CITY OF HAYWARD
DEVELOPMENT SERVICES DEPARTMENT
INITIAL STUDY CHECKLIST

PROJECT TITLE: 2366 Rainbow Court Single-Family Residence
Site Plan Review No. 201804682

LEAD AGENCY NAME/ADDRESS: City of Hayward
Planning Division
777 B Street
Hayward CA 94541

CONTACT PERSON: Marcus Martinez, Assistant Planner
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PROJECT LOCATION: 2366 Rainbow Court
Assessor Parcel No. 425-0410-027-00

PROJECT APPLICANT: Joyce and Robert Steinfeld
19281 Mountain Way
Los Gatos CA 95030

ZONING DISTRICT: Single Family Residential (RS)

GENERAL PLAN DESIGNATION: Suburban Density Residential (SDR)
1.0 – 4.3 Dwelling Units per Net Acre

PROJECT DESCRIPTION: The proposed project includes an application for Site Plan Review (SPR) with Grading Permit for the construction of a two-story split level, 2,700 square-foot single-family residence and related on- and off-site improvements on an 0.32-acre (14,196 square feet) vacant hillside parcel located at 2366 Rainbow Court. The proposed project includes grading and development on slopes exceeding 20% within the vicinity of the development area.

The proposed new single-family residence meets all the development regulations of the Single Family Residential (RS) zoning district set forth by the Hayward Municipal Code. The project also includes the construction of a driveway, drought-tolerant landscaping, and will connect to the existing utilities (electricity, gas, sewer, and water) on Rainbow Court.

REQUESTED LOCAL APPROVALS: The City of Hayward, as the Lead Agency, will take the following actions in order to carry out the project:

- Site Plan Review
- Grading Permit (For Sites with an Average Slope Greater than 20%)

SURROUNDING LAND USES AND SETTING: The 0.32-acre project site is pie-shaped and steeply sloped from the north (toe of slope) to the south (top of slope) toward Rainbow Court. Adjacent land uses include a predominantly single-family residential on varying lot sizes.

OTHER PUBLIC AGENCIES WHOSE APPROVAL IS REQUIRED: None

ATTACHMENTS:

Attachment I - Project Plans
Attachment II - Geotechnical Report

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐	Aesthetics	☐	Agriculture and Forestry Resources	☐	Air Quality
☐	Biological Resources	☐	Cultural Resources	☒	Geology /Soils
☐	Greenhouse Gas Emissions	☐	Hazards & Hazardous Materials	☐	Hydrology / Water Quality
☐	Land Use / Planning	☐	Mineral Resources	☐	Noise
☐	Population / Housing	☐	Public Services	☐	Recreation
☐	Transportation/Traffic	☐	Utilities / Service Systems	☐	Mandatory Findings of Significance

DETERMINATION: (To be Completed by the Lead Agency)

Based on 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 by 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.

Marcus Martinez, Assistant Planner

February 22, 2019
Date

EVALUATION OF ENVIRONMENTAL IMPACTS

ENVIRONMENTAL ISSUES:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS. Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐

The project site is not within the vicinity of any designated scenic vistas and the proposed single-family residence has been designed in accordance with the City of Hayward Hillside and Urban/Wildlife Interface Design Guidelines to step the building architecture with the existing hillside to maintain views afforded to other adjacent properties. Impacts to scenic vistas is considered *less than significant*.

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

The project site is not located within or along a designated State scenic highway and will not impact designated scenic resources, including trees, rock outcroppings or historic buildings. As such the project proposes *no impact*.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐

The existing site is located along a sloped area within the Single-Family Residential (RS) zoning district where other single-family residences are permitted by-right and currently exist. The proposed project consists of the construction of a two-story split-level, 2,700 square-foot single-family residence on a vacant hillside parcel at the above-referenced address. The City of Hayward Hillside and Urban/Wildfire Interface Guidelines requires that new development within interface area the exhibit varied elevations, floor plans, setbacks, and a quality architecture to enhance the hillside setting. Front elevations facing the public right-of-way should be articulated with well-proportioned windows, roof lines, entries, wall offsets, materials and other details. Side and rear elevations should be attractively designed. The architecture design of the home, color palette, and choice of building materials should provide a smooth visual transition between the homes and the natural surroundings.

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The proposed project reduces the building bulk and mass by adding significant window detailing, neutral colors and a stepped, modern building design. Further, the proposed project will include new drought-tolerant landscaping in compliance with the Bay-Area Friendly Water Efficient Landscape Ordinance and will enhance the visual quality and character of the existing vacant site. As designed, the project would not substantially degrade the character or quality of the site and its surroundings and any impacts would be considered *less than significant.*

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

The proposed single-family residence would result in the development of a currently vacant site and would thereby introduce a new source of light to the site, however the additional light emissions from one single-family dwelling is not considered significant. The project, as conditioned, will require that all exterior lights be shielded downward as to not to cast light or glare onto adjacent properties. Thus, the impacts of the proposed project are considered *less than significant* related to lighting and glare.

II. AGRICULTURE AND FOREST 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 Dept. 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 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:

a) 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?	☐	☐	☐	☒

Per the California Department of Conservation, Important Farmland Finder Mapping System, the project site is designated as *"Urban and Built-Up Land"*; therefore, the project

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
does not involve any Prime Farmland, Unique Farmland, or Farmland of Statewide Importance; thus, *no impact*. (City of Hayward Zoning Map, Important Farmland Finder).				
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
The proposed project is not zoned for agricultural uses nor is the property under Williamson Act contract; thus, *no impact* (Zoning Map, Google Earth).				
c) 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))?	☐	☐	☐	☒
The proposed project, construction of single-family residence, does not involve the rezoning of forest land or timberland; thus, *no impact* (Zoning Map, Google Earth).				
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
The proposed project does not involve the loss of forest land or involve conversion of forest land to non-forest use; thus, *no impact* (Zoning Map, Google Earth).				
e) 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?	☐	☐	☐	☒
The proposed project would not result in a conversion of Farmland to non-agricultural uses nor would it result in conversion of any farmland to a non-forest use (Zoning Map, Google Earth). Thus, *no impact*.				

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

III. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☒	☐

The proposed project involves development of one single-family residence on an existing vacant parcel and will thereby result in an increase in stationary and mobile source emissions over the existing baseline condition. However, the proposed project is consistent with the subject Zoning District (Single Family Residential) and General Plan Land Use Designation (Suburban Density Residential) for the property, which envisioned the proposed development of a single-family residence. Therefore, the development of the subject site with a single-family residence will not conflict with the goals of the regional air quality plan; thus, considered *less than significant*.

b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐

The Bay Area Air Quality Management District (BAAQMD) established screening criteria (Urban Land Use Emissions Model) as part of their CEQA Air Quality Guidelines to assist in determining if a proposed project could result in potentially significant construction-related or ongoing operational air quality impacts (BAAQMD 2016 CEQA Guidelines, Table 3.1, Operational-Related Criteria Air Pollutant and Precursor Screening Level Sizes). Based on the District's criteria, the proposed single-family residence is well below the screening level for a significant impact related to air quality impacts and is therefore considered *less than significant*.

c) 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐

As noted in III.a and III.b above, the construction of a single-family residence is below the screening size for projects that are expected to result in significant air pollutant emissions. Therefore, air quality emissions from the proposed project are expected to be well below the BAAQMD significance thresholds for both construction exhaust and operational emissions for regional criteria pollutants.

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While the development of a single-family residence falls below the potentially significant threshold, it is important to note that any construction activities, particularly during site preparation and grading, would temporarily generate fugitive dust in the form of PM_{10} and $PM_{2.5}$. Unless properly controlled, vehicles leaving the site would deposit mud on local streets, which could be an additional source of airborne dust after it dries. Standard Conditions of Approval related to construction activities to minimize fugitive dust and particulate matter will be incorporated, in the form of Conditions of Approval and Best Management Practices (BMPs), into the Site Plan Review project approval; thus, *less than significant* impact.

d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒

The proposed project involves development of a single-family residence on a vacant lot. The project site is located within a predominantly single-family residential neighborhood and is surrounded by similar land uses to the North, South, West, and East. There are no sources of pollutant concentrations near the site and the proposed single family-residence will not result in exposure of sensitive receptors to substantial pollutant concentrations. Thus, *no impact*.

e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

The proposed project would not include or result in any significant and permanent sources of significant odors that could create objectionable odors affecting a substantial number of people. Thus, *no impact*.

IV. BIOLOGICAL RESOURCES. Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐

The project site is currently vacant, consisting of ruderal groundcover and several mature trees. The project site is surrounded by other single-family residential homes on hillside lots. While development of the site will result in permanent disturbance of a portion of the currently vacant site that likely hosts urban wildlife such as mice, gophers, squirrels among others, it will not

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

have a substantial impact on any valuable habitat that is known to host candidate, sensitive or special status species. Thus, *less than significant* impact.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☒	☐

While development of the site with a new single-family residence will result in permanent disturbance of a portion of the site which is likely hosting some urban wildlife such as mice, gophers, squirrels and other small rodents, the site does not contain a riparian habitat and will not have a substantial impact on any riparian habitat or other identified sensitive natural communities; thus, *less than significant* impact.

c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒

The project site does not contain any wetlands; thus, *no impact* (City of Hayward Background Conditions Report, Figure 7-1, Existing Vegetation Communities).

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐

While development of the site with a single-family residence will result in permanent disturbance of a portion of the site, which is likely hosting some urban wildlife such as mice, gophers, squirrels and other small rodents, the location of the project site within an existing residential neighborhood will not impede the use of native wildlife nursery site. No trees are proposed to be removed as part of the proposed project; however, in the future if any existing, mature trees are proposed be removed and/or pruned, it require the issuance of a Tree Removal/Pruning Permit which will ensure that the tree proposed for removal and/or pruning

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will not contain active nests, which could impact migratory birds pursuant to the Federal Migratory Bird Act. Thus, *less than significant* impact.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☒	☐

The subject site has a ruderal groundcover with several mature trees (City of Hayward Background Conditions Report, Figure 7-1, Existing Vegetation Communities; Google Earth). Although some existing Coast Live Oak trees are present and located towards the northern portion of the sloped site, none are requested to be removed in order to accommodate the proposed development of the single-family residence (Hayward GIS Web-Map, Landscaping Plan). All Coast Live Oak trees identified in the landscaping plans will remain and be preserved. In the event of any future tree pruning and/or removal on the subject property in conjunction with new development, the applicant shall be subject to Chapter 10, Article 15 of the Hayward Municipal Code (Tree Preservation Ordinance) which will require submittal of an Arborist Report with the appraised value of each tree prior to the issuance of a Tree Removal Permit.

In addition, the applicant has retained the services of a landscape architect who has prepared landscape, planting, and irrigation plans. The applicant proposes to plant a 24-inch box tree in accordance with the RS district development standards along with a combination of additional shrubs and groundcover. Additionally, the project would comply with local policies and ordinances protecting biological resources such as a tree preservation policy or ordinance, resulting in *less than significant impact* related to biological resources.

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

The City of Hayward does not have an adopted Habitat Conservation Plan or Natural Community Conservation Plan; thus, *no impact*.

V. CULTURAL RESOURCES. Would the project:	☐	☐	☒	☐
a) Cause a substantial adverse change in the significance of a historical resource as				

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
defined in § 15064.5?				

There are no known historic resources associated with the project site or the adjacent parcels (City of Hayward Background Conditions Report, Figures 1-3 and 1-4, and Table 1-2). In the unlikely event that historic or cultural resources are discovered during excavation related to later phases of the project, standard Conditions of Approval for all development projects require the contractor to stop all work adjacent to the find and contact the City of Hayward Development Services Department to preserve and record the uncovered materials so it can be safely removed (General Plan Policy Natural Resources NR-7.2, Paleontological Resource Mitigation).

If standard procedures are followed in the event cultural/historical resources are uncovered at the project site, there will be a *less than significant* impact related to the project (Hayward 2040 General Plan Background Report and City of Hayward Historical Resources Survey and Inventory Report, July 2010).

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☐	☒	☐

No known archaeological resources exist on the site (City of Hayward Background Conditions Report, Figures 1-3 and 1-4, and Table 1-2). As indicated above, in the unlikely event that historical or cultural resources are discovered in later phases of work, standard Conditions of Approval for all development projects would apply as described in Section V.A above. Therefore, if standard procedures are followed in the event cultural/historical resources are uncovered at the project site, there will be a *less than significant* impact related to the project (Hayward 2040 General Plan).

c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐

No known paleontological resources exist on the site (City of Hayward Background Conditions Report, 7-137 and 7-138). Other than the steep slope, which is characteristic of the surrounding area, there are no unique geological features on or near the site (City of Hayward Web-map, Google Earth). In the unlikely event that paleontological resources are discovered during later phases of development, the project's standard Conditions of Approval for all development projects would apply as described in V.A above.

If standard procedures are followed in the event cultural, historical or paleontological resources are uncovered at the project site, there will be a *less than significant* impact related to the development of the single-family residence (Hayward 2040 General Plan).

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

There is no recorded information related to the location of known human remains or cemeteries near the project site; however, standard procedures for grading operations shall be followed during development, which require that if any such remains or resources are discovered, grading operations shall be halted, the City and County Coroner shall be notified and the resources/remains shall be evaluated by a qualified professional. Further, if necessary, mitigation plans shall be formulated and implemented prior to commencement of grading operations consistent with the City's General Plan Policy NR-7.2. These standard measures would be conditions of approval should the project be approved thus resulting in a *less than significant* impact related to the potential disturbance of human remains.

VI. GEOLOGY AND SOILS. Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) 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.	☐	☒	☐	☐

The project site is not located within a known Earthquake Hazard Zone nor is there geomorphic evidence suggestive of active faulting within the site; however, the subject parcel is located in an area that is assigned a high seismic rating, due to the proximity of several faults, including the Hayward Fault. As such, a major earthquake in the future would expose people and property to strong seismic ground shaking, liquefaction and soil instability. It is essential to note that all structures will be designed using sound engineering judgment and adhere to the latest California Residential Code (CRC) requirements which will minimize impacts related to such activity, but site-specific mitigation is required to minimize these impacts due to the heavily sloped topography.

