

**COUNTY OF SAN MATEO
PLANNING AND BUILDING DEPARTMENT**

DATE: February 13, 2019

TO: Planning Commission

FROM: Planning Staff

SUBJECT: EXECUTIVE SUMMARY: Certification of an Initial Study and Mitigated Negative Declaration, and Coastal Development, Design Review, Resource Management, and Grading permits, as well as a Lot Line Adjustment, to construct four single-family residences, located on Vallemar Street at Juliana Avenue, in the unincorporated Moss Beach area of San Mateo County. This project is appealable to the California Coastal Commission.

County File Number: PLN 2015-00380 (Moss Beach Associates, LLC)

PROPOSAL

The applicant proposes to merge and adjust seven existing legal vacant lots into four lots, and to construct four new single-family residences, with detached two-car garages (as described in the table below).

	Lot 1	Lot 2	Lot 3	Lot 4
Parcel Size	23,473 sq. ft.	22,220 sq. ft.	24,211	32,324 sq. ft.
House Size	4,020 sq. ft.	4,072 sq. ft.	4,018 sq. ft.	4,020 sq. ft.
Total Grading	250 c/y cut 400 c/y fill	300 c/y cut 500 c/y fill	0 c/y cut 1100 c/y fill	50 c/y cut 1100 c/y fill
Tree Removal	1	9	9	11

Across all four lots, to be located between the west facing sides of the residential development and the lots' westernmost property lines (which includes much of the trail along the ocean bluffs), is proposed a Conservation and Open Space Easement (Easement) (covering approximately 36% of the project site) and will permanently protect and restore the coastal prairie grassland and other rare plant species located on and near the site, as well as access to and along the bluff top trail (and to accommodate its relocation to due bluff erosion) to the west of the proposed development. The Easement will be granted to a non-profit conservation organization/land trust and preclude development and other activities that would degrade the biotic, scenic and

recreational resources and values, while obligating the project property owners to fund, protect and manage these resources and values.

RECOMMENDATION

Certify the Mitigated Negative Declaration and approve the Coastal Development, Design Review, Resource Management District Development Review, Grading Permits, and Lot Line Adjustment (County File No: PLN 2015-00380).

SUMMARY

Setting. The undeveloped project site is zoned RM-CZ (Resource Management District-Coastal Zone), surrounded to the north, east and south by single-family residential zoning where the minimum parcel size is 5,000 square feet. The County Parks Department's Fitzgerald Marine Reserve lies between the project site's westernmost boundary, which includes the coastal bluff tops and extends to the beach below the bluffs. A long-established trail runs along the westerly bluff top, which is mostly located on the easterly half of the abandoned The Strand right-of-way, with a minor portion located within the County's Reserve area. The area in between the bluff-top trail and the Monterey Cypress trees on the project sites eastern portion is generally comprised of coastal prairie grasslands and other native and non-native species of groundcover and other rare California native plants. Located just off and west of the project site (west of the bluff-top trail on the Reserve land) is located a very rare plant species, the Coast yellow leptosiphon CYL), recently listed as "endangered" under the California Endangered Species Act (CESA).

Compliance with Design Review Standards. The project was considered by the Coastsides Design Review Committee (DRC) at three meetings. At the last meeting (October, 2017), the DRC recommended approval, with the DRC Moss Beach representative expressing concerns relative to the Design Review standard: "Building Mass, Shape and Scale." The issue of the size and scale of the four homes was also of concern to several residents who commented on the Initial Study/Mitigated Negative Declaration (IS/MND) and is addressed in detail by the staff report, which concludes that the project is in compliance with Design Review standards.

Compliance with General Plan, Local Coastal Program (LCP), RM-CZ, Grading and Lot Line Adjustment Policies and Requirements. The project has been found to comply with all applicable policies, criteria and regulations. The project was reviewed and found to be consistent with LCP policies, including those under the "Sensitive Habitats," "Visual Resources," "Hazards" and "Shoreline Access" (specifically access to and protection of the bluff top trail into perpetuity) components.

Environmental Review. An IS/MND was prepared for this project and circulated from January 17 through February 15, 2018. In response to the first circulation, comments were received by the Midcoast Community Council, California Coastal Commission (CCC), several nearby residents and the California Department of Fish and Wildlife (F&W). F&W's comments focused on the document's impact conclusions and associated mitigation measures (MMs) with regard to the rare plant species on and

near the project site, and most specifically, the project's potential impacts to the CYL, known to occur on the west, adjacent County-owned Reserve and which was under consideration as an "endangered" plant species pursuant to the CESA; it has since been so designated. The CCC echoed similar concerns around adequate protection of these plant species. In response to these concerns, a more comprehensive study of the CYL and other identified rare plants was undertaken, and a revised IS/MND was recirculated from October 10 through November 8, 2018.

The recirculated IS/MND added and expanded MMs to ensure better protection and preservation of the CYL and other rare plants, as well as to ensure access and preservation of the bluff top trail (together with the Easement, Habitat Management Plan and Covenants, Conditions and Restrictions). In response, the CCC provided feedback supportive of the project and F&W did not provide additional comments. Revised MMs and conditions were also added in response to the Native American Heritage Commission's comments to ensure compliance with State law, and to address the Department of Public Works' comments regarding compliance with the Half Moon Bay Airport ALUCP.

Several comments received from some neighbors (and echoed in the Midcoast Council's comments) assert that the size, scale and height of the four houses are out of character with the surrounding single family development, and will have an adverse visual impact as seen from the beach down below the bluffs and from points along Highway 1, Vallemar and Juliana. Concerns also included the number of Monterey cypress trees to be removed.

Staff concludes that while the size of the four single-family dwellings (SFDs) are larger than those in the surrounding (R-1/S-17) neighborhood, the project SFDs are located on lots whose total size range 4.4 to 6.4 times the R-1 District's minimum lot size of 5,000 sq. ft., and thereby proportional to the project site. The four SFDs have been located as far east on the project site as is feasible, both to mitigate issues around future bluff top erosion and to protect the site's sensitive habitat and visual resources. The SFDs take access from and front onto Vallemar and maintain the minimum 50-foot front and 20-foot side yard setbacks required by the RM-CZ development standards. The number of Monterey cypress trees being removed and trimmed is due to the shear density of the tree grove on that portion of the project site where the SFDs can best be located to take access from Vallemar and protect environmentally and visually sensitive areas area to the west.

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**COUNTY OF SAN MATEO
PLANNING AND BUILDING DEPARTMENT**

DATE: February 13, 2019

TO: Planning Commission

FROM: Planning Staff

SUBJECT: Certification of an Initial Study and Mitigated Negative Declaration pursuant to the California Environmental Quality Act, and consideration of Coastal Development, Design Review, Resource Management permits, pursuant to Sections 6328.4, 6565.20 and 6903, respectively, of the County Zoning Regulations, a Grading Permit, pursuant to Section 9283 of the County Building Regulations (Division VII, Chapter 5), and a Lot Line Adjustment, pursuant to Section 7125 of the San Mateo County Subdivision Regulations, to construct four single-family residences, with associated grading, tree removal and installation of all required access and utilities, located on Vallemar Street at Juliana Avenue, in the unincorporated Moss Beach area of San Mateo County. This project is appealable to the California Coastal Commission.

County File Number: PLN 2015-00380 (Moss Beach Associates, LLC)

PROPOSAL

Four new single-family dwellings (SFDs) are proposed on a 2.48 acre property, currently comprised of seven parcels. The SFDs are proposed on four parcels that will be reconfigured from the existing seven legal parcels via the Lot Line Adjustment (LLA). The development proposed on each of the reconfigured lots is described below.

Lot 1: Construction of a new two-story, 4,020 sq. ft., single-family residence (with a 191 sq. ft. “catwalk” area providing access to a roof deck), with an attached (by covered walkway) two-car 576 sq. ft. garage, including 510 sq. ft. of covered decks and 494 sq. ft. of exterior uncovered decks, located on a 23,473 sq. ft. parcel. Construction of this residence includes the removal of one (1) significant (Monterey cypress) tree and associated grading (250 cubic yards (cu/yds) of cut and 400 cu/yds of fill; net import 150 cu/yds).

Lot 2: Construction of a new two-story, 4,072 sq. ft. single-family residence (with a 284 sq. ft. “catwalk”/conditioned floor area providing access to a roof deck), with a 586 sq. ft. attached two-car garage, including 409 sq. ft. of covered decks and 291 sq. ft. of exterior uncovered decks, located on a 22,220 sq. ft. parcel. Construction of this residence includes the removal of nine (9) significant and two (2) non-significant

(Monterey cypress) trees and associated grading (300 cu/yds of cut and 500 cu/yds of fill; net import 200 cu/yds).

Lot 3: Construction of a new two-story, 4,018 sq. ft. single-family residence (with a 190 sq. ft. “catwalk” providing access to a roof deck), with an attached (by covered walkway) 576 sq. ft. two car garage, including 502 sq. ft. of covered decks and 654 sq. ft. of exterior uncovered decks, located on a 24,211 sq. ft. parcel. Construction of this residence includes the removal of nine (9) significant (Monterey cypress) trees and associated grading (0 cu/yds of cut and 1,100 cu/yds of fill; net import 1,100 cu/yds).

Lot 4: Construction of a new two-story, 4,020 sq. ft. single-family residence (includes a 189 sq. ft. “catwalk” providing access to a roof deck), with a 576 sq. ft. attached (by covered walkway) two-car garage, including 477 sq. ft. of covered decks and 760 sq. ft. of exterior uncovered decks, located on a 32,324 sq. ft. parcel. Construction of this residence includes the removal of eleven (11) significant (Monterey cypress) trees and associated grading (50 cu/yds of cut and 1,100 cu/yds of fill; net import 1,050 cu/yds).

In addition to the residential development described above, the project includes a comprehensive plan for protecting, restoring, and maintaining the valuable natural and recreational coastal resources that exist to the west of the proposed homes. A Conservation and Open Space Easement (Easement) is proposed on all four lots (in depths ranging from 97 feet to 173 feet), between the west facing sides of the residential development and the mid-point of The Strand right-of-way, including the land on which the trail along the ocean bluffs exists.) The size of the easement area is approximately 0.92 acres, and the purpose of the easement is to permanently protect and restore the Coastal Prairie Grassland and other rare plant species located within this area. The easement also recognizes and protects the public’s ability to access the bluff top trail, among other ways by providing for its potential future relocation to the east, in the event that future bluff top erosion necessitates this move. Deed restrictions requiring future owners to allow continued lateral access and future relocation of the trail have been proposed by the applicant and must be recorded concurrently with the final map. . The Easement will be granted to a non-profit conservation organization acceptable to the Community Development Director, and will preclude any development or other activities that would degrade the biotic, scenic and recreational resources and values of the easement area. The Easement also obligates the future owners of the developed properties to be members of the Moss Beach Homeowners Association (HOA). The Covenants, Conditions, and Restrictions (CCRs) of this HOA require future owners to fund, protect and manage these resources, among other ways by implementing the Habitat Management Plan (HMP) required by a recommended condition of approval.

RECOMMENDATION

That the Planning Commission certify the Mitigated Negative Declaration and approve the Coastal Development, Design Review, Resource Management District Development Review and Grading Permits, and Lot Line Adjustment (County File

No: PLN 2015-00380), by making the required findings and adopting the conditions of approval identified in Attachment A.

BACKGROUND

Report Prepared By: Dave Holbrook, Project Planner, Telephone 650/363-1837

Applicant/Owner: Moss Beach Associates, LLC

Location: Vallemar Street at Julianna Avenue, Moss Beach. APNs: 037-086-230, -240, -250, -260, -270, -280 and -290; 2.48 acres (combined parcels).

Size: 2.48 acres (Project Site)

Zoning: Resource Management District-Coastal Zone/Design Review (RM-CZ/DR)

General Plan Designation: Open Space - Urban

Parcel Legality: Legal parcels, created via 1989 Lot Line Adjustment (File No. LLA 89-21); to be reconfigured with the proposed LLA included with this project.

Existing Land Use (of all subject parcels): Undeveloped, except for trail along bluff tops

Water Supply/Sanitary Sewer Supply: Montara Water & Sanitary District

Flood Zone: FEMA Flood Insurance Rate Map designation indicates parcel as Zone X, Area of Minimal Flooding, Community Map No. 06081C0138E, dated October 16, 2012.

Environmental Evaluation: An Initial Study and Mitigated Negative Declaration (IS/MND) was prepared for this project and initially circulated from January 17 through February 15, 2018. A second and revised IS/MND was circulated from October 10 through November 8, 2018.

Surrounding Land Uses and Setting: The undeveloped project site is zoned RM-CZ, surrounded to the north, east and south by single-family residential zoning (R-1/S-17/DR) where the minimum parcel size is 5,000 square feet. The property is bordered to the east by Vallemar Street (with Cabrillo Highway parallel and just east of that), to the south by Julianna Avenue (Vallemar and Juliana are County-maintained roadways), to the west by the Fitzgerald Marine Reserve (which begins on the westerly half of The Strand right-of-way (ROW) and which includes the coastal bluffs above the beach and Pacific Ocean), and to the north by R-1/S-17 zoned and developed parcels. The property lies within the Cabrillo Highway County Scenic Corridor. The project site slopes to the southwest at an average slope of approximately 10% and ranges from about 26% near Vallemar to about 3% closer to the bluffs.

Along the project site's easterly side (closest to and generally parallel with Vallemar) is a dense grove of Monterey cypress trees. A long-established trail runs along the westerly bluff top. The trail, which has been historically used by the public to access the bluff top and enjoy the expansive coastal views, is primarily located on the easterly half of an unimproved right-of-way (r-o-w) known as "the Strand", the eastern half of which is owned by the applicant, and the western half of which is owned by County Parks. The majority of the trail is on the eastern portion of the Strand r-o-w owned by the applicant. A small portion of the trail is located within the County owned portion of the r-o-w at the north (west of Lot 1) and south (coming off its entrance from Juliana) of the project site. The area in between the existing bluff-top trail and Monterey Cypress trees is generally comprised of coastal prairie grasslands and other native and non-native species of groundcover, as well as a single population of California Wild Strawberry, a unique species of sensitive habitat as defined in the Local Coastal Program (LCP), and two other rare California native plants. Located just off and westerly of the project site (primarily west of the bluff-top trail on the County Parks managed Fitzgerald Marine Reserve land) is located a California rare plant species, the coast yellow leptosiphon (CYL, *Leptosiphon croceus*), which has recently been designated by the California Department of Fish & Wildlife (F&W) as "endangered" under the California Endangered Species Act..

The only development currently on the property is a domestic well that was approved and drilled in 1999 (Case No. CDP97-0016/RMD97-0013). That well has subsequently been capped, but not formally abandoned pursuant to the standards of the County Department of Environmental Health Services. The recommended conditions of approval prohibit this well from being reactivated and used for either domestic or landscaping water purposes.

Project Scope Evolution: Prior to this project's formal application submittal, a Major Development Pre-Application meeting was held in conjunction with the Midcoast Community Council's December 9, 2015 meeting. At that time, the proposal was for six residences on the existing seven lots. There were several comments regarding that project's potential impacts on bluff-top erosion, bluff-top trail preservation, visual resources, and on the CYL and other rare plant species known to occur on and near the project site. As a result, and prior to the project's first submittal before the Coastside Design Review Committee, the project was reduced down to the four residences described above.

DISCUSSION

A. KEY ISSUES

1. Conformance with the General Plan

The applicable General Plan (GP) Policies cited below are drawn from the General Plan's following Chapters: "Vegetative, Water, Fish and Wildlife," "Visual Quality," "Historical and Archaeological Resources," "Park and

Recreation Resources,” “Urban Land Use,” “Water Supply,” “Wastewater,” and “Natural Hazards.”

Vegetative, Water, Fish and Wildlife. In this GP Chapter, the project invokes Policies 1.27 (*Regulate Development to Protect Sensitive Habitats*), 1.28 (*Establish Buffer Zones*) and 1.30 (*Uses Permitted in Buffer Zones*). Because these policies are covered by similar policies in the LCP’s “Sensitive Habitat” Component, please see the detailed discussion under the LCP Conformance Section of this report.

Visual Quality. The project invokes Policies 4.14 (*Appearance of New Development*), 4.16 (*Protections for Coastal Features*), 4.21 (*Scenic Corridors*), and 4.25 (*Urban Area Design Concept*). Because these policies are covered and exceeded by policies in the LCP’s “Visual Resources” Component, please see the detailed discussion under the LCP Conformance section of this report.

Historical and Archaeological Resources. The project invokes Policies 5.15 (*Protection of Historical Resources/Character of New Development*), 5.20 (*Protection of Archaeological/Paleontological Resources; Site Survey*), 5.21 (*Site Treatment*). During the initial circulation of the IS/MND, the project was referred to the Sonoma State University Northwest Information Center. Their response identified that there was no indication or need for further archaeological study or survey at this time. See the discussion in the “Environmental Review” Section of this report for additional discussion in response to comments received from the Native American Heritage Commission, including revised Mitigation Measures (MMs) and added conditions of approval (Attachment A) to ensure compliance with these policies.

Park and Recreation. The project invokes Policy 6.18 (*County Park and Recreation Facilities: Regulation of Encroachment*). Because this policy is covered and exceeded by policies in the LCP’s “Recreation/Visitor Serving Facilities” Component, please see the detailed discussion under the LCP Conformance Section of this report.

Urban Land Use. The project invokes Policies 8.14 (*Residential Land Use Compatibility*), and 8.31 (*Overcoming Constraints to Development*). Because these policies are covered and exceeded by policies in the LCP’s “Locating and Planning New Development” Component, please see the detailed discussion under the LCP Conformance section of this report.

Water Supply and Wastewater. The project invokes Policies 10.10 (*Water Suppliers in Urban Areas*), 10.25 (*Efficient Water Use*), and 11.4 (*Wastewater Management in Urban Areas*). Because these policies are covered and exceeded by policies in the LCP’s “Locating and Planning New

Development” Component, please see the detailed discussion under the LPC Conformance section.

Natural Hazards. The project invokes Policies 15.4 and 15.5 (*Definitions of Natural and Geotechnical Hazards*), 15.12 (*Locating New Development in Areas Which Contain Natural Hazards*), 15.14 (*Disclosure of Natural Hazards*). Because these policies are covered and exceeded by policies in the LCP’s “Hazards” Component, please see the detailed discussion under the LPC Conformance section of this report.

Taken together with associated MMs and conditions of approval listed in Attachment A, staff concludes that the project complies with these GP policies.

2. Conformance with the Montara/Moss Beach/El Granada Community Plan

The Community Plan includes goals and policies regarding “Land Use (Residential)”, “Transportation (Trails)”, “Conservation and Open Space”, and “Community Appearance.” The applicable goals and policies are cited in the table below, with references to the appropriate sections of this report, where discussion around the project’s compliance with such issues are addressed.

Community Design Manual	Corresponding LCP Component and Other Sources of Discussion
Natural Resource Protection	Sensitive Habitats; IS/MND
Design Characteristics	Visual Resources; DR Conformance & IS/MND
Development Patterns	Visual Resources; DR Conformance
Potential Trail Locations	Shoreline Access; IS/MND
Housing Design	Visual Resources; DR Conformance
Open Space/Preservation of Resources	Sensitive Habitats & Visual Resources; IS/MND
Urban Design/Preserving Community Character	Visual Resources; DR Conformance
Preserving Natural Amenities.	Sensitive Habitats & Visual Resources; IS/MND
Protection of Scenic Vistas	Visual Resources; IS/MND
Preservation of Landforms and Vegetation	Visual Resources; DR Conformance
Regulation of Appearance/Community Design Manual.	Visual Resources; DR Conformance

3. Conformance with the Local Coastal Program

The applicable Local Coastal Program (LCP) policies are discussed below, and are contained within the following LCP Components: “Locating and Planning New Development,” “Sensitive Habitats,” “Visual Resources,” “Hazards,” “Shoreline Access,” and “Recreation/Visitor Serving Facilities.”

a. Locating and Planning New Development

Policy 1.5 (*Land Uses and Development Densities in Urban Areas*).

Subsection a. permits, in urban areas, land uses designated on the LCP Land Use Plan Map, up to the densities specified in Table 1.3. The use and amount of development allowed on a parcel, including in areas designated “General Open Space” (in this case, “Open Space - Urban”) within the urban boundary in the Coastal Zone, shall be limited to the uses and to the amount, density and size of development permitted by the LCP.

With regard to these land use and density issues (including the density credit requirements of Policy 1.8c., subsection (c) and Table 1.3), the RM-CZ zoning regulations allow a single family residence, as discussed further in Section A.4 of this report. Table 1.3 (first paragraph) states that “all legal parcels shall accumulate...one density credit.” As cited in the discussion of LCP Policy 1.28, the original seven parcels (adjusted to four lots with the proposed LLA) were legally created; thus each of the four proposed lots (with one density credit each), are able to each accommodate a SFD, and do not exceed the density limits of the LCP, which allow for up to seven new residences under the existing lot configuration.

Policy 1.18 (*Location of New Development*) directs development to existing urban areas in order to: (1) discourage urban sprawl, (2) maximize the efficiency of public facilities, services and utilities, (3) minimize energy consumption, (4) protect and enhance the natural environment, and (5) concentrate new development in urban areas by requiring the “infilling” of existing residential subdivisions.

The project is consistent with the LCP directives to focus new development within existing urban areas. The project site is located within, and surrounded by, long-standing residential subdivisions, in an area where all public facilities, services and utilities currently exist. The project protects and enhances the natural environment, as the four SFDs are on relatively large parcels that range in size from 22,220 to 32,324 sq. ft., enabling the houses to be set back a good distance easterly of the bluff top trail and thereby protect sensitive habitats and provide for the trail’s continued use. A good portion of the existing Monterey cypress grove on the east side of the project site will also be preserved, and the proposed Conservation and Open Space Easement (between the SFD development and the trail and bluffs beyond) will protect sensitive habitats and the open space quality of the site.

Policy 1.19 (*Ensure Adequate Public Services and Infrastructure for New Development in Urban Areas*) stipulates that no permit for development in the urban area shall be approved unless the project will be served with adequate water supplies and wastewater treatment facilities. In this area, the Montara Water and Sanitary District (MWSD) provides both services. Water and sanitary service to the project site is consistent with the MWSD Public Works Plan and all other policies of the LCP, and the ability to serve these parcels has been confirmed by MWSD.

Policy 1.23 (*Timing of New Development in the Midcoast*) limits the number of new dwelling units in the urban Midcoast to 40 units each calendar year. To date, counting all such units for 2018 (which include new SFDs, Second Dwelling Units and Multiple Dwelling Units), 24 building permits have been issued. Looking back in past years, the average annual number has ranged from 15 to 30. Projecting ahead, it's not expected that the number of new residential units constructed in 2019 or 2020 will go beyond the current average.

Policy 1.25 (*Protection of Archaeological/Paleontological Resources*). The Mitigation Measures and Conditions of Approval associated with this project will ensure consistency with this policy. See the discussion in the Environmental Review Section of this report (response to the Native American Heritage Commission's comments to the IS/MND).

Policy 1.28 (*Conforming Legality of Parcels*)

Policy 1.29 (*Legalizing Parcels*)

Policy 1.30 (*Coastal Development Permit Standards of Review for Legalizing Parcels*)

The seven subject parcels (to be adjusted to four with the Lot Line Adjustment (LLA)) are legal parcels by virtue of the previously approved LLA. Thus, these policies do not apply to the project. See the discussion in the Environmental Review section of this report (response to Coastal Commission's comments to the first circulated IS/MND), as well as the LLA Conformance section for compliance with the LLA criteria.

Policy 1.35 (*All New Land Use Development and Activities Shall Protect Coastal Water Quality Among Other Ways By*):
(1) implementing appropriate site design and source control best management practices (BMPs), (2) preventing pollutants from entering stormwater runoff, (3) using natural features and stormwater

treatment systems, (4) minimizing the introduction of pollutants into coastal waters, (5) minimizing the amount of impervious surfaces of new development and maximizing on-site infiltration of runoff, and (6) avoiding development of areas that are susceptible to erosion and sediment loss where feasible and incorporating BMPs to minimize erosion and sediment loss.

The County Geotechnical Section has reviewed the project's 2017 Preliminary Storm Drainage Report (by Mesiti-Miller Engineering, Inc., Attachment P), the 2016 Geotechnical Investigation (by Haro, Kasunich and Associates; Attachment S), together with the 2018 Geotechnical Investigation Update (Attachment S.1), and concluded that these plans are consistent with the policies cited above. Additionally, the IS/MND includes several MMs that will ensure that all measures are implemented per the approved plans and maintained, both during project construction and post-construction.

Policy 1.36 (*Half Moon Bay Airport Influence Area Requirements*), states that new development and land uses must comply with all relevant Federal Aviation Administration (FAA) standards and criteria; in this case around safety. The project site is within the "Half Moon Bay Airport Influence Area" (LCP Map 1.5). As a result, the project was reviewed against the 2014 County Half Moon Bay Airport Land Use Compatibility Plan (ALUCP), with specific attention given (around safety criteria) to airport generated noise impacts.

The project site is located about 2,500 lineal feet (0.47 miles) north of the Half Moon Bay Airport, a public airport operated by the County Department of Public Works. Development within certain proximities of the airport are regulated by applicable policies and requirements of ALUCP, as adopted in 2014. The project site is located approximately 2,625 lineal feet north of the airport's Airport Overlay Zone and approximately 3,000 feet north of the "Runway Protection Zone," both as shown in the ALUCP (Exhibit 2E), as well as outside and north of the "Extremely Noise-Sensitive Areas" (Exhibit 2J).

Also, per the ALUCP's Figure 2G (*Projected Yr 2032 Noise Exposure Contours*), the project site lies in an area subjected to noise levels of less than 60 CNEL and the heights of the four residences, averaging around 28 feet, are well under the Plan's Airspace Terrain Penetration zone (which dictates height limits for structures, trees and other objects) of 216 feet.

Given the ALUCP's Table 4B shows that the project site is not located within the HMB Airport's 65 decibels CNEL or higher and pursuant to California Public Utilities Code (CPUC) Section 21669.5, the project

doesn't meet the definition of a "noise-sensitive land use." As such, recordation of an Avigation Easement is not required.

Finally, per Exhibit 4C (*Safety Zones*) (Attachment DD.1), the project site lies just outside of and north of the "Outer Approach/Departure (Zone 4)," which is aligned with runways 30 (identified at south end) and 12 (at north end). However, since the project site is within the "Airport Influence Area (AIA) (Zone 7)," Table 4B (*Safety Criteria Matrix*) applies, which stipulates criteria and conditions for various uses. For uses within the AIA, while there are no limits to residential density (dwelling units per acre), the applicable criteria here is that Development Conditions require an "Airport Disclosure Notice." To this end, the ALUCP's Appendix D includes a "California Real Estate Disclosure Notice" that states (per the California Business and Professions Code, Section 11010(b)(13)) that for owners of subdivided property within an airport influence area as adopted by the airport land use committee [per the cited ALUCP], the location of the airport must be disclosed. By law, the following statement must be included in the notice of disclosure:

NOTICE OF AIRPORT IN VICINITY

The property is presently located in the vicinity of an airport, within what is known as an airport influence area. For that reason, the property may be subject to some of the annoyances or inconveniences associated with proximity to airport operations (i.e., noise, vibration, or odors). Individual sensitivities to those annoyances can vary from person to person. You may wish to consider what airport annoyances, if any, are associated with the property before you complete your purchase and determine whether they are acceptable to you.

In order to carry out LCP Policy 1.36 and comply with the use and safety criteria cited in the ALUCP, the recommended conditions of approval requires that the above cited "Airport Disclosure Notice" be recorded on the deeds of the four lots.

b. Public Works Component

Policy 2.52 (*Traffic Mitigation for all Development in the Urban Midcoast*) requires applicants for new development that generates any net increase in vehicle trips on Highways 1 and/or 92. This requirement does not apply to the development of SFDs on existing legal lots and therefore is not applicable to the project.

c. Sensitive Habitats Component

Policy 7.1 (*Definition of Sensitive Habitats*). Pursuant to the documentation of the McGraw Biological Survey (Attachment T), and meeting the California Department of Fish and Wildlife's (F&W) definition as "rare and endangered," Coastal Prairie Grassland, the endangered coast yellow leptosiphon (CYL) and other rare plant species (Johnny nip, harlequin lotus and Blasdale's bent grass) exist either on or near the project site; all meeting the definition of "Sensitive Habitat per this policy.

Policy 7.3 (*Protection of Sensitive Habitats*) prohibits any land use or development which would have significant adverse impact on sensitive habitat areas. Pursuant to the documentation found in the McGraw Biological Survey (Attachment T), the discussion in the revised IS/MND's "Biological Resources" section, and the associated MMs, together with the proposed Easement (intended to preserve and protect the coastal prairie grass land and other identified rare plant species on the project site; the CYL is located off and just west of the site), staff concludes that the project is consistent with this policy.

Policy 7.4 (*Permitted Uses in Sensitive Habitats*) permits only resource-dependent uses in sensitive habitats. All of the sensitive habitat areas contained on the site are included in the proposed easement area. The types of activities permitted within the easement area are limited to "resource-dependent" uses; thus the project is consistent with this policy. With regard to the CYL and other rare plant species occurring off the project site and on the ocean side of the bluff top trail, MM 7 requires future property owners to cooperate with the County on the restoration and management of these habitat areas in a manner that makes them indistinguishable from the adjacent sensitive habitat areas covered by the easement, and that allows for continued lateral coastal access while preserving sensitive plant habitats.

There is no riparian vegetation or wetlands (per LCP Definitions cited in Policies 7.7 and 7.14, respectively) on or near the project site

Policy 7.22 (*Designation of Marine and Estuarine Habitats*) designates the Fitzgerald Marine Reserve (adjacent to and west of the project site) as requiring protection. The Project site is adjacent and east of the Reserve. The project's design minimizes impervious areas, and includes a stormwater drainage plan (Attachment P) that provides for the implementation of Best Management Practices during construction. Implementation of these plans and measures ensure that impact to the coastal bluffs will be minimal. As such, the project is consistent with this policy.

Policy 7.31 (*Sea Cliffs – Development Standards*) restricts pedestrian traffic in bluff and cliff areas for safety and resource protection purposes. The “pedestrian traffic” in this case consists of those walking along the long existent bluff top trail (listed in LCP Table 10.2 as a trail to which the public has likely established a prescriptive right to use). MM 7 addresses future management of the trail to ensure that its continued use is consistent with the protection of public safety and sensitive habitats. The discussion of applicable LCP policies within the Shoreline Access Component also concludes that the project is consistent with this and other policies that seek to protect and enhance coastal access opportunities in a safe and environmentally sustainable manner.

Policy 7.32 (*Designation of Habitats of Rare and Endangered Species*)

Policy 7.33 (*Permitted Uses*)

Policy 7.34 (*Permit Conditions*)

While there are no known rare or endangered animal species on or near the project site, previous discussion in this section has acknowledged that the CYL and other identified rare plants are located on and near the project site. And while there is surrounding habitat that supports these plants, there are also identified areas of invasive plants that possibly threaten the rare and endangered plants. As discussed above, the MMs contained in the IS/MND and the recommended conditions of project approval ensure consistency with these three policies.

Policy 7.35 (*Preservation of Critical Habitats*) requires preservation of all habitats of rare and endangered species using criteria including, but not limited to, the RM-CZ District’s Development Review criteria, as referenced in Section A.5 of this report. The previous discussion in this Sensitive Habitats Section of this report describes how the MMs contained in the IS/MND and the recommended conditions of project approval achieve consistency with this policy.

d. Visual Resources Component

Policy 8.4 (*Cliffs and Bluffs*) requires all development and associated landscaping to be set back sufficiently to ensure that it is not visually obtrusive when viewed from the shoreline, except in highly developed areas where adjoining development is nearer the bluff edge.

The proposed four SFDs are set back from their western property line boundaries by a distance of 97 to 173 feet, with an additional distance between the four lots' westernmost boundaries to the bluff top, as shown in the table below:

	Lot 1	Lot 2	Lot 3	Lot 4
Westernmost Property Line to Bluff Edge	Varies: ~35 ft. – 60 ft.	Varies: ~5 ft. – 60 ft.	Varies: ~12 ft. – 25 ft.	Varies: ~30 ft. – 70 ft.
Bluff top Trail to Bluff Edge	Varies: ~10 ft. – 35 ft.	Varies: ~5 ft. – 35 ft.	Varies: ~5 ft. – 20 ft.	Varies: ~20 ft. – 50 ft.

The top portions of all four of the proposed SFDs will be visible as viewed from the beach below the bluffs. However, pursuant to the qualifications of this policy, the project site is located in and surrounded by a relatively highly developed area. Additionally, based on the set back of the four SFDs from the bluff top, their partial visibility from the beach vantage point is not obtrusive. Thus, the project is consistent with this policy.

Policy 8.5 (*Location of Development*) applies to urban parcels larger than 20,000 sq. ft. (of which all four subject parcels exceed), and requires that new development (1) is least visible from State and County Scenic Roads; (2) is least likely to significantly impact views from public viewpoints, (3) is consistent with all other LCP requirements and best preserves the visual and open space qualities of the parcel overall.

The project site is within the Highway 1 County Scenic Corridor, and potentially impacts public views as seen from Highway 1, as well as from Vallemar and Juliana streets, generally looking westward. The development will also be visible from the beach below the bluff top, looking up and eastward, as well as from the bluff top trail looking eastward (directly at the proposed four SFDs). Portions of the detached garages and residence rooflines would be visible as seen from Highway 1, although the portion of the Monterey cypress grove to be preserved will minimize that impact. From Vallemar looking westward, the current view to the beach is blocked with the dense cypress grove. The development, once complete (with portions of the cypress grove removed), will reveal the detached garages and the upper portions of the SFDs behind them, from some of these easterly vantage points. This is, on balance, the most protective of important coastal resources because locating the SFDs as far eastward on their respective lots is necessary to protect sensitive habitat on the project site, as previously discussed.

The project also complies with the RM-CZ's minimum required 50 ft. front and 20 ft. side setbacks. While the four SFDs will be clearly visible from the bluff top trail looking eastward, the development is set well back from the trail as shown (in approximate distances) in the table below:

	Lot 1	Lot 2	Lot 3	Lot 4
Distance (ft.) from trail to west-facing vertical side of SFDs	~90-100 ft.	~90-100 ft.	~95-100 ft.	~120+ ft.
Distance from trail to closest edge of west-facing (grade-level) outside deck area	~ 85 ft.	~75 ft.	~70 ft.	~100 ft.
Depth of Conservation and Open Space Easement (from westernmost SFD development to lots' westernmost boundaries)	~95-120 ft.	~105-120 ft.	~105-150 ft.	~155-195 ft.

The visual impacts of the four SFDs will also be softened by the remaining Monterey cypress grove to be preserved. The top most portions of the four SFDs will be visible from some vantage points down on the beach below the coastal bluffs (as shown on the Photo Simulations provided in Attachment O.). However, the SFDs have been set back as far as reasonably possible on the proposed lots, while meeting minimum setback requirements. Finally, the proposed Easement (with its depths shown on the table above) will result in a permanent open space-protected area, which will serve to mitigate the views of the SFDs as seen from the trail. On balance, the project protects the most significant coastal resources on the parcel, and minimizes its visual impacts consistent with this policy.

Policy 8.8 (*Natural Features-Vegetative Features*) defines vegetative forms as either naturally occurring or introduced vegetation. The previous discussion in the Sensitive Habitat section, together with the McGraw Biological Survey, documents both the native and introduced vegetative features. The Monterey cypress grove, which will be thinned in order to accommodate the project, is an introduced species, while native grassland species will be preserved within the proposed easement area. As such, the project is consistent with this policy.

Policy 8.9 (*Trees*) seeks to locate new development to minimize tree removal (of "significant" size per the Significant Tree Ordinance) and protect trees specifically selected for their visual prominence and their important scenic qualities.

The dense Monterey cypress grove covers the easterly portion of the project site, adjacent to Vallemar. The location of the four SFDs

toward the site's far eastern side will require the removal of 30 significant trees (see Moss Beach Tree Survey; Attachment V), with several others being trimmed and preserved, pursuant to the discussion in the IS/MND's "Biological Resources" Section and cited MMs. The number of trees being removed is necessary to accommodate the four SFD's and the setbacks required to: (1) protect sensitive coastal prairie habitat and provide the minimum 50 ft. front setback from Vallemar to the SFDs; (2) allow adequate driveway access from Vallemar to the garages, (3) accommodate the grading required to locate the SFDs on this steeper portion of the project site, and (4) meet minimum fire safety clearance distances. In light of these factors, and the inclusion of native tree species in the landscape plan, the project is consistent with this policy.

Policy 8.12 (*General Regulations*): (a) applies the Design Review (DR) Zoning District to urban areas in the Midcoast, including the design standards in Section 6565.20, and (b) seeks to locate and design new development and landscaping so that ocean views are not blocked from public viewing points such as public roads and publicly-owned lands.

As discussed in the Design Review Conformance section (A.6.) of this report, the project was considered by the Coastside Design Review Committee (C-DRC) on three occasions, where it was reviewed against all DR standards applicable for all Midcoast residential development (as required by the RM-CZ District regulations). The review of the location and design of all four SFDs took into consideration policy directives that require the blockage of ocean views from public viewing points to be minimized. The C-DRC found that the project complied with these and other applicable DR standards and voted (2-1) to recommend approval (see Attachment W.). While the Moss Beach representative (as well as other local residents) did not support such a decision, their primary comments centered more on the size and scale of the four SFDs relative to those in the surrounding area (as discussed in the "Environmental Review" section of this report). The C-DRC's recommendation, together with staff's analysis of these issues, concludes that the project is consistent with this policy.

Policy 8.13 (*Special Design Guidelines for Coastal Communities*). In the Montara-Moss Beach-El Granada-Miramar area, the following criteria apply:

- (1) Design structures that fit the topography of the site and do not require extensive cutting, grading, or filling for construction.

- (2) Employ the use of natural materials and colors that blend with the vegetative cover of the site;
- (3) Use pitched roofs that are surfaced with non-reflective materials except for the employment of solar energy panels;
- (4) Design structures that are in scale with the character of their setting and blend rather than dominate or distract from the overall view of the urban landscape;
- (5) To the extent feasible, design development to minimize the blocking of views to or along the ocean shoreline from Highway 1 and the sea.

Both the C-DRC's recommendation and staff's analysis, as presented in Section A.6. of this report (DR Conformance), concludes that the project is consistent with Subsections (1) through (5) above. With further regard to item (4), please see the discussion in the "Environmental Review" Section of this report (Resident comments to IS/MND), which responds to the "scale" issue that was primary and common to many of the comments received.

Policy 8.32 (*Regulations of Scenic Corridors in Urban Areas*) applies the regulations of the DR Zoning Ordinance, as previously discussed in reference to Policies 8.12 and 8.13.

This policy includes all applicable DR Standards as part of the standard of review. The C-DRC reviewed the project against these standards and recommended approval. As discussed in the analysis of project compliance with LCP Policy 8.12, the project is consistent with requirements of Policies 8.13 and 8.32.

e. Hazards Component

Policy 9.1 (*Definition of Hazard Areas*)

Policy 9.2 (*Designation of Hazard Areas*)

Policy 9.3 (*Regulation of Geologic Hazard Areas*) applies several RM Development Review criteria, the most applicable being "Hazards to Public Safety" (Section 6324.6).

The project site is adjacent to a coastal bluff with limited stability due to factors including sea rise levels, erosion caused by stormwater runoff, and liquefaction issues affecting the southerly portion of the

site. As a result, the project site meets the LCP definition of, and is designated as, a “Hazard Area.”

Policy 9.8 (*Regulation of Development on Coastal Bluff Tops*) permits bluff and cliff top development only if design and setback provisions are adequate to assure stability and structural integrity for the expected economic life span of the development (at least 50 years) and if the development (including storm runoff, foot traffic, grading, and irrigation) will neither create nor contribute significantly to erosion problems or geologic instability of the site or surrounding area. This policy also requires the submittal of a site evaluation report prepared by a soils engineer/certified engineering geologist demonstrating that the soil is stable enough to support the proposed development.

As discussed in the Geology/Soils section of the IS/MND (Attachment AA), and in compliance with Policy 9.8 a. and b. cited above, the “Valleamar Bluffs Coastal Hazards Assessment”, prepared by Environmental Science Associates (Attachment Q.) provides an updated coastal bluff recession study (incorporating more conservative sea-rise estimates in league with the California Coastal Commissions standards) to the applicant’s initially submitted report (Attachment P). With the reduction of the original project scope from six to four SFDs, and the large setback easterly from the bluff top edge, issues around bluff top erosion affecting the proposed four SFDs was significantly remediated. Additionally, the “Geotechnical Investigation Update” by Haro, Kusinich & Associates (which was based on geotechnical soils borings and testing on all four lots; Attachment S.1), together with the “Preliminary Storm Drainage Report” by Mesiti-Miller Engineering (Attachment P.), ensures that stormwater drainage will be captured and filtrated on-site, preventing any significant impacts from stormwater drainage on the bluff tops, as well as recommending foundation types (specifically on southerly Lot 4) to mediate any potential liquefaction impacts.

All reports cited above have been reviewed by the County’s geotechnical engineer and found consistent with all policies cited here (including with Policy 9.10; *Geologic Investigation of Building Sites*). Additionally, pursuant to Policy 9.8 c. (prohibiting new structures that would require the need for bluff protection work), and consistent with the California Coastal Commission’s comments to the IS/MND (as cited in the Environmental Review Section of this report), a new condition of approval has been added that includes a deed restriction prohibiting any future bluff protection measures. As a result, and together with the other applicable MMs associated with this policy, the project is consistent with the cited “Hazards Component” Policies.

f. Shoreline Access Component

Policy 10.1 (*Permit Conditions for Shoreline Access*) requires some provision for shoreline access as a condition of granting development permits for any private development permits between the sea and the nearest road.

Policy 10.3 (*Definition of Shoreline Access*) defines shoreline access as the provision for the general public from a public road to and along the shoreline, both vertical and lateral access.

Policy 10.4 (*Designation of Shoreline Access*) designates lateral (shoreline destinations) access to the applicable policies of this Component, as well as to the designation and assessment of the bluff top trail as found in Tables 10.1 (*Assessment of Access Trails and Shoreline Destinations*), 10.2 (*Preliminary Analysis of Likelihood of Prescriptive Rights in the Midcoast*), and 10.6 (*Site Specific Recommendations for Shoreline Destinations*).

The above three policies are applicable to the project. As stated in the beginning of this report, a bluff top trail runs generally parallel to the bluffs (constituting “lateral access”), located primarily on the eastern half of abandoned Strand roadway, whose ownership lies with the applicant (although some portion of the trail lies within the directly adjacent and County-owned Fitzgerald Marine Reserve). This trail is accessed from the westerly end of Juliana Ave. and traverses northerly along the project site, to where it turns easterly and outfalls at Vallemar St. This trail is also acknowledged on all three tables cited in Policy 10.4.

While there is access down to the beach (Fitzgerald Marine Reserve) below the project site’s coastal bluffs at the end of Juliana Ave., such access is not authorized nor maintained by the County Parks Department; the access actually occurs across private property. Nor is such access to the beach below (at this point) recognized in the LCP tables cited above. The Parks Department’s formal and managed access point down to the beach is located about a 1/3 of a mile to the south, at North Lake Street and California Avenue.

Policy 10.9 (*Public Safety*) seeks to provide safe access to shoreline destinations (as just described) which are large enough to accommodate public service improvements and public use, i.e. bluff areas which are large/wide enough and of a physical character to accommodate safety improvements and which provide room for public use as a vista point.

Portions of the subject bluff top trail, due to its proximity to bluff tops that are expected to erode (from weather, age and expected sea rise) will in the future inevitably need to move easterly. Staff anticipates this occurrence and recommends that MM 7 be revised to require that the conservation easement accommodate any necessary future relocation of the trail into the easement area.

Policy 10.17 (*Lateral Access – Shoreline Destinations with Coastal Bluffs*) seeks to provide a pathway with a right-of-way at least 25 feet in width, which allows feasible unobstructed public access along the top of the bluff when no such access is provided in the area between the mean high tide and the base of the bluff.

Policy 10.23 (*Development Standards for Protecting Public Safety – Access Trails*) gives preference to providing access trails in level, safe areas, and where no safe areas exist, fences along the edges of narrow bluffs be considered.

Policy 10.24 (*Development Standards for Protecting Fragile Resources – Access Trails in Fragile Resource Areas*) seeks to conduct studies by a qualified person to determine the least disruptive method of constructing access trails and associated improvements. Consider in the study and implement appropriate levels of development and management practices to protect resources.

Policy 10.26 (*Access Trails in Sensitive Habitats*) seeks to provide improvements and management practices in sensitive habitats and their buffer zones adequate to protect the resources, which may include interpretive trails posted with educational signs which minimize public intrusions and impacts.

With regard to Policies 10.9, 10.17, 10.23, 10.24 and 10.26, there is public access (from the County's managed access point about 1/3 mile south) along the beach down below at the base of the bluffs. However, regarding the bluff top trail, the recommended conditions of approval require the current and future owners to maintain lateral bluff top access in a manner that is consistent with public safety and with the protection of sensitive habitats. This will be achieved through the required agreement with the County Parks Department; the terms of the conservation easement, HMP, and CC&R's; and, the enforcement of these terms, and the conditions of permit approvals, by the easement interest holder and the County.

Further, the coastal bluffs, due to their erosive features, would be considered a "fragile resource" as are the coastal prairie grassland and other rare plants (which also represent sensitive habitats) near

and on the subject site. As previously stated, when any portion of the bluff top trail requires relocation, the plan for relocation will require assessment by a biologist, and will be executed and managed as necessary to avoid any adverse impact on sensitive habitats, including through the use of signage and fencing. With these conditions, the project is consistent with the cited policies.

Compliance with State Coastal Act, Chapter 3, Article 2 (Public Access). Chapter 3, Article 2 (commencing with Section 30200) stipulates that every coastal development permit issued for any development between the nearest public road and the sea or the shoreline of any body of water located in the coastal zone (as is the case with this project) shall include a specific finding that the development is in conformity with the public access and public recreation policies of this part.

Section 30212 (*New Development Projects*) states that public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where: (1) it is inconsistent with public safety or the protection of fragile coastal resources, or (2) adequate access exists nearby. Dedicated accessway shall not be required to be opened to public use until a public agency or private association agrees to accept responsibility for maintenance and liability of the accessway.

As previously cited in the discussion to Policy 10.4, the access down to the beach (Fitzgerald Marine Reserve) at the end of Juliana is not authorized and can result in potentially adverse impacts to coastal resources; formal and authorized access to the Research and beach is provided about 1/3-mile to the south. Conditions of project approval that memorialize the applicant's commitment to maintain and preserve the existing bluff top trail carry out the cited Coastal Act policies.

Policy 10.27 (*Development Standards for Protecting Adjacent Land Uses – Residential*) seeks to provide separation between shoreline access and adjacent residential uses to protect the privacy and security of houses. The existing bluff top trail's distance away from the westernmost side of residential development on the four lots ranges from 70 to 120. Thus, even with the potential need to move portions of the trail easterly (in the event of future bluff top erosion), there will be ample setback to ensure consistency with this policy.

Policy 10.38.b. (*California Coastal Trail (CCT)*) states that segments of the California Coastal Trail shall be development consistent with the County Parks Department. Subsection (5), "CCT Siting and Design Standards", states that the trail should be sited and designed to be

located along or as close to the shoreline where physically possible. In this case, a continuous trail cannot be placed right along the shoreline/coastal bluffs, as lateral coastal access along the existing bluff top trail terminates at its intersection with private property to the north. Accordingly, this policy allows the CCT to be located along and within a public road right-of-way, and County Parks has indicated that the west side Vallemar right-of-way is identified as a link to further and complete the CCT. As a result, a Condition of Approval has been added that prior to issuance of any of the building permits for the four residences, the applicant shall work with the County Parks and Public Works Departments towards the planning and implementation of that segment of the CCT that would run along either side (but within the Vallemar road right-of-way), taking into consideration the minimum required trail width and any striping/signage standards set and allowed by those departments. The trail section shall be completed, to those departments' satisfaction, prior to the final building permit approval of the last of the four residences. As such, the project is consistent with this policy.

4. Conformance with Resource Management-Coastal Zone/Design Review (RM-CZ/DR) (Midcoast) Development Standards

Residential structures within an RM-CZ District and located within the Midcoast LCP Update Project Area (Section 6908A) are regulated by the standards shown (with project compliance indicated) in the table below:

	Maximum Allowable Height ¹ :	Minimum Required Setbacks:	Maximum Allowable Floor Area:	Maximum Allowable Impervious Surface Area ² :	Covered Parking ³ :
	28'	50' front 20' sides & rear	6,200 sq. ft.	10% Parcel Size (for structures <18" above grade)	2 covered parking spaces
Lot 1	All Comply	All Comply	4,020 sq. ft.	0%	All Comply
Lot 2			4,072 sq. ft.	2.2%	
Lot 3			4,018 sq. ft.	1.8%	
Lot 4			4,020 sq. ft.	1.4%	

¹ While all four proposed houses do not exceed this limit, it's important to note that height calculation (in the RM-CZ, as opposed to the R-1/S-17 District) is based on the height as measured from each respective lot's average grade to the mid-point between the topmost gable and the topmost roof peak (see Attachment EE).

² Pursuant to Section 6908D, the runoff equivalent of 10% (from non-porous driveways, decks, patio, walkways) can be achieved by directing runoff to on-site porous areas or through the use of detention basins, both of which are proposed by the project.

³ Covered parking is compliant pursuant to the Parking Regulations, Section 6119.

Further, pursuant to the DR overlay element of the RM-CZ District, the proposed development was subject to the Midcoast DR standards, including review and recommendation by the Coastsides Design Review Committee, as occurred pursuant to the discussion in Section A.6 of this report.

5. Conformance with the RM-CZ Development Review Criteria

The RM-CZ regulations require that a RM Development Review permit be obtained for development, to ensure compliance with the Development Review Criteria cited in Chapter 20A.2.(Section 6324) of the Zoning Regulations. The applicable Development Review criteria are cited in the table below, with references to the equivalent LCP Component policies as cited and discussed in the LCP Conformance section of this report, as well as other sources in the report. Pursuant to that discussion and cited MMs and Conditions of Approval, the project complies with Development Review standards.

RM Development Criteria	Corresponding LCP Component & Other Sources of Discussion
Environmental Quality Criteria	Sensitive Habitats; IS/MND
Utilities	Visual Resources
Site Design Criteria	Visual Resources; IS/MND
Water Resources Criteria	Locating and Planning New Development
Cultural Resources Criteria	Locating and Planning New Development (also discussed in General Plan Conformance and Environmental Review Sections)
Primary Scenic Resources Areas Criteria	Visual Resources; IS/MND (also discussed in Section A.4.: Conformance with DR Standards)
Ocean Shoreline Criteria	Shoreline Access
Primary Natural Vegetative Areas Criteria	Sensitive Habitats; IS/MND
Slope Instability Area Criteria	Hazards; IS/MND

6. Conformance with the Design Review Standards

The Project Site is located in the RM-CZ/Design Review (DR) zoning district, whereby the DR requires consideration and a recommendation by the Coastsides Design Review Committee (C-DRC). The project was considered by the C-DRC on three occasions: July 25, September 26, and October 31, 2017. At the last meeting, the C-DRC recommended approval on a 2-1 vote (Attachment W.), with the minority member (the Moss Beach representative) continuing to express concerns about the overall size of the four residences.

Critical standards considered by the C-DRC for the project included “Neighborhood Definition & Character,” “Site Planning & Structure Placement,” “Elements of Design,” and “Landscaping, Paved Areas, Fences, Lighting & Noise.” Despite the C-DRC’s subsequent recommendation for approval, it was the standard under “Building Mass, Shape & Scale” (of “Elements of Design”), that consistently - throughout all three DR meetings triggered the greatest concerns as posed by neighbors, as well as by the C-DRC Moss Beach representative. That standard reads:

“New...homes should respect the scale of the neighborhood through building dimensions, shape and form, façade articulation, or architectural details that appears proportional and complimentary to other homes in the neighborhood”

With regard to this standard, it’s important to understand the maximum allowable floor area and height limits imposed by the RM-CZ District in Midcoast area. The RM-CZ (Midcoast) Zoning Regulations limit floor area to 6,200 sq. ft. for parcels exceeding 11,698 sq. ft., as is the case for the subject lots.

While the floor areas of all four residences are larger than the average size of single family residences in the surrounding R-1/S-17 areas (a comparison submitted by neighbors for 13 other houses located north along Vallemar to the end of Julianna cited an average house size at nearly 2,100 sq. ft.), the lot sizes of the four project sites range, respectively, range from 4.7 to 6.4 times the size of the surrounding R-1/S-17 zoning whose minimum lot size is 5,000 sq. ft. The residences’ height calculation is based on the height as measured from each respective lot’s *average* grade to the mid-point between the topmost gable and the topmost roof peak (see Attachment Z). While all four houses comply with the maximum allowable limit measured in this fashion, the houses are slightly higher than the maximum allowable height applied to the surrounding houses, given the method of measurement in the R-1/S-17 zoning district (see Attachment EE.). While the C-DRC’s decision found that all four residences conformed with the Design Review standards, they were not unanimous in their charge to control house size given some neighbors’ (as well as the CDRC’s Moss Beach representative) concern that their size was not in scale with other homes in the immediate R-1/S-17 zoned neighborhood.

With regard to the issues of size and scale, please see the discussion in the “Environmental Review” Section of this report (Local Residents’ Comments to IS/MND)

7. Conformance with the Grading Regulations

The grading required to construct the project is quantified in the following table:

	Cut	Fill	Grading Total	Distance from Vallemar to Lots' Westernmost Edge/Average Slope
Lot 1	250 c/y	400 c/y Net Import: 150 c/y*	650 c/y	135 ft./13.3%
Lot 2	300 c/y	500 c/y Net Import: 200 c/y*	800 c/y	120 ft./15.8%
Lot 3	0 c/y	1,100 c/y Net Import: 1,100 c/y*	1,100 c/y	140 ft./16.4%
Lot 4	50 c/y	1,100 c/y Net Import: 1,050 c/y*	1,150 c/y	140 ft./15%
* Net import of fill means that the use of cubic yards of cut is not adequate to contribute the proposed and necessary fill; the net import amount is brought to the site from off-site sources.				

Most of the grading involved for each of the residences (as shown in the table above) occurs in the area where the project site's slope is greatest, and is necessary to accommodate driveways from Vallemar (at an incline not to exceed 20%), where the easterly-facing sides of the garages maintain the RM-CZ Zoning District's requisite 50-foot front setback.

The purpose of the Grading Regulations is to promote the conservation of natural resources, including topography and vegetation, as well as to protect health and safety, which includes the reduction or elimination of erosion, siltation and flooding. Any grading associated with construction of a building that exceeds 250 cubic yards (c/y) requires a Grading Permit. All application requirements of the Grading Regulations (including grading plans with engineer's estimate of the quantity of materials, an erosion and sediment control plan, dust control plan, cross sections detailing the grading to occur), have been submitted and reviewed by the County Department of Public Works and the County Geotechnical Section and deemed compliant with the applicable requirements. Further, the following findings are required and can be made:

That this project, as conditioned, will not have a significant adverse effect on the environment. The project has been reviewed by Planning staff and the Department of Public Works, which found that the project can be completed without significant harm to the environment as conditioned.

Review of the grading and erosion control plans – together with the County Geotechnical Section's review of submitted soils study, bluffs hazard assessment and drainage reports - was critical to ensure that that: (1) the

development and its associated grading during construction and post-construction stormwater drainage (for the four residences) was adequately contained on their respective four lots, and did not adversely affect or increase erosion as it could affect the bluff top, trail or other resources. In addition to the discussion of these issues and impacts in the revised IS/MND (Attachment AA), the associated mitigation measures of that document, together with the conditions of approval will ensure that the project can be completed without significant harm to the environment.

That this project, as conditioned, conforms to the criteria of the San Mateo County Grading Ordinance and is consistent with the General Plan. Planning staff and the Department of Public Works have reviewed the project and have determined its conformance to the criteria of Chapter 8, Division VII, San Mateo County Ordinance Code, including the standards referenced in Section 8605 and the San Mateo County General Plan.

Pursuant to the County Department of Public Works and Geotechnical Sections review and conditioned approval of the grading plans, as well as the discussion and associated MMs cited in Section 9 (*Hydrology and Water Quality*) of the revised IS/MND, the project complies with the Grading Ordinance.

8. Conformance with the Lot Line Adjustment Criteria and Requirements

The project includes a Lot Line Adjustment (LLA), effectively reconfiguring and reducing the original seven legal lots down to four lots (see Attachment FF.). The County Subdivision Regulations (Chapter 10, Section 7126) cite the following criteria against which Lot Line Adjustments are reviewed with staff response:

- a. *Conformity with applicable General Plan, specific plan (e.g., the Montara/Moss Beach/El Granada Community Plan), LCP, and Zoning and Building Regulations.*

The subject LLA complies with applicable policies in the General Plan and the Montara/Moss Beach/El Granada Community Plan, as referenced in Sections A.1 and A.2 of this report, which directs to a broader discussion of issues in the LCP Conformance (specifically around Policies 1.28, 1.29, and 1.30), as well as the Environmental Review (Response to California Coastal Commission Comments on IS/MND) sections of this report.

- b. *Suitability of building sites created by the LLA.*

The LLA will reduce the existing seven lots down to four, with resultant lot sizes ranging from 22,220 sq. ft. through 32,324 sq. ft. The

proposed development of a single-family residence on each lot meets minimum front side and rear setbacks as required by the RM-CZ regulations, resulting in building sites that are suitable for the proposed development.

- c. *Provision for adequate routine and emergency access.*

All four proposed lots front onto and take direct driveway access from Vallemar Street, a fully improved County-maintained roadway intersecting with Highway 1 just south of the project site, providing adequate routine and emergency access to the lots.

- d. *Provision of adequate water supply and sewage disposal.*

Water and sewage disposal service connections are available to serve all four lots; connections will occur from existing main trunk lines along Vallemar Street.

- e. *Avoiding or minimizing impacts upon scenic corridors, wetlands, coastal resources, or authorized coastal development.*

The Project site is located within the Highway 1 County Scenic Corridor, with the proposed four lots oriented generally perpendicular to the Highway and Vallemar. Due to the downward topographic slope from the lots' easterly edge (closest to Vallemar), together with the Monterey cypress grove that will be retained, the visibility of the houses (e.g., the top of the detached garage roofs) as seen from Highway 1 will be minimized. Primary coastal resources existent and affecting areas both on and near the project site include sensitive habitats (coastal terrace prairie grass, CYL and other rare plants), visual (views of proposed houses as seen from Highway 1 looking westerly, and from along the coastal bluff top trail and the beach down below the bluffs looking easterly), hazards (inevitable bluff top erosion) and shoreline access (ensuring the bluff top trail remains intact and accessible from Juliana Avenue). As discussed at length in the LCP Conformance and Environmental Review sections of this report, the proposed LLA will avoid or minimize impacts to these coastal resources.

Pursuant to Section 7128.1 (*Standard Condition for All Lot Line Adjustments*), the project includes Parcel Map option (subsection (c)), whereby the recordation of such map will be required as a Condition of Approval once all other required permit approvals have been provided. As also discussed earlier in this report, the recordation of the LLA Parcel Map will include with it the final, approved versions of the

Conservation and Open Space Easement, the Habitat Management Plan, and associated CC&Rs.

B. ENVIRONMENTAL REVIEW

An Initial Study and Mitigated Negative Declaration (IS/MND) was prepared for this project and circulated from January 17 through February 15, 2018. Comments were received from the Midcoast Community Council, California Coastal Commission, County Departments, California Department of Fish & Wildlife (F&W), as well as many location residents and interested parties. While initially released and circulated for a 20-day period (to have ended on February 5, 2018), the County extended the review period for another ten days pursuant to F&W's request for additional time for comments due to their concurrent consideration of designating a particular rare plant (coast yellow leptosiphon; CYL), located just off and westerly of the project site) as "endangered". As a result, the County extended the review period to February 25, 2018.

Several comments were received from some neighbors regarding the size of the four houses, as well as comments from the California Coastal Commission (CCC). However, F&W also sent a letter challenging the efficacy of the IS/MND, specifically regarding the document's discussion, impact conclusions and associated mitigation measures cited in the document's "Biological Resources" section around the status of the CYL known to be present on the adjacent County-owned property, as well as other rare plant species located on the subject site. This was due to their pending consideration of a petition (submitted by Toni Corelli, a local biologist) to designate the CYL as "endangered" under the California Endangered Species Act. In addition, the CCC's letter echoed similar concerns around the protection of these plant species. As a result, staff agreed to have the applicant provide additional study on the CYL and other rare plants, and to recirculate an appropriately revised IS/MND.

Soon after the F&W's letter and in response to those comments, on March 20, 2018, County staff, the applicant and his biologist, the County Parks Department biologist and the CCC's biologist met with F&W staff at their Yountville office. The outcome of that meeting was to determine some basic parameters for a new biological survey (on and off the project site) regarding the CYL and other rare plants, and the scheduling of a joint visit which occurred on April 5, 2018 (which included the applicant's biologist (Jodi McGraw), and staff from F&W, Coastal Commission, County Parks Department, and County Planning Section, as well as Toni Corelli.

As a result of Ms. McGraw's broader and comprehensive study of the CYL and other identified rare plant species, both on and off the subject site, a revised IS/MND was recirculated for a 30-day review period, from October 10 through November 8, 2018 (Attachment AA.). The only other section that was revised in this recirculated IS/MNG was the discussion in the "Geology & Soils" Section,

which provided an update of issues around expansive soils and project-related drainage per the review and approval of the County's Geotechnical Engineer.

What follows is a summary of the comments received, each followed by staff response. Where appropriate or required, the mitigation measures as they initially appeared with the Negative Declaration have been revised. All mitigation measures recommended by the Negative Declaration (including those revised) have been included as Conditions of Approval in Attachment A.

Local Residents. Upon circulation of the first IS/MND (January/February 2018), responses from eight area residents (see Attachment AA for full emails/letters and, where included, photos) were received (with addresses provided where known). While most appreciated the reduction of the number of houses to four, preservation of the heavily used bluff-top trail and the proposed conservation easement to further provide setback relief of development and providing protection for much of the on-site coastal prairie grass and rare plants, they all expressed a great love and appreciation for the beauty and varied public use that this bluff-top property has provided in the past and the strong desire to preserve it as such for the future. The table below summarizes their critical concerns and comments:

Resident Names	Critical Concerns/Comments
Deana and Michael Histan (200 Wienke Way, Moss Beach)	- Reduce height of homes by deleting third floor "catwalks", so that they are less obtrusive on bluff; - Reduce number of Monterey Cypress to be removed.
Stephanie Sills	- Houses are imposing and obtrusive as seen from the beach below; their design feels out of scale and character; - Eliminate third level, lowering roof line to two stories like other homes in neighborhood; - Preserve more Monterey Cypress trees (and the raptors that nest in them); e.g., preserving tree numbers 161, 167, 169 and 170 would help obscure the dominance of these homes; - Implement eco-friendly solutions to mitigate water pooling and runoff issues.
Gail Erwin and Paul Smith (21 Julianna Avenue, Moss Beach)	- Reduce size and height of homes; the 'mezzanine' is a third floor; the size will change the character of our neighborhood, encouraging weekend, part-time residents rather than permanent residents; - Outdoor patio configurations feature fireplaces and increase footprints of homes; - Any future armoring of the coastal cliffs should be prohibited; - The bluff-top (public use) trail should be a protected area subject to reconfiguration due to erosion.
Mike Schelp (210 Wienke Way, Moss Beach)	- The homes are too large and does not fit in with the neighborhood; disagrees with DRC member who stated that DRC's purpose is not to evaluate size but only design. - Echoed Gail and Paul Smith's comments.
Debbie McCarthy	- The homes' size and overall design scale are out of character with and will adversely impact the neighborhood;

	- Based on where the project's westernmost boundary would be, there is little room left for public use of the bluff-top trail; - Story poles misrepresented visual impact of project, due to significant tree removal; - Remove the third floor, keeping the height of homes more like those in immediate neighborhood; - Keep as many Monterey cypress trees as possible; they are home to raptors and would give each home more privacy.
Donna Croix (Wienke Way, Moss Beach)	- Reduce the size of the homes to fit in with the other homes in the area; - Preserve more of the Monterey cypress grove for the nesting birds and animals; - Eliminate the third level and lower the roof line to two stories; the nocturnal animals will appreciate less light.
James and Katherine Lockhart	- 'Biological Resources' Section not checked [this was corrected in Revised circulated IS/MND] - Aesthetics (both relative to discussion in IS/MND and with applicable LCP policies). Project will have a significant adverse impact on views from existing residential areas, public lands (Fitzgerald Marine Reserve, including from Wienke Cove Beach) and roadways (Highway 1, Vallemar, Juliana, Wienke Way). - Intrusion into naturally scenic area with Monterey cypress grove, many of which will be removed. - Conservation Easement description (boundaries, language) should be formalized and recorded prior to granting of CDP. - Mitigations should include: (a) elimination of third floor "catwalks," (b) substantial lowering of rooflines, (c) elimination of all external seaside patio fireplaces and associated tall chimneys, (d) elimination of second story portion of the two-story garages, and (e) reduce number of trees to be removed.

Staff Response: The above concerns and suggestions have been addressed in in the LCP Conformance section of this report, and are summarized below:

1. While the size (floor area and scale) of the four SFDs are certainly larger than those of the surrounding (R-1/S-17 zoned) neighborhood, they are also located on lots whose size (including the Easement area) range 4.4 to 6.4 times (in the case of Lot 4) the R-1/S-17 District's minimum lot size of 5,000 sq. ft.
2. While several residents commented that the removal of the third-story mezzanine/catwalk (leading to a west-facing upper deck) would reduce height and scale, this mezzanine area actually occurs within the upper clearstory area of the second story floor. The project architect concludes that its presence does not result in the roof line being any higher; conversely, removing it would not affect the roof line. This issue was discussed at some length in the C-DRC process, and removing the mezzanine area and/or lowering the roof line was not recommended by the C-DRC's (with due respect to the C-DRC's Moss Beach representative who took issue with the size and height of the proposed residences).

3. The four residences have been located as far east on the project site as is feasible, both to mitigate issues around future bluff top erosion and to accommodate the proposed easement (which will protect and preserve critical sensitive habitat and identified rare plants on the project site). Additional constraints included the need to take access from Vallemar, while maintaining the minimum 50 ft. front (from Vallemar) and 20 ft. side yard setbacks required by the RM-CZ development standards.
4. As a result of the locational criteria cited above, the project does result in the removal of 30 significant trees, with others being trimmed (to also ensure minimum fire suppression clearance requirements) to accommodate the four SFDs. Several native trees will also be planted, a MM that was supported by the CCC. The project also includes MMs requiring the assessment of such trees for nesting birds/raptors prior to any disturbance.
5. The bluff top trail's access by the public is ensured via the documents and MMs discussed in this report.
6. Concerns regarding the project's visibility from viewing points at the beach below the bluffs, and from points along Highway 1, Vallemar, and Juliana are, discussed in the LCP Conformance (*Visual Resources*) Section of this report. Some of the residents' comments were accompanied by a picture taken when the story poles were up early in the C-DRC process that clearly shows the four SFDs. Since then, more recent visual simulations (Attachment O) show the houses in the location they were moved back to, and with other changes that the C-DRC required. While the topmost roof elements of the SFDs will be visible from Highway 1 and (to a greater degree) from Vallemar and Juliana, that is because the houses have been moved back as easterly on the property (with the garages detached to reduce their massing) to accommodate access from Vallemar while still complying with minimum required front setbacks. Tree removal and trimming will certainly increase their visibility from these roadways, but many of the trees will remain (with new trees planted) to reduce the visual impacts. Taken altogether, the visual impacts from all cited public viewing points will not be significant.

Midcoast Community Council (MCCC). Upon circulation of the first IS/MND (January/February 2018), the MCCC provided comments (letter dated January 24, 2018; Attachment Z.); they did not provide any additional comments to the second circulation of the IS/MND. However, their initial comments are summarized as follows:

* *Biotic Easement:* The biotic easement (since referred to as the Conservation Easement) should have a deadline on when it must be finalized.

* *Perimeter Fence and Public Trail*: A Condition of Approval should be added requiring a determination by the County Parks Department to determine a safe minimum distance for the public trail, between the cliff edge and private property boundary fence.

* *Coastal Hazard*: Require a: (a) prohibition of future shoreline armoring; (b) removal of development if it becomes unsafe to occupy due to threat of coastal (bluff erosion) hazards; (c) removal of debris that falls from the bluff top onto the beach below; (d) assumption of all risks of coastal hazards, waiver of liability and indemnification agreement; and (e) recordation of deed restriction imposing coastal hazards as covenants, conditions and restrictions (CC&Rs) on the use and enjoyment if the property.

Response: Regarding the “Biotic Easement”, MM 4 requires that the Easement document, together with the other cited documents in that mitigation, be amended, reviewed and finalized prior to the commencement of any site disturbance or construction.

Regarding “Perimeter Fencing and Public Trail”, see the discussion about this issue in the LCP Conformation Section of this report (e.g., Policies 10.9, 10.17, 10.23 through 10.26. MMs 4 through 7 have been revised to require current and future owners to relocate the trail eastward as may be required due to bluff top erosion). If it becomes necessary to move the trail, the relocation plan must address any potential impacts to existing populations or replantings of coastal terrace prairie grassland and the other identified rare plants occurring within the Easement area. The trail relocation plan would also address the potential need to adjust habitat protection fencing, and could include additional signage to educate the public about the importance to protect such resources and to stay on the designated trail.

Regarding the “Coastal Hazard” issue and prohibiting future armoring of the shoreline bluffs (and in furthering the broader intent of and compliance with LCP (Hazards) Policy 9.8.d.), the following Condition of Approval has been added (Attachment A):

The construction of any shoreline protective device(s) for the purpose of protecting the development approved in this project including, but not limited to, the approved building and associated foundation, and all future development on this property in the event that these structures are threatened with imminent damage or destruction from coastal hazards including, but not limited to, episodic and long-term shoreline retreat and coastal erosion and bluff and geologic instability is prohibited. Prior to the issuance of the building permit for this project, the property owner shall record a deed restriction on the subject property prohibiting the construction of any shoreline protective devices for the subject project and any future development on the subject property and submit a copy of the recorded document to the Planning and Building Department.

With regards to the other requests cited under the “Coastal Hazard” comment, the recommended conditions of project approval accomplish the objectives recommended by the MCC and CCC.

California Coastal Commission (CCC) – First Comment Letter. Upon circulation of the first IS/MND, the CCC provided comments (letter dated March 1, 2018; Attachment W), within which they cited issues and concerns summarized as follows:

- * More adequate protection of the coastal prairie grassland and coast yellow leptosiphon (CYL), pursuant to the measures discussed in the project’s “Adaptive Management and Monitoring Plan” and “Conservation Strategy” (on and near the project site), including a revised biological survey that would include performance criteria and quantitative-based measures (to the standards cited by F&W), to ensure protection of these resources, with discussion of and compliance with applicable LCP (*Sensitive Habitats*) Policies.
- * More expanded analysis in the revised biological survey as to plant species within the “Transitional Area” and associated protection measures, including better quantification and identification of non-exotic (non-native) and native areas to be affected by development.
- * More adequate measures for the protection of the coastal terrace prairie grassland and CYL and establishment of sensitive habitat buffers, both during and after all ground disturbance activities, including identifying staging, access routes and temporary construction fencing to be implemented during such activities and marked on the project plans and reviewed by F&W.
- * Acknowledging that the project’s Tree Protection Plan will help to mitigate the views of the four houses as seen from Highway 1 and from the western portion (along trail) of the bluff, the Plan should maximize the planting of native species to replace removal of Monterey cypress.
- * Expanded analysis and discussion of the project (given bluff-impacting geologic hazards and project-related drainage) as it would affect bluff top erosion, including that project will not allow for the construction of any shoreline protection to armor the development against future erosion and sea-level rise, to ensure consistency with LCP (*Hazards*) Policy 9.8.
- * Adequacy of measures to ensure compliance with LCP (*Locating and Planning New Development*) Policy 1.35, including analysis and discussion that site drainage will not be adversely impacted from grading and construction of houses, including discussion of water quality impacts with respect to sensitive habitat on the project site, in adjacent bluff top areas, and the Fitzgerald Marine Reserve.

* Insuring that project has adequate water and wastewater service, road access public services and infrastructure (LCP Policy 1.19) and that the four residences will not exceed the 40 new units permitted per year in the Midcoast (LCP Policy 1.23).

* Provide evidence that the proposed project qualifies as a lot line adjustment under, and is otherwise consistent with all applicable laws in effect when in 1989 the 40 original lots (of the 1908 Moss Beach Highlands Subdivision) were merged and lines altered to result in the seven current lots/parcels. This shall include discussion of the seven lots' legality and demonstrate that the proposed lot line adjustment (LLA) is consistent with Policies 1.28, 1.29 and 1.30.

Response: With regard to the legal status of the existing seven parcels (to be reduced via a LLA to four parcels as part of this project), the County processed and recorded a previous LLA in 1980-1991. That action established the parcels being adjusted as part of this project as legal parcels, as further described below (also see Attachment EE for a complete zoning and parcel creation history).

1. Applicable (1989) State Map Act Provisions. The State Map Act (CA Govt. Code 66412(d)) provision, as it applied to LLAs, was different in 1989 than it currently reads. The 1989 version states:

“This division shall be inapplicable to:...(d) A lot line adjustment [LLA] between two or more existing adjacent parcels, where the land taken from one parcel is added to an adjacent parcel, and where a greater number of parcels than originally existed is not thereby created, provided the LLA is approved by the local agency... A local agency...shall limit its review and approval to a determination of whether or not the parcels resulting from the LLA will conform to local zoning and building ordinances....”.

In 1989, the proposed LLA was seen as an adjustment between two or more parcels (of the 41 lots of record representing a portion of the recorded 1908 Moss Beach Heights subdivision). That LLA effectively adjusted the 41 lots down to seven lots. Thus, the LLA did not create a “greater number of parcels than originally existed”. Also, since the above cited section required that the LLA comply with local zoning, the issue of the subject site’s zoning is relevant.

2. RM-CZ Zoning District Regulations. In 1989, County deemed that the subject 2.48-acre was comprised of 41 legal lots of record as described above. While this property had been consolidated into two APNs (037-086-160 and -170 by the time the 1989 LLA application was submitted, such APNs reflected parcels for tax assessment purposes; they were not considered legal “parcels” for the purpose of the criteria put forth by the above-cited Government Code Section. Relative to the code section’s mandate that the LLA comply with zoning, the RM-CZ District regulations (Section 6901, Paragraph 3), state:

“All parcels 5 acres or larger in size which were legally in existence at the time of the enactment of this ordinance [in or around 1980] shall continue to be legal parcels. Parcels smaller than 5 acres in size shall continue to be legal parcels only if no adjacent property was in the same ownership at the time of enactment of this ordinance, or if a potable on-site water supply had been developed on the parcel at the time of enactment of this ordinance [no such water supply, e.g., a well, had been developed]. When such parcels can be aggregated to a minimum of 5 acres, each 5-acre aggregation shall constitute one legal parcel.”

Critical to the last sentence is the implication that of the total 2.48-acre site (the 41 lots of record), the County should have aggregated or merged those lots “to a minimum of 5 acres,” leading to what would have been a single merger of the 41 lots in one legal (albeit less than 5 acre) parcel. In 1989, the County Subdivision Ordinance stated (Section 14.5; *Parcel Mergers*; Subsection 14.5.2; *Mergers Required*): “If any one of two or more contiguous parcels held by the same owner does not conform to standards for minimum parcel size to permit use or development under a zoning, subdivision or other ordinance of the County...then such parcel shall be considered merged for the purpose of this Chapter.”

Relative to the above-cited RM-CZ section – and critical to the portion of the above-quoted Merger section - the County determined that the RM-CZ regulations do not inherently mandate a minimum parcel size. Additionally, at the time, the only areas mandated for merger in the LCP (Policy 1.21; Lot Consolidation) pursuant to the LCP Land Use Map, was as follows: “...consolidate contiguous lots, held in the same ownership, in residential subdivisions in Seal Cove to minimize risks to life and property and in Miramar to protect coastal views and scenic coastal areas.” The only other mergers to have occurred involved several parcels in the Montara Estates area, whereby a single owner of many such parcels voluntarily merged parcels in 1979. The LCP did not identify either the subject site or other similarly configured or zoned properties as mandated for merger. As a result, the RM-CZ reference to merging parcels was not deemed legally effective.

3. LLA Process in 1989. Finally, it’s important to understand that the County’s certified LCP exempted LLAs, with no qualifications. That said – and pursuant to the above rationale – the County followed the LLA procedural policy that was deemed appropriate at the time (since the State Map Act did not mandate process, nor were LLA’s yet included and discussed in the County Subdivision Ordinance in effect at that time).

California Coastal Commission (CCC) – Second Comment Letter. Upon circulation of the second revised IS/MND, the CCC provided comments (letter dated November 15, 2018; Attachment X), whereby they cited issues and concerns summarized as follows:

* Biological Resources. The CCC acknowledged that the revised IS/MND's discussion and associated MMs (arising primarily from the McGraw Botanical Survey Report; Attachment S), together with the revised (more detailed and resource protective) Habitat Management Plan (included within the "Valleymar Bluffs Conservation and Development Project Management Planning Framework"), Conservation and Open Space Easement, and Draft CC&Rs (Attachments S.1, S.2, and S.3, respectively), appeared to ensure far greater protection and result in no significant impacts to sensitive habitat (as previously cited and described) in the project area.

However, the CCC recommends that the County provide full discussion to ensure consistency with LCP Policies 7.3 and 7.5. With regard to MM 7, the CCC suggested that the County require the applicant to clearly identify to whom monitoring reports (of the effect of the recreational use of the bluff-top trail) will be submitted and that those reports meet the requirements of F&W to ensure protection of the sensitive species identified in the project area.

The MPF provides the basis for development of and integration into a Habitat Management Plan "following approval" of the project and prior to issuance of building permits. The CCC suggested that the County require that this occur prior to issuance of the proposed CDP. Also, with regards to MM 4, they suggested that the CCC staff be included in the review of the Easement together with the Habitat Management Plan and associated CC&Rs prior these documents' recordation with the LLA/Parcel Map.

Response: Staff has provided a full discussion of the project's consistency with the applicable LCP (Sensitive Habitat) policies in the LCP Conformance section of this report and agrees with the suggestions regarding to MMs 4 through 7, which have been revised to address the CCC's comments.

Geologic Hazard. The CCC reiterated their comment from their March 2018 letter regarding the prohibition of the placement of any bluff protection in the future.

Response: As stated in staff's response to that comment, a Condition of Approval has been added prohibiting any such future bluff protection, in the form of a deed restriction prior to issuance of any building permits.

Visual. CCC recommends that the project be evaluated for consistency with LCP Policies 8.12 and 8.13 (including its special design guidelines for coastal communities), due to the project's location between the first public road and the sea. Specific discussion shall address Policy 8.13's requirement that structures be designed to fit the topography of the site and do not require extensive cutting, grading or filling for construction, are in scale with the character of their setting and blend rather than dominate or distract from the overall view of the landscape.

Response: See the LCP Conformance and DR Conformance sections of this report for a full discussion responding to these policies.

Native American Heritage Commission (NAHC). Upon circulation of the second and revised IS/MND (October/November 2018), the NAHC provided a letter (dated 10/22/2018; Attachment CC), that included the following summary comments:

* In the Discussion section of “Tribal Resources” [in the IS/MND], the conclusion that the project is not subject to AB [Assembly Bill] 52 is inaccurate. While the tribal consultation requirements portion of AB52 are not applicable because tribes have not submitted letters requesting contact for projects, other portions of AB52 do apply to the project.

* Mitigation for inadvertent finds of human remains in Mitigation Measure (MM) 31 [found in discussion in the IS/MND] is inaccurate. There is no time limit on when the inspection by the MLD [Most Likely Descendant] can take place. The MLD has 48 hours from the time they are given access to the site to make recommendations. Please refer to California Public Resources Code (CPRC) Section 5097.98 for the process of designating a MLD for human remains determined to be Native American.

Response: Prior to the IS/MND’s initial circulation in January/February of 2018, staff was aware of AB52 (adopted in 2014 and effective July 2015), which stipulated statutory and CEQA guidelines and procedures for inadvertent discoveries of Native American burials. Prior to the first circulation of the IS/MND, staff submitted (on 11/14/2017) to the NAHC a “Sacred Lands File and Native American Contacts List Request.” Planning had concluded that applicability of AB52 was dependent on California Native American (CNA) tribes requesting that they be notified by lead agencies through formal notice of proposed projects in the geographic area where the tribe is traditionally and culturally affiliated; no response to the “List Request” was received from the NAHC.

However, in an effort to comply with the intent of AB52, staff both emailed and send certified mail notice to a listing of seven CNA tribes that the NAHC had subsequently sent to other Planning staff, requesting comments as well as any additional or revised MMs. As of the date of this report’s writing, three of the tribal contacts have responded that the project site is outside of their tribal jurisdiction; and one tribe (Mewekma/Ohlone Indian Tribe) responded with extensive information on that tribe’s legal recognition by the US Bureau of Indian Affairs and the State of California; however, no other comments were added. And no other tribes have responded back with comments. Any late comments will be presented to the Planning Commission at the hearing, with staff’s recommendation to revise or add any new MMs as deemed necessary to ensure compliance with AB52.

Additionally, and in response to the NAHC's initial comment cited above, MM 31 has been revised to change the cited 24-hour notice requirement to 48 hours (NAHC's stipulated contact time limit), in the event that any human remains are found during any project-related ground disturbance activities. Additionally, both MMs 29 and 31 have been revised to add the following language (as recommended by the notified representative of the Amah Mutsun Tribal Band):

"Confirm to the satisfaction of the Community Development Director that, prior to the commencement of any ground disturbance activities, they have hired an archaeologist to provide adequate training to any construction crew that will be performing any such activities to ensure that they are aware of how to identify any potential archaeological or human remains and associated burial items encountered."

Staff has added eight MMs to comply with CPRC Section 21084.3(b), as cited in the NAHC's response letter. With these revised MMs and added Conditions of Approval, staff concludes that the project will meet the intent of AB 52.

San Mateo County Department of Public Works. In response to the recirculated IS/MND of October/November 2018, the Director of the Department of Public Works provided a comment letter (Attachment DD) that due to the project site's being located directly under the departure path for Runway 30, "any new residences in this location will be markedly impacted by aircraft departure noise." As a result, the Director requested that aircraft noise impacts be added to Section 5(d) of the IS/MND.

Response: To reiterate the discussion in the LCP Conformance section of this report (relative to the project's consistency with LCP Policy 1.36), pursuant to the ALUCP's Exhibit 4C (*Safety Zones*), the project site lies just outside of and north of the "Outer Approach/Departure (Zone 4)", which is aligned with runways 30 (identified at south end) and 12 (at north end) (Attachment DD.1). However, since the project site is within the "Airport Influence Area (AIA) (Zone 7)", associated Table 4B (*Safety Criteria Matrix*) applies, which stipulates criteria and conditions for various uses. For uses within the AIA, while there are no limits to residential density (dwelling units per acre), the Development Conditions require an "Airport Disclosure Notice". To this end, and as discussed and specified in the LCP Conformance section, while the project doesn't trigger the need for an Avigation Easement, nor additional construction or sound attenuation measures (beyond those cited in the Uniform Building Code, Title 24), staff does recommend that a Condition of Approval be added to require that a "California Real Estate Disclosure Notice" (entitled: "Notice of Airport in Vicinity") be added upon the sale of any of the proposed four lots.

As a result, staff recommends the addition of a condition of approval that will require that all four residences be constructed with adequate and effective sound

attenuation materials to ensure that the impact from aircraft noise is less significant.

C. MIDCOAST COMMUNITY COUNCIL REVIEW

The Midcoast Community Council provided their formal recommendation on this project in a letter dated January 24, 2018 (Attachment Z) in response to the IS/MND. Their comments are summarized, with staff response, in the Environmental Review section of this report.

D. COUNTY DEPARTMENT AND OTHER AGENCY REVIEW

Department of Public Works
Building Inspection Section (no comments)
Department of Parks
Environmental Health Services
County Counsel
Midcoast Community Council
California Coastal Commission
California Department of Fish and Wildlife
Committee for Green Foothills
Coastside Fire Protection District
Montara Water & Sanitary District

ATTACHMENTS

- A. Findings and Conditions of Approval
- B. Location Map*
- C. Project Site Plan*
- D. Site Sections*
- E. Existing Vegetation (See Attachments E.1 thru E.4 for Updated Plant Types) *
- E.1 McGraw Survey – Existing Plant Communities
- E.2 McGraw Survey – Existing Rare Plants
- E.3 McGraw Survey – Proposed Conservation & Development Areas
- E.4 McGraw Survey – Conservation & Restoration Areas
- F. Tree Removal and Tree Replacement Plan*
- G. Tree and Shrub Planting Plan on House Sites (see Attachment T.2. for Vegetation Plan on Conservation and Open Space Easement Area)*
- H. Grading Plans*
- I. Drainage Areas* (also see Attachment P)
- J. Erosion Control Plan*
- K. Site Plan and Elevations (Lot 1)*
- L. Site Plan and Elevations (Lot 2)*
- M. Site Plan and Elevations (Lot 3)*
- N. Site Plan and Elevations (Lot 4)*
- O. Project Photo Simulations*

- P. Preliminary Storm Drainage Report, Mesiti-Miller Engineering, Inc. (April 26, 2017)
- Q. Coastal Bluff Recession Study, Haro, Kasunich and Associates (April 24, 2015)*
- R. Vallemar Bluffs Coastal Hazards Assessment, Environmental Science Associates (October 26, 2016)*
- S. Geotechnical Investigation, Haro, Kasunich and Associates (August 2016)*
- S.1 Geotechnical Investigation Update, Haro, Kasunich and Associates (June 18, 2018)*
- T. Biological Survey Report, Jodi McGraw Consulting (August 2018)*
- T.1 Habitat Management Plan (Vallemar Bluffs Conservation and Development Project Management Planning Framework) (August 2018)*
- T.2 Proposed Conservation and Open Space Easement
- T.3 Draft Covenants, Conditions and Restrictions (CC&Rs)
- U. California Department of Fish and Wildlife Letter (June 6, 2017)*
- U.1 California Department of Fish and Wildlife, Memorandum to Fish and Game Commission (December 7, 2017)*
- U.2 (New) California Department of Fish and Wildlife Letter/Response (February 7, 2018)*
- V. Moss Beach Tree Survey (May 2015)*
- W. Coastside Design Review Committee Recommendation (October 12, 2017)*
- X. California Coastal Commission Letter/Response to IS/MND (March 1, 2018)*
- Y. California Coastal Commission Letter/Response to Revised IS/MND (11/15/2018)
- Z. Midcoast Community Council Comments (January 24, 2018)
- AA. Revised Initial Study/Mitigated Negative Declaration (Review Period: 10/10/2018 - 11/8/2018)
- BB. Neighbor/Resident Comment Letters and Photos Received in Response to Initially Circulated IS/MND (Review Period: 1/27/2018 – 2/15/2018).
- CC. Native American Heritage Commission Response Letter (October 22, 2018)
- DD. Department of Public Works Response Letter (January 23, 2018)\
- DD.1. Half Moon Bay Airport Land Use Compatibility Plan (2014); Safety Zones
- EE. Height Measurement Diagram (R-1/S-17 vs. RM-CZ Regulations)
- FF. Zoning and Parcel History of Project Site
- GG. Lot Line Adjustment/Parcel Map

* *These documents can be found at the Planning and Building office or on-line on the Planning and Building Department's website at: <http://planning.smcgov.org/major-projects>. Under Major Projects; go to the "Four Residences on Vallemar at Julianna, Moss Beach", where these documents are located (and downloadable) under labeled .pdf files.*

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County of San Mateo
Planning and Building Department

RECOMMENDED FINDINGS AND CONDITIONS OF APPROVAL

Permit or Project File Number: PLN 2015-00380 Hearing Date: February 13, 2019

Prepared By: David Holbrook
Project Planner

For Adoption By: Planning Commission

RECOMMENDED FINDINGS

For the Environmental Review, Find:

1. That the Planning Commission does hereby find that this Mitigated Negative Declaration reflects the independent judgment of San Mateo County
2. That the Mitigated Negative Declaration is complete, correct, and adequate and prepared in accordance with the California Environmental Quality Act (CEQA) and applicable State and County Guidelines.
3. That, on the basis of the Initial Study, comments received hereto, and testimony presented and considered at the public hearing, there is no substantial evidence that the project will have a significant effect on the environment.
4. That the Mitigation Measures (numbered 1 through 36) in the Mitigated Negative Declaration and agreed to by the owner and placed as conditions on the project have been incorporated into the Mitigation Monitoring and Reporting Plan in conformance with the California Public Resources Code Section 21081.6.

For the Coastal Development Permit, Find:

5. That the project, as described in the application and accompanying materials required by Section 6328.7 and as conditioned in accordance with Section 6328.14, conforms to the plans, policies, requirements and standards of the San Mateo County Local Coastal Program.
6. That the project conforms to the specific findings required by policies of the San Mateo County Local Coastal Program. The legalization will not affect any sensitive habitats, visual resources, or public access to and along the coast.
7. That the project conforms to the applicable policies of the Local Coastal Program (LCP) as discussed.

8. The development is in conformity with the public access and public recreation policies of Chapter 3 of the State Coastal Act (commencing with Section 30200), as discussed in the sections of this report addressing bluff top access.

For the Design Review Permit, Find:

9. That the project has been reviewed under and found to be in general compliance with the Design Review Standards for One-Family Development in the Midcoast, pursuant to Section 6565.20 of the County Zoning Regulations.

For the Resource Management District Development Review Permit, Find:

10. That the project complies with the applicable criteria and standards, as required by Section 6324 of the County Zoning Regulations.

For the Grading Permit, Find:

11. That this project, as conditioned, will not have a significant adverse effect on the environment. The project has been reviewed by planning staff and the Department of Public Works, which found that the project can be completed without significant harm to the environment as conditioned.
12. That this project, as conditioned, conforms to the criteria of the San Mateo County Grading Ordinance and is consistent with the General Plan. Planning staff and the Department of Public Works have reviewed the project and have determined its conformance to the criteria of Chapter 8, Division VII, San Mateo County Ordinance Code, including the standards referenced in Section 8605 and the San Mateo County General Plan.

For the Lot Line Adjustment, Find:

13. That the Lot Line Adjustment conforms to the General Plan, LCP, and Zoning and Building Regulations.
14. That the Lot Line Adjustment creates suitable building sites with provisions for adequate routine and emergency access.
15. That the Lot Line Adjustment accommodates provisions for adequate water supply and sewage disposal.
16. That the Lot Line Adjustment avoid or minimize impacts upon scenic corridors, wetlands, coastal resources, or authorized coastal development.

RECOMMENDED CONDITIONS OF APPROVAL

Current Planning Section

1. This approval applies only to the proposal as described in the plans, supporting materials and reports approved by the Planning Commission on February 13, 2019. Minor revisions or modifications to the project may be made subject to the review and approval of the Community Development Director, if they are consistent with the intent of and in substantial conformance with this approval.
2. This permit shall be valid for one year. Any extension of this permit shall require submittal of an application for permit extension and payment of applicable permit extension fees 60 days prior to expiration.
3. The applicant shall submit a check in the amount of \$2,404.75, payable to San Mateo County, prior to and required for filing of the Mitigated Negative Declaration's 'Notice of Determination' with the County Clerk's office, as required by the California Department of Fish and Wildlife (\$2,354.75 + \$50 County Clerk processing fee).
4. Prior to issuance of any of the building permits for the four residences, the applicant shall submit, for the review and approval of the County Parks and Public Works Departments, plans for construction of the segment of the California Coastal Trail (CCT) within the Vallemar Street road right-of-way adjacent to the project. The plans shall, among other things, satisfy the trail width, striping, and signage requirements established by these departments. The trail section shall be completed to the departments' satisfaction prior to the final building permit inspection of the last of the four residences.
5. The construction of any shoreline protective device(s) for the purpose of protecting the development approved in this project is prohibited. This includes, but is not limited to, the construction of any seawall or revetment for the purpose of protecting the approved buildings and associated foundations, in the event that these structures are threatened with imminent damage or destruction from coastal hazards such as episodic and long-term shoreline erosion, and bluff and geologic instability. Prior to the issuance of the building permit for this project, the property owner shall record a deed restriction, to the satisfaction of the Community Development Director, which informs all future property owners of this prohibition.
6. At the building permit application stage, the project shall demonstrate compliance with the Water Efficient Landscape Ordinance (WELO) and provide the required forms. WELO applies to new landscape projects equal to or greater than 500 sq. ft. A prescriptive checklist is available as a compliance option for projects under 2,500 sq. ft. WELO also applies to rehabilitated landscape projects equal to or greater than 2,500 sq. ft. The following restrictions apply to projects using the prescriptive checklist:

- a. Compost: The project must incorporate compost at a rate of at least four (4) cubic yards per 1,000 sq. ft. to a depth of 6 inches into the landscape area (unless contra-indicated by a soil test).
 - b. Plant Water Use (Residential): Install climate adapted plants that require occasional, little, or no summer water (average WUCOLS plant factor 0.3) for 75% of the plant area excluding edibles and areas using recycled water.
 - c. Mulch: A minimum 3-inch layer of mulch should be applied on all exposed soil surfaces of planting areas, except in areas of turf or creeping or rooting groundcovers.
 - d. Turf: Total turf area shall not exceed 25% of the landscape area. Turf is not allowed in non-residential projects. Turf (if utilized) is limited to slopes not exceeding 25% and is not used in parkways less than 10 feet in width. Turf, if utilized in parkways, is irrigated by sub-surface irrigation or other technology that prevents overspray or runoff.
 - e. Irrigation System: The property shall certify that Irrigation controllers use evapotranspiration or soil moisture data and utilize a rain sensor; Irrigation controller programming data will not be lost due to an interruption in the primary power source; and Areas less than 10 feet in any direction utilize sub-surface irrigation or other technology that prevents overspray or runoff.
7. No grading activities shall commence until the property owner has been issued a grading permit (issued as the "hard card" with all necessary information filled out and signatures obtained) together with the building permit by the Current Planning Section.
 8. No grading shall be allowed during the winter season (October 1 to April 30) to avoid potential soil erosion. An applicant-completed and County-issued grading permit "hard card" is required prior to the start of any land disturbance/grading operations. Along with the "hard card" application, the applicant shall submit a letter to the Current Planning Section, at least two (2) weeks prior to commencement of grading, stating the date when grading operations will begin, anticipated end date of grading operations, including dates of revegetation and estimated date of establishment of newly planted vegetation.
 9. Prior to any land disturbance and throughout the grading operation, the property owner shall implement the erosion control plan, as prepared and signed by the engineer of record and approved by the Planning Commission. Revisions to the approved erosion control plan shall be prepared and signed by the engineer and submitted to the Community Development Director for review and approval.
 10. Prior to issuance of the grading permit "hard card," the property owner shall submit a schedule of all grading operations to the Current Planning Section,

subject to review and approval by the Current Planning Section. The submitted schedule shall include a schedule for winterizing the site. If the schedule of grading operations calls for the grading to be completed in one grading season, then the winterizing plan shall be considered a contingent plan to be implemented if work falls behind schedule. All submitted schedules shall represent the work in detail and shall project the grading operations through to completion.

11. The property owner shall adhere to the San Mateo Countywide Stormwater Pollution Prevention Program “General Construction and Site Supervision Guidelines,” including, but not limited to, the following:
 - a. Delineation with field markers of clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses within the vicinity of areas to be disturbed by construction and/or grading.
 - b. Protection of adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.
 - c. Performing clearing and earth-moving activities only during dry weather.
 - d. Stabilization of all denuded areas and maintenance of erosion control measures continuously between October 1 and April 30.
 - e. Storage, handling, and disposal of construction materials and wastes properly, so as to prevent their contact with stormwater.
 - f. Control and prevention of the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, wash water or sediments, and non-stormwater discharges to storm drains and watercourses.
 - g. Use of sediment controls or filtration to remove sediment when dewatering site and obtain all necessary permits.
 - h. Avoiding cleaning, fueling, or maintaining vehicles on-site, except in a designated area where wash water is contained and treated.
 - i. Limiting and timing application of pesticides and fertilizers to prevent polluted runoff.
 - j. Limiting construction access routes and stabilization of designated access points.
 - k. Avoiding tracking dirt or other materials off-site; cleaning off-site paved areas and sidewalks using dry sweeping methods.

- l. Training and providing instruction to all employees and subcontractors regarding the Watershed Protection Maintenance Standards and construction Best Management Practices.
 - m. Additional Best Management Practices in addition to those shown on the plans may be required by the Building Inspector to maintain effective stormwater management during construction activities. Any water leaving the site shall be clear and running slowly at all times.
 - n. Failure to install or maintain these measures will result in stoppage of construction until the corrections have been made and fees paid for staff enforcement time.
- 12. It shall be the responsibility of the engineer of record to regularly inspect the erosion control measures for the duration of all grading remediation activities, especially after major storm events, and determine that they are functioning as designed and that proper maintenance is being performed. Deficiencies shall be immediately corrected, as determined by and implemented under the observation of the engineer of record.
- 13. For the final approval of the grading permit, the property owner shall ensure the performance of the following activities within thirty (30) days of the completion of grading at the project site: (a) The engineer shall submit written certification that all grading has been completed in conformance with the approved plans, conditions of approval/mitigation measures, and the Grading Regulations, to the Department of Public Works and the Planning and Building Department's Geotechnical Engineer, (b) The geotechnical consultant shall observe and approve all applicable work during construction and sign Section II of the Geotechnical Consultant Approval form, for submittal to the Planning and Building Department's Geotechnical Engineer and Current Planning Section.
- 14. Applicant shall prepare a Stormwater Management Plan (SWMP) that includes, at a minimum, exhibit(s) showing drainage areas and location of Low Impact Development (LID) treatment measures; project watershed; total project site area and total area of land disturbed; total new and/or replaced impervious area; treatment measures and hydraulic sizing calculations; a listing of source control and site design measures to be implemented at the site; hydro-modification management measures and calculations, if applicable; NRCS soil type; saturated hydraulic conductivity rate(s) at relevant locations or hydrologic soil type (A, B, C or D) and source of information; elevation of high seasonal groundwater table; a brief summary of how the project is complying with Provision C.3 of the MRP; and detailed Maintenance Plan(s) for each site design, source control and treatment measure requiring maintenance.
- 15. LID treatment measures to be shown on final improvement or grading plans shall not differ materially from the LID treatment measures presented on the project's

Lot Line Adjustment/Parcel Map Map, without written approval from the Planning Department.

16. Project construction activities shall comply with all requirements of the Municipal Regional Stormwater NPDES Permit Provision C.3. Please refer to the San Mateo Countywide Water Pollution Prevention Program's (SMCWPPP) C.3 Stormwater Technical Guidance Manual for assistance in implementing LID measures at the site.
17. **(Mitigation Measure 1):** All development on all four proposed lots shall comply with the plans approved by the Coastside Design Review Committee on October 12, 2017, and shall include the following revisions to the project on the plans submitted in conjunctions with the required building permit applications:
 - a. Revise the variable color scheme to be neutral so as to blend with the immediate landscape so that the structures' exteriors weather naturally. Weathered (pickled) wood, stucco or cementitious hardy sidings are acceptable options. Any such changes shall require the submittal of material samples for review by the Community Development Director.
 - b. Submit revised plans to show modified deck specifications to include the floor area of the mezzanine decks (for all houses that include such decks) pursuant to the second revision plans presented [to the DRC] on October 12, 2017 (definitive deck square footage was delineated only for entry, rear, and garage decks in all versions of previously submitted plans).
 - c. Any additional exterior lighting (in addition to the single fixture shown at the entry and garage locations) shall be dark sky compliant fixtures, which shall be mounted or recessed under the soffits at other openings and allowed only as required by building code (for safety). No additional site, building, or landscape lighting is proposed.
 - d. All paved pathways and patios shall be shown as dimensioned, on the plans, with identified materials [which shall be of a pervious nature].
 - e. The applicant shall provide "finished floor elevation verification" to certify that the structure is actually constructed at the height shown on the submitted plans. The applicant shall have a licensed land surveyor or engineer establish a baseline elevation datum point in the vicinity of the [four] construction sites.
 - (1) The applicant shall maintain the datum point so that it will not be disturbed by the proposed construction activities until final approval of the building permit.

- (2) This datum point and its elevation shall be shown on the submitted site plan. This datum point shall be used during construction to verify the elevation of the finished floors relative to the existing natural or to the grade of the site (finished grade).
 - (3) Prior to Planning approval of the building permit application, the applicant shall also have the licensed land surveyor or engineer indicate on the construction plans: (a) the natural grade elevations at the significant corners (at least four) of the footprint of the proposed structure on the submitted site plan, and (b) the elevations of proposed finished grades.
 - (4) In addition, (a) the natural grade elevations at the significant corners of the proposed structure, (b) the finished floor elevations, (c) the topmost elevation of the roof, and (d) the garage slab elevation must be shown on the plan, elevations, and cross-section (if one is provided).
 - (5) Once the building is under construction, prior to the below floor framing inspection or the pouring of the concrete slab (as the case may be) for the lowest floor(s), the applicant shall provide to the Building Inspection Section a letter from the licensed land surveyor or engineer certifying that the lowest floor height, as constructed, is equal to the elevation specified for that floor in the approved plans. Similarly, certifications on the garage slab and the topmost elevation of the roof are required.
 - (6) If the actual floor height, garage slab, or roof height, as constructed, is different than the elevation specified in the plans, then the applicant shall cease all construction and no additional inspections shall be approved until a revised set of plans is submitted to and subsequently approved by both the Building Official and the Community Development Director.
- f. All new power and telephone utility lines from the street or nearest existing utility pole to the project structures on the property shall be placed underground.
18. **(Mitigation Measure 2):** The applicant shall submit an Air Quality Best Management Practices Plan to the Planning and Building Department prior to the issuance of any grading “hard card” or building permit that, at a minimum, includes the “Basic Construction Mitigation Measures” as listed in Table 8-1 of the BAAQMD California Environmental Quality Act (CEQA) Guidelines (May 2011). These measures shall be implemented prior to beginning any grading and/or construction activities and shall be maintained for the duration of the project grading and/or construction activities:

- a. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access road) shall be watered two times per day.
 - b. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
 - c. All visible mud or dirt track-out onto adjacent paved roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
 - d. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).
 - e. Roadways and building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
 - f. Idling times shall be minimized either by shutting equipment or vehicles off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.
 - g. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications.
 - h. Minimize the idling time of diesel powered construction equipment to two minutes.
19. **(Mitigation Measure 3):** The applicant shall submit a dust control plan to the Planning Department for review and approval prior to the issuance of a building permit for the project. The approved plan shall be implemented for the duration of any grading, demolition, and construction activities that generate dust and other airborne particles. The plan shall include the following control measures:
- a. Water all active construction areas at least twice daily.
 - b. Water or cover stockpiles of debris, soil, sand, or other materials that can be blown by the wind.
 - c. Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least 2 feet of freeboard.
 - d. Apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking and staging areas at construction sites. Also, hydroseed or apply non-toxic soil stabilizers to inactive construction areas.

- e. Sweep daily (preferably with water sweepers) all paved access roads, parking and staging areas at construction sites.
 - f. Sweep adjacent public streets daily (preferably with water sweepers) if visible soil material is carried onto them.
 - g. Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).
 - h. Limit traffic speeds on unpaved roads within the project parcel to 15 mph.
 - i. Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
 - j. Replant vegetation in disturbed areas as quickly as possible.
20. **(REVISED Mitigation Measure 4):** The project developer, and all future owners, shall be responsible for protecting and maintaining the environmentally sensitive habitat areas that exist on the project site in perpetuity. To this end, a final Habitat Management Plan (HMP), Conservation and Open Space Easement, and associated Covenants, Conditions and Restrictions (CC&Rs), shall be submitted for the review and approval of the Community Development Director prior to commencement of grading or construction, and, upon approval, recorded with the Final Lot Line Adjustment/Parcel Map. The purpose of the easement and the CCR's shall be to restrict the use and development of the easement area in a manner that protects sensitive habitats, identify the ongoing responsibilities of the property owners to protect and maintain these habitat areas, and allow for the lateral public coastal access trail to be relocated within the easement areas in the event the existing trail is undermined by erosion. The easement shall be conveyed from the Project owner to the Golden State Land Conservancy or other entity acceptable to the Community Development Director, who will be responsible for ensuring compliance with the easement's provisions and effective implementation of the approved Habitat Management Plan.
21. **(Mitigation Measure 5):** Prior to the final building inspection of any of the four residences, a permanent fence – not to exceed three (3) feet in height and of a construction and nonsolid design (i.e., wood split-rail) as approved by the Community Development Director – shall be placed along all the boundaries of the easement area, to include respective access points on its eastern boundaries adjacent to the west-facing building site areas for each of the four lots. Said fencing shall include the installation of interpretive signs (not to exceed 3 feet in height) that provide information about the conservation area, subject to the Community Development Director's review and approval of the of the signs design and content.

22. **(Mitigation Measure 6):** The CC&Rs for the parcels as well as the Conservation Easement shall prohibit all forms of access and development within the Easement area that are not compatible with conservation, restoration, and management of native coastal terrace prairie plants and habitats. Examples of prohibited uses and activities include: installation of permanent or semi-permanent infrastructure or equipment such as outdoor furniture (e.g., patio furniture, picnic tables, umbrellas), play equipment (trampolines, play structures, etc.) or other items that intensify use or otherwise modify the structure and species composition of the grassland.
23. **(REVISED Mitigation Measure 7):** Prior to the recordation of the final map, the permittee shall enter into an agreement with the County Parks Department that identifies the actions to be taken by current and future owners of the property on which the project is located to maintain lateral public access along the entire length of the coastal bluff, in a manner that is consistent with the protection of rare plants and their habitats. These measures may include, but shall not be limited to the installation of erosion control and trail improvements, relocation of trail segments threatened by coastal erosion, and installation of signage and temporary fencing where needed to protect natural resources. The agreement shall identify the improvements that will be installed by the current owner, which shall be completed to the satisfaction of the Parks Department prior to a final building inspection, and shall include a monitoring program that specifies the circumstances under which future actions will be taken.
24. **(Mitigation Measure 8):** The respective building plans for each of the four residences shall include a landscape plan that identifies tree removal, new trees, shrubs and other landscaping, and (if applicable) irrigation. Landscaping shall be with plant species native to the San Mateo Coast, to limit the potential for the spread of non-native species into the adjacent habitat, and limit the need for irrigation and pesticide use, which could influence nearby natural communities. The landscape plans shall be reviewed by the applicant's biologist and incorporate the biologist's recommendations, prior to being submitted for the review and approval of the Community Development Director, which must occur prior to the issuance of the building permit.
25. **(Mitigation Measure 9):** Prior to the issuance of any respective building permit for the four residences, the applicant shall submit to the Planning Department for review and approval an erosion control plan (to be included in each respective set of building plans for the four residences) that shows how the transport and discharge of soil and pollutants from and within the project site shall be minimized on each respective lot, as tailored to the approved development on that lot. The plan shall generally follow the Erosion Control Plan as included and shown on Page C6.0, C7.0 of the Project Plans, and shall be designed to minimize potential sources of sediment, control the amount of runoff and its ability to carry sediment by diverting incoming flows and impeding internally generated flows, and retain

sediment that is picked up on the project site through the use of sediment-capturing devices. The plan shall minimize impacts from stormwater and urban runoff on the biological integrity of the natural drainage systems leading to and within the adjacent Fitzgerald Marine Reserve. The plan shall also limit application, generation and migration of toxic substances, ensure the proper storage and disposal of toxic materials, and apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters. Such measures shall be confirmed to have been implemented (by a qualified contractor and under the supervision of the project's civil engineer) prior to the issuance of the respective building permits for the four residences, to the satisfaction of the Planning and Building Department. The County will monitor compliance of this mitigation measure by conducting weekly construction inspections during the rainy season (October 1 through May 1) for the period covering all land disturbance activities, as required by the State Water Board's Special Protections. Such measures shall be kept in place for each of the lots through the duration of the construction activities on that lot, up to the final inspection approval of the respective building permit for development on that lot. Said plan shall adhere to the San Mateo Countywide Stormwater Pollution Prevention Program "General Construction and Site Supervision Guidelines," including:

- a. Sequence construction to install sediment-capturing devices first, followed by runoff control measures and runoff conveyances. No construction activities shall begin until after all proposed measures are in place.
- b. Minimize the area of bare soil exposed at one time (phased grading).
- c. Clear only areas essential for construction.
- d. Within five (5) days of clearing or inactivity in construction, stabilize bare soils through either non-vegetative best management practices (BMPs), such as mulching, or vegetative erosion control methods, such as seeding. Vegetative erosion control shall be established within two (2) weeks of seeding/planting.
- e. Construction entrances shall be stabilized immediately after grading and frequently maintained to prevent erosion and control dust.
- f. Control wind-born dust through the installation of wind barriers such as hay bales and/or sprinkling.
- g. Soil and/or other construction-related material stockpiled on-site shall be placed a minimum of 200 feet from all wetlands and drain courses. Stockpiled soils shall be covered with tarps at all times of the year.

- h. Intercept runoff above disturbed slopes and convey it to a permanent channel or storm drains by using earth dikes, perimeter dikes or swales, or diversions. Use check dams where appropriate.
 - i. Provide protection for runoff conveyance outlets by reducing flow velocity and dissipating flow energy.
 - j. Use silt fence and/or vegetated filter strips to trap sediment contained in sheet flow. The maximum drainage area to the fence should be 0.5-acre or less per 100 feet of fence. Silt fences shall be inspected regularly and sediment removed when it reaches 1/3 the fence height. Vegetated filter strips should have relatively flat slopes and be vegetated with erosion resistant species.
26. **(Mitigation Measure 10):** Prior to commencement of any project-related site disturbance, grading/clearing, tree removal/trimming or construction activities, and in conjunction with an approved Erosion Control Plan, the applicant shall place adequate temporary construction fencing along all boundaries of the proposed Conservation Easement and surrounding all limits of the four building sites. No such activity shall extend beyond that fenced perimeter. All environmentally sensitive areas shall be clearly flagged. Additional measures shall also be included in the plan narrative and implemented as follows:
- a. Entrance and exit from the construction site by construction equipment and other vehicles shall occur from Vallemar Street, and the point of access shall be clearly identified.
 - b. An excavator with a swivel bucket shall be used during construction. The excavator will have “street” tracks to minimize site disturbance.
 - c. Construction lay down areas shall be located on the building envelopes not under active construction or within other portions of the construction footprint.
 - d. Spoil material that will be hauled away may first be stored either on the building envelopes not in active construction or on the paved parking area on Vallemar Street, subject to an encroachment permit from San Mateo County Public Works.
 - e. A biological monitor will be present during ground disturbing activities to ensure that encroachment into the flagged environmentally sensitive areas does not occur. The biological monitor will have the authority to stop work in the event construction activities are encroaching into environmentally sensitive areas.

27. **(Mitigation Measure 11):** The erosion control plan for the project shall include the following best management practices (BMPs) and shall be implemented and maintained (under the supervision of the project civil engineer) as described:
- a. Control and prevent the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, washwater or sediments, rinse water from architectural copper, and non-stormwater discharges to storm drains and watercourses.
 - b. Store, handle, and dispose of construction materials/wastes properly to prevent contact with stormwater.
 - c. Do not clean, fuel, or maintain vehicles on-site, except in a designated area where wash water is contained and treated.
 - d. Train and provide instruction to all employees/subcontractors regarding construction BMPs.
 - e. Protect all storm drain inlets in vicinity of site using sediment controls such as berms, fiber rolls, or filters.
 - f. Limit construction access routes and stabilize designated access points.
 - g. Perform clearing and earthmoving activities only during dry weather.
 - h. Use sediment controls or filtration to remove sediment when dewatering and obtain all necessary permits.
 - i. Trap sediment on site, using BMPs such as sediment basins or traps, earthen dikes or berms, silt fences, check dams, soil blankets or mats, covers for soil stockpiles, etc.
 - j. Divert on-site runoff around exposed areas; divert off-site runoff around the site (e.g. swells and dikes).
 - k. Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.
 - l. No land clearing operations where grading operations may take place between October 15 and April 15 unless a separate winter erosion control plan is approved prior to beginning such construction.
 - m. Erosion is to be controlled at all times. The specific measures shown are to be implemented at all times. Additional measures will be required for construction between October 15 and April 15.

28. **(Mitigation Measure 12):** Site all construction materials and staging areas in converted (i.e., paved), ruderal, or planted, areas within the portion of the property proposed for development, to avoid impacts to special-status communities and species.
29. **(Mitigation Measure 13):** Implement measures to prevent indirect effects of the development project on the adjacent coastal terrace prairie community and rare species during construction, including:
- a. Fence the project disturbance envelop during construction using ESA fencing to clearly delimit the area of work;
 - b. Erect signs on the fences and in other areas to prevent workers from entering them during construction;
 - c. Conduct worker awareness training to educate construction personnel about the sensitive communities and special-status species, as well as the measures that must be implemented to protect them;
 - d. Prevent erosion and manage drainage during construction to prevent concentrated runoff and sediment deposition in the coastal terrace prairie, including by installing, silt fences where needed;
 - e. Monitor compliance with the protection measures during construction, to ensure that fences and signage remain in places, and that the areas outside of the disturbance envelope are not disturbed or otherwise utilized during construction;
 - f. Monitor the site throughout construction period (and in perpetuity, per Mitigation Measure 5 below) and using early-detection/rapid response to eradicate any new occurrences of exotic plant species.
30. **(Mitigation Measure 14):** Prior to disturbing any portion of the development footprint area that supports coastal terrace prairie dominated or co-dominated by native plants (2018 McGraw Survey; Figure 6), including the stormwater infiltration spreader areas and limits of grading, salvage the sod, topsoil, seed, and individual native plants, where appropriate and feasible. Use the salvaged material to restore areas of temporary disturbance; if the salvaged area is to be permanently impacted, use the material to restore other highly degraded habitat on site (e.g., ice plant mats) where appropriate.
31. **(Mitigation Measure 15):** Minimize the potential for indirect impacts to coastal terrace prairie and rare plant species that could result from landscaping, by:

- a. Avoiding landscaping elements that could degrade adjacent habitat, including pesticides, herbicides, fertilizers, and irrigation beyond that required to establish plantings; and
 - b. Installing plants native to the coastal terrace prairie, coastal strand, and coastal scrub communities in San Mateo County. For plant species found in the native communities in the study area, use container stock from local (coastal San Mateo County) sources to avoid disrupting locally adapted genetic complexes (i.e., causing genetic erosion or outbreeding depression) within the adjacent remaining habitat on-site and in the adjacent FMR.
32. **(Mitigation Measure 16):** Compensate for the impacts of the project on coastal terrace prairie by implementing the following measures:
- a. Permanently protect 0.92 acres of coastal terrace prairie, through dedication of a perpetual conservation easement (as required in Mitigation Measure 4) to a tax exempt nonprofit organization qualified under Section 501(c)(3) of the Internal Revenue Code and qualified to do business in California that has as its primary purpose the preservation, protection, or enhancement of land in its natural, scenic, historical, agricultural, forested, or open-space condition or use.
 - b. Restore an estimated 0.71 acres within the conservation easement area that feature planted/ornamental species (i.e., Monterey cypress), are dominated by exotic plant species, and/or have been previously disturbed and feature unnatural topography or materials (e.g., wood chips). Table 9 and Figure 8 (2018 McGraw Survey) illustrate the acreages and approximate locations of restoration treatment areas. The restoration should follow a specific restoration plan that addresses the anthropogenic factors that have degraded native plant community structure and species composition. The restoration plan will also describe how the areas in the conservation easement area that were graded and installed with spreaders will be restored. It will critically evaluate and use, where appropriate, the following approaches:
 - (1) Removing the planted/ornamental plant species and ice plant mats;
 - (2) Removing wood chips, base rock, or other non-native material covering the soil;
 - (3) Recreating the natural topography in areas where mounds or swales were created through prior excavation;
 - (4) Controlling other invasive plants (e.g., Italian rye grass and prickly sow thistle) that outcompete native plant species;

- (5) Managing the abundance of disturbance-adapted native plants such as coastal tarweed, where they are dominant (e.g., in the southeastern corner of the property) to promote the establishment and growth of a broader diversity of native grasses and forbs;
 - (6) Establishing native plants in areas previously used as trails to access the bluff trail;
 - (7) Salvaging seed and topsoil from coastal terrace prairie and areas supporting harlequin lotus prior to any ground-disturbing activities and using the material in on-site restoration, where appropriate; and
 - (8) Increasing the cover and diversity of native coastal terrace prairie plant species by sowing native plant seed (or spreading topsoil, where available) into restoration areas.
- c. Manage and monitor, in perpetuity, the entire 0.92-acre conservation area to address anthropogenic factors that degrade native plant community structure and species composition. Management elements should be identified in a management plan developed for the conservation area based on the site conditions and the literature documenting relevant conservation and management strategies, which are anticipated to include the following:
- (1) Controlling exotic plants, and preventing the invasion and spread of new exotic plant species;
 - (2) Managing recreation and access on and adjacent to the conservation area, including by:
 - (a) Installing fencing and signage to deter public access within the conservation area;
 - (b) Recording in the CC&Rs for the site and in the conservation easement, prohibitions against recreational use and access that are not compatible with conservation and management natural community structure and species composition in the coastal terrace prairie and populations of rare native plants. Installation of permanent or semi-permanent infrastructure and play equipment such as law chairs, umbrellas, trampolines, or any other items that intensify use in one area should be prohibited;
 - (c) Siting, constructing, and managing any public trails that are all or partially within the conservation area so that the recreational use is compatible with the protection of coastal terrace prairie and adjacent coastal bluff habitat;

(d) Monitoring compliance with the measures to prevent trampling associated with recreational use and taking steps to increase compliance when/if negative impacts are observed.

(3) Monitoring natural community structure and species composition and rare plant populations within coastal terrace prairie, to gauge the effectiveness of management and inform adjustments as part of the adaptive management framework.

33. (Mitigation Measure 17): The erosion control plan for the project shall include the following BMPs and shall be implemented and maintained (under the supervision of the project civil engineer) as described:

- a. Control and prevent the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, washwater or sediments, rinse water from architectural copper, and non-stormwater discharges to storm drains and watercourses.
- b. Store, handle, and dispose of construction materials/wastes properly to prevent contact with stormwater.
- c. Do not clean, fuel, or maintain vehicles on-site, except in a designated area where wash water is contained and treated.
- d. Train and provide instruction to all employees/subcontractors regarding construction BMPs.
- e. Protect all storm drain inlets in vicinity of site using sediment controls such as berms, fiber rolls, or filters.
- f. Limit construction access routes and stabilize designated access points.
- g. Perform clearing and earthmoving activities only during dry weather.
- h. Use sediment controls or filtration to remove sediment when dewatering and obtain all necessary permits.
- i. Trap sediment on site, using BMPs such as sediment basins or traps, earthen dikes or berms, silt fences, check dams, soil blankets or mats, covers for soil stockpiles, etc.
- j. Divert on-site runoff around exposed areas; divert off-site runoff around the site (e.g. swells and dikes).

- k. Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.
 - l. No land clearing operations where grading operations may take place between October 15 and April 15 unless a separate winter erosion control plan is approved prior to beginning such construction.
 - m. Erosion is to be controlled at all times. The specific measures shown are to be implemented at all times. Additional measures will be required for construction between October 15 and April 15.
34. **(Mitigation Measure 18):** The applicant shall implement the drainage improvement recommendations of the Mesity-Miller Engineering, Inc., (2017) Preliminary Storm Drainage Report to limit impacts to the Coastal Terrace Prairie grass, erosive bluff edge, and the near-shore marine environment (within the Fitzgerald Marine Reserve adjacent and just west of the project site, including the surveyed area of the endangered coast yellow leptosiphon on the coastal bluff promontory just west of the project site's westernmost property line) utilizing (within the Easement Area as shown) infiltration trenches with overflow spreaders on each lot to disperse the runoff over wide areas and maintain existing hydrology and soil moisture on the site, and using pervious pavers and detention areas to control peak runoff. The respective building permits for each of the four residences shall include a drainage plan that incorporates and implements all drainage measures cited in the report by Mesity-Miller Engineering, Inc. The project shall minimize alteration of the site's hydrology, including by using permeable pavers (in all driveways, walkways and patio areas) to increase infiltration of rainfall, and installing overflow spreaders in trenches to diffuse runoff.
35. **(Mitigation Measure 19):** Prior to any ground disturbing activities, including vegetation/tree removal or tree trimming, that would occur during the nesting/breeding season of native bird species potentially nesting/roosting on the site (typically February 1 through August 31 in the project region), a survey for nesting birds shall be conducted by a qualified biologist experienced with the nesting behavior of bird species of the region. The intent of the survey would be to determine if active nests of special-status bird species or other species protected by the Migratory Bird Treaty Act and/or the California Fish and Wildlife Code are present in the construction zone or within 500 feet of the construction zone. The surveys shall be timed such that the last survey is concluded no more than 2 weeks prior to initiation of construction or tree removal work. If ground disturbance activities are delayed, then an additional pre-construction survey shall be conducted such that no more than 2 weeks will have elapsed between the last survey and the commencement of ground disturbance activities.

If active nests are found in areas that could be directly affected or subject to prolonged construction-related noise, a no-disturbance buffer zone shall be

created around active nests during the breeding season or until a qualified biologist determines that all young have fledged. The size of the buffer zones and types of construction activities restricted within them will be determined through consultation with the California Department of Fish and Wildlife (CDFW), taking into account factors such as the following:

- a. Noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity;
- b. Distance and amount of vegetation or other screening between the construction site and the nest; and
- c. Sensitivity of individual nesting species and behaviors of the nesting birds.

Limits of construction to avoid an active nest shall be established in the field with flagging, fencing, or other appropriate barriers and construction personnel shall be instructed on the sensitivity of nest areas. A qualified biologist shall serve as a construction monitor during those periods when construction activities would occur near active nest areas of special status bird species and all birds covered by the Migratory Bird Act to ensure that no impacts on these nests occur.

- 36. **(Mitigation Measure 20):** The new trees indicated on the applicant's Tree Replacement Plan and Tree and Shrub Replanting Plan (found in the Project Plans) shall be planted prior to Planning final approval of the respective building permits for the four residences. Tree removal (identified by tree numbers), new trees and shrubs, additional landscaping, and tree preservation shall be shown on the submitted building plans for each of the four respective residences. The landscaping plan (for tree replacement and all other proposed landscaping) shall include plants that are pest- and/or disease-resistant, drought-tolerant, and attractive to beneficial insects. Upon implementation of the plan (for each of the four residences), the use of quick-release fertilizers shall be minimized. The associated irrigation system shall be designed to efficiently distribute water and minimize runoff. The planting of all new trees shall occur pursuant to the standards for such planting (depth of holes dug, fertilizing at planting and watering for respective tree types) and under the observation of a qualified, licensed arborist. The arborist shall confirm (via letter and/or email) that this has occurred for all trees prior to final inspection approval of the respective building permits for the four residences, to the satisfaction of the Community Development Director.
- 37. **(Mitigation Measure 21):** Any plan modifications to the subsequent development on the four lots (assuming they are deemed "minor" by the Community Development Director) that occur post issuance of any of the respective building permits for the four residences shall be reviewed by the arborist to assess any potential impacts to existing trees, trees that are being

preserved, and/or new trees to be planted affecting trees should be reviewed by the project consulting arborist (arborist) with regard to tree Impacts.

38. **(Mitigation Measure 22):** The submitted building plans for each of the four respective residences shall demarcate a Tree Protection Zone, to be established for all trees to be preserved, in which no disturbance is permitted. These plans shall indicate the method and measures of such protection (i.e., 6-foot high fencing placed at the trees' dripline) pursuant to the design and confirmed observation by the arborist. All such tree protection measures shall be reviewed and approved by the Community Development Director prior to issuance of the respective building permits for the four residences. No grading, excavation, construction or storage of materials, equipment, spoils, waste or wash-out water may be deposited, stored, or parked within the Tree Protection Zone. All underground services, including utilities, sub-drains (and other drainage features), irrigation lines, water and sewer laterals, shall be routed around the Tree Protection Zone. All tree protection measures shall be confirmed by the County to have been implemented prior to the issuance of any of the respective building permits for the four residences. All tree protection measures shall remain until all construction on each respective lot is completed.
39. **(Mitigation Measure 23):** Any herbicides placed under paving materials must be safe for use around trees (as determined and confirmed by the arborist) and labeled for that use.
40. **(Mitigation Measure 24):** All tree pruning shall be done by skilled tree or landscape contractors pursuant to the specific standards (adhering to the latest edition for Best Management Practices – and Tree Pruning as published by the International Society of Arboriculture), directions and under the supervision of the arborist.
41. **(Mitigation Measure 25):** Prior to the initiation of any site disturbance activities (prior to issuance of the building permits), the project contractors working in the vicinity of trees to be preserved shall meet with the arborist at the site to review all work procedures, access routes, storage areas and tree protection measures.
42. **(Mitigation Measure 26):** Upon issuance of the building permits, any excavation within the dripline or other work that is expected to encounter tree roots should be approved and monitored by the arborist. Any roots requiring cutting (including the type of backfill soil, compaction, fertilizing and watering) shall be the standards and under the supervision of the arborist to ensure that such root cutting does not damage the long term health of the tree.
43. **(Mitigation Measure 27):** Should any tree or its roots be damaged during construction, it should be evaluated as soon as possible by the arborist so that appropriate treatments can be applied.

44. **(Mitigation Measure 28):** Any additional or unanticipated tree pruning needed for clearance during construction shall be performed to the standards and under the supervision by the arborist.
45. **(REVISED Mitigation Measure 29):** In addition to Mitigation Measures 34, 35, & 36, and prior to building permit issuance for construction of residences on all or any of the respective lots, the applicant shall **(a) confirm to the satisfaction of the Community Development Director that, prior to the commencement of any ground disturbance activities, they have hired an archaeologist to providing adequately training to any construction crew that will be performing any such activities to ensure that they are aware of how to identify any potential archaeological resources encountered,** and (b) incorporate, via a note on the first page of the building construction plans, that in the event that archaeological resources are inadvertently discovered during construction, work in the immediate vicinity (within 25 feet) of the find must stop until a qualified archaeologist can evaluate the significance of the find. Construction activities may continue in other areas beyond the 25-foot stop work area. A qualified archaeologist is defined as someone who meets the Secretary of the Interior's Professional Qualifications Standards in archaeology. The Community Development Director shall be notified of such findings, and no additional work shall be done in the stop work area until the archaeologist has recommended appropriate measures, and those measures have been approved by the Current Planning Section and implemented. Disposition of Native American remains shall comply with CEQA Guidelines Section 15064.5(e).
46. **(Mitigation Measure 30):** In the event that paleontological resources are inadvertently discovered during construction, work in the immediate vicinity (within 25 feet) of the find must stop until a qualified paleontologist can evaluate the significance of the find. The Community Development Director shall be notified of such findings, and no additional work shall be done in the stop work area until the paleontologist has recommended appropriate measures, and those measures have been approved by the Current Planning Section and implemented.
47. **(REVISED Mitigation Measure 31):** The applicant confirm to the satisfaction of the Community Development Director that, prior to the commencement of any ground disturbance activity, they have hired an archaeologist to provide adequately training to any construction crew that will be performing any such activities to ensure that they are aware of how to identify any potential human remains and associated burial items encountered. Should any human remains be discovered during construction, all ground disturbing work shall cease and the County Coroner be immediately notified, pursuant to Section 7050.5 of the State of California Health and Safety Code. Work must stop until the County Coroner can make a determination of origin and disposition of the remains pursuant to California Public Resources Code Section 5097.98. If the County Coroner determines the remains to be Native American, the Native American Heritage Commission shall be contacted within **48** hours. A qualified

archaeologist, in consultation with the Native American Heritage Commission, shall recommend subsequent measures for disposition of the remains. Whenever the California Native American Heritage Commission receives notification of a discovery of Native American human remains from a county coroner pursuant to subdivision (c) of Section 7050.5 of the Health and Safety Code, it shall immediately notify those persons it believes to be most likely descended from the deceased Native American. The descendants may, with the permission of the owner of the land, or his or her authorized representative, inspect the site of the discovery of the Native American human remains and may recommend to the owner or the person responsible for the excavation work means for treatment or disposition, with appropriate dignity, of the human remains and any associated grave goods. The descendants shall complete their inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. Also see Conditions of Approval 52 and 54 (Mitigation Measures 29 and 31, respectively).

