*Bromus* spp.). Intermittent patches of stinkwort (*Dittrichia graveolens*) are also present as well. There were also a few orchard trees scattered throughout the grassland habitat, including the rootstock of stone fruit (*Prunus* sp.), which are likely remnants from an historical orchard on the site.



Photo 1. Ruderal grassland habitat.

Wildlife. Wildlife use of grasslands on the project site is limited by human disturbance (e.g., due to regular disking and mowing), the small extent of the grassland habitat, and the isolation of this habitat from more extensive grasslands in the region. As a result, some of the wildlife species associated with extensive grasslands in the South Bay, such as the grasshopper sparrow (*Ammodramus savannarum*), are absent from the grasslands on the project site. In addition, due to the minimal vegetation present, this habitat provides limited foraging opportunities for wildlife species that may inhabit adjacent developed or woodland areas and forage on the site opportunistically.

Bird species that occur on the site are primarily associated with surrounding developed and woodland areas and use the grasslands and remnant orchard trees on the site for foraging. These include the California towhee (*Melospiza crissalis*), mourning dove (*Zenaidura macroura*), lesser goldfinch (*Spinus psaltria*), dark-eyed junco (*Junco hyemalis*), Anna's hummingbird (*Calypte anna*), northern mockingbird (*Mimus polyglottos*), and American crow (*Corvus brachyrhynchos*). Birds are not expected to nest on the ground in the grassland habitat on the site due to the mown/disked conditions; however, small numbers of common bird species such as the Anna's hummingbird and mourning dove may nest in the remnant orchard trees within this habitat.

Burrows of California ground squirrels (*Otospermophilus beecheyi*) and Botta's pocket gophers (*Thomomys bottae*) are present beneath trees along the western boundary of the site where the grassland area is mown instead of disked. These fossorial mammals are an important component of grassland communities, providing a prey base for diurnal raptors and terrestrial predators. Other rodent species that can potentially occur in the grassland habitat on the site include the California vole (*Microtus californicus*) and deer mouse (*Peromyscus maniculatus*). Diurnal raptors such as red-tailed hawks (*Buteo jamaicensis*) and Cooper's hawks (*Accipiter cooperi*) forage for these

small mammals on the site during the day, and at night nocturnal species, such as barn owls (*Tyto alba*) and great-horned owls (*Bubo virginianus*), will forage for nocturnal rodents, such as deer mice.

Several reptile species may occur in the ruderal grassland habitat, including the western fence lizard (*Sceloporus occidentalis*) and gopher snake (*Pituophis catenifer*). Mammals such as the native striped skunk (*Mephitis mephitis*), black-tailed deer (*Odocoileus hemionus*), and coyote (*Canis latrans*) as well as the nonnative Virginia opossum (*Didelphis virginianus*) and feral cat (*Felis catus*) are likely to occasionally forage in these grasslands. Common species of bat, such as the Mexican free-tailed bat (*Tadarida brasiliensis*) may forage aerially over this habitat for insects.

3.2.2 Coast Live Oak Woodland

Vegetation. A small portion of the site contains a coast live oak woodland (Photo 2). Within the south west portion of the project site, this habitat is situated on a westward-facing slope (30–40%) and abuts the dirt road that runs along the western boundary of the site. This habitat is dominated by mature, closely spaced coast live oak (*Quercus agrifolia*) trees. The understory of the coast live oak woodland is mowed, partially disked, and mostly devoid of any vegetation, except for small patches of wild oats around the bases of trees.



Photo 2. Coast live oak woodland habitat.

Wildlife. Woodlands dominated by oaks typically support diverse animal communities in California. Coast live oaks provide cavities, bark crevices, and complex branching growth that create shelter for wildlife species, and these trees produce mast crops that are an important food source for many birds and mammals. However, the coast live oak woodland habitat on the project site is limited in extent, with a mown understory that is nearly devoid of vegetation. As a result, this habitat provides fewer structural resources and foraging opportunities for wildlife species compared to more natural and/or more extensive oak woodlands in the region. Nevertheless, due to the close proximity of Heintz Open Space immediately west of the site, species associated with more extensive oak woodlands in the open space area may utilize the oak woodland habitat on the site for breeding and foraging.

Birds such as the California scrub-jay (*Aphelocoma californica*), white-breasted nuthatch (*Sitta carolinensis*), Bewick's wren (*Thryomanes bewickii*), chestnut-backed chickadee (*Poecile rufescens*), and oak titmouse (*Baeolophus inornatus*) may nest and forage in oaks on the project site, and the acorn woodpecker (*Melanerpes formicivorus*) and California quail (*Callipepla californica*) may forage for acorns on the site and nest in the adjacent Heintz Open Space. Other birds expected to use this habitat are the wintering ruby-crowned kinglet (*Regulus calendula*) and Townsend's warbler (*Setophaga townsendi*). Raptors such as the red-tailed hawk, red-shouldered hawk, and Cooper's hawk may forage for prey in this woodland. These species could also potentially nest in the limited oak woodland present

on the site, but no active or inactive raptor nests were detected during the site visit, suggesting that raptors have not nested on the site in recent years.

Because the oak woodland habitat on the site lacks understory cover and vegetation, amphibian and reptile species that are typically associated with dense leaf cover and coarse woody debris in wooded habitats are not expected to occur here. Reptiles associated with the adjacent grassland habitat, such as the western fence lizard and Pacific gopher snake, may forage in the mown understories. Burrows of native California ground squirrels and Botta's pocket gophers were observed beneath these trees during the site visit, and several nests of the nonnative eastern gray squirrel (*Sciurus carolinensis*) were present in the oak trees. Mammals that forage in grasslands on the site such as the striped skunk, black-tailed deer, and coyote as well as the nonnative Virginia opossum and feral cat are expected to forage in this habitat. No cavities or crevices were observed in oaks on the site that provide high-quality roosting habitat for bats.

3.2.3 Ephemeral Drainage

An ephemeral drainage feature is located along the western boundary of the project site (Photo 3). The drainage is situated in a topographically low position relative to the adjacent slopes and is located in what historically (ie.

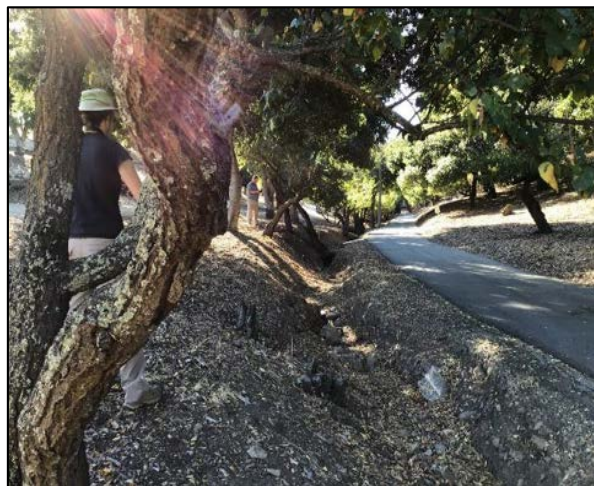


Photo 3. Ephemeral drainage located adjacent to the western border of the project site.

prior to the development of the area) would have been the bottom of a ravine. Presently, the drainage appears to only convey flows following storm events in winter months, and the majority of the flow in the channel is likely contributed by run-off from the adjacent road. There was no observed flowing or standing water within the drainage during the October 24, 2019 site visit. The channel bottom of the ephemeral drainage is approximately 1 foot wide. The width of the channel (and what would be considered its ordinary high water mark [OWHM] during periods of flow following storm events) is approximately 2 feet. The channel banks are earthen and largely devoid of vegetation with the exception of a small patch of Himalayan blackberry (*Rubus discolor*) found near the culvert at the downstream end. The drainage is within the canopy

cover of the adjacent coast live oak woodland as well as remnant orchard trees rooted on the hillside upslope of the drainage. There is no riparian vegetation associated with the drainage. The culvert at the downstream end of drainage (at the northeast corner of the project site) is an 18-inch concrete culvert, which conveys run-off from the site into the storm drain system in the neighborhood to the north. The storm drain system in the neighborhood flows into Ross Creek approximately 1 mile north of the project site and subsequently into Guadalupe Creek in the City of San José.

Wildlife. The ephemeral (short-lived) nature of the drainage along the western boundary of the project site precludes the presence of fish and aquatic wildlife species, and wildlife use of this drainage is similar to that described for the ruderal grassland and coast live oak woodland habitats above. During rain events when the drainage conveys flow, this feature may be utilized as a water source for bird and mammal species, as well as a dispersal corridor for common species of amphibians such as the Pacific tree frog (*Pseudacris sierra*) and California newt (*Taricha torosa*).

Section 4. Special-Status Species and Sensitive Habitats

CEQA requires assessment of the effects of a project on species that are protected by state, federal, or local governments as “threatened, rare, or endangered”; such species are typically described as “special-status species”. For the purpose of the environmental review of the project, special-status species have been defined as described below.

For purposes of this analysis, “special-status” plants are considered plant species that are:

- Listed under the Federal Endangered Species Act as threatened, endangered, proposed threatened, proposed endangered, or a candidate species.
- Listed under the California Endangered Species Act as threatened, endangered, rare, or a candidate species.
- Listed by the CNPS as CRPR 1A, 1B, 2, 3, or 4.

For purposes of this analysis, “special-status” animals are considered animal species that are:

- Listed under the Federal Endangered Species Act as threatened, endangered, proposed threatened, proposed endangered, or a candidate species.
- Listed under the California Endangered Species Act as threatened, endangered, or a candidate threatened or endangered species.
- Designated by the CDFW as a California species of special concern.
- Listed in the California Fish and Game Code as fully protected species (fully protected birds are provided in Section 3511, mammals in Section 4700, reptiles and amphibians in Section 5050, and fish in Section 5515).

Information concerning threatened, endangered, and other special-status species that potentially occur on the project site was collected from several sources and reviewed by H. T. Harvey & Associates biologists as described in Section 2.1 above.

4.1 Special-Status Plant Species

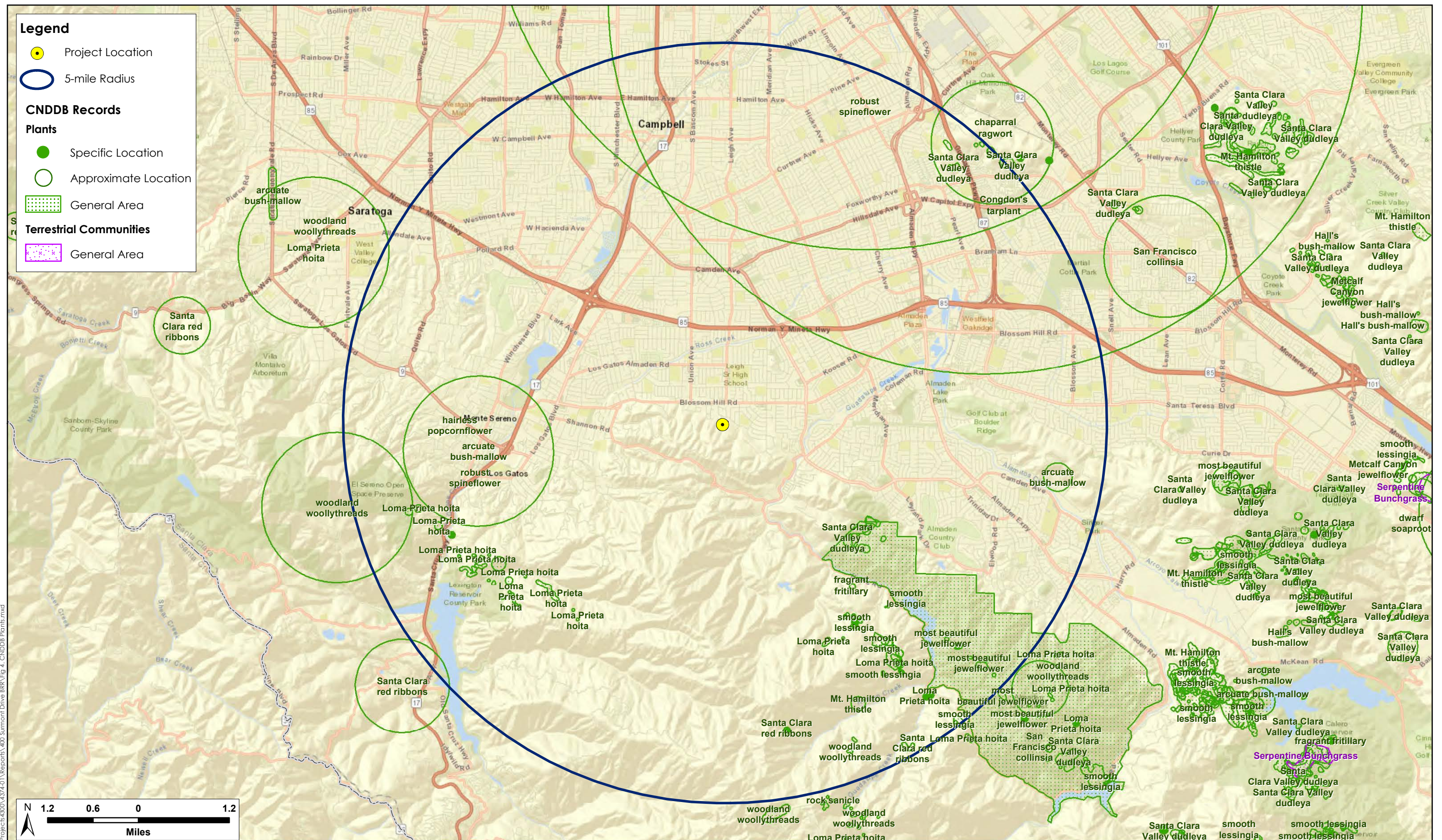
The CNPS (2020) and CNDDB (2020) identified 92 special-status plant species as known or potentially occurring in at least one of the nine USGS 7.5-minute quadrangles containing or surrounding the project site. The majority of the site is ruderal grassland, which may have historically been in orchard production, and which is presently mowed and disked. The small amount of coast live woodland in the southwest corner of the property is also heavily disturbed in the understory, with limited understory herbaceous vegetation, and also being mowed and disked in this area, in many cases right up to the trees. Due to the current and recent historical

land use involving frequent and continued disturbance of native vegetation, as well as the lack of specialized habitats (e.g. serpentine soils, wetlands, etc.) on the site, none of the special-status plant species identified in the background review have potential to occur on the project site.

Figure 4 shows the CNDDDB-mapped records of special-status plants within a 5-mile radius of the project site. A total of 14 special-status species have been known to occur within a 5-mile radius of the project site, including: robust spineflower (*Chorizanthe robusta* var. *robusta*), hairless popcornflower (*Plagiobothrys glaber*), arcuate bush-mallow (*Malacothamnus arcuatus*), woodland woollythreads (*Monolopia gracilens*), Loma Prieta hoita (*Hoita strobilina*), Santa Clara red ribbons (*Clarkia concinna* ssp. *automixa*), Mt. Hamilton fountain thistle (*Cirsium fontinale* var. *campylon*), smooth lessingia (*Lessingia micradenia* var. *glabrata*), most beautiful jewelflower (*Streptanthus albidus* ssp. *peramoenus*), fragrant fritillary (*Fritillaria liliacea*), Santa Clara Valley dudleya (*Dudleya abramsii* ssp. *setchellii*), San Francisco Collinsia (*Collinsia multicolor*), Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), and chaparral ragwort (*Senecio aphanactis*) (CNDDDB 2020). Though the project site is within the appropriate elevational range for each of these special-status species, no appropriate habitat and edaphic conditions exist to support these species. Robust spineflower is found in sandy or gravelly openings in chaparral, scrub, or grassland habitats, and these edaphic conditions do not occur on the project site. Woodland woollythreads, Loma Prieta hoita, Mt. Hamilton fountain thistle, smooth lessingia, most beautiful jewelflower, fragrant fritillary, Santa Clara Valley dudleya, and San Francisco collinsia all occur on serpentine soils, which do not occur on the project site. Arcuate bush-mallow can occur in woodland habitats, but is more associated with chaparral, which does not occur on the project site; additionally, no shrubs in the genus *Malacothamnus* (which are apparent and identifiable to genus year-round) were observed on the project site. Chaparral ragwort occurs in dry, open rocky areas in chaparral or scrub habitats, often in alkaline soils, which do not occur on the site.

Congdon's tarplant is the one special-status plant which is known to occasionally occur in disturbed annual grassland habitat. This plant, which blooms from May to October, would have been blooming and identifiable at the time of the survey. The plant ecologist conducting the site visit for this project also surveyed for and observed Congdon's tarplant at the Sunnyvale Baylands Park, in Sunnyvale, California, on October 23, 2019. Given the small size of the 400 Surmount Drive project site, she was able to survey the entirety of the project site for Congdon's tarplant. No Congdon's tarplant was observed on this site and it is presumed to be absent.

Thus, no special-status plant species are expected to be present on the project site.



4.2 Special-Status Animal Species

We identified several special-status animal species as potentially occurring in the project vicinity, and Figure 5 shows CNDDDB-mapped records of special-status animals in the site vicinity. However, the majority of these species were determined to be absent from the project site. Species considered for occurrence but rejected, as well as the reasons for their rejection, are as follows:

- The California tiger salamander (*Ambystoma californiense*), federally and state listed as threatened, and the California red-legged frog (*Rana draytonii*), federally listed as threatened and a California species of special concern, occurred historically in the project vicinity. No suitable breeding habitat for these species occurs on the site, and both species have been extirpated from the majority of the project region, including the entire urbanized Santa Clara Valley floor, due to development, the alteration of hydrology of its aquatic habitats, and the introduction of nonnative predators such as non-native fishes and bullfrogs (H. T. Harvey & Associates 1997, Santa Clara Valley Water District 2011). As a result, these species are determined to be absent from the project site.
- The foothill yellow-legged frog (*Rana boylei*), a candidate for listing under the California Endangered Species Act, occurred historically in the project vicinity. No aquatic habitat to support this species occurs on the site (or adjacent to the site in the ephemeral drainage), and this species has been extirpated from Valley floor areas of Santa Clara County, and is no longer known to occur along the County's streams below major reservoirs (H. T. Harvey & Associates 1999). As a result, this species is determined to be absent from the project site.
- Burrows of California ground squirrels on the site provide ostensibly suitable roosting habitat for burrowing owls (*Athene cunicularia*), a California species of special concern. However, all of these burrows are located under trees, which provide perches for predatory raptors (e.g., hawks, owls and falcons) that prey upon burrowing owls, and the adjacent grassland habitat provides limited foraging habitat due to high levels of disturbance (i.e., due to disking) and its small size. As a result, the site provides only very low-quality habitat for this species due to high levels of disturbance and the presence of trees. Burrowing owls occur more widely in the South Bay during the nonbreeding season, but they are not known to nest or occur on the site or in nearby areas in the foothills of Los Gatos and south San José (CNDDDB 2020, Cornell Lab of Ornithology 2020). No burrowing owls or signs of recent burrowing owl use of the site (e.g., pellets, fecal material, or feathers) were observed on the site during the October 24, 2019 site visit. Due to the low-quality of the habitat on the site and the lack of recent or historical records of the species from the surrounding area, burrowing owls are determined to be absent.

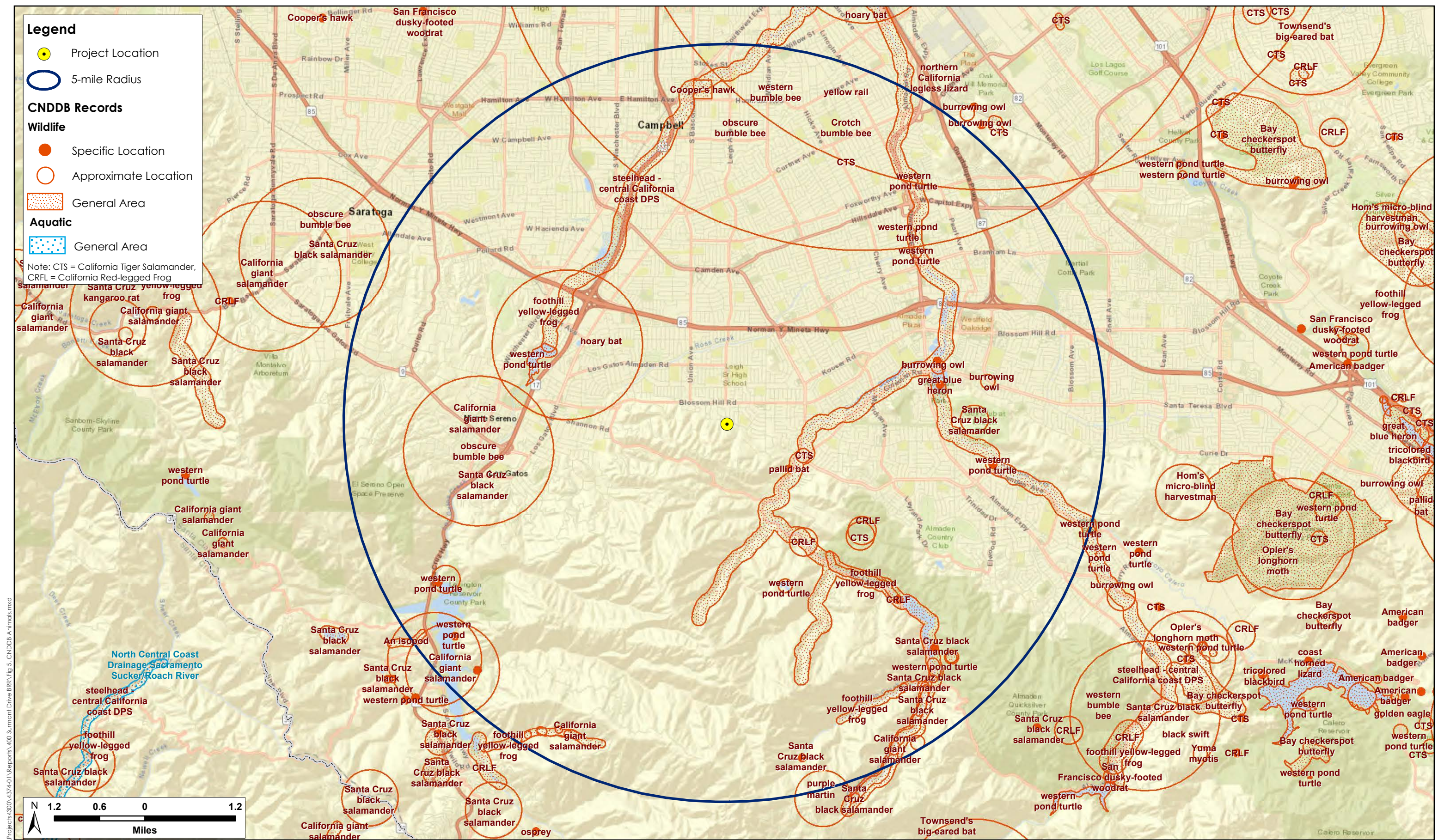


Figure 5. CNDDDB-Mapped Records of Special-Status Animals

- An examination of trees on the project site failed to detect any cavities or crevices large enough to provide high-quality habitat for a roosting or maternity colony of common or special-status bat species. Further, no sign of bats (e.g., guano or urine staining) was observed on trees on the project site. Special-status bats, including the pallid bat (*Antrozous pallidus*), are not known to occur in the site vicinity, and are determined to be absent from the site due to a lack of suitable roosting habitat. Individual bats may fly over the site or forage opportunistically on the site on occasion.

The white-tailed kite (*Elanus leucurus*), a state fully protected species, occurs in open grasslands in the South Bay. However, the grasslands on the project site and in the immediate vicinity are not sufficiently extensive to support a nesting pair of this species, and white-tailed kites are not known to nest in the site vicinity. Occasional individuals may occur on the site or in adjacent open space areas as non-breeding foragers. The proposed project will have little impact on this species' foraging habitat and no impacts on regional populations of the species. Therefore, this species is not discussed further in this report.

One old nest of the San Francisco dusky-footed woodrat, a California species of special concern, was observed in an oak tree on the project site; however, this nest was dilapidated and clearly inactive. Several active woodrat nests were observed at the edge of the adjacent Heintz Open Space west of the site, and woodrats that inhabit the open space area likely forage on the site occasionally. Suitable habitat for this species is present within oak woodland habitat on the project site; however, woodrats are unlikely to occupy the site in the future due to the lack of understory vegetation, which they rely on for foraging opportunities and cover. Nevertheless, given the presence of an old woodrat nest in an oak tree on the site, the possibility that one or more woodrats may create new active nests in oak trees on the project site in the future cannot be ruled out. To address potential project impacts on dusky-footed woodrats that may occur on the project site, this species is discussed under Section 5 *CEQA Discussion* below.

In summary, the only special-status animal species that can potentially occur on the project site are the white-tailed kite, which may occasionally occur on the site or in adjacent open space areas as a non-breeding forager, and the San Francisco dusky-footed woodrat, for which there is at least a low potential of nesting on the site.

4.3 Sensitive and Regulated Habitats

Sensitive and regulated habitats are rare, ecologically valuable, and/or protected by federal, state, regional, and/or local laws. Generally, such habitats require permits from regulatory agencies if they are to be disturbed, altered, or lost. The CDFW ranks certain rare or threatened plant communities, such as wetlands, tracked in the CNDDDB. The most commonly regulated habitats are wetland and aquatic habitats including rivers, streams, ponds, and seasonal wetlands, which fall under the jurisdiction of the U. S. Army Corps of Engineers (USACE) via Section 404 of the Clean Water Act, the Regional Water Quality Control Board (RWQCB) via Section 401 of the Clean Water Act and the Porter-Cologne Water Quality Control Act, and/or the CDFW via Section 1602 of the California Fish and Game Code.

CDFW Sensitive Natural Communities and Sensitive Vegetation Alliance and Associations. A query of sensitive natural communities in Rarefind (CNDDDB 2020) identified three sensitive natural communities as occurring in the project vicinity: maritime coast range ponderosa pine forest (Rank G1/S1.1), northern maritime chaparral (G1/S1.2), and serpentine bunchgrass (Rank G2/S2.2). None of these sensitive natural communities occurs on the project site.

The CDFW also maintains a list of vegetation alliances and associations within the state of California (CDFW 2020). This list includes global (G) and state (S) rarity ranks for associations and alliances. Alliances and associations currently ranked as S1-S3 are considered highly imperiled. The California annual grassland and coast live oak woodland on the site do not correspond to any sensitive vegetation alliances or associations as defined by CDFW.

Waters of the U.S./State. H. T. Harvey & Associates' reconnaissance-level survey of the project site and background review of available material was in agreement with the two memoranda prepared by Live Oak Associates for the Town of Los Gatos (Live Oak Associates 2019, Live Oak Associates 2020). The ephemeral drainage that is located along the boundary of the project site has potential to be considered a jurisdictional drainage by the USACE and/or RWQCB based on the fact that it is a channel with a bed and bank morphology (and therefore containing an ordinary high water mark), and at least seasonal flow, and is hydrologically connected via the storm drain system north of the project site to Ross Creek approximately 1 mile to the north.

In summary, the only sensitive or regulated habitat on the project site is the ephemeral drainage located along the site boundary.

Section 5. CEQA Discussion

The State CEQA Guidelines provide direction for evaluating the impacts of projects on biological resources and determining which impacts will be significant. CEQA defines a “significant effect on the environment” as “a substantial adverse change in the physical conditions which exist in the area affected by the proposed project.” Under State CEQA Guidelines Section 15065, a project's impacts on biological resources are deemed significant if the project would:

- A. “substantially reduce the habitat of a fish or wildlife species”
- B. “cause a fish or wildlife population to drop below self-sustaining levels”
- C. “threaten to eliminate a plant or animal community”
- D. “reduce the number or restrict the range of a rare or endangered plant or animal”

In addition to the Section 15065 criteria that trigger mandatory findings of significance, Appendix G of State CEQA Guidelines provides a checklist of other potential impacts to consider when analyzing the significance of project effects. The impacts listed in Appendix G may or may not be significant, depending on the level of the impact. For biological resources, these impacts include whether the project would:

- A. “have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service”
- B. “have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service”
- C. “have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means”
- D. “interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites”
- E. “conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance”
- F. “conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan”

Following is a brief assessment of potential project impacts on biological resources. The impact assessment below is structured based on the six significance criteria (A–F) listed above.

5.1 Impacts on Special-Status Species: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS (Less than Significant)

5.1.1 Special-Status Plants (No Impact)

As described above, no special-status plant species have potential to occur on the project site. Therefore, the project will have no impact on these species, and no mitigation measures are warranted to avoid and minimize project impacts on special-status plants under CEQA.

5.1.2 Impacts on the San Francisco Dusky-Footed Woodrat (Less than Significant)

Suitable habitat for the San Francisco dusky-footed woodrat is present in oak woodland habitat on the project site, and one old/inactive woodrat nest was observed in an oak tree on the site during the October 2019 site visit. In our opinion, woodrats are unlikely to occupy the site in the future due to the lack of understory vegetation, which they rely on for foraging opportunities and cover. Nevertheless, given the presence of an old woodrat nest in an oak tree on the site, the possibility that one or more woodrats may create new active nests in oak trees on the site in the future cannot be ruled out. If one or more woodrats established active nests in trees on the site, we would expect them to be present in very low numbers (i.e., one or two individuals) due to the limited availability of foraging opportunities and cover in the immediate area.

In our opinion, impacts of the project on, at most, one or two individual woodrats would not be considered significant under CEQA, as such an impact would represent a small proportion of the regional population of the species. Thus, in our opinion, no mitigation measures are warranted to avoid and minimize project impacts on woodrats under CEQA. Nevertheless, the project will be required to implement standard conditions to avoid and minimize impacts on woodrats during project construction, as described in Section 1.2.3.

5.1.3 Impacts on Nesting Birds (Less than Significant)

Several species of common native birds protected by the Migratory Bird Treaty Act and California Fish and Game Code may nest in trees and shrubs on the site or immediately adjacent to the site. The removal of vegetation supporting active nests may cause the direct loss of eggs or young, while construction-related activities located near an active nest may cause adults to abandon their eggs or young. This type of impact would not be significant under CEQA, in our opinion, because of the local and regional abundances of the species that could potentially nest on the site and the very low magnitude of the potential impact of development on these species (i.e., the project is expected to impact only a few pairs of these species, which is not a substantial impact on their regional populations). Thus, in our opinion, no mitigation measures are warranted to avoid and minimize project impacts on nesting birds under CEQA. Nevertheless, per the

requirements of the Town of Los Gatos, the project will implement standard conditions to avoid and minimize impacts on nesting birds during project construction, as described in Section 1.2.1.

5.1.4 Roosting Bats (No Impact)

As discussed under Section 4.2 above, an examination of trees on the project site failed to detect any cavities or crevices large enough to provide high-quality habitat for a roosting or maternity colony of common or special-status bat species. As a result, the project is not expected to impact common or special-status species of bats, and no mitigation measures are warranted to avoid and minimize project impacts on roosting bats under CEQA, in our opinion. Nevertheless, per the requirements of the Town of Los Gatos, the project will implement standard conditions to avoid and minimize impacts on roosting bats during project construction, as described in Section 1.2.2.

5.2 Impacts on Sensitive Communities: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS (No Impact)

5.2.1 Impacts on Riparian Habitat, or Other Sensitive Natural Communities (No Impact)

The CDFW defines sensitive natural communities and vegetation alliances using NatureServe's standard heritage program methodology (CDFW 2020), as described above in Section 4.3. Aquatic, wetland and riparian habitats are protected under applicable federal, state, or local regulations, and are generally subject to regulation, protection, or consideration by the USACE, RWQCB, CDFW, and/or the U.S. Fish and Wildlife Service. Project impacts on sensitive natural communities, vegetation alliances/associations, or any such community identified in local or regional plans, policies, and regulations, were considered and evaluated. No riparian habitat or other sensitive natural communities are located on or adjacent to the project site, and thus, there will be no impacts to riparian habitat or other sensitive natural communities as a result of the project. Indirect impacts to aquatic habitat due to water quality are discussed below under Section 5.3.

5.3 Impacts on Wetlands: Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means (Less than Significant)

A potentially jurisdictional ephemeral drainage is located along the western boundary of the project site. This drainage may be considered jurisdictional waters of the U.S. by the USACE, waters of the state by RWQCB, and/or waters subject to the jurisdiction of the CDFW under Section 1600 of the California Fish and Game Code.

The Town of Los Gatos has adopted the guidance for evaluation of land use near streams provided in the Santa Clara Valley Water District's (Valley Water's) *Guidelines and Standards for Land Use Near Streams: A Manual of Tools*,

Standards, and Procedures to Protect Streams and Streamside Resources in Santa Clara County (Valley Water 2006) Consistent with *Section II.E.* on page 3.8 of the *Guidelines* (“Slope Stability Protection Area for Single-Family Units”, page 3.8) and as determined by the Town of Los Gatos, the setback for the ephemeral aquatic feature on the site is 20 feet. This setback is shown on Figure 3. In our opinion, no additional setback from this drainage should be necessary given its relatively low ecological value.

Where the project proposes features with the proposed setback described above, all project work will be outside the bed and bank of ephemeral drainage feature on the project site. The proposed driveway will be directly adjacent and immediately outside the top of bank at its downslope end (i.e. in the northwest corner of the parcel). To prevent indirect impacts on water quality within the drainage and in the downslope watershed, the project will construct a 30-foot-long by 2-foot-tall retaining wall in between the driveway and the drainage. The retaining wall will be constructed just above the top of bank to protect the bank and avoid any erosion from construction of the driveway into the ephemeral drainage. In addition, this project will implement the conditions to minimize impacts on water quality within the ephemeral drainage as described in Section 1.2.4.

With the use of the proposed setback, the retaining wall, and the avoidance and minimization measures that will be part of the project, the project will not result in direct impacts on jurisdictional wetlands or waters.

As discussed in Section 1.2.4 above, the project will implement standard erosion control measures and BMPs for work near aquatic environments, and comply with the Town’s required setback for the construction of new structures. Project compliance with these conditions will reduce potential project impacts on water quality to a less-than-significant level under CEQA, in our opinion, and no mitigation measures are warranted to avoid and minimize project impacts on water quality under CEQA, in our opinion.

5.4 Impacts on Wildlife Movement: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites (Less than Significant)

For many species, the landscape is a mosaic of suitable and unsuitable habitat types. Environmental corridors are segments of land that provide a link between these different habitats while also providing cover. Development that fragments natural habitats (i.e., breaks them into smaller, disjunct pieces) can have a twofold impact on wildlife: first, as habitat patches become smaller they are unable to support as many individuals (patch size); and second, the area between habitat patches may be unsuitable for wildlife species to traverse (connectivity).