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

Per the Preliminary Geotechnical Report prepared by Milstone Geotechnical (August 2018), the proposed project could be built with mitigation to reduce impacts. The report provides general recommendations for the project, including the seismic design, site preparations, foundation, retaining walls, concrete slab-on-grade, and drainage that would reduce geological-related impacts to a *less than significant with mitigation.*

GEO-1 Impact: New construction on the subject site could be susceptible to strong ground shaking or unstable soils created by planned cuts and fills in the existing steeply sloped hillside property.

GEO-1 Mitigation Measure: The proposed residence shall incorporate the proposed mitigation measures and recommendations set forth in the Geotechnical Engineering Report prepared by Milstone Geotechnical, dated August 2018.

GEO-1 Mitigation Monitoring: The City shall review and approve the civil, site and building plans to ensure compliance prior to the issuance of any grading or building permits.

ii) Strong seismic ground shaking?	☐	☒	☐	☐

See VI.A Implementation of **Mitigation Measure GEO-1** would reduce the impact to a level of *less than significant with mitigation.*

iii) Seismic-related ground failure, including liquefaction?	☐	☒	☐	☐

See VI.A. Implementation of **Mitigation Measure GEO-1** would reduce the impact to a level of *less than significant with mitigation.*

iv) Landslides?	☐	☒	☐	☐

Per the Geotechnical Report prepared by Milstone Geotechnical, investigation into the site does not reveal a record of or potential for landslides. Compliance with **Mitigation Measure GEO-1** will ensure that all the construction-level design will minimize any potential landslide related impacts to level of *less than significant with mitigation.*

b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐

The project will be subject to standard Planning and Building permit review and inspection processes that would require standard construction-related erosion control measures set forth in

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

the Hayward Municipal Code (HMC), including but not limited to gravelling construction entrances and protecting drain inlets. Furthermore, the project is required to obtain a Grading Permit from the City Council due to grading on slopes greater than 20 percent. The issuance of the Grading Permit is subject to the review and approval of the City's Public Works Department. The project will also be subject to the standard conditions of approval requiring grading to occur consistently with grading plans prepared by a State licensed engineer and approved by the City. The grading plan must include details for retaining walls and slope protection measures. Thus, the potential impacts to soil erosion or loss of topsoil is considered *less than significant*.

c) 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?	☐	☒	☐	☐

As noted in VI.A.I above, the proposed project site is vulnerable to unstable geological activity. Implementation of **Mitigation Measure GEO-1** would reduce the impact to a level of *less than significant with mitigation*.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☒	☐	☐

According to a Geotechnical Investigation Report prepared by Milstone Geotechnical (August 2018), the proposed site is suitable for the proposed development of a single-family residence provided the project is constructed with the recommendations contained in the Geological Report. In addition, as noted in VI.A.III above, implementation of **Mitigation Measure GEO-1** would reduce the impact of unstable soils to a level of *less than significant with mitigation*.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

The proposed project would not involve the use of septic tanks or an alternative waste water disposal system. Thus, *no impact*.

VII. GREENHOUSE GAS EMISSIONS. Would the project:	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?				

The BAAQMD has established screening criteria as part of their CEQA Air Quality Guidelines to assist in determining if a proposed project could result in operational-related impacts to Greenhouse Gas (GHG) emissions. The proposed project involves the construction of one single-family residence along an existing hillside with associated grading (Project Description). Single-family residential projects with less than fifty-six (56) dwelling units have been identified by the BAAQMD Air Quality Guidelines as having emissions less than 1,100 metric tons of CO^2e per year which is below the threshold recommended by the respective Air Quality District for evaluation of GHG emissions for new land use projects; thus, *less than significant*.

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

As discussed in Section VII.A above, the proposed project will not exceed the threshold for operational GHG emissions. Further, the project would not conflict with the City of Hayward's adopted Climate Action Plan and *Hayward 2040 General Plan* policies and programs adopted for the purpose of reducing GHG emissions; thus, *no impact*.

VIII. HAZARDS AND HAZARDOUS MATERIALS. Would the project:

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

The proposed construction of one single-family residence along the hillside and associated grading activities will not involve the transport, use or disposal of hazardous materials; thus, *no impact*.

b) 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?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
The proposed construction of one single-family residence along the hillside and associated grading activities will not involve the use of hazardous materials that could result in the release of hazardous materials into the environment; thus, *no impact*.				
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
The proposed project site and construction of one single-family residence along the hillside with associated grading activities will not emit hazardous emissions nor would it result in the handling of hazardous materials; thus, *no impact*.				
d) 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?	☐	☐	☐	☒
The proposed project site is located within a predominantly residential area and is surrounded by single-family residential development. The proposed project site is not listed on the State of California's Department of Toxic Substances Control's EnviroStor Webpage (http://www.envirostor.dtsc.ca.gov/public/search.asp?basic=True, accessed February 6, 2019) and no hazardous material sites are located within 1,000 feet of the project site. Thus, *no impact*.				
e) 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 for people residing or working in the project area?	☐	☐	☐	☒
The project site is not located within the vicinity of a private air strip and is more than four-miles from the Hayward Executive Airport; thus, *no impact*.				
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒

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

The project site is not located within the vicinity of a private air strip and is more than four-miles from the Hayward Executive Airport; thus, *no impact*.

g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒

The proposed project proposes the construction of one single-family residence along the hillside that currently contains adequate emergency access. The project will not interfere with an adopted emergency response plan or emergency evacuation plan; thus, *no impact*.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

The project site is located within the City of Hayward Wildland/Urban Interface Area, and will be required to meet the construction requirements set forth in the City of Hayward Hillside Design and Urban/Wildland Interface Guidelines, including but not limited to installation of Class A roofing materials, exterior non-combustible siding materials, installation of double-pane windows, and compliance with requirements contained in the 2016 California Residential Code Section R327, as Conditions of Approval for the project. With implementation of these design and construction features, the proposed single-family residence will have a *less than significant* impact related to exposure of people or structures to wildland fire risk.

IX. HYDROLOGY AND WATER QUALITY. Would the project:

a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐

Construction and grading activity would result in the disturbance of soil. Depending on the dates of proposed grading activity, the applicant will be required to submit a grading permit and comply with an Erosion Control Plan which will be monitored by the City's Public Works Department, as a standard Condition of Approval. The proposed project would also be required to manage post-construction stormwater runoff with Low Impact Development methods such as directing runoff into cisterns, rain barrels or vegetated areas (Site Plan and Civil, Drainage

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

and Utility Plans). The project would comply with State and Local water quality and discharge requirements, resulting in a *less than significant* impact related to a degradation of water quality.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒

The proposed single-family residence will be connected to the existing water supply and will not involve the use of water wells and will not deplete groundwater supplies or interfere with groundwater recharge; thus, *no impact*.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐

While Ward Creek is located to the north of the subject property, there are no streams or rivers on, along or within the boundaries of the project site. The proposed project consists of construction of a new single-family residence and a driveway which would result in introduction of impervious areas on the site. Given that the project consists of a single-family residence, the project is deemed exempt from any on-site detention and treatment requirements of stormwater runoff due to the square-footage and size of the disturbed area. Based on the project grading and drainage plans, run-off will continue along the natural topography similar to the existing conditions.

Further, standard construction requirements and Conditions of Approval will require that project incorporate on-site measures and that run-off be directed into vegetated areas and/or rain barrels to minimize post-development run-off. The minimal increase in post-development run-off would result in a *less than significant* impact related to flooding on- or off-site.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?				

There are no streams or rivers on or within the project site. The site is substantially surrounded by development and water naturally drains along the existing slope. As noted in IX. c above, the drainage from the proposed development would continue along the natural topography and the project itself is exempt from any stormwater detention and treatment due to the scale of the development. Further, standard construction requirements and Conditions of Approval will require that run-off be directed into vegetated areas, rain barrels, and self-retaining areas to minimize post-development run-off. The minimal increase in post-development run-off would result in a *less than significant* impact related to flooding on- or off-site.

e) 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?	☐	☐	☒	☐

See IX.c and IX.d above.

f) Otherwise substantially degrade water quality?	☐	☐	☒	☐

See IX.a, IX.c and IX.d above.

g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒

The project site is not located within a 100-year flood hazard area; thus, *no impact* (FEMA Flood Map Panel No. 06001CO2916, effective August 3, 2009).

h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
The project site is not located within a 100-year flood hazard area; thus, *no impact* (FEMA Flood Map Panel No. 06001CO2916, effective August 3, 2009).				
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
The project site is not located within a designated flood zone. Further, the site is not located in proximity to any known dam or levee thus there is *no impact* related to flooding from such a facility (FEMA Flood Map Panel No. 06001CO2916, effective August 3, 2009 and Hayward 2040 General Plan Background Report Figure 9-5, Hayward Dam Inundation Areas).				
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
The proposed project is located more than five miles from the San Francisco Bay thus there is no impacts related to inundation (FEMA Flood Map Panel No. 06001CO2916, effective August 3, 2009 and Google Earth).				

X. LAND USE AND PLANNING.
Would the project:

a) Physically divide an established community?	☐	☐	☐	☒
The proposed project involves construction of a single-family residence on an existing parcel that is zoned for single-family residential development. The site is surrounded by other single-family residential land uses and as such, will not physically divide an established community; thus, *no impact*.				
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐

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

The proposed project involves construction of a single-family residence on a vacant parcel of land within an existing single-family neighborhood. The proposed development is consistent with the density and lot size of the Suburban Density Residential (SDR) General Plan Land Use designation, the minimum design and performance standards and development standards set forth in the corresponding Single Family Residential (RS) Zoning District and the proposed design of the residence is consistent with the applicable Urban/Wildland Hillside Design Guidelines in that the residential structure will exhibit a stepped design to follow the existing natural terrain of the property. Thus, the proposed development will result in a *less than significant* impact related to conflicts with applicable land use plans, policies and/or regulations.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

The City of Hayward does not have an adopted Habitat Conservation Plan or Natural Community Conservation Plan; thus, *no impact*.

XI. MINERAL RESOURCES. Would the project:

a) 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?	☐	☐	☐	☒

There are no known mineral resources on the project site; thus, *no impact* (Hayward 2040 General Plan Background Report).

b) 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?	☐	☐	☐	☒

There are no known mineral resources on the project site; thus, *no impact* (Hayward 2040 General Plan Background Report).

XII. NOISE -- Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
ordinance, or applicable standards of other agencies?				

The project involves construction of a new single-family residence and associated grading activities in an existing residential neighborhood. The proposed use is not expected to generate a substantial increase in the permanent ambient noise levels above standards established in the Hayward 2040 General Plan. Additionally, the project site is not located near any roadway segments identified as significant noise generators (Hayward General Plan Background Report, Table 9-11, and Summary of Modeled Existing Traffic Noise Levels). Thus, there are *less than significant* impacts related to the proposed project resulting in exposure of persons to or generation of noise levels in excess of adopted standards.

b) Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?	☐	☐	☒	☐

Per the California Department of Transportation Construction Vibration Guidance Manual (September 2013), a significant impact related to excessive ground-borne vibration or ground-borne noise levels would occur if the construction of later phases of the proposed project would expose people to vibration levels exceeding 0.3 inches per second peak particle velocity (in/sec PPV).

Project construction activities related to grading activities will generate vibration in the immediate vicinity of the work area. Vibration levels from periods of heavy construction are anticipated to be 0.1 in/sec PPV or less at a distance of 50 feet from construction. The nearest point of grading activity would be about 20 feet from the existing residential developments adjacent to the project site; thus, the potential increase may be in the realm of 0.2 to 0.25 in/sec PPV, which is considered *less than significant*.

c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐

See XII.A above; *less than significant* impact.

d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐

The proposed project would result in temporary increase in noise related to construction activities. Noise generated by construction activities would temporarily elevate noise levels at adjacent noise sensitive receptors, but this would be considered *less than significant* because construction activities shall be conducted in accordance with the provisions of Section 4-1.03.4

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

of the Hayward Municipal Code, which incorporate construction best management practices specifically described in Conditions of Approval for the project. Thus, temporary or periodic noise impacts related to construction would be considered *less than significant.*

e) 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 expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

The project site is not located within the vicinity of a public or private airport, which would expose people residing at the residence to excessive noise levels; thus, *no impacts* would occur as a result of the project.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

The project site is not located within the vicinity of a private air strip; thus, no such impacts would occur as a result of the project.

XIII. POPULATION AND HOUSING.
Would the project:

a) Induce substantial 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)?	☐	☐	☒	☐

The proposed project involves construction of a single-family residence on an existing vacant lot within an established single-family residential neighborhood that was zoned for single-family residential uses. The project would not induce substantial population growth either directly or indirectly and is consistent with the General Plan. Thus, *less than significant* impact.

b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

The project involves construction of one single-family residence on a currently vacant lot and would thus not involve displacement of any existing housing stock. Thus, *no impact.*

☐	☐	☐	☒

c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

The proposed project involves construction of one new single-family residence on a currently vacant lot and would not displace anyone or require replacement housing elsewhere; Thus, *no impact.*

XIV. PUBLIC SERVICES.

a) 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:

Fire protection? ☐ ☐ ☒ ☐

The proposed project involves construction of a single-family residence on a currently vacant lot in an established single-family residential neighborhood. The proposed project would not require the construction or expansion of fire protection facilities beyond those already planned under General Plan assumptions. Thus, the proposed development will have a *less than significant* impact related to fire protection.

Police protection? ☐ ☐ ☒ ☐

Although construction of the new residence and occupation of the currently vacant site would incrementally increase the demand for police services, the proposed project would not require the construction or expansion of police protection facilities beyond those already planned under the General Plan assumptions. Thus, the proposed development will have a *less than significant* impact related to police protection.

Schools? ☐ ☐ ☒ ☐

The proposed project is located within the Hayward Unified School District (HUSD) and the developer will be required to pay School Impact Mitigation Fees at the time of building permit issuance, which is considered full mitigation pursuant to State Law. Thus, impacts related to schools are considered *less than significant.*

Parks? ☐ ☐ ☒ ☐

The project proponent would be required to pay park dedication in-lieu fees pursuant to Chapter 10, Article 16, Property Developers - Obligations for Parks and Recreation of the Hayward Municipal Code; thus, the project impacts would be reduced to *less than significant.*

Other public facilities? ☐ ☐ ☒ ☐

The proposed project site is infill and surrounded by development including roads, streetlights and other public facilities. The proposed project will not result in a need for public facilities beyond those already planned under General Plan assumptions. Thus, the proposed project impacts are considered *less than significant* related to other public facilities.