48. Upon the discovery of Native American remains, the landowner shall ensure that the immediate vicinity, according to generally accepted cultural or archaeological standards or practices, where the Native American human remains are located, is not damaged or disturbed by further development activity until the landowner has discussed and conferred, as prescribed in this section, with the most likely descendants regarding their recommendations, if applicable, taking into account the possibility of multiple human remains. The landowner shall discuss and confer with the descendants all reasonable options regarding the descendants' preferences for treatment.
 - a. The descendants' preferences for treatment may include the following:
 - b. The nondestructive removal and analysis of human remains and items associated with Native American human remains.
 - c. Preservation of Native American human remains and associated items in place.
 - d. Relinquishment of Native American human remains and associated items to the descendants for treatment.
 - e. Other culturally appropriate treatment.
 - f. The parties may also mutually agree to extend discussions, taking into account the possibility that additional or multiple Native American human remains, as defined in this section, are located in the project area, providing a basis for additional treatment measures.
49. For the purposes of this section, "conferral" or "discuss and confer" means the meaningful and timely discussion and careful consideration of the views of each

party, in a manner that is cognizant of all parties' cultural values, and where feasible, seeking agreement. Each party shall recognize the other's needs and concerns for confidentiality of information provided to the other.

50. Human remains of a Native American may be an inhumation or cremation, and in any state of decomposition or skeletal completeness. Any items associated with the human remains that are placed or buried with the Native American human remains are to be treated in the same manner as the remains, but do not by themselves constitute human remains.
51. Whenever the Commission is unable to identify a descendant, or the descendants identified fail to make a recommendation, or the landowner or his or her authorized representative rejects the recommendation of the descendants and the mediation provided for in subdivision (k) of Section 5097.94, if invoked, fails to provide measures acceptable to the landowner, the landowner or his or her authorized representative shall reinter the human remains and items associated with Native American human remains with appropriate dignity on the property in a location not subject to further and future subsurface disturbance. To protect these sites, the landowner shall do one or more of the following:
 - a. Record the site with the Commission or the appropriate Information Center.
 - b. Utilize an open-space or conservation zoning designation or easement.
 - c. Record a document with the county in which the property is located. The document shall be titled "Notice of Reinterment of Native American Remains" and shall include a legal description of the property, the name of the owner of the property, and the owner's acknowledged signature, in addition to any other information required by this section. The document shall be indexed as a notice under the name of the owner.
52. Upon the discovery of multiple Native American human remains during a ground disturbing land development activity, the landowner may agree that additional conferral with the descendants is necessary to consider culturally appropriate treatment of multiple Native American human remains. Culturally appropriate treatment of the discovery may be ascertained from a review of the site utilizing cultural and archaeological standards. Where the parties are unable to agree on the appropriate treatment measures the human remains and items associated and buried with Native American human remains shall be reinterred with appropriate dignity, pursuant to subdivision (e).
53. Notwithstanding Section 5097.9, this section, including those actions taken by the landowner or his or her authorized representative to implement this section and any action taken to implement an agreement developed pursuant to subdivision (l) of Section 5097.94, shall be exempt from the requirements of the California Environmental Quality Act (Division 13, commencing with Section 21000).

54. Notwithstanding Section 30244, this section, including those actions taken by the landowner or his or her authorized representative to implement this section and any action taken to implement an agreement developed pursuant to subdivision (l) of Section 5097.94, shall be exempt from the requirements of the California Coastal Act of 1976 (Division 20, commencing with Section 30000).
55. **(Mitigation Measure 32):** The project design for the development of each of the four lots (at the time of the submitted respective building permits), shall each include lot-specific geotechnical reports and shall carefully follow the geotechnical recommendations presented in the subject Haro, Kasunich and Associates (HKA) geotechnical report (pages 25 through 46, except where such recommendations affect Lot 4), covering the following categories: General Site Grading (including Cut and Fill Slopes); Foundations (including Conventional Spread and Skin Friction Pier Foundations); Perched Groundwater Drainage (including Concrete Slab-On-Ground); Retaining Walls (including Lateral Pressures and use of Tie-Backs); Utility Trenches; Surface Drainage (including use of Curtain Drains); Pavement Design; and Plan Review, Construction Observation and Testing. Additionally, and more specifically, the project design for the development on Lot 4 shall carefully follow the recommendations presented in the HKA Geotechnical Investigation Update, dated June 13, 2018. Specifically, the proposed residence and other structures on Lot 4 are recommended to be supported by shallow stiffened grid foundations or structural mat foundations, either of which is capable of withstanding the estimated liquefaction induced vertical ground settlement (from an earthquake) and capable of being re-leveled after such an event. Shallow stiffened foundations are recommended by geotechnical consultants for single family dwelling construction on sites with potentially liquefiable soils as an alternative to ground improvements (i.e., stone columns, compaction grouting) or deep driven piles, either of which would have a much higher environmental impact to the site. Any such changes to the recommendations by the project geotechnical engineer presented in this report shall be pursuant to the review and approval of the County's geotechnical engineer.
56. **(Mitigation Measure 33):** The applicant's architect shall complete and submit the County 2013 Energy Efficiency Climate Action Plans (EECAP) Development Checklist, and shall incorporate applicable measures and performance criteria into the submitted building plans for each of the four residences.
57. **(Mitigation Measure 34):** Should any traditionally or culturally affiliated Native American tribe respond to the County's issued notification for consultation, such process shall be completed and any resulting agreed upon measures for avoidance and preservation of identified resources be taken prior to implementation of the project.
58. **(Mitigation Measure 35):** In the event that tribal cultural resources are inadvertently discovered during project implementation, all work shall stop until a qualified professional can evaluate the find and recommend appropriate

measures to avoid and preserve the resource in place, or minimize adverse impacts to the resource, and those measures shall be approved by the Current Planning Section prior to implementation and continuing any work associated with the project.

59. **(Mitigation Measure 36):** Any inadvertently discovered tribal cultural resources shall be treated with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, protecting the cultural character and integrity of the resource, protecting the traditional use of the resource, and protecting the confidentiality of the resource.

Department of Public Works

60. The applicant shall have prepared, by a registered civil engineer, a drainage analysis of the proposed subdivision and submit it to the Department of Public Works for review and approval. The drainage analysis shall consist of a written narrative and a plan. The flow of the stormwater onto, over, and off of the property being subdivided shall be detailed on the plan and shall include adjacent lands as appropriate to clearly depict the pattern of flow. The analysis shall detail the measures necessary to certify adequate drainage. Post-development flows and velocities shall not exceed those that existed in the pre-developed state. Recommended measures shall be designed and included in the street improvement plans and submitted to the Department of Public Works for review and approval.
61. Prior to the issuance of the building permit or planning permit (if applicable), the applicant shall submit a driveway "Plan and Profile," to the Department of Public Works, showing the driveway access to the parcel (garage slab) complying with County Standards for driveway slopes (not to exceed 20%) and to County Standards for driveways (at the property line) being the same elevation as the center of the access roadway. When appropriate, as determined by the Department of Public Works, this plan and profile shall be prepared from elevations and alignment shown on the roadway improvement plans. The driveway plan shall also include and show specific provisions and details for both the existing and the proposed drainage patterns and drainage facilities.
62. The applicant shall submit to the Department of Public Works and the Planning Department, review, deed restrictions for sensitive habitat, coastal access, as needed.
63. Erosion and sediment control during the course of this grading work shall be according to a plan prepared and signed by the Engineer of Record, and approved by the Department of Public Works and the Planning Department. Revisions to the approved erosion and sediment control plan shall be prepared and signed by the Engineer.

64. It shall be the responsibility of the applicant's engineer to regularly inspect the erosion control measures and determine that they are functioning as designed and that proper maintenance is being performed. Deficiencies shall be immediately corrected.
65. Prior to the issuance of the Building Permits for each of the four residences, the applicant will be required to provide payment of "roadway mitigation fees" based on the square footage (assessable space) of the proposed building per Ordinance No. 3277.
66. The applicant shall submit a Lot Line Adjustment/Parcel Map to the Department of Public Works County Surveyor for review, to satisfy the State of California Subdivision Map Act. The final map will be recorded only after all Inter Department conditions have been met.
67. The applicant shall submit written certification from the appropriate utilities to the Department of Public Works and the Planning and Building Department stating that they will provide utility (e.g., sewer, water, energy, communication, etc.) services to the proposed parcels of this Lot Line Adjustment.

Building Inspection Section

68. The proposed structures associated with this application shall obtain building permits.
69. The proposed structures associated with this application shall be designed and constructed using the currently adopted and locally amended California Building Standards Codes, which at the time of this review is the 2016 version.

Environmental Health Services

70. The applicant shall obtain a well destruction permit (for the existing capped well on APN 037-083-260; Lot 4) from Environmental Health Services. The well destruction shall to the standards of and be witnessed by Environmental Health Services.

Coastside Fire Protection District

71. Fire Department access shall be to within 150 feet of all exterior portions of the facility and all portions of the exterior walls of the first story of the buildings as measured by an approved access route around the exterior of the building or facility. Access shall be asphalt and be a minimum of 20 feet wide, with roadway and able to support a fire apparatus weighing 75,000 lbs. Where a fire hydrant is located in the access, a minimum of 26 feet is required for a minimum of 20 feet on each side of the hydrant. Fire Department access less than 26 feet in width

shall require NO PARKING FIRE LANE CVC 22500 1 posted on both sides of roadway.

72. All buildings that have a street address shall have the number of that address on the building, mailbox, or other type of sign at the driveway entrance in such a manner that the number is easily and clearly visible from either direction of travel from the street. Residential buildings shall have internally illuminated address numbers contrasting with the background so as to be seen from the public way fronting the building. Residential address numbers shall be at least six feet above the finished surface of the driveway. An address sign shall be placed at each break of the road where deemed applicable by the Coastside Fire Protection District. Numerals shall be contrasting in color to their back-ground and shall be no less than 4 inches in height, and have a minimum 3/4-inch stroke. Remote signage shall be a 6-inch x 18-inch green reflective metal sign.
73. No combustibles shall be on-site prior to required fire protection water supply and fire department access provided.
74. Contact the Fire Marshal's Office to schedule Inspections prior to occupancy and Final Inspection by a Building Inspector. Allow for a minimum 72-hour notice to the Fire Department at 650/726-5213. This project will require the formation of a Mello-Roos Community Facilities District (CFD) before final.
75. A fire flow of 1,000 gallons per minute (gpm) for 2 hours with a 20 pounds per square inch (psi) residual operating pressure must be available as specified by additional project conditions to the project site. The applicant shall provide documentation including hydrant location, main size, and fire flow report at the building permit application stage. Inspection required prior to Fire's final approval of the building permit or before combustibles are brought on site.
76. Maintain around and adjacent to such buildings or structures a fuelbreak/firebreak made by removing and clearing away flammable vegetation for a distance of not less than 30 feet and up to 100 feet around the perimeter of all structures, or to the property line, if the property line is less than 30 feet from any structure.
77. The required fire flow shall be available from a Clow 960 Standard 6" Wet Barrel Fire Hydrant. The configuration of the hydrant shall have a minimum of one each 4 1/2-inch outlet and one each 2 1/2-inch outlet located not more than 250 feet from the building measured by way of approved drivable access to the project site.
78. The applicant shall install the proper occupancy separations, as per current California Building and Residential Codes. Plans at the building permit application stage shall include listing and construction details. Inspections will occur throughout construction and prior to Fire's final approval of the building permit.

79. All roof assemblies shall have a minimum CLASS-B fire resistive rating and be installed in accordance with the manufacturer's specifications and current California Building and Residential Codes.
80. Smoke alarms and carbon monoxide detectors shall be installed in accordance with the California Building and Residential Codes. This includes the requirement for hardwired, interconnected detectors equipped with battery backup and placement in each sleeping room in addition to the corridors and on each level of the residence.
81. An approved Automatic Fire Sprinkler System meeting the requirements of NFPA-13D shall be required to be installed for your project. Plans shall be submitted to the San Mateo County Building Inspection Section for review and approval by the authority having jurisdiction.
82. A statement that the building will be equipped and protected by automatic fire sprinklers must appear on the title page of the building plans.
83. If applicable, street signs shall be posted at each intersection conforming to the standards of the Department of Public Works.

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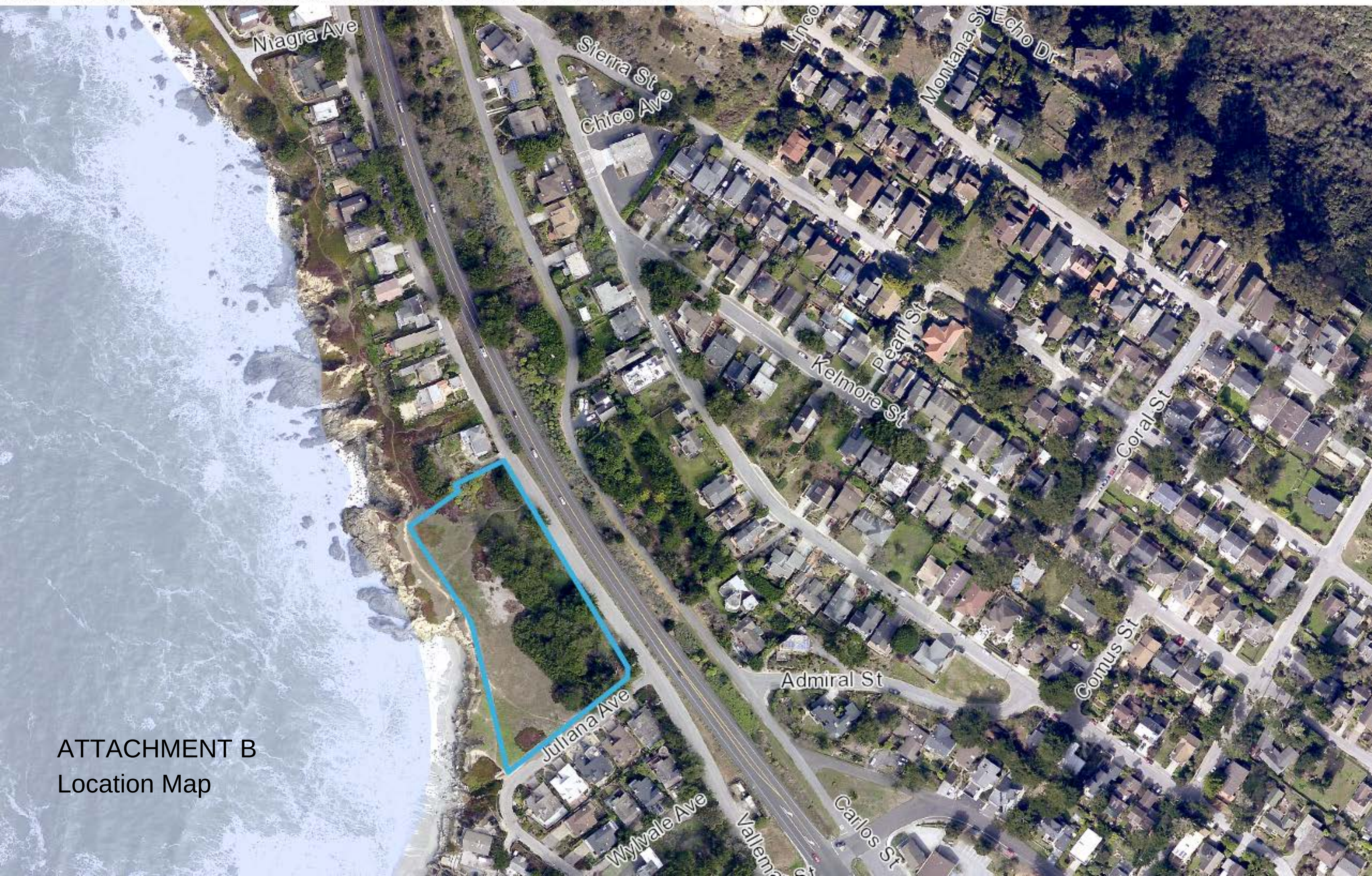


County of San Mateo - Planning and Building Department

ATTACHMENT B

Vallemar Project Location Map

Disclaimer: Information displayed here is for reference. For precise boundary data or information, consult official records. Printed: Fri Jan 5 2018 04:19:39 PM.



ATTACHMENT B
Location Map



County of San Mateo - Planning and Building Department

ATTACHMENT C

SITE LEGEND

EXISTING 5 FT. CONTOURS
EXISTING 1 FT. CONTOURS
NEW CONTOURS
PROPERTY LINE
EASEMENT, SETBACK OR ENVELOPE
PROPOSED NEW PROPERTY LOT LINE
EXISTING PROPERTY LOT LINE
EXISTING TREE (TO REMAIN)
EXISTING TREE DRIPLINE
14'-0" WIDE PERVIOUS PAVING DRIVEWAY
(W/ "TWO-TRACK" VEGETATION STRIP)
PERVIOUS PAVING COURTYARD (PARKING)
RE-VEGETATED NATIVE GRASS MEADOW

GENERAL SITE NOTES

1. GRADING NOTES & SPOT ELEVATIONS, SEE CIVIL DRAWINGS
2. UTILITY AND LOCATION INFORMATION, SEE CIVIL DRAWINGS
3. AREA OF DISTURBANCE TO BE MINIMIZED BY CONTRACTOR
4. SPECIFIC TREE REMOVAL SPECIFICATIONS, SEE LANDSCAPE
5. RETAINING WALLS, TERRACES, AND FENCES, SEE LANDSCAPE FOR LOCATION & APPEARANCE

PROTECTED GRASSLANDS, ZONE A

PROTECTED GRASSLANDS, ZONE B

100' BUFFER FROM LEPTOSIPHON

HIGHWAY 1

MAR STREET

PDG
PEARSON
DESIGN GROUP
102 N. BROADWAY AVE. BOZEMAN, MT 59715
OFFICE: 409.591.9191 FAX: 409.591.9192
WWW.PEARSONDESIGNGROUP.COM

MOSS BEACH - OVERALL

VALLEMAR ST. & JULIANA AVE.

COASTSIDE DESIGN
REVIEW APPLICATION

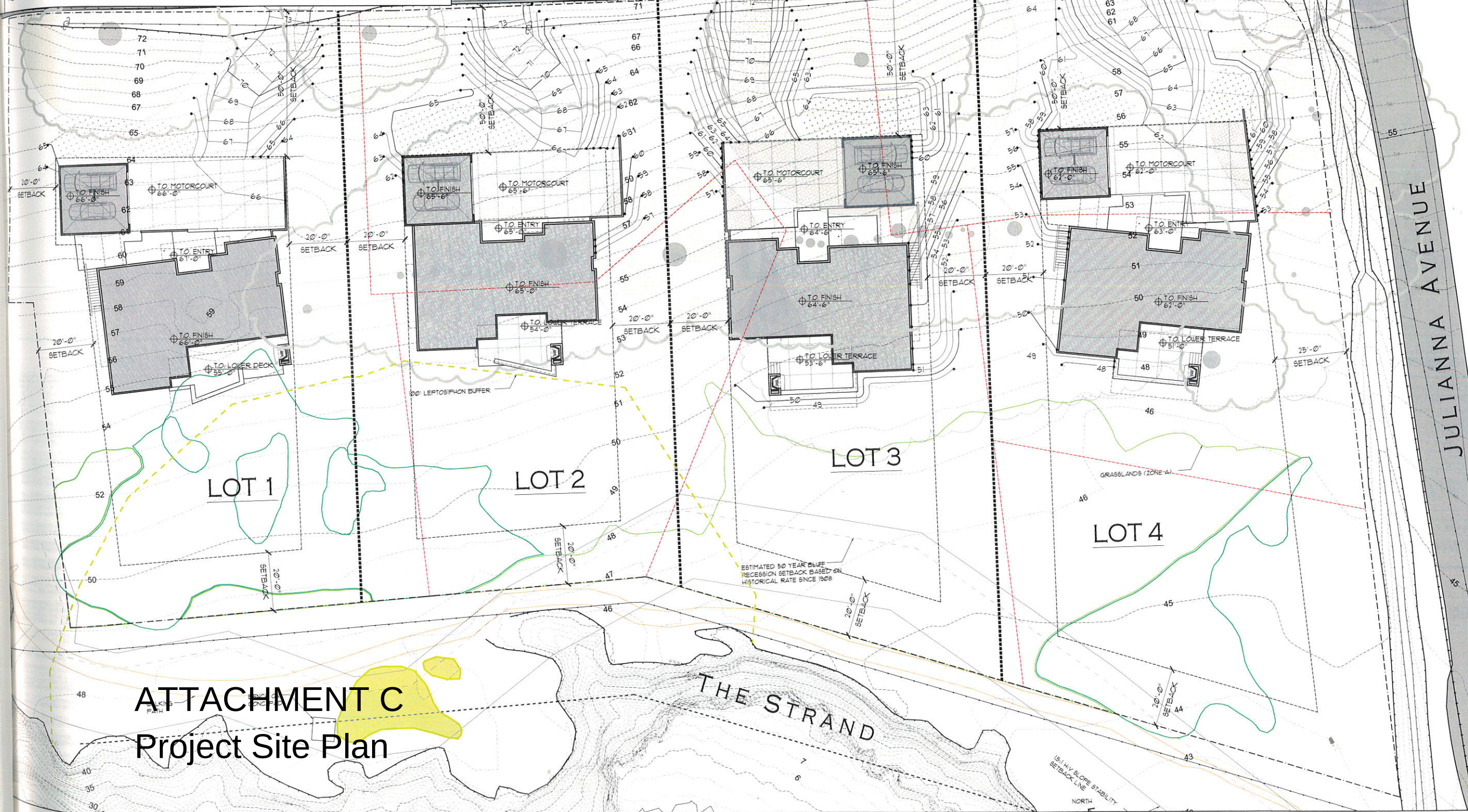
DRAWING:
SITE PLAN

PROJECT NUMBER: 1507
DATE: OCTOBER 12, 2017
DESIGN REVIEW SET
SHEET NO.

A1.0

ATTACHMENT C Project Site Plan

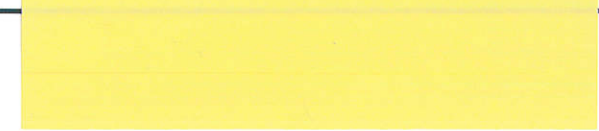
1 SITE PLAN
SCALE: 1/8"=1'-0"





County of San Mateo - Planning and Building Department

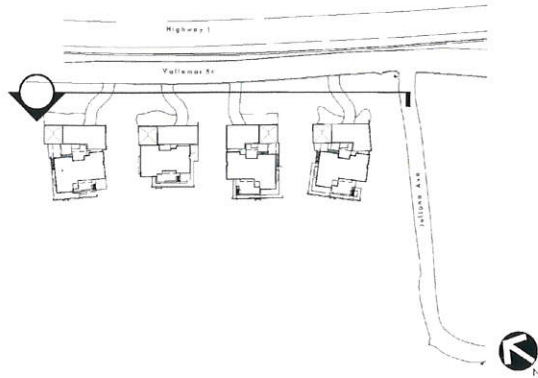
ATTACHMENT D



VERDE DESIGN

LANDSCAPE ARCHITECTURE
CIVIL ENGINEERING
SPORT PLANNING & DESIGN

2455 The Alameda
Santa Clara, CA 95050
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www.VerdeDesigninc.com



STAMP



CONSULTANT

SHEET TITLE

VALLEMAR ST.
ELEVATION/
PERSPECTIVE

PROJECT NAME

MOSS BEACH
OCEAN
DEVELOPMENT

PROJECT ADDRESS

VALLEMAR ST. &
JULIANA AVE
MOSS BEACH, CA

SUBMITTAL	DATE
DESIGN REVIEW APPLICATION	08/21/15
DESIGN REVIEW RESUBMITTAL	08/09/16

NO.	REVISIONS	DATE
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DRAWN BY	PH	CHECKED BY	MB
DATE ISSUED	08/23/17	SCALE	AS SHOWN
PROJ. NO.	1500600-1668		
SHEET NO.	L1.1	OF	SHEETS

VALLEMAR ST. ELEVATION/PERSPECTIVE



VALLEMAR ST. PERSPECTIVE

ATTACHMENT D

Project Perspective From Vallemar Ave.



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Santa Clara, CA 95050
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fax: 408.985.7260
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STAMP



CONSULTANT

SHEET TITLE

SITE SECTION

PROJECT NAME

MOSS BEACH
OCEAN
DEVELOPMENT

PROJECT ADDRESS

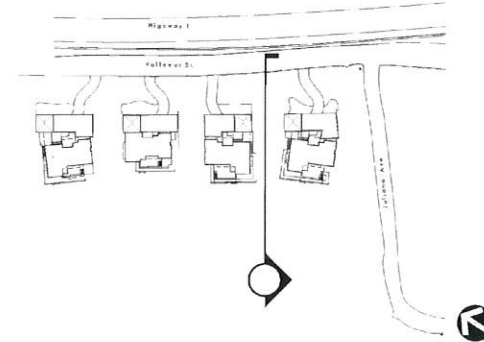
VALLEMAR ST. &
JULIANA AVE
MOSS BEACH, CA

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SHEET NO. L1.2	OF SHEETS

SITE SECTION

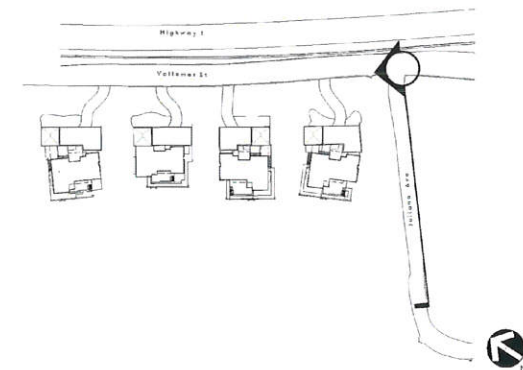


PDC
PEARSON
DESIGN GROUP

SITE SECTION

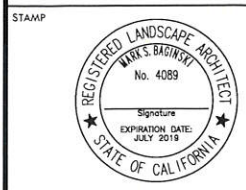


Project Section (Lot 1) from Site's North Side Looking South



PDC
PEARSON
DESIGN GROUP

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CIVIL ENGINEERING
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Santa Clara, CA 95050
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CONSULTANT

SHEET TITLE

**JULIANA AVE.
SECTION/
PERSPECTIVE**

PROJECT NAME

**MOSS BEACH
OCEAN
DEVELOPMENT**

PROJECT ADDRESS

**VALLEMAR ST. &
JULIANA AVE
MOSS BEACH, CA**

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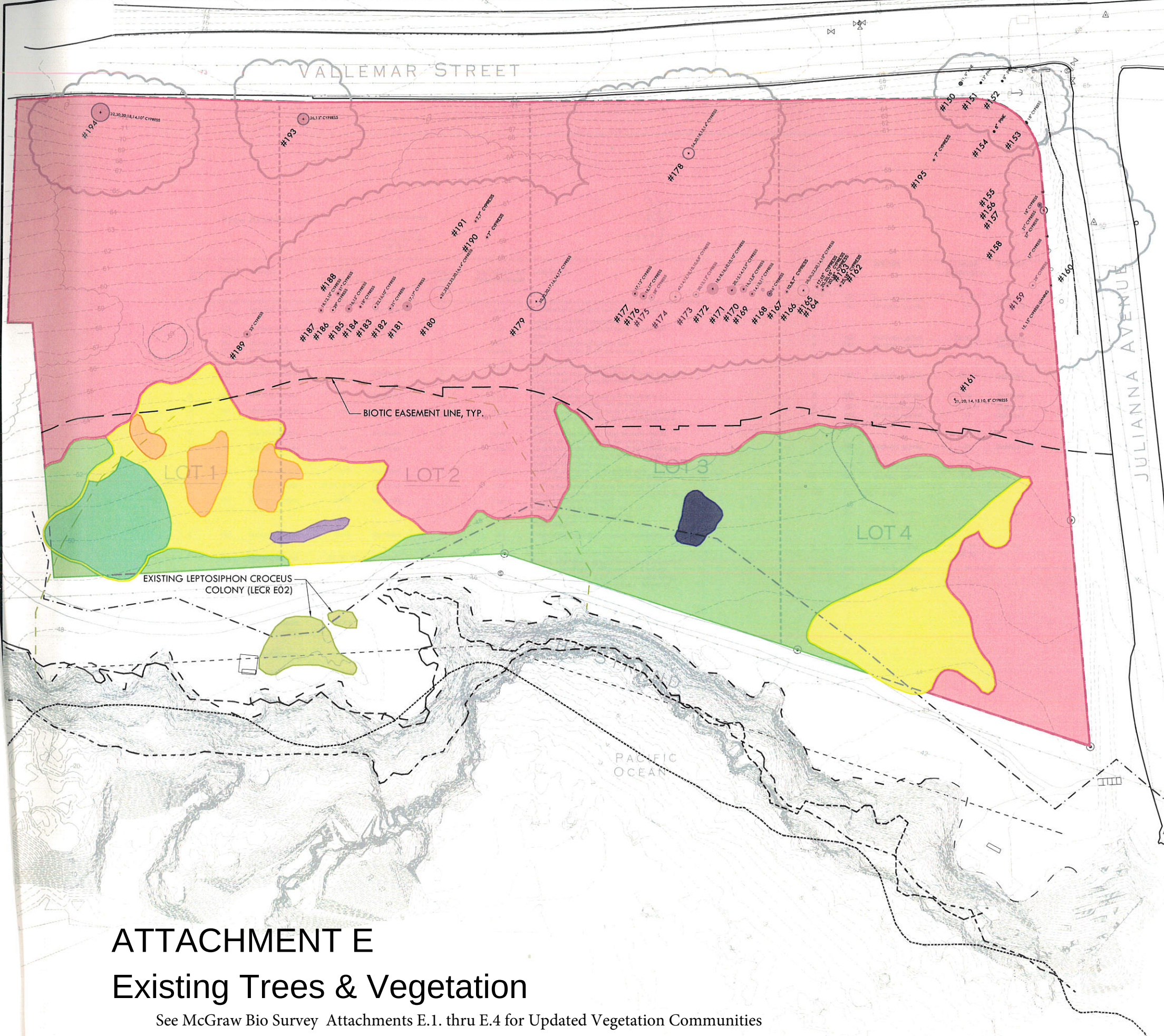
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PROJ. NO. 1500600-1668	
SHEET NO. L1.3	OF SHEETS

Project Section (Lot 4) from Julianna Looking North



County of San Mateo - Planning and Building Department

ATTACHMENT E



SITE PLAN LEGEND	
SYMBOL	DESCRIPTION
	TOP EDGE OF BLUFF
	TOP OF BEDROCK
	1983 BLUFF EDGE
	TOP OF BEACH
	MOSS BEACH HEIGHTS SUBDIVISION MAP 6-RSM-88, DATED MAY 1908
EXISTING TREES AND VEGETATION TYPES LEGEND	
SYMBOL	DESCRIPTION
	ZONE A - COASTAL PRAIRIE GRASSLAND
	ZONE B - TRANSITIONAL AREA
	ZONE C - NON-NATIVE VEGETATION
	ICEPLANT MAT
	DESCHAMPSIA-DOMINATED AREA
	DANTHONIA-DOMINATED AREA
	BEACH STRAWBERRY
	LEPTOSIPHON CROCEUS - LECR ELEMENT OCCURRENCE 02 PER CALIFORNIA NATIVE PLANT SOCIETY MEMORANDUM, 5/25/2016
	EXISTING TREE, DIAMETER OF TRUNK(S) AND SPECIES TYPE
	TREE NO.

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CONSULTANT

SHEET TITLE

**EXISTING TREES
AND VEGETATION**

PROJECT NAME

**MOSS BEACH
OCEAN
DEVELOPMENT**

PROJECT ADDRESS

**VALLEMAR ST. &
JULIANA AVE
MOSS BEACH, CA**

SUBMITTAL	DATE
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NO.	REVISIONS	DATE
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DATE ISSUED 08/23/17	SCALE AS SHOWN
PROJ. NO. 1500600-1668	SHEET NO. L2.3
	OF SHEETS

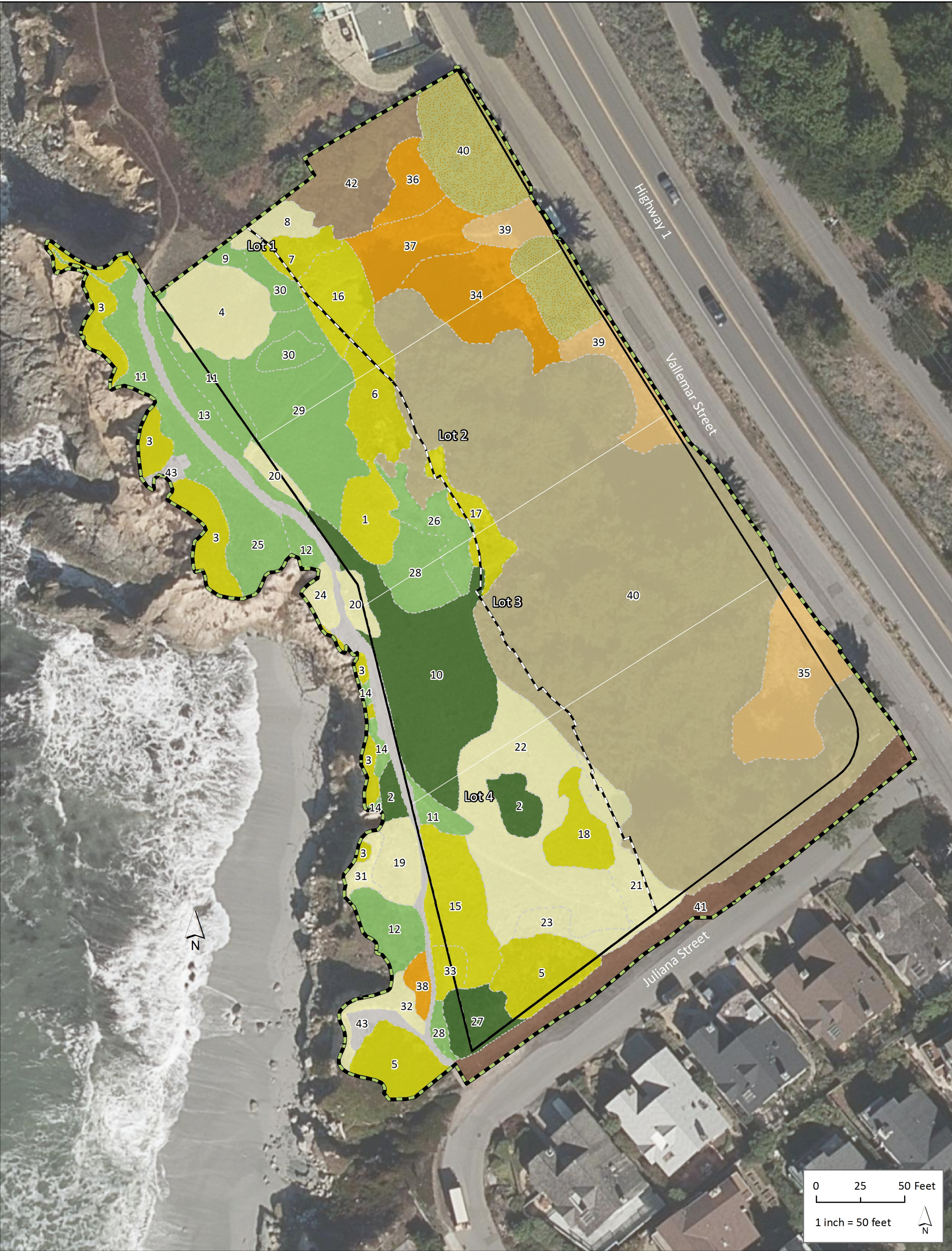
EXISTING TREES & VEGETATION

ATTACHMENT E
Existing Trees & Vegetation
See McGraw Bio Survey Attachments E.1. thru E.4 for Updated Vegetation Communities



County of San Mateo - Planning and Building Department

ATTACHMENT E1



Vallemar Bluffs Study Area: Plant Communities by Native/Exotic Species Dominance Categories

Coastal Terrace Prairie Assemblages

- Native Dominated
- Native-Exotic Co-dominated
- Exotic Dominated-Natives Subdominant
- Exotic Dominated-Natives Present

Ruderal Assemblages

- Exotic Dominated-Natives Present
- Exotic Dominated-No/Very Low Natives Present

Planted Assemblages

- Native-Exotic Co-dominated
- Exotic Dominated-Natives Subdominant
- Exotic Dominated-Natives Present
- Exotic Dominated-No/Very Low Natives Present
- Bluff Trail (Mostly Bare Ground)
- Dominant Species (Label Descriptions in Table 2)
- Study Area Boundary

Moss Beach Associates Project

- Property Boundary
- Proposed Parcels
- Proposed Conservation Area

Sources: JMc, Ifland Survey

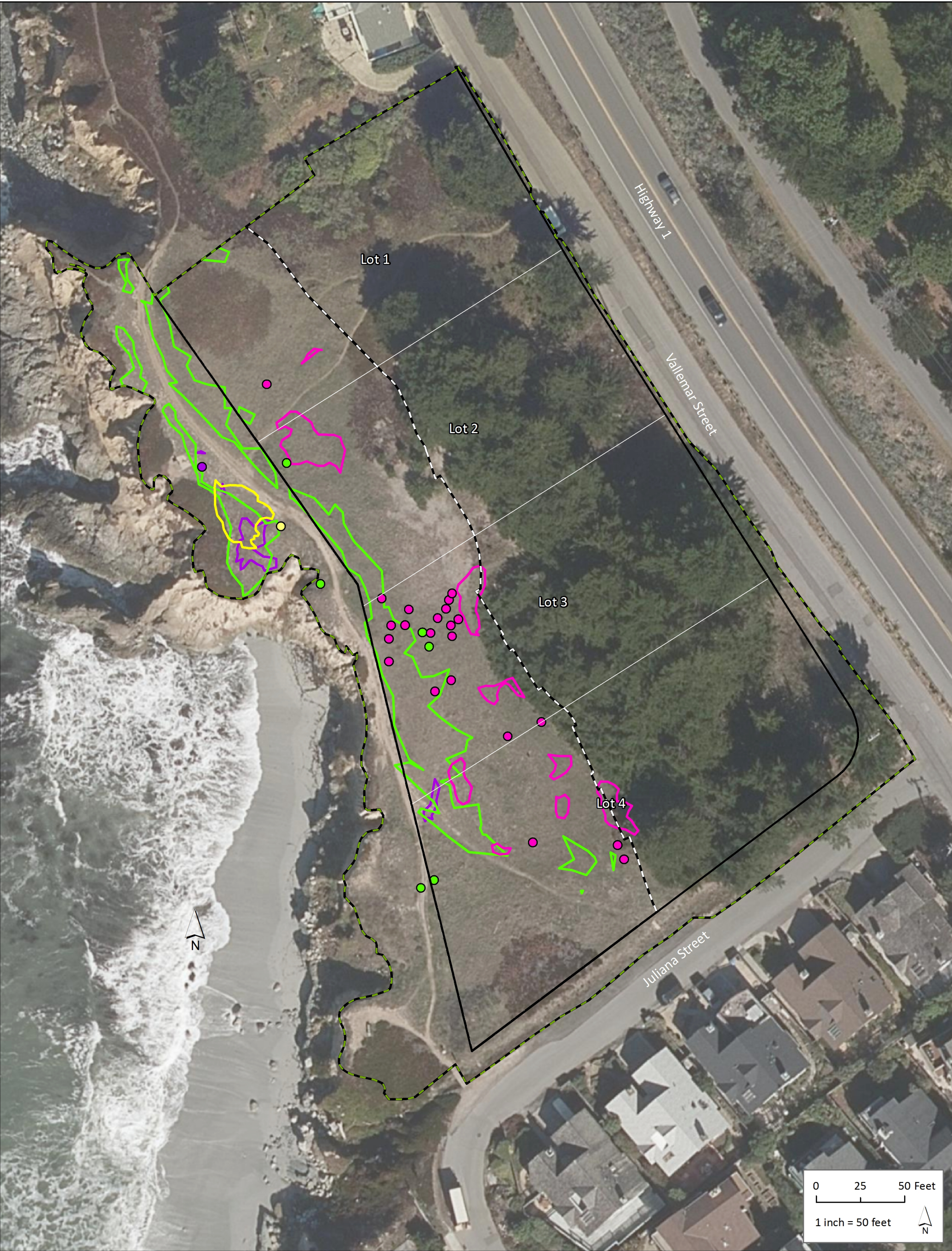


Jodi McGraw Consulting



County of San Mateo - Planning and Building Department

ATTACHMENT E2



Vallemar Bluffs Rare Plants

Mapped Patches

- Blasdale's Bent Grass
- Coast Yellow Leptosiphon
- Johnny Nip
- Harlequin Lotus

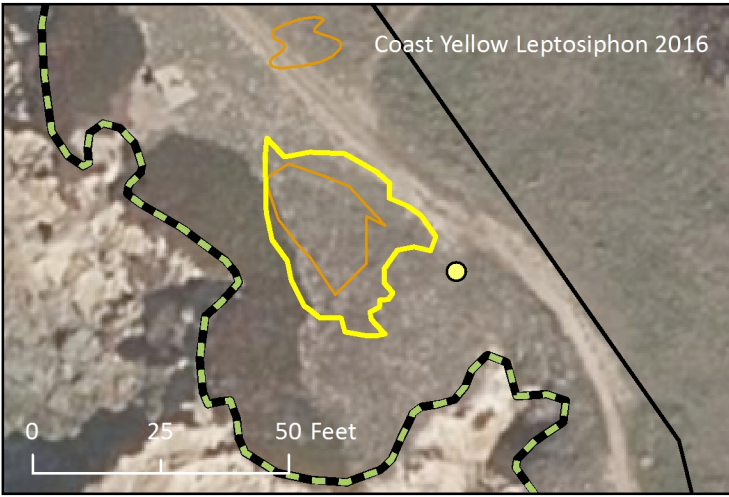
Point Occurrences

- Blasdale's Bent Grass
- Coast Yellow Leptosiphon
- Johnny Nip
- Harlequin Lotus
- Study Area Boundary

Moss Beach Associates Project

- Property Boundary
- Proposed Parcels
- Proposed Conservation Area

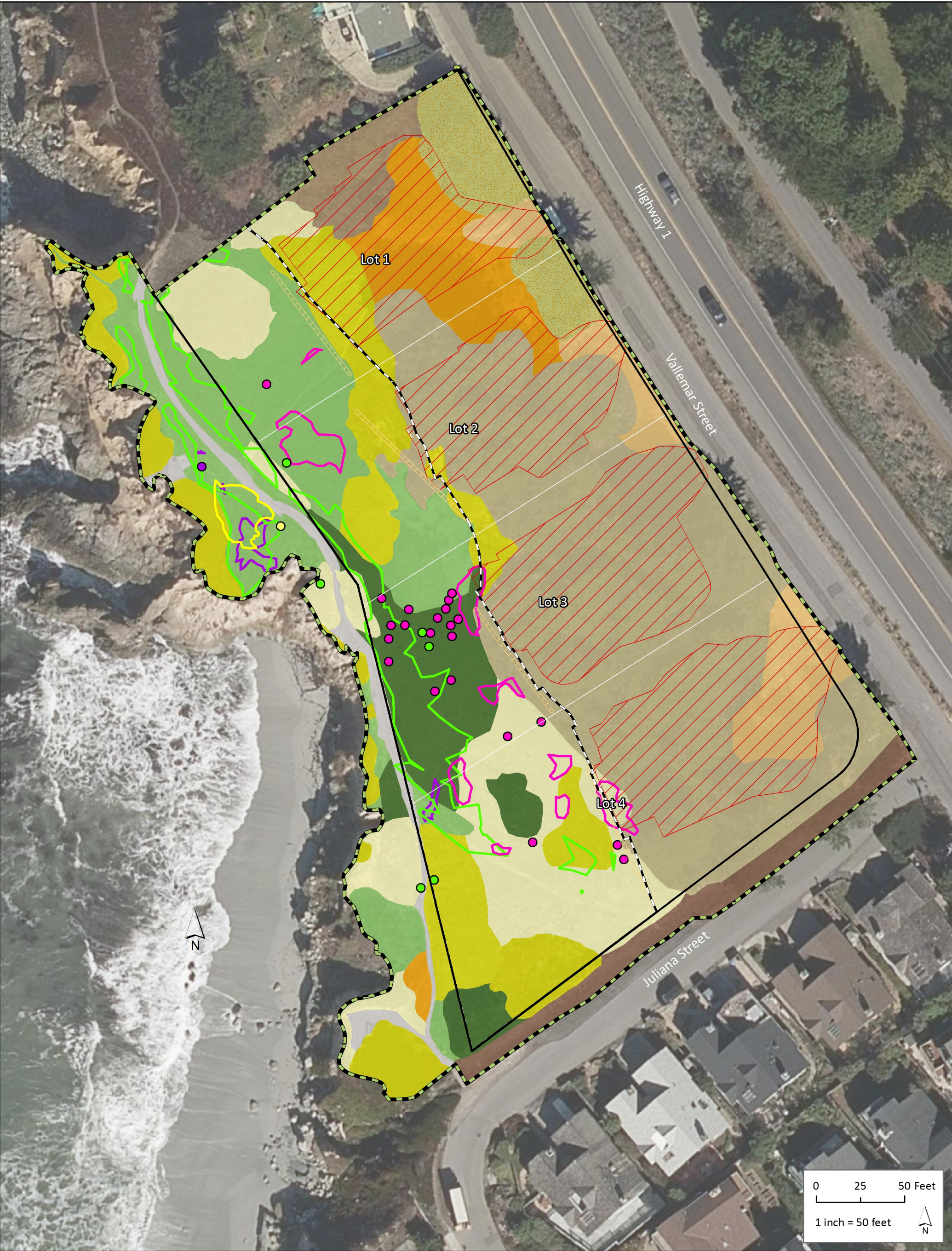
Sources: JMc, Ifland Survey





County of San Mateo - Planning and Building Department

ATTACHMENT E3



Vallemar Bluffs: Proposed Conservation and Development Areas and Sensitive Botanical Resources

Mapped Points and Patches

- Blasdale's Agrostis
- Coast Yellow Leptosiphon
- Johnny Nip
- Harlequin Lotus
- Study Area Boundary

Coastal Terrace Prairie Assemblages

- Native Dominated
- Native-Exotic Co-dominated
- Exotic Dominated-Natives Subdominant
- Exotic Dominated-Natives Present

Ruderal Assemblages

- Exotic Dominated-Natives Present
- Exotic Dominated-No/Very Low Natives Present

Planted Assemblages

- Native-Exotic Co-dominated
- Exotic Dominated-Natives Subdominant
- Exotic Dominated-Natives Present
- Exotic Dominated-No/Very Low Natives Present

CommType2, GenOrigin

- Bluff Trail (Mostly Bare Ground)

Sources: JMc, Ifland Survey

Moss Beach Associates Project

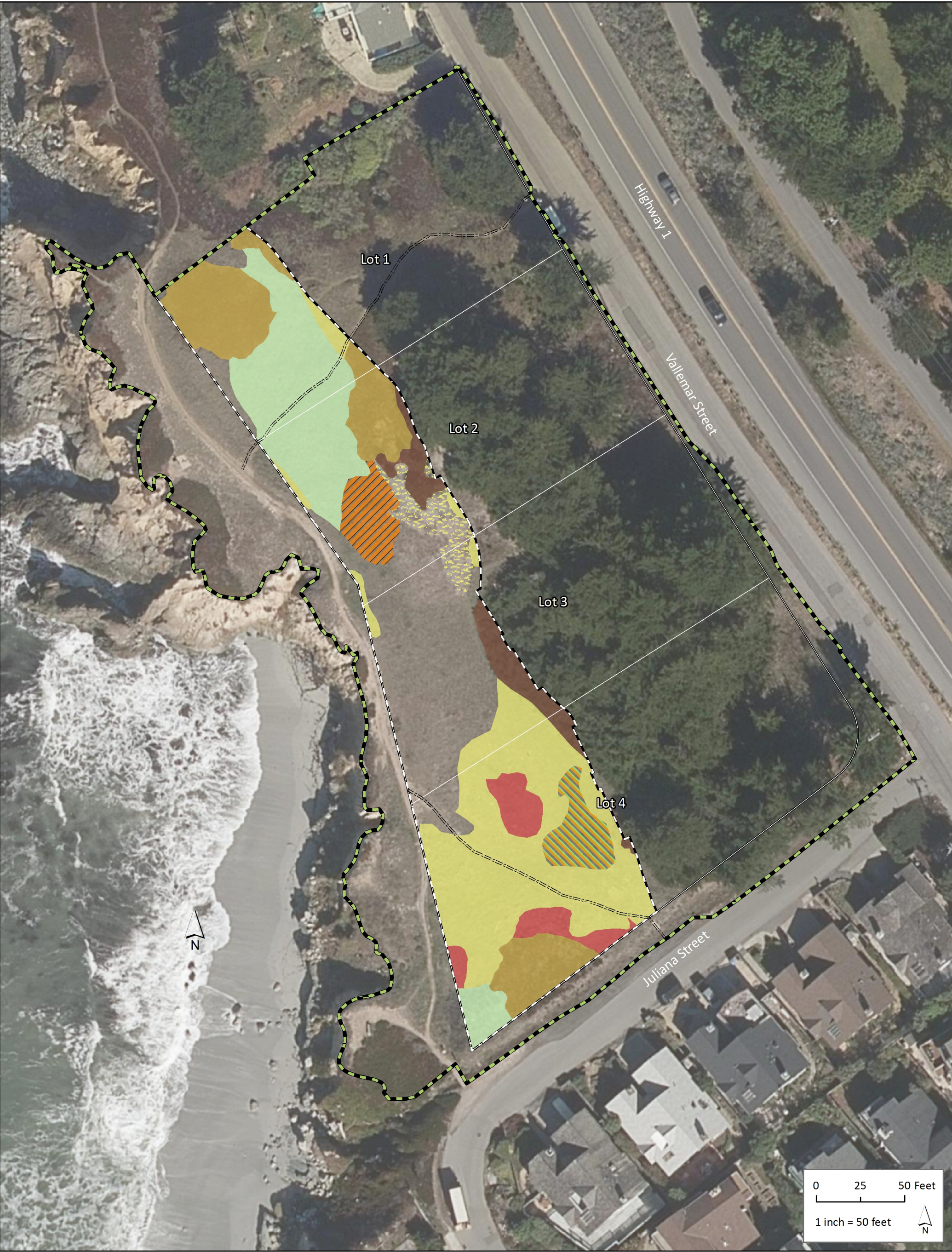
- Property Boundary
- Proposed Parcels
- Proposed Conservation Area
- Limits of Grading
- Infiltration Spreaders

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County of San Mateo - Planning and Building Department

ATTACHMENT E4



Vallemar Bluffs: Conservation and Restoration Areas

-  Restore De Facto Trails
-  Address Unnatural Topography (Mound)
-  Address Unnatural Topography (Swale)
-  Remove Planted/Ornamental Species
-  Remove Ice Plant Mats
-  Control Invasive Plants
-  Control Dense Exotic Grasses and Forbs
-  Manage Native Disturbance-Adapted Plants
-  Conservation Area (0.92 acres)
-  Study Area Boundary
-  Remove Wood Chips

Moss Beach Associates Project

-  Property Boundary
-  Proposed Parcels

Sources: JMc, Ifland Survey

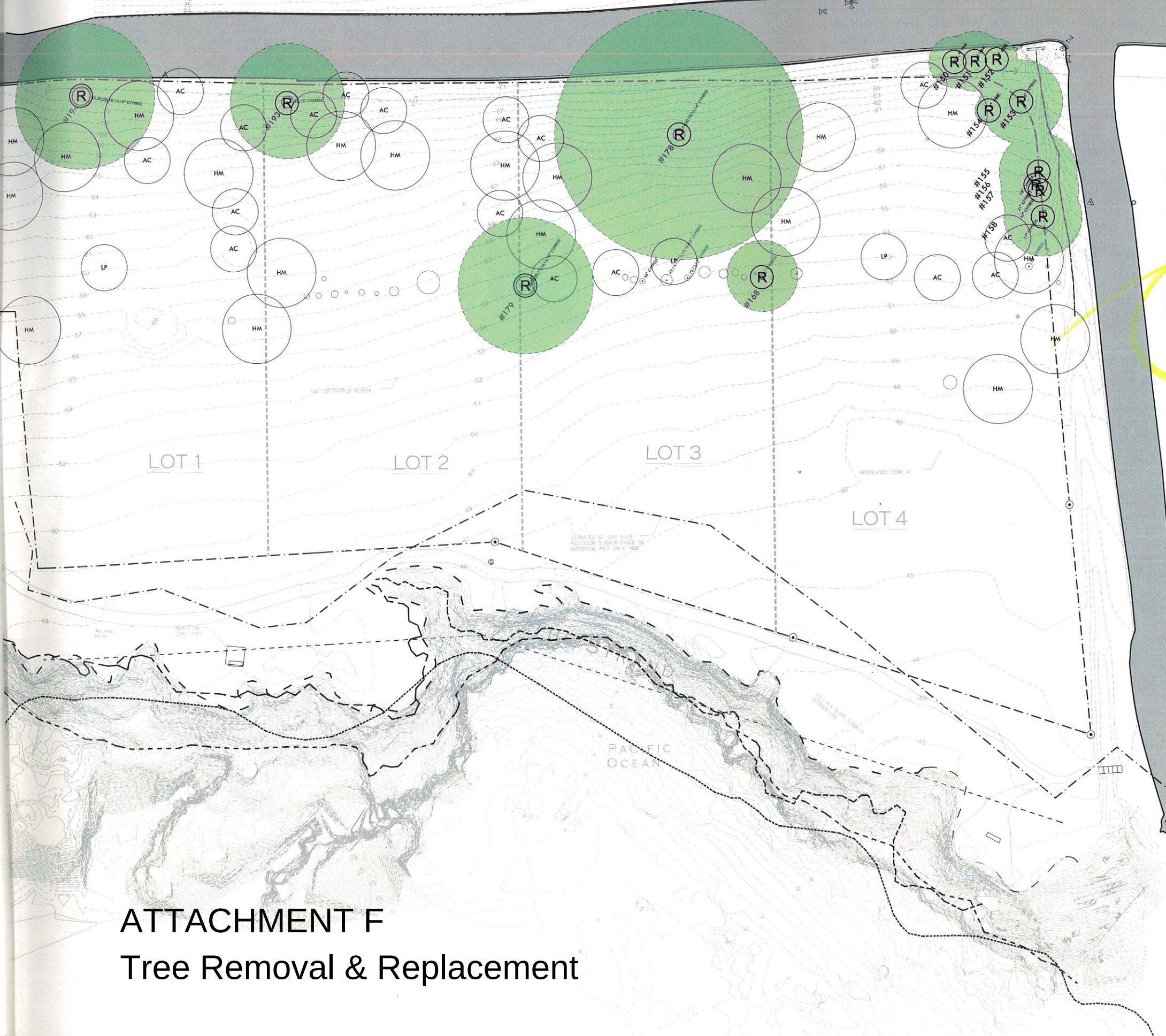


Jodi McGraw
Consulting



County of San Mateo - Planning and Building Department

ATTACHMENT F



SYMBOL	DESCRIPTION
	TOP EDGE OF BLUFF
	TOP OF BEDROCK
	1983 BLUFF EDGE
	TOP OF BEACH
	MOSS BEACH HEIGHTS SUBDIVISION MAP 6-RSM-88, DATED MAY 1908
	EXISTING TREE, DIAMETER OF TRUNK(S) AND SPECIES TYPE
	TREE NO.
	EXISTING TREE TO BE REMOVED QUANTITY: 31
	EXISTING TREE TO BE REMAIN AND BE PROTECTED QUANTITY: 14
	TREE PROTECTION ZONE (1' RADIUS PER 1" TRUNK DIAMETER)

TREE REPLACEMENT LEGEND			
SYM	QTY	SIZE	BOTANICAL/COMMON NAME
HM	20	24" BOX	HESPEROCYPARIS MACROCARPA MONTEREY CYPRESS
AC	17	24" BOX	AESCULUS CALIFORNICA CALIFORNIA BUCKEYE
LP	3	24" BOX	LAGUNARIA PATERSONII PRIMROSE TREE

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CONSULTANT

SHEET TITLE

**TREE REPLACEMENT
PLAN**

PROJECT NAME

**MOSS BEACH
OCEAN
DEVELOPMENT**

PROJECT ADDRESS

**VALLEMAR ST. &
JULIANA AVE
MOSS BEACH, CA**

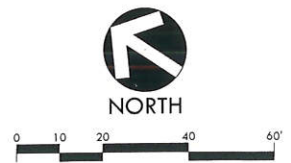
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PROJ. NO.	1500600-1668
SHEET NO.	L3.2 OF SHEETS

TREE REPLACEMENT PLAN

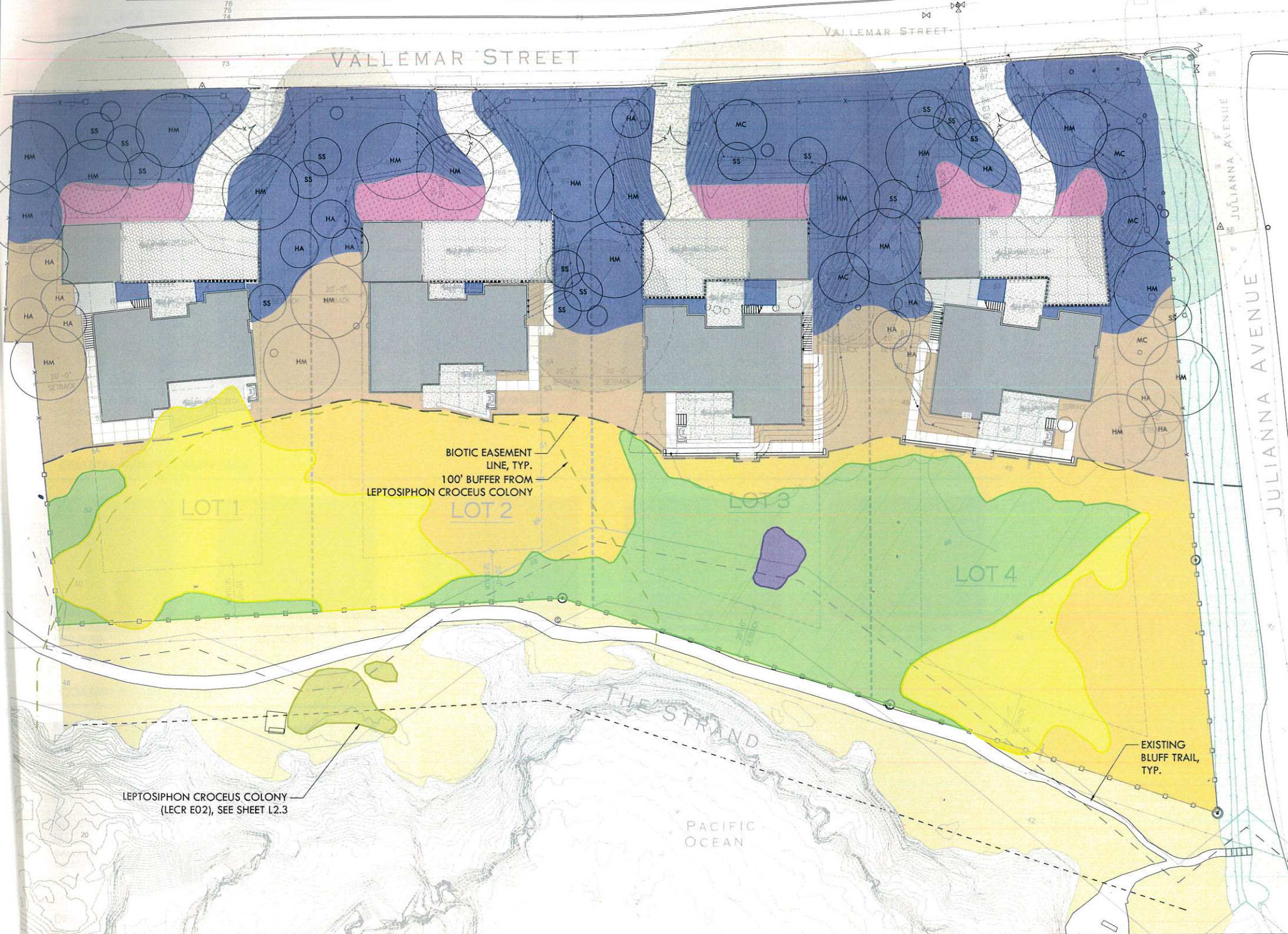
ATTACHMENT F
Tree Removal & Replacement





County of San Mateo - Planning and Building Department

ATTACHMENT G



ATTACHMENT G
Tree & Shrub Planting Plan with Biotic Easement

- PLANTING NOTES**
1. PLANTING PLAN HAS BEEN REVIEWED BY PROJECT BIOLOGIST, ZANDER ASSOCIATES ENVIRONMENTAL CONSULTANTS, ON SEPTEMBER 1, 2015, AND APPROVED WITHIN THE RECOMMENDATION LETTER DATED SEPTEMBER 1, 2015.
 2. ALL NON-TURF PLANTING AREAS SHALL RECEIVE A 3" LAYER OF BARK MULCH TOP DRESS (UNLESS NOTED OTHERWISE) EXCEPT IN PROXIMITY TO THE SPREADERS WHERE A 1/2" CRUSHED STONE MULCH 3" DEEP WILL BE USED. REFER TO SPECIFICATIONS.
 3. WHEN WORK HAS TO OCCUR UNDER THE DRIPLINE OF EXISTING TREES NOT SCHEDULED FOR REMOVAL, THE CONTRACTOR SHALL USE ALL POSSIBLE CARE TO AVOID INJURY TO THE TREES AND TREE ROOTS. GRADE IN LINES RADIAL TO THE EXISTING TREES RATHER THAN TANGENTIAL. ALL PARTIAL CUTS OR TEARS THROUGH ROOTS TWO INCHES IN DIAMETER AND LARGER SHALL BE CUT CLEAN. TRENCHES ADJACENT TO TREES SHALL BE FILLED WITHIN 24 HOURS AFTER EXCAVATION, BUT WHERE THIS IS NOT POSSIBLE, THE SIDE OF THE TRENCH ADJACENT TO THE TREE, AND ANY EXPOSED ROOTS SHALL BE KEPT SHADED AND MOIST WITH DAMPENED BURLAP OR CANVAS.
 4. ALL TURF, MULCH AND PLANTERS TO RECEIVE SOIL AMENDMENTS AN SOIL PREPARATION PER SPECIFICATIONS UNLESS OTHERWISE NOTED.

SYM	QTY	SIZE			
14,424 SF	N/A	N/A	ZONE A - COASTAL PRAIRIE GRASSLAND TO REMAIN AND BE PROTECTED		
11,683 SF	N/A	N/A	ZONE B - TRANSITIONAL AREA TO REMAIN AND BE PROTECTED, NON-NATIVE SPECIES TO BE REMOVED		
498 SF	N/A	N/A	BEACH STRAWBERRY TO REMAIN AND BE PROTECTED		
TREES					
SYM	QTY	SIZE	BOTANICAL/COMMON NAME	SPACING/SPREAD	HEIGHT
TREES					
HM	20	24" BOX	HESPEROCYPARIS MACROCARPA MONTEREY CYPRESS	30' O.C.	60'
AC	17	24" BOX	AESCULUS CALIFORNICA CALIFORNIA BUCKEYE	25' O.C.	25'
LP	3	24" BOX	LAGUNARIA PATERSONIA PRIMROSE TREE	20' O.C.	20'
HA	14	24" BOX	HETEROMELES ARBUTIFOLIA TOYON	20' O.C.	15'
MC	5	24" BOX	MORELLA CALIFORNICA PACIFIC WAX MYRTLE	15' O.C.	20'
SS	16	24" BOX	SAUX SCOUERIANA SCOUER'S WILLOW	15' O.C.	15'
SHRUBS & GRASSES					
SYM	QTY	SIZE	BOTANICAL/COMMON NAME	HEIGHT/SPREAD	
ORNAMENTAL NATIVES					
23,806 SF	20%	1 GAL	ACHILLEA MILLEFOLIUM YARROW	2' X 2'	
	20%	1 GAL	ARMERIA MARITIMA SEA THRIFT	1' X 1'	
	20%	1 GAL	BACCHARIS PILULARIS 'PIGEON POINT' DWARF COYOTE BRUSH	3' X 6'	
	20%	1 GAL	FRANGULA CALIFORNICA 'EVE CASE' COFFEEBERRY	8' X 8'	
	20%	1 GAL	RIBES AUREUM GRACILLUM GOLDEN CURRANT	6' X 6'	
COASTAL PRAIRIE / NATIVE MIX					
10,777 SF	30%	4" POTS	CAREX PRAEGRACILIS FIELD SEDGE	2' X 2'	
	15%	4" POTS	ERIGERON GLAUCUS SEASIDE DAISY	1' X 1'	
	15%	4" POTS	DANTHONIA CALIFORNICA CALIFORNIA OAT GRASS	1' X 1'	
	25%	4" POTS	MELICA CALIFORNICA CALIFORNIA MELIC	3' X 1'	
	15%	4" POTS	SISYRINCHIUM BELLUM BLUE-EYED GRASS	2' X 2'	
ON-SITE COASTAL PRAIRIE RESTORATION					
13,430 SF	80%	4" POTS	DANTHONIA CALIFORNICA CALIFORNIA OAT GRASS	1' X 1'	
	10%	4" POTS	DESCHAMPSIA CESPITOSA 'HOLCIFORMIS' PACIFIC HAIRGRASS	3' X 2'	
	10%	4" POTS	STIPA PULCHRA PURPLE NEEDLE GRASS	2' X 2'	
BLUFF COASTAL PRAIRIE RESTORATION (SUBJECT TO COUNTY APPROVAL)					
14,868 SF	80%	4" POTS	DANTHONIA CALIFORNICA CALIFORNIA OAT GRASS	1' X 1'	
	10%	4" POTS	DESCHAMPSIA CESPITOSA 'HOLCIFORMIS' PACIFIC HAIRGRASS	3' X 2'	
	10%	4" POTS	STIPA PULCHRA PURPLE NEEDLE GRASS	2' X 2'	
DRAINAGE PLANTING (SUBJECT TO COUNTY APPROVAL)					
6,911 SF	50%	1 GAL	JUNCUS EFFUSUS COMMON RUSH	3' X 2'	
	50%	1 GAL	JUNCUS PATENS CALIFORNIA GREY RUSH	3' X 3'	
BIO-RETENTION SWALE PLANTING					
1,478 SF	50%	1 GAL	JUNCUS EFFUSUS COMMON RUSH	3' X 2'	
	50%	1 GAL	JUNCUS PATENS CALIFORNIA GREY RUSH	3' X 3'	
NATIVE COASTAL GRASS LAWN					
3,227 SF	100%	SEED	AGROSTIS PALLENS SEASHORE BENTGRASS	N/A	
EXISTING VEGETATION TO REMAIN AND BE PROTECTED					
766 SF	N/A	N/A	LEPTOSIPHON CROCEUS - LEICR ELEMENT OCCURRENCE 02 PER CA NATIVE PLANT SOCIETY MEMORANDUM (5/25/2016)		

NORTH

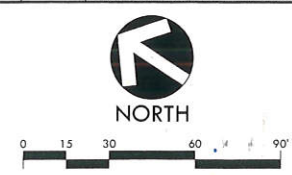
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15

30

60

90'



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CONSULTANT

SHEET TITLE

TREE AND SHRUB PLANTING PLAN

PROJECT NAME

MOSS BEACH OCEAN DEVELOPMENT

PROJECT ADDRESS

**VALLEMAR ST. & JULIANA AVE
MOSS BEACH, CA**

SUBMITTAL	DATE
DESIGN REVIEW APPLICATION	08/21/15
DESIGN REVIEW RESUBMITTAL	08/09/16

NO.	REVISIONS	DATE
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PROJ. NO.	1500600-1668		
SHEET NO.	L3.3		

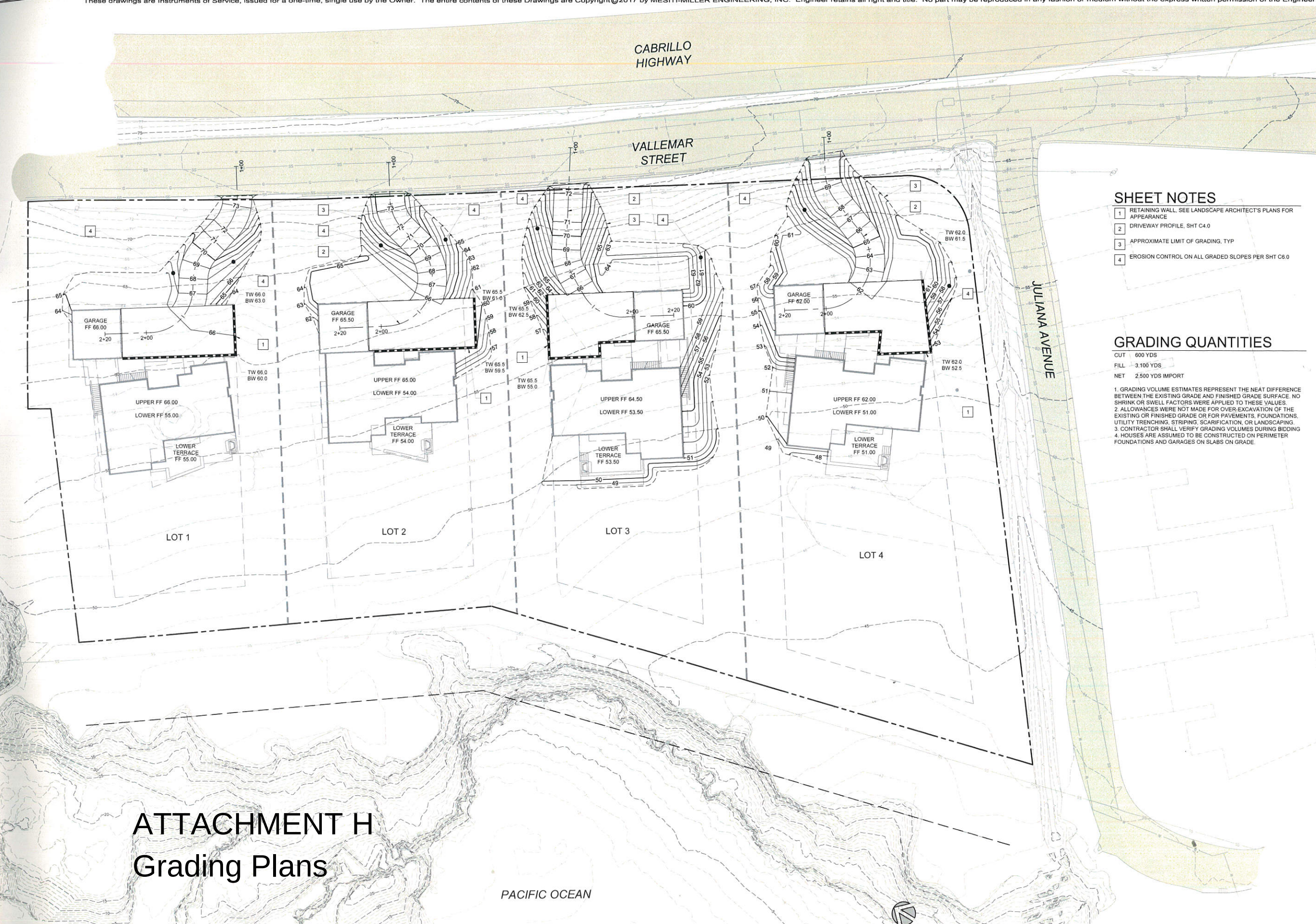
OF SHEETS

TREE AND SHRUB PLANTING PLAN



County of San Mateo - Planning and Building Department

ATTACHMENT H



ATTACHMENT H

Grading Plans

PACIFIC OCEAN

GRADING PLAN
SCALE: 1" = 20'

SHEET NOTES

1. RETAINING WALL, SEE LANDSCAPE ARCHITECT'S PLANS FOR APPEARANCE
2. DRIVEWAY PROFILE, SHT C4.0
3. APPROXIMATE LIMIT OF GRADING, TYP
4. EROSION CONTROL ON ALL GRADED SLOPES PER SHT C6.0

GRADING QUANTITIES

CUT 600 YDS
FILL 3,100 YDS
NET 2,500 YDS IMPORT

1. GRADING VOLUME ESTIMATES REPRESENT THE NET DIFFERENCE BETWEEN THE EXISTING GRADE AND FINISHED GRADE SURFACE. NO SHRINK OR SWELL FACTORS WERE APPLIED TO THESE VALUES.
2. ALLOWANCES WERE NOT MADE FOR OVER-EXCAVATION OF THE EXISTING OR FINISHED GRADE OR FOR PAVEMENTS, FOUNDATIONS, UTILITY TRENCHING, STRIPING, SCARIFICATION, OR LANDSCAPING.
3. CONTRACTOR SHALL VERIFY GRADING VOLUMES DURING BIDDING.
4. HOUSES ARE ASSUMED TO BE CONSTRUCTED ON PERIMETER FOUNDATIONS AND GARAGES ON SLABS ON GRADE.

DATE	BY	DESCRIPTION
9/1/2016	RTC	PLANNING PERMIT SUBMITTAL
8/9/2016	RTC	DESIGN REVIEW RESUBMITTAL
4/26/2017	RTC	FOUR LOT PLANNING RESUBMITTAL
8/23/2017	RTC	LOT 1 REVISIONS

REV	1	2	3	4
BY	RTC	RTC	RTC	RTC
DATE	8/23/2017	8/23/2017	8/23/2017	8/23/2017

Mesiti-Miller Engineering, Inc.
CIVIL AND STRUCTURAL DESIGN
651-425-3183 BUREAU CROZEE WWW.MME.COM

PRELIMINARY NOT FOR CONSTRUCTION	VALLEMAR STREET & JULIANA AVENUE MOSS BEACH, CALIFORNIA PREPARED AT THE REQUEST OF MOSS BEACH ASSOCIATES 612 SPRING ST SANTA CRUZ, CA 95060
--	--

GRADING PLAN	DRAWN BY: DAM
	CHECKED BY: RTC
	JOB NUMBER: 15147
	SHEET
	C2.0

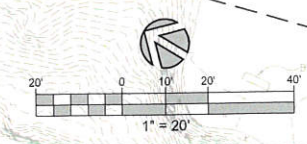


County of San Mateo - Planning and Building Department

ATTACHMENT I

ATTACHMENT I Drainage Plans

UTILITY & DRAINAGE PLAN
SCALE: 1" = 20'



SHEET NOTES

- 1 GRAVITY SANITARY SEWER LINE PER PROFILE SHT C5.0
- 2 DOMESTIC SANITARY SEWER PUMP AND FORCE MAIN WITH BACKFLOW PREVENTION DEVICE, TYP
- 3 SANITARY SEWER CLEANOUT AND GRAVITY LATERAL, TYP
- 4 WATER METER AND WATER SERVICE LATERAL, TYP
- 5 RAINWATER LEADER DIRECTED TO BIO-RETENTION SWALE OR INFILTRATION SPREADER, TYP. DOWNSPOUT LOCATIONS APPROXIMATE. COORDINATE LOCATIONS WITH ARCHITECT
- 6 ECO RAIN DETENTION SYSTEM PER DETAIL 2/C8.0
- 7 STORM DRAIN CATCH BASIN PER DETAIL 6/C8.0, TYP
- 8 EXISTING FIRE HYDRANT
- 9 INFILTRATION SPREADER PERFORATED PIPE AND TRENCH PER DETAIL 1/C8.0
- 10 FOUNDATION CURTAIN DRAIN PER DETAIL 10/C8.0 OR RETAINING WALL BACKDRAIN, TYP

DRAINAGE AREAS

LOT	IMPERVIOUS AREAS* (SF)	PERVIOUS PAVER AREAS (SF)
LOT 1	4,300	1,420
LOT 2	3,920	1,190
LOT 3	4,330	1,110
LOT 4	4,520	1,380
TOTAL (SF)	17,070	5,100

*IMPERVIOUS AREAS INCLUDE ROOFS, TERRACES, AND CONCRETE DRIVEWAYS. IMPERVIOUS AREAS DO NOT INCLUDE DECKS OR ROOF OVERHANGS. PERVIOUS PAVER AREAS INCLUDE MOTORCOURTS.

NOTES

1. ALL INLETS SHALL READ, "NO DUMPING! FLOWS TO BAY" OR EQUIVALENT.
2. PLACE 3 FOOT CONCRETE PLUG IN EACH UTILITY TRENCH WHERE IT PASSES UNDER EXTERIOR FOUNDATIONS.
3. UTILITY TRENCHES SHOULD BE CAPPED WITH 1.5 FEET OF RELATIVELY IMPERMEABLE SOIL.
4. DRAINAGE SYSTEMS SHALL BE MAINTAINED IN ACCORDANCE WITH THE DRAINAGE MAINTENANCE AGREEMENT



PRELIMINARY
NOT FOR
CONSTRUCTION

VALLEMAR STREET & JULIANA AVENUE
MOSS BEACH, CALIFORNIA

UTILITY & DRAINAGE PLAN

DRAWN BY: RTC, DAM
CHECKED BY: RTC
JOB NUMBER: 15147-5

SHEET
C3.0

REV	DESCRIPTION	DATE
1	PLANNING PERMIT SUBMITTAL	9/1/2017
2	DESIGN REVIEW RESUBMITTAL	9/20/2017
3	FOUR LOT PLANNING RESUBMITTAL	4/26/2020
4	LOT 1 REVISIONS	4/26/2020



County of San Mateo - Planning and Building Department

ATTACHMENT J

CABRILLO
HIGHWAY

VALLEMAR
STREET

JULIANA AVENUE

SHEET NOTES

1. PROTECT ALL CUT AND FILL SLOPES WITH EROSION CONTROL FABRIC AND OR MULCH
2. PROTECT ALL STORM DRAIN SYSTEMS AND BIOSWALES FROM SEDIMENT DURING CONSTRUCTION WITH FABRIC INLET COVERS AND OR GRAVEL BAG BERMS, TYP
3. PROTECT DITCH FROM SEDIMENT DURING CONSTRUCTION WITH SILT FENCES AND/OR FIBER ROLLS
4. PREVENT CONCENTRATED RUNOFF FROM FLOWING OVER SLOPE
5. TEMPORARY SILT FENCE
6. TREE PROTECTION, TEMPORARY FENCE (TYPE ESA) PER CALTRANS STANDARD PLAN T65, REMOVE FENCE FOLLOWING APPROVAL OF FINAL STABILIZATION



PRELIMINARY
NOT FOR
CONSTRUCTION

VALLEMAR STREET & JULIANA AVENUE
MOSS BEACH, CALIFORNIA

PREPARED AT THE REQUEST OF
MOSS BEACH ASSOCIATES
612 SPRING ST.
SANTA CRUZ, CA 95060

EROSION CONTROL PLAN

DRAWN BY: DAM
CHECKED BY: RTC
JOB NUMBER: 15147
SHEET

C6.0

CONSTRUCTION BEST MANAGEMENT PRACTICES

GENERAL

1. CONTROL AND PREVENT THE DISCHARGE OF ALL POTENTIAL POLLUTANTS, INCLUDING PAVEMENT CUTTING WASTES, PAINTS, CONCRETE, PETROLEUM PRODUCTS, CHEMICALS, WASHWATER OR SEDIMENTS, RINSE WATER FROM ARCHITECTURAL COPPER, AND NON-STORMWATER DISCHARGES TO STORM DRAINS AND WATERCOURSES.
2. STORE, HANDLE, AND DISPOSE OF CONSTRUCTION MATERIALS/WASTES PROPERLY TO PREVENT CONTACT WITH STORMWATER.
3. DO NOT CLEAN, FUEL, OR MAINTAIN VEHICLES ON-SITE, EXCEPT IN A DESIGNATED AREA WHERE WASHWATER IS CONTAINED AND TREATED.
4. TRAIN AND PROVIDE INSTRUCTION TO ALL EMPLOYEES/SUBCONTRACTORS RE: CONSTRUCTION BMPs.
5. PROTECT ALL STORM DRAIN INLETS IN THE VICINITY OF SITE USING FABRIC INLET COVERS SUCH AS BERMS, FIBER ROLLS, OR BAGS.
6. LIMIT CONSTRUCTION ACCESS ROUTES AND STABILIZE DESIGNATED ACCESS POINTS.
7. PERFORM CLEARING AND EARTH MOVING ACTIVITIES ONLY DURING DRY WEATHER.
8. USE SEDIMENT CONTROL MEASURES TO PREVENT SEDIMENT FROM ENTERING STORM DRAINS.
9. OBTAIN ALL NECESSARY PERMITS TO TRAP SEDIMENT ON-SITE, USING BMPs SUCH AS SEDIMENT BASINS OR TRAPS, EARTHEN DIKES OR BERMS, SILT FENCES, CHECK DAMS, SOIL BLANKETS OR MATS, COVERS FOR SOIL STOCK PILES, ETC.
10. DIVERT ON-SITE RUNOFF AROUND EXPOSED AREAS; DIVERT OFF-SITE RUNOFF AROUND THE SITE (E.G., SWALES AND DIKES).

ATTACHMENT J Erosion Control Plan

11. PROTECT ADJACENT PROPERTIES AND UNDISTURBED AREAS FROM CONSTRUCTION IMPACTS USING VEGETATIVE BUFFER STRIPS, SEDIMENT BARRIERS OR FILTERS, DIKES, MULCHING, OR OTHER MEASURES AS APPROPRIATE.
12. NO LAND CLEARING OPERATIONS OR GRADING OPERATIONS MAY TAKE PLACE BETWEEN OCTOBER 15 AND APRIL 15 UNLESS A SEPARATE WINTER EROSION CONTROL PLAN IS APPROVED PRIOR TO BEGINNING SUCH CONSTRUCTION.
13. EROSION IS TO BE CONTROLLED AT ALL TIMES. THE SPECIFIC MEASURES SHOWN ARE TO BE IMPLEMENTED AT ALL TIMES. ADDITIONAL MEASURES WILL BE REQUIRED FOR CONSTRUCTION BETWEEN OCTOBER 15 AND APRIL 15.
14. EROSION CONTROL MEASURES SHALL BE MONITORED, MAINTAINED, AND REPLACED AS NEEDED TO PREVENT ESCAPE OF SEDIMENT FROM THE SITE. NO TURBID RUNOFF SHALL BE ALLOWED TO LEAVE THE CONSTRUCTION SITE.

RESPONSIBILITY

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ALL SEDIMENTATION ON-SITE OR OFF-SITE THAT IS GENERATED BY GRADING AND RELATED ACTIVITIES OF THE PROJECT.
2. PROTECTION OF DISTURBED AREAS:
 1. EROSION CONTROL MEASURES SHALL BE IMPLEMENTED AS SOON AS PRACTICAL SO THAT SUFFICIENT GROWTH WILL BE ESTABLISHED PRIOR TO INCLEMENT WEATHER CONDITIONS AND CONTINUALLY MAINTAINED TO MINIMIZE SURFACE EROSION.
 2. ALL DISTURBED AREAS SHALL BE HYDROSEEDING USING A NATIVE SEED MIX AND MULCHED SO THAT THE DISTURBED AREAS ARE PROTECTED BY MATURE GRASS PRIOR TO OCTOBER 15. IN THE EVENT THAT IT IS NOT POSSIBLE TO ESTABLISH MATURE GRASS BY OCTOBER 15TH, ALL DISTURBED AREAS SHALL BE HYDROSEEDING, MULCHED, AND PROTECTED BY EROSION CONTROL BLANKETS INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
 3. EROSION CONTROL BLANKETS SHALL BE REED & GRAHAM WOVEN JUTE MESH 0.9 #/YD² OR EQUAL.
 4. BETWEEN OCTOBER 15 AND APRIL 15, EXPOSED SOIL SHALL BE PROTECTED FROM EROSION AT ALL TIMES. DURING CONSTRUCTION ALL DISTURBED SLOPES NOT ACTIVELY USED FOR CONSTRUCTION WILL BE SEEDING, MULCHED, AND BLANKETED. HAY BALES, FILTER BERMS, SILT FENCE(S) SHALL BE EMPLOYED TO TRAP SEDIMENT BEFORE IT LEAVES THE SITE OF ANY CONSTRUCTION.
 5. AFTER OCTOBER 15 AND APRIL 15, A STOCKPILE OF SOIL SHALL REMAIN ON THE JOB SITE DURING THE COURSE OF CONSTRUCTION. CONTRACTOR SHALL USE STRAW BALES FOR CHECK DAMS AND FOR EROSION CONTROL PROTECTION DURING THE RAINY SEASON AS NECESSARY.
 6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ALL SEDIMENTATION ON-SITE OR OFF-SITE THAT IS

PROTECTION OF DISTURBED AREAS

1. EROSION CONTROL MEASURES SHALL BE IMPLEMENTED AS SOON AS PRACTICAL SO THAT SUFFICIENT GROWTH WILL BE ESTABLISHED PRIOR TO INCLEMENT WEATHER CONDITIONS AND CONTINUALLY MAINTAINED TO MINIMIZE SURFACE EROSION.
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6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ALL SEDIMENTATION ON-SITE OR OFF-SITE THAT IS

RUNOFF

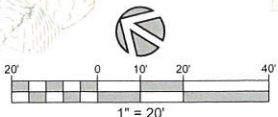
1. NO TURBID RUNOFF SHALL BE ALLOWED TO LEAVE THE SITE.
2. RUNOFF MUST BE PREVENTED FROM FLOWING OVER UNPROTECTED SLOPES.
3. KEEP RUNOFF AWAY FROM DISTURBED AREAS DURING GRADING AND RELATED ACTIVITIES.
4. SILT BARRIERS SHALL BE CONSTRUCTED ALONG THE BOTTOM OF ALL GRADED SLOPES. SILT DEPOSITS SHALL BE REMOVED AS NECESSARY TO PREVENT MORE THAN 12 INCHES OF ACCUMULATION.
5. EQUIPMENT FUELING, MAINTENANCE, AND CLEANING SHALL OCCUR IN A CONTROLLED LOCATION. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY.

SEEDING PROCEDURE

1. TEMPORARY SEED MIX SHALL CONSIST OF NATIVE SEEDS AND SHALL BE APPLIED AT RATE OF 140 POUNDS PER ACRE. SEED SHALL BE SUBMITTED TO LANDSCAPE ARCHITECT FOR REVIEW & APPROVAL.
2. BEFORE SEEDING, REMOVE WOOD CHIPS, ROCKS, AND DEBRIS FROM THE DISTURBED AREA. RAKE OUT SCARP TO PROVIDE A SMOOTH TRANSITION FOR EROSION CONTROL BLANKETS.
3. SEEDING - APPLY SEED AND FERTILIZER BY HYDROSEEDING.
4. MULCHING - AFTER HYDROSEEDING, APPLY 2" OF STRAW MULCH.
5. INSTALL EROSION CONTROL BLANKETS ON EXPOSED SLOPES.
6. INSTALL STRAW ROLLS.
7. IRRIGATION - SHALL BE USED SO THAT EFFECTIVE PLANT GROWTH IS ESTABLISHED AS SOON AS POSSIBLE. THE SOIL SHOULD BE KEPT CONTINUALLY MOIST UNTIL THE SEED GERMINATES (2-3 WEEKS) AND THE GRASS IS THREE INCHES (3") HIGH. THEN CONTINUE TO WATER ABOUT ONCE A WEEK OR AS REQUIRED UNTIL THE RAINY SEASON BEGINS. IRRIGATION SHALL BE CLOSELY MONITORED SO THAT IT WILL NOT CAUSE AN EROSION PROBLEM.
8. MAINTENANCE - THE CONTRACTOR SHALL COMMENCE WATERING THE COVERED AREAS WITHIN ONE WEEK AFTER SEEDING. THE WATERING WILL CONTINUE UNTIL THE GROUND COVER IS FULLY DEVELOPED AND AS REQUIRED. THE OWNER SHALL MONITOR, MAINTAIN, AND REPAIR ALL EROSION CONTROL MEASURES AS REQUIRED.
9. AUTOMATIC IRRIGATION IS NOT APPROVED.

EROSION CONTROL PLAN

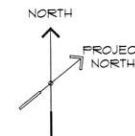
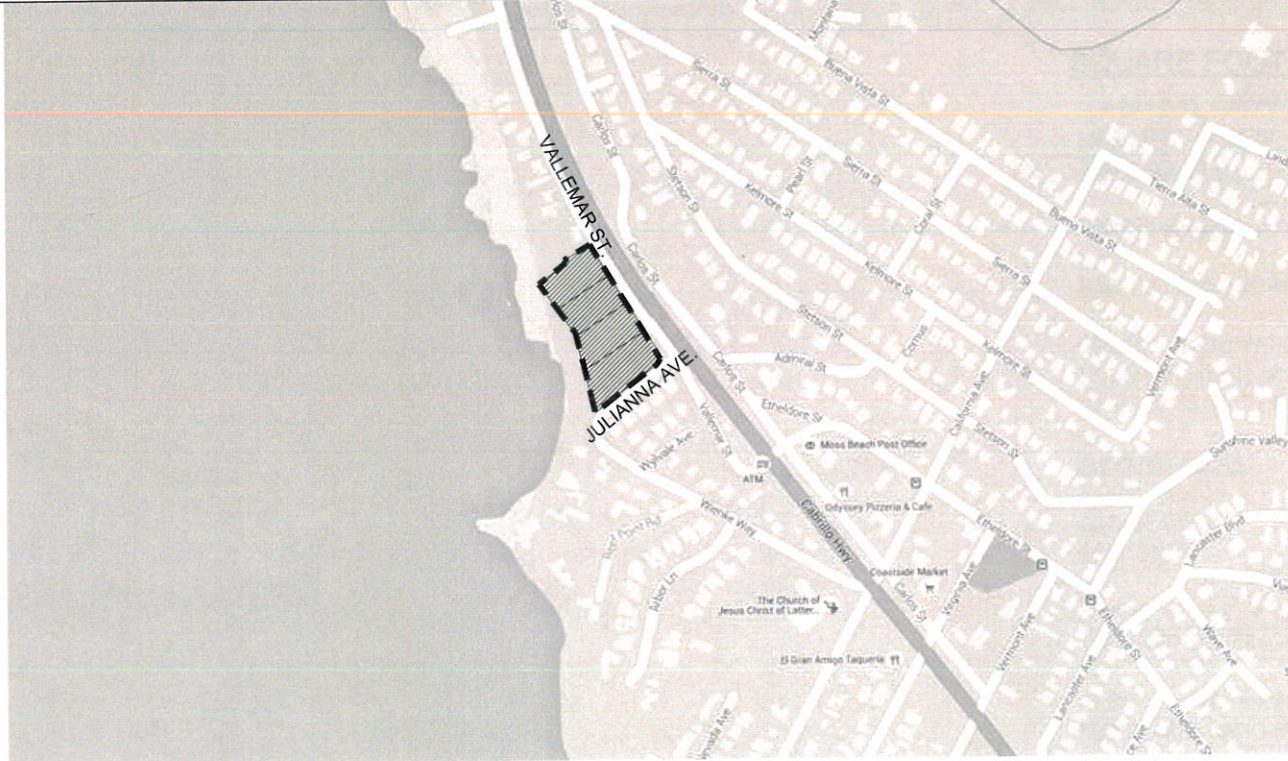
SCALE: 1" = 20'





County of San Mateo - Planning and Building Department

ATTACHMENT K



LOT 1

ARCHITECTURAL

COVER VICINITY MAP & PROPERTY SUMMARY
A01 AREA PLAN CALCULATIONS

A11 SITE PLAN

A21 LOWER LEVEL PLAN
A22 MAIN LEVEL PLAN
A23 COURTYARD PLAN
A24 ROOF ACCESS & GARAGE ROOF PLAN
A25 ROOF PLAN

A31 EXTERIOR ELEVATIONS
A32 EXTERIOR ELEVATIONS
A33 EXTERIOR ELEVATIONS
A34 EXTERIOR ELEVATIONS

A41 BUILDING CROSS-SECTION
A42 BUILDING CROSS-SECTION

MOSS BEACH - LOT 1

VALLEMAR ST. & JULIANA AVE.

GENERAL NOTES

Drawings and specifications, as instruments of service, are the exclusive property of this architect whether the project for which they were prepared is executed and constructed or not. These documents are not to be reproduced in any form and they are not to be used by the project owner or any other entity on any other projects or for any extensions, additions or alterations to the original project except by written authorization and permission from and agreement with this architect.

Contractor shall verify all dimensions and conditions shown on the drawings at the job site and shall notify the architect of any discrepancies, omissions, and/or conflicts before proceeding with the work.

Contractor must comply with the rules and regulations of agencies having jurisdiction and shall conform to all city, county, state, federal, construction safety and sanitary laws, codes, ordinances and regulations. All fees, taxes, permits, applications and certificates of inspection and the filing of all work with governmental agencies shall be the responsibility of the contractor.

Work shall be performed by skilled and qualified workmen in accordance with the best practices of those trades involved, and in compliance with building regulations and/or governmental laws, codes, ordinances and regulations concerning the use of union labor.

Work shall proceed in a fashion that will not delay the trades working thereon.

Contractors shall be responsible for the distribution of drawings and/or specifications to the trades under their jurisdiction.

Work shall be erected and installed plumb, level, square, true and in proper alignment.

Materials shall be new, unused and of the highest quality in every respect, unless noted otherwise. Manufactured materials and equipment shall be installed per manufacturer's recommendations and instructions.

There shall be no substitution of materials where a manufacturer is specified where the terms "equal to", "equivalent" or "approved equal" are used. The architect shall determine equality based on information submitted by the contractor.

Work and materials shall be guaranteed against defects for a period of at least one (1) year from approval for final payment.

Contractor shall be responsible for all cutting and patching required for their work.

Contractor shall at all times keep the premises free of accumulation of site materials or rubbish. Premises to be kept clean daily of related construction debris. At the completion of the work, leave the job site free of all materials and broom clean.

Not scale drawings: dimensions shall govern. Larger scale drawings shall govern smaller scale.

Finish all areas where floor is not level or true prior to the installation of flooring or carpeting.

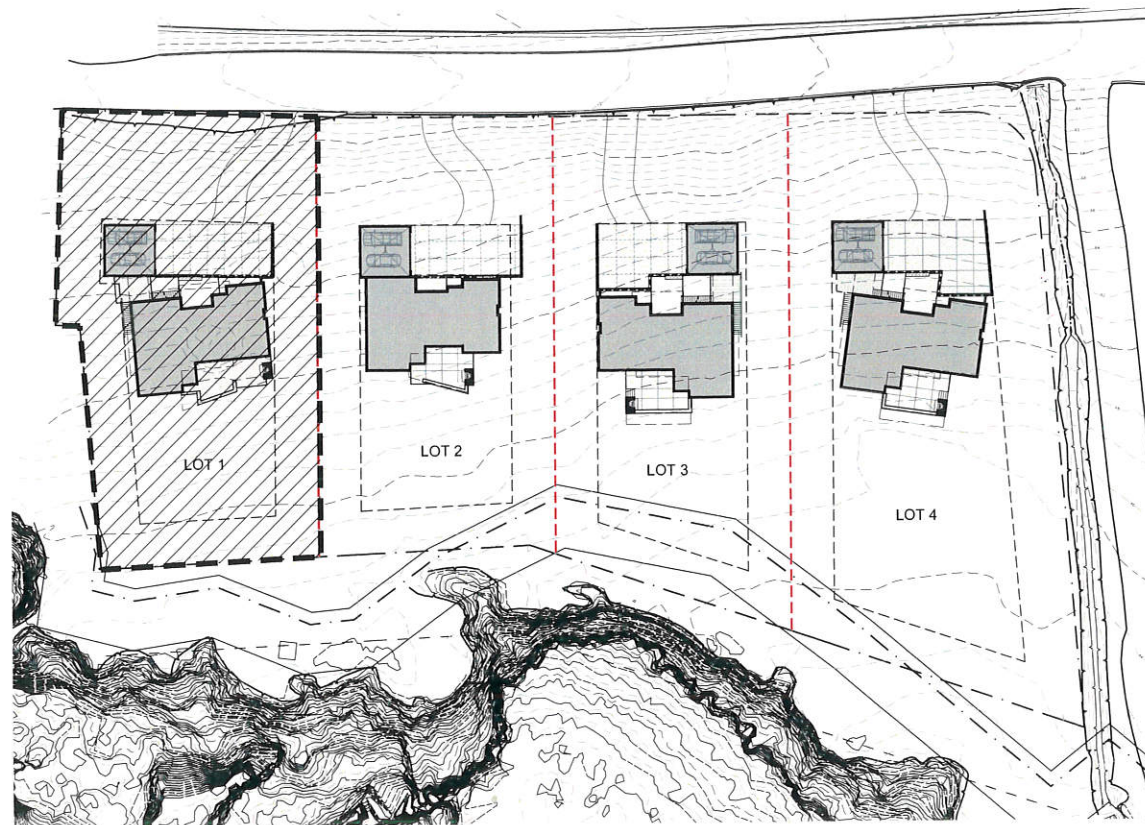
Ensure proper and adequate blocking. All blocking for cabinet work shall be the responsibility of the cabinet contractor.

Upon completion of the work, the contractor shall walk through with the architect and compile a "punch list" of corrections and unsatisfactory work. No complete work final payment will be contingent upon the completion of these items.

Any change which results in extra cost shall not proceed without written authorization of the owner and the architect.

The design, adequacy, and safety of erection bracing, shoring, temporary supports, etc., is the sole responsibility of the general contractor and shall not be considered by the architect or engineer. The general contractor shall be responsible for the stability of the structure throughout construction.

Any ambiguities, discrepancies, or conflicts discovered through the use of these drawings shall be reported immediately to the architect.



VICINITY MAP
NTS

PROPERTY SUMMARY

LOT: 1

APN: 031086230
PARCEL ID: T.B.D.
CITY NAME: MOSS BEACH (UNINC)
ZIP CODE: 94038
MITIGATION FEE AREA: MIDCOAST URBAN

ZONING: RM-CZ/DR/CD
MIDCOAST LCP

Maximum Building Height: 28'

Parcel SF: 23,413 SF
Maximum Floor Building Area: 6,200 SF.

SQUARE FOOTAGE SUMMARY

LOWER LEVEL (GROSS)	1763#
MAIN LEVEL (GROSS)	2234#
TOTAL FLOOR AREA (GROSS)	3997#
GARAGE (GROSS)	576#
ROOF ACCESS (CATWALK)	239#
COVERED ENTRY PATIO	128#
COVERED GARAGE DECK	66#
COVERED REAR DECK	316#
ELEVATED DECKS	
ENTRY DECK	179#
GARAGE DECK	217#
REAR DECK	553#

ARCHITECT



102 NORTH BROADWAY AVE.
BOZEMAN, MT 59715
OFFICE: 406.587.1997 FAX: 406.587.0311
WWW.PEARSONDESIGNGROUP.COM

ISSUE DATE

COUNTY COASTSIDE
DESIGN REVIEW SET

OCTOBER 12, 2017

ATTACHMENT K

SITE LEGEND	
EXISTING 5 FT. CONTOURS	--- 7565 ---
EXISTING 1 FT. CONTOURS	--- 32'-0" ---
NEW CONTOURS	---
PROPERTY LINE	---
EASEMENT, SETBACK OR ENVELOPE	---
PROPOSED NEW, PROPERTY LOT LINE	-----
EXISTING, PROPERTY LOT LINE	---
EXISTING TREE (TO REMAIN)	---
EXISTING TREE DRIPLINE	---
14'-0" WIDE PERVIOUS PAVING DRIVEWAY (11' TUC-TRACK VEGETATION STRIP)	---
PERVIOUS PAVING COURTYARD (PARKING)	---
RE-VEGETATED NATIVE GRASS MEADOW	---
PROTECTED GRASSLANDS, ZONE A	---
PROTECTED GRASSLANDS, ZONE B	---
100' BUFFER FROM LEPTOSIPHON	---

GENERAL SITE NOTES

1. GRADING NOTES & SPOT ELEVATIONS, SEE CIVIL DRAWINGS
2. UTILITY AND LOCATION INFORMATION, SEE CIVIL DRAWINGS
3. AREA OF DISTURBANCE TO BE MINIMIZED BY CONTRACTOR
4. SPECIFIC TREE REMOVAL SPECIFICATIONS, SEE LANDSCAPE
5. RETAINING WALLS, TERRACES, AND FENCES, SEE LANDSCAPE FOR LOCATION & APPEARANCE

ELEVATION

0'-0" = 54'-9"

LOWER LEVEL ELEVATION

0'-3" = 55'-0"

GARAGE FLOOR ELEVATION

11'-3" = 66'-0"

MAIN LEVEL ELEVATION

11'-3" = 66'-0"

COASTSIDE DESIGN
REVIEW APPLICATION

DRAWING
SITE PLAN

PROJECT NUMBER: 1507

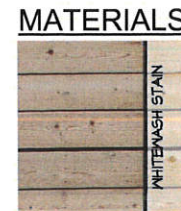
DATE: OCTOBER 12, 2017

DESIGN REVIEW SET

SHEET NO.

A1.1

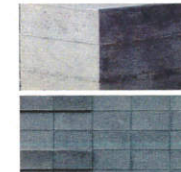




SIDING
1X6 ROUGH-SAWN CEDAR,
PLANK 1/4" REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
4 WHITEWASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
- BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



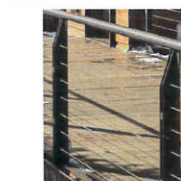
ROOF
STANDING SEAM
METAL ROOF
1/4" BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
1/4" SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

MOSS BEACH - LOT 1
VALLEMAR ST. & JULIANNA AVE.

REVISION
NO. DATE

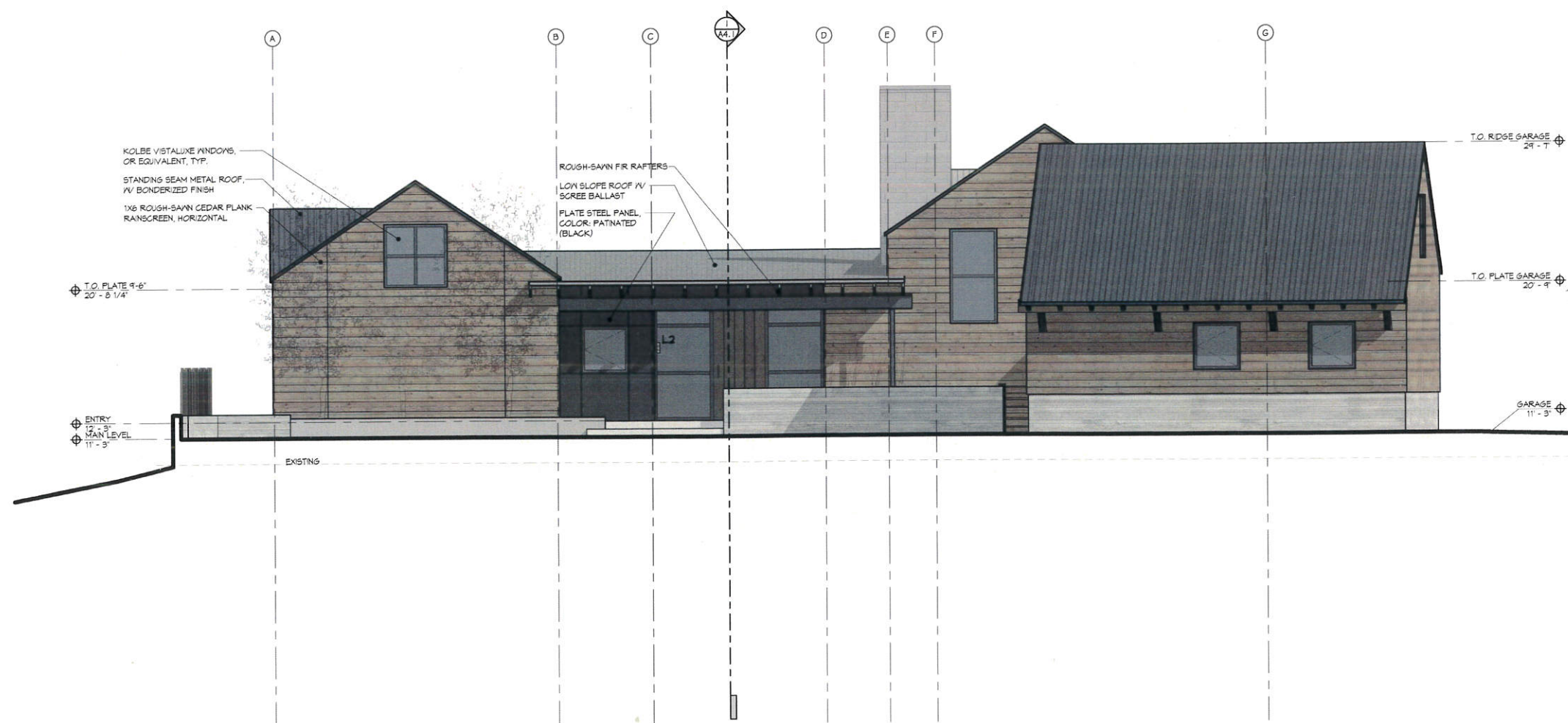
COASTSIDE DESIGN
REVIEW APPLICATION

DRAWING
ELEVATIONS

PROJECT NUMBER 1507
DATE OCTOBER 12, 2017
DESIGN REVIEW SET

SHEET NO.

A3.1



1 NORTH ELEVATION
1/4" = 1'-0"

MATERIALS



SIDING
1X6 ROUGH-SAWN CEDAR,
PLANK W/ REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
& WHITEWASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



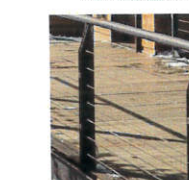
ROOF
STANDING SEAM
METAL ROOF
W/ BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
W/ SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

PDC

**PEARSON
DESIGN GROUP**

102 N. BROADWAY AVE., BOZEMAN, MT 59715
OFFICE: 406.597.1997 FAX: 406.597.031
WWW.PEARSONDESIGNGROUP.COM

MOSS BEACH - LOT 1 VALLEMAR ST. & JULIANNA AVE.

REVISION
NO. DATE

COASTSIDE DESIGN
REVIEW APPLICATION

DRAWING:
ELEVATIONS

PROJECT NUMBER: 1507

DATE:

OCTOBER 12, 2017

DESIGN REVIEW SET

SHEET NO.

A3.2



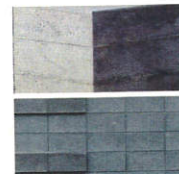
1 EAST ELEVATION
1/4" = 1'-0"



SIDING
1X8 ROUGH-SAWN CEDAR,
PLANK 1/4" REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
& WHITEWASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



ROOF
STANDING SEAM
METAL ROOF
1/4" BONDORIZED FINISH



FLAT ROOF
EPDM MEMBRANE
1/4" SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



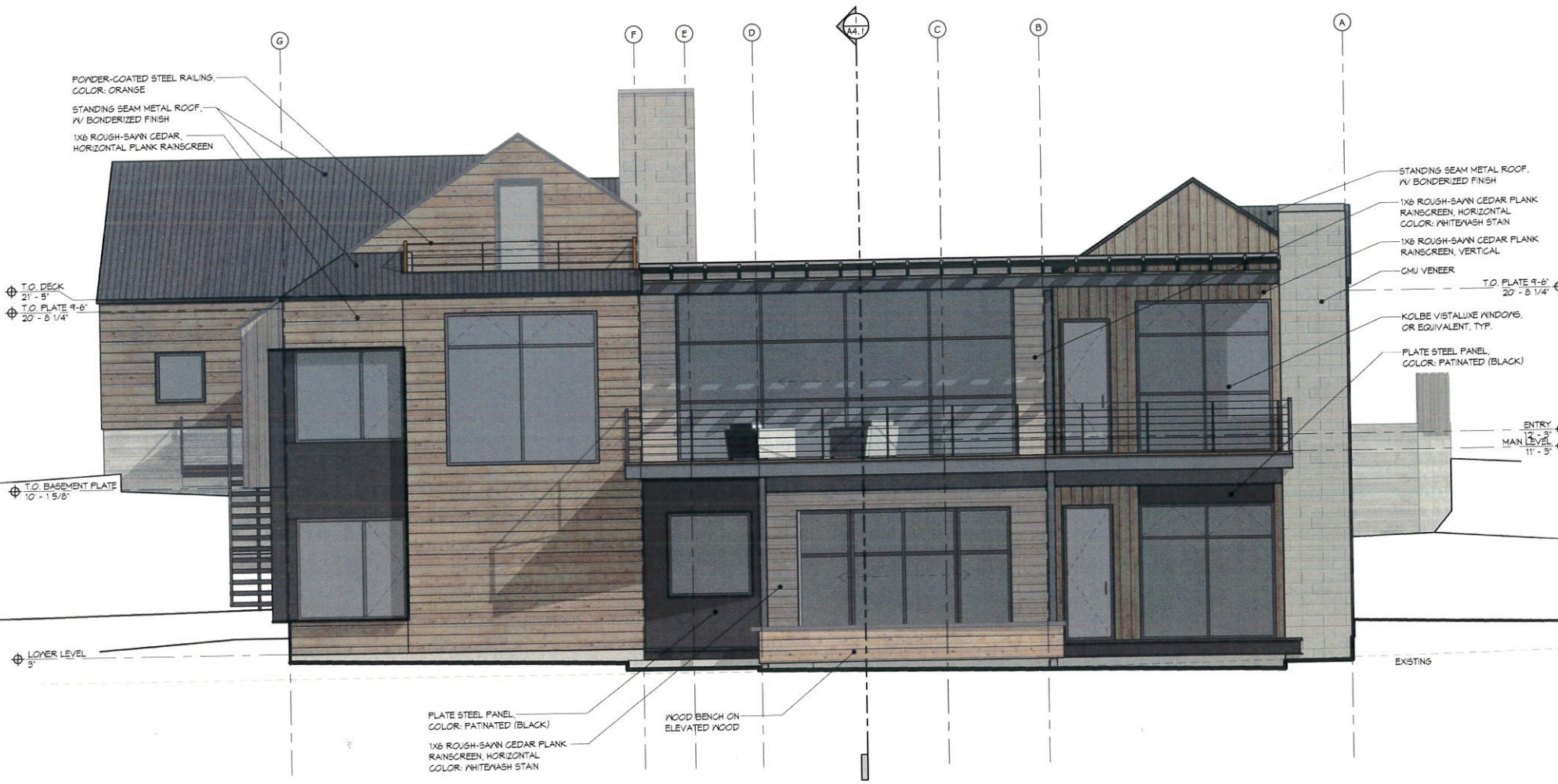
RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

MOSS BEACH - LOT 1
VALLEMAR ST. & JULIANNA AVE.

REVISION	
NO.	DATE
COASTSIDE DESIGN REVIEW APPLICATION	
DRAWING: ELEVATIONS	
PROJECT NUMBER:	1507
DATE:	OCTOBER 12, 2017
DESIGN REVIEW SET	
SHEET NO.	
A3.3	



1 SOUTH ELEVATION
1/4" = 1'-0"

1111 IANNA AVE

A3.4

RAFTERS
ROUGH SAWN FIR



RAFTERS
ROUGH SAWN FIR

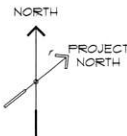


County of San Mateo - Planning and Building Department

ATTACHMENT L

ARCHITECTURAL

- COVER VICINITY MAP & PROPERTY SUMMARY
A01 AREA PLAN CALCULATIONS
- A11 SITE PLAN
- A21 LOWER LEVEL PLAN
A22 MAIN LEVEL PLAN
A23 ROOF ACCESS & ROOF PLAN
- A31 EXTERIOR ELEVATIONS
A32 EXTERIOR ELEVATIONS
A33 EXTERIOR ELEVATIONS
A34 EXTERIOR ELEVATIONS
- A41 BUILDING CROSS-SECTION
A42 BUILDING CROSS-SECTION



LOT 2

MOSS BEACH - LOT 2
VALLEMAR ST. & JULIANA AVE.

GENERAL NOTES

ALL SPECIFICATIONS, AS INSTRUMENTS OF SERVICE, ARE THE EXCLUSIVE PROPERTY OF THIS ARCHITECT. WHETHER THE PROJECT FOR WHICH THEY WERE PREPARED IS EXECUTED AND CONSTRUCTED OR NOT, THESE DOCUMENTS ARE NOT TO BE PRODUCED IN ANY FORM AND THEY ARE NOT TO BE USED BY THE PROJECT OR ANY OTHER ENTITY ON ANY OTHER PROJECTS OR FOR ANY EXTENSIONS OR ALTERATIONS TO THE ORIGINAL PROJECT EXCEPT BY WRITTEN PERMISSION AND PERMISSION FROM AND AGREEMENT WITH THIS ARCHITECT.

THE ARCHITECT SHALL VERIFY ALL DIMENSIONS AND CONDITIONS SHOWN ON DRAWINGS AT THE JOB SITE AND SHALL NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES, OMISSIONS, AND/OR CONFLICTS BEFORE PROCEEDING WITH WORK.

THE CONTRACTOR MUST COMPLY WITH THE RULES AND REGULATIONS OF AGENCIES WITH JURISDICTION AND SHALL CONFORM TO ALL CITY, COUNTY, STATE, FEDERAL, CONSTRUCTION, SAFETY AND SANITARY LAWS, CODES, ORDINANCES, ALL FEES, TAXES, PERMITS, APPLICATIONS AND FEES OF INSPECTION AND THE FILING OF ALL WORK WITH GOVERNMENTAL AGENCIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

ALL WORK SHALL BE PERFORMED BY SKILLED AND QUALIFIED WORKMEN IN ACCORDANCE WITH THE BEST PRACTICES OF THOSE TRADES INVOLVED, AND IN ACCORDANCE WITH BUILDING REGULATIONS AND/OR GOVERNMENTAL LAWS, ORDINANCES CONCERNING THE USE OF UNION LABOR.

WORK SHALL PROCEED IN A FASHION THAT WILL NOT DELAY THE TRADES INVOLVED IN THE PROJECT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DISTRIBUTION OF DRAWINGS AND SPECIFICATIONS TO THE TRADES UNDER THEIR JURISDICTION.

ALL WORK SHALL BE INSTALLED PLUMB, LEVEL, SQUARE, TRUE AND PROPER ALIGNMENT.

MATERIALS SHALL BE NEW UNLESS NOTED OTHERWISE. MANUFACTURED MATERIALS AND EQUIPMENT SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS.

ALL BE NO SUBSTITUTION OF MATERIALS WHERE A MANUFACTURER IS SPECIFIED. WHERE THE TERMS "EQUAL TO", "EQUIVALENT" OR "APPROVED EQUAL" ARE USED, THE ARCHITECT SHALL DETERMINE EQUALITY BASED ON INFORMATION PROVIDED BY THE CONTRACTOR.

ALL MATERIALS SHALL BE GUARANTEED AGAINST DEFECTS FOR A PERIOD OF AT LEAST ONE (1) YEAR FROM APPROVAL FOR FINAL PAYMENT.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING REQUIRED TO COMPLY WITH THESE DRAWINGS.

THE CONTRACTOR SHALL AT ALL TIMES KEEP THE PREMISES FREE OF ACCUMULATION OF DEBRIS OR RUBBISH. PREMISES TO BE SWEEPED CLEAN DAILY OF RELATED TO THE WORK. AT THE COMPLETION OF THE WORK, LEAVE THE JOB SITE CLEAN AND ALL MATERIALS AND EQUIPMENT REMOVED.

ALL SCALE DRAWINGS: DIMENSIONS SHALL GOVERN. LARGER SCALE DRAWINGS SHALL GOVERN SMALLER SCALE.

ALL AREAS WHERE FLOOR IS NOT LEVEL OR TRUE PRIOR TO THE INSTALLATION OF FLOORING OR CARPETING.

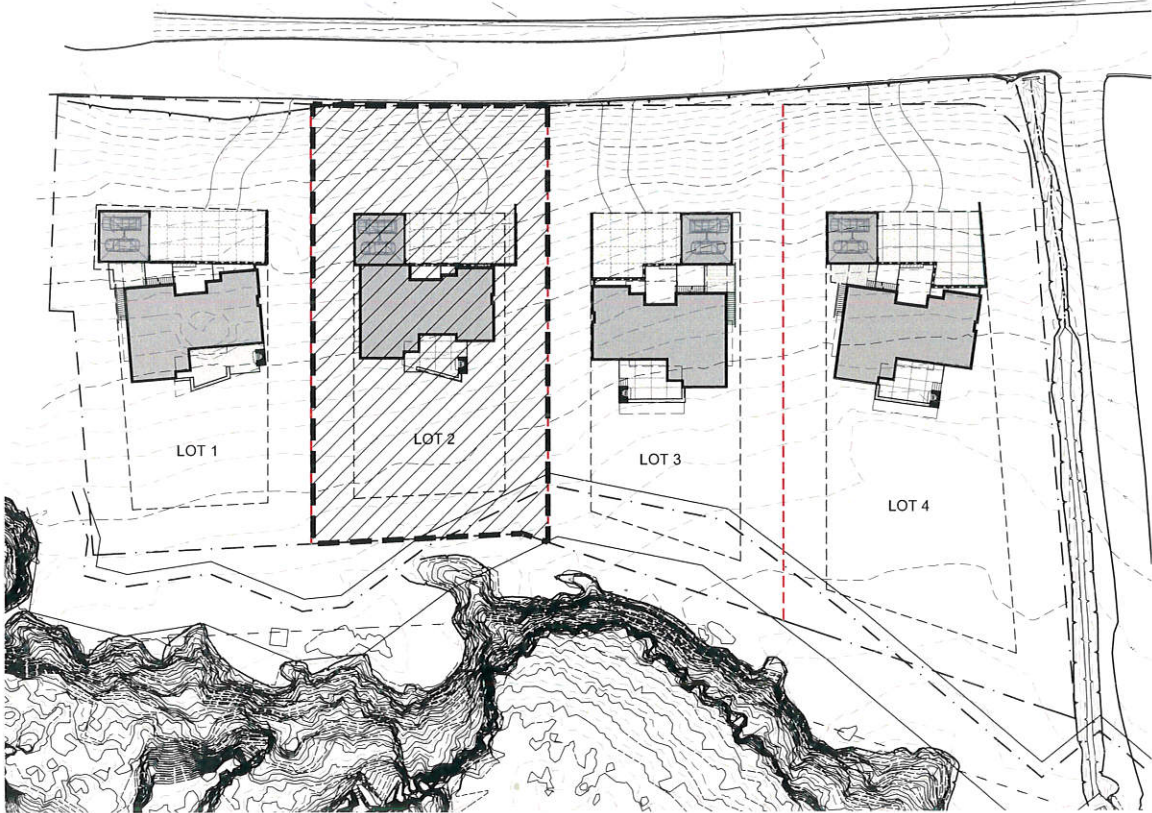
THE CONTRACTOR SHALL PROVIDE PROPER AND ADEQUATE BLOCKING. ALL BLOCKING FOR CABINET WORK SHALL BE THE RESPONSIBILITY OF THE CABINET CONTRACTOR.

AT THE COMPLETION OF THE WORK THE CONTRACTOR SHALL WALK THROUGH WITH THE ARCHITECT AND COMPILE A "PUNCH LIST" OF CORRECTIONS AND UNSATISFACTORY WORK. COMPLETE WORK. FINAL PAYMENT WILL BE CONTINGENT UPON THE COMPLETION OF THESE ITEMS.

ANY WORK WHICH RESULTS IN EXTRA COST SHALL NOT PROCEED WITHOUT WRITTEN PERMISSION OF THE OWNER AND THE ARCHITECT.

THE ARCHITECT'S RESPONSIBILITY FOR THE DESIGN OF THE PROJECT, INCLUDING THE ADEQUACY, AND SAFETY OF ERECTION BRACING, SHORING, TEMPORARY STRUCTURES, ETC. IS THE SOLE RESPONSIBILITY OF THE ARCHITECT. THE ARCHITECT HAS BEEN CONSIDERED BY THE ARCHITECT OR ENGINEER THE GENERAL CONTRACTOR FOR THE STABILITY OF THE STRUCTURE THROUGHOUT CONSTRUCTION.

ALL DISCREPANCIES, DISCREPANCIES, OR CONFLICTS DISCOVERED THROUGH THE USE OF THESE DRAWINGS SHALL BE REPORTED IMMEDIATELY TO THE ARCHITECT.



VICINITY MAP
NTS

PROPERTY SUMMARY

LOT: 2

APN: 037086230
PARCEL ID: T.B.D.
CITY NAME: MOSS BEACH (UNINC)
ZIP CODE: 94038
MITIGATION FEE AREA: MIDCOAST URBAN

ZONING: RM-CZ/DR/CD
MIDCOAST LCP

Maximum Building Height: 28'

Parcel SF: 22,220 SF
Maximum Floor Building Area: 6,200 SF.

SQUARE FOOTAGE SUMMARY	
LOWER LEVEL (GROSS)	1,862*
MAIN LEVEL (GROSS)	2,132*
TOTAL FLOOR AREA (GROSS)	3,994*
GARAGE (GROSS)	586*
GARAGE STRG/ ROOF ACCESS (GROSS)	461*
COVERED ENTRY PATIO	188*
COVERED REAR DECK	215*
ELEVATED DECKS	
REAR DECK	420*

ARCHITECT



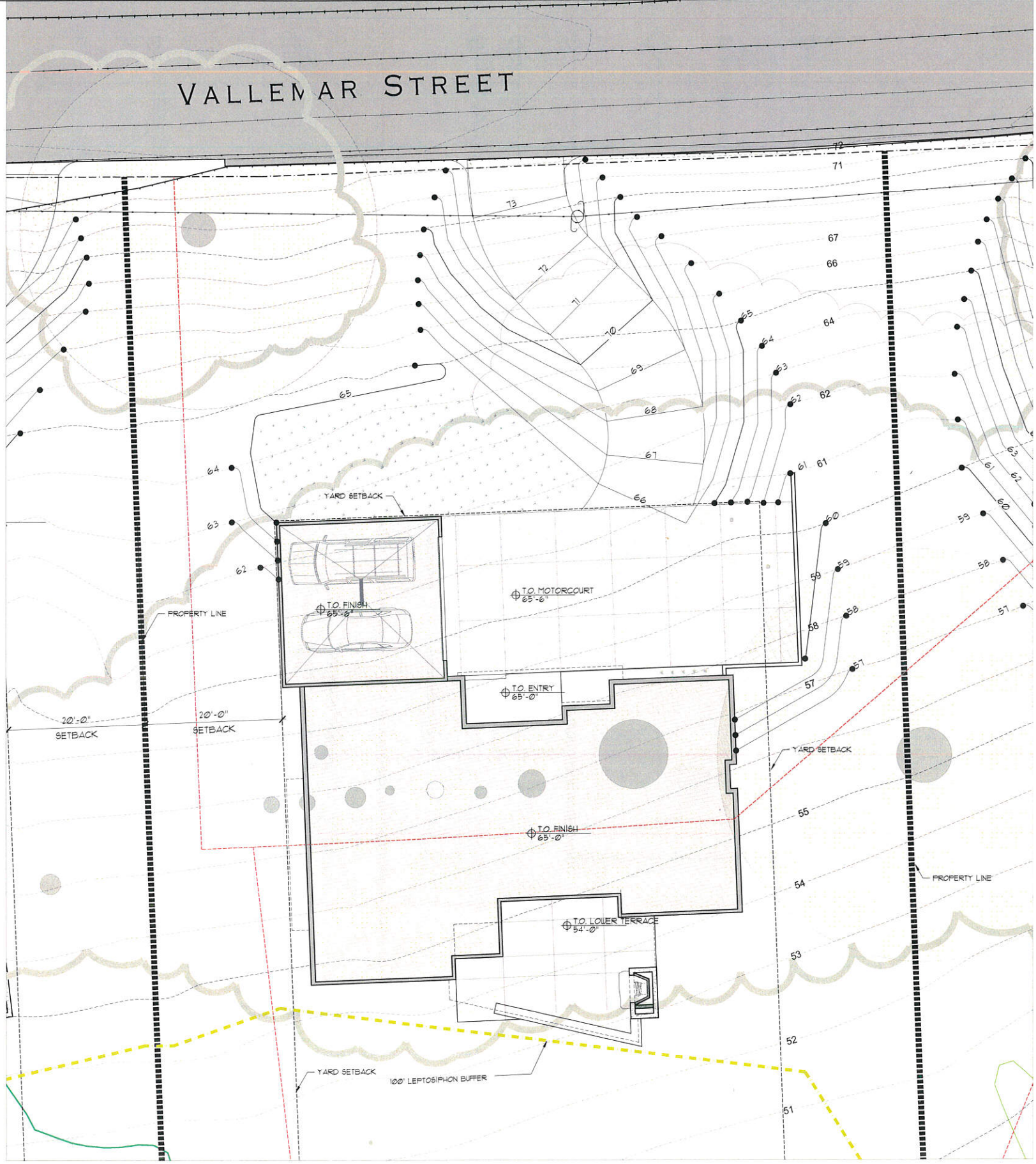
102 NORTH BROADWAY AVE.
BOZEMAN, MT 59715
OFFICE: 406.587.1997 FAX: 406.587.0311
WWW.PEARSONDESIGNGROUP.COM

ISSUE DATE

COUNTY COASTSIDE
DESIGN REVIEW SET

OCTOBER 12, 2017

ATTACHMENT L



SITE LEGEND

EXISTING 5 FT. CONTOURS	----- 7565 -----
EXISTING 1 FT. CONTOURS	----- 92'-0" -----
NEW CONTOURS	----- 92'-0" -----
PROPERTY LINE	----- 92'-0" -----
EASEMENT, SETBACK OR ENVELOPE	----- 92'-0" -----
PROPOSED NEW PROPERTY LOT LINE	----- 92'-0" -----
EXISTING PROPERTY LOT LINE	----- 92'-0" -----
EXISTING TREE (TO REMAIN)	----- 92'-0" -----
EXISTING TREE DRIPLINE	----- 92'-0" -----
14'-0" WIDE PERVIOUS PAVING DRIVEWAY (W/ "TWO-TRACK" VEGETATION STRIP)	----- 92'-0" -----
PERVIOUS PAVING COURTYARD (PARKING)	----- 92'-0" -----
RE-VEGETATED NATIVE GRASS MEADOW	----- 92'-0" -----
PROTECTED GRASSLANDS, ZONE A	----- 92'-0" -----
PROTECTED GRASSLANDS, ZONE B	----- 92'-0" -----
100' BUFFER FROM LEPTOSIPHON	----- 92'-0" -----

GENERAL SITE NOTES

1. GRADING NOTES & SPOT ELEVATIONS, SEE CIVIL DRAWINGS
2. UTILITY AND LOCATION INFORMATION, SEE CIVIL DRAWINGS
3. AREA OF DISTURBANCE TO BE MINIMIZED BY CONTRACTOR
4. SPECIFIC TREE REMOVAL SPECIFICATIONS, SEE LANDSCAPE
5. RETAINING WALLS, TERRACES, AND FENCES, SEE LANDSCAPE FOR LOCATION & APPEARANCE

ELEVATION
0'-0" = 53'-9"

LOWER LEVEL ELEVATION
0'-3" = 54'-0"

GARAGE FLOOR ELEVATION
11'-9" = 65'-6"

MAIN LEVEL ELEVATION
11'-3" = 65'-0"

102 N BROADWAY AVE, BOZEMAN, MT 59718
OFFICE: 409.597.1111 FAX: 409.597.1112
WWW.PEARSONDESIGNGROUP.COM

MOSS BEACH - LOT 2

VALLEMAR ST. & JULIANA AVE.

COASTSIDE DESIGN
REVIEW APPLICATION

DRAWING
SITE PLAN

PROJECT NUMBER 1507
DATE OCTOBER 12, 2017
DESIGN REVIEW SET
SHEET NO.