The project site is situated on the edge of a dense matrix of urban development. Further, the ephemeral drainage on the site does not provide an important movement pathway for aquatic or terrestrial wildlife species, as the drainage does not support vegetative cover and holds water only ephemeral during rain events. As a result, the proposed redevelopment of the project site would not result in the fragmentation of natural habitats. While some wildlife species that occur in nearby natural areas may move through the site when traveling through the

area, they will continue to be able to move between Heintz Open Space to the east and Belgatos Park to the west following construction of the new residences on the property, either by passing south of the new structures on the property or south of all development on the property (i.e., through the park, which connects from east to west south of the property). Thus, any wildlife species that currently move through the project site would continue to be able to do so following project construction, and the project would not interfere with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors in the site vicinity.

5.5 Impacts due to Conflicts with Local Policies: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (Less than Significant)

5.5.1 Impacts Due to the Removal of Protected Trees (Less than Significant)

According to the Town of Los Gatos Municipal Code, no person is allowed to unlawfully prune or remove any tree that qualifies as a “protected tree” (Los Gatos, CA Code of Ordinances, Sec. 29.10.0950). The Town considers a protected tree of significant size to be:

- All trees which have a 12-inch or greater diameter on a developed residential property.
- All trees which have an 8-inch or greater diameter on a developed hillside residential property.
- All trees of the following species which have an 8-inch or greater diameter (measured at 4.5 feet [54 inches] above natural grade) located on any developed residential property:
 - Blue oak (*Quercus douglasii*)
 - Black oak (*Quercus kelloggii*)
 - California buckeye (*Aesculus californica*)
 - Pacific madrone (*Arbutus menziesii*)
- All trees which have a 4-inch or greater diameter on a vacant or non-residential property.
- All trees which have a 4-inch or greater diameter when removal relates to any development review.
- Any tree that existed at the time of a zoning approval or subdivision approval and was a specific subject of such approval or otherwise covered by subsection (6) of this section (e.g., landscape or site plans).
- All trees, which have a 4-inch or greater diameter (12.5-inch circumference) of any trunk and are located on property other than developed residential property.
- All publicly owned trees growing on Town lands, public places or in a public right-of-way easement, which have a 4-inch or greater diameter (12.5-inch circumference) of any trunk.
- A protected tree shall also include a stand of trees, the nature of which makes each dependent upon the other for the survival of the stand.

- Any tree that was required to be planted or retained by the terms and conditions of a development approval, building permit, tree removal permit or code enforcement action.
- Any large protected tree with a diameter of 48 inches or more, as well as all native oak species, California buckeye, and Pacific madrone with a diameter of 24 inches or more.

Many of the trees on the project site, including all remnant orchard trees greater than 24-inches in diameter, as well as all coast live oak trees greater than 8 inches in diameter, would be considered protected trees by the Town of Los Gatos. A Tree Removal Permit will be required from the Town of Los Gatos for the removal or pruning of any protected trees.

5.6 Impact due to Conflicts with an Adopted Habitat Conservation

Plan: Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan (Less Than Significant)

The project site is not located within an area covered by an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, the project would not conflict with any such plans.

5.7 Cumulative Impacts

Cumulative impacts arise due to the linking of impacts from past, current, and reasonably foreseeable future projects in the region. Future development activities in the Town will result in impacts on the same habitat types and species that will be affected by the proposed project. The proposed project, in combination with other projects in the area and other activities that impact the species that are affected by this project, could contribute to cumulative effects on special-status species. Other projects in the area include office/retail/commercial development, mixed use, and residential projects that could adversely affect these species.

The cumulative impact on biological resources resulting from the project in combination with other projects in the larger region would be dependent on the relative magnitude of adverse effects of these projects on biological resources compared to the relative benefit of impact avoidance and minimization efforts prescribed by planning documents, CEQA mitigation measures, and permit requirements for each project; and compensatory mitigation and proactive conservation measures associated with each project. In the absence of such avoidance, minimization, compensatory mitigation, and conservation measures, cumulatively significant impacts on biological resources could occur.

However, many projects in the region that impact resources similar to those impacted by the project will be subject to CEQA requirements. It is expected that such projects would mitigate their impacts on sensitive

habitats and special-status species through the incorporation of mitigation measures and compliance with permit conditions.

Regardless of the magnitude and significance of cumulative impacts that result from other projects, the 400 Surmont Drive project is not expected to have a significant impact on biological resources, and would implement the conditions described in Section 1.2, which ensure the project would not result in significant impacts. Thus, the project will not have a cumulatively considerable contribution to cumulative effects on biological resources.

Section 6. References

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LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

February 13, 2020

Mr. Bob Hughes
400 Surmont Drive
Los Gatos, CA 95032

RE: 400 Surmont Drive, Town of Los Gatos, Santa Clara County, California (PN 2358-01)

Dear Mr. Hughes:

At your request, I conducted a site visit to evaluate the location of a wall that is being proposed to be built between the driveway that will access the proposed project's two new lots and an existing ephemeral swale feature, on your property located at 400 Surmont Drive in the Town of Los Gatos, in Santa Clara County, CA. The purpose of this follow-up site visit was to evaluate whether the construction of the proposed wall would result in fill being placed within the swale that may require permits from the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB) and/or California Department of Fish and Wildlife (CDFW).

Site Visit

Previously, in January 2019, I conducted a site visit to evaluate the swale and provide our analysis of an appropriate setback from this feature. A full description of the swale was provided in our report of findings from that evaluation (LOA 2019).

On February 10, 2020, I conducted the follow-up site visit to evaluate the location of the proposed wall in relation to the bed and bank of the ephemeral swale feature. The existing conditions of the swale had not changed since the January 2019 site visit. The swale was completely dry during this 2020 site visit and, in the location of the proposed wall, it was completely barren of vegetation within the bed and bank. Terry from T.S. Civil Engineering had staked and flagged the outside edge of wall prior to the site visit.

Findings from the Site Visit

Photos taken during the site visit are attached. The closest edge of the wall occurs outside of the bed and bank of the swale, and therefore, its construction will not result in fill being placed within the bed and bank of this feature.

Discussion and Conclusions

With features such as the one occurring on the site which does not support either wetland vegetation or woody riparian vegetation, the extent of the USACE's jurisdiction would be the Ordinary High Water mark on opposing banks, while the jurisdiction of both the CDFW and RWQCB would be the top of the bank.

In this case, the wall is proposed to be built outside of the bed and bank of the ephemeral swale feature and therefore will result in no impacts to waters regulated by the USACE, CDFW or RWQCB.

Thank you very much for allowing us to assist you with your project. If you wish to discuss our evaluation or findings, please feel free to contact me at 408-281-5884.

Sincerely,

A handwritten signature in cursive script that reads "Pamela E. Peterson". The ink is dark and the signature is fluid.

Pamela E. Peterson
Senior Project Manager
Plant and Wetland Ecologist

Attachment: Photos







LIVE OAK ASSOCIATES, INC.

an Ecological Consulting Firm

April 3, 2019

Mr. Bob Hughes
400 Surmont Drive
Los Gatos, CA 95032

RE: 400 Surmont Drive, Town of Los Gatos, Santa Clara County, California (PN 2358-01)

Dear Mr. Hughes:

At your request, we are providing this setback evaluation for an aquatic feature that occurs adjacent to areas where you are proposing to develop two new single-family lots, on your property located at 400 Surmont Drive in the Town of Los Gatos, in Santa Clara County, CA. The evaluation of the setback is being based upon guidance contained in the Guidelines and Standards for Land Use Near Streams (SCVWD 2005, revised 2006) which the Town has adopted. To that aim, we conducted a background review and a site visit. Below we provide our evaluation of the feature.

Background Review

Prior to the site visit, LOA completed a background review of information relevant to the proposed project, the project site, and the site's vicinity. Information reviewed included the site plans provided by T.S. Civil Engineers dated March 13, 2019, Google Earth aerial photographs, USGS topographic maps, and the U.S. Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI) (accessed on-line on April 2, 2019 at <https://www.fws.gov/wetlands/data/mapper.html>).

Additionally, the *Guidelines and Standards for Land Use Near Streams: A Manual of Tools, Standards, and Procedures to Protect Streams and Streamside Resources in Santa Clara County* (Santa Clara Valley Water District 2005 (revised 2006)) was reviewed, which has been adopted by the Town of Los Gatos to guide determinations on stream setback requirements.

The aquatic feature in question does not show up as a wetland or stream on the USFWS NWI and it also does not show up on the USGS topographic map as a blue-line stream or other aquatic feature. There also are no aquatic features that show up on the NWI or USGS upstream of the feature that may provide a perennial or intermittent source of water for the feature, such as a spring.

Existing Conditions

On April 2, 2019, I visited the project site along with yourself and with Terry Scewczyk from T.S. Civil Engineering to evaluate the aquatic feature on the site. The feature generally flows from south to north along the east side, and within two to three feet, of the paved area of Surmont Drive. In the location where the two new lots are proposed, in the northernmost portion of the property, the channel has earthen banks which are generally barren of vegetation. Habitats adjacent to the feature include California annual grassland and oak woodland/savannah with an open canopy to the east, and on the west side of Surmont Drive, dense oak woodland habitat is present. The feature is incised with a width at the top of the bank of approximately five feet, and a depth of between one and two feet. It flows off-site to the north via an underground, 18-inch cement culvert, which in turn drains into the storm drain system and eventually into Ross Creek.

As noted above, the channel is generally barren of vegetation along the reach that is adjacent to the proposed lots. Vegetation associated with the banks and channel in this location are limited to a few California blackberry (*Rubus ursinus*) plants just before the feature flows underground and off-site. No other wetland or riparian vegetation was observed to be associated with the feature. Trees that occur in the vicinity of the feature include native coast live oaks (*Quercus agrifolia*) and one valley oak (*Quercus lobata*), as well as cultivated and ornamental species including apricot (*Prunus armeniaca*) (remnant trees from the apricot orchard that used to occur on the property per our discussion at the site), Monterey cypress (*Cupressus macrocarpus*), coast redwood (*Sequoia sempervirens*) and pine (*Pinus* sp.).

Although it had rained the night before the site visit and surface soils were moist, there was no flowing or standing water observed in the channel, and there was no evidence of an ordinary high water mark observed. Per our communications at the site, after a very heavy storm, the feature may maintain a flow for up to a week after, but otherwise it will stop flowing and dry out quickly once it stops raining. There are two sources of water for the feature: one is storm water runoff from the hillsides of the adjoining property to the west which flow into the channel via a small erosional feature and the second source is storm water runoff from the hillsides of the owner's own property. There are no springs or other non-storm water sources that appear to be associated with the feature.

Upstream from the proposed lots, the channel is completely cement and rock-lined.

Conclusions

Based on the background review, site visit and information provided by the property owner, the aquatic feature on the site appears to be an ephemeral channel which only flows following storm events and has no other water source aside from storm water runoff from adjacent hillsides.

According to Section II.E. on page 3.8 of the *Guidelines and Standards for Land Use Near Streams* ("Slope Stability Protection Area for Single-Family Units", page 3.8), the recommended minimum Slope Stability Protection Area or setback for ephemeral features such as the one occurring on the site is between 10 to 15 feet, with the exact setback determined at the discretion of the local jurisdiction. It does note in the Guidelines on page 3.8 that for lots larger than 10,000

square feet, another five feet may be added to the required Slope Stability Area (setback). Therefore, the setback range may be increased to a minimum of 15 to 20 feet from the top of the bank for your project.

Other Considerations

There are native oak trees that occur between the top of the bank and the proposed driveway that will service the two new lots. In addition to an appropriate setback from the top of the bank of the ephemeral feature, we would also recommend that the project avoids construction of impervious surfaces within the dripline of any retained native oak trees.

Thank you very much for allowing us to assist you with your project. If you wish to discuss our evaluation or findings, please feel free to contact me at 408-281-5884.

Sincerely,

A handwritten signature in cursive script that reads "Pamela E. Peterson". The ink is dark and the signature is fluid, with a large loop at the end of the last name.

Pamela E. Peterson
Senior Project Manager
Plant and Wetland Ecologist

Attachment B: Arborist Report

**Tree Inventory, Assessment,
and
Protection**

**400 Surmont Drive
Los Gatos, CA 95032**

Prepared for:

Town of Los Gatos

September 27, 2019

Prepared By:

Richard Gessner

ASCA - Registered Consulting Arborist ® #496

ISA - Board Certified Master Arborist® WE-4341B

ISA - Tree Risk Assessor Qualified



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Summary

The inventory contains 26 trees comprised of 6 different species. One coast live oak is considered Large Protected and seven are Exempt. Fourteen trees are in good condition, ten fair, and two in poor shape. Sixteen trees (mostly oaks) have good suitability for retention. There are six trees within the footprint of the proposed driveway and two in or near the proposed building sites. Tree protection for this project would consist of a Type I scheme around all the trees to be retained with a maximum encroachment radius of six times the trunk diameter distance. A total of 26 trees were appraised for a rounded depreciated value of \$53,920.00 using the Trunk Formula Method.

Introduction

Background

The Town of Los Gatos asked me to assess the site, trees, and proposed footprint plan, and to provide a report with my findings and recommendations to help satisfy planning requirements.

Assignment

- Provide an arborist's report including an assessment of the trees within the project area and on the adjacent sites. The

assessment is to include the species, size (trunk diameter), condition (health and structure), and suitability for preservation ratings. Affix aluminum number tags on the trees for reference on site and on plans.

- Provide tree protection specifications, guidelines, and impact ratings for trees that may be affected by the project.
- Provide appraised values.

Limits of the assignment

- The information in this report is limited to the condition of the trees during my inspection on May 20, 2019. No tree risk assessments were performed.
- Tree heights and canopy diameters are estimates.
- The most recent *Guide to Plant Appraisal, Tenth Edition* was published in late 2018 by the ISA. The Guide is not functional at this time due to significant errors in the original printed version and gaps in information regarding regional species characteristics and nursery stock wholesale costs. Therefore the ninth edition and its supplemental publications was used for this assignment with the exception of the "condition ratings" assessment.



- The plans reviewed for this assignment were as follows (Table 1).

Table 1: Plans Reviewed Checklist

Plan	Date	Sheet	Review ed	Source
Existing Site Topographic Map or A.L.T.A with tree locations				
Proposed Site Plan	8/21/19	C-1 and C-2	Yes	TS/Civil Engineering
Demolition Plan				
Construction Staging				
Grading and Drainage				
Utility Plan and Hook-up locations				
Exterior Elevations				
Landscape Plan				
Irrigation Plan				
T-1 Tree Protection Plan				

Purpose and use of the report

The report is intended to identify all the trees within the plan area that could be affected by a project. The report is to be used by the Town of Los Gatos and the property owners as a reference for existing tree conditions to help satisfy planning requirements.

Observations

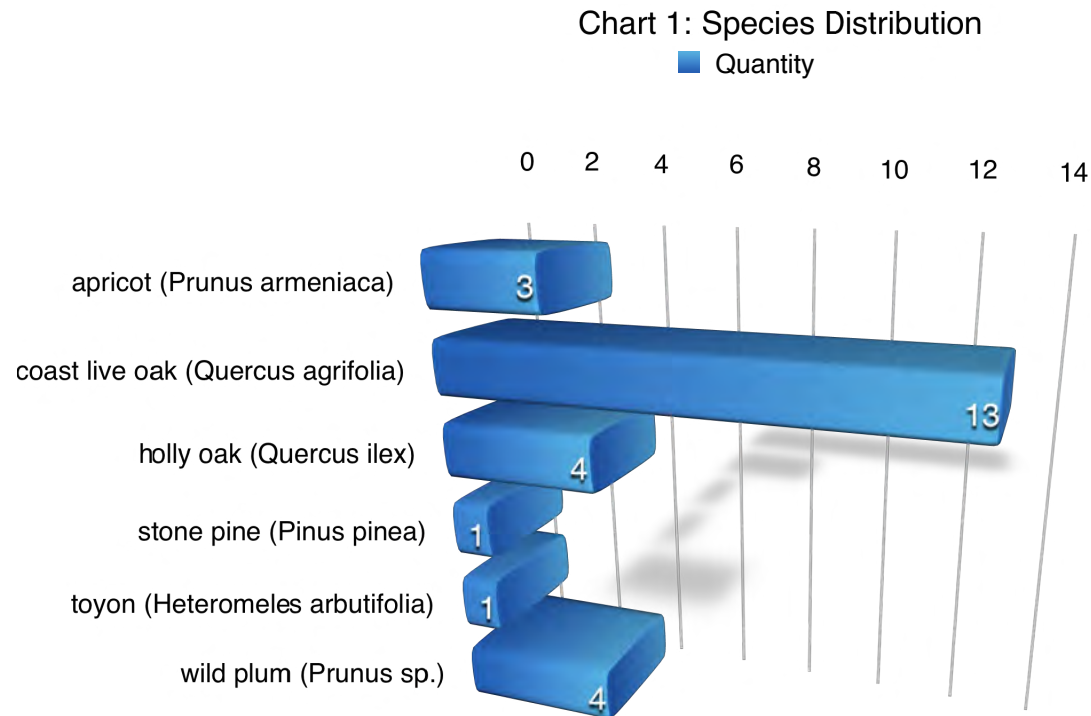
The plans provided indicated the proposed location of the driveway to the two lots. The topographic survey provided is not completely accurate and the red "X" located on the plan in Appendix A indicates at least one oak that has been removed.

Tree Inventory

The inventory consists of trees protected by the Town of Los Gatos located on site and those in close proximity on neighboring properties. Sec. 29.10.0960. - Scope of protected trees. All trees which have a four-inch or greater diameter (twelve and one half-inch circumference) of any trunk, when removal relates to any review for which zoning approval or subdivision approval is required. (Appendix A and B). Los Gatos Town Ordinance 29.10.0970 Exceptions (1) states the following: "A fruit or nut tree that is less than eighteen (18) inches in diameter (fifty-seven-inch circumference).



The inventory contains 26 trees comprised of 6 different species. Two coast live oaks are considered Large Protected¹, and seven fruit trees are Exempt². The chart below list the species and their relative quantities (Chart 1).



¹ Large protected tree means any oak (*Quercus* spp.), California buckeye (*Aesculus californica*), or Pacific madrone (*Arbutus menziesii*) which has a 24-inch or greater diameter (75-inch circumference); or any other species of tree with a 48-inch or greater diameter (150-inch circumference).

² A fruit or nut tree that is less than eighteen (18) inches in diameter (fifty-seven-inch circumference).



Analysis

Tree appraisal was performed according to the Council of Tree & Landscape Appraisers *Guide for Plant Appraisal 9th Edition, 2000* (CLTA) along with Western Chapter International Society of Arboriculture *Species Classification and Group Assignment, 2004*. The trees were appraised using the “Cost Approach” and more specifically the “Trunk Formula Method” (Appendix B).

“Trunk Formula Method” is calculated as follows: Basic Tree Cost = (Appraised tree trunk increase X Unit tree cost + Installed tree cost) Appraised Value = (Basic tree cost X Species % X Condition % X Location %).

The trunk formula valuations are based on four tree factors; species, size (trunk cross sectional area), condition, and location. There are two steps to determine the overall value. The first step is to determine the “Basic Tree Cost” based on size and species rating which is determined by the *Species Classification and Group Assignment, 2004 Western Chapter Regional Supplement*.

The second part is to depreciate the value according to the location and condition of the trees.

The condition assessment and percentages are defined in the “Condition Rating” section of this report. The condition ratings deviate from the Guide’s condition assessment numerical rating system. The reason for this deviation is the Guide’s assessment criteria fails to account for significant health or structural issues creating high percentages for tree with either significant structural defects or health problems that could ultimately lead to failure or irreversible decline.

Location rating is an average of three factors; site, contribution, and placement. Site is determined by the relative property value where the trees are planted. The residential site would be classified as “very high” value with a 90 percent rating compared to similar sites in the area (ISA, 2000).

Contribution and placement is determined by the function and aesthetics the trees provide for the site and their location on the property. The percent of contribution and placement can range from 10 to 100 percent depending on the trees influence to the value of the property. These percentages ranged from 0 to 90 percent in my assessment.

A total of 26 trees were appraised for a rounded depreciated value of \$53,920.00 using the Trunk Formula Method (Appendix B).



Discussion

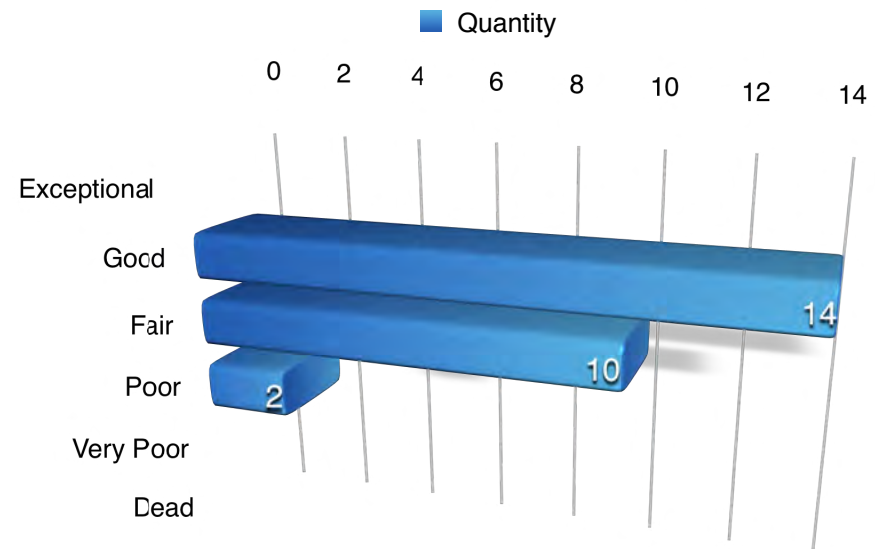
Condition Rating

A tree's condition is a determination of its overall health, structure, and form. The assessment considered both the health and structure for a combined condition rating.

- 100% - Exceptional = Good health and structure with significant size, location or quality.
- 61-80% - Good = Normal vigor, well-developed structure, function and aesthetics not compromised with good longevity for the site.
- 41-60 % - Fair = Reduced vigor, damage, dieback, or pest problems, at least one significant structural problem or multiple moderate defects requiring treatment. Major asymmetry or deviation from the species normal habit, function and aesthetics compromised.
- 21-40% - Poor = Unhealthy and declining appearance with poor vigor, abnormal foliar color, size or density with potential irreversible decline. One serious structural defect or multiple significant defects that cannot be corrected and failure may occur at any time. Significant asymmetry and compromised aesthetics and intended use.
- 6-20% - Very Poor = Poor vigor and dying with little foliage in irreversible decline. Severe defects with the likelihood of failure being probable or imminent. Aesthetically poor with little or no function in the landscape.
- 0-5% - Dead/Unstable = Dead or imminently ready to fail.

Fourteen trees are in good condition, ten fair, and two in poor shape (Chart 2).

Chart 2: Condition Ratings



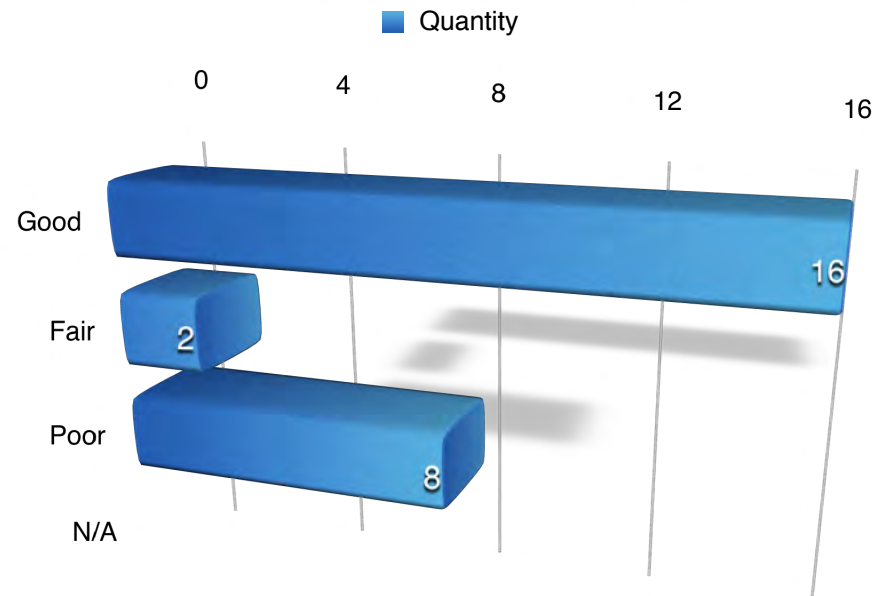
Suitability for Preservation

A tree's suitability for conservation is determined based on its health, structure, age, species and disturbance tolerances, proximity to cutting and filling, proximity to construction or demolition, and potential longevity using a scale of good, fair, or poor (Fite, K, and Smiley, E. T., 2016). Trees with good suitability have good vigor, structural stability, and potential longevity after construction.

- Good = Trees with good health, structural stability and longevity.
- Fair = Trees with fair health and/or structural defects that may be mitigated through treatment. These trees require more intense management and monitoring, and may have shorter life spans than those in the good category.
- Poor = Trees in poor health with significant structural defects that cannot be mitigated and will continue to decline regardless of treatment. The species or individual may possess characteristics that are incompatible or undesirable in landscape settings or unsuited for the intended use of the site.

Eight trees are poorly suited for retention which are primarily fruit trees (Chart 3). Two trees have fair suitability. The remaining sixteen have good suitability for retention. Most of the trees with good suitability are naturally occurring oaks on the site.

Chart 3: Suitability for Preservation

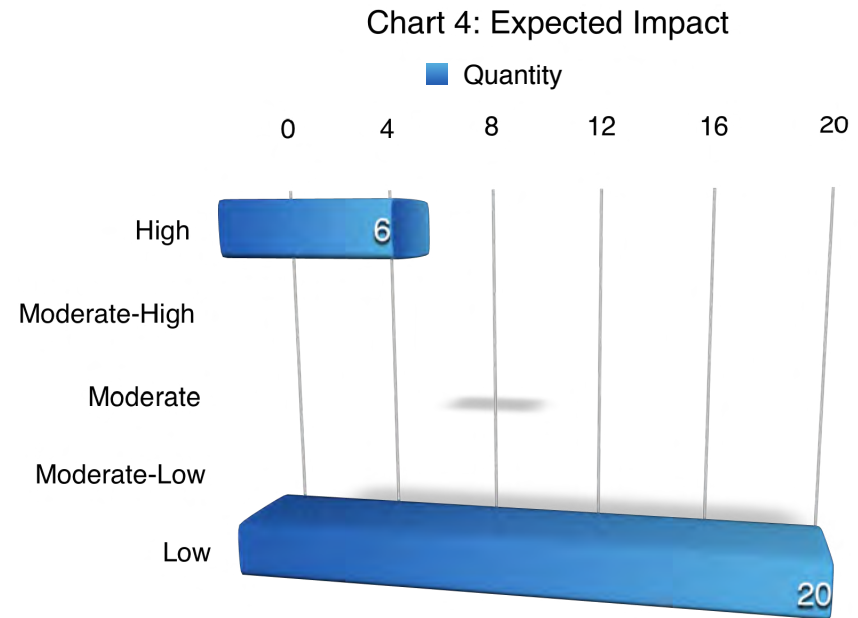


Expected Impact Level

Impact level defines how a tree may be affected by construction activity and proximity to the tree, and is described as low, moderate, or high. The following scale defines the impact rating:

- Low = The construction activity will have little influence on the tree.
- Moderate = The construction may cause future health or structural problems, and steps must be taken to protect the tree to reduce future problems.
- High = Tree structure and health will be compromised and removal is recommended, or other actions must be taken for the tree to remain. The tree is located in the building envelope.

There are six trees within the footprint of the proposed driveway and two in or near the proposed building sites (Chart 4). From what was provided there will be at least six trees lost due to the driveway configuration (Appendix A).



Mitigation for Removals

The table below indicates the recommended replacement values (Table 3). Alternatively it may be possible to create an approved landscape plan or provide an in-lieu payment.

Table 3: Town of Los Gatos Tree Canopy - Replacement Standard

Canopy Size of Removed Tree (1)	Replacement Requirement (2)(4)	Single Family Residential Replacement Option (3)(4)
10 feet or less	Two 24 inch box trees	Two 15 gallon trees
More than 10 feet to 25 feet	Three 24 inch box trees	Three 15 gallon trees
More than 25 feet to 40 feet	Four 24 inch box trees or two 36 inch box trees	Four 15 gallon trees
More than 40 feet to 55 feet	Six 24 inch box trees; or three 36 inch box trees	Not available
Greater than 55 feet	Ten 24 inch box trees; or five 36 inch box trees	Not available

¹To measure an asymmetrical canopy of a tree, the widest measurement shall be used to determine canopy size.

²Often, it is not possible to replace a single large, older tree with an equivalent tree(s). In this case, the tree may be replaced with a combination of both the Tree Canopy Replacement Standard and in-lieu payment in an amount set forth by Town Council resolution paid to the Town Tree Replacement Fund.

³Single Family Residential Replacement Option is available for developed single family residential lots under 10,000 square feet that are not subject to the Town's Hillside Development Standards and Guidelines. All 15-gallon trees must be planted on-site. Any in-lieu fees for single family residential shall be based on 24" box tree rates as adopted by Town Council.

⁴Replacement Trees shall be approved by the Town Arborist and shall be of a species suited to the available planting location, proximity to structures, overhead clearances, soil type, compatibility with surrounding canopy and other relevant factors. Replacement with native species shall be strongly encouraged. Replacement requirements in the Hillsides shall comply with the Hillside Development Standards and Guidelines Appendix A and Section 29.10.0987 Special Provisions—Hillsides.



Tree Protection

Tree protection focuses on avoiding damage to the roots, trunk, or scaffold branches (Appendix D). The most current accepted method for determining the TPZ is to use a formula based on species tolerance, tree age/vigor, and trunk diameter (Matheny, N. and Clark, J. 1998) (Fite, K, and Smiley, E. T., 2016). Preventing mechanical damage to the trunk from equipment or hand tools can be accomplished by wrapping the main stem with straw wattle or using vertical timbers.

Both the *ISA Best Management Practices: Root Management*, 2017 and *ISA Best Management Practices: Managing trees during construction, second edition*, 2016 indicate linear cuts should be beyond six times the trunk diameter distance when affected on only one side.

Tree protection for this project would consist of a Type I scheme around all the trees to be retained with a maximum encroachment radius of six times the trunk diameter distance or at the drip line distance. If any tree is to be impacted on multiple sides the tree protection radius would need to be expanded to twelve times the trunk diameter radius in feet.

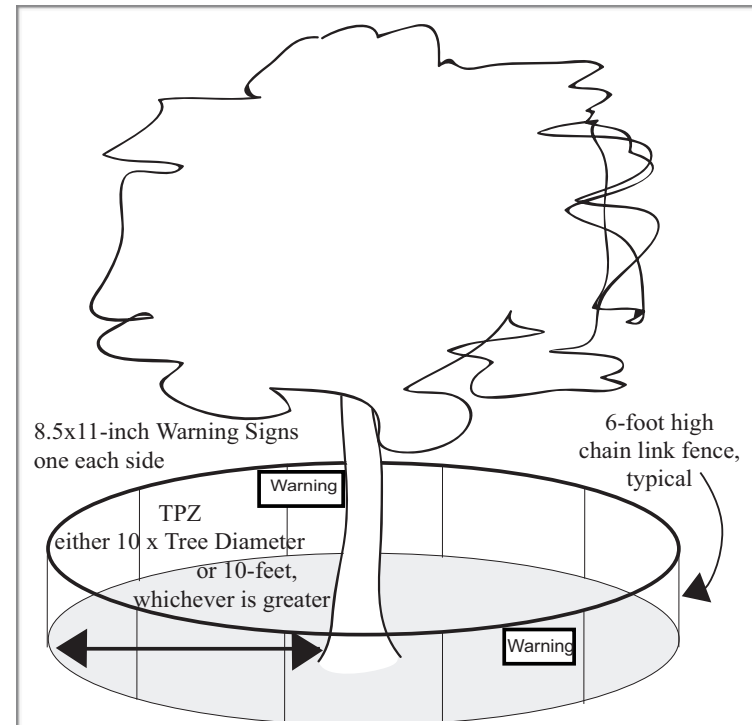


Figure 1: Type I Tree protection with fence placed at a radius of ten times the trunk diameter. Image City of Palo Alto 2006.



Conclusion

The inventory contains 26 trees comprised of 6 different species. Two coast live oaks are considered Large Protected and seven fruit trees are Exempt. Fourteen trees are in good condition, ten fair, and two in poor shape. Eight trees are poorly suited for retention which are primarily fruit trees. Two trees have fair suitability and the remaining sixteen (mostly oaks) have good suitability for retention. There are six trees within the footprint of the proposed driveway and two in or near the proposed building sites. From what was provided there will be at least six trees lost due to the driveway configuration. Tree protection for this project would consist of a Type I scheme around all the trees to be retained with a maximum encroachment radius of six times the trunk diameter distance or at the drip line. A total of 26 trees were appraised for a rounded depreciated value of \$53,920.00 using the Trunk Formula Method.



Recommendations

1. Update the survey to show the current existing conditions and the locations of the trees and their trunks including those along the drainage.
2. Place tree numbers and tree protection fence locations and guidelines on the plans including the grading, drainage, and utility plans. Create a separate plan sheet that includes all protection measures labeled “T-1 Tree Protection Plan.”
3. Place tree protection fence along the service road near the drainage outside the tree dip lines, around #132, and adjacent to #122, #124, #125, #128 and #133.
4. Provide a landscape plan that accounts for the loss in tree canopy to include in tabular form the required replacements in accordance with the Town’s Tree Canopy Replacement Standard.
5. All tree maintenance and care shall be performed by a qualified arborist with a C-61/D-49 California Contractors License. Tree maintenance and care shall be specified in writing according to American National Standard for Tree Care Operations: *Tree, Shrub and Other Woody Plant Management: Standard Practices* parts 1 through 10 and adhere to ANSI Z133.1 safety standards and local regulations. All maintenance is to be performed according to ISA Best Management Practices.
6. Refer to Appendix D for general tree protection guidelines including recommendations for arborist assistance while working under trees, trenching, or excavation within a trees drip line or designated TPZ/CRZ.
7. Provide a copy of this report to all contractors and project managers, including the architect, civil engineer, and landscape designer or architect. It is the responsibility of the owner to ensure all parties are familiar with this document.
8. Arrange a pre-construction meeting with the project arborist or landscape architect to verify tree protection is in place, with the correct materials, and at the proper distances.



Bibliography

American National Standard for Tree Care Operations: Tree, Shrub and Other Woody Plant Management : Standard Practices (Management of Trees and Shrubs During Site Planning, Site Development, and Construction)(Part 5). Londonderry, NH: Secretariat, Tree Care Industry Association, 2012. Print.