XV. RECREATION.

a) 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? ☐ ☐ ☒ ☐

The proposed project involves construction of a one new single-family residence with related grading activities on a vacant lot within an established residential neighborhood. While the construction of the new residence would likely increase the use of existing parks by adding new residents to the community, it is not anticipated that the minor increase in population would result in substantial deterioration of such facilities. In addition, as noted above, the project proponent would be required to pay Park Dedication In-Lieu fees thus reducing the project's impact to a level of *less than significant*.

b) 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? ☐ ☐ ☒ ☐

See XV.A comment above.

XVI. TRANSPORTATION/TRAFFIC -
- Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? ☐ ☐ ☒ ☐

The traffic generated from construction of a new single-family residence within an established residential neighborhood is not sufficient to warrant further study and is not expected to result

in any discernible impact to the surrounding circulation patterns. Thus, the impact to the existing roadway is considered *less than significant*.

b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐

No intersection level of service will be impacted by the construction of a single-family residence on a vacant lot in an established residential neighborhood; thus, *less than significant*.

c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	☐	☐	☐	☒

The proposed project involves no changes to air traffic patterns; thus, *no impact*.

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

The project will add a driveway on Rainbow Court but has been designed to meet all City standards and visibility requirements. As such, the increased hazards due to design are considered *less than significant*.

e) Result in inadequate emergency access?	☐	☐	☐	☒

The proposed single-family residence would be located on a site that is accessible from an existing roadway (Rainbow Court). In addition, the residence would be sited within 20 feet of the front property line (20-feet required) and would therefore be within the range of fire service hoses. Thus, *no impact* is anticipated to emergency access.

f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

The proposed project will not impact or conflict with any designated transit, bicycle or pedestrian plans or facilities and as such *no impact.*

XVII. UTILITIES AND SERVICE SYSTEMS. Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☒	☐

Sanitary sewage from the City's system is treated at the Hayward Water Pollution Control Facility (WPCF) which discharges into the San Francisco Bay under a permit with the Regional Water Quality Control Board (RWQCB). As a standard Condition of Approval, the proposed new development will be required to connect to the City's service which is located along Rainbow Court. The proposed development consists of construction of one single-family residence on a vacant lot surrounded by an established residential neighborhood and would not result in exceedance of wastewater treatment requirements of the WPCF. Thus, *less than significant* impact.

b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐

The proposed project is located within the City's water and wastewater service boundaries. As noted in XVII.A above, the proposed project would result in a minimal increase in wastewater and would not require construction of or expansion of wastewater treatment facilities. With regard to water demand, the proposed single-family use was anticipated under the Hayward 2040 General Plan and the City's Water Master Plan (Hayward 2040 General Plan Background Report, 8-3).

The proposed project would not require construction of new water or wastewater treatment facilities or expansion of existing facilities; thus, *less than significant* impact.

c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐

As described in IX.C and IX.D related to hydrology and stormwater run-off, the drainage from the proposed development would be subject to standard on-site measure requirements and Conditions of Approval that require run-off be directed into vegetated areas, rain barrels, and/or self-retaining areas to minimize post-development run-off. Thus,

the overall increase in run-off flowing from the site would result in a minor increase over existing conditions and would result in a *less than significant* impact and would not require the construction of new stormwater drainage facilities.

d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐

As noted in XVII.B above, the proposed development of a single-family residence was anticipated in the Hayward 2040 General Plan and in the City's Urban Water Management Plan (Hayward 2040 General Plan Background Report, 8-3); thus, the proposed project would result in a *less than significant* impact related to water supplies.

e) Result in a 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?	☐	☐	☒	☐

See XVII.A and XVII.B above.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐

There is sufficient capacity to accommodate the proposed single-family residence and waste from the City of Hayward at Altamont Landfill through 2024. Solid waste generated by the project would contribute incrementally to the use of the landfill capacity. The City of Hayward has adopted City-wide policies and ordinances (see Hayward Municipal Code Chapter 5, Article 1, Solid Waste Collection and Disposal) intended to maximize the City's diversion rate from landfills. Adherence to these policies will result in a *less than significant* impact.

g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

See XVII.F above. The project would be subject to all adopted City regulations related to solid waste and there is adequate capacity at the Altamont Landfill to accommodate the proposed project. Thus, the project would result in a *less than significant* impact related to solid waste.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE --

a) Does the project have the potential to 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, 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?	☐	☐	☒	☐

The proposed project involves construction of one single-family residence with associated grading on a currently vacant site in an established residential neighborhood. While urban wildlife may be present on the site, it does not have adequate or documented habitat for any identified, endangered or otherwise protected species. Further, there is no evidence of any cultural or paleontological resources at or near the site although standard General Plan policies and conditions related to halting work and reporting a find is required per local and State law. Thus, the impact is *less than significant*.

b) 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)?	☐	☐	☒	☐

A lead agency shall find that a project may have a significant effect on the environment where there is substantial evidence that the project has potential environmental effects "that are individually limited, but cumulatively considerable." As defined in Section 15065(a)(3) of the CEQA Guidelines, cumulatively considerable means "that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects." The proposed project involves construction of one single-family residence along the hillside in an established suburban residential neighborhood and would not result in an impact that would be cumulatively considerable over existing conditions. Thus, *less than significant* impact.

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

As described in **Impact GEO-1**, the proposed project could be susceptible to strong ground shaking or unstable soils created by planned cuts and fills in the existing steeply sloped site; however, implementation of **Mitigation Measure GEO-1** will minimize those risks through design and field verifications via a Licensed Professional Engineer prior, during, and post construction. With the implementation of standard measures and Conditions of Approval identified and described throughout this study, the proposed development of one single-family dwelling would not result in substantial adverse impacts on human beings, either directly or indirectly. Thus, *less than significant impact with mitigation.*

SOURCES

1. Professional Judgement and Expertise of The Individual That Prepared This Initial Study Based Upon Review If the Site and Surrounding Conditions and Project Plans
2. Bay Area Air Quality Management District. *California Environmental Quality Act Air Quality Guidelines.* May 2011.
3. Bay Area Air Quality Management District Updated CEQA Guidelines, http://www.baaqmd.gov/plans-and-climate/california-environmental-quality-act-ceqa/updated-ceqa-guidelines, accessed on January 2019.
4. City of Hayward 2040 General Plan
5. City of Hayward 2040 General Plan Background Report, January 2014
6. City of Hayward Geographic Information Systems (http://webmap.hayward-ca.gov/)
7. City of Hayward Hillside Design and Urban/Wildland Interface Guidelines
8. City of Hayward Municipal Code
9. FEMA Flood Map Panel No. 06001C0293G, August 3, 2009. FEMA Flood Map Service Center: Search by Address. http://msc.fema.gov/portal/search, accessed on January 2019
10. Geotechnical Report prepared by Milstone Geotechnical (August 2018)
11. Google Earth
12. State of California, Department of Conservation, Regulatory Maps. http://maps.conservation.ca.gov/cgs/informationwarehouse/index.html?map=regulatorymaps, Accessed on February 2019
13. State of California's Department of Toxic Substances Control's Envirostor Webpage (http://www.envirostor.dtsc.ca.gov/public/search.asp?basic=True, Accessed January 2019.
14. State of California, Department of Transportation, Scenic Highway Routes, http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/scenic_hwy.htm, Accessed January 2019.
15. State of California, Department of Transportation Construction Vibration Guidance Manual (September 2013)
16. State of California Department of Conservation, California Important Farmland Finder, Accessed January 2019. http://maps.conservation.ca.gov/ciff/ciff.html

CITY OF HAYWARD
DEVELOPMENT SERVICES DEPARTMENT
MITIGATED NEGATIVE DECLARATION

Notice is hereby given that the City of Hayward finds that the proposed project described in detail below would not have a significant effect on the environment as prescribed by the California Environmental Quality Act of 1970, as amended:

I. PROJECT DESCRIPTION:

Title: 2366 Rainbow Court Hillside Single-Family Residence
Site Plan with Grading Permit Review File No. 201804682

Description: The proposed project includes an application for Site Plan Review (SPR) with a Grading Permit for the construction of an approximately 2,700 square-foot single-family residence with a two-car garage and related on- and off-site improvements on an existing 0.32-acre (14,195 square feet) hillside lot located at 2366 Rainbow Court. The proposed project includes grading and development on slopes exceeding 20% within the vicinity of the development area.

The proposed new single-family residence meets all development standards related to building setbacks, building height, parking, floor area ratio, and permitted use regulations of the Single Family Residential (RS) zoning district set forth by the Hayward Municipal Code. Additionally, the project includes the construction of a driveway, drought-tolerant landscaping compliant with the Bay Area Friendly Water Efficient Landscape Ordinance, and will connect to the existing utilities (electricity, gas, sewer, and water) along Rainbow Court.

Location: 2366 Rainbow Court, Assessor Parcel No. 425-0410-027-00

Approvals: Site Plan Review with Grading Permit

II. FINDING PROJECT WILL NOT SIGNIFICANTLY AFFECT ENVIRONMENT:

The proposed project, with the mitigation measures included in the Initial Study and Mitigation Monitoring and Reporting Program (MMRP) prepared for this project, will not have a significant effect on the environment.

III. FINDINGS SUPPORTING DECLARATION:

1. The proposed project has been reviewed according to the standards and requirements of the California Environmental Quality Act (CEQA) and an Initial Study Environmental Evaluation Checklist has been prepared for the proposed project. The Initial Study has determined that the proposed project, with the recommended mitigation measures, could not result in significant effects on the environment.

2. The project was found to have either no impact or less than significant impacts in the areas of Aesthetics, Agricultural Resources, Air Quality, Biological Resources, Cultural Resources, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology or Water Quality, Land Use, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation and Traffic, and Utilities and Service Systems.

3. The project could result in impacts related to Geology and Soils in that new construction on the site with slopes over 20% could be susceptible to strong ground shaking or unstable soils created by planned cuts and fills in the existing steeply sloped hillside property. Impacts can be mitigated to a level of less than significant if the proposed residence incorporates all the proposed recommendations and mitigation measures set forth in the Geotechnical Engineering Report prepared by Milstone Geotechnical, dated August 2018, in regard to seismic design, site preparations, foundations, retaining walls, concrete slab-on-grade, and drainage.

4. With regard to the Mandatory Findings of Significance, the proposed project could result in impacts that could cause an adverse effect on human beings as described above and in the attached Initial Study; however, those impacts can be mitigated to a level of less than significant as described above and in the Initial Study.

IV. LEAD AGENCY REPRESENTATIVE AND PERSON WHO PREPARED THE INITIAL STUDY:

Marcus Martinez, Assistant Planner — 2/21/19 Date

V. CONTACT INFORMATION

For additional information, please contact Marcus Martinez, Assistant Planner at the City of Hayward Planning Division at 510-583-4236.

Written comments may be sent to Marcus Martinez via email at marcus.martinez@hayward-ca.gov or at City of Hayward Planning Division, 777 B Street, Hayward, CA 94541.

VI. COPY OF ENVIRONMENTAL CHECKLIST

Copies of the Initial Study and Mitigated Negative Declaration are available for public review at Hayward City Hall, at 777 B Street, Hayward on the First-Floor Permitting Center, Monday through Thursday from 8 a.m. to 5 p.m.; at the Weekes Branch Library located at 27300 Patrick Avenue in Hayward, and on the City's website at http://www.hayward-ca.gov/content/projects-under-environmental-review-0. Please see the Library and Community Services webpage at http://www.library.ci.hayward.ca.us/ for library days and hours.

Attachment V

Mitigation Monitoring and Reporting Program (MMRP)

Hillside Single-Family Residence Located at 2366 Rainbow Court Application No. 201804682

City of Hayward
Development Services Department
Planning Division

February 2019

PREFACE

Section 21081 of the California Environmental Quality Act (CEQA) requires a Lead Agency to adopt a Mitigation Monitoring and Reporting Program whenever it approves a project for which measures have been required to mitigate or avoid significant effects on the environment. The purpose of the monitoring or reporting program is to ensure compliance with the mitigation measures during project implementation.

The Initial Study concluded that the implementation of the project could result in significant effects on the environment and mitigation measures were incorporated into the proposed project or are required as a condition of project approval. This Mitigation Monitoring and Reporting Program addresses those measures in terms of how and when they will be implemented.

This document does *not* discuss those subjects for which the Initial Study concluded that the impacts from implementation of the project would be less than significant.

MITIGATION MONITORING OR REPORTING PROGRAM 2366 RAINBOW COURT SINGLE FAMILY HOME				
Impact	**Mitigation**	**Timeframe for Implementation**	**Responsibility for Implementation**	**Oversight of Implementation**
GEOLOGY AND SOILS				
Geo-1 Impact: New construction on the subject site which has slopes greater than 20% could be susceptible to strong ground shaking or unstable soils created by planned cuts and fills in the existing steeply sloped site. **(Potentially Significant Impact)**	**Mitigation Measure GEO-1:** The project could result in impacts related to Geology and Soils in that new construction on the site with slopes greater than 20% could be susceptible to strong ground shaking or unstable soils created by planned cuts and fills. Impacts can be mitigated to a level of less than significant if the proposed residence incorporates all the proposed recommendations and mitigation measures set forth in the Geotechnical Engineering Report prepared by Milstone Geotechnical, dated August 13, 2018, in regard to seismic design, site preparations, foundations, retaining walls, concrete slab-on-grade, and drainage.	All recommendations shall be included on grading permit application submittal and construction level drawings (civil, landscape, site plans). All recommendations shall be verified and approved by appropriate City Division prior to issuance of grading and building permits for the proposed development.	Project Applicant	Public Works – Engineering; Development Services Department – Planning Division and Building Division.

SOURCE: City of Hayward, Rainbow Court Single-Family Residence Plans

REPORT

GEOTECHNICAL INVESTIGATION

PROPOSED RESIDENCE
2366 Rainbow Court
Hayward, California

for
Joyce Steinfeld
19281 Mountain Way
Los Gatos, California 95030

Project No. 184920
August 2018

Project 201804682 SPR
2366 Rainbow Court

MILSTONE
GEOTECHNICAL

17020 Melody Lane
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SEP 11 2018
PLANNING DIVISION

MILSTONE GEOTECHNICAL

August 13, 2018
Project No. 184920

Joyce Steinfeld
19281 Mountain Way
Los Gatos, CA 95030

SUBJECT: **Geotechnical Report Update**
Proposed Residence
2366 Rainbow Court
Hayward, California

Dear Ms. Steinfeld,

Milstone Geotechnical has completed a geotechnical investigation for the above referenced site in accordance with your authorization. The accompanying report presents the results of the investigation with conclusions and geotechnical design criteria for the proposed development.