A1.1

MATERIALS



SIDING
1X8 ROUGH-SAWN CEDAR,
PLANK 1/4" REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
4 WHITEWASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



ROOF
STANDING SEAM
METAL ROOF
1/4" BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
1/4" SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



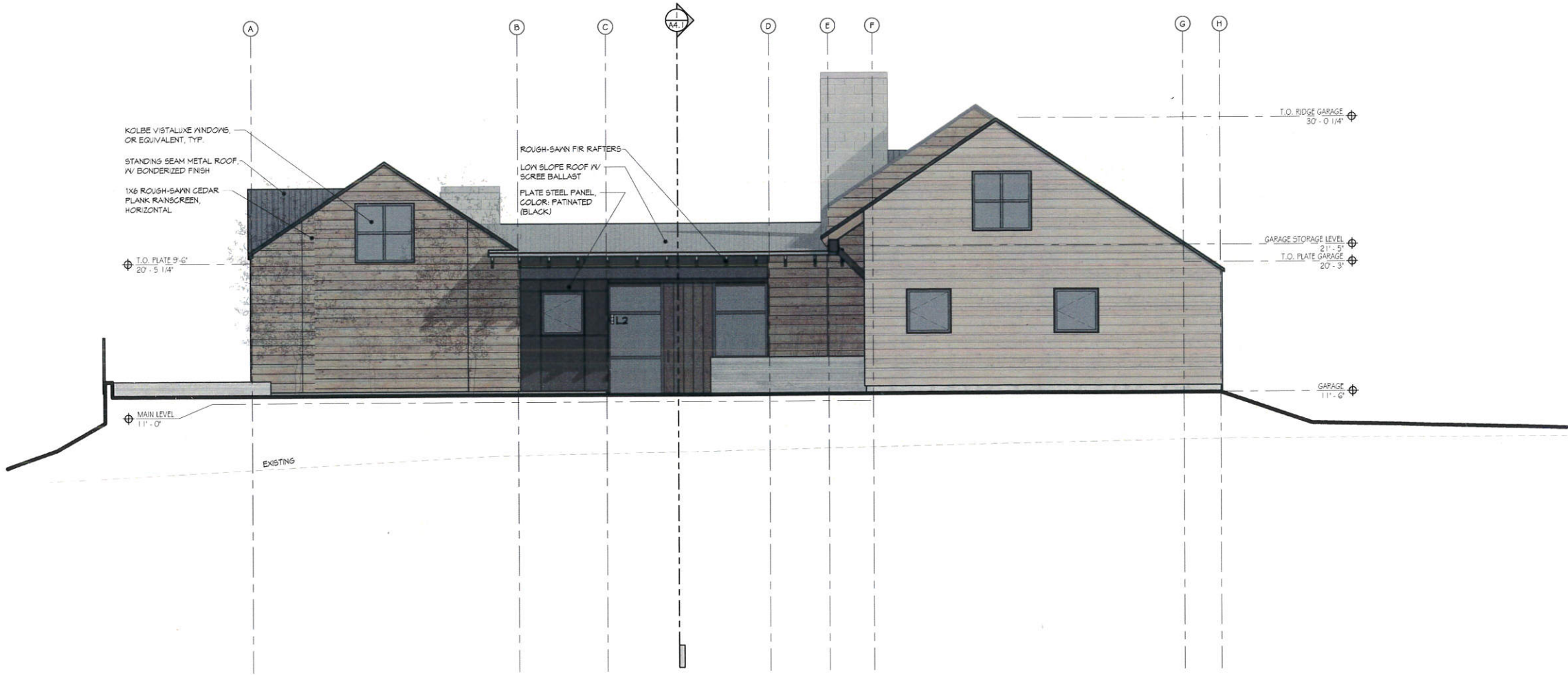
RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

MOSS BEACH - LOT 2 VALLEMAR ST. & JULIANNA AVE.

REVISION	
NO.	DATE
COASTSIDE DESIGN REVIEW APPLICATION	
DRAWING: ELEVATIONS	
PROJECT NUMBER:	1507
DATE:	OCTOBER 12, 2017
DESIGN REVIEW SET	
SHEET NO.	
A3.1	



1 NORTH ELEVATION
1/4" = 1'-0"

MATERIALS



SIDING
1X8 ROUGH-SAWN CEDAR,
PLANK 1/4" REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
4 WHITENASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



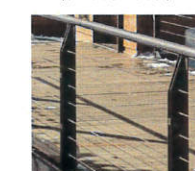
ROOF
STANDING SEAM
METAL ROOF
1/4" BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
1/4" SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

PDC

**PEARSON
DESIGN GROUP**

102 N. BROADWAY AVE. BOZEMAN, MT 59715
OFFICE: 406.587.1997 FAX: 406.587.0301
WWW.PEARSONDESIGNGROUP.COM

MOSS BEACH - LOT 2 VALLEMAR ST. & JULIANNA AVE.

REVISION

NO. DATE

COASTSIDE DESIGN
REVIEW APPLICATION

DRAWING
ELEVATIONS

PROJECT NUMBER 1507

DATE OCTOBER 12, 2017

DESIGN REVIEW SET

SHEET NO.

A3.2



1 EAST ELEVATION
1/4" = 1'-0"

MATERIALS



SIDING
1X6 ROUGH-SAWN CEDAR,
PLANK 1/4" REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
4 WHITENASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



ROOF
STANDING SEAM
METAL ROOF
1/4" BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
1/4" SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

MOSS BEACH - LOT 2 VALLEMAR ST. & JULIANNA AVE.

REVISION
NO. DATE

COASTSIDE DESIGN
REVIEW APPLICATION

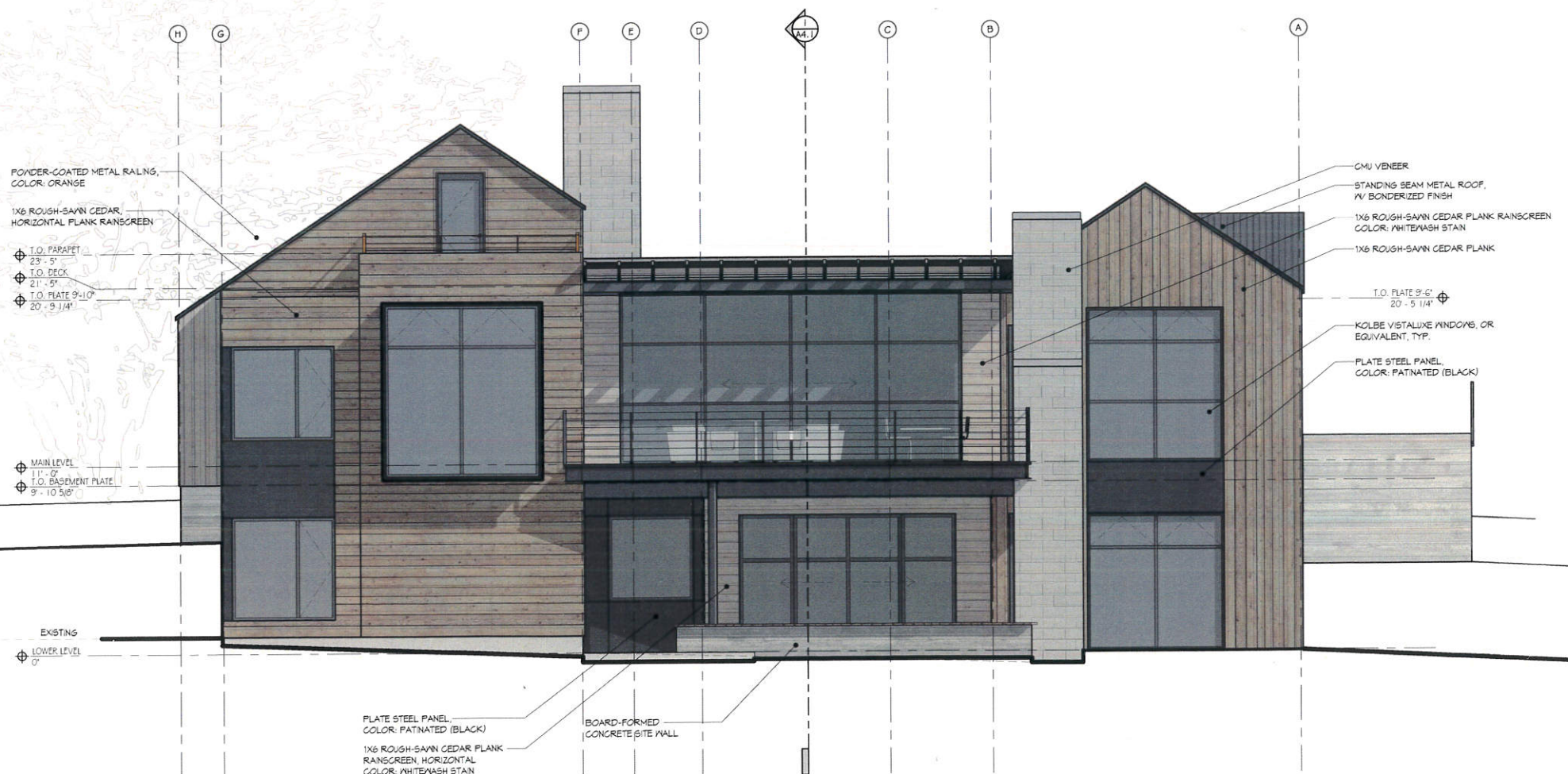
DRAWING
ELEVATIONS

PROJECT NUMBER: 1507
DATE: OCTOBER 12, 2017

DESIGN REVIEW SET

SHEET NO.

A3.3



1 SOUTH ELEVATION
1/4" = 1'-0"

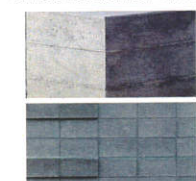
MATERIALS



SIDING
1X6 ROUGH-SAWN CEDAR,
PLANK W/ REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
& WHITEWASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



ROOF
STANDING SEAM
METAL ROOF
W/ BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
W/ SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM

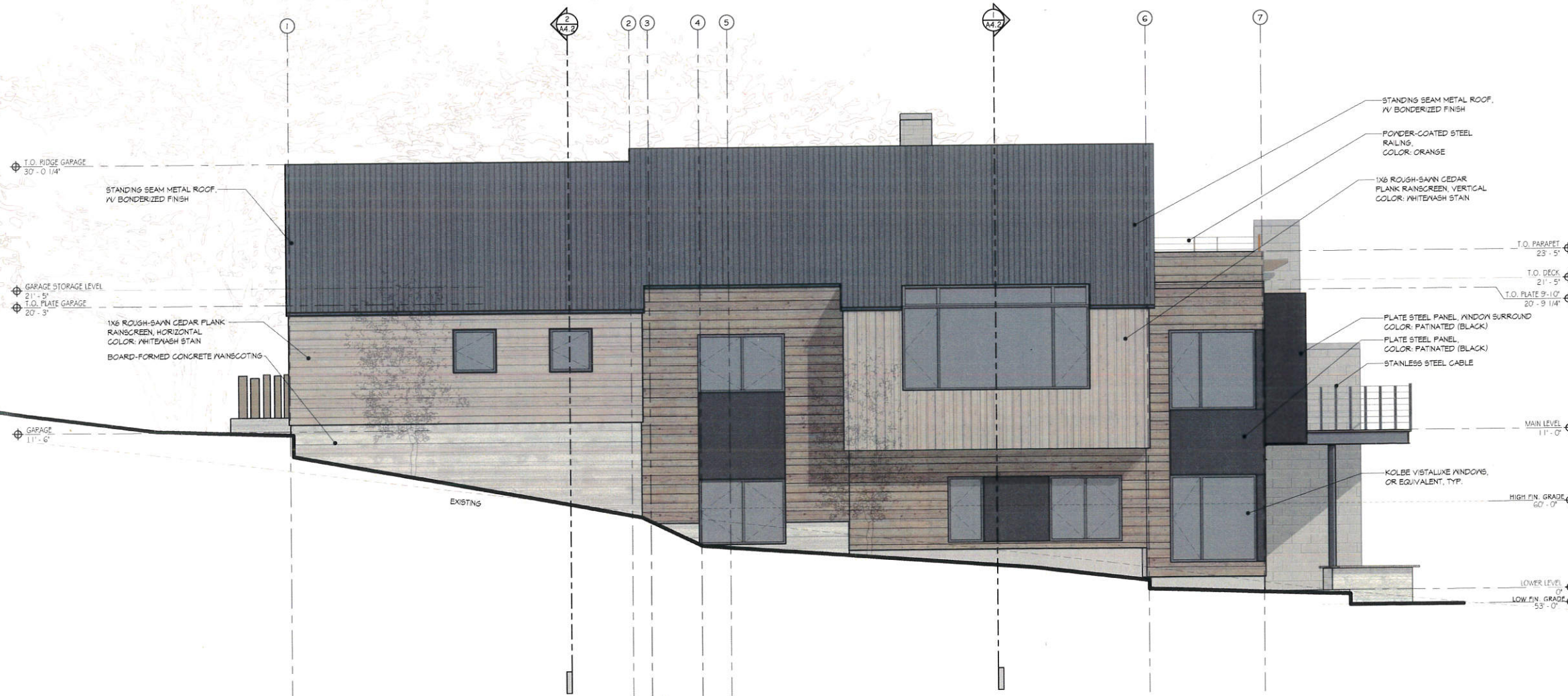


RAFTERS
ROUGH SAWN FIR

MOSS BEACH - LOT 2

VALLEMAR ST. & JULIANNA AVE.

REVISION	
NO.	DATE
COASTSIDE DESIGN REVIEW APPLICATION	
DRAWING ELEVATIONS	
PROJECT NUMBER	1507
DATE	OCTOBER 12, 2017
DESIGN REVIEW SET	
SHEET NO.	
A3.4	

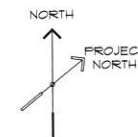


1 WEST ELEVATION
1/4" = 1'-0"



County of San Mateo - Planning and Building Department

ATTACHMENT M



LOT 3

MOSS BEACH - LOT 3

VALLEMAR ST. & JULIANA AVE.

ARCHITECTURAL	
COVER	VICINITY MAP & PROPERTY SUMMARY
A02	AREA PLAN CALCULATIONS
A11	SITE PLAN
A21	LOWER LEVEL PLAN
A22	MAIN LEVEL PLAN
A23	COURTYARD PLAN
A24	ROOF ACCESS & GARAGE ROOF PLAN
A25	ROOF PLAN
A31	EXTERIOR ELEVATIONS
A32	EXTERIOR ELEVATIONS
A33	EXTERIOR ELEVATIONS
A34	EXTERIOR ELEVATIONS
A41	BUILDING CROSS-SECTION
A42	BUILDING CROSS-SECTION

GENERAL NOTES

Drawings and specifications, as instruments of service, are the exclusive property of this architect. They are not to be reproduced, copied, or used in any way for any other project or for any other entity. These documents are not to be used for any other project or for any other entity. These documents are not to be used for any other project or for any other entity.

Contractor shall verify all dimensions and conditions shown on drawings at the job site and shall notify the architect of any discrepancies, omissions, and/or conflicts before proceeding with the work.

Contractor must comply with the rules and regulations of agencies having jurisdiction and shall conform to all city, county, state, and federal construction safety and sanitary laws, codes, ordinances, and regulations. All fees, taxes, permits, applications, and licenses shall be the responsibility of the contractor.

Work shall be performed by skilled and qualified workmen in accordance with the best practices of those trades involved, and in compliance with building regulations and/or governmental laws, codes, and ordinances concerning the use of union labor.

Trade will proceed in a fashion that will not delay the trades following them.

Contractors shall be responsible for the distribution of drawings and specifications to the trades under their jurisdiction.

Work shall be erected and installed plumb, level, square, true and in proper alignment.

Materials shall be new, unused, and of the highest quality in every respect, unless noted otherwise. Manufactured materials and equipment shall be installed per manufacturer's recommendations and instructions.

There shall be no substitution of materials where a manufacturer is specified. Where the terms "equal to," "equivalent," or "approved equal" are used, the architect shall determine equality based on information provided by the contractor.

Work and materials shall be guaranteed against defects for a period of at least one (1) year from approval for final payment.

Contractor shall be responsible for all cutting and patching required for their work.

Contractor shall at all times keep the premises free of accumulation of materials or rubbish. Premises to be swept clean daily of related construction debris. At the completion of the work, leave the job site of all materials and broom clean.

Not scale drawings: dimensions shall govern. Larger scale drawings shall govern smaller scale.

In all areas where floor is not level or true prior to the installation of doors or carpeting.

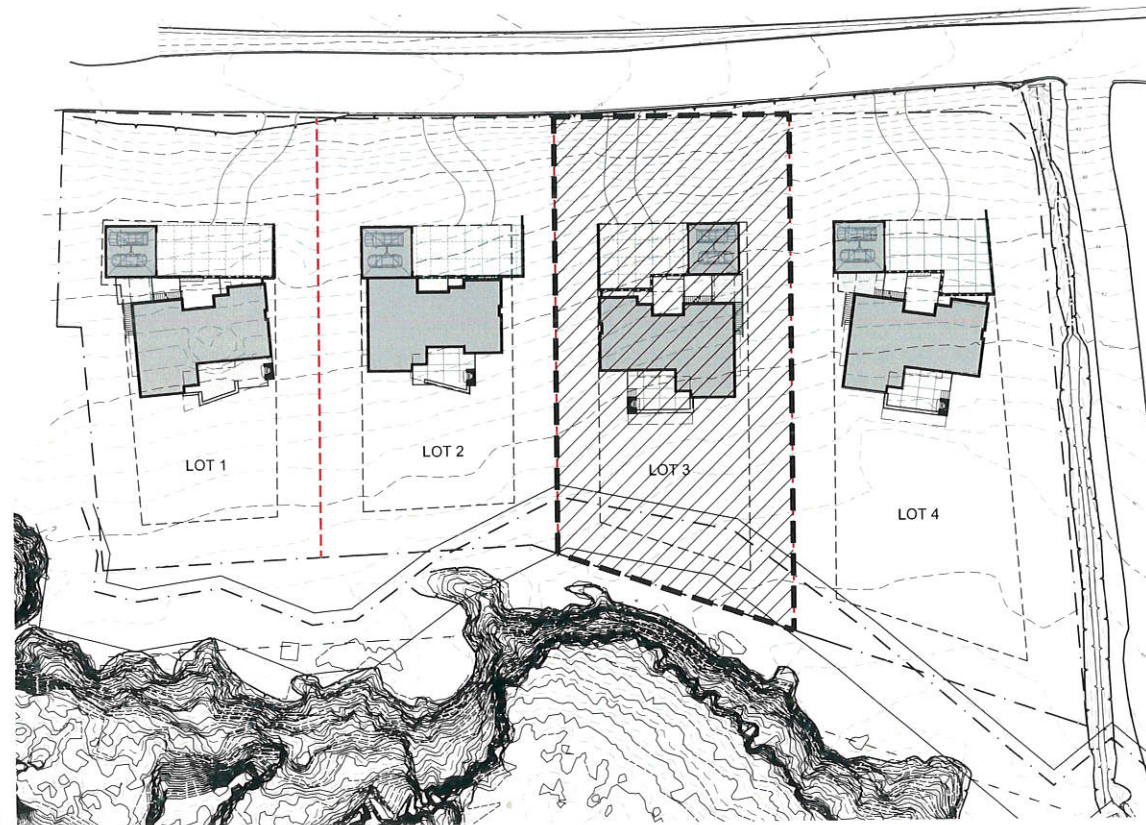
Ensure proper and adequate blocking. All blocking for cabinet work shall be the responsibility of the cabinet contractor.

At completion of the work, the contractor shall walk through with the architect and compile a "punch list" of corrections and unsatisfactory or incomplete work. Final payment will be contingent upon the completion of these items.

Change which results in extra cost shall not proceed without written authorization of the owner and the architect.

Design, adequacy, and safety of erection, bracing, shoring, temporary works, etc., is the sole responsibility of the general contractor and not been considered by the architect or engineer. The general contractor shall be responsible for the stability of the structure throughout construction.

Any ambiguities, discrepancies, or conflicts discovered through the use of drawings shall be reported immediately to the architect.



VICINITY MAP
NTS

PROPERTY SUMMARY

LOT: 3

APN: 037086230
PARCEL ID: T.B.D.
CITY NAME: MOSS BEACH (UNINC)
ZIP CODE: 94038
MITIGATION FEE AREA: MIDCOAST URBAN

ZONING: RM-CZ/DR/CD
MIDCOAST LCP

Maximum Building Height: 28'

Parcel SF: 24,211 SF
Maximum Floor Building Area: 6,200 SF.

SQUARE FOOTAGE SUMMARY	
LOWER LEVEL (GROSS)	1,763#
MAIN LEVEL (GROSS)	2,234#
TOTAL FLOOR AREA (GROSS)	3,997#
GARAGE (GROSS)	576#
ROOF ACCESS (CATWALK)	239#
COVERED ENTRY PATIO	113#
COVERED GARAGE DECK	116#
COVERED REAR DECK	230#
ELEVATED DECKS	
ENTRY DECK	196#
GARAGE DECK	247#
REAR DECK	604#

ARCHITECT



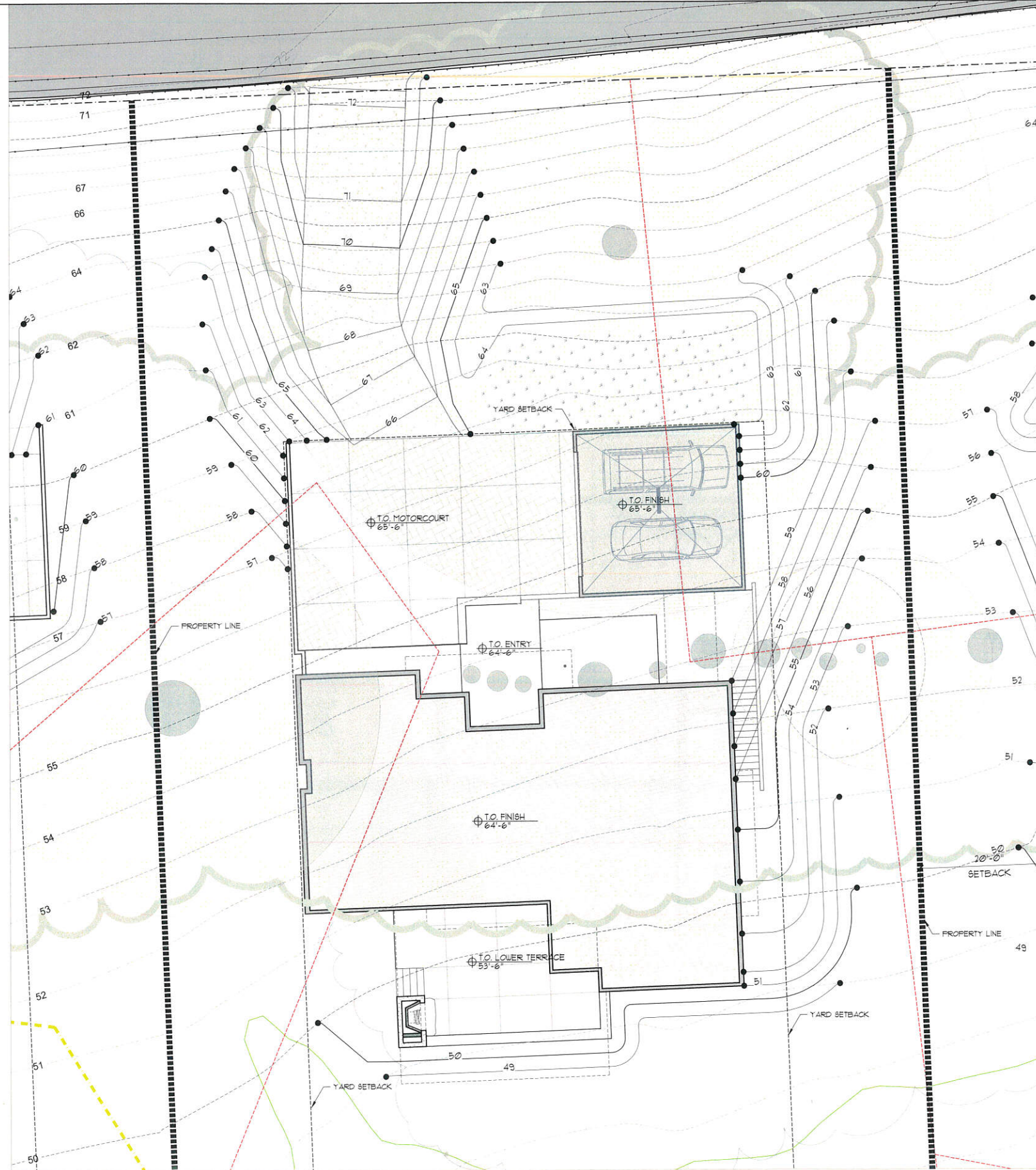
102 NORTH BROADWAY AVE.
BOZEMAN, MT 59715
OFFICE: 406.587.1997 FAX: 406.587.0311
WWW.PEARSONDESIGNGROUP.COM

ISSUE DATE

COUNTY COASTSIDE
DESIGN REVIEW SET

OCTOBER 12, 2017

ATTACHMENT M



SITE LEGEND

EXISTING 5 FT. CONTOURS	---	7565
EXISTING 1 FT. CONTOURS	---	32'-0"
NEW CONTOURS	---	
PROPERTY LINE	---	
EASEMENT, SETBACK OR ENVELOPE	---	
PROPOSED NEW PROPERTY LOT LINE	---	
EXISTING PROPERTY LOT LINE	---	
EXISTING TREE (TO REMAIN)	---	
EXISTING TREE DRIPLINE	---	
14'-0" WIDE PERVIOUS PAVING DRIVEWAY (W/ "TWO-TRACK" VEGETATION STRIP)	---	
PERVIOUS PAVING COURTYARD (PARKING)	---	
RE-VEGETATED NATIVE GRASS MEADOW	---	
PROTECTED GRASSLANDS, ZONE A	---	
PROTECTED GRASSLANDS, ZONE B	---	
100' BUFFER FROM LEPTOSIPHON	---	

GENERAL SITE NOTES

1. GRADING NOTES & SPOT ELEVATIONS, SEE CIVIL DRAWINGS
2. UTILITY AND LOCATION INFORMATION, SEE CIVIL DRAWINGS
3. AREA OF DISTURBANCE TO BE MINIMIZED BY CONTRACTOR.
4. SPECIFIC TREE REMOVAL SPECIFICATIONS, SEE LANDSCAPE
5. RETAINING WALLS, TERRACES, AND FENCES, SEE LANDSCAPE FOR LOCATION & APPEARANCE

ELEVATION
0'-0" = 53'-3"

LOWER LEVEL ELEVATION
0'-3" = 53'-6"

GARAGE FLOOR ELEVATION
12'-3" = 65'-6"

MAIN LEVEL ELEVATION
11'-3" = 64'-6"

MOSS BEACH - LOT 3

VALLEMAR ST. & JULIANA AVE.

COASTSIDE DESIGN
REVIEW APPLICATION

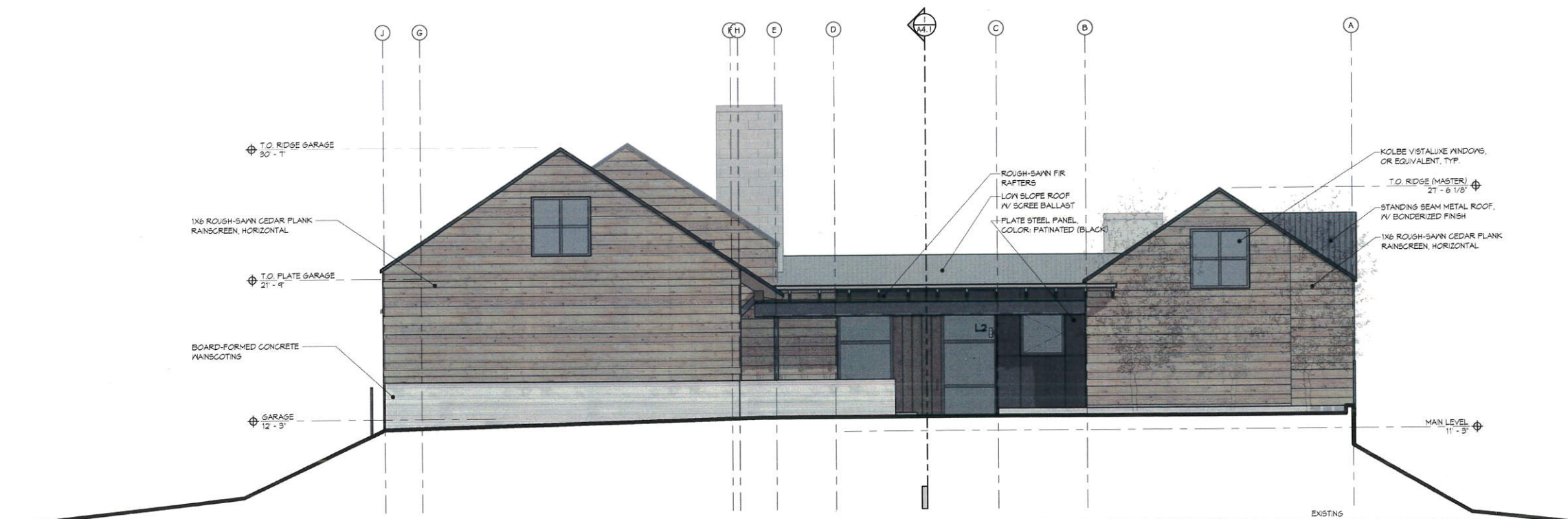
DRAWING
SITE PLAN

PROJECT NUMBER: 1507

DATE: OCTOBER 12, 2017

DESIGN REVIEW SET
SHEET NO.

A1.1

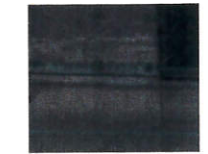


1 NORTH ELEVATION
1/4" = 1'-0"

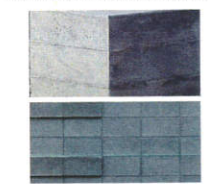
MATERIALS



SIDING
1X6 ROUGH-SAWN CEDAR,
PLANK 1/4" REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
& WHITEWASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



ROOF
STANDING SEAM
METAL ROOF
1/4" BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
1/4" SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

MOSS BEACH - LOT 3
VALLEMAR ST. & JULIANNA AVE.

REVISION	
NO.	DATE
COASTSIDE DESIGN REVIEW APPLICATION	
DRAWING ELEVATIONS	
PROJECT NUMBER	1507
DATE	OCTOBER 12, 2017
DESIGN REVIEW SET	
SHEET NO.	
A3.1	

MOSS BEACH - LOT 3

VALLEMAR ST. & JULIANNA AVE.

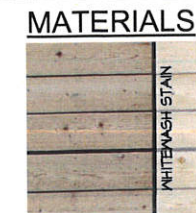


WHITENASH STAIN

A close-up photograph of a concrete beam-column joint. A vertical crack is visible in the column, extending from the joint downwards. The concrete is light-colored and shows signs of weathering.

A3.2





SIDING
1X8 ROUGH-SAWN CEDAR,
PLANK 1/4" REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
WHITENASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



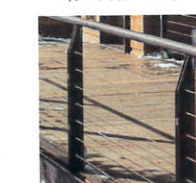
ROOF
STANDING SEAM
METAL ROOF
1/4" BONDURIZED FINISH



FLAT ROOF
EPDM MEMBRANE
1/4" SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



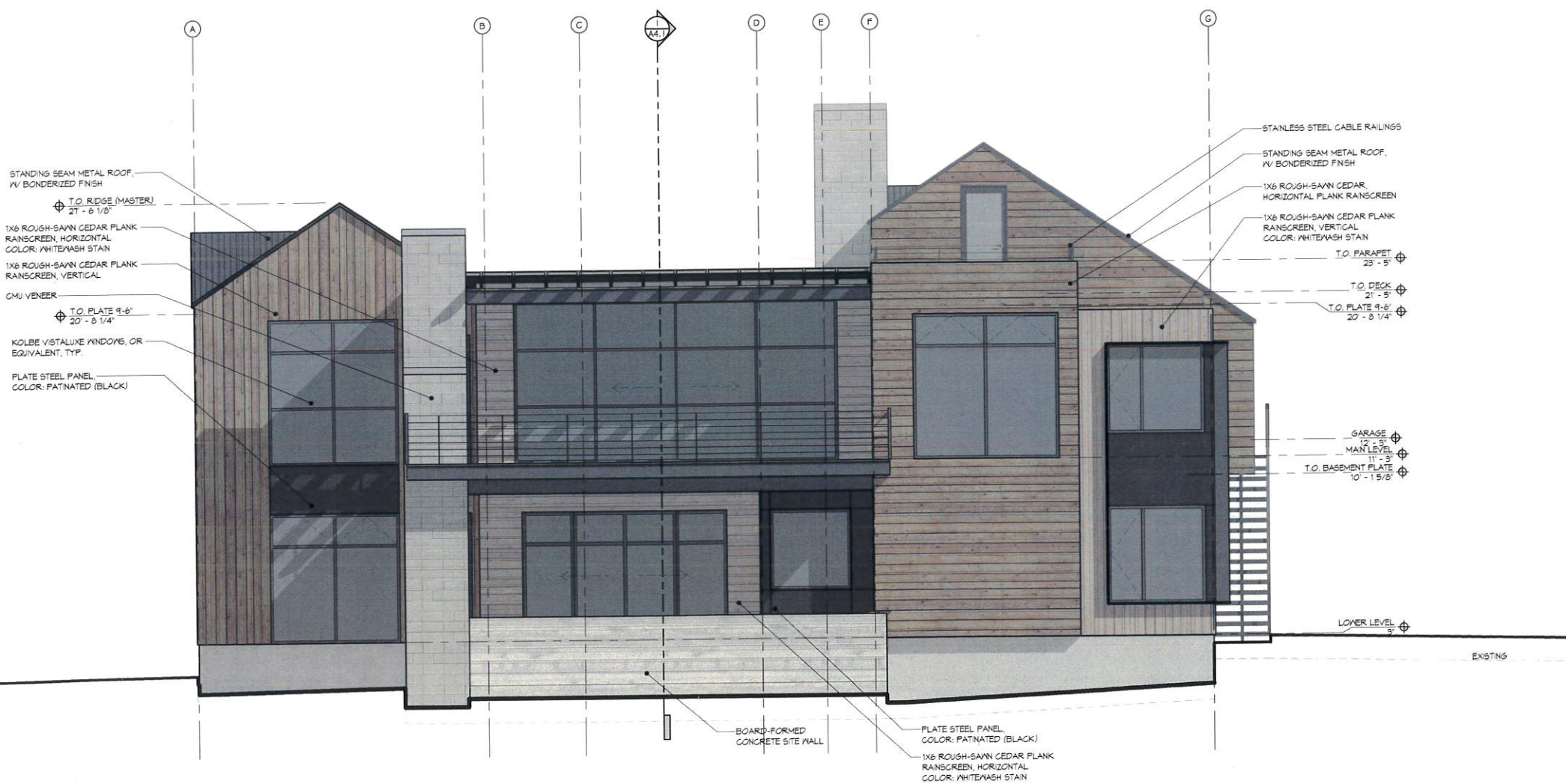
RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

MOSS BEACH - LOT 3
VALLEMAR ST. & JULIANNA AVE.

REVISION	
NO.	DATE
COASTSIDE DESIGN REVIEW APPLICATION	
DRAWING ELEVATIONS	
PROJECT NUMBER	1507
DATE	OCTOBER 12, 2017
DESIGN REVIEW SET	
SHEET NO.	A3.3



1 SOUTH ELEVATION
1/4" = 1'-0"

MATERIALS



SIDING
1X8 ROUGH-SAWN CEDAR,
PLANK IV REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
& WHITEWASH STAIN)



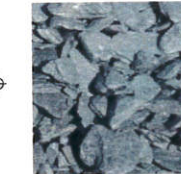
SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



ROOF
STANDING SEAM
METAL ROOF
IV BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
IV SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

MOSS BEACH - LOT 3 VALEMAR ST. & JULIANNA AVE.

REVISION

NO. DATE

COASTSIDE DESIGN
REVIEW APPLICATION

DRAWING
ELEVATIONS

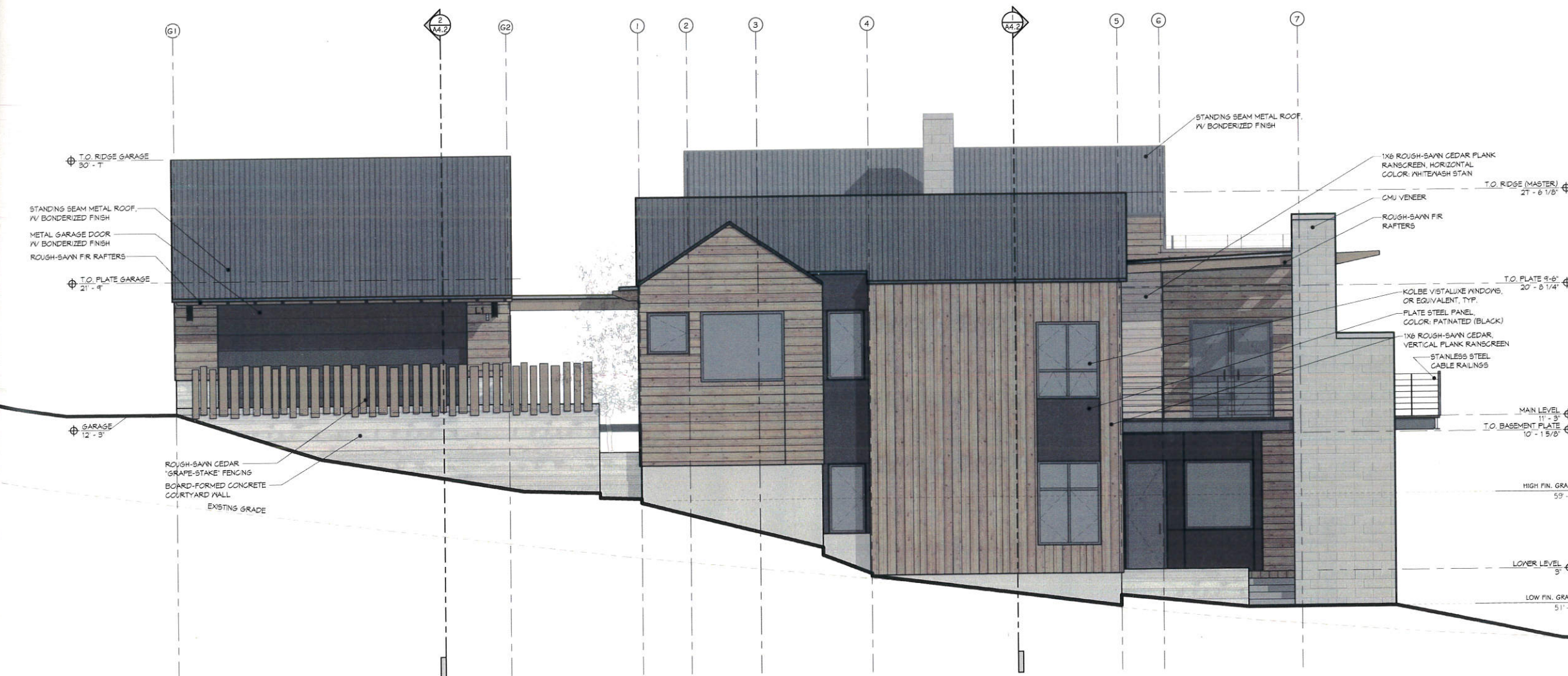
PROJECT NUMBER: 1507

DATE: OCTOBER 12, 2017

DESIGN REVIEW SET

SHEET NO.

A3.4

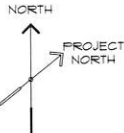
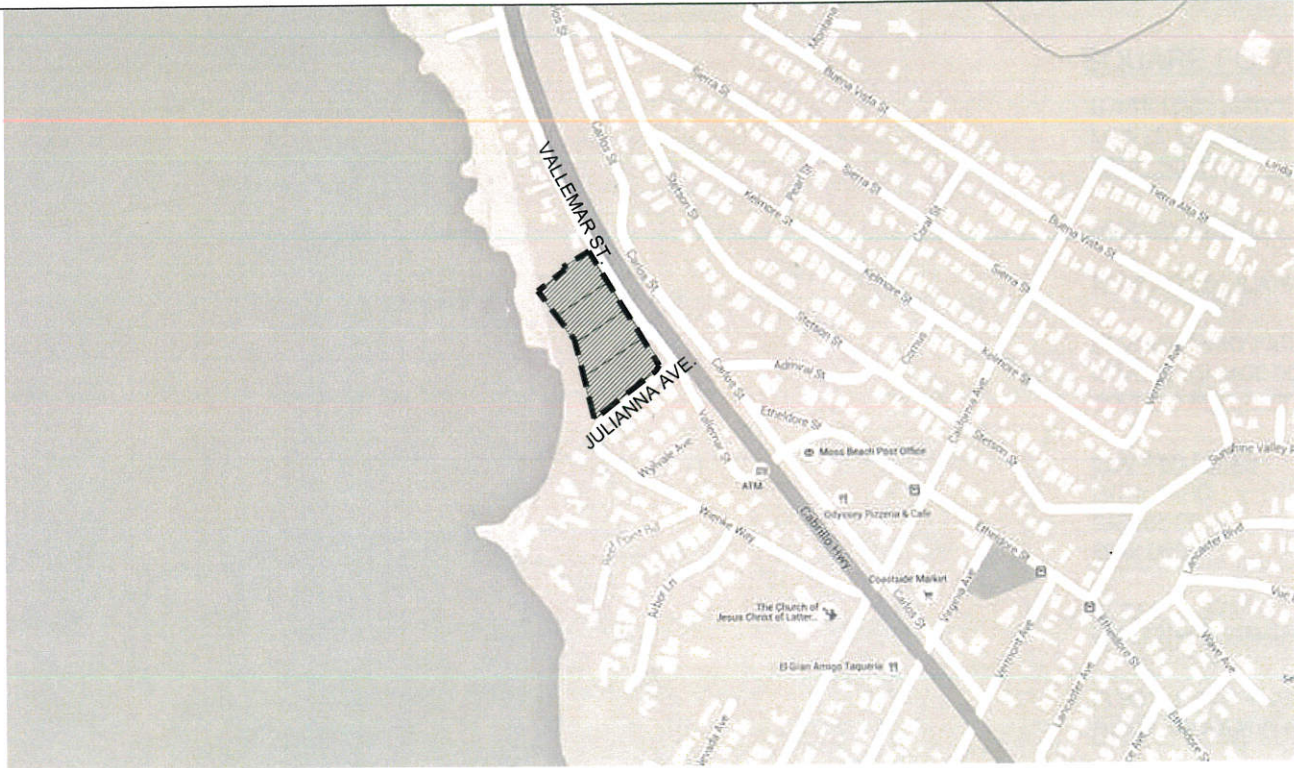


1 WEST ELEVATION
1/4" = 1'-0"



County of San Mateo - Planning and Building Department

ATTACHMENT N



LOT 4

INDEX OF DRAWINGS

ARCHITECTURAL

COVER	VICINITY MAP & PROPERTY SUMMARY
A01	AREA PLAN CALCULATIONS
A11	SITE PLAN
A21	LOWER LEVEL PLAN
A22	MAIN LEVEL PLAN
A23	COURTYARD PLAN
A24	ROOF ACCESS & GARAGE ROOF PLAN
A25	ROOF PLAN
A31	EXTERIOR ELEVATIONS
A32	EXTERIOR ELEVATIONS
A33	EXTERIOR ELEVATIONS
A34	EXTERIOR ELEVATIONS
A41	BUILDING CROSS-SECTION
A42	BUILDING CROSS-SECTION

MOSS BEACH - LOT 4
VALLEMAR ST. & JULIANA AVE.

GENERAL NOTES

1. SPECIFICATIONS, AS INSTRUMENTS OF SERVICE, ARE THE EXCLUSIVE PROPERTY OF THE ARCHITECT. THESE DOCUMENTS ARE NOT TO BE REPRODUCED IN ANY FORM AND THEY ARE NOT TO BE USED BY THE PROJECT OR ANY OTHER ENTITY ON ANY OTHER PROJECTS OR FOR ANY EXTENSIONS OR ALTERATIONS TO THE ORIGINAL PROJECT EXCEPT BY WRITTEN PERMISSION FROM AND AGREEMENT WITH THIS ARCHITECT.

2. THE ARCHITECT SHALL VERIFY ALL DIMENSIONS AND CONDITIONS SHOWN ON THE JOB SITE AND SHALL NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES, OMISSIONS, AND/OR CONFLICTS BEFORE PROCEEDING WITH THE WORK.

3. THE CONTRACTOR SHALL COMPLY WITH THE RULES AND REGULATIONS OF AGENCIES AND SHALL CONFORM TO ALL CITY, COUNTY, STATE AND FEDERAL ORDINANCES, ALL FEES, TAXES, PERMITS, APPLICATIONS AND INSPECTIONS, AND THE FILING OF ALL WORK WITH GOVERNMENTAL AGENCIES. THE RESPONSIBILITY OF THE CONTRACTOR.

4. ALL WORK SHALL BE PERFORMED BY SKILLED AND QUALIFIED WORKMEN IN ACCORDANCE WITH THE BEST PRACTICES OF THOSE TRADES INVOLVED, AND IN ACCORDANCE WITH BUILDING REGULATIONS AND/OR GOVERNMENTAL LAWS, ORDINANCES CONCERNING THE USE OF UNION LABOR.

5. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

6. THE ARCHITECT SHALL BE RESPONSIBLE FOR THE DISTRIBUTION OF DRAWINGS TO THE TRADES UNDER THEIR JURISDICTION.

7. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

8. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

9. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

10. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

11. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

12. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

13. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

14. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

15. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

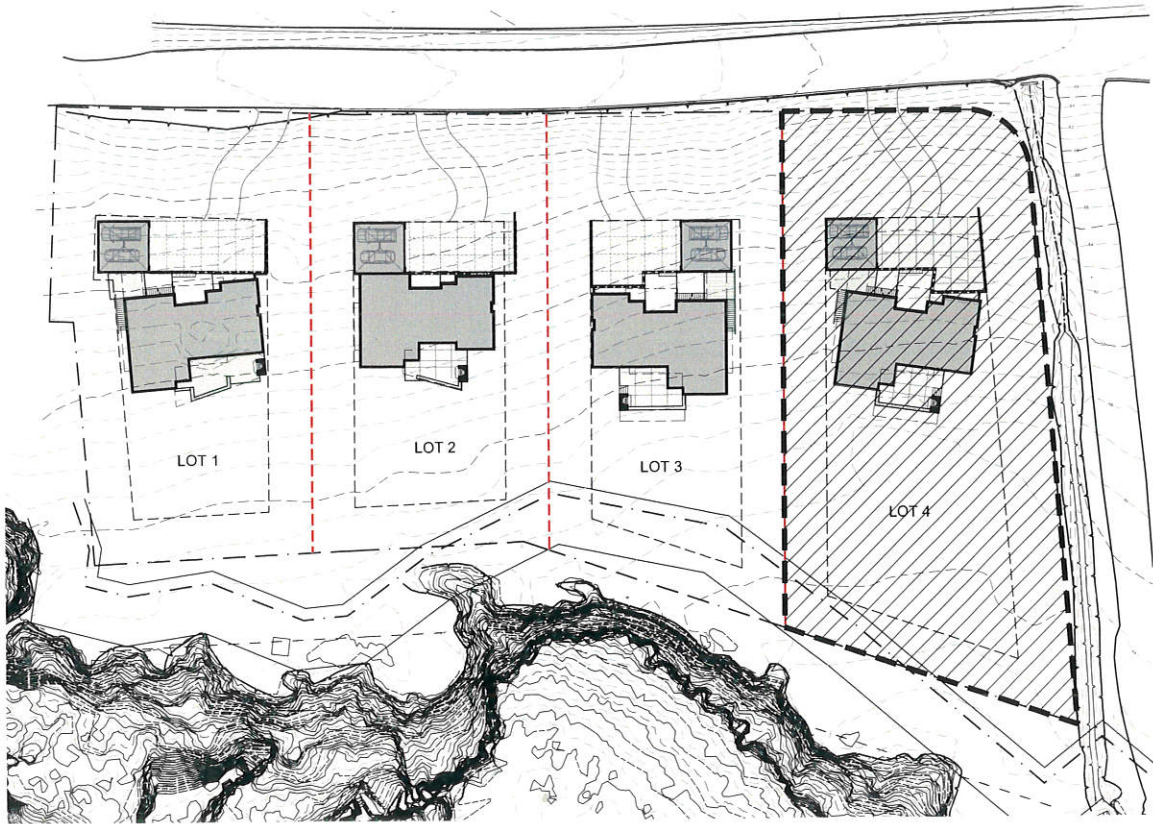
16. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

17. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

18. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

19. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.

20. ALL WORK SHALL BE DONE IN A MANNER THAT WILL NOT DELAY THE TRADES INVOLVED.



VICINITY MAP
NTS

PROPERTY SUMMARY

LOT: 4

APN: 037086230
PARCEL ID: T.B.D.
CITY NAME: MOSS BEACH (UNINC)
ZIP CODE: 94038
MITIGATION FEE AREA: MIDCOAST URBAN

ZONING: RM-CZ/DR/CD
MIDCOAST LCP

Maximum Building Height: 28'

Parcel SF: 32,324 SF
Maximum Floor Building Area: 6,200 SF.

SQUARE FOOTAGE SUMMARY	
LOWER LEVEL (GROSS)	1,763#
MAIN LEVEL (GROSS)	2,234#
TOTAL FLOOR AREA (GROSS)	3,997#
GARAGE (GROSS)	576#
ROOF ACCESS (CATWALK)	239#
COVERED ENTRY PATIO	113#
COVERED GARAGE DECK	75#
COVERED REAR DECK	288#
ELEVATED DECKS	
ENTRY DECK	215#
GARAGE DECK	230#
REAR DECK	604#

ARCHITECT



102 NORTH BROADWAY AVE.
BOZEMAN, MT 59715
OFFICE: 406.587.1997 FAX: 406.587.0311
WWW.PEARSONDESIGNGROUP.COM

ISSUE DATE

COUNTY COASTSIDE
DESIGN REVIEW SET

OCTOBER 12, 2017

ATTACHMENT N



SITE LEGEND

- EXISTING 5 FT. CONTOURS
- EXISTING 1 FT. CONTOURS
- NEW CONTOURS
- PROPERTY LINE
- EASEMENT, SETBACK OR ENVELOPE
- PROPOSED NEW PROPERTY LOT LINE
- EXISTING PROPERTY LOT LINE
- EXISTING TREE (TO REMAIN)
- EXISTING TREE DRIPLINE
- 14'-0" WIDE PERVIOUS PAVING DRIVEWAY (W/ "TWO-TRACK" VEGETATION STRIP)
- PERVIOUS PAVING COURTYARD (PARKING)
- RE-VEGETATED NATIVE GRASS MEADOW
- PROTECTED GRASSLANDS, ZONE A
- PROTECTED GRASSLANDS, ZONE B
- 100' BUFFER FROM LEPTOSIPHON

GENERAL SITE NOTES

1. GRADING NOTES & SPOT ELEVATIONS, SEE CIVIL DRAWINGS
2. UTILITY AND LOCATION INFORMATION, SEE CIVIL DRAWINGS
3. AREA OF DISTURBANCE TO BE MINIMIZED BY CONTRACTOR
4. SPECIFIC TREE REMOVAL SPECIFICATIONS, SEE LANDSCAPE
5. RETAINING WALLS, TERRACES, AND FENCES, SEE LANDSCAPE FOR LOCATION & APPEARANCE

ELEVATION
0'-0" = 50'-9"
LOWER LEVEL ELEVATION
0'-3" = 51'-0"
GARAGE FLOOR ELEVATION
11'-3" = 62'-0"
MAIN LEVEL ELEVATION
11'-3" = 62'-0"

MOSS BEACH - LOT 4

VALLEMAR ST. & JULIANA AVE.

COASTSIDE DESIGN
REVIEW APPLICATION

DRAWING:
SITE PLAN

PROJECT NUMBER: 1507

DATE: OCTOBER 12, 2017

DESIGN REVIEW SET
SHEET NO.

A1.1

SITE PLAN - LOT 4
SCALE: 1/8"=1'-0"



SIDING
1X8 ROUGH-SAWN CEDAR,
PLANK W/ REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
& WHITENASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



ROOF
STANDING SEAM
METAL ROOF
W/ BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
W/ SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



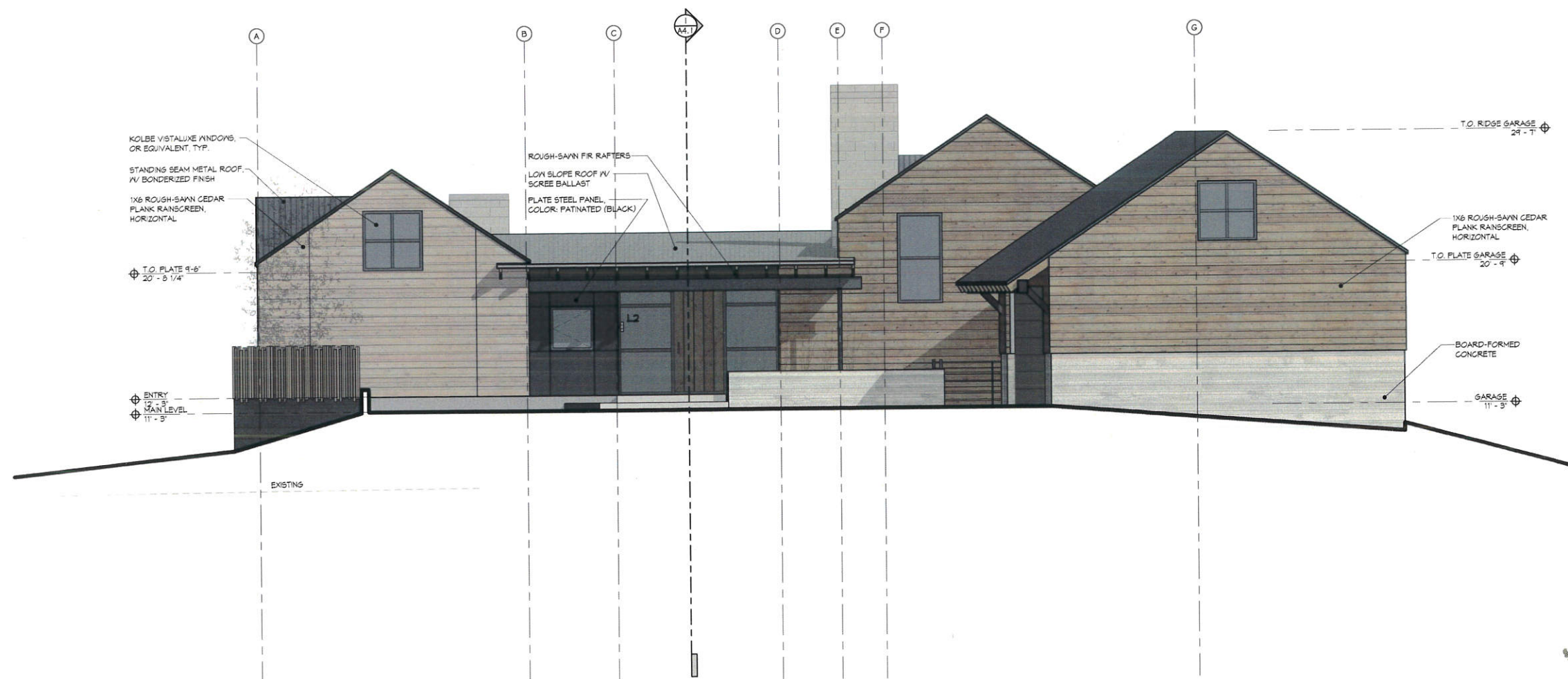
RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

MOSS BEACH - LOT 4
VALLEMAR ST. & JULIANA AVE.

REVISION	
NO.	DATE
COASTSIDE DESIGN REVIEW APPLICATION	
DRAWING ELEVATIONS	
PROJECT NUMBER:	1507
DATE:	OCTOBER 12, 2017
DESIGN REVIEW SET	
SHEET NO.	
A3.1	



1 NORTH ELEVATION
1/4" = 1'-0"

MATERIALS



SIDING
1X8 ROUGH-SAWN CEDAR,
PLANK W/ REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
& WHITEWASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



ROOF
STANDING SEAM
METAL ROOF
W/ BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
W/ SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

PDC

**PEARSON
DESIGN GROUP**

102N BROADWAY AVE. BOZEMAN, MT 59715
OFFICE: 406.937.9971 FAX: 406.937.9331
WWW.PEARSONDESIGNGROUP.COM

MOSS BEACH - LOT 4 VALEMAR ST. & JULIANA AVE.

REVISION

NO. DATE

COASTSIDE DESIGN
REVIEW APPLICATION

DRAWING:
ELEVATIONS

PROJECT NUMBER: 1507

DATE:
OCTOBER 12, 2017

DESIGN REVIEW SET

SHEET NO.

A3.2



1 EAST ELEVATION
1/4" = 1'-0"

MATERIALS



SIDING
1X6 ROUGH-SAWN CEDAR,
PLANK 1/4" REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
4 WHITEWASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



ROOF
STANDING SEAM
METAL ROOF
1/4" BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
1/4" SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



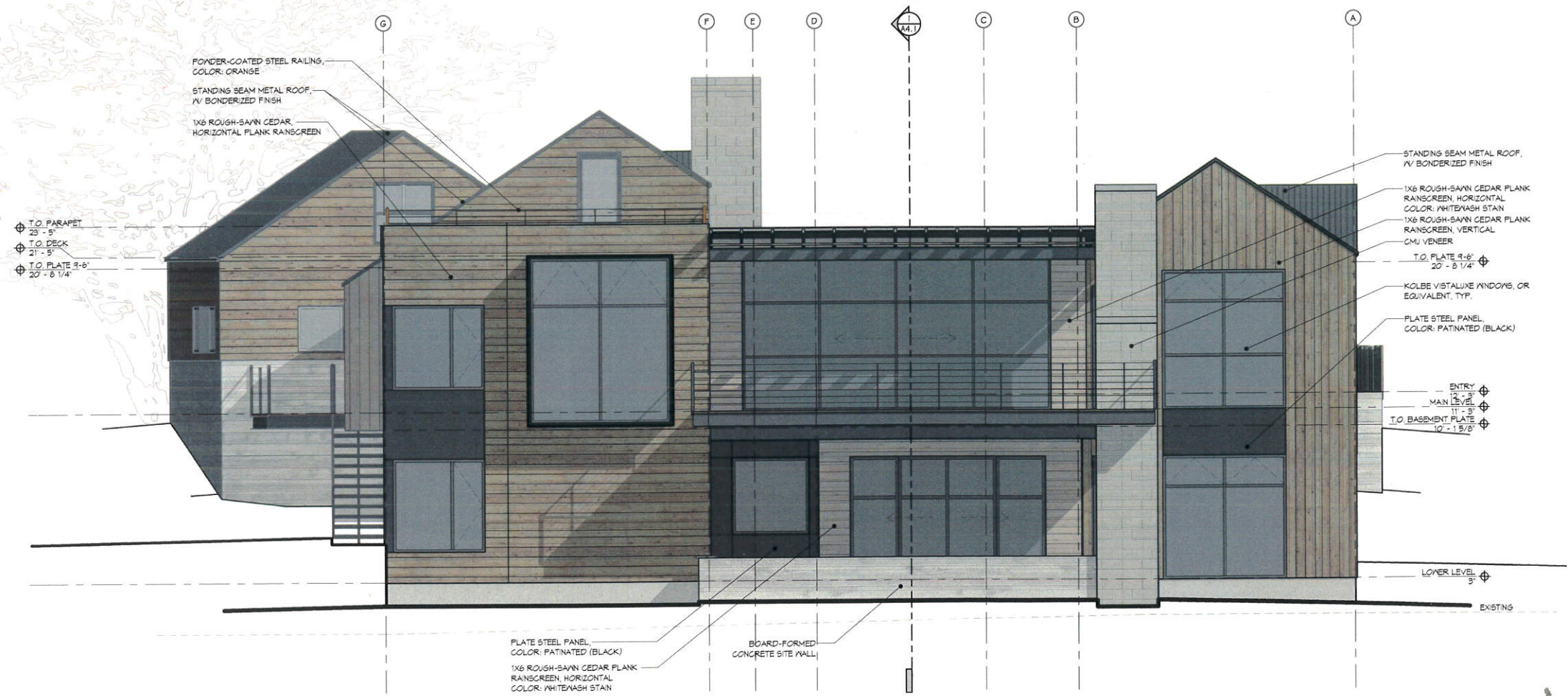
RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

MOSS BEACH - LOT 4
VALLEMAR ST. & JULIANA AVE.

REVISION	
NO.	DATE
COASTSIDE DESIGN REVIEW APPLICATION	
DRAWING: ELEVATIONS	
PROJECT NUMBER: 1507	
DATE: OCTOBER 12, 2017	
DESIGN REVIEW SET	
SHEET NO.	
A3.3	



1 SOUTH ELEVATION
1/4" = 1'-0"

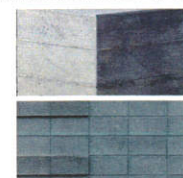
MATERIALS



SIDING
1X6 ROUGH-SAWN CEDAR,
PLANK 1/4" REVEAL EVERY
THIRD BOARD
(NATURAL WEATHERING STAIN,
4 WHITENASH STAIN)



SIDING
PLATE STEEL (BLACK PATINA)



WALLS
BOARD-FORMED CONCRETE
(CMU VENEER CHIMNEY)



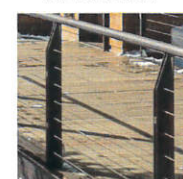
ROOF
STANDING SEAM
METAL ROOF
1/4" BONDERIZED FINISH



FLAT ROOF
EPDM MEMBRANE
1/4" SCREE BALLAST



SOFFITS
ROUGH SAWN CEDAR
(OR REDWOOD)



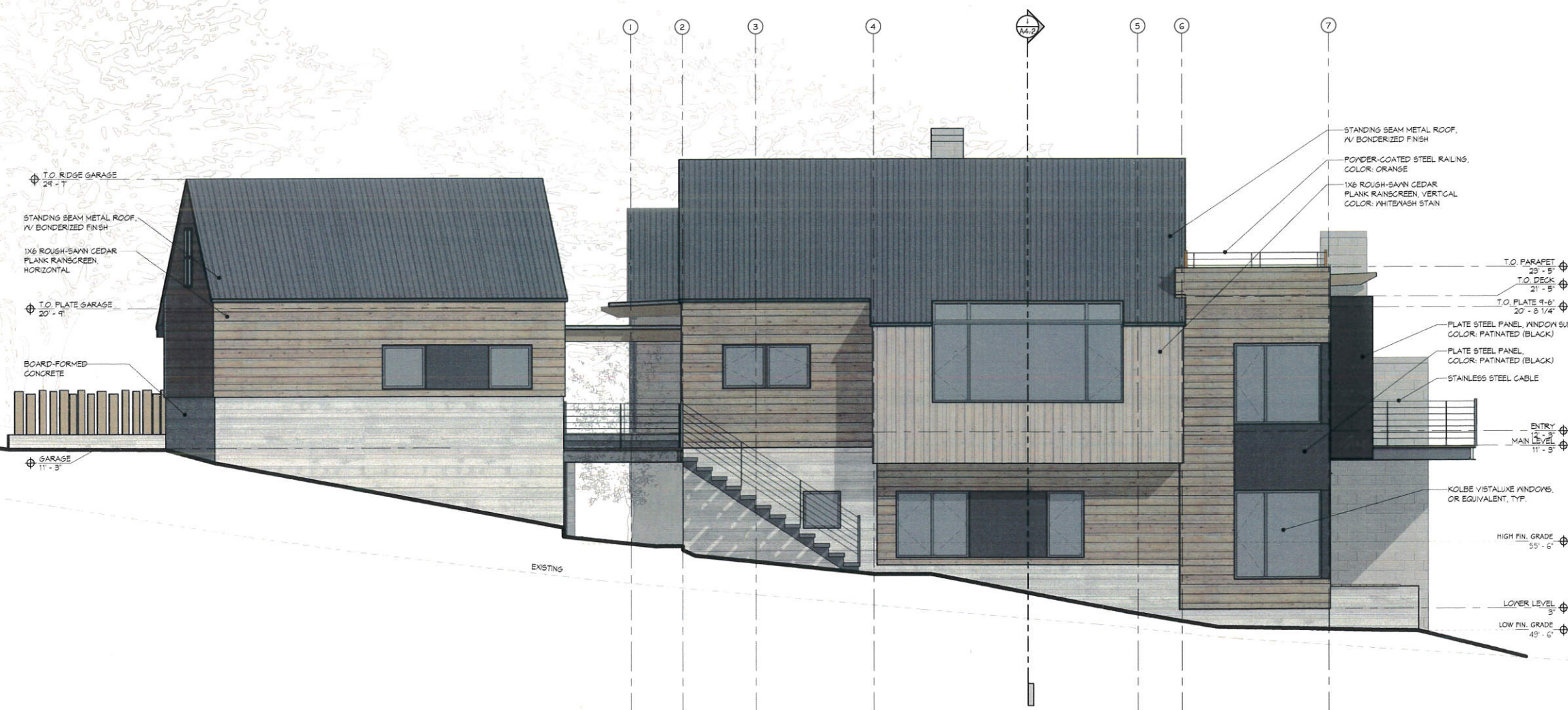
RAILINGS & TRIM
STAINLESS STEEL CABLE
RAILINGS
& STAINLESS STEEL TRIM



RAFTERS
ROUGH SAWN FIR

MOSS BEACH - LOT 4 VALLEMAR ST. & JULIANA AVE.

REVISION	
NO.	DATE
COASTSIDE DESIGN REVIEW APPLICATION	
DRAWING: ELEVATIONS	
PROJECT NUMBER:	1507
DATE:	OCTOBER 12, 2017
DESIGN REVIEW SET	
SHEET NO.	
A3.4	



1 WEST ELEVATION
1/4" = 1'-0"



County of San Mateo - Planning and Building Department

ATTACHMENT O



ATTACHMENT O

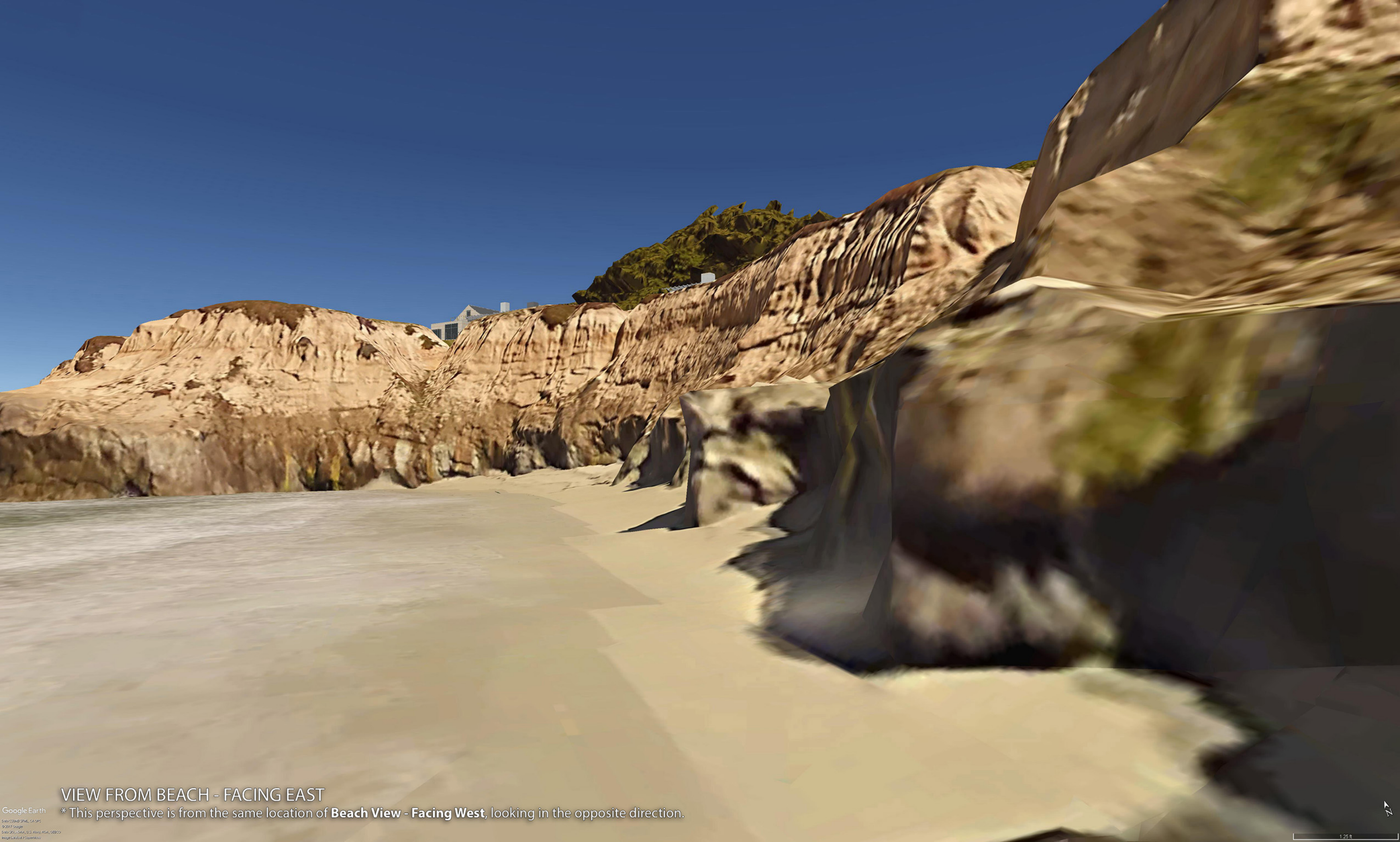
VIEW FACING NORTH

* Houses are geo-located within Google Earth. Tree imagery is indicative of the existing conditions, and does not accurately represent the tree preservation and replacement plan. (See Landscape Drawings)



VIEW FACING SOUTHEAST

* Houses are geo-located within Google Earth. Tree imagery is indicative of the existing conditions, and does not accurately represent the tree preservation and replacement plan. (See Landscape Drawings)



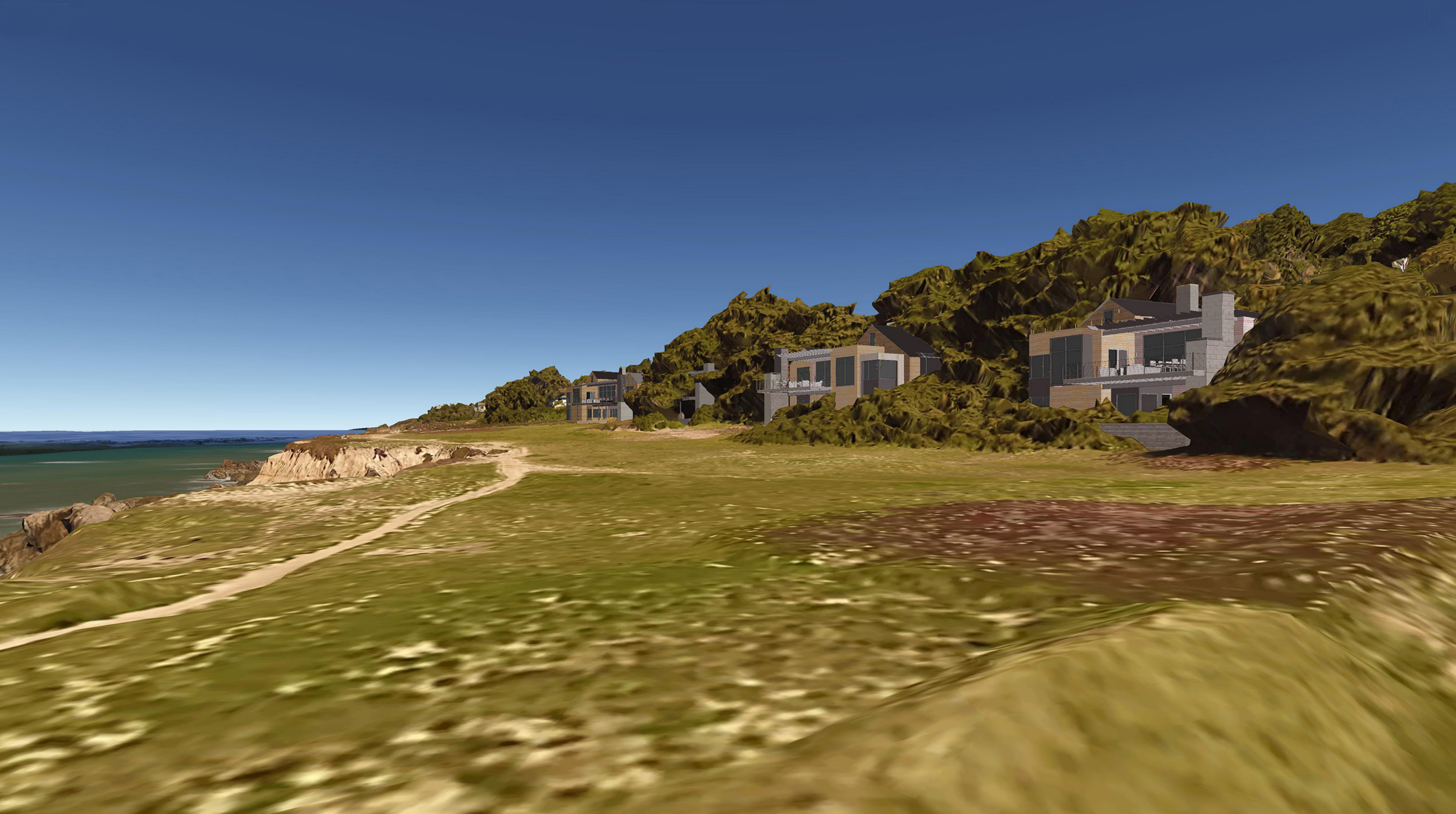
VIEW FROM BEACH - FACING EAST

* This perspective is from the same location of **Beach View - Facing West**, looking in the opposite direction.



VIEW FROM BEACH - FACING WEST

* This perspective is from the same location of **Beach View - Facing East**, looking in the opposite direction.



VIEW FACING NORTH

* Houses are geo-located within Google Earth. Tree imagery is indicative of the existing conditions, and does not accurately represent the tree preservation and replacement plan. (See Landscape Drawings)



County of San Mateo - Planning and Building Department

ATTACHMENT P



PRELIMINARY STORM DRAINAGE REPORT

For

MOSS BEACH DEVELOPMENT

SAN MATEO COUNTY
CALIFORNIA

Prepared for:
Moss Beach Associates, LLC
612 Spring Street
Santa Cruz, CA 95060

Prepared by:
Mesiti-Miller Engineering, Inc.
224 Walnut Avenue, Suite B
Santa Cruz, CA 95060
831-426-3186

Project No. 15147-5
April 26, 2017



April 26, 2017

Owen Lawlor

Moss Beach Associates, LLC
612 Spring Street
Santa Cruz, CA 95060

Re: Moss Beach Development - Four Lot Plan
Preliminary Drainage Report

MME Project No: 15147-5

Dear Owen:

We have prepared the enclosed report for the Moss Beach Development in accordance with our scope.

Respectfully yours,

Reviewed by,

Daniel Mays, E.I.T.
Engineer II

Rodney Cahill, C.E., LEED AP
Principal

Enclosures

cc: Project File

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Moss Beach Development - Four Lot Plan - Preliminary Drainage Report

1. Introduction

Purpose

Mesiti-Miller Engineering, Inc. (MME) prepared this report at the request of Owen Lawlor and Moss Beach Associates for the Moss Beach Development project. The purpose of this report is to provide preliminary hydrologic and hydraulic analyses of existing and proposed drainage conditions.

Project Description

The project is a residential development located on a 2.35 acre site in Moss Beach, California. The site consists of seven adjoining lots on the west side of the Vallemar Street and Juliana Avenue intersection.

The proposed development includes four two-story single-family residences and associated improvements.

2. Existing Drainage Conditions

Site Slope and Soils

The site slopes to the southwest at an average slope of approximately ten percent and range from about 26 percent near Vallemar Street to about 3 percent closer to the bluffs. The Geotechnical Investigation (Appendix D) reported surface soils as loose to very loose silty and clayey sands underlain by stiff to very stiff sandy clays. Groundwater was encountered at the southeast lots near Juliana Avenue. Measured depths to groundwater ranged from 17 feet near Vallemar Street to 13 feet closer to the bluffs.

Site Runoff and Calculations

The site is divided into four sub watershed areas corresponding to the lots for each of the proposed single-family residences (Figure 1, Appendix A). Preliminary hydrologic calculations for the drainage areas under pre and post-development conditions are presented in Appendix A.

We used the Rational Method to develop preliminary runoff rates for the 10-year storm events per San Mateo County Drainage Guidelines and calculated a weighted coefficient of runoff for each drainage area under post-development conditions for initial design sizing. Rainfall intensity calculations for this method were prepared using Rainfall Runoff Data for San Mateo County (Appendix A).

For detailed design, we prepared a detailed hydrologic and hydraulic model using unit hydrograph methods and HydroCAD 10 software to check our results and



refine detention facility design. Resulting flow rates were higher than from simplified methods based in part on the Type C hydrologic soil group and a rainfall depth of four inches for the 10-year storm¹. Other parameters that caused an increase in estimated runoff included the use of an SCS Type I rainfall pattern consistent with the Central Coast of California, and an Antecedent Moisture Condition of 3 to account for the clay soils found at the site. A full report containing calculation parameters, methods, and results including graphical charts is included in Appendix C.

Existing Drainage System

Runoff from the site currently flows over the bluffs to the southwest.

3. Proposed Drainage Conditions

Site Soils and Flow Dispersion

Based on recommendations from Jodi McGraw, the Project Biologist, the plan calls for utilizing infiltration trenches with overflow spreaders to disperse the runoff over wide areas and maintain existing hydrology and soil moisture distribution on the site (see Sheet C3.0, Appendix B). This will also help to prevent concentrated runoff from flowing over the bluffs and reduce the potential for soil erosion.

Proposed Impervious Area

The plan proposes the use of pervious pavers for driveways and parking areas to minimize impervious area on the site. The total proposed impervious area for the entire site is currently 17,070 square feet (0.39 acre). See Sheet C3.0, Appendix B, for a more detailed description of the impervious area for each lot. Infiltration trenches and detention systems are also proposed for mitigating runoff from the impervious surfaces.

Site Run-off and Calculations

Preliminary hydrologic calculations for the drainage areas for each lot under both pre and post-development conditions are presented in Appendix A. Rational method calculations for the entire lot do not account for the proposed infiltration and detention facilities and therefore show how the proposed development would increase flow without mitigation. Since mitigation is included in this project, runoff rates will be controlled to pre-development levels per County requirements. Preliminary calculations for the infiltration trenches are also included in Appendix A.

A detailed hydrologic and hydraulic model was prepared to examine proposed drainage conditions and determine the infiltration and detention facility details required to cause no net increase in flow off the site due to the project (Appendix C). Based on the model results, the net runoff from the site will decrease with



the proposed drainage improvements (see Table 2 below). The model estimates the attenuation for the proposed detention systems is 11-13% with lag times ranging from 3.2 to 3.5 minutes. The infiltration trenches had much higher attenuation and lag times due to high rates of infiltration and additional storage volume.

Table 1 - Comparison of runoff from each lot for pre and post-development peak flow conditions.

Lot	Pre-Development		Post-Development	
	Q (cfs)	V (fps)	Q (cfs)	V (fps)
1	1.1	0.4	0.9	0.3
2	1.0	0.4	0.9	0.3
3	1.1	0.3	1.1	0.2
4	1.4	0.3	1.4	0.2
Total	4.6	-	4.3	-

Low Impact Design (LID)

The key Low Impact Design (LID) objectives of the drainage plan were to slow down and filter stormwater to reduce the impact of development on water resources.

LID drainage techniques we recommend for the project include the use of pervious pavers for driveways and parking areas, infiltration trenches with overflow spreaders to disperse runoff, and detention facilities. These systems will slow down and disperse runoff, provide storage, filtration, and remediation for pollutants.

Summary of LID Strategies included in design:

1. Minimizing disturbance of existing vegetation, including preserving cypress tree groves and native grasses throughout the site, and minimizing grading activities within the dripline of individual trees and groves
2. Using infiltration facilities to store and filter runoff from impervious rooftops
3. Using detention facilities to store peak runoff volumes from the rooftops and pervious pavers driveways
4. Reducing imported grading volumes through excavation of infiltration and detention facilities
5. Planning for construction-phase erosion control
6. Maintaining water quality devices through regular inspection and cleaning (see Appendix E for County maintenance plan templates)



4. Recommendations

We recommend the following drainage improvements:

1. Infiltration trenches for each lot with overflow spreaders to disperse runoff
2. Pervious pavers and detention areas to control peak runoff

The recommended pipe and inlet sizes, slopes, and configurations presented in the plans and this report are the result of preliminary engineering, not a final engineering design, and are therefore suitable for schematic plans, development permit application, and construction cost estimating. The presently proposed system will be further refined during the design development phase to minimize cost, maximize design efficiency, and refine drainage components. We recommend the design process include consideration of other detailed design parameters such as precise inlet and pipe location, ongoing coordination with other disciplines, depth of other utility crossings, spatial constraints, driveways, structure connection details, construction phasing, traffic considerations, and the economy of standardizing material types.

List of Appendices

Appendix A - Preliminary Hydrology and Hydraulic Calculations
Appendix B - Plans
Appendix C - HydroCAD Model Output
Appendix D - Geotechnical Investigation
Appendix E - County Maintenance Plan Templates
Appendix F - C3 and C6 Development Review Checklist

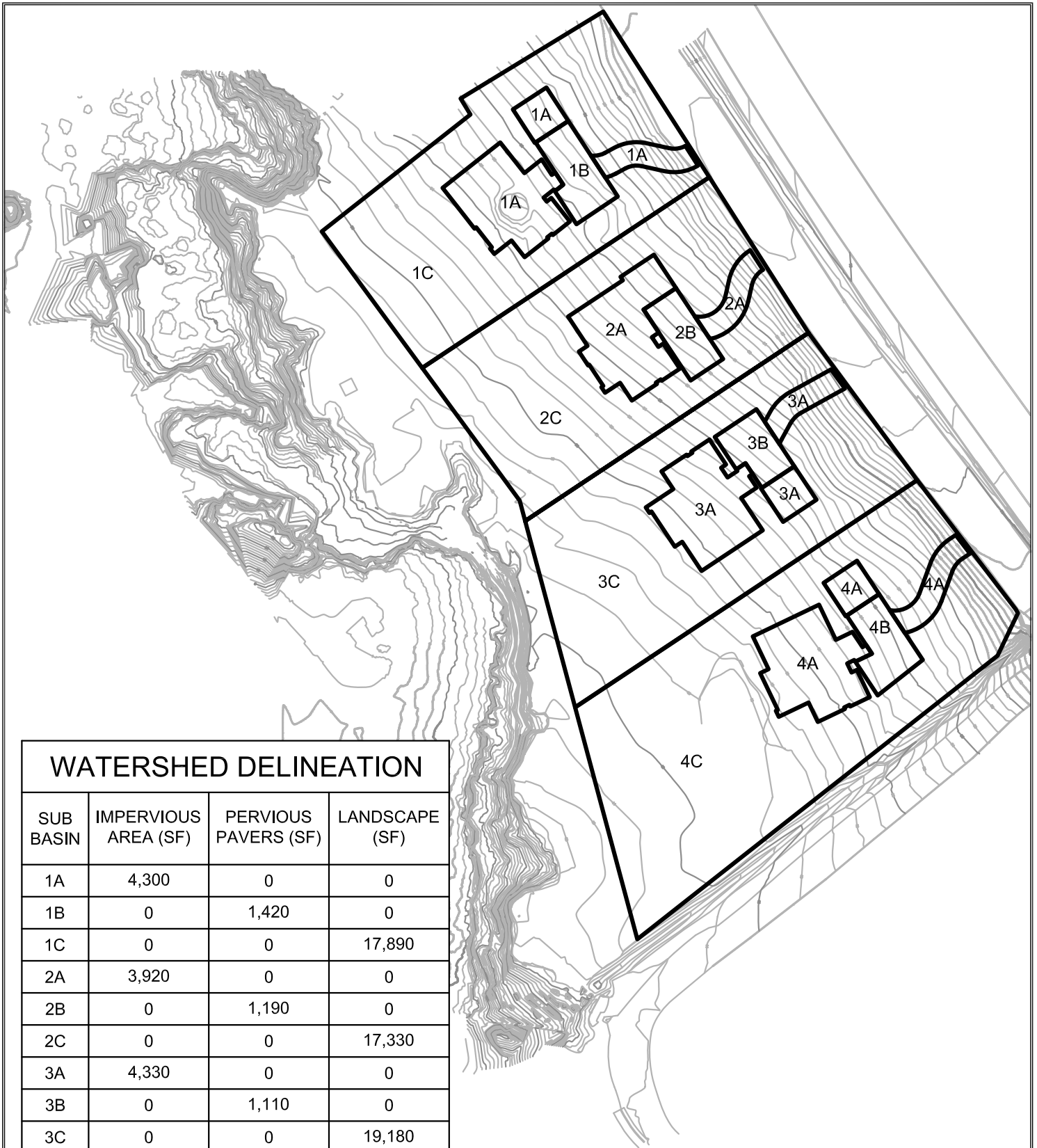
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ⁱ National Weather Service, Precipitation Frequency Atlas of the Western United States, NOAA Atlas 2 Volume XI-California, 1973



APPENDIX A

Preliminary Hydrology and Hydraulic Calculations



WATERSHED DELINEATION			
SUB BASIN	IMPERVIOUS AREA (SF)	PERVIOUS PAVERS (SF)	LANDSCAPE (SF)
1A	4,300	0	0
1B	0	1,420	0
1C	0	0	17,890
2A	3,920	0	0
2B	0	1,190	0
2C	0	0	17,330
3A	4,330	0	0
3B	0	1,110	0
3C	0	0	19,180
4A	4,520	0	0
4B	0	1,380	0
4C	0	0	27,570
TOT	17,070	5,100	81,970

SCALE: 1" = 80'



MESITI-MILLER ENGINEERING, INC.
224 Walnut Street Suite B
Santa Cruz, California 95060
(831) 426 3186

Job:	15147-5		
Sheet	1	Of	4
Calc By	DM	Date	4/26/2017
Check By	RC	Date	4/26/2017

PRELIMINARY - Lot 1

Table 1 - Estimated Peak Runoff Rates

Method: San Mateo County Guidelines for Drainage Review

$$Q = C I A F$$

F =	1.2	Rainfall Runoff Data, San Mateo County
I ₁₀ =	2.45	Rainfall Runoff Data, San Mateo County
I ₁₀₀ =	3.60	Rainfall Runoff Data, San Mateo County

10-year - Pre and Post Development - Entire Lot

WATERSHED	Tc (min)	C	I ₁₀ *F (in/hr)	AREA (ac)	Q (cfs)
LOT 1 - Pre-Development	10.0	0.30	2.94	0.54	0.48
LOT 1 - Post-Development	10.0	0.42	2.94	0.54	0.66

Coefficient of Runoff

AREA	AREA (SF)	C	A*C
IMPERVIOUS	4300	0.90	3870
PERVIOUS PAVERS	1420	0.40	568
LANDSCAPE	17890	0.30	5367
TOTAL	23610		9805
WEIGHTED C		0.42	

Water Quality Treatment - 0.2 in/hr - Flow to Infiltration Trench and Spreader

WATERSHED	Tc (min)	C	I (in/hr)	AREA (ac)	Q (cfs)
1A + 1B	10.0	0.78	0.20	0.13	0.02

Coefficient of Runoff

AREA	AREA (SF)	C	A*C
IMPERVIOUS	4300	0.90	3870
PERVIOUS PAVERS	1420	0.40	568
TOTAL	5720		4438
WEIGHTED C		0.78	

INFILTRATION AREA	A* (SF)	R* (in/hr)	Qmax (cfs)
Lot 1 Spreader	781	3.9	0.07

*A = Surface Area, R = Percolation Rate, per Geotechnical Engineer (HKA), Qmax = Max Exfiltration from Spreader

10-year - Flow to Infiltration Trench and Spreader

WATERSHED	Tc (min)	C	I ₁₀ *F (in/hr)	AREA (ac)	Q (cfs)
1A + 1B	10.0	0.78	2.94	0.13	0.30

SUMMARY

100% infiltration for 0.2 in/hr event

Approximately 0.23 cfs flows out of spreader in 10 year storm event. 0.07 cfs infiltrates



MESITI-MILLER ENGINEERING, INC.
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Santa Cruz, California 95060
(831) 426 3186

Job:	15147-5		
Sheet	2	Of	4
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Check By	RC	Date	4/26/2017

PRELIMINARY - Lot 2

Table 1 - Estimated Peak Runoff Rates

Method: San Mateo County Guidelines for Drainage Review

$$Q = C I A F$$

F =	1.2	Rainfall Runoff Data, San Mateo County
I ₁₀ =	2.45	Rainfall Runoff Data, San Mateo County
I ₁₀₀ =	3.60	Rainfall Runoff Data, San Mateo County

10-year - Pre and Post Development - Entire Lot

WATERSHED	Tc (min)	C	I ₁₀ *F (in/hr)	AREA (ac)	Q (cfs)
LOT 2 - Pre-Development	10.0	0.30	2.94	0.52	0.45
LOT 2 - Post-Development	10.0	0.41	2.94	0.52	0.62

Coefficient of Runoff

AREA	AREA (SF)	C	A*C
IMPERVIOUS	3920	0.90	3528
PERVIOUS PAVERS	1190	0.40	476
LANDSCAPE	17330	0.30	5199
TOTAL	22440		9203
WEIGHTED C		0.41	

Water Quality Treatment - 0.2 in/hr - Flow to Infiltration Trench and Spreader

WATERSHED	Tc (min)	C	I (in/hr)	AREA (ac)	Q (cfs)
2A + 2B	10.0	0.78	0.20	0.12	0.02

Coefficient of Runoff

AREA	AREA (SF)	C	A*C
IMPERVIOUS	3920	0.90	3528
PERVIOUS PAVERS	1190	0.40	476
TOTAL	5110		4004
WEIGHTED C		0.78	

INFILTRATION AREA	A* (SF)	R* (in/hr)	Qmax (cfs)
Lot 2 Spreader	965	1.4	0.03

*A = Surface Area, R = Percolation Rate, per Geotechnical Engineer (HKA), Qmax = Max Exfiltration from Spreader

10-year - Flow to Infiltration Trench and Spreader

WATERSHED	Tc (min)	C	I ₁₀ *F (in/hr)	AREA (ac)	Q (cfs)
2A + 2B	10.0	0.78	2.94	0.12	0.27

SUMMARY

100% infiltration for 0.2 in/hr event

Approximately 0.24 cfs flows out of spreader in 10 year storm event. 0.02 cfs infiltrates



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224 Walnut Street Suite B
Santa Cruz, California 95060
(831) 426 3186

Job:	15147-5		
Sheet	3	Of	4
Calc By	DM	Date	4/26/2017
Check By	RC	Date	4/26/2017

PRELIMINARY - Lot 3

Table 1 - Estimated Peak Runoff Rates

Method: San Mateo County Guidelines for Drainage Review

$$Q = C I A F$$

F =	1.2	Rainfall Runoff Data, San Mateo County
I₁₀ =	2.45	Rainfall Runoff Data, San Mateo County
I₁₀₀ =	3.60	Rainfall Runoff Data, San Mateo County

10-year - Pre and Post Development - Entire Lot

WATERSHED	Tc (min)	C	I ₁₀ *F (in/hr)	AREA (ac)	Q (cfs)
LOT 3 - Pre-Development	10.0	0.30	2.94	0.57	0.50
LOT 3 - Post-Development	10.0	0.41	2.94	0.57	0.68

Coefficient of Runoff

AREA	AREA (SF)	C	A*C
IMPERVIOUS	4330	0.90	3897
PERVIOUS PAVERS	1110	0.40	444
LANDSCAPE	19180	0.30	5754
TOTAL	24620		10095
WEIGHTED C		0.41	

Water Quality Treatment - 0.2 in/hr - Flow to Infiltration Trench and Spreader

WATERSHED	Tc (min)	C	I (in/hr)	AREA (ac)	Q (cfs)
3A + 3B	10.0	0.80	0.20	0.12	0.02

Coefficient of Runoff

AREA	AREA (SF)	C	A*C
IMPERVIOUS	4330	0.90	3897
PERVIOUS PAVERS	1110	0.40	444
TOTAL	5440		4341
WEIGHTED C		0.80	

INFILTRATION AREA	A* (SF)	R* (in/hr)	Qmax (cfs)
Lot 3 Spreader	781	0.6	0.01

*A = Surface Area, R = Percolation Rate, per Geotechnical Engineer (HKA), Qmax = Max Exfiltration from Spreader

10-year - Flow to Infiltration Trench and Spreader

WATERSHED	Tc (min)	C	I ₁₀ *F (in/hr)	AREA (ac)	Q (cfs)
3A + 3B	10.0	0.80	2.94	0.12	0.29

SUMMARY

50% infiltration for 0.2 in/hr event. Approximately 0.01 cfs flows out of spreader
Approximately 0.28 cfs flows out of spreader in 10 year storm event. 0.01 cfs infiltrates



MESITI-MILLER ENGINEERING, INC.
224 Walnut Street Suite B
Santa Cruz, California 95060
(831) 426 3186

Job:	15147-5		
Sheet	4	Of	4
Calc By	DM	Date	4/26/2017
Check By	RC	Date	4/26/2017

PRELIMINARY - Lot 4

Table 1 - Estimated Peak Runoff Rates

Method: San Mateo County Guidelines for Drainage Review

$$Q = C I A F$$

F =	1.2	Rainfall Runoff Data, San Mateo County
I ₁₀ =	2.45	Rainfall Runoff Data, San Mateo County
I ₁₀₀ =	3.60	Rainfall Runoff Data, San Mateo County

10-year - Pre and Post Development - Entire Lot

WATERSHED	Tc (min)	C	I ₁₀ *F (in/hr)	AREA (ac)	Q (cfs)
LOT 4 - Pre-Development	10.0	0.30	2.94	0.77	0.68
LOT 4 - Post-Development	10.0	0.39	2.94	0.77	0.87

Coefficient of Runoff

AREA	AREA (SF)	C	A*C
IMPERVIOUS	4520	0.90	4068
PERVIOUS PAVERS	1380	0.40	552
LANDSCAPE	27570	0.30	8271
TOTAL	33470		12891
WEIGHTED C		0.39	

Water Quality Treatment - 0.2 in/hr - Flow to Infiltration Trench and Spreader

WATERSHED	Tc (min)	C	I (in/hr)	AREA (ac)	Q (cfs)
4A + 4B	10.0	0.78	0.20	0.14	0.02

Coefficient of Runoff

AREA	AREA (SF)	C	A*C
IMPERVIOUS	4520	0.90	4068
PERVIOUS PAVERS	1380	0.40	552
TOTAL	5900		4620
WEIGHTED C		0.78	

INFILTRATION AREA	A* (SF)	R* (in/hr)	Qmax (cfs)
Lot 4 Spreader	860	0	0.00

*A = Surface Area, R = Percolation Rate, per Geotechnical Engineer (HKA), Qmax = Max Exfiltration from Spreader

10-year - Flow to Infiltration Trench and Spreader

WATERSHED	Tc (min)	C	I ₁₀ *F (in/hr)	AREA (ac)	Q (cfs)
4A + 4B	10.0	0.78	2.94	0.14	0.31

SUMMARY

Infiltration trench volume retained. Excess runoff flows out of spreader
Approximately 0.31 cfs flows out of spreader in 10 year storm event

SAN MATEO COUNTY GUIDELINES FOR DRAINAGE REVIEW

The following is intended to summarize the San Mateo County Policy on Storm Drainage to guide the applicant and the civil engineer when preparing a drainage analysis as a required "Condition of Approval" for proposed development.

SAN MATEO COUNTY DRAINAGE POLICY:

1. Post-development peak flow (runoff) and velocity must be less than or equal to pre-development peak flow and velocity in areas where there are no existing down stream storm drain systems. No additional runoff, caused by development, can cross property lines. In areas where there are existing storm drain systems, those systems must be of adequate size to accept the increased runoff, or, mitigation procedures must be taken. Mitigation procedures may include on-site storm drain detention or off-site storm drain improvements.
2. If permanent structures are to be built over existing drainage courses or drainage facilities courses or drainage facilities.
 - a. adequate drainage facilities must be provided to protect the proposed development and existing downstream development.
 - b. A means of adequate access must be provided for maintenance
 - c. An alternate system for drainage must be provided in the event the primary system becomes plugged or otherwise inoperable.
3. The use of dry wells to dispose of surface runoff may be allowed.
4. Drainage systems that are designed to rely on pumps may not be allowed.

To comply with County Policy, the applicant's civil engineer must submit a drainage report, hydrologic study, hydraulic calculations, and drainage improvement plans. The following sections present general guidelines for these items.

DRAINAGE REPORT:

A drainage report (written narrative) must be submitted to the County for review and include the following:

1. Delineation of drainage basins and subbasins.
2. Description of proposed drainage system.
3. Discussion of rationale used to design system
4. Discussion of methods and/or calculations.
5. Description of how excess drainage will be detained.
6. Description of how discharge will be controlled to comply with County Policy.

HYDROLOGIC ANALYSIS:

The hydrologic calculations must be based on an appropriate design storm for the specific site conditions and project. For projects located within a floodplain or bounding an existing drainage course located on or adjacent to the property, the design shall be based upon a design storm of no less than a 100 year recurrence interval may be used.

The hydrologic analysis must include the following:

1. ANALYSIS/CALCULATIONS MUST BE SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER. WITHOUT THIS REQUIREMENT BEING MET, NO FURTHER REVIEW OF THE DRAINAGE ANALYSIS WILL BE PERFORMED.
2. All drainage basins and/or subbasins clearly shown on a map plan.
3. A clear description of the method used to determine peak flows.
4. If the rational method ($Q = C I A$) is used;
 - a. provide a clear statement of the basis for the runoff coefficient, (C) rainfall intensity (I), time of concentration (T), and duration, etc., and
 - b. a clear description showing the areas used in the formula.
5. If another method is used, provide a statement of method, a clear description of the basis for all assumptions and the source of all information used in the particular method.
6. Calculations for pre-development peak flow AND velocity.
7. Calculations for post-development peak flow AND velocity.
8. Calculations for detention basin design and a determination of the required volume of storage to comply with a County Policy.

HYRAULIC ANALYSIS:

ANALYSIS/CALCULATIONS MUST BE SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER. WITHOUT THIS REQUIREMENT BEING MET, NO FURTHER REVIEW OF THE DRAINAGE ANALYSIS WILL BE PERFORMED.

The hydraulic analysis must include calculations that clearly demonstrate:

1. that the post-development discharge will be controlled, and peak flow and velocity will not exceed pre-development values

2. that all storm drainage facilities have sufficient capacity to carry the anticipated peak flows. These facilities include, but are not necessarily limited to:
 - a. pipes
 - b. culverts
 - c. swales
 - d. ditches
 - e. valley gutters, etc.

PLANS:

The plans must incorporate the following items:

1. PLANS MUST BE SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER. WITHOUT THIS REQUIREMENT BEING MET, NO FURTHER REVIEW OF THE DRAINAGE ANALYSIS WILL BE PERFORMED.
2. All proposed storm drainage contours and/or spot elevations clearly indicated.
3. Existing and proposed contours and/or spot elevations clearly indicated.
4. All flow patterns clearly shown.
5. Profiles of all storm drain lines including all crossings of other utilities. A minimum one (1) foot clearance between utility lines is required.
6. Construction details must be shown, including but not necessarily limited to:
 - a. specific locations of all storm drainage facilities specified (i.e. stations, dimensions from property lines, etc.),
 - b. dimensions of all storm drainage facilities, including Standard County Drawings where applicable,
 - c. pipe/swale slopes, pipe sizes, etc.,
 - d. invert elevations, and
 - e. construction materials must be specified (i.e. RCP, PVC, DIP, etc.).

SUMMARY:

The above is intended only to provide the applicant and the applicant's civil engineer with minimum guidelines when preparing a drainage analysis. The County does not specify the design method that the applicant's engineer uses to prepare the drainage analysis. It is incumbent on the engineer to select a design method that is appropriate for the specific project and site accepting responsibility for the design. The County reviews the design as to concept and to see that the design adequately reflects County policy. The County's review does not include checking the calculations for accuracy nor making assumptions regarding the analysis.

It is to the applicant's advantage to clearly show what is being recommended for construction. Mistakes, ambiguities, incomplete information, and poor preparation of the analysis only serve to delay the review and approval process.

RAINFALL RUNOFF DATA

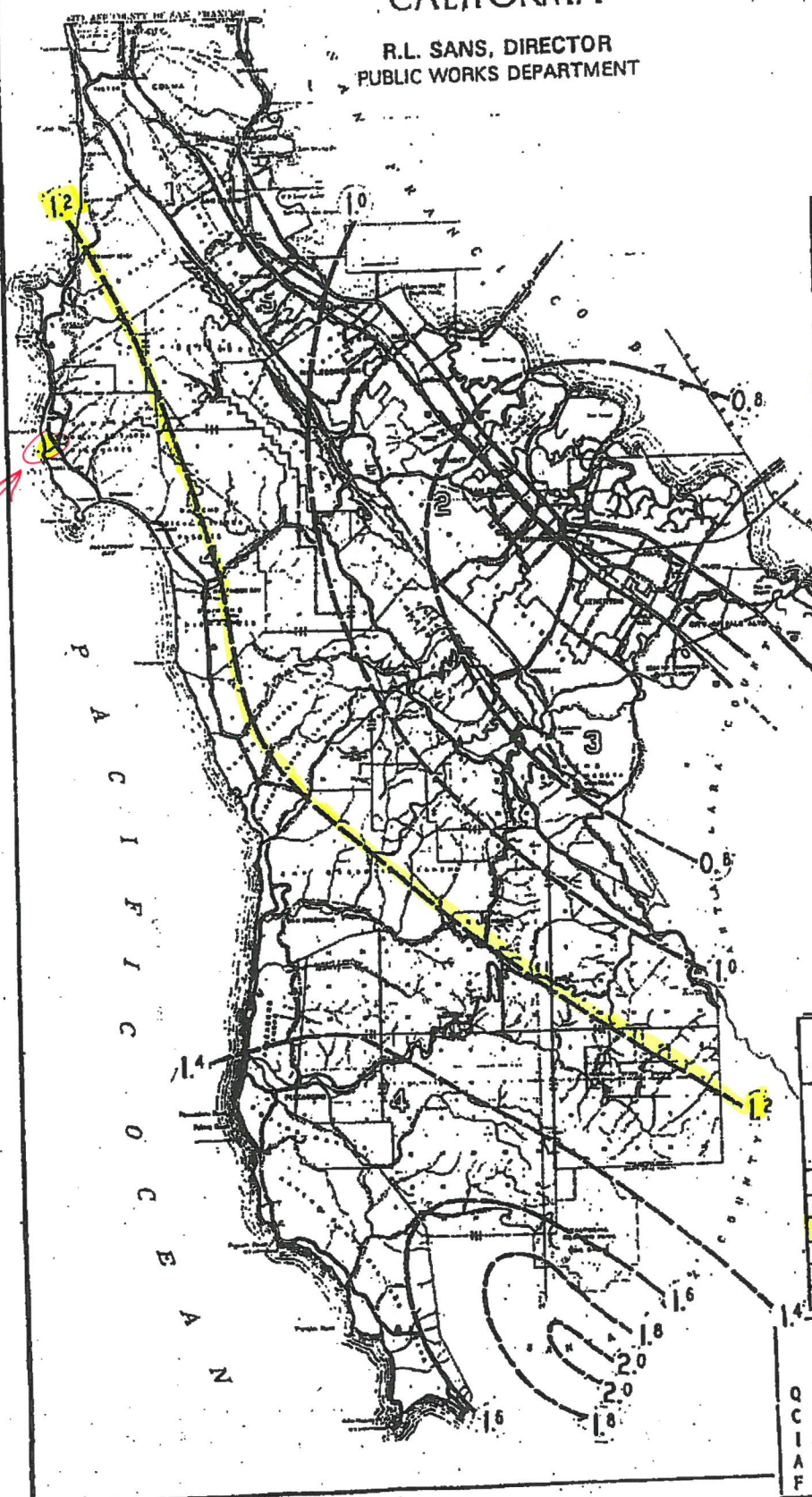
SAN MATEO COUNTY

CALIFORNIA

R.L. SANS, DIRECTOR
PUBLIC WORKS DEPARTMENT



SCALE - MILES



RAINFALL		
TIME OF CONCENTRATION	INTENSITY INCHES PER HOUR	
HRS. MIN.	10 YR.	100 YR.
0-10	2.45	3.60
0-15	2.05	3.00
0-20	1.73	2.55
0-25	1.50	2.22
0-30	1.33	1.95
0-35	1.20	1.75
0-40	1.10	1.61
0-45	1.02	1.49
0-50	0.95	1.37
0-55	0.90	1.28
1-00	0.86	1.21
1-15	0.75	1.07
1-30	0.67	0.95
1-45	0.61	0.87
2-00	0.56	0.80
2-30	0.49	0.70
3-00	0.44	0.63
3-30	0.40	0.57
4-00	0.37	0.53
4-30	0.34	0.49
5-00	0.32	0.45
6-00	0.29	0.41
7-00	0.26	0.38
8-00	0.24	0.35
9-00	0.23	0.33
10-00	0.21	0.30
12-00	0.19	0.27
24-00	0.13	0.18

RUNOFF COEFFICIENTS	
TYPE OF DEVELOPMENT	COEF.
PARKS AND CEMETERIES	0.30
RESIDENTIAL - ACRES	0.40
RESIDENTIAL - REGULAR	0.50
INDUSTRIAL	0.65
COMMERCIAL	0.75
PAVED AREAS	0.85

RATIONAL FORMULA

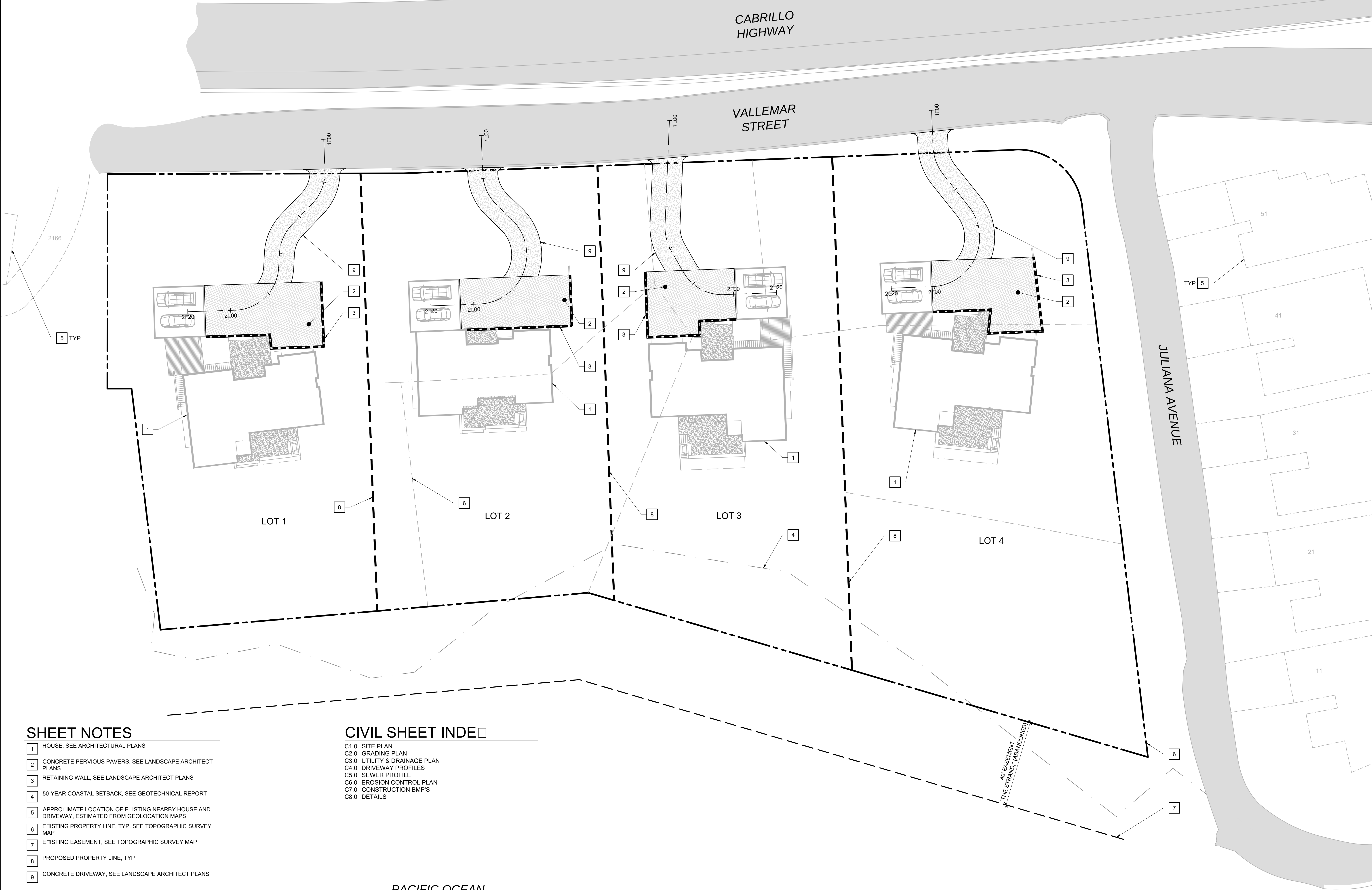
$Q = C I A F$
 Q - RUNOFF - CUBIC FEET PER SECOND
 C - RUNOFF COEFFICIENT - PERCENT
 I - RAINFALL INTENSITY - INCHES PER HOUR
 A - DRAINAGE AREA - ACRES
 F - INTENSITY FACTOR (FROM MAP)

Dr. 22-1846



APPENDIX B

Plans



SHEET NOTES

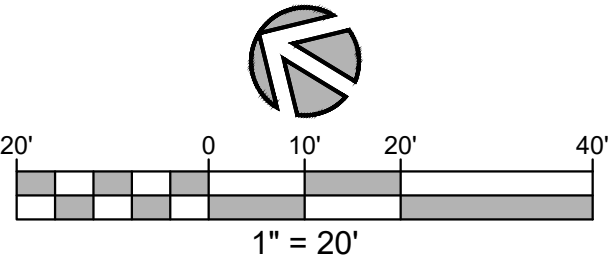
- 1 HOUSE, SEE ARCHITECTURAL PLANS
- 2 CONCRETE PERVIOUS PAVERS, SEE LANDSCAPE ARCHITECT PLANS
- 3 RETAINING WALL, SEE LANDSCAPE ARCHITECT PLANS
- 4 50-YEAR COASTAL SETBACK, SEE GEOTECHNICAL REPORT
- 5 APPROXIMATE LOCATION OF EXISTING NEARBY HOUSE AND DRIVEWAY, ESTIMATED FROM GEOLOCATION MAPS
- 6 EXISTING PROPERTY LINE, TYP, SEE TOPOGRAPHIC SURVEY MAP
- 7 EXISTING EASEMENT, SEE TOPOGRAPHIC SURVEY MAP
- 8 PROPOSED PROPERTY LINE, TYP
- 9 CONCRETE DRIVEWAY, SEE LANDSCAPE ARCHITECT PLANS

CIVIL SHEET INDEX

- C1.0 SITE PLAN
- C2.0 GRADING PLAN
- C3.0 UTILITY & DRAINAGE PLAN
- C4.0 DRIVEWAY PROFILES
- C5.0 SEWER PROFILE
- C6.0 EROSION CONTROL PLAN
- C7.0 CONSTRUCTION BMP'S
- C8.0 DETAILS

SITE PLAN

SCALE: 1" = 20'



PRELIMINARY
NOT FOR
CONSTRUCTION

VALLEMAR STREET & JULIANA AVENUE
MOSS BEACH, CALIFORNIA

PREPARED AT THE REQUEST OF
MOSS BEACH ASSOCIATES
612 SPRING ST.
SANTA CRUZ, CA 95060

SITE PLAN

DRAWN BY: ALH, DAM

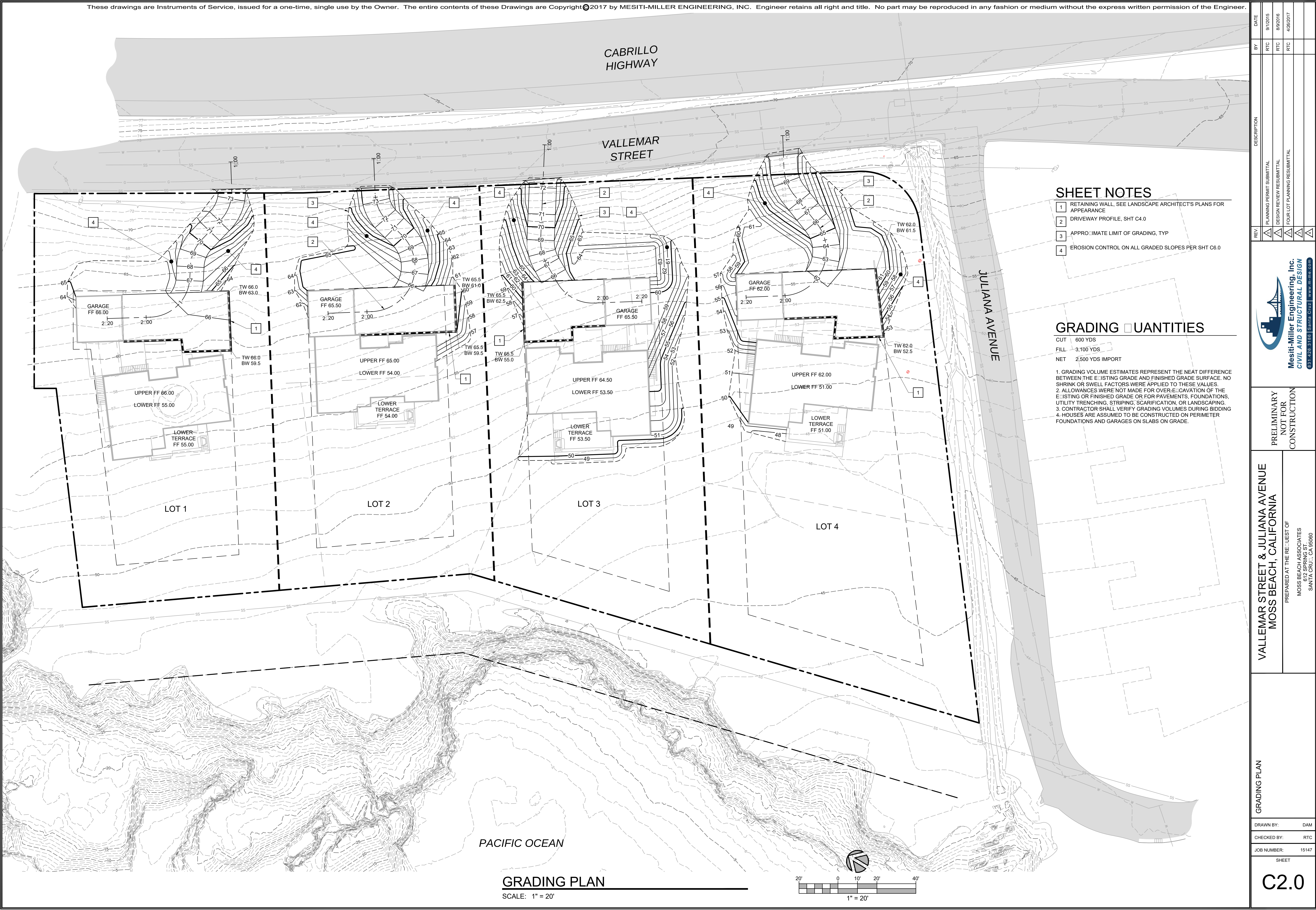
CHECKED BY: RTC

JOB NUMBER: 15147

SHEET

C1.0

REV	DESCRIPTION	BY	DATE
1	PLANNING PERMIT SUBMITTAL	RTC	9/1/2015
2	DESIGN REVIEW RESUBMITTAL	RTC	8/9/2016
3	FOUR LOT PLANNING RESUBMITTAL	RTC	4/26/2017



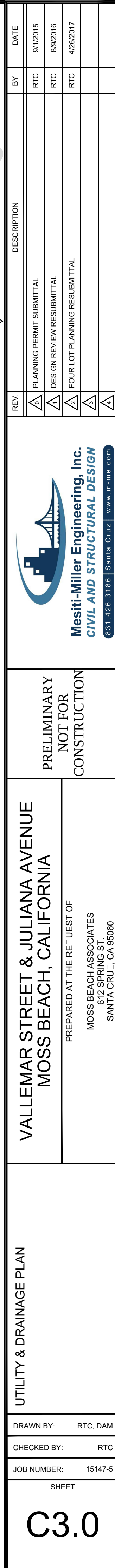
- SHEET NOTES**
- 1 RETAINING WALL, SEE LANDSCAPE ARCHITECT'S PLANS FOR APPEARANCE
 - 2 DRIVEWAY PROFILE, SHT C4.0
 - 3 APPROXIMATE LIMIT OF GRADING, TYP
 - 4 EROSION CONTROL ON ALL GRADED SLOPES PER SHT C6.0

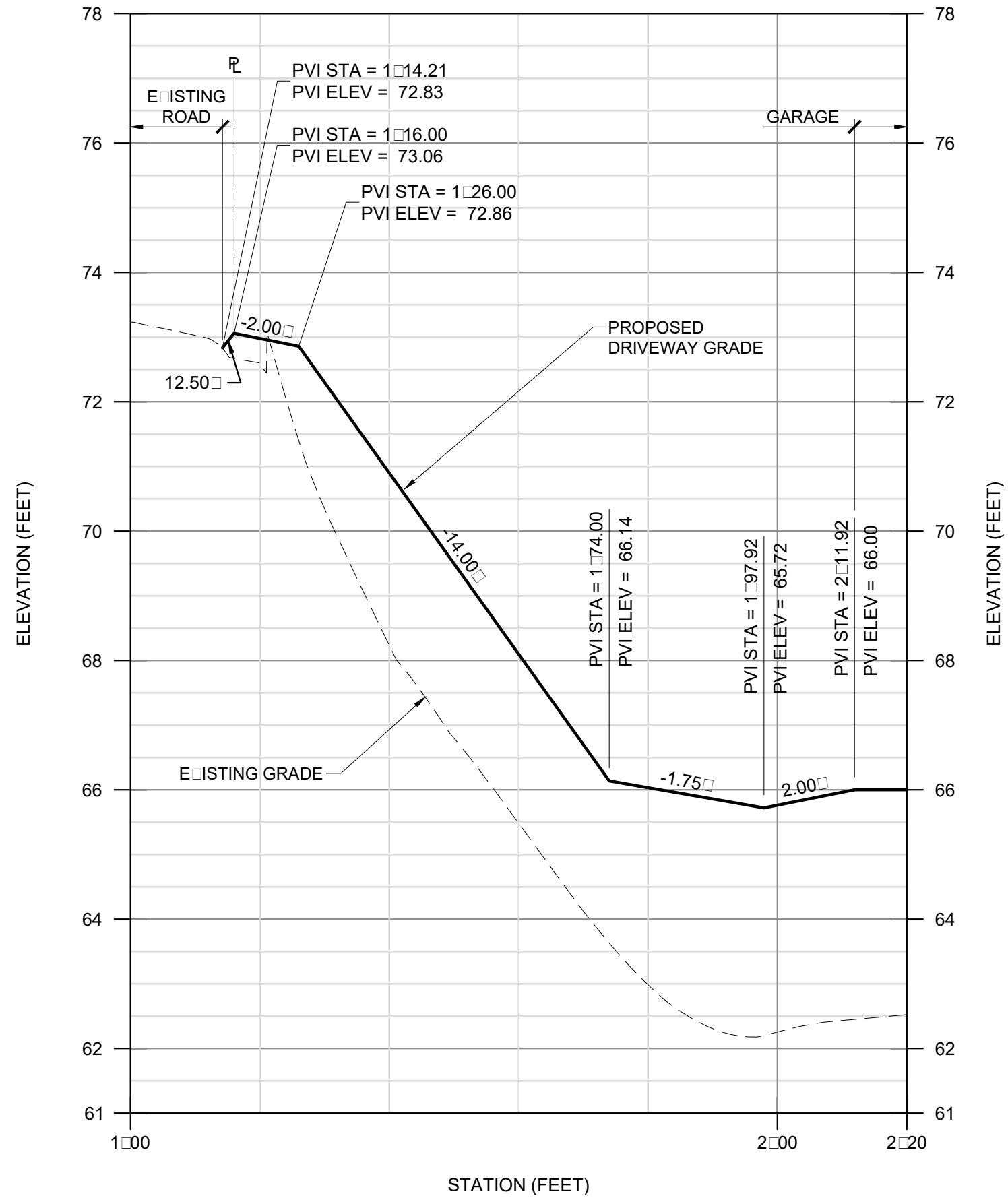
GRADING QUANTITIES

CUT 600 YDS
FILL 3,100 YDS
NET 2,500 YDS IMPORT

1. GRADING VOLUME ESTIMATES REPRESENT THE NET DIFFERENCE BETWEEN THE EXISTING GRADE AND FINISHED GRADE SURFACE. NO SHRINK OR SWELL FACTORS WERE APPLIED TO THESE VALUES.
2. ALLOWANCES WERE NOT MADE FOR OVER-EXCAVATION OF THE EXISTING OR FINISHED GRADE OR FOR PAVEMENTS, FOUNDATIONS, UTILITY TRENCHING, STRIPING, SCARIFICATION, OR LANDSCAPING.
3. CONTRACTOR SHALL VERIFY GRADING VOLUMES DURING BIDDING.
4. HOUSES ARE ASSUMED TO BE CONSTRUCTED ON PERIMETER FOUNDATIONS AND GARAGES ON SLABS ON GRADE.

DESCRIPTION		BY	DATE
PLANNING PERMIT SUBMITTAL	RTC	9/1/2015	
DESIGN REVIEW RESUBMITTAL	RTC	8/9/2016	
FOUR LOT PLANNING RESUBMITTAL	RTC	4/26/2017	
REV	Δ	Δ	Δ
Mesiti-Miller Engineering, Inc. CIVIL AND STRUCTURAL DESIGN 631.425.3182 STATE CDR WWW.MME.COM			
PRELIMINARY NOT FOR CONSTRUCTION		VALLEMAR STREET & JULIANA AVENUE MOSS BEACH, CALIFORNIA	
GRADING PLAN		PREPARED AT THE REQUEST OF MOSS BEACH ASSOCIATES 612 SPRING ST. SANTA CRUZ, CA 95060	
DRAWN BY: DAM		JOB NUMBER: 15147	
CHECKED BY: RTC		SHEET	
C2.0			

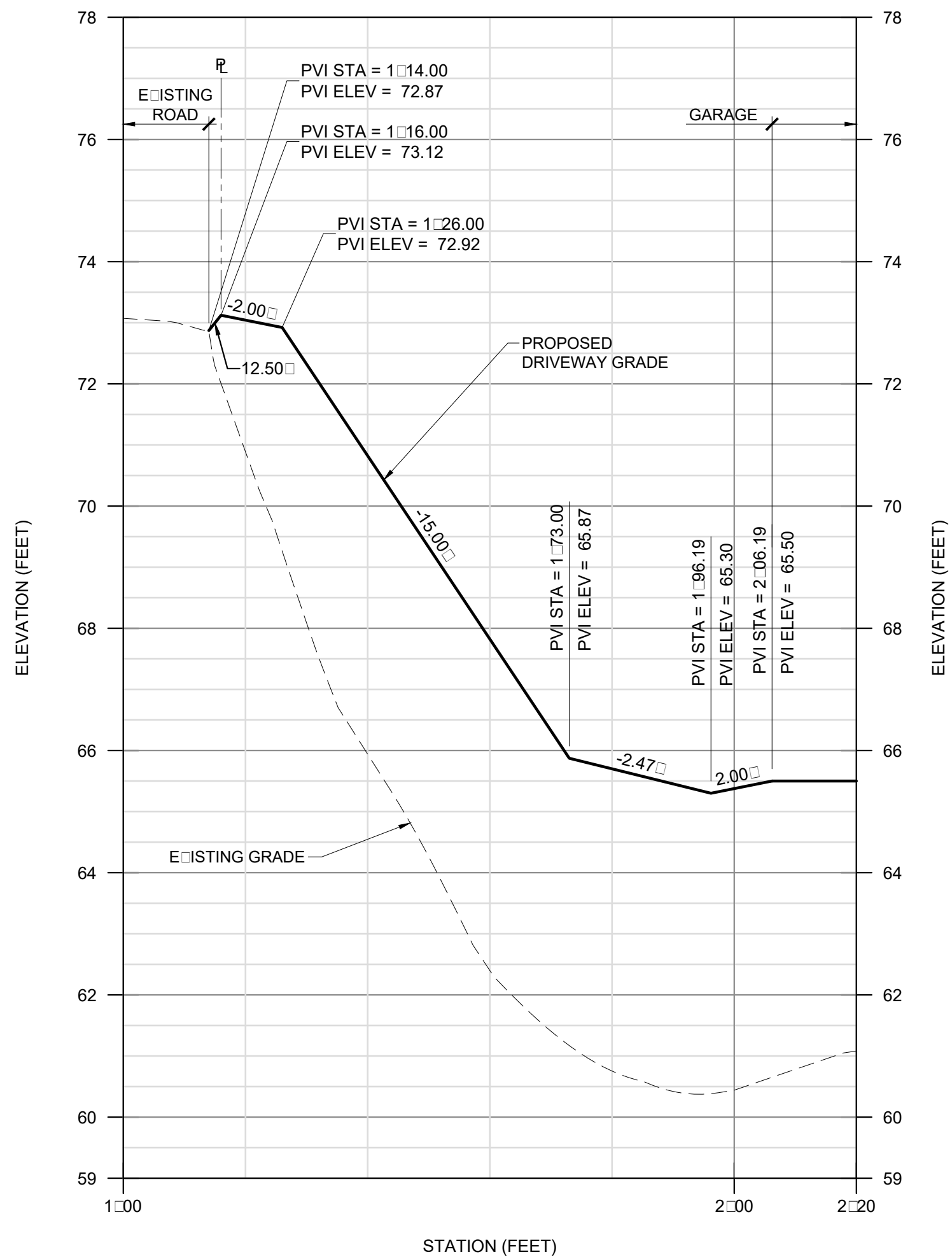




DRIVEWAY PROFILE

SCALE: H: 1" = 20' V: 1" = 2'

1

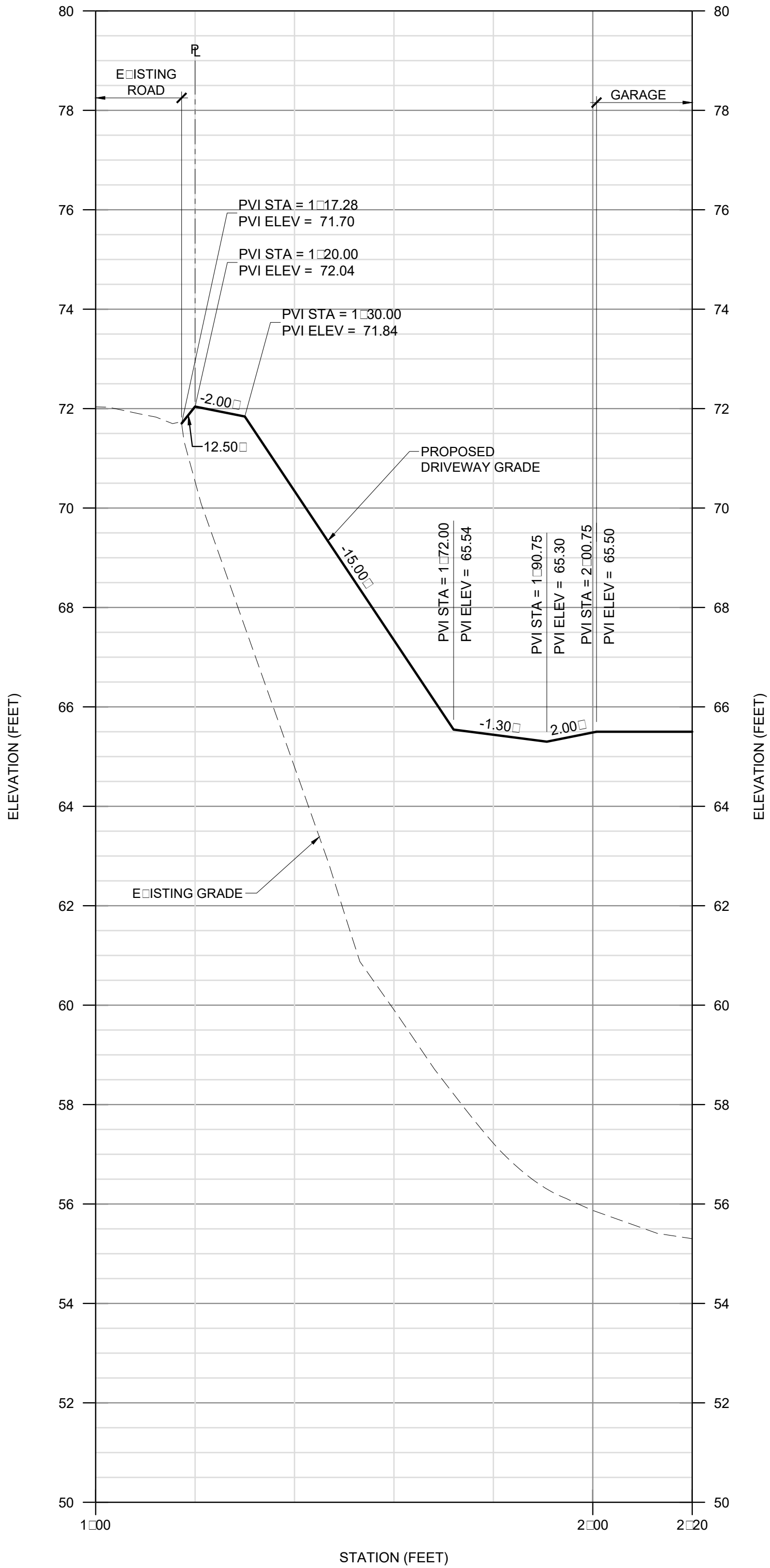


DRIVEWAY PROFILE

SCALE: H: 1" = 20' V: 1" = 2'

2

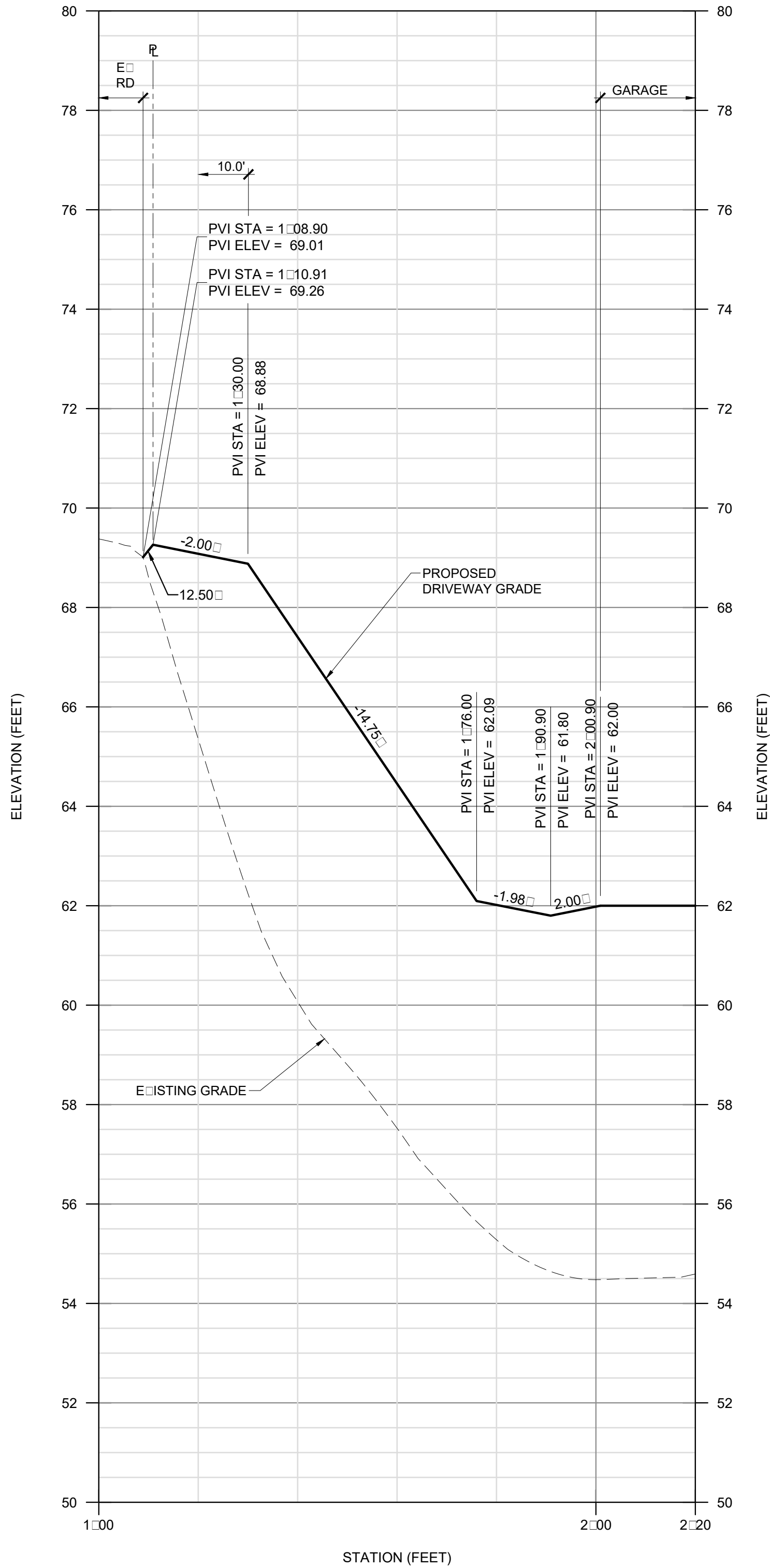
- NOTES:
1. VERTICAL CURVES NOT SHOWN ON PRELIMINARY PROFILES.