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Matheny, Nelda P., Clark, James R. *Trees and development: A technical guide to preservation of trees during land development*. Bedminster, PA: International Society of Arboriculture 1998.

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Glossary of Terms

Basic Tree Cost: The cost of replacement for a perfect specimen of a particular species and cross sectional area prior to location and condition depreciation.

Cost Approach: An indication of value by adding the land value to the depreciated value of improvements.

Defect: An imperfection, weakness, or lack of something necessary. In trees defects are injuries, growth patterns, decay, or other conditions that reduce the tree's structural strength.

Diameter at breast height (DBH): Measures at 1.4 meters (4.5 feet) above ground in the United States, Australia (arboriculture), New Zealand, and when using the Guide for Plant Appraisal, 9th edition; at 1.3 meters (4.3 feet) above ground in Australia (forestry), Canada, the European Union, and in UK forestry; and at 1.5 meters (5 feet) above ground in UK arboriculture.

Drip Line: Imaginary line defined by the branch spread or a single plant or group of plants. The outer extent of the tree crown.

Form: describes a plant's habit, shape or silhouette defined by its genetics, environment, or management.

Health: Assessment is based on the overall appearance of the tree, its leaf and twig growth, and the presence and severity of insects or disease.

Mechanical damage: Physical damage caused by outside forces such as cutting, chopping or any mechanized device that may strike the tree trunk, roots or branches.

Scaffold branches: Permanent or structural branches that form the scaffold architecture or structure of a tree.

Straw wattle: also known as straw worms, bio-logs, straw noodles, or straw tubes are man made cylinders of compressed, weed free straw (wheat or rice), 8 to 12 inches in diameter and 20 to 25 feet long. They are encased in jute, nylon, or other photo degradable materials, and have an average weight of 35 pounds.



Structural evaluation: focused on the crown, trunk, trunk flare, above ground roots and the site conditions contributing to conditions and/or defects that may contribute to failure.

Tree Protection Zone (TPZ): Defined area within which certain activities are prohibited or restricted to prevent or minimize potential injury to designated trees, especially during construction or development.

Tree Risk Assessment: Process of evaluating what unexpected things could happen, how likely it is, and what the likely outcomes are. In tree management, the systematic process to determine the level of risk posed by a tree, tree part, or group of trees.

Trunk: Stem of a tree.

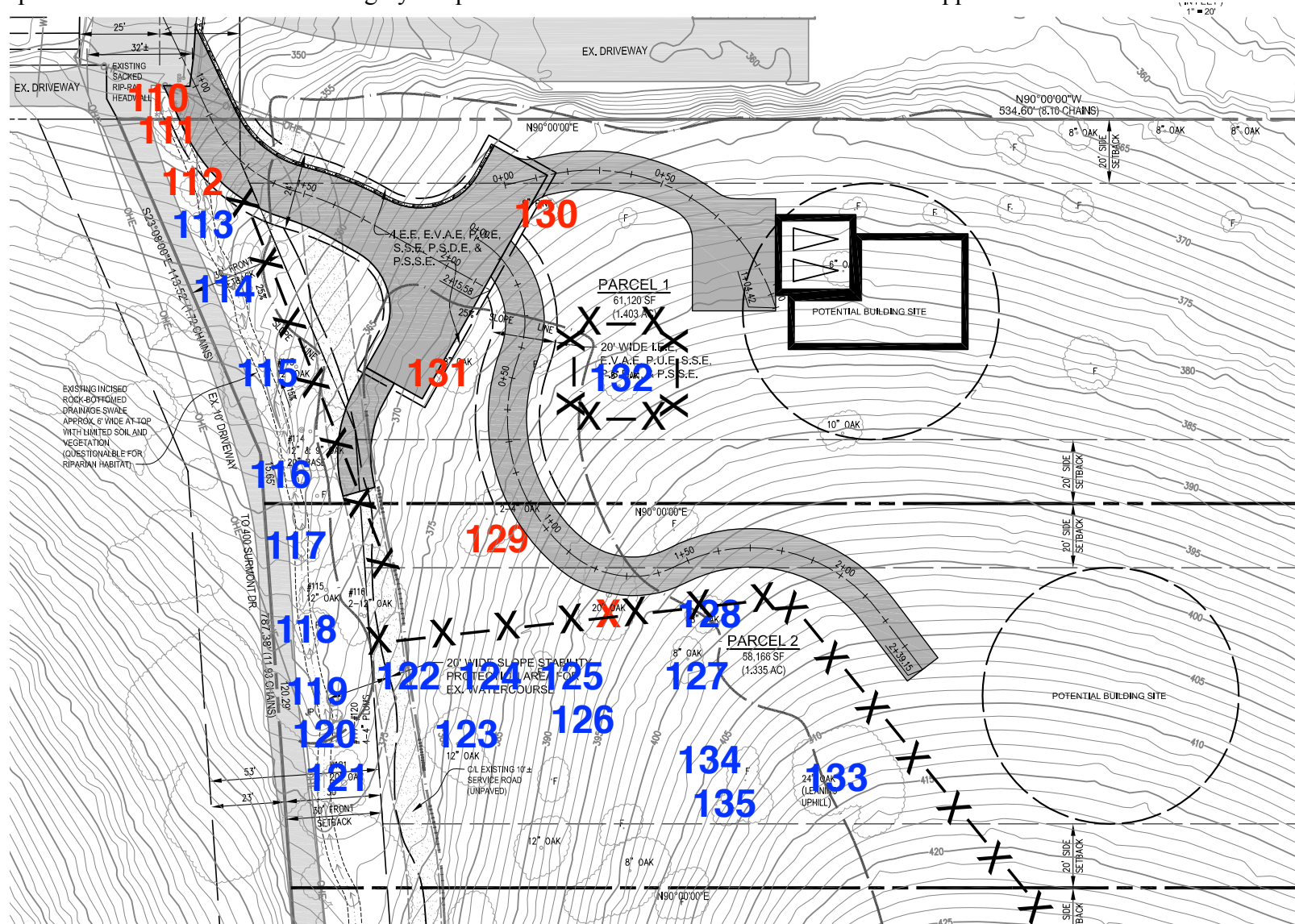
Trunk Formula Method: Method to appraise the monetary value of trees considered too large to be replaced with nursery or field grown stock. Based on developing a representative unit cost for replacement with the same or comparable species of the same size and in the same place, subject to depreciation for various factors. Contrast with replacement cost method.

Volunteer: A tree, not planted by human hands, that begins to grow on residential or commercial property. Unlike trees that are brought in and installed on property, volunteer trees usually spring up on their own from seeds placed onto the ground by natural causes or accidental transport by people. Normally, volunteer trees are considered weeds and removed, but many desirable and attractive specimens have gone on to become permanent residents on many public and private grounds.



Appendix A: Site Plan

Site plan not to scale. Tree in Red “highly” impacted and those in Blue “low”. X—X—X = Approximate TPZ Fence.



Appendix B: Tree Inventory and Assessment Tables

Table 2: Tree Inventory and Assessment Summary

Tree Species	#	Trunk Diameter (in.)	~ Canopy Diameter (ft.)	Health	Structure	Form	Condition	Suitability	Expected Impact	Rounded Value	Large Protected /Exempt
apricot (<i>Prunus armeniaca</i>)	110	8	15	Fair	Poor	Fair	Poor	Poor	High	\$470.00	Exempt
coast live oak (<i>Quercus agrifolia</i>)	111	6, 5	15	Good	Fair	Fair	Fair	Fair	High	\$750.00	
apricot (<i>Prunus armeniaca</i>)	112	7, 7	15	Fair	Poor	Fair	Poor	Poor	High	\$710.00	Exempt
holly oak (<i>Quercus ilex</i>)	113	13	30	Good	Fair	Fair	Fair	Fair	Low	\$2,340.00	
coast live oak (<i>Quercus agrifolia</i>)	114	14, 9	30	Good	Fair	Good	Fair	Good	Low	2700	
coast live oak (<i>Quercus agrifolia</i>)	115	14	35	Good	Good	Good	Good	Good	Low	\$1,380.00	
coast live oak (<i>Quercus agrifolia</i>)	116	13, 15	35	Good	Fair	Good	Fair	Good	Low	\$2,090.00	Large Protected
wild plum (<i>Prunus sp.</i>)	117	8	25	Good	Fair	Good	Good	Poor	Low	\$620.00	Exempt
wild plum (<i>Prunus sp.</i>)	118	8	25	Good	Fair	Good	Good	Poor	Low	\$620.00	Exempt
wild plum (<i>Prunus sp.</i>)	119	6	25	Good	Fair	Good	Good	Poor	Low	390	Exempt
wild plum (<i>Prunus sp.</i>)	120	8, 4, 3	25	Good	Fair	Good	Good	Poor	Low	\$770.00	Exempt



Tree Species	#	Trunk Diameter (in.)	~ Canopy Diameter (ft.)	Health	Structure	Form	Condition	Suitability	Expected Impact	Rounded Value	Large Protected /Exempt
coast live oak (<i>Quercus agrifolia</i>)	121	18.5	35	Good	Good	Good	Good	Good	Low	\$5,400.00	
apricot (<i>Prunus armeniaca</i>)	122	8, 8	15	Fair	Poor	Good	Fair	Poor	Low	\$1,700.00	Exempt
coast live oak (<i>Quercus agrifolia</i>)	123	10, 9	35	Good	Fair	Good	Fair	Good	Low	\$1,820.00	
holly oak (<i>Quercus ilex</i>)	124	8, 6	25	Good	Fair	Good	Fair	Good	Low	\$1,420.00	
holly oak (<i>Quercus ilex</i>)	125	5	20	Good	Good	Good	Good	Good	Low	\$620.00	
holly oak (<i>Quercus ilex</i>)	126	6, 4, 4	20	Good	Poor	Good	Fair	Good	Low	\$940.00	
coast live oak (<i>Quercus agrifolia</i>)	127	14	30	Good	Good	Good	Good	Good	Low	3140	
coast live oak (<i>Quercus agrifolia</i>)	128	11	30	Good	Good	Good	Good	Good	Low	1990	
coast live oak (<i>Quercus agrifolia</i>)	129	11, 9	25	Good	Fair	Good	Good	Good	High	\$3,140.00	
stone pine (<i>Pinus pinea</i>)	130	9	15	Good	Good	Good	Good	Poor	High	\$880.00	
toyon (<i>Heteromeles arbutifolia</i>)	131	7, 7, 7	25	Good	Fair	Fair	Fair	Good	High	\$2,150.00	
coast live oak (<i>Quercus agrifolia</i>)	132	8, 5, 5	30	Good	Fair	Good	Fair	Good	Low	1120	



Tree Species	#	Trunk Diameter (in.)	~ Canopy Diameter (ft.)	Health	Structure	Form	Condition	Suitability	Expected Impact	Rounded Value	Large Protected /Exempt
coast live oak (<i>Quercus agrifolia</i>)	133	27	55	Good	Fair	Good	Good	Good	Low	11300	Large Protected
coast live oak (<i>Quercus agrifolia</i>)	134	9, 9	25	Good	Fair	Good	Good	Good	Low	2730	
coast live oak (<i>Quercus agrifolia</i>)	135	13	25	Good	Good	Good	Good	Good	Low	2730	



Appendix C: Photographs

C1: Trees near hammerhead



Appendix D: Tree Protection Guidelines

Section 29.10.1005. - Protection of Trees During Construction

Tree Protection Zones and Fence Specifications

1. **Size and materials:** Six (6) foot high chain link fencing, mounted on two-inch diameter galvanized iron posts, shall be driven into the ground to a depth of at least two (2) feet at no more than ten-foot spacing. For paving area that will not be demolished and when stipulated in a tree preservation plan, posts may be supported by a concrete base.
2. **Area type to be fenced:** Type I: Enclosure with chain link fencing of either the entire dripline area or at the tree protection zone (TPZ), when specified by a certified or consulting arborist. Type II: Enclosure for street trees located in a planter strip: chain link fence around the entire planter strip to the outer branches. Type III: Protection for a tree located in a small planter cutout only (such as downtown): orange plastic fencing shall be wrapped around the trunk from the ground to the first branch with two-inch wooden boards bound securely on the outside. Caution shall be used to avoid damaging any bark or branches.
3. **Duration of Type I, II, III fencing:** Fencing shall be erected before demolition, grading or construction permits are issued and remain in place until the work is completed. Contractor shall first obtain the approval of the project arborist on record prior to removing a tree protection fence.
4. **Warning Sign:** Each tree fence shall have prominently displayed an eight and one-half-inch by eleven-inch sign stating: "Warning—Tree Protection Zone—This fence shall not be removed and is subject to penalty according to Town Code 29.10.1025." Text on the signs should be in both English and Spanish (Appendix E).



All persons, shall comply with the following precautions

1. Prior to the commencement of construction, install the fence at the dripline, or tree protection zone (TPZ) when specified in an approved arborist report, around any tree and/or vegetation to be retained which could be affected by the construction and prohibit any storage of construction materials or other materials, equipment cleaning, or parking of vehicles within the TPZ. The dripline shall not be altered in any way so as to increase the encroachment of the construction.
2. Prohibit all construction activities within the TPZ, including but not limited to: excavation, grading, drainage and leveling within the dripline of the tree unless approved by the Director.
3. Prohibit disposal or depositing of oil, gasoline, chemicals or other harmful materials within the dripline of or in drainage channels, swales or areas that may lead to the dripline of a protected tree.
4. Prohibit the attachment of wires, signs or ropes to any protected tree.
5. Design utility services and irrigation lines to be located outside of the dripline when feasible.
6. Retain the services of a certified or consulting arborist who shall serve as the project arborist for periodic monitoring of the project site and the health of those trees to be preserved. The project arborist shall be present whenever activities occur which may pose a potential threat to the health of the trees to be preserved and shall document all site visits.
7. The Director and project arborist shall be notified of any damage that occurs to a protected tree during construction so that proper treatment may be administered.

Monitoring

Any trenching, construction or demolition that is expected to damage or encounter tree roots should be monitored by the project arborist or a qualified ISA Certified Arborist and should be documented.

The site should be evaluated by the project arborist or a qualified ISA Certified Arborist after construction is complete, and any necessary remedial work that needs to be performed should be noted.



Root Pruning

Roots greater than two inches in diameter shall not be cut. When roots over two inches in diameter are encountered and are authorized to be cut or removed, they should be pruned by hand with loppers, handsaw, reciprocating saw, or chain saw rather than left crushed or torn. Roots should be cut beyond sinker roots or outside root branch junctions and be supervised by the project arborist. When completed, exposed roots should be kept moist with burlap or backfilled within one hour.

Boring or Tunneling

Boring machines should be set up outside the drip line or established Tree Protection Zone. Boring may also be performed by digging a trench on both sides of the tree until roots one inch in diameter are encountered and then hand dug or excavated with an Air Spade® or similar air or water excavation tool. Bore holes should be adjacent to the trunk and never go directly under the main stem to avoid oblique (heart) roots. Bore holes should be a minimum of three feet deep.

Tree Pruning and Removal Operations

All tree pruning or removals should be performed by a qualified arborist with a C-61/D-49 California Contractors License. Treatment, including pruning, shall be specified in writing according to the most recent ANSI A-300A Standards and Limitations and performed according to ISA Best Management Practices while adhering to ANSI Z133.1 safety standards. Trees that need to be removed or pruned should be identified in the pre-construction walk through.



Appendix E: Tree Protection Signs
E1: English

Warning

Tree Protection Zone

**This Fence Shall Not Be Removed
And Is Subject To Penalty According To
Town Code 29.10.1025**



E2: Spanish

Cuidado Zona De Arbol Pretejido

Esta valla no podrán ser sacados
Y está sujeta a sanción en función de
Código Ciudad del 29.101025



Qualifications, Assumptions, and Limiting Conditions

Any legal description provided to the consultant is assumed to be correct. Any titles or ownership of properties are assumed to be good and marketable. All property is appraised or evaluated as though free and clear, under responsible ownership and competent management.

All property is presumed to be in conformance with applicable codes, ordinances, statutes, or other regulations.

Care has been taken to obtain information from reliable sources. However, the consultant cannot be responsible for the accuracy of information provided by others.

The consultant shall not be required to give testimony or attend meetings, hearings, conferences, mediations, arbitration, or trials by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services.

This report and any appraisal value expressed herein represent the opinion of the consultant, and the consultant's fee is not contingent upon the reporting of a specified appraisal value, a stipulated result, or the occurrence of a subsequent event.

Sketches, drawings, and photographs in this report are intended for use as visual aids, are not necessarily to scale, and should not be construed as engineering or architectural reports or surveys. The reproduction of information generated by architects, engineers, or other consultants on any sketches, drawings, or photographs is only for coordination and ease of reference. Inclusion of said information with any drawings or other documents does not constitute a representation as to the sufficiency or accuracy of said information.

Unless otherwise expressed: a) this report covers only examined items and their condition at the time of inspection; and b) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that structural problems or deficiencies of plants or property may not arise in the future.



Certification of Performance

I Richard Gessner, Certify:

That I have personally inspected the tree(s) and/or the property referred to in this report, and have stated my findings accurately. The extent of the evaluation and/or appraisal is stated in the attached report and Terms of Assignment;

That I have no current or prospective interest in the vegetation or the property that is the subject of this report, and I have no personal interest or bias with respect to the parties involved;

That the analysis, opinions and conclusions stated herein are my own;

That my analysis, opinions, and conclusions were developed and this report has been prepared according to commonly accepted Arboricultural practices;

That no one provided significant professional assistance to the consultant, except as indicated within the report.

That my compensation is not contingent upon the reporting of a predetermined conclusion that favors the cause of the client or any other party, nor upon the results of the assessment, the attainment of stipulated results, or the occurrence of any other subsequent events;

I further certify that I am a Registered Consulting Arborist® with the American Society of Consulting Arborists, and that I acknowledge, accept and adhere to the ASCA Standards of Professional Practice. I am an International Society of Arboriculture Board Certified Master Arborist®. I have been involved with the practice of Arboriculture and the care and study of trees since 1998.

Richard J. Gessner



ASCA Registered Consulting Arborist® #496
ISA Board Certified Master Arborist® WE-4341B
ISA Tree Risk Assessor Qualified



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Attachment C: Geotechnical Investigation

REPORT

GEOTECHNICAL INVESTIGATION

PROPOSED ANDERSON RESIDENCES
400 Surmont Drive
Los Gatos, California

for
Sandra Anderson
c/o Robert O. Hughes
The Building Works
2730 Union Street, Suite B
San Jose, CA 95124

Project No. 184950
July 2018



17020 Melody Lane
Los Gatos, California 95033
www.milstonegeo.com

Tel 408.353.5528
Fax 802.448.1025
bsm@milstonegeo.com

June 12, 2019
Project No. 195040

Sandra Anderson
c/o Robert O. Hughes
The Building Works
2730 Union Street, Suite B
San Jose, CA 95124

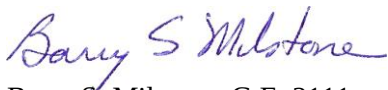
SUBJECT: Geotechnical Investigation
RE: Proposed Anderson Residences
400 Surmont Drive
Los Gatos, California

Dear Ms. Anderson:

Milestone Geotechnical has completed a geotechnical investigation for the above referenced site, in accordance with your authorization. The accompanying report presents the results of the investigation with conclusions and recommendations for the geotechnical aspects of the proposed development.

Based on the work performed for this investigation, we are pleased to report that, from a geotechnical perspective, the site is suitable for the proposed development if properly designed and constructed. It has been a pleasure providing professional services to you on this project and I look forward to continued service. If you have any questions regarding the contents of this report, or require additional assistance, please phone.

Sincerely,
MILSTONE GEOTECHNICAL


Barry S. Milstone, G.E. 2111
Principal Geotechnical Engineer



**GEOTECHNICAL INVESTIGATION
PROPOSED ANDERSON RESIDENCES
400 Surmont Drive
Los Gatos, California**

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**GEOTECHNICAL INVESTIGATION
PROPOSED ANDERSON RESIDENCES
400 Surmont Drive
Los Gatos, California**

INTRODUCTION

This report presents the findings, conclusions, and recommendations of a geotechnical investigation related to the construction of two new single-family residences in Los Gatos, California (Figure 1). This investigation was conducted in accordance with our proposal dated March 8, 2019.

**Project
Description**

Based on communications with, Robert Hughes, project manager, is our understanding that the project will involve the construction of two new, single-level, single-family residences without basements on adjacent, currently undeveloped, parcels. It is anticipated that site development will include grading to establish building pads, access driveways and parking areas, and landscape and hardscape improvements including possible swimming pools and pool houses. It is our understanding that the properties will be serviced by the municipal sanitary sewer system.

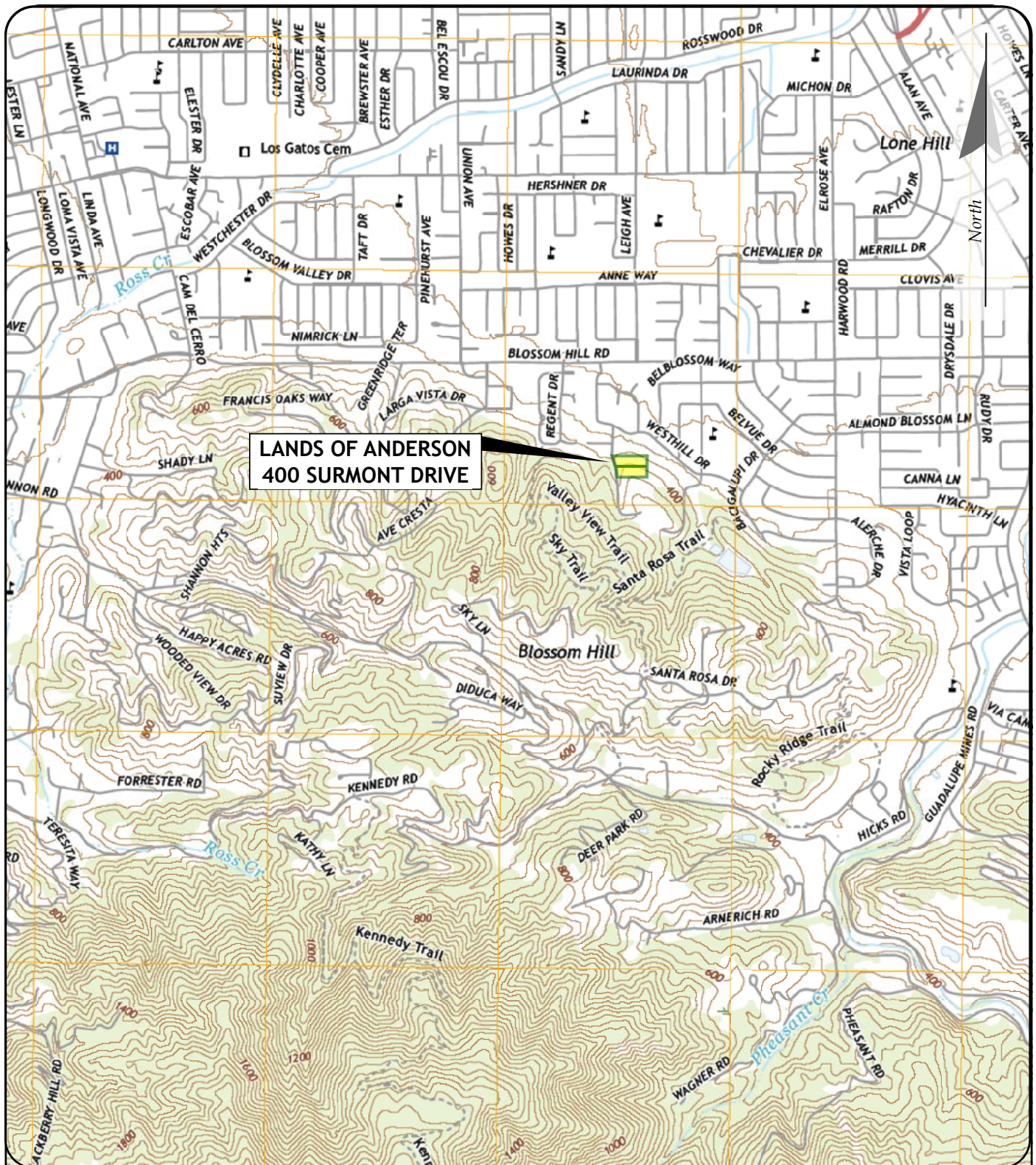
**Purpose and Scope
of Investigation**

The investigation was predicated on the data and conclusions presented in a Engineering Geologic Investigation¹ performed by Steven Connelly, CEG, with whom we collaborated during the undertaking of our investigation. The purposes of the investigation were to characterize the geotechnical conditions of the proposed development areas and provide specific recommendations for the geotechnical aspects of the proposed improvements.

The scope of services undertaken for this investigation included the following tasks:

- Compilation and review of available published and unpublished engineering and geologic documents relevant to site development;
- Visual site reconnaissance to note pertinent geotechnical site conditions, identify potential borehole locations, and mark the site for utility notification of intended drilling;
- Consultation with the project geologist and examination of four (4) of the exploratory test pits;
- Drilling, logging, in-situ testing, and sampling of four (4) small-diameter exploratory boreholes;

¹ Connelly, Steven F., CEG, 5/18/19, Engineering Geologic Investigation, Proposed Residences, APN 527-20-003, 400 Surmont Drive, Los Gatos, California.



SITE LOCATION MAP

PROPOSED ANDERSON RESIDENCES
400 Surmont Drive
Los Gatos, California

FIGURE NO.

1



Date
June 2019

Scale
1 inch = 2,000 feet

Drawn by
BSM

Project No.
195040

- Laboratory testing of representative subsurface materials to verify field classifications and determine index properties and pertinent engineering characteristics
- Analysis of the resulting data and development of geotechnical design criteria;
- Preparation of this report and the accompanying illustrations describing the findings, conclusions, and recommendations.

SITE GEOLOGY

Geologic Setting

Site geology, including geologic and seismic settings, faulting, and landsliding, have recently been investigated and reported by Steven Connelly¹, project geologist. The investigation included review of previous nearby geologic studies and pertinent geologic documents, analysis of aerial photographs, visual reconnaissance, logging of six (6) exploratory test pits, and review of data derived during the current investigation. The reader is referred to the referenced report for complete description of the investigation and discussion of their findings.

Based on published map review, air photo analysis, geologic reconnaissance, and logging of exploratory test pits, Connelly reports that a potentially active fault crosses the southwest corner of the property. Consequently, he identifies a recommended building setback. The proposed building sites are located outside of the recommended setback. Furthermore, Connelly indicates that Evidence of landsliding or other geologic hazards that would restrict the proposed development were not encountered on the property.

Based on the results of his investigation, Connelly opines that “the weathered bedrock underlying the property should provide good support for the proposed residences”, and that “the potential hazard from fault rupture, landsliding, liquefaction, ground subsidence, lateral spreading, tsunamis, seiches, or flooding to the proposed residences, is very low to minimal, provided construction does not occur within the recommended building setback zone.”

Seismicity

Connelly indicates that moderate to strong ground shaking is likely to occur at the site due to movement on one of the range front faults such as the Blossom Hill fault. Additionally, he indicates the possibility of secondary fissures or ground cracks that could damage the property.

Based on the most recent earthquake forecasts published by the Working Group on California Earthquake Probabilities², there is estimated to be a 72 percent chance of at least one magnitude 6.7 or greater earthquake occurring in the Bay Area region between 2014 and 2044. The property is expected to experience violent ground shaking during large earthquakes on the nearby segment of the San Andreas fault, similar to the level experienced in the 1906 earthquake.

The National Earthquake Hazard Reduction Program, the USGS³ has classified the subject area to be within a Site Class C shaking hazard zone. This is generally consistent with a shear wave velocity of 471 meters per second (m/s) reported by Hartzell and others for similar deposits approximately 6,000 feet to the east.

**Anticipated
Ground Surface
Acceleration**

The property is expected to experience violent ground shaking during large earthquakes on the nearby segment of the San Andreas fault, similar to the level experienced in the 1906 earthquake. The peak ground acceleration, with a 10% probability of being exceeded in 50 years, is estimated to be 0.52g using the probabilistic parameters provided by the California OSHPD⁴.

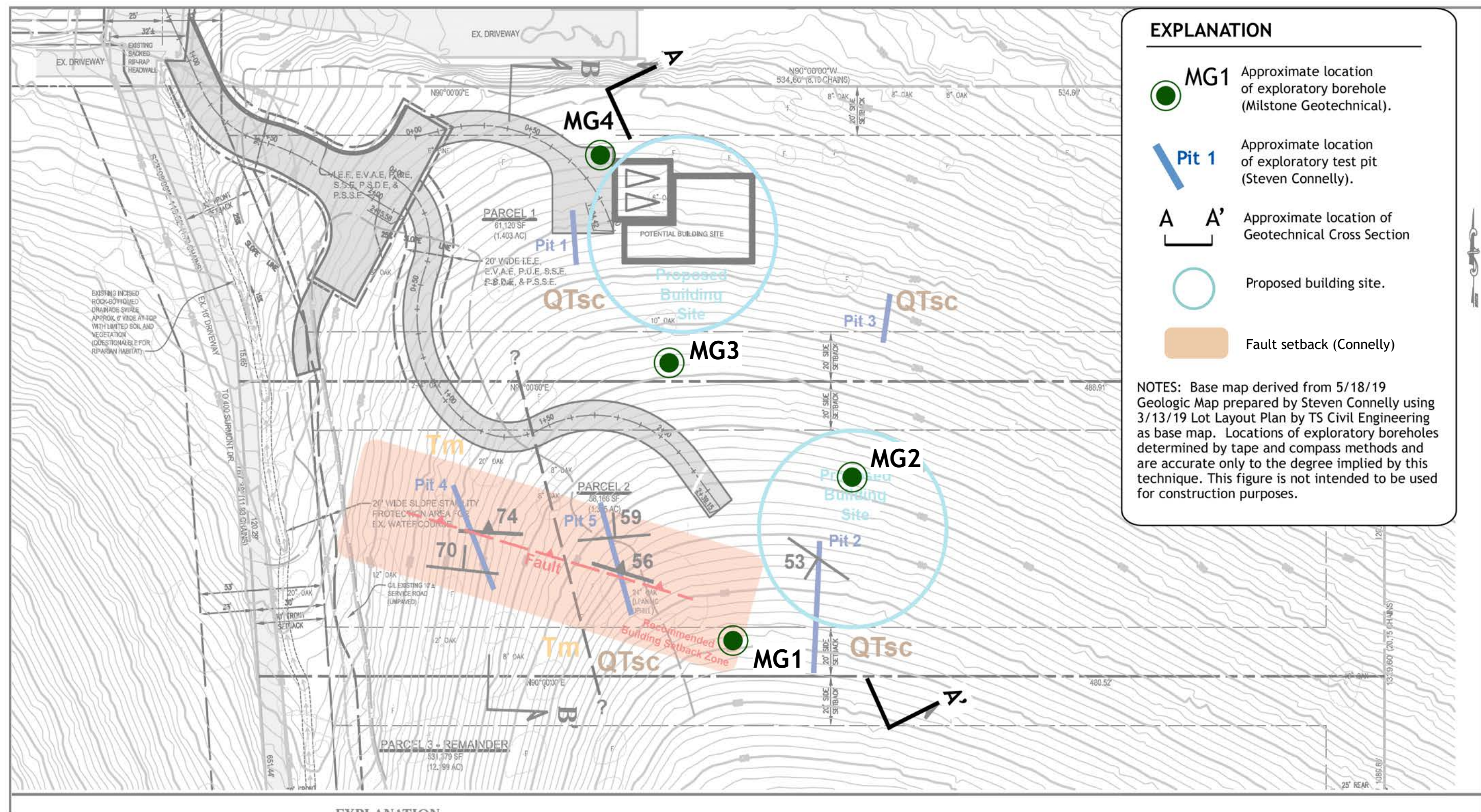
As a minimum, the proposed structure should be designed in accordance with the current California Building Code (CBC) standards for static and seismic design. More specific seismic design criteria are presented in the Geotechnical Design Criteria section. It should be noted that there is a paucity of data available for near field sites, such as the subject site, and that it is possible that actual ground surface accelerations will exceed the current estimates.

² Field, E.H., Biasi, G.P., Bird, P., Dawson, T.E., Felzer, K.R., Jackson, D.D., Johnson, K.M., Jordan, T.H., Madden, C., Michael, A.J., Milner, K.R., Page, M.T., Parsons, T., Powers, P.M., Shaw, B.E., Thatcher, W.R., Weldon, R.J., II, and Zeng, Y., 2013, Uniform California earthquake rupture forecast, version 3 (UCERF3)—The time-independent model: U.S. Geological Survey Open-File Report 2013–1165, 97 p., California Geological Survey Special Report 228, and Southern California Earthquake Center Publication 1792, <http://pubs.usgs.gov/of/2013/1165/>.

³ United States Geological Survey, undated, Soil type and shaking hazard in the San Francisco Bay Area, <https://earthquake.usgs.gov/hazards/urban/sfbay/soiltype/>.

⁴ California Office of Statewide Health Planning and Development, 2008, Seismic Design Maps, <https://seismicmaps.org>.

SITE CONDITIONS	The subject property is situated on a northeast-facing hillside located in the foothills near the base of the northeast flank of the Santa Cruz Mountains, approximately two (2) miles east of the Los Gatos town center (Figure 1).
Site Setting	The adjacent, approximately 1.3-acre, east-west oriented, generally elongated rectangular shaped lots constitute the northernmost parcels of a three (3) lot subdivision. The properties are accessed by a private south-trending extension of Surmont Drive approximately 1,200 feet south of Blossom Hill Road.
Surface Topography	Site topography (Figure 2) is defined by gentle, north plunging spur ridge that descends from an elevation of 423 feet near the center of the southern property line to 355 at the northwest corner and 345 at the northeast corner. Within the proposed development areas, the ground surfaces slope at inclinations of about 20 percent.
Surface Drainage	The development area drains by uncontrolled sheet flow to the northwest and northeast from the central portions of the lots.
Existing Development	The site of the proposed improvements is current undeveloped. Historic aerial photographs indicate that the properties previously functioned as orchards.
Vegetation	The development areas are covered with local grasses and weeds.
SUBSURFACE CONDITIONS	Milestone Geotechnical investigated the subsurface conditions of the site by examining Connelly ¹ test pits 1 through 4 and by drilling, logging, in-situ testing, and sampling of four (4) small-diameter exploratory boreholes to depths of 15.5 and 20.0 feet using a track-mounted drill rig. The purpose of the subsurface investigation was to supplement data presented by Connelly ¹ , characterize the geotechnical subsurface conditions of the site, and obtain representative undisturbed samples for testing. The field investigation is discussed in more detail in Appendix A. Representative soil samples were transported to the laboratory to verify field descriptions and perform index testing. Laboratory test results are summarized following the material descriptions.
Subsurface Investigation	Subsurface exploration locations are depicted on Figure 2. Graphical logs of the small-diameter boreholes are presented in Appendix A of this report. Our interpretations of the available subsurface information at the proposed



SITE PLAN AND EXPLORATION MAP

PROPOSED ANDERSON RESIDENCES
 400 Surmont Drive
 Los Gatos, California

FIGURE NO.