Based on the results of this investigation we are pleased to report that, from a geotechnical perspective, the site is suitable for the residence if properly designed and constructed. It has been a pleasure providing professional services to you on this project and we are looking forward to assisting you and your design and construction team through project construction.

Please phone or e-mail if you have any questions regarding the contents of this report or require additional assistance.

Sincerely,
MILSTONE GEOTECHNICAL

Barry S. Milstone

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

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GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENCE
2366 Rainbow Court
Hayward, California

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APPENDIX A - FIELD AND LABORATORY INVESTIGATION

Description of Small-Diameter Borehole Investigation
Soil Classification Chart
Log of Exploratory Borehole MG1
Log of GEI Borehole 15
Direct Shear Test Result (GEI)

GEOTECHNICAL INVESTIGATION
PROPOSED RESIDENCE

2366 Rainbow Court
Hayward, California

INTRODUCTION

This report presents the findings, conclusions, and updated recommendations resulting from our supplemental geotechnical investigation related to the construction of a proposed new residence at 2366 Rainbow Court in Hayward, California (Figure 1).

Project Description

Based on our discussions and my review of the provided schematic site improvement drawings, it is my understanding that the project will involve the construction of a new, multi-level, single-family residence at a currently undeveloped site.

Purpose and Scope of Investigation

The site was previously investigated by Geotechnical Engineering Inc. (GEI). The purposes of this investigation were to characterize the geotechnical conditions of the site and provide specific recommendations for the geotechnical aspects of the proposed improvements. Our investigation was supplemented by data provided by Geotechnical Engineering Inc. (GEI) in their 1995[1] and 2017[2] geotechnical investigations of the site.

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

- Compilation and review of available engineering and geologic data relevant to site improvements including previous geotechnical investigation reports at the site prepared by GEI[1,2];
- Limited geotechnical mapping of the site using the provided site plan to identify pertinent surficial features;
- Hand-drilling, logging, in-situ testing, and sampling of one (1) small diameter exploratory borehole;

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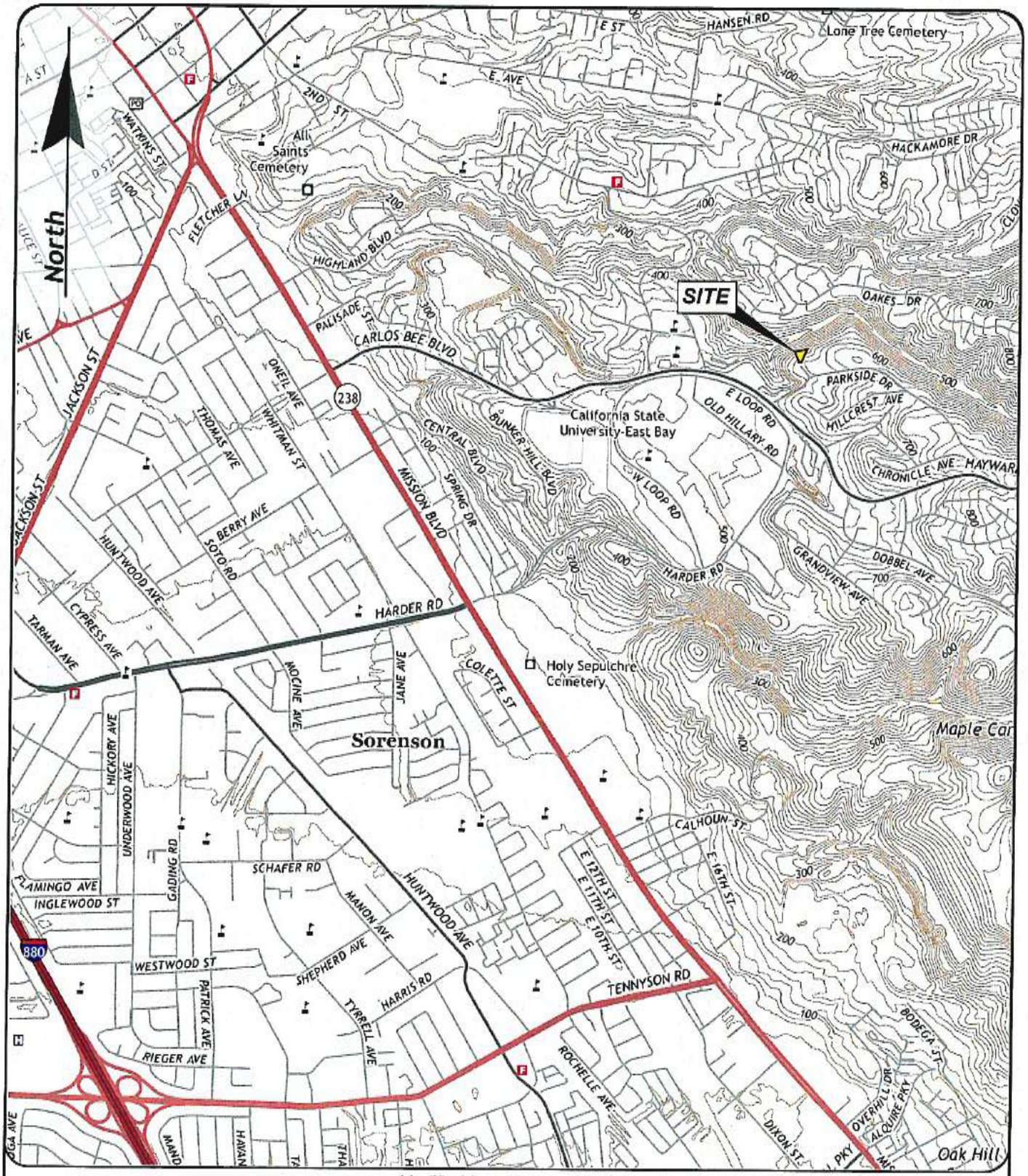
[1] Geotechnical Engineering Inc., November 2, 1989, Geotechnical Investigation, Report, Supplementary Investigation and Geologic Reconnaissance, Proposed Residential Development, Parkside Drive & Rainbow Court, Tract 3992, Hayward California for Victoria Court Management, 1221 State Street, Suite 203, Santa Barbara, CA 93101.

[2] Geotechnical Engineering Inc., September 6, 2017, Geotechnical Investigation, Report – Soil Investigation, Planned Single Family Residence, 2366 Rainbow Court, Hayward, California for Robert Jay and Joyce Steinfeld, 19281 Mountain Way, Los Gatos, CA.



Modified from Hayward, 7.5' Quadrangle, Alameda County, CA, USGS, 2015.

MILSTONE GEOTECHNICAL	SITE LOCATION MAP PROPOSED STEINFELD RESIDENCE 2366 Rainbow Court Hayward, California			FIGURE NO. 1
	Date: August 2018	Scale: 1 inch = 2,000 feet	Drawn by: BSM	Project No. 184920

- Laboratory testing of representative soil samples to verify field classifications, characterize the subsurface materials, and determine index properties and pertinent engineering characteristics for analysis and design;
- Engineering analysis of the resulting data and formulation of geotechnical design criteria;
- Preparation of this report and the accompanying illustrations.

GEOLOGIC SETTING

Regional Geologic Setting

The subject property is located near the base of the east flank of the northern Santa Cruz Mountains and within the Coast Ranges Geomorphic Province of Northern California. These mountains are composed primarily of tertiary, sedimentary, and small amounts of igneous rock. The crustal bedrock have been uplifted, folded and faulted into their present form, and marine terraces, colluvium and alluvium have subsequently been deposited on the range's flanks. Structurally, the region is dominated by northwest trending faults and folds. Due to on-going plate tectonic activity, structural deformation of the Santa Cruz Mountain area continues into the present. In more recent geologic time, the dominant sense of movement is right lateral motion concentrated along the active San Andreas Fault zone located about 2.9 miles southwest of the site.

Local Geologic Conditions

Graymer and others[3] indicate that the site is underlain by Jurassic-age Knoxville Formation materials (Figure 2) consisting of "mainly dark greenish-gray silt or clay shale with thin sandstone interbeds". Locally, the bedrock is mapped as favorably bedded with a northwest strike and dipping generally cross slope at an inclination of about of 46 degrees. A northwest striking contact fault adjoining Late-Cretaceous-age Joaquin Miller Formation consisting of "thinly bedded shale with minor sandstone" is mapped approximately 200 feet to the northeast.

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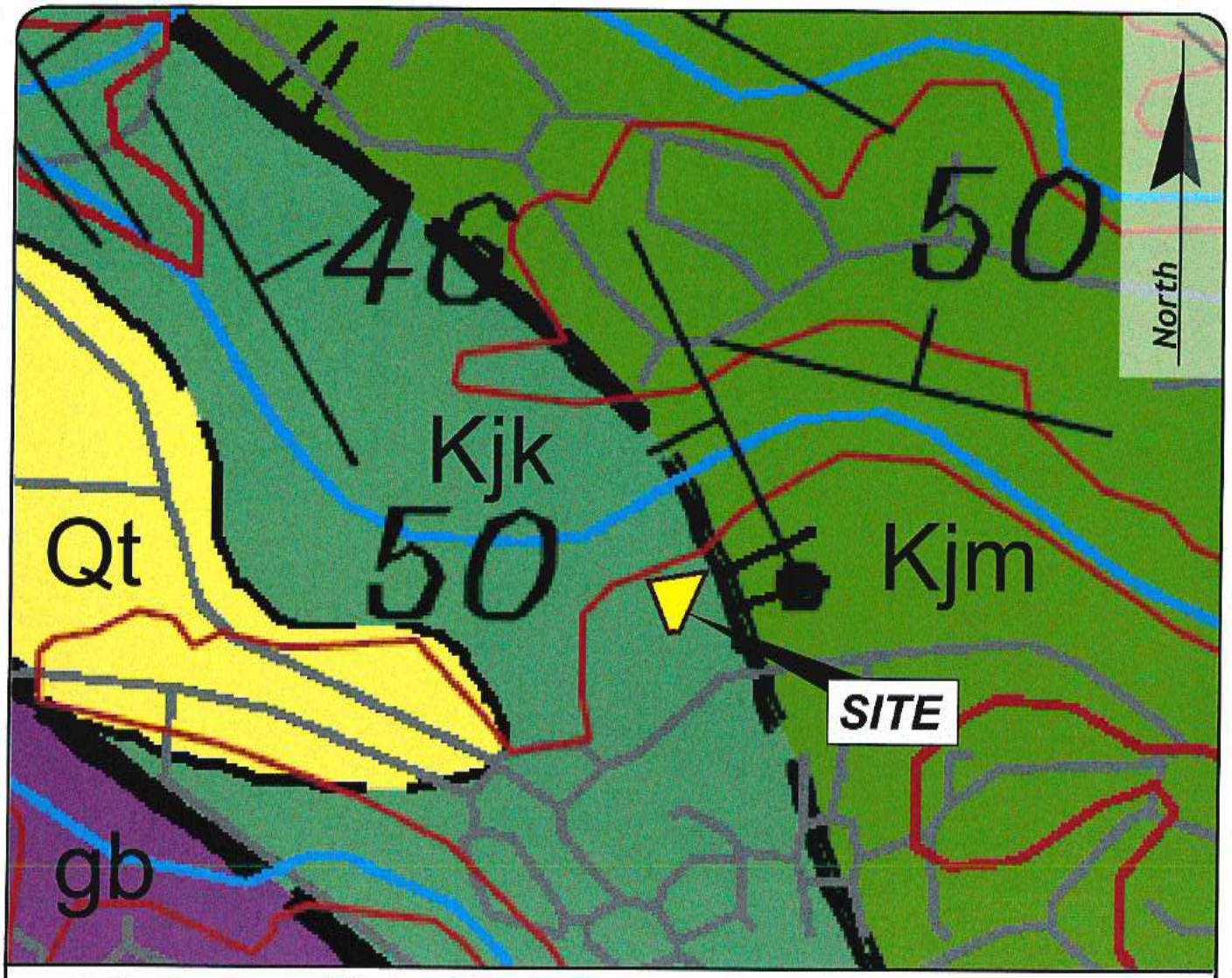
[3] Graymer, R.W., Jones, D.L., and Brabb, E.E., 1996, Preliminary geologic map emphasizing bedrock formations in Alameda County, California: A digital database, U.S. Geological Survey Open-File Report 96-252.



Modified from: Graymer, R.W., Jones, D.L., and Brabb, E.E., 1996, Preliminary geologic map emphasizing bedrock formations in Alameda County, California: A digital database, U.S. Geological Survey Open-File Report 96-252.

EARTH MATERIALS

- **Kjm** - Joiquin Miller Formation (Late Cretaceous, Cenomanian)
- **Kjk** - Knoxville Formation (Late Jurassic and Early Cretaceous)
- **gb** - Gabbro (Jurassic)
- **Qt** - Terrace Deposits (Holocene and Pleistocene)

MAP SYMBOLS

- Geologic contact, dashed where approximately located
- Fault; dashed were approximately located
- Oblique fault with normal component, dashed where approximately located
- 30 — Strike and dip of bedding
- 50 — Strike and dip bedding, top direction known

Modified from Hayward, 7.5' Quadrangle, Alameda County, CA, USGS, 2015.

MILSTONE GEOTECHNICAL

REGIONAL GEOLOGIC MAP			FIGURE NO.
PROPOSED STEINFELD RESIDENCE 2366 Rainbow Court Hayward, California			2
Date: August 2018	Scale: 1 inch = 500 feet	Drawn by: BSM	Project No. 184920

The site is located within a State-designated Earthquake-Induced Landslide Hazard Zone[4] (Figure 3). The Alameda County landslide map prepared by Roberts and others[5] does not depict any landslides in the general vicinity nor anywhere along the neighboring Ward Creek creekbanks that are located in the Seismic Hazard Zone. Visual reconnaissance of the site did not reveal surface geomorphology or disturbance to the mature tree cover that would be indicative of recent or historic slope stability.

