County of Santa Cruz

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
www.sccoplanning.com

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)
INITIAL STUDY/ENVIRONMENTAL CHECKLIST

Date: October 19, 2021 **Application Number:** 191306

Project Name: 9041 Soquel Drive, Aptos **Staff Planner:** Lezanne Jeffs

I. OVERVIEW AND ENVIRONMENTAL DETERMINATION

APPLICANT: Bill Kempf, Architect **APN:** 041-141-56

OWNER: Human Spaces, LLC **SUPERVISORIAL DISTRICT:** 2

PROJECT LOCATION: The project is located on the north side of Soquel Drive approximately 0.4 miles west of Rio Del Mar Boulevard, within the community of Aptos in unincorporated Santa Cruz County. Santa Cruz County is bounded on the north by San Mateo County, on the south by Monterey and San Benito counties, on the east by Santa Clara County, and on the south and west by the Monterey Bay and the Pacific Ocean.

SUMMARY PROJECT DESCRIPTION: This is a proposal to construct an approximately 10,981 square foot mixed-use building with a 1,929 square foot basement, 2,889 square feet of office space on the first floor with a covered carport for 5 vehicles, and three residential apartment units on the second floor, located in the PA (Professional-Administrative Office) district. This requires a Commercial Development permit including a Master Occupancy Permit for the two tenant spaces on the ground floor, and a Riparian Exception to allow for a portion of the parking lot and an associated retaining wall, that encroach into the riparian corridor within the arroyo along Valencia Creek. Valencia Creek crosses the northern edge of the parcel approximately 100 feet south of the proposed development site.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: *All of the following potential environmental impacts are evaluated in this Initial Study. Categories that are marked have been analyzed in greater detail based on project specific information.*

- ☐ Aesthetics and Visual Resources
- ☐ Agriculture and Forestry Resources
- ☐ Air Quality
- ☒ Biological Resources
- ☐ Cultural Resources
- ☐ Mineral Resources
- ☐ Noise
- ☐ Population and Housing
- ☐ Public Services
- ☐ Recreation

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED: *All of the following potential environmental impacts are evaluated in this Initial Study. Categories that are marked have been analyzed in greater detail based on project specific information.*

- ☐ Energy
- ☒ Geology and Soils
- ☐ Greenhouse Gas Emissions
- ☐ Hazards and Hazardous Materials
- ☐ Hydrology/Water Supply/Water Quality
- ☐ Land Use and Planning
- ☐ Transportation
- ☐ Tribal Cultural Resources
- ☐ Utilities and Service Systems
- ☐ Wildfire
- ☐ Mandatory Findings of Significance

DISCRETIONARY APPROVAL(S) BEING CONSIDERED:

- ☐ General Plan Amendment
- ☐ Land Division
- ☐ Rezoning
- ☒ Development Permit
- ☒ Sewer Connection Permit
- ☐ Coastal Development Permit
- ☒ Grading Permit
- ☒ Riparian Exception
- ☐ LAFCO Annexation
- ☐ Other:

OTHER PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED (e.g., permits, financing approval, or participation agreement):

Permit Type/Action	Agency
401 Permit	Regional Water Quality Control Board
1602 Permit	California Department of Fish and Wildlife

CONSULTATION WITH NATIVE AMERICAN TRIBES: *Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?*

No California Native American tribes traditionally and culturally affiliated with the area of Santa Cruz County have requested consultation pursuant to Public Resources Code section 21080.3.1.

DETERMINATION:

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

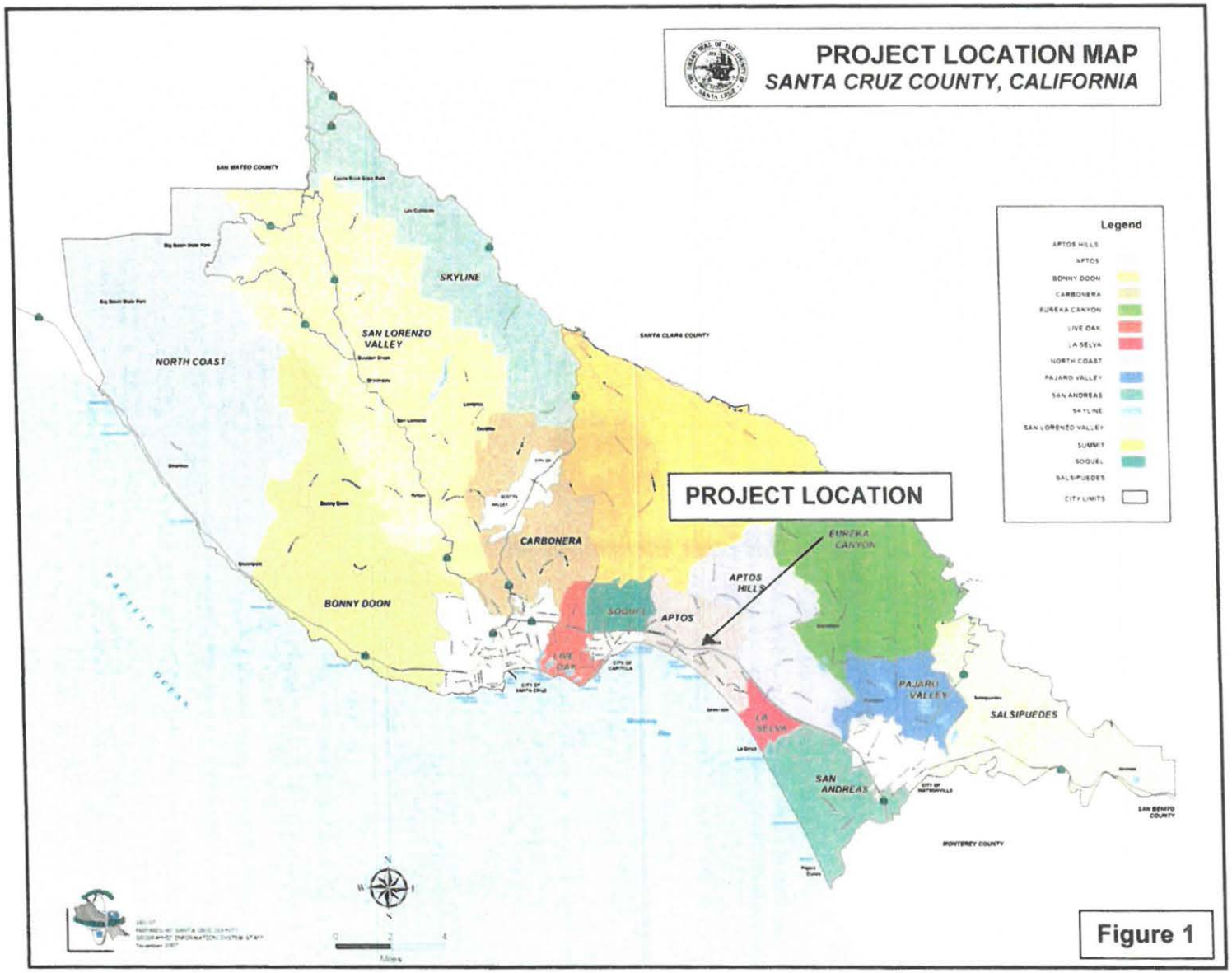
Matt Johnston

MATT JOHNSTON, Environmental Coordinator

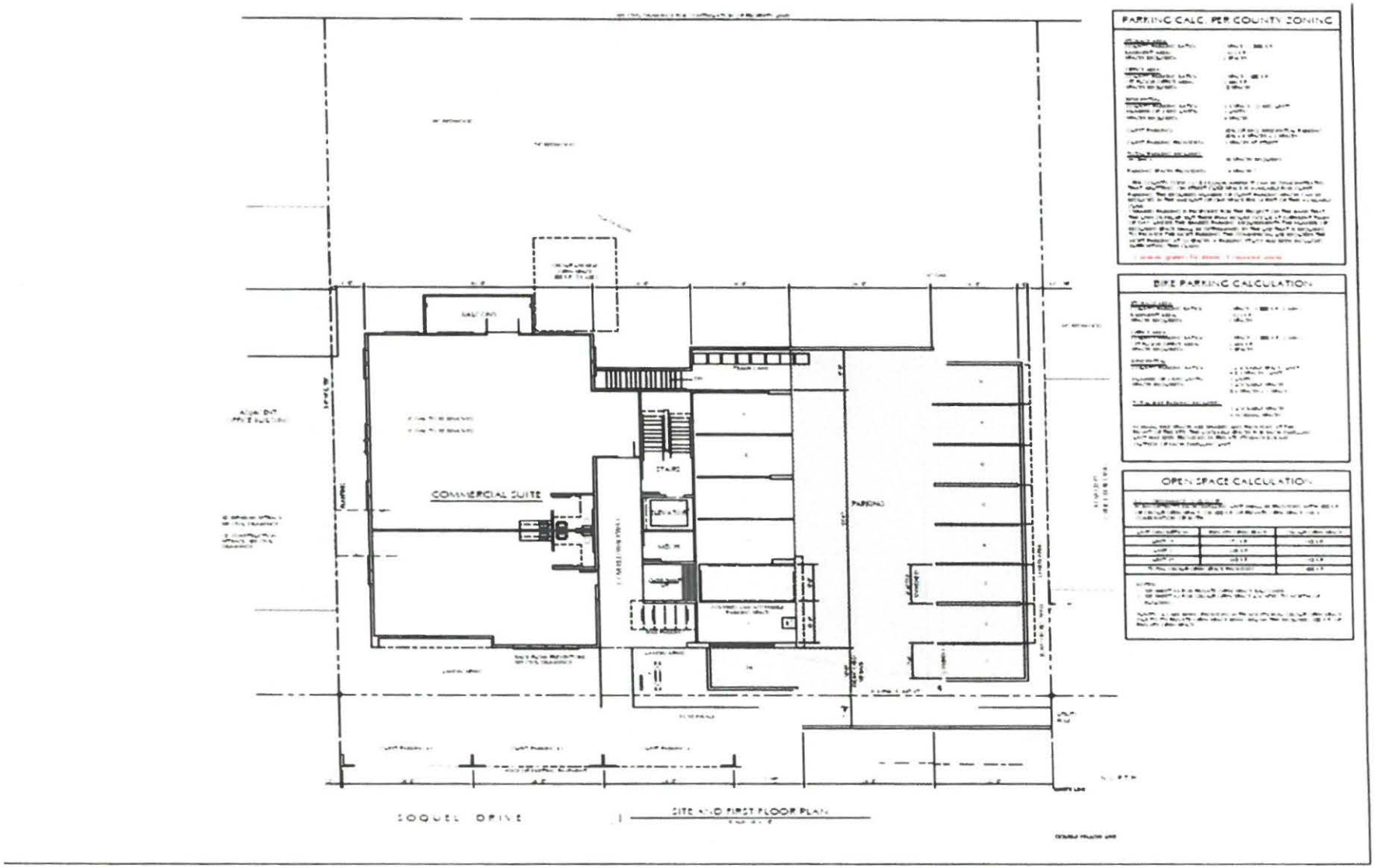
3/11/22

Date

This page intentionally left blank.


PROJECT LOCATION MAP
SANTA CRUZ COUNTY, CALIFORNIA
Legend
APTOS HILLS
APTOS
BONNY DOON
CARBONERA
EUREKA CANYON
LIVE OAK
LA SELVA
NORTH COAST
PAJARO VALLEY
SAN ANDREAS
SKYLINE
SAN LORENZO VALLEY
SUMMIT
SOQUEL
SALSIPUEDES
CITY LIMITS
PROJECT LOCATION
SKYLINE
SAN LORENZO VALLEY
NORTH COAST
BONNY DOON
CARBONERA
EUREKA CANYON
APTOS HILLS
SOQUEL
APTOS
LIVE OAK
PAJARO VALLEY
LA SELVA
SALSIPUEDES
SAN ANDREAS
SANTA CLARA COUNTY
SAN MATEO COUNTY
MONTEREY COUNTY
SAN BENITO COUNTY
PACIFIC OCEAN
Figure 1

This page intentionally left blank.



Project Site Plan **Figure 2**

This page intentionally left blank.

II. BACKGROUND INFORMATION

EXISTING SITE CONDITIONS:

Parcel Size (acres):	31,712 square feet; 12,169 square feet net
Existing Land Use:	Vacant
Vegetation:	Trees including redwoods, live oaks, big leaf maple. Groundcover including brambles and poison oak

Slope in area affected by project: ☐ 0 - 30% ☒ 31 – 100% ☐ N/A

Nearby Watercourse:	Valencia Creek (perennial stream)
Distance To:	Approximately 110 feet down steep slope

ENVIRONMENTAL RESOURCES AND CONSTRAINTS:

Water Supply Watershed:	Not Mapped	Fault Zone:	Not Mapped
Groundwater Recharge:	Yes/Portion	Scenic Corridor:	Scenic
Timber or Mineral:	Not Mapped	Historic:	Not Mapped
Agricultural Resource:	Not Mapped	Archaeology:	Potential
Biologically Sensitive Habitat:	Yes	Noise Constraint:	None
Fire Hazard:	Not Mapped	Electric Power Lines:	Yes
Floodplain:	Zone 6	Solar Access:	Adequate
Erosion:	Potential	Solar Orientation:	Adequate
Landslide:	Not Mapped	Hazardous Materials:	None
Liquefaction:	Very High	Other:	None

SERVICES:

Fire Protection:	Central FPD	Drainage District:	Zone 6
School District:	Pajaro Valley	Project Access:	Soquel Drive
Sewage Disposal:	SC County Sanitation	Water Supply:	Soquel Creek

PLANNING POLICIES:

Zone District: PA (Professional-Administrative Office)

Special Designation:

General Plan: C-O; O-U (Professional and Administrative Office); Urban Open Space Lands)

Urban Services Line:	☒ Inside	☐ Outside
Coastal Zone:	☐ Inside	☒ Outside

ENVIRONMENTAL SETTING AND SURROUNDING LAND USES:

Natural Environment

Santa Cruz County is uniquely situated along the northern end of Monterey Bay approximately 55 miles south of the City of San Francisco along the Central Coast. The Pacific Ocean and Monterey Bay to the west and south, the mountains inland, and the prime agricultural lands along both the northern and southern coast of the county create limitations on the style and amount of building that can take place. Simultaneously, these natural features create an environment that attracts both visitors and new residents every year. The natural landscape provides the basic features that set Santa Cruz apart from the surrounding counties and require specific accommodations to ensure building is done in a safe, responsible and environmentally respectful manner.

The California Coastal Zone affects nearly one third of the land in the urbanized area of the unincorporated County with special restrictions, regulations, and processing procedures required for development within that area. Steep hillsides require extensive review and engineering to ensure that slopes remain stable, buildings are safe, and water quality is not impacted by increased erosion. The farmland in Santa Cruz County is among the best in the world, and the agriculture industry is a primary economic generator for the County. Preserving this industry in the face of population growth requires that soils best suited to commercial agriculture remain active in crop production rather than converting to other land uses.

PROJECT BACKGROUND:

The upper portion of the project site is currently used as an unpermitted bicycle sales and repair shop with a pump track at the top of the arroyo slope. Discretionary Permit Application 89-0123 (Proposal to construct a 3,730 square foot, two-story commercial office building), which is filed under previous APN 041-141-32, was approved in August of 1989. This approval, however, was never exercised in that a building permit was never obtained to construct the office building. There were no other proposals for this site other than a consultation in 2009 to inquire about a 4,000 square foot medical building.

DETAILED PROJECT DESCRIPTION:

The project site is located on Soquel Drive just north of Highway One between Rio Del Mar Boulevard and Trout Gulch Road in Aptos. The parcel is approximately 32,000 square feet. While relatively flat at the front of the parcel, the parcel gently slopes downward towards the rear (north) followed by a sharp decline of about 50% slope where the parcel descends to Valencia Creek. The south side of Soquel Drive is lined with both deciduous and evergreen trees which screen views of the site from Highway One, a designated scenic road.

Surrounding land uses include a Goodwill donation center to the east and an interior design studio to the west. The neighborhood consists of several small-scale commercial businesses

including retail stores, restaurants, offices, and personal service establishments. Approximately one-quarter of a mile east of the site is Redwood Village which has an eclectic mix of shops and restaurants. West of the site along Soquel Drive are additional small-scale commercial businesses as well as several nonconforming single-family dwellings and a three-story apartment complex. Not including the apartment complex, these properties are developed with a mix of one - and two-story buildings with varying architectural styles built between the 1960s and 1980s. Aptos Village is located about one-half mile west of the site where Soquel Drive intersects Trout Gulch Road. Aptos Village supports a wide range of retail shops, restaurants, and medical offices.

The applicant is proposing to construct an approximately 10,981 square foot mixed-use building with office space on the first floor, three residential units on the second floor and a basement at the lower level. As shown on the project plans (Exhibit D), the proposed building will be located along the Soquel Drive frontage and includes parking in carports at the main floor, beneath the second floor of the building, as well as uncovered parking located on the eastern side of the parcel. From the street, the proposed building will appear to be two stories in height, with office tenant spaces on the lower floor and residential units above. Two of the three proposed residential units will be directly above the office space, with the third located over the covered parking area. Below the office space at the rear of the building, is a basement that will serve as storage for the tenants of the office space.

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

III. ENVIRONMENTAL REVIEW CHECKLIST

A. AESTHETICS AND VISUAL RESOURCES

Except as provided in Public Resources Code section 21099, would the project:

1. *Have a substantial adverse effect on a scenic vista?*	☐	☐	☒	☐

Discussion: The parcel is located within a mapped General Plan Scenic area due to its location along Highway One; however, as discussed below, the proposed mixed-use building will not be visible from the scenic road due to existing mature vegetation between the project site and the highway. The project will not directly impact any other public scenic vistas in the area, in that the proposed building is not visible from any other vantage point due to the presence dense woodland to the north, east and west of the project site within the adjacent Valencia Creek arroyo. Therefore, the impact on any scenic vista will be less than significant.

2. *Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?*	☐	☐	☒	☐

Discussion: The project site is located on the north side of Soquel Drive in an area where this street runs parallel and immediately adjacent to Highway One, which is a state scenic highway. However, on the south side of Soquel Drive, between the travelled roadway at Highway One and the project site, there is a thick row of trees and shrubs ranging in height between thirty and one hundred feet, that runs for around 680 feet along the southern edge of Soquel Drive, east toward Rio Del Mar Boulevard. The project site, which is located on the northern side of Soquel Drive between lots that are developed with other two-story commercial structures, is almost entirely hidden behind this existing landscaping. Therefore, because of the screening provided by the existing mature trees and shrubs and because the proposed structure will blend with other existing developments along Soquel Drive, the project would not be noticeably visible from public viewpoints within Highway One, and impacts will be less than significant.

3. *Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?*	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Discussion: The existing visual setting is a mix of commercial and residential structures that run east and west of the project site along the north side of Soquel Drive, backed by dense woodland running along Valencia Creek. Opposite the commercial buildings, between Soquel Drive and Highway One, there is a row of dense of trees and shrubs. Adjacent sites are developed with a mix of one- and two-story buildings with varying architectural styles built between the 1960s and 1980s. The project has been designed and landscaped to fit into this existing setting. The landscape plan includes two new Crape Myrtle trees along the front of the building to replace the two small trees being removed on the west side of the project site, and twelve tall shrubs will be planted between the parking strip and the adjacent building along the eastern side to provide a buffer between the parking strip and the existing Good Will store. A new sidewalk will be installed along the front property line that will connect with a concrete walkway that leads to the entrance to the lower (office) floor, stairs and an elevator leading to the apartment units above, and to stairs in the rear that go down to the basement.

The project is designed to be consistent with County Code sections that regulate height, bulk, density, setback, landscaping, and design of new structures in the County, including County Code Chapter 13.11, Site, Architectural and Landscape Design Review, including all applicable design guidelines. Therefore, impacts from the project will be less than significant.

4.	*Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?*	☐	☐	☒	☐

Discussion: The project would create an incremental increase in night lighting. However, this increase would be small, and would be similar in character to the lighting associated with the surrounding existing uses. As required by County Code, and as included as conditions of approval of this project, all site, building, security and landscape lighting shall be directed downwards onto the site and away from adjacent properties and away from the adjacent riparian corridor. Further, light sources shall not be visible from adjacent properties and shall be shielded by landscaping, structure, fixture design or other physical means. Building and security lighting shall be integrated into the building design. Project impacts are therefore expected to be less than significant.

B. AGRICULTURE AND FORESTRY RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

1. *Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?*	☐	☐	☐	☒

Discussion: The project site does not contain any lands designated as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. In addition, the project does not contain Farmland of Local Importance. Therefore, no Prime Farmland, Unique Farmland, Farmland of Statewide or Farmland of Local Importance would be converted to a non-agricultural use. No impact would occur from project implementation.

2. *Conflict with existing zoning for agricultural use, or a Williamson Act contract?*	☐	☐	☐	☒

Discussion: The project site is zoned PA (Professional-Administrative Office), which is not considered to be an agricultural zone. Additionally, the project site's land is not under a Williamson Act contract. Therefore, the project does not conflict with existing zoning for agricultural use, or a Williamson Act contract. No impact is anticipated.

3. *Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?*	☐	☐	☒	☐

Discussion: The project is not located near land designated as Timber Resource. Therefore, the project would not affect the resource or access to harvest the resource in the future. Timberland as defined by Public Resources Code section 4526, would not support harvesting of redwood trees within the riparian corridor adjacent to Valencia Creek but, if any redwood

trees were required to be removed in the future for safety reasons, the timber resource may only be removed from the site in accordance with California Department of Forestry timber harvest rules and regulations. No trees are within the proposed development area and no trees will be removed as a result of project implementation. No impact would occur.

4.	*Result in the loss of forest land or conversion of forest land to non-forest use?*	☐	☐	☐	☒

Discussion: No forest land will be impacted as a result of this project. See discussion under B-3 above. No impact is anticipated.

5.	*Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?*	☐	☐	☐	☒

Discussion: The project site and surrounding area east and west of Soquel drive does not contain any lands designated as Prime Farmland, Unique Farmland, Farmland of Statewide Importance or Farmland of Local Importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. The nearest parcel zoned Agriculture is on the other side of Highway One which will not be affected by the project site and proposal. Therefore, no Prime Farmland, Unique Farmland, Farmland of Statewide, or Farmland of Local Importance would be converted to a non-agricultural use. In addition, the project site contains no forest land, and no forest land occurs within one half of a mile of the project site. Therefore, no impacts are anticipated.

C. AIR QUALITY

The significance criteria established by the Monterey Bay Air Resources District (MBARD)[1] has been relied upon to make the following determinations. Would the project:

1.	*Conflict with or obstruct implementation of the applicable air quality plan?*	☐	☐	☒	☐

Discussion: The project would not conflict with or obstruct any long-range air quality plans of the MBARD. Because general construction activity related emissions (i.e., temporary sources) are accounted for in the emission inventories included in the air quality plans, impacts to air quality plan objectives are less than significant.

[1] Formerly known as the Monterey Bay Unified Air Pollution Control District (MBUAPCD).

General estimated basin-wide construction-related emissions are included in the MBARD emission inventory (which, in part, form the basis for the air quality plans cited below) and are not expected to prevent long-term attainment or maintenance of the ozone and particulate matter standards within the North Central Coast Air Basin (NCCAB). Therefore, temporary construction impacts related to air quality plans for these pollutants from the project would be less than significant, and no mitigation would be required, since they are presently estimated and accounted for in the District's emission inventory, as described below. No stationary sources would be constructed that would be long-term permanent sources of emissions.

Santa Cruz County is located within the NCCAB. The NCCAB does not meet state standards for ozone (reactive organic gases [ROGs] and nitrogen oxides [NOx]) and fine particulate matter (PM_{10}). Therefore, the regional pollutants of concern that would be emitted by the project are ozone precursors and PM_{10}.

The primary sources of ROG within the air basin are on- and off-road motor vehicles, petroleum production and marketing, solvent evaporation, and prescribed burning. The primary sources of NOx are on- and off-road motor vehicles, stationary source fuel combustion, and industrial processes. In 2010, daily emissions of ROGs were estimated at 63 tons per day. Of this, area-wide sources represented 49%, mobile sources represented 36%, and stationary sources represented 15%. Daily emissions of NOx were estimated at 54 tons per day with 69% from mobile sources, 22% from stationary sources, and 9% from area-wide sources. In addition, the region is "NOx sensitive," meaning that ozone formation due to local emissions is more limited by the availability of NOx as opposed to the availability of ROGs (MBUAPCD, 2013b).

PM_{10} is the other major pollutant of concern for the NCCAB. In the NCCAB, highest particulate levels and most frequent violations occur in the coastal corridor. In this area, fugitive dust from various geological and man-made sources combines to exceed the standard. The majority of NCCAB exceedances occur at coastal sites, where sea salt is often the main factor causing exceedance. In 2005 daily emissions of PM_{10} were estimated at 102 tons per day. Of this, entrained road dust represented 35% of all PM_{10} emission, windblown dust 20%, agricultural tilling operations 15%, waste burning 17%, construction 4%, and mobile sources, industrial processes, and other sources made up 9% (MBUAPCD, 2008).

Given the modest amount of new traffic that would be generated by the project there is no indication that new emissions of ROGs or NOx would exceed MBARD thresholds for these pollutants; and therefore, there would not be a significant contribution to an existing air quality violation.

Project construction may result in a short term, localized decrease in air quality due to generation of PM_{10}. However, standard dust control best management practices (BMPs), such

as periodic watering, would be implemented during construction to avoid significant air quality impacts from the generation of PM_{10}.

2.	*Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?*	☐	☐	☒	☐

Discussion: The primary pollutants of concern for the NCCAB are ozone and PM_{10}, as those are the pollutants for which the district is in nonattainment. Project construction would have a limited and temporary potential to contribute to existing violations of California air quality standards for ozone and PM_{10} primarily through diesel engine exhaust and fugitive dust. The criteria for assessing cumulative impacts on localized air quality are the same as those for assessing individual project impacts. Projects that do not exceed MBARD's construction or operational thresholds and are consistent with the AQMP would not have cumulatively considerable impacts on regional air quality (MBARD, 2008). Because the project would not exceed MBARD's thresholds and is consistent with the AQMP, there would not be cumulative impacts on regional air quality.

3.	*Expose sensitive receptors to substantial pollutant concentrations?*	☐	☐	☒	☐

Discussion:

The proposed mixed-use project would not generate substantial pollutant concentrations. Emissions from construction activities represent temporary impacts that are typically short in duration. Impacts to sensitive receptors would be less than significant.

4.	*Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?*	☐	☐	☒	☐

Discussion: Land uses typically producing objectionable odors include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The proposed project does not include any uses that would be associated with objectionable odors. Odor emissions from the proposed project would be limited to odors associated with vehicle and engine exhaust and idling from cars entering, parking, and exiting the facility. The project does not include any known sources of objectionable odors associated with the long-term operations phase.

During construction activities, only short-term, temporary odors from vehicle exhaust and construction equipment engines would occur. California ultralow sulfur diesel fuel with a

maximum sulfur content of 15 ppm by weight would be used in all diesel-powered equipment, which minimizes emissions of sulfurous gases (sulfur dioxide, hydrogen sulfide, carbon disulfide, and carbonyl sulfide). As the project site is in a coastal area that contains coastal breezes off of the Monterey Bay, construction-related odors would disperse and dissipate and would not cause substantial odors at the closest sensitive receptors. Construction-related odors would be short-term and would cease upon completion. Therefore, no objectionable odors are anticipated from construction activities associated with the project.

The project would not create objectionable odors affecting a substantial number of people; therefore, the project is not expected to result in significant impacts related to objectionable odors during construction or operation.

D. BIOLOGICAL RESOURCES

Would the project:

1.	*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 Wildlife, or U.S. Fish and Wildlife Service?*	☐	☒	☐	☐

Discussion: The project site is located in an area identified as a potential area of biotic concern based on preliminary analysis. The site is mapped for the following biotic resources on the California Natural Diversity Database (CNDDB): Dudley's Lousewort (*Pedicularis dudleyi*), Western Bumble Bee (*Bombus occidentalis*) and Central California Coast Steelhead (*Oncorhynchus mykiss irideus*)

County environmental staff performed several site visits to the property over the course of several months in 2020 and 2021to determine the extent to which any of these sensitive species may be present. With regard to Dudley's lousewort, no plants were identified during the site visits and the last collection of this species occurred in 1884 in the vicinity of Aptos. Since those site visits, the entire development area has been converted to a bicycle shop with storage containers converted to shop space and a bicycle pump track that has been installed in the northern portion of the proposed development area. Within the future building site area all native vegetation has been removed.

No plants that produce suitable nectar for bumble bees currently exist within the development area. However, due to the potential that bumble bees may be present in the wider area, the project

will be conditioned to require planting of a variety of flowering plant species that support these bees should they travel through the area.

Valencia Creek is a tributary to Aptos Creek in the Aptos Creek watershed. Valencia Creek is known to support steelhead (*Oncorhynchus mykiss irideus*), which are part of the Central California Coast Distinct Population Segment, listed as threatened under the federal Endangered Species Act. The project site sits above lower Valencia Creek, which serves as a migration corridor for adults to reach spawning habitat further upstream and also supports low densities of juvenile steelhead throughout the year.