2

Date:
June 2019

Scale:
1 inch = 40 feet

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building site is depicted on the Idealized Subsurface Cross Section A-A' (Figure 3).

**Subsurface
Materials**

Beneath a blanket of surficial and colluvial clay soils, the exploratory boreholes encountered interbedded weathered Santa Clara formation materials. These findings are similar to the subsurface conditions exposed by Connelly¹ and are characteristic of the locally mapped Quaternary age Santa Clara Formation materials described by McLaughlin and others⁵. The subsurface materials are described in more detail below in order of increasing age. More detailed descriptions of the encountered subsurface materials are presented in the exploratory borehole logs (Appendix A).

**Colluvial
Soil**

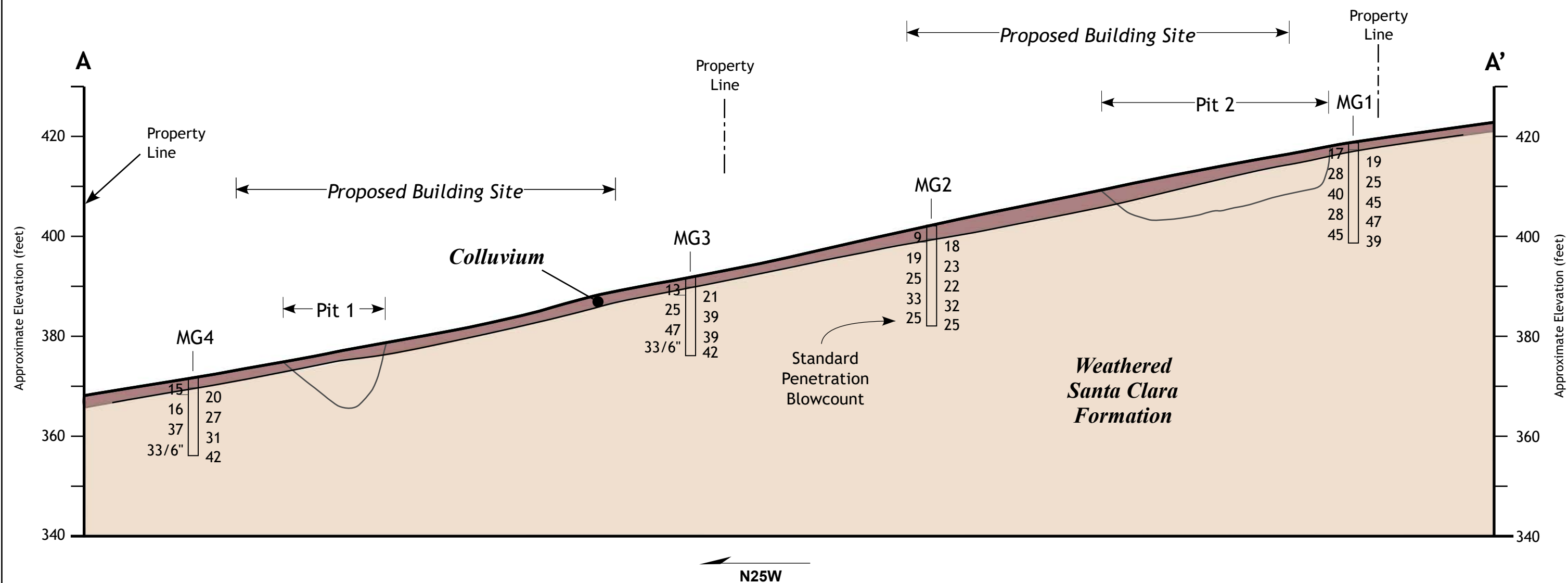
The site is blanketed by one to three (1 to 3) feet of colluvial soil consisting, predominantly, of dark brown and dark grayish brown, firm to stiff, damp to moist, medium to high plasticity, sandy clay with up to 20 percent fine- to coarse-grained sand and abundant rootlets within the upper 12 inches.

Four (4) penetration tests demonstrated an average standard penetration blowcount of 14 blows per foot (bpf). One (1) pocket penetrometer testing in the surficial clay suggest an unconfined compressive strength in excess of 3.2 tons per square foot (tsf).

One (1) undisturbed sample of the clay obtained near the interface with the underlying Santa Clara formation exhibited a dry density of 108.9 pounds per cubic foot (pcf) with a corresponding moisture content of 10.4 percent. A laboratory determined liquid limit of 69 and plasticity index of 46 indicate high plasticity with a significant potential for shrink-swell behavior resulting from moisture fluctuations. A constant-volume swell test demonstrated a swell pressure of 3,417 pounds per square foot (psf) required to limit vertical swelling of an air-dried sample to 0.3 percent when flooded.

⁵ McLaughlin, R. J., Clark, J.C., Brabb, E. E., Helley, E. J. and Colón, C. J., 2001, Geologic maps and structure sections of the southwestern Santa Clara Valley and southern Santa Cruz Mountains, Santa Clara and Santa Cruz counties, California: U.S Geological Survey Miscellaneous Field Studies MF-2373.

GEOTECHNICAL CROSS SECTION A-A'



NOTES: Surface topography and locations of proposed building sites derived from 3/13/19 Lot Layout Plan prepared by TS Civil Engineering. Locations of exploratory test pits derived from 5/18/19 Connelly Geologic Report. Locations of exploratory boreholes determined by tape and compass methods.



MILSTONE
GEOTECHNICAL

IDEALIZED GEOTECHNICAL SECTION A-A'			FIGURE NO. 3
PROPOSED ANDERSON RESIDENCES 400 Surmont Drive Los Gatos, California			
Date: June 2019	Scale: 1 inch = 20 feet	Drawn by: BSM	Project No. 195040

Santa Clara Formation The encountered Santa Clara Formation materials consist, predominantly, of interbedded, medium dense to very dense, moist, silty to clayey gravel and silty to clayey fine- to coarse-grained sand and weathered siltstone. These materials generally demonstrate standard penetration test (SPT) blowcounts ranging from 22 to in excess of 50 bpf with an average of 31 bpf. The upper approximately two to four (2 to 4) feet of these materials exhibits advanced weathering with blowcounts averaging 20 bpf.

The dry density and moisture content of 16 undisturbed samples of the weathered Santa Clara formation average 112 pcf and 15 percent, respectively. Four (4) unconfined compression tests yielded unconfined compressive strengths ranging from 4,833 to 9,318 psf. The lower bound compressive strength of 4,833 psf was adopted for purposes of analysis and design. Empirical strength relationships based on material composition, dry density, and standard penetration blowcount suggest an undrained angle of about 36 degrees for the more highly weathered materials at the shallower elevations of the unit.

**GROUND
WATER**

Ground water was not encountered in any of the four (4) boreholes advanced for this investigation to a maximum depth of 20 feet. It should be noted that ground water conditions at other locations and times, or during different weather conditions might differ from those encountered in our test boreholes. Nevertheless, based on the results of our subsurface investigation and collected data, it is anticipated that construction of the proposed improvements will not be adversely affected by ground water if constructed during the dry season.

**SLOPE
STABILITY**

Most of the subject lots are located within a State of California designated seismic hazard zone with respect to potential earthquake induced landsliding. Presumably, this determination is driven by the slope inclinations. Slope stability analyses were performed to assess the stability of the subject slope during static and seismic loading conditions.

- Methodology** Slope stability was evaluated using SLIDE⁶, a limit equilibrium computer program developed by Rocscience, Inc. An idealized slope model was developed using site geometry, subsurface stratigraphy, ground water conditions, engineering properties of the site soils, and anticipated seismic loading conditions as described previously in this report. Thousands of potential failure surfaces were evaluated with the SLIDE program using Bishop's and Spencer's methods with continued model refinement to result in the lowest factor of safety. The factor of safety is defined as the ratio of forces resisting failure to those that could drive failure. A factor of safety of 1.5 is generally considered to be the minimum acceptable factor of safety under static conditions.
- Geometry** The analyzed surface topography was developed from the topographic survey prepared by TS Civil Engineering.
- Soil Properties** The subsurface material contacts were interpreted from the exploratory borehole advanced for this investigation. The following table summarizes the soil strength properties used in the stability analyses. The bases for these soil properties are described elsewhere in this report. Additionally, sensitivity analyses were performed to evaluate the potential impacts of increases soil and weathered bedrock saturation.

Soil Properties for Stability Analyses

	Moist Density (pcf)	Shear Strength (psf)	Friction Angle (deg)
Colluvial Soil	124	1,000	-
Weathered Santa Clara Fm.	128	-	36 / 0

⁶ Rocscience, Inc., SLIDE version 5.044.

Seismic Loading The subject slope was subjected to a screening analysis based on the previously described ground acceleration determined for a 10 percent probability of exceedance during a 50-year period. Using a five (5)-centimeter displacement criteria, a reduction factor of 0.48 was applied to the probabilistically determined seismic coefficient to yield a seismic coefficient of 0.25g for use in the analyses.

Ground Water Ground water was not encountered to the maximum explored depth (20 feet) during this investigation and no indications of seasonally high ground water, such as mottling or precipitate deposits, were observed in any of the boreholes. Consequently, no ground water was considered in the analysis.

Analysis and Results This analysis yielded a static factor of safety against failure of 3.87 (Figure 4) and a pseudostatic factor of safety of 1.62 (Figure 5) under the considered seismic loading conditions. Only negligible decreases in the factors of safety were observed when considering up to 10 pcf increases in moist densities resulting from potential increased saturation. Consequently, with respect to static and seismic stability, the potential for slope instability during the economic life of the structure is considered to be low.

DISCUSSIONS and CONCLUSIONS

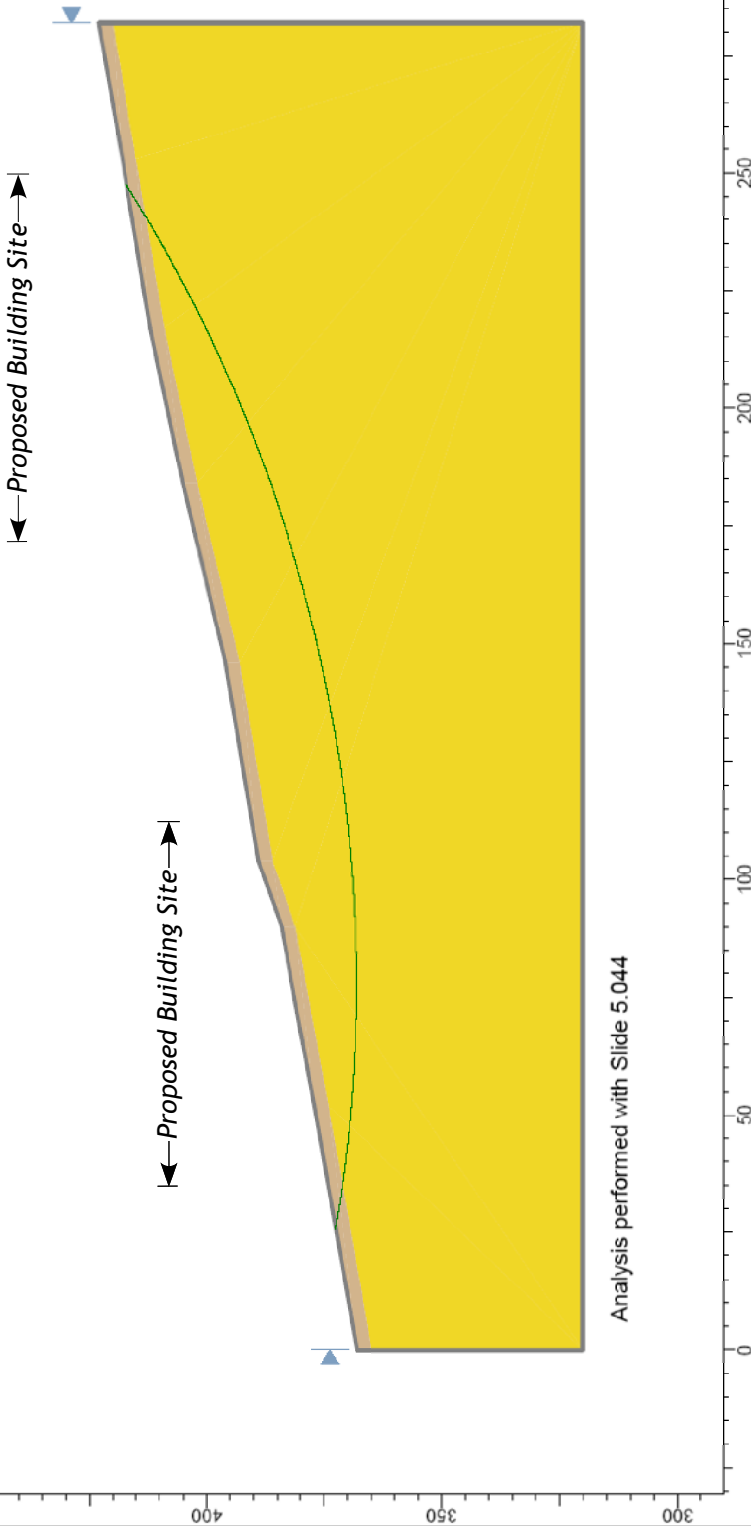
Based on the findings of this investigation and our review of previous site geologic investigations, it is our opinion that the geotechnical conditions of the site are suitable for the proposed improvements provided that the geotechnical design criteria presented in this report are incorporated into the design and construction. We conclude that the primary geotechnical factors affecting the design and construction of the proposed improvements are the hillside setting, relatively weak and creep-prone near-surface soil, expansive near-surface soils, and the potential for significant ground shaking caused by an earthquake on the nearby active San Andreas and Berrocal fault systems.

The following discussions summarize our findings and conclusions regarding the geotechnical aspects of the proposed improvements as determined from the presented data. Specific geotechnical design parameters are presented in a subsequent section.

Expansive and Creep Prone Soil Field observations and laboratory test data indicate that up to about three (3) feet of the surficial soils consist of moderately to highly expansive clay that is

PROPOSED ANDERSON RESIDENCES
Static Stability Analysis

FS - 3.87



STATIC STABILITY - 10 Critical Surfaces

PROPOSED ANDERSON RESIDENCES
400 Surmont Drive
Los Gatos, California

Date: June 2019

Scale: 1 inch = 20 feet

Drawn by: BSM

FIGURE NO.

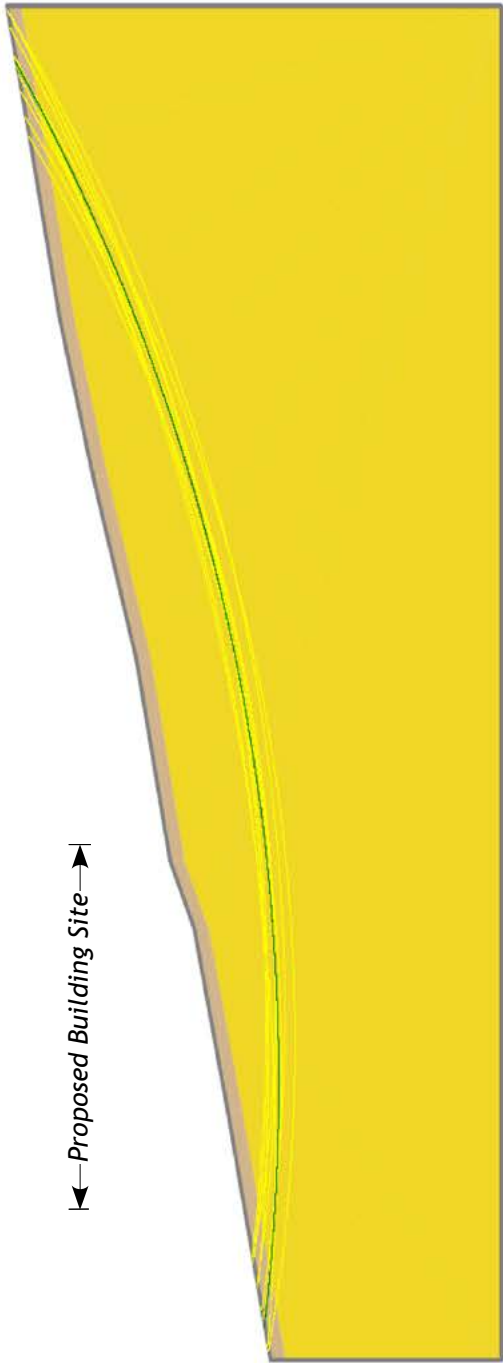
4

Project No.
195040

PROPOSED ANDERSON RESIDENCES
 Seismic Screening Analysis
 $a = 0.25$
FS - 1.62

← Proposed Building Site →

← Proposed Building Site →



Analysis performed with Slide 5.044

	SEISMIC STABILITY - 10 Critical Surfaces			FIGURE NO. 5
	PROPOSED ANDERSON RESIDENCES 400 Surmont Drive Los Gatos, California			Project No. 195040
Date: June 2019		Scale: 1 inch = 20 feet	Drawn by: BSM	

subject to shrink-swell behavior resulting from anticipated seasonal moisture fluctuations. The existence of expansive soils on the site's moderately steep slopes also produce a phenomenon referred to as soil creep. Seasonal expansion and contraction of the site soils creates a condition where slow progressive downslope movement of the clayey soils occurs. The geotechnical recommendations provided below address the potential impacts of expansive soils through avoidance and/or replacement.

**Seismic
Shaking**

The site is expected to experience strong ground shaking from earthquakes along active faults located within the region and on the property during the design life of the project. Based on anticipated ground shaking, a peak horizontal ground acceleration of 0.53g is predicted by probabilistic methods. However, much can be done both to prepare for a large earthquake and to mitigate some of its consequences.

Excellent discussions of simple procedures to make a residence stronger and safer during a major earthquake can be found in "Peace of Mind in Earthquake Country" by Peter Yanev⁷, at the Association of Bay Area Government earthquake information website⁸, and in the United States Geologic Survey "Putting Down Roots in Earthquake Country" handbook⁹. As a minimum, the proposed structure should be designed in accordance with the current California Building Code (CBC) standards for static and seismic design.

⁷ Yanev, Peter and Andrew Thompson, 2009, Peace of Mind in Earthquake Country: How to Save Your Home, Business, and Life, Chronical Books.

⁸ Association of Bay Area Governments, ABAG Earthquakes and Hazard Maps/Info, <http://quake.abag.ca.gov/>.

⁹ US Geologic Survey, 2005, Putting Down Roots in Earthquake Country – Your Handbook for the San Francisco Bay Region, General Information Product 15, <http://pubs.usgs.gov/gip/2005/15/>.

**GEOTECHNICAL
DESIGN
CRITERIA**

The following recommendations are presented as guidelines for subsequent stages of development. These recommendations shall be incorporated into the design of the proposed subdivision improvements. Final detailing of concrete elements and reinforcing steel is to be designed by a qualified structural engineer in accordance with the provided geotechnical criteria. To assure that the intent of these recommendations is included in the project plans and specifications, we request an opportunity to review the plans prior to initiation of construction. It has been our experience that the permit process is often expedited when we review the plans prior to submittal. References to ASTM test designations are intended to indicate the most recent version at the time of construction.

Grading

Due to the site topography, it is anticipated that development of the building pads could involve total cuts and/or fills up to about 10 feet. Based on the experience of borehole drilling, it is expected that proposed site excavations can be performed with conventional earthmoving equipment.

**Clearing and
Site Preparation**

All areas to be graded should be cleared of vegetation and organic laden soil. Stripped materials should be removed from the improvement area for proper disposal. Depressions created by the removal of debris that extends below the proposed finished subgrade should be backfilled with engineered fill as described below. Disturbed soil subgrades to receive fill should be excavated to expose firm soil and should be scarified to a depth of six (6) inches, moisture conditioned to within two (2) percent of optimum, and compacted to a minimum of 90 percent of the maximum dry density as determined by the ASTM D1557 test method.

**Subgrade
Improvement**

Due to the relatively limited thickness of surficial soils, it is recommended that all expansive clays underlying improvement be removed from the site for proper disposal. Subgrade improvement should extend laterally a minimum of two (2) feet beyond the limits of proposed surface improvements. The bases of all excavations shall be in firm material as approved by the project geotechnical engineer, scarified to a depth of six (6) inches, moisture conditioned to achieve a moisture content of about two (2) percent above the optimum moisture content, and compacted to a minimum of 90 and a maximum of 95

percent relative compaction based on the ASTM D 1557 test method.

Where required to achieve design subgrade elevations, the excavated materials are to be replaced with approved, non-expansive, treated on-site or non-expansive import fill that is placed and compacted as described below.

- | | |
|----------------------------------|---|
| Material for Fill | Any fill to be placed at the site should not contain rocks or lumps greater than four (4) inches in greatest dimension and should not contain greater than 15 percent (by dry weight) larger than two-and-one-half (2.5) inches. Fill material within three (3) feet of the ground surface should have a maximum plasticity index of 12. Minimum 50-pound samples of materials to be used as engineered fill should be submitted to the project geotechnical engineer for review and approval prior to placement. It is anticipated that much of the Santa Clara Formation materials encountered at depth will be suitable for use as engineered fill |
| Aggregate Base
for Pavements | Aggregate base materials for pavement sections should consist of material conforming to the requirements for Caltrans Class 2 Aggregate Base, be moisture conditioned to within two (2) percent of optimum, and compacted to a minimum of 95 percent of the maximum dry density as determined by ASTM D1557. |
| Fill Placement
and Compaction | On-site native expansive soil used as fill in landscaping areas should be moisture conditioned to at least two (2) percent above optimum moisture content and compacted to a minimum of 90 percent of the maximum dry density as determined by the ASTM D1557 test method. Non-expansive import material used as fill should be moisture conditioned to within two (2) percent of optimum, spread in horizontal lifts not exceeding eight (8) inches in loose thickness, and compacted with an approved mechanical compactor to a minimum of 95 percent of the maximum dry density as determined by the ASTM D1557 test method. |

The upper 12 inches of fill in landscape areas may be compacted to a minimum of 85 percent to promote growth of vegetation. Final grading of the road should provide a minimum two (2) percent inboard slope to promote drainage.

Cut Slope Design Permanent cut slopes in competent Santa Clara Formation materials should not exceed inclinations of two to one (2 to 1) horizontal to vertical. Permanent cut slopes in surficial materials including soil and colluvium should not exceed inclinations of three-to-one (3 to 1) horizontal to vertical. Short-term temporary cuts should not exceed inclinations of one to one (1 to 1) horizontal to vertical without shoring.

Fill Slope Design Permanent engineered fill slopes should not exceed an inclination of two-to-one (2 to 1) horizontal to vertical. Fill slope inclinations may be increased with the use of geogrid reinforcement. At your request, we can provide design and construction criteria for geogrid-reinforced fill slopes.

Fill slopes should be provided with a keyway founded in competent weathered Santa Clara Formation materials located below the surficial soil and colluvium and be sloped inboard a minimum of two (2) percent. The depth of keyways should be determined in the field by the project geotechnical engineer at the time of construction. For preliminary budgeting purposes, it is anticipated that keyways will extend a minimum of 18 inches into competent materials.

Subdrains should be placed in fill slopes exceeding five (5) feet in height. The subdrains should be trenched a minimum of three (3) feet deep into placed fill and consist of a minimum four (4)-inch diameter, perforated, Schedule 40, PVC pipe (or approved functional equivalent) surrounded by approved, filtered drainrock. The necessity, final design, and construction of subdrains should be determined by the project geotechnical engineer prior to construction.

Previous Excavations Five (5) exploratory test pit was excavated within the properties by Connelly¹. It is presumed that the excavation was loosely backfilled with only moderate compactive effort. It is recommended that any test pits located within the proposed improvement areas and driveways be located, re-excavated, and filled in accordance with the design criteria presented above for Fill Placement and Compaction if it is located within five (5) feet of proposed improvements.

**Building
Foundations**

Because of the hillside setting, presence of expansive and relatively weak near surface soils, variability of foundation soils, and anticipated seismic shaking, it is recommended that the structures be constructed as a drilled, cast-in-place, friction pier and grade beam foundations that are isolated from expansive subgrade soils with the use of void forms. All foundation piers should be interconnected by the grade beams or tie beams. Maximum total and differential settlement of structures supported on drilled pier and grade beam foundations is estimated to be one-half (1/2) inch.

The foundations should be designed and constructed in accordance with the following design criteria. Final design of foundation configuration and reinforcement to be determined by a qualified structural engineer.

Minimum
Pier Diameter 16 inches.

Minimum
Pier Depth Eight (8) feet into competent weathered bedrock that is estimated to be encountered within about three (3) feet below the existing ground surface.

Minimum
Pier Spacing 3 pier diameters, center to center.

Maximum
Pier Spacing 10 feet.

Creep Loading	Piers and grade beams located on slopes should be designed to resist creep loading acting within three feet of the ground surfaces calculated using an equivalent fluid pressure of 85 pcf/f acting across two (2) pier diameters.
Allowable Shaft Friction	In competent weathered Santa Clara Formation materials: 700 psf in compression; 560 psf in uplift resistance. Neglect shaft friction within three (3) feet of existing ground surface. Increase by 33% for transient loads such as wind or seismic.
Lateral Resistance	350 pounds per cubic foot per foot (pcf/f) equivalent fluid pressure (in competent weathered claystone and conglomerate). Apply resistance over two (2) pier diameters. Neglect lateral resistance within three (3) feet of the existing ground surface. Increase by 33% for seismic or wind loads.
Minimum Pier Reinforcement	Four (4) - vertical No. 4 bars (two uphill and two downhill) with No. 3 spirals or ties at maximum 12-inch spacing. Reinforcement to be provided with a minimum of three (3) inches concrete cover. Reinforcing cages to be constructed with sufficient clearance to allow introduction of tremie pipe to the bottom of pier excavation.
Void Forms	Grade beams that do not extend through the surficial clay should be isolated from the clay with an approved, minimum six (6)-inch thick, collapsible void form that is functionally equivalent to <i>SureVoid</i> .
Construction	Pier holes should be free of standing water and cleared of all loose debris prior to pouring of concrete. If standing water collects in the pier excavations, the water should be pumped out or the concrete should be placed by the tremie method with the concrete displacing the water from the bottom up. If casing is required to maintain excavation stability, the casings shall be removed during placement of the concrete so that the concrete will cure in contact with native soil.

Uncased holes that encounter groundwater should be poured within 24 hours of drilling. All pier excavations should be inspected and approved by the project geotechnical engineer prior to the placement of reinforcing steel. Concrete over-pour (“mushrooming”) of piers and grade beams should be prevented with the use of “sono-tubes” where required.

Retaining Walls

Due to the sloping ground conditions, it is anticipated that retaining walls, either as partial rear walls to the structures or as site retaining walls, will be required to establish level building pads. Retaining walls should be supported by pier-and-grade-beam foundations as described previously for building foundations. Residence retaining walls should be constructed integrally with the mat foundations.

Retaining walls are to be designed to support the total of all applicable loads in accordance with the following geotechnical criteria:

Lateral
Loading

	Equivalent Fluid Pressure (pcf/f)			
		Surficial Clay	Weathered Bedrock	Select Fill*
Restrained	Level	80	55	55
	Up to 3H:1V	85	60	60
Unrestrained	Level	60	35	35
	Up to 3H:1V	65	40	40

* Retaining walls with select non-expansive backfill extending at least three (3) feet beyond the wall may be designed using “Select Fill” loading criteria.

Seismic Surcharge As described by Lew and others¹⁰, the evaluation of seismic earth pressures for unrestrained walls less than 12 feet tall is not necessary provided the walls are designed for a factor of safety of at least 1.5. However, the current CBC requires that all walls in excess of six (6) feet be designed to support lateral seismic loads. Restrained retaining walls exceeding six (6) feet in height shall be designed to resist a seismic surcharge calculated as a uniform lateral pressure of 19H psf, where H is the height of the wall. Retaining walls that

¹⁰ Lew, L., Sitar, N., Al Atik, L., Pourzanjani, M., and Hudson, M.B., 2010. “Seismic Earth Pressures on Deep Building Basements”, SEAOC 2010 Convention Proceedings.

can accommodate up to two (2) inches of lateral displacement during seismic loading may be designed to resist a uniform lateral pressure of $12.5H$ psf, where H is the height of the wall.

Traffic Surcharge Retaining walls that will support traffic loading are to be designed to support an additional uniform surcharge load of 80 psf along the upper five (5) feet of wall.

Wall Drainage The provided design pressures assume that the retaining walls will be fully drained. Positive drainage to daylight must be provided behind all retaining walls exceeding 18 inches in height. The drain should consist of a minimum 18-inch wide vertical blanket of Caltrans Class 2 permeable material or clean, crushed, durable one-half- to three-quarter- ($1/2$ - to $3/4$ -) inch drainrock that is completely enveloped by approved non-woven filter fabric. The upper 12 inches of retaining wall backfill should consist of compacted, low permeability material separated from the drainrock by a double layer of filter fabric.

A minimum four (4)-inch diameter, rigid (SDR 35 ABS, or functional equivalent) perforated pipe should be placed near the base of the drainage material on a minimum one (1)-inch thick drainrock layer with at least four (4) inches of drainage material on each side. The pipe should be sloped to drain at a minimum gradient of one (1) percent toward a suitably sited and constructed energy dissipation device to be approved by the project geotechnical engineer. The drainpipe should be provided with appropriate cleanouts.

Alternatively, drainage of the retaining walls may be accomplished by placing a prefabricated drainage panel (such as "Miradrain G100N") between the wall and backfill with fabric facing outward. The drainage panel should extend down to a four (4)-inch diameter, rigid, perforated pipe embedded in a minimum 12-inch wide by 18-inch high blanket of Caltrans Class 2 permeable material at the base of the wall. The manufacturer's specifications regarding any proposed prefabricated drainage panel should be reviewed by a geotechnical engineer to verify that it is appropriate for the intended use.

Wall Backfill Retaining wall drainrock and backfill placement and compaction should conform to the requirements for engineered fill and be compacted with appropriate equipment and in a manner to prevent excessive loading to adjacent walls or damage to waterproofing or drainage systems. Waterproofing membranes should be inspected for integrity during backfill placement and compaction.

**Swimming
Pools**

Swimming pools should be founded on approved, competent, weathered Santa Clara Formation materials that are encountered below the surficial clays.

Shell Pressure The swimming pool shell should be designed to withstand exterior lateral pressures as described above for retaining walls.

Base Drainage The pool bottom should be underlain by a minimum six (6)-inch thick gravel drainage blanket and a suitable pressure relief valve designed to protect the unfilled pool in the event of high groundwater. We should be provided an opportunity to examine the pool excavation prior to the placement of reinforcing steel or concrete.

**Seismic
Design
Criteria**

The site is expected to experience strong ground shaking from earthquakes along active faults located within the region during the design life of the project. Peak probable horizontal ground accelerations of 0.53g have been predicted by probabilistic methods. As a minimum, the structure should be designed to resist lateral loads resulting from ground shaking as provided in the current California Building Code (CBC) or other accepted design methods. Based on the observed site conditions, we conclude the following design parameters to be appropriate for design using the 2016 California Building Code design method:

Seismic Design Parameters

PARAMETER	VALUE
Site Class	C
S _s (0.2s Spectral Response Acc.) Default Site Class B	2.382
S ₁ (1.0s Spectral Response Acc.) Default Site Class B	0.904
S _{MS} (0.2s Spectral Response Acc.) Site Class C	2.382
S _{M1} (1.0s Spectral Response Acc.) Site Class C	1.175
S _{DS} (0.2s Spectral Response Acc.) Site Class C	1.588
S _{D1} (1.0s Spectral Response Acc.) Site Class C	0.783
F _a (Site Class C)	1.0
F _v (Site Class C)	1.3

For additional guidance on reducing the risks associated with living in seismically active areas, owners may wish to consult “Putting Down Roots in Earthquake Country”¹¹ (available on-line at the US Geological Survey), which references additional useful documents.

Concrete Slabs-on-Grade

The subgrades for concrete slabs-on-grade should be non-yielding and compacted to the requirements previously stated for engineered fill. Subgrades for interior slabs on grade should be removed and replaced with a uniform thickness of properly compacted non-expansive import or on-site-derived fill as discussed in the grading section of this report. Exterior slabs in areas underlain by expansive soils should be over-excavated to a minimum depth of 24 inches for replacement with engineered fill.

The slabs-on-grade should be underlain by a minimum of six (6) inches of compacted Caltrans Class 2 aggregate base, a minimum of five (5) inches thick, and reinforced with a minimum of No. 4 bars on 18-inch spacings in both directions. The baserock may count toward the total “non-expansive” thickness as described above. Slabs should be provided with minimum eight (8)-inch by eight (8)-inch thickened edges. Slab thickness, steel reinforcement, load-transfer devices, and crack control features should be determined by the structural engineer.

¹¹ United States Geological Survey, 2005, Putting down roots in earthquake country, General Information Product 15, <http://pubs.usgs.gov/gip/2005/15/>.

Exterior slabs should be structurally isolated from adjacent structures although a sleeved dowel connection may be used at entrances to limit differential vertical displacement. Exterior slab moisture and potential efflorescence can be limited with a moisture barrier consisting of a minimum 10-mil thick waterproof membrane as described in the Moisture Control section.

**Moisture
Control**

It is recommended that the project engage the services of a moisture control specialist to design, review, and oversee the installation of moisture and vapor protection systems. Additionally, it is essential that such systems be installed by qualified and experienced personnel. The following design and construction considerations are offered as a minimum standard.

To minimize moisture infiltration and potential efflorescence, the blind sides of floors and retaining walls should be sealed with a continuous water/vapor barrier such as high-density polyethylene (functionally equivalent to Tremco's *Paraseal LG* or Stego Industries' *StegoWrap* for horizontal surfaces and GCP's *Bithuthene* for vertical surfaces). The integrity of the moisture barrier is to be maintained at below-ground utility penetrations and at foundation piers grade beams. All below-ground cold joints and basement slab control joints should be provided with continuous waterstops flanged at both ends.