Faulting and Seismicity

Although no faults are known to traverse the property, the site is located within the influence of several active and potential active faults with potential to generate significant ground shaking. Structurally, the region is dominated by northwest trending faults and folds with structural deformation continuing into the present. The regional seismic setting is dominated by stress associated with the oblique collision of the Pacific tectonic plate with the North American tectonic plate. Throughout coastal California, the surface expression of this interface is the San Andreas fault, including its principal northwest-aligned branches. In the San Francisco Bay Region, the San Andreas fault system includes several major branches in addition to maintaining a relatively continuous main trace. The study area is part of a structural slice within the Diablo Range between two such branches: the Hayward fault, which is located 0.9 miles to the southwest, and the Calaveras fault, located seven (7) miles to the northeast. These faults are well known active features exhibiting abundant geologic evidence of recurring movement and are the source of both nearly continuous micro-seismicity as well as several large historic earthquakes. Although these are considered to be the closest significant faults, other Bay Area faults such as the San Andreas located 19.4 miles to the southwest and the San Gregorio, located 26.6 miles to the southwest, are considered capable of significantly impacting the proposed development.

The site is not located within an Alquist-Priolo Earthquake Fault Zone[6] and published geologic maps do not indicate the presence of any faulting in the immediate vicinity. Although fault rupture is unlikely within the proposed site

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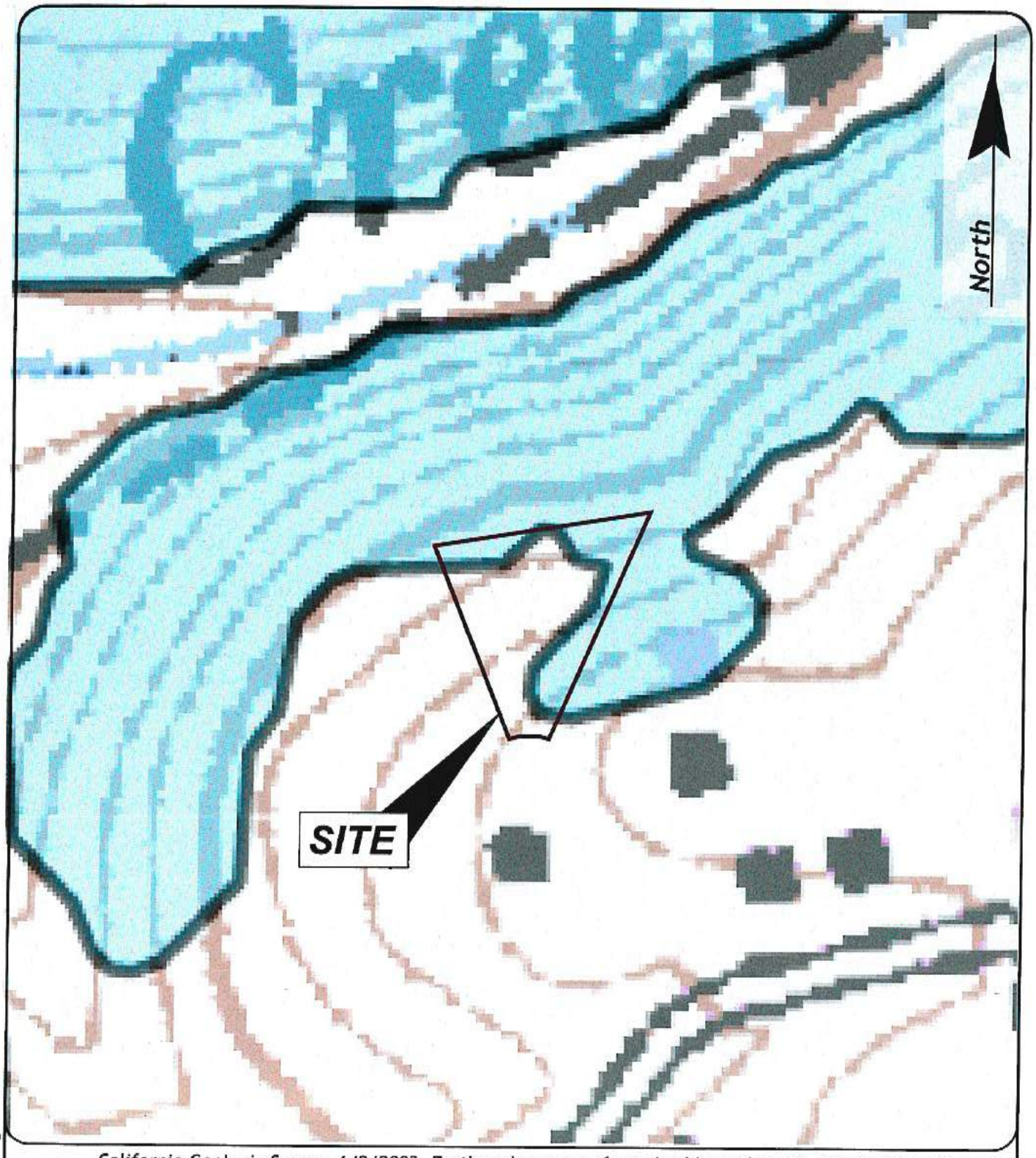
[4] California Geologic Survey, 6/2/2003, Earthquake zones of required investigation, Hayward Quadrangle.

[5] Roberts, S, Roberts, M.A., and Brennan, E.M., 1999, Landslides in Alameda County, California, A digital database extracted from preliminary photointerpretation maps of surficial deposits by T.H. Nilsen in USGS Open-File Report 75-277, U.S. Geological Survey, Open-File Report 99-504.

[6] California Geologic Survey, 9/21/12, Earthquake zones of required investigation, Hayward Quadrangle.



California Geologic Survey, 6/2/2003, Earthquake zones of required investigation, Hayward Quadrangle.

MILSTONE GEOTECHNICAL	SEISMIC HAZARD ZONES			FIGURE NO.
	PROPOSED STEINFELD RESIDENCE 2366 Rainbow Court Hayward, California			3
	Date: August 2018	Scale: 1 inch =100 feet	Drawn by: BSM	Project No. 184920

development area, strong to violent ground shaking due to local fault activity will probably occur sometime during the economic lifetime of the development. Historic data suggests the most severe ground shaking induced by fault rupture will most likely be generated by a major event along the nearby active Hayward fault system. When calculating seismic hazards, the US Geologic Survey[7] assumes a maximum moment magnitude of 7.3 for the combined branches of the Hayward-Rodgers Creek fault, 7.0 for the combined branches of the Calaveras fault, and 7.7 for the combined northern and peninsular segments of the San Andreas.

Based on work performed by the National Earthquake Hazard Reduction Program, the USGS[8] has classified the subject area as within a Site Class B shaking hazard zone.

Anticipated Ground Surface Acceleration

Based on the most recent earthquake forecasts published by the Working Group on California Earthquake Probabilities[9], there is estimated to be there is a 72 percent chance of at least one magnitude 6.7 or greater earthquake occurring in the Bay Area region between 2014 and 2044. The property is expected to experience violent ground shaking during large earthquakes on the nearby faults. Based on the site location (lat. 37.6608, long. -122.0505), the peak ground acceleration with a 10% probability of being exceeded in 50 years is estimated to be 0.65g using the probabilistic seismic evaluation tools provided by the U.S. Geologic Survey[10].

As a minimum, the proposed structure should be designed in accordance with the current California Building Code (CBC) standards for static and seismic design. More specific seismic design criteria are presented in the Geotechnical Design Criteria section. It should be noted that there is a paucity of data

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7 Petersen, M.D. and others, 2008, Documentation for the 2008 Update of the United States National Seismic Hazard Maps, United States Geological Survey, Open File Report 2008-1128.

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

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

10 US Geologic Survey, 2/10/11, Earthquake Ground Motion Parameters V.5.1.0.

available for near field sites, such as the subject site, and that it is possible that actual ground surface accelerations will exceed the current estimates.

GENERAL SITE CONDITIONS

The site is located on a plateau in the southwest foothills of the Diablo Range. The truncated-triangular-shaped, one-third-acre property is situated at the crest of the south flank of the west-flowing Ward Creek drainage channel. Locally, the property is situated on a northwest-trending spur ridge created by Ward Creek and an unnamed drainage to the west. The property is accessed from the north side of the Rainbow Court cul-de-sac, approximately 230 feet northwest of its intersection with Parkside Drive. The property is bordered by the Rainbow Court cul-de-sac to the south, by a wooded slope flanking Ward Creek to the north, by undeveloped land to the west, and by a residentially developed property to the east

Site Setting

Existing Improvements

The site is currently undeveloped although fence posts, an abandoned concrete foundation, and surface debris suggest that the area had been used historically for agricultural, and possibly other, purposes. Aerial photographs suggest that the structure was demolished sometime between 1993 and

Topography

The project is located approximately 570 feet above sea level. Ground surfaces in the vicinity of the proposed residence at the southern portion of the property slope moderately toward the north with inclinations ranging from about four to one (4 to 1) horizontal to vertical to five to one (5 to 1). A localized fill slope traverses the building pad at an inclination of about three to one (3 to 1) horizontal to vertical. Beyond a slope break located approximately 20 feet north of the north of the proposed residence, the slopes incline steeply toward Ward Creek at an inclination of about 1.8 to one (1.8 to 1) horizontal to vertical.

Site Drainage

Surface drainage of storm water occurs by sheet flow to the north toward the south flank of the west-flowing Ward Creek. We observed no indications of concentrated surface runoff such as rills or channels.

Vegetation

The proposed building pad is vegetated with wild grasses. Tightly spaced, predominantly oak and bay, trees of varying age and size, ranging up to at least 40-inch diameter, blanket the northern slope.

SUBSURFACE CONDITIONS

Subsurface Investigation

The subsurface conditions at the site were investigated by drilling, logging, and sampling one (1) small-diameter exploratory borehole to practical refusal at a depth of 4.5 feet and by reviewing data published by GEI from four (4) boreholes that they previously advanced on the site from 3.0 to 8.5 feet deep. Our subsurface investigation is described in more detail in Appendix A. The exploratory borehole locations are depicted on Figure 4 (Site Plan and Exploration Map). Graphical logs of the boreholes are presented in Appendix A of this report.

Subsurface Materials

In general, the proposed development area is underlain by up to two (2) feet of artificial fill blanketing weathered Knoxville Formation siltstone with lesser amounts of sandstone. The upper two to three (2 to 3) feet of the bedrock exhibits advanced weathering to a residual soil. Our findings are similar to those encountered by GEI[1],during previous geotechnical investigations. The encountered earth materials are described below in order of decreasing age. Pertinent field and laboratory test results are summarized at the end of this section.

Weathered Siltstone

At a depth of about three (3) feet beneath the ground surface, our borehole encountered silty gravel that appears to have weathered out of the underlying siltstone. The encountered materials are very dense and consist of about 40 percent hard, angular, siltstone fragments in a matrix of about 40 percent fine to coarse grained sand and 20 percent non-plastic fines. GEI[1] reported a standard penetration blowcount of 85 blows in 11 inches at depth of about five (5) feet near the proposed residence. Pocket penetrometer resistance in these materials exceeded 4.5 tons per square foot (tsf).

Two (2) representative samples of these materials demonstrated an average dry density of 102.7 pounds per cubic foot (pcf) and an average moisture content of 7.5 percent. Unconfined compression test results of 3,540 and 1,750 pounds per square foot (psf) exhibited generally brittle failure and are believed to be a lower-bound representation of the in-situ compressive strengths. The California Geological Survey[11] has published a compilation of laboratory tests on Knoxville Formation materials and, based on 11 tests, report a friction angle of 32 degrees consistent with apparent cohesion of 621 psf.

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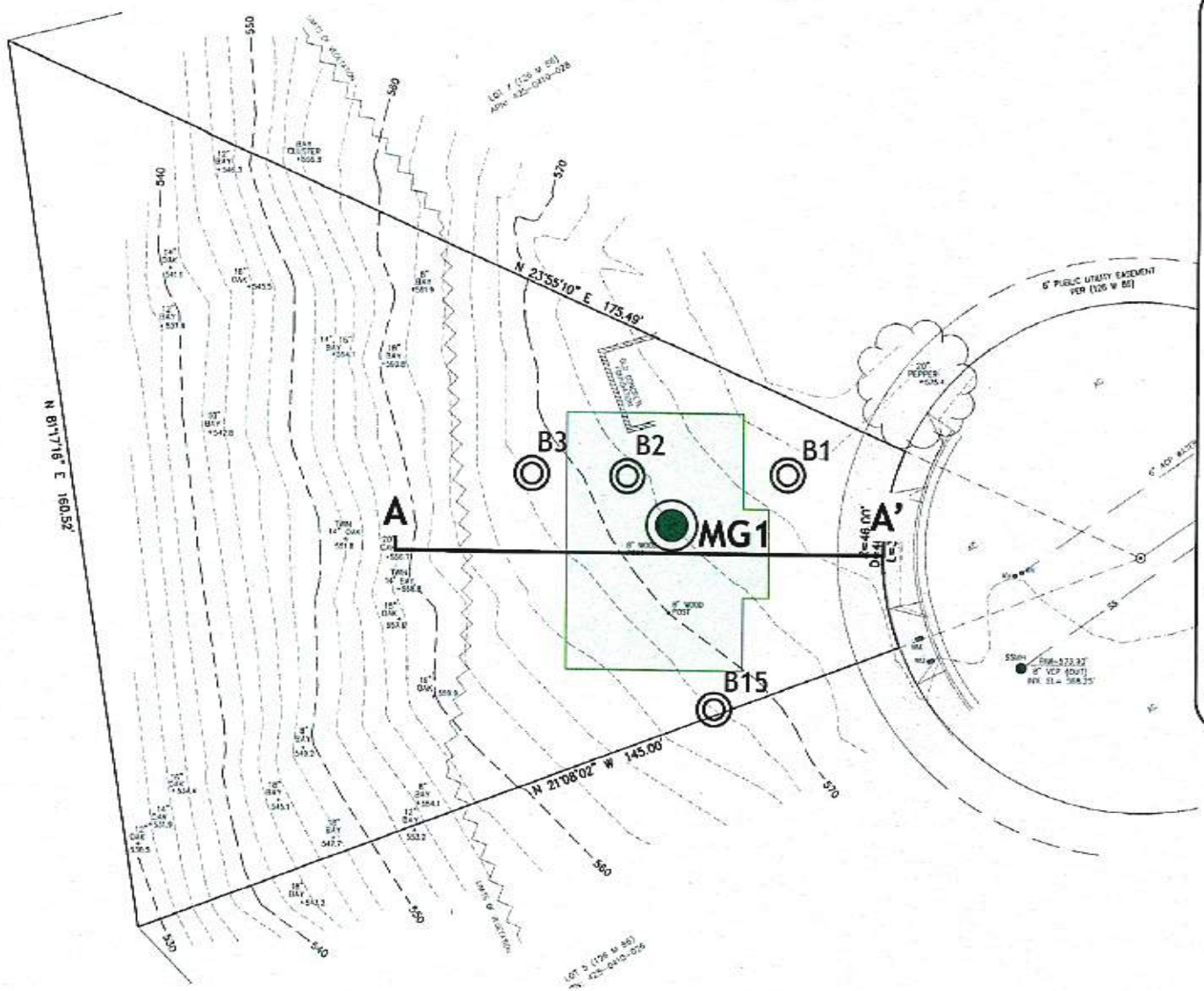
[11] California Geological Survey, 2003, State of California Seismic Hazard Zones, Hayward 7.5-Minute Quadrangle, California: Seismic Hazard Zone Report 091.