The proposed project limits disturbance to the southern, mostly flat, portion of the property, which is approximately 100 feet away laterally and 60 feet above the stream channel. The proposed development envelope would not extend any further towards the stream than existing buildings on the adjacent lots located immediately to the east and west of the project site. The only exception to this is the stormwater discharge. Immediately north of the development area the topography is at or above a 50% slope for a lateral distance of approximately 45 feet. The geotechnical report for the project (Attachment 2), identifies release of stormwaters above this slope as a significant hazard and recommends piping stormwater runoff to the toe of the steep slope. This will require installation of two stormwater pipes that will be be anchored to the slope, and a perforated dispersal pipe set upon rock energy dissipators that will be installed at the toe of the slope. A site visit with County staff, project civil engineer and the project geotechnical engineer on 2/17/2021 identified the two locations for these outlets, one just above a redwood grove/ring approximately 25 feet across and the other west of that location in an area with a slope less than 5%. The area between the two outlets is densely vegetated with a mix of native redwood, willow, native blackberry and dense English and cape ivy. Plans showing the approved location of the drainage outlets is included at Attachment 4. The two discharge locations are approximately 25 feet above and 55 feet away from the stream channel. The project also includes a pervious paver driveway as well as three rain gardens to aide in filtering stormwater. With the relatively gentle slope below the outlets and the dense vegetation, and the dissipation from the spreaders and the RSP, as well as the treatment of stormwater and controlled release from the rain gardens, there should be no significant impact on steelhead water quality.

Furthermore, the proposed development will not require the removal of any trees or removal of riparian vegetation that would provide shade or organic material supporting the aquatic food web, and habitat for both terrestrial and aquatic insects, which are important food sources for steelhead.

An increase in lighting at the project site has the potential to impact riparian habitat and the common species that utilize it. To reduce those impacts to less than significant, only essential artificial lighting will be permitted. In addition, as a condition of project approval, a final detailed lighting plan shall be required, showing that all light sources will be cast downward, shielded and directed away from Valencia Creek, so that light does not spill over into the riparian habitat to the

north, onto adjacent properties or upwards into the night sky. Lighting shall further be limited to limited to warm light colors with an output temperature of 2,700 kelvin or less

There is the potential to cause some impact associated with construction to water quality. In order to ensure that steelhead habitat is protected, the following mitigation measures will reduce potential impacts to a less than significant level.

Mitigation Measures

BIO-1: Prior to any site disturbance, a pre-construction meeting shall be conducted. The purpose of the meeting will be to ensure that the conditions set forth in the proposed project description and Conditions of Approval of the Riparian Exception are communicated to the various parties responsible for constructing the project. The meeting shall involve all relevant parties including the project proponent, construction supervisor and Environmental Planning Staff.

BIO-2: Prior to construction, high visibility construction fencing shall be installed, to indicate the limits of work and prevent inadvertent grading or other disturbance within the adjacent riparian corridor. No work-related activity including equipment staging, vehicular access, and grading shall be allowed outside the limits of work.

BIO-3: A revegetation plan using appropriate California native riparian species plants (shrubs and low growing groundcover) with at least three species known as nectar plants for the obscure bumblebee shall be submitted and approved at the building permit review stage and implemented at the rear of the constructed project (five feet from the back of the building and retaining wall to the existing riparian vegetation) in order to restore of the margins of the riparian area, enhance the riparian corridor and for erosion control.

BIO-4: A permanent three-foot fence shall be erected approximately 5 feet behind the proposed building to demarcate and prevent disturbance to the riparian restoration area. The location of this fence shall be shown on plans submitted in support of the building permit for the project and shall be approved by Environmental Planning staff.

BIO-5: Prior to issuance of a building permit, a final detailed lighting plan shall be submitted for review and approval by Environmental Planning staff, showing that all light sources will be cast downward, shielded and directed away from Valencia Creek, so that light does not spill over into the riparian habitat to the north, onto adjacent properties or upwards into the night sky. Lighting shall further be limited to limited to warm light colors with an output temperature of 2,700 kelvin or less

With the implementation of these mitigation measures, the project is not expected to result in significant impacts and will result in beneficial impacts for the obscure bumblebee.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. *Have a substantial adverse effect on any riparian habitat or sensitive natural community identified in local or regional plans, policies, regulations (e.g., wetland, native grassland, special forests, intertidal zone, etc.) or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?*	☐	☒	☐	☐

Discussion: The site of the proposed mixed-use building and associated parking area is located to the south of Valencia Creek, which runs through the northern half of the parcel within a deeply incised arroyo. In accordance with County Code, "Arroyo" means a gully, ravine or canyon created by a perennial, intermittent or ephemeral stream, with characteristic steep slopes frequently covered with vegetation. An arroyo includes the area between the top of the arroyo banks defined by a discernible break in the slope rising from the arroyo bottom. All areas lying within an arroyo constitute the riparian corridor. The riparian corridor along Valencia Creek is therefore defined by the break of slope which runs across the parcel just north of the proposed building site. Because of the potential impacts on the riparian corridor a resource planner was consulted who indicated the following:

Riparian Woodland

Riparian woodland occurs along the banks of the Valencia Creek in the project area. The woodland is dominated by coast live oaks and redwoods along the higher edge of the banks with redwoods on the steeper slopes beyond. Riparian woodland is considered a sensitive natural community by the California Department of Fish and Wildlife (CDFW) and is regulated under the California Fish and Game Code section 1600 regarding lake and streambed alteration agreements. The riparian woodland in the project area falls within the CDFW stream zone, which extends laterally to the outer edge of riparian vegetation. In addition, riparian habitat is granted further protections under the County's Sensitive Habitat Protection and Riparian Corridor and Wetlands Protection ordinances (SCCC 16.30 and 16.32).

Impacts

Development will not require the removal of any trees or removal of riparian vegetation; however, a portion of the proposed parking area and an associated retaining wall be located within the delineated riparian corridor where the land starts to drop off toward Valencia Creek. In addition, a portion of the proposed mixed-use building, the retaining wall and parking area will be located within the required 10-foot construction buffer along the edge of the riparian corridor. In order to conduct work within a County-defined riparian corridor,

or for any construction within the designated construction buffer, the project requires the approval of a Riparian Exception by the County. Therefore, together with the Commercial Development Permit for the proposed mixed-use building, the applicant is required to obtain approval of a Riparian Exception. Prior to the approval of any Riparian Exception, a specific set of findings must be met (SCCC Section 16.30.060). Preliminary analysis has determined that the project complies with these findings and all conditions of approval for the Riparian Exception shall be adhered to.

See additional discussions and all proposed mitigation measures specified under D-1 above, that will reduce potential impacts on the riparian corridor a less than significant level.

3.	*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?*	☐	☐	☐	☒

Discussion: There are no mapped or designated federally protected wetlands on or adjacent to the project site. Therefore, no impacts would occur from project implementation.

4.	*Interfere substantially with the movement of any native resident or migratory fish or wildlife species or migratory wildlife corridors, or impede the use of native wildlife nursery sites?*	☐	☒	☐	☐

Discussion: The project has some potential to interfere with the movement of steelhead or other migratory species; See discussions and mitigation measures specified under D-1 and D-2 above. With the implementation of these mitigation measures, the project would not interfere with the movement of steelhead trout of any other migratory fish or wildlife species or migratory wildlife corridors or impede the use of native wildlife nursery sites. Impacts would be less than significant.

5.	*Conflict with any local policies or ordinances protecting biological resources (such as the Sensitive Habitat Ordinance, Riparian and Wetland Protection Ordinance, and the Significant Tree Protection Ordinance)?*	☐	☒	☐	☐

Discussion: The project is located within a County-defined riparian corridor. See discussions and mitigation measures specified under D-1 and D-2 above. The project must be granted a Riparian Exception in order to be consistent with the County of Santa Cruz Riparian

Corridor and Wetlands Protection Ordinance. In order for a project to qualify for a Riparian Exception (SCCC Section 16.30.060), a specific set of findings must be made. Preliminary analysis has determined that the project complies with these findings.

The project is therefore consistent with the County of Santa Cruz Riparian Corridor and Wetlands Protection Ordinance and impacts from project implementation would be less than significant with mitigation incorporated.

6.	*Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?*	☐	☐	☐	☒

Discussion: The project would not conflict with the provisions of any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, no impact would occur.

E. CULTURAL RESOURCES

Would the project:

1.	*Cause a substantial adverse change in the significance of a historical resource pursuant to CEQA Guidelines Section 15064.5?*	☐	☐	☐	☒

Discussion: There are no existing permanent structure(s) on the property. As a result, no impacts to historical resources would occur from project implementation.

2.	*Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5?*	☐	☐	☐	☒

Discussion: The Archaeological Survey Report prepared by Patricia Paramoure Archaeological Consulting, dated November 1, 2021, did not indicate the presence of an archaeological site in the vicinity of the proposed project. However, pursuant to section 16.40.040 of the SCCC, if archeological resources are uncovered during construction, the responsible persons shall immediately cease and desist from all further site excavation and comply with the notification procedures given in SCCC Chapter 16.40.040.

Pursuant to section 16.40.040 of the SCCC, if archaeological resources are uncovered during construction, the responsible persons shall immediately cease and desist from all further site excavation and comply with the notification procedures given in SCCC Chapter 16.40.

California Environmental Quality Act (CEQA) Initial Study/Environmental Checklist	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3. *Disturb any human remains, including those interred outside of dedicated cemeteries?*	☐	☐	☒	☐

Discussion: Impacts are expected to be less than significant. However, pursuant to section 16.40.040 of the SCCC, and California Health and Safety Code sections 7050.5-7054, if at any time during site preparation, excavation, or other ground disturbance associated with this project, human remains are discovered, the responsible persons shall immediately cease and desist from all further site excavation and notify the Sheriff-Coroner and the Planning Director. If the coroner determines that the remains are not of recent origin, a full archaeological report shall be prepared, and representatives of local Native American Indian groups shall be contacted. If it is determined that the remains are Native American, the Native American Heritage Commission will be notified as required by law. The Commission will designate a Most Likely Descendant who will be authorized to provide recommendations for management of the Native American human remains. Pursuant to Public Resources Code section 5097, the descendants shall complete their inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. Disturbance shall not resume until the significance of the resource is determined and appropriate mitigations to preserve the resource on the site are established.

F. ENERGY

Would the project:

1. *Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?*	☐	☐	☒	☐

Discussion: The project, like all development, would be responsible for an incremental increase in the consumption of energy resources during site grading and construction due to onsite construction equipment and potential traffic delays. All project construction equipment would be required to comply with the California Air Resources Board (CARB) emissions requirements for construction equipment, which includes measures to reduce fuel-consumption, such as imposing limits on idling and requiring older engines and equipment to be retired, replaced, or repowered. In addition, the project would comply with General Plan policy 8.2.2, which requires all new development to be sited and designed to minimize site disturbance and grading. As a result, impacts associated with the small temporary increase in consumption of fuel during construction are expected to be less than significant.

The project involves the construction of an approximately 11,000 square foot mixed-use building with a 1,900 square foot basement, 3,000 square feet of office space on the first floor with a covered carport for 5 vehicles, and three residential apartment units on the second floor. No impacts are expected from project implementation. Therefore, the project will not result in wasteful, inefficient, or unnecessary consumption of energy resources.

In addition, the County has strategies to help reduce energy consumption and greenhouse gas (GHG) emissions. These strategies included in the *County of Santa Cruz Climate Action Strategy* (County of Santa Cruz, 2013) are outlined below.

Strategies for the Reduction of Energy Use and GHG Emissions

- Develop a Community Choice Aggregation (CCA) Program, if feasible.[2]
- Increase energy efficiency in new and existing buildings and facilities.
- Enhance and expand the Green Business Program.
- Increase local renewable energy generation.
- Public education about climate change and impacts of individual actions.
- Continue to improve the Green Building Program by exceeding the minimum standards of the state green building code (Cal Green).
- Form partnerships and cooperative agreements among local governments, educational institutions, nongovernmental organizations, and private businesses as a cost-effective way to facilitate mitigation and adaptation.
- Reduce energy use for water supply through water conservation strategies.

Strategies for the Reduction of Energy Consumption and GHG Emissions from Transportation

- Reduce vehicle miles traveled (VMT) through County and regional long-range planning efforts.
- Increase bicycle ridership and walking through incentive programs and investment in bicycle and pedestrian infrastructure and safety programs.
- Provide infrastructure to support zero and low emissions vehicles (plug in, hybrid plug-in vehicles).
- Increase employee use of alternative commute modes: bus transit, walking, bicycling, carpooling, etc.
- Increase the number of electric and alternative fuels vehicles in the County fleet.

[2] Monterey Bay Community Power (MBCP) was formed in 2017 to provide carbon-free electricity. All Pacific Gas & Electric Company (PG&E) customers in unincorporated Santa Cruz County were automatically enrolled in the MBCP in 2018.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Therefore, the project will not result in wasteful, inefficient, or unnecessary consumption of energy resources. Impacts are expected to be less than significant.

2.	*Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?*	☐	☐	☐	☒

Discussion: AMBAG's 2040 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) recommends policies that achieve statewide goals established by CARB, the California Transportation Plan 2040, and other transportation-related policies and state senate bills. The SCS element of the MTP targets transportation-related greenhouse gas (GHG) emissions in particular, which can also serve to address energy use by coordinating land use and transportation planning decisions to create a more energy efficient transportation system.

The Santa Cruz County Regional Transportation Commission (SCCRTC) prepares a County-specific regional transportation plan (RTP) in conformance with the latest AMBAG MTP/SCS. The 2040 RTP establishes targets to implement statewide policies at the local level, such as reducing vehicle miles traveled and improving speed consistency to reduce fuel consumption.

In 2013, Santa Cruz County adopted a Climate Action Strategy (CAS) focused on reducing the emission of greenhouse gases, which is dependent on increasing energy efficiency and the use of renewable energy. The strategy intends to reduce energy consumption and greenhouse gas emissions by implementing a number of measures such as reducing vehicle miles traveled through County and regional long-range planning efforts, increasing energy efficiency in new and existing buildings and facilities, increasing local renewable energy generation, improving the Green Building Program by exceeding minimum state standards, reducing energy use for water supply through water conservation strategies, and providing infrastructure to support zero and low emission vehicles that reduce gasoline and diesel consumption, such as plug in electric and hybrid plug in vehicles.

In addition, the Santa Cruz County General Plan has historically placed a priority on "smart growth" by focusing growth in the urban areas through the creation and maintenance of an urban services line. Objective 2.1 (Urban/Rural Distinction) directs most residential development to the urban areas, limits growth, supports compact development, and helps reduce sprawl. The Circulation Element of the General Plan further establishes a more

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

efficient transportation system through goals that promote the wise use of energy resources, reducing vehicle miles traveled, and transit and active transportation options.

Energy efficiency is a major priority throughout the County's General Plan. Measure C was adopted by the voters of Santa Cruz County in 1990 and explicitly established energy conservation as one of the County's objectives. The initiative was implemented by Objective 5.17 (Energy Conservation) and includes policies that support energy efficiency, conservation, and encourage the development of renewable energy resources. Goal 6 of the Housing Element also promotes energy efficient building code standards for residential structures constructed in the County.

The project will be consistent with the AMBAG 2040 MTP/SCS and the SCCRTC 2040 RTP. The project would also be required to comply with the Santa Cruz County General Plan and any implemented policies and programs established through the CAS. In addition, the project design would be required to comply with CALGreen, the state of California's green building code, to meet all mandatory energy efficiency standards. Therefore, the project would not conflict with or obstruct any state or local plan for renewable energy or energy efficiency.

G. GEOLOGY AND SOILS

Would the project:

1.	*Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:*				
	A. *Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.*	☐	☐	☒	☐
	B. *Strong seismic ground shaking?*	☐	☐	☒	☐
	C. *Seismic-related ground failure, including liquefaction?*	☐	☐	☒	☐
	D. *Landslides?*	☐	☐	☒	☐

Discussion (A through D): All of Santa Cruz County is subject to some hazard from earthquakes, and there are several faults within the County. While the San Andreas fault is larger and considered more active, each fault is capable of generating moderate to severe ground shaking from a major earthquake. Consequently, large earthquakes can be expected in the future. The October 17, 1989 Loma Prieta earthquake (magnitude 7.1) was the second largest earthquake in central California history.

The project site is located outside of the limits of the State Alquist-Priolo Special Studies Zone or any County-mapped fault zone (County of Santa Cruz GIS Mapping, California Division of Mines and Geology, 2001). The project site is located approximately 8.5 miles southwest of the San Andreas fault zone, as the crow flies over mountain ranges so actual distance is much greater than this, and 4.5 miles of the Zayante fault zone, as the crow flies over mountain ranges and is considered much farther than this number. A geotechnical investigation for the project was performed by CMAG Engineering, Inc., dated December 30, 2018 (Attachment 2). This report has been reviewed and has been accepted by the County Civil Engineer as indicated in the letter dated January 9, 2020 (Attachment 3). The report concluded that based on the results of their slope stability analysis, there is a low probability for overall slope instability to occur under static and seismic conditions on the steep slope that descends to the north from the proposed improvements. However, under saturated conditions with slope parallel seepage, the factor of safety of shallow seated erosional failures, on the steep slope adjacent to the proposed improvements, does not meet industry standard factors of safety. To conclude, based on the results of the field investigations, laboratory testing, and engineering analysis, the subject site will be suitable for the proposed development provided the recommendations presented are implemented during grading and construction:

- The proposed north side of the building is to be located approximately 10 to 20 feet from the top of the slope.
- The building is to incorporate a basement, approximately 8 to 10 feet below grade for the portion of the building adjacent to the steep slope.
- The proposed north side of the parking area is to be located approximately 10 to 20 feet from the top of the slope.
- The grade for the parking area adjacent to the steep slope is to be raised by approximately 6 to 8 feet.
- Foundation, retaining wall, and grading recommendations in the subject report shall be adhered to.

- Stormwater shall be piped to the toe of the toe of the extreme slope immediately north of the development area and dissipated in a suitable location within the more gently sloped area above the stream channel.

Therefore, impacts associated with geologic hazards will be less than significant.

Implementation of the additional requirements included in the Geotechnical Report Review letter prepared by Environmental Planning staff, dated January 9, 2020, (Attachment 3) will serve to further reduce the potential risk of seismic shaking. Therefore, impacts will be less than significant.

2. *Result in substantial soil erosion or the loss of topsoil?*	☐	☐	☒	☐

Discussion: Some potential for erosion exists during the construction phase of the project, however, this potential is minimal because areas where there will be grading will be replaced with the proposed structure and groundcover will be planted on the slope in the rear to protect Valencia Creek below and prevent erosion on the sloped areas, and standard erosion controls are a required condition of the project. Prior to approval of a grading or building permit, the project must have an approved stormwater pollution control plan (SCCC Section 7.79.100), which would specify detailed erosion and sedimentation control measures. The plan would include provisions for disturbed areas to be planted with ground cover and to be maintained to minimize surface erosion. The locations of the outlets of stormwater on the slope north of the proposed development have been located in the field by the county environmental coordinator and the project geotechnical engineer to ensure discharge does not result in potential erosion. Impacts from soil erosion or loss of topsoil would be considered less than significant.

3. *Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?*	☐	☐	☐	☒

Discussion: The geotechnical report cited above (see discussion under G-1) did not identify a significant potential for damage caused by any of these hazards.

4. *Be located on expansive soil, as defined in section 1803.5.3 of the California Building Code (2016), creating substantial direct or indirect risks to life or property?*	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Discussion: The geotechnical report for the project did not identify any elevated direct or indirect risks associated with expansive soils. Therefore, no impact is anticipated.

5. *Have soils incapable of adequately supporting the use of septic tanks, leach fields, or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?* ☐ ☐ ☐ ☒

Discussion: No septic systems are proposed. The project would connect to the Santa Cruz County Sanitation District, and the applicant would be required to pay standard sewer connection and service fees that fund sanitation improvements within the district as a Condition of Approval for the project.

6. *Directly or indirectly destroy a unique paleontological resource or site of unique geologic feature?* ☐ ☐ ☐ ☒

Discussion: No unique paleontological resources or sites or unique geologic features are known to occur in the vicinity of the project. A query was conducted of the mapping of identified geologic/paleontological resources maintained by the County of Santa Cruz Planning Department, and there are no records of paleontological or geological resources in the vicinity of the project parcel. No direct or indirect impacts are anticipated.

or unique geologic features do not occur on the project site. No direct or indirect impacts are anticipated.

H. GREENHOUSE GAS EMISSIONS

Would the project:

1. *Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?* ☐ ☐ ☒ ☐

Discussion: The project, like all development, would be responsible for an incremental increase in greenhouse gas (GHG) emissions by usage of fossil fuels during the site grading and construction. In 2013, Santa Cruz County adopted a Climate Action Strategy (CAS) intended to establish specific emission reduction goals and necessary actions to reduce greenhouse gas levels to pre-1990 levels as required under Assembly Bill (AB) 32 legislation. The strategy intends to reduce GHG emissions and energy consumption by implementing measures such as reducing vehicle miles traveled through the County and regional long-range planning efforts and increasing energy efficiency in new and existing buildings and facilities. Implementing the CAS, the MBCP was formed in 2017 to provide carbon-free electricity. All

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

PG&E customers in unincorporated Santa Cruz County were automatically enrolled in the MBCP in 2018. All project construction equipment would be required to comply with the CARB emissions requirements for construction equipment. Further, all new buildings are required to meet the State's CalGreen building code. As a result, impacts associated with the temporary increase in GHG emissions are expected to be less than significant.

2. *Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?*	☐	☐	☐	☒

Discussion: See the discussion under H-1 above. No significant impacts are anticipated.

I. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

1. *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?*	☐	☐	☒	☐

Discussion: The project would not create a significant hazard to the public or the environment. No routine transport or disposal of hazardous materials is proposed. However, during construction, fuel would be used at the project site. In addition, fueling may occur within the limits of the staging area proposed to be located at the project site (9041 Soquel Drive). Best management practices would be used to ensure that no impacts would occur. Impacts are expected to be less than significant.

2. *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?*	☐	☐	☒	☐

Discussion: See discussion under I-1 above. Project impacts would be considered less than significant.

3. *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?*	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Discussion: Aptos Junior High School located at 1001 Huntington Drive in Aptos, is approximately .75 miles to the edge of the project site. Although fueling of equipment is likely to occur within the staging area, BMPs to contain spills would be implemented. No impacts are anticipated.

4.	*Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?*	☐	☐	☐	☒

Discussion: The project site is not included on the Cortese list of hazardous sites in Santa Cruz County compiled pursuant to Government Code section 65962.5. No impacts are anticipated from project implementation.

5.	*For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?*	☐	☐	☐	☒

Discussion: The project is not located within two miles of a public airport or public use airport. No impact is anticipated.

6.	*Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?*	☐	☐	☐	☒

Discussion: The project would not conflict with implementation of the County of Santa Cruz Local Hazard Mitigation Plan 2015-2020 (County of Santa Cruz, 2020). Therefore, no impacts to an adopted emergency response plan or evacuation plan would occur from project implementation.

7.	*Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?*	☐	☐	☐	☒

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Discussion: See discussion under Wildfire Question T-2. The project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires. No impact would occur.

J. HYDROLOGY, WATER SUPPLY, AND WATER QUALITY

Would the project:

1. *Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?*	☐	☐	☒	☐

Discussion:

The project is located adjacent to Valencia Creek; however, as conditioned, the project will have no significant impact on water quality and the project would not discharge runoff either directly or indirectly into a public or private water supply. No heavy commercial or industrial activities are proposed that would generate a substantial level of contaminants. However, runoff from this project may contain small amounts of chemicals and other household contaminants, such as pathogens, pesticides, trash, and nutrients. The parking and driveway associated with the project would incrementally contribute urban pollutants to the environment; however, the contribution would be small, given the size of the driveway and parking area. The project incorporates pervious pavers and rain garden catchments to treat stormwater and control release to pre-development levels. The discharge locations direct the pre-treated waters through dense vegetation along a gentle slope over 50-feet from the active channel, further reducing potential impacts. Potential siltation from the project during construction would be addressed through implementation of erosion control BMPs. No water quality standards or waste discharge requirements would be violated, and surface or ground water quality would not otherwise be substantially degraded. Impacts would be less than significant.

2. *Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?*	☐	☐	☒	☐

Discussion: The project would obtain water from Soquel Creek Water District and would not rely on private well water. Although the project would incrementally increase water demand, Soquel Creek Water District has previously provided information indicating that adequate supplies are available to serve the project and prior to the issuance of a building permit, a valid will-serve letter will be required to be submitted. The project is not located in

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

a mapped groundwater recharge area or water supply watershed and will not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin. Impacts would be less than significant.

3. *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:*	☐	☐	☒	☐
A. *result in substantial erosion or siltation on- or off-site;*	☐	☐	☒	☐
B. *substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;*	☐	☐	☒	☐
C. *create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or;*	☐	☐	☒	☐
D. *impede or redirect flood flows?*	☐	☐	☒	☐

Discussion: The project will not alter the course of any stream or river. A drainage plan was prepared for the proposed Project. The County Department of Public Works Stormwater Management Section staff has reviewed and approved the proposed drainage plan. The Project will not substantially alter the existing drainage pattern of the site in a manner that would result in erosion or siltation, or an increase in runoff from the site.

The subject site slopes from the south (Soquel Drive) towards the north (riparian area) and drains to Valencia Creek. The first 35 feet adjacent to Soquel Drive is relatively flat and is steeply sloped beyond that. There are no onsite or near-site drainage facilities. Soquel Drive is crowned and approximately half of the paved road drains toward the subject parcel. The project will result in the construction of approximately 5,000 square feet of impervious area and approximately 3,000 square feet of semi-impervious pavers.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

The project's civil engineer has prepared Preliminary Civil Improvement Plans and drainage calculations that have been reviewed and approved by the Department of Public Works (DPW) Stormwater Management for feasibility to comply with the County Design Criteria. The plans and report detail how the project has been designed to mitigate for the proposed increase in impervious area coverage. The proposal includes routing impervious area runoff to biofiltration areas and through permeable paver and underground rock sections that will provide both filtering for water quality treatment as well as flood control storage. The flood control storage is sized to detain the post development runoff from the 25-year storm while controlling the release so that predevelopment 5-year runoff rates are maintained. The controlled release will be routed to the north in two 8-inch storm drains that discharge on separate rip rap outfalls. The project has been conditioned to provide detailed grading information to ensure that existing runoff from Soquel Drive will continue with existing drainage patterns and routed so as not to impact adjacent private properties. The project is also conditioned to ensure that the civil engineer's final design and siting of the outfall structures are acceptable to the project geotechnical engineer. A recorded maintenance agreement regarding the ongoing maintenance of all proposed stormwater mitigations is also required prior to final acceptance of the project. Impacts would therefore be considered less than significant.

4. *In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?* ☐ ☐ ☐ ☒

Discussion: According to the Federal Emergency Management Agency (FEMA) National Flood Insurance Rate Map, dated September 29, 2017, no portion of the project site lies within a flood hazard zone, and there would be no impact.

5. *Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?* ☐ ☐ ☒ ☐

Discussion: All County water agencies are experiencing a lack of sustainable water supply due to groundwater overdraft and diminished availability of streamflow. Because of this, coordinated water resource management has been of primary concern to the County and to the various water agencies. Projects seeking approval must be consistent with numerous water management plans as described below.

As required by state law, each of the County's water agencies serving more than 3,000 connections must update their Urban Water Management Plans (UWMPs) every five years, with the most recent updates completed in 2021. This project falls within the City of Santa Cruz Water Department service area. The City of Santa Cruz Water Department is

anticipating that water use through 2040 will slightly increase, and they are planning accordingly through the development of several diverse water supply projects.

County staff are working with the water agencies on various integrated regional water management programs to provide for sustainable water supply and protection of the environment. Effective water conservation programs have reduced overall water demand in the past 20 years, despite continuing growth. In August 2014, the Board of Supervisors and other agencies adopted the Santa Cruz Integrated Regional Water Management (IRWM) Plan Update 2014, which identifies various strategies and projects to address the current water resource challenges of the region. In 2020, an updated climate change chapter was added to the IRWMP. A Countywide Storm Water Resources Plan was created through a related effort in 2016 to ensure the coordinated use of storm water as a resource.

The County is working closely with water agencies to implement the Sustainable Groundwater Management Act (SGMA) of 2014. There are three groundwater basins in the County that are subject to SGMA, the Santa Margarita Basin, the Santa Cruz Mid-County Basin, and the Pajaro Valley Basin. The project is located in the Santa Cruz Mid-County Groundwater Basin.

In 2016, Soquel Creek Water District (SqCWD), Central Water District (CWD), County, and City of Santa Cruz adopted a Joint Powers Agreement to form the Santa Cruz Mid-County Groundwater Agency for management of the Mid-County Basin under SGMA. The Groundwater Sustainability Plan (GSP) written by the Groundwater Agency was approved by the Department of Water Resources in June 2021. The GSP outlines an approach to reach sustainability by 2040 which relies on projects including a purified recycled water and an aquifer storage and recovery project to provide additional supply to the Basin. Projects and Management Actions included in the Plan originated through the SqCWD Community Water Plan and the City of Santa Cruz Water Supply Augmentation Strategy.

In addition to the Groundwater Sustainability Plan, Urban Water Management Plans, and the Integrated Regional Water Management Plan, the project will comply with SCCC Chapters 13.13 (Water Conservation – Water Efficient Landscaping), 7.69 (Water Conservation) and 7.70 (Water Wells), as well as Chapter 7.71 (Water Systems) section 7.71.130 (Water use measurement and reporting). The proposed project is consistent with the community Water Plan and so no significant impacts are anticipated.

K. LAND USE AND PLANNING

Would the project:

1.	*Physically divide an established community?*	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Discussion: The project does not include any element that would physically divide an established community. No impact would occur.

2.	*Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?*	☐	☐	☒	☐

Discussion: The project would not cause a significant environmental impact due to a conflict with any land use plan, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect. General Plan policy 5.2.3 (Activities Within Riparian Corridors and Wetlands) states: "Development activities, land alterations and vegetation disturbance within riparian corridors and wetlands and required buffers shall be prohibited unless an exception is granted per the Riparian Corridor and Wetlands Protection ordinance". Please see complete discussion under Question D-5. Impacts would be considered less than significant.

L. MINERAL RESOURCES

Would the project:

1.	*Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?*	☐	☐	☐	☒

Discussion: The site does not contain any known mineral resources that would be of value to the region and the residents of the state. Therefore, no impact is anticipated from project implementation.