Installation, lapping, and sealing of waterproofing membranes should be performed in accordance with the manufacturers' recommendations. It is recommended that corners, such as at wall/footing joints, be provided with a cant strip or sloping infill to reduce the potential for damage to the overlying waterproofing membranes. Vertical vapor barriers should be protected from drainrock and backfill with a rigid panel or prefabricated drainage panel. The top edges of vapor barriers applied to vertical surfaces should be secured with manufacture-recommended termination bars.

**Surface
Drainage**

Positive surface drainage, with a minimum slope five (5) percent, should be provided away from the structures for a minimum distance of 10 feet as mandated by the current California Building Code. Where this is not possible due to topographic considerations, alternate approaches such as lined surface swales or low permeability surface treatments should be considered to limit the introduction of surface runoff to the building foundation.

Cut slope retaining walls should be provided with a lined swale that diverts upslope surface runoff to an appropriate storm water collection and dissipation system. Hard surfaces, such as perimeter walkways may be provided with a minimum one-and-one-half (1.5) percent cross slope. All roof sections should be provided with roof gutters connected via downspouts to minimum four (4)-inch diameter, non-perforated, rigid, smooth-wall drain-pipes that have a minimum slope of one (1) percent to discharge at approved downgradient locations.

The use of 90-degree angled connections should be strictly avoided in favor of long sweep-90 connections or combinations of maximum 45-degree angled connections. Drain lines should be provided with appropriate and sufficient cleanouts and isolated from subsurface drainage facilities.

Final siting of on-site storm drain discharge facilities, such as infiltration trenches or energy dissipaters, should avoid areas immediately downslope of proposed improvements and should be determined in the field by the project architect, civil engineer, and geotechnical engineer. The use of drought tolerant landscaping is encouraged to limit irrigation requirements.

Utilities

Underground utility pipes and conduits should be bedded with approved free-draining sand or quarry-fines. Trenches should be backfilled with compacted on-site or import fill material that does not contain rocks or lumps greater than three (3) inches in size. The backfill should be moisture conditioned to within two (2) percent of optimum, placed in maximum six (6)-inch horizontal layers and compacted by mechanical means to 90 percent of the maximum dry density as determined by the ASTM D1557 test method. The upper 24 inches of fill below exterior surface improvements (such as paved areas) should be backfilled with non-expansive soil and compacted to 95 percent of the maximum dry

density. Compaction of trench backfill by flooding, jetting, or other non-mechanical means shall not be permitted.

Sloping trenches should be provided with minimum 12-inch thick, low permeability cutoff walls (such as clay or controlled density pumpable fill (CDF)) at maximum lateral intervals of 25 feet to limit the migration of bedding soils.

**Erosion
Protection**

Project contractors should observe Best Management Practices during construction operations to protect areas downslope from construction activities and limit generation and offsite transport of sediment throughout the duration of construction. At a minimum, erosion protection should consist of properly installed fiber rolls (bio-wattles) or erosion fencing below the downslope limits of grading. Additionally, stripped slope areas should be provided with appropriate erosion protection methods prior to the rainy season.

**TECHNICAL
REVIEW**

This report should be reviewed by the project architect, engineers, and potential contractors prior to the next stage of development. A copy of this report should also be provided to the general contractor for reference during construction.

Any questions or discrepancies should be brought to the attention of a representative of Milstone Geotechnical prior to the start of design and construction.

We request an opportunity to review the final plans, design calculations, and specifications prior to construction to confirm that our recommendations have been incorporated and, if necessary, to provide supplemental recommendations. It has been our experience that the permit process may be expedited if we review the plans prior to submittal

**GEOTECHNICAL
CONSTRUCTION
OBSERVATION**

Site grading, subgrade improvement, mat subgrade preparation, moisture barrier installation, drainage control installations, and placement of engineered fill and backfill should be observed by the project geotechnical engineer (prior to placement of steel and concrete) to verify that the encountered site conditions are the same as those anticipated by this investigation and to verify conformance with our recommendations. A minimum of three (3) working-days notification prior to construction activities requiring inspection services is required. The cost of these services will be charged on a time-and-expenses basis.

Geotechnical plan review and construction observation are conducted to reduce - not eliminate - the risk of problems arising during construction, and provision of the service does not create a warranty or guarantee of any type. In all cases, contractors shall retain responsibility for the quality and completeness of their work, for adhering to the plans, specifications, and recommendations on which their work is based, and for contacting the appropriate parties in a timely manner regarding construction activities that require inspection or observation services.

It is suggested that an on-site pre-construction meeting be conducted with the owner, designer, geotechnical engineer, general contractor, and appropriate subcontractors (such as excavation and grading) prior to the start of construction to establish project expectations and communication protocol.

LIMITATIONS

These services consist of professional opinions and recommendations made in accordance with generally accepted engineering geologic and geotechnical engineering principles and practices in the San Francisco Bay Area at the time this report was written. The investigation was performed, and this report prepared, for the exclusive use of the client, and for specific application to proposed site development as outlined in the body of the report. No third-party shall have the right to rely on the findings, opinions, or recommendations rendered in connection with this investigation without the written consent of Milstone Geotechnical. No warranty, express or implied, or merchantability of fitness, is made or intended in connection with this work, by the proposal for consulting or other services, or by the furnishing of oral or written reports or findings.

This report is issued with the understanding that the owners choose the risk they wish to bear by the expenditures and savings involved with the chosen construction alternatives. The recommendations and design criteria presented in this report are contingent upon a representative of Milstone Geotechnical being retained to review the final plans and specifications and to provide geotechnical construction observation services for all earthwork and construction operations that are addressed by this report.

Unanticipated soils and geologic conditions are commonly encountered during construction and cannot be fully determined from existing exposures. If conditions encountered in the field are different than those anticipated by this report, our firm should be contacted immediately to provide any necessary revisions to the recommendations.

This report is issued with the understanding that it is the responsibility of the owner or of their representative to see that all parties to this project including designers, engineers, contractors, subcontractors, etc. are made aware of this report and to see that the contractor and subcontractors carry out such recommendations in the field. The recommendations contained herein are valid for one year, after which time they must be reviewed by a representative of Milstone Geotechnical to determine whether they are still applicable.

APPENDIX A
FIELD INVESTIGATION

Description of Subsurface Investigation

Soil Classification Chart

Logs of Exploratory Boreholes MG1 through MG4

SUBSURFACE INVESTIGATION DESCRIPTION

Our subsurface investigation involved drilling, logging, and sampling of two (2) small diameter exploratory boreholes to verify and supplement subsurface data presented by Steven Connelly^{Error! Bookmark not defined.}. The boreholes were advanced by Britton Exploration, under the direction of Milstone Geotechnical, using a track-mounted CME45 drill rig with a six (6.0)-inch diameter solid-stem auger. The boreholes were drilled to depths of 15.5 and 20.0 on May 6, 2019. Following completion of drilling and sampling, the boreholes were backfilled with loosely tamped soil cuttings to the ground surface. Subsequently, obtained samples were transported to the laboratory to verify field classification and perform index and strength testing. Borehole locations are depicted on Figure 3 located in the body of the report. Graphical logs of the boreholes and a key to soil classification follows in this appendix.

The encountered earth materials were continuously logged and described in the field by a registered geotechnical engineer. Relatively undisturbed samples were obtained at various depths with a three (3.0)-inch-outside-diameter, two-and-one-half (2.5)-inch-inside-diameter, split-barrel (Modified California) sampler with a series of six (6)-inch-long, thin walled brass liners. Resistance blowcounts were obtained with the samplers by repeatedly dropping a 140-pound auto-hammer through a free-fall distance of 30 inches using an automatic hammer. The samplers were driven 18 inches (or to apparent refusal) and the number of blows recorded for each six (6) inches of penetration. The blows per foot recorded on the borehole logs represent the accumulated number of blows to drive the sampler the last 12 inches of penetration corrected to represent standard penetration blowcounts with Modified California sampler results corrected to represent Standard Penetration test blowcounts.

The borehole logs and related information show our interpretation of the subsurface conditions at the dates and locations indicated, and it is not implied that they are representative of subsurface conditions at other locations or at other times.

CRITERIA FOR ASSIGNING GROUP SYMBOLS AND GROUP NAMES			SOIL CLASSIFICATION		
			GRAPHIC SYMBOL	USCS GROUP SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS LARGER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES		GW	Well graded gravel
				GP	Poorly graded gravel
		GRAVELS WITH MORE THAN 12% FINES		GM	Silty gravel
				GC	Clayey gravel
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES		SW	Well graded sand
				SP	Poorly graded sand
		SANDS WITH MORE THAN 12% FINES		SM	Silty sand
				SC	Clayey sand
FINE-GRAINED SOILS MORE THAN HALF IS SMALLER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50%	INORGANIC		ML	Low plasticity silt
				CL	Low plasticity clay, Lean clay
		ORGANIC		OL	Low plasticity organic silt, Low plasticity organic clay
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%	INORGANIC		MH	High plasticity silt, Elastic silt
				CH	High plasticity clay, Fat clay
		ORGANIC		OH	Medium to high plasticity organic silt or clay
	HIGHLY ORGANIC SOILS	PRIMARILY ORGANIC MATTER		PT	Peat

Note: Blow-counts reported for samplers other than a Standard Penetration Split Spoon Sampler were obtained by empirically converting the number of blows required to drive the sampler through the last 12 inches of an 18-inch penetration to the equivalent number of blows using a Standard Penetration Split Spoon Sampler.

Note: The borehole logs depict our interpretation of the subsurface conditions at the dates and locations indicated. It is not warranted that they are representative of subsurface conditions at other times and locations. The lines separating strata on the boring logs represent approximate boundaries only. Actual transitions may be gradual.

ABBREVIATIONS

AD: Auger Drilling

MC: Modified California Sampler

SPT: Casagrande Sampler

T1: Tube Sample (undisturbed)

B1: Grab Sample (disturbed)



**MILSTONE
GEOTECHNICAL**

**SOIL CLASSIFICATION CHART
AND
KEY TO LOGS OF EXPLORATORY BOREHOLES**

LOG OF EXPLORATORY BOREHOLE MG1

Project Proposed Anderson Residences

Project Number 184950

Location 400 Surmont, CA

Project Elev. ~420 feet

Page 1 of 1

Drilling Equipment Track-mounted CME45

Hole Diameter 6 inches

Logged By RLF

Drilling Contractor Britton Exploration

Surface weeded

Date 5/6/19

TORVANE (tsf)	POCKET PENET. (tsf)	GROUND- WATER	RECOVERY (in./in.)	SPT (bpf) or PRESS. (psi)	SAMPLE OR DRILL MODE	SAMPLE DESIG- NATION	DEPTH IN FEET	GRAPHIC LOG	USCS DESIG.	GEOTECHNICAL DESCRIPTION
					AD		1		SC	COLLUVIAL AND RESIDUAL SOIL Clayey SAND Gravel: Very dark gray (10YR3/1); loose; damp; abundant rootlets.
			18/18	17	MC	T1	2		GC	SANTA CLARA FORMATION Clayey GRAVEL: Light yellowish brown and brownish yellow (10YR6/4,6/1); ~70% medium to severely weathered gravel to 2-inch size; ~20% fine to coarse grained sand; ~10% medium plasticity fines; medium dense; moist.
			18/18	19	SPT	B1	3			
					AD		4		SM	Silty SAND: with Gravel: Yellowish brown (10YR5/6); ~30% weathered sandstone and siltone gravel to 1-inch size; ~60% fine to coarse grained sand; ~10% low plasticity fines; medium dense; moist.
			12/18	28	MC	T3	5		GC	
					AD		6			
			18/18	25	SPT	B2	7		Slst	Clayey GRAVEL: Dark yellowish brown with very dark grayish brown (10YR4/6,3/2); ~70% medium to severely weathered gravel to 1.5-inch size; ~15% medium to coarse grained sand; ~15% medium plasticity fines; medium dense; moist to wet.
					AD		8			Sandy SILTSTONE: Yellowish brown (10YR5/6); severely weathered; weak; soft; friable; with very fine grained sand; very moist.
			18/18	40	MC	T5	9		Clst	Weathered CLAYSTONE: Grayish brown (10YR5/2) with carbonate stained veins; severely weathered; weak; soft; friable; moist.
					AD		10			
			18/18	45	SPT	B3	11			Silty GRAVEL with Sand: Yellowish brown (10YR5/6) with variable gravel colors; ~70% rounded to subrounded gravel to 2-inch size; ~20% fine to coarse grained sand; ~10% medium plasticity fines; dense; moist.
					AD		12			
			18/18	28	MC	T7	13			
					AD		14		GM	
			18/18	47	SPT	B4	15			Slightly clayey, very moist.
					AD		16			
			18/18	45	MC	T9	17			Clayey matrix.
					AD		18			
			18/18	39	SPT	B5	19		Clst	Weathered CLAYSTONE: Light yellowish brown and pale yellow (10YR6/3,7/4); severely weathered; weak; soft; carveable; moist.



**MILSTONE
GEOTECHNICAL**

Remarks: Borehole terminated at 20.0 feet.
No ground water encountered.
Borehole backfilled with tamped cuttings.

LOG OF EXPLORATORY BOREHOLE MG2

Project Proposed Anderson Residences

Project Number 184950

Location 400 Surmont, CA

Project Elev. ~403 feet

Page 1 of 1

Drilling Equipment Track-mounted CME45

Hole Diameter 6 inches

Logged By RLF

Drilling Contractor Britton Exploration

Surface weeded

Date 5/6/19

TORVANE (tsf)	POCKET PENET. (tsf)	GROUND- WATER	RECOVERY (in./in.)	SPT (bpf) or PRESS. (psi)	SAMPLE OR DRILL MODE	SAMPLE DESIG- NATION	DEPTH IN FEET	GRAPHIC LOG	USCS DESIG.	GEOTECHNICAL DESCRIPTION
					AD		1	CH	CH	COLLUVIAL AND RESIDUAL SOIL Sandy CLAY: Very dark grayish brown (10YR3/2); fine to coarse grained sand; medium to high plasticity fines; damp; abundant rootlets.
>4.5			9/18	9	MC	T1	2	CH	CH	Sandy CLAY: Dark yellowish brown (10YR3/4); trace gravel to 1/2-inch size; ~20% fine to coarse grained sand; ~80% medium to high plasticity fines; very stiff; very moist.
3.0			12/18	18	SPT	B1	3			
					AD		4	SC	SC	SANTA CLARA FORMATION Clayey SAND with Gravel: Yellow brown with brownish yellow and dark brown and dark yellowish brown (10YR5/6, 6/8, 4/6); ~5% weathered gravel to 3/4-inch size; ~60% fine to coarse grained sand; ~35% medium plasticity fines; medium dense; moist.
2.5			15/18	19	MC	T3	5	CL	CL	Sandy CLAY: Dark yellowish brown (10YR4/6); ~40% very fine to fine grained sand; ~60% low to medium plasticity fines; very stiff; very moist.
			15/18	23	SPT	B2	6			
					AD		7	GC/SC	GC/SC	Clayey GRAVEL to Clay SAND: Dark yellowish brown (10YR4/6); ~40% subangular to subrounded gravel to 1.5-inch size; ~40% fine to coarse grained sand; ~20% medium plasticity fines; medium dense; very moist.
>4.5			12/18	25	MC	T5	8			
>4.5					AD		9			
			18/18	22	SPT	B3	10			Weathered SILTSTONE: Yellowish brown (10YR5/6); severely weathered; weak; soft; slightly clayey; trace very fine grained sand; very moist.
					AD		11			
			15/18	33	MC	T7	12			
>4.5					AD		13			
>4.5			18/18	32	SPT	B4	14			
					AD		15			
			18/18	25	MC	T9	16			
4.5					AD		17			Mottled with yellowish brown (10YR5/4); clayey; very moist.
>4.5			18/18	25	SPT	B5	18			
					AD		19			
					AD					Clayey GRAVEL: Dark yellowish brown (10YR4/6); ~50% rounded gravel to 1/2-inch size; ~20% fine to coarse grained sand; ~30% medium plasticity fines; medium dense; moist; abundant calcium carbonate.



**MILSTONE
GEOTECHNICAL**

Remarks: Borehole terminated at 20.0 feet.
No ground water encountered.
Borehole backfilled with tamped cuttings.

LOG OF EXPLORATORY BOREHOLE MG3

Project Proposed Anderson Residences Project Number 184950
 Location 22700 Mt. Eden Road, Saratoga, CA Project Elev. ~394 feet Page 1 of 1
 Drilling Equipment Track-mounted CME45 Hole Diameter 6 inches Logged By RLF
 Drilling Contractor Britton Exploration Surface weeded Date 5/6/19

TORVANE (tsf)	POCKET PENET. (tsf)	GROUND- WATER	RECOVERY (in./in.)	SPT (bpf) or PRESS. (psi)	SAMPLE OR DRILL MODE	SAMPLE DESIG- NATION	DEPTH IN FEET	GRAPHIC LOG	USCS DESIG.	GEOTECHNICAL DESCRIPTION
	>4.5				AD		1		CH	COLLUVIAL AND RESIDUAL SOIL Sandy CLAY with Gravel: Dark brown (10YR3/3); gravel to 2-inch size; fine to coarse grained sand; medium to high plasticity fines; damp; abundant rootlets.
			18/ 18	13	MC	T1	2		CH	
						T2				Sandy CLAY: Dark yellowish brown with yellowish brown specs (10YR3/4,5/8); ~20% fine to coarse grained sand; ~80% medium to high plasticity fines; hard; moist.
			18/ 18	21	SPT	B1	3			
					AD		4		SM	SANTA CLARA FORMATION Silty to Clayey GRAVEL with Sand: Light yellowish brown and brownish yellow (10YR5/6,6/8); ~50% moderately weathered gravel to 1.5-inch size; ~30% fine to coarse grained sand; ~20% medium plasticity fines; medium dense; moist. Yellowish brown (10YR5/6); dense.
			12/ 18	25	MC	T3	5			
						T4	6			
			18/ 18	39	SPT	B2	7			
					AD		8			
			18/ 18	47	MC	T5	9			
						T6	10			
			18/ 18	39	SPT	B3	11			
					AD		12			
			12/ 12	33/ 6"	MC	T7	13			
						T8	14			
			18/ 18	42	SPT	B4	15			
							16			
							17			
							18			
							19			



**MILSTONE
GEOTECHNICAL**

Remarks: Borehole terminated at 15.5 feet.
 No ground water encountered.
 Borehole backfilled with tamped cuttings.

LOG OF EXPLORATORY BOREHOLE MG4

Project Proposed Anderson Residences

Project Number 184950

Location 22700 Mt. Eden Road, Saratoga, CA

Project Elev. ~374 feet

Page 1 of 1

Drilling Equipment Track-mounted CME45

Hole Diameter 6 inches

Logged By RLF

Drilling Contractor Britton Exploration

Surface weeded

Date 5/6/19

TORVANE (tsf)	POCKET PENET. (tsf)	GROUND- WATER	RECOVERY (in./in.)	SPT (bpf) or PRESS. (psi)	SAMPLE OR DRILL MODE	SAMPLE DESIG- NATION	DEPTH IN FEET	GRAPHIC LOG	USCS DESIG.	GEOTECHNICAL DESCRIPTION
	3.25				AD		1		CH	COLLUVIAL AND RESIDUAL SOIL Sandy CLAY with Gravel: Dark brown (10YR3/3); gravel to 2-inch size; fine to coarse grained sand; medium to high plasticity fines; soft; damp; abundant rootlets.
			18/18	15	MC	T1	2		CH	
						T2				Sandy CLAY with Gravel: Dark yellowish brown with yellowish brown specs (10YR4/4); ~20% fine to coarse grained sand; ~80% medium to high plasticity fines; very stiff; very moist.
			18/18	20	SPT	B1	3		SC/GC	
					AD		4			SANTA CLARA FORMATION Clay SAND to clayey GRAVEL: Dark yellowish brown (10YR4/4,4/6); ~40% gravel to 1-inch size; ~40% fine to coarse grained sand; ~20% medium to high plasticity fines; medium dense; moist.
			12/18	16	MC	T3	5			
						T4	6			Clayey GRAVEL: Dark yellowish brown and yellowish brown (10YR4/6,5/6); ~60% moderately weathered gravel to 1.5-inch size; ~20% fine to coarse grained sand; ~20% medium plasticity fines; medium dense; moist.
			18/18	27	SPT	B2	7			
					AD		8			Gravel to at least 2.5-inch size.
							9			
			18/18	37	MC	T5	10		GC	
						T6				
			18/18	31	SPT	B3	11			
					AD		12			
			12/12	33/6"	MC	T7	13			
						T8	14			
			18/18	42	SPT	B4	15			
							16			
							17			
							18			
							19			



**MILSTONE
GEOTECHNICAL**

Remarks: Borehole terminated at 15.5 feet.
No ground water encountered.
Borehole backfilled with tamped cuttings.

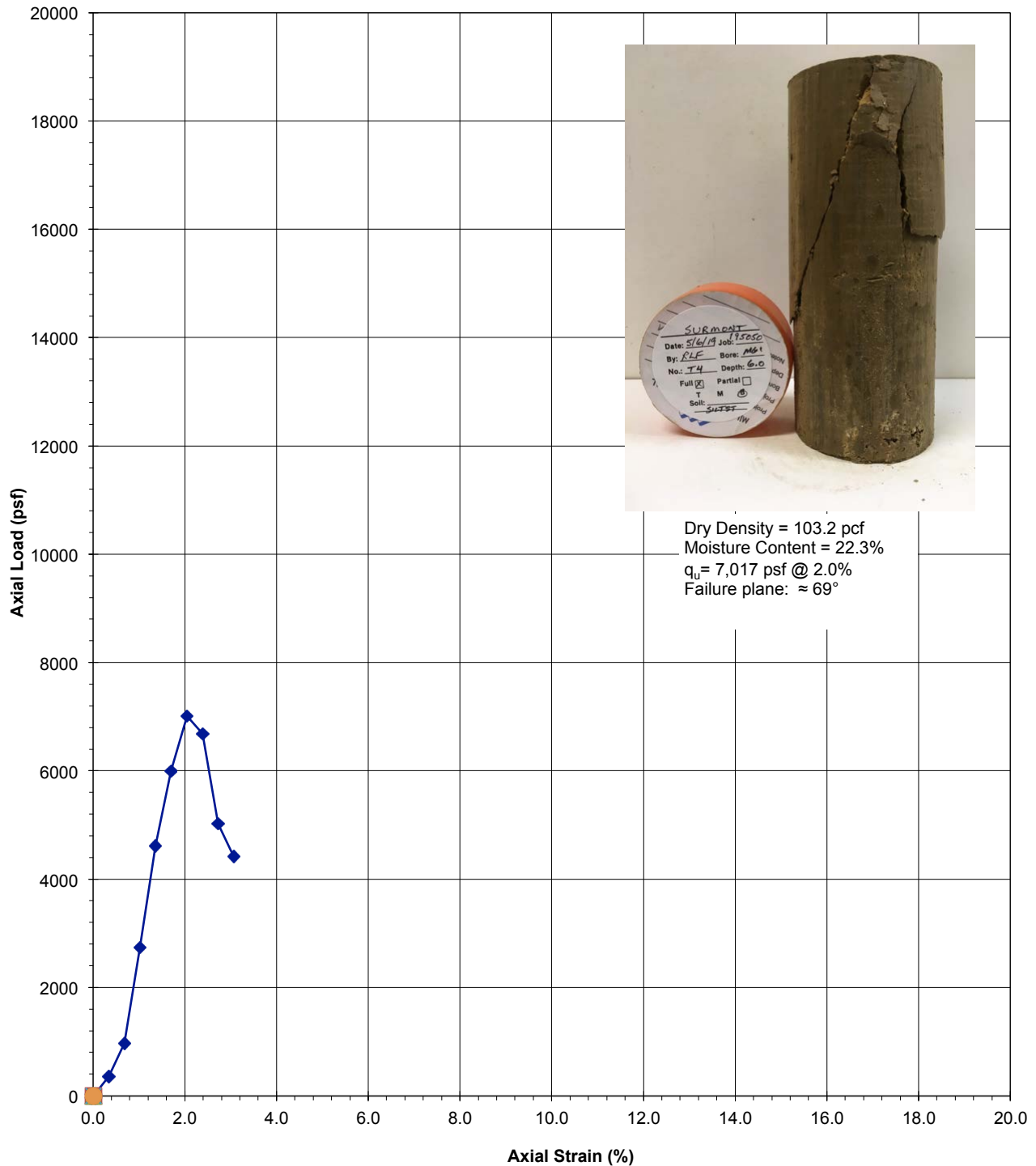
APPENDIX B
LABORATORY INVESTIGATION

Summary of Laboratory Test Results
Unconfined Compression
Atterberg Limits
Constant Volume Swell

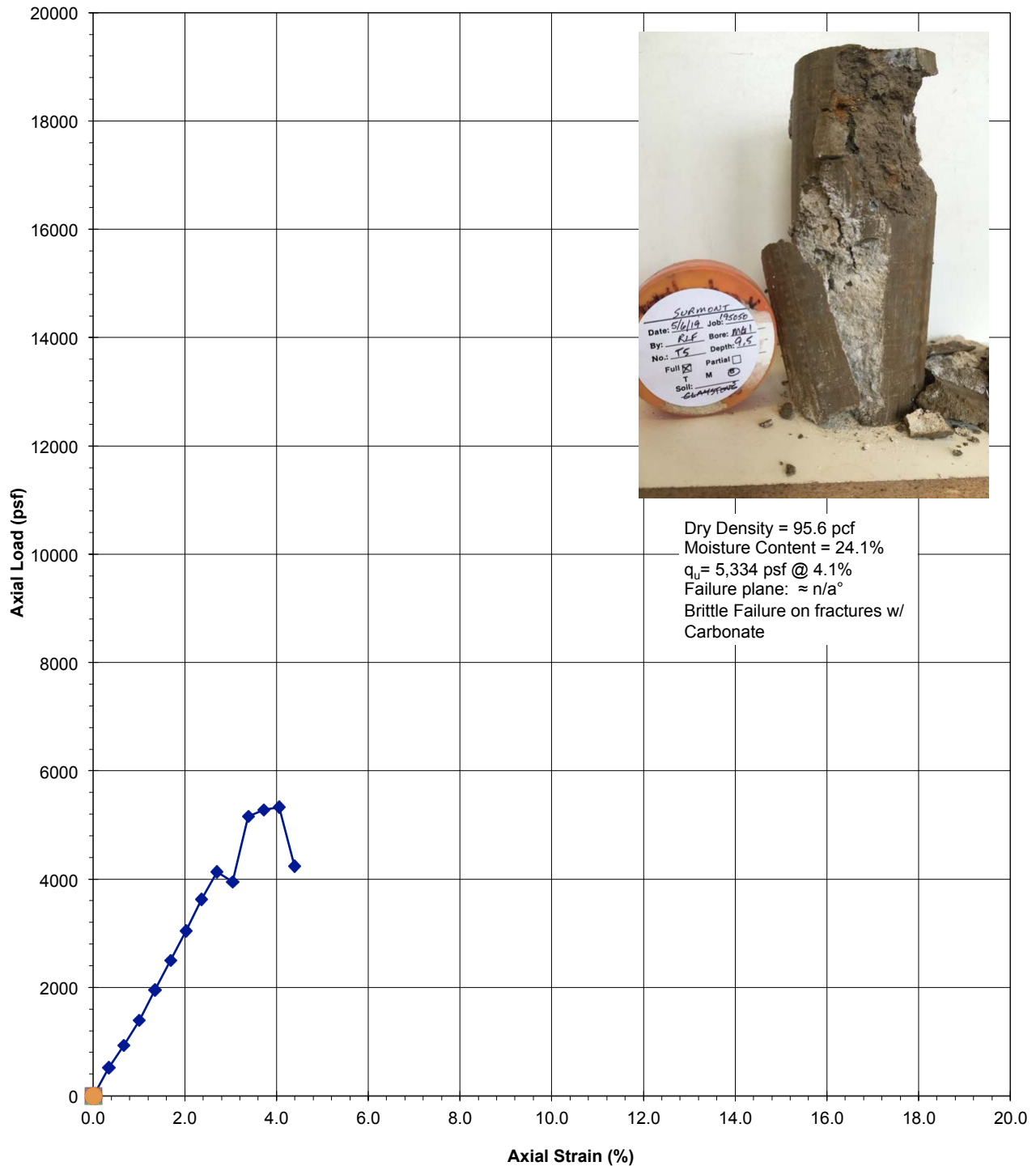
Summary of Laboratory Test Results
Proposed Surmont Residences
400 Surmont Drive
Los Gatos, California

Borehole/ Sample No.	Depth (ft)	Earth Material	Moisture Content (%)	Dry Density (pcf)	Unconfined Compressive Strength (psf)	Atterberg Limits (LL / PI) (% / %)	Constant Volume Swell Pressure (psf)
MG1/T2	2.0	GC	10.4	108.9	-	-	-
MG1/T4	6.0	CH-CL	22.3	103.2	7,017	-	-
MG1/T5	9.5	SC	24.1	95.6	5,334	-	-
MG1/T8	14.0	CH	10.3	119.0	-		3,417
MG1/T10	18.0	SC/CH	8.0	126.9	-	-	-
MG2/T2	2.0	CH-CL	-	-	-	-	-
MG2/T4	6.0	CH	22.8	104.5	-	-	-
MG2/T6	10.0	SC	22.9	101.3	4,883	-	-
MG2/T8	14.0	CH-CL	19.1	110.5	9,318	-	-
MG2/T9	17.5	CH/GC	22.5	101.1	-	-	-
MG3/T2	2.0	CH-CL	11.5	111.0	-	-	-
MG3/T4	6.0	CH	14.2	110.0	-	-	-
MG3/T6	10.0	SC	8.6	121.0	-	-	-
MG3/T8	13.5	CH-CL	11.4	103.9	-	-	-
MG4/B1	0.5	CH-CL	22.9	-	-	69 / 46	-
MG4/T2	2.0	CH-CL	14.3	118.7	-	-	-
MG4/T4	6.0	CH	13.9	119.6	-	-	-
MG4/T6	10.0	SC	8.9	124.4	-	-	-
MG4/T7	13.0	CH-CL	10.0	119.8	-	-	-

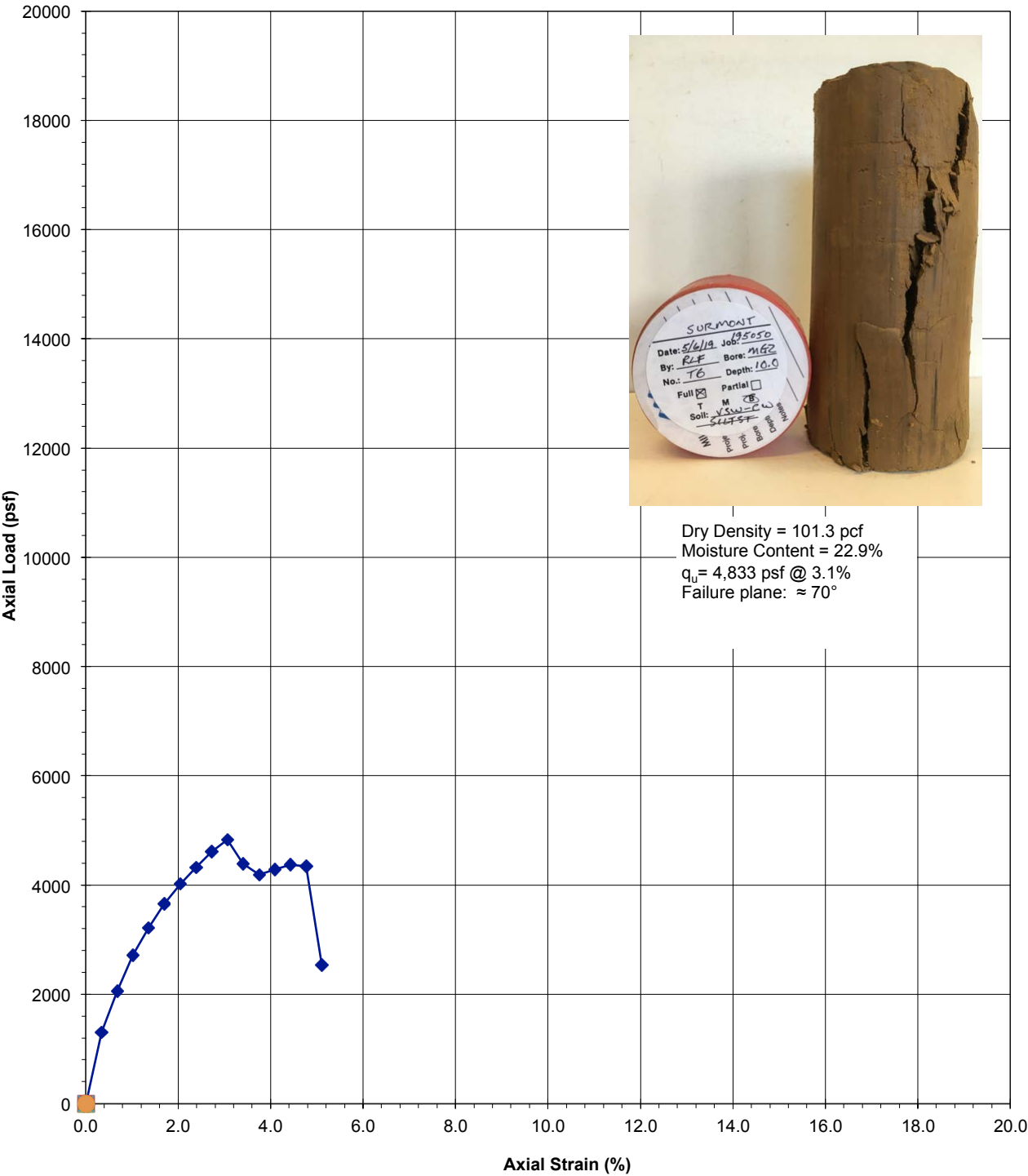
Unconfined Compression Test Results
Surmont
Boring MG1, T4 @ 6.0'
Claystone, Yel Brn, Very Severely Weathered, Soft