DRIVEWAY PROFILE

SCALE: H: 1" = 20' V: 1" = 2'

3



DRIVEWAY PROFILE

SCALE: H: 1" = 20' V: 1" = 2'

4



PRELIMINARY
NOT FOR
CONSTRUCTION

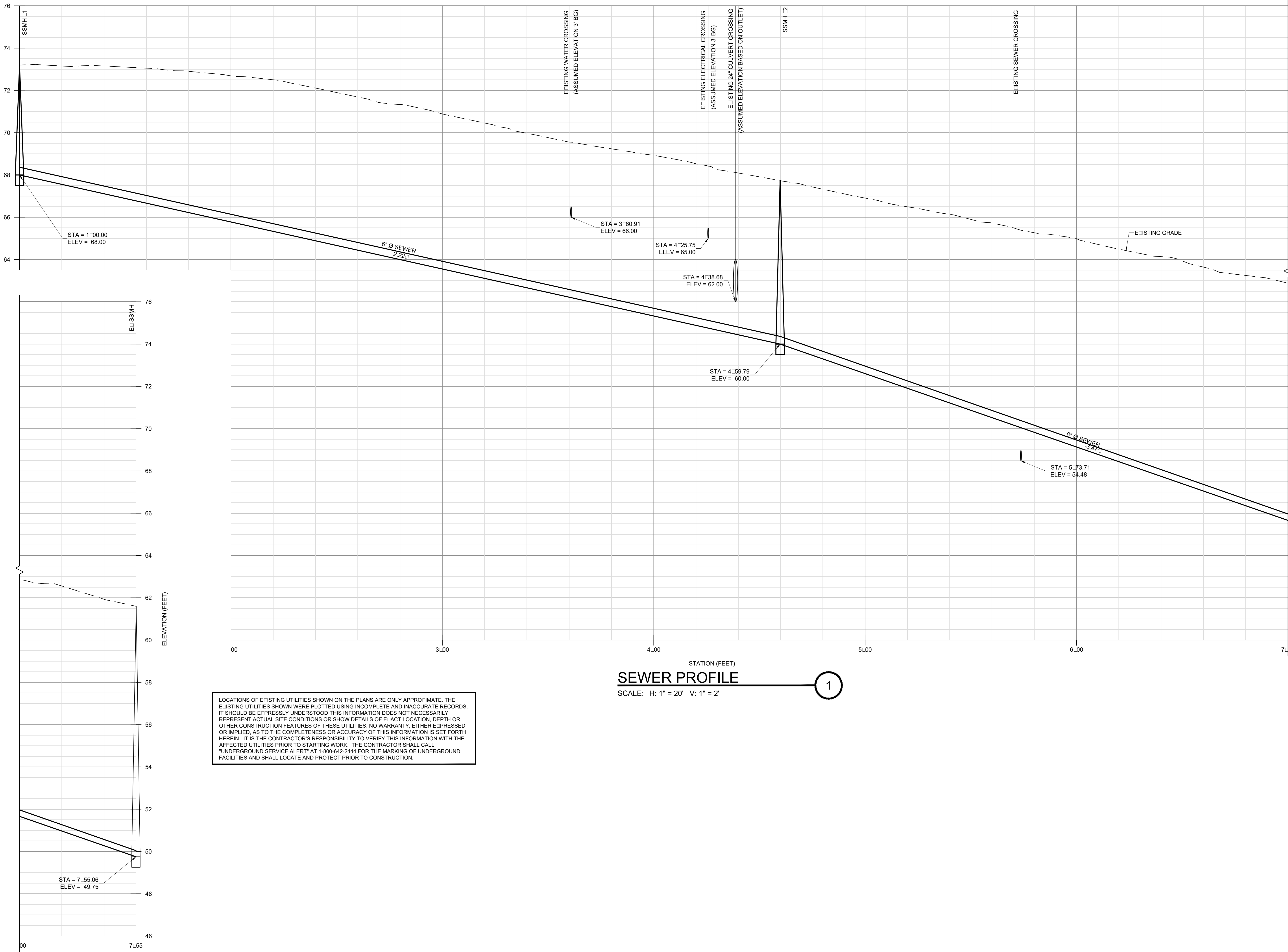
VALLEMAR STREET & JULIANA AVENUE
MOSS BEACH, CALIFORNIA

PREPARED AT THE REQUEST OF
MOSS BEACH ASSOCIATES
612 SPRING ST.
SANTA CRUZ, CA 95060

DRIVEWAY PROFILES

DRAWN BY: DAM
CHECKED BY: RTC
JOB NUMBER: 15147
SHEET

C4.0



PRELIMINARY
NOT FOR
CONSTRUCTION

VALLEMAR STREET & JULIANA AVENUE
MOSS BEACH, CALIFORNIA

PREPARED AT THE REQUEST OF
MOSS BEACH ASSOCIATES
612 SPRING ST.
SANTA CRUZ, CA 95060

SEWER PROFILE

DRAWN BY: RTC

CHECKED BY: RTC

JOB NUMBER: 15147

SHEET

C5.0



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GENERAL

- CONTROL AND PREVENT THE DISCHARGE OF ALL POTENTIAL POLLUTANTS, INCLUDING PAVEMENT CUTTING WASTES, PAINTS, CONCRETE, PETROLEUM PRODUCTS, CHEMICALS, WASHWATER OR SEDIMENTS, RINSE WATER FROM ARCHITECTURAL COPPER, AND NON-STORMWATER DISCHARGES TO STORM DRAINS AND WATERCOURSES.
- STORE, HANDLE, AND DISPOSE OF CONSTRUCTION MATERIALS/WASTES PROPERLY TO PREVENT CONTACT WITH STORMWATER.
- DO NOT CLEAN, FUEL, OR MAINTAIN VEHICLES ON-SITE, EXCEPT IN A DESIGNATED AREA WHERE WASHWATER IS CONTAINED AND TREATED.
- TRAIN AND PROVIDE INSTRUCTION TO ALL EMPLOYEES/SUBCONTRACTORS RE: CONSTRUCTION BMPs.
- PROTECT ALL STORM DRAIN INLETS IN VICINITY OF SITE USING SEDIMENT CONTROLS SUCH AS BERMS, FIBER ROLLS, OR FILTERS.
- LIMIT CONSTRUCTION ACCESS ROUTES AND STABILIZE DESIGNATED ACCESS POINTS.
- PERFORM CLEARING AND EARTH MOVING ACTIVITIES ONLY DURING DRY WEATHER.
- USE SEDIMENT CONTROLS OR FILTRATION TO REMOVE SEDIMENT WHEN DEWATERING AND OBTAIN ALL NECESSARY PERMITS.
- TRAP SEDIMENT ON-SITE, USING BMPs SUCH AS SEDIMENT BASINS OR TRAPS, EARTHEN DIKES OR BERMS, SILT FENCES, CHECK DAMS, SOIL BLANKETS OR MATS, COVERS FOR SOIL STOCK PILES, ETC.
- DIVERT ON-SITE RUNOFF AROUND EXPOSED AREAS; DIVERT OFF-SITE RUNOFF AROUND THE SITE (E.G., SWALES AND DIKES).

- PROTECT ADJACENT PROPERTIES AND UNDISTURBED AREAS FROM CONSTRUCTION IMPACTS USING VEGETATIVE BUFFER STRIPS, SEDIMENT BARRIERS OR FILTERS, DIKES, MULCHING, OR OTHER MEASURES AS APPROPRIATE.
- NO LAND CLEARING OPERATIONS OR GRADING OPERATIONS MAY TAKE PLACE BETWEEN OCTOBER 15 AND APRIL 15 UNLESS A SEPARATE WINTER EROSION CONTROL PLAN IS APPROVED PRIOR TO BEGINNING SUCH CONSTRUCTION.
- EROSION IS TO BE CONTROLLED AT ALL TIMES. THE SPECIFIC MEASURES SHOWN ARE TO BE IMPLEMENTED AT ALL TIMES. ADDITIONAL MEASURES WILL BE REQUIRED FOR CONSTRUCTION BETWEEN OCTOBER 15 AND APRIL 15.
- EROSION CONTROL MEASURES SHALL BE MONITORED, MAINTAINED, AND REPLACED AS NEEDED TO PREVENT ESCAPE OF SEDIMENT FROM THE SITE. NO TURBID RUNOFF SHALL BE ALLOWED TO LEAVE THE CONSTRUCTION SITE.

RESPONSIBILITY

- IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO REGULARLY INSPECT THE EROSION AND SEDIMENT CONTROL MEASURES AND SUBMIT A WEEKLY REPORT TO THE OWNER THAT THEY ARE FUNCTIONING AS DESIGNED AND THAT PROPER MAINTENANCE IS BEING PERFORMED. DEFICIENCIES SHALL BE IMMEDIATELY CORRECTED BY THE CONTRACTOR.
- IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ADDITIONAL MEASURES ARE NECESSARY TO CONTROL SITE EROSION AND PREVENT SEDIMENT TRANSPORT OFF-SITE ARE IMPLEMENTED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND DISPOSAL OF ALL SEDIMENTATION ON-SITE OR OFF-SITE THAT IS

GENERATED BY GRADING AND RELATED ACTIVITIES OF THE PROJECT.

PROTECTION OF DISTURBED AREAS:

- EROSION CONTROL MEASURES SHALL BE IMPLEMENTED AS SOON AS PRACTICAL SO THAT SUFFICIENT GROWTH WILL BE ESTABLISHED PRIOR TO INCLEMENT WEATHER CONDITIONS AND CONTINUALLY MAINTAINED TO MINIMIZE SURFACE EROSION.
- ALL DISTURBED AREAS SHALL BE HYDROSEEDING USING A NATIVE SEED MIX AND MULCHED SO THAT THE DISTURBED AREAS ARE PROTECTED BY MATURE GRASS PRIOR TO OCTOBER 15. IN THE EVENT THAT IT IS NOT POSSIBLE TO ESTABLISH MATURE GRASS BY OCTOBER 15TH, ALL DISTURBED AREAS SHALL BE HYDROSEEDING, MULCHED, AND PROTECTED BY EROSION CONTROL BLANKETS INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. EROSION CONTROL BLANKETS SHALL BE REED & GRAHAM WOVEN JUTE MESH 0.9 #YD² OR EQUIVALENT.
- BETWEEN OCTOBER 15 AND APRIL 15, EXPOSED SOIL SHALL BE PROTECTED FROM EROSION AT ALL TIMES. DURING CONSTRUCTION ALL DISTURBED SLOPES NOT ACTIVELY USED FOR CONSTRUCTION WILL BE SEED, MULCHED, AND BLANKETED. HAY BALES, FILTER BERMS, SILT FENCE(S) SHALL BE EMPLOYED TO TRAP SEDIMENT BEFORE IT LEAVES THE SITE OF ANY CONSTRUCTION.
- BETWEEN OCTOBER 15 AND APRIL 15, A STRAW BALE STOCKPILE SHALL REMAIN ON THE JOB SITE DURING THE COURSE OF CONSTRUCTION. CONTRACTOR SHALL USE STRAW BALES FOR CHECK DAMS AND FOR EROSION CONTROL PROTECTION DURING THE RAINY SEASON AS NECESSARY.
- BETWEEN OCTOBER 15 AND APRIL 15, EROSION CONTROL MEASURES SHALL BE IN PLACE AT THE END OF EACH DAYS WORK.

- BETWEEN OCTOBER 15 AND APRIL 15, VEGETATION REMOVAL SHALL NOT PRECEDE SUBSEQUENT GRADING OR CONSTRUCTION ACTIVITIES BY MORE THAN 15 DAYS. DURING THIS PERIOD, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE IN PLACE.
- BEFORE COMPLETION OF THE PROJECT, ANY EXPOSED SOIL ON DISTURBED SLOPES SHALL BE PERMANENTLY PROTECTED FROM EROSION.
- CONTRACTOR SHALL IDENTIFY AND MARK ALL EXISTING VEGETATION TO BE PROTECTED WITHIN THE DISTURBED AREA.

RUNOFF:

- NO TURBID RUNOFF SHALL BE ALLOWED TO LEAVE THE SITE.
- RUNOFF MUST BE PREVENTED FROM FLOWING OVER UNPROTECTED SLOPES.
- KEEP RUNOFF AWAY FROM DISTURBED AREAS DURING GRADING AND RELATED ACTIVITIES.
- SILT BARRIERS SHALL BE CONSTRUCTED ALONG THE BOTTOM OF ALL GRADED SLOPES.
- SILT DEPOSITS SHALL BE REMOVED AS NECESSARY TO PREVENT MORE THAN 12 INCHES OF ACCUMULATION.
- EQUIPMENT FUELING, MAINTENANCE, AND CLEANING SHALL OCCUR IN A CONTROLLED LOCATION. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY.

SPOILS:

- SPOILS MUST BE REMOVED PROMPTLY AND STOCKPILING OF FILL MATERIALS MUST BE AVOIDED WHEN RAIN IS FORECAST. IF RAIN THREATENS, STOCKPILED SOILS AND OTHER MATERIALS SHALL BE COVERED WITH A TARP OR OTHER WATERPROOF MATERIAL.
- EXCAVATED MATERIAL SHALL BE REMOVED TO AN APPROVED DISPOSAL SITE OR DISPOSED OF ON-SITE IN A MANNER THAT WILL NOT CAUSE EROSION.

SEEDING PROCEDURE:

- TEMPORARY SEED MIX SHALL CONSIST OF NATIVE SEEDS AND SHALL BE APPLIED AT RATE OF 140 POUNDS PER ACRE. SEED SHALL BE SUBMITTED TO LANDSCAPE ARCHITECT FOR REVIEW & APPROVAL.
- BEFORE SEEDING, REMOVE WOOD CHIPS, ROCKS, AND DEBRIS FROM THE DISTURBED AREA. RAKE OUT SCARP TO PROVIDE A SMOOTH TRANSITION FOR EROSION CONTROL BLANKETS.
- SEEDING - APPLY SEED AND FERTILIZER BY HYDROSEEDING.
- MULCHING - AFTER HYDROSEEDING, APPLY 2" OF STRAW MULCH.
- INSTALL EROSION CONTROL BLANKETS ON EXPOSED SLOPES.
- INSTALL STRAW ROLLS.
- IRRIGATION - SHALL BE USED SO THAT EFFECTIVE PLANT GROWTH IS ESTABLISHED AS SOON AS POSSIBLE. THE SOIL SHOULD BE KEPT CONTINUALLY MOIST UNTIL THE SEED GERMINATES (2-3 WEEKS) AND THE GRASS IS THREE INCHES (3") HIGH. THEN CONTINUE TO WATER ABOUT ONCE A WEEK OR AS REQUIRED UNTIL THE RAINY SEASON BEGINS. IRRIGATION SHALL BE CLOSELY MONITORED SO THAT IT WILL NOT CAUSE AN EROSION PROBLEM.
- MAINTENANCE - THE CONTRACTOR SHALL COMMENCE WATERING THE COVERED AREAS WITHIN ONE WEEK AFTER SEEDING. THE WATERING WILL CONTINUE UNTIL THE GROUND COVER IS FULLY DEVELOPED AND AS REQUIRED. THE OWNER SHALL MONITOR, MAINTAIN, AND REPAIR ALL EROSION CONTROL MEASURES AS REQUIRED.
- AUTOMATIC IRRIGATION IS NOT APPROVED.

EROSION CONTROL PLAN

SCALE: 1" = 20'

SHEET NOTES

- PROTECT ALL CUT AND FILL SLOPES WITH EROSION CONTROL FABRIC AND OR MULCH
- PROTECT ALL STORM DRAIN SYSTEMS AND BIOSWALES FROM SEDIMENT DURING CONSTRUCTION WITH FABRIC INLET COVERS AND OR GRAVEL BAG BERMS, TYP
- PROTECT DITCH FROM SEDIMENT DURING CONSTRUCTION WITH SILT FENCES AND/OR FIBER ROLLS
- PREVENT CONCENTRATED RUNOFF FROM FLOWING OVER SLOPE
- TEMPORARY SILT FENCE
- TREE PROTECTION, TEMPORARY FENCE (TYPE ESA) PER CALTRANS STANDARD PLAN T65, REMOVE FENCE FOLLOWING APPROVAL OF FINAL STABILIZATION

REVISION		DESCRIPTION	BY	DATE
1	PLANNING PERMIT SUBMITTAL	RTG	RTG	9/1/2016
2	DESIGN REVIEW RESUBMITTAL	RTG	RTG	8/9/2016
3	FOUR LOT PLANNING RESUBMITTAL	RTG	RTG	4/26/2017
4	FOUR LOT PLANNING RESUBMITTAL	RTG	RTG	4/26/2017
5	FOUR LOT PLANNING RESUBMITTAL	RTG	RTG	4/26/2017
6	FOUR LOT PLANNING RESUBMITTAL	RTG	RTG	4/26/2017

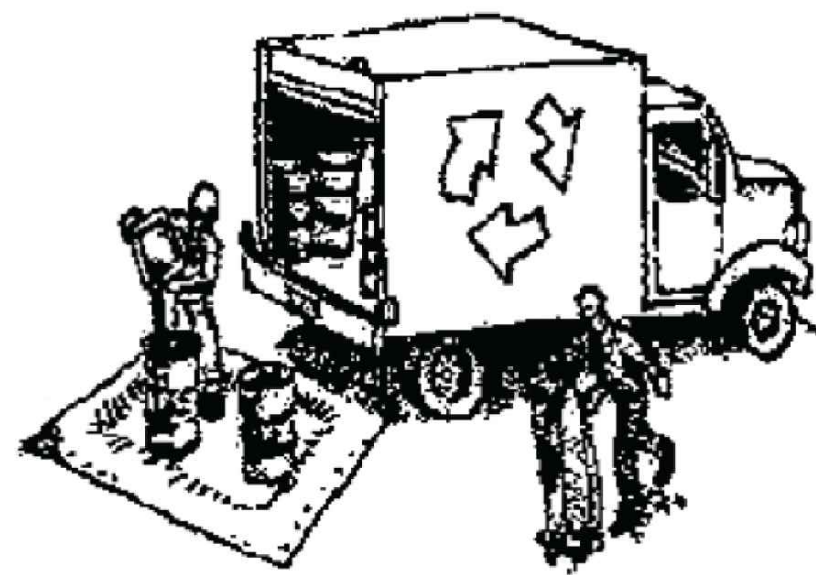
PRELIMINARY NOT FOR CONSTRUCTION		VALLEMAR STREET & JULIANA AVENUE MOSS BEACH, CALIFORNIA	
PREPARED AT THE REQUEST OF: MOSS BEACH ASSOCIATES 612 SPRING ST. SANTA CRUZ, CA 95060		DRAWN BY: DAM	
		CHECKED BY: RTG	
		JOB NUMBER: 15147	
		SHEET	
		C6.0	



Construction Best Management Practices (BMPs)

Construction projects are required to implement the stormwater best management practices (BMP) on this page, as they apply to your project, all year long.

Materials & Waste Management



Non-Hazardous Materials

- ❑ Berm and cover stockpiles of sand, dirt or other construction material with tarps when rain is forecast or if not actively being used within 14 days.
- ❑ Use (but don't overuse) reclaimed water for dust control.

Hazardous Materials

- ❑ Label all hazardous materials and hazardous wastes (such as pesticides, paints, thinners, solvents, fuel, oil, and antifreeze) in accordance with city, county, state and federal regulations.
- ❑ Store hazardous materials and wastes in water tight containers, store in appropriate secondary containment, and cover them at the end of every work day or during wet weather or when rain is forecast.
- ❑ Follow manufacturer's application instructions for hazardous materials and be careful not to use more than necessary. Do not apply chemicals outdoors when rain is forecast within 24 hours.
- ❑ Arrange for appropriate disposal of all hazardous wastes.

Waste Management

- ❑ Cover waste disposal containers securely with tarps at the end of every work day and during wet weather.
- ❑ Check waste disposal containers frequently for leaks and to make sure they are not overfilled. Never hose down a dumpster on the construction site.
- ❑ Clean or replace portable toilets, and inspect them frequently for leaks and spills.
- ❑ Dispose of all wastes and debris properly. Recycle materials and wastes that can be recycled (such as asphalt, concrete, aggregate base materials, wood, gyp board, pipe, etc.)
- ❑ Dispose of liquid residues from paints, thinners, solvents, glues, and cleaning fluids as hazardous waste.

Construction Entrances and Perimeter

- ❑ Establish and maintain effective perimeter controls and stabilize all construction entrances and exits to sufficiently control erosion and sediment discharges from site and tracking off site.
- ❑ Sweep or vacuum any street tracking immediately and secure sediment source to prevent further tracking. Never hose down streets to clean up tracking.

Equipment Management & Spill Control



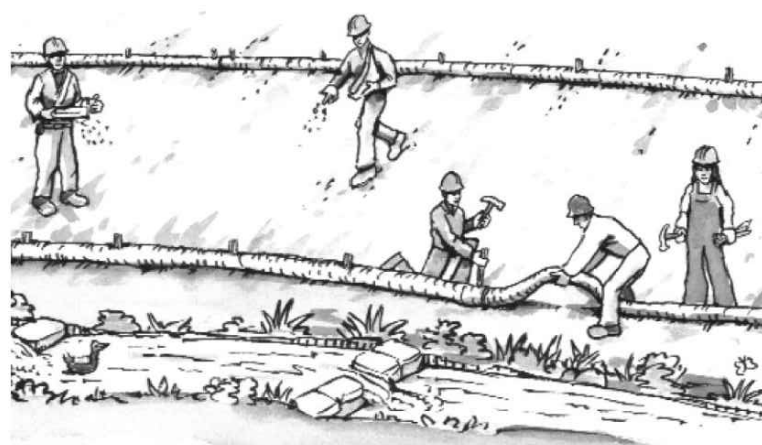
Maintenance and Parking

- ❑ Designate an area, fitted with appropriate BMPs, for vehicle and equipment parking and storage.
- ❑ Perform major maintenance, repair jobs, and vehicle and equipment washing off site.
- ❑ If refueling or vehicle maintenance must be done onsite, work in a bermed area away from storm drains and over a drip pan or drop cloths big enough to collect fluids. Recycle or dispose of fluids as hazardous waste.
- ❑ If vehicle or equipment cleaning must be done onsite, clean with water only in a bermed area that will not allow rinse water to run into gutters, streets, storm drains, or surface waters.
- ❑ Do not clean vehicle or equipment onsite using soaps, solvents, degreasers, or steam cleaning equipment.

Spill Prevention and Control

- ❑ Keep spill cleanup materials (e.g., rags, absorbents and cat litter) available at the construction site at all times.
- ❑ Inspect vehicles and equipment frequently for and repair leaks promptly. Use drip pans to catch leaks until repairs are made.
- ❑ Clean up spills or leaks immediately and dispose of cleanup materials properly.
- ❑ Do not hose down surfaces where fluids have spilled. Use dry cleanup methods (absorbent materials, cat litter, and/or rags).
- ❑ Sweep up spilled dry materials immediately. Do not try to wash them away with water, or bury them.
- ❑ Clean up spills on dirt areas by digging up and properly disposing of contaminated soil.
- ❑ Report significant spills immediately. You are required by law to report all significant releases of hazardous materials, including oil. To report a spill: 1) Dial 911 or your local emergency response number, 2) Call the Governor's Office of Emergency Services Warning Center, (800) 852-7550 (24 hours).

Earthmoving



- ❑ Schedule grading and excavation work during dry weather.
- ❑ Stabilize all denuded areas, install and maintain temporary erosion controls (such as erosion control fabric or bonded fiber matrix) until vegetation is established.
- ❑ Remove existing vegetation only when absolutely necessary, and seed or plant vegetation for erosion control on slopes or where construction is not immediately planned.
- ❑ Prevent sediment from migrating offsite and protect storm drain inlets, gutters, ditches, and drainage courses by installing and maintaining appropriate BMPs, such as fiber rolls, silt fences, sediment basins, gravel bags, berms, etc.
- ❑ Keep excavated soil on site and transfer it to dump trucks on site, not in the streets.

Contaminated Soils

- ❑ If any of the following conditions are observed, test for contamination and contact the Regional Water Quality Control Board:
 - Unusual soil conditions, discoloration, or odor.
 - Abandoned underground tanks.
 - Abandoned wells
 - Buried barrels, debris, or trash.

Paving/Asphalt Work



- ❑ Avoid paving and seal coating in wet weather or when rain is forecast, to prevent materials that have not cured from contacting stormwater runoff.
- ❑ Cover storm drain inlets and manholes when applying seal coat, tack coat, slurry seal, fog seal, etc.
- ❑ Collect and recycle or appropriately dispose of excess abrasive gravel or sand. Do NOT sweep or wash it into gutters.
- ❑ Do not use water to wash down fresh asphalt concrete pavement.

Sawcutting & Asphalt/Concrete Removal

- ❑ Protect nearby storm drain inlets when saw cutting. Use filter fabric, catch basin inlet filters, or gravel bags to keep slurry out of the storm drain system.
- ❑ Shovel, absorb, or vacuum saw-cut slurry and dispose of all waste as soon as you are finished in one location or at the end of each work day (whichever is sooner!).
- ❑ If sawcut slurry enters a catch basin, clean it up immediately.

Concrete, Grout & Mortar Application



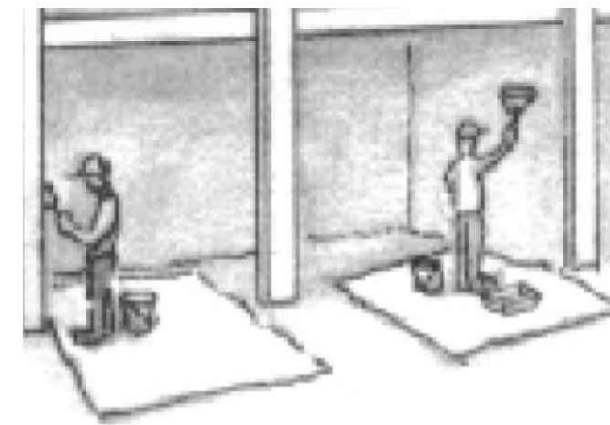
- ❑ Store concrete, grout, and mortar away from storm drains or waterways, and on pallets under cover to protect them from rain, runoff, and wind.
- ❑ Wash out concrete equipment/trucks offsite or in a designated washout area, where the water will flow into a temporary waste pit, and in a manner that will prevent leaching into the underlying soil or onto surrounding areas. Let concrete harden and dispose of as garbage.
- ❑ When washing exposed aggregate, prevent washwater from entering storm drains. Block any inlets and vacuum gutters, hose washwater onto dirt areas, or drain onto a bermed surface to be pumped and disposed of properly.

Landscaping



- ❑ Protect stockpiled landscaping materials from wind and rain by storing them under tarps all year-round.
- ❑ Stack bagged material on pallets and under cover.
- ❑ Discontinue application of any erodible landscape material within 2 days before a forecast rain event or during wet weather.

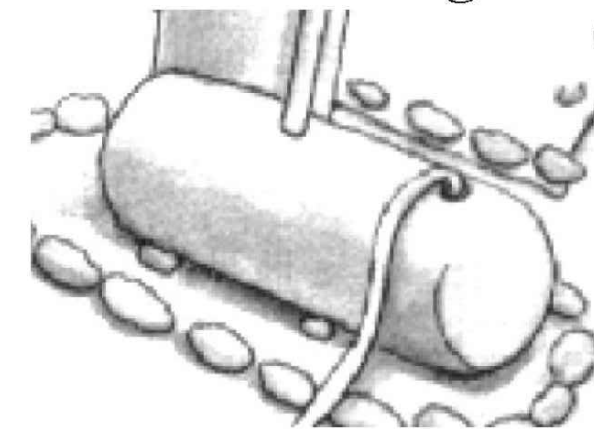
Painting & Paint Removal



Painting Cleanup and Removal

- ❑ Never clean brushes or rinse paint containers into a street, gutter, storm drain, or stream.
- ❑ For water-based paints, paint out brushes to the extent possible, and rinse into a drain that goes to the sanitary sewer. Never pour paint down a storm drain.
- ❑ For oil-based paints, paint out brushes to the extent possible and clean with thinner or solvent in a proper container. Filter and reuse thinners and solvents. Dispose of excess liquids as hazardous waste.
- ❑ Paint chips and dust from non-hazardous dry stripping and sand blasting may be swept up or collected in plastic drop cloths and disposed of as trash.
- ❑ Chemical paint stripping residue and chips and dust from marine paints or paints containing lead, mercury, or tributyltin must be disposed of as hazardous waste. Lead based paint removal requires a state-certified contractor.

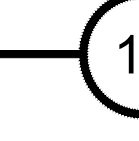
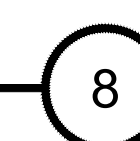
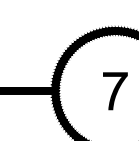
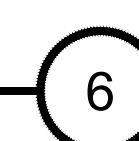
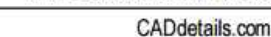
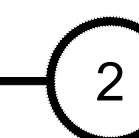
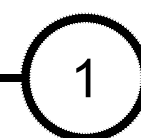
Dewatering



- ❑ Discharges of groundwater or captured runoff from dewatering operations must be properly managed and disposed. When possible send dewatering discharge to landscaped area or sanitary sewer. If discharging to the sanitary sewer call your local wastewater treatment plant.
- ❑ Divert run-on water from offsite away from all disturbed areas.
- ❑ When dewatering, notify and obtain approval from the local municipality before discharging water to a street gutter or storm drain. Filtration or diversion through a basin, tank, or sediment trap may be required.
- ❑ In areas of known or suspected contamination, call your local agency to determine whether the ground water must be tested. Pumped groundwater may need to be collected and hauled off-site for treatment and proper disposal.

Storm drain polluters may be liable for fines of up to \$10,000 per day!

CONSTRUCTION BMP'S	VALLEMAR STREET & JULIANA AVENUE MOSS BEACH, CALIFORNIA		PRELIMINARY NOT FOR CONSTRUCTION	 Mesiti-Miller Engineering, Inc. CIVIL AND STRUCTURAL DESIGN 631 428-3188 Santa Cruz www.m-me.com	REV	DESCRIPTION	BY	DATE
	PREPARED AT THE REQUEST OF MOSS BEACH ASSOCIATES 10000 WILSON BLVD SANTA CRUZ, CA 95060				1	PLANNING PERMIT SUBMITTAL	RTC	9/1/2015
			2		DESIGN REVIEW RESUBMITTAL	RTC	8/9/2016	
			3		FOUR LOT PLANNING RESUBMITTAL	RTC	4/26/2017	
			4					



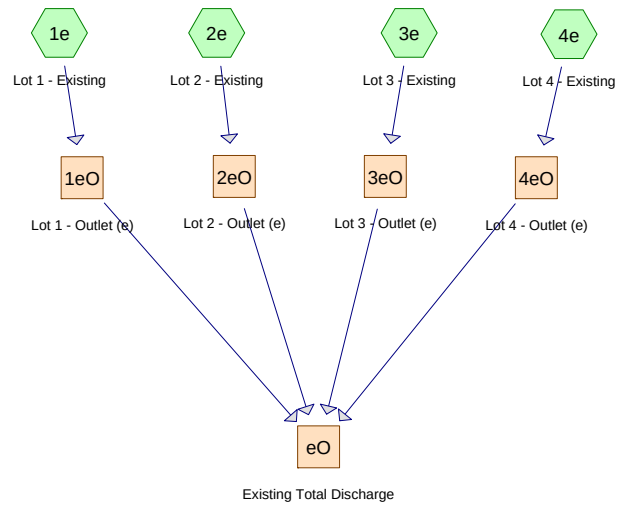
DETAILS	DRAWN BY: ALH, DAM	
	CHECKED BY: RTC	
	JOB NUMBER: 15147	
	SHEET	
	C8.0	



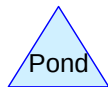
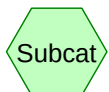
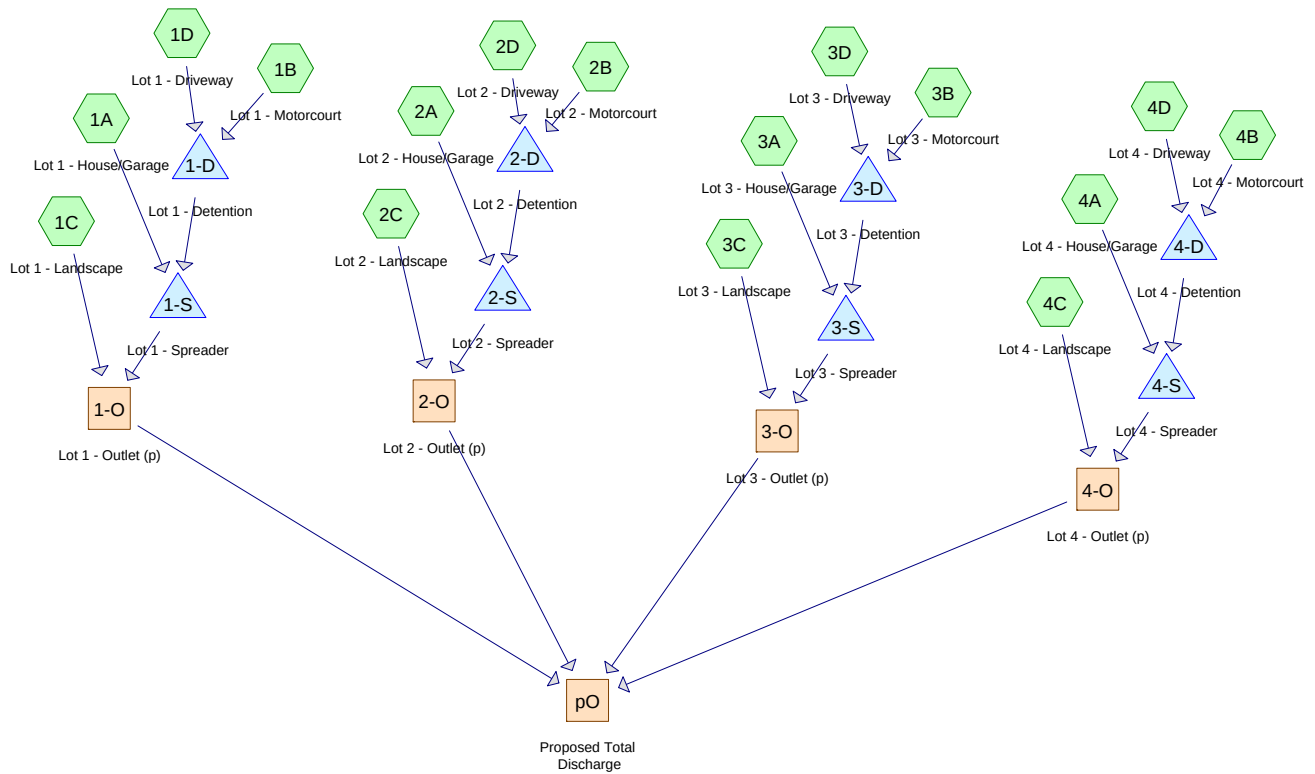
APPENDIX C

HydroCAD Model Output

EXISTING MODEL



PROPOSED MODEL



Routing Diagram for 15147-5_model

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Area Listing (all nodes)

Area (sq-ft)	CN	Description (subcatchment-numbers)
186,110	74	>75% Grass cover, Good; HSG C (1C, 1e, 2C, 2e, 3C, 3e, 4C, 4e)
17,070	98	Impervious; HSG C (1A, 1D, 2A, 2D, 3A, 3D, 4A, 4D)
5,100	89	Pervious Pavers; HSG C (1B, 2B, 3B, 4B)
208,280	76	TOTAL AREA

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Soil Listing (all nodes)

Area (sq-ft)	Soil Group	Subcatchment Numbers
0	HSG A	
0	HSG B	
208,280	HSG C	1A, 1B, 1C, 1D, 1e, 2A, 2B, 2C, 2D, 2e, 3A, 3B, 3C, 3D, 3e, 4A, 4B, 4C, 4D, 4e
0	HSG D	
0	Other	
208,280		TOTAL AREA

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Ground Covers (all nodes)

HSG-A (sq-ft)	HSG-B (sq-ft)	HSG-C (sq-ft)	HSG-D (sq-ft)	Other (sq-ft)	Total (sq-ft)	Ground Cover
0	0	186,110	0	0	186,110	>75% Grass cover, Good;
0	0	17,070	0	0	17,070	Impervious;
0	0	5,100	0	0	5,100	Pervious Pavers;
0	0	208,280	0	0	208,280	TOTAL AREA

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Time span=0.00-24.00 hrs, dt=0.01 hrs, 2401 points
 Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
 Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment1A: Lot 1 - House/Garage	Runoff Area=3,480 sf 100.00% Impervious Runoff Depth>3.87" Tc=10.0 min AMC Adjusted CN=99 Runoff=0.21 cfs 1,123 cf
Subcatchment1B: Lot 1 - Motorcourt	Runoff Area=1,420 sf 0.00% Impervious Runoff Depth>3.53" Tc=10.0 min AMC Adjusted CN=96 Runoff=0.08 cfs 418 cf
Subcatchment1C: Lot 1 - Landscape	Runoff Area=17,890 sf 0.00% Impervious Runoff Depth>2.72" Tc=10.0 min AMC Adjusted CN=88 Runoff=0.84 cfs 4,057 cf
Subcatchment1D: Lot 1 - Driveway	Runoff Area=820 sf 100.00% Impervious Runoff Depth>3.87" Tc=10.0 min AMC Adjusted CN=99 Runoff=0.05 cfs 265 cf
Subcatchment1e: Lot 1 - Existing	Runoff Area=23,610 sf 0.00% Impervious Runoff Depth>2.72" Tc=10.0 min AMC Adjusted CN=88 Runoff=1.11 cfs 5,355 cf
Subcatchment2A: Lot 2 - House/Garage	Runoff Area=3,140 sf 100.00% Impervious Runoff Depth>3.87" Tc=10.0 min AMC Adjusted CN=99 Runoff=0.19 cfs 1,014 cf
Subcatchment2B: Lot 2 - Motorcourt	Runoff Area=1,190 sf 0.00% Impervious Runoff Depth>3.53" Tc=10.0 min AMC Adjusted CN=96 Runoff=0.07 cfs 350 cf
Subcatchment2C: Lot 2 - Landscape	Runoff Area=17,330 sf 0.00% Impervious Runoff Depth>2.72" Tc=10.0 min AMC Adjusted CN=88 Runoff=0.82 cfs 3,930 cf
Subcatchment2D: Lot 2 - Driveway	Runoff Area=780 sf 100.00% Impervious Runoff Depth>3.87" Tc=10.0 min AMC Adjusted CN=99 Runoff=0.05 cfs 252 cf
Subcatchment2e: Lot 2 - Existing	Runoff Area=22,440 sf 0.00% Impervious Runoff Depth>2.72" Tc=10.0 min AMC Adjusted CN=88 Runoff=1.06 cfs 5,089 cf
Subcatchment3A: Lot 3 - House/Garage	Runoff Area=3,590 sf 100.00% Impervious Runoff Depth>3.87" Tc=10.0 min AMC Adjusted CN=99 Runoff=0.22 cfs 1,159 cf
Subcatchment3B: Lot 3 - Motorcourt	Runoff Area=1,110 sf 0.00% Impervious Runoff Depth>3.53" Tc=10.0 min AMC Adjusted CN=96 Runoff=0.07 cfs 327 cf
Subcatchment3C: Lot 3 - Landscape	Runoff Area=19,180 sf 0.00% Impervious Runoff Depth>2.72" Tc=10.0 min AMC Adjusted CN=88 Runoff=0.90 cfs 4,350 cf
Subcatchment3D: Lot 3 - Driveway	Runoff Area=740 sf 100.00% Impervious Runoff Depth>3.87" Tc=10.0 min AMC Adjusted CN=99 Runoff=0.05 cfs 239 cf
Subcatchment3e: Lot 3 - Existing	Runoff Area=24,620 sf 0.00% Impervious Runoff Depth>2.72" Tc=10.0 min AMC Adjusted CN=88 Runoff=1.16 cfs 5,584 cf
Subcatchment4A: Lot 4 - House/Garage	Runoff Area=3,620 sf 100.00% Impervious Runoff Depth>3.87" Tc=10.0 min AMC Adjusted CN=99 Runoff=0.22 cfs 1,168 cf

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Subcatchment4B: Lot 4 - Motorcourt	Runoff Area=1,380 sf 0.00% Impervious Runoff Depth>3.53" Tc=10.0 min AMC Adjusted CN=96 Runoff=0.08 cfs 406 cf
Subcatchment4C: Lot 4 - Landscape	Runoff Area=27,570 sf 0.00% Impervious Runoff Depth>2.72" Tc=10.0 min AMC Adjusted CN=88 Runoff=1.30 cfs 6,253 cf
Subcatchment4D: Lot 4 - Driveway	Runoff Area=900 sf 100.00% Impervious Runoff Depth>3.87" Tc=10.0 min AMC Adjusted CN=99 Runoff=0.06 cfs 291 cf
Subcatchment4e: Lot 4 - Existing	Runoff Area=33,470 sf 0.00% Impervious Runoff Depth>2.72" Tc=10.0 min AMC Adjusted CN=88 Runoff=1.58 cfs 7,591 cf
Reach 1-O: Lot 1 - Outlet (p)	Avg. Flow Depth=0.03' Max Vel=0.32 fps Inflow=0.94 cfs 4,128 cf n=0.100 L=62.5' S=0.0560 ' Capacity=7.64 cfs Outflow=0.86 cfs 4,110 cf
Reach 1eO: Lot 1 - Outlet (e)	Avg. Flow Depth=0.03' Max Vel=0.36 fps Inflow=1.11 cfs 5,355 cf n=0.100 L=63.0' S=0.0635 ' Capacity=8.14 cfs Outflow=1.08 cfs 5,334 cf
Reach 2-O: Lot 2 - Outlet (p)	Avg. Flow Depth=0.03' Max Vel=0.31 fps Inflow=1.07 cfs 4,083 cf n=0.100 L=63.0' S=0.0556 ' Capacity=8.37 cfs Outflow=0.92 cfs 4,064 cf
Reach 2eO: Lot 2 - Outlet (e)	Avg. Flow Depth=0.03' Max Vel=0.36 fps Inflow=1.06 cfs 5,089 cf n=0.100 L=63.0' S=0.0794 ' Capacity=10.00 cfs Outflow=1.02 cfs 5,070 cf
Reach 3-O: Lot 3 - Outlet (p)	Avg. Flow Depth=0.04' Max Vel=0.24 fps Inflow=1.20 cfs 4,957 cf n=0.100 L=75.0' S=0.0200 ' Capacity=5.25 cfs Outflow=1.10 cfs 4,924 cf
Reach 3eO: Lot 3 - Outlet (e)	Avg. Flow Depth=0.03' Max Vel=0.28 fps Inflow=1.16 cfs 5,584 cf n=0.100 L=75.0' S=0.0333 ' Capacity=6.77 cfs Outflow=1.08 cfs 5,551 cf
Reach 4-O: Lot 4 - Outlet (p)	Avg. Flow Depth=0.04' Max Vel=0.22 fps Inflow=1.63 cfs 7,848 cf n=0.100 L=109.0' S=0.0138 ' Capacity=5.40 cfs Outflow=1.37 cfs 7,765 cf
Reach 4eO: Lot 4 - Outlet (e)	Avg. Flow Depth=0.04' Max Vel=0.27 fps Inflow=1.58 cfs 7,591 cf n=0.100 L=109.0' S=0.0275 ' Capacity=7.64 cfs Outflow=1.38 cfs 7,524 cf
Reach eO: Existing Total Discharge	Inflow=4.54 cfs 23,479 cf Outflow=4.54 cfs 23,479 cf
Reach pO: Proposed Total Discharge	Inflow=4.24 cfs 20,863 cf Outflow=4.24 cfs 20,863 cf
Pond 1-D: Lot 1 - Detention	Peak Elev=62.83' Storage=21 cf Inflow=0.13 cfs 683 cf Discarded=0.01 cfs 292 cf Primary=0.11 cfs 390 cf Outflow=0.12 cfs 682 cf
Pond 1-S: Lot 1 - Spreader	Peak Elev=52.21' Storage=242 cf Inflow=0.32 cfs 1,514 cf Discarded=0.10 cfs 1,439 cf Primary=0.20 cfs 71 cf Outflow=0.30 cfs 1,510 cf
Pond 2-D: Lot 2 - Detention	Peak Elev=62.20' Storage=19 cf Inflow=0.12 cfs 602 cf Discarded=0.00 cfs 129 cf Primary=0.10 cfs 473 cf Outflow=0.10 cfs 602 cf
Pond 2-S: Lot 2 - Spreader	Peak Elev=51.21' Storage=301 cf Inflow=0.29 cfs 1,486 cf Discarded=0.04 cfs 1,327 cf Primary=0.25 cfs 152 cf Outflow=0.29 cfs 1,479 cf

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Pond 3-D: Lot 3 - DetentionPeak Elev=62.12' Storage=17 cf Inflow=0.11 cfs 566 cf
Discarded=0.00 cfs 60 cf Primary=0.10 cfs 506 cf Outflow=0.10 cfs 565 cf**Pond 3-S: Lot 3 - Spreader**Peak Elev=47.21' Storage=242 cf Inflow=0.31 cfs 1,664 cf
Discarded=0.01 cfs 898 cf Primary=0.30 cfs 607 cf Outflow=0.31 cfs 1,505 cf**Pond 4-D: Lot 4 - Detention**Peak Elev=59.01' Storage=24 cf Inflow=0.14 cfs 697 cf
Discarded=0.00 cfs 0 cf Primary=0.12 cfs 696 cf Outflow=0.12 cfs 696 cf**Pond 4-S: Lot 4 - Spreader**Peak Elev=45.71' Storage=268 cf Inflow=0.33 cfs 1,864 cf
Discarded=0.00 cfs 2 cf Primary=0.33 cfs 1,595 cf Outflow=0.33 cfs 1,597 cf**Total Runoff Area = 208,280 sf Runoff Volume = 49,220 cf Average Runoff Depth = 2.84"**
91.80% Pervious = 191,210 sf 8.20% Impervious = 17,070 sf

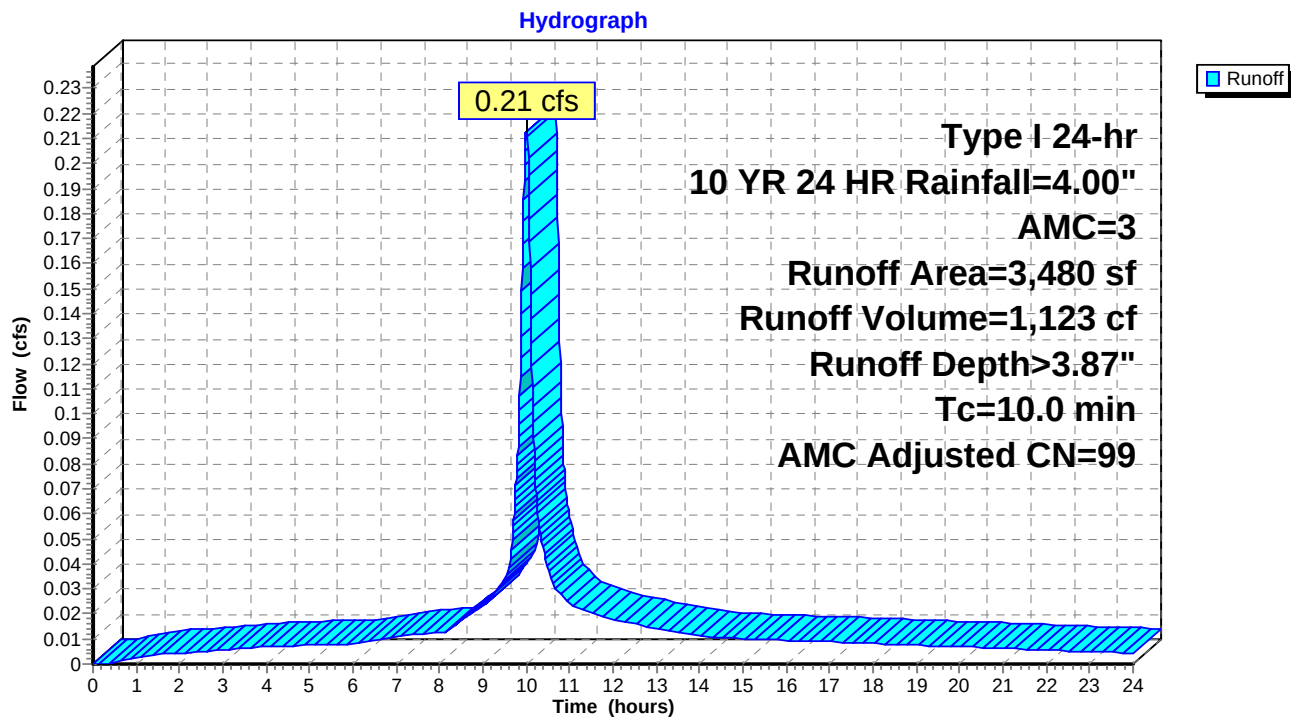
Summary for Subcatchment 1A: Lot 1 - House/Garage

Runoff = 0.21 cfs @ 10.00 hrs, Volume= 1,123 cf, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	3,480	98		Impervious; HSG C
*	0	89		Pervious Pavers; HSG C
	3,480	98	99	Weighted Average, AMC Adjusted
	3,480			100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 1A: Lot 1 - House/Garage

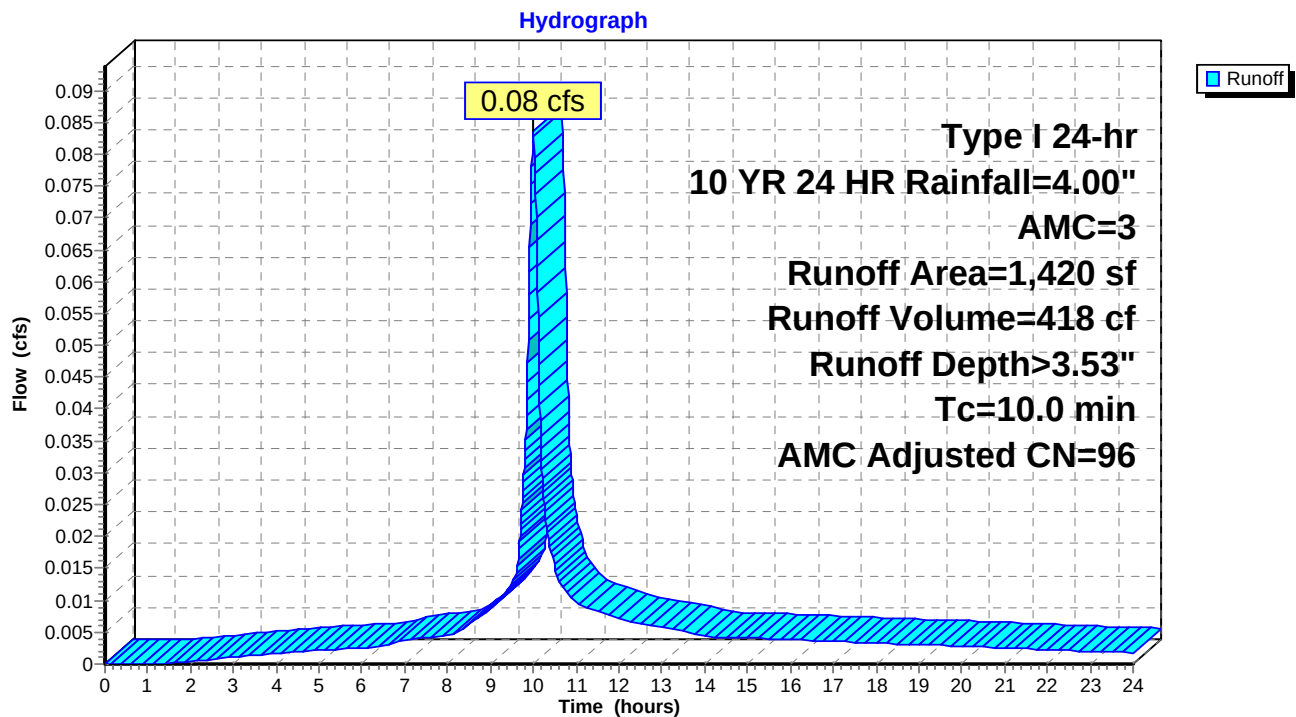
Summary for Subcatchment 1B: Lot 1 - Motorcourt

Runoff = 0.08 cfs @ 10.01 hrs, Volume= 418 cf, Depth> 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	0	98		Impervious; HSG C
*	1,420	89		Pervious Pavers; HSG C
	1,420	89	96	Weighted Average, AMC Adjusted
	1,420			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 1B: Lot 1 - Motorcourt

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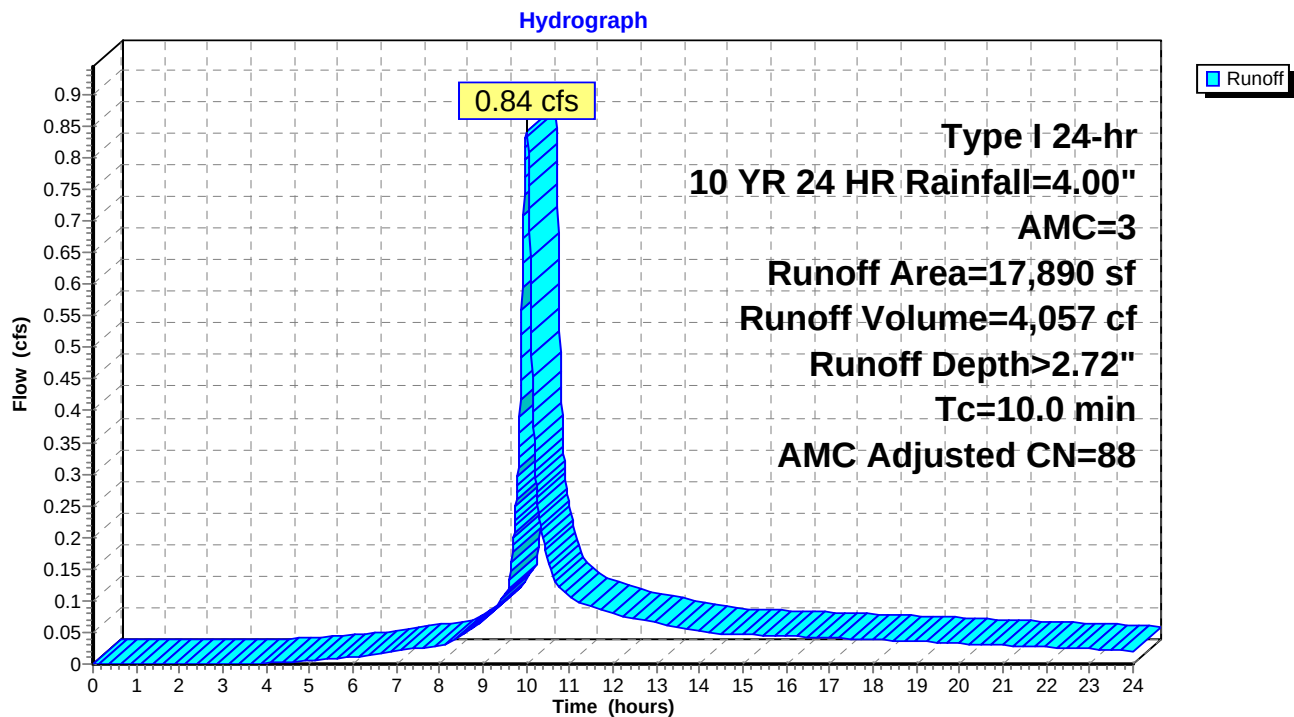
Summary for Subcatchment 1C: Lot 1 - Landscape

Runoff = 0.84 cfs @ 10.01 hrs, Volume= 4,057 cf, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	17,890	74		>75% Grass cover, Good; HSG C
*	0	89		Pervious Pavers; HSG C
	17,890	74	88	Weighted Average, AMC Adjusted
	17,890			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 1C: Lot 1 - Landscape

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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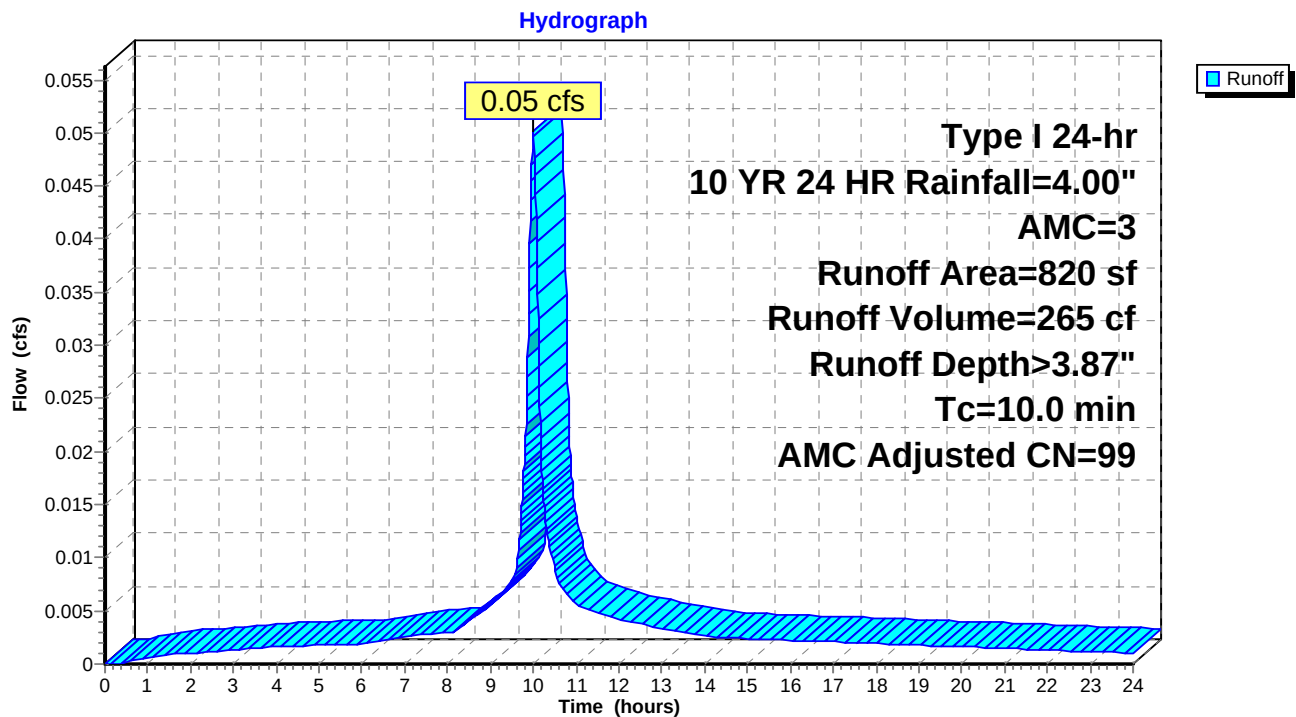
Summary for Subcatchment 1D: Lot 1 - Driveway

Runoff = 0.05 cfs @ 10.00 hrs, Volume= 265 cf, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	820	98		Impervious; HSG C
*	0	89		Pervious Pavers; HSG C
	820	98	99	Weighted Average, AMC Adjusted
	820			100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 1D: Lot 1 - Driveway

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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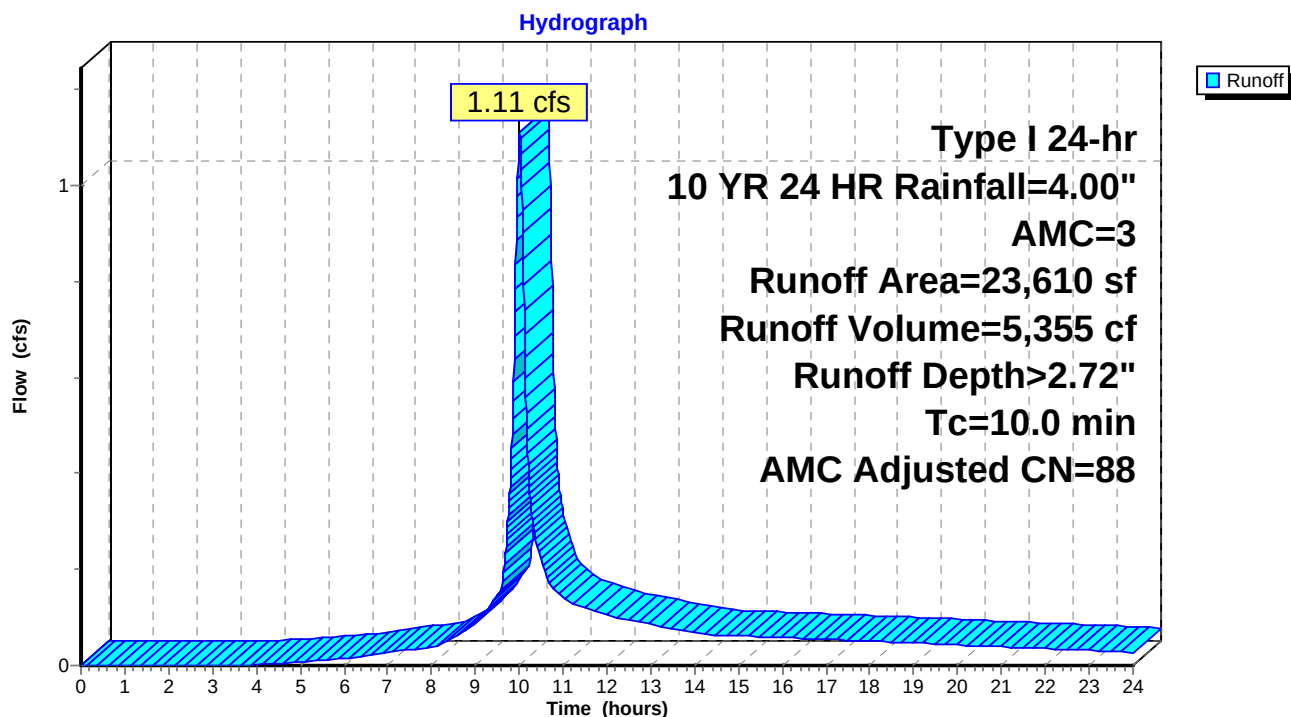
Summary for Subcatchment 1e: Lot 1 - Existing

Runoff = 1.11 cfs @ 10.01 hrs, Volume= 5,355 cf, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	23,610	74		>75% Grass cover, Good; HSG C
	23,610	74	88	Weighted Average, AMC Adjusted
	23,610			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 1e: Lot 1 - Existing

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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Summary for Subcatchment 2A: Lot 2 - House/Garage

Runoff = 0.19 cfs @ 10.00 hrs, Volume= 1,014 cf, Depth> 3.87"

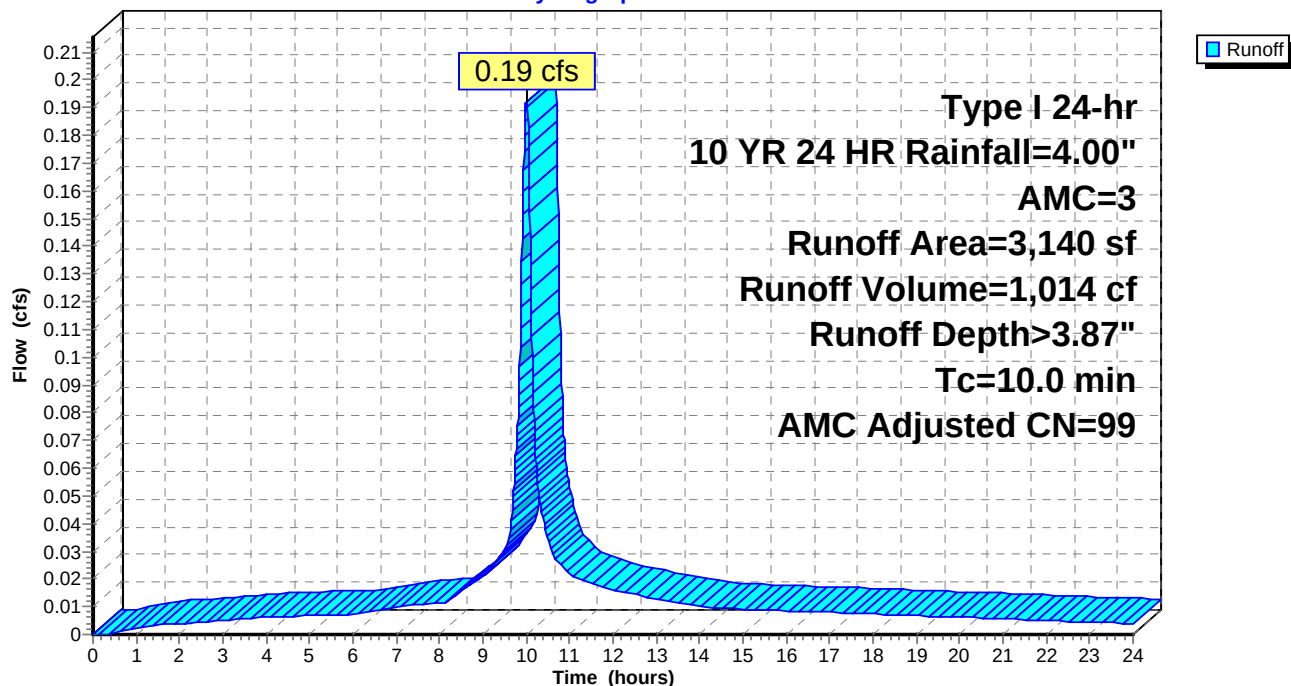
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

Area (sf)	CN	Adj	Description
* 3,140	98		Impervious; HSG C
3,140	98	99	Weighted Average, AMC Adjusted
3,140			100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 2A: Lot 2 - House/Garage

Hydrograph



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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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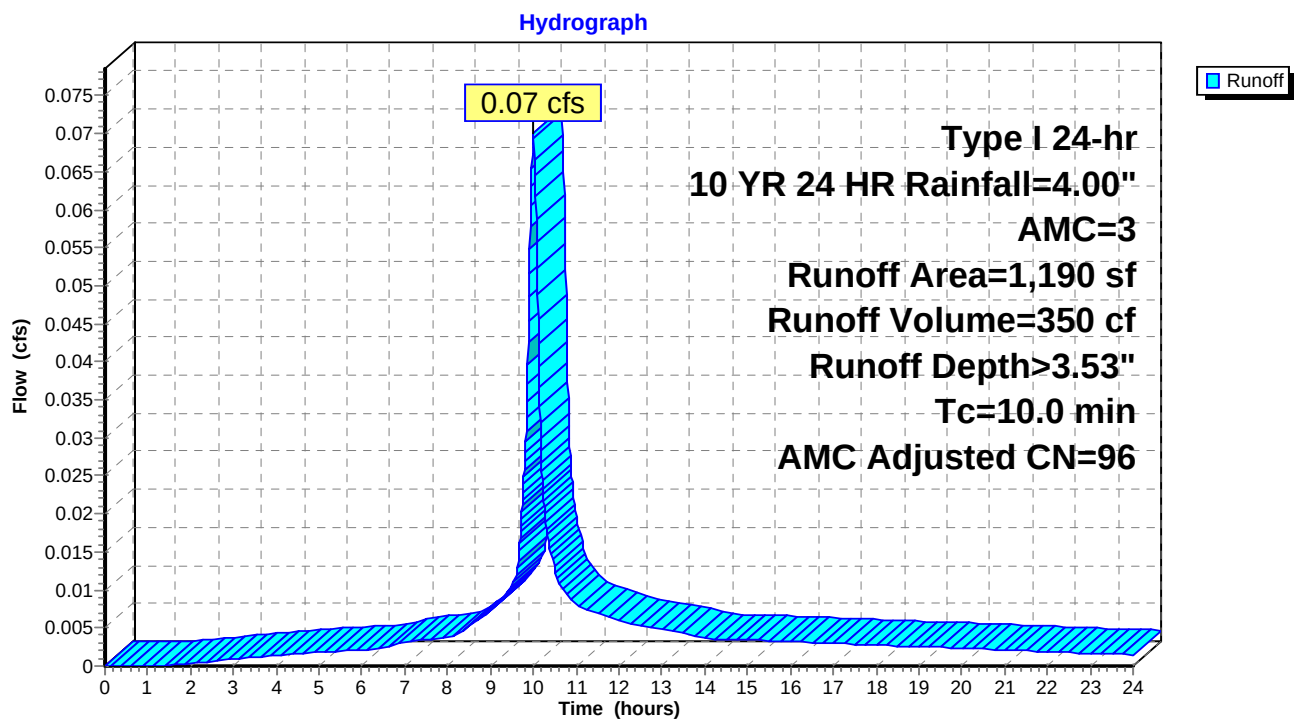
Summary for Subcatchment 2B: Lot 2 - Motorcourt

Runoff = 0.07 cfs @ 10.01 hrs, Volume= 350 cf, Depth> 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	0	98		Impervious; HSG C
*	1,190	89		Pervious Pavers; HSG C
	1,190	89	96	Weighted Average, AMC Adjusted
	1,190			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 2B: Lot 2 - Motorcourt

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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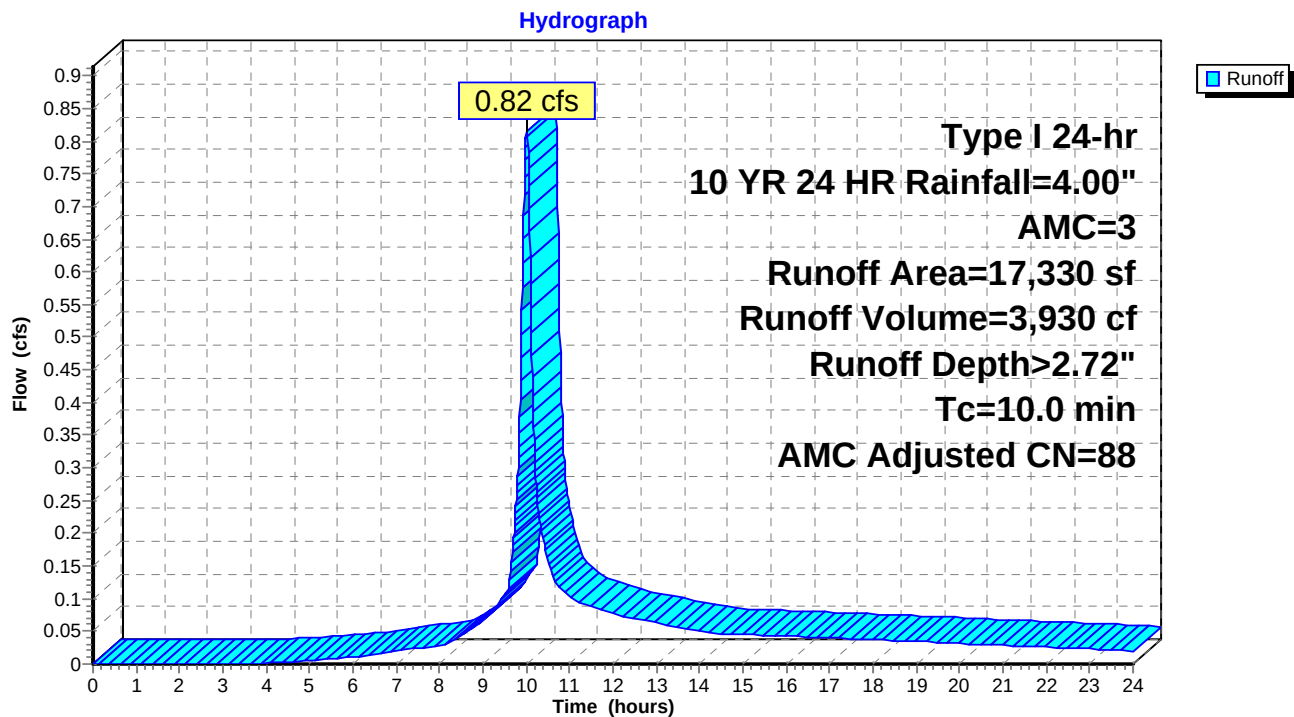
Summary for Subcatchment 2C: Lot 2 - Landscape

Runoff = 0.82 cfs @ 10.01 hrs, Volume= 3,930 cf, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	17,330	74		>75% Grass cover, Good; HSG C
*	0	89		Pervious Pavers; HSG C
	17,330	74	88	Weighted Average, AMC Adjusted
	17,330			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 2C: Lot 2 - Landscape

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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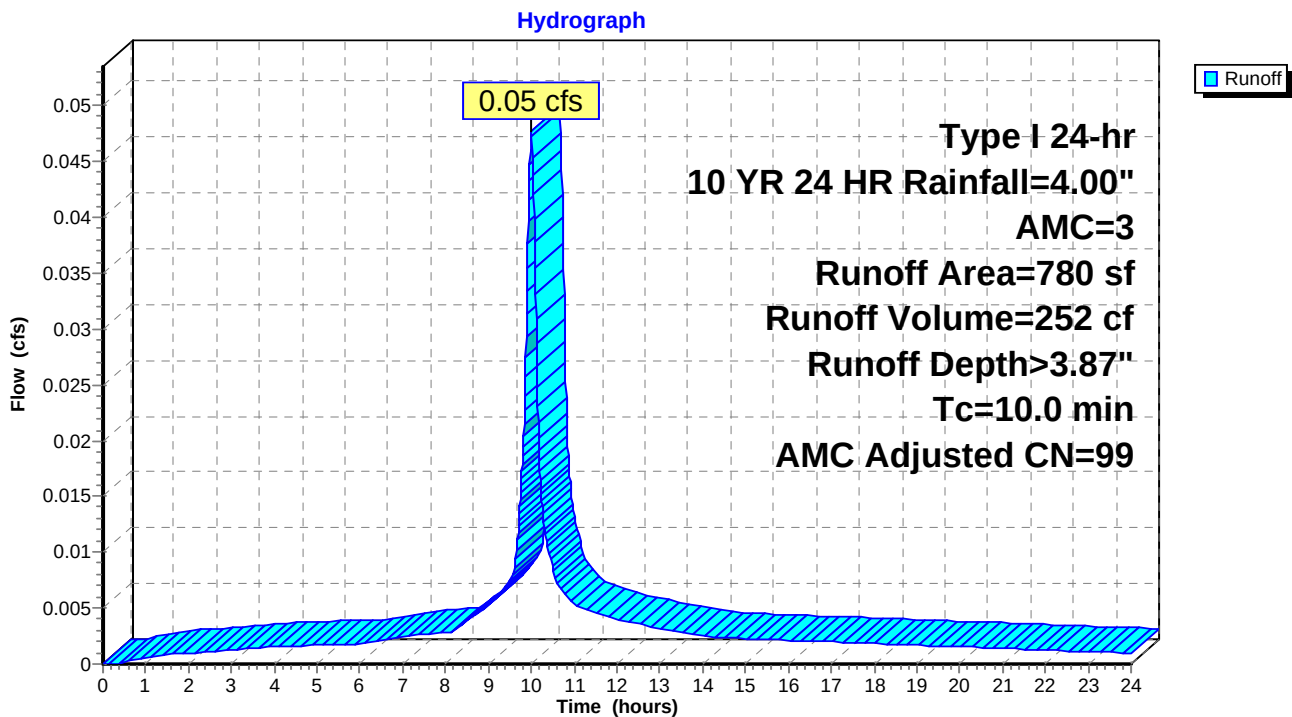
Summary for Subcatchment 2D: Lot 2 - Driveway

Runoff = 0.05 cfs @ 10.00 hrs, Volume= 252 cf, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	780	98		Impervious; HSG C
*	0	89		Pervious Pavers; HSG C
	780	98	99	Weighted Average, AMC Adjusted
	780			100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 2D: Lot 2 - Driveway

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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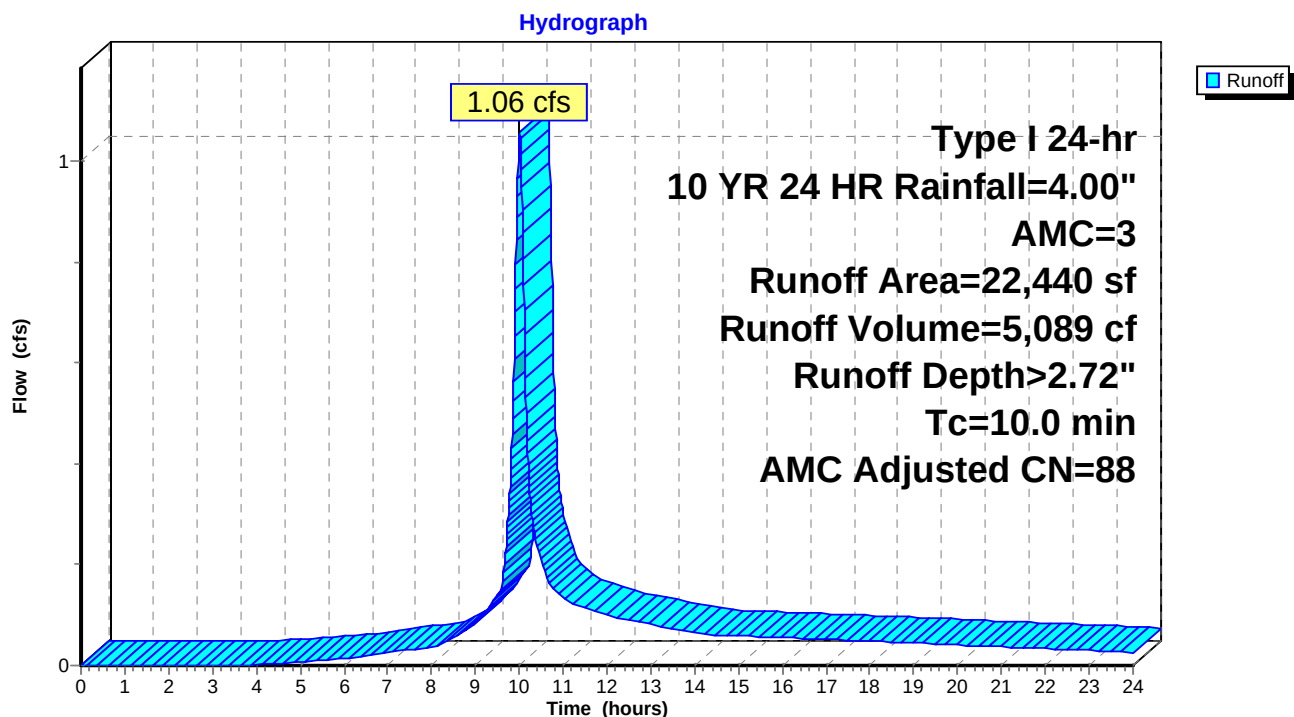
Summary for Subcatchment 2e: Lot 2 - Existing

Runoff = 1.06 cfs @ 10.01 hrs, Volume= 5,089 cf, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	22,440	74		>75% Grass cover, Good; HSG C
	22,440	74	88	Weighted Average, AMC Adjusted
	22,440			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 2e: Lot 2 - Existing

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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Summary for Subcatchment 3A: Lot 3 - House/Garage

Runoff = 0.22 cfs @ 10.00 hrs, Volume= 1,159 cf, Depth> 3.87"

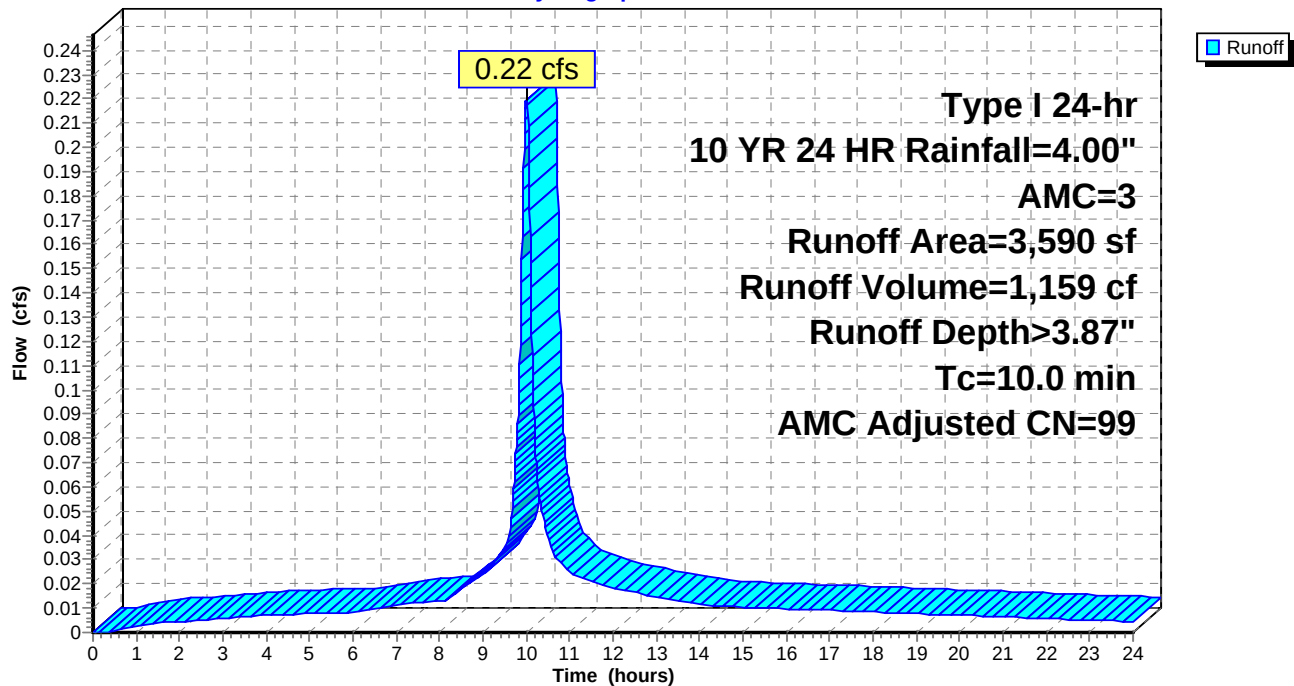
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	3,590	98		Impervious; HSG C
	3,590	98	99	Weighted Average, AMC Adjusted
	3,590			100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 3A: Lot 3 - House/Garage

Hydrograph



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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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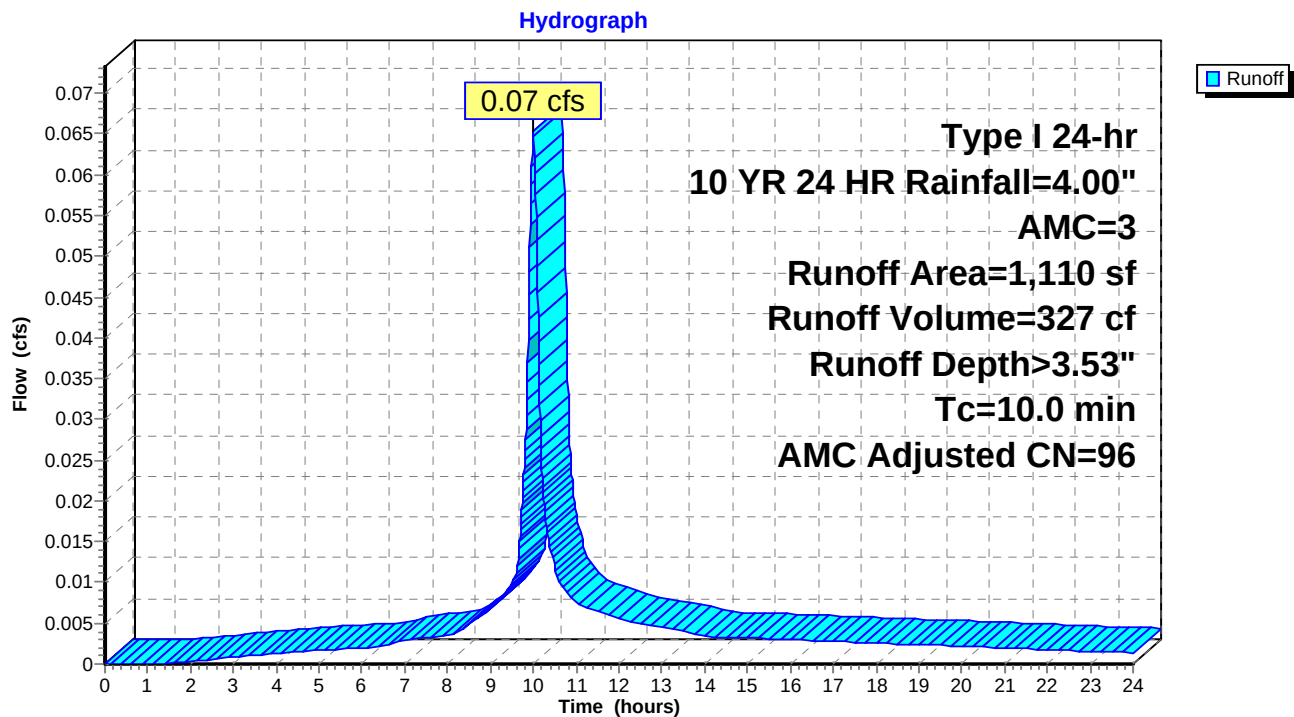
Summary for Subcatchment 3B: Lot 3 - Motorcourt

Runoff = 0.07 cfs @ 10.01 hrs, Volume= 327 cf, Depth> 3.53"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	0	98		Impervious; HSG C
*	1,110	89		Pervious Pavers; HSG C
	1,110	89	96	Weighted Average, AMC Adjusted
	1,110			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 3B: Lot 3 - Motorcourt

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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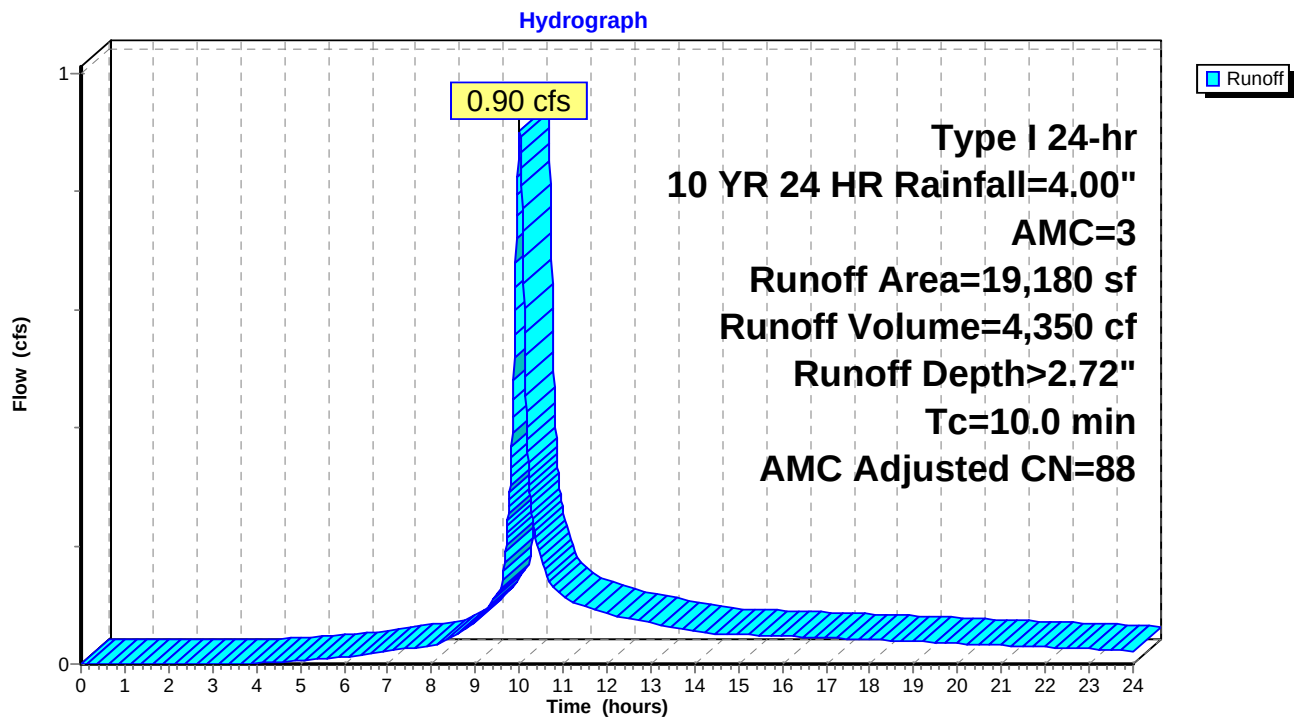
Summary for Subcatchment 3C: Lot 3 - Landscape

Runoff = 0.90 cfs @ 10.01 hrs, Volume= 4,350 cf, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	19,180	74		>75% Grass cover, Good; HSG C
*	0	89		Pervious Pavers; HSG C
	19,180	74	88	Weighted Average, AMC Adjusted
	19,180			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 3C: Lot 3 - Landscape

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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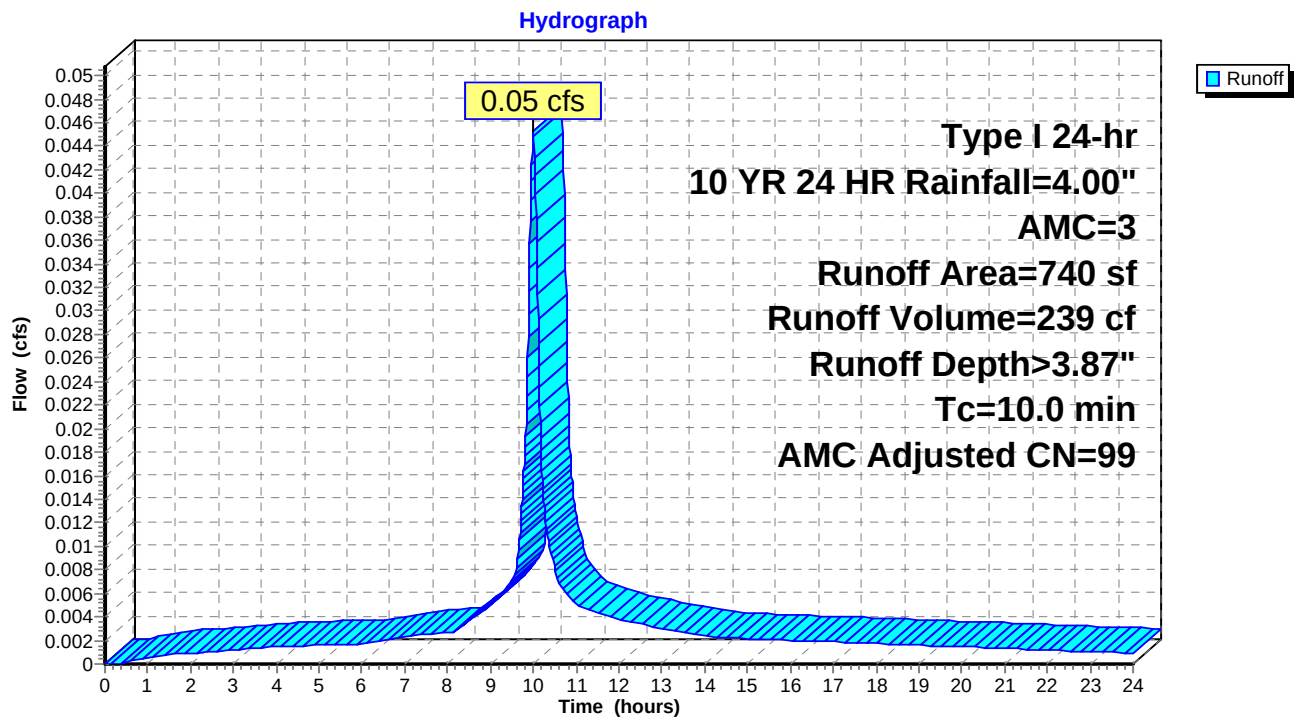
Summary for Subcatchment 3D: Lot 3 - Driveway

Runoff = 0.05 cfs @ 10.00 hrs, Volume= 239 cf, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	740	98		Impervious; HSG C
*	0	89		Pervious Pavers; HSG C
	740	98	99	Weighted Average, AMC Adjusted
	740			100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 3D: Lot 3 - Driveway

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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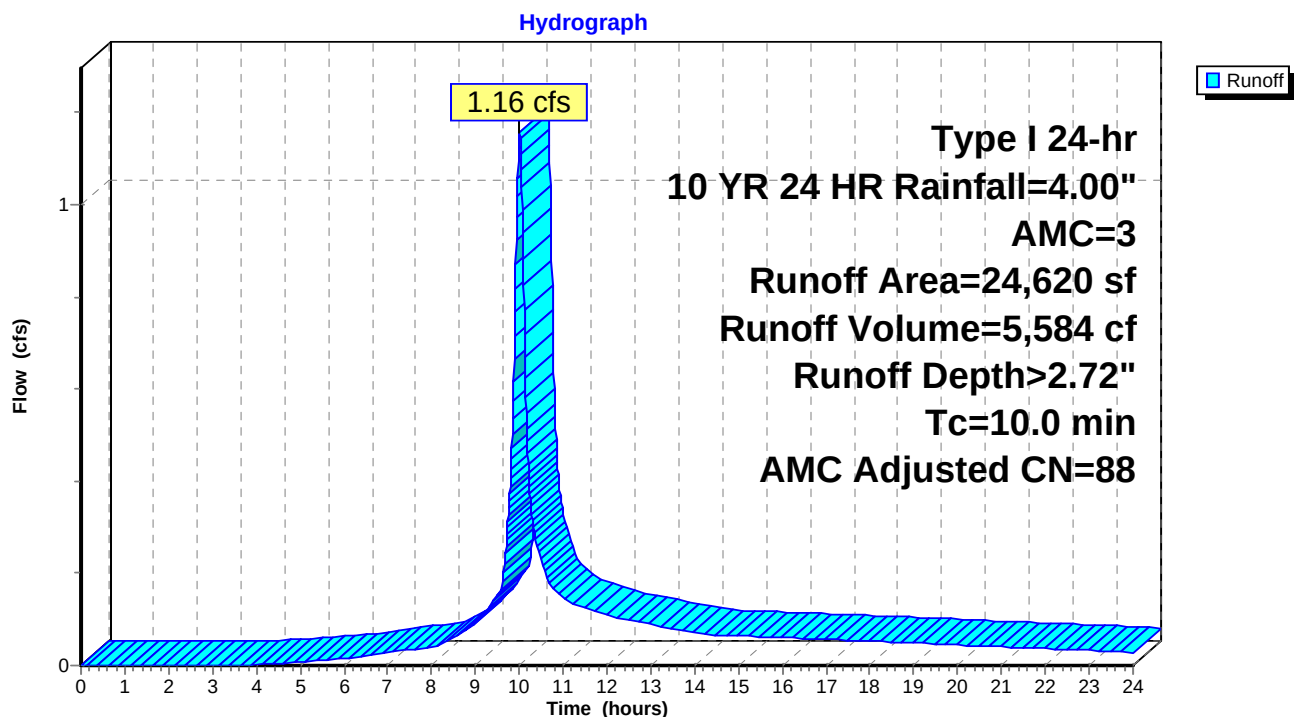
Summary for Subcatchment 3e: Lot 3 - Existing

Runoff = 1.16 cfs @ 10.01 hrs, Volume= 5,584 cf, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	24,620	74		>75% Grass cover, Good; HSG C
	24,620	74	88	Weighted Average, AMC Adjusted
	24,620			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 3e: Lot 3 - Existing

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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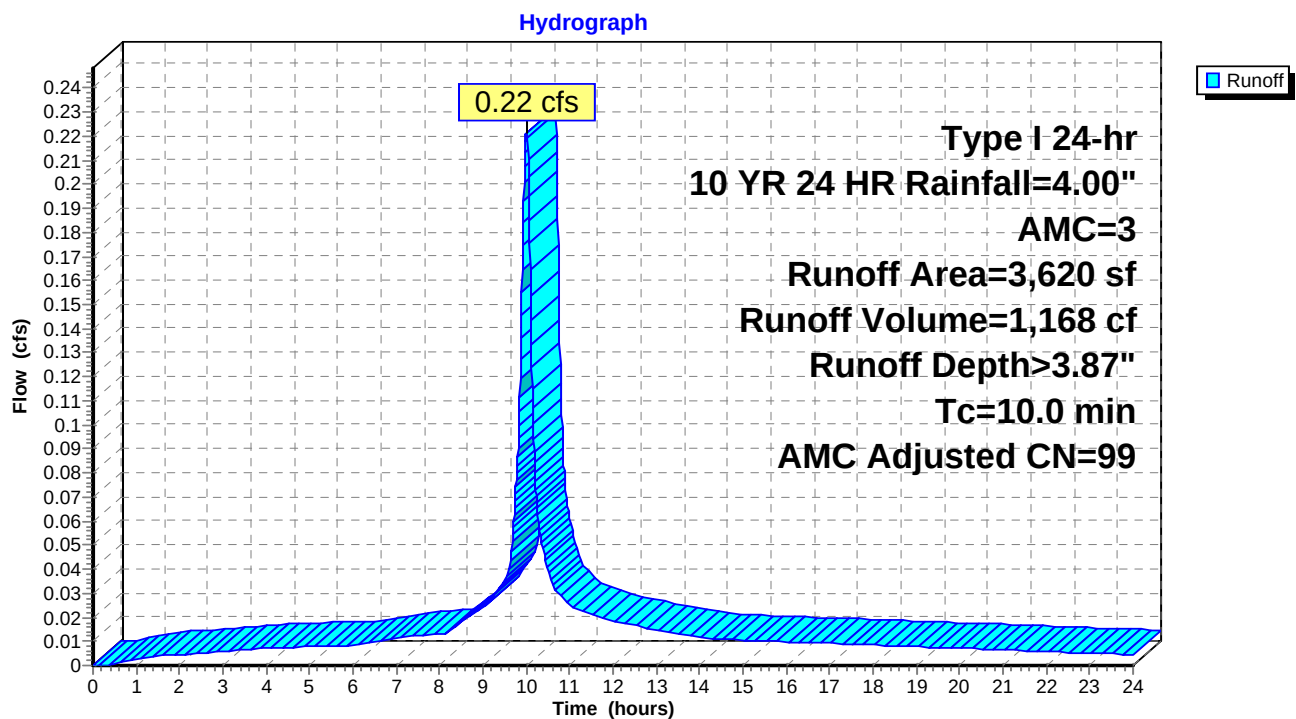
Summary for Subcatchment 4A: Lot 4 - House/Garage

Runoff = 0.22 cfs @ 10.00 hrs, Volume= 1,168 cf, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	3,620	98		Impervious; HSG C
	3,620	98	99	Weighted Average, AMC Adjusted
	3,620			100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 4A: Lot 4 - House/Garage

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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Summary for Subcatchment 4B: Lot 4 - Motorcourt

Runoff = 0.08 cfs @ 10.01 hrs, Volume= 406 cf, Depth> 3.53"

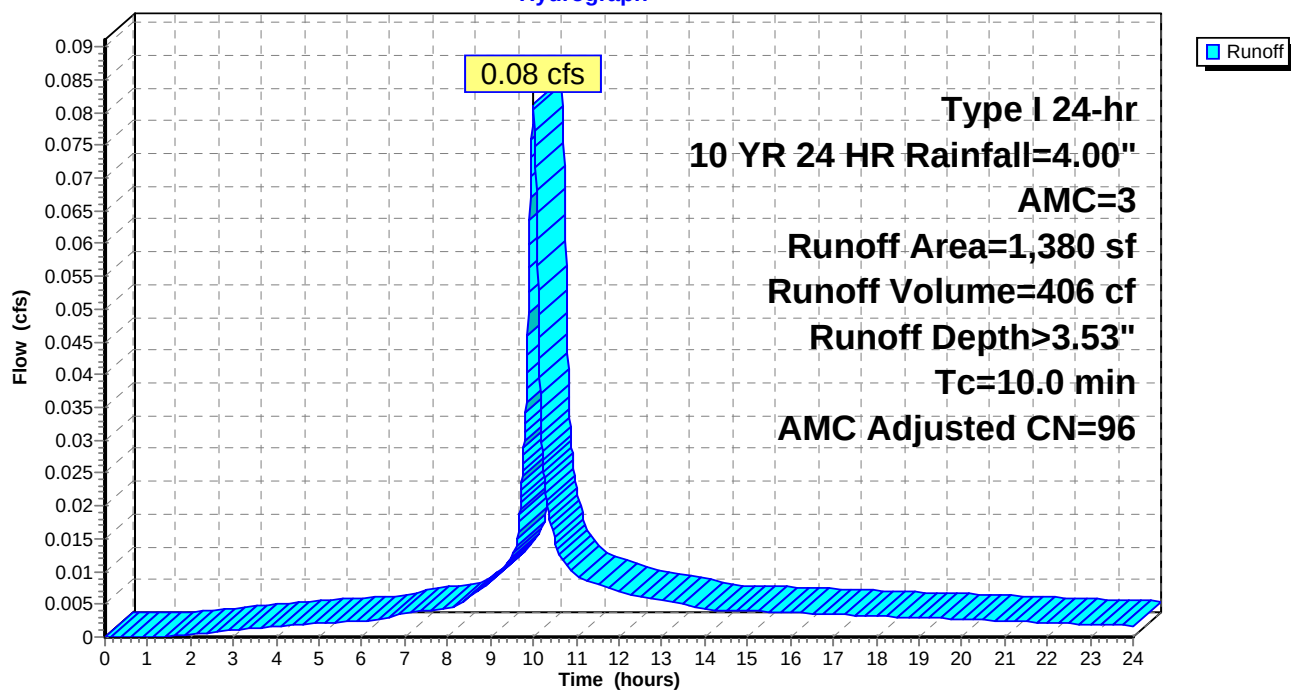
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	0	98		Impervious; HSG C
*	1,380	89		Pervious Pavers; HSG C
	1,380	89	96	Weighted Average, AMC Adjusted
	1,380			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 4B: Lot 4 - Motorcourt

Hydrograph



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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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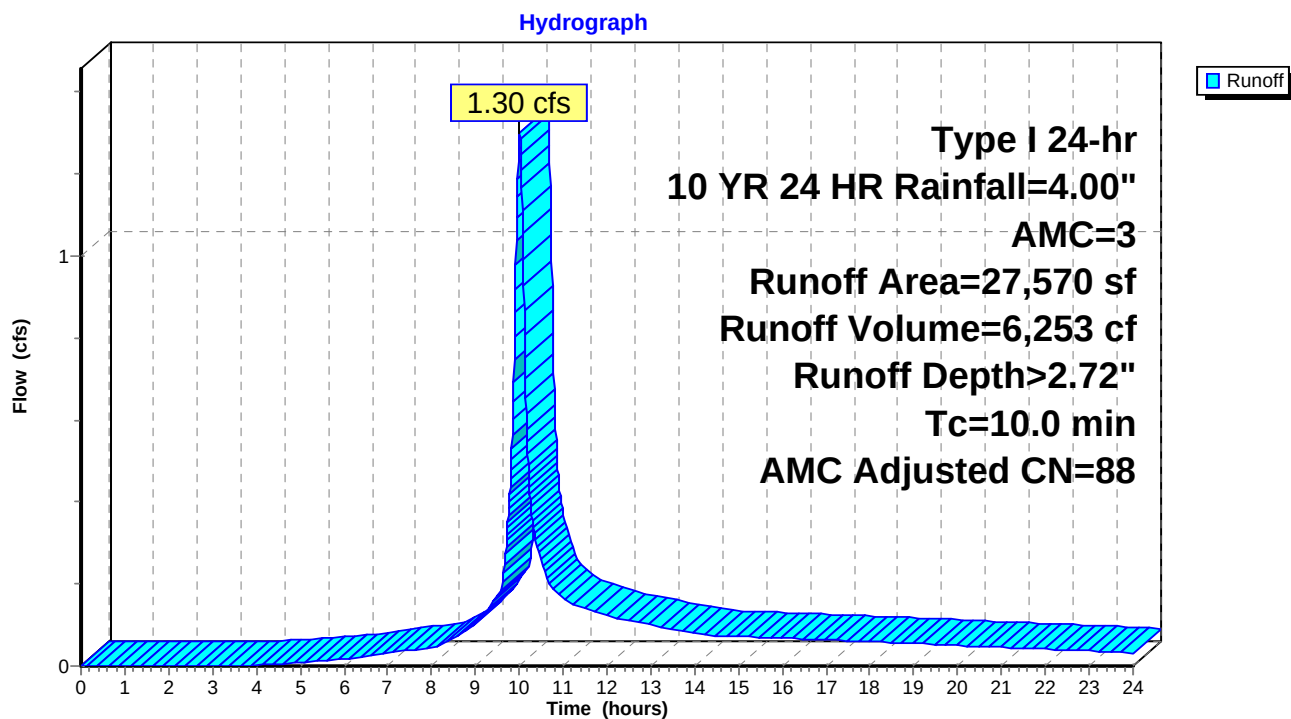
Summary for Subcatchment 4C: Lot 4 - Landscape

Runoff = 1.30 cfs @ 10.01 hrs, Volume= 6,253 cf, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	27,570	74		>75% Grass cover, Good; HSG C
*	0	89		Pervious Pavers; HSG C
	27,570	74	88	Weighted Average, AMC Adjusted
	27,570			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 4C: Lot 4 - Landscape

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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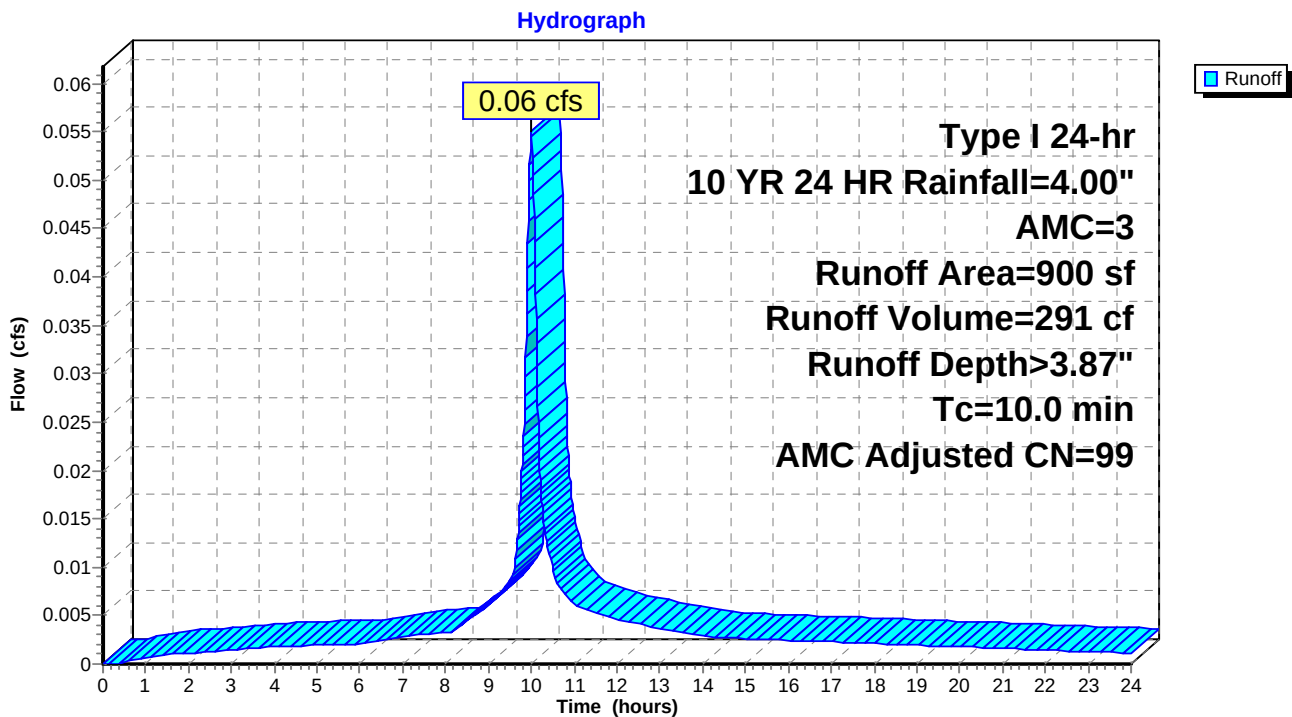
Summary for Subcatchment 4D: Lot 4 - Driveway

Runoff = 0.06 cfs @ 10.00 hrs, Volume= 291 cf, Depth> 3.87"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	900	98		Impervious; HSG C
*	0	89		Pervious Pavers; HSG C
	900	98	99	Weighted Average, AMC Adjusted
	900			100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 4D: Lot 4 - Driveway

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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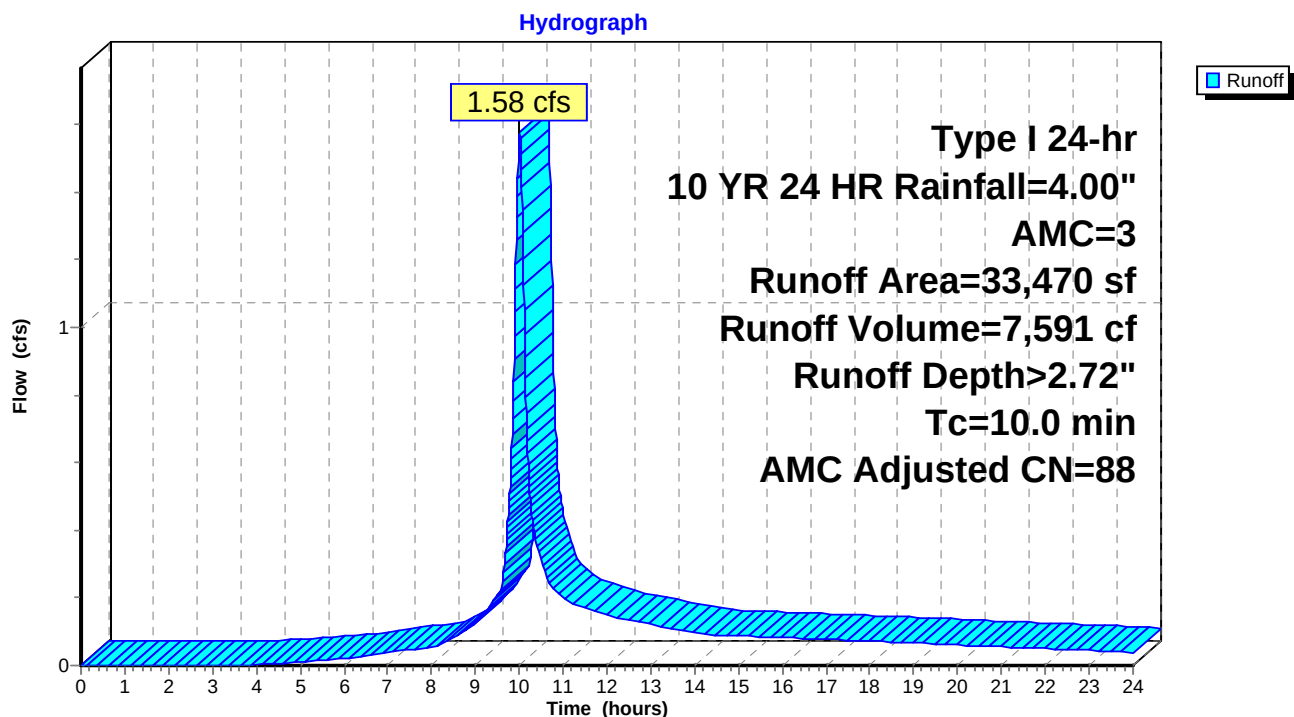
Summary for Subcatchment 4e: Lot 4 - Existing

Runoff = 1.58 cfs @ 10.01 hrs, Volume= 7,591 cf, Depth> 2.72"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

	Area (sf)	CN	Adj	Description
*	33,470	74		>75% Grass cover, Good; HSG C
	33,470	74	88	Weighted Average, AMC Adjusted
	33,470			100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					Direct Entry,

Subcatchment 4e: Lot 4 - Existing

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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Summary for Reach 1-O: Lot 1 - Outlet (p)

Inflow Area = 23,610 sf, 18.21% Impervious, Inflow Depth > 2.10" for 10 YR 24 HR event
Inflow = 0.94 cfs @ 10.06 hrs, Volume= 4,128 cf
Outflow = 0.86 cfs @ 10.08 hrs, Volume= 4,110 cf, Atten= 9%, Lag= 1.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 2

Max. Velocity= 0.32 fps, Min. Travel Time= 3.3 min

Avg. Velocity= 0.09 fps, Avg. Travel Time= 11.0 min

Peak Storage= 170 cf @ 10.08 hrs

Average Depth at Peak Storage= 0.03'

Bank-Full Depth= 0.10' Flow Area= 10.1 sf, Capacity= 7.64 cfs

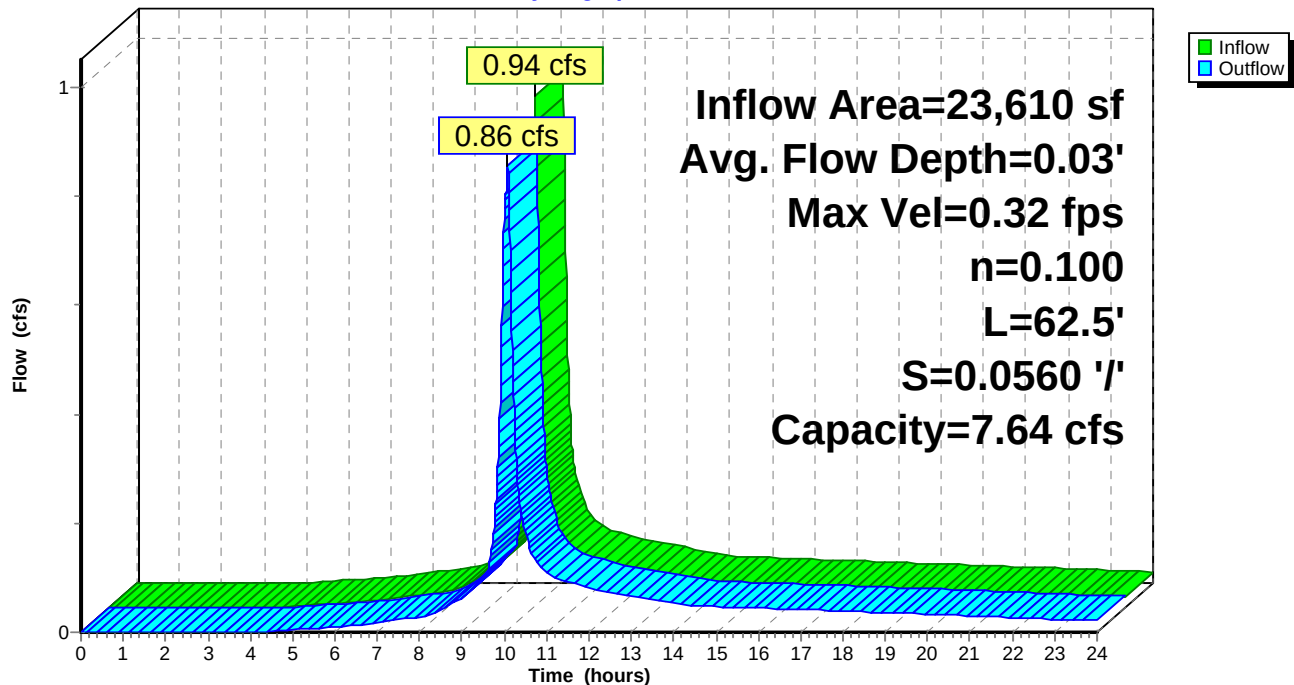
101.00' x 0.10' deep channel, n= 0.100

Length= 62.5' Slope= 0.0560 '/'

Inlet Invert= 52.00', Outlet Invert= 48.50'

**Reach 1-O: Lot 1 - Outlet (p)**

Hydrograph



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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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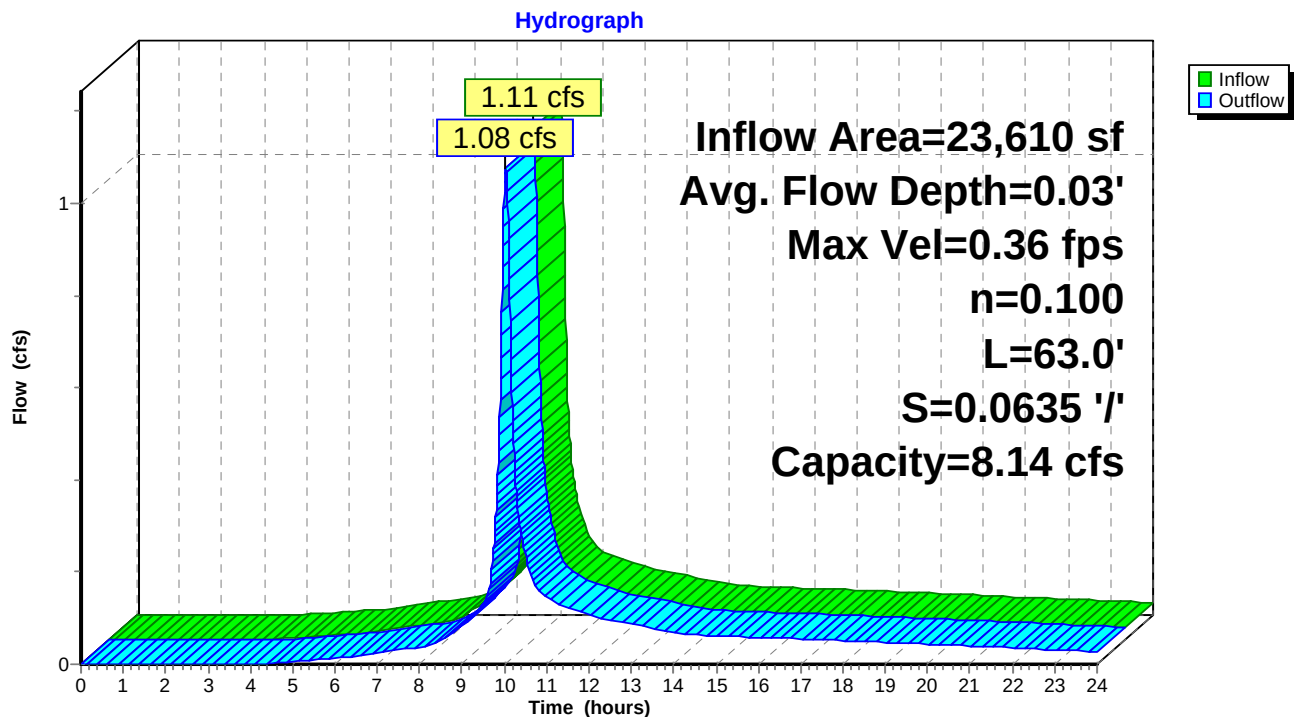
Summary for Reach 1eO: Lot 1 - Outlet (e)

Inflow Area = 23,610 sf, 0.00% Impervious, Inflow Depth > 2.72" for 10 YR 24 HR event
Inflow = 1.11 cfs @ 10.01 hrs, Volume= 5,355 cf
Outflow = 1.08 cfs @ 10.04 hrs, Volume= 5,334 cf, Atten= 3%, Lag= 1.7 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs
Max. Velocity= 0.36 fps, Min. Travel Time= 2.9 min
Avg. Velocity = 0.11 fps, Avg. Travel Time= 9.6 min

Peak Storage= 189 cf @ 10.04 hrs
Average Depth at Peak Storage= 0.03'
Bank-Full Depth= 0.10' Flow Area= 10.1 sf, Capacity= 8.14 cfs

101.00' x 0.10' deep channel, n= 0.100
Length= 63.0' Slope= 0.0635 '/'
Inlet Invert= 53.00', Outlet Invert= 49.00'

**Reach 1eO: Lot 1 - Outlet (e)**

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Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

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Summary for Reach 2-O: Lot 2 - Outlet (p)

Inflow Area = 22,440 sf, 17.47% Impervious, Inflow Depth > 2.18" for 10 YR 24 HR event
Inflow = 1.07 cfs @ 10.03 hrs, Volume= 4,083 cf
Outflow = 0.92 cfs @ 10.07 hrs, Volume= 4,064 cf, Atten= 14%, Lag= 2.1 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Max. Velocity= 0.31 fps, Min. Travel Time= 3.4 min

Avg. Velocity= 0.09 fps, Avg. Travel Time= 11.7 min

Peak Storage= 186 cf @ 10.07 hrs

Average Depth at Peak Storage= 0.03'

Bank-Full Depth= 0.10' Flow Area= 11.1 sf, Capacity= 8.37 cfs

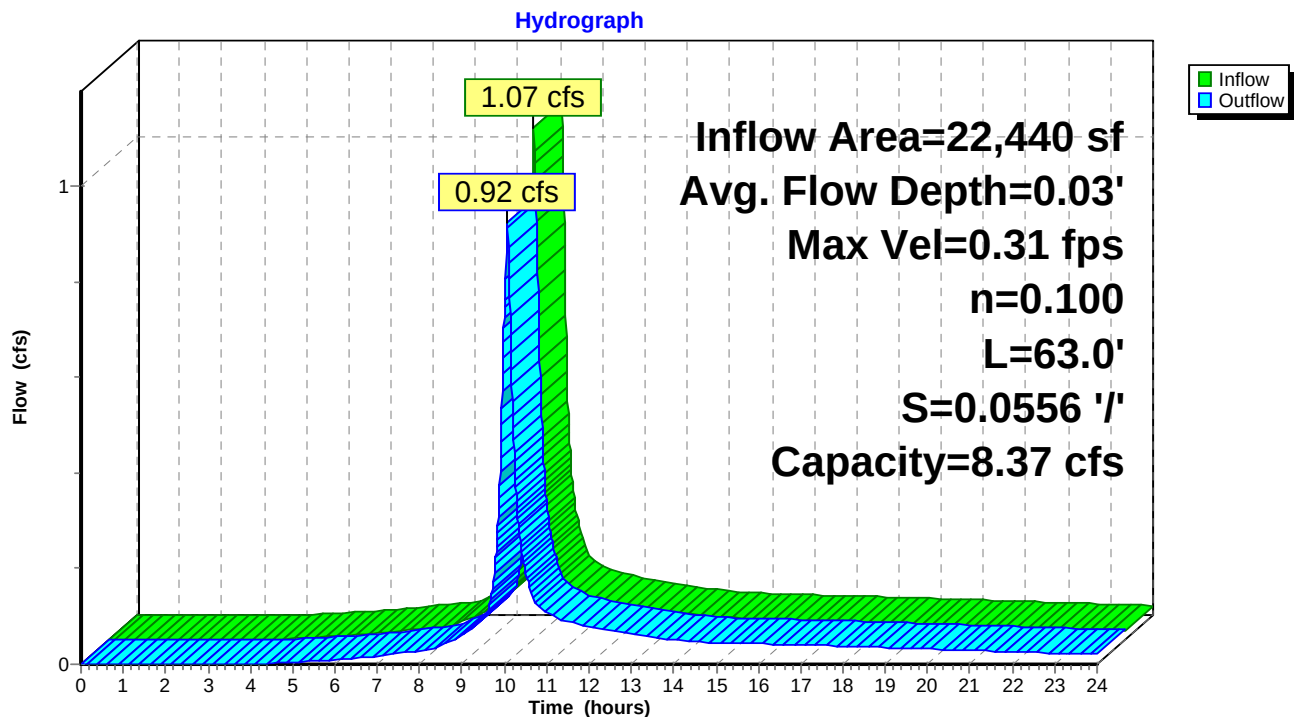
111.00' x 0.10' deep channel, n= 0.100

Length= 63.0' Slope= 0.0556 '/'

Inlet Invert= 51.00', Outlet Invert= 47.50'



Reach 2-O: Lot 2 - Outlet (p)



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Summary for Reach 2eO: Lot 2 - Outlet (e)

Inflow Area = 22,440 sf, 0.00% Impervious, Inflow Depth > 2.72" for 10 YR 24 HR event
Inflow = 1.06 cfs @ 10.01 hrs, Volume= 5,089 cf
Outflow = 1.02 cfs @ 10.04 hrs, Volume= 5,070 cf, Atten= 3%, Lag= 1.6 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Max. Velocity= 0.36 fps, Min. Travel Time= 2.9 min