2.	*Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?*	☐	☐	☐	☒

Discussion: The project site is zoned PA, which is not considered to be an Extractive Use Zone (M-3) nor does it have a land use designation with a Quarry Designation Overlay (Q) (County of Santa Cruz 1994). Therefore, no potentially significant loss of availability of a known mineral resource of locally important mineral resource recovery (extraction) site delineated on a local general plan, specific plan or other land use plan would occur as a result of this project.

M. NOISE

Would the project result in:

1. *Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?*	☐	☐	☒	☐

Discussion:

County of Santa Cruz General Plan

The County of Santa Cruz has not adopted noise thresholds for construction noise. The following applicable noise related policy is found in the Public Safety and Noise Element of the Santa Cruz County General Plan (Santa Cruz County 1994).

- Policy 6.9.7 Construction Noise. Require mitigation of construction noise as a condition of future project approvals.

The General Plan also contains the following table, which specifies the maximum allowable noise exposure for stationary noise sources (operational or permanent noise sources) (Table 2).

Table 2: Maximum Allowable Noise Exposure for Stationary Noise Sources[1]

	Daytime[5] (7:00 am to 10:00 pm)	Nighttime[2, 5] (10:00 pm to 7:00 am)
Hourly Leq average hourly noise level, dB[3]	50	45
Maximum Level, dB[3]	70	65
Maximum Level, dB – Impulsive Noise[4]	65	60

Notes:
1 As determined at the property line of the receiving land use. When determining the effectiveness of noise mitigation measures, the standards may be applied to the receptor side of noise barriers or other property line noise mitigation measures.
2 Applies only where the receiving land use operates or is occupied during nighttime hours
3 Sound level measurements shall be made with "slow" meter response.
4 Sound level measurements shall be made with "fast" meter response
5 Allowable levels shall be raised to the ambient noise levels where the ambient levels exceed the allowable levels. Allowable levels shall be reduced to 5 dB if the ambient hourly Leq is at least 10 dB lower than the allowable level.
Source: County of Santa Cruz 1994

County of Santa Cruz Code

There are no County of Santa Cruz ordinances that specifically regulate construction or operational noise levels. However, Section 8.30.010 (Curfew—Offensive noise) of the SCCC contains the following language regarding noise impacts:

(A) No person shall make, cause, suffer, or permit to be made any offensive noise.

(B) "Offensive noise" means any noise which is loud, boisterous, irritating, penetrating, or unusual, or that is unreasonably distracting in any other manner such that it is likely to disturb people of ordinary sensitivities in the vicinity of such noise, and includes, but is not limited to, noise made by an individual alone or by a group of people engaged in any business, activity, meeting, gathering, game, dance, or amusement, or by any appliance, contrivance, device, tool, structure, construction, vehicle, ride, machine, implement, or instrument.

I The following factors shall be considered when determining whether a violation of the provisions of this section exists:

(1) Loudness (Intensity) of the Sound.

(a) Day and Evening Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 8:00 a.m. and 10:00 p.m. and it is:

(i) Clearly discernible at a distance of 150 feet from the property line of the property from which it is broadcast; or

(ii) In excess of 75 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute's Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data.

A noise not reaching this intensity of volume may still be found to be offensive depending on consideration of the other factors outlined below.

(b) Night Hours. For purposes of this factor, a noise shall be automatically considered offensive if it occurs between the hours of 10:00 p.m. and 8:00 a.m. and it is:

(i) Clearly discernible at a distance of 100 feet from the property line of the property from which it is broadcast; or

(ii) In excess of 60 decibels at the edge of the property line of the property from which the sound is broadcast, as registered on a sound measuring instrument meeting the American National Standard Institute's Standard S1.4-1971 (or more recent revision thereof) for Type 1 or Type 2 sound level meters, or an instrument which provides equivalent data.

A noise not reaching this intensity of volume may still be found to be offensive depending on consideration of the other factors outlined below.

(2) Pitch (frequency) of the sound, e.g., very low bass or high screech;

(3) Duration of the sound;

(4) Time of day or night;

(5) Necessity of the noise, e.g., garbage collecting, street repair, permitted construction activities;

(6) The level of customary background noise, e.g., residential neighborhood, commercial zoning district, etc.; and

(7) The proximity to any building regularly used for sleeping purposes. [Ord. 5205 § 1, 2015; Ord. 4001 § 1, 1989]

Table 3: Typical Noise Levels for Common Construction Equipment (at 50 feet)

Equipment	Noise (dBA)
Air Compressor	80
Backhoe	80
Chain Saw	85
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Saw	90
Crane	83
Dozer	85
Dump Truck	84
Excavator	85
Flat Bed Truck	84
Fork Lift	75
Generator	82
Grader	85
Hoe-ram	90
Jack Hammer	88
Loader	80
Paver	85
Pick-up Truck	55
Pneumatic Tool	85
Roller	85
Tree Chipper	87
Truck	84

Source: Federal Transit Authority, 2006, 2018.

Sensitive Receptors

Some land uses are generally regarded as being more sensitive to noise than others due to the type of population groups or activities involved. Sensitive population groups generally include children and the elderly. Noise sensitive land uses typically include all residential uses (single- and multi-family, mobile homes, dormitories, and similar uses), hospitals, nursing homes, schools, and parks.

The nearest sensitive receptors are residential units across the creek and riparian area that goes down and up to a residential neighborhood, located approximately 500 feet to the north of the project area.

Impacts

Potential Temporary Construction Noise Impacts

Noise generated during project construction would increase the ambient noise levels in adjacent areas. Construction would be temporary, and construction hours would be limited as a condition of approval. Given the limited duration of construction and the limited hours of construction activity, this impact is considered to be less than significant.

Potential Permanent Impacts

The project would not result in a permanent increase in the ambient noise level. The main source of ambient noise in the project area is traffic noise along Soquel Drive. However, no substantial increase in traffic trips is anticipated as a result of the project. Impacts are expected to be less than significant.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. *Generation of excessive groundborne vibration or groundborne noise levels?*	☐	☐	☒	☐

Discussion: The use of construction and grading equipment would potentially generate periodic vibration in the project area. This impact would be temporary and periodic and is not expected to cause damage; therefore, impacts are not expected to be significant.

3. *For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?*	☐	☐	☐	☒

Discussion: The project is not in the vicinity of a private airstrip or within two miles of a public airport. Therefore, the project would not expose people residing or working in the project area. No impact is anticipated.

N. POPULATION AND HOUSING

Would the project:

1. *Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?*	☐	☐	☐	☒

Discussion: The project would not induce substantial population growth in an area because the project does not propose any physical or regulatory change that would remove a restriction to or encourage population growth in an area. The project proposes only to construct an approximately 11,000 square foot mixed-use building with a 1,900 square foot basement, 3,000 square feet of commercial space and 3 apartment units and would not induce population growth. No impact would occur.

2. *Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?*	☐	☐	☐	☒

Discussion: The project would not displace any existing housing since the project site is currently considered vacant. No impact would occur.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

O. PUBLIC SERVICES

Would the project:

1. *Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:*

a.	*Fire protection?*	☐	☐	☒	☐
b.	*Police protection?*	☐	☐	☒	☐
c.	*Schools?*	☐	☐	☒	☐
d.	*Parks?*	☐	☐	☒	☐
e.	*Other public facilities; including the maintenance of roads?*	☐	☐	☒	☐

Discussion (a through e): The project site is served by the Aptos/La Selva Fire Protection District and County Sheriff. The site is located within the Pajaro Valley Unified School District which has available space for new children should any be added as a result of this project. Nearby schools include Rio Del Mar and Valencia Elementary Schools (which serve students from kindergarten through 6th grade), Aptos Junior High School (which serves students for 7th and 8th grade) and Aptos High School (serving students from 9th grade to graduation). The nearest parks to serve this parcel are the Aptos Village County Park which is located approximately .75 miles to the west of the project site and the Polo Grounds County Park which is located approximately .75 miles to the east of the project site. While the project represents an incremental contribution to the need for services, the increase would be minimal. Moreover, the project meets all of the standards and requirements identified by the local fire agency or California Department of Forestry, as applicable, and school, park, and transportation fees to be paid by the applicant would be used to offset the incremental increase in demand for school and recreational facilities and public roads. Impacts would be considered less than significant.

P. RECREATION

Would the project:

1.	*Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?*	☐	☐	☒	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Discussion: The project would not substantially increase the use of existing neighborhood and regional parks or other recreational facilities. Impacts would be considered less than significant.

2. *Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?*	☐	☐	☐	☒

Discussion: The project does not propose the expansion or require the construction of additional recreational facilities. No impact would occur.

Q. TRANSPORTATION

Would the project:

1. *Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?*	☐	☐	☒	☐

Discussion:

Senate Bill (SB) 743, signed by Governor Jerry Brown in 2013, changed the way transportation impacts are identified under CEQA. Specifically, the legislation directed the State of California's Office of Planning and Research (OPR) to look at different metrics for identifying transportation impacts. OPR issued its "Technical Advisory on Evaluating Transportation Impacts in CEQA" (December 2018) to assist practitioners in implementing the CEQA Guidelines revisions to use vehicle miles traveled (VMT) as the preferred metric for assessing passenger vehicle related impacts. The CEQA Guidelines were also updated in December 2018, such that vehicle level of service (LOS) will no longer be used as a determinant of significant environmental impacts, and an analysis of Vehicle Miles Traveled (VMT) will be required as of July 2020. A discussion of consistency with the Santa Cruz County General Plan LOS policy is provide below for informational purposes only.

The project would create a small incremental increase in traffic on nearby roads and intersections. The proposed project would generate an estimated 69 daily trips with 7 trips during the AM peak hour and 10 trips during the PM peak hour. The increase would not cause the LOS at any nearby intersection to drop below LOS D, consistent with General Plan Policy 3.12.1.

The project design would comply with current road requirements, including the regulations under section 13.11.074 of the County Code, "Access, circulation and parking" to prevent

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

potential hazards to motorists, bicyclists, and/or pedestrians, as well as the County of Santa Cruz Department of Public Works design criteria. Impacts would be considered less than significant.

2. *Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)(1) (Vehicle Miles Traveled)?*	☐	☐	☒	☐

Discussion: In response to the passage of Senate Bill 743 in 2013 and other climate change strategies, OPR amended the CEQA Guidelines to replace LOS with VMT as the measurement for transportation impacts. The "Technical Advisory on Evaluating Transportation Impacts in CEQA," prepared by OPR (2018) provides recommended thresholds and methodologies for assessing impacts of new developments on VMT. There are also a number of screening criteria recommended by OPR that can be used to determine whether a project will have a less-than-significant impact. The screening criteria include projects that generate less than 110 net new trips, map-based screening, projects within a ½ mile of high-quality transit, affordable housing projects, and local serving retail. Since Santa Cruz County has a Regional Transportation Planning Authority and generally conducts transportation planning activities countywide, the county inclusive of the cities is considered a region.

In June of 2020, the County of Santa Cruz adopted a threshold of 15% below the existing countywide average per capita VMT levels for residential projects, 15% below the existing countywide average per employee VMT for office and other employee-based projects, no net increase in the countywide average VMT for retail projects, and no net increase in VMT for other projects. Based on the countywide travel demand model the current countywide average per capita VMT for residential uses is 10.2 miles. The current countywide per employee average VMT for the service sector (including office land uses) is 8.9 miles, for the agricultural sector is 15.4, for the industrial sector is 13.9, and for the public sector is 8.2. Therefore, the current VMT thresholds for land use projects are 8.7 miles per capita for residential projects. For employee-based land uses the current thresholds are: 7.6 miles per employee for office and services projects, 13.1 miles per employee for agricultural projects, 11.8 miles per employee for industrial projects, and 7 miles per employee for public sector land use projects. The threshold for retail projects and all other land uses is no net increase in VMT. For mixed-use projects, each land use is evaluated separately unless they are determined to be insignificant to the total VMT.

A traffic impact analysis for the proposed mixed-use development was submitted by traffic engineer Keith Higgins (dated February 6, 2020) which summarizes traffic impacts in two ways. One method was to summarize the project trip generation. County Code states if a

Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

proposed project generates 20 or more AM or PM peak hour vehicle trips, a formal traffic impact analysis is required. Exhibit 7 of the he submitted traffic study summarizes the project trip generation, which was estimated using trip rates from *Trip Generation Manual,* 10th Edition, published by the Institute of Transportation Engineers in 2017. The proposed project would generate an estimated 69 daily trips with 7 trips during the AM peak hour and 10 trips during the PM peak hour. A formal traffic impact analysis, therefore, is not required since this is below the threshold number of 20 additional trips. Furthermore, the small number of added trips generated by the project would be distributed throughout the surrounding street network, including Soquel Drive and Highway One, which will minimize the number of trips added to any one of these roadways. Therefore. the project as proposed would not adversely impact existing roads or intersections in the surrounding area.

Vehicle Miles Traveled (VMT) is defined as the total miles traveled by all vehicles traveling to and from a specific area over an average day. Santa Cruz County standards state that projects that generate less than 110 net new daily vehicle trips are considered to have a less than significant impact on VMT. Exhibit 7 of the Traffic Report indicates that the project would only generate 69 daily trips, therefore, the proposed project would have a less than significant impact on VMT.

3.	*Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?*	☐	☐	☐	☒

Discussion: The project consists of a proposal to construct a 10,981 square foot mixed-use building that includes an approximately 1,900 square foot basement storage area, approximately 3,000 square feet of office space on the first floor with a covered carport for 5 vehicles, and three residential apartment units at the second floor, located in the PA (Professional-Administrative Office) district. No increase in hazards would occur from project design or from incompatible uses. No impact would occur from project implementation.

4.	*Result in inadequate emergency access?*	☐	☐	☐	☒

Discussion: The project's road access meets County standards and has been approved by the local fire agency or California Department of Forestry, as appropriate.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

R. TRIBAL CULTURAL RESOURCES

1. *Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:*

A. *Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources Code section 5020.1(k), or*	☐	☐	☐	☐
B. *A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.*	☐	☐	☐	☒

Discussion: The project proposes to establish an approximately 11,000 square foot mixed-use building with a 1,900 square foot basement, 3,000 square feet of office space on the first floor with a covered carport for 5 vehicles, and three residential apartment units on the second floor, located in the PA (Professional-Administrative Office) district. Section 21080.3.1(b) of the California Public Resources Code (AB 52) requires a lead agency formally notify a California Native American tribe that is traditionally and culturally affiliated within the geographic area of the discretionary project when formally requested. As of this writing, no California Native American tribes traditionally and culturally affiliated with the Santa Cruz County region have formally requested a consultation with the County of Santa Cruz (as Lead Agency under CEQA) regarding Tribal Cultural Resources. However, no Tribal Cultural Resources are known to occur in or near the project area. Therefore, no impact to the significance of a Tribal Cultural Resource is anticipated from project implementation.

S. UTILITIES AND SERVICE SYSTEMS

Would the project:

1. *Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water*	☐	☐	☒	☐

drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Discussion:

Water

The project would connect to an existing municipal water supply. Soquel Creek Water District has previously determined that adequate supplies are available to serve the project and that no new facilities are required to serve the project. Prior to the issuance of a building permit, an updated will-serve letter is required confirming this initial determination. No impact would occur from project implementation.

Wastewater

Municipal wastewater treatment facilities are available and have capacity to serve the project. No new wastewater facilities are required to serve the project. No impact would occur from project implementation.

Stormwater

The drainage analysis for the project 9041 Soquel Drive, prepared by Ramsey Civil Engineering, Inc., dated April 1, 2020. The project's civil engineer has prepared Preliminary Civil Improvement Plans and drainage calculations that have been reviewed and approved by the Department of Public Works (DPW) Stormwater Management for feasibility to comply with the County Design Criteria. The plans and report detail how the project has been designed to mitigate for the proposed increase in impervious area coverage. The proposal includes routing impervious area runoff to biofiltration areas and through permeable paver and underground rock sections that will provide both filtering for water quality treatment as well as flood control storage. The flood control storage is sized to detain the post development runoff from the 25-year storm while controlling the release so that predevelopment 5-year runoff rates are maintained. The controlled release will be routed to the north in two 8-inch storm drains that discharge on separate rip rap outfalls The project has been conditioned to provide detailed grading information to ensure that existing runoff from Soquel Drive will continue with existing drainage patterns and routed so as not to impact adjacent private properties. The project is also conditioned to ensure that the civil engineer's final design and siting of the outfall structures are acceptable to the project geotechnical engineer. A recorded maintenance agreement regarding ongoing maintenance of the proposed stormwater mitigations is required prior to final acceptance of the project. No impacts are expected to occur from the project.

Electric Power

Pacific Gas and Electric Company (PG&E) provides power to existing and new developments in the Santa Cruz County area. As of 2018, residents and businesses in the County were automatically enrolled in MBCP's community choice energy program, which provides locally controlled, carbon-free electricity delivered on PGE's existing lines.

The proposed site is previously undeveloped and is not currently served by electric power (the unpermitted bike shop uses a solar inverter system). Electric power service will be required to serve the site; however, no substantial environmental impacts will result from the additional improvements; impacts will be less than significant.

Natural Gas

PG&E serves the urbanized portions of Santa Cruz County with natural gas.

The proposed site is considered undeveloped and not currently served by natural gas. Extension of gas lines are proposed to serve the site. However, no environmental impacts will result from the additional improvements; impacts will be less than significant.

Telecommunications

Telecommunications, including telephone, wireless telephone, internet, and cable, are provided by a variety of organizations. AT&T is the major telephone provider, and its subsidiary, DirectTV provides television and internet services. Cable television services in Santa Cruz County are provided by Charter Communications in Watsonville and Comcast in other areas of the county. Wireless services are also provided by AT&T, as well as other service providers, such as Verizon.

No improvements related to telecommunications are required, and there will be no impact.

2.	*Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?*	☐	☐	☒	☐

Discussion: All the main aquifers in this County, the primary sources of the County's potable water, are in some degree of overdraft. Overdraft is manifested in several ways including 1) declining groundwater levels, 2) degradation of water quality, 3) diminished stream base flow, and/or 4) seawater intrusion. Surface water supplies, which are the primary source of supply for the northern third of the County, are inadequate during drought periods and will be further diminished as a result of the need to increase stream baseflows to restore habitat for endangered salmonid populations. In addition to overdraft, the use of water resources is further constrained by various water quality issues.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

Soquel Creek Water District has previously indicated that adequate water supplies are available to serve the project subject to the payment of fees and charges in effect at the time of service. Prior to issuance of a building permit an updated will-serve letter will be required to be submitted, confirming this initial determination. The development would also be subject to the water conservation requirements in Chapter 7.69 (Water Conservation) and 13.13 (Water Conservation—Water Efficient Landscaping) of the County Code and the policies of section 7.18c (Water Conservation) of the General Plan. Therefore, existing water supplies would be sufficient to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years. Impacts would be less than significant.

3.	*Result in determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?*	☐	☐	☐	☒

Discussion: The Santa Cruz County Sanitation District has reviewed the proposed project and has determined that that the project meets all feasibility requirements and that adequate capacity in the sewer collection system is available to serve the project. Therefore, existing wastewater collection/treatment capacity would be sufficient to serve the project. No impact would occur from project implementation.

4.	*Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?*	☐	☐	☒	☐

Discussion: Due to the small incremental increase in solid waste generation by the project during construction and operations, the impact would be less than significant.

5.	*Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?*	☐	☐	☐	☒

Discussion: The project would comply with all federal, state, and local statutes and regulations related to solid waste disposal. No impact would occur.

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

T. WILDFIRE

If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:

1. *Substantially impair an adopted emergency response plan or emergency evacuation plan?*	☐	☐	☐	☒

Discussion: The project is not located in a State Responsibility Area, a Very High Fire Hazard Severity Zone, or a County-mapped Critical Fire Hazard Area and will not conflict with emergency response or evacuation plans. Therefore, no impact would occur.

2. *Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?*	☐	☐	☒	☐

Discussion: The project is not located in a State Responsibility Area, a Very High Fire Hazard Severity Zone, or a County-mapped Critical Fire Hazard Area. In addition, the project design incorporates all applicable fire safety code requirements and includes fire protection devices as required by the local fire agency and is unlikely to exacerbate wildfire risks. Impacts would be less than significant.

3. *Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?*	☐	☐	☒	☐

Discussion: The project is not located in a State Responsibility Areas, a Very High Fire Hazard Severity Zone, or a County-mapped Critical Fire Hazard Area. Improvements associated with the project are unlikely to exacerbate wildfire risks. Impacts would be less than significant.

4. *Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?*	☐	☐	☒	☐

Discussion: The project is not located within a State Responsibility Areas, a Very High Fire Hazard Severity Zone, or a County-mapped Critical Fire Hazard Area. Downslope and downstream impacts associated with wildfires are unlikely to result from the project.

Regardless, the project design incorporates all applicable fire safety code requirements and includes fire protection devices as required by the local fire agency. Impacts would be less than significant. See section D.1. for further discussion of slope stability related to stormwater release.

U. MANDATORY FINDINGS OF SIGNIFICANCE

1. *Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal community or eliminate important examples of the major periods of California history or prehistory?*	☐	☐	☒	☐

Discussion: The potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory were considered in the response to each question in Section III (A through T) of this Initial Study. As a result of this evaluation, with the proposed mitigations, there is no substantial evidence that significant effects associated with this project would result. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

2. *Does the project have impacts that are individually limited, but cumulatively considerable? ("cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?*	☐	☐	☒	☐

Discussion: In addition to project specific impacts, this evaluation considered the project's potential for incremental effects that are cumulatively considerable. As a result of this evaluation, there were determined to be no potentially significant cumulative effects

	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact

associated with this project. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

3.	*Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?*	☐	☐	☐	☒

Discussion: In the evaluation of environmental impacts in this Initial Study, the potential for adverse direct or indirect impacts to human beings were considered in the response to specific questions in Section III (A through T). As a result of this evaluation, no potentially adverse effects to human beings associated with this project were identified. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

IV. REFERENCES USED IN THE COMPLETION OF THIS INITIAL STUDY

California Department of Conservation, 1980

Farmland Mapping and Monitoring Program Soil Candidate Listing for Prime Farmland and Farmland of Statewide Importance Santa Cruz County U.S. Department of Agriculture, Natural Resources Conservation Service, soil surveys for Santa Cruz County, California, August 1980.

California Department of Fish and Wildlife, 2019

California Natural Diversity Database SOQUEL USGS 7.5 minute quadrangle; queried November 29, 2021

CalFIRE, 2010

Santa Cruz County-San Mateo County Community Wildfire Protection Plan. May 2010.

Caltrans, 2018

California Public Road Data 2017: Statistical Information Derived from the Highway Performance Monitoring System. Released by the State of California Department of Transportation November 2018.

County of Santa Cruz, 1994

1994 General Plan and Local Coastal Program for the County of Santa Cruz, California. Adopted by the Board of Supervisors on May 24, 1994, and certified by the California Coastal Commission on December 15, 1994.

County of Santa Cruz, 2013

County of Santa Cruz Climate Action Strategy. Approved by the Board of Supervisors on February 26, 2013.

County of Santa Cruz, 2015

County of Santa Cruz Local Hazard Mitigation Plan 2015-2020. Prepared by the County of Santa Cruz Office of Emergency Services.

DOF, 2018

E-5 Population and Housing Estimates for Cities, Counties and the State—January 1, 2011-2018. Released by the State of California Department of Finance May 2018.

Federal Transit Administration, 2006

Transit Noise and Vibration Impact Assessment Manual.

Federal Transit Administration, 2018

Transit Noise and Vibration Impact Assessment Manual. September 2018.

FEMA,

Flood Insurance Rate Map Flood Insurance Rate Map 0351 Federal Emergency Management Agency. Effective on May 16, 2012.

MBUAPCD, 2008

Monterey Bay Unified Air Pollution Control District (MBUAPCD), CEQA Air Quality Guidelines. Prepared by the MBUAPCD, Adopted October 1995, Revised: February 1997, August 1998, December 1999, September 2000, September 2002, June 2004 and February 2008.

MBUAPCD, 2013a

Monterey Bay Unified Air Pollution Control District, NCCAB (NCCAB) Area Designations and Attainment Status – January 2013. Available online at http://www.mbuapcd.org/mbuapcd/pdf/Planning/Attainment_Status_January_2013_2.pdf

MBUAPCD, 2013b

Triennial Plan Revision 2009-2011. Monterey Bay Unified Air Pollution Control District. Adopted April 17, 2013.

OPR, 2018

"Technical Advisory on Evaluating Transportation Impacts in CEQA." Available online at http://www.opr.ca.gov/docs/20190122-743_Technical_Advisory.pdf.

This page intentionally left blank.

Attachment 1

Mitigation Monitoring and Reporting Program

County of Santa Cruz

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123

MITIGATION MONITORING AND REPORTING PROGRAM
For
9041 Soquel Drive, Aptos
Application No. 191306, October 2019

No.	Environmental Impact	Mitigation Measures	Responsibility for Compliance	Method of Compliance	Timing of Compliance
Biological Resources					
BIO-1	*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 Wildlife, or U.S. Fish and Wildlife Service?*	Prior to any site disturbance, a pre-construction meeting shall be conducted. The purpose of the meeting will be to ensure that the conditions set forth in the proposed project description and Conditions of Approval of the Riparian Exception are communicated to the various parties responsible for constructing the project. The meeting shall involve all relevant parties including the project proponent, construction supervisor and Environmental Planning Staff.	Applicant	Compliance monitored by the County Planning Department and Applicant	To be implemented prior to and during project construction
BIO-2		Prior to construction, high visibility construction fencing shall be installed, to indicate the limits of work and prevent inadvertent grading or other disturbance within the adjacent riparian corridor. No work-related activity including equipment staging, vehicular access, and grading shall be allowed outside the limits of work.	Applicant	Compliance monitored by the County Planning Department and Applicant	To be implemented prior to and during project construction
BIO-3	*Have a substantial adverse effect on any riparian habitat or sensitive natural community identified in local or regional plans, policies, regulations (e.g., wetland, native grassland, special forests, intertidal zone, etc.) or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?*	A revegetation plan using appropriate California native riparian species plants (shrubs and low growing groundcover) with at least three species known as nectar plants for the obscure bumblebee shall be submitted and approved at the building permit review stage and implemented at the rear of the constructed project (five feet from the back of the building and retaining wall to the existing riparian vegetation) in order to restore of the margins of the riparian area, enhance the riparian corridor and for erosion control.	Applicant	Compliance monitored by the County Planning Department and Applicant	To be implemented prior to and during project construction
BIO-4		A permanent three-foot high fence shall be erected approximately 5 feet behind the proposed building to demarcate and prevent disturbance to the riparian restoration area. The location of this fence shall be shown on plans submitted in support of the building permit for the project and shall be approved by Environmental Planning staff.	Applicant	Compliance monitored by the County Planning Department and Applicant	To be implemented prior to and during project construction
BIO-5		Prior to issuance of a building permit, a final detailed lighting plan shall be submitted for review and approval by Environmental Planning staff, showing that all light sources will be cast downward, shielded and directed away from Valencia Creek, so that light does not spill over into the riparian habitat to the north, onto adjacent properties or upwards into the night sky. Lighting shall further be limited to limited to warm light colors with an output temperature of 2,700 kelvin or less.	Applicant	Compliance monitored by the County Planning Department and Applicant	To be implemented prior to and during project construction

Attachment 2

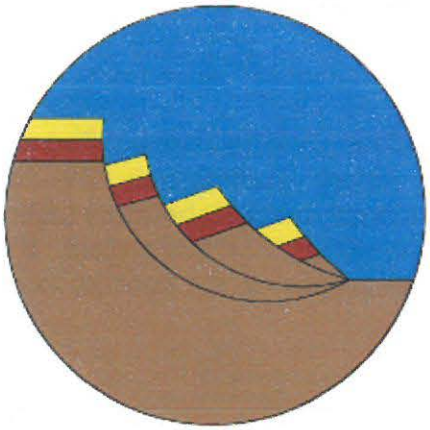
Geotechnical Report by CMAG Engineering, Inc.
Dated December 30, 2018

GEOTECHNICAL INVESTIGATION

9041 Soquel Drive
Aptos, Santa Cruz County, California

Submitted to:

Testorff Construction
335 Spreckels Drive, Suite D
Aptos, California 95003



Prepared by:

CMAG ENGINEERING, INC.

Project No. 18-142-SC
December 30, 2018

CMAG ENGINEERING, INC.

P.O. BOX 640 APTOS, CALIFORNIA 95001
PHONE: 831.475.1411
WWW.CMAGENGINEERING.COM

December 30, 2018
Project No. 18-142-SC

Testorff Construction
335 Spreckels Drive, Suite D
Aptos, California 95003

Attn: Pete Testorff

SUBJECT: **GEOTECHNICAL INVESTIGATION**
Proposed Commercial Building
9041 Soquel Drive,
Aptos, Santa Cruz County, California
APN 041-141-56

Dear Mr. Testorff:

In accordance with your authorization, we have completed a geotechnical investigation for the subject project. This report summarizes the findings, conclusions, and recommendations from our field exploration, laboratory testing, and engineering analysis. It is a pleasure being associated with you on this project. If you have any questions, or if we may be of further assistance, please do not hesitate to contact our office.

Sincerely,

CMAG ENGINEERING, INC.

Adrian L. Garner, PE, GE
Principal Engineer
C 66087, GE 2814
Expires 6/30/20

Distribution: Addressee (4 Hard Copies; Electronic Copy)

TABLE OF CONTENTS

1.0 INTRODUCTION

This report presents the results of our geotechnical investigation for the proposed commercial building at 9041 Soquel Drive in Aptos, Santa Cruz County, California.

The purpose of our investigation was to provide information regarding the surface and subsurface soil and bedrock conditions, and based on our findings, provide geotechnical recommendations for the design and construction of the proposed commercial building and associated improvements. Conclusions and recommendations related to geotechnical hazards, site grading, drainage, foundations, concrete slabs, retaining structures, and pavements are presented herein.