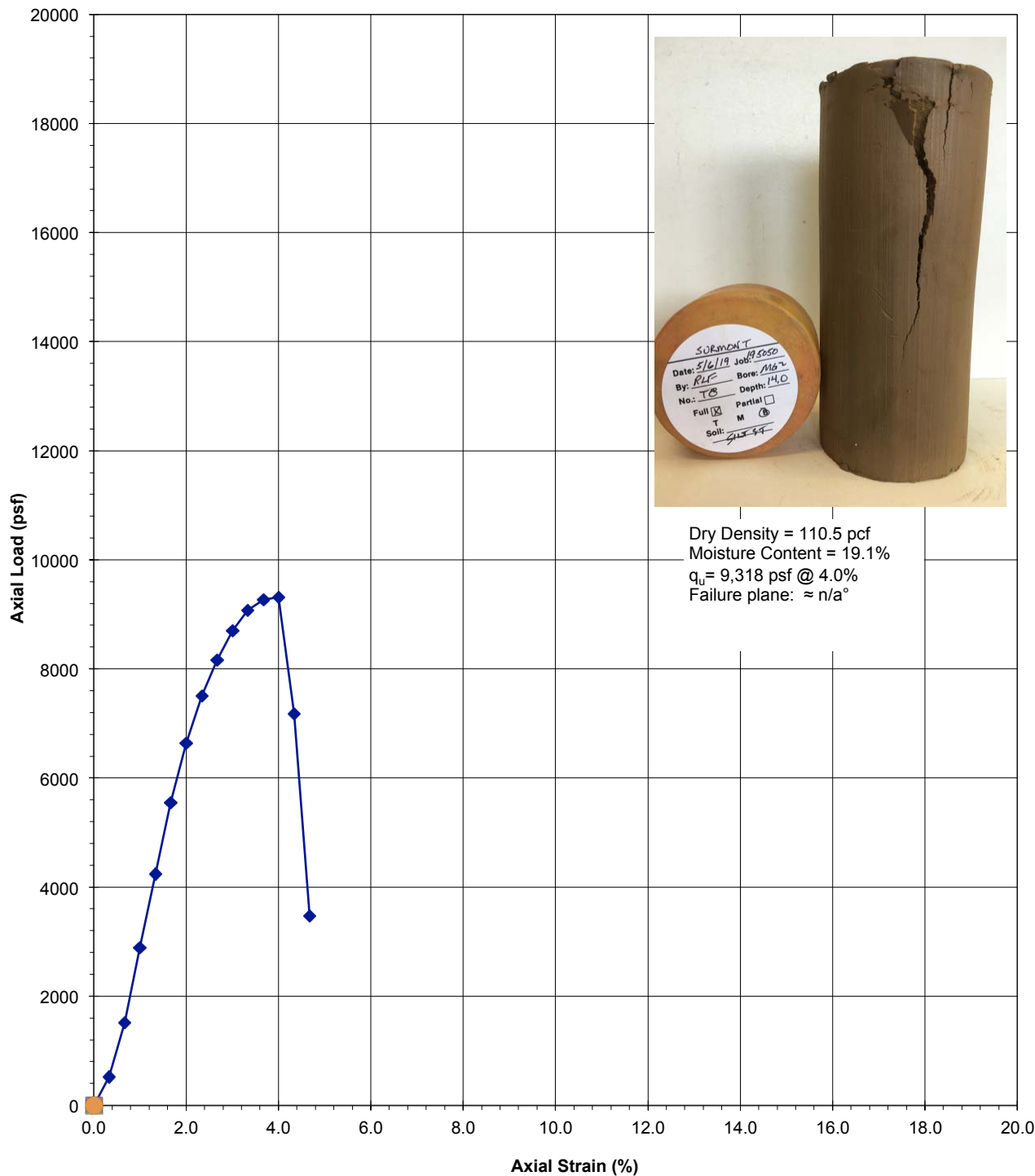
Unconfined Compression Test Results
Surmont
Boring MG1, T5 @ 9.5'
Claystone, Mottled Dk Yel Brn, Very Severely Weathered, Soft



Unconfined Compression Test Results
Surmont
Boring MG2, T6 @ 10.0'
Siltstone, Dk Yel Brn, Very Severely Weathered, Soft



Unconfined Compression Test Results
Surmont
Boring MG2, T8 @ 14.0'
Siltstone, Dk Yel Brn, Very Severely Weathered, Soft



FISHER GEOTECHNICAL

Client Name: Milstone Geotechnical
Client Address: 17020 Melody Lane
Los Gatos, CA 95033

Client Contact: Barry Milstone
Report Date: 5/20/19
Date Received: 5/6/19

Project Name: Surmont
Project Location: 400 Surmont Dr., Los Gatos
Sample ID: MG4, B1@ 0-1.0'
Visual Description: Sandy Fat Clay (CH), dk yel brn/dk brn
Reference: Passing No. 40 portion tested
Test Classification: CH

Liquid Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:	6.00	8.10	7.20	6.10	6.00	
Weight of Dry Soils + Pan:	5.10	6.00	5.80	4.80	4.70	
Weight of Pan:	3.70	2.90	3.70	2.90	2.90	
Weight of Dry Soils:	1.40	3.10	2.10	1.90	1.80	
Weight of Moisture:	0.90	2.10	1.40	1.30	1.30	
% Moisture:	64.3 %	67.7 %	66.7 %	68.4 %	72.2 %	
Number of Blows, N:	41	33	31	24	19	

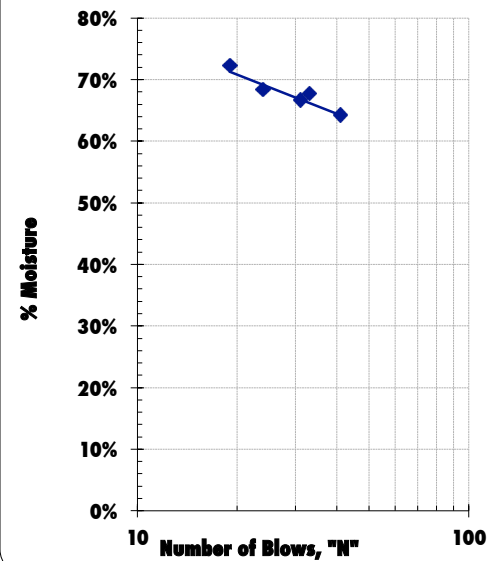
Atterberg Limits (whole no.)

Liquid Limit@ 25 Blows:	69.34 %	69
Plastic Limit Average:	23.54 %	24
Plasticity Index, I _p :	45.81 %	46

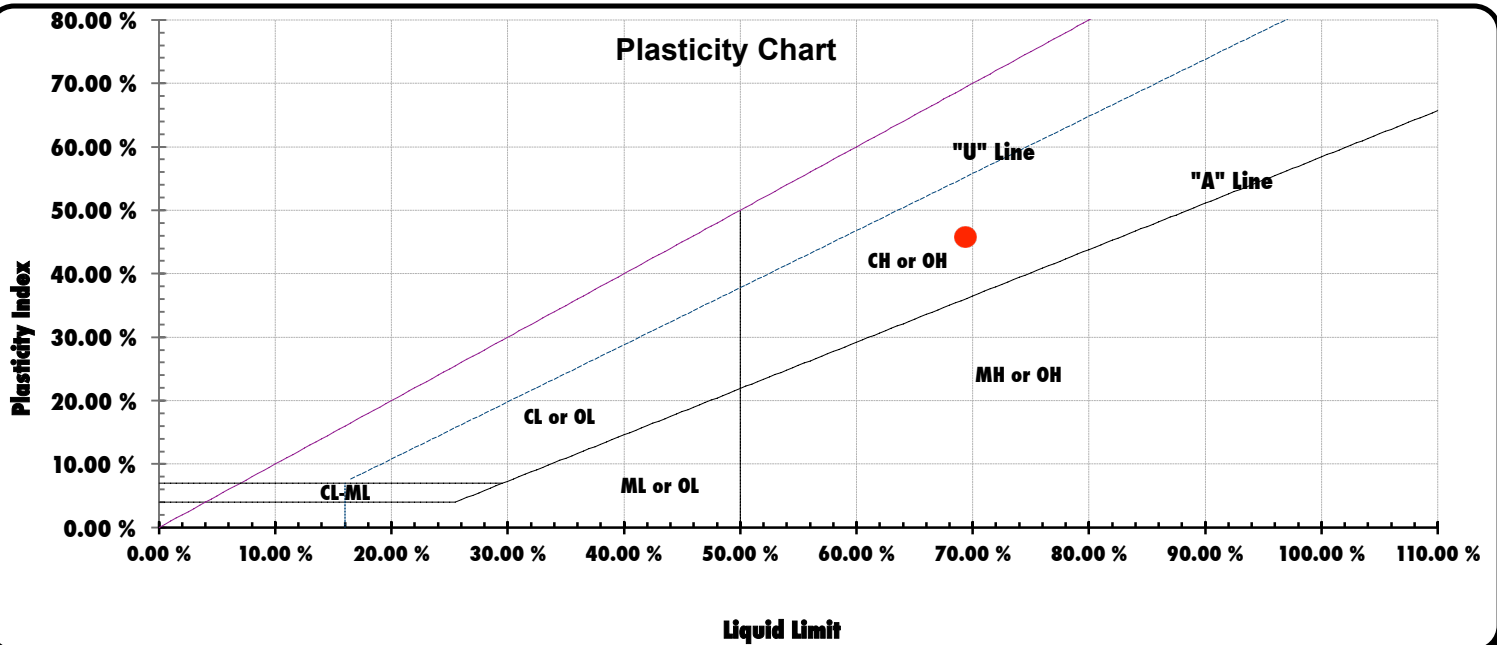
Plastic Limit Determination

	#1	#2	#3	#4	#5	#6
Weight of Wet Soils + Pan:	8.10	8.90				
Weight of Dry Soils + Pan:	7.10	7.90				
Weight of Pan:	2.90	3.60				
Weight of Dry Soils:	4.20	4.30				
Weight of Moisture:	1.00	1.00				
% Moisture:	23.8 %	23.3 %				

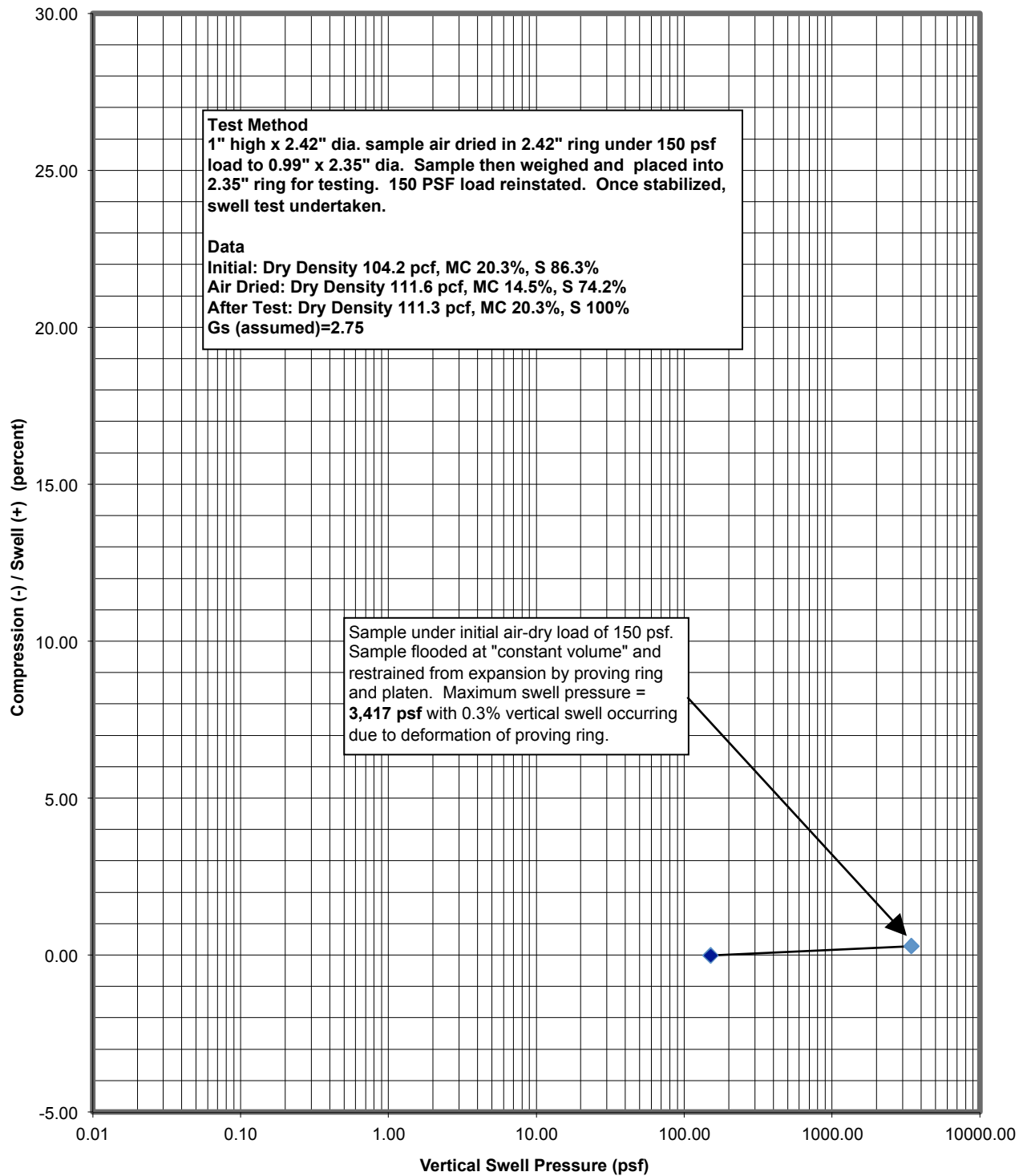
Liquid Limit



Plasticity Chart



SWELL TEST RESULTS (CONSTANT VOLUME)
SURMONT
PROJECT 195050, BORING MG2 @ 2.0' Sample T2
Dk Brn Sandy Fat Clay (CH)



FISHER GEOTECHNICAL
SOIL TESTING LABORATORY

CLIENT: Milstone Geotechnical

Attachment D: Geologic Report

**ENGINEERING GEOLOGIC INVESTIGATION
PROPOSED RESIDENCES
APN 527-260-003
400 SURMONT DRIVE
LOS GATOS, CALIFORNIA**

Prepared for

**Ms. Sandra K. Anderson
%
Mr. Bob Hughes
400 Surmont Drive
Los Gatos, California**

May 2019

STEVEN F. CONNELLY, C.E.G.



May 18, 2019
Project #1909

Ms. Sandra K. Anderson
%
Mr. Bob Hughes
400 Surmont Drive
Los Gatos, CA 95032

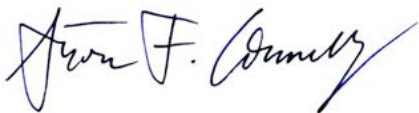
Subject: **ENGINEERING GEOLOGIC INVESTIGATION**
Proposed Residences
APN 527-20-003
400 Surmont Drive
Los Gatos, California

Dear Ms. Anderson,

At your request, I have prepared this Engineering Geologic Investigation for the proposed residences to be constructed on your property, APN 527-20-003, located at 400 Surmont Drive in Los Gatos, California. I understand that you intend to subdivide the property and construct two new residences on Parcels 1 and 2, as approximately shown on plans provided for my review. The accompanying report presents my findings regarding the geologic conditions and potential geologic hazards influencing the proposed development.

I am pleased to have been of service to you on this project. Please contact me if you have any questions regarding this report.

Very truly yours,



Steven F. Connelly
Certified Engineering Geologist 1607

Copies: 7 - Addressee
 1 - Milstone Geotechnical

**ENGINEERING GEOLOGIC INVESTIGATION
PROPOSED RESIDENCES
APN 527-20-003
400 SURMONT DRIVE
LOS GATOS, CALIFORNIA**

This report presents the results of an Engineering Geologic Investigation for the proposed residences to be constructed on the property, APN 527-20-003, located at 400 Surmont Drive in Los Gatos, California (see Figure 1, Site Location Map). I understand that 2 new lots will be subdivided from the property and that new homes are planned, as approximately shown on Figure 9, Site Geologic Map.

The property is located within the Blossom Hill area of Los Gatos, as shown on Figure 2, Regional Topographic Map. Several northwest-trending thrust faults have been mapped to the southwest of the property, as shown on Figure 3, Regional Geologic Map. The property is also located within hillside terrain susceptible to potential landsliding. Most of the property lies within a State Seismic Hazard Zone for potential earthquake-induced landsliding, as shown on Figure 5, State Seismic Hazard Zone Map. Consequently, the Town of Los Gatos requires geologic investigation to assess potential geologic hazards for the proposed residences.

The purpose of this Engineering Geologic Investigation is to identify existing geologic conditions and potential geologic, fault, landslide, or seismic hazards on the subject property, and to provide appropriate recommendations for the proposed residences. The scope of this investigation included review of pertinent geologic maps and literature; review of previous nearby investigations; communications with Dr. Robert Wright, the Reviewing Geologist for the Town of Los Gatos; consultation with the project Geotechnical Engineer, Mr. Barry Milstone of Milstone Geotechnical; analysis of historical aerial photographs; a site reconnaissance and mapping; excavation and logging of five test pits on the property; engineering geologic analysis; drafting and preparation of this report.

This report has been prepared for the exclusive use of Ms. Sandra K. Anderson, and project architects and engineers for the proposed new construction. This investigation has been conducted in accordance with generally accepted engineering geology principles and practices. No other warranty, either expressed or implied, is made. In the event that any changes in the nature or location of the improvements are planned, the conclusions and recommendations of this report shall not be considered valid unless such changes are reviewed, and the conclusions and recommendations of this report are modified or verified in writing by Certified Engineering Geologist 1607.



Photo 1: 2009 aerial photograph showing the subject property.

Site Conditions

The proposed new parcels are roughly rectangular-shaped lots located to the southeast of the end of Surmont Drive, as shown on Photo 1 above. The parcels are situated within the Los Gatos foothills along the northeast flank of the northwest-trending Santa Cruz Mountain Range, as shown on Figure 2, Regional Topographic Map.

The parcels and proposed homesites are inclined gently towards the northeast, as shown on Figure 9, Site Geologic Map and Figure 15, Geologic Cross-Section A-A'. A driveway to the existing upper home site bounds the western margin of the proposed new parcels. The parcels are vegetated by grass, scattered oak trees, and brush.

Geology

Bailey and Everhart (1964) initially mapped geology and fault traces in the site vicinity. Their mapping has been reproduced in a geologic map compiled by McLaughlin and others (2001), as shown on Figure 3, Regional Geologic Map. An un-named northwest-

trending fault is mapped about 200 feet to the southwest of the site. The active Blossom Hill, Shannon, and Berrocal faults are mapped further to the southwest. Monterey Shale bedrock is identified underlying the property and site vicinity. Santa Clara Formation is mapped capping the Monterey Shale to the east and west. Holocene alluvial fan deposits are mapped to the north.

The middle Miocene age (11 to 16 million years old) Monterey Shale in the site vicinity consists mainly of well-bedded siliceous mudstone, shale, and porcelanite, with minor interbeds of sandstone and dolomite (Stanley and others, 2002). The Monterey Shale is a marine sedimentary unit deposited in a continental shelf environment.

The late Pliocene to middle Pleistocene age (3.4 million to 100,000 years old) Santa Clara Formation consists of poorly lithified conglomerate, sandstone, siltstone, and mudstone. The sediments were deposited in various fluvial and lacustrine environments (Cummings, 1968; McLaughlin and others, 1999). The Santa Clara Formation was deposited over the Monterey Shale along an angular unconformity.

Holocene age (less than 11,000 years old) alluvial fan deposits are composed of unsorted boulders, gravel, sand, silt, and soil deposited by recent stream activity.

The faults mapped in the site vicinity are part of a northwest-trending belt of faults that lie sub-parallel to the San Andreas fault along the southwest margin of the Santa Clara Valley. The belt of faults is referred to as the Range Front Fault System, which includes the Sargent, Berrocal, Shannon, Blossom Hill, and Monta Vista faults and other faults that may exist beneath the valley fill to the northeast.

The range front faults generally accommodate both dip-slip and lateral movement. Based on geologic, geophysical, and seismic data, these faults are considered to be the locus of about 3 to 4 kilometers of uplift and an undetermined amount of lateral slip within the last 5 million years (McLaughlin and others, 1999).

Nolan Associates (2002) identified similar geologic relationships on a geologic hazards map produced for the Town of Los Gatos, as shown on Figure 4, Town Geologic Hazards Map. Landslide deposits are not mapped on the property or immediate site vicinity.

The California Geological Survey (2002) has mapped most of the subject property within a State Seismic Hazard Zone, susceptible to potential seismically-induced landsliding, as shown on Figure 5, State Seismic Hazard Zone Map. The hazard zone mapping for the subject property appears to be based on slope inclinations and not on any particular mapped landslide deposit.

Seismicity

The greater San Francisco Bay Area is recognized by Geologists and Seismologists as one of the most active seismic regions in the United States. Several major fault zones pass through the Bay Area in a northwest direction (see Figure 1) which have produced approximately 12 earthquakes per century strong enough to cause structural damage.

The faults causing such earthquakes are part of the San Andreas Fault System, a major rift in the earth's crust that extends for at least 700 miles along western California. The San Andreas Fault System includes the San Andreas, Hayward, Calaveras, Greenville, and San Gregorio Fault Zones.

According to Blake (2000), the San Andreas fault is located about 6 miles southwest of the subject site. The Calaveras and Hayward faults are located about 14 miles and 16 miles northeast of the site, respectively. The San Gregorio fault is located about 22 miles to the west and the Greenville fault about 28 miles to the northeast. These faults are considered to be active (Hart and Bryant, 1997), having had surface displacement within Holocene time (the last 11,000 years).

As previously discussed, an un-named fault has been mapped about 200 feet to the southwest of the property, as shown on Figure 3, Regional Geologic Map and Figure 4, Town Geologic Hazards Map. The County of Santa Clara (2004) includes this fault within a County Fault Rupture Hazard Zone, as shown on Figure 6, County Fault Rupture Hazard Zone Map. The Blossom Hill fault was identified by Steven F. Connelly, C.E.G. (2003) as an active fault, and is located about 1200 feet to the southwest.

Hitchcock and others (1994) mapped several scarps and lineations possibly related to the range front faults in the site vicinity. Topographic saddles and vegetation lineaments were mapped to the northwest and southwest of the property, as shown on Figure 7, Map of Geomorphic Surfaces.

Geomorphic and seismic data, as well as surficial deformation documented following the 1989 Loma Prieta earthquake, suggests that faults within the Range Front Fault System may be currently active. Schmidt and others (1995) identified damage to pavement and pipes associated with the Loma Prieta Earthquake, as shown on Figure 8, Map of 1989 Coseismic Deformation. Extensive damage was noted in the immediate site vicinity.

The range front faults may be independent seismic hazards, as evidenced by a recent earthquakes along the Monta Vista fault. Activity may also occur as triggered slip in response to large events on the nearby San Andreas fault. Hitchcock and others (1994)

suggest that a M6.5 earthquake in 1865 may have been centered on the Monta Vista or Shannon faults. Kovach and Beroza (1993) indicate that a M7.1 earthquake could potentially be generated by rupture along the entire length of the Range Front Fault System. Steven F. Connelly, C.E.G. (2003) documented evidence of recent fault activity along the Blossom Hill fault with up to about 3 feet of displacement within the last 600 years.

Air Photo Review

The following stereographic pairs of black & white aerial photographs were examined to observe site conditions and to aid in identifying potential fault or landslide hazards. Several GoogleEarth air photo images from 1993 to present were also examined.

<u>Date</u>	<u>Photo Identification</u>	<u>Type</u>	<u>Scale</u>
6-9-56	CIV-6R-72 & 73	B&W	1:20,000
5-16-65	SCL-10-106 & 107	B&W	1:12,000



Photo 2: Aerial photograph from 1965 showing the subject property as part of a large fruit orchard.

The subject property is clearly visible in the photos reviewed, as shown on Photo 2 above. The proposed parcels are located along the nose of a broad gently-inclined north-trending ridgeline along the northeast flank of the Los Gatos foothills. The existing residence on the upper southern portion of the property was constructed sometime prior to the 1956 photo date.

A northwest-trending linear depression or saddle is evident in the air photos about 200 feet to the southwest of the property. The saddle is coincident with the un-named fault mapped on Figures 3, 4, and 6. Evidence of recent landsliding or faulting, in the form of fresh scarps, ground cracking, soil lineations, or disturbed vegetation, however, is not apparent on the subject property in the air photos reviewed. Debris flow tracks or debris flow source areas were not observed upslope of the property.

Previous Investigation

Steven F. Connelly, C.E.G. (2003) completed a Fault Investigation for a proposed home site on Greenridge Terrace about 4000 feet to the west of the subject property. The Blossom Hill fault was observed thrusting Monterey Formation rocks over younger rocks of the Santa Clara Formation. Evidence of recent fault activity was observed along the Blossom Hill fault and the proposed building site was found to be unsuitable for the proposed home construction.

Steven F. Connelly, C.E.G. (2016) completed an Engineering Geologic Investigation for a proposed home site on Belgatos Lane on the adjacent property to the east of the subject property. Monterey Shale was encountered underlying the uphill southern portion of the property. Santa Clara Formation in depositional contact with the Monterey Shale was found mantling the lower northern portion of the property. Evidence of active faulting or landsliding was not encountered and the proposed building site was found to be suitable for the proposed home construction.

FIELD INVESTIGATION

Site Reconnaissance

Several site reconnaissances were completed of the subject property during the course of the field investigation. The proposed building sites are located on a broad gently-inclined north-trending ridgeline. Large mature oak trees are located adjacent to the western side of the proposed building sites. Bedrock exposures do not occur on the property.



Photo 3: View of backhoe excavating Test Pit 1.

Subsurface Investigation

As part of this investigation, four test pits were initially excavated on the property, in the approximate locations shown on Figure 9, using a track-mounted excavator (see Photo 3 above). When Test Pit 4 encountered anomalous materials, a fifth test pit was excavated to investigate geologic relationships. Test Pit 2 was later lengthened and deepened as part of further investigation. Detailed logs of the materials encountered in Test Pits 1 through 5 are shown on Figures 10 through 14, Logs of Test Pits 1 through 5. Groundwater was not encountered in any of the excavations.

Test Pits 1 and 3 encountered about 2 to 3 feet of colluvial soil composed of brown, firm, highly plastic, silty clay with some sand and sub-rounded gravel clasts. Weathered bedrock of the Santa Clara Formation composed of yellowish brown, dense to very dense, poorly cemented, gravelly silty sand was observed at depth below the colluvial soil. Test Pit 2 also encountered about 2.5 feet of colluvial soil underlain by weathered bedrock of the Santa Clara Formation. The gravelly silty sand was interbedded with grayish brown claystone and bedding was folded into syncline, as shown on Figure 11. A bedding attitude of N55W 53S was measured in the claystone.



Photo 5: View of Santa Clara Formation exposed in Test Pit 4.

Photo 4: View of Monterey Shale exposed in Test Pit 4.

Test Pit 4 encountered about 1 to 2 feet of colluvial soil composed of brown, loose to firm, medium plasticity, silty clay with some sand and gravel. Weathered bedrock of the Monterey Shale (see Photo 4 above) was encountered in the northern half of Test Pit 4, composed of pale brown, moderately dense to dense, closely-bedded, siltstone containing gypsum veins and crystals deposited parallel to bedding. A bedding attitude of N84W 70N was measured in the siltstone. Weathered bedrock of the Santa Clara Formation (see Photo 5 above) was encountered in the southern portion of Test Pit 4, composed of interbedded, gravelly sandy silt and claystone. The Santa Clara Formation is in depositional contact with Monterey Shale as a slightly undulating unconformity.

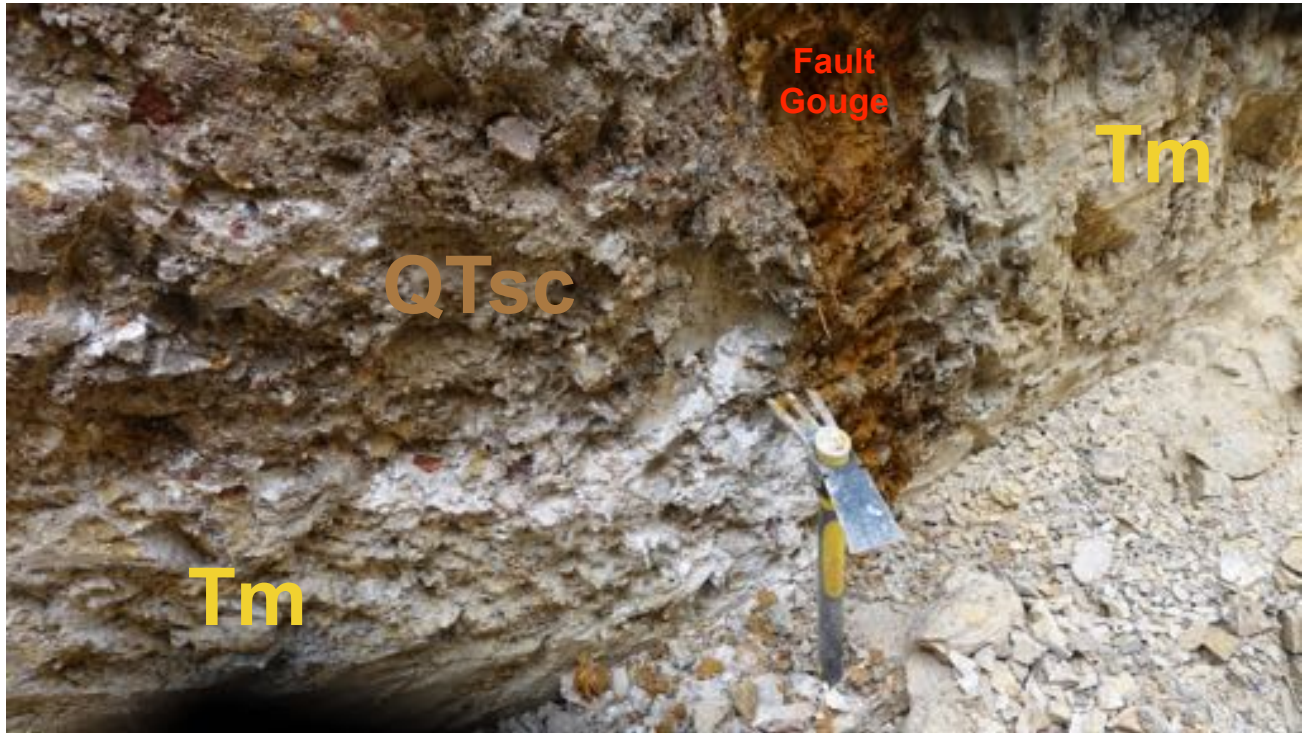


Photo 6: View of the western wall of Test Pit 4. Closely-bedded Monterey Shale **Tm** is exposed to the right of the photo. Strong brown-colored fault gouge is apparent just to the right of the soil pick. Santa Clara Formation sediment **QTsc** overlying Monterey Shale is exposed to the left of the soil pick.

A prominent fault defined by a 4 to 6-inch-wide layer of fault gouge composed of strong brown, highly plastic, clay separates the Monterey Shale in the northern portion of Test Pit 4 from the Santa Clara Formation and Monterey Shale in the southern end of the pit (see Photo 6 above and Photo 7 below). The fault plane is oriented parallel to bedding in the Monterey Shale and is bounded at its base by white carbonate veins and carbonate deposits up to 3 inch thick. The fault gouge thins and flattens out in the uphill direction as depicted on Figure 13. The fault thrusts older Monterey Shale rocks over younger Santa Clara Formation rocks in an uphill direction, antithetical to the common range front thrust dynamics in the site vicinity.

Test Pit 5 was excavated adjacent to Test Pit 4 in an attempt to further document the fault and determine its lateral continuity. About 1 foot of colluvial soil overlying weathered bedrock of the Santa Clara Formation was encountered in Test Pit 5. The Santa Clara Formation is in depositional contact with Monterey Shale in Test Pit 5 as a slightly undulating unconformity, similar to observations in the southern end of Test Pit 4. The Monterey Shale strikes N86E and dips 59N, similar to bedding attitudes measured in Test



Photo 7: View of the eastern wall of Test Pit 4. Closely-bedded Monterey Shale **Tm** is exposed to the left of the photo. Strong brown-colored fault gouge defines a thrust fault that thrusts older Monterey Shale over younger Santa Clara Formation sediment **QTsc** in the right of the photo.

Pit 4. A fault defined as a slightly-undulating, thin, clay surface was observed in Test Pit 5 along the projected trend of the fault observed in Test Pit 4. The fault trends N74W and plunges 56N. The fault appears to thrust the Santa Clara Formation and Monterey Shale materials towards the south over a different unit of the Santa Clara Formation containing boulders up to 1 foot in diameter.

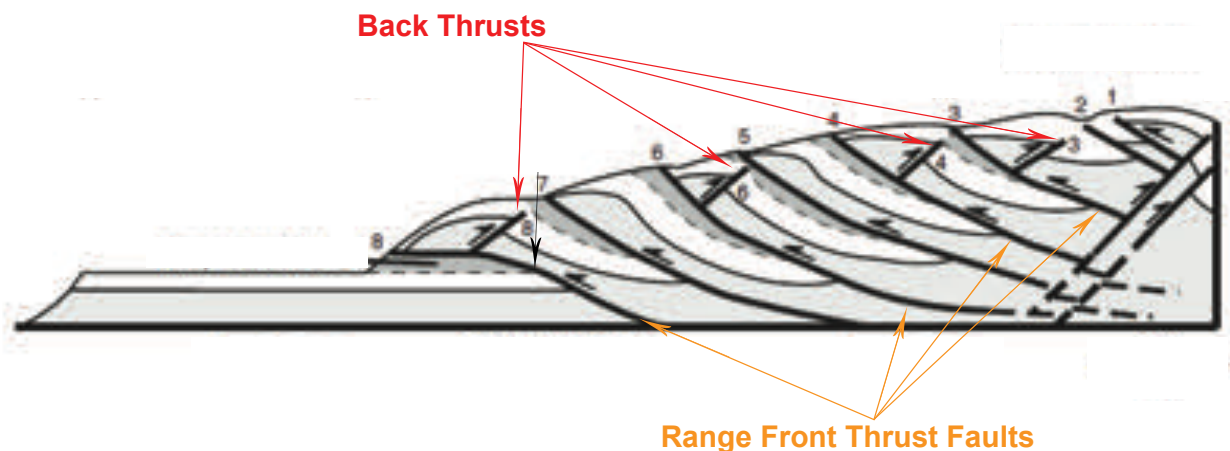
Test Pit 2 was re-excavated, deepened, and lengthened, as shown on Figure 11 to determine if the fault observed in Test Pits 4 and 5 extends further towards the southeast. The fault was not observed in Test Pit 2, however, beds within the Santa Clara Formation were folded into a syncline, possibly as a result of fault deformation.

Discussion

Depositional contacts, where younger Santa Clara Formation rocks overlie older Monterey Shale, were observed in Test Pits 4 and 5. The subsurface relationships are depicted on Figure 15, Geologic Cross-Section B-B'. These contacts appear to be similar to the depositional contact shown by McLaughlin and others (2001) to the east of the property on Figure 3, Regional Geologic Map.