Avg. Velocity = 0.11 fps, Avg. Travel Time= 9.5 min

Peak Storage= 178 cf @ 10.04 hrs

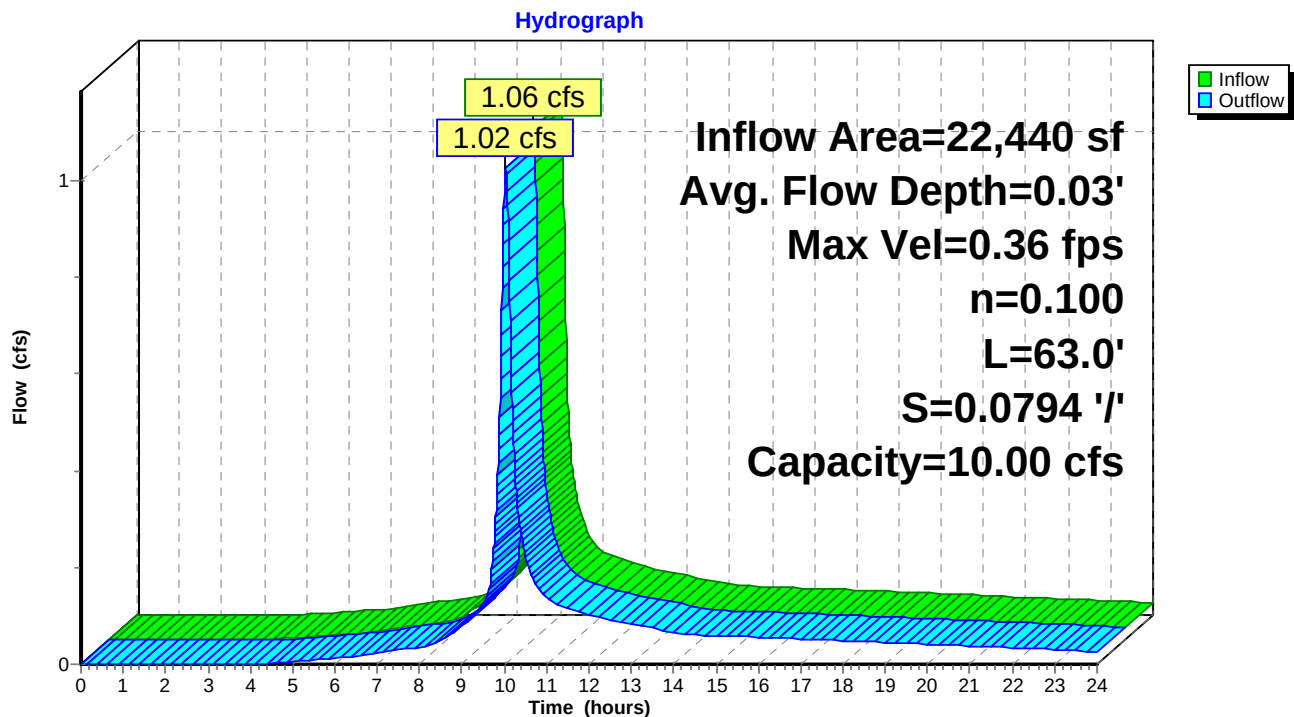
Average Depth at Peak Storage= 0.03'

Bank-Full Depth= 0.10' Flow Area= 11.1 sf, Capacity= 10.00 cfs

111.00' x 0.10' deep channel, n= 0.100

Length= 63.0' Slope= 0.0794 '/'

Inlet Invert= 52.00', Outlet Invert= 47.00'

**Reach 2eO: Lot 2 - Outlet (e)**

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Summary for Reach 3-O: Lot 3 - Outlet (p)

Inflow Area = 24,620 sf, 17.59% Impervious, Inflow Depth > 2.42" for 10 YR 24 HR event
Inflow = 1.20 cfs @ 10.01 hrs, Volume= 4,957 cf
Outflow = 1.10 cfs @ 10.06 hrs, Volume= 4,924 cf, Atten= 8%, Lag= 2.7 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Max. Velocity= 0.24 fps, Min. Travel Time= 5.2 min

Avg. Velocity= 0.07 fps, Avg. Travel Time= 18.3 min

Peak Storage= 341 cf @ 10.06 hrs

Average Depth at Peak Storage= 0.04'

Bank-Full Depth= 0.10' Flow Area= 11.6 sf, Capacity= 5.25 cfs

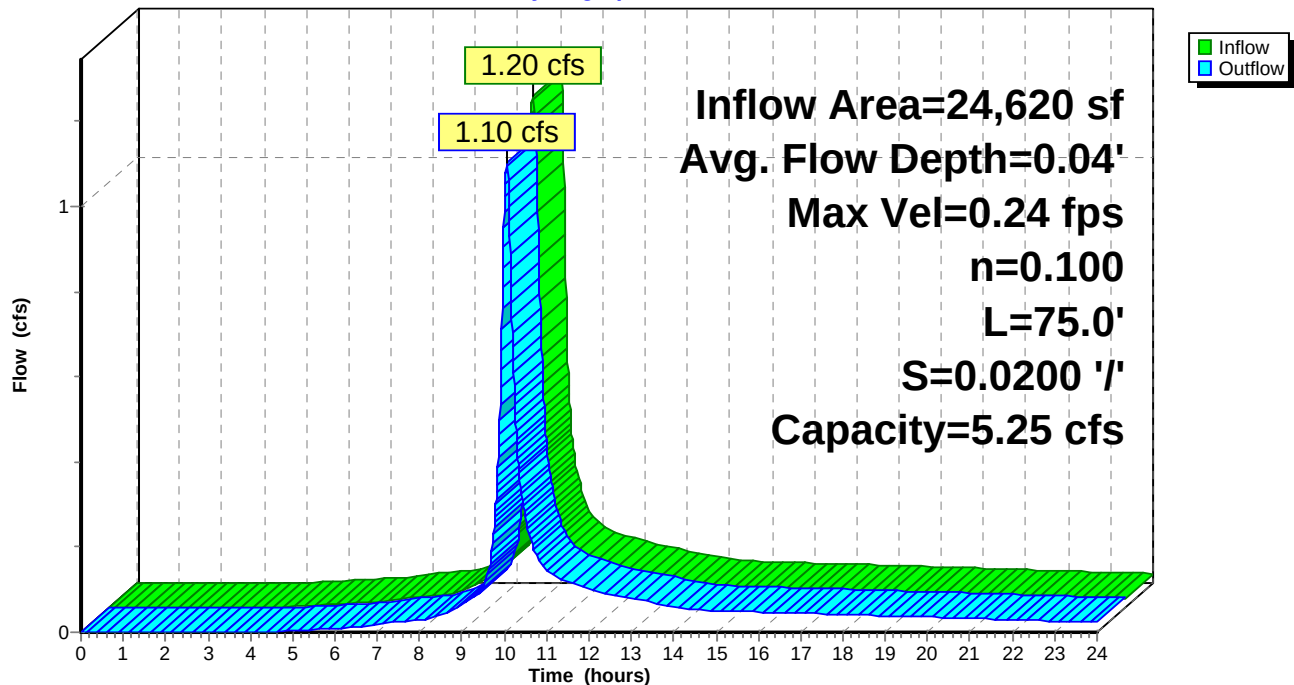
116.00' x 0.10' deep channel, n= 0.100

Length= 75.0' Slope= 0.0200 '/

Inlet Invert= 47.00', Outlet Invert= 45.50'

**Reach 3-O: Lot 3 - Outlet (p)**

Hydrograph



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Summary for Reach 3eO: Lot 3 - Outlet (e)

Inflow Area = 24,620 sf, 0.00% Impervious, Inflow Depth > 2.72" for 10 YR 24 HR event
Inflow = 1.16 cfs @ 10.01 hrs, Volume= 5,584 cf
Outflow = 1.08 cfs @ 10.05 hrs, Volume= 5,551 cf, Atten= 7%, Lag= 2.4 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Max. Velocity= 0.28 fps, Min. Travel Time= 4.5 min

Avg. Velocity = 0.09 fps, Avg. Travel Time= 14.5 min

Peak Storage= 289 cf @ 10.05 hrs

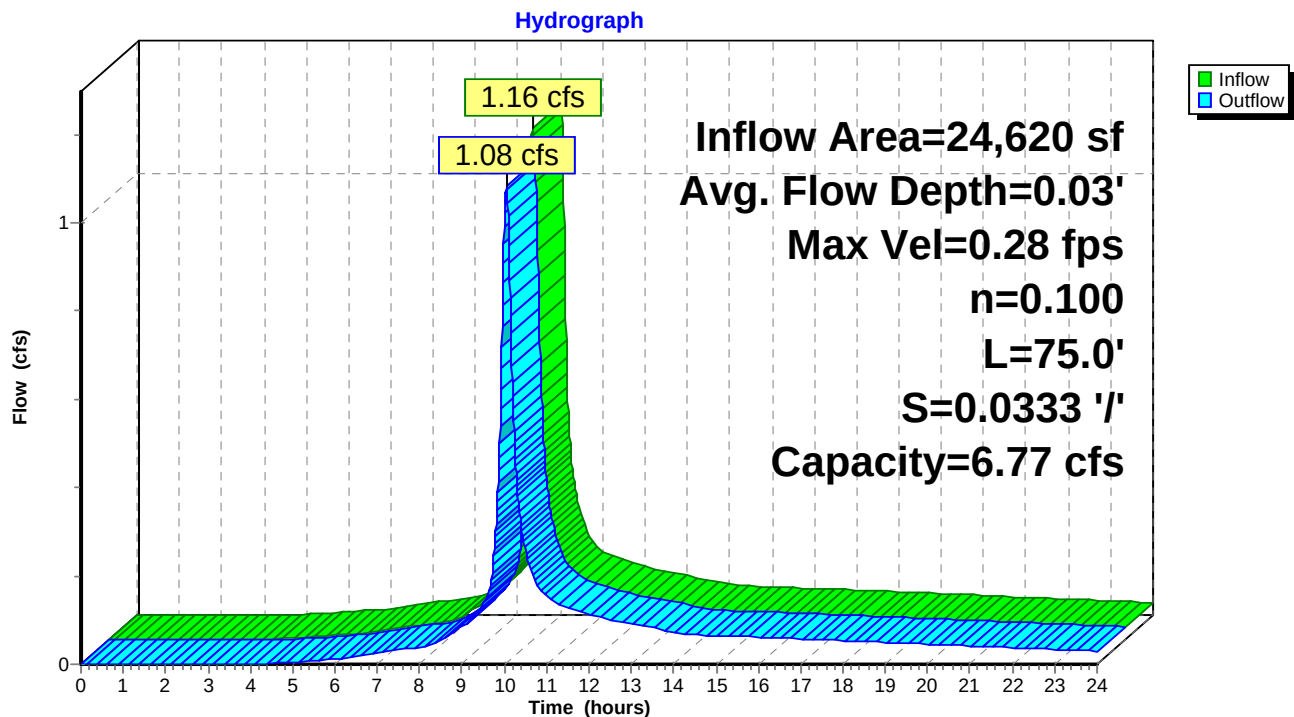
Average Depth at Peak Storage= 0.03'

Bank-Full Depth= 0.10' Flow Area= 11.6 sf, Capacity= 6.77 cfs

116.00' x 0.10' deep channel, n= 0.100

Length= 75.0' Slope= 0.0333 '/'

Inlet Invert= 48.00', Outlet Invert= 45.50'

**Reach 3eO: Lot 3 - Outlet (e)**

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Summary for Reach 4-O: Lot 4 - Outlet (p)

Inflow Area = 33,470 sf, 13.50% Impervious, Inflow Depth > 2.81" for 10 YR 24 HR event
Inflow = 1.63 cfs @ 10.01 hrs, Volume= 7,848 cf
Outflow = 1.37 cfs @ 10.08 hrs, Volume= 7,765 cf, Atten= 16%, Lag= 3.9 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Max. Velocity= 0.22 fps, Min. Travel Time= 8.4 min

Avg. Velocity= 0.07 fps, Avg. Travel Time= 26.6 min

Peak Storage= 690 cf @ 10.08 hrs

Average Depth at Peak Storage= 0.04'

Bank-Full Depth= 0.10' Flow Area= 14.4 sf, Capacity= 5.40 cfs

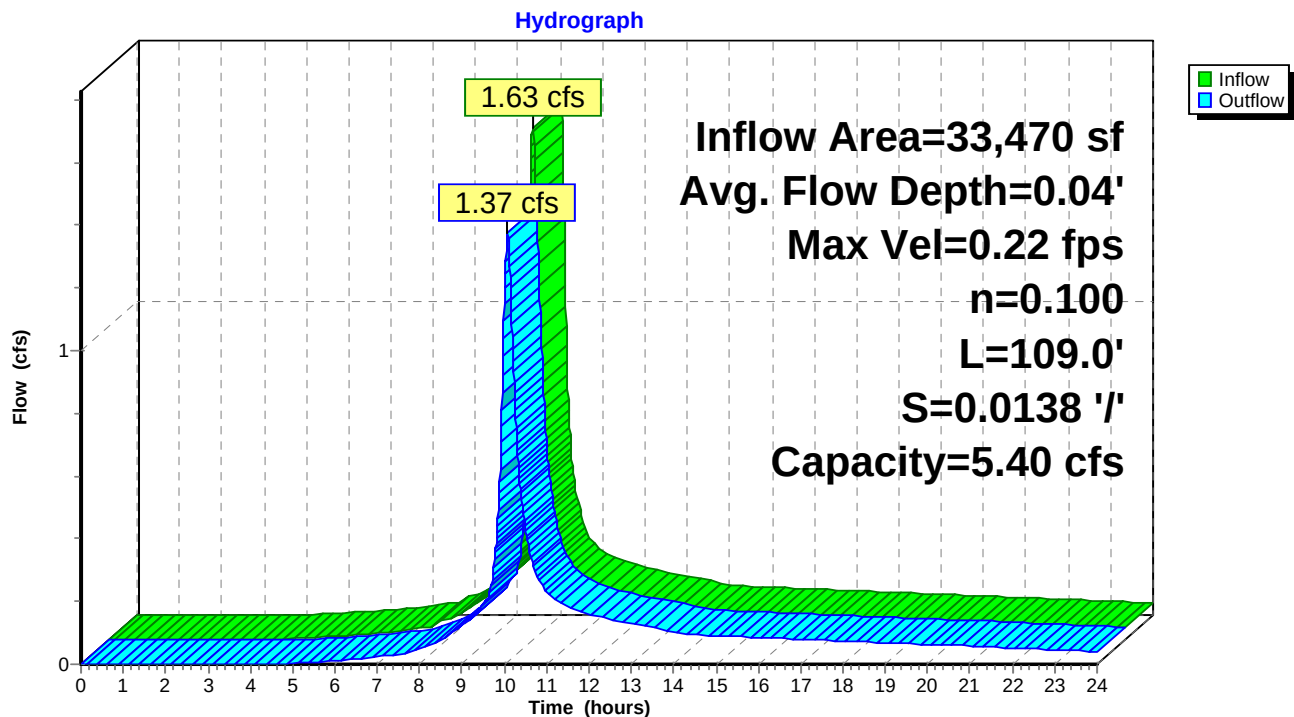
144.00' x 0.10' deep channel, n= 0.100

Length= 109.0' Slope= 0.0138 '/'

Inlet Invert= 45.50', Outlet Invert= 44.00'



Reach 4-O: Lot 4 - Outlet (p)



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Summary for Reach 4eO: Lot 4 - Outlet (e)

Inflow Area = 33,470 sf, 0.00% Impervious, Inflow Depth > 2.72" for 10 YR 24 HR event
Inflow = 1.58 cfs @ 10.01 hrs, Volume= 7,591 cf
Outflow = 1.38 cfs @ 10.06 hrs, Volume= 7,524 cf, Atten= 12%, Lag= 3.4 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Max. Velocity= 0.27 fps, Min. Travel Time= 6.8 min

Avg. Velocity= 0.08 fps, Avg. Travel Time= 21.6 min

Peak Storage= 562 cf @ 10.06 hrs

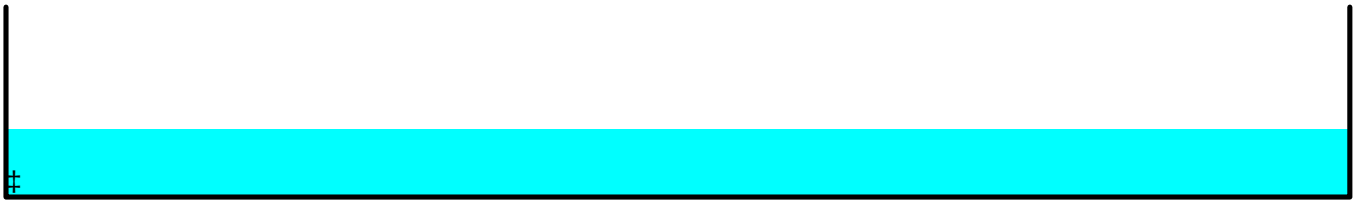
Average Depth at Peak Storage= 0.04'

Bank-Full Depth= 0.10' Flow Area= 14.4 sf, Capacity= 7.64 cfs

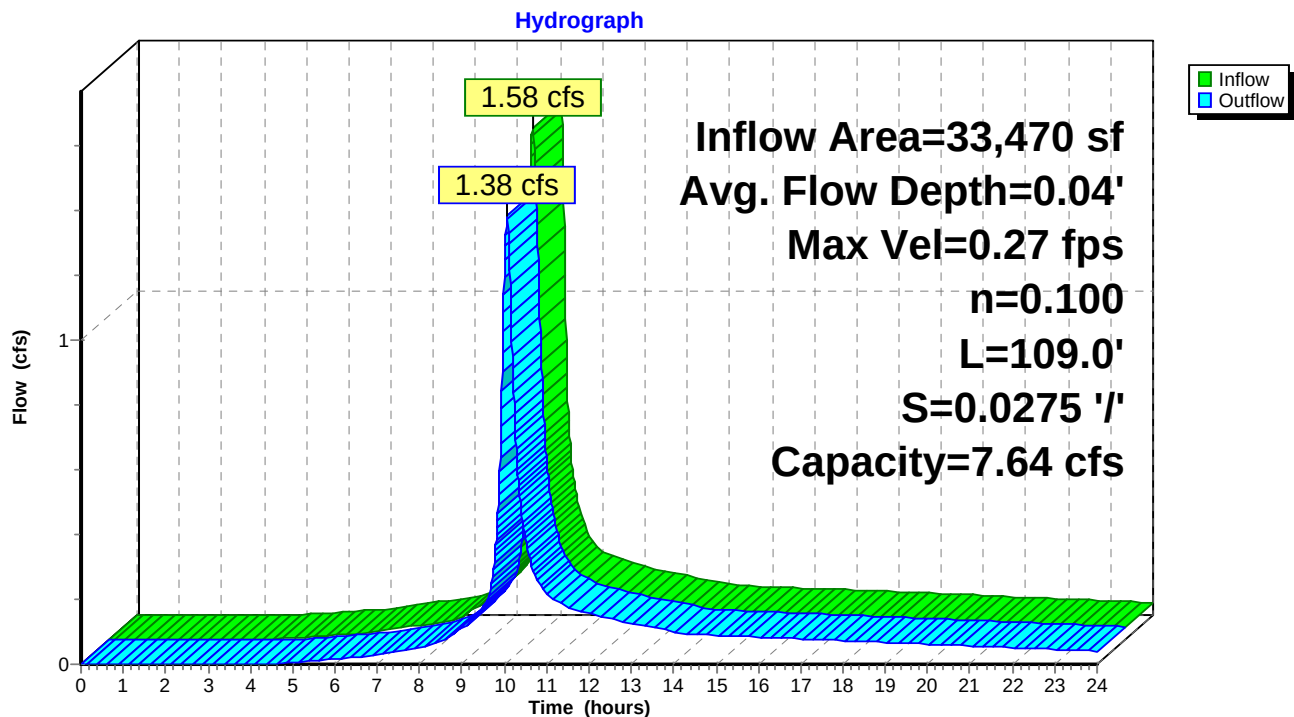
144.00' x 0.10' deep channel, n= 0.100

Length= 109.0' Slope= 0.0275 '/'

Inlet Invert= 47.00', Outlet Invert= 44.00'



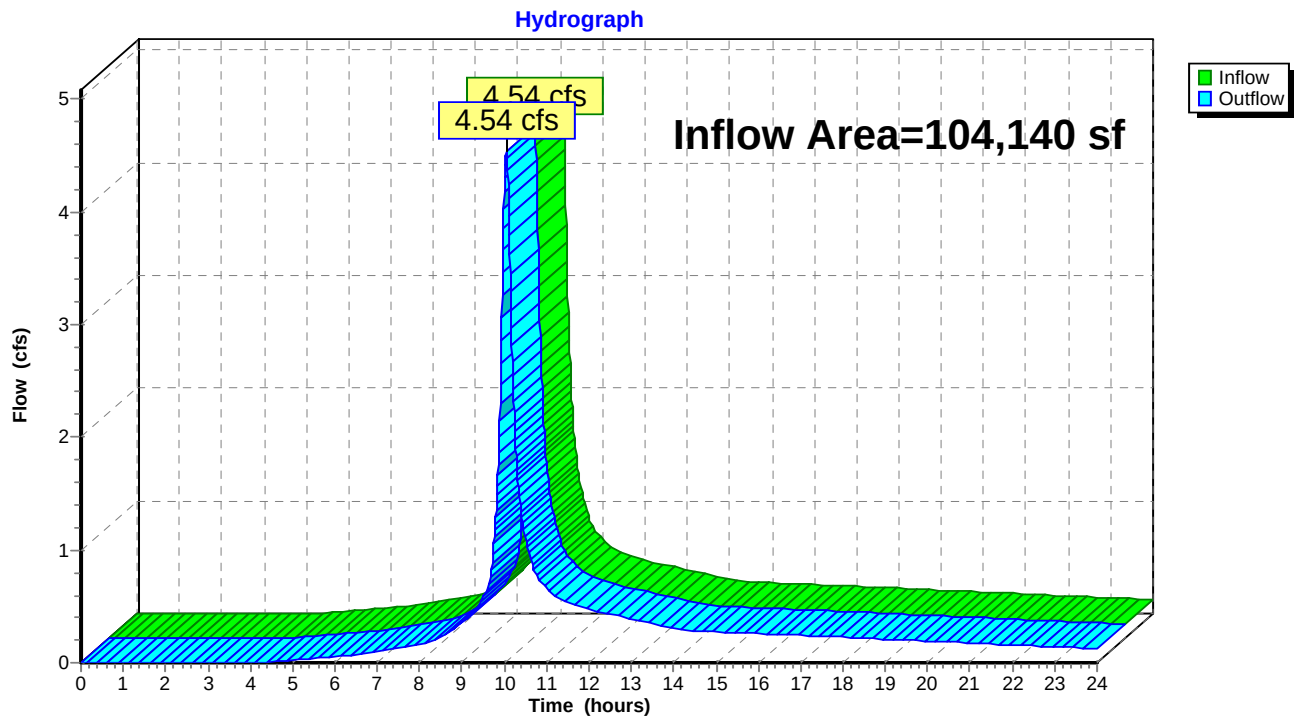
Reach 4eO: Lot 4 - Outlet (e)



Summary for Reach eO: Existing Total Discharge

Inflow Area = 104,140 sf, 0.00% Impervious, Inflow Depth > 2.71" for 10 YR 24 HR event
Inflow = 4.54 cfs @ 10.05 hrs, Volume= 23,479 cf
Outflow = 4.54 cfs @ 10.05 hrs, Volume= 23,479 cf, Atten= 0%, Lag= 0.0 min

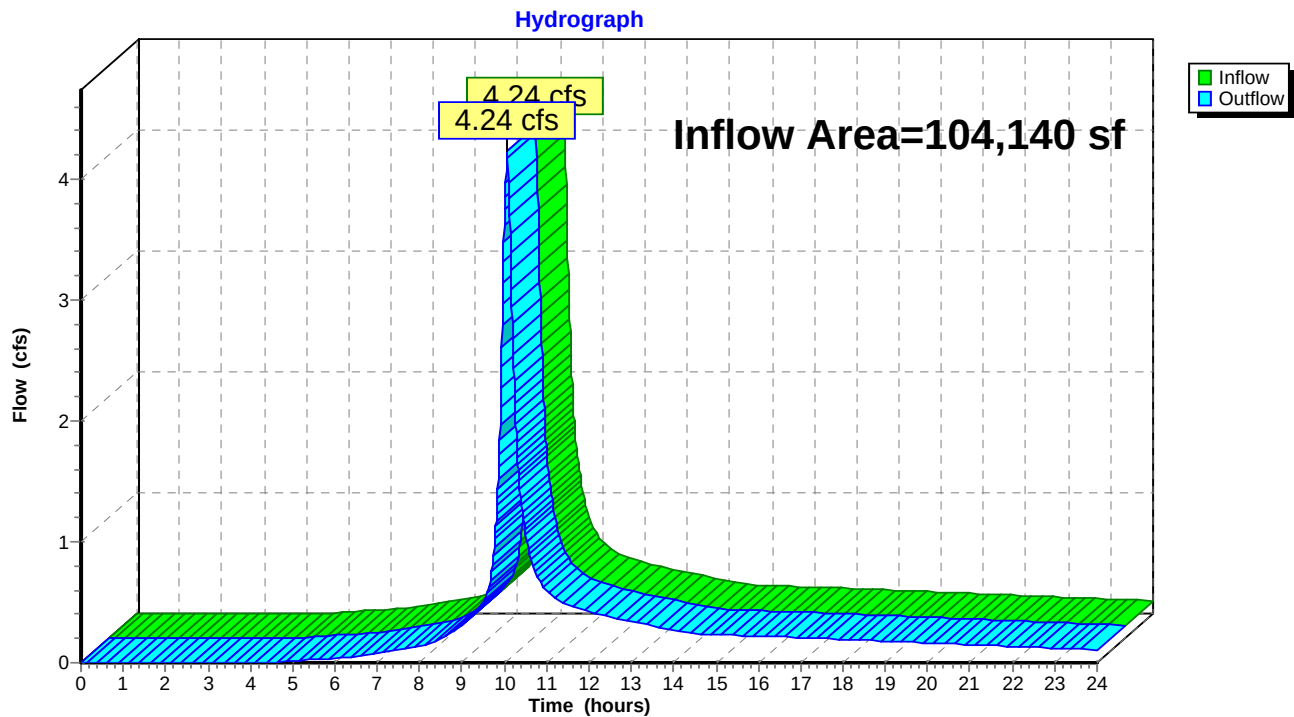
Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach eO: Existing Total Discharge

Summary for Reach pO: Proposed Total Discharge

Inflow Area = 104,140 sf, 16.39% Impervious, Inflow Depth > 2.40" for 10 YR 24 HR event
Inflow = 4.24 cfs @ 10.07 hrs, Volume= 20,863 cf
Outflow = 4.24 cfs @ 10.07 hrs, Volume= 20,863 cf, Atten= 0%, Lag= 0.0 min

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs

Reach pO: Proposed Total Discharge

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Summary for Pond 1-D: Lot 1 - Detention

Inflow Area = 2,240 sf, 36.61% Impervious, Inflow Depth > 3.66" for 10 YR 24 HR event
 Inflow = 0.13 cfs @ 10.00 hrs, Volume= 683 cf
 Outflow = 0.12 cfs @ 10.06 hrs, Volume= 682 cf, Atten= 12%, Lag= 3.3 min
 Discarded = 0.01 cfs @ 10.06 hrs, Volume= 292 cf
 Primary = 0.11 cfs @ 10.06 hrs, Volume= 390 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3

Peak Elev= 62.83' @ 10.06 hrs Surf.Area= 60 sf Storage= 21 cf

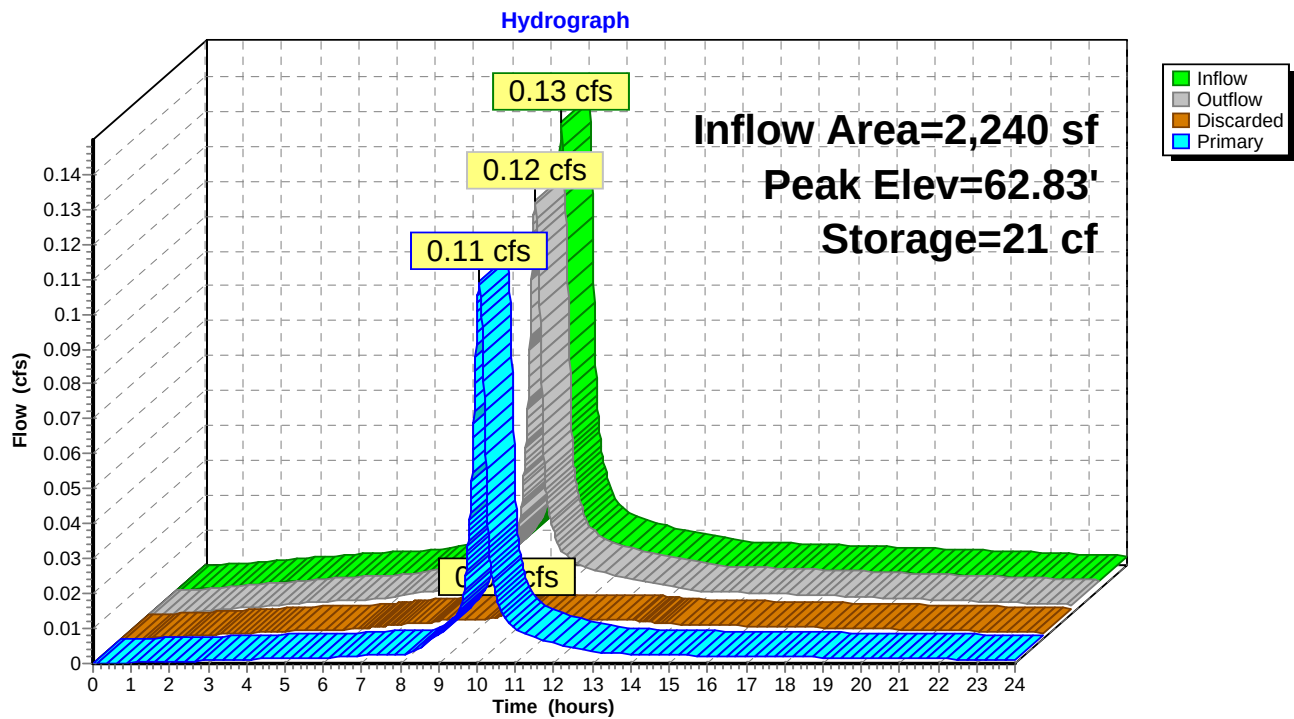
Plug-Flow detention time= 1.7 min calculated for 682 cf (100% of inflow)

Center-of-Mass det. time= 1.4 min (709.0 - 707.6)

Volume	Invert	Avail.Storage	Storage Description
#1	61.67'	78 cf	6.70'W x 9.00'L x 4.33'H Detention Tank 9'L x 6.7'W x 4.33'H Prismatic 261 cf Overall x 30.0% Voids
#2	64.83'	498 cf	26.30'W x 54.00'L x 1.17'H Pervious Pavers, 1420 sf 1,662 cf Overall x 30.0% Voids
		577 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	61.67'	2.0" Vert. Orifice - Bottom Outlet Pipe C= 0.600
#2	Primary	65.99'	2.0" x 2.0" Horiz. Grate - Overflow to Inlet C= 0.600 Limited to weir flow at low heads
#3	Discarded	61.67'	3.900 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 46.00'

Discarded OutFlow Max=0.01 cfs @ 10.06 hrs HW=62.83' (Free Discharge)↑ **3=Exfiltration** (Controls 0.01 cfs)**Primary OutFlow** Max=0.11 cfs @ 10.06 hrs HW=62.83' (Free Discharge)↑ **1=Orifice - Bottom Outlet Pipe** (Orifice Controls 0.11 cfs @ 5.00 fps)↑ **2=Grate - Overflow to Inlet** (Controls 0.00 cfs)

Pond 1-D: Lot 1 - Detention

Summary for Pond 1-S: Lot 1 - Spreader

Inflow Area = 5,720 sf, 75.17% Impervious, Inflow Depth > 3.18" for 10 YR 24 HR event
 Inflow = 0.32 cfs @ 10.01 hrs, Volume= 1,514 cf
 Outflow = 0.30 cfs @ 10.07 hrs, Volume= 1,510 cf, Atten= 6%, Lag= 3.4 min
 Discarded = 0.10 cfs @ 10.07 hrs, Volume= 1,439 cf
 Primary = 0.20 cfs @ 10.07 hrs, Volume= 71 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 52.21' @ 10.07 hrs Surf.Area= 181 sf Storage= 242 cf

Plug-Flow detention time= 21.2 min calculated for 1,509 cf (100% of inflow)
 Center-of-Mass det. time= 19.4 min (703.8 - 684.4)

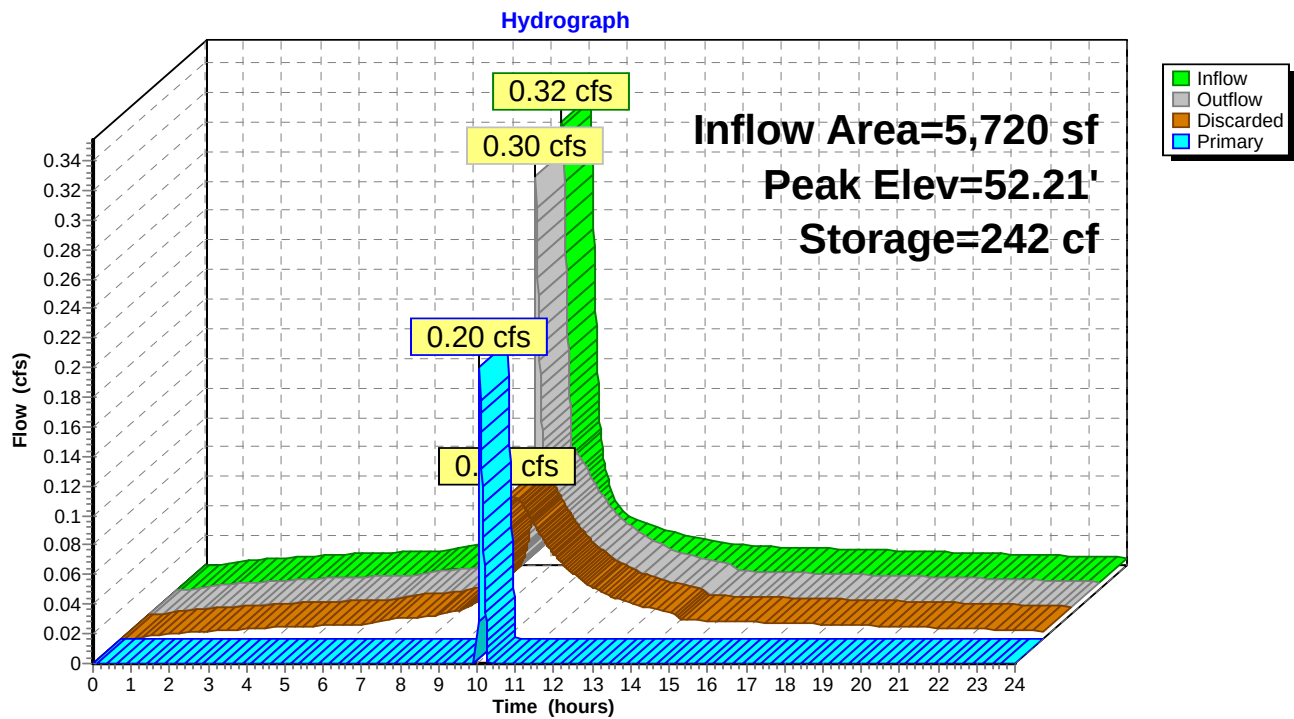
Volume	Invert	Avail.Storage	Storage Description
#1	47.75'	245 cf	2.50'W x 72.50'L x 4.50'H 72.5'L x 2.5'W x 4'D Gravel Trench Prismatoid 816 cf Overall x 30.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	52.20'	72.5' long x 3.0' breadth Spreader - Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Discarded	47.75'	3.900 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 38.00'

Discarded OutFlow Max=0.10 cfs @ 10.07 hrs HW=52.21' (Free Discharge)
 ↑ **2=Exfiltration** (Controls 0.10 cfs)

Primary OutFlow Max=0.13 cfs @ 10.07 hrs HW=52.21' (Free Discharge)
 ↑ **1=Spreader - Broad-Crested Rectangular Weir**(Weir Controls 0.13 cfs @ 0.22 fps)

Pond 1-S: Lot 1 - Spreader



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Summary for Pond 2-D: Lot 2 - Detention

Inflow Area = 1,970 sf, 39.59% Impervious, Inflow Depth > 3.67" for 10 YR 24 HR event
 Inflow = 0.12 cfs @ 10.00 hrs, Volume= 602 cf
 Outflow = 0.10 cfs @ 10.06 hrs, Volume= 602 cf, Atten= 11%, Lag= 3.2 min
 Discarded = 0.00 cfs @ 10.06 hrs, Volume= 129 cf
 Primary = 0.10 cfs @ 10.06 hrs, Volume= 473 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 62.20' @ 10.06 hrs Surf.Area= 60 sf Storage= 19 cf

Plug-Flow detention time= 2.3 min calculated for 602 cf (100% of inflow)
 Center-of-Mass det. time= 1.8 min (708.5 - 706.7)

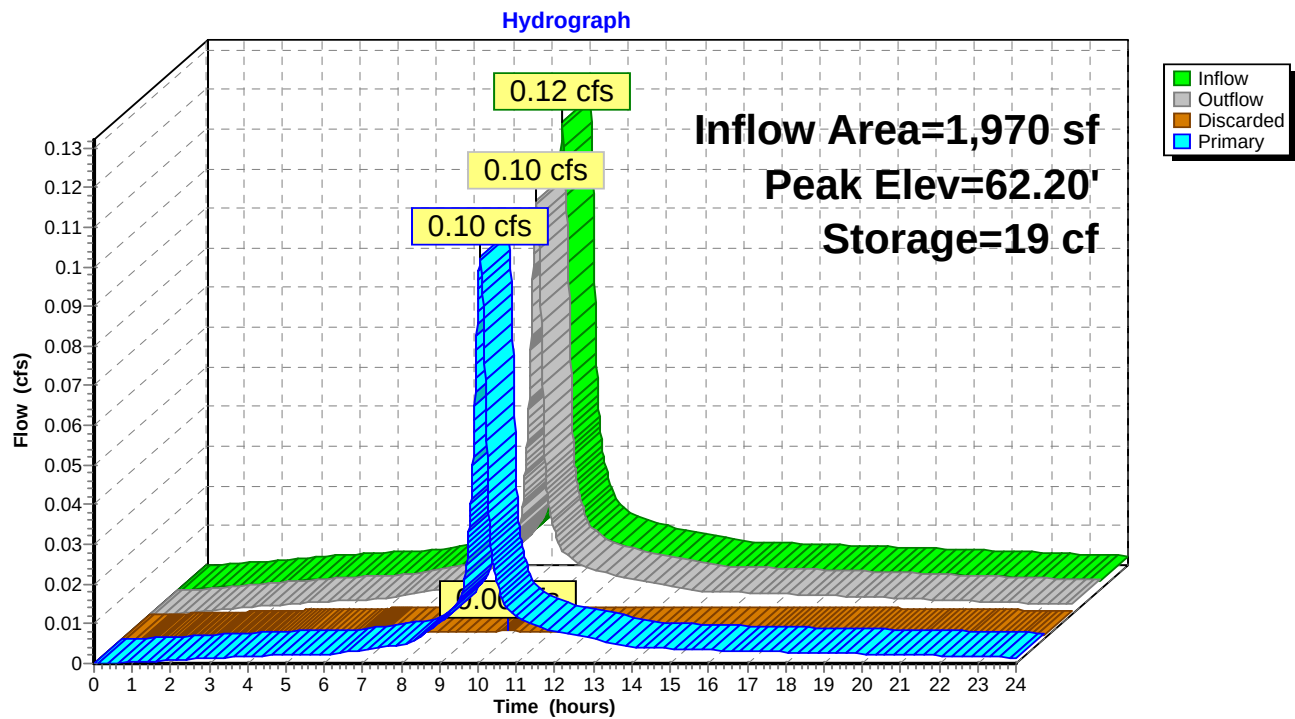
Volume	Invert	Avail.Storage	Storage Description
#1	61.17'	78 cf	6.70'W x 9.00'L x 4.33'H Detention Tank 9'L x 6.7'W x 4.33'H Prismatic 261 cf Overall x 30.0% Voids
#2	64.33'	418 cf	23.33'W x 51.00'L x 1.17'H Pervious Pavers, 1190 sf 1,392 cf Overall x 30.0% Voids
		496 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	61.17'	2.0" Vert. Orifice - Bottom Outlet Pipe C= 0.600
#2	Primary	65.49'	2.0" x 2.0" Horiz. Grate - Overflow to Inlet C= 0.600 Limited to weir flow at low heads
#3	Discarded	61.17'	1.400 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 42.00'

Discarded OutFlow Max=0.00 cfs @ 10.06 hrs HW=62.20' (Free Discharge)
 ↑ **3=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.10 cfs @ 10.06 hrs HW=62.20' (Free Discharge)
 ↑ **1=Orifice - Bottom Outlet Pipe** (Orifice Controls 0.10 cfs @ 4.69 fps)
 ↓ **2=Grate - Overflow to Inlet** (Controls 0.00 cfs)

Pond 2-D: Lot 2 - Detention



Summary for Pond 2-S: Lot 2 - Spreader

Inflow Area = 5,110 sf, 76.71% Impervious, Inflow Depth > 3.49" for 10 YR 24 HR event
 Inflow = 0.29 cfs @ 10.02 hrs, Volume= 1,486 cf
 Outflow = 0.29 cfs @ 10.03 hrs, Volume= 1,479 cf, Atten= 0%, Lag= 0.9 min
 Discarded = 0.04 cfs @ 10.03 hrs, Volume= 1,327 cf
 Primary = 0.25 cfs @ 10.03 hrs, Volume= 152 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 51.21' @ 10.03 hrs Surf.Area= 225 sf Storage= 301 cf

Plug-Flow detention time= 77.4 min calculated for 1,478 cf (99% of inflow)
 Center-of-Mass det. time= 73.6 min (762.5 - 688.9)

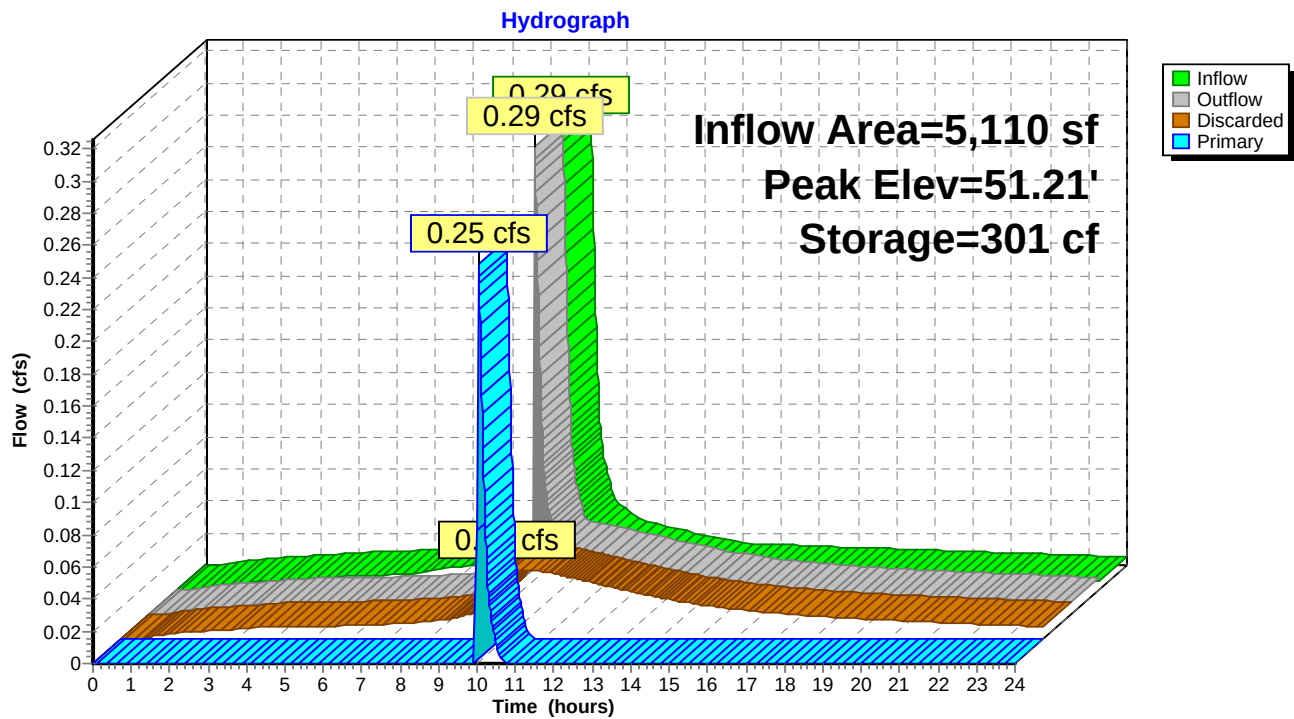
Volume	Invert	Avail.Storage	Storage Description
#1	46.75'	304 cf	2.50'W x 90.00'L x 4.50'H 90'L x 2.5'W x 4'D Gravel Trench Prismatoid 1,013 cf Overall x 30.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	51.20'	90.0' long x 3.0' breadth Spreader - Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Discarded	46.75'	1.400 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 37.00'

Discarded OutFlow Max=0.04 cfs @ 10.03 hrs HW=51.21' (Free Discharge)
 ↑ **2=Exfiltration** (Controls 0.04 cfs)

Primary OutFlow Max=0.16 cfs @ 10.03 hrs HW=51.21' (Free Discharge)
 ↑ **1=Spreader - Broad-Crested Rectangular Weir**(Weir Controls 0.16 cfs @ 0.22 fps)

Pond 2-S: Lot 2 - Spreader



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Summary for Pond 3-D: Lot 3 - Detention

Inflow Area = 1,850 sf, 40.00% Impervious, Inflow Depth > 3.67" for 10 YR 24 HR event
 Inflow = 0.11 cfs @ 10.00 hrs, Volume= 566 cf
 Outflow = 0.10 cfs @ 10.06 hrs, Volume= 565 cf, Atten= 11%, Lag= 3.2 min
 Discarded = 0.00 cfs @ 10.06 hrs, Volume= 60 cf
 Primary = 0.10 cfs @ 10.06 hrs, Volume= 506 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 62.12' @ 10.06 hrs Surf.Area= 60 sf Storage= 17 cf

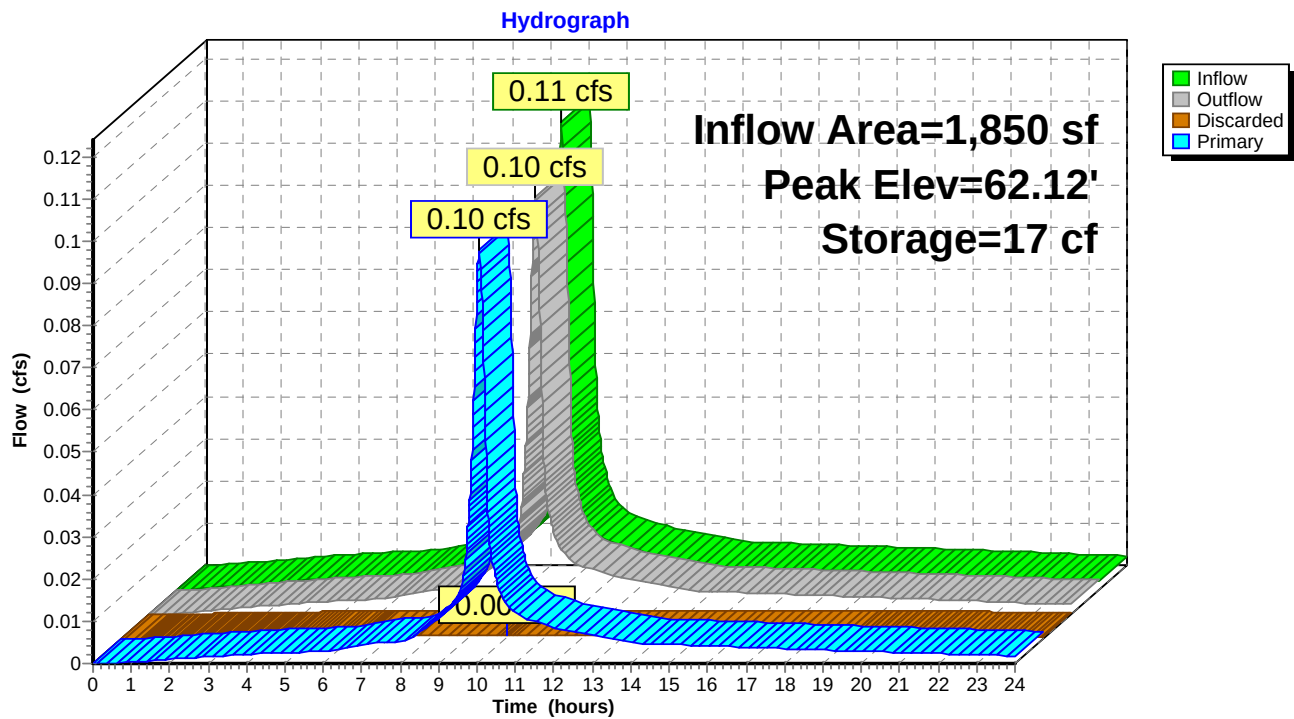
Plug-Flow detention time= 2.6 min calculated for 565 cf (100% of inflow)
 Center-of-Mass det. time= 2.0 min (708.5 - 706.5)

Volume	Invert	Avail.Storage	Storage Description
#1	61.17'	78 cf	6.70'W x 9.00'L x 4.33'H Detention Tank 9'L x 6.7'W x 4.33'H Prismatoid 261 cf Overall x 30.0% Voids
#2	64.33'	390 cf	27.07'W x 41.00'L x 1.17'H Pervious Pavers, 1110 sf 1,299 cf Overall x 30.0% Voids
		468 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	61.17'	2.0" Vert. Orifice - Bottom Outlet Pipe C= 0.600
#2	Primary	65.49'	2.0" x 2.0" Horiz. Grate - Overflow to Inlet C= 0.600 Limited to weir flow at low heads
#3	Discarded	61.17'	0.600 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 42.00'

Discarded OutFlow Max=0.00 cfs @ 10.06 hrs HW=62.12' (Free Discharge)
 ↑ **3=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.10 cfs @ 10.06 hrs HW=62.12' (Free Discharge)
 ↑ **1=Orifice - Bottom Outlet Pipe** (Orifice Controls 0.10 cfs @ 4.48 fps)
 ↓ **2=Grate - Overflow to Inlet** (Controls 0.00 cfs)

Pond 3-D: Lot 3 - Detention

Summary for Pond 3-S: Lot 3 - Spreader

Inflow Area = 5,440 sf, 79.60% Impervious, Inflow Depth > 3.67" for 10 YR 24 HR event
 Inflow = 0.31 cfs @ 10.01 hrs, Volume= 1,664 cf
 Outflow = 0.31 cfs @ 10.01 hrs, Volume= 1,505 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.01 cfs @ 10.01 hrs, Volume= 898 cf
 Primary = 0.30 cfs @ 10.01 hrs, Volume= 607 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 47.21' @ 10.01 hrs Surf.Area= 181 sf Storage= 242 cf

Plug-Flow detention time= 135.6 min calculated for 1,504 cf (90% of inflow)
 Center-of-Mass det. time= 74.2 min (766.0 - 691.9)

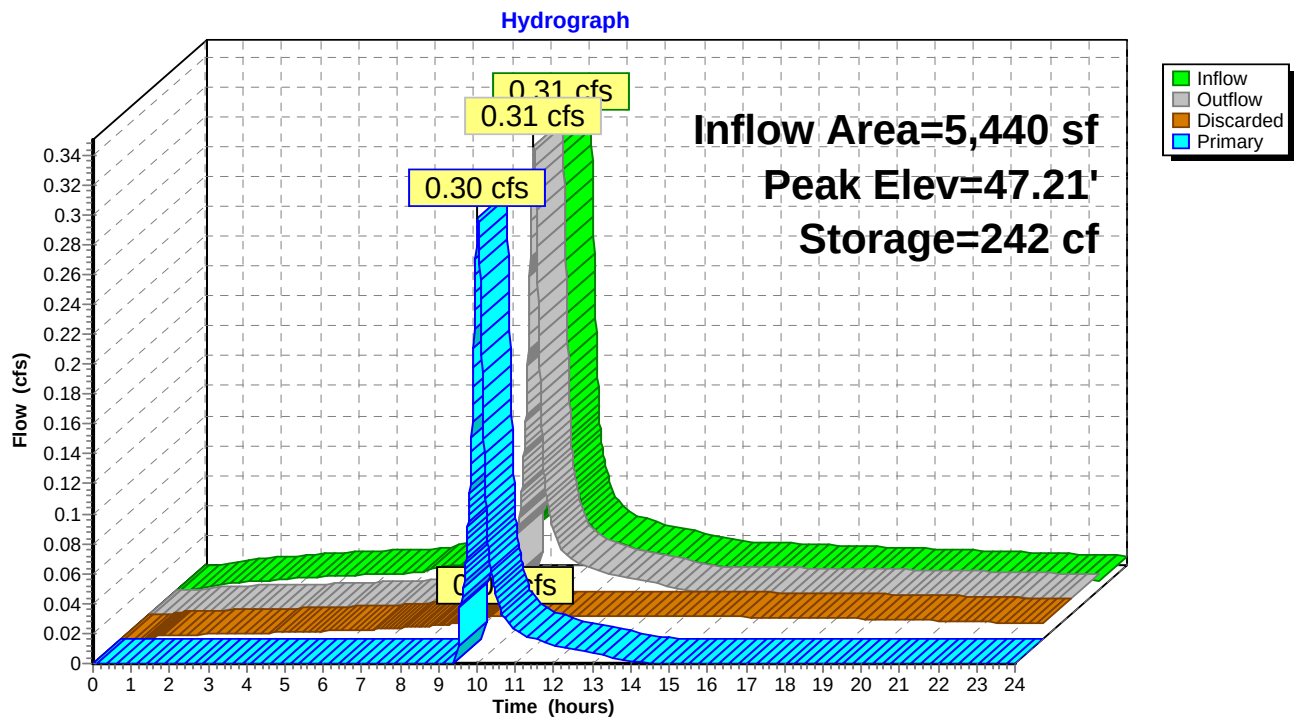
Volume	Invert	Avail.Storage	Storage Description
#1	42.75'	245 cf	2.50'W x 72.50'L x 4.50'H 72.5'L x 2.5'W x 4'D Gravel Trench Prismatoid 816 cf Overall x 30.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	47.20'	90.0' long x 3.0' breadth Spreader - Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Discarded	42.75'	0.600 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 33.00'

Discarded OutFlow Max=0.01 cfs @ 10.01 hrs HW=47.21' (Free Discharge)
 ↑ **2=Exfiltration** (Controls 0.01 cfs)

Primary OutFlow Max=0.19 cfs @ 10.01 hrs HW=47.21' (Free Discharge)
 ↑ **1=Spreader - Broad-Crested Rectangular Weir**(Weir Controls 0.19 cfs @ 0.23 fps)

Pond 3-S: Lot 3 - Spreader



Summary for Pond 4-D: Lot 4 - Detention

Inflow Area = 2,280 sf, 39.47% Impervious, Inflow Depth > 3.67" for 10 YR 24 HR event
 Inflow = 0.14 cfs @ 10.00 hrs, Volume= 697 cf
 Outflow = 0.12 cfs @ 10.06 hrs, Volume= 696 cf, Atten= 14%, Lag= 3.5 min
 Discarded = 0.00 cfs @ 10.06 hrs, Volume= 0 cf
 Primary = 0.12 cfs @ 10.06 hrs, Volume= 696 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 59.01' @ 10.06 hrs Surf.Area= 60 sf Storage= 24 cf

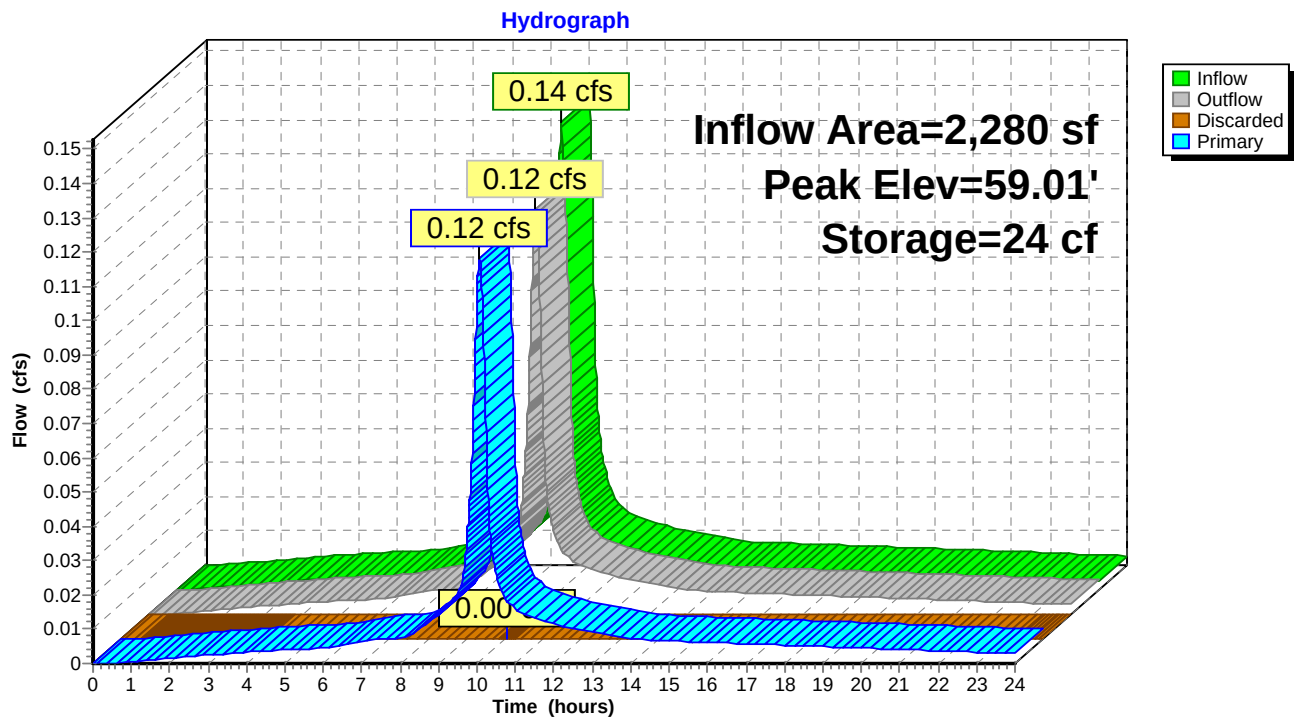
Plug-Flow detention time= 2.7 min calculated for 696 cf (100% of inflow)
 Center-of-Mass det. time= 2.0 min (708.7 - 706.7)

Volume	Invert	Avail.Storage	Storage Description
#1	57.67'	78 cf	6.70'W x 9.00'L x 4.33'H Detention Tank 9'L x 6.7'W x 4.33'H Prismatic 261 cf Overall x 30.0% Voids
#2	60.83'	485 cf	29.20'W x 47.30'L x 1.17'H Pervious Pavers, 1380 sf 1,616 cf Overall x 30.0% Voids
		563 cf	Total Available Storage

Device	Routing	Invert	Outlet Devices
#1	Primary	57.67'	2.0" Vert. Orifice - Bottom Outlet Pipe C= 0.600
#2	Primary	61.99'	2.0" x 2.0" Horiz. Grate - Overflow to Inlet C= 0.600 Limited to weir flow at low heads
#3	Discarded	57.67'	0.001 in/hr Exfiltration over Surface area Conductivity to Groundwater Elevation = 42.00'

Discarded OutFlow Max=0.00 cfs @ 10.06 hrs HW=59.01' (Free Discharge)
 ↑ **3=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.12 cfs @ 10.06 hrs HW=59.01' (Free Discharge)
 ↑ **1=Orifice - Bottom Outlet Pipe** (Orifice Controls 0.12 cfs @ 5.40 fps)
 ↓ **2=Grate - Overflow to Inlet** (Controls 0.00 cfs)

Pond 4-D: Lot 4 - Detention

Summary for Pond 4-S: Lot 4 - Spreader

Inflow Area = 5,900 sf, 76.61% Impervious, Inflow Depth > 3.79" for 10 YR 24 HR event
 Inflow = 0.33 cfs @ 10.02 hrs, Volume= 1,864 cf
 Outflow = 0.33 cfs @ 10.02 hrs, Volume= 1,597 cf, Atten= 0%, Lag= 0.0 min
 Discarded = 0.00 cfs @ 10.02 hrs, Volume= 2 cf
 Primary = 0.33 cfs @ 10.02 hrs, Volume= 1,595 cf

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.01 hrs / 3
 Peak Elev= 45.71' @ 10.02 hrs Surf.Area= 200 sf Storage= 268 cf

Plug-Flow detention time= 152.6 min calculated for 1,597 cf (86% of inflow)
 Center-of-Mass det. time= 65.9 min (761.9 - 695.9)

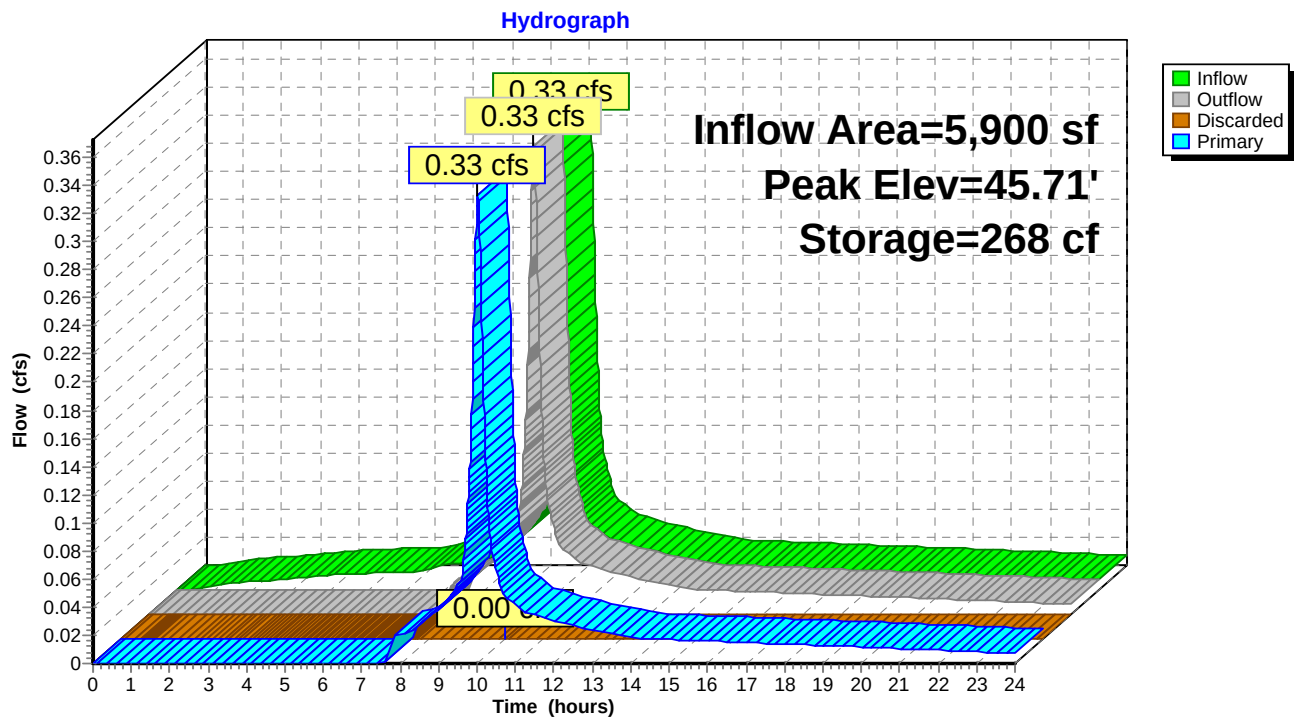
Volume	Invert	Avail.Storage	Storage Description
#1	41.25'	270 cf	2.50'W x 80.00'L x 4.50'H 80'L x 2.5'W x 4'D Gravel Trench Prismatoid 900 cf Overall x 30.0% Voids

Device	Routing	Invert	Outlet Devices
#1	Primary	45.70'	90.0' long x 3.0' breadth Spreader - Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32
#2	Discarded	41.25'	0.001 in/hr Exfiltration over Wetted area Conductivity to Groundwater Elevation = 31.50'

Discarded OutFlow Max=0.00 cfs @ 10.02 hrs HW=45.71' (Free Discharge)
 ↑**2=Exfiltration** (Controls 0.00 cfs)

Primary OutFlow Max=0.21 cfs @ 10.02 hrs HW=45.71' (Free Discharge)
 ↑**1=Spreader - Broad-Crested Rectangular Weir**(Weir Controls 0.21 cfs @ 0.24 fps)

Pond 4-S: Lot 4 - Spreader



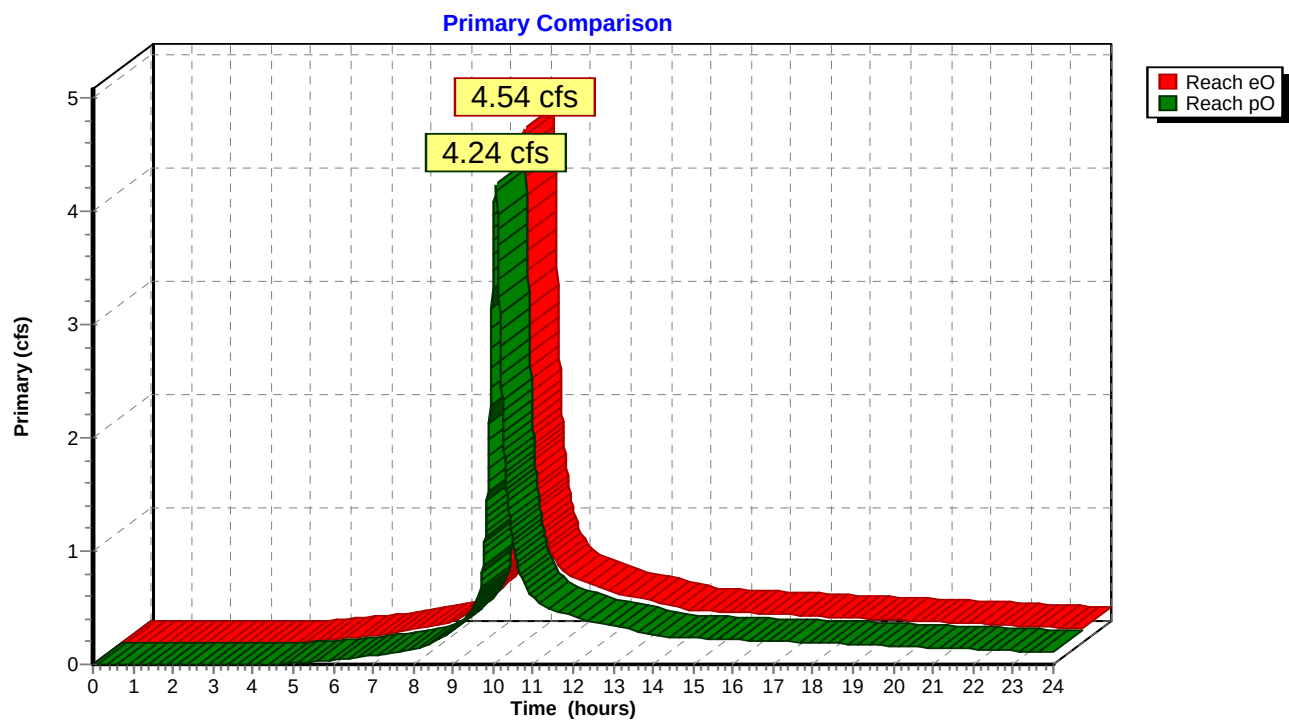
15147-5_model

Prepared by Mesiti-Miller Engineering

HydroCAD® 10.00-18 s/n 04524 © 2016 HydroCAD Software Solutions LLC

Type I 24-hr 10 YR 24 HR Rainfall=4.00", AMC=3

Printed 4/26/2017





APPENDIX D

Geotechnical Investigation

**GEOTECHNICAL INVESTIGATION
For
Five Home Residential Development
Valleamar Street and Juliana Avenue
APN 037-086-23, -26, -27, -28, -29
Lots A, D, E, F, G
Moss Beach, California**

**Prepared For
Moss Beach Associates, LLC
c/o Lawlor LandUse Manager, Santa Cruz, California**

**Prepared By
HARO, KASUNICH & ASSOCIATES, INC.
Geotechnical & Coastal Engineers
Project No. SM10391.2
August 2016**

Project No. SM10391.2
12 August 2016

MR. OWEN LAWLOR
Moss Beach Associates LLC
c/o Lawlor LandUse
612 Spring Street
Santa Cruz, CA 95060-2030

Subject: Geotechnical Investigation

Reference: Five Home Residential Development
Vallemar Street and Juliana Avenue
APN's 037-086-23, -26, -27, -28, & -29
Moss Beach, California

Dear Mr. Lawlor:

In accordance with your authorization, we have performed a Geotechnical Investigation for the referenced property in Moss Beach, California. This investigation was completed with consideration to the Coastal Bluff Recession Map prepared by our firm for the referenced property. The Coastal Bluff Recession Map is included in the appendix of this report and should be reviewed as part of this document.

The accompanying report presents our geotechnical recommendations and design criteria, along with the results and methodology of our investigation. If the recommendations in our geotechnical report are followed during project design and construction, the project will be subject to "ordinary risks" as defined in the Scale of Acceptable Risks From Geologic Hazards" in Appendix E of this report. If this level of risk is unacceptable, more extensive mitigation of the hazards can be recommended. In brief we have recommended the new residences be situated landward of the estimated 50 year coastal bluff recession setback and supported by conventional spread foundations embedded into an earthen mat of engineered fill.

If you have any questions concerning our conclusions or recommendations, presented in this report please contact our office.

Respectfully Submitted,

HARO, KASUNICH AND ASSOCIATES, INC.

Moses Cuprill
C.E. 78904

MC/mc

Copies: 3 to Addressee + pdf lawlor@gmail.com
pdf to rodney@m-me.com



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GEOTECHNICAL INVESTIGATION

Introduction

This report presents the results of our Geotechnical Investigation for the proposed construction of five (5) new single family dwellings on five separate parcels. The five parcels are designated on preliminary maps as lots A, D, E, F, & G. Lots B and C are designated as open space. We have also prepared an estimated 50 year future coastal bluff recession map for the bluff that borders Lots A, B, C, & D. The recession map should be reviewed in conjunction with this geotechnical investigation.

Purpose and Scope

The purpose of the geotechnical investigation is to develop geotechnical design parameters for design and construction of the new residences at the referenced site. We performed slope stability analysis on a critical cross section selected by HKA and developed from a topographic map prepared for this site. The critical cross section is cut through one of the steepest portions of the coastal bluff and area of the proposed home site to estimate for potential of bluff failures. This information also corroborated the slope stability portion of the estimated 50 year future coastal bluff recession setback.

Specifically we did the following:

- A. Document review of information provided by property owner in our files pertinent

to the site and region, including:

- Coastal Bluff Recession Map and Cross Sections, prepared by Haro, Kasunich and Associates Inc., dated 9 March 2015.
- Architectural plan sheets A3.1 – A3.4, prepared by Pearson Design Group, Undated.
- Site sections L4.1 – L4.3, prepared by Verde Design, dated 28 July 2015.
- Civil plan sheets C1.0 – C8.0 dated 5 August 2016, prepared by Mesiti-Miller Engineering.
- Conferred with and discussed scope and requirements with San Mateo County Public Works department, Diana Shu and County Geologist Jean Demouthe.

B. Met at the site with the Project Biologist to review environmental constraints at the project site. HKA placed wood stakes at each of the test boring locations and contacted USA Underground as mandated by law within 48 hours of scheduled drill date.

C. HKA obtained a geotechnical soil boring permit for this project site from San Mateo County Health Services Division (SMCHSD). A soil boring location map and

Drilling Notification Form was submitted to SMCHSD a minimum 48 hours prior to the scheduled drill date.

- D. Subsurface exploration consisting of logging and interval sampling of soils encountered in five (5) exploratory test bore holes advanced in the area of the proposed residences between 13.5 to 25.0 feet deep. The exploratory test bore holes were advanced using portable drilling equipment that was hand carried onto the site in parts and built in place of each test boring location. The soil samples obtained were sealed and returned to our laboratory for testing. After completion of each test boring the drilled shaft was infilled with a cement grout mixture specified by SMCHSD. The mixing and placement of the grout was performed by a drilling contractor with a C-57 license. Pictures were taken during this operation and forwarded to Lawlor Land Use see Appendix F of this report. Soil cuttings were hauled off site for proper disposal.
- E. A total of five (5) percolation test holes were advanced near the areas of the proposed drain fields between 2.15 to 4.04 feet deep. The holes were advanced using hand auger gear. Percolation tests were performed within the drilled shafts following an EPA and San Mateo County procedures for determining percolation test rate within soils. The holes were backfilled with soil cuttings.

- F. Laboratory testing of select samples obtained. Moisture content and dry density tests of selected samples was performed to evaluate the consistency of the in situ soils. Soil strength parameters were derived from in-situ field penetration tests (SPT), an unconfined compression test, and a laboratory direct shear test on select samples under saturated and in-situ moisture contents. Atterberg limits tests were performed on select clay soil samples to qualify its expansion potential. Corrosion testing was performed on bulk samples of site soil.
- G. Quantitative slope stability analysis was performed on a critical cross section (Section 3) cut through on one of the steepest portions of the coastal bluff and the area where one of the proposed home sites is nearest the bluff. The location of the critical cross section was selected by HKA from site observations and review of a topographic map prepared for this site. The analysis were run under static and pseudo static (seismic) loading conditions.
- H. Geotechnical analysis with consideration to our laboratory test results, slope stability results, the estimated 50-year future coastal bluff recession setback, our experience in the area, and engineering judgement. Our analysis developed geotechnical design parameters for building foundations, grouted soil anchors, retaining walls, and concrete slab-on-ground.

- I. Preparation of this report summarizing our findings, conclusions, and recommendations.

Site Location and Project Description

The project site consists of five privately owned parcels on the seaward side of California State Highway 1. The parcels make up an undeveloped field bound by Vallemar Street to the east and Juliana Avenue to the south. The project site is a relatively flat, elevated marine terrace that sits approximately 45 feet above sea level. The project site is covered with grasses, ice plant, trees, and shrubs. There is evidence of historical grading, associated with the construction of Vallemar Street and possibly Highway 1. A fill wedge descends from the seaward side of Vallemar Street down to the landward side of the project site. The coastal bluffs that line the seaward side of the project site are steeply cut from years of wave attack. A drainage swale which appears to be part of the construction of Juliana Avenue runs along the southeast side of the project side and discharges into a small ravine descending to the beach below.

Based on interaction with Lawlor LandUse and review of conceptual drawings, HKA understands the proposed improvements consists of the following. Grading of building pads on each site by means of cut and fill construction methods. A new single family dwelling and driveway is shown to be constructed on each parcel. The parcels are designated by lot lettering. Lot A on the north corner of the site and Lot G to its east. Lot

D, E, and F are located on the southeast side of the project site adjacent to Juliana Avenue. Lot D is the seaward most, Lot F is adjacent to Vallemar Street, and Lot E is between the two. The new homes are referred to as the "Home A, D, E, F, and G" respective to the lot letter for this project and within this report.

Home A and Home G are shown to have frontage onto Vallemar Street. The driveway and parking area for Home A is shown to be built up with 2 to 5 feet of engineered fill and the 2 story house is shown to be cut into the fill embankment with its upper level even with the parking area. Home G is shown to be cut into the site up to five feet and fill placed on the down slope side of the access driveway. Retaining or basement walls are anticipated on the upslope side of the Home A and Home G.

Home D, Home E, and Home F are shown to have frontage onto Juliana Avenue. Each of these home will require construction of a small bridge to cross the drainage swale adjacent Juliana Street. Starting at home F, a cut is shown on the upslope side on the order of 2 to 4 feet and a fill on the order of 4 feet shown the downslope side. Home E is shown to have significantly less grading with cut and fills on the order of 1 to 3 feet. Home D is shown to have minimal grading with cut and fills 1 foot thick or less.

Field Exploration

On 22 and 24 March 2016 a total of five (5) exploratory test bore holes were advanced at the project site. One test boring near the location of each home site. On 30 March 2016 we returned to the site and advanced five (5) percolation test bore holes near the area of the proposed drain fields for the homes.

The exploratory test boring in the area of the new homes were advanced to depths of 13.5 to 25 feet below the ground surface (bgs). The exploratory test bore holes were advanced using solid flight auger portable drilling equipment that was hand carried onto the site in parts and built at the locations of each test borings. The soil samples obtained were sealed and returned to our laboratory for testing. After completion of each test boring the drilled shaft was infilled with a cement grout mixture specified by SMCHSD. The mixing and placement of the grout was performed by a drilling contractor with a C-57 license. Pictures were taken during this operation and forwarded to the Lawlor Land Use. Soil cuttings were placed into 5 gallon buckets and hand carried to a waiting truck. The packed soil was transferred off site for proper disposal See Appendix F of this report for pictures of drilling operation.

A total of five (5) percolation test holes were advanced near the areas of the proposed drain fields between 2.15 to 4.04 feet deep. The holes were advanced using hand auger gear. Percolation tests were performed within the drilled shafts following an EPA

procedure for determining percolation test rate within soils. The holes were backfilled with soil cuttings.

To provide extra protection against disturbance of the site a large tarp was laid over the work areas. Each exploratory and percolation test boring was advanced through the tarp and all buckets, drilling parts, soils cuttings etc. were carefully handled over the tarp. After the work area was cleared the tarp was folded up and the plants were replaced.

In-situ samples were collected from within the exploratory test borings. Samples were obtained by driving a California Sampler (3 inch outside diameter) or split spoon sampler (2 inch outside diameter) up to 18 inches in depth at select elevations using a standard 140-pound hammer over a 30-inch drop. The amount of blows to drive the sampler 1 foot were recorded and presented on our logs of borings attached to this letter (Figures 4 to 13). The logs also include profiles of the percolation test bore holes.

The approximate location of test bore holes are shown on our Test Boring Location Map (Figure 2). The soil encountered in the borings was continuously logged in the field and described in accordance with the Unified Soil Classification System (ASTM D2487).

Laboratory Testing

The laboratory testing program was directed toward determining pertinent soil engineering, corrosion, and index properties.

The natural moisture content was determined on select samples and is recorded on the Logs of Test Borings at the appropriate depths. Since water has a significant influence on soil, the natural moisture content provides a rough indicator of the soil's compressibility, strength, and potential expansion characteristics.

A saturated moisture direct shear tests and an in-situ moisture unconfined compression test were completed to determine strength properties for coastal terrace. Density tests were also performed to aid in the assignment of soil properties to each soil type.

Atterberg limits tests were performed on select clay soil samples to qualify its expansion potential. The Atterberg limits were run on a select near surface sample collected from within the exploratory test boring advanced on each of the home sites.

The results of the field and laboratory testing appear on the "Logs of Test Borings" opposite the samples tested (Figures 4 through 13).

Subsurface Conditions

In general within test bore holes advanced in the area of the home sites the soil profile encountered consisted of clay soil over either silty sand, clayey sand, sand with silt or a combination of thereof all overlying a hard bedrock formation. The overburden soils are interpreted as coastal terrace and were loose near the surface and became mostly medium dense and occasionally dense with depth. The coastal terrace was mixed with organics and roots within the upper 1 to 2 feet as a result of top soil development. The upper 6 to 8 feet of the coastal terrace was stiff to very stiff sandy clay or clay. In the area of Home G the clay layer was 15 feet thick. The silt clay sand mixtures extended below the clay layer to a depth of approximately 25 feet bgs where drilling refusal was encountered. We interpret this contact as hard bedrock.

In the percolation test bore holes advanced in the area of the proposed drain fields for Home A, Home F, and Home G consisted of top soil in the top foot and silty sand below that. These locations had low to moderately low percolation rates. In the locations of the drain fields for Home D and Home E the soil encountered consisted of 1 foot of top soil over clay. These locations had zero percolation.

Expansive Soils

Based on the measured Atterberg Limits, the clay soil collected within the foundation zone of the home sites was qualified to have moderately high potential for expansion and in

the upper 2 to 3 feet at Home D and Home E it has a high potential for expansion. There was a large standing puddle observed in this area for several weeks during the course of our field exploration phase of this study. The clay soil with moderately high potential for expansion (Homes A, F, & G) can be mitigated for foundation support if the recommendations in this report are carefully followed during development of project plans and during construction. The clay soil with high potential for expansion in foundation zones (Homes D & E) should be removed and replaced with select granular fill.

Groundwater

Groundwater was encountered within our test bore holes advanced at Homes D, E, & F adjacent to Juliana Avenue. The groundwater was encountered at 17 feet bgs near Vallemar Street and 13 feet at Home D closer to the bluff. The groundwater appears to be perched upon the bedrock and seeping through the terrace near the contact. That being said saturated soils and active seeps in the coastal terrace soils should be anticipated and planned for by designers and contractors. Retaining wall back drains and under slab blanket drains will be essential for the design of this structure. It is recommended to relieve drainage collected in these subsurface systems through a gravity flow if possible.

Liquefaction Potential

Liquefaction is a phenomenon where loose to medium dense soils with low to zero

cohesion that are submerged and subject to seismic shaking can temporarily lose their shear strength. This is most common in young alluvial soils near sloughs, rivers, and flood plains. Although medium dense sand and silt was encountered just above the bedrock formation it was relatively thin and more than 15 feet bgs. Based on the lack of evidence of ground effects related to liquefaction occurring within coastal terrace the potential for liquefaction at the site is low.

Soil Properties

Based on our field exploration and results of laboratory tests the soils encountered were simplified into two soil types. Soil Type 1: Clay Soil Coastal Terrace and Soil Type 2: Silt Sand Clay Mixture Terrace Deposit, Soil type 3: Bedrock Formation. The geotechnical strength parameters of the soil types are summarized in the table below.

Table 1: Geotechnical Design Values

Soil Stratum	γ_t (lbs/ft ³)	ϕ (degrees)	Cohesion (lbs/ft ²)
Soil 1	123	10	1000
Soil 2	113	43	200
Soil 3	135	45	1000

Erosion

Surficial soils at the site are prone to erosion which can be severe where there are steep slopes and uncontrolled runoff, particularly where the natural drainage is modified by the works of man and not properly controlled. Typically, once the upper surface of the material is breached by a rill or a gully, erosion proceeds at an accelerated rate, and the rills and gullies deepen and migrate headward (upslope). This process may contribute to the initiation of debris flows if rills and gullies are not mitigated or maintained and if surface drainage controls are not adequately designed and constructed.

Surface Drainage

The project site is located near a coastal bluff comprised partially of coastal terrace deposits that are susceptible to erosion, particularly by concentrated uncontrolled runoff of surface drainage. The proposed improvements will increase the runoff flow rate shedding away from the site. Collection of surface runoff into drain lines with single discharge points will further concentrate it relative to the sheet flow type drainage prior to improving the site. Development of an engineered drainage plan that conveys surface runoff to multiple discharge locations and promotes sheet type flow of collected drainage is recommended for this site. Level drainage spreaders are an example of this type of system.

Geotechnical Related Seismicity

The improvements should be designed in conformance with the most current California Building Code (2013 CBC). For seismic design, the soil properties at the site are classified as **Site Class “D”** based on definitions presented in Table 1613.5.2 in the 2013 CBC. The longitude and latitude were determined using a satellite image generated by Google Earth. These coordinates were taken from the approximate middle of the area of the proposed improvements:

Longitude = -122.5169, Latitude = 37.5300

The coordinates listed above were used as inputs in the Java Ground Motion Parameter Calculator created by the USGS to determine the ground motion associated with the maximum considered earthquake (MCE) SM and the reduced ground motion for design SD. The results are as follows:

Site Class D

SM_s= 2.269 g

SM₁= 1.439 g

SD_s= 1.512 g

SD₁= 0.960 g

A maximum considered earthquake geometric mean (MCE_G) peak ground acceleration (PGA) was estimated using the Figure 22-7 of the ASCE Standard 7-10. The mapped

PGA was 0.89 g and the site coefficient F_{PGA} for Site Class D is 1.0. The MCE_G peak ground acceleration adjusted for Site Class effects is $PGA_M = F_{PGA} * PGA$

$$PGA_M = 1.0 * 0.89 \text{ g} = 0.89 \text{ g}$$

Quantitative Slope Stability Analysis

Stability analysis was performed on the worst case or critical cross section cut through the coastal bluff and Lot D. The critical section (Cross Section 3) was selected by HKA and developed using a topographical map prepared by Gary Ifland surveyor, Inc. A copy of the cross section is included with this report (Appendix C). The slope stability analysis was performed to quantify the potential for bluff failure that could impact the proposed building site. It also corroborated the development of the recommended 50-year future coastal bluff recession slope stability setback line.

General Methodology

Slope failures or landslides can cause problems including encroachment and undermining of engineered structures. Failures of slopes occur when stress acting on the soil mass is greater than its internal strength (shear strength). A slope is considered stable when the strength of its soil mass is greater than the stress field acting within it.

Some common variables influencing stress are gravity (steeper slopes), hydrostatic pressure (perched groundwater), bearing pressures (proposed structures), and seismic surcharge (earthquake shaking).

Various methods of analyzing stability of slopes yield a factor of safety. A factor of safety is determined by dividing the resisting forces within the slope soils by the driving forces within the slope (stress field). A factor of safety (FS) greater than or equal to 1.0 is considered to be in equilibrium. A FS less than 1.0 is a potentially un-stable slope condition. HKA considers the potential for instability of a slope or hillside with a FS against sliding greater than or equal to 1.10 under seismic loading conditions and 1.50 under static loading conditions to be low.

Quantitative Analysis with GSTABL7

The analysis was completed with the aid of GSTABL7 software. A model for the section was defined with the input parameters consisting of slope geometry, soil properties, loading conditions, and pore water pressure ratio. Each model was evaluated under static and seismic loading. The analysis calculates the factor of safety against sliding for the failure surface(s).

Circular failure surfaces were assumed for this model. GSTABL7 program uses the Simplified Bishop Method of Slices to determine normal and resistive forces in each slice.

The forces in each slice are then summed up for total force acting on the mass. The computer program assumes many failure surfaces using initiation and termination points on the ground surface selected by the user. These chosen points represent the toe and scarp of each potential landslide in relation to the assumed failure surfaces. The critical trial failure surface from the pseudo static analysis condition was selected as the projected failure surface in the development of design parameters.

Seismic Coefficient

The ground motion parameter used in pseudo static analysis is referred to as the seismic coefficient “k”. The selection of a seismic coefficient has relied heavily on engineering judgment, local building code, and professional publications. Current version of the California Building Code contains reference to maps of peak ground acceleration (PGA) based on site latitude and longitude. For this project the mapped PGA is 0.89g. The PGA is multiplied by a factor related to the seismicity of the site to obtain the seismic coefficient. The factor was estimated to be 0.58 by using Figure 1 of Chapter 5 Analysis of Earthquake-Induced Landslide Hazards in CGS *Special Publication 117 Guidelines For Analyzing and Mitigating Seismic Hazards in California 2008*.

The multiplying factor was developed as part of a screen analysis procedure for seismic slope stability by Stewart, Blake, and Hollingsworth. The multiplier results in a percentage of the peak which represents the more repeatable ground motion. The assumption is the

site can tolerate at least 2 inches of displacement during a design seismic event. The higher the multiplying factor the less displacement during a design seismic event is assumed to be tolerable by site improvements. For example if the full peak ground acceleration is used in the analysis (multiplier of 1.0) it is assumed 0 inches of displacement is tolerated during a design seismic event. For this project we assumed 2 inches of ground displacement is tolerable resulting a horizontal seismic coefficient of 0.51g.

Geometric Assumptions

For our analysis, failure surfaces were focused within Soil 1 "Unclassified Fill and Coastal Terrace Deposits" due to its vulnerability to bluff failures relative to Soil 2 "Bedrock Formation" which is much more resistance to erosional processes and slope failures. The trial failure surfaces used in the analysis were selected using engineering judgment as well as the software's ability to generate many random surfaces.

Slope Stability Conclusions

The computed factors of safety for the trial failure surfaces are greater than 1.50 under static loading conditions and 1.10 for pseudo-static conditions. The results of our analysis indicate that the portion of the coastal bluff comprised of terrace deposits is stable at slope gradients of 1.5:1 (H:V) or flatter. Based on these results the potential for instability of the coastal bluff impacting the proposed home sites is low. However, portions of the coastal

bluff that have slope gradients steeper than 1.5:1 (H:V) are predicted to have bluff failures until the slope gradient recesses to 1.5:1 (H:V). A portion of the coastal terrace deposit portion of the bluff along Cross Section 1 and 4 are flatter than 1.5:1 (H:V). These slope gradients are estimated to be stable and therefore slope stability analysis was not performed on these cross sections. Section 2 is similar to Section 3 but a little flatter and qualitatively would have a higher factor of safety against sliding compared to Section 3. The results of the slope stability analyses are summarized in the following table as well as presented graphically in Appendix B of this report.

Table 2: Slope Stability Analysis Results

Bluff Recession Section	Loading Condition	Minimum Factor of Safety Against Sliding	Meet or Exceed Required FS
3	Static	2.48	Yes
3	Pseudo Static	1.27	Yes

Limitations of Analysis

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

used as indicating trend lines. A slope with a safety factor less than one will not necessarily fail, but the probability of slope movement will be greater than a slope with a higher safety factor. Conversely, a slope with a safety factor greater than one may fail, but the probability of stability is higher than a slope with a lower safety factor.

Percolation Testing Set-Up

HKA performed percolation tests near the proposed drain field areas. The exact areas of the proposed drain fields could not be tested due to presence of trees, bushes, and other sensitive plants. Based on interaction with the project Civil Engineer Mesiti Miller Engineering (MME), HKA understand the drain fields will consist of pits on the order of 2 to 4 feet deep infilled with drain rock. Depths and locations of the percolation test holes were also worked out with MME.

On 30 March 2016 five (5) percolation test borings were drilled using a 6 inch diameter hand auger. After drilling to the selected depth, a layer of 1/4" angular gravel approximately 2 to 3 inches thick was placed at the bottom of each percolation test boring. Three (3) inch diameter NDS pipe was prepared for each test hole by cutting slots with a hacksaw along the bottom 6 inches of the pipe sections. The slotted pipe sections were placed in each test hole with additional gravel placed between the pipe and the borehole sidewall to secure the pipe in place. The bottom 12 inches of the test bore holes were filled with clear water 4 times within 24 hours prior to commencing the percolation test.

Percolation Testing

On 31 March 2016, HKA returned to the site after the 24 hour soaking period to conduct the percolation tests.

The percolation test holes were inspected and all but P-4 and P-5 were completely drained. Percolation test holes P-4 (Lot 4) and P-5 (Lot 5) still had 12 inches of standing water in the bottom of the test holes. These percolation test were advanced into a layer of clay soil and near the standing puddle.

On the same day the 6-inch falling head percolation tests were performed as follows:

- Clear water was placed within the bottom 6 inches of each test hole.
- A water level reading was taken every 30 minutes and the percolation test hole was refilled with clear water to 6 inches above the bottom of the hole.
- Up to eight (8) water level readings were taken in each percolation test hole. If 3 consecutive readings were within 1/16 of an inch of each other the EPA test method recommends to stop the test.
- The percolation rate in inches per hour was calculated by dividing the change in height of the water level in inches by the interval between readings in hours.
- The last change in the water level reading and consideration to the set of readings was used to report the percolation rate for the respective test hole.

Percolation Test Results

Test Hole ID	Percolation Zone (feet)	Percolation Rate (in/hr)
P-1	1.146 to 2.146	3.9
P-2	1.146 to 2.146	1.4
P-3	3.042 to 4.042	0.6
P-4	1.958 to 2.958	0.0
P-5	1.958 to 2.958	0.0

Graphical and tabulated results are included in the Appendix D of this report.

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our investigation, the proposed improvements at the referenced site will be subject to “ordinary risks”, as defined in the “Scale of Acceptable Risks From Geologic Hazards” in Appendix D of this report provided the design criteria and recommendations presented in this report as well as those in our geologic report for this project are incorporated into the design and construction of the proposed project and maintained for the life of the development.

The primary geotechnical considerations at the site include strong seismic shaking, adequate foundation support of new buildings, temporary cut slopes during construction, expansive clay soil in foundation zone, subsurface seepage, coastal bluff erosion, and control of concentrated surface runoff,.

Based on our analysis of site soils conditions and consideration to the recommended 50 year future coastal bluff recession setback, the proposed Home A, Home B, and Home F should be supported by conventional spread foundations embedded into an earthen mat of moisture conditioned on-site soils prepared in accordance with this report. Home D and Home E should be supported by conventional spread foundations embedded into an earthen mat of select granular engineered fill prepared in accordance with this report.

Groundwater was encountered within our test bore holes at the time they were drilled. Saturated soils and active seeps in the coastal terrace soils should be anticipated and planned for by designers and contractors. Retaining wall back drains and under slab blanket drains will be essential for the design of these structures. It is recommended to relieve drainage collected in these subsurface systems through perforated collection pipes tied to solid drain lines that are conveyed to a discharge location by gravity flow if possible.

Based on our interaction with the project design team HKA understands a partial basement is proposed below Home A and Home G. The basement is not shown along the seaward perimeter of these homes. Excavations for the partial basements are shown to create cut slopes on the order of 5 to 10 feet tall into coastal terrace deposits. The cut slopes should be laid back to safe slope gradients or temporary cantilever or tied back shoring utilizing top down construction methods should be employed. As an alternative the basement wall could be constructed and then backfilled. Once this decision is made HKA should be consulted to make supplement recommendations as needed that are compatible with the project goals. The pier criteria can be used for the basement wall or for Home D and Home E as an alternative design. The architect, civil engineer, and structural designer should assume wet to saturated coastal terrace will be encountered within the cut face of the excavation. Criteria for drilled shaft, grouted, post tensioned soil

anchors are included for use in the temporary shoring system or permanent basement retaining walls if needed.

The following recommendations should be used as guidelines for preparing project plans and specifications, and assume that **Haro, Kasunich & Associates** will be commissioned to review project grading and foundation plans before construction and to observe, test and advise during earthwork and foundation construction. This additional opportunity to examine the site will allow us to compare subsurface conditions exposed during construction with those inferred from this investigation. Unusual or unforeseen soil conditions may require supplemental evaluation by the geotechnical engineer.

General Site Grading

1. The geotechnical engineer should be notified **at least four (4) working days prior to any grading or excavating foundations** so the work in the field can be coordinated with the grading contractor and arrangements for testing and observation can be made. The recommendations of this report are based on the assumption that a representative from HKA will perform the required testing and observation during grading and construction. It is the owner's responsibility to make the necessary arrangements for these required services.

2. Where referenced in this report, Percent Relative Compaction and Optimum Moisture Content shall be based on ASTM Test Designation D1557.
3. Areas to be graded or to receive proposed improvements should be cleared of all obstructions and fill materials, including trees not designated to remain and other unsuitable material. Existing depressions or voids created during site clearing should be backfilled with engineered fill. Any surface or subsurface obstructions, or questionable material encountered during grading, should be brought immediately to our attention for proper exposure, removal, and processing as directed.
4. Cleared areas should then be stripped of organic-laden topsoil. Stripping depth is anticipated to be from 2 to 4 inches, although the actual depth of stripping should be determined in the field by a representative from HKA. Strippings should be wasted off-site or stockpiled for use in landscaped areas if desired.
5. On-site soils reused as engineered fill and imported select granular fill should be placed in thin lifts not exceeding 8 inches in loose thickness. On-site clay soil approved for re-use by HKA should be, water conditioned to a moisture content about 3 to 6 percent above optimum, and compacted to 87 to 89 percent relative compaction back up to the ground surface. Imported select granular fill should be, water conditioned to a moisture content about 2 to 4 percent above optimum, and compacted to at least 90 percent

relative compaction. The upper 8 inches of subgrade should be compacted to at least 95 percent relative compaction. Aggregate base below pavements should likewise be compacted to at least 95 percent relative compaction.

6. If grading is performed during or shortly after the rainy season, the grading contractor may encounter compaction difficulty with the wet soils. If compaction cannot be achieved after adjusting the soil moisture content, it may be necessary to use imported fill or gravel and stabilize the bottom of the excavation with stabilization fabric.

7. Provided they can be adequately moisture conditioned (or dried back) prior to use, the on-site soils appear generally suitable for use as engineered fill, however clay soils with intermediate or high plasticity may be unsuitable. Materials used for engineered fill which must be imported should be free of organic and deleterious material, contain no rocks or clods over 4 inches in dimension, and should contain no more than 15 percent by weight of rocks larger than 2½ inches. Imported fill should also be granular, have a Plasticity Index of less than 18, and should have sufficient binder to allow excavations to stand without caving. Prior to delivery to the site, a representative sample of proposed import should be sent to our laboratory for evaluation.

8. We estimate shrinkage factors of about 17 percent for the on-site materials when used in engineered fills.

Cut and Fill Slopes

9. Temporary excavations should be properly shored and braced during construction to prevent sloughing and caving at sidewalls. The contractor should be aware of all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

10. The excavation along the northeast side of Home A and Home G is shown to be on the order of 5 to 10 feet deep bgs. Designers should assume the cut slope to be comprised of stiff or medium dense coastal terrace deposit.

11. It should be anticipated that perched ground water will be actively seeping from the face of the cut slope excavated into the coastal terrace deposits. The thickness of the seepage layer will depend upon the time of year the excavation is made. Designers and contractors should plan accordingly.

12. Temporary cut slopes excavated into the coastal terrace deposits should be inclined at a slope gradient of 1:1 (H:V) or flatter where no seepage is observed from face of cut slope and 2:1 (H:V) or flatter where seepage is observed. Depending on the amount of seepage from the face of the cut slope shoring may be required. Temporary cut slopes excavated for the project are considered those that are to remain from 24 hours up to the start of the rain season.

13. For design of lateral earth support systems used for temporary shoring or permanent retaining walls a lateral earth pressure equivalent to a fluid weighing (EFW) 40 pcf should be used under drained conditions (i.e. gravel drain) for an active condition. For at rest or restrained condition use 30H psf uniform load. For 2:1 back slope gradients add 15 pcf and 10H psf respectively. If the shoring is to be designed without a drain or "undrained condition" Add 45 pcf or 30H respectively.

14. Compacted fill slopes should be constructed at a slope inclination not steeper than 2:1 (horizontal to vertical) at 90 percent relative compaction. Fill slopes with these recommended gradients may require periodic maintenance to remove minor soil sloughing. All fills must be adequately benched into firm native soil, and keys for stability will be required at the toe of the fill slope. The toe key should be at least 8 feet wide and should extend at least 2 feet into firm native soil. The bottom of the toe key should be sloped downward at about 2 percent toward the back of the key.

15. There should be a minimum of 10 feet horizontal separation between the top of supporting soil that will be used for skin friction and the face of slope.

16. In order to maintain stable slopes at the recommended gradients, it is important that seepage forces and accompanying hydrostatic pressure be relieved by adequate drainage. Adequate backdrains in keyways and benches should be provided as

determined necessary by HKA. The locations of backdrains and outlets would be determined by a representative of HKA in the field during grading.

17. Following grading, exposed soil should be planted as soon as possible with erosion-resistant vegetation.

18. After the earthwork operations have been completed and HKA has made the required observations of the work, no further earthwork operations shall be performed without the direct observation of HKA.

Conventional Spread Foundations

19. The new homes should be supported by conventional spread foundations that are embedded into an earthen mat of engineered fill that extends a minimum of 18 inches below bottom of foundations elements and 6 horizontal feet beyond the outer most edge of foundation. For Home A, B, and F the earthen mat should be comprised of re-used on-site soils. For Home D and Home E the earthen mat should be comprised of select import granular fill.

20. Foundations should be embedded into an earthen mat of engineered fill a minimum 2 feet deep. Actual footing depths should be determined in accordance with anticipated use and applicable design standards. Conventional footings should be reinforced as

required by the structural designer based on the actual loads transmitted to the foundation.

21. Foundations designed in accordance with the above may be designed for an allowable soil bearing pressure of 1,700 psf for dead plus live loads. The allowable bearing capacity may be increased by one-third to include short-term seismic and wind loads.

22. Deep foundation elements (piers) may be used as an alternative foundation. See the section titled "Skin Friction Pier Foundations".

23. Lateral load resistance for structures supported on spread footings may be developed in friction between the foundation bottom and the supporting subgrade. A friction coefficient of 0.30 is considered applicable.

24. Footings located adjacent to other footings or utility trenches should have their bearing surfaces founded below an imaginary 2:1 plane projected upward from the bottom edge of the adjacent footings or utility trenches.

25. Total and differential settlements across the new homes are anticipated to be less than 1 inch.

26. All footing excavations should be thoroughly cleaned and observed by HKA prior to placing forms and steel. Observation of foundation excavations allows anticipated soil conditions to be correlated to those inferred from our investigation and to verify that the footings are in accordance with our recommendations

Skin Friction Pier Foundation

27. Drilled pier foundations can be used where the structural designer determines deep foundation are necessary to resist lateral overturning forces, concentrated axial loads, or simply as an alternative to the earthen mat construction. Drilled piers may also be considered for foundation support of temporary shoring to support cut slopes.

28. Actual pier depth will depend upon a force analysis by the project design professional; however the piers should have a minimum diameter of 18 inches and minimum spacing of 4 feet on center. The piers should be embedded into the coastal terrace a minimum of 10 feet. Based on our recent exploratory boring we were able to drill through the coastal terrace and hit drill refusal on the bedrock at a depth of 25 feet bgs. It should be noted we drilled with a 4 inch diameter solid flight auger portable drill rig.

29. The upper 3 foot of the pier should be neglected for passive resistance and skin friction. The piers should be designed to withstand an uplift pressure of 450 psf in the upper 4 feet.

30. For vertical bearing capacity in the upper 10 feet of the pier an allowable skin friction of 600 psf should be applied to the surface of the pier below the neglect depth. For resistance to uplift forces, an allowable skin friction of 300 psf should be applied to the surface of the pier below the neglect depth. For each additional foot of pier depth below 10 feet deep add 15 psf of skin friction for vertical bearing and 7.5 psf to resist uplift. Maximum allowable skin friction is 700 psf for vertical being and 350 for uplift resistance. The increased value should be applied to the full depth of the pier.

31. A passive lateral earth pressure with an equivalent fluid weight of 300 pcf acting over 2.0 pier diameters should be applied to the pier below the depth of neglect.

32. Reinforcing vertical steel for the concrete piers should extend the full depth of the excavation to a point 3 inches above the bottom of the pier hole.

Perched Groundwater Drainage

33. Seepage should be collected from behind retaining walls and beneath slabs-on-ground in gravel drains with perforated pipe. The collected drainage is recommended if possible to be relieved by gravity flow to a discharge area approved by a representative from HKA. It is imperative to waterproof the exterior basement retaining walls and floor slab of the new homes to protect against moisture intrusion from perched groundwater seepage.

34. The drainage systems should be a minimum 12 inches wide behind walls or 12 inches deep beneath slabs and comprised of Class 1 Type A gravel with a perforated pipe placed near the bottom of the drain a thin bedding of gravel.

35. A representative from HKA should observe the drainage system just after the pipes have been placed over the gravel bedding.

Concrete Slab-On-Ground

36. Concrete slab floors should be constructed with an under slab drain comprised of a 12 inch thick blanket of gravel that has been set with a vibratory plate. The bottom of the subexcavation should be scarified, moisture conditioned or dried back as needed, and compacted to a minimum 95 percent.

37. For construction of the under slab drain use $\frac{3}{4}$ inch nominal drain rock (or equivalent) wrapped in filter fabric. Furthermore, a 14 mil vapor barrier should be placed below the slab and wrapped under the footings and up to the side of exterior of the building. A perforated pipe should be embedded into the blanket drain that conveys collected drainage by gravity flow to a discharge location seaward from improvements, but preferably landward of the coastal bluff setback. Drainage from basement retaining wall back drains or surface drainage should not be allowed to enter into the under slab blanket drain.

38. To reduce the potential for cracking and curling as well as other undesirable defects the concrete slab-on-grade design, placement, and curing should be done in accordance with the most recent version of ACI 302.1R-04.

39. If floor wetness would be unacceptable for the buildings for reasons such as moisture sensitive floor covering or interior humidity control a vapor barrier should be placed below the slab. Vapor barriers should be overlapped a minimum of 6 inches at the joints and carefully fitted around service openings.

40. Whether to locate the vapor barrier in direct contact with the slab or beneath a blotter layer of granular fill should be made with careful considerations to many factors directly and indirectly related to concrete construction. Such factors include but are not limited to; whether a water tight roof membrane is in place prior to slab construction, sequence of slab construction in relation to other construction activities requiring water, and the floor covering manufacturer's recommendations. Proposed installation should be independently evaluated as to the moisture-related sensitivity of subsequent floor finishes, project conditions, schedule, and the potential effects of slab curling and cracking. We also recommend that a qualified experienced waterproofing specialist be included on the design team and these recommendations and any revised or supplemental recommendations they make be included in the final design construction documents and implemented during construction.

41. If placement of concrete in direct contact with the vapor barrier is selected measures to minimize potential for shrinkage related defects such as but not limited to slab curling, dominant joints, and plastic or drying shrinkage cracking will be required. Measures would include selection of concrete mixtures with low potential for shrinkage and/or tighter joint spacing.

42. If a blotter layer of granular fill over the vapor barrier is selected it should be a minimum of 4 inches thick, trimmable, and compactible at low moisture content (4 to 5 percent). The use of cushion or clean sand with uniform particle size is not recommended for use as a blotter layer of granular fill. Crusher run material graded from 3/4 inch down to rock dust is suitable. The blotter layer of granular fill should be compacted to a minimum 95 percent relative compaction in accordance with ASTM D1557 To prevent the granular fill from becoming a water reservoir (contributing to floor wetness) it will be imperative to keep it dry after preparation has been completed.

Retaining Walls and Lateral Pressures

43. For design of retaining walls up to 20 feet in height and fully drained, the following design criteria may be used:

- A. Active earth pressure for walls allowed to yield (up to ½ percent of their height) is that exerted by an equivalent fluid weighing 40 pcf for a level back

slope gradient; 55 pcf for a 2:1 backslope gradient, and 48 pcf for backslope gradients between 3:1 and 6:1. This is assuming a fully drained condition. For un-drained conditions add an additional 40 pcf to the respective active earth pressure.

- B. Where walls are restrained from moving at the top, design for uniform wall pressure of $30H$ psf/ft for level backfill and $40H$ psf/ft for 2:1 backfill slope gradient, and $36H$ psf/ft for backslope gradients between 3:1 and 6:1 where H is the height of the wall. This is assuming a fully drained condition. For un-drained conditions add an additional $30H$ psf/ft to the respective active earth pressure.
- C. Site retaining walls should be supported by conventional spread footings embedded into firm coastal terrace or pier and grade beam foundations. The foundations should be designed and constructed in accordance with the recommendations of this report.
- D. For seismic design of critical structures, a nominal earthquake load equal to $10 H^2$ lbs/horizontal foot of wall may be assumed to act at $0.6H$ above the heel of the wall base (where H is the height of the wall).
- E. In addition, the walls should be designed for a surcharge loads for adjacent live or dead surcharge loads which will exert a force on the wall. Contact HKA for a detailed evaluation of lateral surcharge loads acting against retaining walls.

- F. For fully drained conditions as delineated above, we recommend that permeable material meeting the State of California Standard Specifications, Section 68-1.025, Class 1, Type A, or an approved equivalent be placed behind the wall, with a minimum continuous width of 12 inches, and extend the full height of the wall to within 1-foot of the ground surface. A 4-inch diameter perforated drain pipe (with perforations placed downward) should be installed within 4 inches of the bottom of the granular backfill and be discharged to a suitable location. Surface drainage should not be allowed to enter retaining back drains, nor should back drains be tied to under slab blanket drains.
- G. Wall backfill should be compacted to a minimum of 90 percent relative compaction. The backfill material should be approved by HKA
- H. HKA should observe foundation excavations during to observe anticipated soil conditions and excavation depths.

Retaining Wall Tie Backs

44. Where the structural designer deems tie backs necessary, drilled shaft and grouted tie backs should be used in conjunction with the selected foundation system for the retaining wall.

45. Tie backs should be constructed out of steel reinforcement that extends the entire length of the tie back and concrete grout in the bonded zone (stressing zone). Tie backs

should be designed and constructed, and tested in accordance with the Post Tensioning Manual by the Post Tensioning Institute.

46. Tie backs should be a minimum 6 to 8 inches in diameter. If larger diameter tie backs are needed HKA should be notified to make appropriate adjustments to the recommendations.

47. Tie backs should be a minimum 30 feet in length and installed between 20 to 30 degrees below an imaginary level horizontal line.

48. Tie backs should have a minimum un-bonded length of 15 feet and minimum bonded (stressing) length of 15 feet.

49. The structural designer should use a bond stress between the surface area of the grouted portion of the tie back and the drilled shaft. For non-pressure grouting applications a bond stress of 2000 psf should be applied and for pressure grouting applications 3000 psf should be applied.

50. The bonding strata is fine to medium sands and gravels. This will require either a cased drilled shaft or hollow stem drill augers to keep the shaft from collapsing in the bonded length of the tie back.

Utility Trenches

51. Trenches must be properly shored and braced during construction or laid back at an appropriate angle to prevent sloughing and caving at sidewalls. The project plans and specifications should direct the attention of the contractor to all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

52. Utility trenches that are parallel to the sides of buildings should be placed so that they do not extend below an imaginary line sloping down and away at a 2:1 (horizontal to vertical) slope from the bottom outside edge of footing elements. The structural design professional should coordinate this requirement with the utility layout plans for the project

53. Trenches should be backfilled with granular-type material and uniformly compacted by mechanical means to the relative compaction as required by county specifications, but not less than 95 percent under paved areas and 90 percent elsewhere. The relative compaction will be based on the maximum dry density obtained from a laboratory compaction curve run in accordance with ASTM Procedure #D1557.

54. We strongly recommend placing a three-foot (3') concrete plug in each trench where it passes under the exterior foundations. Care should be taken not to damage utility lines.

55. Trenches should be capped with 1.5 feet of relatively impermeable soil.

Surface Drainage

56. An engineered drainage plan to handle surface runoff should be developed for this site. Site drainage should be adequately controlled both during and after construction.

57. Surface runoff should be collected into level spreaders to result in sheet flow type discharge.

58. The collected runoff should be discharged in at least two locations to minimize impact. The specific discharge locations should be selected by the engineer who prepares the drainage. As an alternative a single level spreader can be used that promotes sheet type flow. The level spreaders should be located as from the bluff edge as possible. Landward of the 50 year future coastal bluff recession setback is recommended.

59. On-site retention is not recommended within the 50 year future coastal bluff recession setback.

60. All exposed soil should be landscaped and permanently protected against erosion as soon as possible after grading.

61. We recommend that full gutters be used along all roof down eaves to collect storm runoff water and channel it through closed rigid conduits to a suitable discharge point a minimum 10 feet away from all structural improvements.

62. Surface runoff should **not** be allowed to flow onto graded or natural slopes with gradients equal to or steeper than 3:1 (H:V). Consideration should be given to catch basins, berms, concrete v-ditches, or drainage swales at the top of all slopes to intercept runoff and direct it to a suitable discharge point.

63. Surface drainage should include provisions for positive gradients so that surface runoff is not permitted to pond adjacent to foundations and on pavements. Surface drainage should be directed away from the building foundations, at a minimum gradient of 2 percent for a distance of at least 10 feet to an adequate discharge point. Concentrations of surface water runoff should be handled by providing necessary structures, such as paved ditches, catch basins, etc.

64. Irrigation activities at the site should be done in a controlled and reasonable manner. Planter areas should not be sited adjacent to walls; otherwise, measures should be implemented to contain irrigation water and prevent it from seeping into walls and under foundations.

65. The migration of water or spread of extensive root systems below foundations, slabs, or pavements may cause undesirable differential movements and subsequent damage to these structures. Landscaping should be planned accordingly.

66. Drainage patterns approved at the time of fine grading should be maintained throughout the life of proposed structures.

Curtain Drain

67. Groundwater seeping through the terrace deposits perched upon the bedrock formation was encountered at this site. Pervious pavements are also proposed adjacent to some of the new homes. To protect the homes from moisture intrusion through seepage curtain drains should be constructed on the upslope side of the homes extending beyond the footprint a minimum 10 horizontal feet. The curtain drains should also wrap around the sides of the homes where pervious pavement is placed adjacent to the building. Where basement retaining walls with back drains are proposed such as Home A the curtain drain is not required.

68. The curtain drains should be a minimum 12 inches wide and extend to a minimum depth of 18 inches below bottom of foundation elements. The curtain drains should be placed within 3 horizontal feet of the outer most edge of the building foundation. For this project we anticipate curtain drains to be on the order of 4 to 6 feet deep.

69. The trench for the curtain drain should be lined on the side adjacent to the home with a vapor barrier, a 4 inch diameter perforated pipe with holes placed down should be set on a thin bed of gravel along the bottom of the drain, and the trench infilled with drain rock wrapped in filter fabric. The perforated pipe should be connected to a solid drain pipe that conveys the collected drainage away from the trench and discharges it into a level spreader down slope from the home.

Pavement Design

70. R-Value tests have not been performed for this project.

71. To have the selected pavement sections perform to their greatest efficiency, it is very important that the following items be considered:

- a. Scarify and moisture condition the top 8 inches of subgrade and compact to a minimum relative compaction of 95 percent, at a moisture content which is about 4 percent above laboratory optimum value.
- b. Provide sufficient gradient to prevent ponding of water.
- c. Use only quality materials of the type and thickness (minimum) specified. All baserock (R=78 minimum) must meet CALTRANS Standard Specifications for Class 2 Untreated Aggregate Base

(Section 26). All subbase (R=50 minimum) must meet CALTRANS Standard Specifications for Class 2 Untreated Aggregate Subbase, (Section 25). Angular gravel (ASTM D448) or Class II permeable aggregate base (Caltrans Spec) should be used below pervious pavements.

- d. Compact the baserock and subbase uniformly to a minimum relative compaction of 95 percent. Gravel or permeable aggregate baserock should be placed in 8 inch lifts and set using a vibratory plate under observation of HKA.
- e. Place the asphaltic concrete only during periods of fair weather when the free air temperature is within prescribed limits.
- f. Maintenance should be undertaken on a routine basis.

Plan Review, Construction Observation and Testing

72. Our firm should be provided the opportunity for a general review of the project plans prior to construction so that our geotechnical recommendations may be properly interpreted and implemented. The purpose is to determine if this preliminary report is adequate and complete for the final planned grading and construction. It is not intended that the geotechnical engineer approve or disapprove the plans, but to provide an opportunity to update the preliminary report and include additions or qualifications as

necessary. If our firm is not accorded the opportunity of making the recommended review, we can assume no responsibility for misinterpretation of our recommendations.

73. We recommend that our office review the project plans prior to submittal to public agencies, to expedite project review. The recommendations presented in this report require our review of final plans and specifications prior to construction and upon our observation and, where necessary, testing of the earthwork and foundation excavations. Observation of grading and foundation excavations allows anticipated soil conditions to be correlated to those actually encountered in the field during construction.

IMITATIONS AND UNIFORMITY OF CONDITIONS

1. The conclusions and recommendations noted in this report are based on probability and in no way imply that the proposed improvements will not possibly be subjected to ground failure or seismic shaking so intense they will be severely damaged or destroyed.
2. This report is issued with the understanding that it is the duty and responsibility of the owner or his representative or agent to ensure that the recommendations contained in this report are brought to the attention of the architects and engineers and contractors for the project, incorporated into the plans and specifications, and that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.
3. The conclusions and recommendations contained herein are professional opinions derived in accordance with current standards of professional practice in the Santa Cruz County area. No other warranty, expressed or implied, is made.
4. If any unexpected variations in soil conditions, or if adverse soil conditions are encountered during construction, or if the proposed construction will differ from that planned at the present time, Haro, Kasunich and Associates should be notified so that supplemental recommendations can be given.
5. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside our control. Therefore, this report should not be relied upon after a period of three years without being reviewed by a geotechnical engineer.

APPENDIX A

Site Vicinity Map (Figure 1)

Map Showing Location of Test Borings (Figure 2)

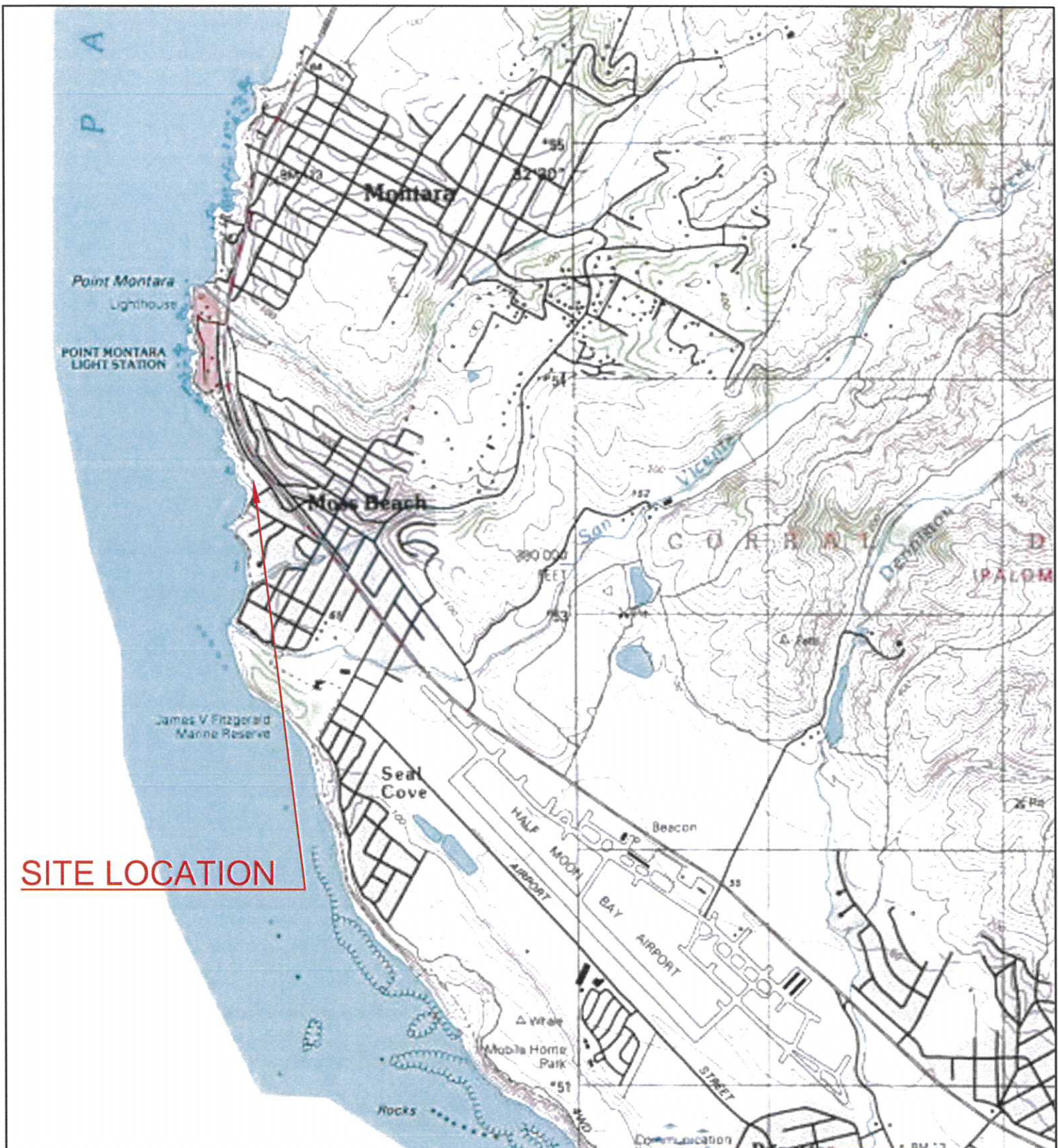
Key to Logs (Figure 3)

Logs of Test Bore Holes (Figures 4-13)

Direct Shear Test Results (Figure 14)

Atterberg Limits Test Results (Figure 15)

Corrosion Test Results (Figure 16)



SITE LOCATION

SITE VICINITY MAP
 APN 037-086-023, -026, -027, -028, -029,
 VALLEMAR STREET & JULIANA AVENUE
 MOSS BEACH, CALIFORNIA

SCALE No Scale
 DRAWN BY MC
 DATE JUNE 2016
 REVISED
 JOB NO SM10391.2

HARO, KASUNICH & ASSOCIATES, INC.
 GEOTECHNICAL AND COASTAL ENGINEERS
 116 E. LAKE AVENUE, WATSONVILLE, CA 95076
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FIGURE NO. 1

SHEET NO **49**

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands or gravelly sands, little or no fines
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
			HIGHLY ORGANIC SOILS	

GRAIN SIZES

U.S. STANDARD SERIES SIEVE

CLEAR SQUARE SIEVE OPENINGS

200 40 10 4 3/4" 3" 12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY		CONSISTENCY			SAMPLING METHOD			H.O.	
SANDS AND GRAVELS	BLOWS PER FOOT*	SILTS AND CLAYS	STRENGTH (TSF)**	BLOWS PER FOOT*	STANDARD PENETRATION TEST	T		Final	
VERY LOOSE	0 - 4	VERY SOFT	0 - 1/4	0 - 2	MODIFIED CALIFORNIA	L or M		Initial	
LOOSE	4 - 10	SOFT	1/4 - 1/2	2 - 4	PITCHER BARREL	P		Water level designation	
MEDIUM DENSE	10 - 30	FIRM	1/2 - 1	4 - 8	SHELBY TUBE	S			
DENSE	30 - 50	STIFF	1 - 2	8 - 16	BULK	B			
VERY DENSE	OVER 50	VERY STIFF	2 - 4	16 - 32					
		HARD	OVER 4	OVER 32					

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

**Unconfined compressive strength in tons/ft² as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D-1586), pocket penetrometer, torvane, or visual observation

**Haro Kasunich &
Associates**

**KEY TO LOGS
VALLEMAR STREET
& JULIANA AVENUE
MOSS BEACH, CALIFORNIA**

**Project No.
SM10391.2
JUNE 2016**

**Figure
No. 3**

LOGGED BY MC DATE DRILLED 3-22-16 BORING DIAMETER 4" BORING NO. B-1

Date: 6/27/2016

File: C:\superlog4\HKGALOGS\SM10391.2 Vallemar Street.log

SuperLog CiviTech Software, USA www.civiltech.com

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - ts.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Iceplant/roots	SM-CL					
1-1-1 (L)			Brown Silty SAND with CLAY binder fine to medium grain, 1/4 inch clasts, wet, loose		19		113	12.7	(1-1) Atterberg Limits PI = 9 LL = 18.4% (1-2) PI = 25 LL = 36.8
1-2 (T)			Brown orange Sandy CLAY, fine to medium grain, moist, very stiff	CL	21			17.2	
1-3-1 (L)			Same as above		36				
1-4 (T)			Grading to a brown orange Clayey SAND, fine to medium grain, damp to moist, medium dense	SC	28				
10	1-5-1 (L)		Brown tan grey Silty SAND, fine to medium grain, damp to dry, cemented, very dense terrace deposit		50/6"				
11	1-6 (T)		harder drilling at 11 feet		49				
13.5			Brown Silty SAND with CLAY binder, fine to medium grain, damp, very dense Boring terminated at 13.5 feet						
20									
25									
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 4

LOGGED BY MC DATE DRILLED 3-22-16 BORING DIAMETER 4" BORING NO. B-2

File: C:\superlog\HAROKASUNICH\SM10391.2 Vallemar Street.log Date: 6/27/2016
 SuperLog CivilTech Software, USA www.civiltech.com

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Topsoil/roots						
2-1-1 (L)			Dark brown Clayey SAND, fine to medium grain, wet, loose	SC	20			15.3	Atterberg Limits PI = 22 LL = 31.5%
2-2 (T)			Mottled brown orange grey Sandy CLAY, fine grain, moist, very stiff	CL	24				
2-3- (L)			Same as above		32				
2-4 (T)			Same as above		26				
2-5-1 (L)			Grey with orange mottling Sandy CLAY, fine to medium grain, moist, very stiff coastal terrace	CL	38				
2-6 (T)					22				
2-7 (T)			Grey with orange and rust mottling Silty SAND, fine to medium grain, damp, dense, terrace	SM	48				
2-8 (T)			Grey fine to medium SAND, wet to saturated, dense	SW	35				
			Boring terminated at 21.5 feet						

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 5

LOGGED BY MC DATE DRILLED 3-22-16 BORING DIAMETER 4" BORING NO. B-3

Date: 6/27/2016
File: C:\superlog\HAROKASUNICH\SM10391.2 Vallemar Street.log
SuperLog CivilTech Software, USA www.civiltech.com

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Roots/topsoil						
	3-1-1 (L)		Black Sandy CLAY, fine to medium grain, wet, firm	CL	19			110	Atterberg Limits PI = 18 LL = 30.3% PI = 28 LL = 37.9%
	3-2 (T)				19				
5	3-3-1 (L)		Brown orange grey Sandy CLAY, fine to medium grain, moist, stiff, terrace deposit	CL	35			15.5	
	3-4 (T)		Brown orange grey Clayey SAND, fine to coarse grain, moist to damp, medium dense	SC	28				
10	3-5- (L)		Same as above		53				
15									
			Grey fine SAND with SILT, saturated	SP-ML					
20	3-6 (T)				10				
			Boring terminated at 21.5 feet						
25									
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 6

LOGGED BY MC DATE DRILLED 3-24-16 BORING DIAMETER 4" BORING NO. B-4

Date: 6/27/2016 File: C:\superlog\HAROKASUNICH\SM10391.2 Vallemar Street.log www.civiltech.com SuperLog CivilTech Software, USA

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Sandy CLAY, fine to medium grain, saturated, very loose	CL					
4-1-1 (L)			Brown CLAY, wet, firm	CL	6			18.8	Atterberg Limits
4-2 (T)			Grey light brown sandy Lean CLAY, fine to medium grain, moist, very stiff, terrace	CL	12			15.5	Pi = 38
4-3-1 (L)			Same as above		34				LL = 48.3%
4-4 (T)			Same as above		22				(4-2) PI = 27
									LL = 36.6%
									(4-3) Unconfined
									Compression Test
									Qu = 8003 psf
									C = 2000 psf
									$\phi = 10^\circ$
10	4-5-1 (L)		Grey with light orange mottling Clayey SAND, fine to medium grain, moist, medium dense	SC	25				
15	4-6-1 (L)		Blue grey SAND with SILT, fine to medium grain, wet to saturated, weathered rock, medium dense to dense	SW-ML	53				
20									
25			Harder drilling at 22 feet then broke through to soft gain						
25			Drill auger refusal at 25 feet						
25			Boring terminated at 25.01 feet						
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 7

LOGGED BY **MC**

DATE DRILLED **3-24-16**

BORING DIAMETER **4"**

BORING NO. **B-5**

Date: 6/27/2016

File: C:\superlog\HAROKASUNICH\SM10391.2 Vallemar Street.log

SuperLog CivilTech Software, USA www.civiltech.com

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Iceplant and topsoil						
5-1-1 (L)			Dark brown Clayey SAND, fine to medium grain, saturated, very loose	SC	7				
5-2 (T)			Dark brown CLAY, moist, firm	CL	8				
5-3-1 (L)			Brown Sandy CLAY, fine to medium grain, moist, medium dense, terrace	CL	36				
5-4 (T)			Grey orange mottling, Sandy CLAY, fine to coarse, grain, moist, very stiff		20				
			Brown orange SAND, fine to medium grain, wet, medium dense	SW	50				
5-5-1 (L)							97	15.6	Saturated Direct Shear Test C = 0 psf $\phi = 43^\circ$
			Blue grey fine to medium SAND, saturated, dense	SW	29				
5-6 (T)									
			Boring terminated at 16.5 feet						
20									
25									
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 8

LOGGED BY JD DATE DRILLED March 30, 2016 BORING DIAMETER 6" BORING NO. P-1

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\H\K\LOGS\SM10391.2 Valleamar Bluff.log Date: 6/27/2016

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Silty SAND with Clay and Organics, roots, moist, loose (Topsoil)	TP					
1			Dark brown Silty SAND, fine to medium grain, moist (Terrace)	SM					
2			Boring terminated at 2.1 feet						
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: dk

FIGURE NO. 9

LOGGED BY JD DATE DRILLED March 30, 2016 BORING DIAMETER 6" BORING NO. P-2

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\UKALOGS\SM10391.2 Valleamar Bluff.log Date: 6/27/2016

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - ts.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Silty SAND with Clay and Organics, roots, moist, loose (Topsoil)	TP					
1			Dark brown Silty SAND, fine to medium grain, moist (Terrace)	SM					
2			Boring terminated at 2.1 feet						
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: dk

FIGURE NO. 10

LOGGED BY JD DATE DRILLED March 30, 2016 BORING DIAMETER 6" BORING NO. P-3

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\HUKALOGS\SM10391.2 Valleamar Bluff.log Date: 6/27/2016

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Silty SAND, fine grain, roots, moist, loose (Topsoil)	TP					
2			Dark brown Silty SAND, fine to medium grain, damp to moist, loose to medium dense	SM					
4			Boring terminated at 4.0 feet						
6									
8									
10									
12									
14									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: dk

FIGURE NO. 11

LOGGED BY JD DATE DRILLED March 30, 2016 BORING DIAMETER 6" BORING NO. P-4

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\HAKALOGS\SM10391.2 Valleamar Bluff.log Date: 6/27/2016

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Silty SAND, fine grain, moist, roots, loose, topsoil	TP					
1			Orange tan Sandy CLAY, moist, terrace	CL					
2									
			Boring terminated at 2.9 feet						
4									
6									
8									
10									
12									
14									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: dk

FIGURE NO. 12

LOGGED BY JD DATE DRILLED March 30, 2016 BORING DIAMETER 6" BORING NO. P-5

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\HKALOGS\SM10391.2 Valleamar Bluff.log Date: 6/27/2016

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Silty SAND, fine grain, moist, roots, loose, topsoil	TP					
1			Orange tan Sandy CLAY, moist, terrace	CL					
2									
3									
4									
4.5									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									

Boring terminated at 4.5 feet

HARO, KASUNICH AND ASSOCIATES, INC.