1.1 Terms of Reference

CMAG Engineering, Inc.'s (CMAG) scope of work for this phase of the project included site reconnaissance, subsurface exploration, soil and bedrock sampling, laboratory testing, engineering analyses, and preparation of this report.

The work was undertaken in accordance with CMAG's *Proposal for Geotechnical Services* dated October 22, 2018.

The recommendations contained in this report are subject to the limitations presented in Section 8.0 of this report.

1.2 Site Location

The project site is located on the north side of Highway 1 and the north side of Soquel Drive, between Rio Del Mar Boulevard and Spreckels Drive in Aptos, Santa Cruz County, California. The site location is shown on the Site Location Map, Appendix A, Figure A-1.

1.3 Surface Conditions

The parcel is 0.7 acres in size, irregular in shape, and currently, undeveloped. The parcel is situated on the north side of Soquel Drive. The south side of the parcel is flat to gently sloping. The north side of the parcel consists of a dissected slope that descends to the north towards Valencia Creek. Immediately adjacent to Soquel Drive, the site is relatively flat. The flat area, covered with baserock, extends to the north from Soquel Drive for approximately 35 feet and has been previously graded to create the relatively flat pad. A second, gently sloping terrace, extends further to the north of the flat pad, for an average distance of approximately 60 feet. A dissected north facing slope is located further to the north of the terrace. Immediately adjacent to the north side of the terrace, the slope is steep. Beyond the steep slope, moderate and steep north facing slopes descend towards Valencia Creek.

Adjacent to Soquel Drive, the site is covered with baserock. The gently sloping terrace is vegetated with grass and weeds. The remaining portion of the site, that descends to Valencia Creek, is densely vegetated with mature trees and brush.

2.0 PROJECT DESCRIPTION

It is our understanding that the project consists of the construction of a new two-story commercial building with a partial basement. The proposed building envelope is located on the relatively flat and gently sloping portion of the site. It is our understanding that the north side of the proposed building is to be located approximately 10 to 20 feet from the top of the steep slope. Also proposed is open parking, utility, stormwater retention/detention facilities, and landscape improvements.

The preliminary plan consists of constructing a partial basement on the north side of the building, extending approximately 8 to 10 feet below grade. The proposed parking area is located on the west side of the parcel. A retaining wall will be required to support the north side of the parking area due to the grade change between the relatively flat area and the terrace further to the north.

3.0 FIELD EXPLORATION AND LABORATORY TESTING PROGRAMS

Our field exploration program included drilling, logging, and interval sampling of 5 borings on October 22 and December 7, 2018. The borings were advanced to depths ranging from 17.5± feet to 36.5± feet below the existing grades. Details of the field exploration program, including the Boring Logs, Figures A-4 through A-8, are presented in Appendix A.

Representative samples obtained during the field investigation were taken to the laboratory for testing to determine physical and engineering properties. Details of the laboratory testing program are presented in Appendix B. Test results are presented on the Boring Logs and in Appendix B.

4.0 SUBSURFACE CONDITIONS AND EARTH MATERIALS

4.1 General

The geologic map of Santa Cruz County (Brabb, 1989) depicts the subject property as underlain by Older Flood Plain deposits (Qof; Holocene) described as consisting of unconsolidated fine grained sand, silt, and clay. Alluvial deposits (Qal; Holocene) are depicted on the north side of the parcel, within close proximity to Valencia Creek. Purisima Formation bedrock (Tp; Pliocene and Upper Miocene) described as consisting of yellowish-gray siltstone with interbeds of fine grained sandstone is depicted south and north of the parcel.

Five borings were advanced in the vicinity of the proposed improvements. The subsurface profile encountered in our field exploration consisted of Older Flood Plain Deposits overlying Purisima Formation bedrock within the depths explored. A thin veneer of fill was encountered on the south side of the parcel, adjacent to Soquel Drive. Complete subsurface profiles are presented on the Boring Logs, Appendix A, Figures A-4 through A-8. The boring locations are shown on the Boring Location Plan, Figure A-2.

A representative cross section has been constructed based on the results of our field exploration program. See Appendix A, Figure A-9.

4.2 Artificial Fill - af

Fill was encountered on the south side of the parcel to a maximum depth of approximately 6 feet below grade. Fill was also encountered in Boring B-3, adjacent to the crest of the slope, extending to a depth of approximately 2.5 feet below grade. The fill generally consisted of very loose to medium dense silty and clayey sands with varying amounts of gravel.

4.3 Older Flood Plain Deposits - Qof

Older Flood Plain Deposits were encountered in all the borings. The deposits consisted of interbedded silty sands, sandy silts, clayey sands, and sandy lean and fat clays. The cohesionless deposits were generally medium dense. The cohesive soils were generally firm to very stiff. Based on the results of our laboratory testing, the near surface clays have a high expansion potential.

4.4 Purisima Formation Bedrock - Tp

Purisima Formation bedrock was encountered at depths varying from 24± to 32.5± feet below existing grades. The bedrock generally consisted of dense, non cemented sandstone.

4.5 Groundwater

Groundwater was not encountered during our field exploration.

It should be noted that groundwater conditions, perched or regional, may vary with location and may fluctuate with variations in rainfall, runoff, irrigation, and other changes to the conditions existing at the time our field investigation was performed.

5.0 GEOTECHNICAL HAZARDS

5.1 General

In our opinion, the geotechnical hazards that could potentially affect the proposed project are:

- Seismic Shaking
- Slope Creep

5.2 Seismic Shaking

The seismic hazard due to seismic shaking in California is high in many areas, indicative of the number of large earthquakes that have occurred historically. Intense seismic shaking may occur at the site during the design lifetime of the proposed structure from an earthquake along one of the local fault systems. Generally, the intensity of shaking will increase the closer the site is to the epicenter of an earthquake, however, seismic shaking is a complex phenomenon and may be modified by local topography and soil conditions. The transmission of earthquake vibrations from the ground into the structure may cause structural damage.

5.2.1 2016 California Building Code

The County of Santa Cruz has adopted the seismic provisions set forth in the 2016 California Building Code (2016 CBC) to address seismic shaking. The seismic provisions in the 2016 CBC are minimum load requirements for the seismic design for the proposed structure. The provisions set forth in the 2016 CBC will not prevent structural and nonstructural damage from direct fault ground surface rupture, coseismic ground cracking, liquefaction and lateral spreading, seismically induced differential compaction, or seismically induced landsliding.

Table 1 has been constructed based on the 2016 CBC requirements for the seismic design of the proposed structure. The Site Class has been determined based on our field investigation and laboratory testing.

Table 1. Seismic Design Parameters - 2016 CBC

S_S	S_1	Site Class	F_a	F_v	S_{MS}	S_{M1}	S_{DS}	S_{D1}	PGA_M
1.659g	0.628g	D	1.0	1.5	1.659g	0.942g	1.106g	0.628g	0.633g

5.2.2 2008 USGS PSHA

We determined the PGAs using the USGS *2008 NSHMP PSHA Unified Hazard Tool (UHT).* The PGA has been established for a return period that corresponds to 10 percent chance of exceedance in 50 years. The input parameters for the online tool consist of the site latitude and longitude and a V_{S30} value. A V_{S30} of 760 m/s for the soft rock site condition was used for the determination. The PGA is presented in Table 2.

Table 2. PGA - 2008 USGS PSHA

Return Period (Chance of Exceedance)	PGA - Soft Rock Site Condition (V_{S30} = 760 m/s)
475 Years (10% in 50 Years)	0.41g

5.3 Collateral Seismic Hazards

In addition to seismic shaking, other seismic hazards that may have an adverse affect to the site and/or the structure are: fault ground surface rupture, coseismic ground cracking, seismically induced liquefaction and lateral spreading, seismically induced differential compaction, and seismically induced landsliding. It is our opinion that the potential for collateral seismic hazards to affect the site, and to damage the proposed structure is low. Slope stability, including seismically induced stability is discussed in Section 5.4.

5.4 Slope Stability

5.4.1 Introduction

The proposed commercial building and parking area is situated adjacent to a steep slope that descends to the north. We have analyzed the stability of the steep slope in the immediate vicinity of the proposed improvements.

5.4.2 Analysis

The slope stability analysis for the existing configuration, Cross section A-A' was completed for the static and pseudostatic cases. See Appendix A, Figure A-2 for the location of Cross Section A-A', and Figure A-9 for Cross Section A-A'. We have also analyzed the condition assuming seepage parallel to the ground surface within the upper 4 feet of the steep slope descending from the proposed improvements. The material properties used in our analysis are presented in Appendix C.

The stability of the slope was analyzed using the computer program Slide, Version 7.0 from Rocscience, Inc. This program utilizes a limiting equilibrium method for determining the factor of safety against sliding on an assumed failure surface. The factor of safety against slope failure was calculated using Spencer's method which satisfies both force and moment equilibrium and accounts for inter-slice forces. We also analyzed the slope using a typical infinite slope formulation.

To analyze the seismic stability of the cross section, we performed a pseudostatic analysis based on *Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California* (2008). Our pseudostatic analysis was performed assuming a k_{eq} of 0.27g. The k_{eq} was calculated based on an allowable screen displacement of 5cm. The event that we considered for determination of k_{eq} consisted of a magnitude 8.0 earthquake at a distance of 11.1 km from the site generating a peak ground acceleration of 0.41g. The event is based on the USGS *2008 NSHMP PSHA* for a 10 percent chance of exceedance in 50 years (Section 5.2.2, Table 2).

In terms of slope stability, the factor of safety against sliding is defined as the ratio of resisting forces to driving forces. A factor of safety of unity (1.0) indicates a delicate balance between the resisting and driving forces and represents incipient failure. A factor of safety below unity indicates instability.

5.4.3 Analysis Results

The results of our analysis are presented in Appendix C, Figures C-1 through C-3. A summary of the results are presented in Table 3. The details of our slope stability analysis including the soil and bedrock parameters used are presented in Appendix C.

Table 3. Summary of Calculated Factors of Safety

Figure	Description	Calculated F.S.	Minimum Acceptable F.S.
C-1	Cross Section A-A' - Static Case	1.6	1.5*
C-2	Cross Section A-A' - Pseudostatic Case	1.6	1.0**
C-3	Infinite Slope - Slope Parallel Seepage	1.4	1.5*

Notes: *Considered the minimum industry standard Factor of Safety.
** Considered the minimum Factor of Safety for the pseudostatic analysis procedure outlined in *Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California* (2008).

5.4.4 Acceptable Factors of Safety

The industry standard acceptance criteria for the long-term static stability of a slope is a factor of safety equal to, or greater than 1.5. The pseudostatic slope stability analysis was performed per the procedure recommended by *Special Publication 117A, Guidelines for Evaluating and Mitigating Seismic Hazards in California* (2008). The minimum acceptable factor of safety based on the pseudostatic analysis procedure is 1.0.

5.4.5 Discussion

Based on the results of our analysis, it is our opinion that there is a low probability for overall slope instability to occur under static and seismic conditions in the location of Cross Section A-A'. However, our analysis also indicates that under saturated conditions with slope parallel seepage, the factor of safety of shallow seated erosional failures, on the steep slope adjacent to the proposed improvements, does not meet industry standard factors of safety.

It must be cautioned that slope stability analysis is an inexact science; and that the mathematical models of the slopes and soils contain many simplifying assumptions, not the least of which is homogeneity. Density, moisture content and shear strength may vary within a soil type. There may be localized areas of low strength within a soil.

Slope stability analyses and the generated factors of safety should be used as indicating trendlines. A slope with a safety factor less than one will not necessarily fail, but the probability of slope movement will be greater than a slope with a higher safety factor. Conversely, a slope with a safety factor greater than one may fail, but the probability of stability is higher than a slope with a lower safety factor.

5.5 Slope Creep

Slope creep is an imperceptibly slow downward and outward movement of slope forming rocks and soils. Creep can affect both the near surface soil or deep seated materials. The on-site clays may experience soil creep due to expansion and contraction from seasonal wetting and drying cycles. Typically the amount of movement is governed by the shear strength of the clay, slope angle, slope height, elapsed time, moisture conditions, and thickness of the active creep zone. Based on the results of our expansion index test of the near surface clay and the angle of the steep slope on the north side of the proposed improvements, it is our opinion that the potential for creep to affect the steep slope is high.

6.0 DISCUSSIONS AND CONCLUSIONS

The subsurface profile consists of Older Flood Plain Deposits overlying Purisima Formation bedrock within the depths explored. A thin veneer of fill was encountered on the south side of the parcel, adjacent to Soquel Drive. The Older Flood Plain Deposits consisted of interbedded silty sands, sandy silts, clayey sands, and sandy lean and fat clays. The cohesionless deposits were generally medium dense. The cohesive soils were generally firm to very stiff. Dense sandstone bedrock was encountered beneath the flood plain deposits at depths varying from 24± to 32.5± feet below the existing grades. The fill, on the south side of the parcel, extended to a maximum depth of approximately 6 feet below grade. Fill was also encountered in Boring B-3, adjacent to the crest of the slope, extending to a depth of approximately 2.5 feet below grade. The fill generally consisted of very loose to medium dense silty and clayey sands with varying amounts of gravel. Groundwater was not encountered during the course of our field exploration.

Based on the results of our slope stability analysis, it is our opinion that there is a low probability for overall slope instability to occur under static and seismic conditions on the steep slope that descends to the north from the proposed improvements. However, our analysis also indicates that under saturated conditions with slope parallel seepage, the factor of safety of shallow seated erosional failures, on the steep slope adjacent to the proposed improvements, does not meet industry standard factors of safety.

Valencia Creek is located at the toe of the north facing slope, downslope of the steep slope that we analyzed for our stability analysis (Section 5.4). A quantitative hydraulic and scour analysis of the creek channel was beyond the scope of our services for this project and has not been performed. The slope stability analysis, presented in this report, assumes that Valencia Creek will not adversely affect the stability of the steep slope, descending from the proposed improvements, throughout the life of the project.

The results of our laboratory testing indicates that the near surface clay has a high expansion potential. Based on the results of our laboratory testing coupled with the angle of the steep slope on the north side of the proposed improvements, it is our opinion that the potential for creep to affect the steep slope is high.

7.0 RECOMMENDATIONS

7.1 General

Based on the results of our field investigation, laboratory testing, and engineering analysis, it is our opinion, from the geotechnical standpoint, the subject site will be suitable for the proposed development provided the recommendations presented herein are implemented during grading and construction.

Based on the proximity of the steep slope to the proposed building footprint, we recommend that the proposed commercial building be founded on drilled, cast-in-place concrete shafts. We also recommend that the retaining wall, supporting the north side of the parking area, be supported by drilled, cast-in-place concrete shafts. The recommendations provided herein are based on the following assumptions:

- The proposed north side of the building is to be located approximately 10 to 20 feet from the top of the slope.
- The building is to incorporate a basement, approximately 8 to 10 feet below grade for the portion of the building adjacent to the steep slope.
- The proposed north side of the parking area is to be located approximately 10 to 20 feet from the top of the slope.
- The grade for the parking area adjacent to the steep slope is to be raised by approximately 6 to 8 feet.

Foundation recommendations are provided in Section 7.3. Retaining wall recommendations, for both the basement walls and the wall supporting the parking area, are provided in Sections 7.3 and 7.4.

Grading recommendations are provided in Section 7.2.

It is our understanding that you are considering permeable pavers for the parking area. This system is most effective in areas where shallow groundwater is not present and/or the underlying base course and subgrade has the ability to drain. If project requirements dictate the need for permeable pavers, the base course and subgrade should be designed and constructed per the recommendations provided by the Interlocking Concrete Pavement Institute (ICPI). The ICPI provides design guidelines for permeable interlocking concrete pavement systems. The near surface native soils generally consist of clay with a low permeability. We Therefore recommend that the paver section be designed assuming no exfiltration. The subgrade should be sloped at a minimum of 2 percent to a subdrain to intercept the groundwater. Mirafi RS380i, or approved equivalent, should be placed between the native subgrade and the rock section to provide additional subgrade stabilization. Additional geotechnical design recommendations for the proposed pavers can be provided upon request.

7.2 Site Grading

7.2.1 Site Clearing

Prior to grading, the areas to be developed for structures, pavements and other improvements, should be stripped of any vegetation and cleared of any surface or subsurface obstructions, including any existing foundations, utility lines, basements, septic tanks, pavements, stockpiled fills, and miscellaneous debris.

Surface vegetation and organically contaminated topsoil should be removed from areas to be graded. The required depth of stripping will vary with the time of year the work is done and should be observed by the Geotechnical Engineer. It is generally anticipated that the required depth of stripping will be 4 to 8 inches.

Holes resulting from the removal of buried obstructions that extend below finished site grades should be backfilled with compacted engineered fill compacted to the requirements of Subsection 7.2.2.

7.2.2 Preparation of On-Site Soils

Drilled, cast-in-place, concrete shafts, require no reworking of materials other than that necessary to rework materials disturbed during earthwork and construction.

For concrete slabs-on-grade, the **native** soil should be overexcavated a minimum of 1 foot below the bottom of the crushed rock, or 2 feet below existing grade, whichever is greater. The exposed surface should then be scarified, moisture conditioned, and compacted to a minimum of 90 percent relative compaction. If slabs are constructed on the south side of the site, in the area of the existing fill soils, the **fill** should be overexcavated a minimum of 2 feet below the bottom of the crushed rock, or 3 feet below existing grade, whichever is greater. Mirafi 600X stabilization fabric should be placed on the bottom of the overexcavation. The material which was removed should then be replaced with engineered fill compacted to a minimum of 90 percent relative compaction. This zone of reworking shall extend a minimum of 3 feet laterally beyond the concrete slabs-on-grade.

Beneath the basement slab, the native soil should be overexcavated a minimum of 1 foot below the bottom of the crushed rock. The exposed surface should then be scarified, moisture conditioned, and compacted to a minimum of 90 percent relative compaction. The material which was removed should then be replaced with engineered fill compacted to a minimum of 90 percent relative compaction.

In drive areas (including concrete, asphalt, and non-permeable pavers), the **native** soil should be overexcavated to a minimum of 1 foot below the bottom of the aggregate base course, or 1.5 feet below existing grade, whichever is greater. The exposed surface should then be scarified, moisture conditioned, and compacted to a minimum of 90 percent relative compaction. For pavements on the south side of

the site, in the area of the existing fill soils, the **fill** should be overexcavated a minimum of 1.5 feet below the bottom of the aggregate base course, or 2 feet below existing grade, whichever is greater. Mirafi 600X stabilization fabric should be placed on the bottom of the overexcavation. The material which was removed should then be replaced as engineered fill compacted to a minimum of 90 percent relative compaction. The upper 6 inches of subgrade and all aggregate base and subbase in drive areas shall be compacted to achieve a minimum relative compaction of 95 percent. This zone of reworking should extend laterally a minimum of 2 feet beyond the drive areas.

Beneath new fills, the native soil should be removed to a minimum of 1 foot below existing grade. The exposed surface should then be scarified, moisture conditioned, and compacted to a minimum of 90 percent relative compaction. The material which was removed should then be replaced as engineered fill compacted to a minimum of 90 percent relative compaction.

The on-site soils, with the exception of the clay, may be used as engineered fill. Note: If this work is done during or soon after the rainy season, or in the spring, the soil may require significant drying prior to use as engineered fill. Separation and removal of the expansive clay soils will be necessary if the native soils are processed for use as engineered fill. The soil should be verified by a representative of CMAG in the field during grading operations. All soils, both existing on-site and imported, to be used as fill, should contain less than 3 percent organics and be free of debris and gravel over 2.5 inches in maximum dimension.

Imported fill material should be approved by a representative of CMAG prior to importing. Soils having a significant expansion potential should not be used as imported fill. **The Geotechnical Engineer should be notified not less than 5 working days in advance of placing any fill or base course material proposed for import**. Each proposed source of import material should be sampled, tested, and approved by the Geotechnical Engineer prior to delivery of any soils imported for use on the site.

All fill should be compacted with heavy vibratory equipment. Fill should be compacted by mechanical means in uniform horizontal loose lifts not exceeding 8 inches in thickness. The relative compaction and required moisture content shall be based on the maximum dry density and optimum moisture content obtained in accordance with ASTM D1557. **The Geotechnical Engineer should observe the overexcavations, and placement of engineered fill.**

Any surface or subsurface obstruction, or questionable material encountered during grading, should be brought immediately to the attention of the Geotechnical Engineer for proper processing as required.

7.2.3 Cut and Fill Slopes

Cut and Fill slopes are not anticipated for the project at this time. Cut and fill slopes may affect the stability of the site, and should be analyzed for overall stability and suitability by the Geotechnical Engineer if project requirements change.

7.2.4 Utility Trenches

Bedding material should consist of sand with SE not less than 30 which may then be jetted.

The on-site soils, with the exception of the clay, may be utilized for trench backfill. Separation and removal of the expansive clay soils will be necessary if the native soils are processed for use as trench backfill. Imported fill should be free of organic material and gravel over 2.5 inches in diameter. Backfill of all exterior and interior trenches should be placed in thin lifts and mechanically compacted to achieve a relative compaction of not less than 95 percent in paved areas and 90 percent in other areas per ASTM D1557. Care should be taken not to damage utility lines.

Utility trenches that are parallel to the sides of a building should be placed so that they do not extend below a line sloping down and away at an inclination of 2:1 H:V (horizontal to vertical) from the bottom outside edge of all footings.

A 3 foot concrete plug should be placed in each trench where it passes under the exterior footings. Anti-seep collars (trench dams) should also be placed in utility trenches on steep slopes to prevent migration of water and sand.

Trenches should be capped with 1.5± feet of impermeable material. Import material should be approved by the Geotechnical Engineer prior to its use.

Trenches must be shored as required by the local regulatory agency, the State Of California Division of Industrial Safety Construction Safety Orders, and Federal OSHA requirements.

7.2.5 Vibration During Compaction

The neighboring buildings are within close proximity to the proposed commercial building. The contractor should take all precautionary measures to minimize vibration on the site during grading operations. This may require that the engineered fill be placed in thin lifts using a static roller or hand operated equipment. It is the contractor's responsibility to ensure that the process in which the engineered fill is placed does not adversely affect the neighboring parcels.

7.2.6 Excavating Conditions

We anticipate that excavation of the on-site soils may be accomplished with standard earthmoving and trenching equipment.

Wet conditions should be anticipated, geotextile, rock, or other means may be required to stabilize the base of the overexcavations if constructed during, or shortly after the rainy season.

If drilled shafts extend into the underlying bedrock, difficult drilling conditions due to dense sandstone bedrock should be anticipated.

7.2.7 Surface Drainage

Surface runoff should not be allowed to discharge over the steep slope to the north of the building pad.

Proposed on-site retention / detention systems may affect the stability of the steep slope to the north. Geotechnical input is necessary for the design of on-site retention / detention systems and can be supplied upon request.

Pad drainage should be designed to collect and direct surface water away from structures to approved drainage facilities. A minimum gradient of 2± percent should be maintained and drainage should be directed toward approved swales or drainage facilities. Concentrations of surface water runoff should be handled by providing the necessary structures, paved ditches, catch basins, etc.

All roof eaves should be guttered with the outlets from the downspouts provided with adequate capacity to carry the storm water away from the structure to reduce the possibility of soil saturation and erosion.

Drainage patterns approved at the time of construction should be maintained throughout the life of the structures. The building and surface drainage facilities must not be altered nor any grading, filling, or excavation conducted in the area without prior review by the Geotechnical Engineer.

Irrigation activities at the site should be controlled and reasonable. Planter areas should not be sited adjacent to walls without implementing approved measures to contain irrigation water and prevent it from seeping into walls and under foundations and slabs-on-grade.

The finished ground surface should be planted with erosion resistant landscaping and ground cover and continually maintained to minimize surface erosion.

7.3 Foundations

7.3.1 Drilled, Cast-In-Place Concrete Shafts and Grade Beams

The drilled, cast-in-place concrete shafts adjacent to the slope, for both the proposed building and parking area, should have a minimum embedment depth of **15 feet below the bottom of the grade beams or 20 feet below grade, whichever is greater. The remaining shafts should have a minimum embedment depth of 15 feet below the bottom of the grade beams.** The minimum recommended shaft diameter is 18 inches. Shafts should be spaced no closer than 2.5 diameters, center to center.

Based on the results of our laboratory testing, the underlying clay has a high expansion potential and a swell pressure of approximately 1,600 psf. The grade beams, for foundations at grade, should be designed to withstand 1,600 psf of uplift pressure. The dead load of the building and parking area retaining wall may be used to offset the expansive pressure on the grade beams. Note that this recommendation does not apply to the foundations at the basement level. For foundations at grade, the grade beams should be founded a minimum of 18 inches below lowest adjacent grade.

The clay, exposed in the grade beam, should be pre-soaked to a moisture content of 30 percent to a depth of 2 feet prior to pouring concrete. It is important that the clay be thoroughly saturated for 24 to 48 hours prior to the time the concrete is poured. This applies to all foundation levels, at grade and at the basement level.

The allowable downward and upward axial shaft capacities for 18 inch diameter, drilled, cast-in-place, concrete shafts are included in Table 4. The upward capacity includes the weight of the shaft. The downward capacity includes the weight of the shaft.

Table 4. 18 Inch Diameter - Drilled, Cast-In-Place Concrete Shaft Axial Capacities

Depth Below Grade Beams (ft)	Allowable Downward Capacity (Kips)	Allowable Upward Capacity (Kips)
15	20	10
17	24	14
19	28	19
21	33	24
23	37	29

A passive pressure of 280 psft/ft (equivalent fluid pressure) acting over a plane 2 times the shaft diameter, may be assumed for design purposes. Neglect passive pressure in the top 4 feet of soil, below finished grade. Passive pressure may be mobilized from the top of shafts for shafts supporting the partial basement . Passive pressures may be increased by one-third for seismic loading.

The drilled excavations for the cast-in-place concrete shafts should be clean, dry, and free of debris or loose soil. The drilled excavations should not deviate more than 1 percent from vertical.

Caving was not observed during our field exploration, however, the potential for caving is always present and casing of the drilled excavations may become necessary. If the contractor chooses to use casing, it must be pulled during the concrete pour. It must be pulled slowly with a minimum of 4 feet of casing remaining embedded within the concrete at all times. If the bottom of the holes are unable to be cleaned with conventional drilling and hand equipment, a bucket auger should be utilized to clean the bottom of the shafts and remove all loose slough.

It is not anticipated that groundwater will present a problem during construction. However, if drilled during or shortly after the rainy season, groundwater may present a problem. If groundwater is encountered within the shafts and is unable to be pumped from the drilled excavation, a tremie will be required. The tremie must be placed to the bottom of the drilled excavation to remove all groundwater. The end of the tube must remain embedded a minimum of 4 feet into the concrete at all times. The concrete and steel design of the drilled, cast-in-place concrete shaft should be such that a tremie can be easily placed down the center of the excavation.

For drilled, cast-in-place concrete shafts depths in excess of 8 feet, concrete should be placed via a tremie. The end of the tube must remain embedded a minimum of 4 feet into the concrete at all times.

All shaft construction must be observed by the Geotechnical Engineer before steel reinforcement is placed and concrete is poured.

7.3.2 Concrete Slabs

We recommend that concrete slabs be founded on compacted engineered fill per Subsection 7.2.2. The subgrade should be proof-rolled just prior to construction to provide a firm, relatively unyielding surface, especially if the surface has been loosened by the passage of construction traffic.

The exposed surface should be pre-soaked to a moisture content of 30 percent to a depth of 2 feet prior to pouring concrete. It is important that the clay be thoroughly saturated for 24 to 48 hours prior to the time the concrete is poured.

The slabs should be underlain by a minimum 4 inch thick capillary break of clean crushed rock. It is recommended that neither Class II baserock nor sand be employed as the capillary break material. Where moisture sensitive floor coverings are anticipated or vapor transmission may be a problem, a vapor retarder should be placed between the granular layer and the floor slab in order to reduce moisture condensation under the floor coverings. The vapor retarder should be specified by the slab designer. It should be noted that conventional slab-on-grade construction is not waterproof. Under-slab construction consisting of a capillary break and vapor retarder will not prevent moisture transmission through the slabs. CMAG does not practice in the field of moisture vapor transmission evaluation or mitigation. Where moisture sensitive floor coverings are to be installed, a waterproofing expert should be consulted for their recommended moisture and vapor protection measures.

7.3.3 Settlements

Total and differential settlements beneath foundations are expected to be within tolerable limits. Vertical movements are not expected to exceed 1 inch. Differential movements are expected to be within the normal range (½ inch) for the anticipated loads and spacings. These preliminary estimates should be reviewed by the Geotechnical Engineer when foundation plans for the proposed structures become available.

7.4 Retaining Structures

7.4.1 General

Retaining walls should be founded on drilled, cast-in-place concrete shafts per the recommendations of Subsections 7.3.1.

7.4.2 Lateral Pressure Due to Earthquake Motions

For design purposes, the lateral force on retaining walls due to earthquake motions is $6H^2$ lbs/horizontal foot, acting at a point 1/3H above the wall base, where H is the height of the wall in feet.

7.4.3 Lateral Earth Pressures

The lateral earth pressures presented in Table 5 are recommended for the design of retaining structures with a backdrain and backfill consisting of the native soils.

Table 5. Lateral Earth Pressures

Soil Profile (H:V)	Equivalent Fluid Pressure (psf/ft)	
	Active Pressure	At-Rest Pressure
Level	40	61
6:1	41	72
3:1	46	81
2:1	59	89

Pressure due to any surcharge loads from adjacent footings, traffic, etc., should be analyzed separately. Pressures due to these loading can be supplied upon receipt of the appropriate plans and loads. Refer to Figure 1.

7.4.4 Backfill

Backfill should be placed under engineering control. Backfill should be compacted per Subsection 7.2.2, however, precautions should be taken to ensure that heavy compaction equipment is not used immediately adjacent to walls, so as to prevent undue pressures against, and movement of, the walls.