The fault encountered in Test Pits 4 and 5 appears to be a “back thrust”, as depicted on Figure 15, Geologic Cross-Section B-B'. Older rocks of the Monterey Shale are thrust over younger rocks of the Santa Clara Formation. The fault, however, plunges towards the north, unlike relationships encountered along the Blossom Hill fault nearby (Steven F. Connelly, C.E.G., 2003), where Monterey Shale is thrust along southwest-dipping faults over the Santa Clara Formation.

Mr. James Baker, C.E.G., visited the property on April 18, 2019, observed the relationships in Test Pits 4 and 5, and concurred that the fault relationship appears to be a back thrust. Mr. Bob McLaughlin, USGS emeritus, also agreed in email communications that the fault was likely a back thrust, where a fault block undergoes tensional release as a result of thrusting occurring along a related downslope underlying thrust fault. A diagram of back thrusts and related range front thrust faults is shown below, based on a publication on fold and thrust belt kinematics by Poblet and Lisle (2011). It should be noted that this relationship suggests that there is an unidentified and unmapped thrust fault occurring downslope and to the north of the subject property.



The fault observed in Test Pits 4 and 5 appears to have possibly broken the ground surface and, in my opinion, should be considered potentially active. Ground rupture, however, was not observed in Test Pit 2. Consequently, I recommend a building setback zone, as depicted on Figure 9, Site Geologic Map, from the potentially active fault.

Evidence of recent landsliding was not observed in the surface topography on the subject property, during the site reconnaissance, during the review of air photos or published maps and literature, or subsurface investigation. Consequently, in my opinion, the building sites for the proposed residences, are suitable for the proposed new construction, provided the residences are constructed outside of my recommended building setback zone and according to the recommendations of the project Soil Engineer, Mr. Barry Milstone of Milstone Geotechnical.

FINDINGS

Based upon the results of this Engineering Geologic Investigation, a potentially active fault crosses the southwest corner of the subject property. Consequently, a building set back zone is recommended as depicted on Figure 9, Site Geologic Map. Evidence of landsliding or other geologic hazards was not encountered that would restrict construction of the proposed residences on the subject property.

In my opinion, the weathered bedrock underlying the property should provide good support for the proposed residences. It is my opinion that the potential hazard from fault rupture, landsliding, liquefaction, ground subsidence, lateral spreading, tsunamis, seiches, or flooding to the proposed residences, is very low to minimal, provided construction does not occur within the recommended building setback zone.

Seismic Hazards

Based upon the results of this Engineering Geologic Investigation, a potentially active fault passes through the subject property, as approximately shown on Figure 9, Site Geologic Map. Habitable construction should avoid the recommended building setback zone shown on Figure 9. An un-named fault has been mapped about 200 feet to the southwest and the active Blossom Hill fault is located about 1400 feet to the southwest.

It is reasonable to assume that the proposed residences will be subjected to moderate to strong shaking from a major earthquake on the Blossom Hill fault, or one of the other active or potentially active faults in the Bay Area during the design life of the structures.

During such an earthquake, the danger from primary fault offset through the proposed building sites is low, but moderate to strong ground shaking is likely to occur.

Based on a deterministic analysis of preliminary data for selected California faults by Blake (2000), one of the range front faults such as the Blossom Hill fault presents the most significant seismic shaking hazard to the sites. Using a fault attenuation relationship by Idriss (1994), a peak site acceleration of 0.73 g and a Modified Mercalli shaking intensity of XI are predicted for the property from a possible 6.7 Mw earthquake on one of the range front faults.

Historically, Blake (2000) indicates that the property experienced a site acceleration of 0.38 g and a Modified Mercalli shaking intensity of X due to the 6.3 Mw 1865 Earthquake. The 1865 Earthquake was possibly associated with an earthquake in the Range-Front Fault System along a fault such as the Blossom Hill fault. A site acceleration of 0.24 g and a Modified Mercalli shaking intensity of IX occurred on the property during the recent 7.0 Mw 1989 Loma Prieta Earthquake centered about 14 miles south of the site. The property experienced 0.16 g from the 1906 Earthquake on the San Andreas fault, located about 45 miles to the northwest.

Properly designed buildings using the California Building Code (California Building and Standards Commission, 2007) and sound engineering practices should mitigate the damaging effects of ground shaking. As a minimum, the proposed residences should be designed using current building code requirements.

It is possible that secondary fissures or ground cracks may damage the subject property during an earthquake on one of the range front faults or San Andreas fault. Extensive secondary ground cracks unrelated to primary fault offset occurred during the 1989 Loma Prieta Earthquake.

According to Schmidt and others (1995), minor to severe damage occurred to several residences nearby (see Figure 8) as a result of secondary fault movement. These fissures or ground cracks were commonly focused on ridge top locations and were associated with weaker shale interbeds (Cotton and others, 1990), preexisting landslides, or intense ground shaking (Hart and others, 1990).

The U.S. Geological Survey (2008) recently cited a 63 percent probability that a Richter magnitude 6.7 or greater earthquake, similar to the 1989 Loma Prieta Earthquake, will occur on one of the active faults in the San Francisco Bay Region by the year 2032. A 21 percent probability was attributed specifically to the nearby San Andreas fault that a large

earthquake will occur along its trace by the year 2032, as shown on Figure 16, Earthquake Probability Map.

In addition, Dr. David Schwartz of the U.S.G.S. has cited a 9 percent probability for an earthquake on one of the range-front faults such as the Blossom Hill fault, by the year 2032 in a recent lecture (oral communication).

Landsliding

Based upon my review of air photos, site reconnaissance, and subsurface investigation, the property and proposed building sites are underlain by resistant weathered bedrock at shallow depth, as approximately depicted on Figure 15, Geologic Cross-Section A-A'. In my opinion, the resistant weathered bedrock should provide adequate support for the proposed residences. In my opinion, the potential for deep-seated landsliding on the property is very low. Evidence of recent active landsliding was not observed on or adjacent to the property.

In addition, in my opinion, the hazard due to potential earthquake-induced landsliding to the property is very low. Springs or seeps were not observed on the property during my review of air photos, site reconnaissance, or subsurface investigation. These groundwater sources, commonly associated with landslides or contributing to potential landsliding were not observed.

The proposed residences will be located on gently-inclined terrain and sources for potential debris flow landslides were not observed upslope during my review of air photos. Consequently, the hazard to the proposed building sites from debris flow landsliding is, in my opinion, considered negligible.

Liquefaction

Liquefaction most commonly occurs during earthquake shaking in loose fine sands and silty sands associated with a high ground water table. Based on the subsurface investigation, the property is underlain by stiff soils and weathered bedrock at shallow depth that are not susceptible to liquefaction. Liquefaction is therefore, in my opinion, unlikely to occur on the property. The California Geological Survey (2002) indicates that the property is located in an area with a very low susceptibility to liquefaction (see Figure 5, State Seismic Hazard Zones Map).

Ground Subsidence

Ground subsidence may occur when poorly-consolidated soils densify as a result of earthquake shaking. Since the proposed building sites are underlain by stiff soils and resistant weathered bedrock at relatively shallow depth, the hazard due to ground subsidence is, in my opinion, considered negligible.

Lateral Spreading

Lateral spreading may occur when a weak layer of material, such as a sensitive silt or clay, loses its shear strength as a result of earthquake shaking. Overlying blocks of competent material may be translated laterally towards a free face. Since the proposed building sites are underlain by stiff soils and resistant weathered bedrock at shallow depth, the hazard due to lateral spreading is, in my opinion, considered negligible.

Tsunamis, Seiches, and Flooding

The subject property is located in an inland area removed from the hazard of inundation by tsunamis (Ritter and Dupre, 1972). The Association of Bay Area Governments (1980b) indicates that the subject property is located in an area free from the hazard of seiches and flooding caused by dam failure.

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

A list of References, Table, and Figures are attached and complete this report:

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APN 527-20-003
400 Surmont Drive
Los Gatos, California

May 18, 2019
Project #1909

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TABLE I - MODIFIED MERCALLI INTENSITY SCALE

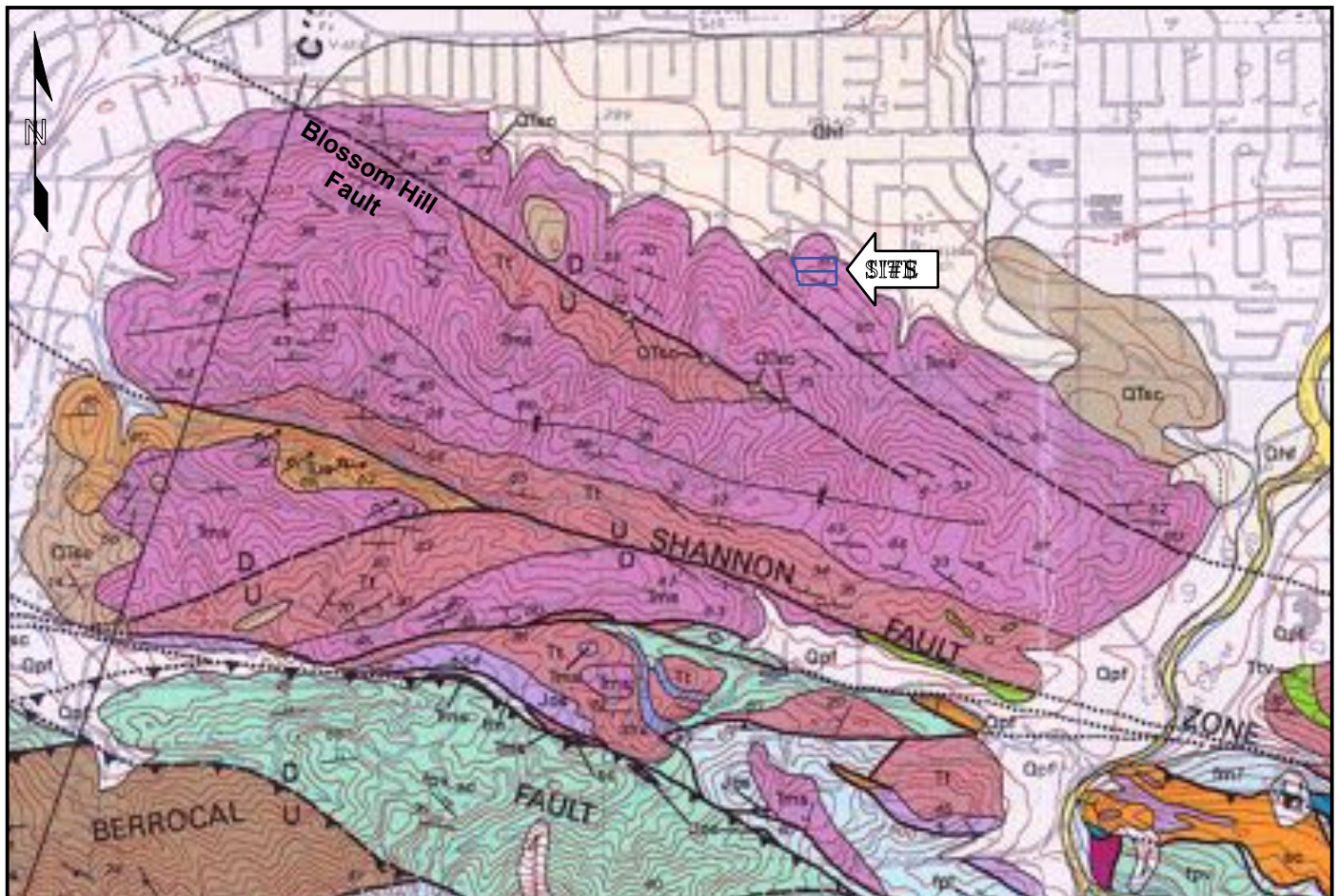
I	Not felt. Marginal and long-period affects of large earthquakes.
II	Felt by persons at rest, on upper floors, or favorably placed.
III	Felt indoors. Hanging objects swing. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV	Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a ball striking walls. Standing motor cars rock. Windows, dishes, doors rattle. Glasses clink. Crockery clashes. In the upper range of IV wooden walls and frames creak.
V	Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move.
VI	Felt by all. May frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken, knickknacks, books, etc., off shelves. Pictures off walls. Furniture moved or overturned. Weak plaster and masonry D cracked. Small bells ring (church, school). Trees, bushes shaken (visible, or heard to rustle).
VII	Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry D, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices (also unbraced parapets and architectural ornaments). Some cracks in masonry C. Waves on ponds; water turbid with mud. Small slides and caving along sand and gravel banks. Large bells ring. Concrete irrigation ditches damaged.
VIII	Steering of motor cars affected. Damage to masonry C; partial collapse. Some damage to masonry B; none to masonry A. Fall of stucco and some masonry walls. Twisting, fall of chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundation if not bolted down; loose panel walls thrown out. Decayed piling broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	General panic. Masonry destroyed or seriously damaged. (Damage to foundations.) Frame structures, if not bolted, shifted off foundations. Frames racked. Serious damage to reservoirs. Buried pipes broken. Conspicuous ground cracks. In alluviated areas sand and mud ejected, earthquake fountains, sand craters.
X	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Large landslides. Water thrown on banks to canals, rivers, lakes, etc. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI	Rails bent greatly. Underground pipelines completely out of service.
XII	Damage nearly total. Large rock masses displaced. Lines of sight and level distorted. Objects thrown into air.

Source: Richter, C.F., Elementary Seismology, San Francisco, CA: W.H. Freeman Co., 1957.

Note: To avoid ambiguity, the quality of masonry, brick, or other material is specified by the following lettering system. (This has no connection with the conventional classes A, B, and C construction.) Masonry A. Good workmanship, mortar, and design; reinforced, especially laterally, and bound together by using steel, concrete, etc.; designed to resist lateral forces. Masonry B. Good workmanship and mortar; reinforced, but not designed to resist lateral forces. Masonry C. Ordinary workmanship and mortar; no extreme weaknesses, like failing to tie in at corners, but neither reinforced nor designed to resist horizontal forces. Masonry D. Weak materials, such as adobe; poor mortar; low standards of workmanship; weak horizontally.



Site Location Map		APN 527-20-003 400 Surmont Drive Los Gatos, California			
! "\$%&'(&) *%%#++,-&)(#(. (		Project #	Approximate Scale	Date	Figure
		1909	1 Inch = 10 Miles	5/18/19	1



EXPLANATION

	Geologic Contact, dashed where approx., dotted where concealed		Alluvial fan deposits (Holocene)
	Fault Trace, dashed where approx., dotted where concealed, queried where uncertain		Landslide deposits, undivided (Holocene and Pleistocene)
	Thrust or Reverse Fault		Alluvial fan deposits (Pleistocene)
	Strike and Dip of Bedding		Santa Clara Formation (Pleistocene and Pliocene)
	Strike and Dip of Foliation		Unnamed sandstone (mid Miocene or younger)
	Landslide deposit, arrows in direction of movement		Monterey Shale (mid and lower Miocene)
			Temblor Sandstone (mid Miocene to Oligocene?)
			Serpentinized ultramafic rocks (Jurassic)
			Melange of the Central belt (Upper Cretaceous)
			Foraminiferal limestone (Upper and Lower Cretaceous)
			Volcanic rocks (Lower Cretaceous)
			Sandstone (Upper and or Lower Cretaceous)

Source: McLaughlin and others, 2001

Regional Geologic Map

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APN 527-20-003

400 Surmont Drive
Los Gatos, California

Project #

1909

Scale

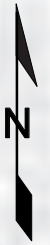
1 Inch = 2000 Feet

Date

5/18/19

Figure

3



EXPLANATION

Qfl	Modern fluvial deposits	Qtsc	Santa Clara Formation
Qls	Landslide deposits	Tmm	Monterey Shale
Qal	Undifferentiated alluvium	Tmt	Temblor Sandstone
Qt	Youngest fluvial terrace deposits	Tmv	Dacitic tuff, tuff breccia, and intrusive rocks
Qf	Youngest alluvial fan deposits	Jos	Serpentinite
Qto	Older fluvial terrace deposits	sc	Siliceous, mercury bearing carbonates
Qfo	Older alluvial fan deposits	flp	Limestone
	Contact, dashed where approximate, dotted where concealed	fcp	Chert
	Fault, dashed where approximate, dotted where concealed, queried where uncertain, U and D denote up and downthrown blocks	fvp	Basalt
	Thrust fault, barbs on upper plate	fsrc	Melange
	Synclinal axis	fsm	Metasandstone
	Landslide headscarp	fcm	Radiolarian chert
	Landslide mass, arrows indicate direction of movement	fvm	Basalt
		fsrc	Melange

Source: Nolan Associates, revised 11/21/02

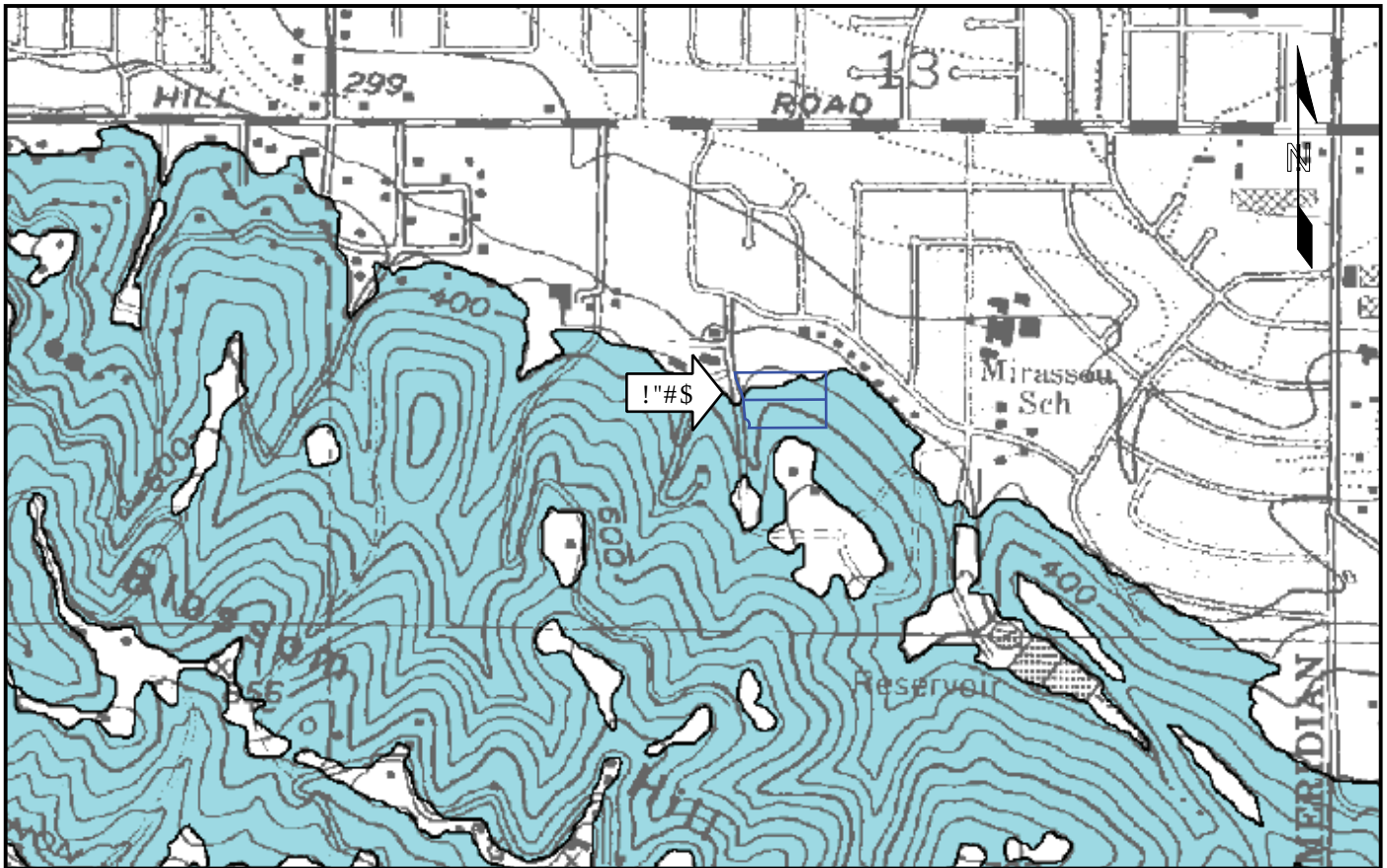
Town Geologic Hazards Map

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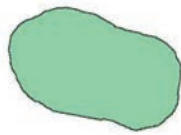


APN 527-20-003
400 Surmont Drive
Los Gatos, California

Project #	Scale	Date	Figure
1909	1 Inch = 1000 Feet	5/18/19	4



EXPLANATION



Liquefaction

Areas where historic occurrence of liquefaction, or local geological, geotechnical and groundwater conditions indicate a potential for permanent ground displacements such that mitigation would be required



Earthquake-Induced Landslides

Areas where previous occurrence of landslide movement, or local topographic, geological, geotechnical and subsurface water conditions indicate a potential for permanent ground displacements such that mitigation would be required.

Base: California Geological Survey, 2002

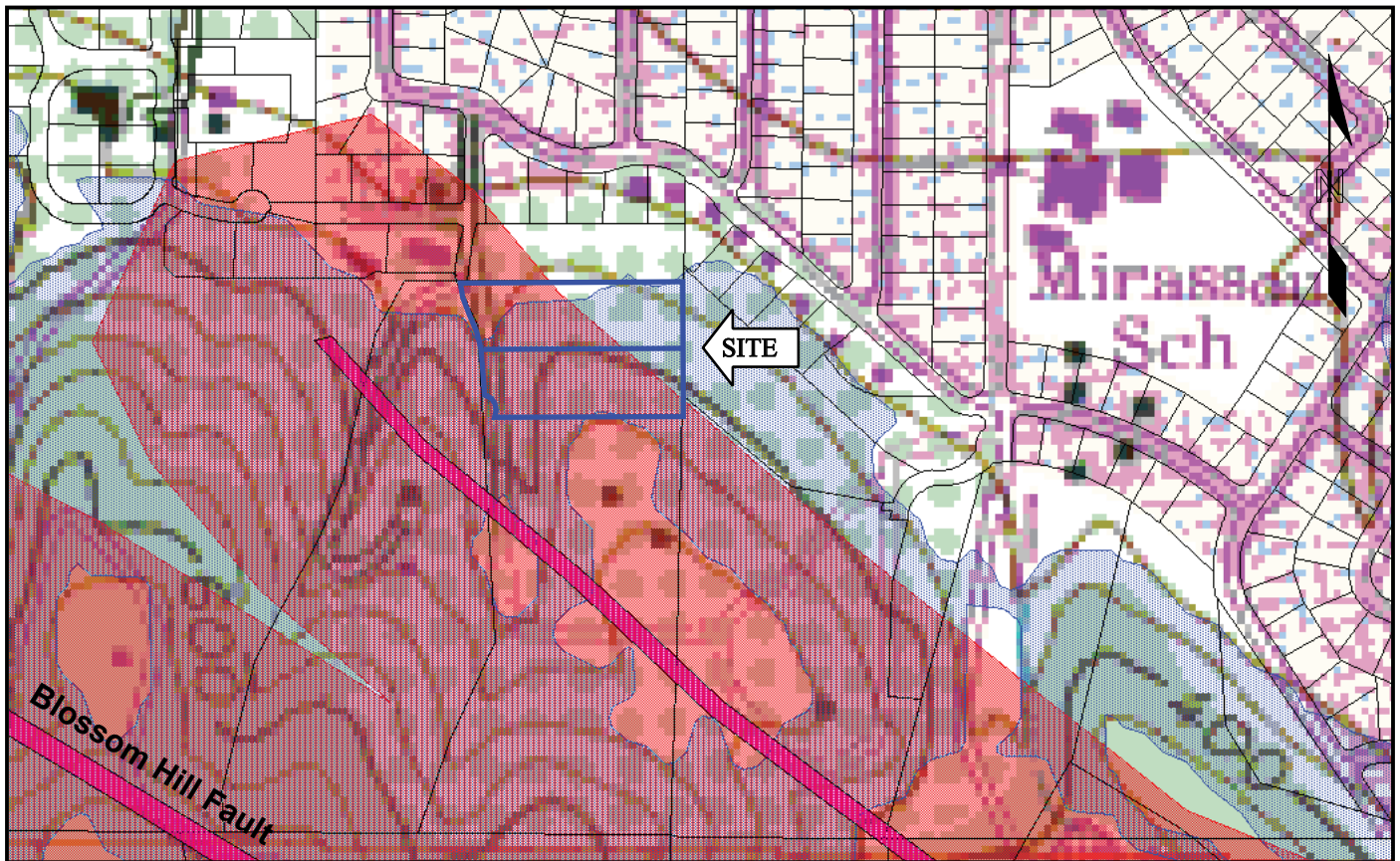
State Seismic Hazard Zone Map

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APN 527-20-003
400 Surmont Drive
Los Gatos, California

Project #	Scale	Date	Figure
1909	1 Inch = 1000 Feet	5/18/19	5



EXPLANATION

-  Fault Rupture Hazard Zone
-  Fault Trace
-  Fault-Related Lineations
-  Landslide Zone
-  Earthquake-Induced Landslide Hazard Zone
-  Liquefaction Zone

Base: County of Santa Clara, 2004

County Fault Rupture Hazard Zone Map

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APN 527-20-003
400 Surmont Drive
Los Gatos, California

Project #	Scale	Date	Figure
1909	1 Inch = 400 Feet	5/18/19	6



Explanation

Key

Qt4p
 Surface type — Drainage Basin
 — Relative age

Surface Type

- fp active floodplain
- t fluvial surface
- lv levee
- p pediment developed on Qtsc

Relative Age

- u undifferentiated
- 5 youngest
- 4
- 3
- 2
- 1 oldest

Lineaments

- v vegetation
- s saddle
- sc scarp
- t tonal
- fct faceted spur
- cd closed depression
- ld linear depression
- lf linear front

Drainage Basin

- p Permanente Creek
- s Stevens Creek
- r Regnart Creek
- c Calabazas Creek
- st Saratoga Creek
- a Aquinas Creek
- lg Los Gatos Creek
- rs Ross Creek

Surficial deposits/bedrock

- Qls landslide deposits
- Qal Undifferentiated stream alluvium
- Qlv Levee deposits
- Qtsc Santa Clara gravel
- pQ Undifferentiated bedrock

Hitchcock and others, 1994

Map of Geomorphic Surfaces

!"#\$%&'(&) *%%#++,-&)(#(. (



APN 527-20-003
 400 Surmont Drive
 Los Gatos, California

Project #	Scale	Date	Figure
1909	1 Inch = 1000 Feet	5/18/19	7



Categories of Damage

COSEISMIC PAVEMENT BREAKS

IN ASPHALT

- Linear zone of complex rupture; denotes area of severe damage
- Fresh break or buckle suggestive of contractional deformation
- Fresh break with unspecified sense of deformation

IN CONCRETE

- Fresh contractional break in channel lining of Los Gatos Creek
- Fresh break or buckle suggestive of contractional deformation
- Apparently fresh break with unspecified sense of deformation
- Break with unspecified sense of deformation

IN BOTH ASPHALT AND CONCRETE

EXTENSIONAL RUPTURE IN BOTH PAVEMENT AND SOIL

COSEISMIC PIPE BREAKS

- Underground water line
- Underground natural-gas distribution line
- Above-ground natural-gas distribution line
- More than one type of pipe

OTHER BREAKS

- In both pipe and pavement
- Pavement break that pre-dates the earthquake
- Combination of pre-earthquake and coseismic break in pavement
- Contractional deformation that post-dates the earthquake

OTHER SYMBOLS

- Fault

Source: Schmidt and others, 1995

Map of 1989 Coseismic Deformation

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APN 527-20-003

400 Surmont Drive
Los Gatos, California

Project #

1909

Scale

1 Inch = 1 Mile

Date

5/18/19

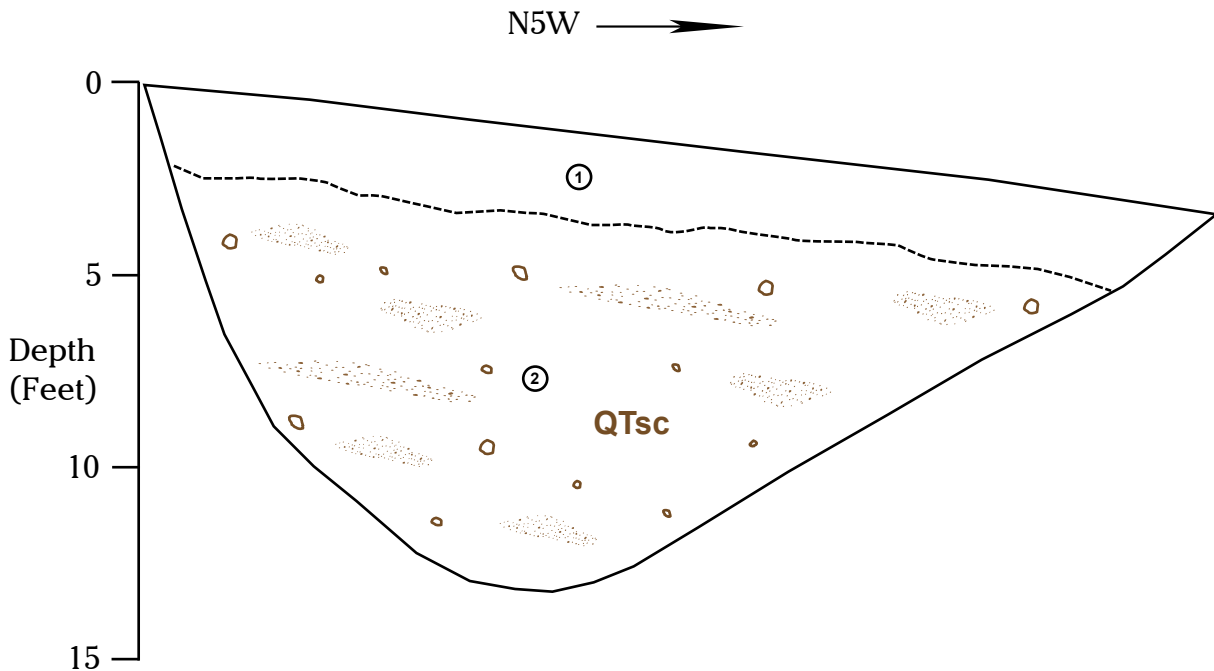
Figure

8

Symbols

-  gradational contact
 relatively sharp contact
 very sharp contact

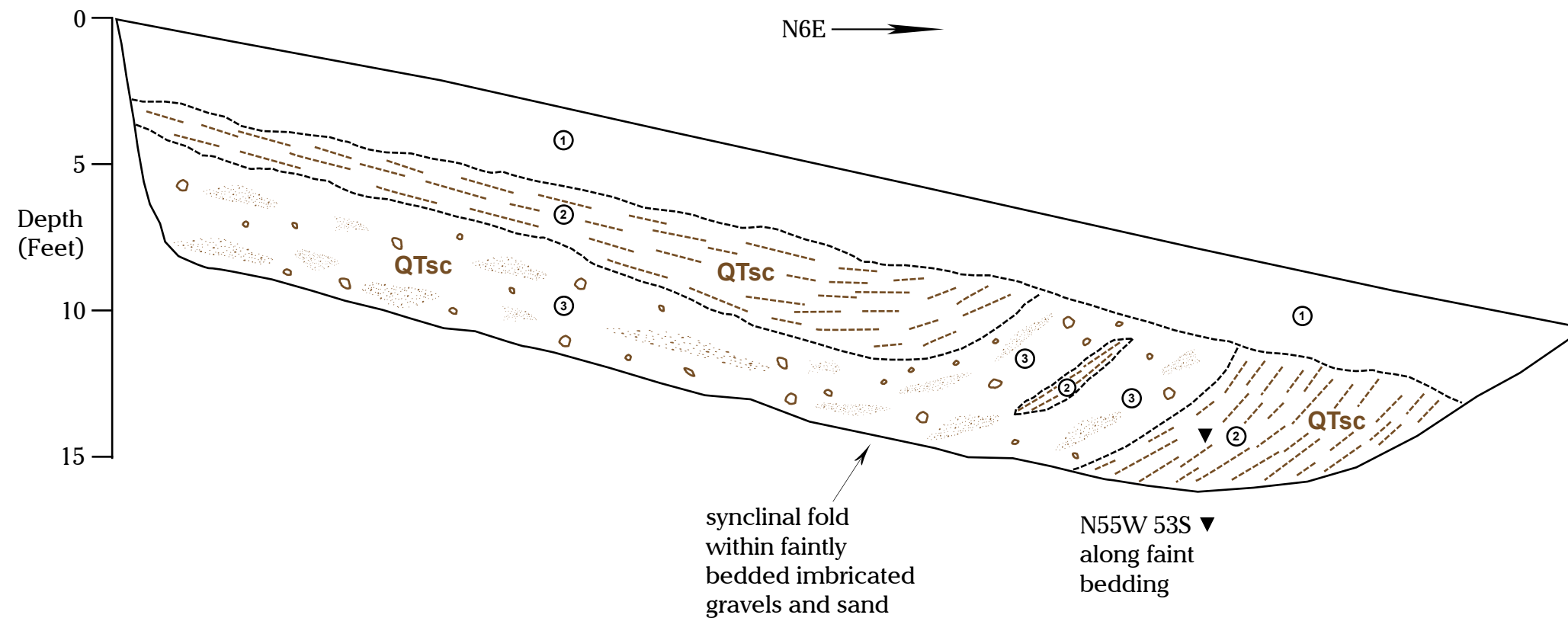
N35W 9SW ▼ strike and dip of bedding
or trend and plunge of
shear surface



- ① brown, 10YR5/3, silty clay, moist, firm, highly plastic, some sand and subrounded gravel, some rootlets, CH (Colluvial Soil)
- ② yellowish brown, 10YR5/4, gravelly silty sand, slightly moist, dense to very dense with some subrounded cobbles and boulders, poorly cemented, poorly bedded (Weathered Bedrock, Santa Clara Formation)

Logged by Steven F. Connelly, C.E.G., 4/11/19

Log of Test Pit 1		APN 527-20-003			
 ! "\$%&'(&) *%%#+, -&)#(. (& Consulting in Engineering Geology		400 Surmont Drive Los Gatos, California			
		Project #	Scale	Date	Figure
		1909	1 Inch = 5 Feet	5/18/19	10



- ① brown, 10YR5/3, silty clay, moist, firm, highly plastic, some sand and subrounded gravel, some rootlets, CH (Colluvial Soil)
- ② grayish brown, 10YR5/2, claystone (Weathered Bedrock, Santa Clara Formation)
- ③ yellowish brown, 10YR5/4, gravelly silty sand, slightly moist, dense to very dense with some subrounded cobbles and boulders up to 8 inches, trace clasts of Monterey shale, poorly cemented, poorly bedded (Weathered Bedrock, Santa Clara Formation)