BY: dk

FIGURE NO. 13

Direct Shear

Project:	Vallemar Bluff
Sample #	5-5-1
Description	Orange Brown Silty Sand

Date	4/7/2016
Tested By:	MA

Test Number	1	2	3	4
Normal Pressure (PSF)	530	1030	2030	4030
Max Shear Stress	13.4	33.5	64.7	
Shear Stress (PSF)	394.6	986.4	1902.2	

Equation of Trendline	
Intercept	Slope
0	0.9312

C (PSF)	PHI
0	43

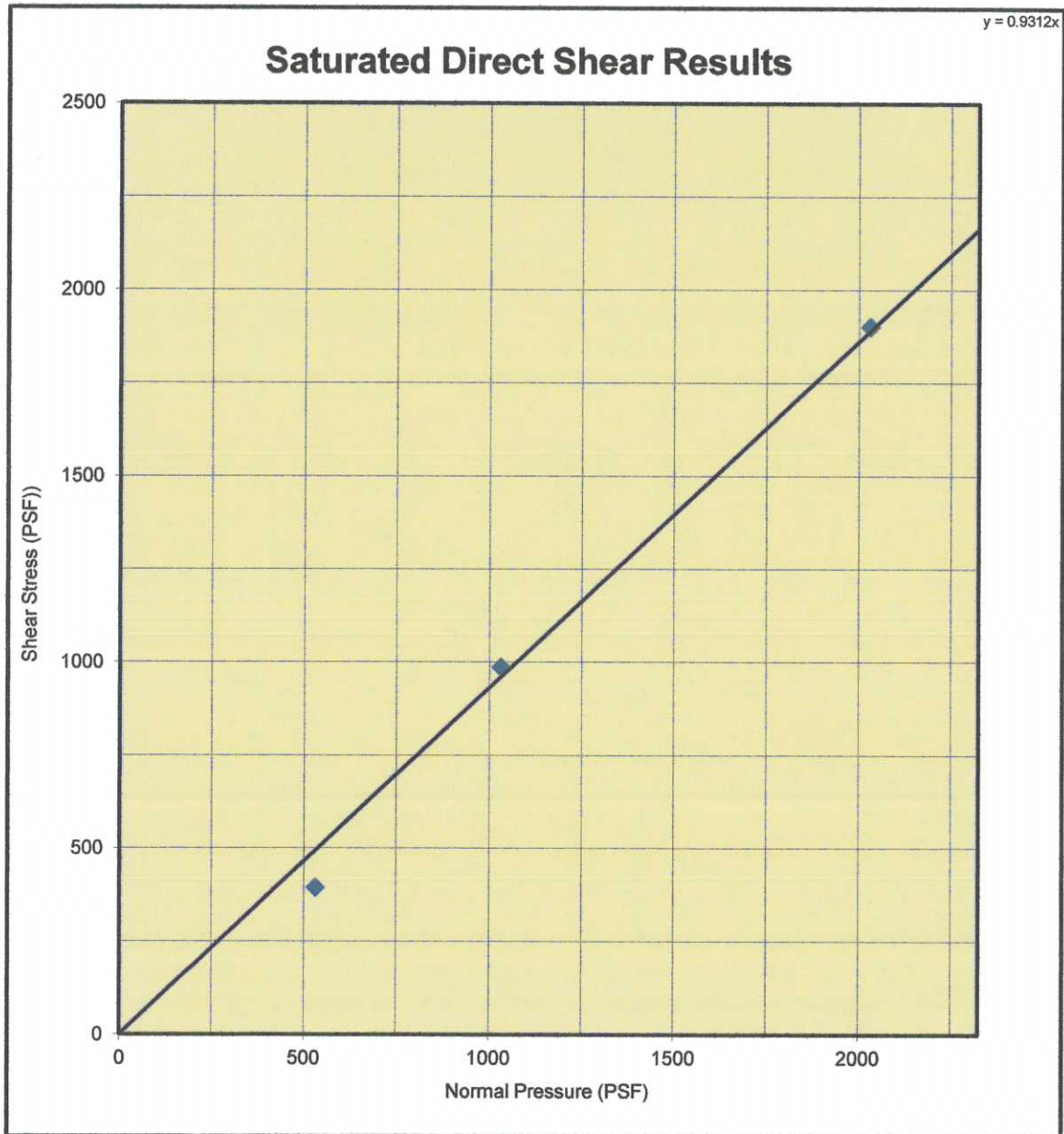
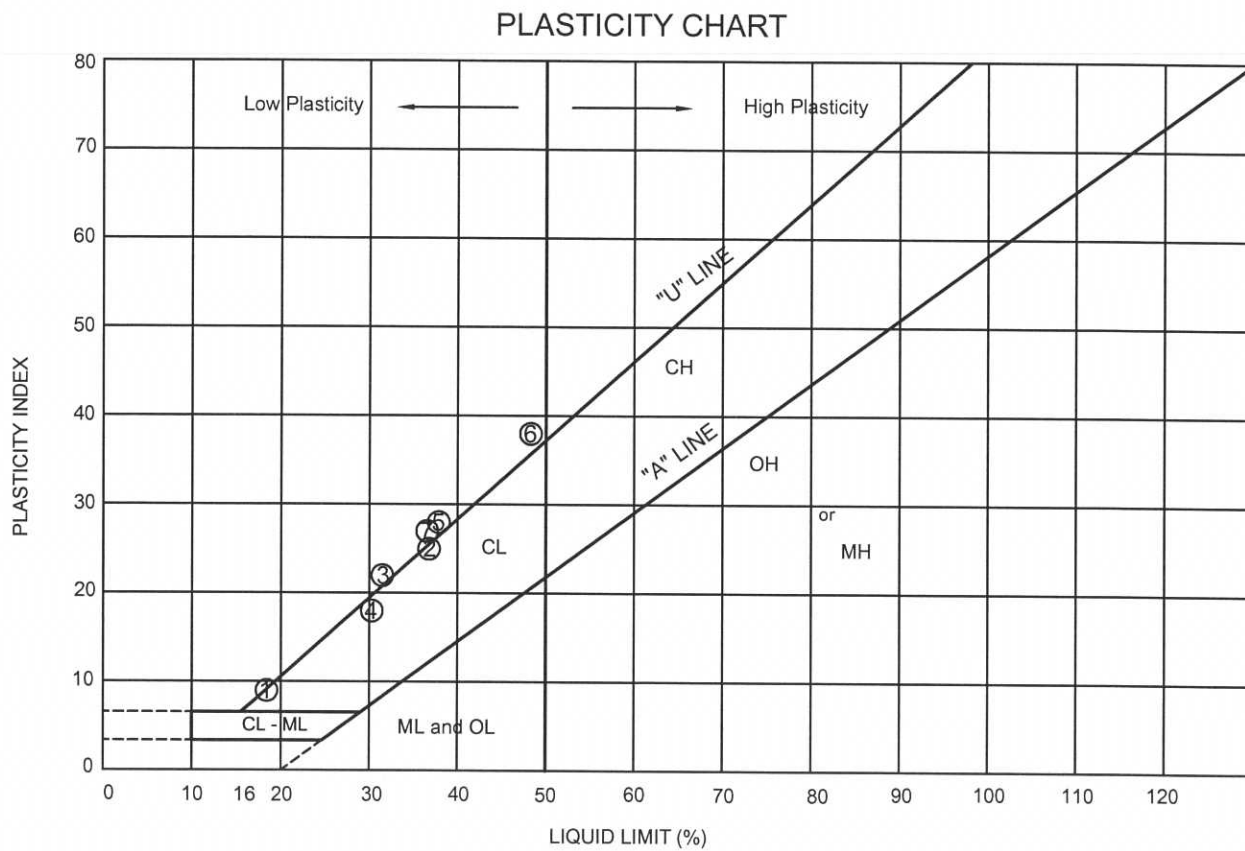


Figure No. 14



PLASTICITY DATA

Key Symbol	Sample Number	Depth (feet)	Natural Water Content W(%)	Plastic Limit (%)	Liquid Limit (%)	Plasticity Index	Liquidity Index $\frac{W-PL}{LL-PL}$	Unified Soil Classification Symbol
①	1-1	2.0	12.7	10.3	18.4	9	+0.2667	CL
②	1-2	3.5	17.2	12.6	36.8	25	+0.1840	CL
③	2-1	2.0	15.3	9.9	31.5	22	+0.2455	CL
④	3-1	2.0	17.2	17.1	30.3	18	+0.0056	CL
⑤	3-3	5.0	15.5	10.2	37.9	28	+0.1893	CL
⑥	4-1	2.5	18.8	10.8	48.3	38	+0.2105	CL
⑦	4-2	3.5	15.5	9.7	36.6	27	+0.2148	CL

ATTERBERG LIMITS TEST RESULTS

APN 037-086-023, -026, -027, -028, -029,
VALLEMAR STREET & JULIANA AVENUE
MOSS BEACH, CALIFORNIA

SCALE: No Scale

DRAWN BY: MC

DATE: JUNE 2016

REVISED:

JOB NO: SM10391.2

HARO, KASUNICH & ASSOCIATES, INC.

GEOTECHNICAL AND COASTAL ENGINEERS
116 E. LAKE AVENUE, WATSONVILLE, CA 95076
(831) 722-1475

FIGURE NO. 15

SHEET NO. **63**

SOIL CONTROL LAB

42 HANGAR WAY
WATSONVILLE
CALIFORNIA
95076
USA

Work Order #: 6040263

Account #: 2953

Date Received: April 7, 2016

Date Reported: April 11, 2016

Haro - Kasunich and Assoc.
116 East Lake Avenue
Watsonville, CA 95076

Reporting Date: April 11, 2016

Date Received: April 7, 2016
Project#/Name: SM 10391.2 / Vallemar Bluff
Matrix: Soil

Sample Identification	pH (units)	Chloride (mg/Kg)	Sulfate (mg/Kg)	Resistivity (ohms x cm)
LOT A	4.4	470	130	240
LOT E	5.8	540	290	240
	<u>Method</u> CalTest 643 June 2007	<u>Method</u> CalTest 422 April 2000	<u>Method</u> CalTest 417 March 1999	<u>Method</u> CalTest 643 June 2007

Mike Galloway

APPENDIX B

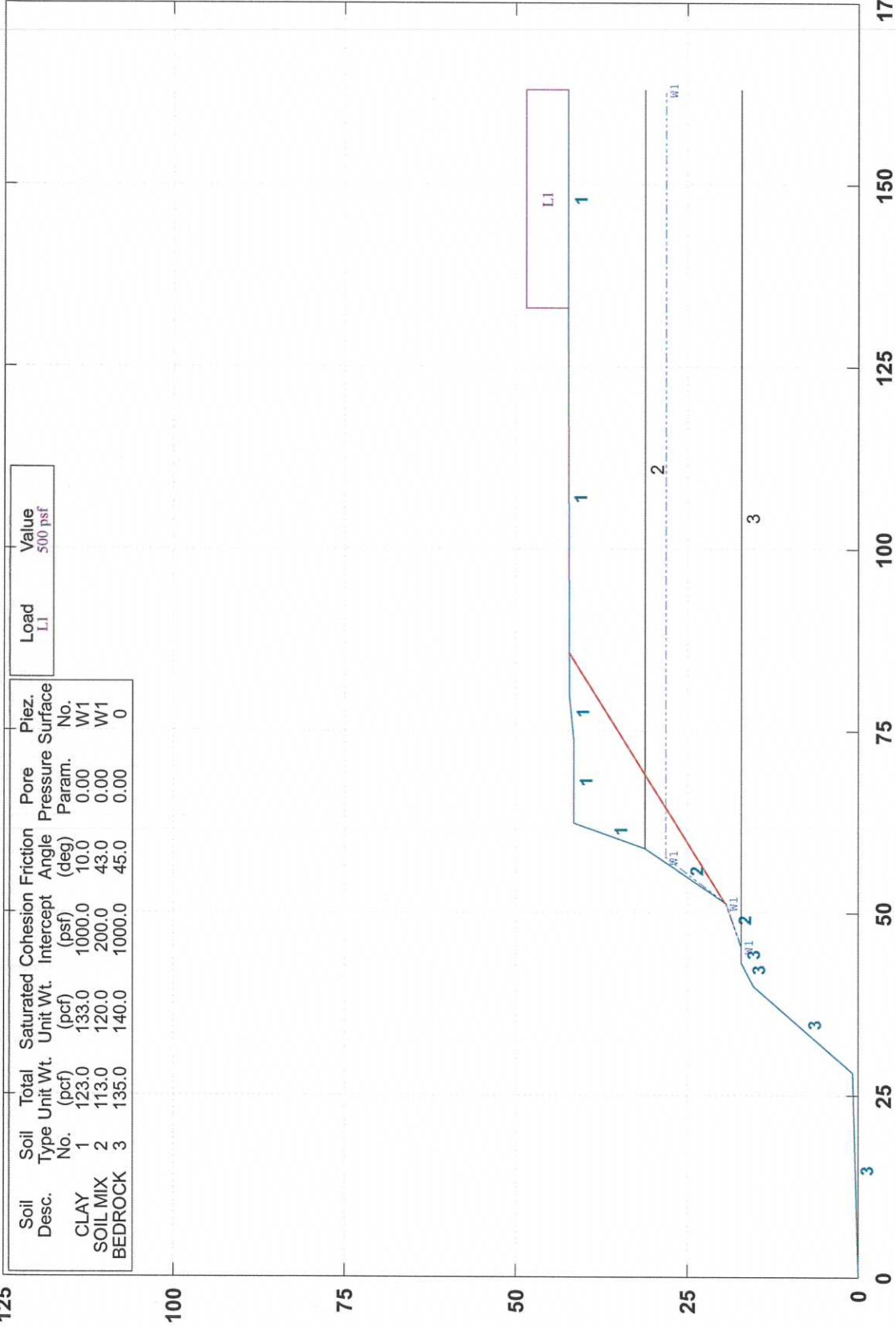
Slope Stability Analysis Results

VALLEMAR ST AND JULIANA AVE SLOPE STABILITY ANALYSIS SECTION 3 STATIC

c:\users\moses\documents\projects\san mateo\coastal bluff\valleamar bluff\slope stability\section 3 stc.plt Run By: Moses Cuprill, P.E. 6/25/2016 06:14PM

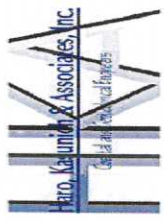
125

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Piez. Surface No.	Load	Value
CLAY	1	123.0	133.0	1000.0	10.0	0.00	W1	LI	500 psf
SOIL MIX	2	113.0	120.0	200.0	43.0	0.00	W1		
BEDROCK	3	135.0	140.0	1000.0	45.0	0.00	0		



GSTABL7 v.2 FSmin=2.48

Factor Of Safety Is Calculated By The Simplified Janbu Method



*** GSTABL7 ***

** GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **

(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer & Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 6/25/2016

Time of Run: 06:14PM

Run By: Moses Cuprill, P.E.

Input Data Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ Slope STABILITY\stability section 3 stc.in

Output Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ Slope STABILITY\stability section 3 stc.OUT

Unit System: English

Plotted Output Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ Slope STABILITY\stability section 3 stc.PLT

PROBLEM DESCRIPTION: VALLEMAR ST AND JULIANA AVE SLOPE STABILITY ANALYSIS SECTION 3 STATIC

BOUNDARY COORDINATES

11 Top Boundaries

13 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	0.00	28.20	0.80	3
2	28.20	0.80	40.00	15.20	3
3	40.00	15.20	43.20	17.10	3
4	43.20	17.10	45.40	17.20	3
5	45.40	17.20	51.40	19.30	2
6	51.40	19.30	58.80	31.20	2
7	58.80	31.20	62.30	41.50	1
8	62.30	41.50	73.70	41.50	1
9	73.70	41.50	79.80	42.20	1
10	79.80	42.20	132.70	42.30	1
11	132.70	42.30	163.00	42.30	1
12	58.80	31.20	163.00	31.20	2
13	45.40	17.20	163.00	17.20	3

Default Y-Origin = 0.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param. (psf)	Pressure Constant	Piez. Surface No.
1	123.0	133.0	1000.0	10.0	0.00	0.0	1
2	113.0	120.0	200.0	43.0	0.00	0.0	1
3	135.0	140.0	1000.0	45.0	0.00	0.0	0

1 PIEZOMETRIC SURFACE(S) SPECIFIED

Unit Weight of Water = 62.40 (pcf)

Piezometric Surface No. 1 Specified by 4 Coordinate Points

Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	45.40	17.20
2	51.40	19.30
3	57.60	28.20
4	163.00	28.20

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
----------	-------------	--------------	-----------------	------------------

1 133.00 163.00 500.0 0.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.

Specified Peak Ground Acceleration Coefficient (A) = 0.890(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.510(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

EARTHQUAKE DATA HAS BEEN SUPPRESSED

Janbu's Empirical Coef. is being used for the case of c & phi both > 0

Trial Failure Surface Specified By 2 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	51.500	19.461
2	85.720	42.211

Janbu's Empirical Coefficient (fo) = 1.000

* * Factor Of Safety Is Calculated By The Simplified Janbu Method * *

Factor Of Safety For The Preceding Specified Surface = 2.481

Table 1 - Individual Data on the 9 Slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	6.1	2049.2	0.0	707.5	0.0	0.0	0.0	0.0	0.0
3	1.2	893.0	0.0	385.3	0.0	0.0	0.0	0.0	0.0
4	3.5	4547.0	0.0	714.0	0.0	0.0	0.0	0.0	0.0
5	2.3	3985.3	0.0	137.0	0.0	0.0	0.0	0.0	0.0
6	4.5	6481.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	4.5	4911.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	6.1	4203.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	5.9	1428.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 2 - Base Stress Data on the 9 Slices

Slice No.	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	33.62	51.51	0.03	193.22	0.66
2	33.62	54.56	7.30	407.38	186.67
3	33.62	58.20	1.44	619.31	411.99
4	33.62	60.55	4.20	1203.90	719.26
5	33.62	63.47	2.82	1671.16	940.88
6	33.62	66.90	5.42	1479.07	795.25
7	33.62	71.43	5.45	1365.25	598.58
8	33.62	76.75	7.33	1285.98	381.50
9	33.62	82.76	7.11	1195.46	133.63

Sum of the Resisting Forces (including Pier/Pile, Tieback, Reinforcing
Soil Nail, and Applied Forces if applicable) = 47011.89 (lbs)

Average Available Shear Strength (including Tieback, Pier/Pile, Reinforcing,
Soil Nail, and Applied Forces if applicable) = 1144.05(psf)

Sum of the Driving Forces = 18947.37 (lbs)

Average Mobilized Shear Stress = 461.09(psf)

Total length of the failure surface = 41.09(ft)

**** END OF GSTABL7 OUTPUT ****

VALLEMAR ST AND JULIANA AVE SLOPE STABILITY ANALYSIS SECTION 3 SEISMIC

c:\users\moses\documents\projects\san mateo\coastal bluff\valleamar bluff\slope stability\section 3 smc.plt Run By: Moses Cuprill, P.E. 6/25/2016 06:13PM

125

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Piez. No.	Load L1	Value
CLAY	1	123.0	133.0	1000.0	10.0	0.00	W1	Peak(A)	500 psf
SOIL MIX	2	113.0	120.0	200.0	43.0	0.00	W1	kh Coef.	0.890(g)
BEDROCK	3	135.0	140.0	1000.0	45.0	0.00	0		0.510(g)

100

75

50

25

0

0

25

50

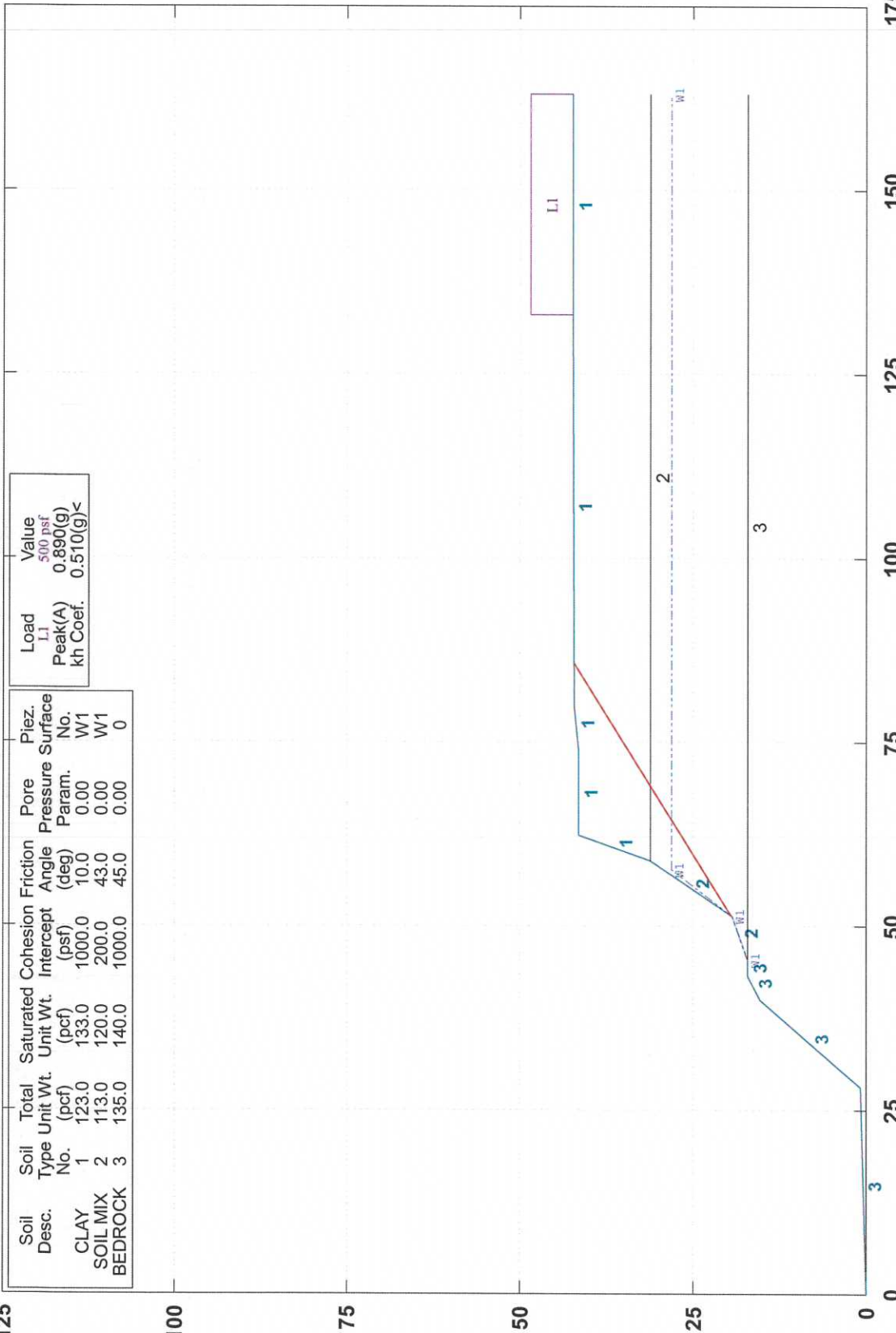
75

100

125

150

175



GSTABL7 v.2 FSmin=1.27

Factor Of Safety Is Calculated By The Simplified Janbu Method



*** GSTABL7 ***

** GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **

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SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer & Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 6/25/2016

Time of Run: 06:13PM

Run By: Moses Cuprill, P.E.

Input Data Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ SloPE STABILITY\stability section 3 smc.in

Output Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ SloPE STABILITY\stability section 3 smc.OUT

Unit System: English

Plotted Output Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ SloPE STABILITY\stability section 3 smc.PLT

PROBLEM DESCRIPTION: VALLEMAR ST AND JULIANA AVE SLOPE STABILITY ANALYSIS SECTION 3 SEISMIC

BOUNDARY COORDINATES

11 Top Boundaries

13 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	0.00	28.20	0.80	3
2	28.20	0.80	40.00	15.20	3
3	40.00	15.20	43.20	17.10	3
4	43.20	17.10	45.40	17.20	3
5	45.40	17.20	51.40	19.30	2
6	51.40	19.30	58.80	31.20	2
7	58.80	31.20	62.30	41.50	1
8	62.30	41.50	73.70	41.50	1
9	73.70	41.50	79.80	42.20	1
10	79.80	42.20	132.70	42.30	1
11	132.70	42.30	163.00	42.30	1
12	58.80	31.20	163.00	31.20	2
13	45.40	17.20	163.00	17.20	3

Default Y-Origin = 0.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param. (psf)	Pressure Constant (psf)	Piez. Surface No.
1	123.0	133.0	1000.0	10.0	0.00	0.0	1
2	113.0	120.0	200.0	43.0	0.00	0.0	1
3	135.0	140.0	1000.0	45.0	0.00	0.0	0

1 PIEZOMETRIC SURFACE(S) SPECIFIED

Unit Weight of Water = 62.40 (pcf)

Piezometric Surface No. 1 Specified by 4 Coordinate Points

Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	45.40	17.20
2	51.40	19.30
3	57.60	28.20
4	163.00	28.20

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
----------	-------------	--------------	-----------------	------------------

1 133.00 163.00 500.0 0.0

NOTE - Intensity Is Specified As A Uniformly Distributed

Force Acting On A Horizontally Projected Surface.

Specified Peak Ground Acceleration Coefficient (A) = 0.890(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.510(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

Janbu's Empirical Coef. is being used for the case of c & phi both > 0

Trial Failure Surface Specified By 2 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	51.500	19.461
2	85.720	42.211

Janbu's Empirical Coefficient (fo) = 1.000

* * Factor Of Safety Is Calculated By The Simplified Janbu Method * *

Factor Of Safety For The Preceding Specified Surface = 1.270

Table 1 - Individual Data on the 9 Slices

Slice No.	Width (ft)	Weight (lbs)	Water Force		Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force		Surcharge Load	
			Top (lbs)	Bot (lbs)			Hor (lbs)	Ver (lbs)		
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	6.1	2049.2	0.0	707.5	0.0	0.0	1045.1	0.0	0.0	0.0
3	1.2	893.0	0.0	385.3	0.0	0.0	455.4	0.0	0.0	0.0
4	3.5	4547.0	0.0	714.0	0.0	0.0	2319.0	0.0	0.0	0.0
5	2.3	3985.3	0.0	137.0	0.0	0.0	2032.5	0.0	0.0	0.0
6	4.5	6481.7	0.0	0.0	0.0	0.0	3305.7	0.0	0.0	0.0
7	4.5	4911.2	0.0	0.0	0.0	0.0	2504.7	0.0	0.0	0.0
8	6.1	4203.4	0.0	0.0	0.0	0.0	2143.7	0.0	0.0	0.0
9	5.9	1428.9	0.0	0.0	0.0	0.0	728.7	0.0	0.0	0.0

Table 2 - Base Stress Data on the 9 Slices

Slice No.	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	33.62	51.51	0.03	162.26	1.17
2	33.62	54.56	7.30	342.11	329.87
3	33.62	58.20	1.44	520.08	728.04
4	33.62	60.55	4.20	1011.01	1271.02
5	33.62	63.47	2.82	1403.40	1662.64
6	33.62	66.90	5.42	1242.09	1405.29
7	33.62	71.43	5.45	1308.90	1057.76
8	33.62	76.75	7.33	1232.89	674.16
9	33.62	82.76	7.11	1146.11	236.14

Sum of the Resisting Forces (including Pier/Pile, Tieback, Reinforcing Soil Nail, and Applied Forces if applicable) = 42507.43 (lbs)

Average Available Shear Strength (including Tieback, Pier/Pile, Reinforcing, Soil Nail, and Applied Forces if applicable) = 1034.43(psf)

Sum of the Driving Forces = 33482.20 (lbs)

Average Mobilized Shear Stress = 814.80(psf)

Total length of the failure surface = 41.09(ft)

*** SEISMIC SLOPE DISPLACEMENT DATA ***

(Note: kv is set = zero for displacement calculations)

Seismic Yield Coefficient (ky) = 0.7575(g)

Calculated Newmark Seismic Displacement = 0.119(ft)

Non-Symmetrical Sliding Resistance Has Been Specified for Downhill Sliding.

**** END OF GSTABL7 OUTPUT ****

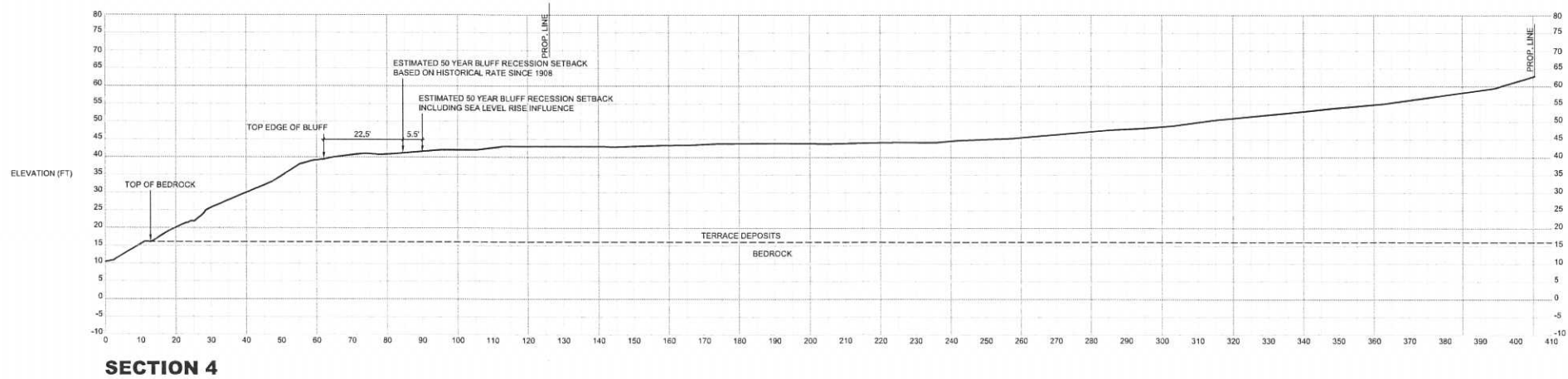
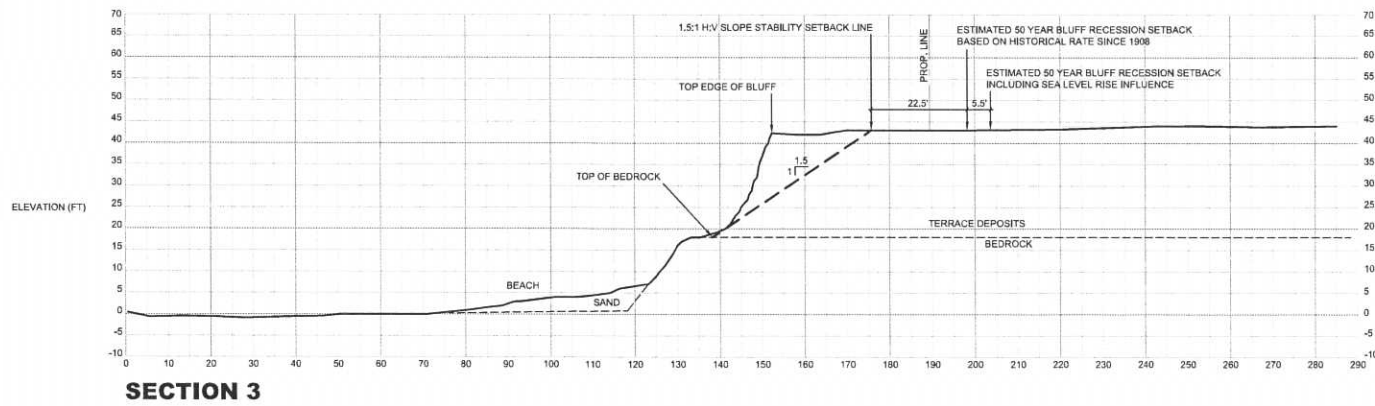
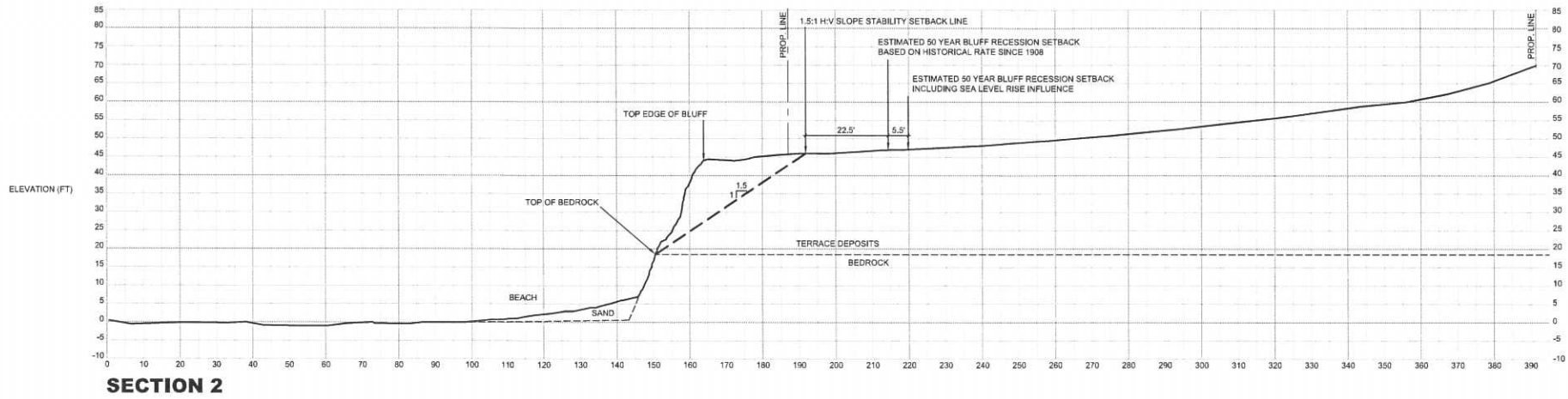
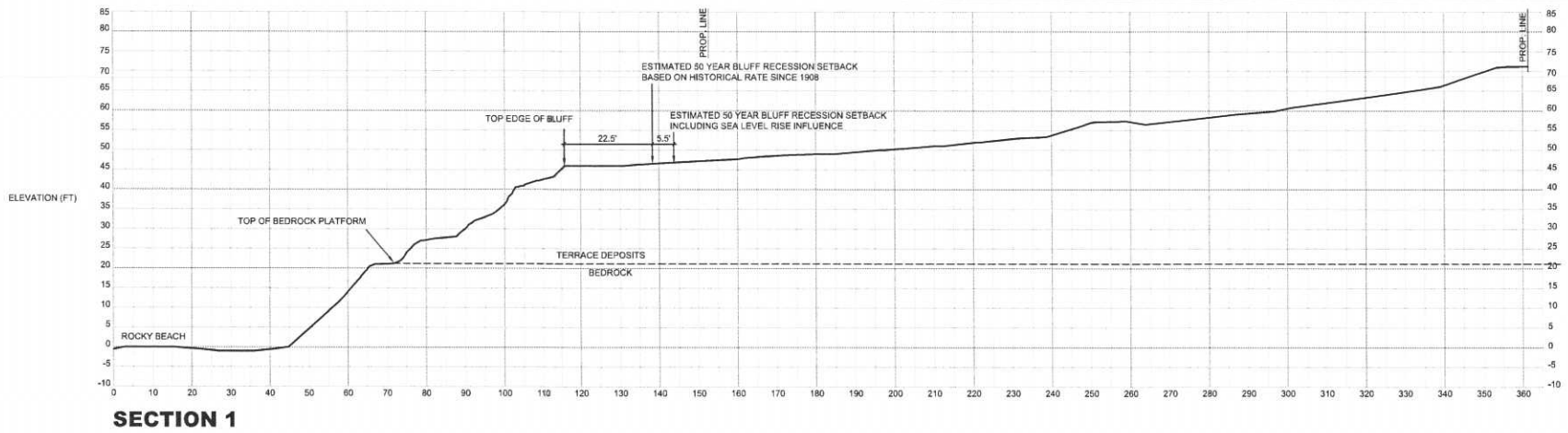
APPENDIX C

Coastal Bluff Recession Map and Sections

REVISIONS	BY
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REVISIONS	BY
COASTAL BLUFF RECESSION CROSS SECTIONS	
MOSS BEACH ASSOCIATES, LLC	
VALLEMAR STREET & JULIANA AVENUE, MOSS BEACH, CA	
SAN MATEO COUNTY A.P.N.'S 037-086-023, 024, 025, 026, 027, 028 & 029	
HARO, KASUNICH AND ASSOCIATES, INC.	
CONSULTING CIVIL, GEOTECHNICAL & COASTAL ENGINEERS	
116 EAST LAKE AVE., WATSONVILLE, CA 95076 (831) 722-4175	
Date	3/9/2015
Scale	AS SHOWN
Drawn	MF
Job	
Sheet	2
OF 2 SHEETS	

APPENDIX D

Percolation Test Results

Percolation Test Results For Vallemar Street and Jullaina APN 037-086-023

Project No: SM10391.2

Date: 31 APRIL 2016

By: Haro, Kasunich and Associates

HOLE NO.:	P-1	TEST DATE: 3/31/16 DRILL DATE: 3/30/16				
WATER LEVEL AFTER PRE-SOAK: Dry		DEPTH OF BORING (feet) 2.146				
TESTED BY: JD		PERCOLATION ZONE (feet): 1.146 2.146				
READING	ELAPSED TIME (min)	WATER DEPTH (feet)	REFILL TO (feet)	Incremental Change (in.)	PERCOLATION RATE (min/inch)	PERC (in/hr)
Start	0	1.6250	-	-	-	-
1	40	1.7917	1.6302	2.0000	20.00	3.0000
2	80	1.7708	1.6250	1.6875	23.70	2.5313
3	115	1.7917	1.6250	2.0000	17.50	3.4286
4	145	1.7813	1.6250	1.8750	16.00	3.7500
5	175	1.7760	1.6250	1.8125	16.55	3.6250
6	205	1.7813	1.6250	1.8750	16.00	3.7500
7	235	1.7865	1.6250	1.9375	15.48	3.8750
8	265	1.7917	1.6250	2.0000	15.00	4.0000

Average Of Reading's (in/hr)= 3.4950

Reported Percolation Rate (in/hr) = 3.9

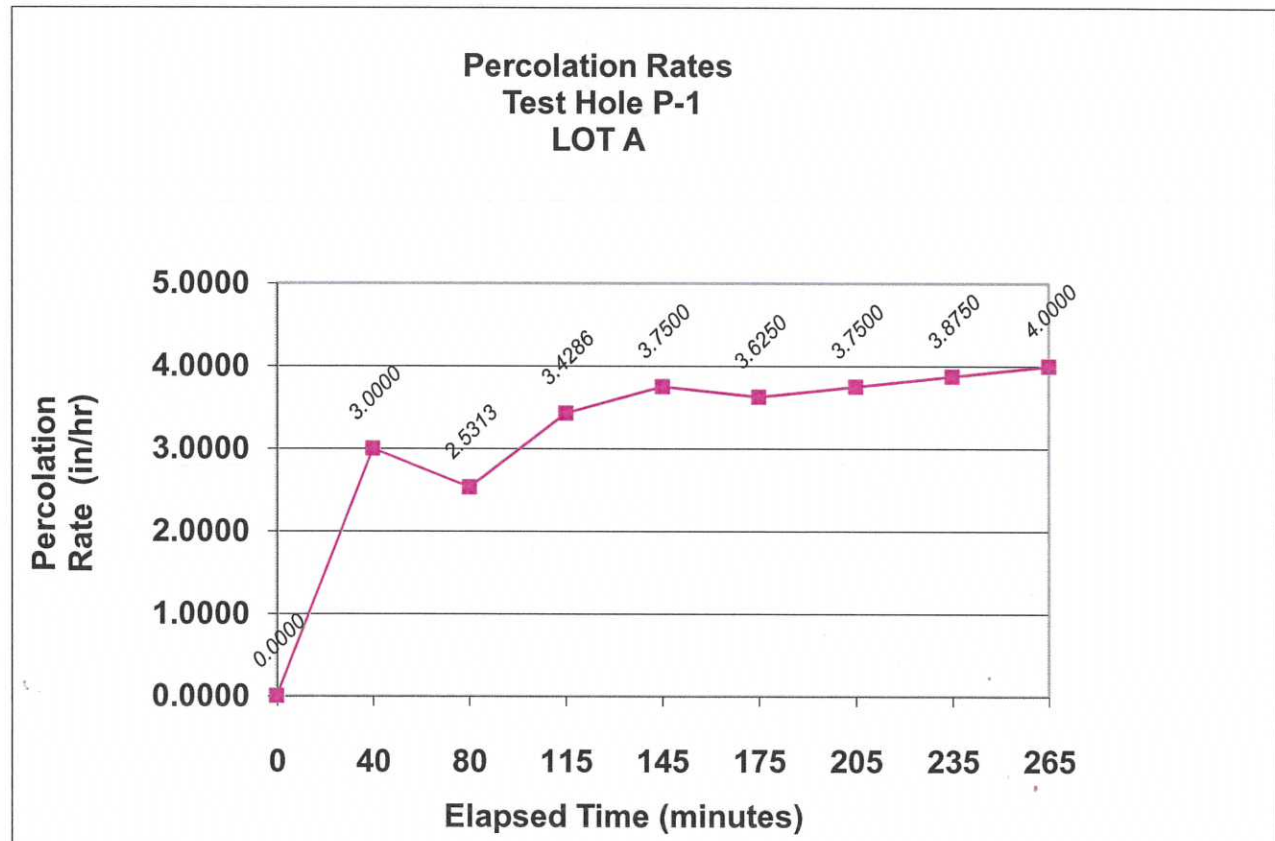


Figure No. _____

Page No. 78

Percolation Test Results For Vallemar Street and Jullaina APN 037-086-029

Project No: SM10391.2

Date: 31 APRIL 2016

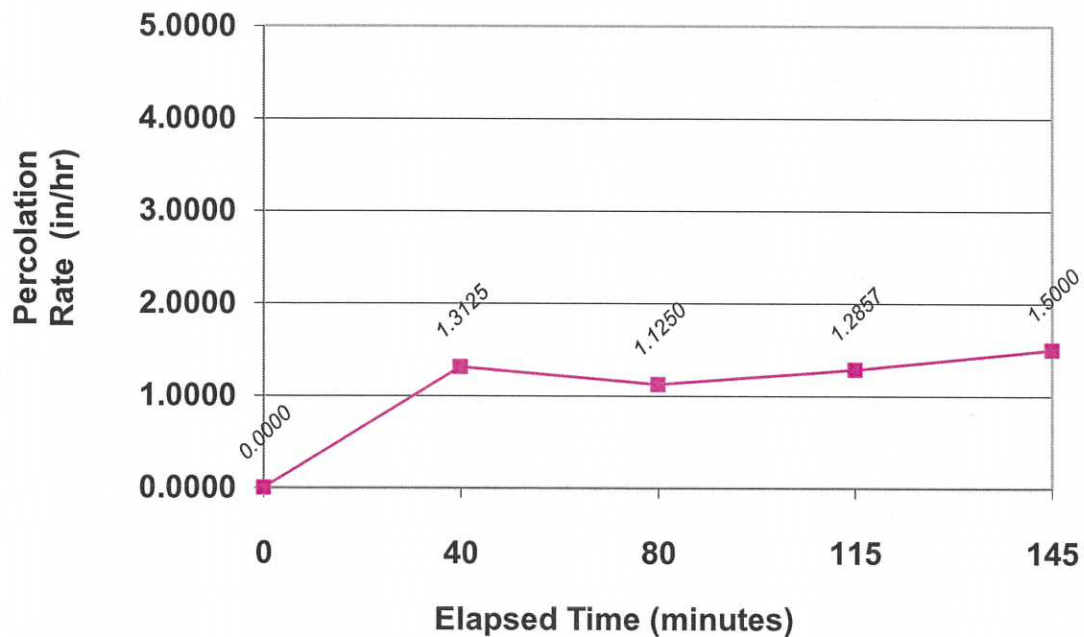
By: Haro, Kasunich and Associates

HOLE NO.:	P-2	TEST DATE: 3/31/16 DRILL DATE: 3/30/16				
WATER LEVEL AFTER PRE-SOAK: Dry		DEPTH OF BORING (feet) 2.146				
TESTED BY:	JD	PERCOLATION ZONE (feet): 1.146 2.146				
READING	ELAPSED TIME (min)	WATER DEPTH (feet)	REFILL TO (feet)	Incremental Change (in.)	PERCOLATION RATE (min/inch)	PERC (in/hr)
Start	0	1.6458	-	-	-	-
1	40	1.7188	1.6458	0.8750	45.71	1.3125
2	80	1.7083	1.6458	0.7500	53.33	1.1250
3	115	1.7083	1.6458	0.7500	46.67	1.2857
4	145	1.7083	1.6458	0.7500	40.00	1.5000
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-

Average Of Reading's (in/hr)= 1.3058

Reported Percolation Rate (in/hr) = 1.4

Percolation Rates
Test Hole P-2
LOT G



Percolation Test Results For Vallemar Street and Jullaina APN 037-086-028

Project No: SM10391.2

Date: 31 APRIL 2016

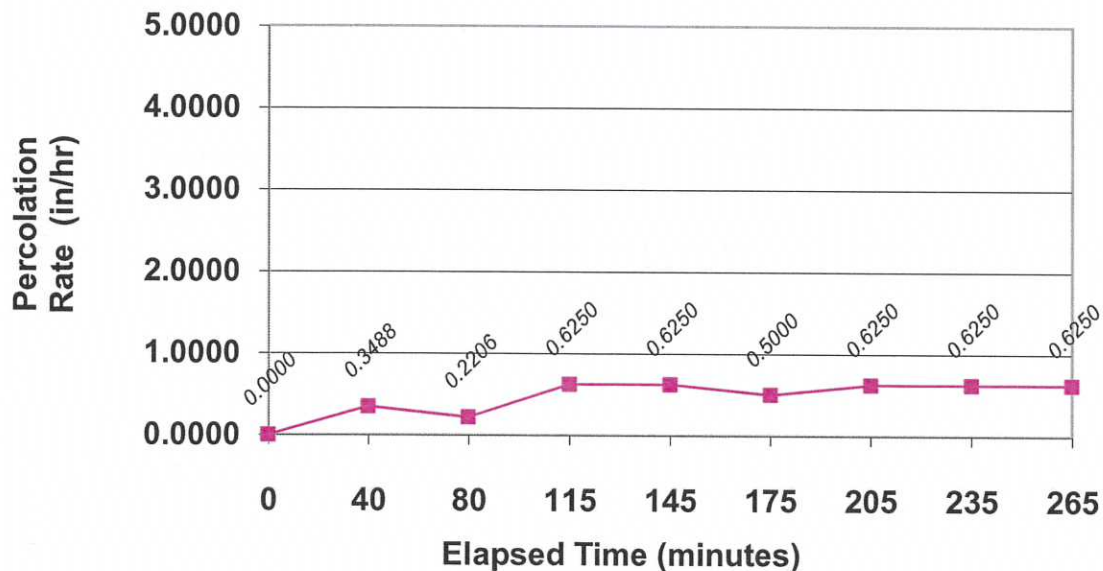
By: Haro, Kasunich and Associates

HOLE NO.: P-3			TEST DATE: 3/31/16 DRILL DATE: 3/30/16			
WATER LEVEL AFTER PRE-SOAK: 3.708			DEPTH OF BORING (feet) 4.042			
TESTED BY: JD			PERCOLATION ZONE (feet): 3.042 4.042			
READING	ELAPSED TIME (min)	WATER DEPTH (feet)	REFILL TO (feet)	Incremental Change (in.)	PERCOLATION RATE (min/inch)	PERC (in/hr)
Start	0	3.5417	-	-	-	-
1	43	3.5625	3.5417	0.2500	172.00	0.3488
2	77	3.5521	3.5417	0.1250	272.00	0.2206
3	107	3.5677	3.5417	0.3125	96.00	0.6250
4	137	3.5677	3.5417	0.3125	96.00	0.6250
5	167	3.5625	3.5417	0.2500	120.00	0.5000
6	197	3.5677	3.5417	0.3125	96.00	0.6250
7	227	3.5677	3.5417	0.3125	96.00	0.6250
8	257	3.5677	3.5417	0.3125	96.00	0.6250

Average Of Reading's (in/hr)= 0.5243

Reported Percolation Rate (in/hr) = 0.6

Percolation Rates
Test Hole P-3
LOT F



Percolation Test Results For Vallemar Street and Jullaina APN 037-086-027

Project No: SM10391.2

Date: 31 APRIL 2016

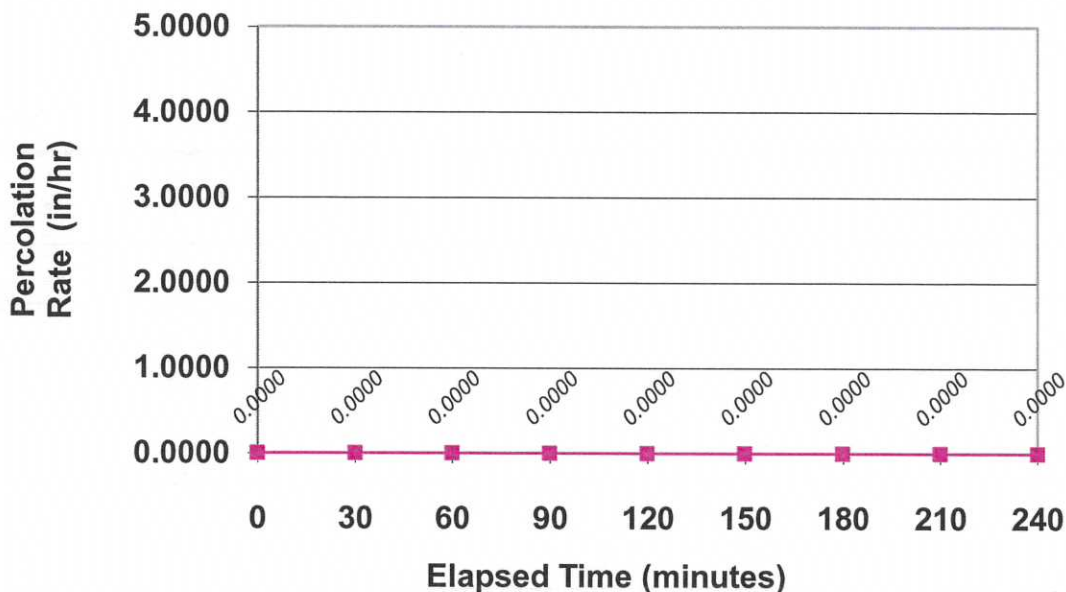
By: Haro, Kasunich and Associates

HOLE NO.: P-4		TEST DATE: 3/31/16 DRILL DATE: 3/30/16				
WATER LEVEL AFTER PRE-SOAK: 1.958		DEPTH OF BORING (feet) 2.958				
TESTED BY: JD		PERCOLATION ZONE (feet): 1.958 2.958				
READING	ELAPSED TIME (min)	WATER DEPTH (feet)	REFILL TO (feet)	Incremental Change (in.)	PERCOLATION RATE (min/inch)	PERC (in/hr)
Start	0	1.9583	-	-	-	-
1	30	1.9583	0.0000	0.0000	-	0.0000
2	60	1.9583	0.0000	0.0000	-	0.0000
3	90	1.9583	0.0000	0.0000	-	0.0000
4	120	1.9583	0.0000	0.0000	-	0.0000
5	150	1.9583	0.0000	0.0000	-	0.0000
6	180	1.9583	0.0000	0.0000	-	0.0000
7	210	1.9583	0.0000	0.0000	-	0.0000
8	240	1.9583	0.0000	0.0000	-	0.0000

Average Of Reading's (in/hr)= 0.0000

Reported Percolation Rate (in/hr) = 0.0

Percolation Rates
Test Hole P-4
LOT E



Percolation Test Results For Vallemar Street and Jullaina APN 037-086-026

Project No: SM10391.2

Date: 31 APRIL 2016

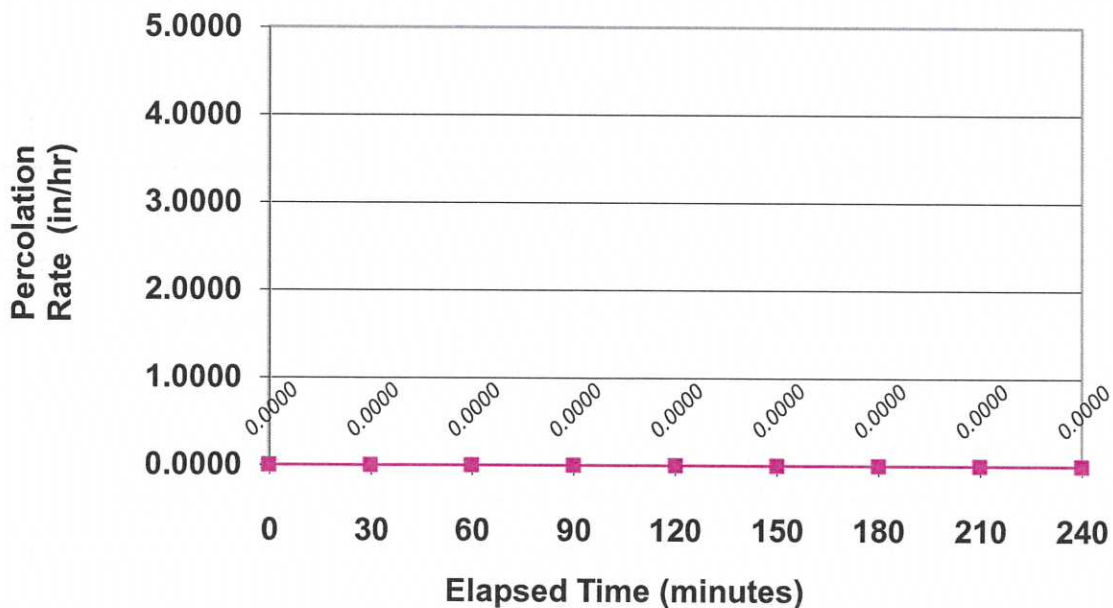
By: Haro, Kasunich and Associates

HOLE NO.:	P-4	TEST DATE: 3/31/16 DRILL DATE: 3/30/16				
WATER LEVEL AFTER PRE-SOAK: 1.958		DEPTH OF BORING (feet) 2.958				
TESTED BY: JD		PERCOLATION ZONE (feet): 1.958 2.958				
READING	ELAPSED TIME (min)	WATER DEPTH (feet)	REFILL TO (feet)	Incremental Change (in.)	PERCOLATION RATE (min/inch)	PERC (in/hr)
Start	0	1.9583	-	-	-	-
1	30	1.9583	0.0000	0.0000	-	0.0000
2	60	1.9583	0.0000	0.0000	-	0.0000
3	90	1.9583	0.0000	0.0000	-	0.0000
4	120	1.9583	0.0000	0.0000	-	0.0000
5	150	1.9583	0.0000	0.0000	-	0.0000
6	180	1.9583	0.0000	0.0000	-	0.0000
7	210	1.9583	0.0000	0.0000	-	0.0000
8	240	1.9583	0.0000	0.0000	-	0.0000

Average Of Reading's (in/hr)= 0.0000

Reported Percolation Rate (in/hr) = 0.0

Percolation Rates
Test Hole P-5
LOT D



APPENDIX E
Scale of Acceptable Risks from Geologic Hazards

APPENDIX E

SCALE OF ACCEPTABLE RISKS FROM NON-SEISMIC GEOLOGIC HAZARDS*

RISK LEVEL	STRUCTURE TYPE	RISK CHARACTERISTICS
EXTREMELY LOW RISKS	Structures whose continued functioning is critical, or whose failure might be catastrophic: nuclear reactors, large dams, power intently systems, plants manufacturing or storing explosive or toxic materials.	Failure affects substantial populations risk equals nearly zero.
VERY LOW RISKS	Structures whose use is critically needed after a disaster: important utility centers: hospitals: fire, police, and emergency communication facilities; fire stations; and critical transportation elements such as bridges and overpasses; also smaller dams.	Failure affects substantial populations.
LOW RISKS	Structures of high occupancy, or whose use after a disaster: important utility centers; hospitals; fire, police, and emergency communication facilities; fire stations; and critical transportation elements such as bridges and overpasses; also smaller dams.	Failure of a single structure would affect primary only the occupants.
"ORDINARY RISKS"	The vast majority of structures: most commercial and industrial buildings; small hotels and apartment buildings, and single-family residences.	Failure only affects owners/occupants of a structure rather than a substantial population. No significant potential for loss of life of serious physical injury. Risk level is similar or comparable to other ordinary risks (including seismic risks) to citizens of coastal California. No collapse of structures; structural damage limited to repairable damage in most cases. This degree of damage is unlikely as a result of storms with a repeat time of 50 years or less.
MODERATE RISKS	fences, driveways, non-habitable structures, detached retaining walls, sanitary landfills, recreation areas and open space.	Structure is not occupied or occupied infrequently. Low probability of physical injury. Moderate probability of collapse.

*Non-seismic geologic hazards include flooding, landslides, erosion, wave run-up and sinkhole collapse.

APPENDIX E
SCALES OF ACCEPTABLE RISKS FROM SEISMIC GEOLOGIC HAZARDS

LEVEL OF ACCEPTABLE RISK	KINDS OF STRUCTURES	EXTRA PROJECT COST PROBABLY REQUIRED TO REDUCE RISK TO AN ACCEPTABLE LEVEL
Extremely Low	Structures whose continued functioning is critical, or whose failure might be catastrophic nuclear reactors, large dams, power intently systems, plants manufacturing or storing explosives to toxic materials.	No set percentage (whatever is required for maximum attainable safety).
Slightly higher than under level 1 ¹	Structures whose use is critically needed after a disaster; important utility centers; hospitals; fire, police, and emergency communication facilities; fire station; and critical transportation elements such as bridges and overpasses; also smaller dams.	5 to 25 percent of project cost.
Lowest possible risk to occupants of the structure ³	Structures of high occupancy or whose use after a disaster would be particularly convenient; schools, churches, theaters, large hotels, and other high-rise buildings housing large numbers of people, other places normally attracting large concentrations of people civic buildings such as fire stations, secondary utility structures, extremely large commercial enterprises, most roads, alternative or non-critical bridges and overpasses.	5 to 15 percent of project cost.
An "ordinary" level or risk to occupants of the structure ^{3,5}	The vast majority of structures; most commercial and industrial buildings, small hotels and apartment buildings and single-family residences.	1 to 2 percent of project cost in most cases (2 to 10 percent of project cost in a minority of cases) ⁴

1. Failure of a single structure may affect substantial populations.
2. These additional percentages are based on the assumption that the base cost is the total cost of the building or other facility when ready for occupancy. In addition, it is assumed that the structure would have been designed and built in accordance with current California practice. Moreover, the estimated additional cost presumes that structures in this acceptable-risk category are to embody sufficient safety to remain functional following an earthquake.
3. Failure of single structure would affect primarily only the occupants.
4. These additional percentages are based on the assumption that the base cost is the total cost of the building or facility when ready for occupancy. In addition, it is assumed that the structures would have been designed and built in accordance with current California Practice. Moreover, the estimated additional cost presumes that structures in this acceptable-risk category are to be sufficiently safe to give reasonable assurance of preventing injury or loss of life during and following an earthquake, but otherwise not necessarily to remain functional.
5. "Ordinary Risk": Resist minor earthquakes without damage; resist moderate earthquakes without structural damage but with some non-structural damage; resist major earthquakes of the intensity or severity of the strongest experienced in California, without collapse, but with some structural, as well as non-structural damage. In most structures, it is expected that structural damage, even in a major earthquake, could be limited to repairable damage. (Structural Engineers Association of California).

Source: Meeting The Earthquake Challenge, Joint Committee on Seismic Safety of the California Legislature, January 1974, p.9.

APPENDIX F

Photographs



Drilling operations at test bore hole B1



Collection of spoils and mixing of grout at test bore hole B1



Grouting of test bore hole B1



Ground surface after drilling operation at test bore hole B1



Drill setup test bore hole B4



Ground surface after drilling operation test bore hole B4



Location of test bore hole B5



Drilling operation test bore hole B5



Grouting test bore hole B2



Drilling operation test bore hole B2



Grouting of test bore hole B3



APPENDIX E

County Maintenance Plan Templates

Infiltration Trench Maintenance Plan for Moss Beach Development

8/19/16



An infiltration trench is a long, narrow, excavated trench backfilled with a stone aggregate, and lined with a filter fabric. Runoff is stored in the void space between the stones and infiltrates through the bottom and into the soil matrix.

Project Address and Cross Streets _____

Vallemar Street and Juliana Avenue

Assessor's Parcel No.: _____

Property Owner: _____

Phone No.: _____

Designated Contact: _____

Phone No.: _____

Mailing Address: _____

The property contains infiltration trench(es), as shown on the attached plans.

- **Refer to Utility & Drainage Plan (Appendix B) for locations and details.**

I. Routine Maintenance Activities

The principal maintenance objective is to prevent sediment buildup and clogging, which reduces pollutant removal efficiency and may lead to trench failure. Routine maintenance activities, and the frequency at which they will be conducted, are shown in Table 1.

Table 1 Routine Maintenance Activities for Infiltration Trenches		
No.	Maintenance Task	Frequency of Task
1	Remove obstructions, debris and trash from infiltration trench and dispose of properly.	Monthly, or as needed after storm events
2	Inspect trench to ensure that it drains between storms, and within 5 days after rainfall. Check observation well 2-3 days after storm to confirm drainage.	Monthly during wet season, or as needed after storm events
3	Inspect filter fabric for sediment deposits by removing a small section of the top layer.	Annually
4	Monitor observation well to confirm that trench has drained during dry season.	Annually, during dry season
5	Mow and trim vegetation around the trench to maintain a neat and orderly appearance.	As needed
6	Remove any trash, grass clippings and other debris from the trench perimeter and dispose of properly.	As needed
7	Check for erosion at inflow or overflow structures.	As needed
8	Confirm that cap of observation well is sealed.	At every inspection
9	Inspect infiltration trench using the attached inspection checklist.	Monthly, or after large storm events, and after removal of accumulated debris or material

II. Prohibitions

Trees and other large vegetation shall be prevented from growing adjacent to the trench to prevent damage.

Infiltration Trench Maintenance Plan
Property Address: _____

Date of Inspection: _____
Treatment Measure No.: _____

Standing water shall not remain in the treatment measures for more than five days, to prevent mosquito generation. Should any mosquito issues arise, contact the San Mateo County Mosquito Abatement District (SMCMAD), as needed for assistance. Mosquito larvicides shall be applied only when absolutely necessary, as indicated by the SMCMAD, and then only by a licensed professional or contractor. Contact information for SMCMAD is provided below.

III. Mosquito Abatement Contact Information

San Mateo County Mosquito Abatement District
1351 Rollins Road
Burlingame, CA 94010
PH: (650) 344-8592
FAX: (650) 344-3843
[Email: info@smcmad.org](mailto:info@smcmad.org)

IV. Inspections

The attached Infiltration Trench Inspection and Maintenance Checklist shall be used to conduct inspections monthly (or as needed), identify needed maintenance, and record maintenance that is conducted.

Infiltration Trench Inspection and Maintenance Checklist

Property Address: _____

Property Owner: _____

Treatment Measure No.: _____

Date of Inspection: _____

Type of Inspection: _____

☒ Wet Season

☐ Pre

☐ After heavy runoff ☐ End of Wet Season

☐ Other: _____

Inspector(s): _____

Defect	Conditions When Maintenance Is Needed	Maintenance Needed? (Y/N)	Comments (Describe maintenance completed and if needed maintenance was not conducted, note when it will be done)	Results Expected When Maintenance Is Performed
1. Standing Water	When water stands in the infiltration trench between storms and does not drain within 5 days after rainfall.			There should be no areas of standing water once inflow has ceased. Any of the following may apply: sediment or trash blockages removed, improved grade from head to foot of infiltration trench, removed clogging at check dams, or added underdrains.
2. Trash and Debris Accumulation	Trash and debris accumulated in the infiltration trench.			Trash and debris removed from infiltration trench and disposed of properly.
3. Sediment	Evidence of sedimentation in trench. Less than 50% storage volume remaining in sediment traps, forebays or pretreatment swales.			Material removed and disposed of properly so that there is no clogging or blockage.
4. Inlet/Outlet	Inlet/outlet areas clogged with sediment or debris, and/or eroded.			Material removed and disposed of properly so that there is no clogging or blockage in the inlet and outlet areas.
5. Overflow Spillway	Clogged with sediment or debris, and/or eroded.			Material removed and disposed of properly so that there is no clogging or blockage, and trench is restored to design condition.
6. Filter Fabric	Annual inspection, by removing a small section of the top layer, shows sediment accumulation that may lead to trench failure.			Replace filter fabric, as needed, to restore infiltration trench to design condition.
7. Observation Well	Routine monitoring of observation well indicates that trench is not draining within specified time or observation well cap is missing.			Restore trench to design conditions. Observation well cap is sealed.
8. Miscellaneous	Any condition not covered above that needs attention in order for the infiltration trench to function as designed.			Meet the design specifications.



APPENDIX F

C3 and C6 Development Review Checklist

C.3 and C.6 Development Review Checklist

Address 455 County Center, 2nd Floor
Phone Redwood City, CA 94063
Website 650-363-1825

Project Information

I.A Enter Project Data (For "C.3 Regulated Projects," data will be reported in the municipality's stormwater Annual Report.)

Project Name: Moss Beach Ocean Development Case Number:
Project Address & Cross Street: Juliana Ave and Vallemar St
Project APN: Project Watershed:
Applicant Name: Owen Lawlor Project Phase No.
Applicant Phone: 831-457-1331 Applicant E-mail: owen.lawlor@gmail.com

Development Type: ☐ Single Family Residential: A stand-alone home that is not part of a larger project.
(check all that apply) ☒ Single Family Residential: Two or more lot residential development.¹ # of units: 4
☐ Multi-Family Residential # of units:
☐ Commercial
☐ Industrial, Manufacturing
☐ Mixed-Use # of units:
☐ Streets, Roads², etc.
☐ Redevelopment³ as defined by MRP: creating, adding and/or replacing exterior existing impervious surface on a site where past development has occurred.

I.A.1 ☐ Special land use categories³ as defined by MRP: (1) auto service facilities³, (2) retail gasoline outlets, (3) restaurants, (4) uncovered parking area (stand-alone or part of a larger project)
☐ Institutions: schools, libraries, jails, etc.
☐ Parks and trails, camp grounds, other recreational
☐ Agricultural, wineries
☐ Kennels, Ranches
☐ Other, Please specify

Project Description (Also not any past or future phases of the project.)⁴ Residential development with four 2-story buildings

I.A.2 Total Area of Site: 2.35 acres
I.A.3 Total Area of land disturbed during construction : 0.84 acres I.A.4 Site slope: %
(include clearing, grading, excavating and stockpile area)

I.A.5 Certification:

I certify that the information provided on this form is correct and acknowledge that, should the project exceed the amount of new and/or replaced impervious surface provided in this form, the as-built project may be subject to additional improvements.

☐ Attach Preliminary Calculations ☐ Attach Final Calculations ☐ Attach copy of site plan showing areas
Name of person completing the form: Daniel Mays Title: Engineer II
Signature:  Date: 4/26/2017
Phone Number: 831-426-3186 x105 E-mail: daniel@m-me.com

1 Common Plans of Development (subdivisions or contiguous, commonly owned lots, for the construction of two or more homes developed within 1 year of each other) are not considered single family projects by the MRP.
2 Roadway projects creating 10,000 sq.ft. or more of contiguous impervious surface are subject to C.3 requirements if the roadway is new or being widened with additional traffic lanes.
3 See Standard Industrial Classification (SIC) codes here: www.flowstobay.org/documents/business/new-development/Notice_to_Applicants-LID_FINAL.doc
4 Project description examples: 5-story office building, industrial warehouse, residential with five 4-story buildings for 200 condominiums, etc. 1/1/16 v.2

I.B Is the project a “C.3 Regulated Project” per MRP Provision C.3.b?**I.B.1** Enter the amount of Impervious surface Retained, Replaced and/or Created by the project:**Table I.B.1 Impervious⁵ and Pervious Surfaces**

	I.B.1.a	I.B.1.b	I.B.1.c	I.B.1.d	I.B.1.e
Type of Impervious Surface	Pre-Project Impervious Surface (sq.ft.)	Existing Impervious Surface to be Retained ⁶ (sq.ft.)	Existing Impervious Surface to be Replaced ⁶ (sq.ft.)	New Impervious Surface to be Created ⁶ (sq.ft.)	Post-Project Impervious Surface (sq.ft.) (=b+c+d)
Roof area(s)	0	0	0	13830	13830
Impervious ⁵ sidewalks, patios, paths, driveways, streets	0	0	0	3240	3240
Impervious ⁵ uncovered parking ⁷	0	0	0	0	0
Totals:	0	0	0	17070	17070
I.B.1.f - Total Impervious Surface Replaced and Created: (sum of totals for columns I.B.1.c and I.B.1.d):			17070		
Type of Pervious Surface	Pre-Project Pervious Surface (sq.ft.)				Post-project Pervious Surface(sq.ft.)
Landscaping	102200				80030
Pervious Paving	0			I.B.1.e.1	5100
Green Roof	0				0
Totals:	102200				85130
Total Site Area (Total Impervious + Total Pervious)	102200				102200

I.B.2 Please review and attach additional worksheets as required below using the Total Impervious Surface (IS) Replaced and Created in cell **I.B.1.f** from Table **I.B.1** above and other factors:

	Review Steps	Check One		Attach Worksheet
		Yes	No	
I.B.2.a	Does this project involve any earthwork? If YES, then Check Yes, and Complete Worksheet A. If NO, then go to I.B.2.b	☒	☐	A
I.B.2.b	Is I.B.1.f greater than or equal to 2,500 sq.ft? If YES, then the Project is subject to Provision C.3.i. - complete Worksheets B, C & go to I.B.2.c. If NO, then Stop here - go to I.A.5 and complete Certification or ask municipal staff for Small Project Checklist.	☒	☐	B, C
I.B.2.c	Is the total Existing IS to be Replaced (column I.B.1.c) 50 percent or more of the total Pre-Project IS (column I.B.1.a)? If YES, site design, source control and treatment requirements apply to the whole site. Continue to I.B.2.d If NO, these requirements apply only to the impervious surface created and/or replaced. Continue to I.B.2.d	☐	☒	
I.B.2.d	Is this project a Special Land Use Category (I.A.1) and is I.B.1.f greater than or equal to 5,000 sq.ft? If YES, project is a C.3 Regulated Project. Fill out Worksheet D. Then continue to I.B.2.f. If NO, go to I.B.2.e	☐	☒	D
I.B.2.e	Is I.B.1.f greater than or equal to 10,000 sq.ft? If YES, project is a C.3 Regulated Project - complete Worksheet D. Then continue to I.B.2.f. If NO, then skip to I.B.2.g.	☒	☐	D
I.B.2.f	Is I.B.1.f greater than or equal to 43,560 sq.ft? If YES, project may be subject to Hydromodification Management requirements - complete Worksheet E then go to I.B.2.g. If NO, then go to I.B.2.g.	☐	☒	E
I.B.2.g	Is I.A.3 greater than or equal to 1 acre? If YES, check box, obtain coverage under CA Const. General Permit & submit Notice of Intent to municipality - go to I.B.2.h. If NO, then go to I.B.2.h. For more information see: www.swrcb.ca.gov/water_issues/programs/stormwater/construction.shtml	☐	☒	
I.B.2.h	Is this a Special Project or does it have the potential to be a Special Project? If YES, complete Worksheet F - then continue to I.B.2.i. If NO, go to I.B.2.i.	☐	☒	F
I.B.2.i	Is this project a High Priority Site? (Determined by the Municipality. High Priority Sites can include those located within 100 ft. of a sensitive habitat, an Area of Special Biological Significance, a body of water, or starting 7/1/16 on sites disturbing >=5,000 sq.ft. with slopes >=15% (see I.A.4) [or per municipal criteria/map.] Subject to monthly inspections from Oct 1 to April 30.) If YES, complete section G-2 on Worksheet G - then continue to I.B.2.j. If NO, then go to I.B.2.j	☒	☐	G
I.B.2.j	For Municipal Staff Use Only: Are you using Alternative Certification for the project review? If YES, then fill out section G-1 on Worksheet G. Fill out other sections of Worksheet G as appropriate. See cell I.B.1.e.1 above - Is the project installing 3,000 square feet or more of pervious paving? If YES, then fill out section G-3 on Worksheet G. Add to Municipal Inspection Lists (C.3 and C.3.h)	☐	☐	G

⁵ Per the MRP, pavement that meets the following definition of pervious pavement is NOT an impervious surface. Pervious pavement is defined as pavement that stores and infiltrates rainfall at a rate equal to immediately surrounding unpaved, landscaped areas, or that stores and infiltrates the rainfall runoff volume described in Provision C.3.

⁶ “Retained” means to leave existing impervious surfaces in place; “Replaced” means to install new impervious surface where existing impervious surface is removed anywhere on the same property; and “Created” means the amount of new impervious surface being proposed which exceeds the total existing amount of impervious surface at the property.

⁷ Uncovered parking includes the top level of a parking structure.

Worksheet A

C6 – Construction Stormwater BMPs

Identify Plan sheet showing the appropriate construction Best Management Practices (BMPs) used on this project:

(Applies to all projects with earthwork)

Yes	Plan Sheet	Best Management Practice (BMP)
☒	C6.0	Control and prevent the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, wash water or sediments, rinse water from architectural copper, and non-stormwater discharges to storm drains and watercourses.
☒	C6.0	Store, handle, and dispose of construction materials/wastes properly to prevent contact with stormwater.
☒	C6.0	Do not clean, fuel, or maintain vehicles on-site, except in a designated area where wash water is contained and treated.
☒	C6.0	Train and provide instruction to all employees/subcontractors re: construction BMPs.
☒	C6.0	Protect all storm drain inlets in vicinity of site using sediment controls such as berms, fiber rolls, or filters.
☒	C6.0	Limit construction access routes and stabilize designated access points.
☒	C7.0	Attach the San Mateo Countywide Water Pollution Prevention Program's construction BMP plan sheet to project plans and require contractor to implement the applicable BMPs on the plan sheet.
☒	C6.0	Use temporary erosion controls to stabilize all denuded areas until permanent erosion controls are established.
☒	C6.0	Delineate with field markers clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses.
☒	C6.0, L3.3	Provide notes, specifications, or attachments describing the following: ■ Construction, operation and maintenance of erosion and sediment controls, include inspection frequency; ■ Methods and schedule for grading, excavation, filling, clearing of vegetation, and storage and disposal of excavated or cleared material; ■ Specifications for vegetative cover & mulch, include methods and schedules for planting and fertilization; ■ Provisions for temporary and/or permanent irrigation.
☒	C6.0	Perform clearing and earth moving activities only during dry weather.
☒	C6.0	Use sediment controls or filtration to remove sediment when dewatering and obtain all necessary permits.
☒	C6.0	Trap sediment on-site, using BMPs such as sediment basins or traps, earthen dikes or berms, silt fences, check dams, soil blankets or mats, covers for soil stock piles, etc.
☒	C6.0	Divert on-site runoff around exposed areas; divert off-site runoff around the site (e.g., swales and dikes).
☒	C6.0	Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.

Worksheet B

C3 – Source Controls

Select appropriate source controls and identify the detail/plan sheet where these elements are shown.

Yes	Detail/Plan Sheet No.	Features that require source control measures	Source Control Measures (Refer to Local Source Control List for detailed requirements)
☒	C3.0	Storm Drain	Mark on-site inlets with the words "No Dumping! Flows to Bay" or equivalent.
☐		Floor Drains	Plumb interior floor drains to sanitary sewer [or prohibit].
☐		Parking garage	Plumb interior parking garage floor drains to sanitary sewer. ⁸
☒	L3.3	Landscaping	■ Retain existing vegetation as practicable. ■ Select diverse species appropriate to the site. Include plants that are pest- and/or disease-resistant, drought-tolerant, and/or attract beneficial insects. ■ Minimize use of pesticides and quick-release fertilizers. ■ Use efficient irrigation system; design to minimize runoff.
☐		Pool/Spa/Fountain	Provide connection to the sanitary sewer to facilitate draining. ⁸
☐		Food Service Equipment (non-residential)	Provide sink or other area for equipment cleaning, which is: ■ Connected to a grease interceptor prior to sanitary sewer discharge.⁸ ■ Large enough for the largest mat or piece of equipment to be cleaned. ■ Indoors or in an outdoor roofed area designed to prevent stormwater run-on and run-off, and signed to require equipment washing in this area.
☐		Refuse Areas	■ Provide a roofed and enclosed area for dumpsters, recycling containers, etc., designed to prevent stormwater run-on and runoff. ■ Connect any drains in or beneath dumpsters, compactors, and tallow bin areas serving food service facilities to the sanitary sewer.⁸
☐		Outdoor Process Activities ⁹	Perform process activities either indoors or in roofed outdoor area, designed to prevent stormwater run-on and runoff, and to drain to the sanitary sewer. ⁸
☐		Outdoor Equipment/ Materials Storage	■ Cover the area or design to avoid pollutant contact with stormwater runoff. ■ Locate area only on paved and contained areas. ■ Roof storage areas that will contain non-hazardous liquids, drain to sanitary sewer⁸, and contain by berms or similar.
☐		Vehicle/ Equipment Cleaning	■ Roofed, pave and berm wash area to prevent stormwater run-on and runoff, plumb to the sanitary sewer⁸, and sign as a designated wash area. ■ Commercial car wash facilities shall discharge to the sanitary sewer.⁸
☐		Vehicle/ Equipment Repair and Maintenance	■ Designate repair/maintenance area indoors, or an outdoors area designed to prevent stormwater run-on and runoff and provide secondary containment. Do not install drains in the secondary containment areas. ■ No floor drains unless pretreated prior to discharge to the sanitary sewer.⁸ ■ Connect containers or sinks used for parts cleaning to the sanitary sewer.⁸
☐		Fuel Dispensing Areas	■ Fueling areas shall have impermeable surface that is a) minimally graded to prevent ponding and b) separated from the rest of the site by a grade break. ■ Canopy shall extend at least 10 ft. in each direction from each pump and drain away from fueling area.
☐		Loading Docks	■ Cover and/or grade to minimize run-on to and runoff from the loading area. ■ Position downspouts to direct stormwater away from the loading area. ■ Drain water from loading dock areas to the sanitary sewer.⁸ ■ Install door skirts between the trailers and the building.
☐		Fire Sprinklers	Design for discharge of fire sprinkler test water to landscape or sanitary sewer. ⁸
☐		Miscellaneous Drain or Wash Water	■ Drain condensate of air conditioning units to landscaping. Large air conditioning units may connect to the sanitary sewer.⁸ ■ Roof drains from equipment drain to landscaped area where practicable. ■ Drain boiler drain lines, roof top equipment, all wash water to sanitary sewer.⁸
☐		Architectural Copper Rinse Water	■ Drain rinse water to landscaping, discharge to sanitary sewer ⁸ , or collect and dispose properly offsite. See flyer "Requirements for Architectural Copper."

⁸ Any connection to the sanitary sewer system is subject to sanitary district approval.

⁹ Businesses that may have outdoor process activities/equipment include machine shops, auto repair, industries with pretreatment facilities.

Worksheet C

Low Impact Development – Site Design Measures

Select Appropriate Site Design Measures (Required for C.3 Regulated Projects; all other projects are encouraged to implement site design measures, which may be required at municipality discretion.) Projects that create and/or replace 2,500 – 10,000 sq.ft. of impervious surface, and stand-alone single family homes that create/replace 2,500 sq.ft. or more of impervious surface, must include **one of Site Design Measures a through f** (Provision C.3.i requirements).¹⁰ Larger projects must also include applicable Site Design Measures g through i. Consult with municipal staff about requirements for your project.

Select appropriate site design measures and Identify the Plan Sheet where these elements are shown.

Yes	Plan Sheet No.	
☐		a. Direct roof runoff into cisterns or rain barrels and use rainwater for irrigation or other non-potable use.
☒	C3.0	b. Direct roof runoff onto vegetated areas.
☒	C3.0	c. Direct runoff from sidewalks, walkways, and/or patios onto vegetated areas.
☒	C3.0	d. Direct runoff from driveways and/or uncovered parking lots onto vegetated areas.
☒ ☒	C1.0, L4.2	e. Construct sidewalks, walkways, and/or patios with pervious or permeable surfaces. Use the specifications in the C3 Technical Guidance (Version 4.1) downloadable at www.flowstobay.org/newdevelopment .
☒	C1.0, L4.2	f. Construct bike lanes, driveways, and/or uncovered parking lots with pervious surfaces. Use the specifications in the C3 Technical Guidance (Version 4.1) downloadable at www.flowstobay.org/newdevelopment .
	C3.0	g. Limit disturbance of natural water bodies and drainage systems; minimize compaction of highly permeable soils; protect slopes and channels; and minimize impacts from stormwater and urban runoff on the biological integrity of natural drainage systems and water bodies;
☒	C1.0, L3.2	h. Conserve natural areas, including existing trees, other vegetation and soils.
☒	C1.0, C3.0	i. Minimize impervious surfaces.

Regulated Projects can also consider the following site design measures to reduce treatment system sizing:

Yes	Plan Sheet No.	
☒	C3.0	j. Self-treating area (see Section 4.2 of the C.3 Technical Guidance)
☒	C3.0	k. Self-retaining area (see Section 4.3 of the C.3 Technical Guidance)
☐		l. Plant or preserve interceptor trees (Section 4.1, C.3 Technical Guidance)

¹⁰ See MRP Provision C.3.a.i.(6) for non-C.3 Regulated Projects, C.3.c.i.(2)(a) for Regulated Projects, C.3.i for projects that create/replace 2,500 to 10,000 sq.ft. of impervious surface and stand-alone single family homes that create/replace 2,500 sq.ft. or more of impervious surface.

Worksheet D

C3 Regulated Project - Stormwater Treatment Measures

Check all applicable boxes and indicate the treatment measure(s) included in the project.

Yes

☐ Attach Worksheet F and Calculations	Is the project a Special Project?¹¹ If yes, consult with municipal staff about the need to evaluate the feasibility and infeasibility of 100% LID treatment. Indicate the type of non-LID treatment to be used, the hydraulic sizing method, and percentage of the amount of runoff specified in Provision C.3.d that is treated: <table border="0"> <tr> <td><u>Non-LID Treatment Measures:</u></td> <td><u>Hydraulic sizing method</u>¹²</td> <td><u>% of C.3.d amount of runoff treated</u></td> </tr> <tr> <td>☐ Media Filter</td> <td>☐ 2.a ☐ 2.b ☐ 2.c</td> <td> %</td> </tr> <tr> <td>☐ Tree well Filter</td> <td>☐ 2.a ☐ 2.b ☐ 2.c</td> <td> %</td> </tr> </table>	<u>Non-LID Treatment Measures:</u>	<u>Hydraulic sizing method</u> ¹²	<u>% of C.3.d amount of runoff treated</u>	☐ Media Filter	☐ 2.a ☐ 2.b ☐ 2.c	%	☐ Tree well Filter	☐ 2.a ☐ 2.b ☐ 2.c	%
<u>Non-LID Treatment Measures:</u>	<u>Hydraulic sizing method</u> ¹²	<u>% of C.3.d amount of runoff treated</u>								
☐ Media Filter	☐ 2.a ☐ 2.b ☐ 2.c	%								
☐ Tree well Filter	☐ 2.a ☐ 2.b ☐ 2.c	%								
☒	Is the project using infiltration systems? The MRP no longer requires the use or analysis of the feasibility of infiltration, but infiltration systems are encouraged and may be beneficial depending on the project. Indicate the infiltration measures to be used, and hydraulic sizing method: <table border="0"> <tr> <td><u>Infiltration Measures:</u></td> <td><u>Hydraulic sizing method</u>¹²</td> </tr> <tr> <td>☒ Bioinfiltration¹³</td> <td>☐ 1.a ☐ 1.b ☒ 2.c ☐ 3</td> </tr> <tr> <td>☐ Infiltration Trench</td> <td>☐ 1.a ☐ 1.b</td> </tr> <tr> <td>☐ Other (specify):</td> <td> </td> </tr> </table>	<u>Infiltration Measures:</u>	<u>Hydraulic sizing method</u> ¹²	☒ Bioinfiltration ¹³	☐ 1.a ☐ 1.b ☒ 2.c ☐ 3	☐ Infiltration Trench	☐ 1.a ☐ 1.b	☐ Other (specify):		
<u>Infiltration Measures:</u>	<u>Hydraulic sizing method</u> ¹²									
☒ Bioinfiltration ¹³	☐ 1.a ☐ 1.b ☒ 2.c ☐ 3									
☐ Infiltration Trench	☐ 1.a ☐ 1.b									
☐ Other (specify):										
☐	Is the project harvesting and using rainwater? The MRP no longer requires the use or analysis of the feasibility of rainwater harvesting, but it rainwater harvesting and use is encouraged and may be beneficial depending on the project. <table border="0"> <tr> <td><u>Rainwater Harvesting/Use Measures:</u></td> <td><u>Hydraulic sizing method</u>¹²</td> </tr> <tr> <td>☐ Rainwater Harvesting for indoor non-potable water use</td> <td>☐ 1.a ☐ 1.b</td> </tr> <tr> <td>☐ Rainwater Harvesting for landscape irrigation use</td> <td>☐ 1.a ☐ 1.b</td> </tr> </table>	<u>Rainwater Harvesting/Use Measures:</u>	<u>Hydraulic sizing method</u> ¹²	☐ Rainwater Harvesting for indoor non-potable water use	☐ 1.a ☐ 1.b	☐ Rainwater Harvesting for landscape irrigation use	☐ 1.a ☐ 1.b			
<u>Rainwater Harvesting/Use Measures:</u>	<u>Hydraulic sizing method</u> ¹²									
☐ Rainwater Harvesting for indoor non-potable water use	☐ 1.a ☐ 1.b									
☐ Rainwater Harvesting for landscape irrigation use	☐ 1.a ☐ 1.b									
☐	Is the project installing biotreatment measures? Indicate the measures to be used, and the hydraulic sizing method: <table border="0"> <tr> <td><u>Biotreatment Measures:</u></td> <td><u>Hydraulic sizing method</u>¹²</td> </tr> <tr> <td>☐ Bioretention area</td> <td>☐ 2.c ☐ 3</td> </tr> <tr> <td>☐ Flow-through planter</td> <td>☐ 2.c ☐ 3</td> </tr> <tr> <td>☐ Other (specify):</td> <td> </td> </tr> </table>	<u>Biotreatment Measures:</u>	<u>Hydraulic sizing method</u> ¹²	☐ Bioretention area	☐ 2.c ☐ 3	☐ Flow-through planter	☐ 2.c ☐ 3	☐ Other (specify):		
<u>Biotreatment Measures:</u>	<u>Hydraulic sizing method</u> ¹²									
☐ Bioretention area	☐ 2.c ☐ 3									
☐ Flow-through planter	☐ 2.c ☐ 3									
☐ Other (specify):										

A copy of the long term Operations and Maintenance (O&M) Agreement and Plan for this project will be required. Please contact the NPDES Representative of the applicable municipality for an agreement template and consult the C.3 Technical Guidance at www.flowstobay.org for maintenance plan templates for specific facility types.

¹¹ Special Projects are smart growth, high density, or transit-oriented developments with the criteria defined in Provision C.3.e.ii.(2), (3) or (4) (see Worksheet F).

¹² Indicate which of the following Provision C.3.d.i hydraulic sizing methods were used. Volume based approaches: 1(a) Urban Runoff Quality Management approach, or 1(b) 80% capture approach (recommended volume-based approach). Flow-based approaches: 2(a) 10% of 50-year peak flow approach, 2(b) 2 times the 85th percentile rainfall intensity approach, or 2(c) 0.2-Inch-per-hour intensity approach (recommended flow-based approach - also known as the 4% rule). Combination flow and volume-based approach: 3.

¹³ See Section 6.1 of the C.3 Technical Guidance for conditions in which bioretention areas provide bioinfiltration.

Moss Beach, C.3 and C.6 Development Review Checklist Calculations

WORKSHEET D

Size bioinfiltration and bioretention facilities:

Lot	Roof Area (sf)	Required Bioinfiltration/ Bioretention Area* (sf)	Bioinfiltration Area** (sf)
1	4,300	172	181
2	3,920	157	225
3	4,330	173	181
4	4,520	181	200
Total	17,070	683	787

*Simplified Bioretention Sizing Method: 4% of Impervious Surface area per C.3 Stormwater Technical Guidance, San Mateo Countywide Water Pollution Prevention Program.

**See utility & drainage plan.

Worksheet G
(For municipal staff use only)

G-1 Alternative Certification: Were the treatment and/or HM control sizing and design reviewed by a qualified third-party professional that is not a member of the project team or agency staff?

☐ Yes ☐ No Name of Reviewer: _____

G-2 High Priority Site: High Priority Sites can include those located in or within 100 feet of a sensitive habitat, an Area of Special Biological Significance (ASBS), a body of water, or **starting 7/1/16** on "hillside projects" disturbing $\geq 5,000$ sq.ft. of land and with steep slopes (of $\geq 15\%$ - see cell **I.A.4** - or as identified by municipal criteria or map). These sites are subject to monthly inspections from Oct 1 to April 30. See MRP Provision C.6.e.ii.(2).

☐ Yes ☐ No If yes, then add site to Staff's Monthly Rainy Season Construction Site Inspection List

G-3 Inspections of Sites with Pervious Paving: Starting 7/1/16, Regulated projects that are installing 3,000 sq.ft. or more of pervious paving (see cell **I.B.1.e.1**) (excluding private-use patios in single family homes, townhomes, or condominiums) must have the paving system inspected by the jurisdiction upon completion of the installation and the site must be added to the jurisdiction's list of sites needing inspections at least once every five years – see provision C.3.h. Pervious pavement systems include pervious concrete, pervious asphalt, pervious pavers and grid pavers etc. and are described in the C3 Technical Guidance (Version 4.1) downloadable at: www.flowstobay.org/newdevelopment

☐ Yes ☐ No If yes, then add site to Staff's Lists for Construction and O&M inspections (C.3 and C.3.h)

Operations and Maintenance (O&M) Submittals

G-4 Stormwater Treatment Measure and/HM Control Owner or Operator's Information:

Name: _____

Address: _____

Phone: _____ Email: _____

► Applicant must call for inspection and receive inspection within 45 days of installation of treatment measures and/or hydromodification management controls.

The following questions apply to C.3 Regulated Projects and Hydromodification Management Projects.

		Yes	No	N/A
G-4.1	Was maintenance plan submitted?	☐	☐	☐
G-4.2	Was maintenance plan approved?	☐	☐	☐
G-4.3	Was maintenance agreement submitted? (Date executed: _____)	☐	☐	☐

► Attach the executed maintenance agreement as an appendix to this checklist.

G-5 Annual Operations and Maintenance (O&M) Submittals (for municipal staff use only):

For C.3 Regulated Projects and Hydromodification Management Projects, indicate the dates on which the Applicant submitted annual reports for project O&M:

G-6 Comments (for municipal staff use only):

G-7 NOTES (for municipal staff use only):

Project Info Notes: _____

Worksheet A Notes: _____

Worksheet B Notes: _____

Worksheet C Notes: _____

Worksheet D Notes: _____

Worksheet E Notes: _____

Worksheet F Notes: _____

G-8 Project Close-Out (for municipal staff use only):

	Yes	No	N/A
8.1 Were final Conditions of Approval met?	☐	☐	
8.2 Was initial inspection of the completed treatment/HM measure(s) conducted? (Date of inspection: _____)	☐	☐	☐
8.3 Was maintenance plan submitted? (Date executed: _____)	☐	☐	☐
8.4 Was project information provided to staff responsible for O&M verification inspections? (Date provided to inspection staff: _____)	☐	☐	☐

G-9 Project Close-Out (Continued -- for municipal staff use only):

Name of staff confirming project is closed out: _____

Signature: _____ Date: _____

Name of O&M staff receiving information: _____

Signature: _____ Date: _____



County of San Mateo - Planning and Building Department

ATTACHMENT Q

Project SM10391.1
24 April 2015

OWEN LAWLOR
Moss Beach Associates LLC
C/O Lawlor Land Use
612 Spring Street
Santa Cruz, CA 95060-2030

RECEIVED

SEP 08 2015

San Mateo County
Planning Division

Subject: Coastal Bluff Recession Study

Reference: Juliana Avenue and Vallemar Street
Moss Beach, California
San Mateo County APN's 37-08-23, 24, 25, 26, 27, 28 and 29

Dear Mr. Lawlor:

Below is our report from Phase1 of our Coastal Bluff Recession Study that we have recently completed at your request, for the property bordering Juliana Avenue and Vallemar Street in Moss Beach, California. We understand that Moss Beach Associates LLC is proposing to develop 6 or 7 new homes there.

The referenced property is a beautiful piece of property with almost 500 feet of oceanfront and includes 7 lots of record. The purpose of this report is to address future coastal bluff recession at the property and it's impact on the development over the proposed 50 year design life. We have reviewed the project designs you provided to us in 2012 through 2015, including the renderings by Larry Pearson.

Summary:

We have evaluated the historical coastal bluff recession rates at Juliana Avenue and Vallemar Street in Moss Beach, California. We also estimated the slope stability of the coastal bluff, including the influence of an earthquake that could cause recession.

During our study, we obtained and reviewed several sets of historical vertical aerial and satellite photographs from 1986 through 2013. In addition we obtained the original subdivision map survey of the property from May 1908. We visited the site, observed the geologic conditions and made measurements from the seaward edge of the existing home out to the top edge of the coastal bluff. We worked with Gary Ifland of Ifland Surveys, who prepared a detailed topographic map. From our comparison of the surveyed 2014 bluff edge position with that on the 1908 subdivision map, it appears that

Moss Beach Associates LLC
Project No. SM10391.1
Coastal Bluff Recession Study
Juliana Avenue and Vallemar Street
24 April 2015
Page 2

the coastal bluff has receded inland up to 48 feet since 1908, which is a long term historical bluff recession rate of about 0.45 feet per year. From comparison of vertical aerial photography taken in 1986 and the 2014 survey, it appears that about 10 to 18 feet of bluff recession occurred in that time period which is a long term historical bluff recession rate of about 0.36 to 0.64 feet per year. Accelerating future sea level rise rates may result in possible increased future recession rates (compared to average historical recession rates).

In our opinion, the best way to predict future bluff recession and evaluate coastal recession risk is to use long term historical average annual erosion rates as a minimum.

That would suggest that a minimum of 22.5 feet of bluff recession will occur at the subject property in the next 50 years. Future bluff recession may occur at faster rates because the rate at which sea level is rising is accelerating. Based on the analysis we have completed to date, we are unable to accurately predict how much future bluff recession rates will increase due to sea level rise. If the noted historical recession rates increased by 25 % because of accelerating sea level rise, that would suggest that 28 feet of recession will occur at the subject property in the next 50 years.

We have depicted an estimated 50 year coastal bluff recession setback line on the topographic map prepared by Ifland Surveys, and have shown the locations of the presently proposed homes on that map. All of the proposed homes are located landward of the estimated 50 year coastal bluff recession setback line.

The California Coastal Commission requires consideration of historical recession rates, future increases in recession rates due to sea level rise and potential bluff instability if and when they evaluate bluff setbacks relative to Coastal Development Permit applications. San Mateo County requires evaluation of a minimum 50 year coastal recession setback line and prohibits development seaward of that line.

Analysis:

We completed the following tasks in our scope of services:

- 1) Conducted preliminary and administrative work to plan the investigation and study.

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- 2) Reviewed the pertinent documentation in the files you provided to us including the renderings by Larry Pearson.
- 3) Made a preliminary site visit.
- 4) Obtained an APN map.
- 5) Obtained the recorded subdivision map.
- 6) Reviewed site geology.
- 7) Obtained a recent digital aerial photo.
- 8) Obtained 1986 historical vertical aerial photos, satellite imagery from Google Earth from 1993 through 2014, and oblique aerial photography from 1972 through 2013 from www.californiacoastline.org
- 9) Reviewed the 2014 topographic map by Ifland surveys. Worked with Ifland Surveys to survey the bluff edge and bluff edge conditions.
- 10) Digitally overlaid the Subdivision Map on the 2014 topographic map.
- 11) Digitally overlaid the historical aerial photograph from 1986 on the 2014 topographic map.
- 12) Trace the historical bluff edges and the current bluff edge and evaluate historical long term bluff recession rates (average feet or inches per year).
- 13) Prepared four geologic cross sections.
- 14) Evaluated bluff recession causation
- 15) Assessed future sea level rise requirements.
- 16) Evaluated the influence of future sea level rise on future bluff recession rates.
- 17) Qualitatively evaluated slope stability as it pertains to future bluff recession rates.

18) Recommended a future bluff recession rate for future development, based on 50 years of future bluff recession, including future sea level rise and bluff instability factors.

19) Drew a recommended 50 year development setback line on the 2014 topographic survey map prepared by Ifland Engineers (Appendix C of this report).

20) Prepared this report.

Historical Bluff Recession

We obtained aerial and satellite photography of the site from 1972 through 2013. We scanned and enlarged each historical photograph and then compared the position of the top edge of the coastal bluff on selected aerial photographs and the centerline of each nearby street as well as reference points on nearby homes in the vicinity of the subject property. We then enlarged each photograph to be the same scale.

We attempted to overlay various historical vertical images; in order to look at the historical changes in the bluff edge. There was poor agreement in the registration of some of the various images. Some of the photos were distorted and unusable for this purpose, probably because the photographs were not truly vertical views of the property because the airplane camera was at a slightly oblique angle at the time of the photograph. The 1986 vertical aerial photograph, which is included in Appendix A, appeared to be most useful for evaluation of historical bluff recession, and were relatively free of distortion and tree shadow coverage. From comparison of the vertical aerial photography taken in 1986 with the conditions found and our 2014 field measurements, it appears that about 10 to 18 feet of bluff recession occurred in that time period which is a long term historical bluff recession rate of about 0.36 to 0.64 feet per year.

We also obtained a 1 inch = 100 foot scale map of "Moss Beach Heights", that is a subdivision map dated 1908 and a partial copy is included in Appendix B. This subdivision map shows the subdivision of this part of the Moss Beach area, and most importantly for our purposes shows the top edge of the coastal bluff where it existed in 1908. By field measurements at the site, we compared the position of the top edge of the coastal bluff in 2014 relative to the position shown on the 1908 surveyed subdivision map. From our comparison of the surveyed bluff edge position in 1908 compared to the current bluff edge position, it appears that the coastal bluff has receded landward up to 48 feet since 1908, which is a long term historical bluff recession rate of about 0.45 feet per year.

The faster rates from 1986 to 2014 (compared to the 1908 to 2014 rate) in part of the property frontage may be a result of the short time period being used for measurement; which include the erosion episode resulting from the extreme coastal storms that occurred in the El Nino year of 1998.

In two areas of the bluff edge, shallow (1-2 feet deep) gullies extend inland from the bluff edge, masking the bluff edge position derived from coastal erosion related to the oceanfront environment. These gullies appear to be from overland storm runoff. Development should incorporate best management drainage control practices to reduce future rilling or gullying.

If historical long term average annual erosion rates from 1908 to 2014 were to continue into the future for 50 years at 0.45 feet per year, the top of the coastal bluff in 2065 would be 22.5 feet inland from where it is now. It is important to note that coastal bluff recession occurs episodically and not at a constant rate. It is more likely that 2 or 3 or 5 or even 10 feet of recession will happen at one time any given point on the coastal bluff, than a few inches per year each and every year will occur.

Sea Level has risen and the rate at which it is rising is accelerating. In general, sea level rise tends to make future coastal bluff recession rates faster than measured historical coastal bluff recession rates.

Future Sea Level Rise

The State of California, through the California Ocean Protection Council agency, has adopted the following sea level rise projections using the year 2000 as a base line:

Sea Level Rise Amounts Adopted by the State of California (2011)		
Year	Average of Models	Range of Models
2030	7 in (0.6 Feet)	5 to 8 inches
2050	14 in (1.2 Feet)	10 to 17 inches
2070	Low 23 inches	17 to 27 inches
	Medium 24 inches (2.0 Feet)	18 to 29 inches
	High 27 inches	20 to 32 inches
2100	Low 40 inches	31 to 50 inches
	Medium 47 inches (4.0 Feet)	37 to 60 inches
	High 55 inches	43 to 69 inches

The data adopted by the State of California in 2011 indicates 40 to 55 inches of sea level rise should be planned for by 2100. This equates to between 3.4 to 5.5 feet of sea level increase by 2100. We have graphed the State of California data. Interpolating that data for 2065 (50 years from now), results in a projection of 21 to 24 inches of sea level rise should be planned for by 2065. This equates to between 1.7 to 2.0 feet of sea level increase by then.

The National Research Council prepared a 2012 report entitled Sea Level Rise for the Coasts of California, Oregon and Washington: Past, Present and Future. This report stated the following sea level rise projections for areas South of Cape Mendocino using the year 2000 as a base line:

Sea Level Rise Amounts from the National Research Council (2012)	
Year	Sea Level Rise
2050	Lower Range 5 inches
	Higher Range 24 inches
2100	Lower Range 16 inches
	Higher Range 66 inches

The 2012 NRC projections of sea level rise appear to be more uncertain than the 2011 State of California projections; that is the low range estimates are lower and the high range estimates are higher. Utilizing a linear interpolation, the 2012 NRC projections suggest that 8 to 37 inches of sea level rise should be planned for by 2065.

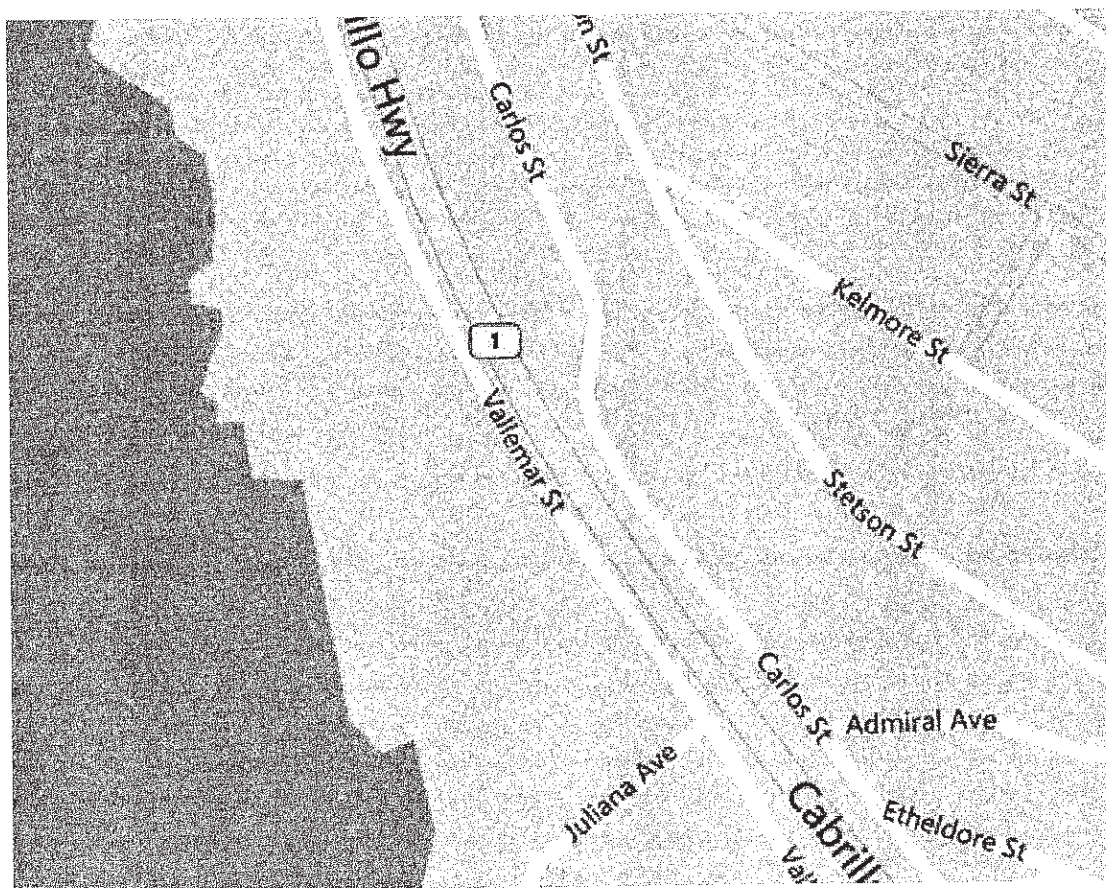
Sea level rise will cause faster rates of bluff recession than have occurred historically. The degree to which sea level rise will cause coastal bluff rates to increase is not agreed upon by all geologists.

Future bluff recession may occur at faster rates because the rate at which sea level is rising is accelerating. Based on the analysis we have completed to date, we are unable to accurately predict how much future bluff recession rates will increase due to sea level rise. Nobody really knows. If the noted historical recession rates increased by 25 % because of accelerating sea level rise, that would suggest that a minimum of 28 feet of recession will occur at the subject property in the next 50 years.

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Coastal Bluff Recession Study
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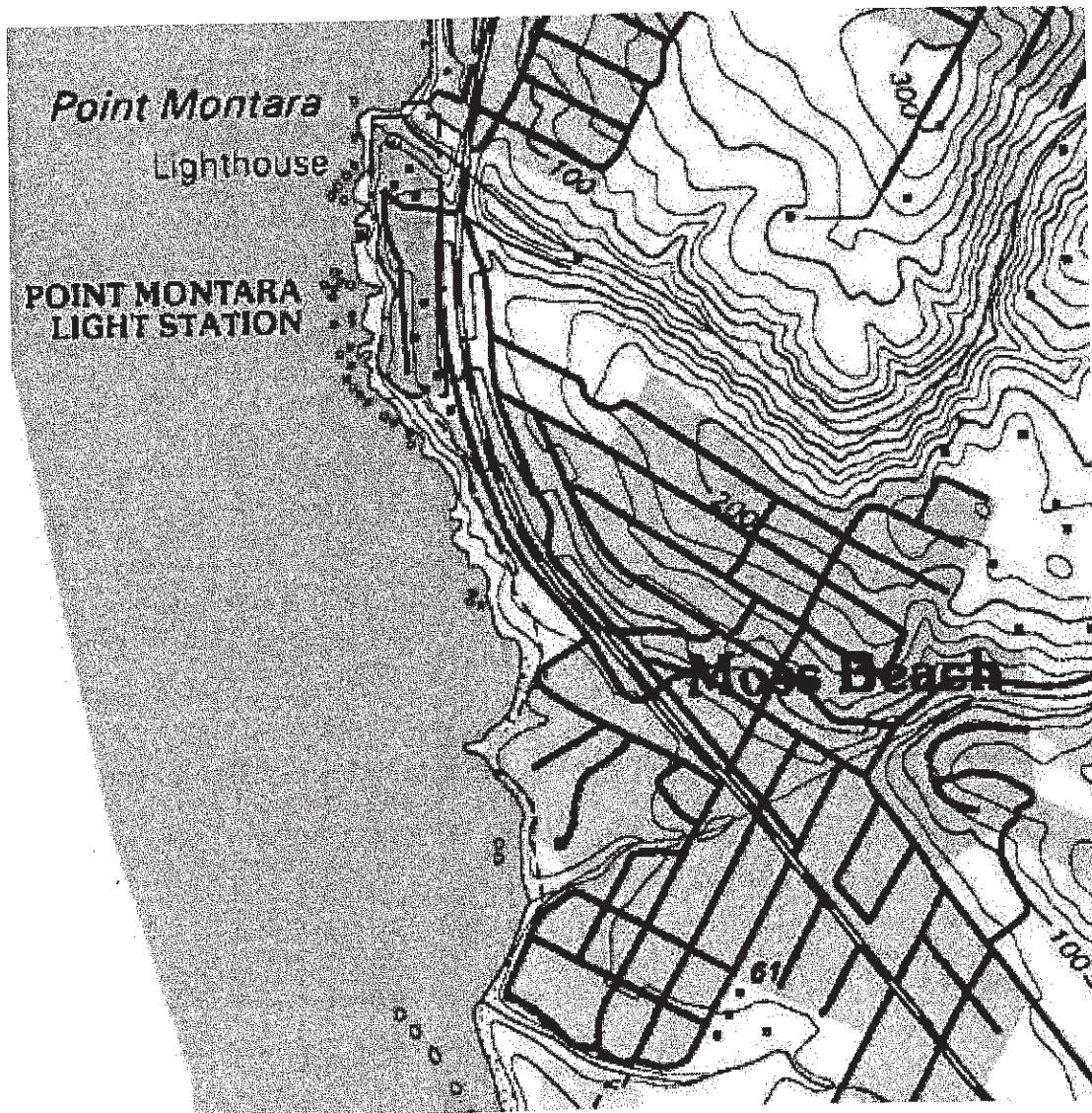
Bluff Geology and Future Bluff Recession Discussion

The referenced property is situated just upcoast from the City of Half Moon Bay, in Moss Beach.



Vicinity Map of Juliana Avenue and Vallemar Street in Moss Beach

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Topographic Map of Juliana Avenue and Vallemar in Moss Beach

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April 15, 2013 Vertical Image of Site
Copyright Google Earth

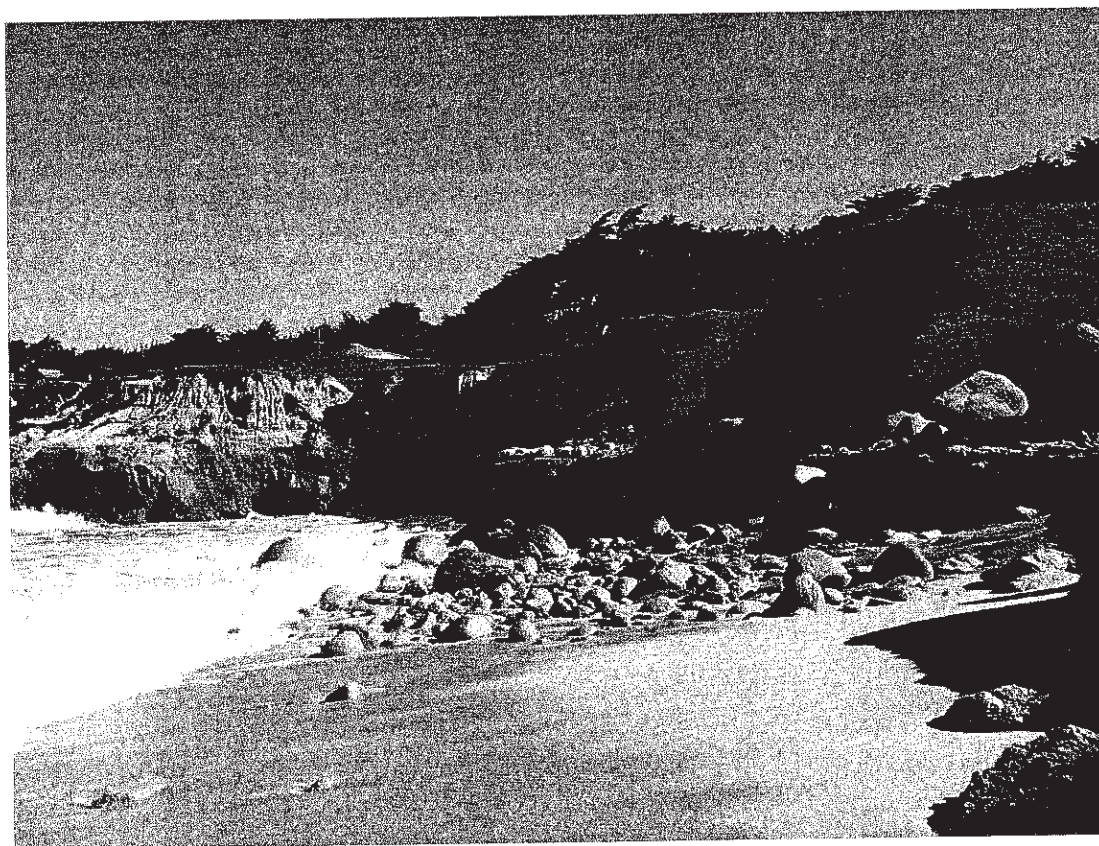
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2010 Oblique Aerial Photo of Site
Copyright www.californiacoastline.org

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Photographs of the bluff face at the property are shown below:



Bluff Face Looking Upcoast



Bluff Face Looking Downcoast

We observed the bluff from the ocean to the building site. The level bluff top area where the oceanfront homes will be located is 42 to 55 feet above sea level. The upper bluff face is steeply inclined downward and is composed of marine terrace deposits (Qmt), which are approximately 22 to 26 feet thick where exposed in the bluff face. Below the terrace deposits, the lower bluff below approximately elevation 20 is composed of hard erosion resistant bedrock, which is nearly vertical, consisting of granitic rock (Kgr). The bedrock is erosion resistant and therefore the upper bedrock surface forms an exposed rough horizontal bench where the more erodible upper terrace deposits have receded more than the bedrock. Along the downcoast half of the site, seaward of the base of the bluff is a thin deposit of cobbles and beach sand that is often covered by ocean water or wave runup. The beach width varies significantly based on tidal conditions and ocean wave runup.

One form of bluff recession is caused by rainfall or wave splash or spray that erodes the bluff face. Slope instability (landsliding) along the coastal bluff face is another form of the coastal erosion process that results in landward recession of the top edge of the coastal bluff. Coastal bluff landslides are caused either by undermining of the base of the bluff or from saturation of the bluff edge or bluff face. Because the upper part of the bluff is composed primarily of relatively weak sedimentary deposits (terrace deposits), the failure mechanism from landsliding is typically tabular or consists of very shallow, large radius, circular arc type failure. Field observations of the geology and geomorphology of the bluff suggest that terrace deposits in the bluff face are generally stable at a 1:1 to 1.25:1 (H:V) gradient. The top half of the bluffs in the upcoast half of the property are flatter because they are protected by a bedrock outcrop in the bottom half. The top half of the bluffs in the downcoast half of the property are steeper because they are unprotected by a bedrock outcrop in the bottom half and more exposed to erosion. Under worst case seismic conditions, qualitative evaluation suggests the terrace deposits are probably stable at a 1.5:1 (H:V) gradient. A complete evaluation of site stability is beyond the scope of this report; such an evaluation would require additional work, including subsurface exploration, laboratory testing, and quantitative slope stability analysis. More detailed quantitative analysis would be required to assess that.

In our opinion, the best way to predict future bluff recession and evaluate coastal recession risk is to use long term historical average annual erosion rates as a minimum. That would suggest that a minimum of 22.5 feet of recession will occur at the subject property in the next 50 years. In addition to those minimums, we recommend that the influence of rising sea level be considered, which would accelerate those rates. Based on the analysis we have completed to date, we are unable to accurately predict how much future bluff recession rates will increase due to sea level rise, but can make an estimate. In order to allow for the possibility that future accelerating sea level rise will increase the long term average annual, rate of recession, we recommend that the average annual historical recession rate be increased by 25 percent, in order to estimate an average annual future recession rate during the next 100 years. That would suggest that an additional 5.5 feet of recession will occur at the subject property in the next 50 years as a result of accelerating sea level rise.

Based on bluff face slope gradients at the property, and observations of the geology we recommend that projected future bluff edge recession be measured from where the bluff is considered to be stable. Projected future recession should be added inland of this to arrive at an estimated 50 year coastal recession setback line on the property.

We have prepared a drawing that shows an Estimated 50 Year Future Coastal Bluff Recession Setback that depict the setback in plan view on a 2014 topographic base map prepared by Ifland Surveys (Appendix C). The Setback was developed based on where an estimated projected failure of the bluff face to a 1.5 to 1.0 (H to V) stable gradient would come to (varying from 0 to about 25 feet back from the existing bluff edge; depending on existing bluff face gradient), then an additional 22.5 feet of recession to account for 50 years of future coastal erosion at the historical rate that recession has occurred at since 1908, plus an additional 5.5 feet of recession to account for accelerating bluff recession resulting from accelerating sea level rise. The 5.5 feet represents a 25% acceleration in the long term historical recession rate at this site. As a result the total Estimated 50 Year Future Coastal Bluff Recession Setback is predicted to be 28 feet landward of where the bluff would be stable based on the 1.5 to 1 (H to V) gradients discussed above. This results in a total Estimated 50 Year Future Coastal Bluff Recession Setback line 28 to 56 feet inland of the existing top edge of the bluff, as shown on the 2014 topographic base map prepared by Ifland Surveys in Appendix C.

We note that our analysis considers the influence of both slope instability and coastal recession. It accounts for 50 years of recession that causes the bluff face to recede landward uniformly, then an episode of slope instability in the 50th year that flattens the bluff face to a 1.5 to 1 (H:V) gradient in areas that have been oversteepened by active recent erosion. It is statistically unlikely that an episode of slope instability will occur exactly in the 50th year; this makes the analysis conservative. Because the historical recession rates used herein were calculated using the position of the top edge of the bluff, those calculated rates include the influence of both slope instability and coastal erosion. This adds a second degree of conservatism to the setback line we have presented, since it considers the influence of slope instability and coastal erosion in an additive manner.

The California Coastal Commission requires consideration of historical recession rates, future increases in recession rates due to sea level rise and potential bluff instability if and when they evaluate bluff setbacks relative to Coastal Development Permit applications. San Mateo County requires evaluation of a 50 year coastal recession setback line and regulates development seaward of that line.

We recommend that if new development (as defined in the County Ordinances) is proposed, that it be setback landward of the Estimated 50 Year Future Coastal Bluff Recession Setback, which we believe is the distance necessary to provide a stable building site over a 50-year lifetime of the proposed structure.

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We also recommend that mitigating measures (i.e., landscaping and drainage control) be used and maintained to avoid increased erosion at the property.

Limitations

Because of uncertainties that are inherent in the analysis and are beyond the control of HKA, no guarantee or warranty is possible that future recession will occur at the rate predicted. Greater or lesser erosion and recession may occur. In any case, damage to improvements should be expected at some point in the far future. This study should not be used in lieu of appropriate insurance coverage. The owners and occupants of the coastal improvements shall accept the risk of that damage, and HKA recommends that they should purchase appropriate insurance to mitigate the inherent risk.

If you have any questions or concerns, please call us at (831) 722-4175 Ext. 0, and we will be happy to discuss them.

Respectfully submitted,

HARO, KASUNICH AND ASSOCIATES, INC.



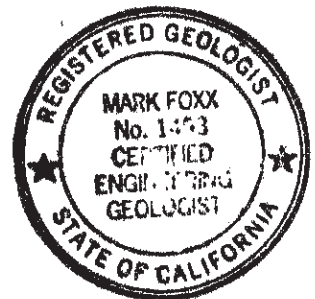
Mark Foxx
CEG 1493

MF/JEK/dk

Attachments:

- Appendix A: 1986 Vertical Aerial Photograph
- Appendix B: 1908 Moss Beach Heights Subdivision Map
- Appendix C: 2014 Topographic Map and Cross Sections Showing
Estimated 50 Year Future Coastal Bluff Recession Setback

Copies: 4 to Addressee
1 to File



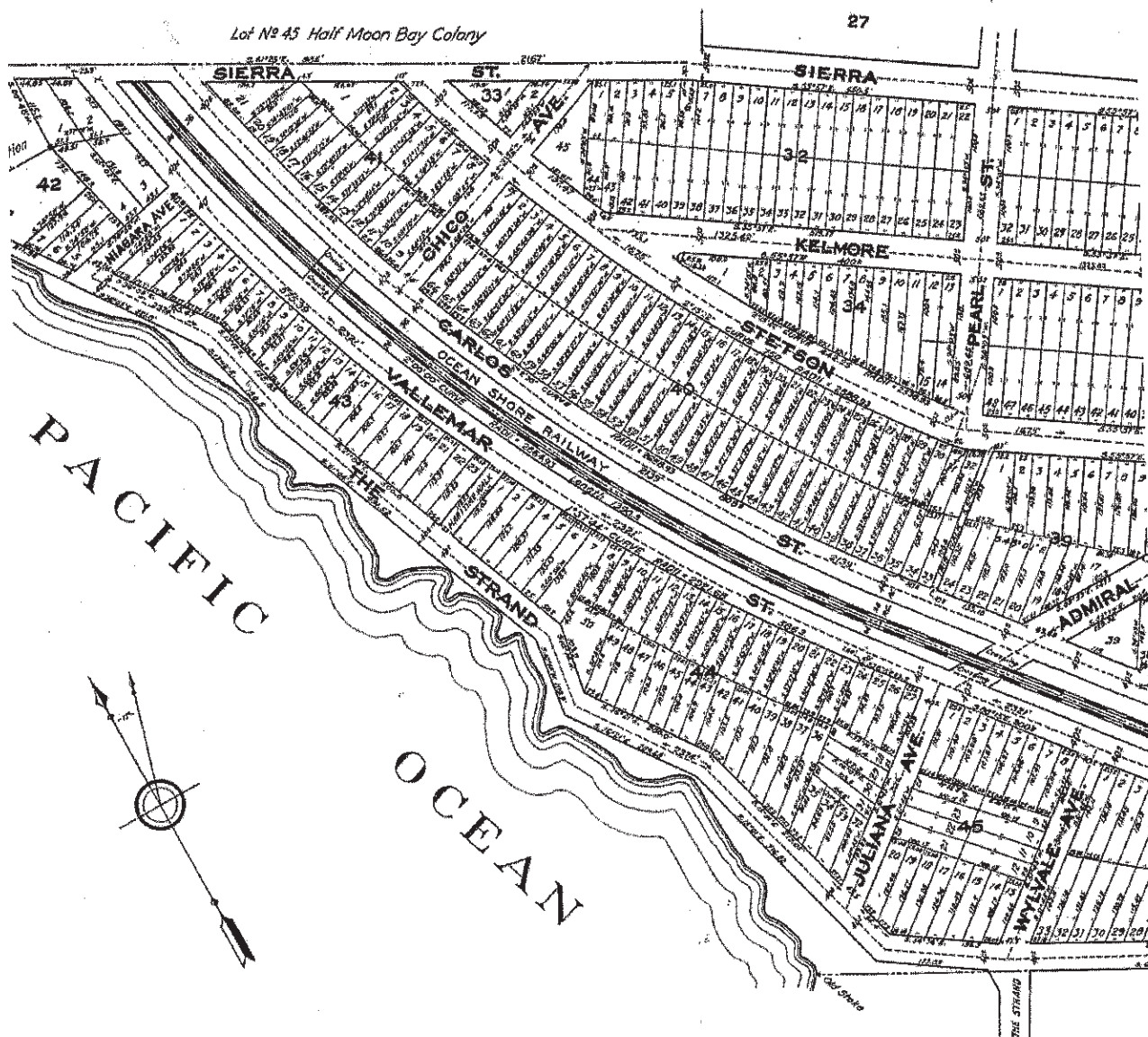
Moss Beach Associates LLC
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Appendix A
3-26-1986 Vertical Aerial Photograph



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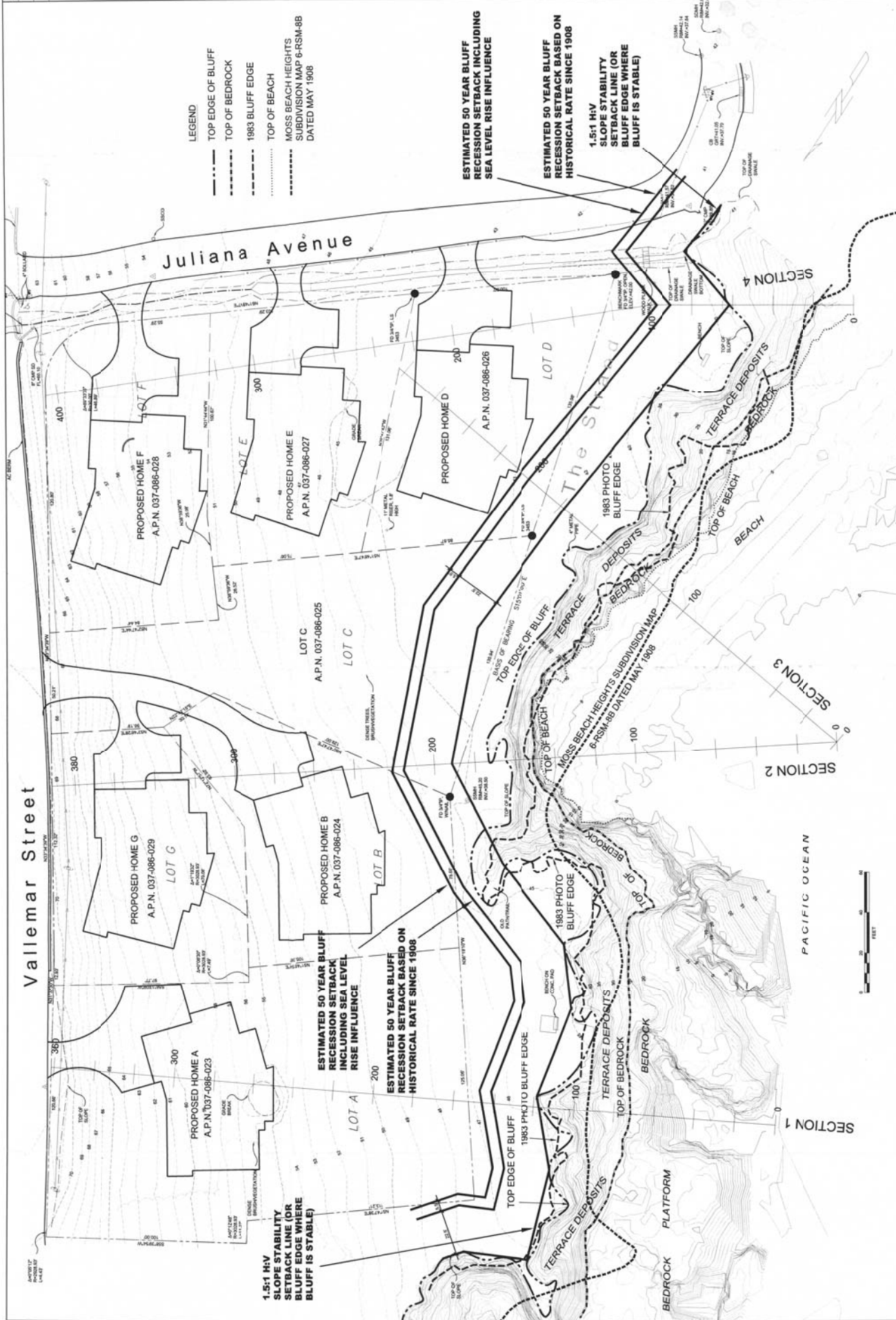
Appendix B 1908 Moss Beach Heights Subdivision Map



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Appendix C

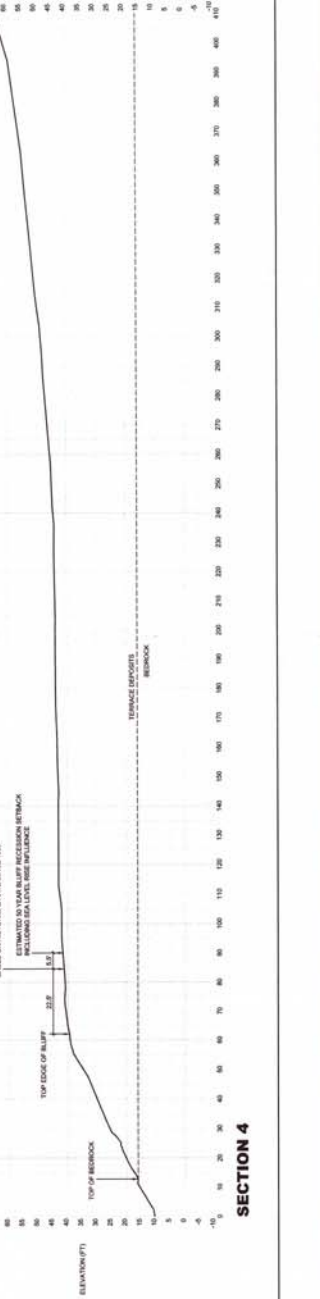
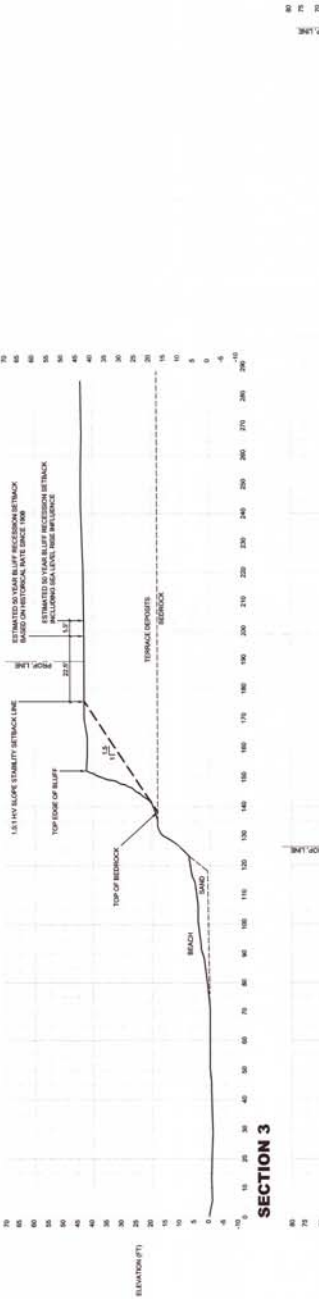
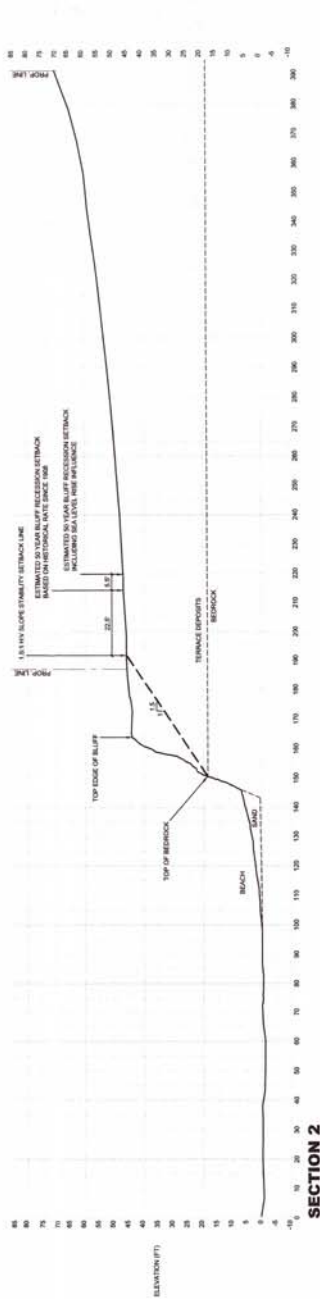
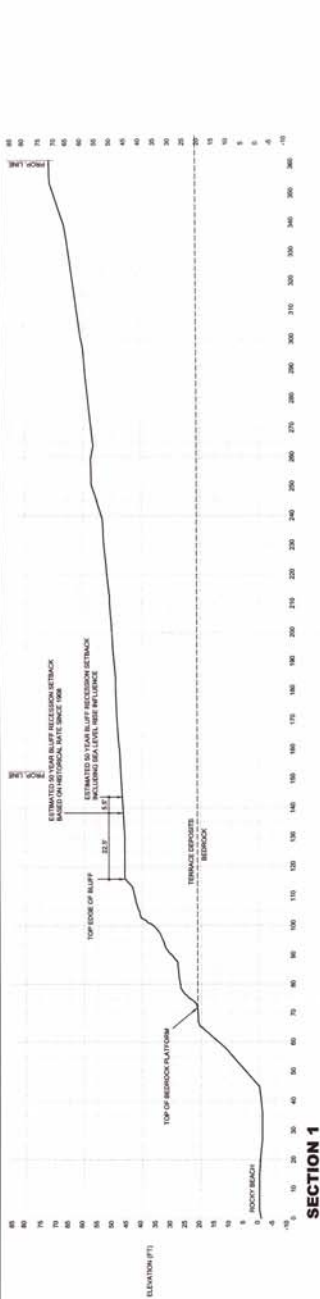
2014 Topographic Base Map and Cross Sections by Ifland Surveys Showing Estimated 50 Year Future Coastal Bluff Recession Setback



REVISIONS BY

COASTAL BLUFF RECESSION CROSS SECTIONS
MOSS BEACH ASSOCIATES, LLC
VALLEMAR STREET & JULIANA AVENUE, MOSS BEACH, CA
SAN MATEO COUNTY A.P.N.'S 037-086-023, 024, 025, 026, 027, 028 & 029

HARO, KASUNICH AND ASSOCIATES, INC.
CONSULTING CIVIL, GEOTECHNICAL & COASTAL ENGINEERS
118 EAST LAKE AVE., WATSONVILLE, CA 95076 (831) 723-4175
Date: 3/9/2015
Scale: AS SHOWN
Drawn: MF
JCS
Sheet: 2
OF 2 SHEETS





County of San Mateo - Planning and Building Department

ATTACHMENT R



memorandum

date October 26, 2016

to Lennie Roberts (Committee for Green Foothills)

from Louis White, PE

subject Vallemar Bluffs Coastal Hazards Assessment: Estimate of Accelerated Bluff Erosion due to Sea Level Rise (ESA Ref. #D160715.00)

1. Introduction

This memorandum presents the findings of a coastal hazards assessment, including estimates of future bluff erosion and wave uprush elevations, at an undeveloped bluff top site in Moss Beach, California. The Committee for Green Foothills (CGF) retained Environmental Science Associates (ESA) to review existing studies for the site by others and to conduct a technical analysis to estimate the potential future erosion limits associated with sea level rise (SLR). The analysis is based on information reported by others, as well as site observations and topographic data collected by ESA, and tide and wave data accessed from National Oceanic and Atmospheric Administration (NOAA) and Coastal Data Information Program (CDIP), respectively. Although the findings presented in this memorandum are intended to be used as a comparison to recommendations by others, they are not sufficient for locating structures, and this memorandum is not intended to do so.