It is recommended that granular, or relatively low expansivity, backfill be utilized, for a width equal to approximately 1/3 times the wall height, and not less than 1.5 feet, subject to review during construction.

The use of water-stops/impermeable barriers and appropriate waterproofing should be considered for any basement construction, and for building walls which retain earth.

7.4.5 Backfill Drainage

Backdrains should be provided in the backfill. Backdrains should consist of 4 inch diameter SDR 35 PVC perforated pipe or equivalent, embedded in Caltrans Class 2 permeable drain rock. The drain should be a minimum of 18 inches in width and should extend to within 12 inches from the surface. The upper 12 inches should be capped with native soils or the pavement section in drive areas. Mirafi 140N, or approved equivalent, should be placed between the drain rock and the native soil cap / pavement section. The pipe should be 4± inches above the trench bottom; a gradient of 2± percent being provided to the pipe and trench bottom; discharging into suitably protected outlets. See Figure 2 for the standard detail for the backdrain.

Perforations in backdrains are recommended as follows: 1/2 inch diameter, in 2 rows at the ends of a 120 degree arc, at 5 inch centers in each row, staggered between rows, placed downward.

Backdrains should be observed by the Geotechnical Engineer after placement of bedding and pipe and prior to the placement of clean crushed gravel.

An unobstructed outlet should be provided at the lower end of each segment of backdrain. The outlet should consist of an unperforated pipe of the same diameter, connected to the perforated pipe and extended to a protected outlet at a lower elevation on a continuous gradient of at least 1 percent.

7.5 Plan Review

The recommendations presented in this report are based on preliminary design information for the proposed project and on the findings of our geotechnical investigation. When completed, the Grading Plans, Foundation Plans and design loads should be reviewed by CMAG prior to submitting the plans and contract bidding. Additional field exploration and laboratory testing may be required upon review of the final project design plans.

7.6 Observation and Testing

Field observation and testing must be provided by a representative of CMAG to enable them to form an opinion regarding the adequacy of the site preparation, the adequacy of fill materials, and the extent to which the earthwork is performed in accordance with the geotechnical conditions present, the requirements of the regulating agencies, the project specifications, and the recommendations presented in this report. Any earthwork performed in connection with the subject project without the full knowledge of, and not under the direct observation of CMAG will render the recommendations of this report invalid.

CMAG should be notified **at least 5 working days** prior to any site clearing or other earthwork operations on the subject project in order to observe the stripping and disposal of unsuitable materials and to ensure coordination with the grading contractor. During this period, a preconstruction meeting should be held on the site to discuss project specifications, observation and testing requirements and responsibilities, and scheduling.

8.0 LIMITATIONS

The recommendations contained in this report are based on our field explorations, laboratory testing, and our understanding of the proposed construction. The subsurface data used in the preparation of this report was obtained from the borings drilled during our field investigation. Variation in soil, geologic, and groundwater conditions can vary significantly between sample locations. As in most projects, conditions revealed during construction excavation may be at variance with preliminary findings. If this occurs, the changed conditions must be evaluated by the Project Geotechnical Engineer and the Geologist, and revised recommendations be provided as required. In addition, if the scope of the proposed construction changes from the described in this report, our firm should also be notified.

Our investigation was performed in accordance with the usual and current standards of the profession, as they relate to this and similar localities. No other warranty, expressed or implied, is provided as to the conclusions and professional advice presented in this report.

This report is issued with the understanding that it is the responsibility of the Owner, or of his Representative, to ensure that the information and recommendations contained herein are brought to the attention of the Architect and Engineer for the project and incorporated into the plans, and that it is ensured that the Contractor and Subcontractors implement such recommendations in the field. The use of information contained in this report for bidding purposes should be done at the Contractor's option and risk.

This firm does not practice or consult in the field of safety engineering. We do not direct the Contractor's operations, and we are not responsible for other than our own personnel on the site; therefore, the safety of others is the responsibility of the Contractor. The Contractor should notify the Owner if he considers any of the recommended actions presented herein to be unsafe.

The findings of this report are considered valid as of the present date. However, changes in the conditions of a site can occur with the passage of time, whether they be due to natural events or to human activities on this or adjacent sites. In addition, changes in applicable or appropriate codes and standards may occur, whether they result from legislation or the broadening of knowledge. Accordingly, this report may become invalidated wholly or partially by changes outside our control. Therefore, this report is subject to review and revision as changed conditions are identified.

The scope of our services mutually agreed upon did not include any environmental assessment or study for the presence of hazardous to toxic materials in the soil, surface water, or air, on or below or around the site. CMAG is not a mold prevention consultant; none of our services performed in connection with the proposed project are for the purpose

of mold prevention. Proper implementation of the recommendations conveyed in our reports will not itself be sufficient to prevent mold from growing in or on the structures involved.

REFERENCES

American Society of Civil Engineers (2010). *Minimum Design Loads for Buildings and Other Structures*. ASCE Standard 7-10.

ASTM International (2014). *Annual Book of ASTM Standards, Section Four, Construction*. Volume 4.08, Soil and Rock (I): D 420 - D 5876.

Brabb, E.E. (1989). *Geologic Map of Santa Cruz County, California*. U.S. Geological Survey Miscellaneous Investigation Series, Map I-1905, scale 1:62500.

Bray, J.D., Rathje, E.M., Augello, A.J., and Merry, S.M. (1998). *Simplified Seismic Design Procedure for Geosynthetic-Lined, Solid-Waste Landfills*. Geosynthetics International, Vol. 5, No 1-2, pp. 203-235.

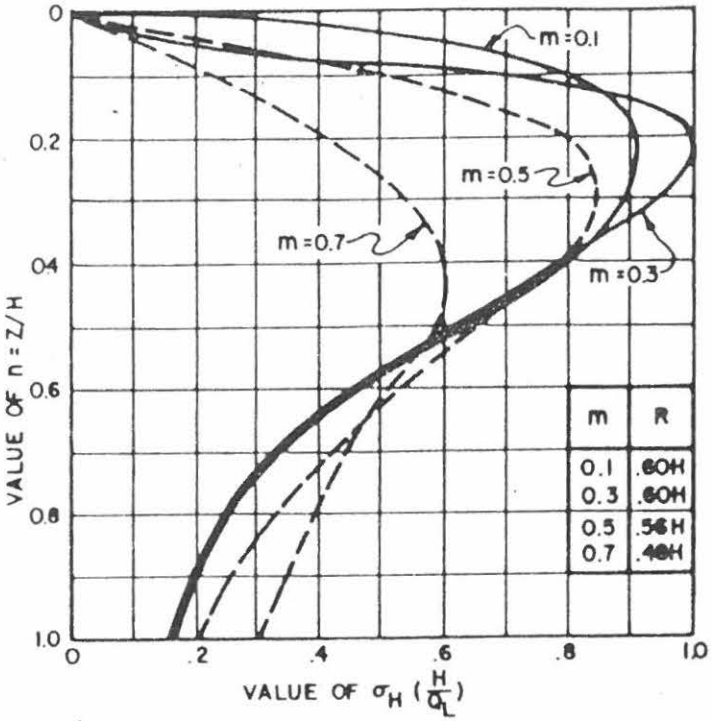
California Department of Conservation, California Geologic Survey (2008). *Guidelines for Evaluating and Mitigating Seismic Hazards in California*. Special Publication 117A, 98 pp.

CMAG Engineering, Inc. (October 22, 2018). *Proposal for Geotechnical Services, Geotechnical Investigation, Proposed Commercial Building, 9041 Soquel Drive, Aptos, Santa Cruz County, California, APN 041-141-56.* Proposal No. P18-86.

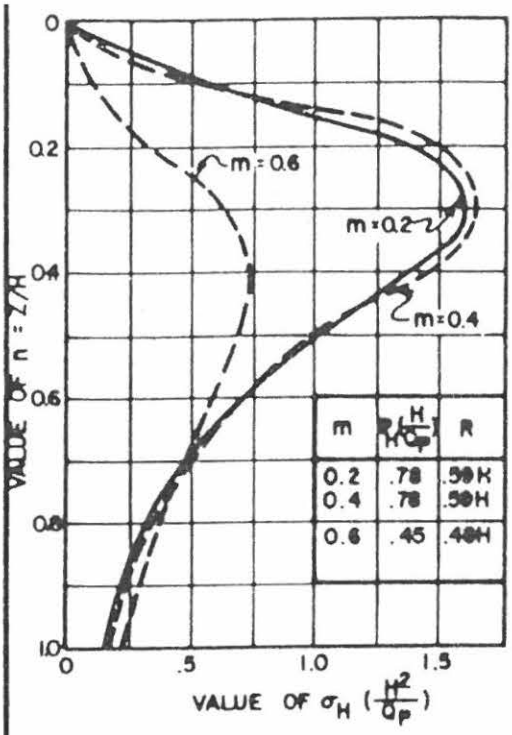
International Code Council (2016). *California Building Code.* Volume 2.

Southern California Earthquake Center (2003). *Recommended Procedures for Implementation of DMG Special Publication 117: Guidelines for Analyzing and Mitigating Landslide Hazards in California.*

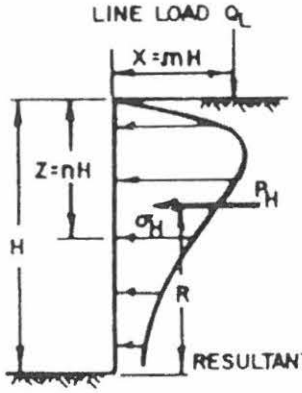
U.S. Geological Survey. *USGS NSHMP Unified Hazard Tool (UHT). (https://earthquake.usgs.gov/hazards/interactive/).*



m	R
0.1	.60H
0.3	.60H
0.5	.56H
0.7	.48H



m	$\sigma_H \left(\frac{H}{Q_P}\right)$	R
0.2	.78	.50H
0.4	.78	.50H
0.6	.45	.48H



FOR $m \leq 0.4$:

$$\sigma_H \left(\frac{H}{Q_L}\right) = \frac{0.20n}{(0.16+n^2)^2}$$

$$P_H = 0.55 Q_L$$

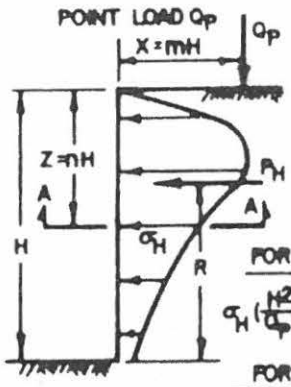
FOR $m > 0.4$:

$$\sigma_H \left(\frac{H}{Q_L}\right) = \frac{1.28 m^2 n}{(m^2+n^2)^2}$$

RESULTANT $P_H = \frac{0.64 Q_L}{(m^2+1)}$

PRESSURES FROM LINE LOAD Q_L

(BOUSSINESQ EQUATION MODIFIED BY EXPERIMENT)



FOR $m \leq 0.4$:

$$\sigma_H \left(\frac{H^2}{Q_P}\right) = \frac{0.28 n^2}{(0.16+n^2)^3}$$

FOR $m > 0.4$:

$$\sigma_H \left(\frac{H^2}{Q_P}\right) = \frac{1.77 m^2 n^2}{(m^2+n^2)^3}$$

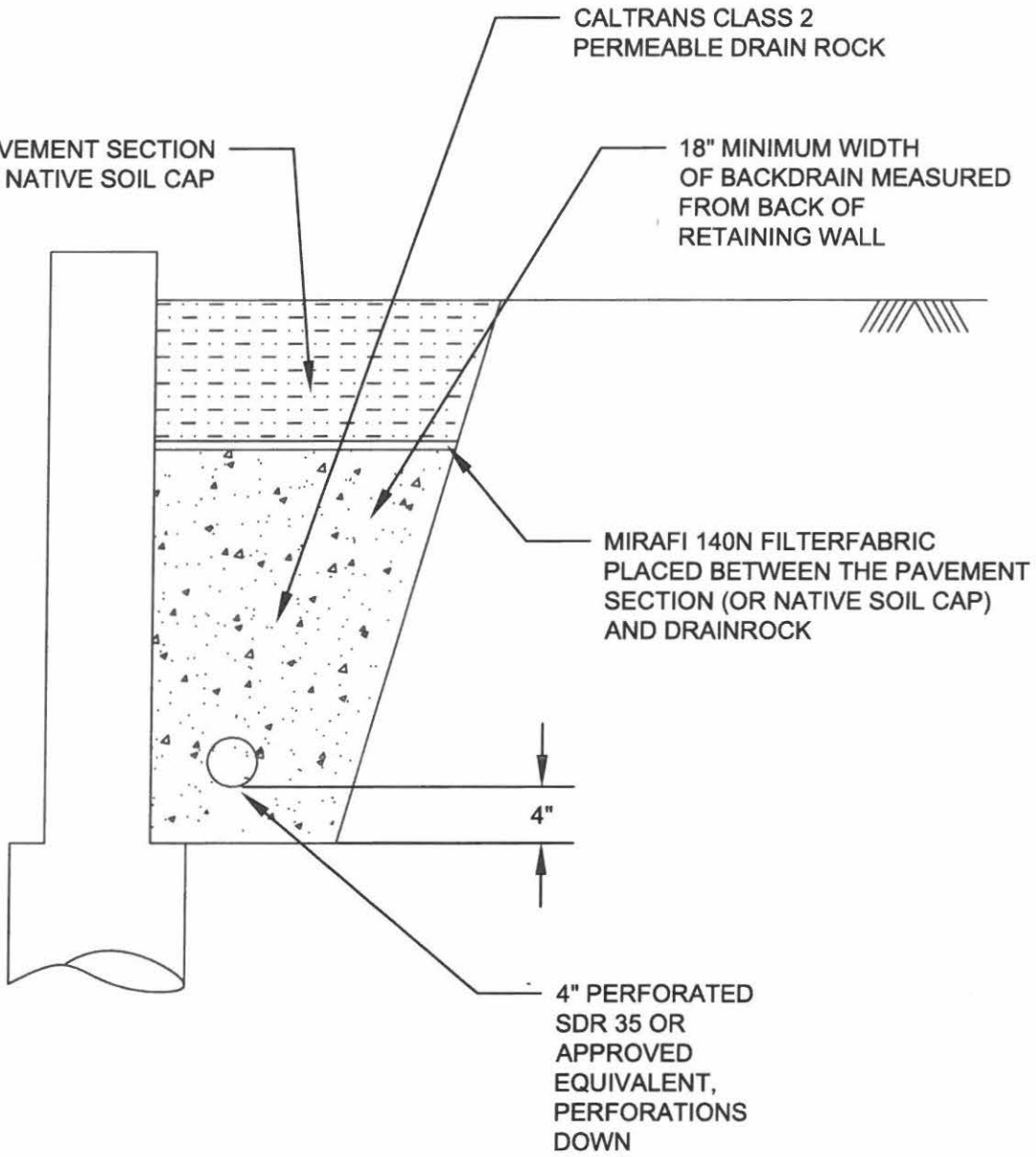
$$\sigma_H' = \sigma_H \cos^2(1.1\theta)$$

SECTION A-A

PRESSURES FROM POINT LOAD Q_P

(BOUSSINESQ EQUATION MODIFIED BY EXPERIMENT)

CMAG ENGINEERING	SURCHARGE PRESSURE DIAGRAM	FIGURE 1



NOTES:

1. DRAWING IS NOT TO SCALE
2. 2± PERCENT TO PIPE AND TRENCH BOTTOM
3. PERFORATED SDR 35 PVC PIPE, OR APPROVED EQUIVALENT, CONNECTED TO CLOSED CONDUITS THAT DISCHARGE TO AN APPROVED LOCATION
4. INSTALL CLEAN OUTS AT APPROVED LOCATIONS

CMAG ENGINEERING	TYPICAL BACKDRAIN DETAIL	FIGURE 2

APPENDIX A

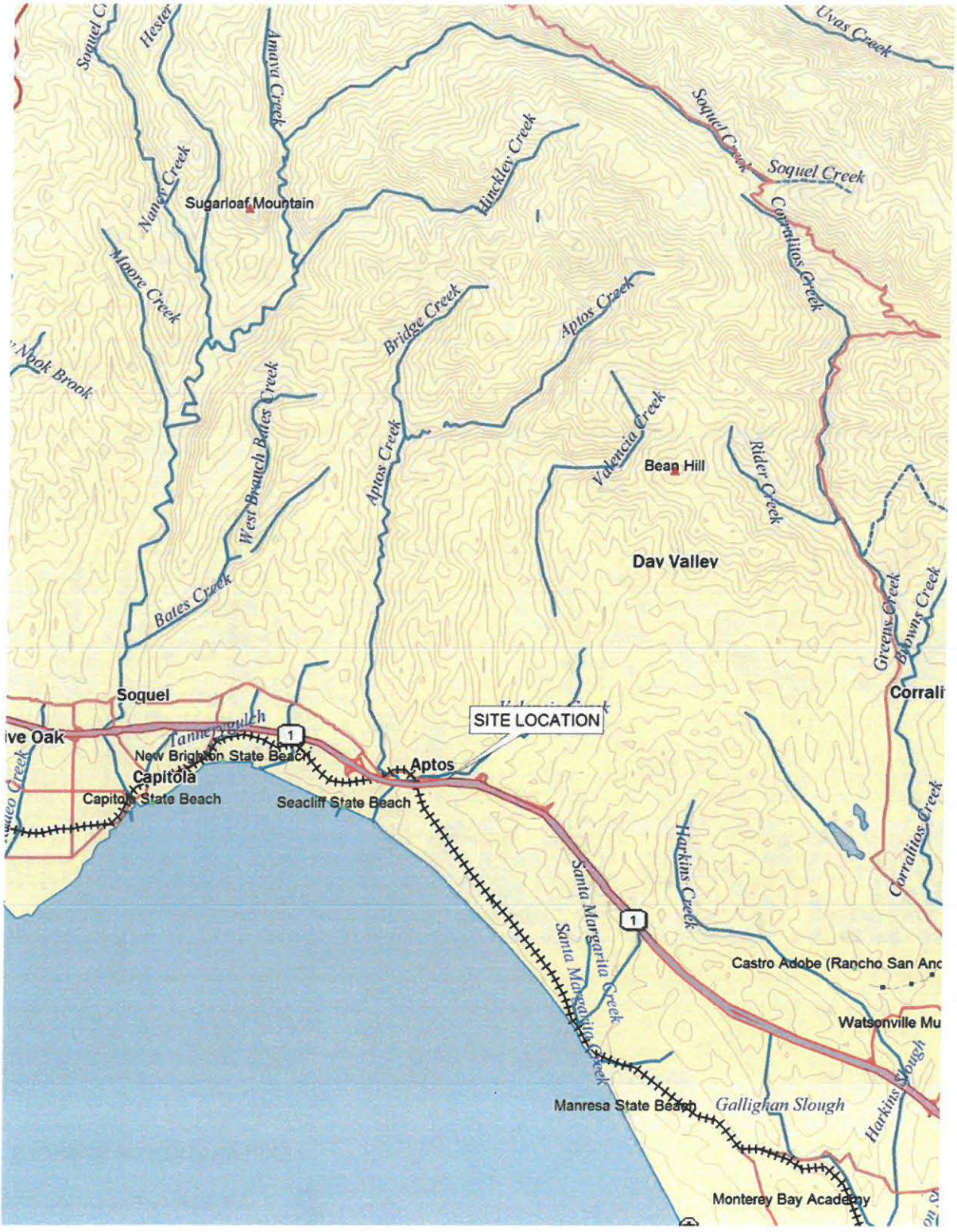
FIELD EXPLORATION PROGRAM

FIELD EXPLORATION PROCEDURES

Subsurface conditions were explored by drilling 5 borings to depths between 17.5± feet and 36.5± feet below the existing grades. The borings were drilled with a track mounted drill rig equipped with 6 inch diameter solid stem augers. The Key to The Logs and the Logs of the Borings are included in Appendix A, Figures A-3 through A-8. The approximate locations of the borings are shown on the Boring Location Plan, Figure A-2.

The earth materials encountered in the borings were continuously logged in the field by a representative of CMAG. Bulk and relatively undisturbed samples for identification and laboratory testing were obtained in the field. These samples were classified based on field observations and laboratory tests. The classification is in accordance with the Unified Soil Classification System (Figure A-3).

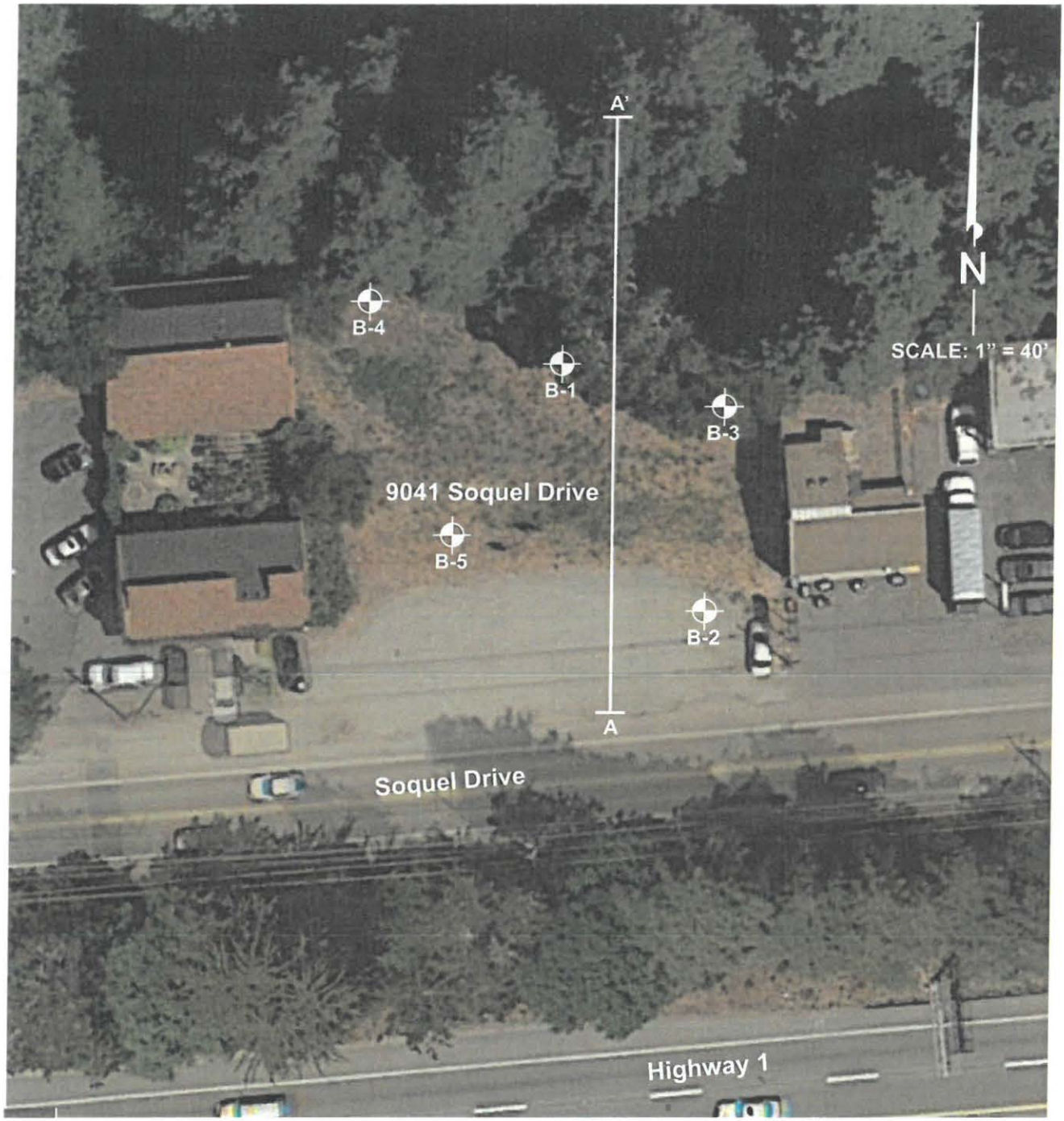
Representative samples were obtained by means of a drive sampler, the hammer weight and drop being 140 lb and 30 inches, respectively. These samples were recovered using a 3 inch outside diameter Modified California Sampler or a 2 inch outside diameter Terzaghi Sampler. The number of blows required to drive the samplers 12 inches are indicated on the Boring Logs. The penetration test data for the Terzaghi driven samples has been presented as N_{60} values. The N_{60} values are also indicated on the Boring Logs.
A representative cross section was obtained for the subject site. See Cross Section A-A', Figure A-9. For an explanation of the symbols and units on the cross section, see Section 4.0 of the report.



BASEMAP: DeLorme Topo USA®

SCALE: 1:100,000

CMAG ENGINEERING	SITE LOCATION MAP	FIGURE
	9041 Soquel Drive	A-1



EXPLANATION OF SYMBOLS

B-1 APPROXIMATE LOCATION OF BORING

A A' LOCATION OF CROSS SECTION

BASEMAP: Google Earth

CMAG ENGINEERING	BORING LOCATION PLAN	FIGURE
	9041 Soquel Drive	A-2

KEY TO LOGS

UNIFIED SOIL CLASSIFICATION SYSTEM

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS More than half of the material is larger than the No. 200 sieve	GRAVELS More than half of the coarse fraction is larger than the No. 4 sieve	CLEAN GRAVELS (Less than 5% fines)	GW	Well graded gravels, gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels, gravel-sand mixtures, little or no fines
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines
	SANDS More than half of the coarse fraction is smaller than the No. 4 sieve	CLEAN SANDS (Less than 5% fines)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands, gravelly sands, little or no fines
		SAND WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines
			SC	Clayey sands, sand-clay mixtures, plastic fines
FINE GRAINED SOILS More than half of the material is smaller than the No. 200 sieve	SILTS AND CLAYS Liquid limit less than 50		ML	Inorganic silts and very fine sands, silty or clayey fine sands or clayey silts with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS Liquid limit greater than 50		MH	Inorganic silts, micaceous or diatomacaceous fine sandy or silty soils, elastic silts
			CH	Inorganic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils

GRAIN SIZE LIMITS

SILT AND CLAY	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		
No. 200	No. 40	No. 10	No. 4	3/4 in.	3 in.	12 in.	

US STANDARD SIEVE SIZE

RELATIVE DENSITY	
SAND AND GRAVEL	BLOWS/FT*
VERY LOOSE	0 - 4
LOOSE	4 - 10
MEDIUM DENSE	10 - 30
DENSE	30 - 50
VERY DENSE	OVER 50

CONSISTENCY	
SILT AND CLAY	BLOWS/FT*
VERY SOFT	0 - 2
SOFT	2 - 4
FIRM	4 - 8
STIFF	8 - 16
VERY STIFF	16 - 32
HARD	OVER 32

MOISTURE CONDITION
DRY
MOIST
WET

BEDROCK
(GROUP SYMBOL)
Brackets Denote Bedrock

* Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 inch I.D.) split spoon (ASTM D-1586).

CMAG ENGINEERING

FIGURE A-3

LOG OF EXPLORATORY BORING

Project No.:	18-142-SC	Boring:	B-1
Project:	9041 Soquel Drive	Location:	See Figure A-2, Boring Location Plan
	Santa Cruz County, California	Elevation:	
Date:	October 22, 2018	Method of Drilling:	Track Mounted Drill Rig, 6in. Solid Stem
Logged By:	ALG		Auger, 140lb. Automatic Trip

2" Ring Sample | 2.5" Ring Sample | Bulk Sample | Terzaghi Split Spoon Sample | Groundwater | 3" Shelby Tube (S)

Depth (ft.)	Soil Type	Undisturbed	Bulk	Description	Blows / Foot	N_{60}	Dry Density (pcf)	Moisture Content (%)	Other Tests
	SM/SC			**Qof:** Dark Brown Silty and Clayey SAND. Dry to Moist,NP. Sand-FG to CG					
	CL			Dark Grayish Brown Sandy Lean CLAY. Very Stiff, Moist, Plastic. Sand - Fine Grained.	26		84.3	25.0	
	CL			Light Olive Brown Sandy Lean CLAY. Very Stiff, Moist, Plastic. Sand - Fine Grained.	21	21		27.3	
5									c' = 0 psf Φ' = 30°
	SM			Light Olive Brown and Yellowish Brown Silty SAND. Medium Dense, Moist, Non Plastic. Sand - Fine Grained.	19		96.8	13.4	Particle Size:
					15	17		10.8	F.C. = 39.9%
10									
				Interbedded: Light Olive Brown and Olive Brown					
	SM/CL			Silty SAND and Clayey SAND. Medium Dense, Moist, Non Plastic.	19		99.1	13.7	
	ML-CL			Sand - Fine Grained.	5	6		43.8	
15				Sandy SILT to Sandy Lean CLAY. Firm, Moist, Plastic. Sand - Fine Grained.					
				Interbedded: Olive Brown					
	CL			Sandy Lean CLAY. Stiff, Moist, Plastic. Sand - Fine Grained.	19		76.0	43.7	q_u = 3,778 psf
	CL-SC			Sandy Lean CLAY to Clayey SAND. Stiff, Moist, Plastic. Sand - Fine Grained.	11	15		27.9	
20									
				Interbedded: Olive Brown					
	SM/SC			Silty SAND and Clayey SAND. Medium Dense, Moist, Non Plastic.	19		97.4	21.1	q_u = 2,022 psf
	/CL			Sand - Fine Grained to Coarse Grained.	18	25		27.8	
25				Sandy Lean CLAY. Stiff. Moist, Plastic. Sand - Fine Grained.					
				Tp:					
	(SP-SM)			Light Olive Brown SANDSTONE. Dense, Moist. (Poorly Graded Sand with Silt), Sand - Predominately Fine Grained.	24	34		16.1	
30									
				Light Olive Brown SANDSTONE. Very Dense, Moist. (Poorly Graded Sand with Silt), Sand - Fine Grained Beds and Fine to Coarse Grained Beds.					
	(SP-SM)			Trace Gravels - up to 0.5", Subrounded.	43	61		14.6	
35				Boring Terminated at 34.5± ft., No GW, Boring Backfilled With Cuttings.					