Logged by Steven F. Connelly, C.E.G., 5/2/19

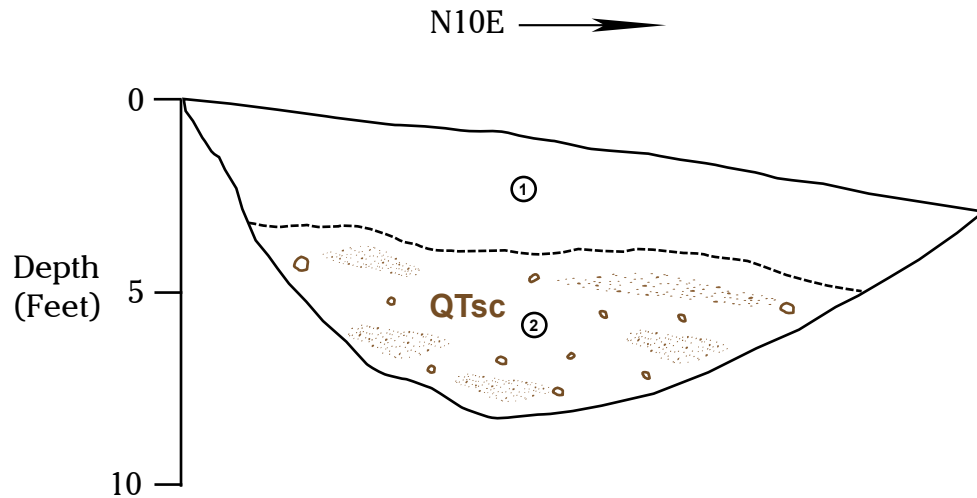
..... gradational contact
 - - - - - relatively sharp contact

Log of Test Pit 2		APN 527-20-003		
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! "\$%&'(&)*%%#++,-&)(#(.(&		Los Gatos, California		
Project #	Scale	Date	Figure	
1909	1 Inch = 5 Feet	5/18/19	11	

Symbols

-  gradational contact
 relatively sharp contact
 very sharp contact

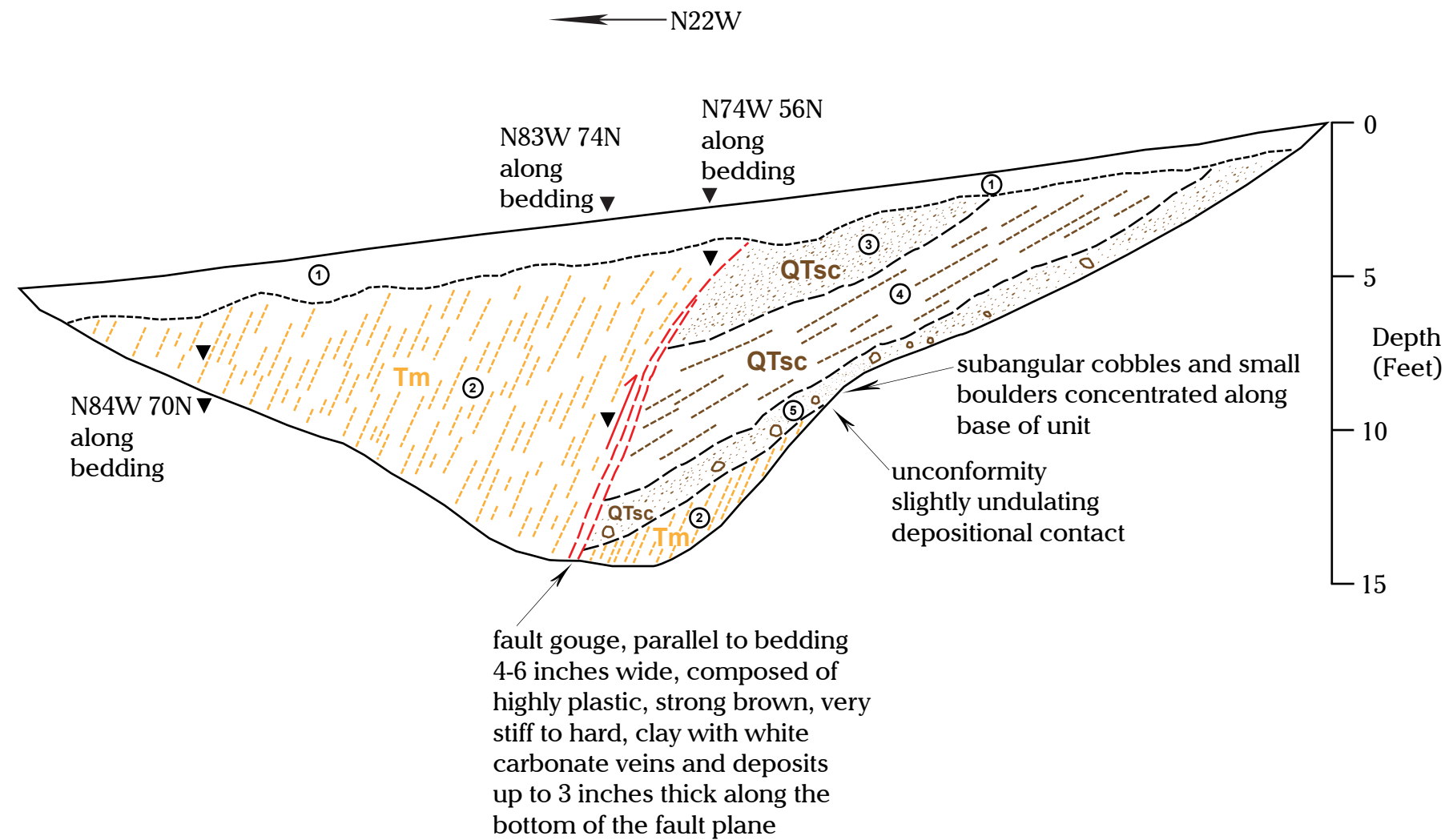
N35W 9SW ▼ strike and dip of bedding
or trend and plunge of
shear surface



- ① brown, 10YR5/3, silty clay, moist, firm, highly plastic, some sand and subrounded gravel, some rootlets, CH (Colluvial Soil)
- ② yellowish brown, 10YR5/4, gravelly silty sand, slightly moist, dense to very dense with some subrounded cobbles and boulders, poorly cemented, poorly bedded (Weathered Bedrock, Santa Clara Formation)

Logged by Steven F. Connelly, C.E.G., 4/11/19

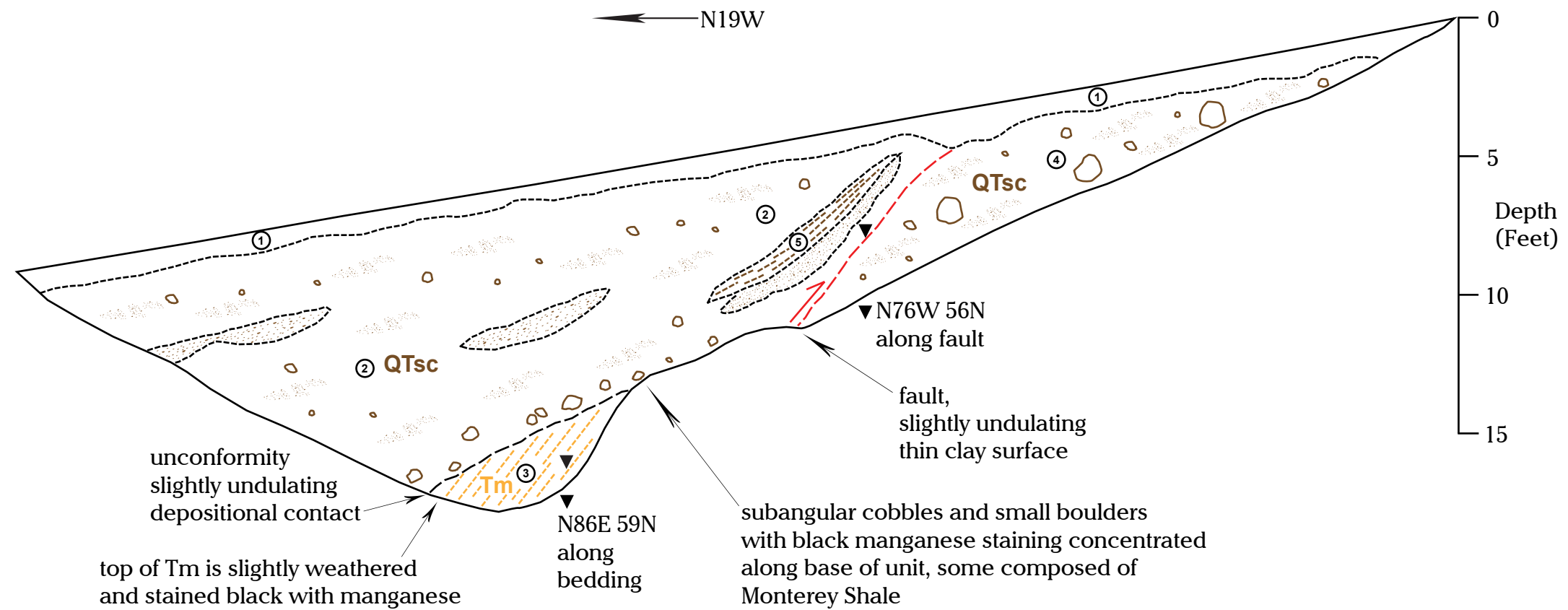
Log of Test Pit 3	APN 527-20-003			
! "\$%&'(&) * %%#++,-&)(#(. (&	400 Surmont Drive			
	Los Gatos, California			
	Project #	Scale	Date	Figure
	1909	1 Inch = 5 Feet	5/xx/19	12



- ① brown, 10YR4/3, clayey silt, with some sand and gravel, slightly moist to moist, loose to firm, some rootlets, medium plasticity (Colluvial Soil)
- ② pale brown, 2.5Y7/3, siltstone, with yellow staining, moderately dense to dense, closely-bedded, some gypsum veins parallel to bedding (Weathered Bedrock, Monterey Shale)
- ③ light yellowish brown, 10YR6/4, gravelly sandy silt, slightly moist, very stiff to hard, trace rootlets (Weathered Bedrock, Santa Clara Formation)
- ④ grayish brown, 10YR5/2, claystone (Weathered Bedrock, Santa Clara Formation)
- ⑤ brownish yellow, 10YR6/6, gravelly sandy silt, with subrounded gravel and cobbles of sandstone, chert, volcanic rocks, and coarse-grained sandstone, with lenses of sandy silt, slightly moist, moderately hard to hard, friable (Weathered Bedrock, Santa Clara Formation)

..... gradational contact
 - - - - - relatively sharp contact

Log of Test Pit 4		APN 527-20-003 400 Surmont Drive Los Gatos, California		
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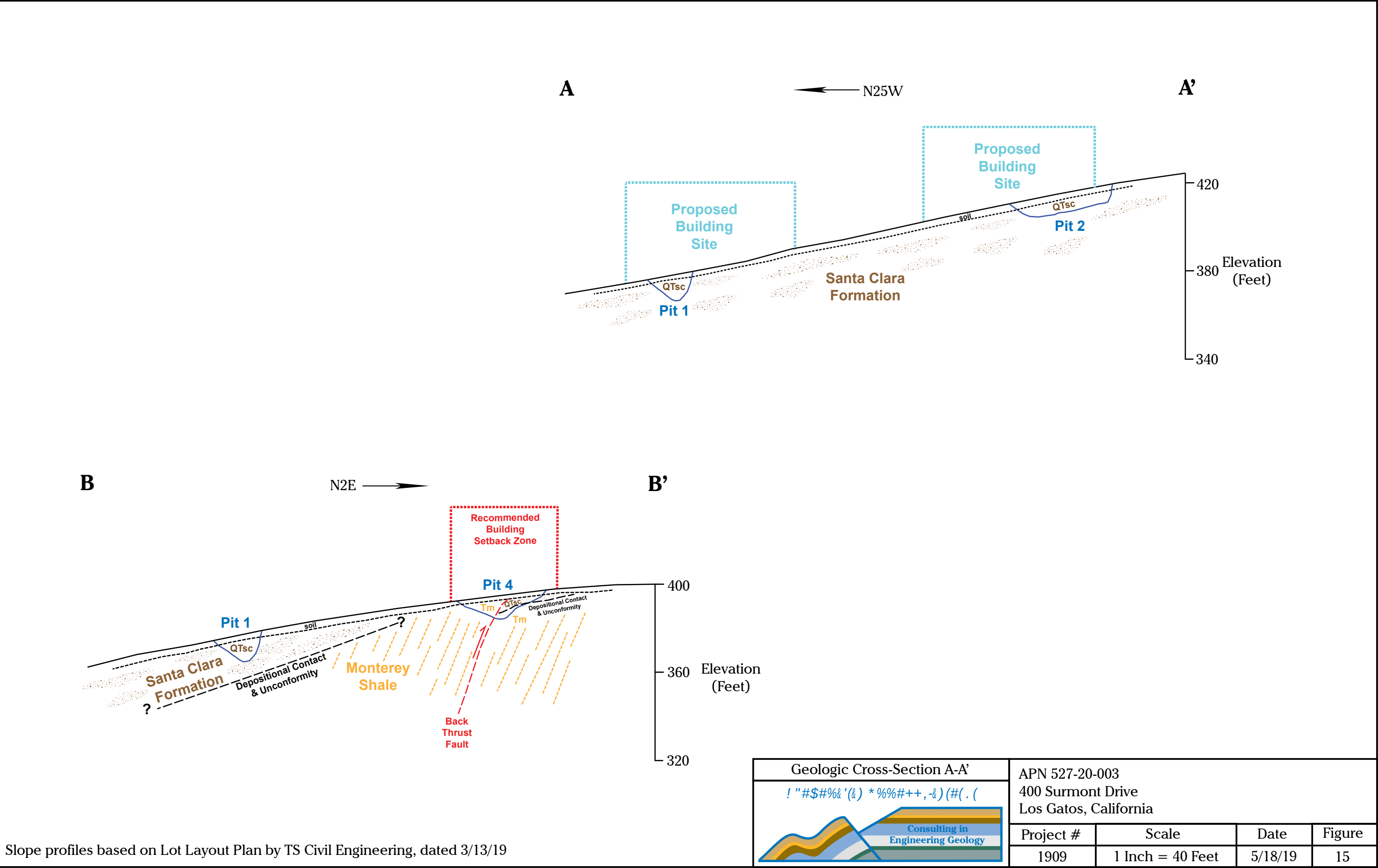


- ① brown, 10YR4/3, clayey silt, with some sand and gravel, slightly moist to moist, loose to firm, some rootlets, medium plasticity (Colluvial Soil)
- ② brownish yellow, 10YR6/6, gravelly sandy silt, with subrounded gravel and cobbles of sandstone, chert, volcanic rocks, and coarse-grained sandstone, with lenses of sandy silt, slightly moist, moderately hard to hard, friable (Weathered Bedrock, Santa Clara Formation)
- ③ pale brown, 2.5Y7/3, siltstone, with yellow staining, moderately dense to dense, closely-bedded, some gypsum veins parallel to bedding (Weathered Bedrock, Monterey Shale)
- ④ brownish yellow, 10YR6/6, gravelly sandy silt, with subrounded gravel, cobbles, and boulders up to 1 foot in diameter of sandstone, chert, volcanic rocks, and coarse-grained sandstone, with lenses of sandy silt, slightly moist, moderately hard to hard, friable (Weathered Bedrock, Santa Clara Formation)
- ⑤ grayish brown, 10YR5/2, claystone (Weathered Bedrock, Santa Clara Formation)

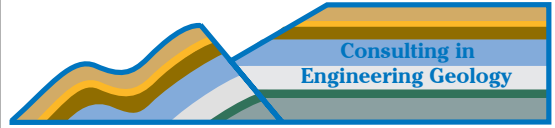
..... gradational contact
 - - - - - relatively sharp contact

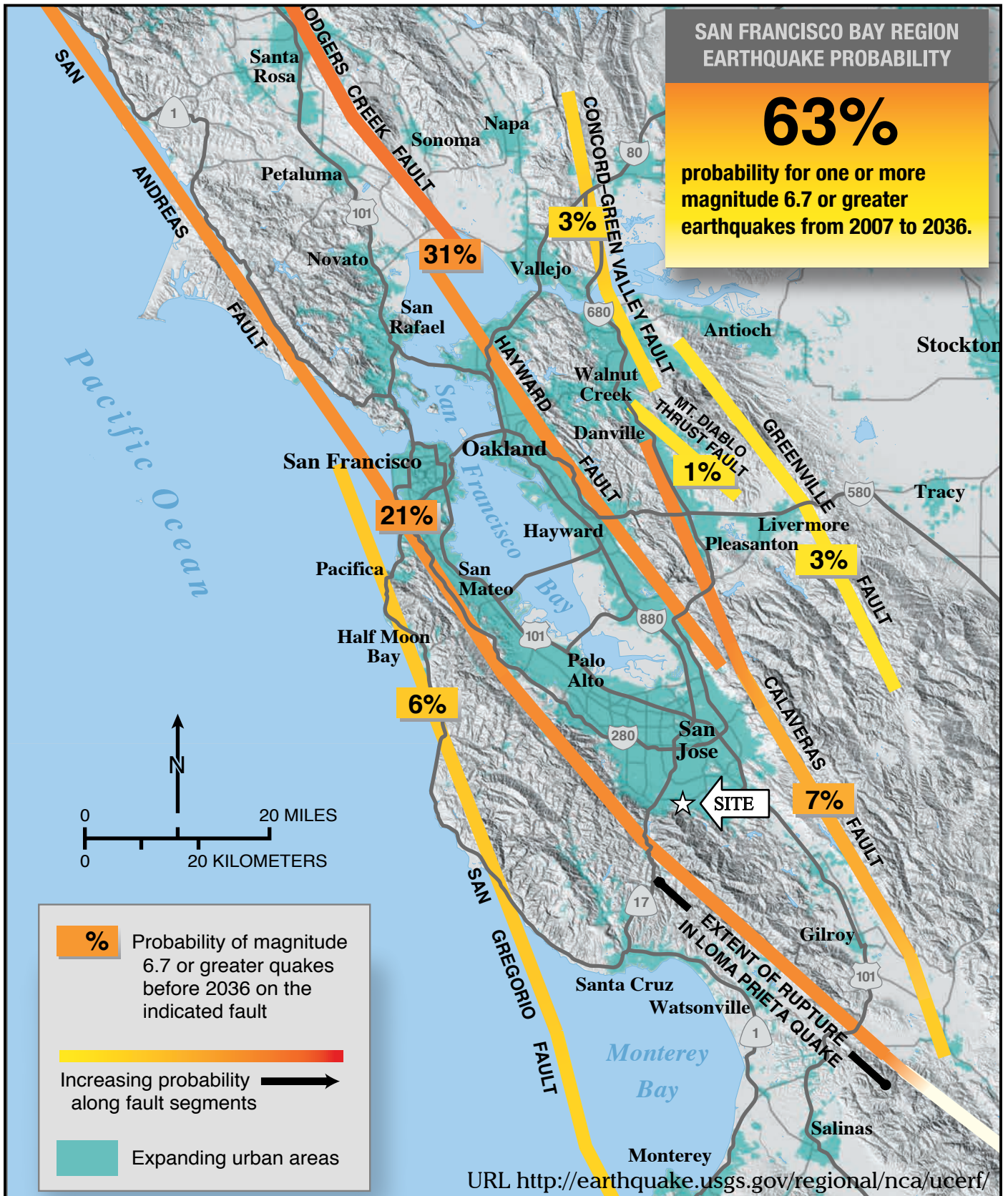
Logged by Steven F. Connelly, C.E.G., 4/18/19

Log of Test Pit 5		APN 527-20-003		
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Project #	Scale	Date	Figure	
1909	1 Inch = 5 Feet	5/18/19	14	



Slope profiles based on Lot Layout Plan by TS Civil Engineering, dated 3/13/19

Geologic Cross-Section A-A'		APN 527-20-003		
! "\$ % & ' () * % % # + + , - &) (# (. (		400 Surmont Drive Los Gatos, California		
	Project #	Scale	Date	Figure
	1909	1 Inch = 40 Feet	5/18/19	15



Earthquake Probability Map ! " # \$ % & ' () * % % # + + , - &) (# (. (&		APN 527-20-003 400 Surmont Drive Los Gatos, California		
	Project # 1909		Scale As Shown	Date 5/18/19
			Figure 16	



Wood Environment & Infrastructure Solutions, Inc.
180 Grand Avenue, Suite 1100
Oakland, California 94612-3066
USA

T: (510) 663-4100
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www.woodplc.com

November 5, 2019

Project 0084492620

Mr. Mike Weisz, PE
Associate Engineer
Town of Los Gatos
41 Miles Avenue
Los Gatos, CA 95030

Subject: Peer Review – 400 Surmont Drive, Los Gatos, California

Geotechnical Investigation

Proposed Anderson Residences, 400 Surmont Drive Los Gatos California, prepared by Milstone Geotechnical (MG), dated June 12, 2019.

Engineering Geologic Investigation

Proposed Residences, 400 Surmont Drive, prepared by Steven F. Connelly C.E.G (SC), dated May 18, 2019.

Plans

TS Civil Engineering Inc., 5 Sheets, dated 4/29/19 and 8/21/19.

Dear Mr. Weisz:

At your request, Wood Environment & Infrastructure Solutions, Inc. performed a peer review of the subject documents. In addition to reviewing the subject documents we review pertinent published and unpublished documents. We are familiar with the area but have not visited the site.

The proposed project consists of the construction of two new single-level, single-family residence, one each on adjoining undeveloped parcels off Surmont Drive in the Hillside area northeast of Downtown.

Reference 2 addresses the geologic and seismic conditions at the site and the potential geologic hazards. As discussed in Reference 2, no mapped faults traverse the parcels or are in close proximity. The closest mapped fault is a northwest-southeast trending trace of the Shannon fault zone located about 200 southwest. Monterey Shale bedrock is mapped underlying the parcels. The parcels are located in a zone of potential earthquake-induced landsliding on the State Seismic Hazards Zones Map, but no landslides are mapped on the parcels. SC considers the potential for earthquake-induced landsliding and ground deformation to be low.



Five test pits were excavated on the parcels to evaluate subsurface conditions. Highly plastic colluvium up to about 3 feet thick was encountered in the test pits. Santa Clara Formation bedrock was encountered in all the test pits. Monterey Shale bedrock was encountered in Test Pits 4 and 5.

In Test Pit 4 (Figure 13), the Monterey Shale was mapped as thrust over the Santa Clara Formation along a fault. In Test Pit 5 (Figure 14), the Santa Clara was mapped as in depositional contact overlying the Monterey Shale, but a fault was mapped cutting the Santa Clara Formation elsewhere in the test pit.

The relationships in Test Pits 4 and 5 are interpreted to define a northwest-southeast trending depositional contact between the Monterey Shale and overlying Santa Clara Formation, and a west-northwest-south-southeast trending, northeast-dipping thrust fault in the southwest corner of the Parcels (Figure 9). The mapped relationships indicate that Monterey Shale underlies the southwest corner of the parcels, and Santa Clara Formation underlies the remainder of the parcels, including the proposed building sites.

SC could not determine the age of faulting and concluded that the fault should be considered to be potentially active. Reference 2 recommends a building setback from the fault. In our judgment, the building setback should be a minimum of 50 feet from the fault, which is greater than the setback recommended in Reference 2. During construction, SC should carefully observe and document all grading for evidence of faulting and, if any is found, provide supplemental setback recommendations. The owner should be aware that in the event a fault is found closer to a residence under construction than 50 feet, the building may have to be redesigned or relocated.

The parcels will be subjected to very strong to violent ground shaking during a future large earthquake on the nearby San Andreas fault zone, or on one of the other large faults in the region. Seismic design criteria per the current CBC (2016) apply to the proposed project; Reference 2 cites the 2007.

In general, the geotechnical recommendations appear reasonable for the proposed projects. However, we have the following observations and comments which should be corrected and re-submitted for our review:

1. For seismic slope stability analyses MG used a Peak Ground Acceleration of 0.53 based on a probabilistic approach. However, the current California Building Code (2016 CBC), §1803.5.12, requires that a Peak Ground Acceleration be determined in accordance with §11.8.3 of ASCE 7-10. ASCE 7-10 indicates that the *"peak ground acceleration adjusted for site effects (PGAM) is used in this standard for evaluation of liquefaction, lateral spreading, seismic settlements, and other soil related issues."*

Thus, the "PGAM" should be used for seismic slope stability and deformation evaluations. The PGAM is most-appropriately calculated using the SEAOC/OSHPD web application, which was used by MG for other seismic parameters, to be about 0.855 for a Site Class C at the project site, or about 1.64 times larger than the PGA value of 0.52 used by MG for their slope stability evaluation.



Therefore, we recommend MG re-evaluate the PGAM as required by the 2016 CBC, and then re-perform the seismic earth pressures, and the slope stability and deformation analyses, based on this revised PGAM. The evaluations, conclusions, and recommendations should then be modified as appropriate.

2. MG indicates they have applied a reduction factor of 0.48 to the PGA to achieve a deformation of 5 cm or less. We request MG cite the method used for this calculation, and the parameters used with the selected method.

We have the following comments that may be appropriate to respond to but do not need to be re-submitted for our review:

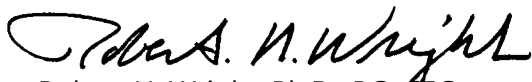
1. There appears to be a repeated typographical error in the presentation of "Equivalent Fluid Pressure as units of "pcf/f". We assume this is intended to be either "pcf" (pounds per cubic foot), or possibly "psf/f" (pounds per square foot per foot, as presented in the building code).
2. Page 12 of the MG report appropriately indicates fill placed on a slope should be provided with a keyway into the slope. However, Drawing Sheet C-2, detail "Typical Section, Shared Access Road," shows fill on a slope without a keyway. We assume fill will be keyed into the slope as recommended by MG.

MG should submit a revised / supplements report to the Town for our review which adequately addresses at least Comments 1 and 2 above

We trust that this provides you with the information you require at this time. Please call if you have any questions or require additional information.

Supplemental review of this project by Wood is required. A supplemental deposit may be required before further review is performed.

Sincerely,
Wood Environment & Infrastructure Solutions, Inc.



Robert H. Wright, Ph.D., PG, CEG
Principal Engineering Geologist



Jim French, PE, GE
Principal Geotechnical Engineer

rhw/jf/smm

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January 28, 2020

Project 0084492620

Mr. Mike Weisz, PE
Associate Engineer
Town of Los Gatos
41 Miles Avenue
Los Gatos, CA 95030

Subject: Second Peer Review – 400 Surmont Drive, Los Gatos, California

Reference Documents:

1. **Geotechnical Investigation:** Proposed Anderson Residences, 400 Surmont Drive Los Gatos California, prepared by Milstone Geotechnical (MG), dated June 12, 2019.
2. **Engineering Geologic Investigation:** Proposed Residences, 400 Surmont Drive, prepared by Steven F. Connelly C.E.G (SC), dated May 18, 2019.
3. **Plans:** TS Civil Engineering Inc., 5 Sheets, dated April 29, 2019 and August 21, 2019.

Supplemental Reference Documents

4. **Response to Geotechnical Peer Review:** Proposed Anderson Residences; 400 Surmont Drive, Los Gatos, California; Prepared by Milstone Geotechnical (MG), dated November 19, 2019.
5. **400 Surmont Drive [E-mail]:** Prepared by Milstone Geotechnical (MG), dated December 20, 2019.
6. **Plan Review:** Proposed Residence, Parcel 2 APN 527-20-003; Prepared by Steven F. Connelly C.E.G. (SC) dated November 21, 2019.
7. **Plans:** TS Civil Engineering Inc.: Sheet C-2 dated May 23, 2019 [dated December 11, 2019, but latest revision date is May 23, 2019], and Sheet C-3 dated April 29, 2019.

Dear Mr. Weisz:

At your request, Wood Environment & Infrastructure Solutions, Inc. performed a peer review of the supplemental documents listed above. We previously reviewed the initial documents and submitted our comments in our letter dated November 5, 2019. The recent documents have been submitted in response to the comments in our November 5, 2019 letter. We repeat the content of our November 5, 2019 letter for completeness, and provide our comments on the responses provided to our observation and comments in that letter.



The proposed project consists of the construction of two new single-level, single-family residence, one each on adjoining undeveloped parcels off Surmont Drive in the Hillside area northeast of Downtown.

Reference 2 addresses the geologic and seismic conditions at the site and the potential geologic hazards. As discussed in Reference 2, no mapped faults traverse the parcels or are in close proximity. The closest mapped fault is a northwest-southeast trending trace of the Shannon fault zone located about 200 southwest. Monterey Shale bedrock is mapped underlying the parcels. The parcels are located in a zone of potential earthquake-induced land sliding on the State Seismic Hazards Zones Map, but no landslides are mapped on the parcels. SC considers the potential for earthquake-induced landsliding and ground deformation to be low.

Five test pits were excavated on the parcels to evaluate subsurface conditions. Highly plastic colluvium up to about 3 feet thick was encountered in the test pits. Santa Clara Formation bedrock was encountered in all the test pits. Monterey Shale bedrock was encountered in Test Pits 4 and 5.

In Test Pit 4 (Figure 13), the Monterey Shale was mapped as thrust over the Santa Clara Formation along a fault. In Test Pit 5 (Figure 14), the Santa Clara was mapped as in depositional contact overlying the Monterey Shale, but a fault was mapped cutting the Santa Clara Formation elsewhere in the test pit.

The relationships in Test Pits 4 and 5 are interpreted to define a northwest-southeast trending depositional contact between the Monterey Shale and overlying Santa Clara Formation, and a west-northwest-south-southeast trending, northeast-dipping thrust fault in the southwest corner of the Parcels (Figure 9). The mapped relationships indicate that Monterey Shale underlies the southwest corner of the parcels, and Santa Clara Formation underlies the remainder of the parcels, including the proposed building sites.

SC could not determine the age of faulting and concluded that the fault should be considered to be potentially active. Reference 2 recommends a building setback from the fault. In our judgment, the building setback should be a minimum of 50 feet from the fault, which is greater than the setback recommended in Reference 2. During construction, SC should carefully observe and document all grading for evidence of faulting and, if any is found, provide supplemental setback recommendations. The owner should be aware that in the event a fault is found closer to a residence under construction than 50 feet, the building may have to be redesigned or relocated.

The most recent Plans show that the proposed residence is a minimum of 50 feet from the fault.

The parcels will be subjected to very strong to violent ground shaking during a future large earthquake on the nearby San Andreas fault zone, or on one of the other large faults in the region. Seismic design criteria per the current CBC (2016) apply to the proposed project; Reference 2 cites the 2007 CBC.



In general, the geotechnical recommendations appear reasonable for the proposed projects. However, we have the following observations and comments which should be corrected and re-submitted for our review:

1. *For seismic slope stability analyses MG used a Peak Ground Acceleration of 0.53 based on a probabilistic approach. However, the current California Building Code (2016 CBC), §1803.5.12, requires that a Peak Ground Acceleration be determined in accordance with §11.8.3 of ASCE 7-10. ASCE 7-10 indicates that the "peak ground acceleration adjusted for site effects (PGAM) is used in this standard for evaluation of liquefaction, lateral spreading, seismic settlements, and other soil related issues."*

Thus, the "PGAM" should be used for seismic slope stability and deformation evaluations. The PGAM is most-appropriately calculated using the SEAOC/OSHPD web application, which was used by MG for other seismic parameters, to be about 0.855 for a Site Class C at the project site, or about 1.64 times larger than the PGA value of 0.52 used by MG for their slope stability evaluation.

Therefore, we recommend MG re-evaluate the PGAM as required by the 2016 CBC, and then re-perform the seismic earth pressures, and the slope stability and deformation analyses, based on this revised PGAM. The evaluations, conclusions, and recommendations should then be modified as appropriate.

The MG responses in Ref. 4 regarding the PGAM and related seismic slope stability and deformation considerations are reasonable and appropriate, and no further response is needed with respect to this topic. However, Ref. 4 did not address our previous request to evaluate whether the modified PGAM would affect their recommendations regarding seismic earth pressures. **We therefore request MG evaluate whether, in light of the revised PGAM, the previous seismic earth pressures are still appropriate or if they should be revised.**

2. *MG indicates they have applied a reduction factor of 0.48 to the PGA to achieve a deformation of 5 cm or less. We request MG cite the method used for this calculation, and the parameters used with the selected method.*

The MG responses in Ref. 4 regarding the seismic coefficient are reasonable and appropriate, and no further response is needed with respect to these.

We have the following comments that may be appropriate to respond to but do not need to be re-submitted for our review:

1. *There appears to be a repeated typographical error in the presentation of "Equivalent Fluid Pressure as units of "pcf/f". We assume this is intended to be either "pcf" (pounds per cubic foot), or possibly "psf/f" (pounds per square foot per foot, as presented in the building code).*

The MG response in Ref. 4 regarding this comment is reasonable and appropriate, and no further response is needed



2. *Page 12 of the MG report appropriately indicates fill placed on a slope should be provided with a keyway into the slope. However, Drawing Sheet C-2, detail "Typical Section, Shared Access Road," shows fill on a slope without a keyway. We assume fill will be keyed into the slope as recommended by MG.*

No change has been made to Sheet C-2. As stated previously, we assume fill will be keyed into the slope as recommended by MG, and that someone will be responsible that this recommendation is implemented.

RECOMMENDATIONS

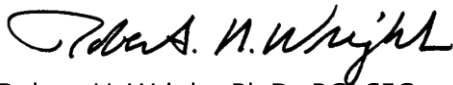
As stated above, we request MG evaluate whether, in light of the revised PGAM, the previous seismic earth pressures are still appropriate or if they should be revised.

MG should review the final Plans to confirm that the Plans incorporate the geotechnical engineering design recommendations and submit a Plan Review letter to the Town prior to the issuance of permits. We suggest they comment at that time on the keying of fill into the slope, as they have recommended on page 12 of Ref. 1.

MG should provide observation and testing of the geotechnical elements of the project during construction. SC should observe grading and trenching for the project to confirm that a fault(s) is not encountered within 50 feet of the residence. An "as-built" letter should be submitted to the Town prior to project Final.

We trust that this provides you with the information you require at this time. Please call if you have any questions or require additional information. No further review by Wood is required for this project unless major changes are made.

Sincerely,
Wood Environment & Infrastructure Solutions, Inc.



Robert H. Wright, Ph.D., PG, CEG
Principal Engineering Geologist



James B. French, PE, GE
Principal Geotechnical Engineer