The work described in this memorandum was completed by ESA staff members Hannah Snow, James Jackson, PE, Damien Kunz, Matt Norcott, and Louis White, PE, with review by Bob Battalio, PE. The information presented in this memorandum is intended solely for the use and benefit of the Committee for Green Foothills. No other person or entity shall be entitled to rely on the services, opinions, recommendations, plans or specifications provided pursuant to this agreement without the express written consent of ESA, 550 Kearny Street, Suite 800, San Francisco, CA 94108.

Background

A proposed residential development project in Moss Beach, at Vallemar Bluffs, is required by the San Mateo County Local Coastal Program (LCP), Section 9.8, to consider coastal bluff erosion for a 50 year time period. The 2.5-acre site, at the intersection of Vallemar Street and Juliana Avenue, is the last undeveloped private land in the San Mateo Midcoast area (Figure 1). Seven lots, which were consolidated from a 1908 subdivision, have multiple owners who have all agreed to submit an application for development of the property as a whole. The application was recently submitted to San Mateo County Planning (County) and is now undergoing a formal review process. The Applicant has reduced the number of proposed houses to five, eliminating development on

one lot closest to the cliffs. The County plans to prepare an Initial Study/Mitigated Negative Declaration for the project.



Figure 1
Project Site (in red), located in Moss Beach at Juliana Avenue and Valleymar Street

CGF retained ESA to provide professional engineering advice on coastal erosion issues at the site, as they relate to the future potential exposure of the proposed development to coastal erosion hazards. Specifically, CGF has opined that revisions to the project are needed because the proposed development on Lot D is too close to the bluffs and will likely be subject to bluff erosion over the 50-year life of the project. CGF has also indicated that allowing this lot to be developed will severely impact coastal access along the existing informal public access trail, impact public views of the coast from Juliana Avenue, as well as impact coastal prairie habitat, which is protected under the Coastal Act and San Mateo County LCP as Environmentally Sensitive Habitat Area (ESHA).

A coastal erosion study was prepared by Haro, Kasunich & Associates (HKA) in 2015 that recommended incorporating a 28-foot bluff setback distance from the top of a slope they estimated to be stable into the development plans (HKA 2015). The recommended setback distance included the projection of their estimated historic erosion rate plus a 25% increase in the historic erosion rate to account for the effects of sea level rise (SLR) over a 50-year project design life. The HKA (2015) study estimated a historic bluff erosion rate of 0.45 feet per year, which has been questioned by project stakeholders as being too low.

Erosion gullies, or swales, filled with imported materials, including soil, concrete debris, and tree trunks, located to the north and south of the promontory immediately opposite Lot D, may introduce additional erosion hazards to the proposed project. JCP (1990) describes a gully on the south side of the promontory as an active landslide approximately 40 feet in diameter and affecting an area approximately 18 feet inland from the existing bluff top. GeoForensics (2001) describes these features as erosion gullies, or drainage swales that extend from the bluff edge toward Lot D, based on photography from 1946. They report that the gullies were filled between 1946 and 1955 according to inspection of aerial imagery.

Several technical topics were identified by CGF as needing additional consideration in the analysis, including the following:

- Historic erosion rate seems low, and should consider additional aerial photographs and methods
- Erosion process with the stratified geology, and influence of the bedrock geometry on erosion of the bluff
- Low stability of the bluffs in the vicinity of Lot D as mapped in a San Mateo County Geologic Hazards Map
- Influence of the groundwater seeps in the bluff face on erosion and stability
- Influence of the gullies and landslides in the area on erosional hazards

Organization of this Memorandum

This memorandum is organized as follows:

- Section 2: Site Observations and Data Collection – a summary of the observations during site visits, topographic survey data, and other data used in the analyses
- Section 3: Climate Change and Sea Level Rise Background – describes guidance recommendations by the State of California, including scenarios, planning horizons, and amounts of sea level rise to be assessed
- Section 4: Analysis and Results – summarizes the technical methods and results of wave runup modeling and bluff erosion modeling

Summary of Findings and Recommendations

Based on the technical analyses conducted by ESA, we present the following findings:

- Erosion is projected to be greater than shown by HKA (2015). Impacts associated with a greater amount of erosion should be considered to avoid potential future hazards to proposed development.
- The historic erosion rate estimated by HKA (2015) should be reviewed in greater detail, and the project applicant should use a higher erosion rate not lower than the higher end of the range of estimates reported by HKA (2015). Additional information and aerial imagery should be used to establish the historic erosion rate.
- Incorporate a factor of safety into the setback distance calculation, or use a higher historic erosion rate.
- Consideration of the erosion gullies is important in assessing the potential hazards at Lot D. The gullies may not behave according to the historic erosion rate, and the presence of fill and concrete debris suggests that a landslide may be deeper than perceived from visual inspection. The potential migration of the gully into Lot D should be assessed in greater detail. Further study should assess whether the gully identified previously as a landslide would be considered active.
- Drainage of the site on the surface and through existing underground infrastructure should be considered in the stability of the bluff as it contributes to rapidly forming gullies and landslides. Future development should not place structures or drainage features in areas that are subject to future coastal erosion.
- Although a project design life established by the developers is 50 years, structures often exceed the design life, and the California Coastal Commission typically requires assessment of the hazard exposure through the end of the century at 2100 so that the project incorporates acceptable adaptation strategies.
- The future coastal flood hazard zone associated with the 100-year total water level is expected to increase in the future with sea level rise, and should be considered in the project planning and design. Results of the modeling described in this memorandum suggest that the bluff may be overtopped by 2065, with significant overtopping by 2100.

2. Site Observations and Data Collection

We based the analysis and findings presented herein on observations and data collected at the site by ESA staff, as well as publically available meteorological data archived by government agencies. The following sections summarize the site observations and the various data collected to support the analysis.

2.1 Site Observations

ESA staff observed the site conditions on September 28, 2016 and October 18, 2016. The first visit, during a low tide, included site reconnaissance and discussion of the proposed project with CGF staff and other stakeholders. At the second visit, ESA field staff collected topographic survey data of the bluff geometry, described in more detail below. Several key observations were made, which we compared to existing studies and incorporated into our bluff erosion and sea level rise analysis.

The geology of the site is stratified, with a layer of marine terrace deposits that overlays a bedrock layer known as the Montara Quartz Diorite (JCP 1990). Figure 2 shows a sandy beach with large granite cobbles and boulders is located in front of the exposed bedrock layer, which is approximately 5 to 15 feet above the top of the beach, and overlain by the marine terrace layer. Inspection of oblique aerial photography of the site archived by the California Coastal Records Project¹ indicates the sandy beach is seasonal. Photographs taken during winter and spring months show a rocky beach with waves breaking at the base of the bedrock bluff. Furthermore, the project area is mapped as an area of “low stability” and classified as unstable bluff material with erosion rate greater than one foot per year in a San Mateo County Geologic Hazards Map (San Mateo County 1975).

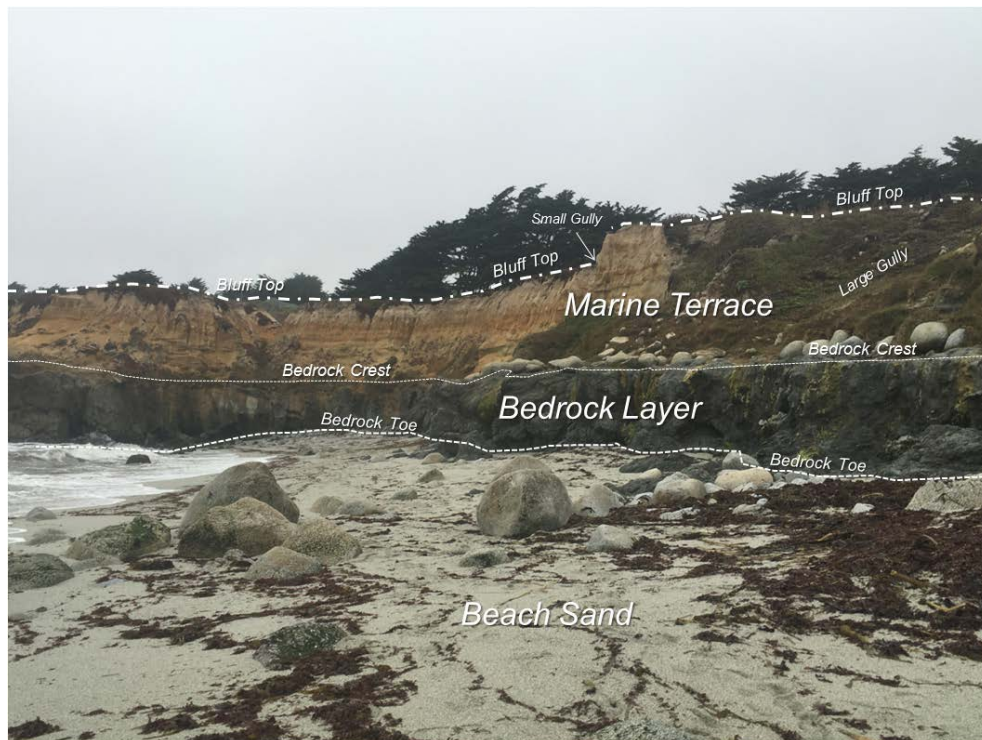


Figure 2
Photograph of site on beach looking north, showing the stratified geology of the bluff

¹ <http://www.californiacoastline.org/>

The promontory opposite Lot D is located between two gullies: one relatively large gully filled with imported soil and debris, and a smaller gully that appears to have been formed by surface drainage and an exposed pipe. The locations of these gullies are shown in Figure 2. The large gully was described by JCP (1990) as an active landslide approximately 40 feet in diameter and affecting an area approximately 18 feet inland from the existing bluff top. JCP (1990) considered this an active landslide because signs of erosion along the bluff face were observed at the time of their study. A study by GeoForensics (2001) stated that several erosion gullies were present along the bluffs in a photograph from 1946, and extended inland from the face of the bluff as much as 90 feet. GeoForensics (1990) indicates that the gullies were filled by 1955, but have more recently been eroding. The left photo of Figure 3 shows imported concrete debris and fill located at the top of the gully that was described as an active landslide by JCP (1990). The photo on the right of Figure 3 shows the location of the “small” gully on the north of the promontory opposite Lot D, thought to be formed by surface drainage. An exposed metal pipe appears to have contributed to the erosion of the “small” gully (right panel, Figure 4). This implies that erosional factors other than average bluff retreat may contribute to future erosion hazards into Lot D.



Figure 3

Photos of the bluff top showing concrete debris and fill at the top of an active landslide (left) and the variability in the bluff edge caused by gullies (right)

Several fissures were observed in the bluff top, which indicate that the bluff edge is in an unstable geometry and is prone to failure (left panel, Figure 4). The fissures are likely a result of the overly steep geometry of the marine terrace deposit layer, and indicative of the episodic nature of erosion. The photo on the right in Figure 4 shows the gully located immediately north of the promontory opposite Lot D.



Figure 4

Photos of bluff top showing a fissure or crack in the bluff (left) and a gully presumably caused by surface drainage (right)

Areas of active erosion on the bluff, as well as groundwater seeps, were observed along the bluff. The photograph in Figure 5 shows a grayish layer of sediment with water seeping out of the face of the bluff. Areas of active erosion were observed adjacent to the wet bluff face, which may be contributing to the instability of the bluff. Areas along the bluff are also vegetated by a mix of native and non-native invasive species that may play a role in surface erosion.



Figure 5

Active erosion and seepage of groundwater on the bluff face

The photographs in Figure 6 show additional groundwater seeps and erosion that was observed below the promontory opposite Lot D. The water seeping out of the bluff runs down the slope and over the bedrock. Algae growths were observed at locations where the groundwater seeps run over the bedrock, possibly indicating that the seeps are active most of the year, and not only in the rainy season.



Figure 6

Groundwater seeps and erosion on the bluff face below the promontory opposite Lot D

A sewer manhole was observed close to the bluff edge at the project site, indicating the presence of an abandoned sewer main. The sewer main likely has little impact on the bluff and erosion unless it is actively leaking and contributing to the moisture observed in the bluff face. The primary issue with the abandoned sewer main will be in the future, when it becomes exposed by erosion of the bluff, which will require removal of debris after it is exposed or in anticipation of future erosion. The geometry of the abandoned sewer infrastructure is not known, and therefore more information is needed to make a recommendation on proposed approach to removing the infrastructure from the bluff.

2.2 Data Collection

Data collection for the project included collecting of topography at the site, reviewing existing studies, and acquiring publically available meteorological data. The following sub-sections describe the data collection.

Survey Data and Measurements

ESA collected a limited amount of topographic data at the project site on October 18, 2016, using a total station and RTK GPS equipment.² The survey measured the horizontal and vertical location of several site features relative to the North American Vertical Datum of 1988 (NAVD), including the:

- Edge of bluff (marine terrace layer)
- Top of bedrock
- Edge of bedrock (also called “crest” in this document)

² ESA performs land surveys and collects hydrographic data to augment traditional surveying services for the purposes of geomorphic interpretation, monitoring of project performance, and other specific uses consistent with Geologic and Landscape Surveys as defined in the Professional Land Surveyors’ Act (California Business and Professionals Code). ESA does not provide traditional land survey services such as property boundaries and maps for general use by others. ESA recommends that a licensed, professional land surveyor accomplish these traditional surveying services under direct contract either with the client or as a sub-consultant to ESA.

- Top of beach
- Profile through promontory opposite Lot D, following Section 3 of HKA (2015)

Figure 7 summarizes the key information from the topographic survey, including dimensions, elevations, and slopes of features. The dashed blue line is located approximately where we surveyed a profile across the bluff and beach. The elevation of the edge of the bluff was measured to be approximately 43 feet NAVD, with some variability along the shore. The marine terrace deposits in this location stand almost vertical and are approximately 25 feet tall. The elevation of the bedrock layer was approximately 18 feet NAVD, although it also varied along the shore, and was approximately 7 feet above the top of the beach. A small “bench” was formed on the bedrock top as it extends seaward from the base of the bluff. The bedrock bench from the bluff toe varied between about 5 feet and 15 feet along the shore, likely a function of the relative exposure to waves breaking near the bedrock and bluff. The bench was not observed toward the north end of the beach, likely because of the presence of a large promontory that extends into the surf zone and protects the northern pocket of the beach from the larger breaking waves. Boulders and large cobbles were observed in the surf zone at approximately the low tide platform, and along the beach. Several boulders were sitting on top of the bench formed by the bedrock, which were likely moved by waves during extreme coastal conditions.



Figure 7
Approximate geometry of beach and bluff

Tidal Water Levels

Tides at the site are characterized by a mixed semi-diurnal tide signal, typical of the California coast, with two high tides and low tides occurring per day, each with unequal heights. The diurnal tide range, or the difference between mean higher high water (MHHW) and mean lower low water (MLLW), is approximately 5.8 feet. Table 1 presents the tidal datums used for the technical analyses described in this report. Tide data and tidal datums

were based on the NOAA Tide Gage Station 9414290 at San Francisco, California, located at the Golden Gate about 20 miles from the project site, but assumed to be representative of the actual conditions at the site. Comparison to a short record of tide data collected at Pillar Point show a small difference in the tide elevations, but was assumed negligible for the analysis we conducted. Figure 8 presents a time series of the tide data that was used in the analysis described below.

TABLE 1
TIDAL DATUMS FROM SAN FRANCISCO TIDE STATION 9414290

Datum	Elevation (feet NAVD)
Highest Observed Water Level (HOWL)	8.7
Mean Higher High Water (MHHW)	5.9
Mean High Water (MHW)	5.3
Mean Tide Level (MTL)	3.2
Mean Sea Level (MSL)	3.2
Mean Low Water (MLW)	1.2
Mean Lower Low Water (MLLW)	0.1
Lowest Observed Water Level (LOWL)	-2.8

Source: NOAA NOS Station 9414290, San Francisco, CA

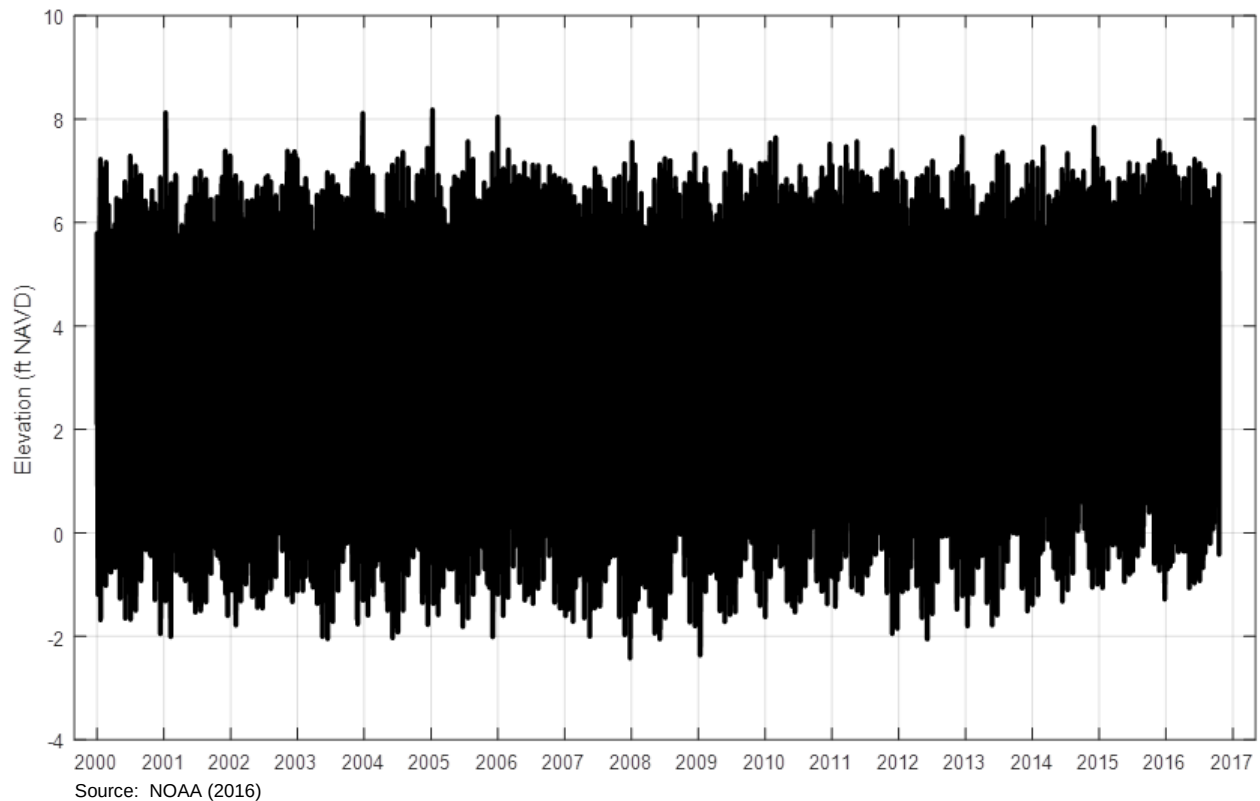
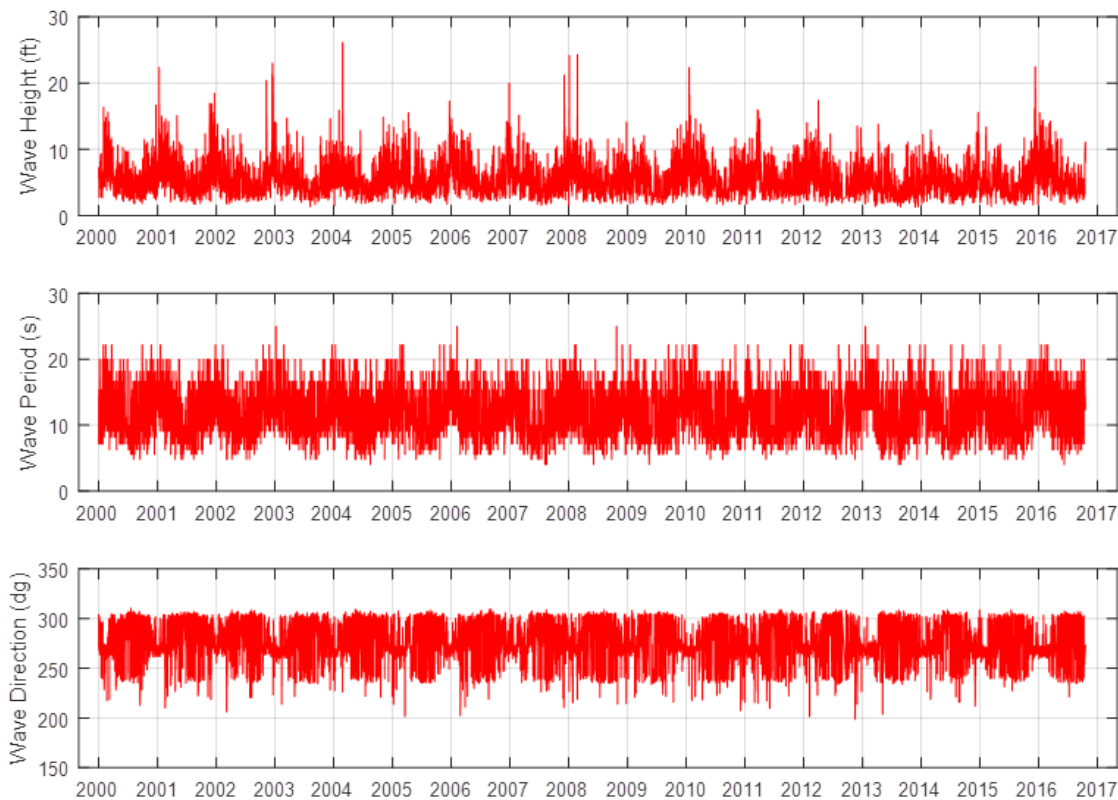


Figure 8
Measured tide elevation at San Francisco, Golden Gate, NOAA NOS 9414290

Wave Climate

Hourly wave height, period, and direction near the project site were obtained from nearshore transformed wave data provided by the Coastal Data Information Program (CDIP) California Coastal Wave Monitoring and Prediction System (O'Reilly et al. 2016). The data comprises the output of a spectral transformation model, at a virtual point located in about 45 feet of water approximately one-half mile offshore of the project site. Figure 9 presents hourly wave data, transformed from deep-water measurements using transformation coefficients computed by CDIP.³ Note the seasonal patterns, with large wave heights and long periods approaching the site with a narrow band from the west-northwest in the winter, and smaller waves with shorter periods approaching from a wide band ranging from west-southwest to northwest. The wave data is an important consideration in the analysis, as it is a driver of the beach elevations, flood elevations and erosion processes.

Recent nearshore wave data from CDIP and historic water levels at the San Francisco tide gauge (NOAA station 9414290) were used as input to the coastal erosion model and flooding calculations. Since these same meteorological and climatic conditions affect water levels and waves, these conditions are correlated. In fact, the worst coastal hazards are typically associated with coincident occurrences of high waves and high storm surge and the effect on coastal hazard responses such as total water level are not necessarily linear (FEMA 2005; Garrity et al. 2006).



Source: CDIP; O'Reilly et al. 2016

Figure 9
Wave height, period and direction record for offshore of the project site at depth of 15 meters

³ Data were furnished by the Coastal Data Information Program (CDIP), Integrative Oceanography Division, operated by the Scripps Institution of Oceanography, under the sponsorship of the U.S. Army Corps of Engineers and the California Department of Parks and Recreation, <http://cdip.ucsd.edu/>

Historic Erosion Rate

Estimation of the historic erosion rate for the project site was beyond the scope of our study, and therefore we relied on prior estimates by others. Our primary source for the historic erosion rate was the HKA (2015) study, which estimated the historical bluff recession rates over time using a 1908 surveyed subdivision map, a vertical photo from 1986, and 2014 field measurements. The HKA (2015) study based their setback analysis on a historic erosion rate of 0.45 feet per year, based on comparing the 1908 survey to the 2014 field measurements, and also reported a range in the erosion rate between 0.36 and 0.64 feet per year based on comparing the 1986 photograph to the 2014 field measurements.

Through comments provided to ESA by CGF, stakeholders have expressed concern in using the 1908 subdivision map as the baseline for the erosion rate calculations because it is not known how accurately the coast was surveyed, including the actual location of the bluff edge at the time of the mapping. GeoForensics (2001) performed a “least-squares regression” analysis on several aerial images acquired for the project site, and projected the computed erosion rates into the future to estimate the future location of the bluff edge. However, it appears that the GeoForensics (2001) study did not consider SLR, and it does not explicitly report the computed historic erosion rates, although the data and linear fits are presented in graphical format. Inspection of the graphs suggests historical erosion rates that vary from about 0.3 feet per year up to 0.75 feet per year in some locations. Selection of the cross-section plays an important role in the calculated erosion rates, because the location of the bluff edge is variable. Other studies nearby for the Fitzgerald Marine Reserve estimate historic bluff erosion rates of over one foot per year and recommend a minimum setback of 100 feet for new development (Brady/LSA 2002).

Overall, we recommend the conducting a more complete bluff erosion analysis to estimate the historical erosion rates at the site. This study should utilize all available aerial images of adequate quality, and use different standard methods to estimate the rate, including a least squares regression and other available software, such as Digital Shoreline Analysis System (DSAS) (Thieler et al. 2009).

In the analysis described in this memorandum, we used the HKA (2015) erosion rate of 0.45 feet per year so that the results from the ESA methods can be compared to HKA (2015). We also considered the implications of a higher erosion rate of 0.64 feet per year reported by HKA (2015) in our analysis. Finally we also considered the implications of a higher historic erosion rate, for which we selected one foot per year.

3. Climate Change and Sea Level Rise Background

3.1 Climate change scenarios

The accumulation of greenhouse gases in the Earth's atmosphere is causing and will continue to cause global warming and resultant climate change. For the coastal setting, the primary exposure will be an increase in mean SLR due to thermal expansion of the ocean's waters and melting of ice sheets.

State planning guidance for coastal flood vulnerability assessments call for considering a range of scenarios (OPC 2013; CCC 2015). These scenarios bracket the likely ranges of future greenhouse gas emissions and ice sheet loss, two key determinants of climate whose future values cannot be precisely predicted. Scenario-based analysis promotes the understanding of impacts from a range of scenarios and identifies the amounts of climate change that would cause impacts.

The guidance recommends using scenarios that represent low, medium, and high rates of climate change. Recent studies of current greenhouse gas emissions and projections of future loss of ice sheet indicate that the low scenario probably underrepresents future SLR (Rahmstorf et al. 2012; Horton et al. 2014). Also, note that even if SLR does not increase as fast as projected for the high scenario, SLR will undoubtedly continue beyond 2100, such that the medium scenario is likely to yield the same amount of SLR. It just would occur a few decades after 2100 instead of at the turn of the century.

While the interim state recommended SLR scenarios have not yet been finalized, we are expecting the state to recommend dropping the "low" SLR scenario. This study thus focuses on the Medium and High SLR scenarios. The assumptions that form the basis for these scenarios are:

- **High Scenario** – The high scenario assumes population growth that peaks mid-century, high economic growth, and development of more efficient technologies. The associated energy demands would be met primarily with fossil-fuel intensive sources.
- **Medium Scenario** – The medium scenario assumes same population, economic, and technologic growth as the high scenario, but also assumes that energy would be derived from a balance of sources, thereby reducing greenhouse gas emissions.

3.2 Planning Horizons

The planning horizons analyzed for this project are 2065 and 2100, selected to inform the potential impacts to the project site for mid- and late-century conditions, and consistent with the CCC (2015) SLR Policy Guidance document. This set of planning horizons is recommended so that decisions about land use can be matched to the timeframe for project lifespans and to facilitate the identification of triggers for adaptation measures. Although HKA (2015) reported that the design life of the project is 50 years, which will occur much earlier than the 2100 planning horizon, it is unlikely that the development would be removed at the end of this project life. Therefore, planning horizons for a SLR analysis are typically longer than the periods associated with near-term decision-making.

3.3 Relative Mean Sea Level Rise Amounts

Two SLR scenarios were evaluated to estimate the change in coastal water levels under medium and high degrees of climate change. This conforms to state planning guidance for coastal flood vulnerability, which recommends

analyzing a range of climate scenarios due to uncertainty about future climate predictions (OPC 2013; CCC 2015). For assessing the impacts of SLR on the project site, we used mean SLR projections through 2100 based on a recent study by the National Research Council (NRC 2012) for the West Coast, which was adopted by the State of California (OPC 2013; CCC 2015). Table 3 presents the values for relative mean SLR at 2065⁴ and 2100 for the San Francisco Region relative to 2000. The relative mean SLR includes regional projections of both mean SLR and vertical land subsidence of 1.5 millimeters per year for the San Andreas region south of Cape Mendocino (see OPC 2013). These values of relative SLR were used in the analysis described in this memo.

TABLE 2
RELATIVE MEAN SEA LEVEL RISE PROJECTIONS FOR THE SAN FRANCISCO REGION FOR MEDIUM AND HIGH SCENARIOS

Year	Medium SLR	High SLR
2065	17 inches	35 inches
2100	36 inches	66 inches

⁴ Although the SLR projections are tabulated at years 2050 and 2100, the CCC (2015) includes a polynomial fit for the High Scenario (Equation B-3 of CCC 2015), which was used to define the SLR value projected for 2065. Similarly, we used a polynomial fit to the NRC (2012) values for the Medium Scenario to define the SLR value projected for 2065.

4. Analysis and Results

The following sections describe the technical analyses conducted to model the bluff erosion and wave runup elevations as a function of sea level rise. The bluff recession model calculates the increase in the historical erosion rate due to SLR as a function of the change in exceedance of a selected wave runup event. Therefore, this section presents the analysis and results of the total water level analysis, followed by the bluff erosion analysis and results.

4.1 Wave Uprush and Total Water Level

The total water level (TWL), defined as the maximum elevation of the wave runup or wave uprush, was estimated using methods described in a Technical Methods Manual titled *Relating Future Coastal Conditions to Existing FEMA Flood Hazard Maps*, recently prepared for the California Department of Water Resources (Battalio et al. 2016), and consistent with FEMA mapping guidelines (FEMA 2005). The “modified TAW” method computes the wave runup height above a reference water level using the TAW equation⁵ with a composite slope of the backshore (i.e. an average slope is calculated over a distance between the breaker location and a point on the bluff), similar to methods described in the *Shore Protection Manual* (USACE 1984).

The modified TAW method computes a reference water level by increasing the observed tidal still water level (SWL) to include the static and dynamic wave setup as caused by waves breaking further offshore. We used the DIM method to calculate the wave setup at the breaker location to establish the reference water level for each wave runup computation. The final step is to compute the wave runup elevation with a depth-limited wave at a selected breaker location. We selected a breaker location as the mean sea level (MSL) contour on the surveyed shore profile.

Using the concurrent time series of tide elevations and offshore wave heights, we generated a time series of TWLs. Figure 10 presents an exceedance curve of the computed TWLs, which relate the TWL elevation (vertical axis) to the percent of time that the value is exceeded (horizontal axis). As shown in Figure 10, elevation 0 feet NAVD is exceeded 100% of the time for the period of observations, and the TWL of 22 feet NAVD is exceeded approximately 1% of the time for the period of observations. Note that the crest of the bedrock bluff is located at approximately 18 feet NAVD, and thus is anticipated to be overtopped approximately 3 to 4% of the time.

⁵ TAW refers to the Technical Advisory Committee on Flood Defence in the Netherlands; the TAW equation was developed by the for estimating wave runup and overtopping as part of a set of guidelines for safety assessment and design of dikes. Application of the TAW equation is also described in FEMA’s Guidelines for Coastal Flood Hazard Analysis and Mapping for the Pacific Coast of the United States (FEMA 2005).

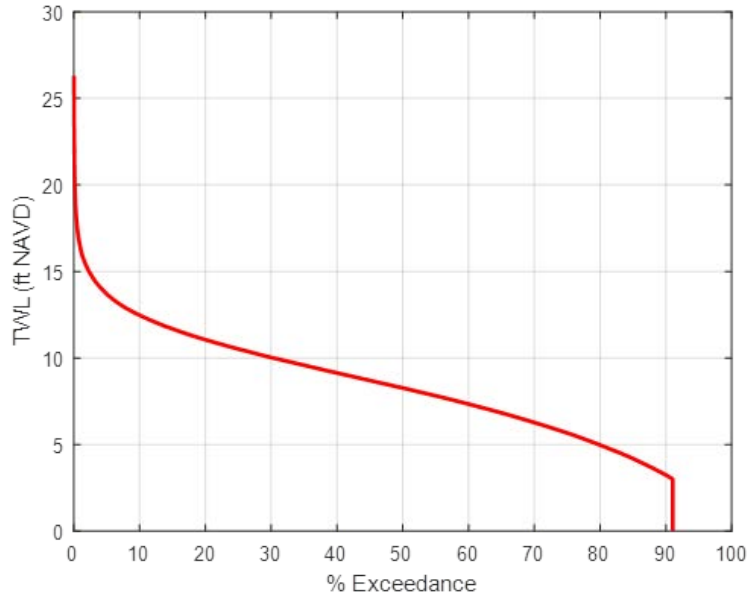


Figure 10

Exceedance curve of the total water level calculated at the site for existing conditions

We estimated the 100-year TWL for existing conditions to be approximately 31 ± 2 feet NAVD. Figure 11 presents several extreme value distributions fit to the annual maximum TWL data for the period of record. This is slightly higher than the base flood elevation (BFE) of 26 feet NAVD mapped in the Preliminary 2015 FEMA FIRM for the project area. However, the FEMA BFE values are calculated on a limited number of transects, with values that range from 26 to 34 feet NAVD along this section of coast with similar shore morphology and wave exposure, and therefore the estimate of the 100-year TWL in this report seems in-line with the FEMA study.

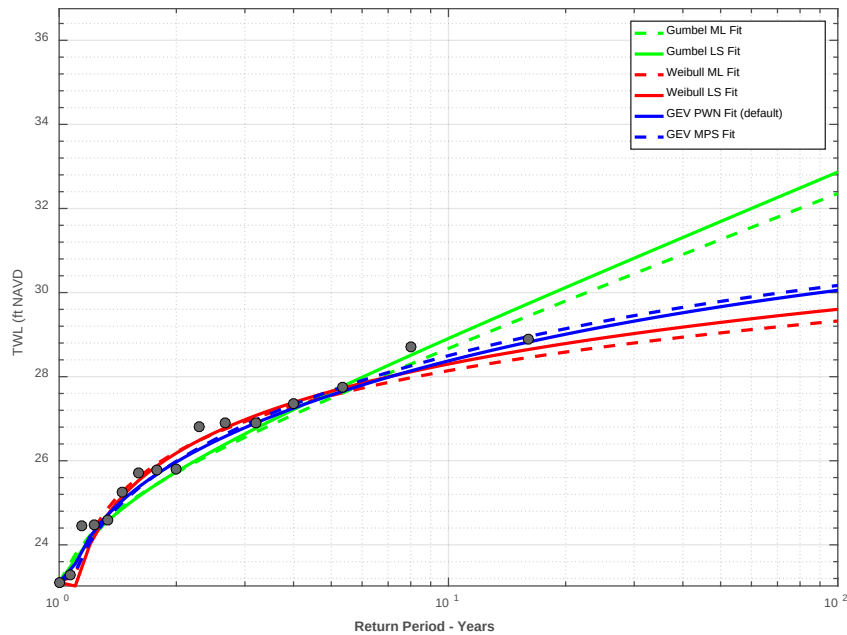


Figure 11

Extreme value analysis of the total water level time series shows a 100-year total water level up to 33 feet NAVD

The wave runup model was calibrated by comparing model output to observations made at the site on October 17, 2016. We used a photograph of the site and observations taken on October 17, 2016 during high tide to estimate a TWL of approximately 23 feet NAVD. Based on the topographic survey, the top of the vegetation shown in the photograph is approximately 23 feet NAVD, which appears to agree well with the spray of the wave. Also note that the reference water level is high compared to the beach, likely due to wave setup caused by the long period swell hitting the coast on that particular day. We ran the modified TAW model using the measured tides from NOAA and nearshore waves from CDIP for the same time period, and calibrated the runup component by adjusting a roughness coefficient so that the model output was similar to the observed data.



Photograph by Kathy Lockhart

Figure 12

Estimate of total water level based on observations made on October 17, 2016

The future 100-year TWL is expected to increase with SLR, with the potential to overtop the bluff by 2065. Recent studies have shown that the change in TWL is approximately 3 to 4 times the amount of SLR at erosion-resistant, steep backshores (Battalio et al. 2016, Vandever et al. 2016). Table 3 presents values of the existing and future 100-year TWL for the profile analyzed at the site. Note that the existing bluff edge is approximately 43 feet NAVD. During wave overtopping, long period waves can propagate a significant landward distance and impact structures with a momentum force proportional to the square of the velocity. FEMA maps the “V” zone, or velocity hazard zone, in FIRMs for coastal areas subject to waves. Construction in a “V” zone is required to meet additional building codes associated with the wave and velocity hazards. FEMA FIRMs are subject to future revisions.

TABLE 3
ESTIMATED EXISTING AND FUTURE 100-YEAR TOTAL WATER LEVEL (FEET NAVD)

Year	Medium Scenario	High Scenario
Existing	31	31
2065	37	43
2100	43	53

4.2 Bluff Retreat Estimate

The estimate of future bluff retreat was completed using an approach first established by ESA (formerly Philip Williams and Associates) and applied to several studies on the coast of California. The method estimates the increase in the erosion rate of the base or toe of the bluff as a function of the change in the TWL exceedance above the toe for future conditions. For this particular site and application, the layered geology was assessed using an additional step and assumptions. A key assumption in this analysis is that for a static sea level, the bedrock layer and the marine terrace layer erode at the same rate. We assume that the bench between the edge of the bedrock and the base of the bluff is a result of variable wave exposure and is not expected to change significantly for a static sea level. As sea level changes, the base erosion rate of the bedrock will increase, due to the change in TWL exceedance above the toe, and the bedrock bench will increase due to the increased impacts of waves on the marine terrace materials. Therefore, we computed the accelerated erosion of the bluff top as a function of the acceleration in the base erosion at the toe of the bedrock, and the increase in the bench width between the bedrock edge and the bluff. Figure 13 presents a schematic that illustrates the conceptual model of the bluff erosion for the site, where X_1 is the base erosion distance of the toe of the bedrock for a given time period and X_2 is the total erosion distance of the bluff edge for the same time period. Note that X_2 is the sum of the base erosion distance X_1 and the change in width of the bench.

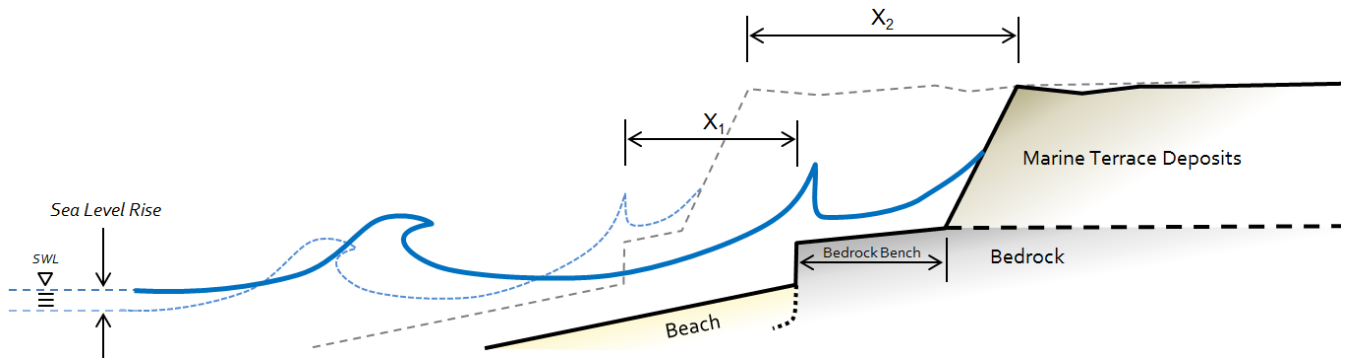


Figure 13
Conceptual model of bluff erosion at the site (not to scale)

Estimate of Accelerated Base Erosion

Methods to estimate future erosion rates that consider sea level rise are described by a limited number of studies. The Pacific Institute study (PWA 2009, Revell et al. 2011) estimated future erosion rates using the following equation,

$$Erosion Rate_{future}(t) = Erosion Rate_{historic} * \left(1 + \alpha \frac{P_f - P_e}{P_e}\right) \quad (1)$$

where P_f and P_e are the future and existing probability of total water level exceedance above the cliff toe elevation, respectively. Since the Pacific Institute study, a number of studies have proposed additional relationships for estimating cliff/bluff erosion rates under accelerated sea level rise (Walkden and Dickson 2008, Ashton et al. 2011). Walkden and Dickson (2008) found that the following equation applied well for the cliff backed/low volume beaches undergoing a historic trend in sea level rise at the Naze Peninsula on the Essex coast in Southern England:

$$Erosion Rate_{future}(t) = Erosion Rate_{historic} * \left(\frac{Rate\ of\ Sea\ Level\ Rise\ (t)}{Rate\ of\ Sea\ Level\ Rise\ (historic)}\right)^m \quad (2)$$

In this equation $m = 0.5$. Ashton et al. 2011 investigated the value of m using various data sets for calibration and confirmed that $m = 0.5$ applies to cliffs/bluffs dominated by wave-driven erosion. In particular, rocky shore platforms and cliffs fronted by low-sediment-volume beaches, both of which apply for the cliffs at the project site.

ESA has further adapted the Walkden and Dickson (2008) equation, as follows:

$$Erosion Rate_{future}(t) = Erosion Rate_{historic} * \left(\frac{A(t)}{A(historic)} \right)^m \quad (3)$$

where A is the area below the total water level exceedance curve and above the existing toe elevation. This area is a combination of the duration of wave impact above the toe elevation and the intensity of that contact (how high above the toe the waves and wave runup are reaching). The exponent, m , was kept at 0.5, in agreement with the previous studies.

Application of this method to the profile at the site yielded increased erosion rates as a function of time. We computed the accelerated erosion rates for three different historic erosion rates as described in Section 2.2, and for the medium and high sea level rise scenarios as described in Section 3.

Estimate of Increase in Width of Bedrock Bench

We estimated the change in width of the bedrock bench on top of the bedrock by accounting for the change in future TWL for events with a 1- to 5-year recurrence interval. The recurrence interval of 1- to 5-years was selected to correspond to the episodic nature of bluff erosion. We modified Equation 5 of Battalio et al. (2016) to relate the ratio of negative freeboard (e.g. the height of the wave runup above the bedrock) for future and existing conditions to the change in width of the bench. For the profile we analyzed, the bench width was approximately 10 feet, and increased over time as the relative negative freeboard increased with the acceleration in SLR.

TABLE 4
ESTIMATED EXISTING AND FUTURE BEDROCK BENCH TOP WIDTH AT ANALYZED PROFILE (FEET)

Year	Medium Scenario	High Scenario
Existing	10	10
2065	20	26
2100	27	35

Calculation of Setback Distance

The setback location was estimated by adding the results of the base erosion estimate with the increase in the width of the bench, and then projecting a slope of 1.5 to 1 (horizontal to vertical) to the existing ground surface, consistent with the method described by HKA (2015) for locating the top of the stable slope.

Figure 14 presents a plan view of the stable slope location and the computed setbacks associated with the medium and high SLR scenarios at 2065 and 2100 for two historic erosion rates. The setbacks shown with the solid lines are based on a historic erosion rate of 0.45 feet per year, and those with the dashed line are based on a historic erosion rate of 0.64 feet per year. These setback distances are applicable to the surveyed profile location only, and may not be representative of appropriate setback distances along the shore. Additional work is required to

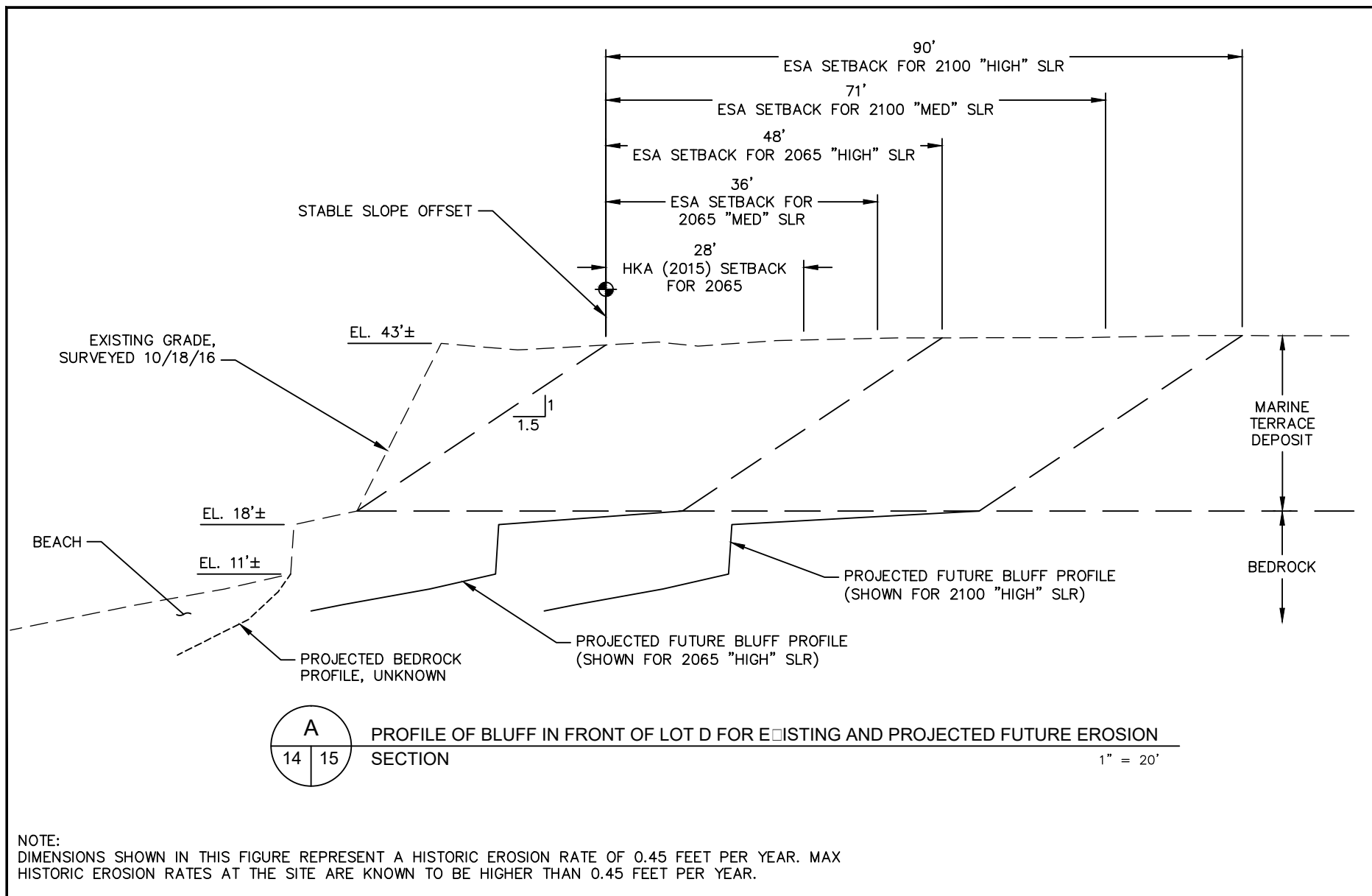
compute the setback line along the shore, and is beyond the scope of this study. Figure 15 shows the profile section, with an example of how the setback distance is estimated for a historic erosion rate of 0.45 feet per year. Table 5 presents the computed setback distances relative to the top of the stable slope for different historic erosion rates at 2065 and 2100.

TABLE 5
TOTAL EROSION DISTANCE RELATIVE TO STABLE SLOPE SETBACK FOR FUTURE CONDITIONS (FEET)

Historic Erosion Rate (feet per year)	Year 2065		Year 2100	
	<u>Medium SLR Scenario</u>	<u>High SLR Scenario</u>	<u>Medium SLR Scenario</u>	<u>High SLR Scenario</u>
0.45	36	48	71	90
0.64	50	60	92	116
1.0	70	83	133+	165+

This approach is consistent with recommended guidelines of the State to use a range in sea level projections and different time frames (see CCC 2015). While accounting for mid-century values at 2065 is indeed important and in compliance with local regulations, assessing the potential exposure at 2100 is another important step that is typically required by the California Coastal Commission in reviewing Coastal Development Permit applications. Identification of future exposure that is likely to occur late in the century is used to inform how potential adaptation strategies and approaches will be incorporated into the proposed project, so that potential future adverse impacts to the coast are minimized.

As shown in Figure 14, we expect a greater amount of erosion to occur by 2065 as compared to the results of HKA (2015). Because of the uncertainty and sensitivity of the historic erosion rate estimated by HKA (2015), we recommend incorporating a factor of safety or use a higher rate. As shown by our results, a relatively small increase in the historic erosion rate resulted in a greater amount of future erosion and larger setback distances. Although this analysis is not intended for locating structures, our findings indicate that a greater amount of erosion should be considered in the proposed project to avoid potential future hazards.



SOURCE: ESA Survey 10/18/16



Version B C H 160715.00

Figure 15

Projected Future Erosion B
H E R 0.45 F Y

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County of San Mateo - Planning and Building Department

ATTACHMENT S

**GEOTECHNICAL INVESTIGATION
For
Five Home Residential Development
Valleamar Street and Juliana Avenue
APN 037-086-23, -26, -27, -28, -29
Lots A, D, E, F, G
Moss Beach, California**

**Prepared For
Moss Beach Associates, LLC
c/o Lawlor LandUse Manager, Santa Cruz, California**

**Prepared By
HARO, KASUNICH & ASSOCIATES, INC.
Geotechnical & Coastal Engineers
Project No. SM10391.2
August 2016**

ATTACHMENT S

Project No. SM10391.2
12 August 2016

MR. OWEN LAWLOR
Moss Beach Associates LLC
c/o Lawlor LandUse
612 Spring Street
Santa Cruz, CA 95060-2030

Subject: Geotechnical Investigation

Reference: Five Home Residential Development
Vallemar Street and Juliana Avenue
APN's 037-086-23, -26, -27, -28, & -29
Moss Beach, California

Dear Mr. Lawlor:

In accordance with your authorization, we have performed a Geotechnical Investigation for the referenced property in Moss Beach, California. This investigation was completed with consideration to the Coastal Bluff Recession Map prepared by our firm for the referenced property. The Coastal Bluff Recession Map is included in the appendix of this report and should be reviewed as part of this document.

The accompanying report presents our geotechnical recommendations and design criteria, along with the results and methodology of our investigation. If the recommendations in our geotechnical report are followed during project design and construction, the project will be subject to "ordinary risks" as defined in the Scale of Acceptable Risks From Geologic Hazards" in Appendix E of this report. If this level of risk is unacceptable, more extensive mitigation of the hazards can be recommended. In brief we have recommended the new residences be situated landward of the estimated 50 year coastal bluff recession setback and supported by conventional spread foundations embedded into an earthen mat of engineered fill.

If you have any questions concerning our conclusions or recommendations, presented in this report please contact our office.

Respectfully Submitted,

HARO, KASUNICH AND ASSOCIATES, INC.

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GEOTECHNICAL INVESTIGATION

Introduction

This report presents the results of our Geotechnical Investigation for the proposed construction of five (5) new single family dwellings on five separate parcels. The five parcels are designated on preliminary maps as lots A, D, E, F, & G. Lots B and C are designated as open space. We have also prepared an estimated 50 year future coastal bluff recession map for the bluff that borders Lots A, B, C, & D. The recession map should be reviewed in conjunction with this geotechnical investigation.

Purpose and Scope

The purpose of the geotechnical investigation is to develop geotechnical design parameters for design and construction of the new residences at the referenced site. We performed slope stability analysis on a critical cross section selected by HKA and developed from a topographic map prepared for this site. The critical cross section is cut through one of the steepest portions of the coastal bluff and area of the proposed home site to estimate for potential of bluff failures. This information also corroborated the slope stability portion of the estimated 50 year future coastal bluff recession setback.

Specifically we did the following:

- A. Document review of information provided by property owner in our files pertinent

to the site and region, including:

- Coastal Bluff Recession Map and Cross Sections, prepared by Haro, Kasunich and Associates Inc., dated 9 March 2015.
- Architectural plan sheets A3.1 – A3.4, prepared by Pearson Design Group, Undated.
- Site sections L4.1 – L4.3, prepared by Verde Design, dated 28 July 2015.
- Civil plan sheets C1.0 – C8.0 dated 5 August 2016, prepared by Mesiti-Miller Engineering.
- Conferred with and discussed scope and requirements with San Mateo County Public Works department, Diana Shu and County Geologist Jean Demouthe.

B. Met at the site with the Project Biologist to review environmental constraints at the project site. HKA placed wood stakes at each of the test boring locations and contacted USA Underground as mandated by law within 48 hours of scheduled drill date.

C. HKA obtained a geotechnical soil boring permit for this project site from San Mateo County Health Services Division (SMCHSD). A soil boring location map and

Drilling Notification Form was submitted to SMCHSD a minimum 48 hours prior to the scheduled drill date.

- D. Subsurface exploration consisting of logging and interval sampling of soils encountered in five (5) exploratory test bore holes advanced in the area of the proposed residences between 13.5 to 25.0 feet deep. The exploratory test bore holes were advanced using portable drilling equipment that was hand carried onto the site in parts and built in place of each test boring location. The soil samples obtained were sealed and returned to our laboratory for testing. After completion of each test boring the drilled shaft was infilled with a cement grout mixture specified by SMCHSD. The mixing and placement of the grout was performed by a drilling contractor with a C-57 license. Pictures were taken during this operation and forwarded to Lawlor Land Use see Appendix F of this report. Soil cuttings were hauled off site for proper disposal.
- E. A total of five (5) percolation test holes were advanced near the areas of the proposed drain fields between 2.15 to 4.04 feet deep. The holes were advanced using hand auger gear. Percolation tests were performed within the drilled shafts following an EPA and San Mateo County procedures for determining percolation test rate within soils. The holes were backfilled with soil cuttings.

- F. Laboratory testing of select samples obtained. Moisture content and dry density tests of selected samples was performed to evaluate the consistency of the in situ soils. Soil strength parameters were derived from in-situ field penetration tests (SPT), an unconfined compression test, and a laboratory direct shear test on select samples under saturated and in-situ moisture contents. Atterberg limits tests were performed on select clay soil samples to qualify its expansion potential. Corrosion testing was performed on bulk samples of site soil.
- G. Quantitative slope stability analysis was performed on a critical cross section (Section 3) cut through on one of the steepest portions of the coastal bluff and the area where one of the proposed home sites is nearest the bluff. The location of the critical cross section was selected by HKA from site observations and review of a topographic map prepared for this site. The analysis were run under static and pseudo static (seismic) loading conditions.
- H. Geotechnical analysis with consideration to our laboratory test results, slope stability results, the estimated 50-year future coastal bluff recession setback, our experience in the area, and engineering judgement. Our analysis developed geotechnical design parameters for building foundations, grouted soil anchors, retaining walls, and concrete slab-on-ground.

- I. Preparation of this report summarizing our findings, conclusions, and recommendations.

Site Location and Project Description

The project site consists of five privately owned parcels on the seaward side of California State Highway 1. The parcels make up an undeveloped field bound by Vallemar Street to the east and Juliana Avenue to the south. The project site is a relatively flat, elevated marine terrace that sits approximately 45 feet above sea level. The project site is covered with grasses, ice plant, trees, and shrubs. There is evidence of historical grading, associated with the construction of Vallemar Street and possibly Highway 1. A fill wedge descends from the seaward side of Vallemar Street down to the landward side of the project site. The coastal bluffs that line the seaward side of the project site are steeply cut from years of wave attack. A drainage swale which appears to be part of the construction of Juliana Avenue runs along the southeast side of the project side and discharges into a small ravine descending to the beach below.

Based on interaction with Lawlor LandUse and review of conceptual drawings, HKA understands the proposed improvements consists of the following. Grading of building pads on each site by means of cut and fill construction methods. A new single family dwelling and driveway is shown to be constructed on each parcel. The parcels are designated by lot lettering. Lot A on the north corner of the site and Lot G to its east. Lot

D, E, and F are located on the southeast side of the project site adjacent to Juliana Avenue. Lot D is the seaward most, Lot F is adjacent to Vallemar Street, and Lot E is between the two. The new homes are referred to as the "Home A, D, E, F, and G" respective to the lot letter for this project and within this report.

Home A and Home G are shown to have frontage onto Vallemar Street. The driveway and parking area for Home A is shown to be built up with 2 to 5 feet of engineered fill and the 2 story house is shown to be cut into the fill embankment with its upper level even with the parking area. Home G is shown to be cut into the site up to five feet and fill placed on the down slope side of the access driveway. Retaining or basement walls are anticipated on the upslope side of the Home A and Home G.

Home D, Home E, and Home F are shown to have frontage onto Juliana Avenue. Each of these home will require construction of a small bridge to cross the drainage swale adjacent Juliana Street. Starting at home F, a cut is shown on the upslope side on the order of 2 to 4 feet and a fill on the order of 4 feet shown the downslope side. Home E is shown to have significantly less grading with cut and fills on the order of 1 to 3 feet. Home D is shown to have minimal grading with cut and fills 1 foot thick or less.

Field Exploration

On 22 and 24 March 2016 a total of five (5) exploratory test bore holes were advanced at the project site. One test boring near the location of each home site. On 30 March 2016 we returned to the site and advanced five (5) percolation test bore holes near the area of the proposed drain fields for the homes.

The exploratory test boring in the area of the new homes were advanced to depths of 13.5 to 25 feet below the ground surface (bgs). The exploratory test bore holes were advanced using solid flight auger portable drilling equipment that was hand carried onto the site in parts and built at the locations of each test borings. The soil samples obtained were sealed and returned to our laboratory for testing. After completion of each test boring the drilled shaft was infilled with a cement grout mixture specified by SMCHSD. The mixing and placement of the grout was performed by a drilling contractor with a C-57 license. Pictures were taken during this operation and forwarded to the Lawlor Land Use. Soil cuttings were placed into 5 gallon buckets and hand carried to a waiting truck. The packed soil was transferred off site for proper disposal See Appendix F of this report for pictures of drilling operation.

A total of five (5) percolation test holes were advanced near the areas of the proposed drain fields between 2.15 to 4.04 feet deep. The holes were advanced using hand auger gear. Percolation tests were performed within the drilled shafts following an EPA

procedure for determining percolation test rate within soils. The holes were backfilled with soil cuttings.

To provide extra protection against disturbance of the site a large tarp was laid over the work areas. Each exploratory and percolation test boring was advanced through the tarp and all buckets, drilling parts, soils cuttings etc. were carefully handled over the tarp. After the work area was cleared the tarp was folded up and the plants were replaced.

In-situ samples were collected from within the exploratory test borings. Samples were obtained by driving a California Sampler (3 inch outside diameter) or split spoon sampler (2 inch outside diameter) up to 18 inches in depth at select elevations using a standard 140-pound hammer over a 30-inch drop. The amount of blows to drive the sampler 1 foot were recorded and presented on our logs of borings attached to this letter (Figures 4 to 13). The logs also include profiles of the percolation test bore holes.

The approximate location of test bore holes are shown on our Test Boring Location Map (Figure 2). The soil encountered in the borings was continuously logged in the field and described in accordance with the Unified Soil Classification System (ASTM D2487).

Laboratory Testing

The laboratory testing program was directed toward determining pertinent soil engineering, corrosion, and index properties.

The natural moisture content was determined on select samples and is recorded on the Logs of Test Borings at the appropriate depths. Since water has a significant influence on soil, the natural moisture content provides a rough indicator of the soil's compressibility, strength, and potential expansion characteristics.

A saturated moisture direct shear tests and an in-situ moisture unconfined compression test were completed to determine strength properties for coastal terrace. Density tests were also performed to aid in the assignment of soil properties to each soil type.

Atterberg limits tests were performed on select clay soil samples to qualify its expansion potential. The Atterberg limits were run on a select near surface sample collected from within the exploratory test boring advanced on each of the home sites.

The results of the field and laboratory testing appear on the "Logs of Test Borings" opposite the samples tested (Figures 4 through 13).

Subsurface Conditions

In general within test bore holes advanced in the area of the home sites the soil profile encountered consisted of clay soil over either silty sand, clayey sand, sand with silt or a combination of thereof all overlying a hard bedrock formation. The overburden soils are interpreted as coastal terrace and were loose near the surface and became mostly medium dense and occasionally dense with depth. The coastal terrace was mixed with organics and roots within the upper 1 to 2 feet as a result of top soil development. The upper 6 to 8 feet of the coastal terrace was stiff to very stiff sandy clay or clay. In the area of Home G the clay layer was 15 feet thick. The silt clay sand mixtures extended below the clay layer to a depth of approximately 25 feet bgs where drilling refusal was encountered. We interpret this contact as hard bedrock.

In the percolation test bore holes advanced in the area of the proposed drain fields for Home A, Home F, and Home G consisted of top soil in the top foot and silty sand below that. These locations had low to moderately low percolation rates. In the locations of the drain fields for Home D and Home E the soil encountered consisted of 1 foot of top soil over clay. These locations had zero percolation.

Expansive Soils

Based on the measured Atterberg Limits, the clay soil collected within the foundation zone of the home sites was qualified to have moderately high potential for expansion and in

the upper 2 to 3 feet at Home D and Home E it has a high potential for expansion. There was a large standing puddle observed in this area for several weeks during the course of our field exploration phase of this study. The clay soil with moderately high potential for expansion (Homes A, F, & G) can be mitigated for foundation support if the recommendations in this report are carefully followed during development of project plans and during construction. The clay soil with high potential for expansion in foundation zones (Homes D & E) should be removed and replaced with select granular fill.

Groundwater

Groundwater was encountered within our test bore holes advanced at Homes D, E, & F adjacent to Juliana Avenue. The groundwater was encountered at 17 feet bgs near Vallemar Street and 13 feet at Home D closer to the bluff. The groundwater appears to be perched upon the bedrock and seeping through the terrace near the contact. That being said saturated soils and active seeps in the coastal terrace soils should be anticipated and planned for by designers and contractors. Retaining wall back drains and under slab blanket drains will be essential for the design of this structure. It is recommended to relieve drainage collected in these subsurface systems through a gravity flow if possible.

Liquefaction Potential

Liquefaction is a phenomenon where loose to medium dense soils with low to zero

cohesion that are submerged and subject to seismic shaking can temporarily lose their shear strength. This is most common in young alluvial soils near sloughs, rivers, and flood plains. Although medium dense sand and silt was encountered just above the bedrock formation it was relatively thin and more than 15 feet bgs. Based on the lack of evidence of ground effects related to liquefaction occurring within coastal terrace the potential for liquefaction at the site is low.

Soil Properties

Based on our field exploration and results of laboratory tests the soils encountered were simplified into two soil types. Soil Type 1: Clay Soil Coastal Terrace and Soil Type 2: Silt Sand Clay Mixture Terrace Deposit, Soil type 3: Bedrock Formation. The geotechnical strength parameters of the soil types are summarized in the table below.

Table 1: Geotechnical Design Values

Soil Stratum	γ_t (lbs/ft ³)	ϕ (degrees)	Cohesion (lbs/ft ²)
Soil 1	123	10	1000
Soil 2	113	43	200
Soil 3	135	45	1000

Erosion

Surficial soils at the site are prone to erosion which can be severe where there are steep slopes and uncontrolled runoff, particularly where the natural drainage is modified by the works of man and not properly controlled. Typically, once the upper surface of the material is breached by a rill or a gully, erosion proceeds at an accelerated rate, and the rills and gullies deepen and migrate headward (upslope). This process may contribute to the initiation of debris flows if rills and gullies are not mitigated or maintained and if surface drainage controls are not adequately designed and constructed.

Surface Drainage

The project site is located near a coastal bluff comprised partially of coastal terrace deposits that are susceptible to erosion, particularly by concentrated uncontrolled runoff of surface drainage. The proposed improvements will increase the runoff flow rate shedding away from the site. Collection of surface runoff into drain lines with single discharge points will further concentrate it relative to the sheet flow type drainage prior to improving the site. Development of an engineered drainage plan that conveys surface runoff to multiple discharge locations and promotes sheet type flow of collected drainage is recommended for this site. Level drainage spreaders are an example of this type of system.

Geotechnical Related Seismicity

The improvements should be designed in conformance with the most current California Building Code (2013 CBC). For seismic design, the soil properties at the site are classified as **Site Class “D”** based on definitions presented in Table 1613.5.2 in the 2013 CBC. The longitude and latitude were determined using a satellite image generated by Google Earth. These coordinates were taken from the approximate middle of the area of the proposed improvements:

Longitude = -122.5169, Latitude = 37.5300

The coordinates listed above were used as inputs in the Java Ground Motion Parameter Calculator created by the USGS to determine the ground motion associated with the maximum considered earthquake (MCE) SM and the reduced ground motion for design SD. The results are as follows:

Site Class D

SM_s= 2.269 g

SM₁= 1.439 g

SD_s= 1.512 g

SD₁= 0.960 g

A maximum considered earthquake geometric mean (MCE_G) peak ground acceleration (PGA) was estimated using the Figure 22-7 of the ASCE Standard 7-10. The mapped

PGA was 0.89 g and the site coefficient F_{PGA} for Site Class D is 1.0. The MCE_G peak ground acceleration adjusted for Site Class effects is $PGA_M = F_{PGA} * PGA$

$$PGA_M = 1.0 * 0.89 \text{ g} = 0.89 \text{ g}$$

Quantitative Slope Stability Analysis

Stability analysis was performed on the worst case or critical cross section cut through the coastal bluff and Lot D. The critical section (Cross Section 3) was selected by HKA and developed using a topographical map prepared by Gary Ifland surveyor, Inc. A copy of the cross section is included with this report (Appendix C). The slope stability analysis was performed to quantify the potential for bluff failure that could impact the proposed building site. It also corroborated the development of the recommended 50-year future coastal bluff recession slope stability setback line.

General Methodology

Slope failures or landslides can cause problems including encroachment and undermining of engineered structures. Failures of slopes occur when stress acting on the soil mass is greater than its internal strength (shear strength). A slope is considered stable when the strength of its soil mass is greater than the stress field acting within it.

Some common variables influencing stress are gravity (steeper slopes), hydrostatic pressure (perched groundwater), bearing pressures (proposed structures), and seismic surcharge (earthquake shaking).

Various methods of analyzing stability of slopes yield a factor of safety. A factor of safety is determined by dividing the resisting forces within the slope soils by the driving forces within the slope (stress field). A factor of safety (FS) greater than or equal to 1.0 is considered to be in equilibrium. A FS less than 1.0 is a potentially un-stable slope condition. HKA considers the potential for instability of a slope or hillside with a FS against sliding greater than or equal to 1.10 under seismic loading conditions and 1.50 under static loading conditions to be low.

Quantitative Analysis with GSTABL7

The analysis was completed with the aid of GSTABL7 software. A model for the section was defined with the input parameters consisting of slope geometry, soil properties, loading conditions, and pore water pressure ratio. Each model was evaluated under static and seismic loading. The analysis calculates the factor of safety against sliding for the failure surface(s).

Circular failure surfaces were assumed for this model. GSTABL7 program uses the Simplified Bishop Method of Slices to determine normal and resistive forces in each slice.

The forces in each slice are then summed up for total force acting on the mass. The computer program assumes many failure surfaces using initiation and termination points on the ground surface selected by the user. These chosen points represent the toe and scarp of each potential landslide in relation to the assumed failure surfaces. The critical trial failure surface from the pseudo static analysis condition was selected as the projected failure surface in the development of design parameters.

Seismic Coefficient

The ground motion parameter used in pseudo static analysis is referred to as the seismic coefficient “k”. The selection of a seismic coefficient has relied heavily on engineering judgment, local building code, and professional publications. Current version of the California Building Code contains reference to maps of peak ground acceleration (PGA) based on site latitude and longitude. For this project the mapped PGA is 0.89g. The PGA is multiplied by a factor related to the seismicity of the site to obtain the seismic coefficient. The factor was estimated to be 0.58 by using Figure 1 of Chapter 5 Analysis of Earthquake-Induced Landslide Hazards in CGS *Special Publication 117 Guidelines For Analyzing and Mitigating Seismic Hazards in California 2008*.

The multiplying factor was developed as part of a screen analysis procedure for seismic slope stability by Stewart, Blake, and Hollingsworth. The multiplier results in a percentage of the peak which represents the more repeatable ground motion. The assumption is the

site can tolerate at least 2 inches of displacement during a design seismic event. The higher the multiplying factor the less displacement during a design seismic event is assumed to be tolerable by site improvements. For example if the full peak ground acceleration is used in the analysis (multiplier of 1.0) it is assumed 0 inches of displacement is tolerated during a design seismic event. For this project we assumed 2 inches of ground displacement is tolerable resulting a horizontal seismic coefficient of 0.51g.

Geometric Assumptions

For our analysis, failure surfaces were focused within Soil 1 "Unclassified Fill and Coastal Terrace Deposits" due to its vulnerability to bluff failures relative to Soil 2 "Bedrock Formation" which is much more resistance to erosional processes and slope failures. The trial failure surfaces used in the analysis were selected using engineering judgment as well as the software's ability to generate many random surfaces.

Slope Stability Conclusions

The computed factors of safety for the trial failure surfaces are greater than 1.50 under static loading conditions and 1.10 for pseudo-static conditions. The results of our analysis indicate that the portion of the coastal bluff comprised of terrace deposits is stable at slope gradients of 1.5:1 (H:V) or flatter. Based on these results the potential for instability of the coastal bluff impacting the proposed home sites is low. However, portions of the coastal

bluff that have slope gradients steeper than 1.5:1 (H:V) are predicted to have bluff failures until the slope gradient recesses to 1.5:1 (H:V). A portion of the coastal terrace deposit portion of the bluff along Cross Section 1 and 4 are flatter than 1.5:1 (H:V). These slope gradients are estimated to be stable and therefore slope stability analysis was not performed on these cross sections. Section 2 is similar to Section 3 but a little flatter and qualitatively would have a higher factor of safety against sliding compared to Section 3. The results of the slope stability analyses are summarized in the following table as well as presented graphically in Appendix B of this report.

Table 2: Slope Stability Analysis Results

Bluff Recession Section	Loading Condition	Minimum Factor of Safety Against Sliding	Meet or Exceed Required FS
3	Static	2.48	Yes
3	Pseudo Static	1.27	Yes

Limitations of Analysis

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

used as indicating trend lines. A slope with a safety factor less than one will not necessarily fail, but the probability of slope movement will be greater than a slope with a higher safety factor. Conversely, a slope with a safety factor greater than one may fail, but the probability of stability is higher than a slope with a lower safety factor.

Percolation Testing Set-Up

HKA performed percolation tests near the proposed drain field areas. The exact areas of the proposed drain fields could not be tested due to presence of trees, bushes, and other sensitive plants. Based on interaction with the project Civil Engineer Mesiti Miller Engineering (MME), HKA understand the drain fields will consist of pits on the order of 2 to 4 feet deep infilled with drain rock. Depths and locations of the percolation test holes were also worked out with MME.

On 30 March 2016 five (5) percolation test borings were drilled using a 6 inch diameter hand auger. After drilling to the selected depth, a layer of 1/4" angular gravel approximately 2 to 3 inches thick was placed at the bottom of each percolation test boring. Three (3) inch diameter NDS pipe was prepared for each test hole by cutting slots with a hacksaw along the bottom 6 inches of the pipe sections. The slotted pipe sections were placed in each test hole with additional gravel placed between the pipe and the borehole sidewall to secure the pipe in place. The bottom 12 inches of the test bore holes were filled with clear water 4 times within 24 hours prior to commencing the percolation test.

Percolation Testing

On 31 March 2016, HKA returned to the site after the 24 hour soaking period to conduct the percolation tests.

The percolation test holes were inspected and all but P-4 and P-5 were completely drained. Percolation test holes P-4 (Lot 4) and P-5 (Lot 5) still had 12 inches of standing water in the bottom of the test holes. These percolation test were advanced into a layer of clay soil and near the standing puddle.

On the same day the 6-inch falling head percolation tests were performed as follows:

- Clear water was placed within the bottom 6 inches of each test hole.
- A water level reading was taken every 30 minutes and the percolation test hole was refilled with clear water to 6 inches above the bottom of the hole.
- Up to eight (8) water level readings were taken in each percolation test hole. If 3 consecutive readings were within 1/16 of an inch of each other the EPA test method recommends to stop the test.
- The percolation rate in inches per hour was calculated by dividing the change in height of the water level in inches by the interval between readings in hours.
- The last change in the water level reading and consideration to the set of readings was used to report the percolation rate for the respective test hole.

Percolation Test Results

Test Hole ID	Percolation Zone (feet)	Percolation Rate (in/hr)
P-1	1.146 to 2.146	3.9
P-2	1.146 to 2.146	1.4
P-3	3.042 to 4.042	0.6
P-4	1.958 to 2.958	0.0
P-5	1.958 to 2.958	0.0

Graphical and tabulated results are included in the Appendix D of this report.

DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Based on the results of our investigation, the proposed improvements at the referenced site will be subject to “ordinary risks”, as defined in the “Scale of Acceptable Risks From Geologic Hazards” in Appendix D of this report provided the design criteria and recommendations presented in this report as well as those in our geologic report for this project are incorporated into the design and construction of the proposed project and maintained for the life of the development.

The primary geotechnical considerations at the site include strong seismic shaking, adequate foundation support of new buildings, temporary cut slopes during construction, expansive clay soil in foundation zone, subsurface seepage, coastal bluff erosion, and control of concentrated surface runoff,.

Based on our analysis of site soils conditions and consideration to the recommended 50 year future coastal bluff recession setback, the proposed Home A, Home B, and Home F should be supported by conventional spread foundations embedded into an earthen mat of moisture conditioned on-site soils prepared in accordance with this report. Home D and Home E should be supported by conventional spread foundations embedded into an earthen mat of select granular engineered fill prepared in accordance with this report.

Groundwater was encountered within our test bore holes at the time they were drilled. Saturated soils and active seeps in the coastal terrace soils should be anticipated and planned for by designers and contractors. Retaining wall back drains and under slab blanket drains will be essential for the design of these structures. It is recommended to relieve drainage collected in these subsurface systems through perforated collection pipes tied to solid drain lines that are conveyed to a discharge location by gravity flow if possible.

Based on our interaction with the project design team HKA understands a partial basement is proposed below Home A and Home G. The basement is not shown along the seaward perimeter of these homes. Excavations for the partial basements are shown to create cut slopes on the order of 5 to 10 feet tall into coastal terrace deposits. The cut slopes should be laid back to safe slope gradients or temporary cantilever or tied back shoring utilizing top down construction methods should be employed. As an alternative the basement wall could be constructed and then backfilled. Once this decision is made HKA should be consulted to make supplement recommendations as needed that are compatible with the project goals. The pier criteria can be used for the basement wall or for Home D and Home E as an alternative design. The architect, civil engineer, and structural designer should assume wet to saturated coastal terrace will be encountered within the cut face of the excavation. Criteria for drilled shaft, grouted, post tensioned soil

anchors are included for use in the temporary shoring system or permanent basement retaining walls if needed.

The following recommendations should be used as guidelines for preparing project plans and specifications, and assume that **Haro, Kasunich & Associates** will be commissioned to review project grading and foundation plans before construction and to observe, test and advise during earthwork and foundation construction. This additional opportunity to examine the site will allow us to compare subsurface conditions exposed during construction with those inferred from this investigation. Unusual or unforeseen soil conditions may require supplemental evaluation by the geotechnical engineer.

General Site Grading

1. The geotechnical engineer should be notified **at least four (4) working days prior to any grading or excavating foundations** so the work in the field can be coordinated with the grading contractor and arrangements for testing and observation can be made. The recommendations of this report are based on the assumption that a representative from HKA will perform the required testing and observation during grading and construction. It is the owner's responsibility to make the necessary arrangements for these required services.

2. Where referenced in this report, Percent Relative Compaction and Optimum Moisture Content shall be based on ASTM Test Designation D1557.
3. Areas to be graded or to receive proposed improvements should be cleared of all obstructions and fill materials, including trees not designated to remain and other unsuitable material. Existing depressions or voids created during site clearing should be backfilled with engineered fill. Any surface or subsurface obstructions, or questionable material encountered during grading, should be brought immediately to our attention for proper exposure, removal, and processing as directed.
4. Cleared areas should then be stripped of organic-laden topsoil. Stripping depth is anticipated to be from 2 to 4 inches, although the actual depth of stripping should be determined in the field by a representative from HKA. Strippings should be wasted off-site or stockpiled for use in landscaped areas if desired.
5. On-site soils reused as engineered fill and imported select granular fill should be placed in thin lifts not exceeding 8 inches in loose thickness. On-site clay soil approved for re-use by HKA should be, water conditioned to a moisture content about 3 to 6 percent above optimum, and compacted to 87 to 89 percent relative compaction back up to the ground surface. Imported select granular fill should be, water conditioned to a moisture content about 2 to 4 percent above optimum, and compacted to at least 90 percent

relative compaction. The upper 8 inches of subgrade should be compacted to at least 95 percent relative compaction. Aggregate base below pavements should likewise be compacted to at least 95 percent relative compaction.

6. If grading is performed during or shortly after the rainy season, the grading contractor may encounter compaction difficulty with the wet soils. If compaction cannot be achieved after adjusting the soil moisture content, it may be necessary to use imported fill or gravel and stabilize the bottom of the excavation with stabilization fabric.

7. Provided they can be adequately moisture conditioned (or dried back) prior to use, the on-site soils appear generally suitable for use as engineered fill, however clay soils with intermediate or high plasticity may be unsuitable. Materials used for engineered fill which must be imported should be free of organic and deleterious material, contain no rocks or clods over 4 inches in dimension, and should contain no more than 15 percent by weight of rocks larger than 2½ inches. Imported fill should also be granular, have a Plasticity Index of less than 18, and should have sufficient binder to allow excavations to stand without caving. Prior to delivery to the site, a representative sample of proposed import should be sent to our laboratory for evaluation.

8. We estimate shrinkage factors of about 17 percent for the on-site materials when used in engineered fills.

Cut and Fill Slopes

9. Temporary excavations should be properly shored and braced during construction to prevent sloughing and caving at sidewalls. The contractor should be aware of all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

10. The excavation along the northeast side of Home A and Home G is shown to be on the order of 5 to 10 feet deep bgs. Designers should assume the cut slope to be comprised of stiff or medium dense coastal terrace deposit.

11. It should be anticipated that perched ground water will be actively seeping from the face of the cut slope excavated into the coastal terrace deposits. The thickness of the seepage layer will depend upon the time of year the excavation is made. Designers and contractors should plan accordingly.

12. Temporary cut slopes excavated into the coastal terrace deposits should be inclined at a slope gradient of 1:1 (H:V) or flatter where no seepage is observed from face of cut slope and 2:1 (H:V) or flatter where seepage is observed. Depending on the amount of seepage from the face of the cut slope shoring may be required. Temporary cut slopes excavated for the project are considered those that are to remain from 24 hours up to the start of the rain season.

13. For design of lateral earth support systems used for temporary shoring or permanent retaining walls a lateral earth pressure equivalent to a fluid weighing (EFW) 40 pcf should be used under drained conditions (i.e. gravel drain) for an active condition. For at rest or restrained condition use 30H psf uniform load. For 2:1 back slope gradients add 15 pcf and 10H psf respectively. If the shoring is to be designed without a drain or "undrained condition" Add 45 pcf or 30H respectively.

14. Compacted fill slopes should be constructed at a slope inclination not steeper than 2:1 (horizontal to vertical) at 90 percent relative compaction. Fill slopes with these recommended gradients may require periodic maintenance to remove minor soil sloughing. All fills must be adequately benched into firm native soil, and keys for stability will be required at the toe of the fill slope. The toe key should be at least 8 feet wide and should extend at least 2 feet into firm native soil. The bottom of the toe key should be sloped downward at about 2 percent toward the back of the key.

15. There should be a minimum of 10 feet horizontal separation between the top of supporting soil that will be used for skin friction and the face of slope.

16. In order to maintain stable slopes at the recommended gradients, it is important that seepage forces and accompanying hydrostatic pressure be relieved by adequate drainage. Adequate backdrains in keyways and benches should be provided as

determined necessary by HKA. The locations of backdrains and outlets would be determined by a representative of HKA in the field during grading.

17. Following grading, exposed soil should be planted as soon as possible with erosion-resistant vegetation.

18. After the earthwork operations have been completed and HKA has made the required observations of the work, no further earthwork operations shall be performed without the direct observation of HKA.

Conventional Spread Foundations

19. The new homes should be supported by conventional spread foundations that are embedded into an earthen mat of engineered fill that extends a minimum of 18 inches below bottom of foundations elements and 6 horizontal feet beyond the outer most edge of foundation. For Home A, B, and F the earthen mat should be comprised of re-used on-site soils. For Home D and Home E the earthen mat should be comprised of select import granular fill.

20. Foundations should be embedded into an earthen mat of engineered fill a minimum 2 feet deep. Actual footing depths should be determined in accordance with anticipated use and applicable design standards. Conventional footings should be reinforced as

required by the structural designer based on the actual loads transmitted to the foundation.

21. Foundations designed in accordance with the above may be designed for an allowable soil bearing pressure of 1,700 psf for dead plus live loads. The allowable bearing capacity may be increased by one-third to include short-term seismic and wind loads.

22. Deep foundation elements (piers) may be used as an alternative foundation. See the section titled "Skin Friction Pier Foundations".

23. Lateral load resistance for structures supported on spread footings may be developed in friction between the foundation bottom and the supporting subgrade. A friction coefficient of 0.30 is considered applicable.

24. Footings located adjacent to other footings or utility trenches should have their bearing surfaces founded below an imaginary 2:1 plane projected upward from the bottom edge of the adjacent footings or utility trenches.

25. Total and differential settlements across the new homes are anticipated to be less than 1 inch.

26. All footing excavations should be thoroughly cleaned and observed by HKA prior to placing forms and steel. Observation of foundation excavations allows anticipated soil conditions to be correlated to those inferred from our investigation and to verify that the footings are in accordance with our recommendations

Skin Friction Pier Foundation

27. Drilled pier foundations can be used where the structural designer determines deep foundation are necessary to resist lateral overturning forces, concentrated axial loads, or simply as an alternative to the earthen mat construction. Drilled piers may also be considered for foundation support of temporary shoring to support cut slopes.

28. Actual pier depth will depend upon a force analysis by the project design professional; however the piers should have a minimum diameter of 18 inches and minimum spacing of 4 feet on center. The piers should be embedded into the coastal terrace a minimum of 10 feet. Based on our recent exploratory boring we were able to drill through the coastal terrace and hit drill refusal on the bedrock at a depth of 25 feet bgs. It should be noted we drilled with a 4 inch diameter solid flight auger portable drill rig.

29. The upper 3 foot of the pier should be neglected for passive resistance and skin friction. The piers should be designed to withstand an uplift pressure of 450 psf in the upper 4 feet.

30. For vertical bearing capacity in the upper 10 feet of the pier an allowable skin friction of 600 psf should be applied to the surface of the pier below the neglect depth. For resistance to uplift forces, an allowable skin friction of 300 psf should be applied to the surface of the pier below the neglect depth. For each additional foot of pier depth below 10 feet deep add 15 psf of skin friction for vertical bearing and 7.5 psf to resist uplift. Maximum allowable skin friction is 700 psf for vertical being and 350 for uplift resistance. The increased value should be applied to the full depth of the pier.

31. A passive lateral earth pressure with an equivalent fluid weight of 300 pcf acting over 2.0 pier diameters should be applied to the pier below the depth of neglect.

32. Reinforcing vertical steel for the concrete piers should extend the full depth of the excavation to a point 3 inches above the bottom of the pier hole.

Perched Groundwater Drainage

33. Seepage should be collected from behind retaining walls and beneath slabs-on-ground in gravel drains with perforated pipe. The collected drainage is recommended if possible to be relieved by gravity flow to a discharge area approved by a representative from HKA. It is imperative to waterproof the exterior basement retaining walls and floor slab of the new homes to protect against moisture intrusion from perched groundwater seepage.

34. The drainage systems should be a minimum 12 inches wide behind walls or 12 inches deep beneath slabs and comprised of Class 1 Type A gravel with a perforated pipe placed near the bottom of the drain a thin bedding of gravel.

35. A representative from HKA should observe the drainage system just after the pipes have been placed over the gravel bedding.

Concrete Slab-On-Ground

36. Concrete slab floors should be constructed with an under slab drain comprised of a 12 inch thick blanket of gravel that has been set with a vibratory plate. The bottom of the subexcavation should be scarified, moisture conditioned or dried back as needed, and compacted to a minimum 95 percent.

37. For construction of the under slab drain use $\frac{3}{4}$ inch nominal drain rock (or equivalent) wrapped in filter fabric. Furthermore, a 14 mil vapor barrier should be placed below the slab and wrapped under the footings and up to the side of exterior of the building. A perforated pipe should be embedded into the blanket drain that conveys collected drainage by gravity flow to a discharge location seaward from improvements, but preferably landward of the coastal bluff setback. Drainage from basement retaining wall back drains or surface drainage should not be allowed to enter into the under slab blanket drain.

38. To reduce the potential for cracking and curling as well as other undesirable defects the concrete slab-on-grade design, placement, and curing should be done in accordance with the most recent version of ACI 302.1R-04.

39. If floor wetness would be unacceptable for the buildings for reasons such as moisture sensitive floor covering or interior humidity control a vapor barrier should be placed below the slab. Vapor barriers should be overlapped a minimum of 6 inches at the joints and carefully fitted around service openings.

40. Whether to locate the vapor barrier in direct contact with the slab or beneath a blotter layer of granular fill should be made with careful considerations to many factors directly and indirectly related to concrete construction. Such factors include but are not limited to; whether a water tight roof membrane is in place prior to slab construction, sequence of slab construction in relation to other construction activities requiring water, and the floor covering manufacturer's recommendations. Proposed installation should be independently evaluated as to the moisture-related sensitivity of subsequent floor finishes, project conditions, schedule, and the potential effects of slab curling and cracking. We also recommend that a qualified experienced waterproofing specialist be included on the design team and these recommendations and any revised or supplemental recommendations they make be included in the final design construction documents and implemented during construction.

41. If placement of concrete in direct contact with the vapor barrier is selected measures to minimize potential for shrinkage related defects such as but not limited to slab curling, dominant joints, and plastic or drying shrinkage cracking will be required. Measures would include selection of concrete mixtures with low potential for shrinkage and/or tighter joint spacing.

42. If a blotter layer of granular fill over the vapor barrier is selected it should be a minimum of 4 inches thick, trimmable, and compactible at low moisture content (4 to 5 percent). The use of cushion or clean sand with uniform particle size is not recommended for use as a blotter layer of granular fill. Crusher run material graded from 3/4 inch down to rock dust is suitable. The blotter layer of granular fill should be compacted to a minimum 95 percent relative compaction in accordance with ASTM D1557 To prevent the granular fill from becoming a water reservoir (contributing to floor wetness) it will be imperative to keep it dry after preparation has been completed.

Retaining Walls and Lateral Pressures

43. For design of retaining walls up to 20 feet in height and fully drained, the following design criteria may be used:

- A. Active earth pressure for walls allowed to yield (up to ½ percent of their height) is that exerted by an equivalent fluid weighing 40 pcf for a level back

slope gradient; 55 pcf for a 2:1 backslope gradient, and 48 pcf for backslope gradients between 3:1 and 6:1. This is assuming a fully drained condition. For un-drained conditions add an additional 40 pcf to the respective active earth pressure.

- B. Where walls are restrained from moving at the top, design for uniform wall pressure of $30H$ psf/ft for level backfill and $40H$ psf/ft for 2:1 backfill slope gradient, and $36H$ psf/ft for backslope gradients between 3:1 and 6:1 where H is the height of the wall. This is assuming a fully drained condition. For un-drained conditions add an additional $30H$ psf/ft to the respective active earth pressure.
- C. Site retaining walls should be supported by conventional spread footings embedded into firm coastal terrace or pier and grade beam foundations. The foundations should be designed and constructed in accordance with the recommendations of this report.
- D. For seismic design of critical structures, a nominal earthquake load equal to $10 H^2$ lbs/horizontal foot of wall may be assumed to act at $0.6H$ above the heel of the wall base (where H is the height of the wall).
- E. In addition, the walls should be designed for a surcharge loads for adjacent live or dead surcharge loads which will exert a force on the wall. Contact HKA for a detailed evaluation of lateral surcharge loads acting against retaining walls.

- F. For fully drained conditions as delineated above, we recommend that permeable material meeting the State of California Standard Specifications, Section 68-1.025, Class 1, Type A, or an approved equivalent be placed behind the wall, with a minimum continuous width of 12 inches, and extend the full height of the wall to within 1-foot of the ground surface. A 4-inch diameter perforated drain pipe (with perforations placed downward) should be installed within 4 inches of the bottom of the granular backfill and be discharged to a suitable location. Surface drainage should not be allowed to enter retaining back drains, nor should back drains be tied to under slab blanket drains.
- G. Wall backfill should be compacted to a minimum of 90 percent relative compaction. The backfill material should be approved by HKA
- H. HKA should observe foundation excavations during to observe anticipated soil conditions and excavation depths.

Retaining Wall Tie Backs

44. Where the structural designer deems tie backs necessary, drilled shaft and grouted tie backs should be used in conjunction with the selected foundation system for the retaining wall.

45. Tie backs should be constructed out of steel reinforcement that extends the entire length of the tie back and concrete grout in the bonded zone (stressing zone). Tie backs

should be designed and constructed, and tested in accordance with the Post Tensioning Manual by the Post Tensioning Institute.

46. Tie backs should be a minimum 6 to 8 inches in diameter. If larger diameter tie backs are needed HKA should be notified to make appropriate adjustments to the recommendations.

47. Tie backs should be a minimum 30 feet in length and installed between 20 to 30 degrees below an imaginary level horizontal line.

48. Tie backs should have a minimum un-bonded length of 15 feet and minimum bonded (stressing) length of 15 feet.

49. The structural designer should use a bond stress between the surface area of the grouted portion of the tie back and the drilled shaft. For non-pressure grouting applications a bond stress of 2000 psf should be applied and for pressure grouting applications 3000 psf should be applied.

50. The bonding strata is fine to medium sands and gravels. This will require either a cased drilled shaft or hollow stem drill augers to keep the shaft from collapsing in the bonded length of the tie back.

Utility Trenches

51. Trenches must be properly shored and braced during construction or laid back at an appropriate angle to prevent sloughing and caving at sidewalls. The project plans and specifications should direct the attention of the contractor to all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

52. Utility trenches that are parallel to the sides of buildings should be placed so that they do not extend below an imaginary line sloping down and away at a 2:1 (horizontal to vertical) slope from the bottom outside edge of footing elements. The structural design professional should coordinate this requirement with the utility layout plans for the project

53. Trenches should be backfilled with granular-type material and uniformly compacted by mechanical means to the relative compaction as required by county specifications, but not less than 95 percent under paved areas and 90 percent elsewhere. The relative compaction will be based on the maximum dry density obtained from a laboratory compaction curve run in accordance with ASTM Procedure #D1557.

54. We strongly recommend placing a three-foot (3') concrete plug in each trench where it passes under the exterior foundations. Care should be taken not to damage utility lines.

55. Trenches should be capped with 1.5 feet of relatively impermeable soil.

Surface Drainage

56. An engineered drainage plan to handle surface runoff should be developed for this site. Site drainage should be adequately controlled both during and after construction.

57. Surface runoff should be collected into level spreaders to result in sheet flow type discharge.

58. The collected runoff should be discharged in at least two locations to minimize impact. The specific discharge locations should be selected by the engineer who prepares the drainage. As an alternative a single level spreader can be used that promotes sheet type flow. The level spreaders should be located as from the bluff edge as possible. Landward of the 50 year future coastal bluff recession setback is recommended.

59. On-site retention is not recommended within the 50 year future coastal bluff recession setback.

60. All exposed soil should be landscaped and permanently protected against erosion as soon as possible after grading.

61. We recommend that full gutters be used along all roof down eaves to collect storm runoff water and channel it through closed rigid conduits to a suitable discharge point a minimum 10 feet away from all structural improvements.

62. Surface runoff should **not** be allowed to flow onto graded or natural slopes with gradients equal to or steeper than 3:1 (H:V). Consideration should be given to catch basins, berms, concrete v-ditches, or drainage swales at the top of all slopes to intercept runoff and direct it to a suitable discharge point.

63. Surface drainage should include provisions for positive gradients so that surface runoff is not permitted to pond adjacent to foundations and on pavements. Surface drainage should be directed away from the building foundations, at a minimum gradient of 2 percent for a distance of at least 10 feet to an adequate discharge point. Concentrations of surface water runoff should be handled by providing necessary structures, such as paved ditches, catch basins, etc.

64. Irrigation activities at the site should be done in a controlled and reasonable manner. Planter areas should not be sited adjacent to walls; otherwise, measures should be implemented to contain irrigation water and prevent it from seeping into walls and under foundations.

65. The migration of water or spread of extensive root systems below foundations, slabs, or pavements may cause undesirable differential movements and subsequent damage to these structures. Landscaping should be planned accordingly.

66. Drainage patterns approved at the time of fine grading should be maintained throughout the life of proposed structures.

Curtain Drain

67. Groundwater seeping through the terrace deposits perched upon the bedrock formation was encountered at this site. Pervious pavements are also proposed adjacent to some of the new homes. To protect the homes from moisture intrusion through seepage curtain drains should be constructed on the upslope side of the homes extending beyond the footprint a minimum 10 horizontal feet. The curtain drains should also wrap around the sides of the homes where pervious pavement is placed adjacent to the building. Where basement retaining walls with back drains are proposed such as Home A the curtain drain is not required.

68. The curtain drains should be a minimum 12 inches wide and extend to a minimum depth of 18 inches below bottom of foundation elements. The curtain drains should be placed within 3 horizontal feet of the outer most edge of the building foundation. For this project we anticipate curtain drains to be on the order of 4 to 6 feet deep.

69. The trench for the curtain drain should be lined on the side adjacent to the home with a vapor barrier, a 4 inch diameter perforated pipe with holes placed down should be set on a thin bed of gravel along the bottom of the drain, and the trench infilled with drain rock wrapped in filter fabric. The perforated pipe should be connected to a solid drain pipe that conveys the collected drainage away from the trench and discharges it into a level spreader down slope from the home.

Pavement Design

70. R-Value tests have not been performed for this project.

71. To have the selected pavement sections perform to their greatest efficiency, it is very important that the following items be considered:

- a. Scarify and moisture condition the top 8 inches of subgrade and compact to a minimum relative compaction of 95 percent, at a moisture content which is about 4 percent above laboratory optimum value.
- b. Provide sufficient gradient to prevent ponding of water.
- c. Use only quality materials of the type and thickness (minimum) specified. All baserock (R=78 minimum) must meet CALTRANS Standard Specifications for Class 2 Untreated Aggregate Base

(Section 26). All subbase (R=50 minimum) must meet CALTRANS Standard Specifications for Class 2 Untreated Aggregate Subbase, (Section 25). Angular gravel (ASTM D448) or Class II permeable aggregate base (Caltrans Spec) should be used below pervious pavements.

- d. Compact the baserock and subbase uniformly to a minimum relative compaction of 95 percent. Gravel or permeable aggregate baserock should be placed in 8 inch lifts and set using a vibratory plate under observation of HKA.
- e. Place the asphaltic concrete only during periods of fair weather when the free air temperature is within prescribed limits.
- f. Maintenance should be undertaken on a routine basis.

Plan Review, Construction Observation and Testing

72. Our firm should be provided the opportunity for a general review of the project plans prior to construction so that our geotechnical recommendations may be properly interpreted and implemented. The purpose is to determine if this preliminary report is adequate and complete for the final planned grading and construction. It is not intended that the geotechnical engineer approve or disapprove the plans, but to provide an opportunity to update the preliminary report and include additions or qualifications as

necessary. If our firm is not accorded the opportunity of making the recommended review, we can assume no responsibility for misinterpretation of our recommendations.

73. We recommend that our office review the project plans prior to submittal to public agencies, to expedite project review. The recommendations presented in this report require our review of final plans and specifications prior to construction and upon our observation and, where necessary, testing of the earthwork and foundation excavations. Observation of grading and foundation excavations allows anticipated soil conditions to be correlated to those actually encountered in the field during construction.

IMITATIONS AND UNIFORMITY OF CONDITIONS

1. The conclusions and recommendations noted in this report are based on probability and in no way imply that the proposed improvements will not possibly be subjected to ground failure or seismic shaking so intense they will be severely damaged or destroyed.
2. This report is issued with the understanding that it is the duty and responsibility of the owner or his representative or agent to ensure that the recommendations contained in this report are brought to the attention of the architects and engineers and contractors for the project, incorporated into the plans and specifications, and that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.
3. The conclusions and recommendations contained herein are professional opinions derived in accordance with current standards of professional practice in the Santa Cruz County area. No other warranty, expressed or implied, is made.
4. If any unexpected variations in soil conditions, or if adverse soil conditions are encountered during construction, or if the proposed construction will differ from that planned at the present time, Haro, Kasunich and Associates should be notified so that supplemental recommendations can be given.
5. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside our control. Therefore, this report should not be relied upon after a period of three years without being reviewed by a geotechnical engineer.

APPENDIX A

Site Vicinity Map (Figure 1)

Map Showing Location of Test Borings (Figure 2)

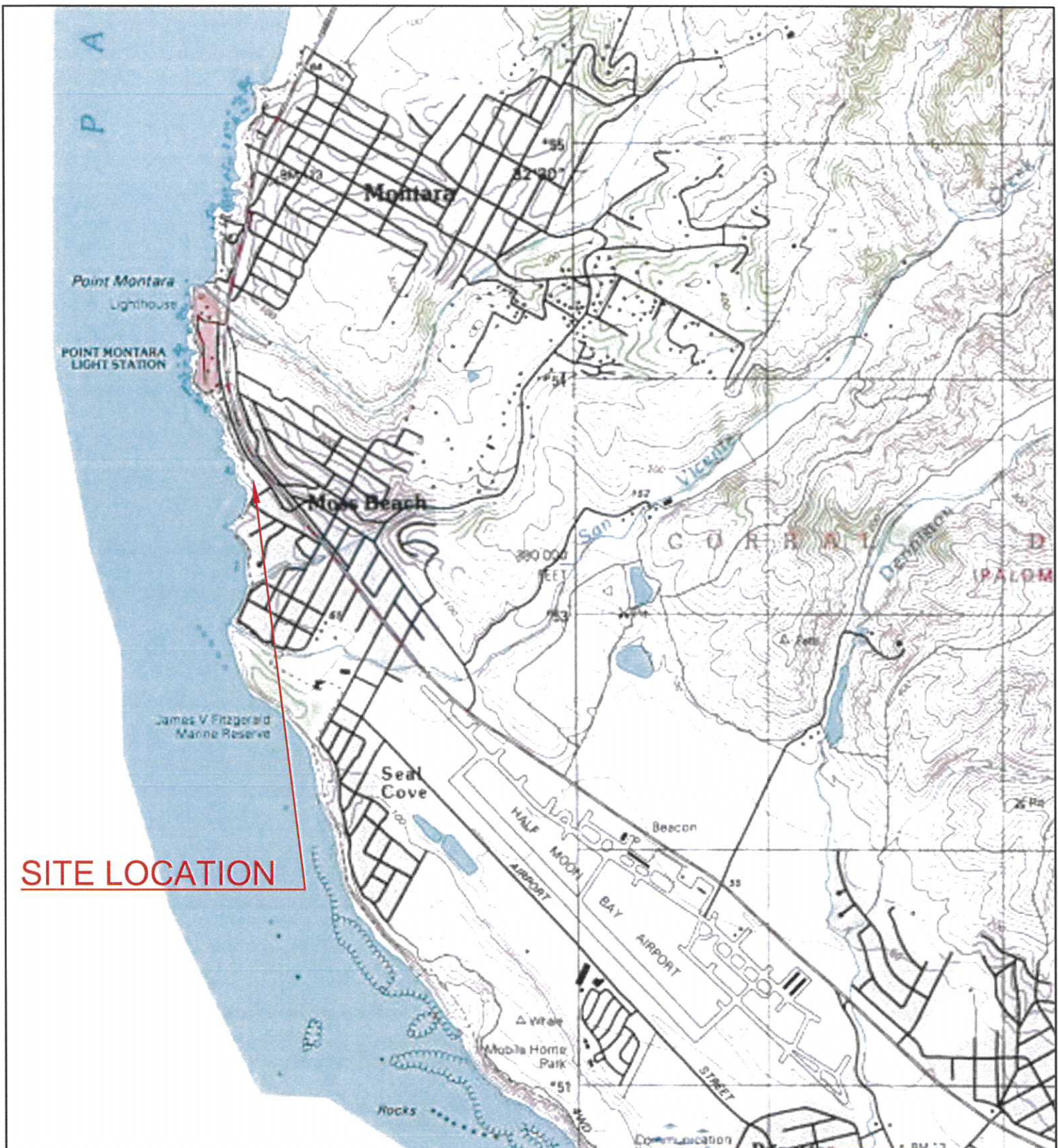
Key to Logs (Figure 3)

Logs of Test Bore Holes (Figures 4-13)

Direct Shear Test Results (Figure 14)

Atterberg Limits Test Results (Figure 15)

Corrosion Test Results (Figure 16)



SITE LOCATION

SITE VICINITY MAP
 APN 037-086-023, -026, -027, -028, -029,
 VALLEMAR STREET & JULIANA AVENUE
 MOSS BEACH, CALIFORNIA

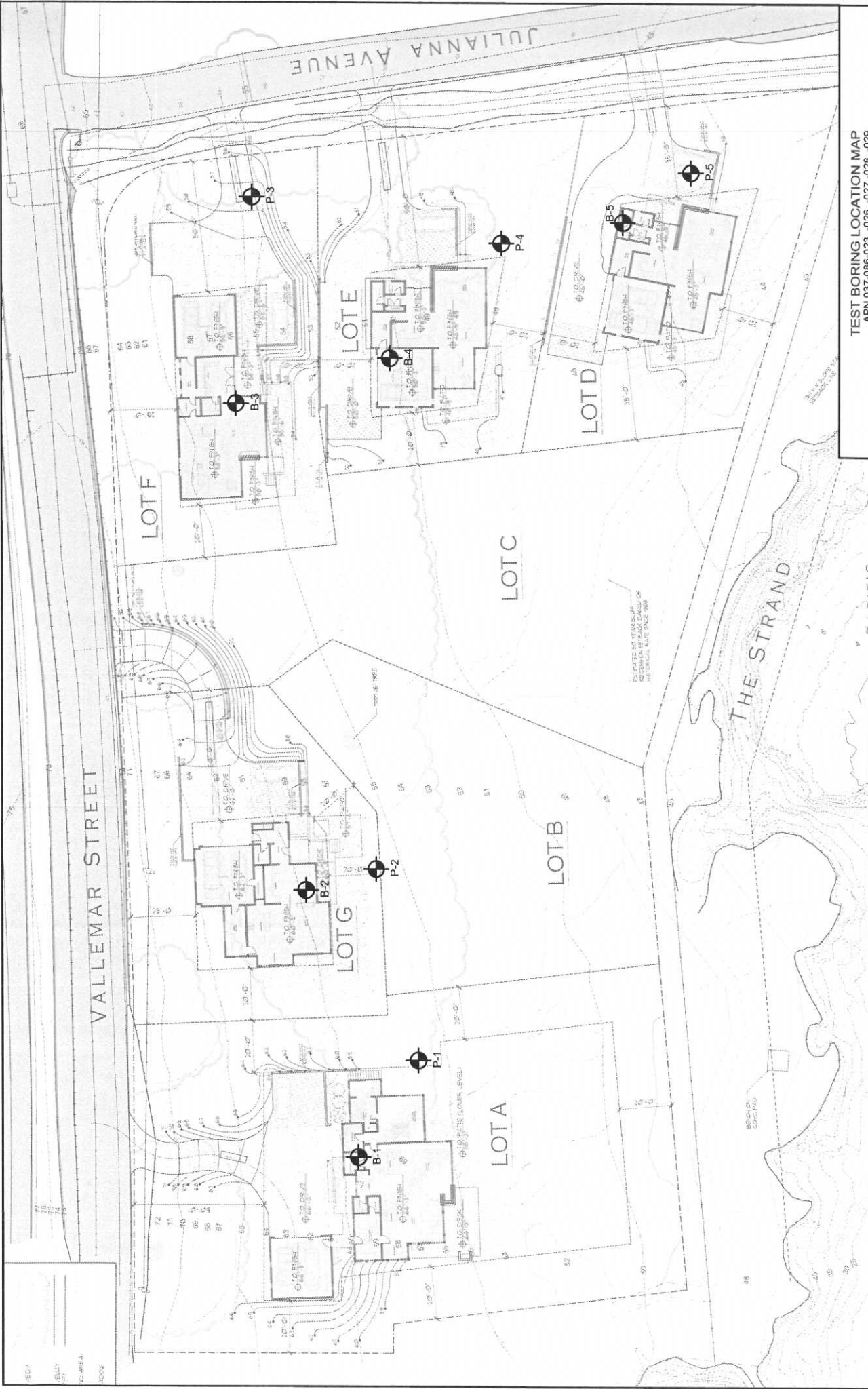
SCALE No Scale
 DRAWN BY MC
 DATE JUNE 2016
 REVISED
 JOB NO SM10391.2

HARO, KASUNICH & ASSOCIATES, INC.
 GEOTECHNICAL AND COASTAL ENGINEERS
 116 E. LAKE AVENUE, WATSONVILLE, CA 95076
 (831) 722-4175

FIGURE NO. 1

SHEET NO **49**

1.00' = 1" (VERTICAL)
 1" = 10' (HORIZONTAL)
 1" = 10' (SCALE)



Scale

50 25 0 50

NORTH

Scale As Shown

MC

JUNE 2016

SM10391.2

FIGURE NO. 2

50

TEST BORING LOCATION MAP
 APN 037-086-023, -026, -027, -028, -029,
 VALLEMAR STREET & JULIANA AVENUE
 MOSS BEACH, CALIFORNIA

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 (831) 722-4175

FIGURE NO. 2

50

TEST BORING LOCATION MAP
 APN 037-086-023, -026, -027, -028, -029,
 VALLEMAR STREET & JULIANA AVENUE
 MOSS BEACH, CALIFORNIA

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 (831) 722-4175

FIGURE NO. 2

50

TEST BORING LOCATION MAP
 APN 037-086-023, -026, -027, -028, -029,
 VALLEMAR STREET & JULIANA AVENUE
 MOSS BEACH, CALIFORNIA

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FIGURE NO. 2

50

DENOTES LOCATION OF TEST
 BORING

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVELS MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE	CLEAN GRAVELS (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVEL WITH FINES	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE	CLEAN SANDS (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands or gravelly sands, little or no fines
		SANDS WITH FINES	SM	Silty sands, sand-silt mixtures, non-plastic fines.
			SC	Clayey sands, sand-clay mixtures, plastic fines.
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT IS LESS THAN 50%		ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
			HIGHLY ORGANIC SOILS	

GRAIN SIZES

U.S. STANDARD SERIES SIEVE

CLEAR SQUARE SIEVE OPENINGS

200 40 10 4 3/4" 3" 12"

SILTS AND CLAYS	SAND			GRAVEL		COBBLES	BOULDERS
	FINE	MEDIUM	COARSE	FINE	COARSE		

RELATIVE DENSITY		CONSISTENCY			SAMPLING METHOD			H.O.	
SANDS AND GRAVELS	BLOWS PER FOOT*	SILTS AND CLAYS	STRENGTH (TSF)**	BLOWS PER FOOT*	STANDARD PENETRATION TEST	T		Final	
VERY LOOSE	0 - 4	VERY SOFT	0 - 1/4	0 - 2	MODIFIED CALIFORNIA	L or M		Initial	
LOOSE	4 - 10	SOFT	1/4 - 1/2	2 - 4	PITCHER BARREL	P		Water level designation	
MEDIUM DENSE	10 - 30	FIRM	1/2 - 1	4 - 8	SHELBY TUBE	S			
DENSE	30 - 50	STIFF	1 - 2	8 - 16	BULK	B			
VERY DENSE	OVER 50	VERY STIFF	2 - 4	16 - 32					
		HARD	OVER 4	OVER 32					

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

**Unconfined compressive strength in tons/ft² as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D-1586), pocket penetrometer, torvane, or visual observation

Haro Kasunich & Associates

**KEY TO LOGS
VALLEMAR STREET
& JULIANA AVENUE
MOSS BEACH, CALIFORNIA**

**Project No.
SM10391.2
JUNE 2016**

**Figure
No. 3**

LOGGED BY MC DATE DRILLED 3-22-16 BORING DIAMETER 4" BORING NO. B-1

Date: 6/27/2016

File: C:\superlog4\HKGALOGS\SM10391.2 Vallemar Street.log

SuperLog CiviTech Software, USA www.civiltech.com

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - ts.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Iceplant/roots	SM-CL					
1-1-1 (L)			Brown Silty SAND with CLAY binder fine to medium grain, 1/4 inch clasts, wet, loose		19		113	12.7	(1-1) Atterberg Limits PI = 9 LL = 18.4% (1-2) PI = 25 LL = 36.8
1-2 (T)			Brown orange Sandy CLAY, fine to medium grain, moist, very stiff	CL	21			17.2	
1-3-1 (L)			Same as above		36				
1-4 (T)			Grading to a brown orange Clayey SAND, fine to medium grain, damp to moist, medium dense	SC	28				
10	1-5-1 (L)		Brown tan grey Silty SAND, fine to medium grain, damp to dry, cemented, very dense terrace deposit		50/6"				
11	1-6 (T)		harder drilling at 11 feet		49				
13.5			Brown Silty SAND with CLAY binder, fine to medium grain, damp, very dense Boring terminated at 13.5 feet						
20									
25									
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 4

LOGGED BY MC DATE DRILLED 3-22-16 BORING DIAMETER 4" BORING NO. B-2

File: C:\superlog\HAROKASUNICH\SM10391.2 Vallemar Street.log Date: 6/27/2016
 SuperLog CivilTech Software, USA www.civiltech.com

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Topsoil/roots						
2-1-1 (L)			Dark brown Clayey SAND, fine to medium grain, wet, loose	SC	20			15.3	Atterberg Limits PI = 22 LL = 31.5%
2-2 (T)			Mottled brown orange grey Sandy CLAY, fine grain, moist, very stiff	CL	24				
2-3- (L)			Same as above		32				
2-4 (T)			Same as above		26				
10	2-5-1 (L)		Grey with orange mottling Sandy CLAY, fine to medium grain, moist, very stiff coastal terrace	CL	38				
	2-6 (T)				22				
15	2-7 (T)		Grey with orange and rust mottling Silty SAND, fine to medium grain, damp, dense, terrace	SM	48				
20	2-8 (T)		Grey fine to medium SAND, wet to saturated, dense	SW	35				
			Boring terminated at 21.5 feet						
25									
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 5

LOGGED BY MC DATE DRILLED 3-22-16 BORING DIAMETER 4" BORING NO. B-3

Date: 6/27/2016 File: C:\superlog\HVKALOGS\SM10391.2 Vallemar Street.log SuperLog CivilTech Software, USA www.civiltech.com

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Roots/topsoil						
3-1-1 (L)			Black Sandy CLAY, fine to medium grain, wet, firm	CL	19		110	17.2	Atterberg Limits PI = 18 LL = 30.3% PI = 28 LL = 37.9%
3-2 (T)					19				
3-3-1 (L)			Brown orange grey Sandy CLAY, fine to medium grain, moist, stiff, terrace deposit	CL	35			15.5	
3-4 (T)			Brown orange grey Clayey SAND, fine to coarse grain, moist to damp, medium dense	SC	28				
3-5- (L)			Same as above		53				
3-6 (T)			Grey fine SAND with SILT, saturated	SP-ML	10				
Boring terminated at 21.5 feet									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 6

LOGGED BY MC DATE DRILLED 3-24-16 BORING DIAMETER 4" BORING NO. B-4

Date: 6/27/2016 File: C:\superlog\HAROKASUNICH\SM10391.2 Vallemar Street.log

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Sandy CLAY, fine to medium grain, saturated, very loose	CL					
4-1-1 (L)			Brown CLAY, wet, firm	CL	6			18.8	Atterberg Limits
4-2 (T)			Grey light brown sandy Lean CLAY, fine to medium grain, moist, very stiff, terrace	CL	12			15.5	Pi = 38
4-3-1 (L)			Same as above		34				LL = 48.3%
4-4 (T)			Same as above		22				(4-2) PI = 27
									LL = 36.6%
									(4-3) Unconfined
									Compression Test
									Qu = 8003 psf
									C = 2000 psf
									$\phi = 10^\circ$
10	4-5-1 (L)		Grey with light orange mottling Clayey SAND, fine to medium grain, moist, medium dense	SC	25				
15	4-6-1 (L)		Blue grey SAND with SILT, fine to medium grain, wet to saturated, weathered rock, medium dense to dense	SW-ML	53				
20									
25			Harder drilling at 22 feet then broke through to soft gain						
25			Drill auger refusal at 25 feet						
25			Boring terminated at 25.01 feet						
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 7

LOGGED BY MC DATE DRILLED 3-24-16 BORING DIAMETER 4" BORING NO. B-5

Date: 6/27/2016

File: C:\superlog\HAROKASUNICH\SM10391.2 Vallemar Street.log

SuperLog CivilTech Software, USA www.civiltech.com

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Iceplant and topsoil						
5-1-1 (L)			Dark brown Clayey SAND, fine to medium grain, saturated, very loose	SC	7				
5-2 (T)			Dark brown CLAY, moist, firm	CL	8				
5-3-1 (L)			Brown Sandy CLAY, fine to medium grain, moist, medium dense, terrace	CL	36				
5-4 (T)			Grey orange mottling, Sandy CLAY, fine to coarse, grain, moist, very stiff		20				
			Brown orange SAND, fine to medium grain, wet, medium dense	SW					
5-5-1 (L)					50		97	15.6	Saturated Direct Shear Test C = 0 psf $\phi = 43^\circ$
			Blue grey fine to medium SAND, saturated, dense	SW					
5-6 (T)					29				
			Boring terminated at 16.5 feet						
20									
25									
30									
35									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: sr

FIGURE NO. 8

LOGGED BY JD DATE DRILLED March 30, 2016 BORING DIAMETER 6" BORING NO. P-1

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\H\K\LOGS\SM10391.2 Valleamar Bluff.log Date: 6/27/2016

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Silty SAND with Clay and Organics, roots, moist, loose (Topsoil)	TP					
1			Dark brown Silty SAND, fine to medium grain, moist (Terrace)	SM					
2			Boring terminated at 2.1 feet						
4									
6									
8									
10									
12									
14									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: dk

FIGURE NO. 9

LOGGED BY JD DATE DRILLED March 30, 2016 BORING DIAMETER 6" BORING NO. P-2

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\HKA\LOGS\SM10391.2 Valleamar Bluff.log Date: 6/27/2016

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - ts.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Silty SAND with Clay and Organics, roots, moist, loose (Topsoil)	TP					
1			Dark brown Silty SAND, fine to medium grain, moist (Terrace)	SM					
2			Boring terminated at 2.1 feet						
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: dk

FIGURE NO. 10

LOGGED BY JD DATE DRILLED March 30, 2016 BORING DIAMETER 6" BORING NO. P-3

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\HUKALOGS\SM10391.2 Valleamar Bluff.log Date: 6/27/2016

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Silty SAND, fine grain, roots, moist, loose (Topsoil)	TP					
2			Dark brown Silty SAND, fine to medium grain, damp to moist, loose to medium dense	SM					
4			Boring terminated at 4.0 feet						
6									
8									
10									
12									
14									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: dk

FIGURE NO. 11

LOGGED BY JD DATE DRILLED March 30, 2016 BORING DIAMETER 6" BORING NO. P-4

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\HAKALOGS\SM10391.2 Valleamar Bluff.log Date: 6/27/2016

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Silty SAND, fine grain, moist, roots, loose, topsoil	TP					
1			Orange tan Sandy CLAY, moist, terrace	CL					
2									
			Boring terminated at 2.9 feet						
4									
6									
8									
10									
12									
14									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: dk

FIGURE NO. 12

LOGGED BY JD DATE DRILLED March 30, 2016 BORING DIAMETER 6" BORING NO. P-5

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\HKALOGS\SM10391.2 Valleamar Bluff.log Date: 6/27/2016

Depth, ft.	Sample No. and type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	Blows/foot 350 ft - lbs.	Qu - t.s.f. Penetrometer	Dry Density p.c.f.	Moisture % dry wt.	MISC. LAB RESULTS
0			Dark brown Silty SAND, fine grain, moist, roots, loose, topsoil	TP					
1			Orange tan Sandy CLAY, moist, terrace	CL					
2									
3									
4									
4.5			Boring terminated at 4.5 feet						
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									

HARO, KASUNICH AND ASSOCIATES, INC.

BY: dk

FIGURE NO. 13

Direct Shear

Project:	Valleamar Bluff
Sample #	5-5-1
Description	Orange Brown Silty Sand

Date	4/7/2016
Tested By:	MA

Test Number	1	2	3	4
Normal Pressure (PSF)	530	1030	2030	4030
Max Shear Stress	13.4	33.5	64.7	
Shear Stress (PSF)	394.6	986.4	1902.2	

Equation of Trendline	
Intercept	Slope
0	0.9312

C (PSF)	PHI
0	43

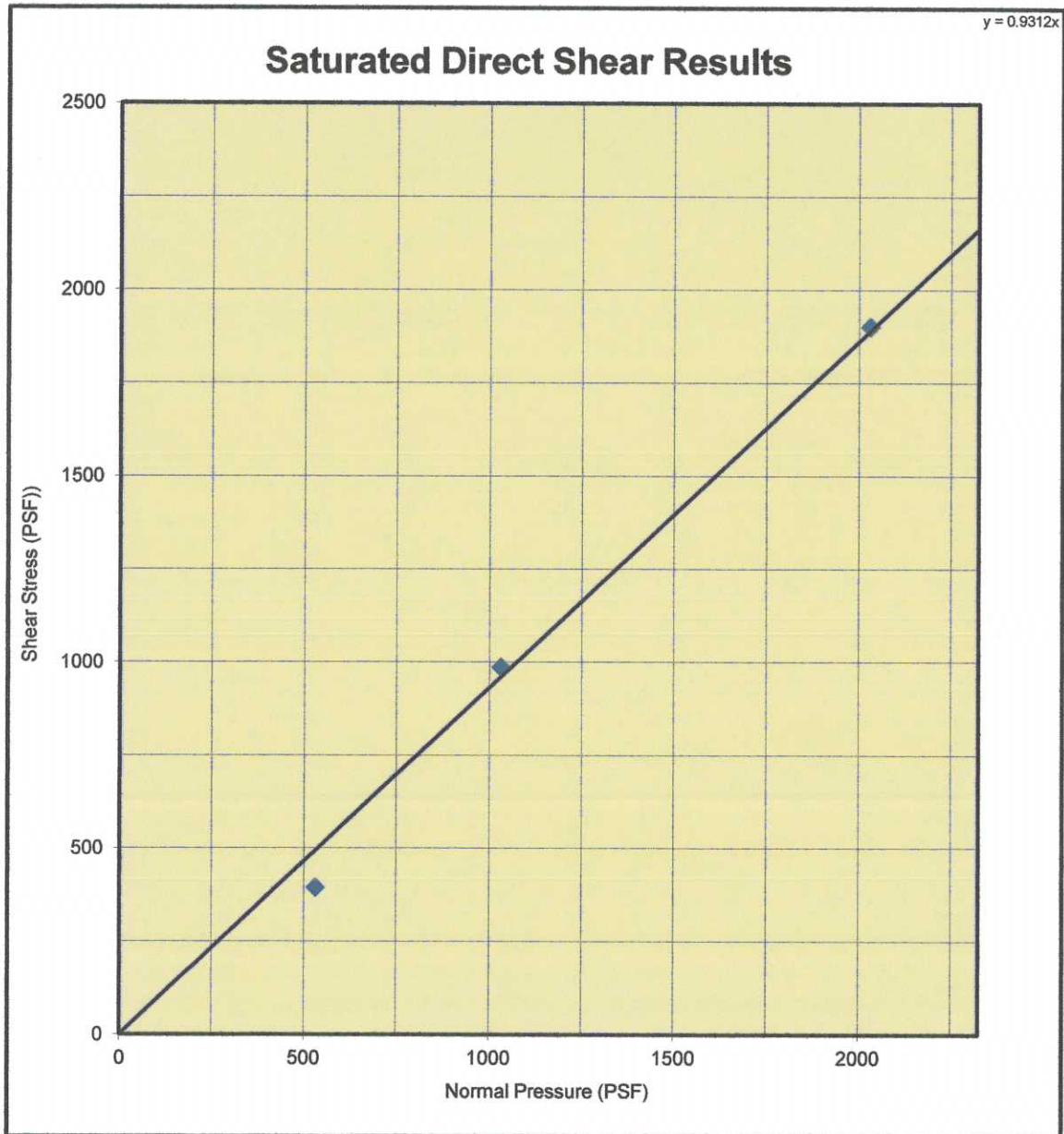
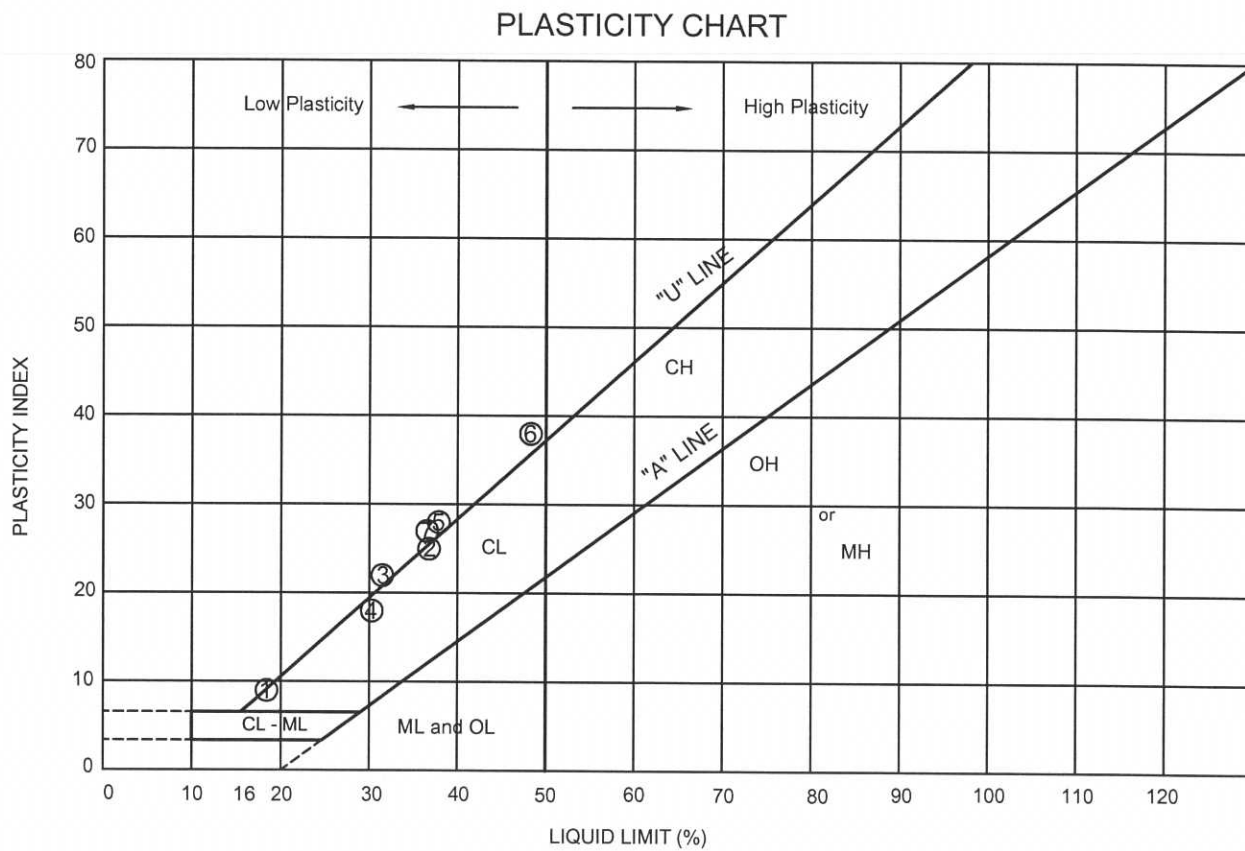


Figure No. 14



PLASTICITY DATA

Key Symbol	Sample Number	Depth (feet)	Natural Water Content W(%)	Plastic Limit (%)	Liquid Limit (%)	Plasticity Index	Liquidity Index $\frac{W-PL}{LL-PL}$	Unified Soil Classification Symbol
①	1-1	2.0	12.7	10.3	18.4	9	+0.2667	CL
②	1-2	3.5	17.2	12.6	36.8	25	+0.1840	CL
③	2-1	2.0	15.3	9.9	31.5	22	+0.2455	CL
④	3-1	2.0	17.2	17.1	30.3	18	+0.0056	CL
⑤	3-3	5.0	15.5	10.2	37.9	28	+0.1893	CL
⑥	4-1	2.5	18.8	10.8	48.3	38	+0.2105	CL
⑦	4-2	3.5	15.5	9.7	36.6	27	+0.2148	CL

ATTERBERG LIMITS TEST RESULTS

APN 037-086-023, -026, -027, -028, -029,
VALLEMAR STREET & JULIANA AVENUE
MOSS BEACH, CALIFORNIA

SCALE: No Scale

DRAWN BY: MC

DATE: JUNE 2016

REVISED:

JOB NO: SM10391.2

HARO, KASUNICH & ASSOCIATES, INC.