EXPLANATION

MG1 — Milstone Geotechnical exploratory borehole

B1 — Geoforensics (1997, 2017) exploratory borehole

A A' — Approximate location of Geotechnical Cross Section.

Limits of proposed residence.

NOTES: Surface topography and Milstone Geotechnical borehole location determined by tape and compass methods. B1 through B3 borehole locations derived from 9/6/17 GEI Soil Investigation Report. B15 borehole location derived from 11/2/89 GEI Investigation and Geologic Reconnaissance Report. Limits of proposed residence derived from undated preliminary layout sketch provided by client. This figure is not intended to be used for construction purposes.

North

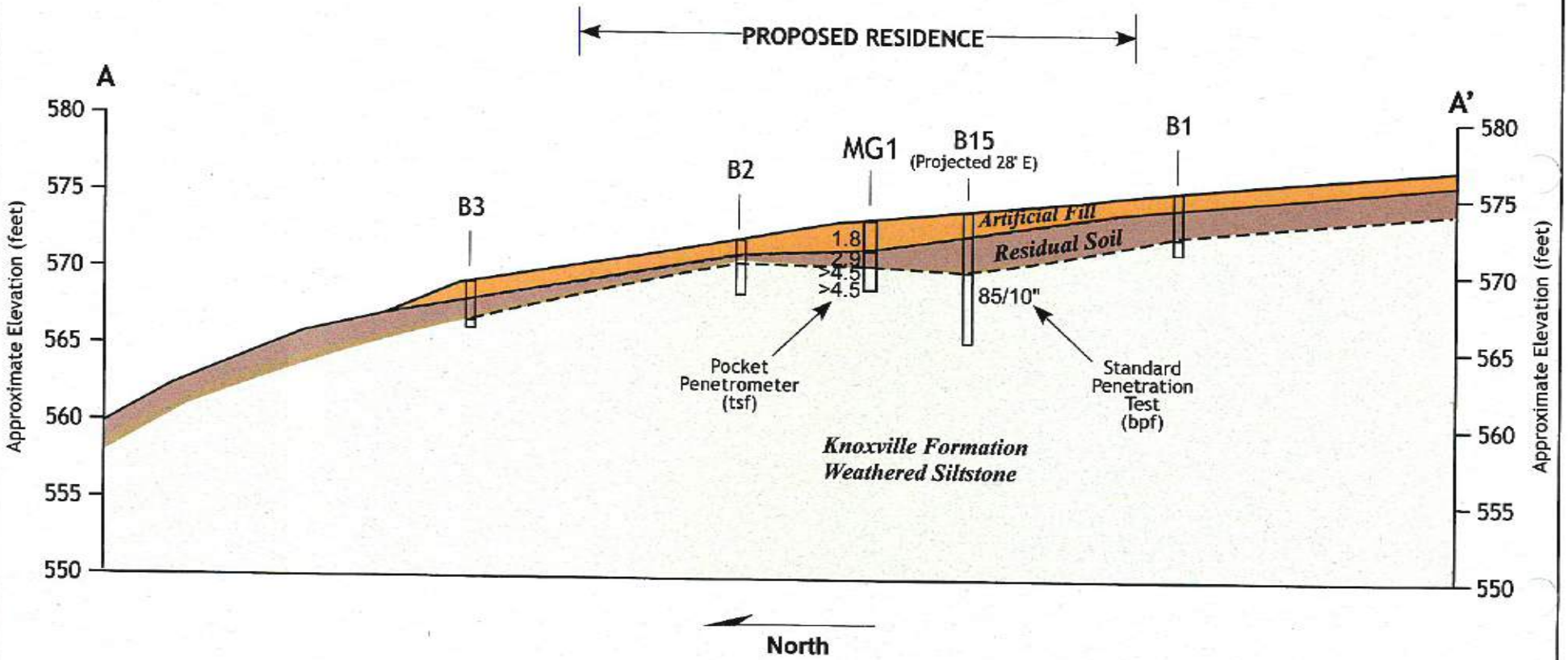
30 0 30
scale feet

MILSTONE GEOTECHNICAL

SITE PLAN AND EXPLORATION MAP			FIGURE NO.
PROPOSED STEINFELD RESIDENCE 2366 Rainbow Court Hayward, California			4
Date August 2018	Scale 1 inch = 30 feet	Engineer BSM	Project No. 174840

Attachment V

GEOTECHNICAL CROSS SECTION A-A'



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MILSTONE GEOTECHNICAL

GEOTECHNICAL CROSS SECTION A-A'			FIGURE NO.
PROPOSED STEINFELD RESIDENCE 2366 Rainbow Court Hayward, California			5
Date August 2018	Scale 1 inch = 10 feet	Engineer BSM	Project No. 174840

Attachment V

Residual Soil The upper two to three (2 to 3) feet of the Knoxville Formation has decomposed through weathering to residual soil consisting of medium stiff to stiff, tough, low to medium plasticity clay and medium dense, clayey, fine-grained sand. Pocket penetrometer testing in these materials indicate and average unconfined compressive strength of about 2.6 (tsf). One (1) representative samples of the residual soil exhibited a dry density of 101.9 psf with a corresponding moisture content of 14.2 percent.

Artificial Fill The site is blanketed by up to two (2) feet of artificial fill placed during original grading operations to establish the cul-de-sac. The encountered fill is characterized as loose to medium dense, moist, silty sand with about 20 percent low plasticity fines, rootlets near the surface, a minor amount of construction debris, and isolated zones of silty gravel.

Two (2) representative samples of the fill demonstrated dry densities of 96.0 and 107.2 pcf with corresponding moisture contents of 13.2 and 10.7 percent. One representative sample of the silty sand exhibited an unconfined compressive strength of 1,700 psf.

Summary of Laboratory Tests

Borehole/ Sample No.	Depth (ft)	Earth Material	Moisture Content (%)	Dry Density (pcf)	Unconfined Compression (psf)
MG1/T1	0.75	Fill	13.2	96.0	1,700
MG1/T2	1.5	Fill	10.7	107.2	-
MG1/T3	2.5	Residual Soil	14.4	101.9	-
MG1/T4	3.0	W. Siltstone	22.0	101.8	3,540
MG1/T4	4.0	W. Siltstone	15.2	103.6	1,750

GROUND WATER

Ground water was not encountered in the borehole advanced for this investigation and the previous investigator did not encounter ground water in their four boreholes that extended to a maximum depth of 8.5 feet. It should be noted that ground water conditions at other locations and times, or during different weather conditions might differ from those encountered in our test boreholes. Nevertheless, based on the results of our subsurface investigation, it is anticipated that construction of the proposed improvements will <u>not</u> be adversely affected by ground water if constructed during the dry season.

SEISMIC SCREENING ANALYSIS

Methodology

Because a portion of the site is located within a seismic hazard zone[4] the property has been evaluated evaluated following the guidelines presented by CGS in Special Publication 117[12] (SP-117). Subsequent to the publication of SP-117, the Southern California Earthquake Center (SCEC) published recommended guidelines[13] for the implementation of SP-117. Based on personal communication with Tim McCrink of the CGS, it is my understanding that CGS recognizes the SCEC procedures to be acceptable, and in many ways preferred to the original SP-117 seismic analysis techniques. Although there is some disagreement within the Bay Area geotechnical community regarding the appropriate use of the SCEC document in Northern California, the seismic stability of the property was evaluated using the procedures described therein. As described by SCEC, the site was subjected to a seismic deformation screening analysis that has been modified from the Seed procedure[14] described in SP-117.

Slope stability was evaluated using SLIDE[15], a limit equilibrium computer program developed by Rocscience, Inc. An idealized slope model was developed for property using site geometry, subsurface stratigraphy, ground water conditions, and engineering properties of the site soils as summarized below. Thousands of potential circular and non-circular failure surfaces were evaluated with the SLIDE software using Bishop's and Spencer's methods with continued model refinement to result in the lowest achievable factors of safety for static and seismic conditions. The analyses considered potential landslides that extend below the surficial soils. The factor of safety is defined as the ratio of forces resisting failure to those that tend to induce failure. Seismic slope analyses were performed by applying a "pseudostatic" horizontal force component to simulate earthquake loading on the subject slope. This was done both by applying a psuedostatic horizontal component to the critical static

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12 California Department of Conservation, Division of Mines and Geology, 1997, Guidelines for Evaluating and Mitigating Seismic Hazards in California, CDMG Special Publication 117.

13 Blake, T.F. and others, ed., 2002, Recommended procedures for implementation of DMG Special Publication 117 Guidelines for Analyzing and Mitigating Landslide Hazards in California, Southern California Earthquake Center.

14 Seed, H.B., 1979, "Considerations in the earthquake-resistant design of earth and rockfill dams," Geotechnique, 29(3), 215-263.

15 Rocscience, Inc., SLIDE version 5.044

surface as recommended by Stark[16] and by conducting a search for the critical surface under seismic loading conditions.

Geometry

Although most of the site below the proposed residence is not included in the State Seismic Hazard zone, for conservatism the analyzed cross section trends through the proposed building site along Section A-A' and extends downslope approximately 125 feet. The surface topography was determined by tape, hand-level, electronic distance meter.

Soil Properties

Due to similar engineering characteristics, the fill and residual soils are combined for purposes of stability analysis. Three representative samples exhibited an average moist density of 115 pcf. Two representative samples of the encountered bedrock exhibited an average moist density of 110 pcf. As described previously in this report, direct shear testing of a representative weathered bedrock sample by a previous investigator yielded a friction angle of 33 degrees and apparent cohesion of 157 psf within the range of confining pressures under consideration. This compares with a friction angle of 32 degrees and cohesion of 621 psf published by CGS[11] for similar materials.

Ground Water

Five (5) boreholes advanced on the property by the current and previous investigators did not encounter ground water to the maximum depth explored of 8.5 feet. The local ground water conditions are likely to be significantly influenced by the deep drainages located to the immediate north and west. Consequently, the ground water level is assumed to be lower than the analyzed section.

Seismic Loading

For this residential project, we applied a horizontal ground acceleration with a 10 percent probability of exceedance during a 50-year period as calculated by the CGS[17] to be 0.65g. Using the 15-centimeter displacement criteria as suggested by Mr. McCrink for an assumed magnitude 7.8 event, a pseudostatic reduction factor of 0.49 was applied to the probabilistically determined seismic coefficient, yielding a pseudostatic seismic coefficient of 0.32g.

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[16] Stark, T.D., 2003, Analysis of Landslides: Shear Strengths, Testing, and Stability Methods, Short Course.

[17] California Geologic Survey, 2005, Probabilistic seismic hazards mapping ground motion page, http://www.consrv.ca.gov/CGS/rghm/pshamap/pshamap.asp.

Findings

The factor of safety is the ratio of available forces to resist failure, such as friction and cohesion, to the forces that would tend to induce failure, such as gravity and seismic loading. Limited Based on the described site properties and anticipated seismic loading conditions, described seismic screening analysis yielded a factor of safety against earthquake induced landsliding of the subject slope of 1.15 (Figure 6). These values exceed the minimum screening analysis factor of safety criteria of 1.0.

Based on the results of the analyses discussed herein, the risk of seismically induced landsliding adversely impacting the proposed development is judged to be low.