CMAG ENGINEERING

FIGURE A-4

LOG OF EXPLORATORY BORING

Project No.:	18-142-SC	Boring:	B-2
Project:	9041 Soquel Drive	Location:	See Figure A-2, Boring Location Plan
	Santa Cruz County, California	Elevation:	
Date:	December 7, 2018	Method of Drilling:	Track Mounted Drill Rig, 6in. Solid Stem
Logged By:	SSC		Auger, 140lb. Automatic Trip

2" Ring Sample | 2.5" Ring Sample | Bulk Sample | Terzaghi Split Spoon Sample | Groundwater | S 3" Shelby Tube

Depth (ft.)	Soil Type	Undisturbed	Bulk	Description	Blows / Foot	N_{60}	Dry Density (pcf)	Moisture Content (%)	Other Tests
	SM/SC			**af:** Dark Yellowish Brown Silty and Clayey SAND with Trace Gravel. Medium Dense, Moist, Non Plastic to Slightly Plastic. Sand - Fine to Coarse Grained. Gravel - up to 1", Subrounded.	32 17	 17	117.4	14.0 15.2	
5	SC-CL			**Qof:** Black Clayey SAND to Sandy Lean CLAY. Stiff, Moist, Plastic. Sand - Fine to Medium Grained.	26 15	 16	106.7	18.9 17.7	q_u = 3,830psf
10	CL			Dark Olive Brown Lean CLAY. Very Stiff, Moist, Plastic.	22	25		32.7	
15	SM/ML			Interbedded: Light Olive Brown and Olive Brown Silty SAND. Medium Dense, Moist, Non Plastic. Sand - Fine Grained. Sandy SILT. Medium Dense, Moist, Non Plastic. Sand - Fine Grained.	11	14		21.7	
20	CH			Olive Brown Fat CLAY. Soft, Moist, Plastic.	5	7		49.7	
25	CL-CH			Olive Brown Lean to Fat CLAY with Sand. Firm, Moist, Plastic.	7	10		39.8	
30	SC/CL			Interbedded: Dark Olive Brown and Olive Brown Sandy Lean CLAY. Firm to Stiff, Moist, Plastic. Sand - Fine Grained. Clayey SAND. Firm to Stiff, Moist, Plastic. Sand - Fine Grained.	12	17		25.9	
35	(SM)			**Tp:** Light Olive Brown SANDSTONE. Moist. (Silty Sand), Sand - FG.					

CMAG ENGINEERING

FIGURE A-5.0

LOG OF EXPLORATORY BORING

Project No.:	18-142-SC	Boring:	B-2, Continued.
Project:	9041 Soquel Drive	Location:	See Figure A-2, Boring Location Plan
	Santa Cruz County, California	Elevation:	
Date:	December 7, 2018	Method of Drilling:	Track Mounted Drill Rig, 6in. Solid Stem
Logged By:	SSC		Auger, 140lb. Automatic Trip

2" Ring Sample | 2.5" Ring Sample | Bulk Sample | Terzaghi Split Spoon Sample | Groundwater | 3" Shelby Tube (S)

Depth (ft.)	Soil Type	Undisturbed	Bulk	Description	Blows / Foot	N_{60}	Dry Density (pcf)	Moisture Content (%)	Other Tests
	(SM)			**Tp:** Light Olive Brown SANDSTONE. Dense, Moist. (Silty Sand), Sand - Fine Grained.	33	47		19.4	
40				Boring Terminated at 36.5± ft. Groundwater Not Encountered. Boring Backfilled With Cuttings.					
45									
50									
55									
60									
65									
70									

CMAG ENGINEERING

FIGURE A-5.1

LOG OF EXPLORATORY BORING

Project No.:	18-142-SC	Boring:	B-3
Project:	9041 Soquel Drive	Location:	See Figure A-2, Boring Location Plan
	Santa Cruz County, California	Elevation:	
Date:	December 7, 2018	Method of Drilling:	Track Mounted Drill Rig, 6in. Solid Stem
Logged By:	SSC		Auger, 140lb. Automatic Trip

2" Ring Sample | 2.5" Ring Sample | Bulk Sample | Terzaghi Split Spoon Sample | Groundwater | 3" Shelby Tube (S)

Depth (ft.)	Soil Type	Undisturbed	Bulk	Description	Blows / Foot	N_{60}	Dry Density (pcf)	Moisture Content (%)	Other Tests
	SM			**af:** Dark Yellowish Brown Silty SAND with Trace Gravel. Very Loose, Moist, Non Plastic. Sand - FC to CG. Gravel - up to 3/4", Angular.	5	3	105.6	10.3	
	SC-CL			**Qof:** Black Clayey SAND to Sandy Lean CLAY. Very Stiff, Moist, Plastic. Sand - Fine to Medium Grained.	17	17		25.8 28.0	
5	CL			Dark Brown Lean CLAY with Sand to Sandy Lean CLAY. Very Stiff to Hard, Moist, Plastic. Sand - Fine Grained.	29 21	23	81.8	25.1 22.8	Swell
10	SM/ML			Interbedded: Olive Brown Silty SAND. Medium Dense, Moist, Non Plastic. Sand - Fine Grained. Sandy SILT. Medium Dense, Moist, Non Plastic. Sand - Fine Grained.	16	19		13.6	
15	SC/CL			Interbedded: Olive Brown Clayey SAND. Medium Dense, Moist, Slightly Plastic. Sand - Fine Grained. Sandy Lean CLAY. Stiff, Moist, Plastic. Sand - Fine Grained.	17	22		33.0	
20				Boring Terminated at 17.5± ft. Groundwater Not Encountered. Boring Backfilled With Cuttings.					
25									
30									
35									

CMAG ENGINEERING

FIGURE A-6

LOG OF EXPLORATORY BORING

Project No.:	18-142-SC	Boring:	B-4
Project:	9041 Soquel Drive	Location:	See Figure A-2, Boring Location Plan
	Santa Cruz County, California	Elevation:	
Date:	December 7, 2018	Method of Drilling:	Track Mounted Drill Rig, 6in. Solid Stem
Logged By:	SSC		Auger, 140lb. Automatic Trip

2" Ring Sample | 2.5" Ring Sample | Bulk Sample | Terzaghi Split Spoon Sample | Groundwater | S 3" Shelby Tube

Depth (ft.)	Soil Type	Undisturbed	Bulk	Description	Blows / Foot	N_{60}	Dry Density (pcf)	Moisture Content (%)	Other Tests
	SM/SC			**Qof:** Black Clayey SAND to Sandy Lean CLAY. Firm, Moist, Plastic. Sand - Fine to Medium Grained.					
	CL			Olive Brown Lean CLAY with Sand. Very Stiff, Moist, Plastic.	26		97.6	32.0	q_u = 7,678psf
				Sand - Fine Grained.	18	18		25.7	E.I. = 122
5									
	SM/ML			Interbedded: Light Olive Brown and Yellowish Brown Silty SAND. Medium Dense, Moist, Non Plastic. Sand - Fine Grained.	17		91.7	13.6	
				Sandy SILT. Medium Dense, Moist, Non Plastic. Sand - Fine Grained.	16	18		18.5	
10									
	CL/ML			Interbedded: Light Olive Brown and Olive Brown Sandy Lean CLAY. Firm to Stiff, Moist, Plastic. Sand - Fine Grained.	9	11		37.2	
15				Sandy SILT. Firm to Stiff, Moist, Plastic. Sand - Fine Grained.					
	SC/CL			Interbedded: Olive Brown Clayey SAND. Medium Dense, Moist, Plastic. Sand - Fine Grained.	17	23		24.1	
20				Sandy Lean CLAY. Firm to Stiff, Moist, Plastic. Sand - Fine Grained.					
25	(SP-SM)			**Tp:** Yellowish Brown and Light Olive Brown SANDSTONE. Dense, Moist. (Poorly Graded Sand with Silt), Sand - Fine to Medium Grained.	32	44		8.6	
30	(SP-SM)			Yellowish Brown and Olive Brown SANDSTONE. Dense, Moist. (Poorly Graded Sand with Silt), Sand - Fine Grained Beds and Fine to Coarse Grained Beds. Trace Gravels - up to 0.5", Subrounded.	34	48		9.6	
35									

CMAG ENGINEERING

FIGURE A-7.0

LOG OF EXPLORATORY BORING

Project No.:	18-142-SC	Boring:	B-4, Continued.
Project:	9041 Soquel Drive	Location:	See Figure A-2, Boring Location Plan
	Santa Cruz County, California	Elevation:	
Date:	December 7, 2018	Method of Drilling:	Track Mounted Drill Rig, 6in. Solid Stem Auger, 140lb. Automatic Trip
Logged By:	SSC		

2" Ring Sample | 2.5" Ring Sample | Bulk Sample | Terzaghi Split Spoon Sample | Groundwater | 3" Shelby Tube (S)

Depth (ft.)	Soil Type	Undisturbed	Bulk	Description	Blows / Foot	N_{60}	Dry Density (pcf)	Moisture Content (%)	Other Tests
	(SP-SM)			**Tp:** Light Olive Brown SANDSTONE. Dense, Moist. (Poorly Graded Sand with Silt), Sand - Fine Grained.	33	47		7.8	
40				Boring Terminated at 36.5± ft. Groundwater Not Encountered. Boring Backfilled With Cuttings.					
45									
50									
55									
60									
65									
70									

CMAG ENGINEERING

FIGURE A-7.1

LOG OF EXPLORATORY BORING

Project No.:	18-142-SC	Boring:	B-5
Project:	9041 Soquel Drive	Location:	See Figure A-2, Boring Location Plan
	Santa Cruz County, California	Elevation:	
Date:	December 7, 2018	Method of Drilling:	Track Mounted Drill Rig, 6in. Solid Stem
Logged By:	SSC		Auger, 140lb. Automatic Trip

2" Ring Sample | 2.5" Ring Sample | Bulk Sample | Terzaghi Split Spoon Sample | Groundwater | S 3" Shelby Tube

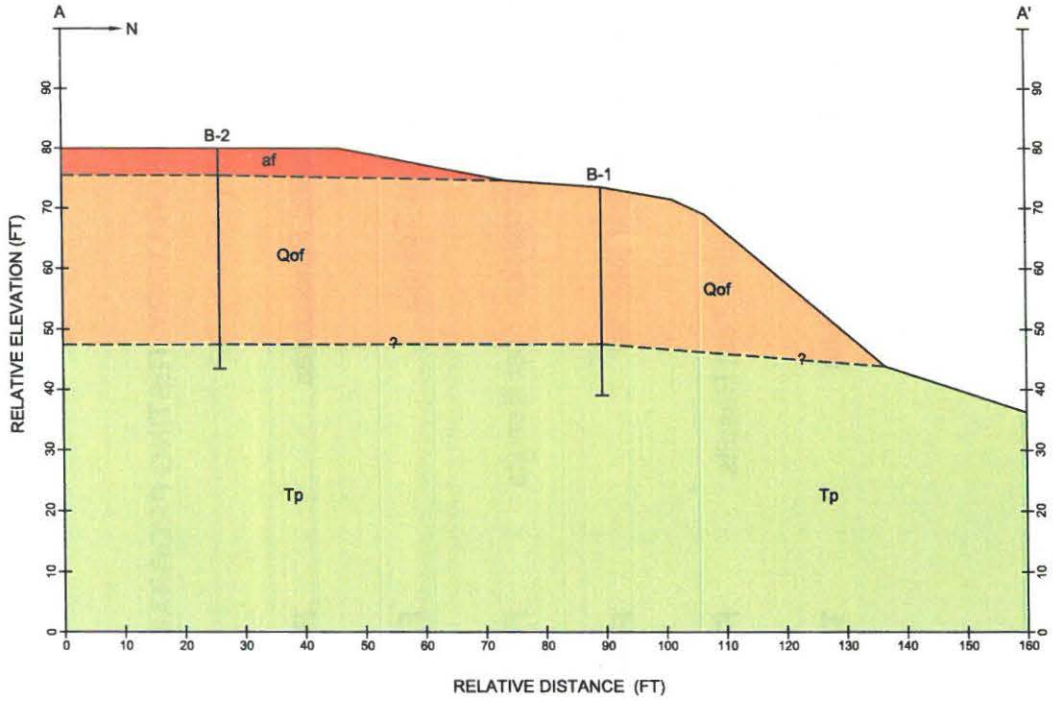
Depth (ft.)	Soil Type	Undisturbed	Bulk	Description	Blows / Foot	N_{60}	Dry Density (pcf)	Moisture Content (%)	Other Tests
0	SM/SC	✓		**af:** Dark Yellowish Brown Silty and Clayey SAND with Trace Gravel. Moist to Wet, Loose to Medium Dense, Non Plastic. Sand - Fine to Coarse Grained. Gravel - up to 1.5", Subrounded. Moist at 2.5'.	4		105.5	17.4	
		✓			10	10		9.2	
5		✓			25		107.6	9.4	
	SC-CL	✓		**Qof:** Black Clayey SAND to Sandy Lean CLAY. Very Stiff, Moist, Plastic. Sand - Fine to Medium Grained.	15	16		17.2	
10	CL-CH	✓		Olive Brown Lean to Fat CLAY with Sand. Very Stiff, Moist, Plastic. Sand - Fine Grained.	21	24		29.8	
15	ML/SM	✓		Interbedded: Light Olive Brown Sandy SILT. Firm, Moist, Plastic. Sand - Fine Grained. Silty SAND. Medium Dense, Moist, Non Plastic. Sand - Fine Grained.	8	10		31.5	
20	ML/ CL-CH	✓		Interbedded: Olive Brown and Light Olive Brown Sandy SILT. Firm, Moist, Plastic. Sand - Fine Grained. Lean to Fat CLAY. Stiff, Moist, Plastic.	10	13		42.8	
25				Boring Terminated at 21.5± ft. Groundwater Not Encountered. Boring Backfilled With Cuttings.					
30									
35									

CMAG ENGINEERING

FIGURE A-8

CROSS SECTION A-A'

SCALE: 1" = 20' H = V



EXPLANATION

UNITS

- af: Artificial Fill
- Qof: Older Flood Plain Deposits
- Tp: Purisima Formation

SYMBOLS

- Geologic Contact, Dashed Where Approximate, Queried Where Uncertain
- B-2 — Approximate Location of Boring B-2

CMAG ENGINEERING	CROSS SECTION A-A'	FIGURE
	9041 Soquel Drive	A-9

APPENDIX B

LABORATORY TESTING PROGRAM

LABORATORY TESTING PROCEDURES

Classification

Soils were classified according to the Unified Soil Classification System in accordance with ASTM D 2487 and D 2488. See Figure A-3. Moisture content and dry density determinations were made for representative, relatively undisturbed samples in accordance with ASTM D 2216. Results of the moisture-density determinations, together with classifications, are shown on the Boring Logs in Appendix A.

Direct Shear

A consolidated drained direct shear test was performed in accordance with ASTM D 3080 on a representative, relatively undisturbed sample of the on-site soils. To simulate possible adverse field conditions the sample was saturated prior to shearing. A saturating device was used which permitted the sample to absorb moisture while preventing volume change. The direct shear test results are presented on the Boring Logs and Figure B-1.

Unconfined Compression

Unconfined compression tests were performed on representative samples of the on-site soils in accordance with ASTM D 2166. The test results are presented on the Boring Logs and Figures B-2 through B-5.

Swell Pressure

A swell pressure test was performed on a representative, relatively undisturbed sample of the on-site soils in accordance with the ASTM D 4546. The test results are presented on Figure B-6.

Particle Size Distribution

A particle size distribution test was performed on a representative sample of the on-site soils in accordance with ASTM D 422. The test results are presented on Figure B-7.

Expansion

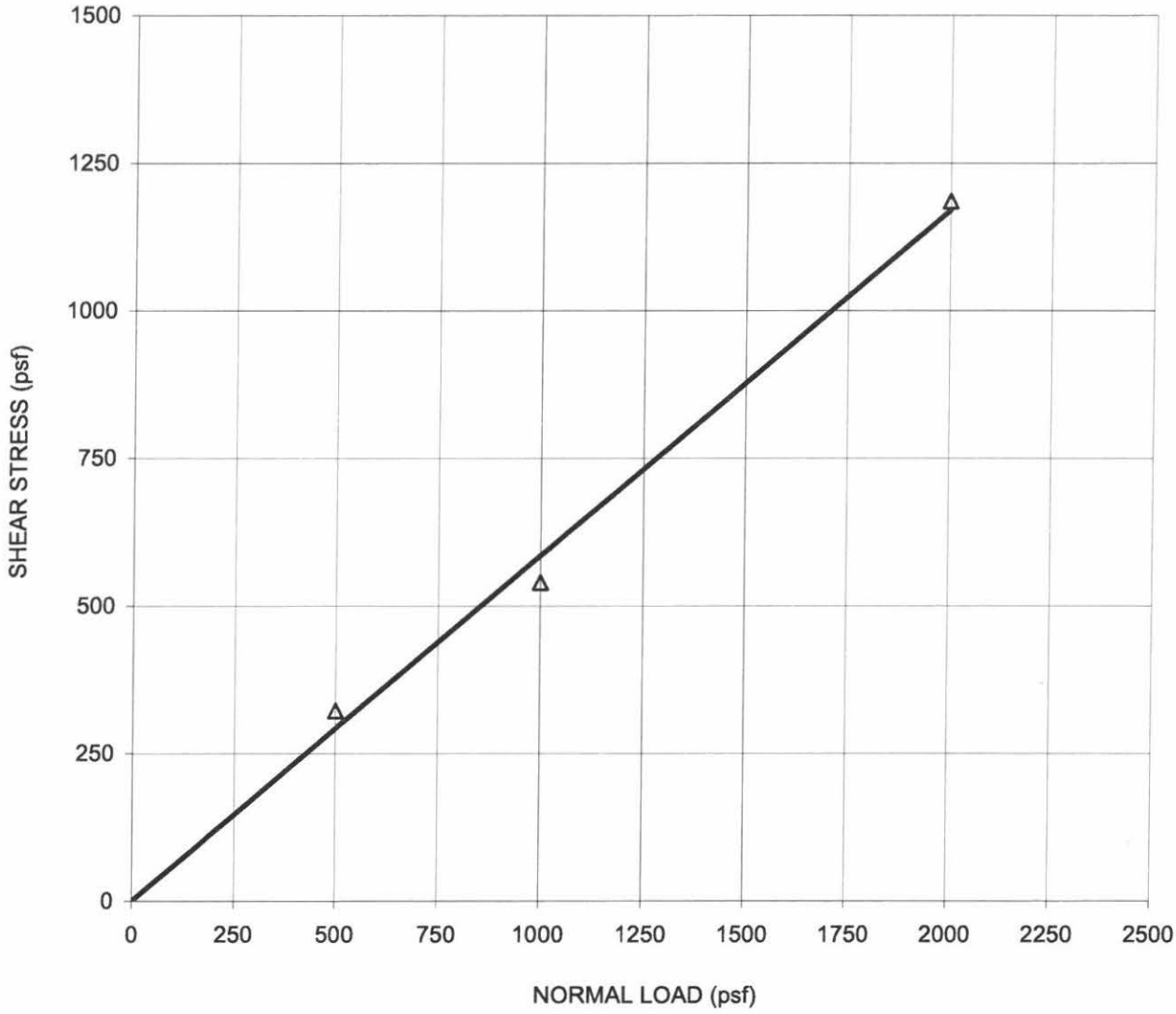
An expansion index test was performed on a representative remolded sample of the on-site soils in accordance with the ASTM D 4829. The test results are presented on the Boring Logs and on Table B-1.

Table B-1. Expansion Index Test Results

Boring	Depth (ft)	Soil Type	Expansion Index	Expansion Potential
B-3	3	CL	122	High

BORING:	B-1		COHESION (psf)	FRICTION ANGLE
DEPTH (ft):	7			
SOIL TYPE (USCS):	SM	PEAK	0	30

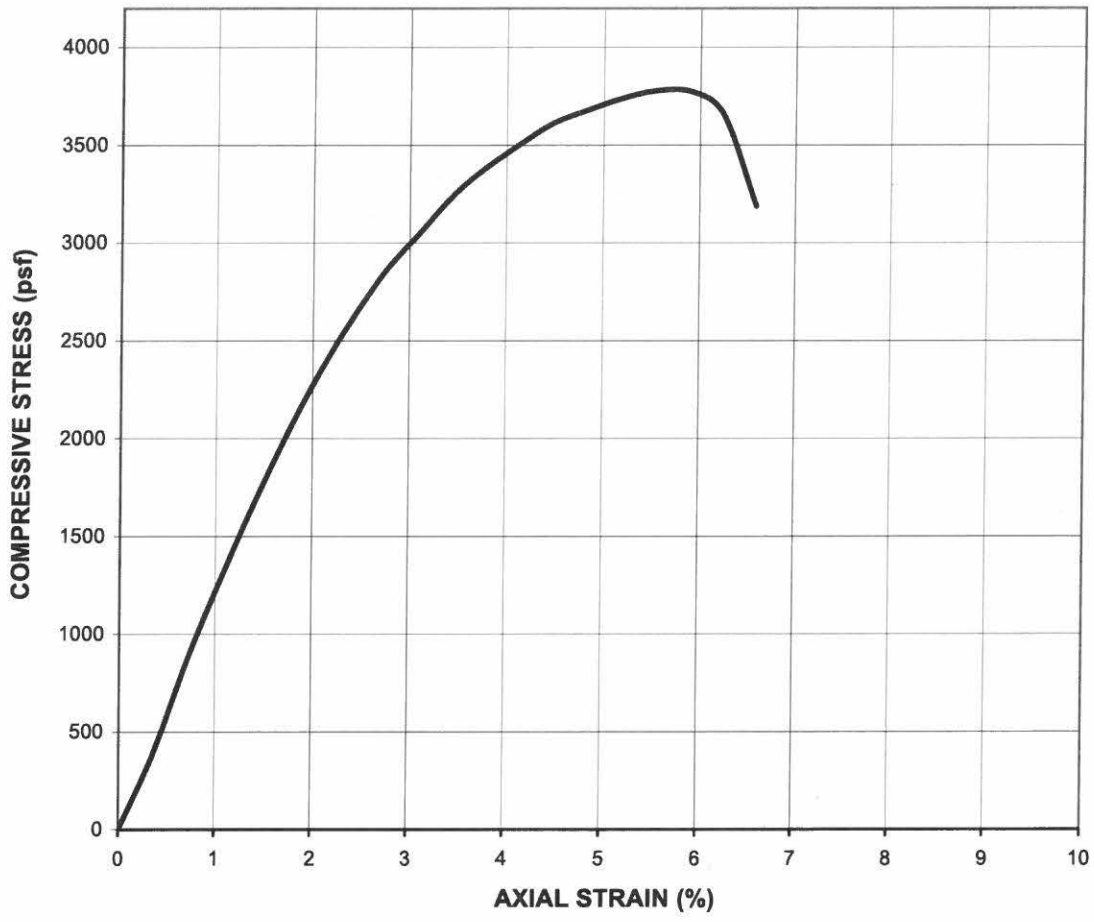
MOISTURE: **SATURATED**	TEST TYPE: **CONSOLIDATED - DRAINED**



CMAG ENGINEERING	DIRECT SHEAR TEST RESULTS	FIGURE
	9041 Soquel Drive	B-1

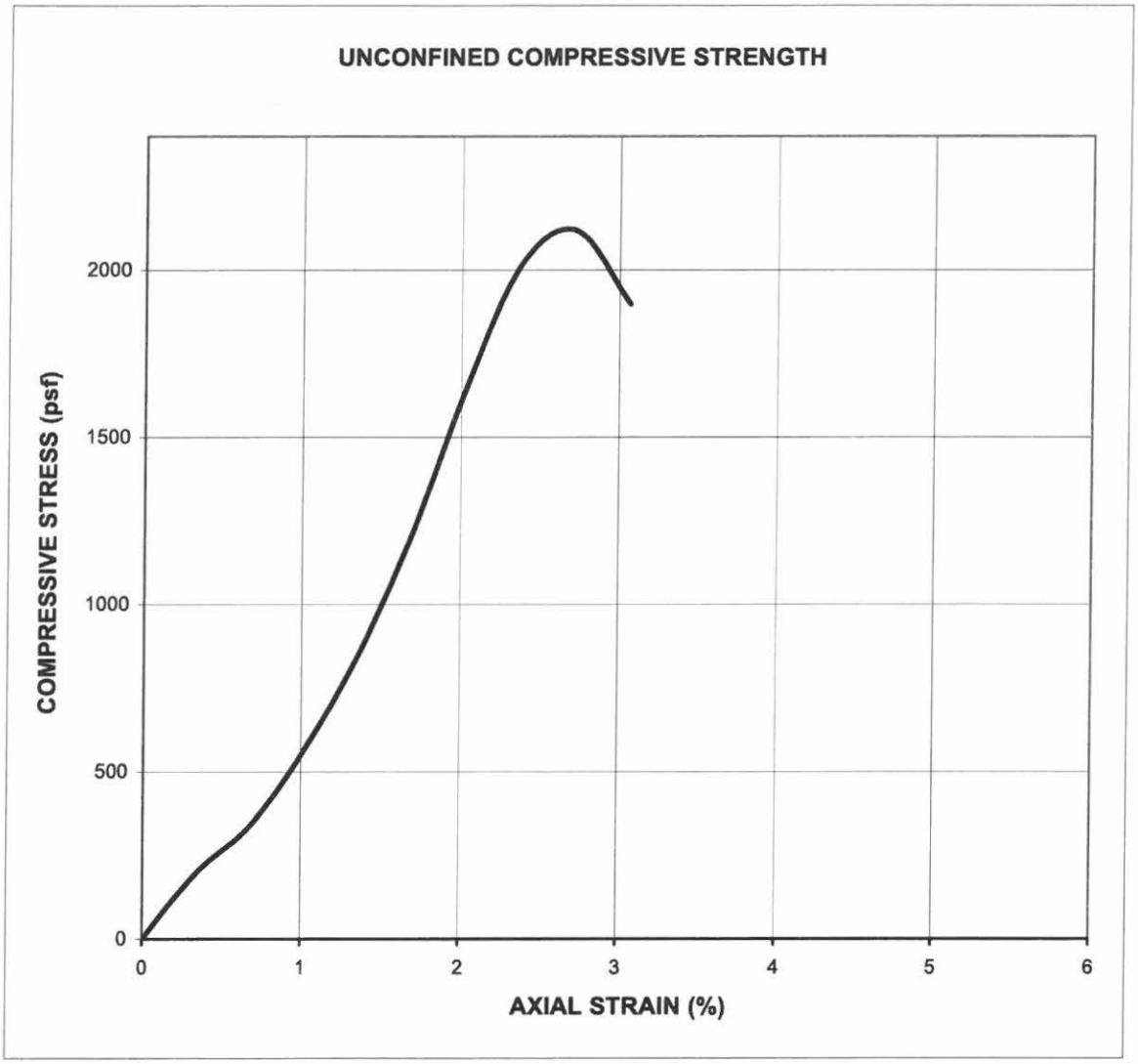
BORING:	B-1	**UNDISTURBED**	UCS
DEPTH (ft):	17		q_u = 3,778 psf
SOIL TYPE (USCS):	CL		
MOISTURE: **INSITU - SATURATED**			

UNCONFINED COMPRESSIVE STRENGTH



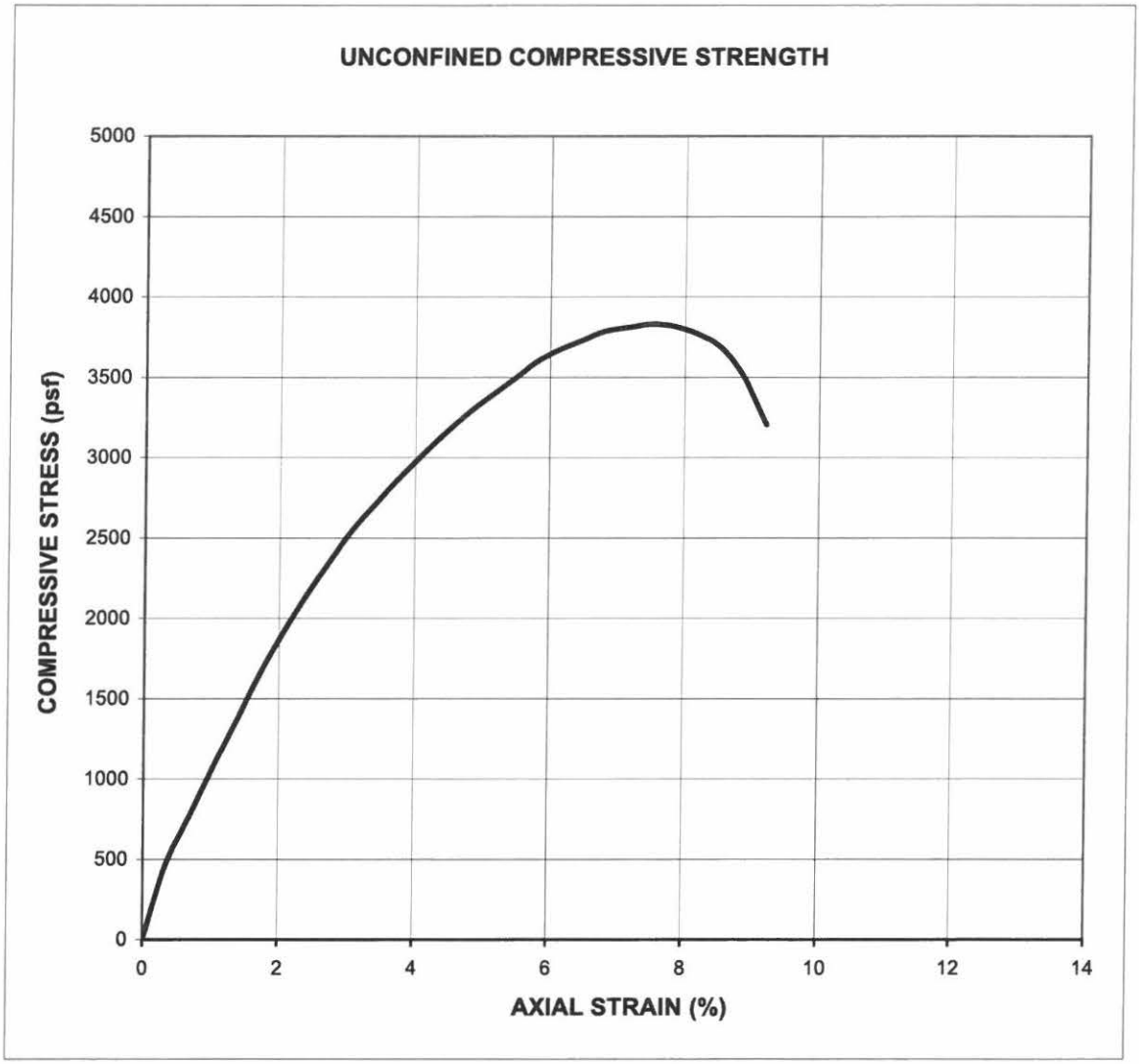
CMAG ENGINEERING	**UNCONFINED COMPRESSIVE STRENGTH RESULTS**	FIGURE
	9041 Soquel Drive	B-2