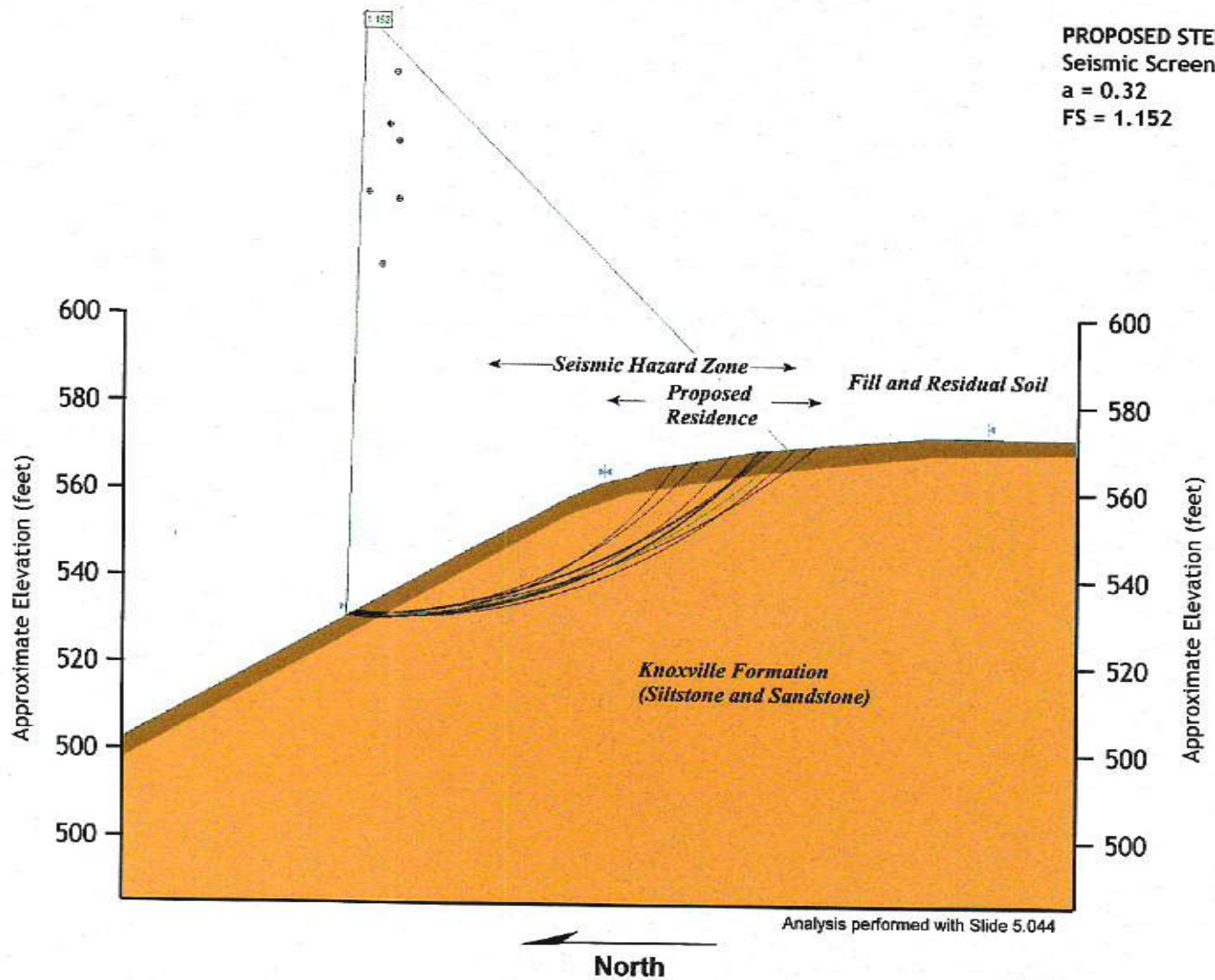
CONCLUSIONS

Based on the findings of this investigation, it is our opinion that the geotechnical conditions of the site are suitable for the proposed landscape improvements provided that the geotechnical criteria presented in this report are incorporated into the design and construction. We conclude that the primary geotechnical factors affecting the design and construction of the proposed improvements are the presence of relatively weaker and potentially expansive-prone near-surface soils and the potential for significant ground shaking caused by an earthquake on the nearby active San Andreas fault and Hayward fault systems.

GEOTECHNICAL DESIGN CRITERIA

The following recommendations are presented as guidelines for subsequent stages of development. These recommendations shall be incorporated into the siting and design of the proposed site improvements. Final detailing of concrete elements and reinforcing steel is to be designed by a qualified structural engineer in accordance with the provided geotechnical criteria.

To assure that the intent of these recommendations is included in the project plans and specifications, we request an opportunity to review the plans prior to initiation of construction. It has been our experience that the permit process is often expedited when we review the plans prior to submittal. References to ASTM test designations are intended to indicate the most recent version at the time of construction.



MILSTONE GEOTECHNICAL

SEISMIC SCREENING ANALYSIS			FIGURE NO.
PROPOSED STEINFELD RESIDENCE 2366 Rainbow Court Hayward, California			6
Date August 2018	Scale 1 inch = 10 feet	Engineer BSM	Project No. 174840

Attachment V

Grading

It is currently anticipated that grading will be limited to, minor cuts and fills to achieve design subgrade elevations and limited amounts of retaining wall backfill. Based on the experience of exploratory borehole drilling, it is expected that proposed site excavations can be performed with conventional earthmoving equipment. It is anticipated that much of the excavated weathered bedrock will be suitable for use as engineered fill.

Clearing and Site Preparation

All areas to be graded should be cleared of organic laden soil and obstructions such as buried utility lines. Stripped materials should be removed from the property for proper disposal. Holes created by the removal of root balls or other debris extending below the proposed finished subgrade should be backfilled with engineered fill as described below. Disturbed soil subgrades to receive fill, should be scarified to a depth of six (6) inches, moisture conditioned to within two (2) percent of optimum, and recompacted to a minimum of 90 percent of the maximum dry density as determined by the ASTM D1557 test method.

Material for Fill

Any fill to be placed at the site should not contain rocks or lumps greater than four (4) inches in greatest dimension and should not contain greater than 15 percent (by dry weight) larger than two-and-one-half (2.5) inches. Fill material in areas to receive structures or within five (5) feet of the ground surface should have a maximum plasticity index of 12. Minimum 50-pound samples of materials to be used as engineered fill should be submitted to the project geotechnical engineer for review and approval prior to placement. Granular soil from the proposed excavations, with the exception of surficial soils and oversized rock fragments, is expected to be suitable for use as engineered fill.

Fill Placement and Compaction

Fill should be moisture conditioned to within two (2) percent of optimum, spread in horizontal lifts not exceeding eight (8) inches in loose thickness, and compacted with an approved mechanical compactor to a minimum of 95 percent of the maximum dry density as determined by the ASTM D1557 test method. Fill placed in landscape areas that will not support structures or vehicular traffic may be compacted to a minimum of 90 percent. The upper 12 inches of fill in landscape areas may be compacted to a minimum of 85 percent to promote growth of vegetation.

Cut and Fill Slope Design	New permanent cut slopes and backfill slopes should not exceed inclinations of two to one (2 to 1) horizontal to vertical.
Building Foundations	Due to the presence of relatively weak near-surface soils, hillside setting, and anticipated seismic shaking, the residence foundation should be supported on a drilled, cast-in-place, concrete piers and grade beams that extend through the surficial and residual soils to derive bearing through friction in the underlying weathered siltstone and sandstone. All foundation piers should be interconnected by grade beams or tie beams. Maximum total and differential settlement of the drilled pier and grade beam supported foundations is estimated to be one-half (1/2) inch or less. Final design of foundation configuration, connections, and reinforcement to be determined by a qualified structural engineer based on the following geotechnical design criteria:
Minimum Pier Diameter	16 inches.
Minimum Pier Depth	Ten (10) feet into competent weathered siltstone that is estimated to be encountered ad depths ranging from about two to four (2 to 4) feet below the existing ground surface.
Minimum Pier Spacing	Three (3) pier diameters, center to center.
Maximum Pier Spacing	10 feet.
Allowable Shaft Friction	In competent weathered sandstone: 600 psf in compression; 500 psf in uplift resistance. Neglect shaft friction in overlying colluvial and fill soils. Increase by 33% for transient loads such as wind or seismic.
Lateral Resistance	350 pounds per cubic foot per foot (pcf/f) equivalent fluid pressure in weathered sandstone. Apply resistance over two (2) pier diameters.

Neglect passive resistance in overlying surficial soils. Increase by 33% for seismic or wind loads.

Minimum Pier Reinforcement

Four (4) - vertical No. 4 bars with No. 3 spirals or ties at maximum 12-inch spacing. Reinforcement to be provided with a minimum of three (3) inches concrete cover. Reinforcing cages to be constructed to allow introduction of tremie pipe to bottom of pier.

Grade Beams

Perimeter grade beams should be embedded a minimum of 18 inches below adjacent exterior grade and 12 inches below the lowest adjacent interior grade. As a minimum, all grade beams should be reinforced with two (2) No. 4 bars, top and bottom with No. 3 stirrups at maximum 12-inch spacings.

Construction

Contractors should be made aware that exploratory boreholes met considerable resistance at relatively shallow depths. Consequently, they should mobilize appropriately-sized drilling equipment to achieve the required depths.

Pier holes should be free of standing water and cleared of all loose debris prior to placement of concrete. Although not currently anticipated, if standing water collects in the pier excavations, the water should be pumped out or the concrete should be placed by the tremie method with the concrete displacing the water from the bottom up. If casing is required to maintain excavation stability, the casings shall be removed during placement of the concrete so that the concrete will cure in contact with native soil. Uncased holes that encounter groundwater should be poured within 24 hours of drilling.

All pier excavations should be inspected and approved by the project geotechnical engineer prior to the placement of reinforcing steel. Concrete over-pour ("mushrooming") of piers and grade beams should be prevented with the use of "sono-tubes" where required.

Retaining Walls

Foundation retaining walls required to achieve grade along the upgradient sides of the structure should be constructed integrally with the building foundation. Site retaining walls may be supported on drilled pier and grade beam foundations as described for the building foundation or on continuous cantilever footings bearing on approved weathered siltstone that is encountered below the surficial soils. Total and differential settlements of retaining walls supported on shallow footings are estimated to be less than one-half (½) inch. Retaining walls are to be designed in accordance with the following geotechnical criteria:

Lateral Loading: Unrestrained: 45 pcf/f equivalent fluid pressure
Restrained: 60 pcf/f equivalent fluid pressure.

Seismic Surcharge: As described by Lew and others[18], the evaluation of seismic earth pressures for unrestrained walls less than 12 feet tall is not necessary provided the walls are designed for a factor of safety of at least 1.5.

Wall Drainage: Positive drainage to daylight must be provided behind all retaining walls exceeding 18 inches in height. The drain should consist of a minimum 12-inch wide vertical blanket of Caltrans Class 2 permeable material or clean, one-half to three-quarter (1/2 to 3/4)-inch drainrock that is completely enveloped by filter fabric such as Mirafi 140N. Drainage materials should be left 12 inches below the ground surface and the top 12 inches of wall backfill should consist of compacted, low permeability material separated from the drainrock by a double layer of non-woven filter fabric. Due to the low likelihood of collected water, the walls may be drained by screened, minimum two (2)-inch diameter weep holes located at maximum four (4) foot spacings that are integrated with the back drain.

If weep holes are not desired, an approved, minimum four (4)-inch diameter, perforated, rigid, smooth-wall, drain-pipe (or approved functional equivalent) should be placed with perforations pointed downward on a minimum one (1)-inch thick drainrock layer over the retaining wall heel. The pipe should be sloped to drain at a minimum

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

inclination of one (1) percent. The use of 90-degree angled connections should be strictly avoided in favor of long sweep-90 connections or combinations of maximum 45-degree angled connections. Drain lines should be provided with appropriate and sufficient cleanouts. Collected waters should be directed to an appropriate approved discharge location.

Wall Backfill	Retaining wall drainrock and backfill placement and compaction should conform to the requirements for engineered fill and be compacted with appropriate equipment and in a manner to prevent excessive loading to adjacent walls or damage to waterproofing or drainage systems. Waterproofing membranes should be inspected for integrity during backfill placement and compaction.
Deepened Footings Alternative	The proposed retaining walls may be founded on deepened continuous footings that bear in approved, competent, weathered siltstone materials that are anticipated to be encountered approximately three to four (3 to 4) feet below the existing ground surface.
Footing Embedment	Deeper of 18 inches or 12 inches into approved, competent, weathered siltstone that is encountered below the existing artificial fill and surficial soils.
Footing Width	Minimum 24 inches.
Bearing Capacity	3,000 psf for dead and live loads; 4,000 psf for dead, live, and transient loads such as wind and seismic.
Passive Resistance	300 pounds per cubic foot per foot (pcf/f) equivalent fluid pressure against the face of footings embedded in weathered bedrock. Neglect passive resistance within artificial fill and surficial soils. Alternatively, lateral resistance may be derived by friction along the base of the footing calculated using a friction factor or 0.3.
Drilled Pier Alternative	Proposed retaining walls may be founded on drilled, cast-in-place concrete piers and grade beams with piers deriving support through skin friction in the weathered siltstone that is encountered below the existing artificial fill and surficial soils. It is estimated that competent bearing materials will be

	encountered approximately three to four (3 to 4) feet below the existing ground surface.
Pier Embedment	Minimum eight (8) feet into approved, competent, weathered bedrock.
Pier Diameter	Minimum 16 inches.
Pier Spacing	Minimum three (3) pier diameters, edge to edge; Maximum eight (8) feet.
Shaft Friction	500 pounds per square foot (psf) in approved weathered bedrock; Neglect shaft resistance in artificial fill and surficial and residual soils.
Passive Resistance	300 pounds per cubic foot per foot in weathered bedrock applied across two (2) pier diameters. Neglect passive resistance within artificial fill and surficial soils. Alternatively, lateral resistance may be derived by friction along the base of the footing calculated using a friction factor or 0.3.
Minimum Reinforcement	Four (4) - vertical No. 4 bars with No. 3 spirals or ties at maximum 12-inch spacing. Reinforcement to be provided with a minimum of three (3) inches concrete cover. Reinforcing cages longer than 10 feet to be constructed to allow introduction of tremie pipe to bottom of pier.
Pier Construction	Pier holes should be free of standing water and cleared of all loose debris prior to pouring of concrete. Although not currently anticipated, if standing water collects in the pier excavations, the water should be pumped out or the concrete should be placed by the tremie method with the concrete displacing the water from the bottom up. Concrete in piers exceeding 10 feet should be placed using the tremie method. If casing is required to maintain excavation stability, the casings shall be removed during placement of the concrete so that the concrete will cure in contact with native soil. Uncased holes that encounter groundwater should be poured within 24 hours of drilling. All pier excavations should be inspected and approved by the project geotechnical engineer prior to the placement of reinforcing steel. Concrete

over-pour ("mushrooming") of piers and grade beams should be prevented with the use of "sono-tubes" where required.

Surface Drainage

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

All roof sections should be provided with gutters connected via downspouts to a minimum four (4)-inch diameter, non-perforated, rigid, smooth-wall drain-pipes that have a minimum slope of one (1) percent to discharge at an appropriate discharge facility. The use of 90-degree angled connections should be strictly avoided in favor of long sweep-90 connections or combinations of maximum 45-degree angled connections. Drain lines should be provided with appropriate and sufficient cleanouts and isolated from subsurface drainage facilities.

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

Concrete Slabs-on-Grade

Exterior concrete slabs may be constructed on grade in accordance with the following recommendations. Slabs should bear on approved, competent, inorganic, native, silty sand or engineered fill that bears on approved subgrade soils, up to a maximum of 18 inches. Engineered fill beneath concrete slabs in living areas should be of uniform thickness.

The slabs-on-grade should be underlain by a minimum of six (6) inches of compacted Caltrans Class 2 permeable material and reinforced with a minimum of No. 4 bars on 18-inch spacings in both directions. Slabs should be provided with minimum eight (8)-inch by eight (8)-inch thickened edges. Final design of slab thickness, steel reinforcement, load-transfer devices, and crack control features should be determined by the structural engineer.

Interior slabs in living areas should be structurally tied to, or constructed integrally with, the footings. Exterior slabs should be structurally isolated from adjacent structures although a sleeved dowel connection may be used at entrances to limit differential vertical displacement.

Interior slabs should be provided with a comprehensive moisture/vapor barrier as described in a subsequent Moisture Control section of this report. Exterior slab moisture and potential efflorescence can be limited with a moisture barrier consisting of a minimum 10-mil thick waterproof membrane that is protected from construction-related damage.

Seismic Design Criteria

The site is expected to experience strong ground shaking from earthquakes along active faults located within the region during the design life of the project. Peak probable horizontal ground accelerations of 0.65g have been predicted by probabilistic methods. As a minimum, the structure should be designed to resist lateral loads resulting from ground shaking as provided in the current California Building Code (CBC) or other accepted design methods. Based on the observed site conditions, we conclude the following design parameters to be appropriate for design using the 2016 California Building Code design method:

Seismic Design Parameters

PARAMETER	VALUE
Site Class	B
S_S (0.2s Spectral Response Acc.) Default Site Class B	2.397
S_1 (1.0s Spectral Response Acc.) Default Site Class B	0.997
S_{MS} (0.2s Spectral Response Acc.)	2.397
S_{M1} (1.0s Spectral Response Acc.)	0.997
S_{DS} (0.2s Spectral Response Acc.)	1.598
S_{D1} (1.0s Spectral Response Acc.)	0.665
F_a (Site Class B)	1.0
F_v (Site Class B)	1.0

For additional guidance on reducing the risks associated with living in seismically active areas, owners may wish to consult "Putting Down Roots in Earthquake Country" [19] (available on-line at the US Geological Survey), which references additional useful documents.

Moisture Control

To minimize efflorescence at the face of exposed exterior walls, the blind sides of the walls may be sealed with a continuous, minimum 15-mil water/vapor barrier that is functionally equivalent to Tremco's *Paraseal LG* or Grace's *Bituthene 3000*.

Installation, lapping, and sealing of waterproofing membranes should be performed in accordance with the manufacturers' recommendations. It is recommended that return corners, such as at wall/footing joints, be provided with a cant strip or sloping infill to reduce the potential for damage to the overlying waterproofing membranes. Waterproofing membranes should be protected from drainrock and backfill with a rigid panel or prefabricated drainage panel. It is critical that waterproofing systems be installed correctly by qualified professionals.

Underground Utilities

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

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

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

Erosion Protection

Project contractors should be responsible to install and maintain adequate erosion protection facilities to protect offsite areas from construction activities throughout the project. At a minimum, erosion protection should consist of properly installed fiber rolls or erosion fencing below the downslope limits of grading. Disturbed slopes should be protected with appropriate erosion resistant matting or hydromulch.

TECHNICAL REVIEW

This report should be reviewed by the project architect, engineers, contractors, and potential sub-contractors prior to the next stage of development. A copy of this report should also be provided to the general contractor for reference during construction. Any questions or discrepancies should be brought to the attention of a representative of Milstone Geotechnical prior to the start of construction.

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

CONSTRUCTION OBSERVATION

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

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

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

LIMITATIONS

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

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

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

APPENDIX A
FIELD AND LABORATORY INVESTIGATION

Description of Small-Diameter Borehole Investigation
Soil Classification Chart
Log of Exploratory Borehole MG1
Log of GEI Borehole 15
Direct Shear Test Results (GEI)

SUBSURFACE INVESTIGATION DESCRIPTION

The small-diameter exploratory borehole MG1 was drilled and logged on February 21, 2018 at the location shown on Figure 4. The borehole was advanced using a 3.5-inch diameter hand auger. The borehole was drilled and sampled to a depth of 4.5 feet.

Earth materials encountered in the borehole were continuously logged and described in the field by a registered geotechnical engineer and representative soil samples were obtained at various depths. Relatively undisturbed samples were obtained with a three (3)-inch-outside-diameter, two-and-one-half (2.5)-inch-inside-diameter, sampler with a six (6)-inch-long, thin walled brass liner. The sampler was advanced using an 18-inch, 10-pound slide hammer. In-situ testing was performed at five (5) locations using a down-hole vane shear device.

Upon the completion of logging, the borehole was backfilled with loosely compacted drill cuttings. All soil samples were transported to the laboratory to verify field descriptions and perform index and strength testing. The laboratory test results are summarized in the body of this report.

A graphical log of the borehole and a key to soil classification follow in this appendix. The following log and related information show our interpretation of the subsurface conditions at the dates and locations indicated. It is not implied that they are representative of subsurface conditions at other locations or at other times.

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

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

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

ABBREVIATIONS

AD: Auger Drilling

HD: Modified California Sampler

T1: Tube Sample (undisturbed)

B1: Grab Sample (disturbed)

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SOIL CLASSIFICATION CHART
AND
KEY TO LOGS OF EXPLORATORY BOREHOLES

LOG OF EXPLORATORY BOREHOLE MG1

Project: Lands of Steinfeld
Location: 2366 Rainbow Court, Hayward, CA
Drilling Equipment: Hand Auger
Drilling Contractor: -

Project Elev.: ~570 feet
Hole Diameter: 3.5 inch
Surface: bare soil

Project Number: 174840
Page: 1 of 1
Logged By: BSM
Date: 11/29/17

GROUND WATER	POCKET TORVANE (tsf)	POCKET PENET. (tsf)	RECOVERY (%)	SPT (bpf) or PRESS. (psi)	SAMPLE OR DRILL MODE	SAMPLE DESIG-NATION	DEPTH IN FEET	GRAPHIC LOG	USCS DESIG.	GEOTECHNICAL DESCRIPTION
					AD					**ARTIFICIAL FILL**
		1.8	6/6		HD	T1	1		SM	Silty SAND: Dark yellowish brown (10YR3/4); ~80% fine to medium grained sand; ~20% low plasticity fines; loose; moist; rootlets in upper 3 inches; glass fragment.
					AD	B1				
		-	4/6		HD	T2	2			
		2.9	3/6		HD	T3				
					AD	B3	3		GM	Silty GRAVEL: Dark yellowish brown (10YR3/4); ~60% hard, angular gravel; ~30% fine to medium grained sand; ~10% low plasticity fines; dense; moist.
		>4.5	6/6		HD	T4				
					AD	B4	4		SC-SM	**RESIDUAL SOIL**
		>4.5	5/6		HD	T5				Clayey to silty SAND with Gravel: Dark yellowish brown (10YR4/4); ~15% fine, hard, angular, gravel; ~60% fine grained sand; ~25% medium plasticity, tough fines; medium dense; moist.
							5			Resistant drilling at 4 feet.
							6			
							7		GM-SM	**WEATHERED SILTSTONE**
							8			Silty GRAVEL to Silty SAND: Dark yellowish brown(10YR4/4); ~45% medium hard, angular, siltstone fragments to 1/2-inch size; ~40% fine to coarse grained sand; ~15% low to medium plasticity fines; very dense; moist.
							9			
							10			Drilling refusal at 4.5 feet.
							11			
							12			
							13			
							14			
							15			
							16			
							17			
							18			
							19			

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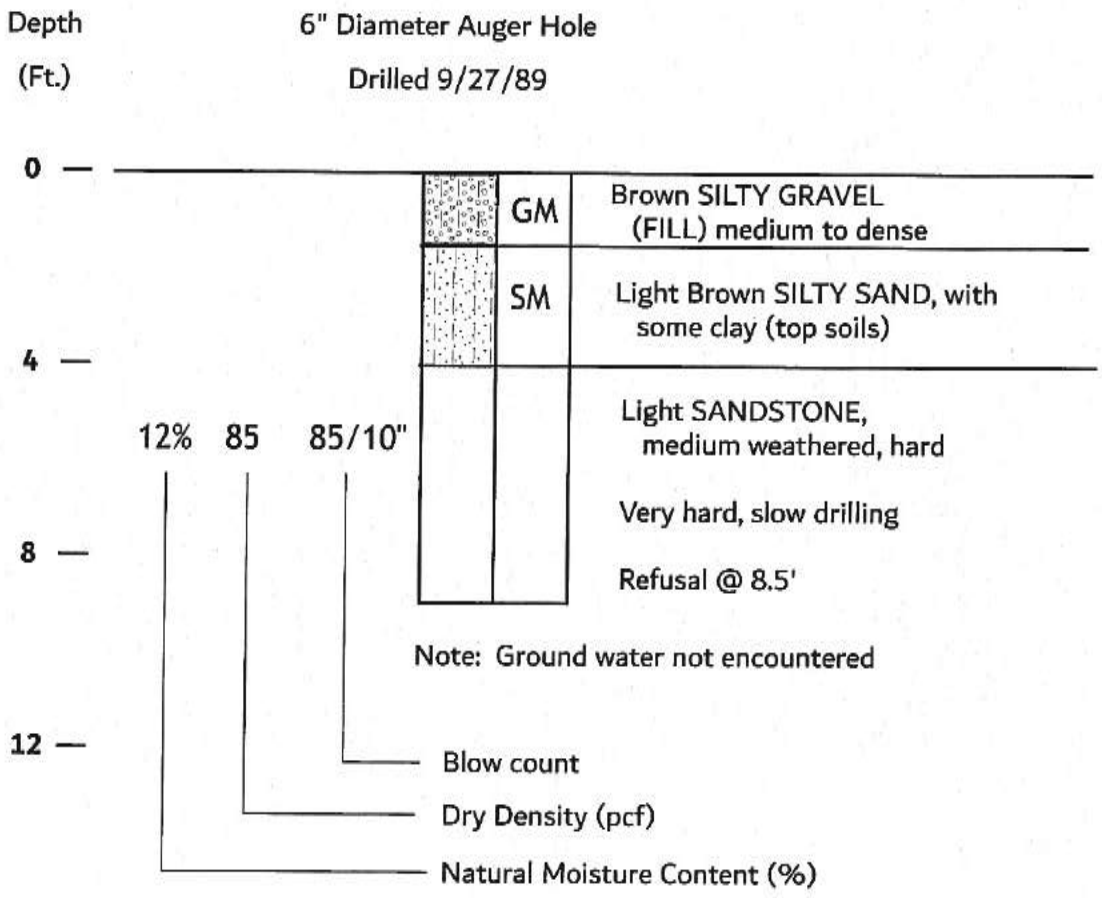
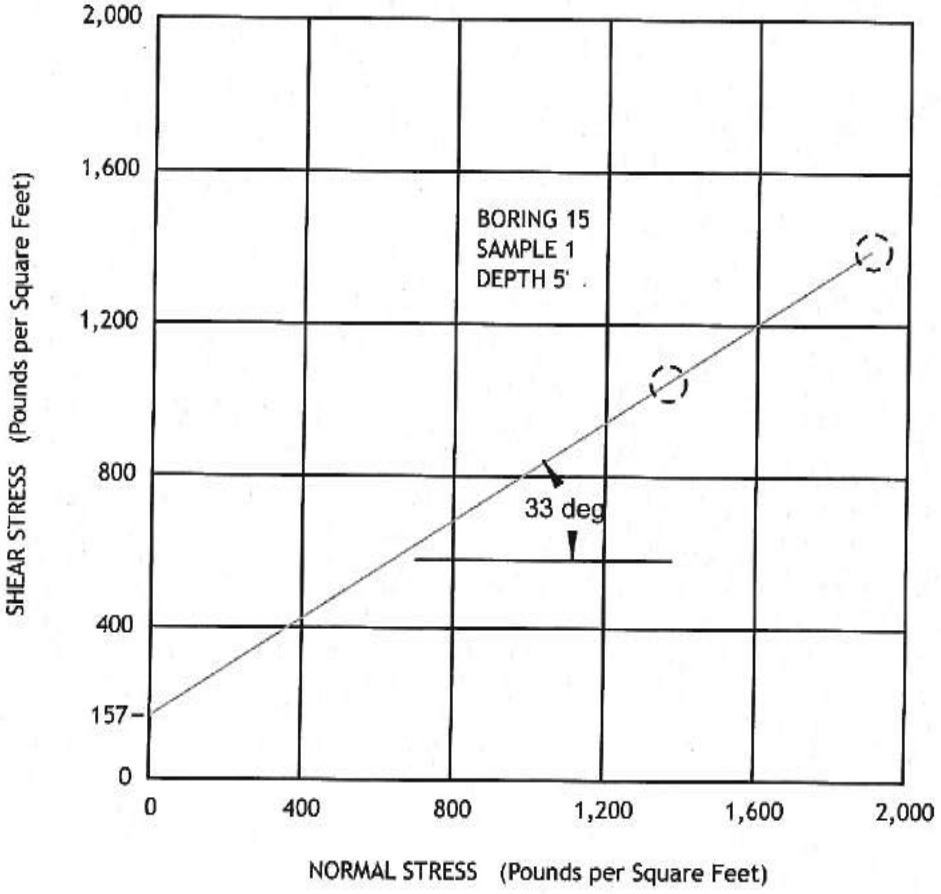
Remarks: Borehole terminated at 4.5 feet.
No ground water encountered.
Borehole backfilled with tamped cuttings.



Trace of borehole log presented in *Geotechnical Engineering Inc., November 2, 1989, Report - Supplementary Investigation and Geologic Reconnaissance, Proposed Residential Development, Parkside Drive & Rainbow Court, Tract 3992, Hayward, California* for Victoria Court Management.

MLSTONE GEOTECHNICAL	GEI BOREHOLE 15			FIGURE NO.
	STEINFELD RESIDENCE 2366 Rainbow Court Hayward, California			
	Date:	Scale:	Drawn by:	Project No. 184920

SATURATED DIRECT SHEAR TEST



Modified from direct shear test presented in *Geotechnical Engineering Inc., November 2, 1989, Report - Supplementary Investigation and Geologic Reconnaissance, Proposed Residential Development, Parkside Drive & Rainbow Court, Tract 3992, Hayward, California* for Victoria Court Management.

MLSTONE GEOTECHNICAL	DIRECT SHEAR TEST			FIGURE NO.
	STEINFELD RESIDENCE 2366 Rainbow Court Hayward, California			
	Date: 11/2/89	Scale: as shown	Drawn by: BSM	Project No. 184920