BORING:	B-1	**UNDISTURBED**	UCS
DEPTH (ft):	22		q_u = 2,022 psf
SOIL TYPE (USCS):	SM/SC		
MOISTURE: **INSITU - SATURATED**			



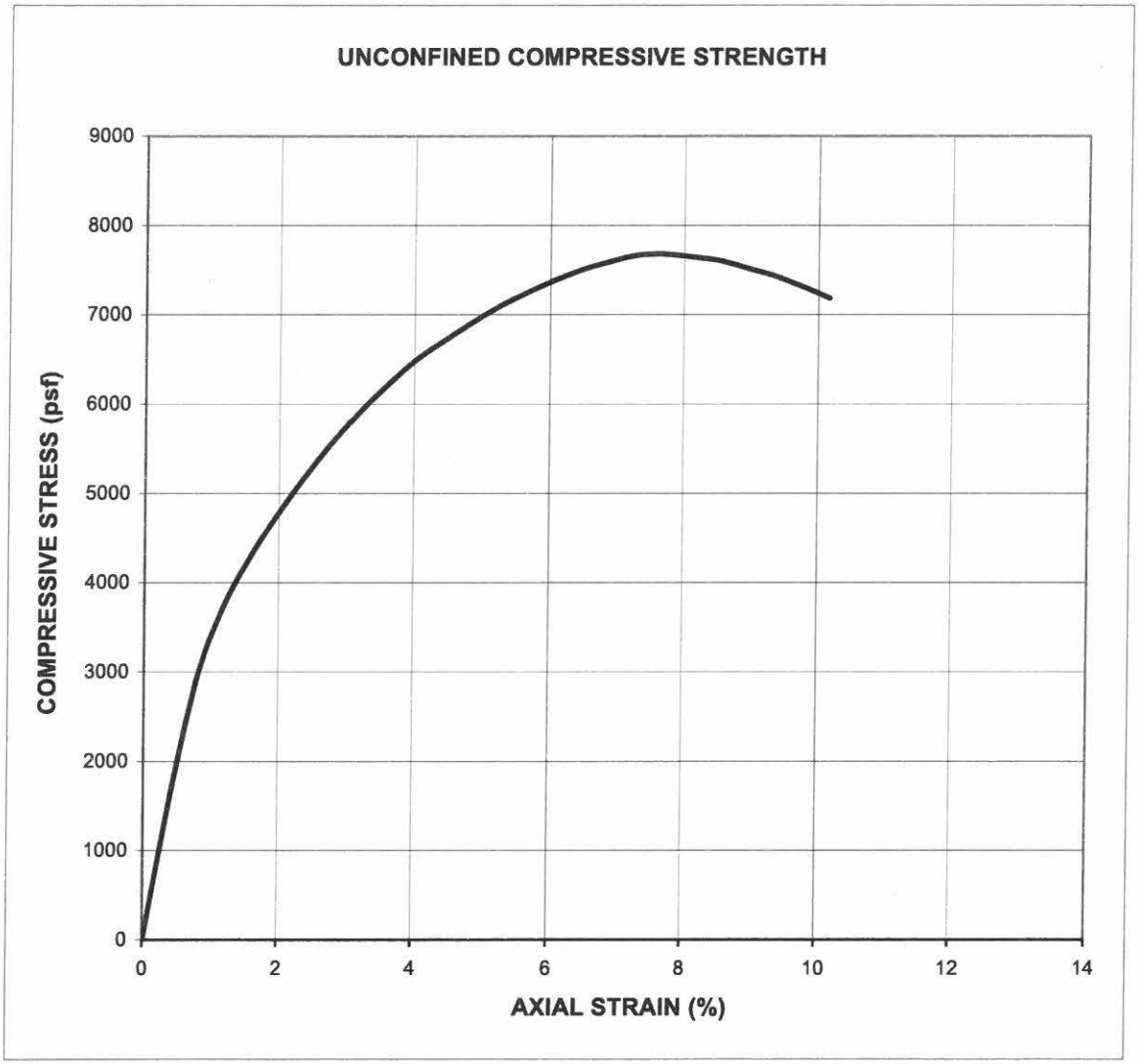
CMAG ENGINEERING	**UNCONFINED COMPRESSIVE STRENGTH RESULTS** 9041 Soquel Drive	FIGURE B-3

BORING:	B-2	**UNDISTURBED**	UCS
DEPTH (ft):	6		
SOIL TYPE (USCS):	SC-CL		q_u = 3,830 psf
MOISTURE: **INSITU - SATURATED**			



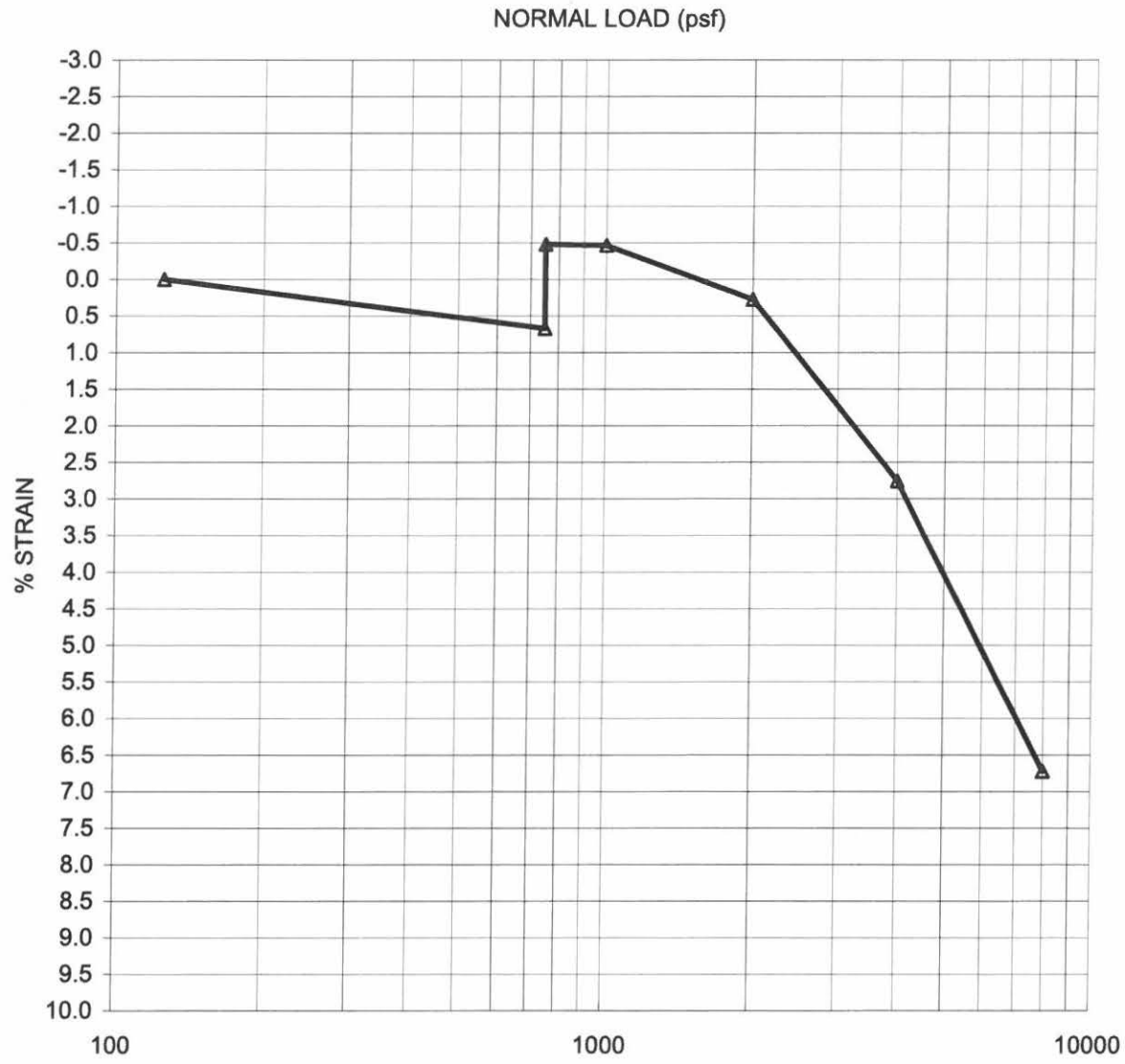
CMAG ENGINEERING	**UNCONFINED COMPRESSIVE STRENGTH RESULTS** 9041 Soquel Drive	FIGURE B-4

BORING:	B-4	**UNDISTURBED**	UCS
DEPTH (ft):	3		
SOIL TYPE (USCS):	CL		q_u = 7,678 psf
MOISTURE: **INSITU - SATURATED**			



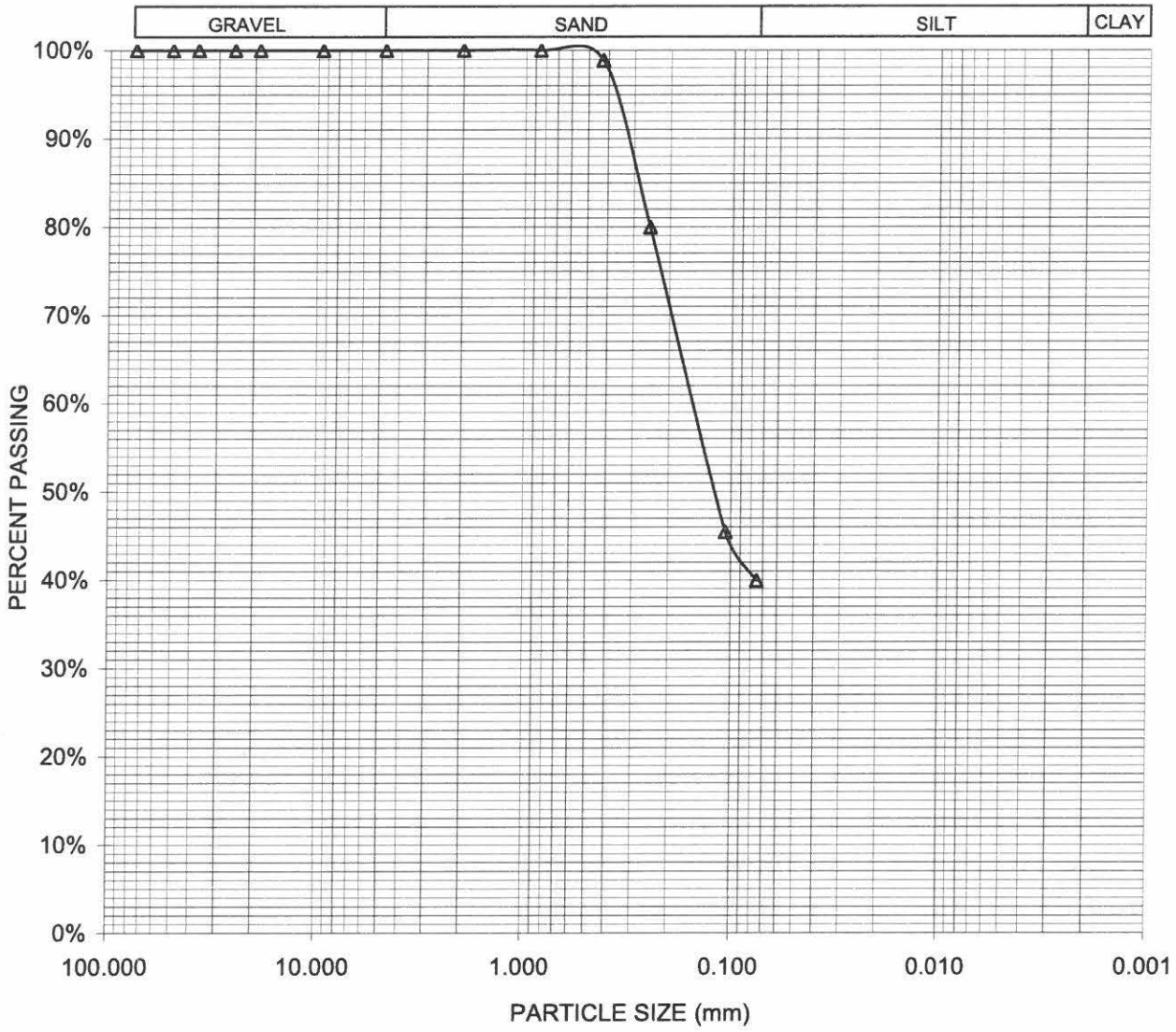
CMAG ENGINEERING	**UNCONFINED COMPRESSIVE STRENGTH RESULTS**	FIGURE
	9041 Soquel Drive	B-5

BORING:	B-3	FIELD MOISTURE:	25.1%
DEPTH (ft):	5	INITIAL SATURATION:	63.8%
SOIL TYPE (USCS):	CL	FINAL MOISTURE:	33.4%



CMAG ENGINEERING	SWELL TEST RESULTS	FIGURE
	9041 Soquel Drive	B-6

BORING:	B-1	PERCENT	PERCENT
DEPTH (ft):	7	PASSING No. 4	PASSING No. 200
SOIL TYPE (USCS):	SM	100.0%	39.9%



CMAG ENGINEERING	PARTICLE SIZE DISTRIBUTION	FIGURE
	9041 Soquel Drive	B-7

APPENDIX C

SLOPE STABILITY PROGRAM

SLOPE STABILITY RESULTS AND METHODOLOGY

The stability of Cross Section A-A' was analyzed using the computer program Slide, Version 7.0 from Rocscience, Inc. This program utilizes a limiting equilibrium method for determining the Factor of Safety against sliding on an assumed failure surface. The cross section was analyzed and the results of the analyses are presented on Figures C-1 and C-2. The location of the cross section analyzed is shown in Appendix A, Figure A-2.

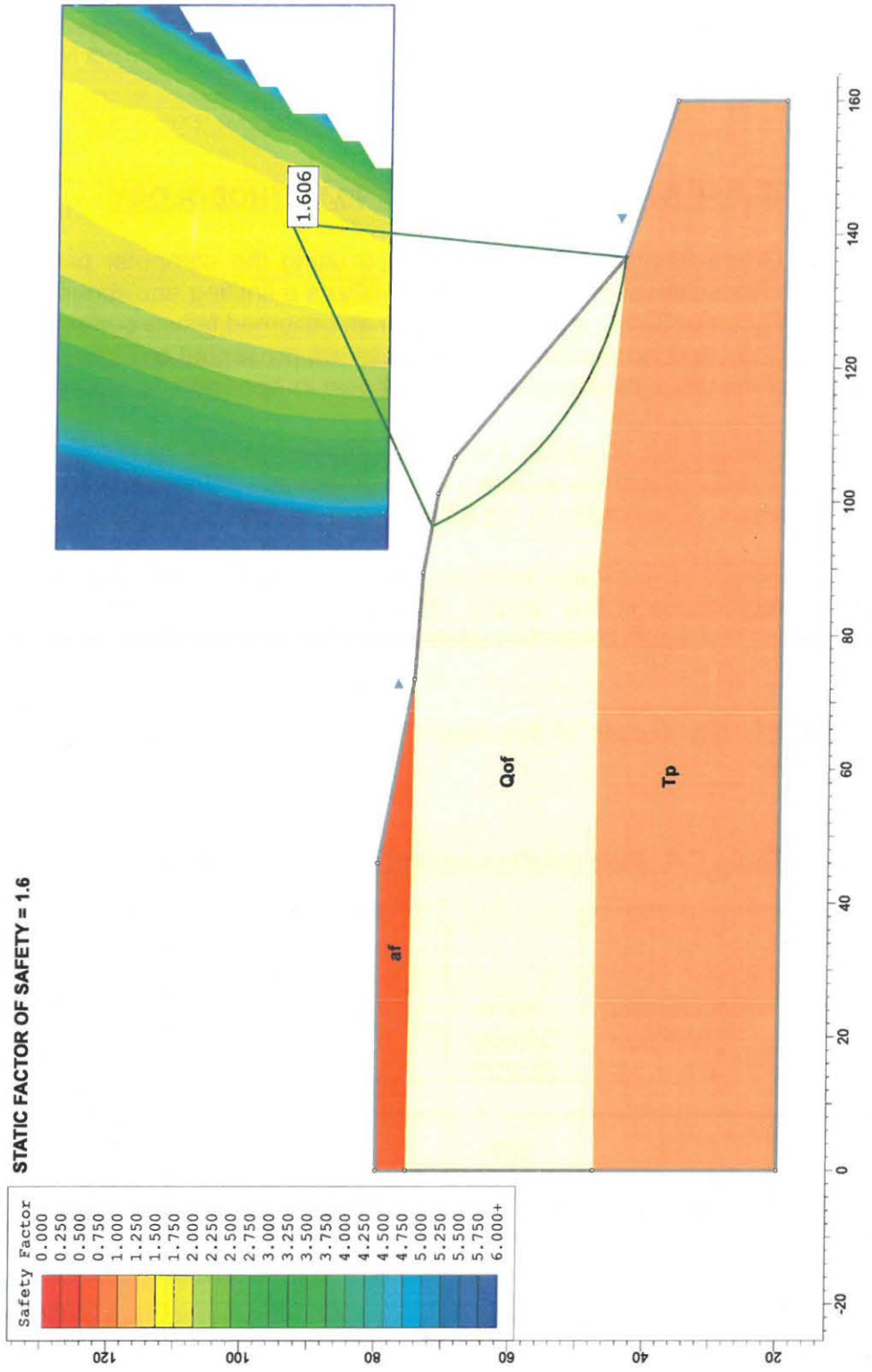
We have also analyzed the condition assuming seepage parallel to the ground surface within the upper 4 feet of the slope adjacent to the proposed commercial building using an infinite slope analysis. The results of the analysis are presented on Figure C-3.

Material properties chosen for these analyses are conservatively based on laboratory test results and on experience in the vicinity. Shear parameters are based on saturated strengths. The shear strength properties used in our slope stability analyses are presented on Table C-1.

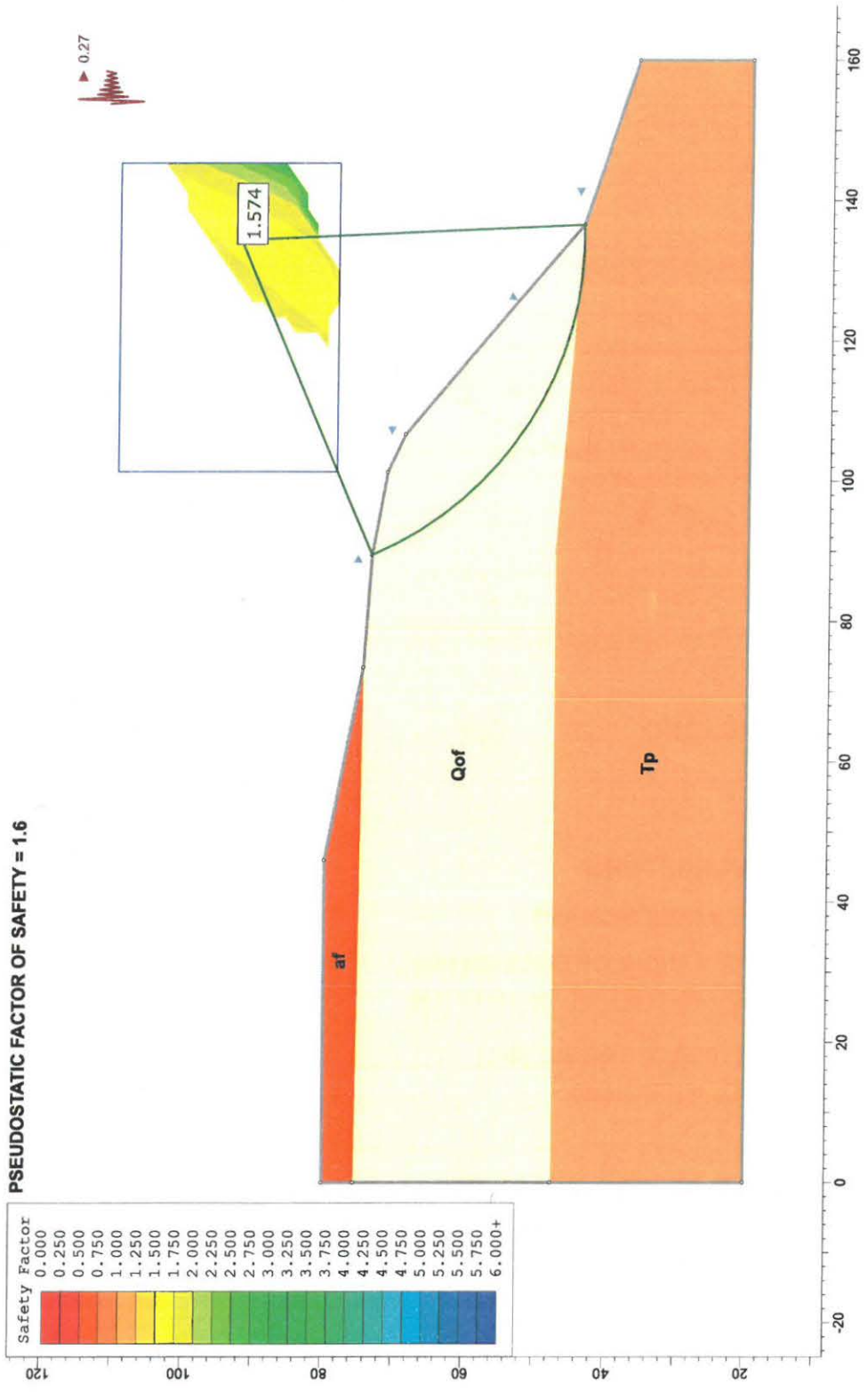
See the Slope Stability section of this report for discussions regarding the calculated Factors of Safety.

Table C-1. Material Properties For Cross Section A-A'

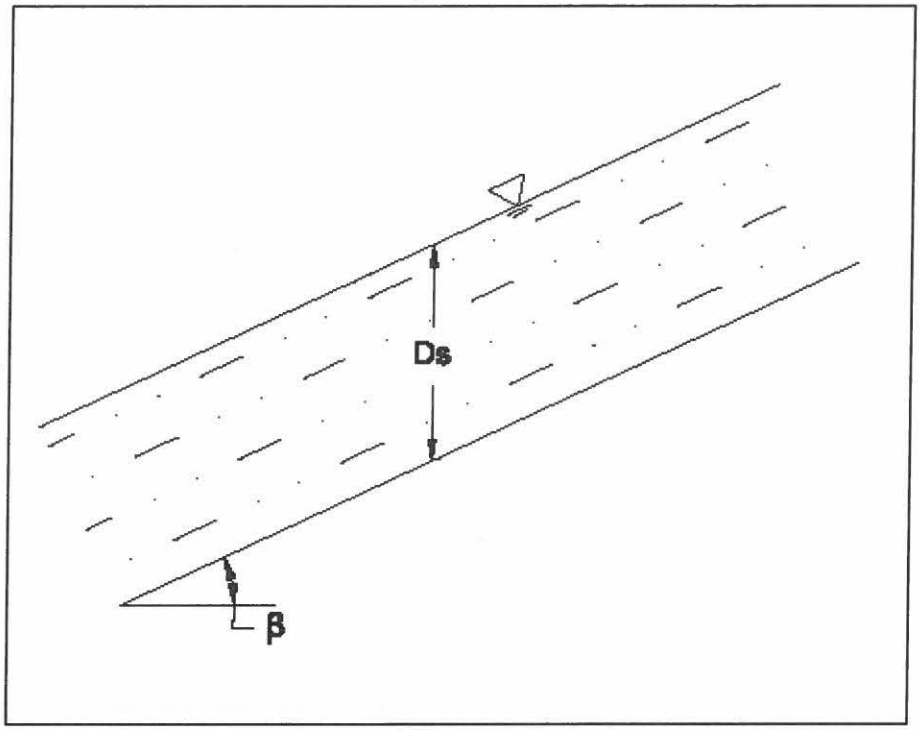
Geologic Unit	Wet Density (lbs/ft^3)	Sat'd Density (lbs/ft^3)	Angle of Internal Friction (°)	Cohesion (lb/ft^2)
			Static / Pseudostatic	Static / Pseudostatic
af	118	128	34 / 34	30 / 30
Qof	113	124	30 / 0	250 / 1,000
Tp	120	125	38 / 38	500 / 500



CMAG ENGINEERING	SLOPE STABILITY - CROSS SECTION A-A' - STATIC CASE	FIGURE
	9041 Soquel Drive	C-1



CMAG ENGINEERING	SLOPE STABILITY - CROSS SECTION A-A' - PSEUDOSTATIC CASE	FIGURE
	9041 Soquel Drive	C-2



GEOLOGIC UNIT: Qof

INPUT PARAMETERS:

c' = COHESION (psf)	= 250
Φ' = ANGLE OF FRICTION (deg)	= 30
γ_s = SATURATED DENSITY (pcf)	= 124
β = SLOPE ANGLE (deg)	= 40
D_s = DEPTH (ft)	= 4

EFFECTIVE STRESS ANALYSIS:

$$FS = \frac{c' + (\gamma_s - \gamma_w) D_s \cos^2\beta \tan\Phi'}{\gamma_s D_s \cos\beta \sin\beta} = \mathbf{1.37}$$

CMAG ENGINEERING	**INFINTE SLOPE - SLOPE PARALLEL SEEPAGE**	FIGURE
	9041 Soquel Drive	C-3

Attachment 3

Geotechnical Report Acceptance Letter
Dated January 9, 2020

CMAG ENGINEERING, INC.

P.O. BOX 640, APTOS, CALIFORNIA 95001
PHONE: 831.475.1411
WWW.CMAGENGINEERING.COM

April 13, 2020
Project No. 18-142-SC

Testorff Construction
335 Spreckels Drive, Suite D
Aptos, California 95003

Attn: Pete Testorff

SUBJECT: **ON-SITE RETENTION**
Proposed Commercial Building
9041 Soquel Drive,
Aptos, Santa Cruz County, California
APN 041-141-56

REFERENCES: CMAG Engineering, Inc. (December 30, 2018). *Geotechnical Investigation , Proposed Commercial Building, 9041 Soquel Drive, Aptos, Santa Cruz County, California, APN 041-141-56.* Project No. 18-142-SC.

Ramsey Civil Engineering, Inc. (April 1, 2020). *Testorff Construction, 9041 Soquel Drive, Aptos, CA, APN 041-141-56.* Sheets C1.0, C2.0, C2.1, C3.0, C4.0, C5.0 and C5.1. Project No. 18-001.

Dear Mr. Testorff:

Per our conversations with the project Civil Engineer, David Ramsey, PE, we have prepared this letter to provide geotechnical recommendations related to on-site retention of stormwater. As indicated in the referenced *Geotechnical Investigation* report (CMAG, 2018), "Proposed on-site retention / detention systems may affect the stability of the steep slope to the north" and, "The near surface native soils generally consist of clay with a low permeability. We therefore recommend that the paver section be designed assuming no exfiltration."

It is our opinion that the site is not feasible for "typical" retention of on-site stormwater. We have worked closely with David Ramsey, PE on the design of the stormwater system outlined in the referenced plans (Ramsey Civil Engineering, Inc., April 1, 2020) consisting of a series of raingardens that consist of treatment, detention, and dishcharge of the stormwater, at pre-development rates, at the base of the slope to the north of the proposed development. It is our opinion that this system is acceptable from a geotechnical standpoint.

It is a pleasure being associated with you on this project. If you have any questions or if we may be of further assistance please do not hesitate to contact our office.

Sincerely,

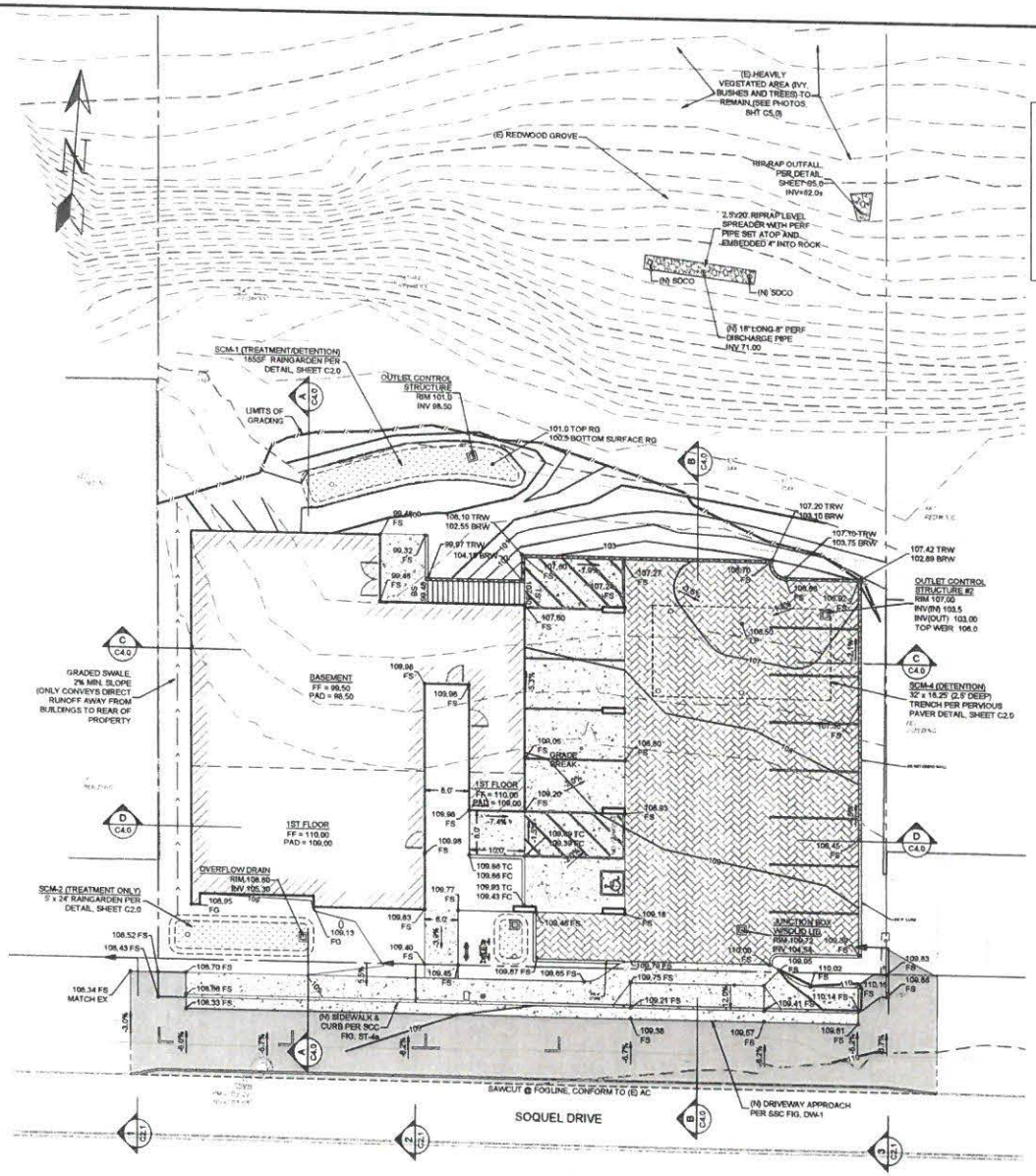
CMAG ENGINEERING, INC.

Adrian L. Garner, PE, GE
Principal Engineer
C 66087, GE 2814
Expires 6/30/20

Distribution: Addressee (Electronic Copy)
David Ramsey (Electronic Copy)

Attachment 4

Approved Locations of Drainage Outlets



PRELIMINARY GRADING & DRAINAGE PLAN

GRADING/PAVING LEGEND

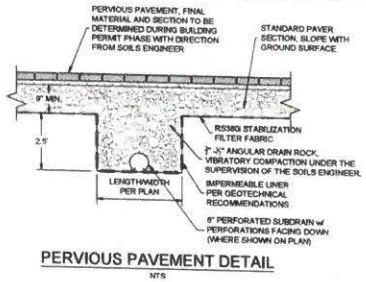
- ASPHALT
- PERVIOUS PAVERS
- CONCRETE

NOTES

1. FOUNDATION PREPARATION PER GEOTECHNICAL RECOMMENDATIONS:
   - 1.1. DRILLED, CAST-IN-PLACE, CONCRETE SHAFTS, REQUIRE NO REWORKING OF MATERIALS OTHER THAN THAT NECESSARY TO REWORK MATERIALS DISTURBED DURING EARTHWORK AND CONSTRUCTION.
   - 1.2. FOR CONCRETE SLABS-ON-GRADE, THE NATIVE SOIL SHOULD BE OVEREXCAVATED A MINIMUM OF 1 FOOT BELOW THE BOTTOM OF THE CRUSHED ROCK, OR 2 FEET BELOW EXISTING GRADE, WHICHEVER IS GREATER. THE EXPOSED SURFACE SHOULD THEN BE SCARIFIED, MOISTURE CONDITIONED, AND COMPACTED TO A MINIMUM OF 90 PERCENT RELATIVE COMPACTION. IF SLABS ARE CONSTRUCTED ON THE SOUTH SIDE OF THE SITE, IN THE AREA OF THE EXISTING FILL SOILS, THE FILL SHOULD BE OVEREXCAVATED A MINIMUM OF 2 FEET BELOW THE BOTTOM OF THE CRUSHED ROCK, OR 3 FEET BELOW EXISTING GRADE, WHICHEVER IS GREATER. MIRAFI 600X STABILIZATION FABRIC SHOULD BE PLACED ON THE BOTTOM OF THE OVEREXCAVATION. THE MATERIAL WHICH WAS REMOVED SHOULD THEN BE REPLACED WITH ENGINEERED FILL COMPACTED TO A MINIMUM OF 90 PERCENT RELATIVE COMPACTION. THIS ZONE OF REWORKING SHALL EXTEND A MINIMUM OF 3 FEET LATERALLY BEYOND THE CONCRETE SLABS-ON-GRADE.
   - 1.3. BENEATH THE BASEMENT SLAB, THE NATIVE SOIL SHOULD BE OVEREXCAVATED A MINIMUM OF 1 FOOT BELOW THE BOTTOM OF THE CRUSHED ROCK. THE EXPOSED SURFACE SHOULD THEN BE SCARIFIED, MOISTURE CONDITIONED, AND COMPACTED TO A MINIMUM OF 90 PERCENT RELATIVE COMPACTION. THE MATERIAL WHICH WAS REMOVED SHOULD THEN BE REPLACED WITH ENGINEERED FILL COMPACTED TO A MINIMUM OF 90 PERCENT RELATIVE COMPACTION.
2. IN DRIVE AREAS (INCLUDING CONCRETE, ASPHALT, AND NON-PERMEABLE PAVERS), THE NATIVE SOIL SHOULD BE OVER EXCAVATED TO A MINIMUM OF 1' BELOW THE BOTTOM OF THE AGGREGATE BASE COURSE, OR 1.5' BELOW EXISTING GRADE, WHICHEVER IS GREATER AND SHALL EXTEND LATERALLY A MINIMUM OF 2' BEYOND THE DRIVE AREAS. CONTRACTOR TO COORDINATE WITH GEOTECHNICAL ENGINEER FOR OVER EXCAVATION LIMITS ON NORTH SIDE OF PROPERTY.
3. THE MATERIAL REMOVED SHOULD BE REPLACED WITH ENGINEERED FILL COMPACTED TO A MINIMUM OF 90% RELATIVE COMPACTION. THE UPPER 8 INCHES OF SUBGRADE AND ALL AGGREGATE BASE AND SUBBASE IN DRIVE AREAS SHALL BE COMPACTED TO ACHIEVE A MINIMUM RELATIVE COMPACTION OF 95%.
4. GROUND IMMEDIATELY ADJACENT TO BUILDING SHALL BE A MINIMUM OF 8" BELOW FINISHED FLOOR AND SLOPE AWAY FROM FOUNDATION AT A MINIMUM OF 5% PER 2016 CDC 18.04.4.
5. PERVIOUS PAVEMENT STRUCTURAL SECTION IS SUBJECT TO CHANGE UPON RECOMMENDATIONS FROM THE GEOTECHNICAL ENGINEER DURING CONSTRUCTION DOCUMENT PHASE. TRENCH DIMENSIONS WITHIN PERVIOUS AREA IS NECESSARY FOR STORMWATER MITIGATION PURPOSES.
6. THE SUBJECT PARCEL RECEIVES MINIMAL RUNOFF FROM ADJACENT PARCELS AND SOQUEL DRIVE. THE MINIMAL RUNOFF ALONG THE WESTERLY PROPERTY LINE WILL BE DIRECTED TO THE NORTH VIA A NEW VEGETATED SWALE. SEE PLANS. PROPERTY OWNER UNDERSTANDS THAT THE SITE DOES RECEIVE SOME RUNOFF AND SHALL NOT BLOCK THE DRAINAGE FROM ADJACENT PARCEL.
7. RIPRAP OUTFALLS TO BE LOCATED AT BASE OF SLOPE WITH A NOTE: "FINAL LOCATION TO BE DETERMINED BY GEOTECHNICAL ENGINEER IN THE FIELD DURING CONSTRUCTION"

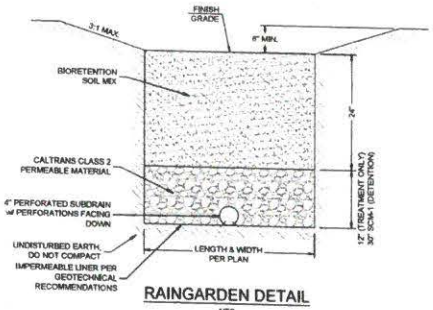
ROOF DRAINAGE NOTE

FLAT ROOF SHALL BE SLOPED AND DRAINED PER THE STORMWATER CONTROL PLAN, SHEET C5.0. ROOF IS DIVIDED INTO THREE SEPARATE DRAINAGE AREAS, EACH DRAINING TO A RAIN GARDEN FACILITY FOR TREATMENT PURPOSES. ASSOCIATED DOWNSPOUTS SHALL DISCHARGE AT GRADE AND DIRECTED TOWARDS MITIGATION FACILITY, AS SHOWN ON SHEET C5.0.



PERVIOUS PAVEMENT DETAIL

NTS



RAINGARDEN DETAIL

NTS

811 Know what's below. Call before you dig.

CIVIL ENGINEERING
LAND PLANNING
PROJECT MANAGEMENT
CONSTRUCTION SUPPORT
OSD AND DSP SERVICES
2905 KRISTIE COURT
SANTA CRUZ, CA 95065
TEL (831) 462-2905
www.ramseycivilengineering.com
DAVID RAMSEY RCE# 73735 DATE

APN# 041-141-56

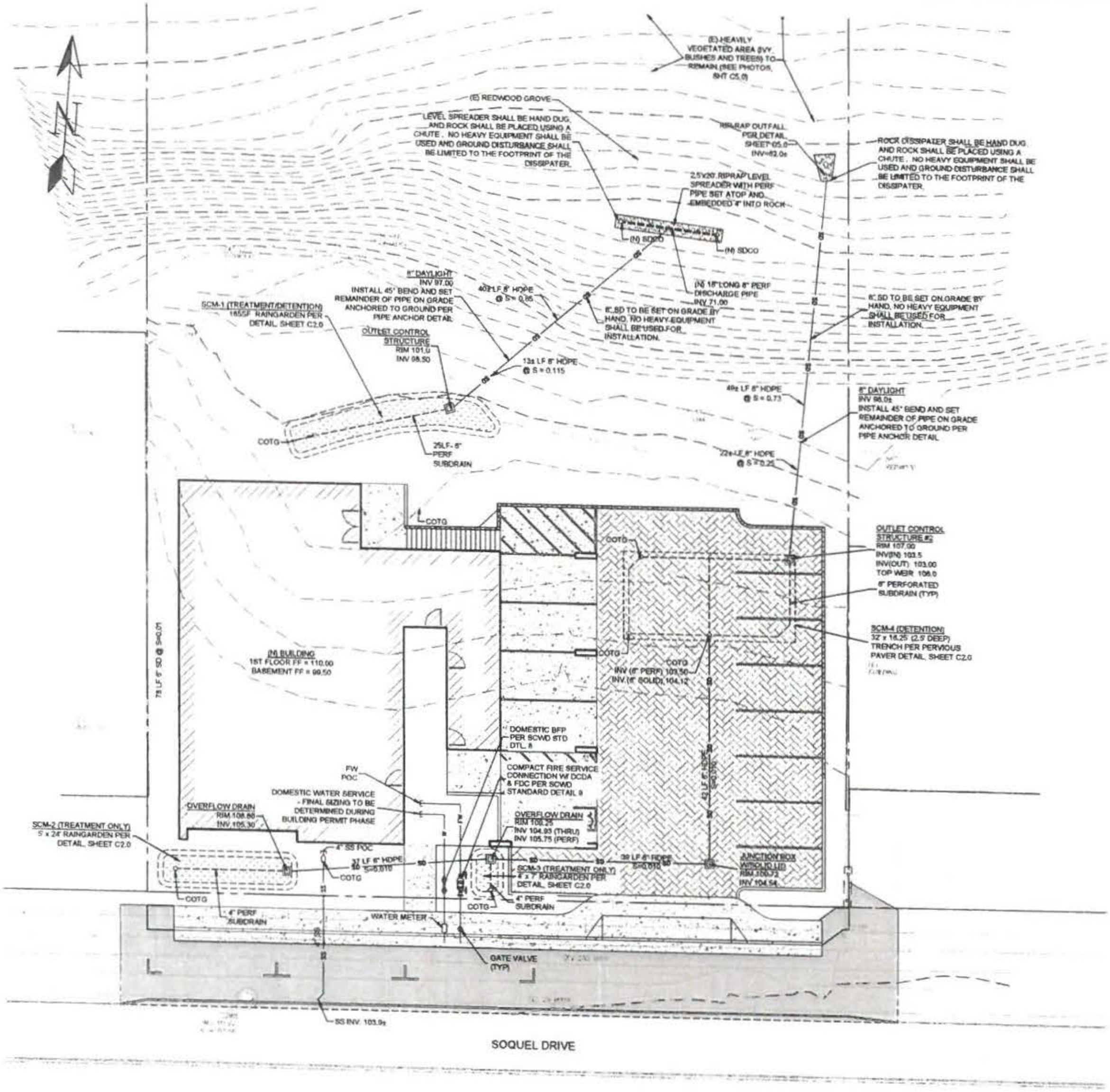
PLAN TYPE
MIXED USE

PRELIMINARY GRADING & DRAINAGE PLAN
TESTORFF CONSTRUCTION
9041 SOQUEL DRIVE, APTOS, CA

NUMBER	BY	DESCRIPTION	DATE
1	DMR	PLANNING 1ST ROUTING COMMENTS	10/2021
2	DMR	PLANNING 2ND ROUTING COMMENTS	4/2022

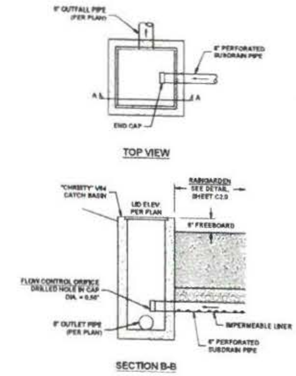
REVISION BLOCK

DRAWN BY:	DMR
DESIGNED BY:	DMR
DATE:	01/26/21
SCALE:	AS NOTED
PROJECT NO:	19-001
SHEET:	C2.0



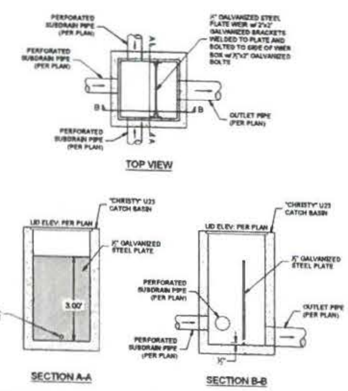
PRELIMINARY UTILITY PLAN

GRAPHIC SCALE: 1 INCH = 10 FEET



OUTLET CONTROL STRUCTURE #1 - DETAIL

SCALE: 1" = 2'



OUTLET CONTROL STRUCTURE #2 - DETAIL

SCALE: 1" = 2'

811 Know what's below. Call before you dig.

CIVIL ENGINEERING
LAND PLANNING
PROJECT MANAGEMENT
CONSTRUCTION SUPPORT
QSD AND QSP SERVICES

2905 KRISTIE COURT
SANTA CRUZ, CA 95065
TEL (831) 462-2905

DAVID RAMSEY RCE# 73735 — DATE

APN# 041-141-56

PLAN TYPE MIXED USE

PRELIMINARY UTILITY PLAN

TESTORFF CONSTRUCTION

9041 SOQUEL DRIVE, APTOS, CA

NUMBER	BY	DESCRIPTION	DATE
2	DMR	PLANNING 2ND ROUTING COMMENTS	1/1/2021
1	DMR	PLANNING 1ST ROUTING COMMENTS	4/1/2020

REVISION BLOCK

DRAWN BY:	DMR
DESIGNED BY:	DMR
DATE:	01/26/21
SCALE:	AS NOTED
PROJECT NO:	18-001
SHEET:	C3.0

LEGEND

DRAINAGE MANAGEMENT AREA (DMA)

SCM-1 (TREATMENT/DETENTION)
1655F RAINGARDEN PER
DETAIL, SHEET C2.0

DMA #1

DMA #2
TREATMENT AREA 3

SCM-4 (DETENTION)
57' x 16.25' (2.7' DEEP)
TRENCH PER PERVIOUS
PAVER DETAIL, SHEET C2.0

DMA #2
TREATMENT AREA 1
(2,814 SF)

DMA #2
TREATMENT AREA 2
(648 SF)

SCM-2 (TREATMENT ONLY)
5' x 24' RAINGARDEN PER
DETAIL, SHEET C2.0

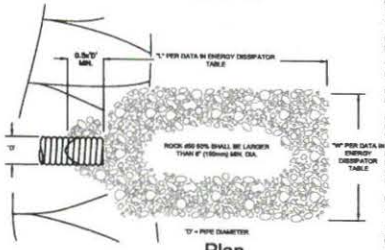
JUNCTION BOX
WITH GRATE

SOQUEL DRIVE

STORM WATER CONTROL PLAN

GRAPHIC SCALE: 1 INCH = 10 FEET

Section



Plan

NOTES:

1. 'La' = LENGTH OF APRON. DISTANCE 'La' SHALL BE OF SUFFICIENT LENGTH TO DISSIPATE ENERGY.
2. APRON SHALL BE SET AT A ZERO GRADE AND ALIGNED STRAIGHT.
3. FILTER MATERIAL SHALL BE FILTER FABRIC OR 9" (150mm) THICK MINIMUM GRADED GRAVEL LAYER.

Energy Dissipator
NTS

CONSTRUCTION SPECIFICATIONS:

ENSURE THAT THE SUBGRADE FOR THE FILTER AND RIPRAP FOLLOWS THE REQUIRED LINES AND GRADES SHOWN IN THE PLAN. COMPACT ANY FILL REQUIRED IN THE SUBGRADE TO THE DENSITY OF THE SURROUNDING UNDISTURBED MATERIAL. LOW AREAS IN THE SUBGRADE OR UNDISTURBED SOIL MAY ALSO BE FILLED BY INCREASING THE RIPRAP THICKNESS.

THE RIPRAP AND GRAVEL FILTER MUST CONFORM TO THE SPECIFIED GRADING LIMITS SHOWN ON THE PLANS.

FILTER CLOTH, WHEN USED, MUST MEET DESIGN REQUIREMENTS AND BE PROPERLY PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION. REPAIR ANY DAMAGED FABRIC BY REMOVING THE RIPRAP AND PLACING ANOTHER PIECE OF FILTER CLOTH OVER THE DAMAGED AREA. ALL CONNECTING JOINTS SHOULD OVERLAP A MINIMUM OF 1 FOOT (300 MM). IF THE DAMAGE IS EXTENSIVE, REPLACE THE ENTIRE FILTER CLOTH. REFER TO APPENDIX
-GEOTEXTILES/GEOSYNTHETICS

RIPRAP MAY BE PLACED BY EQUIPMENT, BUT TAKE CARE TO AVOID DAMAGING THE FILTER.

THE MINIMUM THICKNESS OF THE RIPRAP SHOULD BE 1.5 TIMES THE MAXIMUM STONE DIAMETER.

RIPRAP MAY BE FIELD STONE OR ROUGH QUARRY STONE. IT SHOULD BE HARD, ANGULAR, HIGHLY WEATHER-RESISTANT AND WELL GRADED.

CONSTRUCT THE APRON ON ZERO GRADE WITH NO OVERFALL AT THE END. MAKE THE TOP OF THE RIPRAP AT THE DOWNSTREAM END LEVEL WITH THE RECEIVING AREA OR SLIGHTLY BELOW IT.

ENSURE THAT THE APRON IS PROPERLY ALIGNED WITH THE RECEIVING STREAM AND PREFERABLY STRAIGHT THROUGHOUT ITS LENGTH. IF A CURVE IS NEEDED TO FIT SITE CONDITIONS, PLACE IT IN THE UPPER SECTION OF THE APRON.

IMMEDIATELY AFTER CONSTRUCTION, STABILIZE ALL DISTURBED AREAS WITH VEGETATION.

INSPECTION AND MAINTENANCE:

INSPECT RIPRAP OUTLET STRUCTURES AFTER HEAVY RAINS TO SEE IF ANY EROSION AROUND OR BELOW THE RIPRAP HAS TAKEN PLACE OR IF STONES HAVE BEEN DISLODGED. IMMEDIATELY MAKE ALL NEEDED REPAIRS TO PREVENT FURTHER DAMAGE.

811 Know what's below. Call before you dig.

CIVIL ENGINEERING
LAND PLANNING
PROJECT MANAGEMENT
CONSTRUCTION SUPPORT
QSD AND QSP SERVICES

2905 KRISTIE COURT
SANTA CRUZ, CA 95065
TEL (831) 462-2905
www.ramseycivilengineering.com

REGISTERED PROFESSIONAL ENGINEER DAVID RAMSEY NO. C79736 CIVIL STATE OF CALIFORNIA

DAVID RAMSEY DATE
RCE# 73735

APN# 041-141-56

PLAN TYPE
MIXED USE

STORM WATER CONTROL PLAN

TESTORFF CONSTRUCTION

9041 SOQUEL DRIVE, APTOS, CA

NUMBER	BY	DESCRIPTION	DATE
1	DMR	PLANNING 1ST ROUTING COMMENTS	5/28/21
2	DMR	PLANNING 2ND ROUTING COMMENTS	8/12/2021

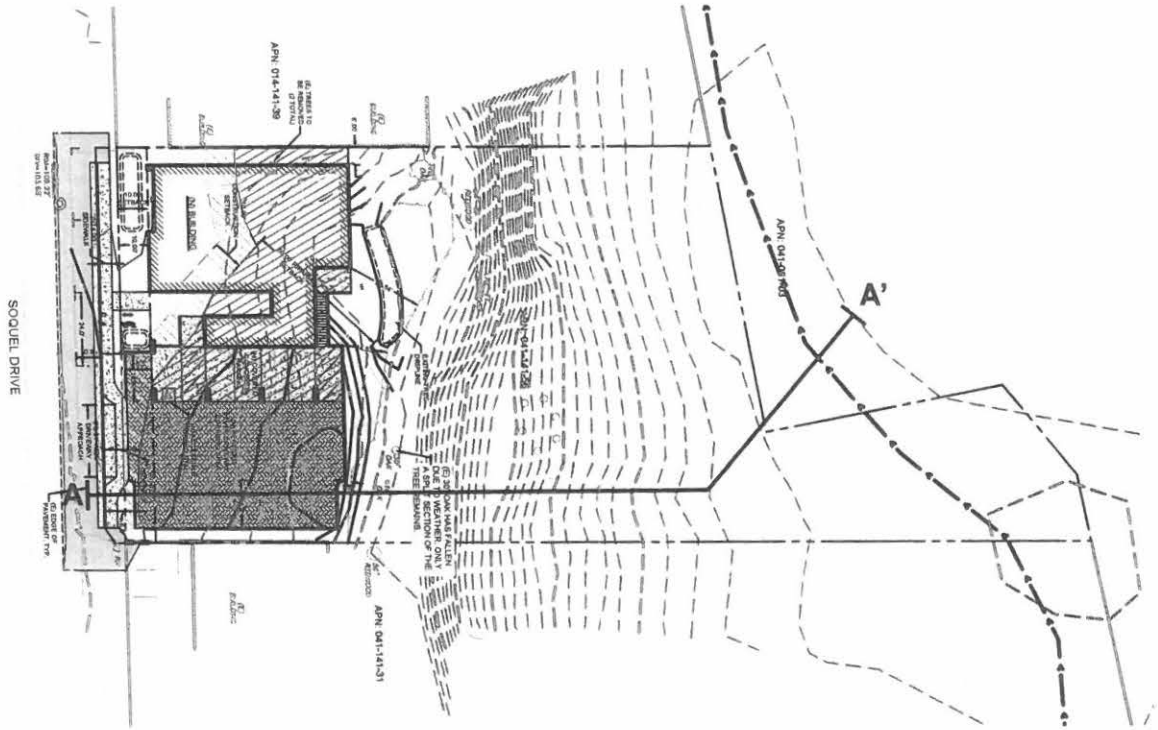
REVISION BLOCK

DRAWN BY:	DMR
DESIGNED BY:	DMR
DATE:	01/26/21
SCALE:	AS NOTED
PROJECT NO:	19-001
SHEET:	C5.0

N

SCALE: 1 INCH = 40 FEET

20 0 20 40 FEET



EXPLANATION OF SYMBOLS

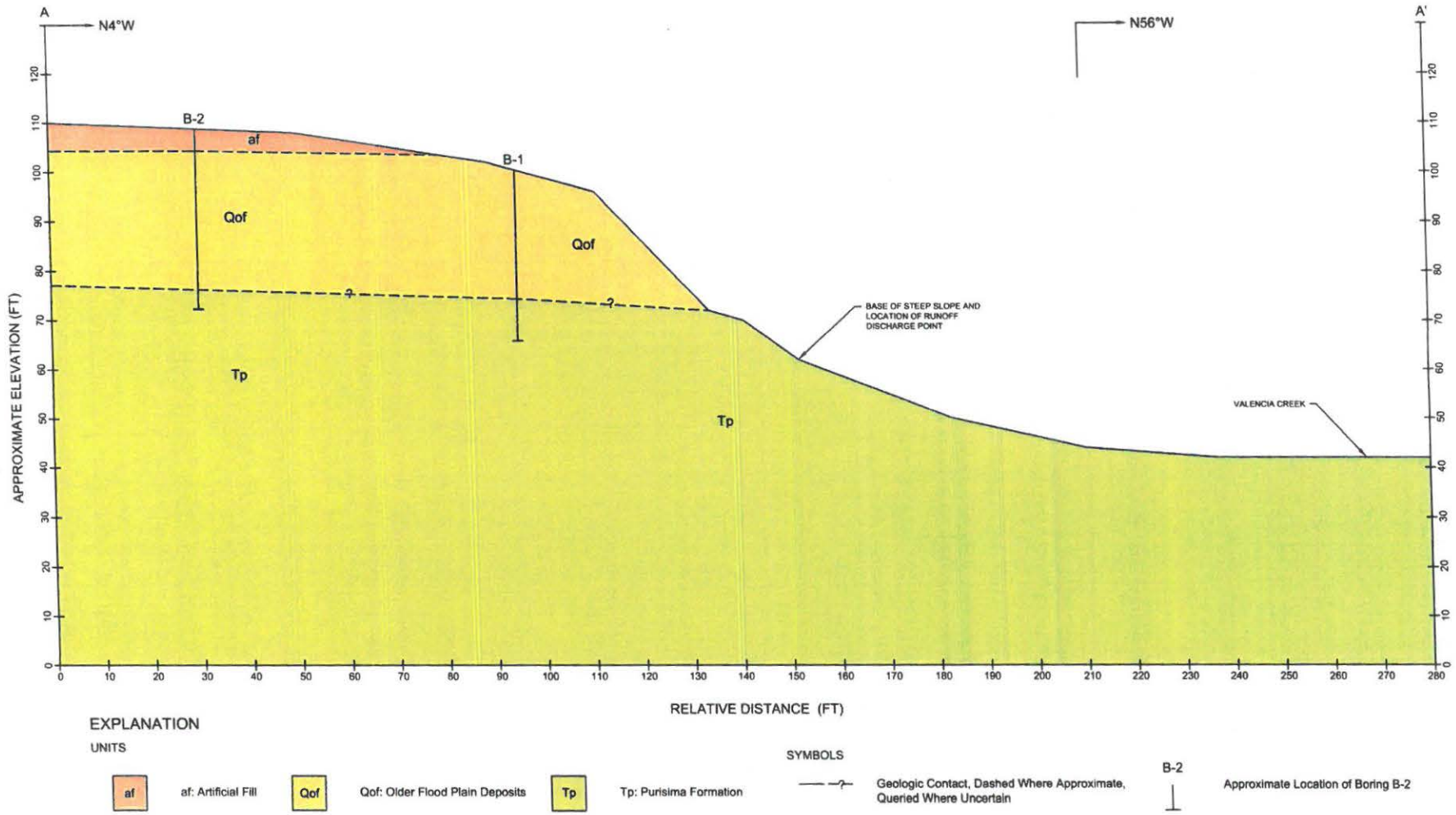
A ——— A' LOCATION OF CROSS SECTION

BASEMAP: Ramsey Civil Engineering, Inc. (January 26, 2021). *Preliminary Site Plan, Testorff Construction, 9041 Soquel Drive, Aptos, CA.* Original Scale: 1" = 20'.

CMAG ENGINEERING	SITE MAP 9041 Soquel Drive	FIGURE 1

CROSS SECTION A-A'

SCALE: 1" = 20' H = V



EXPLANATION

UNITS

- af: Artificial Fill
- Qof: Older Flood Plain Deposits
- Tp: Purisima Formation

SYMBOLS

- Geologic Contact, Dashed Where Approximate, Queried Where Uncertain
- B-2: Approximate Location of Boring B-2

CMAG ENGINEERING	CROSS SECTION A-A'	FIGURE
	9041 Soquel Drive	2