GEOTECHNICAL AND COASTAL ENGINEERS
116 E. LAKE AVENUE, WATSONVILLE, CA 95076
(831) 722-1475

FIGURE NO. 15

SHEET NO. **63**

SOIL CONTROL LAB

42 HANGAR WAY
WATSONVILLE
CALIFORNIA
95076
USA

Work Order #: 6040263

Account #: 2953

Date Received: April 7, 2016

Date Reported: April 11, 2016

Haro - Kasunich and Assoc.
116 East Lake Avenue
Watsonville, CA 95076

Reporting Date: April 11, 2016

Date Received: April 7, 2016
Project#/Name: SM 10391.2 / Vallemar Bluff
Matrix: Soil

Sample Identification	pH (units)	Chloride (mg/Kg)	Sulfate (mg/Kg)	Resistivity (ohms x cm)
LOT A	4.4	470	130	240
LOT E	5.8	540	290	240
	<u>Method</u> CalTest 643 June 2007	<u>Method</u> CalTest 422 April 2000	<u>Method</u> CalTest 417 March 1999	<u>Method</u> CalTest 643 June 2007

Mike Galloway

APPENDIX B

Slope Stability Analysis Results

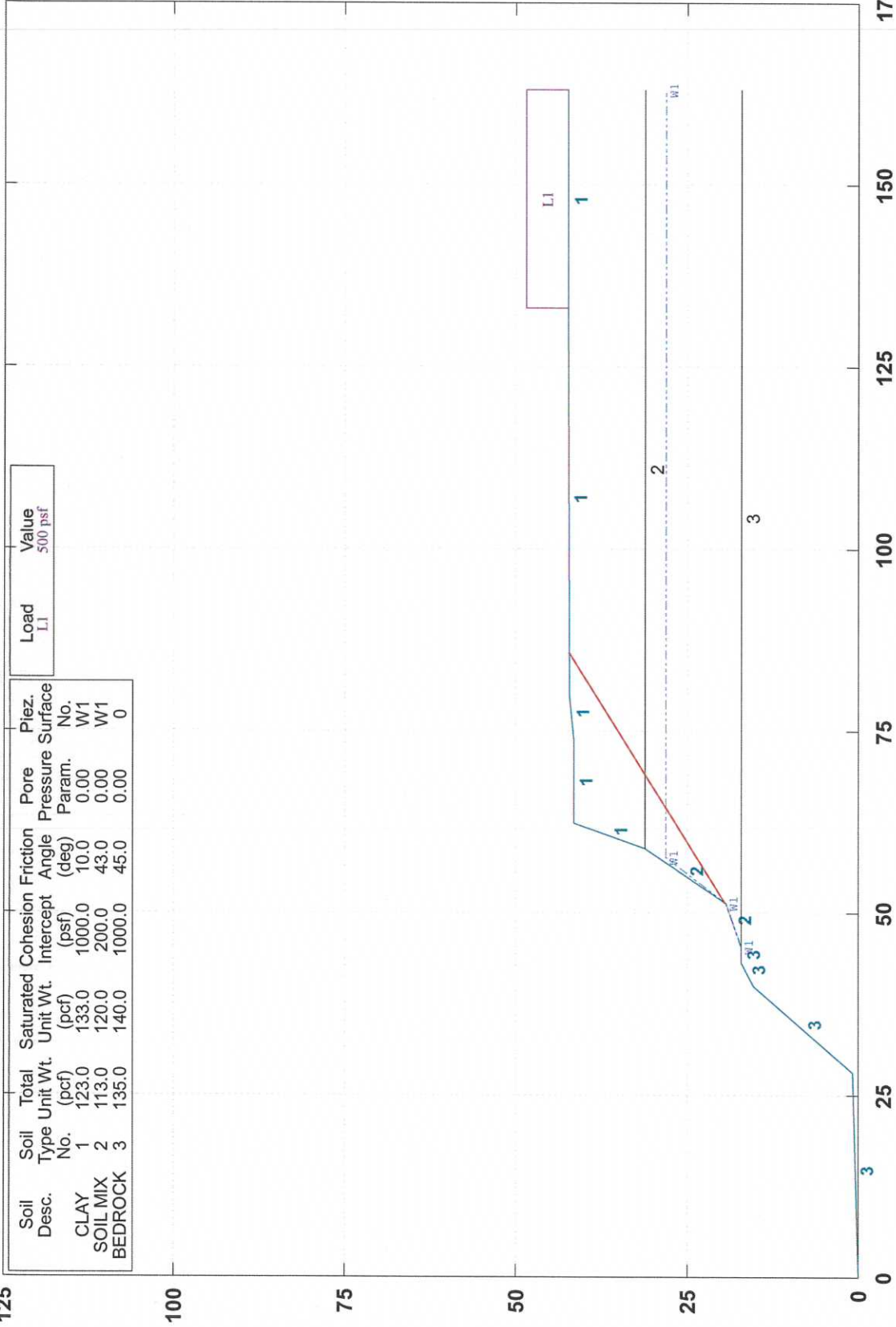
VALLEMAR ST AND JULIANA AVE SLOPE STABILITY ANALYSIS SECTION 3 STATIC

c:\users\moses\documents\projects\san mateo\coastal bluff\valleamar bluff\slope stability\section 3 stc.plt Run By: Moses Cuprill, P.E. 6/25/2016 06:14PM

125

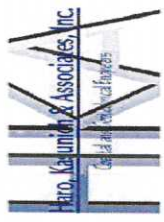
Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (pcf)	Friction Angle (deg)	Pore Pressure Param.	Piez. Surface No.
CLAY	1	123.0	133.0	1000.0	10.0	0.00	W1
SOIL MIX	2	113.0	120.0	200.0	43.0	0.00	W1
BEDROCK	3	135.0	140.0	1000.0	45.0	0.00	0

Load	Value
LI	500 psf



GSTABL7 v.2 FSmin=2.48

Factor Of Safety Is Calculated By The Simplified Janbu Method



*** GSTABL7 ***

** GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **

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SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer & Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 6/25/2016

Time of Run: 06:14PM

Run By: Moses Cuprill, P.E.

Input Data Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ Slope STABILITY\stability section 3 stc.in

Output Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ Slope STABILITY\stability section 3 stc.OUT

Unit System: English

Plotted Output Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ Slope STABILITY\stability section 3 stc.PLT

PROBLEM DESCRIPTION: VALLEMAR ST AND JULIANA AVE SLOPE STABILITY ANALYSIS SECTION 3 STATIC

BOUNDARY COORDINATES

11 Top Boundaries

13 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	0.00	28.20	0.80	3
2	28.20	0.80	40.00	15.20	3
3	40.00	15.20	43.20	17.10	3
4	43.20	17.10	45.40	17.20	3
5	45.40	17.20	51.40	19.30	2
6	51.40	19.30	58.80	31.20	2
7	58.80	31.20	62.30	41.50	1
8	62.30	41.50	73.70	41.50	1
9	73.70	41.50	79.80	42.20	1
10	79.80	42.20	132.70	42.30	1
11	132.70	42.30	163.00	42.30	1
12	58.80	31.20	163.00	31.20	2
13	45.40	17.20	163.00	17.20	3

Default Y-Origin = 0.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param. (psf)	Pressure Constant (psf)	Piez. Surface No.
1	123.0	133.0	1000.0	10.0	0.00	0.0	1
2	113.0	120.0	200.0	43.0	0.00	0.0	1
3	135.0	140.0	1000.0	45.0	0.00	0.0	0

1 PIEZOMETRIC SURFACE(S) SPECIFIED

Unit Weight of Water = 62.40 (pcf)

Piezometric Surface No. 1 Specified by 4 Coordinate Points

Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	45.40	17.20
2	51.40	19.30
3	57.60	28.20
4	163.00	28.20

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
----------	-------------	--------------	-----------------	------------------

1 133.00 163.00 500.0 0.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.

Specified Peak Ground Acceleration Coefficient (A) = 0.890(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.510(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

EARTHQUAKE DATA HAS BEEN SUPPRESSED

Janbu's Empirical Coef. is being used for the case of c & phi both > 0

Trial Failure Surface Specified By 2 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	51.500	19.461
2	85.720	42.211

Janbu's Empirical Coefficient (fo) = 1.000

* * Factor Of Safety Is Calculated By The Simplified Janbu Method * *

Factor Of Safety For The Preceding Specified Surface = 2.481

Table 1 - Individual Data on the 9 Slices

Slice No.	Width (ft)	Weight (lbs)	Water	Water	Tie	Tie	Earthquake		Surcharge Load (lbs)
			Force Top (lbs)	Force Bot (lbs)	Force Norm (lbs)	Force Tan (lbs)	Force Hor (lbs)	Force Ver (lbs)	
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	6.1	2049.2	0.0	707.5	0.0	0.0	0.0	0.0	0.0
3	1.2	893.0	0.0	385.3	0.0	0.0	0.0	0.0	0.0
4	3.5	4547.0	0.0	714.0	0.0	0.0	0.0	0.0	0.0
5	2.3	3985.3	0.0	137.0	0.0	0.0	0.0	0.0	0.0
6	4.5	6481.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	4.5	4911.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	6.1	4203.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	5.9	1428.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 2 - Base Stress Data on the 9 Slices

Slice No.	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	33.62	51.51	0.03	193.22	0.66
2	33.62	54.56	7.30	407.38	186.67
3	33.62	58.20	1.44	619.31	411.99
4	33.62	60.55	4.20	1203.90	719.26
5	33.62	63.47	2.82	1671.16	940.88
6	33.62	66.90	5.42	1479.07	795.25
7	33.62	71.43	5.45	1365.25	598.58
8	33.62	76.75	7.33	1285.98	381.50
9	33.62	82.76	7.11	1195.46	133.63

Sum of the Resisting Forces (including Pier/Pile, Tieback, Reinforcing
Soil Nail, and Applied Forces if applicable) = 47011.89 (lbs)

Average Available Shear Strength (including Tieback, Pier/Pile, Reinforcing,
Soil Nail, and Applied Forces if applicable) = 1144.05(psf)

Sum of the Driving Forces = 18947.37 (lbs)

Average Mobilized Shear Stress = 461.09(psf)

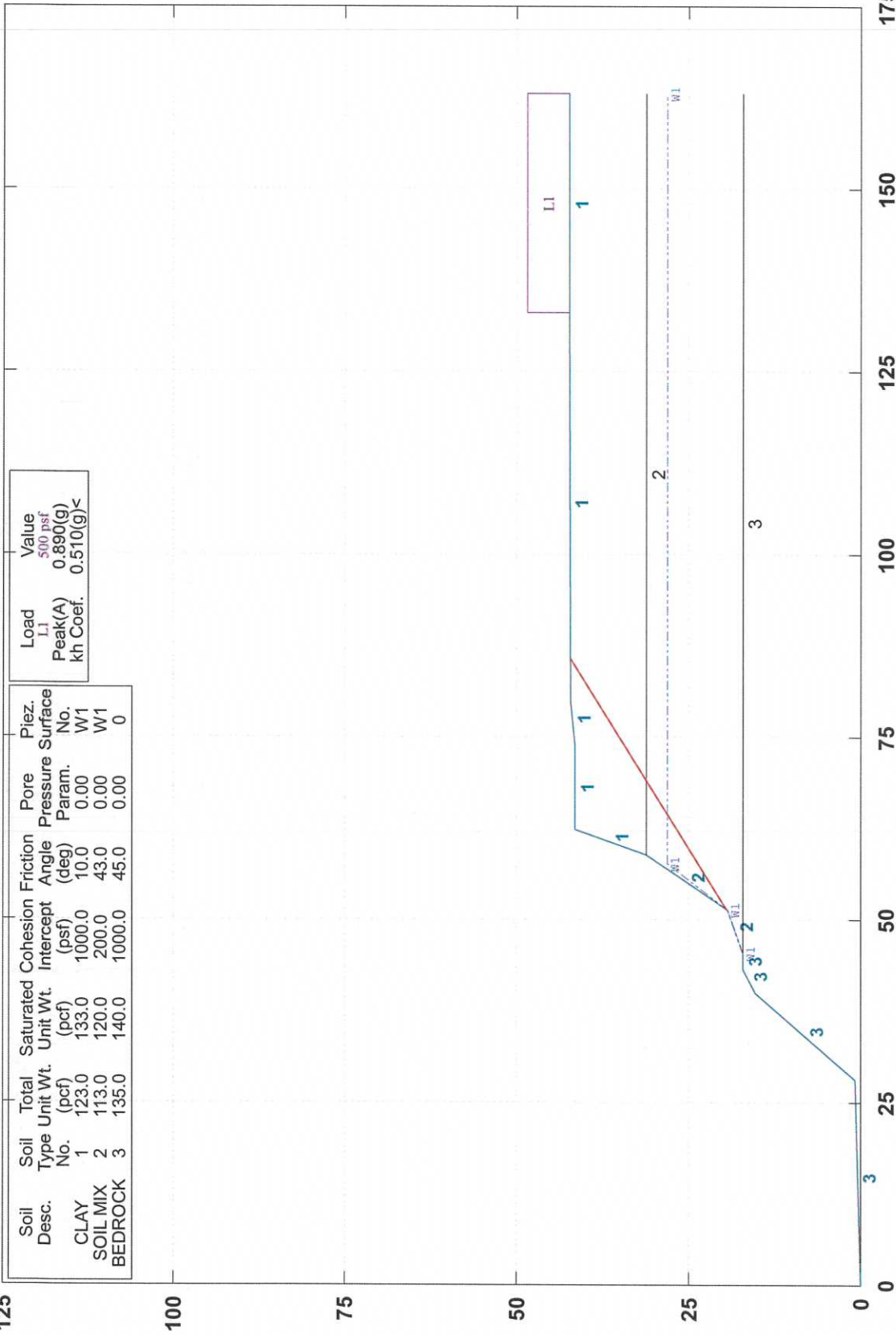
Total length of the failure surface = 41.09(ft)

**** END OF GSTABL7 OUTPUT ****

VALLEMAR ST AND JULIANA AVE SLOPE STABILITY ANALYSIS SECTION 3 SEISMIC

c:\users\moses\documents\projects\san mateo\coastal bluff\valleamar bluff\slope stability\section 3 smc.plt Run By: Moses Cuprill, P.E. 6/25/2016 06:13PM

125



GSTABL7 v.2 FSmin=1.27

Factor Of Safety Is Calculated By The Simplified Janbu Method



*** GSTABL7 ***

** GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.3, Feb. 2013 **

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SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer & Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 6/25/2016

Time of Run: 06:13PM

Run By: Moses Cuprill, P.E.

Input Data Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ SloPE STABILITY\stability section 3 smc.in

Output Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ SloPE STABILITY\stability section 3 smc.OUT

Unit System: English

Plotted Output Filename: C:\Users\Moses\Documents\Projects\San Mateo\Coastal Bluff\Vallemar Bluff\ SloPE STABILITY\stability section 3 smc.PLT

PROBLEM DESCRIPTION: VALLEMAR ST AND JULIANA AVE SLOPE STABILITY ANALYSIS SECTION 3 SEISMIC

BOUNDARY COORDINATES

11 Top Boundaries

13 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	0.00	28.20	0.80	3
2	28.20	0.80	40.00	15.20	3
3	40.00	15.20	43.20	17.10	3
4	43.20	17.10	45.40	17.20	3
5	45.40	17.20	51.40	19.30	2
6	51.40	19.30	58.80	31.20	2
7	58.80	31.20	62.30	41.50	1
8	62.30	41.50	73.70	41.50	1
9	73.70	41.50	79.80	42.20	1
10	79.80	42.20	132.70	42.30	1
11	132.70	42.30	163.00	42.30	1
12	58.80	31.20	163.00	31.20	2
13	45.40	17.20	163.00	17.20	3

Default Y-Origin = 0.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param. (psf)	Pressure Constant (psf)	Piez. Surface No.
1	123.0	133.0	1000.0	10.0	0.00	0.0	1
2	113.0	120.0	200.0	43.0	0.00	0.0	1
3	135.0	140.0	1000.0	45.0	0.00	0.0	0

1 PIEZOMETRIC SURFACE(S) SPECIFIED

Unit Weight of Water = 62.40 (pcf)

Piezometric Surface No. 1 Specified by 4 Coordinate Points

Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	45.40	17.20
2	51.40	19.30
3	57.60	28.20
4	163.00	28.20

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
----------	-------------	--------------	-----------------	------------------

1 133.00 163.00 500.0 0.0

NOTE - Intensity Is Specified As A Uniformly Distributed
Force Acting On A Horizontally Projected Surface.

Specified Peak Ground Acceleration Coefficient (A) = 0.890(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.510(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

Janbu's Empirical Coef. is being used for the case of c & phi both > 0

Trial Failure Surface Specified By 2 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	51.500	19.461
2	85.720	42.211

Janbu's Empirical Coefficient (fo) = 1.000

* * Factor Of Safety Is Calculated By The Simplified Janbu Method * *

Factor Of Safety For The Preceding Specified Surface = 1.270

Table 1 - Individual Data on the 9 Slices

Slice No.	Width (ft)	Weight (lbs)	Water Force		Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force		Surcharge Load	
			Top (lbs)	Bot (lbs)			Hor (lbs)	Ver (lbs)		
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	6.1	2049.2	0.0	707.5	0.0	0.0	1045.1	0.0	0.0	0.0
3	1.2	893.0	0.0	385.3	0.0	0.0	455.4	0.0	0.0	0.0
4	3.5	4547.0	0.0	714.0	0.0	0.0	2319.0	0.0	0.0	0.0
5	2.3	3985.3	0.0	137.0	0.0	0.0	2032.5	0.0	0.0	0.0
6	4.5	6481.7	0.0	0.0	0.0	0.0	3305.7	0.0	0.0	0.0
7	4.5	4911.2	0.0	0.0	0.0	0.0	2504.7	0.0	0.0	0.0
8	6.1	4203.4	0.0	0.0	0.0	0.0	2143.7	0.0	0.0	0.0
9	5.9	1428.9	0.0	0.0	0.0	0.0	728.7	0.0	0.0	0.0

Table 2 - Base Stress Data on the 9 Slices

Slice No.	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Available Shear Strength		Mobilized Shear Stress (psf)
					(psf)	
1	33.62	51.51	0.03		162.26	1.17
2	33.62	54.56	7.30		342.11	329.87
3	33.62	58.20	1.44		520.08	728.04
4	33.62	60.55	4.20		1011.01	1271.02
5	33.62	63.47	2.82		1403.40	1662.64
6	33.62	66.90	5.42		1242.09	1405.29
7	33.62	71.43	5.45		1308.90	1057.76
8	33.62	76.75	7.33		1232.89	674.16
9	33.62	82.76	7.11		1146.11	236.14

Sum of the Resisting Forces (including Pier/Pile, Tieback, Reinforcing
Soil Nail, and Applied Forces if applicable) = 42507.43 (lbs)

Average Available Shear Strength (including Tieback, Pier/Pile, Reinforcing,
Soil Nail, and Applied Forces if applicable) = 1034.43(psf)

Sum of the Driving Forces = 33482.20 (lbs)

Average Mobilized Shear Stress = 814.80(psf)

Total length of the failure surface = 41.09(ft)

*** SEISMIC SLOPE DISPLACEMENT DATA ***

(Note: kv is set = zero for displacement calculations)

Seismic Yield Coefficient (ky) = 0.7575(g)

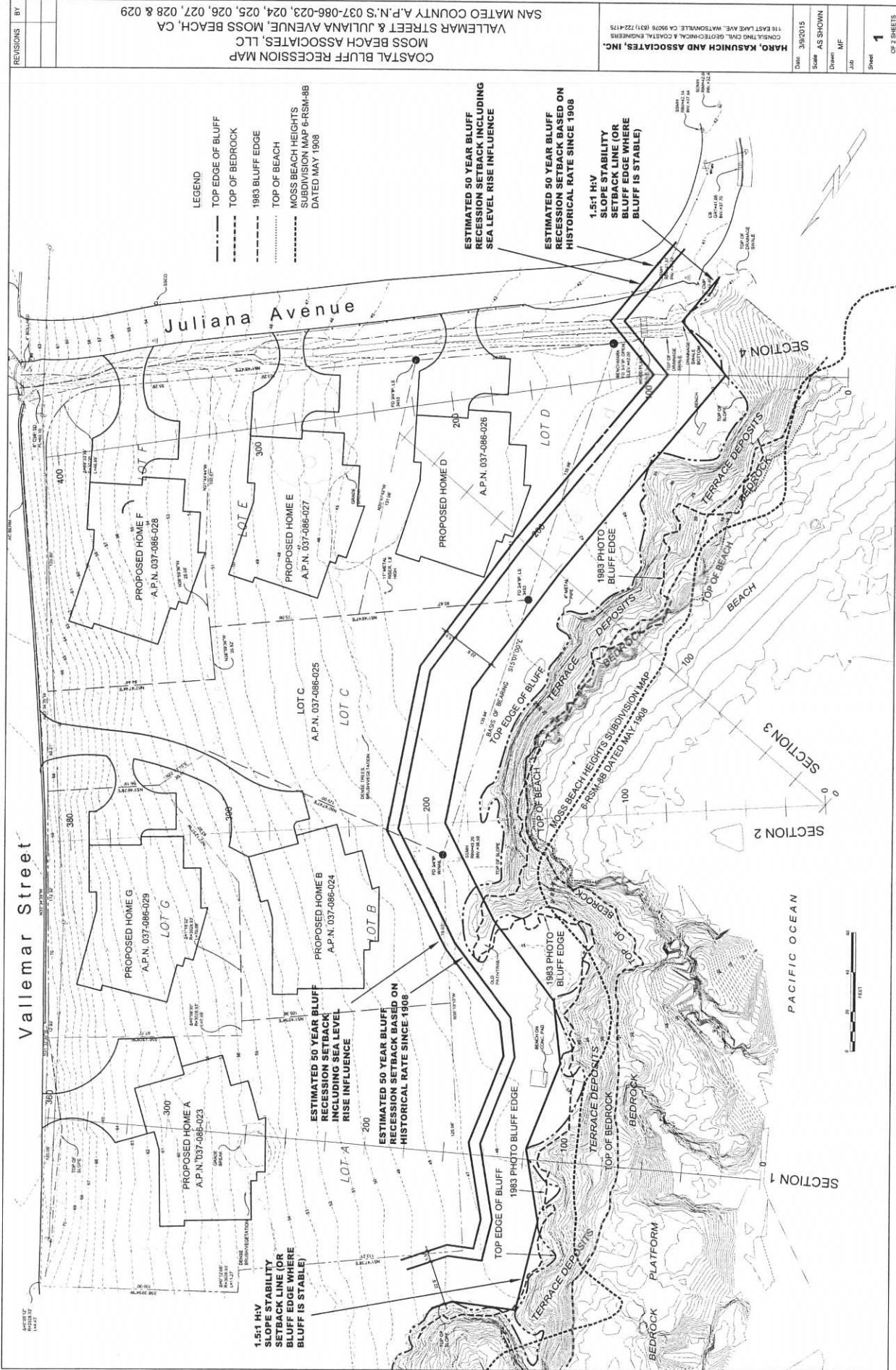
Calculated Newmark Seismic Displacement = 0.119(ft)

Non-Symmetrical Sliding Resistance Has Been Specified
for Downhill Sliding.

**** END OF GSTABL7 OUTPUT ****

APPENDIX C

Coastal Bluff Recession Map and Sections



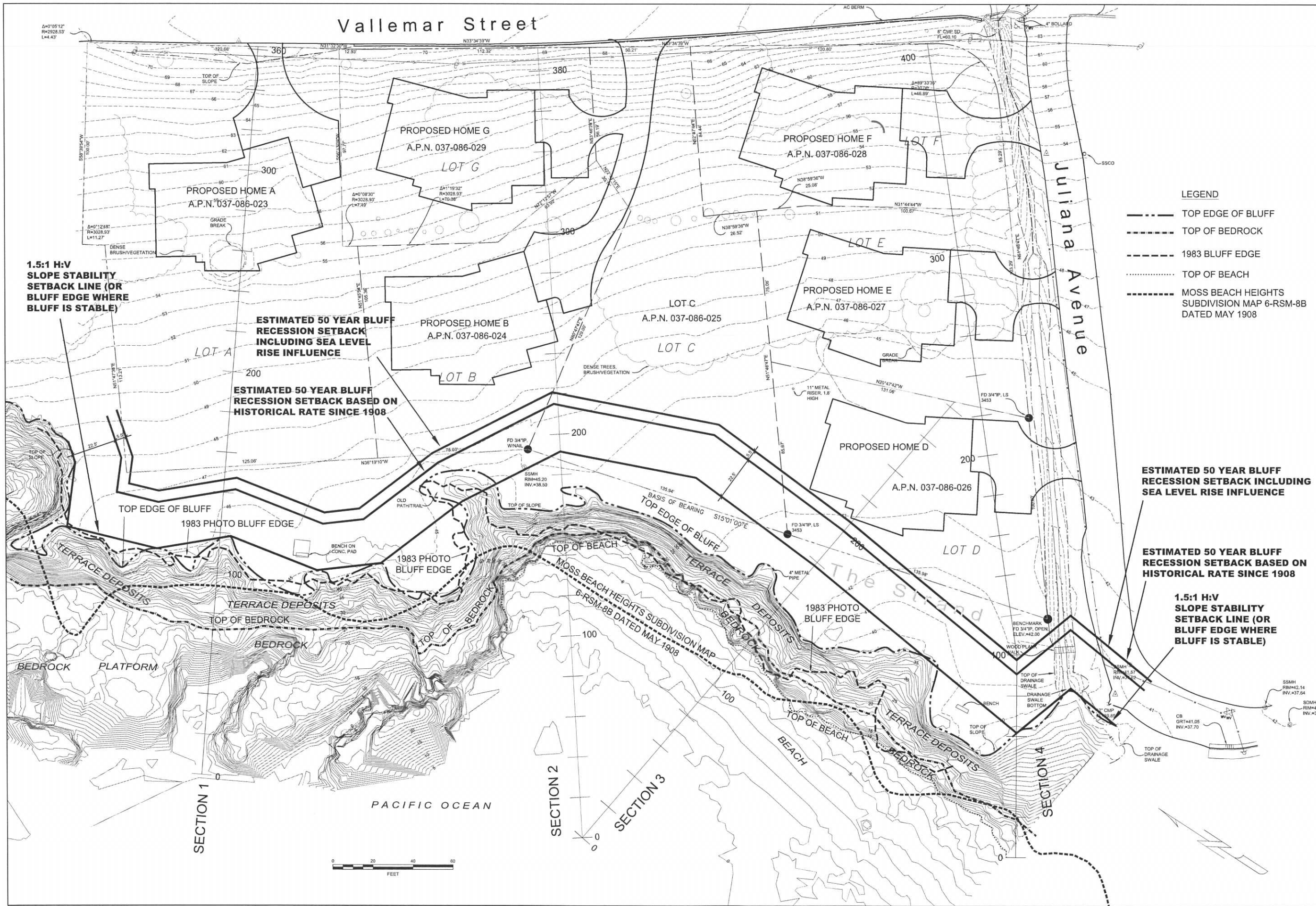
COASTAL BLUFF RECESSION MAP
MOSS BEACH ASSOCIATES, LLC
VALLEMAR STREET & JULIANA AVENUE, MOSS BEACH, CA
SAN MATEO COUNTY A.P.N.'S 037-086-023, 024, 025, 026, 027, 028 & 029

HARGREAVES AND ASSOCIATES, INC.
CONSULTING CIVIL, GEOTECHNICAL & COASTAL ENGINEERS
118 EAST LAKE AVE., WATSONVILLE, CA 95076 (408) 722-4175

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Drawn: MF
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OF 2 SHEETS

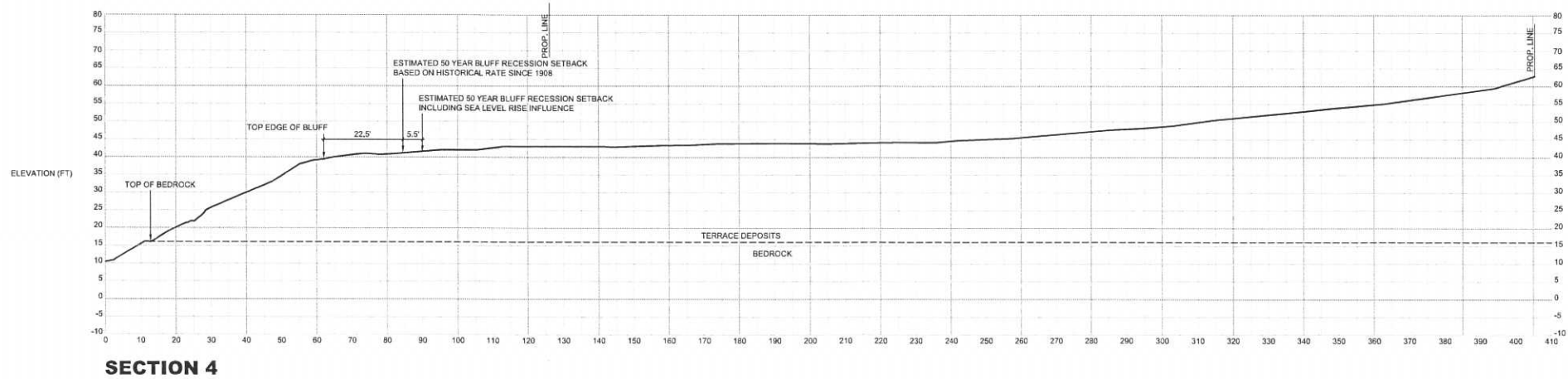
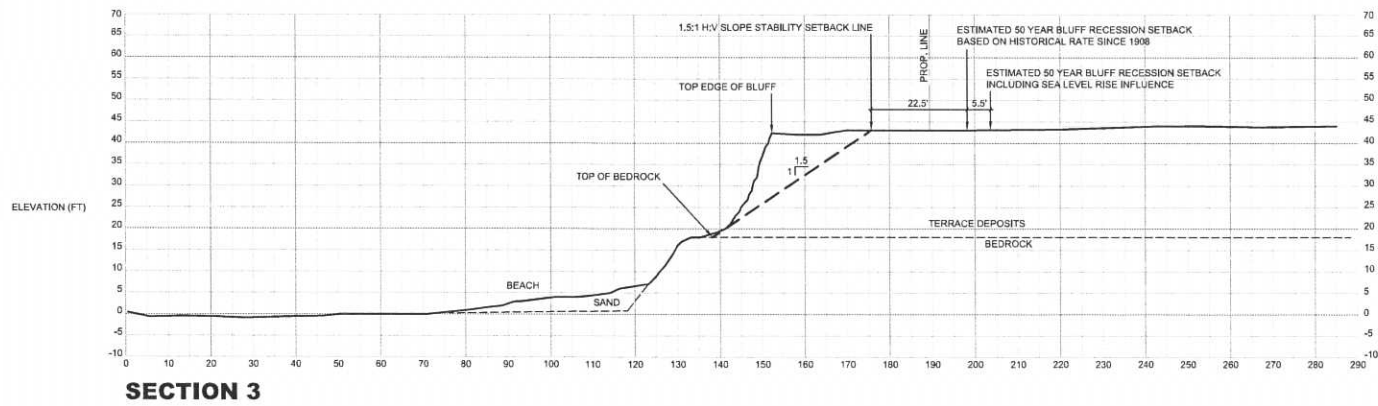
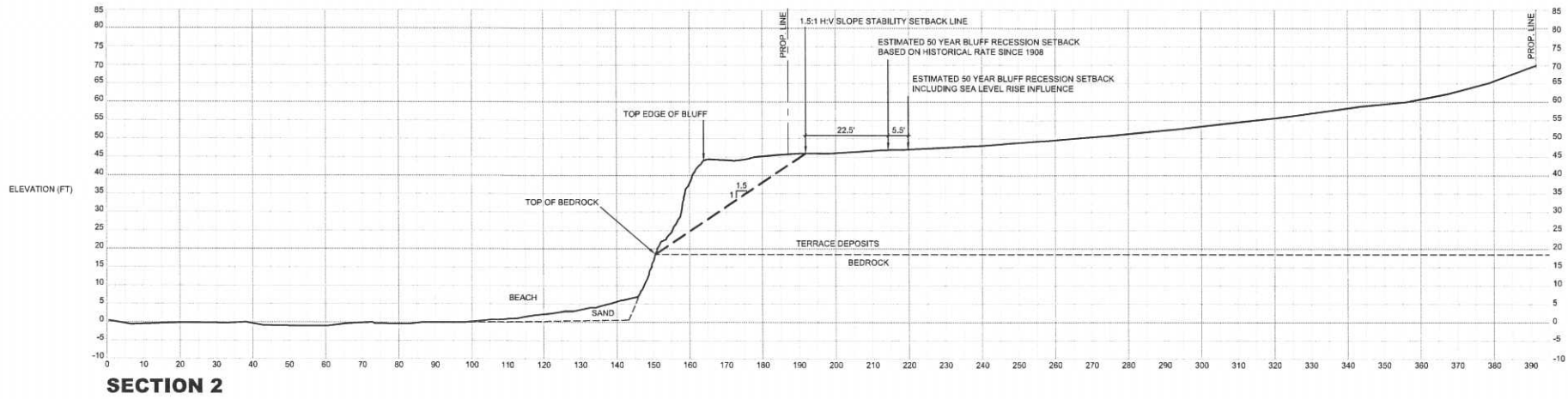
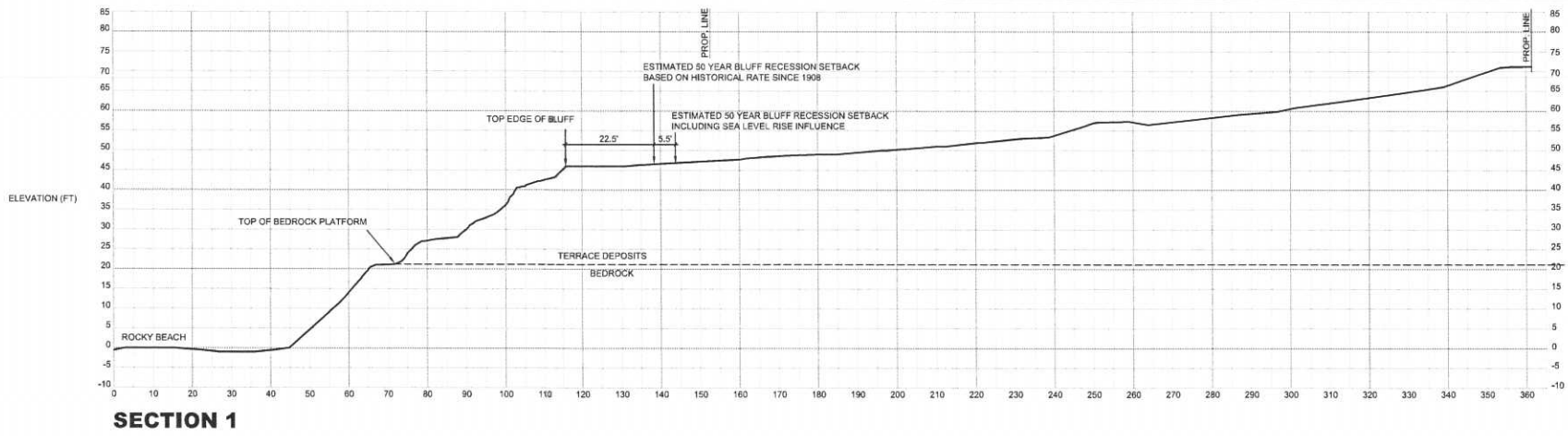
REVISIONS	BY

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REVISIONS	BY
COASTAL BLUFF RECESSION MAP	
MOSS BEACH ASSOCIATES, LLC	
VALLEMAR STREET & JULIANA AVENUE, MOSS BEACH, CA	
SAN MATEO COUNTY A.P.N.'S 037-086-023, 024, 025, 026, 027, 028 & 029	
HARO, KASUNICH AND ASSOCIATES, INC.	
CONSULTING CIVIL, GEOTECHNICAL & COASTAL ENGINEERS	
116 EAST LAKE AVE., WATSONVILLE, CA 95076 (831) 722-4175	
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OF 2 SHEETS	

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REVISIONS	BY
COASTAL BLUFF RECESSION CROSS SECTIONS	
MOSS BEACH ASSOCIATES, LLC	
VALLEMAR STREET & JULIANA AVENUE, MOSS BEACH, CA	
SAN MATEO COUNTY A.P.N.'S 037-086-023, 024, 025, 026, 027, 028 & 029	
HARO, KASUNICH AND ASSOCIATES, INC.	
CONSULTING CIVIL, GEOTECHNICAL & COASTAL ENGINEERS	
116 EAST LAKE AVE., WATSONVILLE, CA 95076 (831) 722-4175	
Date	3/9/2015
Scale	AS SHOWN
Drawn	MF
Job	
Sheet	2
OF 2 SHEETS	

APPENDIX D

Percolation Test Results

Percolation Test Results For Vallemar Street and Jullaina APN 037-086-023

Project No: SM10391.2

Date: 31 APRIL 2016

By: Haro, Kasunich and Associates

HOLE NO.:	P-1	TEST DATE: 3/31/16 DRILL DATE: 3/30/16				
WATER LEVEL AFTER PRE-SOAK: Dry		DEPTH OF BORING (feet) 2.146				
TESTED BY: JD		PERCOLATION ZONE (feet): 1.146 2.146				
READING	ELAPSED TIME (min)	WATER DEPTH (feet)	REFILL TO (feet)	Incremental Change (in.)	PERCOLATION RATE (min/inch)	PERC (in/hr)
Start	0	1.6250	-	-	-	-
1	40	1.7917	1.6302	2.0000	20.00	3.0000
2	80	1.7708	1.6250	1.6875	23.70	2.5313
3	115	1.7917	1.6250	2.0000	17.50	3.4286
4	145	1.7813	1.6250	1.8750	16.00	3.7500
5	175	1.7760	1.6250	1.8125	16.55	3.6250
6	205	1.7813	1.6250	1.8750	16.00	3.7500
7	235	1.7865	1.6250	1.9375	15.48	3.8750
8	265	1.7917	1.6250	2.0000	15.00	4.0000

Average Of Reading's (in/hr)= 3.4950

Reported Percolation Rate (in/hr) = 3.9

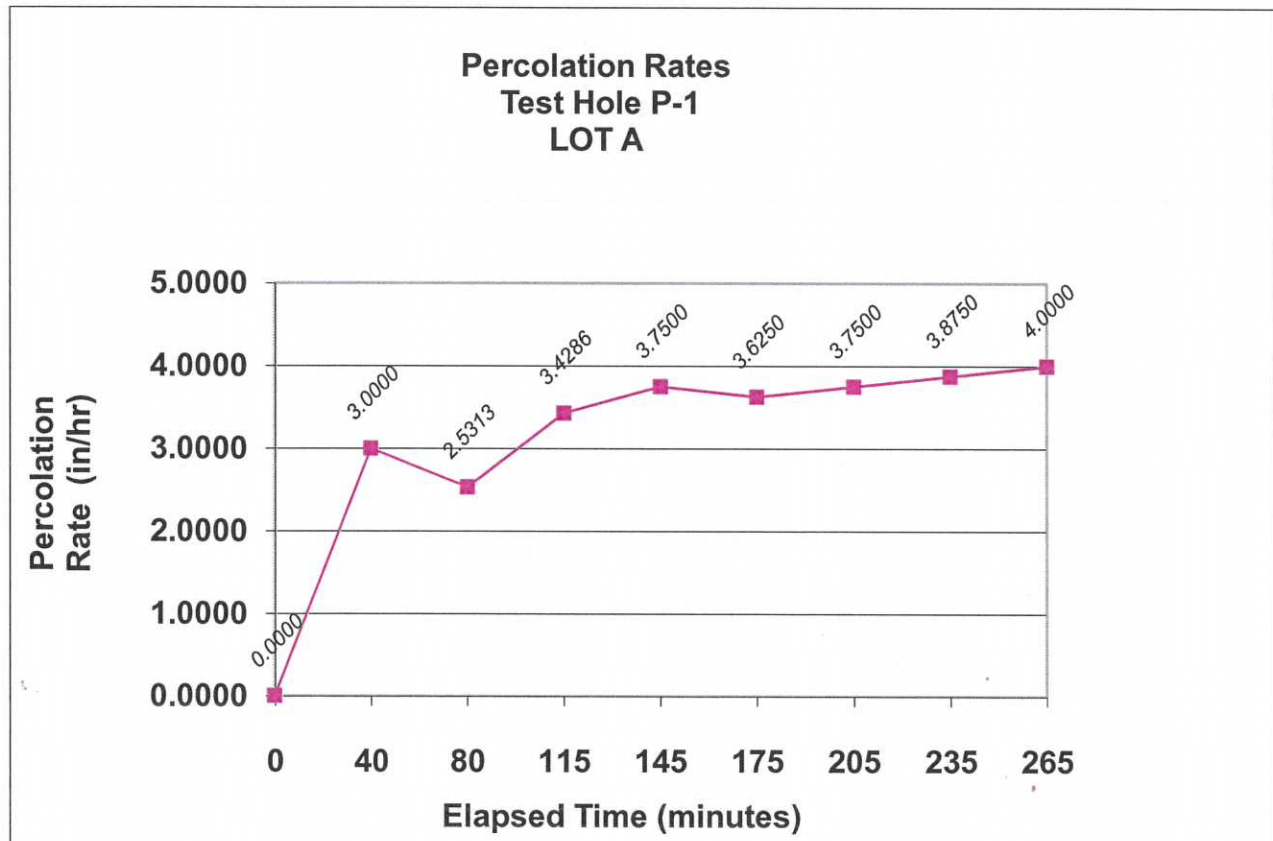


Figure No. _____

Page No. 78

Percolation Test Results For Vallemar Street and Jullaina APN 037-086-029

Project No: SM10391.2

Date: 31 APRIL 2016

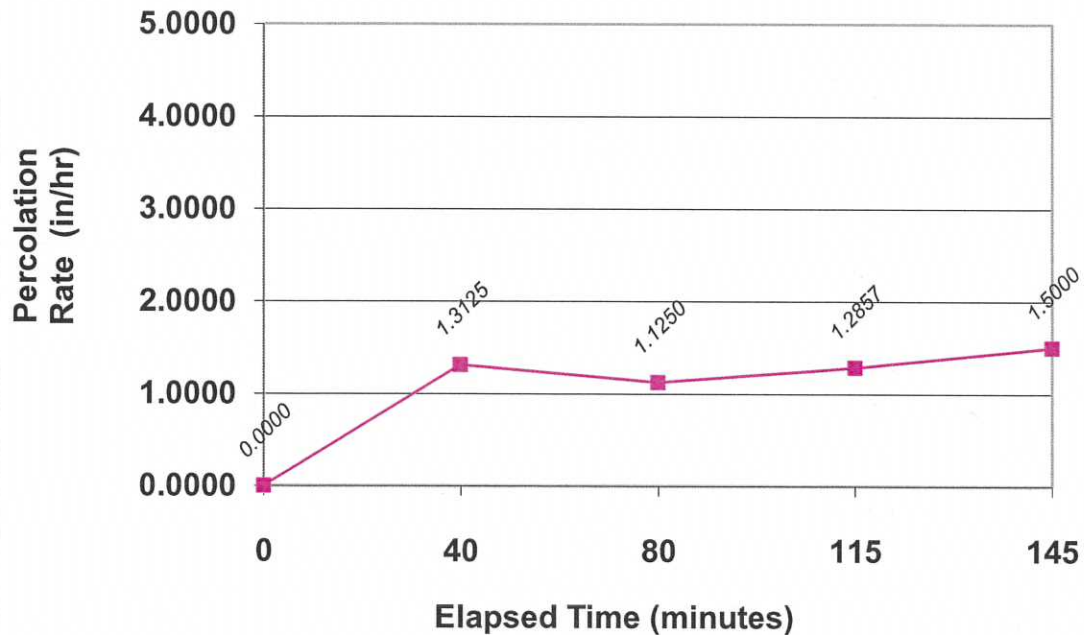
By: Haro, Kasunich and Associates

HOLE NO.:	P-2		TEST DATE:3/31/16 DRILL DATE: 3/30/16			
WATER LEVEL AFTER PRE-SOAK: Dry			DEPTH OF BORING (feet) 2.146			
TESTED BY:	JD		PERCOLATION ZONE (feet): 1.146 2.146			
READING	ELAPSED TIME (min)	WATER DEPTH (feet)	REFILL TO (feet)	Incremental Change (in.)	PERCOLATION RATE (min/inch)	PERC (in/hr)
Start	0	1.6458	-	-	-	-
1	40	1.7188	1.6458	0.8750	45.71	1.3125
2	80	1.7083	1.6458	0.7500	53.33	1.1250
3	115	1.7083	1.6458	0.7500	46.67	1.2857
4	145	1.7083	1.6458	0.7500	40.00	1.5000
5	-	-	-	-	-	-
6	-	-	-	-	-	-
7	-	-	-	-	-	-
8	-	-	-	-	-	-

Average Of Reading's (in/hr)= 1.3058

Reported Percolation Rate (in/hr) = 1.4

Percolation Rates
Test Hole P-2
LOT G



Percolation Test Results For Vallemar Street and Jullaina APN 037-086-028

Project No: SM10391.2

Date: 31 APRIL 2016

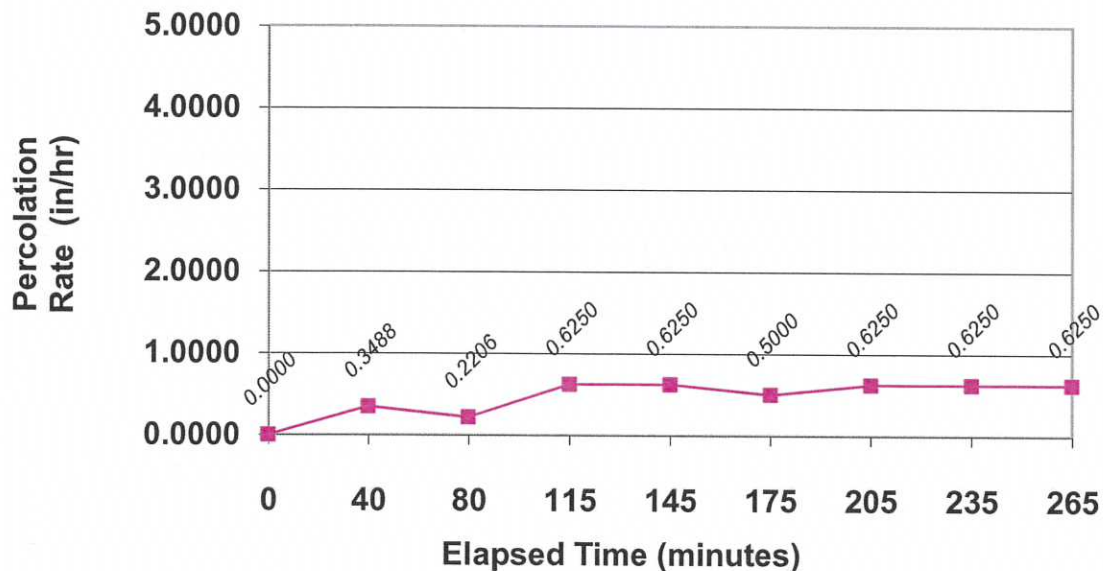
By: Haro, Kasunich and Associates

HOLE NO.: P-3			TEST DATE: 3/31/16 DRILL DATE: 3/30/16			
WATER LEVEL AFTER PRE-SOAK: 3.708			DEPTH OF BORING (feet) 4.042			
TESTED BY: JD			PERCOLATION ZONE (feet): 3.042 4.042			
READING	ELAPSED TIME (min)	WATER DEPTH (feet)	REFILL TO (feet)	Incremental Change (in.)	PERCOLATION RATE (min/inch)	PERC (in/hr)
Start	0	3.5417	-	-	-	-
1	43	3.5625	3.5417	0.2500	172.00	0.3488
2	77	3.5521	3.5417	0.1250	272.00	0.2206
3	107	3.5677	3.5417	0.3125	96.00	0.6250
4	137	3.5677	3.5417	0.3125	96.00	0.6250
5	167	3.5625	3.5417	0.2500	120.00	0.5000
6	197	3.5677	3.5417	0.3125	96.00	0.6250
7	227	3.5677	3.5417	0.3125	96.00	0.6250
8	257	3.5677	3.5417	0.3125	96.00	0.6250

Average Of Reading's (in/hr)= 0.5243

Reported Percolation Rate (in/hr) = 0.6

Percolation Rates
Test Hole P-3
LOT F



Percolation Test Results For Vallemar Street and Jullaina APN 037-086-027

Project No: SM10391.2

Date: 31 APRIL 2016

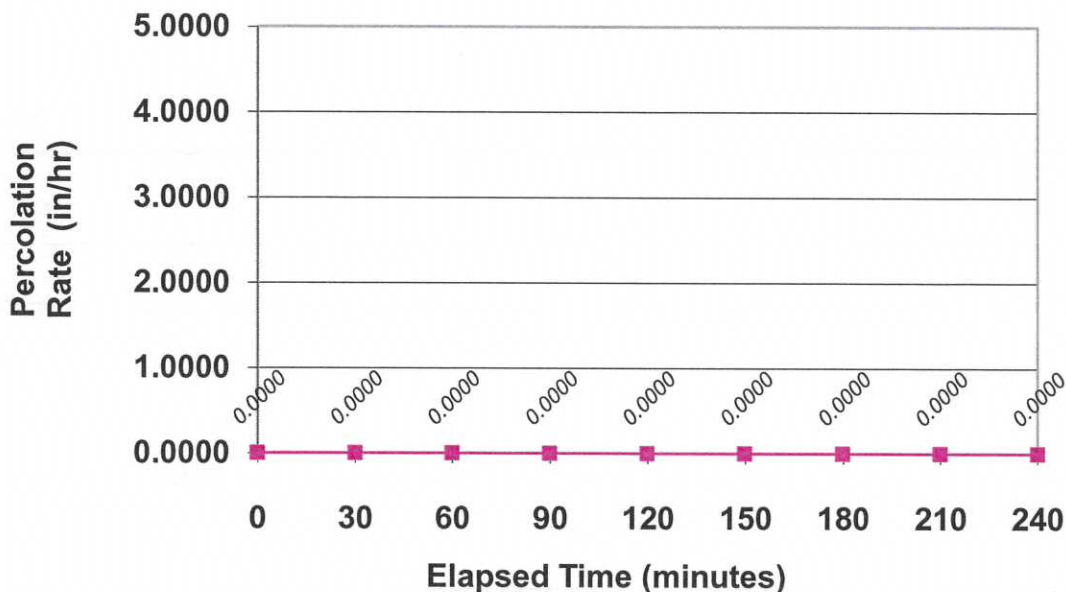
By: Haro, Kasunich and Associates

HOLE NO.:	P-4	TEST DATE: 3/31/16 DRILL DATE: 3/30/16				
WATER LEVEL AFTER PRE-SOAK: 1.958		DEPTH OF BORING (feet) 2.958				
TESTED BY: JD		PERCOLATION ZONE (feet): 1.958 2.958				
READING	ELAPSED TIME (min)	WATER DEPTH (feet)	REFILL TO (feet)	Incremental Change (in.)	PERCOLATION RATE (min/inch)	PERC (in/hr)
Start	0	1.9583	-	-	-	-
1	30	1.9583	0.0000	0.0000	-	0.0000
2	60	1.9583	0.0000	0.0000	-	0.0000
3	90	1.9583	0.0000	0.0000	-	0.0000
4	120	1.9583	0.0000	0.0000	-	0.0000
5	150	1.9583	0.0000	0.0000	-	0.0000
6	180	1.9583	0.0000	0.0000	-	0.0000
7	210	1.9583	0.0000	0.0000	-	0.0000
8	240	1.9583	0.0000	0.0000	-	0.0000

Average Of Reading's (in/hr)= 0.0000

Reported Percolation Rate (in/hr) = 0.0

Percolation Rates
Test Hole P-4
LOT E



Percolation Test Results For Vallemar Street and Jullaina APN 037-086-026

Project No: SM10391.2

Date: 31 APRIL 2016

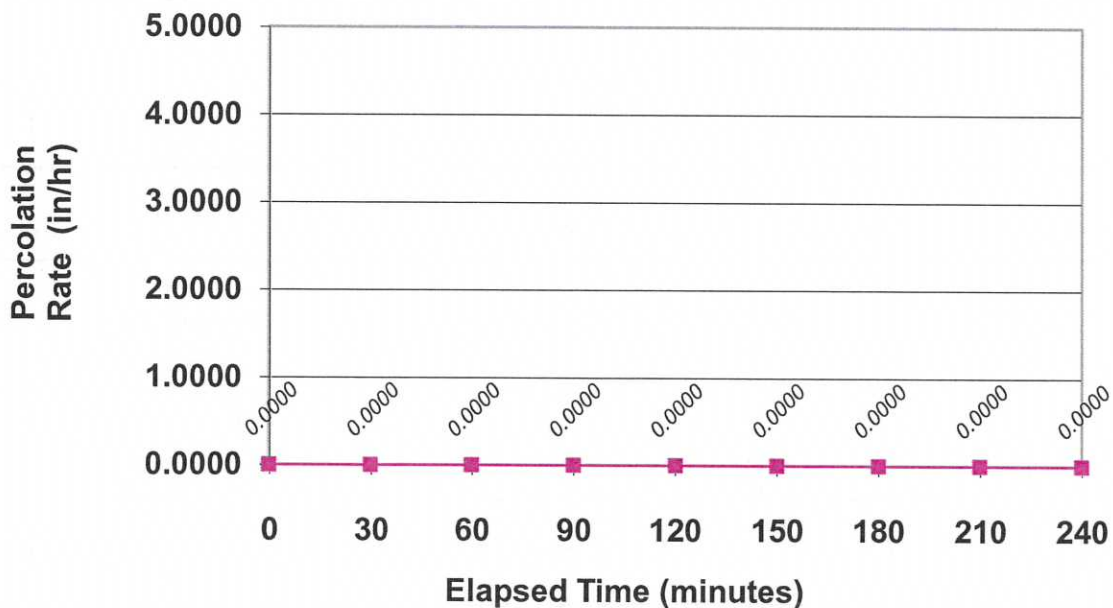
By: Haro, Kasunich and Associates

HOLE NO.:	P-4	TEST DATE: 3/31/16 DRILL DATE: 3/30/16				
WATER LEVEL AFTER PRE-SOAK: 1.958		DEPTH OF BORING (feet) 2.958				
TESTED BY:	JD	PERCOLATION ZONE (feet): 1.958 2.958				
READING	ELAPSED TIME (min)	WATER DEPTH (feet)	REFILL TO (feet)	Incremental Change (in.)	PERCOLATION RATE (min/inch)	PERC (in/hr)
Start	0	1.9583	-	-	-	-
1	30	1.9583	0.0000	0.0000	-	0.0000
2	60	1.9583	0.0000	0.0000	-	0.0000
3	90	1.9583	0.0000	0.0000	-	0.0000
4	120	1.9583	0.0000	0.0000	-	0.0000
5	150	1.9583	0.0000	0.0000	-	0.0000
6	180	1.9583	0.0000	0.0000	-	0.0000
7	210	1.9583	0.0000	0.0000	-	0.0000
8	240	1.9583	0.0000	0.0000	-	0.0000

Average Of Reading's (in/hr)= 0.0000

Reported Percolation Rate (in/hr) = 0.0

Percolation Rates
Test Hole P-5
LOT D



APPENDIX E
Scale of Acceptable Risks from Geologic Hazards

APPENDIX E

SCALE OF ACCEPTABLE RISKS FROM NON-SEISMIC GEOLOGIC HAZARDS*

RISK LEVEL	STRUCTURE TYPE	RISK CHARACTERISTICS
EXTREMELY LOW RISKS	Structures whose continued functioning is critical, or whose failure might be catastrophic: nuclear reactors, large dams, power intently systems, plants manufacturing or storing explosive or toxic materials.	Failure affects substantial populations risk equals nearly zero.
VERY LOW RISKS	Structures whose use is critically needed after a disaster: important utility centers: hospitals: fire, police, and emergency communication facilities; fire stations; and critical transportation elements such as bridges and overpasses; also smaller dams.	Failure affects substantial populations.
LOW RISKS	Structures of high occupancy, or whose use after a disaster: important utility centers; hospitals; fire, police, and emergency communication facilities; fire stations; and critical transportation elements such as bridges and overpasses; also smaller dams.	Failure of a single structure would affect primary only the occupants.
"ORDINARY RISKS"	The vast majority of structures: most commercial and industrial buildings; small hotels and apartment buildings, and single-family residences.	Failure only affects owners/occupants of a structure rather than a substantial population. No significant potential for loss of life of serious physical injury. Risk level is similar or comparable to other ordinary risks (including seismic risks) to citizens of coastal California. No collapse of structures; structural damage limited to repairable damage in most cases. This degree of damage is unlikely as a result of storms with a repeat time of 50 years or less.
MODERATE RISKS	fences, driveways, non-habitable structures, detached retaining walls, sanitary landfills, recreation areas and open space.	Structure is not occupied or occupied infrequently. Low probability of physical injury. Moderate probability of collapse.

*Non-seismic geologic hazards include flooding, landslides, erosion, wave run-up and sinkhole collapse.

APPENDIX E
SCALES OF ACCEPTABLE RISKS FROM SEISMIC GEOLOGIC HAZARDS

LEVEL OF ACCEPTABLE RISK	KINDS OF STRUCTURES	EXTRA PROJECT COST PROBABLY REQUIRED TO REDUCE RISK TO AN ACCEPTABLE LEVEL
Extremely Low	Structures whose continued functioning is critical, or whose failure might be catastrophic nuclear reactors, large dams, power intently systems, plants manufacturing or storing explosives to toxic materials.	No set percentage (whatever is required for maximum attainable safety).
Slightly higher than under level 1 ¹	Structures whose use is critically needed after a disaster; important utility centers; hospitals; fire, police, and emergency communication facilities; fire station; and critical transportation elements such as bridges and overpasses; also smaller dams.	5 to 25 percent of project cost.
Lowest possible risk to occupants of the structure ³	Structures of high occupancy or whose use after a disaster would be particularly convenient; schools, churches, theaters, large hotels, and other high-rise buildings housing large numbers of people, other places normally attracting large concentrations of people civic buildings such as fire stations, secondary utility structures, extremely large commercial enterprises, most roads, alternative or non-critical bridges and overpasses.	5 to 15 percent of project cost.
An "ordinary" level or risk to occupants of the structure ^{3,5}	The vast majority of structures; most commercial and industrial buildings, small hotels and apartment buildings and single-family residences.	1 to 2 percent of project cost in most cases (2 to 10 percent of project cost in a minority of cases) ⁴

1. Failure of a single structure may affect substantial populations.
2. These additional percentages are based on the assumption that the base cost is the total cost of the building or other facility when ready for occupancy. In addition, it is assumed that the structure would have been designed and built in accordance with current California practice. Moreover, the estimated additional cost presumes that structures in this acceptable-risk category are to embody sufficient safety to remain functional following an earthquake.
3. Failure of single structure would affect primarily only the occupants.
4. These additional percentages are based on the assumption that the base cost is the total cost of the building or facility when ready for occupancy. In addition, it is assumed that the structures would have been designed and built in accordance with current California Practice. Moreover, the estimated additional cost presumes that structures in this acceptable-risk category are to be sufficiently safe to give reasonable assurance of preventing injury or loss of life during and following an earthquake, but otherwise not necessarily to remain functional.
5. "Ordinary Risk": Resist minor earthquakes without damage; resist moderate earthquakes without structural damage but with some non-structural damage; resist major earthquakes of the intensity or severity of the strongest experienced in California, without collapse, but with some structural, as well as non-structural damage. In most structures, it is expected that structural damage, even in a major earthquake, could be limited to repairable damage. (Structural Engineers Association of California).

Source: Meeting The Earthquake Challenge, Joint Committee on Seismic Safety of the California Legislature, January 1974, p.9.

APPENDIX F

Photographs



Drilling operations at test bore hole B1



Collection of spoils and mixing of grout at test bore hole B1



Grouting of test bore hole B1



Ground surface after drilling operation at test bore hole B1



Drill setup test bore hole B4



Ground surface after drilling operation test bore hole B4



Location of test bore hole B5



Drilling operation test bore hole B5



Grouting test bore hole B2



Drilling operation test bore hole B2



Grouting of test bore hole B3



County of San Mateo - Planning and Building Department

ATTACHMENT S1

ATTACHMENT S.1

HARO, KASUNICH AND ASSOCIATES, INC.

CONSULTING GEOTECHNICAL & COASTAL ENGINEERS

Project No. SM10391.2

26 May 2018

Revised: 13 June 2018

MR. OWEN LAWLOR
Moss Beach Associates LLC
c/o Lawlor Land Use
612 Spring Street
Santa Cruz, CA 95060-2030

Subject: Geotechnical Investigation Update

Reference: Five Home Residential Development
Vallemar Street and Juliana Avenue
APN's 037-086-23, -26, -27, -28, & -29
Moss Beach, California

Dear Mr. Lawlor:

At your request, we are updating our 12 August 2016 (Project Number SM10391.2) Geotechnical Investigation Report with additional recommendations and current California Building Code (CBC 2016) standards. We have reviewed our prior project file and geotechnical recommendations for this project.

Project plans have changed since our 2016 Report. The current plans provided by Mesiti-Miller Engineering, Inc. (Job No. 15147, Revision Date 8/23/2017) show the project site split into 4 lots (Figure No. 2). Refer to our 2016 Report's Figure No. 2 for the original lot designations when reviewing the 2016 Report.

The project site is located within a seismically active area and strong seismic shaking is expected to occur over the lifetime of the project. Structures should be designed and constructed in accordance with the most current CBC (2016) and the recommendations of this report to minimize reaction to seismic shaking.

The results of our geotechnical investigation indicate the proposed residential structure on Lot 4 could be subject to ground settlement on the order of 3.0 inches total and 1.5 inches differential as a result of liquefaction. The proposed garage on Lot 4 could be subject to ground settlement on the order of 9.0 to 10.0 inches total and 4.0 to 5.0 inches differential as a result of liquefaction. Given the site conditions, the proposed structures on Lot 4 should be supported by a stiffened foundation system such as a structural mat slab with thickened edges or a grid foundation. The stiffened foundation will allow the proposed structures to float over ground effects that may occur during seismic activity including span voids. The foundations may require re-leveling after a

design seismic event and should be evaluated by a licensed profession engineer with experience in foundation design after an earthquake. The stiffened foundation system should bear upon 24 inches of re-densified on-site soil in accordance with the recommendations of our August 2016 Report.

California Building Code (2016) Seismic Design Parameters

The improvements should be designed in conformance with the most current California Building Code (2016 CBC). For seismic design, the soil properties at the site are classified as **Site Class “D”** based on definitions presented in section 1613.3.2 in the 2016 CBC. The longitude and latitude were determined using a satellite image generated by Google Earth Pro. These coordinates were taken from the approximate middle of the area of the proposed improvements:

Longitude = -122.51675, Latitude = 37.53995

The coordinates listed above were used as inputs in the Java Ground Motion Parameter Calculator created by the USGS to determine the ground motion associated with the maximum considered earthquake (MCE) SM and the reduced ground motion for design SD. The results are as follows:

Site Class D

SM_s= 2.298 g

SM₁= 1.461 g

SD_s= 1.532 g

SD₁= 0.974 g

A maximum considered earthquake geometric mean (MCE_G) peak ground acceleration (PGA) was estimated using the Figure 22-7 of the ASCE Standard 7-10. The mapped PGA was 0.896 g and the site coefficient F_{PGA} for Site Class D is 1.0. The MCE_G peak ground acceleration adjusted for Site Class effects is PGA_M = F_{PGA} * PGA

$PGA_M = 1.0 * 0.896 \text{ g} = 0.896 \text{ g}$

Based on these considerations, the risk of substantial structural damage from earthquakes appears relatively low for well-built structures which incorporate lateral shear bracing and current California Building Code (CBC) requirements into their design and construction. These considerations will be the primary factors in reducing the potential for earthquake damage to the project in the future.

Geological Hazards

Liquefaction

During an earthquake, seismic waves travel through the earth and vibrate the ground. In cohesionless, granular material having low relative density (loose to medium dense sands for example), this vibration can disturb the particle framework leading to increased compaction of the material and reduction of pore space between the framework grains. If the sediment is saturated, water occupying the pore spaces resists this compaction and exerts pore pressure that reduces the contact stress between the sediment grains. With continued shaking, transfer of intergranular stress to pore water can generate pore pressures great enough to cause the sediment to lose its strength and change from a solid state to a liquefied state. This mechanical transformation termed liquefaction can cause various kinds of ground failure at or near the ground surface. The liquefaction process typically occurs at depths less than 50 feet below the ground surface. Liquefaction can occur at deeper intervals, given the right conditions, however ground manifestations have been found to be relatively minor.

Based on the presence of groundwater in our test borings B-3 and B-4, there is a moderate potential for liquefaction to occur at Lot 4 of the project site. A model was developed using our lab results and subsurface information collected from our test borings B-3 and B-4. The model was created using Liquefy Pro software to quantify potential for liquefaction, dynamic compaction, and related ground effects within the upper 33 to 39 feet below ground surface (bgs).

The coarse grained soil layers comprised of clayey sand or sand with silt were assumed to have potential for dynamic compaction and/or liquefaction where below the water table. The fine grained soils comprised of sandy clay are non-liquefiable and assigned that way in our model. The soil encountered in Test Boring 3 and Test Boring 4 were visually classified in the field following ASTM D2488 "Description and Identification of Soils Visual Manual Procedure". For use in our model the soil visually classified as sand with silt was assume to have a fines content of 5 percent and soil visually classified as clayey sand was assumed to have a fines content of 12 percent. This is on the low end of the fines content for both soil types so is considered conservative for use in the liquefaction analysis. The results of our analysis indicate there is potential for the sand with silt and or clayey sand layers to liquefy between approximately 17 to 33 feet bgs during ground shaking from a design seismic event.

The proposed residential structure on Lot 4 could be subject to ground settlement on the order of 3.0 inches total and 1.5 inches differential as a result of liquefaction. The proposed garage on Lot 4 could be subject to ground settlement on the order of 9.0 to 10.0 inches total and 4.0 to 5.0 inches differential as a result of liquefaction. Given the site conditions, the proposed structures on Lot 4 should be supported by a stiffened foundation system such as a structural mat slab with thickened edges or a grid

foundation. The stiffened foundation will allow the proposed structures to float over ground effects that may occur during seismic activity as well as span voids. The foundations may require re-leveling after a design seismic event and should be evaluated by a licensed profession engineer with experience in foundation design after an earthquake. The stiffened foundation systems (slab or grid) and its thickened edges should bear upon a minimum 24 inches of re-densified on-site soils in accordance with the recommendations of our August 2016 Report.

Building Codes and Site Class

Project design and construction should conform to the following current building codes:

- 2016 California Building Code (CBC); and
- 2016 Green Building Standards Code (CAL Green)

In accordance with section 1613.3.2 of the 2016 CBC, the project site should be assigned the Site Class D.

Soil Properties

Based on our field exploration and results of laboratory tests the soils encountered were simplified into two soil types. Soil Type 1: Clay Soil Coastal Terrace and Soil Type 2: Silt Sand Clay Mixture Terrace Deposit, Soil type 3: Bedrock Formation. The geotechnical strength parameters of the soil types are summarized in the table below.

Table 1: Geotechnical Design Values

Soil Stratum	γ_t (lbs/ft ³)	ϕ (degrees)	Cohesion (lbs/ft ²)
Soil 1	123	10	1000
Soil 2	113	43	0
Soil 3	135	45	1000

Quantitative Slope Stability Analysis

Stability analysis was performed on the worst case or critical cross section cut through the coastal bluff and Lot 4. The critical section (Cross Section 3) was selected by HKA and developed using a topographical map prepared by Gary Ifland surveyor, Inc. A copy of the slope stability cross section is included with this letter. The slope stability analysis

was performed to quantify the potential for bluff failure that could impact the proposed building site. It also corroborated the development of the recommended 50-year future coastal bluff recession slope stability setback line.

General Methodology

Slope failures or landslides can cause problems including encroachment and undermining of engineered structures. Failures of slopes occur when stress acting on the soil mass is greater than its internal strength (shear strength). A slope is considered stable when the strength of its soil mass is greater than the stress field acting within it. Some common variables influencing stress are gravity (steeper slopes), hydrostatic pressure (perched groundwater), bearing pressures (proposed structures), and seismic surcharge (earthquake shaking).

Various methods of analyzing stability of slopes yield a factor of safety. A factor of safety is determined by dividing the resisting forces within the slope soils by the driving forces within the slope (stress field). A factor of safety (FS) greater than or equal to 1.0 is considered to be in equilibrium. A FS less than 1.0 is a potentially un-stable slope condition. HKA considers the potential for instability of a slope or hillside with a FS against sliding greater than or equal to 1.10 under seismic loading conditions and 1.50 under static loading conditions to be low.

Quantitative Analysis with GSTABL7

The analysis was completed with the aid of GSTABL7 software. A model for the section was defined with the input parameters consisting of slope geometry, soil properties, loading conditions, and pore water pressure ratio. Each model was evaluated under static and seismic loading. The analysis calculates the factor of safety against sliding for the failure surface(s).

A critical surface was selected for this model based on the failure surface in the Coastal Bluff Recession Cross Section 3. GSTABL7 program uses the Janbu Method to determine normal and resistive forces in each slice. The forces in each slice are then summed up for total force acting on the mass.

Seismic Coefficient

The ground motion parameter used in pseudo static analysis is referred to as the seismic coefficient "k". The selection of a seismic coefficient has relied heavily on engineering judgment, local building code, and professional publications. Current version of the California Building Code contains reference to maps of peak ground acceleration (PGA) based on site latitude and longitude. For this project the mapped PGA is 0.896g. The PGA is multiplied by a factor related to the seismicity of the site to obtain the seismic coefficient. The factor was estimated to be 0.58 by using Figure 1 of Chapter 5 Analysis of Earthquake-Induced Landslide Hazards in CGS *Special*

Publication 117 Guidelines For Analyzing and Mitigating Seismic Hazards in California 2008.

The multiplying factor was developed as part of a screen analysis procedure for seismic slope stability by Stewart, Blake, and Hollingsworth. The multiplier results in a percentage of the peak which represents the more repeatable ground motion. The assumption is the site can tolerate at least 2 inches of displacement during a design seismic event. The higher the multiplying factor the less displacement during a design seismic event is assumed to be tolerable by site improvements. For example if the full peak ground acceleration is used in the analysis (multiplier of 1.0) it is assumed 0 inches of displacement is tolerated during a design seismic event. For this project we assumed 2 inches of ground displacement is tolerable resulting a horizontal seismic coefficient of 0.513g.

Geometric Assumptions

For our analysis, the failure surface was focused within Soil 1 "Unclassified Fill and Coastal Terrace Deposits" due to its vulnerability to bluff failures relative to Soil 2 "Bedrock Formation" which is much more resistance to erosional processes and slope failures.

Slope Stability Conclusions

The computed factors of safety for the trial failure surfaces are greater than 1.50 under static loading conditions and 1.10 for pseudo-static conditions. The results of our analysis indicate that the portion of the coastal bluff comprised of terrace deposits is stable at slope gradients of 1.5:1 (H:V) or flatter. Based on these results the potential for instability of the coastal bluff impacting the proposed home sites is low. However, portions of the coastal bluff that have slope gradients steeper than 1.5:1 (H:V) are predicted to have bluff failures until the slope gradient recesses to 1.5:1 (H:V). A portion of the coastal terrace deposit portion of the bluff along Cross Section 1 and 4 are flatter than 1.5:1 (H:V). These slope gradients are estimated to be stable and therefore slope stability analysis was not performed on these cross sections. Section 2 is similar to Section 3 but a little flatter and qualitatively would have a higher factor of safety against sliding compared to Section 3. The results of the slope stability analyses are summarized in the following table as well as presented graphically in Appendix of this letter.

Table 2: Slope Stability Analysis Results

Bluff Recession Section	Loading Condition	Minimum Factor of Safety Against Sliding	Meet or Exceed Required FS
3	Static	2.26	Yes
3	Pseudo Static	1.14	Yes

Limitations of Analysis

It must be cautioned that slope stability analysis is an inexact science; and that the mathematical models of the slopes and soils contain many simplifying assumptions, not the least of which is homogeneity. Density, moisture content and shear strength may vary within a soil type. There may be localized areas of low strength or perched ground water within a soil. Slope stability analyses and the generated factors of safety should be used as indicating trend lines. A slope with a safety factor less than one will not necessarily fail, but the probability of slope movement will be greater than a slope with a higher safety factor. Conversely, a slope with a safety factor greater than one may fail, but the probability of stability is higher than a slope with a lower safety factor.

Additional Geotechnical Recommendations

Based on review of our prior Geotechnical Investigation and associated addendums, we present the following additional recommendations to be used as guidelines for preparing project plans and specifications. All recommendations from Haro, Kasunich & Associates' (HKA) 12 August 2016 Geotechnical Investigation Report should be followed as well. Lots 1, 2 & 3 should have foundations designed per 2016 Report.

Stiffened Foundations for Lot 4

1. Based on the site and soil characteristics, the proposed residential structures should be supported by a stiffened foundation system such as a structural slab with thickened edges or a grid foundation. The stiffened foundation system including thickened edges should bear upon a minimum 24 inches of engineered fill, moisture conditioned, and compacted in accordance with this report. Refer to the *Site Grading* section.
2. The structural slab should be a minimum 10 inches thick with minimum 12 inch thick edges embedded a minimum 8 inches below ground surface. If a grid foundation is selected it should be a minimum 24 inches thick and 18 inches wide with a minimum two (2) – No. 6 steel reinforcement placed top and bottom. Actual dimensions of the foundation and reinforcing should be provided by the

project structural designer based on the actual loads transmitted to the foundation.

3. Stiffened foundations constructed to the given criteria may be designed for the following allowable bearing capacities:
 - a) *Grid Foundation*: 1,200 psf for dead plus live loads for 24 inch deep footing depth.
 - b) *Structural Mat Slab Foundation*: refer to the appendix for bearing capacity graph and soil reaction modulus graph. Graphs assume 28'x28' garage slab and 45'x65' house slab.
 - c) A one-third increase for seismic loading
 - d) Coefficient of friction of 0.30
4. Foundation excavations should be thoroughly cleaned, moisture conditioned and observed by the HKA or representative prior to placing forms and steel. Observation of foundation excavations allows anticipated soil conditions to be correlated to those inferred from our investigation and to verify the foundation excavations are in accordance with our recommendations.
5. Provided our recommendations are incorporated into the design and construction of the project, the structural slab or grid foundation supporting the garage structure should be designed to tolerate on the order of 9.0 to 10.0 inches of total settlement and 4.0 to 5.0 inches of differential settlement. The structural slab or grid foundation system supporting the house on lot 4 should be designed to tolerate on the order of 3.0 inches of total settlement and 1.5 inch of differential settlement. Both garage and house foundation should be designed to span an unsupported length of 12 feet in diameter in any location within the interior and cantilever a distance of 5 feet along the edges. This evaluation for areas of non-support is purely empirical and not intended to model actual site performance. The purpose is to establish foundation stiffness to control differential movement.

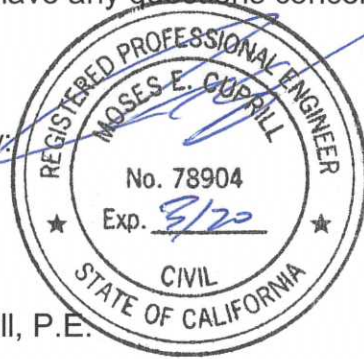
Plan Review, Construction Observation and Testing

The above recommendations and our 12 August 2016 Geotechnical Investigation Report should be used as guidelines for preparing project plans and specifications. **Haro, Kasunich & Associates** should be commissioned to review project grading and foundation plans before construction and to observe, test and advise during earthwork and foundation construction. This additional opportunity to examine the site will allow us to compare subsurface conditions exposed during construction with those inferred from this investigation. Unusual or unforeseen soil conditions may require supplemental evaluation by the geotechnical engineer.

Moss Beach Associates LLC
Project No. SM10391.2
Valleamar Street and Juliana Avenue
26 May 2018
Revised 13 June 2018
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Should you have any questions concerning this letter report, please call our office.

Reviewed by:



Respectfully Submitted,

HARO, KASUNICH & ASSOCIATES, INC.

Moses Cuprill, P.E.
C.E. 78904

Brian R. Shedden, P.E.
C.E. 84817

BRS/MC

Attachments

Copies: 3 to Addressee + pdf lawlor@gmail.com
pdf to rodney@m-me.com
Sherry Liu xliu@smcgov.org
Dave Holbrook dholbrook@smcgov.org

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations of this report are based upon the assumption the soil conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from what is planned at the time, our firm should be notified so supplemental recommendations can be given.
2. This report is issued with the understanding it is the responsibility of the owner, or his representative, to ensure the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and the necessary steps are taken to ensure the Contractors and Subcontractors carry out such recommendations in the field. The conclusions and recommendations contained herein are professional opinions derived in accordance with current standards of professional practice. No other warranty expressed or implied is made.
3. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside our control. Therefore, this report should not be relied upon after a period of three years without being reviewed by a geotechnical engineer.

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APPENDIX A

Site Vicinity Map

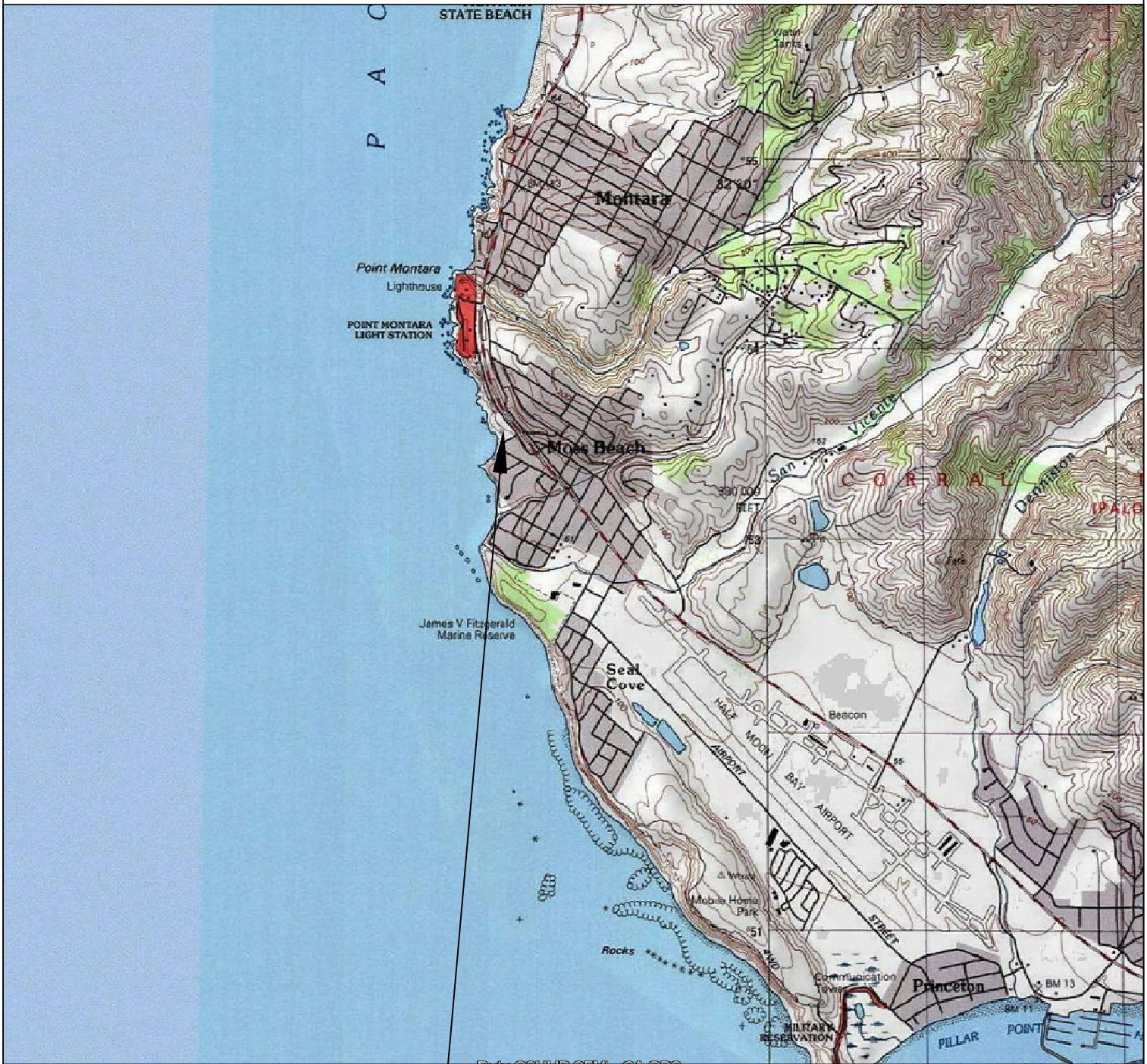
Boring Site Plan

Slope Stability Results

Liquefaction Results

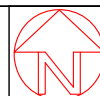
Allowable Bearing Capacity for Mat Foundations

Soil Reaction Modulus for Mat Foundations



SITE LOCATION

FROM:
USGS 20 ft. contour interval



SITE VICINITY MAP
VALLEMAR STREET & JULIANA AVENUE
MOSS BEACH, CALIFORNIA
MOSS BEACH ASSOCIATES

SCALE:	NTS
DRAWN BY:	BRS
DATE:	MAY 2018
REVISED:	
JOB NO.	SM10391.2

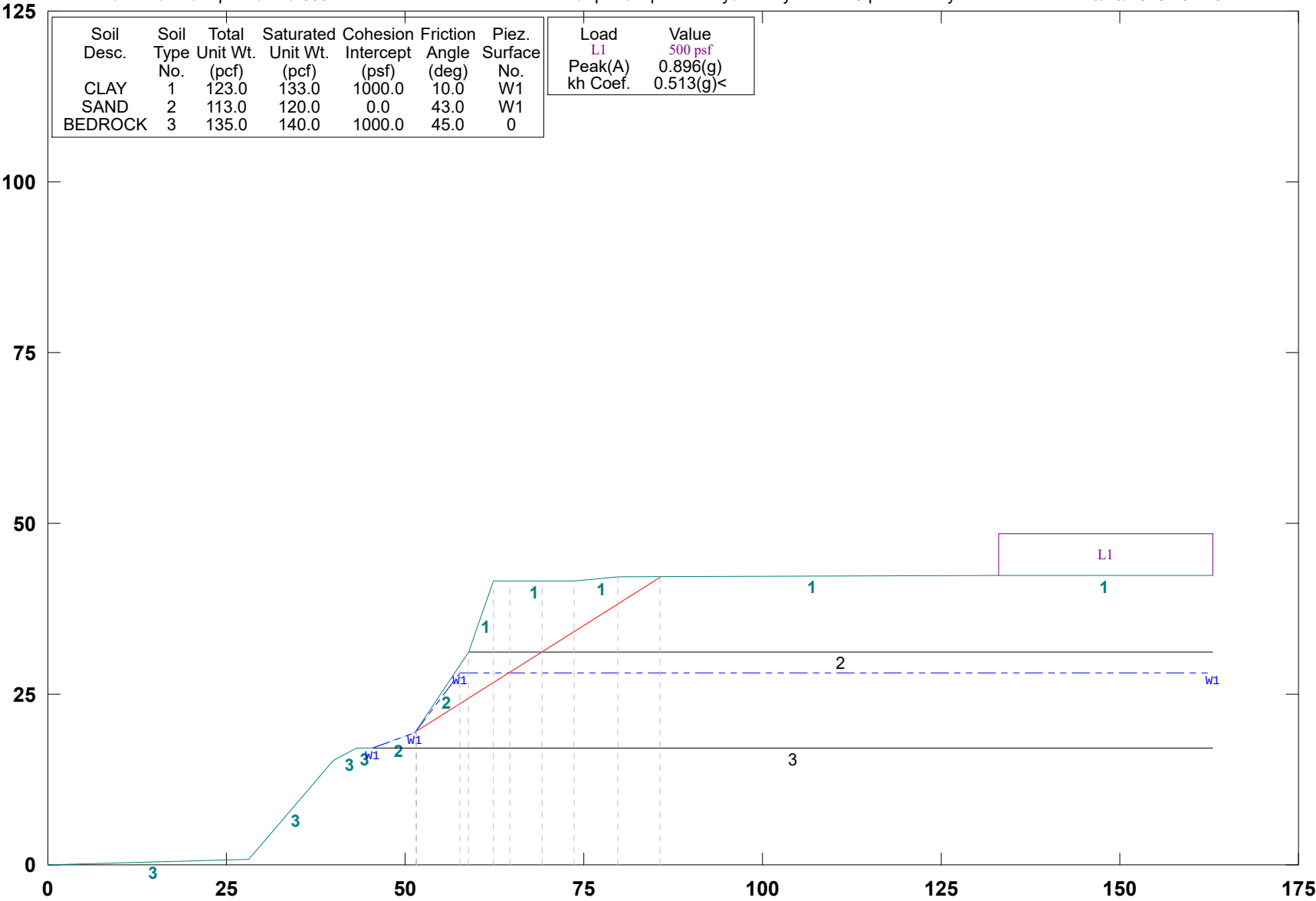
HARO, KASUNICH & ASSOCIATES, INC.
GEOTECHNICAL AND COASTAL ENGINEERS
116 E. LAKE AVENUE, WATSONVILLE, CA 95076
(831) 722-4175

FIGURE NO. 1

SHEET NO.

VALLEMAR ST AND JULIANA AVE SLOPE ST ABILITY ANALYSIS SECTION 3

c:\users\hka\dropbox\hka\10391.2 vallemar street - moss beach\report\slope stability\stability section 3.plt Run By: Brian Shedden 6/13/2018 07:25PM



GSTABL7 v.2 FSmin=1.14
Factor Of Safety Is Calculated By The Simplified Janbu Method

*** GSTABL7 ***

** GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.2, Jan. 2011 **

(All Rights Reserved-Unauthorized Use Prohibited)

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer & Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 6/13/2018

Time of Run: 07:25PM

Run By: Brian Shedden

Input Data Filename: C:\Users\HKA\Dropbox\HKA\10391.2 Vallemar Street - Moss Beach\REPORT\Slope Stability\stability section 3.in

Output Filename: C:\Users\HKA\Dropbox\HKA\10391.2 Vallemar Street - Moss Beach\REPORT\Slope Stability\stability section 3.OUT

Unit System: English

Plotted Output Filename: C:\Users\HKA\Dropbox\HKA\10391.2 Vallemar Street - Moss Beach\REPORT\Slope Stability\stability section 3.PLT

PROBLEM DESCRIPTION: VALLEMAR ST AND JULIANA AVE SLOPE STABILITY ANALYSIS SECTION 3

BOUNDARY COORDINATES

11 Top Boundaries

13 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	0.00	28.20	0.80	3
2	28.20	0.80	40.00	15.20	3
3	40.00	15.20	43.20	17.10	3
4	43.20	17.10	45.40	17.20	3
5	45.40	17.20	51.40	19.30	2
6	51.40	19.30	58.80	31.20	2
7	58.80	31.20	62.30	41.50	1
8	62.30	41.50	73.70	41.50	1
9	73.70	41.50	79.80	42.20	1
10	79.80	42.20	132.70	42.30	1
11	132.70	42.30	163.00	42.30	1
12	58.80	31.20	163.00	31.20	2
13	45.40	17.20	163.00	17.20	3

Default Y-Origin = 0.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param. (psf)	Pressure Constant (psf)	Piez. Surface No.
1	123.0	133.0	1000.0	10.0	0.00	0.0	1
2	113.0	120.0	0.0	43.0	0.00	0.0	1
3	135.0	140.0	1000.0	45.0	0.00	0.0	0

1 PIEZOMETRIC SURFACE(S) SPECIFIED

Unit Weight of Water = 62.40 (pcf)

Piezometric Surface No. 1 Specified by 4 Coordinate Points

Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	45.40	17.20
2	51.40	19.30
3	57.60	28.20
4	163.00	28.20

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	133.00	163.00	500.0	0.0

NOTE - Intensity Is Specified As A Uniformly Distributed

Force Acting On A Horizontally Projected Surface.

Specified Peak Ground Acceleration Coefficient (A) = 0.896(g)

Specified Horizontal Earthquake Coefficient (kh) = 0.513(g)

Specified Vertical Earthquake Coefficient (kv) = 0.000(g)

Specified Seismic Pore-Pressure Factor = 0.000

Janbu's Empirical Coef. is being used for the case of c & phi both > 0

Trial Failure Surface Specified By 2 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	51.500	19.461
2	85.720	42.211

Janbu's Empirical Coefficient (fo) = 1.000

* * Factor Of Safety Is Calculated By The Simplified Janbu Method * *

Factor Of Safety For The Preceding Specified Surface = 1.142

Table 1 - Individual Data on the 9 Slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Surcharge Ver (lbs)	Load (lbs)
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	6.1	2049.2	0.0	707.5	0.0	0.0	1051.2	0.0	0.0
3	1.2	893.0	0.0	385.3	0.0	0.0	458.1	0.0	0.0
4	3.5	4547.0	0.0	714.0	0.0	0.0	2332.6	0.0	0.0
5	2.3	3985.3	0.0	137.0	0.0	0.0	2044.5	0.0	0.0
6	4.5	6481.7	0.0	0.0	0.0	0.0	3325.1	0.0	0.0
7	4.5	4911.2	0.0	0.0	0.0	0.0	2519.5	0.0	0.0
8	6.1	4203.4	0.0	0.0	0.0	0.0	2156.4	0.0	0.0
9	5.9	1428.9	0.0	0.0	0.0	0.0	733.0	0.0	0.0

Table 2 - Base Stress Data on the 9 Slices

Slice No.	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	33.62	51.51	0.03	0.87	1.17
2	33.62	54.56	7.30	174.37	330.71
3	33.62	58.20	1.44	346.06	729.90
4	33.62	60.55	4.20	819.65	1274.26
5	33.62	63.47	2.82	1198.20	1666.89
6	33.62	66.90	5.42	1042.58	1408.88
7	33.62	71.43	5.45	1296.68	1060.46
8	33.62	76.75	7.33	1221.38	675.88
9	33.62	82.76	7.11	1135.41	236.74

Sum of the Resisting Forces (including Pier/Pile, Tieback, Reinforcing

Soil Nail, and Applied Forces if applicable) = 38340.75 (lbs)

Average Available Shear Strength (including Tieback, Pier/Pile, Reinforcing,

Soil Nail, and Applied Forces if applicable) = 933.04(psf)

Sum of the Driving Forces = 33567.70 (lbs)

Average Mobilized Shear Stress = 816.88(psf)

Total length of the failure surface = 41.09(ft)

*** SEISMIC SLOPE DISPLACEMENT DATA ***

(Note: kv is set = zero for displacement calculations)

Seismic Yield Coefficient (ky) = 0.6451(g)

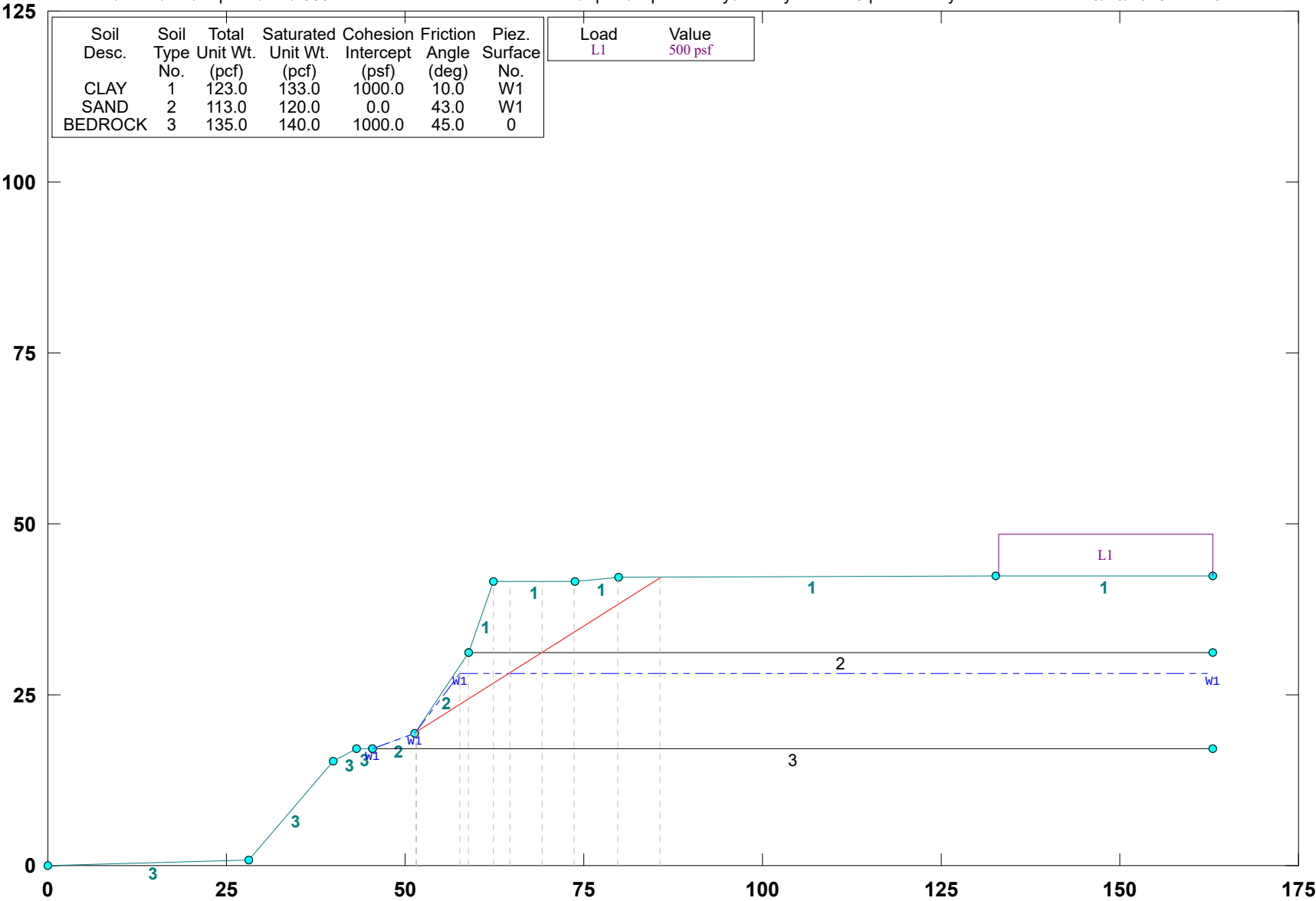
Calculated Newmark Seismic Displacement = 0.168(ft)

Non-Symmetrical Sliding Resistance Has Been Specified for Downhill Sliding.

**** END OF GSTABL7 OUTPUT ****

VALLEMAR ST AND JULIANA AVE SLOPE ST ABILITY ANALYSIS SECTION 3

c:\users\hka\dropbox\hka\10391.2 vallemar street - moss beach\report\slope stability\stability section 3.plt Run By: Brian Shedden 5/26/2018 11:26AM



GSTABL7 v.2 FSmin=2.24
Factor Of Safety Is Calculated By The Simplified Janbu Method

*** GSTABL7 ***

** GSTABL7 by Dr. Garry H. Gregory, Ph.D., P.E., D.GE **

** Original Version 1.0, January 1996; Current Ver. 2.005.2, Jan. 2011 **

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SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.

(Includes Spencer & Morgenstern-Price Type Analysis)

Including Pier/Pile, Reinforcement, Soil Nail, Tieback,

Nonlinear Undrained Shear Strength, Curved Phi Envelope,

Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water

Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 5/26/2018

Time of Run: 11:26AM

Run By: Brian Shedden

Input Data Filename: C:\Users\HKA\Dropbox\HKA\10391.2 Vallemar Street - Moss Beach\REPORT\Slope Stability\stability section 3.in

Output Filename: C:\Users\HKA\Dropbox\HKA\10391.2 Vallemar Street - Moss Beach\REPORT\Slope Stability\stability section 3.OUT

Unit System: English

Plotted Output Filename: C:\Users\HKA\Dropbox\HKA\10391.2 Vallemar Street - Moss Beach\REPORT\Slope Stability\stability section 3.PLT

PROBLEM DESCRIPTION: VALLEMAR ST AND JULIANA AVE SLOPE STABILITY ANALYSIS SECTION 3

BOUNDARY COORDINATES

11 Top Boundaries

13 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	0.00	28.20	0.80	3
2	28.20	0.80	40.00	15.20	3
3	40.00	15.20	43.20	17.10	3
4	43.20	17.10	45.40	17.20	3
5	45.40	17.20	51.40	19.30	2
6	51.40	19.30	58.80	31.20	2
7	58.80	31.20	62.30	41.50	1
8	62.30	41.50	73.70	41.50	1
9	73.70	41.50	79.80	42.20	1
10	79.80	42.20	132.70	42.30	1
11	132.70	42.30	163.00	42.30	1
12	58.80	31.20	163.00	31.20	2
13	45.40	17.20	163.00	17.20	3

Default Y-Origin = 0.00(ft)

Default X-Plus Value = 0.00(ft)

Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

3 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param. (psf)	Pressure Constant (psf)	Piez. Surface No.
1	123.0	133.0	1000.0	10.0	0.00	0.0	1
2	113.0	120.0	0.0	43.0	0.00	0.0	1
3	135.0	140.0	1000.0	45.0	0.00	0.0	0

1 PIEZOMETRIC SURFACE(S) SPECIFIED

Unit Weight of Water = 62.40 (pcf)

Piezometric Surface No. 1 Specified by 4 Coordinate Points

Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	45.40	17.20
2	51.40	19.30
3	57.60	28.20
4	163.00	28.20

BOUNDARY LOAD(S)

1 Load(s) Specified

Load No.	X-Left (ft)	X-Right (ft)	Intensity (psf)	Deflection (deg)
1	133.00	163.00	500.0	0.0

NOTE - Intensity Is Specified As A Uniformly Distributed

Force Acting On A Horizontally Projected Surface.
 Specified Peak Ground Acceleration Coefficient (A) = 0.890(g)
 Specified Horizontal Earthquake Coefficient (kh) = 0.510(g)
 Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
 Specified Seismic Pore-Pressure Factor = 0.000
 EARTHQUAKE DATA HAS BEEN SUPPRESSED
 Janbu's Empirical Coef. is being used for the case of c & phi both > 0
 Trial Failure Surface Specified By 2 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	51.500	19.461
2	85.720	42.211

Janbu's Empirical Coefficient (fo) = 1.000
 * * Factor Of Safety Is Calculated By The Simplified Janbu Method * *
 Factor Of Safety For The Preceding Specified Surface = 2.240

Table 1 - Individual Data on the 9 Slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Surcharge Force Ver (lbs)	Load (lbs)
1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
2	6.1	2049.2	0.0	707.5	0.0	0.0	0.0	0.0	0.0
3	1.2	893.0	0.0	385.3	0.0	0.0	0.0	0.0	0.0
4	3.5	4547.0	0.0	714.0	0.0	0.0	0.0	0.0	0.0
5	2.3	3985.3	0.0	137.0	0.0	0.0	0.0	0.0	0.0
6	4.5	6481.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	4.5	4911.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	6.1	4203.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	5.9	1428.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 2 - Base Stress Data on the 9 Slices

Slice No.	Alpha (deg)	X-Coord. Slice Cntr (ft)	Base Leng. (ft)	Available Shear Strength (psf)	Mobilized Shear Stress (psf)
1	33.62	51.51	0.03	1.05	0.66
2	33.62	54.56	7.30	210.70	186.67
3	33.62	58.20	1.44	418.17	411.99
4	33.62	60.55	4.20	990.45	719.26
5	33.62	63.47	2.82	1447.87	940.88
6	33.62	66.90	5.42	1259.83	795.25
7	33.62	71.43	5.45	1358.66	598.58
8	33.62	76.75	7.33	1279.77	381.50
9	33.62	82.76	7.11	1189.68	133.63

Sum of the Resisting Forces (including Pier/Pile, Tieback, Reinforcing Soil Nail, and Applied Forces if applicable) = 42446.45 (lbs)
 Average Available Shear Strength (including Tieback, Pier/Pile, Reinforcing, Soil Nail, and Applied Forces if applicable) = 1032.95(psf)
 Sum of the Driving Forces = 18947.37 (lbs)
 Average Mobilized Shear Stress = 461.09(psf)
 Total length of the failure surface = 41.09(ft)

**** END OF GSTABL7 OUTPUT ****

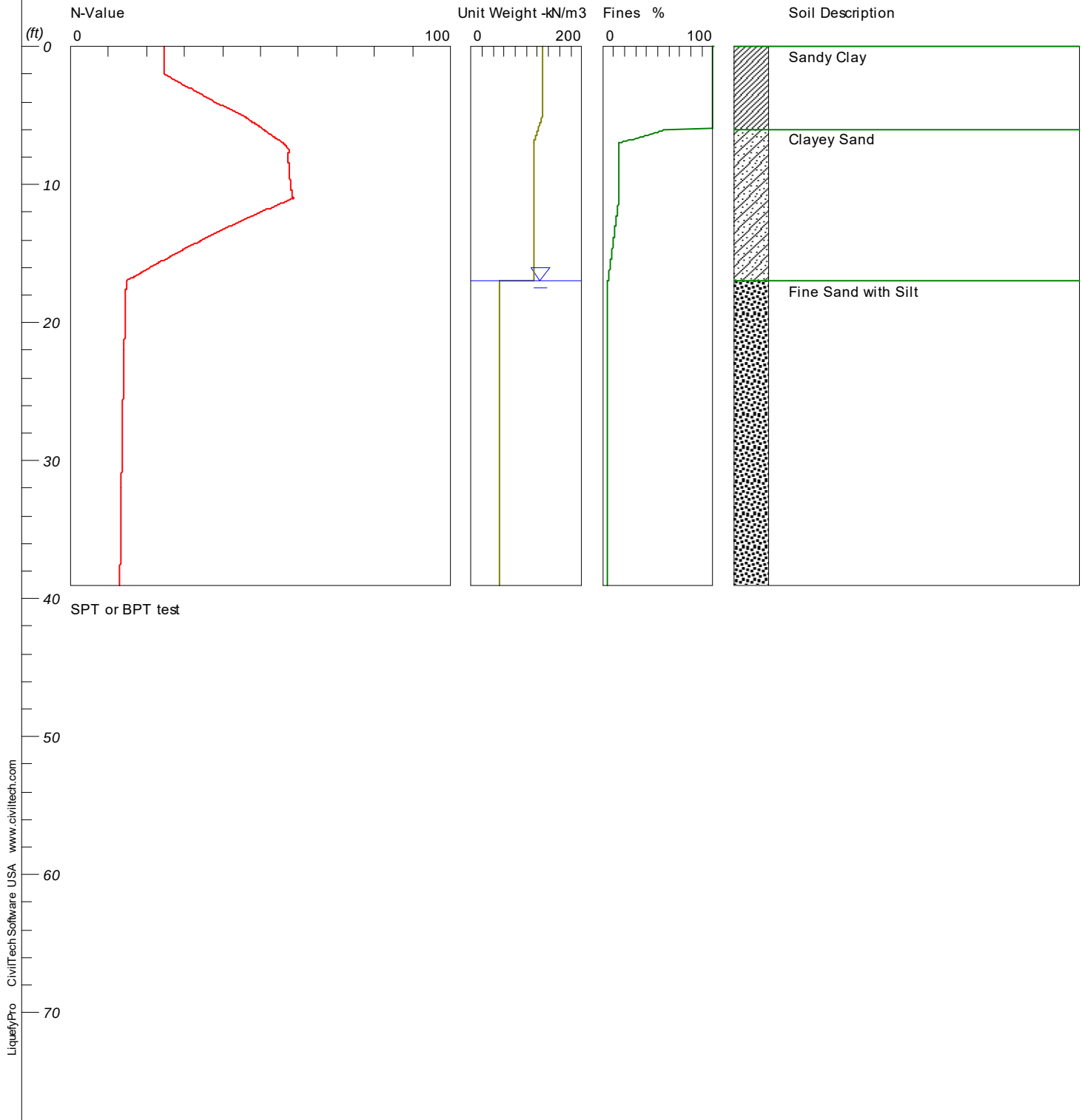
LIQUEFACTION ANALYSIS

SM10391.2 VALLEMAR ST MOSS BEACH

Hole No.=3 Water Depth=17 ft Surface Elev.=56.5

Ground Improvement of Fill=7.5 ft

Magnitude=8
Acceleration=.896g

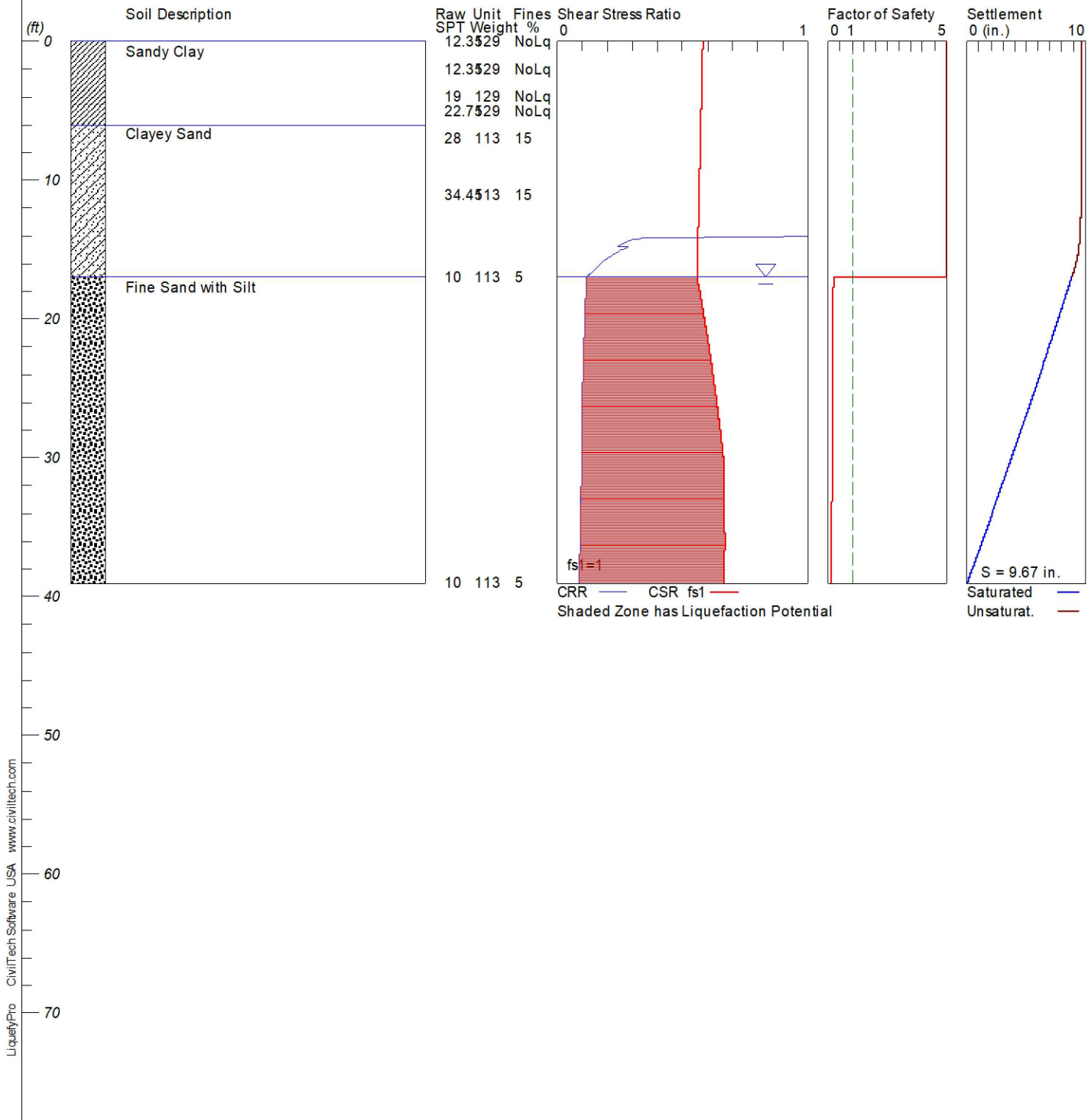


LIQUEFACTION ANALYSIS

SM10391.2 VALLEMAR ST MOSS BEACH

Hole No.=3 Water Depth=17 ft Surface Elev.=56.5
Ground Improvement of Fill=7.5 ft

Magnitude=8
Acceleration=.896g



Haro Kasunich and Associates

BORING B-3

1

liquefaction B-3.cal

LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Font: Courier New, Regular, Size 8 is recommended for this report.
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Input File Name: C:\Users\Moses\Documents\Projects\San Mateo\Coastal
Bluff\10391 Vallemor Bluff\2018 Update\Liquefaction\liquefaction B-3.liq
Title: SM10391.2 VALLEMAR ST MOSS BEACH
Subtitle: BORING B-3

Input Data:

Surface Elev.=56.5
Hole No.=3
Depth of Hole=39.00 ft
Water Table during Earthquake= 17.00 ft
Water Table during In-Situ Testing= 17.00 ft
Max. Acceleration=0.9 g
Earthquake Magnitude=8.00
No-Liquefiable Soils: CL, OL are Non-Liq. Soil
1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Modify Stark/Olson
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = .89
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1
9. User request factor of safety (apply to CSR) , User= 1
Plot one CSR curve (fs1=1)
10. Average two input data between two Depths: Yes*
* Recommended Options

Fill on Ground Surface= 7.5 ft Fill Unit Weight= 125 pcf
Factor of soil strength (SPT or CPT) change due to fill= 1
Depth of this report is based on original ground surface, not based on fill
1 atm (atmosphere) = 1 tsf (ton/ft2)

In-Situ Test Data:

Depth	SPT	Gamma	Fines
-------	-----	-------	-------

			liquefaction B-3.cal
ft		pcf	%
0.00	12.35	129.00	NoLiq
2.00	12.35	129.00	NoLiq
4.00	19.00	129.00	NoLiq
5.00	22.75	129.00	NoLiq
7.00	28.00	113.00	15.00
11.00	34.45	113.00	15.00
17.00	10.00	113.00	5.00
39.00	10.00	113.00	5.00

Output Results:

Calculation segment, dz=0.050 ft

User defined Print Interval, dp=5.00 ft

Peak Ground Acceleration (PGA), a_max = 0.90g

CSR Calculation:

fs1	Depth	gamma	sigma	gamma'	sigma'	rd	mZ	a(z)	CSR	x
	=CSRfs ft	pcf	atm	pcf	atm		g	g		
—	0.00	129.00	0.443	129.00	0.443	1.00	0.000	0.896	0.58	
1.00	0.58									
	5.00	129.00	0.748	129.00	0.748	0.99	0.000	0.896	0.58	
1.00	0.58									
	10.00	113.00	1.023	113.00	1.023	0.98	0.000	0.896	0.57	
1.00	0.57									
	15.00	113.00	1.290	113.00	1.290	0.97	0.000	0.896	0.56	
1.00	0.56									
	20.00	113.00	1.557	50.60	1.468	0.95	0.000	0.896	0.59	
1.00	0.59									
	25.00	113.00	1.824	50.60	1.588	0.94	0.000	0.896	0.63	
1.00	0.63									
	30.00	113.00	2.091	50.60	1.707	0.93	0.000	0.896	0.66	
1.00	0.66									
	35.00	113.00	2.358	50.60	1.827	0.89	0.000	0.896	0.67	
1.00	0.67									

CSR is based on water table at 17.00 during earthquake
sigma and sigma' are based on fill on ground surface during earthquake

liquefaction B-3.cal

CRR Calculation from SPT or BPT data:

(N1)60f	Depth ft	SPT CRR7.5	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60
---------	-------------	---------------	------	----	---------------	----	--------	------------	---------

—	0.00	24.70	0.89	0.75	0.000	1.70	28.03	NoLiq	22.80
50.83	2.00								
	5.00	45.50	0.89	0.75	0.305	1.70	51.63	NoLiq	22.80
74.43	2.00								
	10.00	57.94	0.89	0.85	0.580	1.31	57.58	15.00	2.40
59.98	2.00								
	15.00	27.65	0.89	0.95	0.847	1.09	25.41	8.33	0.80
26.21	0.30								
	20.00	14.32	0.89	0.95	1.025	0.99	11.96	5.00	0.00
11.96	0.13								
	25.00	13.87	0.89	0.95	1.145	0.93	10.96	5.00	0.00
10.96	0.12								
	30.00	13.50	0.89	1.00	1.264	0.89	10.69	5.00	0.00
10.69	0.12								
	35.00	13.20	0.89	1.00	1.384	0.85	9.99	5.00	0.00
9.99	0.11								

CRR is based on water table at 17.00 during In-Situ Testing
SPT or CPT are increased due to increased overburden pressure

Factor of Safety, - Earthquake Magnitude= 8.00:

F.S.=CRRm/CSRfs	Depth ft	sigC' atm	CRR7.5	x Ksig	=CRRv	x MSF	=CRRm	CSRfs
-----------------	-------------	--------------	--------	--------	-------	-------	-------	-------

	0.00	0.00	2.00	1.00	2.00	0.85	2.00	0.58	5.00 ^
	5.00	0.20	2.00	1.00	2.00	0.85	2.00	0.58	5.00 ^
	10.00	0.38	2.00	1.00	2.00	0.85	1.69	0.57	5.00
	15.00	0.55	0.30	1.00	0.30	0.85	0.26	0.56	5.00
	20.00	0.67	0.13	1.00	0.13	0.85	0.11	0.59	0.19 *
	25.00	0.74	0.12	1.00	0.12	0.85	0.10	0.63	0.16 *
	30.00	0.82	0.12	1.00	0.12	0.85	0.10	0.66	0.15 *
	35.00	0.90	0.11	1.00	0.11	0.85	0.09	0.67	0.14 *

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)

^ No-liquefiable Soils or above Water Table.

(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

liquefaction B-3.cal

CPT convert to SPT for Settlement Analysis:

Fines Correction for Settlement Analysis:

Depth ft	Ic	qc/N60	qc1 atm	(N1)60	Fines %	d(N1)60	(N1)60s
0.00	-	-	-	50.83	NoLiq	0.00	50.83
5.00	-	-	-	74.43	NoLiq	0.00	74.43
10.00	-	-	-	59.98	15.00	0.00	59.98
15.00	-	-	-	26.21	8.33	0.00	26.21
20.00	-	-	-	11.96	5.00	0.00	11.96
25.00	-	-	-	10.96	5.00	0.00	10.96
30.00	-	-	-	10.69	5.00	0.00	10.69
35.00	-	-	-	9.99	5.00	0.00	9.99

(N1)60s has been fines corrected in liquefaction analysis, therefore
d(N1)60=0.

Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:

Settlement Analysis Method: Ishihara / Yoshimine

dsp	Depth	CSRsf	/ MSF*	=CSRm	F.S.	Fines	(N1)60s	Dr	ec	dsz
	S									
	ft					%		%	%	in.
in.	in.									
	38.95	0.67	1.00	0.67	0.13	5.00	9.51	49.36	3.583	
2.1E-2	0.021	0.021								
	35.00	0.67	1.00	0.67	0.14	5.00	9.99	50.51	3.482	
2.1E-2	1.673	1.694								
	30.00	0.66	1.00	0.66	0.15	5.00	10.69	52.16	3.364	
2.0E-2	2.054	3.748								
	25.00	0.63	1.00	0.63	0.16	5.00	10.96	52.79	3.319	
2.0E-2	2.010	5.758								
	20.00	0.59	1.00	0.59	0.19	5.00	11.96	55.02	3.160	
1.9E-2	1.945	7.703								
	17.00	0.56	1.00	0.56	0.21	5.00	12.68	56.58	3.049	
1.8E-2	1.118	8.821								

Settlement of Saturated Sands=8.821 in.

qc1 and (N1)60 is after fines correction in liquefaction analysis

dsz is per each segment, dz=0.05 ft

dsp is per each print interval, dp=5.00 ft

S is cumulated settlement at this depth

liquefaction B-3.cal

Settlement of Unsaturated Sands:

ec	Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec
	dsz	dsp	S							
	ft	atm	atm			atm			%	
%	in.	in.	in.							

	16.95	0.95	0.62	12.99	0.56	825.72	6.4E-4	1.0000	1.7172	
1.15	1.9811	2.38E-2	0.024	0.024						
	15.00	0.85	0.55	26.21	0.56	984.30	4.8E-4	0.8291	0.5723	
1.15	0.6603	7.92E-3	0.575	0.599						
	10.00	0.58	0.38	59.98	0.57	1072.95	3.1E-4	0.0950	0.0300	
1.15	0.0346	4.16E-4	0.208	0.808						
	5.00	0.30	0.20	74.43	0.58	836.13	2.1E-4	0.0419	0.0133	
1.15	0.0153	0.00E0	0.045	0.853						
	0.00	0.00	0.00	50.83	0.58	4.22	1.4E-6	0.0010	0.0003	
1.15	0.0004	0.00E0	0.000	0.853						

Settlement of Unsaturated Sands=0.853 in.

dsz is per each segment, dz=0.05 ft

dsp is per each print interval, dp=5.00 ft

S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=9.674 in.

Differential Settlement=4.837 to 6.385 in.

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere) = 1.0581 tsf(1 tsf = 1 ton/ft2 = 2 kip/ft2)

1 atm (atmosphere) = 101.325 kPa(1 kPa = 1 kN/m2 = 0.001 Mpa)

SPT Field data from Standard Penetration Test (SPT)

BPT Field data from Becker Penetration Test (BPT)

qc Field data from Cone Penetration Test (CPT) [atm (tsf)]

fs Friction from CPT testing [atm (tsf)]

Rf Ratio of fs/qc (%)

gamma Total unit weight of soil

gamma' Effective unit weight of soil

Fines Fines content [%]

D50 Mean grain size

Dr Relative Density

sigma Total vertical stress [atm]

```

                                liquefaction B-3.cal
sigma'      Effective vertical stress [atm]
sigC'      Effective confining pressure [atm]
rd          Acceleration reduction coefficient by Seed
a_max.      Peak Ground Acceleration (PGA) in ground surface
mZ          Linear acceleration reduction coefficient X depth
a_min.      Minimum acceleration under linear reduction, mZ
CRRv        CRR after overburden stress correction,  $CRRv = CRR_{7.5} * K_{sig}$ 
  CRR7.5    Cyclic resistance ratio (M=7.5)
  Ksig      Overburden stress correction factor for CRR7.5
  CRRm      After magnitude scaling correction  $CRRm = CRRv * MSF$ 
  MSF       Magnitude scaling factor from M=7.5 to user input M
  CSR       Cyclic stress ratio induced by earthquake
  CSRfs      $CSRfs = CSR * fs1$  (Default  $fs1 = 1$ )
    fs1     First CSR curve in graphic defined in #9 of Advanced page
    fs2     2nd CSR curve in graphic defined in #9 of Advanced page
    F.S.     Calculated factor of safety against liquefaction
F.S.=CRRm/CSRsf
  Cebs      Energy Ratio, Borehole Dia., and Sampling Method
Corrections
  Cr        Rod Length Corrections
  Cn        Overburden Pressure Correction
  (N1)60    SPT after corrections,  $(N1)60 = SPT * Cr * Cn * Cebs$ 
  d(N1)60    Fines correction of SPT
  (N1)60f     $(N1)60$  after fines corrections,  $(N1)60f = (N1)60 + d(N1)60$ 
  Cq        Overburden stress correction factor
  qc1       CPT after Overburden stress correction
  dqc1      Fines correction of CPT
  qc1f      CPT after Fines and Overburden correction,  $qc1f = qc1 + dqc1$ 
  qc1n      CPT after normalization in Robertson's method
  Kc        Fine correction factor in Robertson's Method
  qc1f      CPT after Fines correction in Robertson's Method
  Ic        Soil type index in Suzuki's and Robertson's Methods
  (N1)60s     $(N1)60$  after settlement fines corrections
  CSRm      After magnitude scaling correction for Settlement
calculation CSRm=CSRsf / MSF*
  CSRfs     Cyclic stress ratio induced by earthquake with user
input fs
  MSF*      Scaling factor from CSR,  $MSF^* = 1$ , based on Item 2 of
Page C.
  ec        Volumetric strain for saturated sands
  dz        Calculation segment,  $dz = 0.050$  ft
  dsz       Settlement in each segment, dz
  dp        User defined print interval
  dsp       Settlement in each print interval, dp
  Gmax      Shear Modulus at low strain
  g_eff      $\gamma_{eff}$ , Effective shear Strain
  g*Ge/Gm    $\gamma_{eff} * G_{eff}/G_{max}$ , Strain-modulus ratio
  ec7.5     Volumetric Strain for magnitude=7.5

```

liquefaction B-3.cal

Cec	Magnitude correction factor for any magnitude
ec	Volumetric strain for unsaturated sands, $ec = Cec * ec7.5$
NoLiq	No-Liquefy Soils

References:

-
-
1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
 2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake Engineering and Soil Dynamics, San Diego, CA, March 2001.
 3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND CONSISTENT FRAMEWORK, Earthquake Engineering Research Center, Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

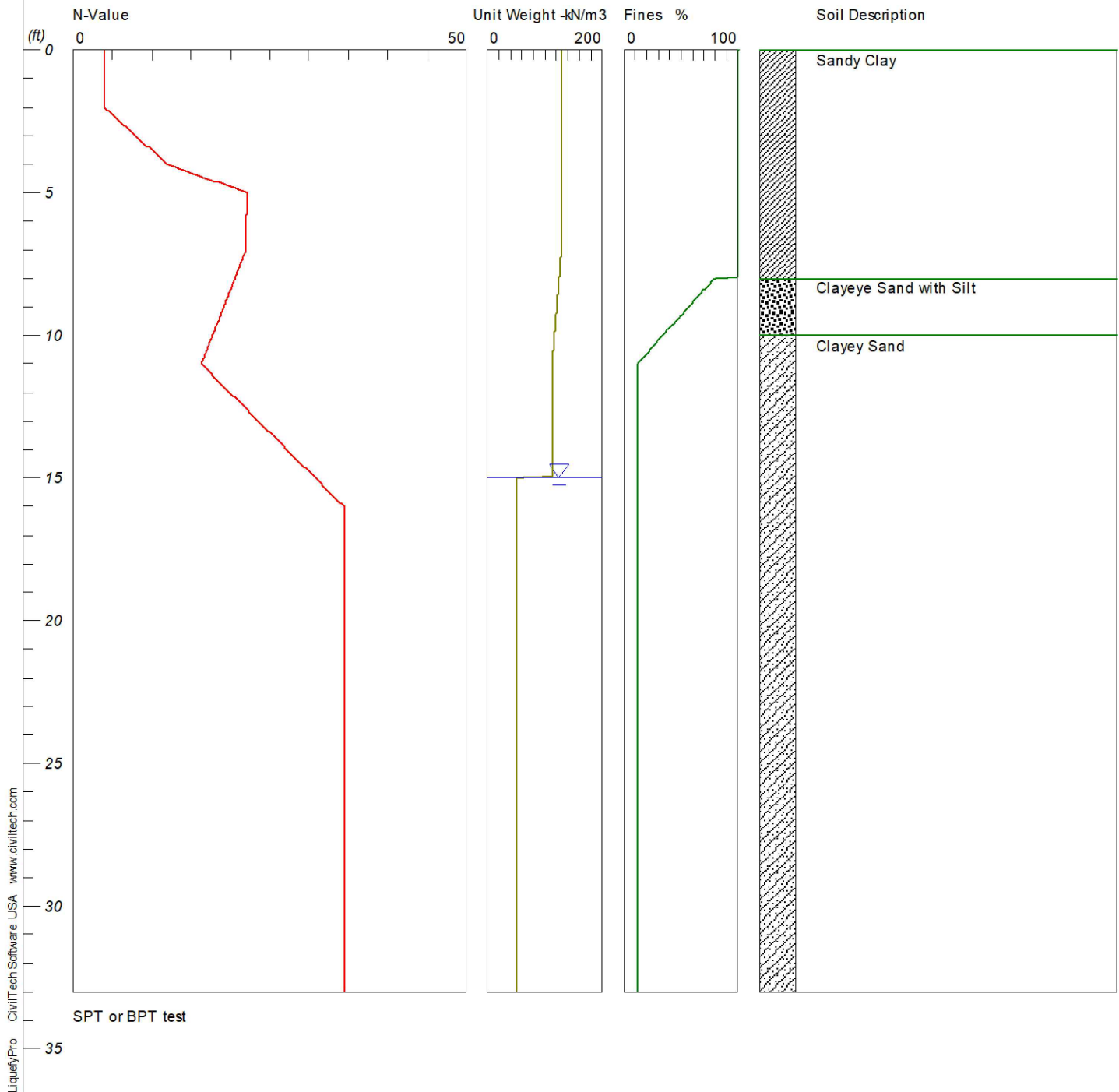
Note: Print Interval you selected does not show complete results. To get complete results, you should select 'Segment' in Print Interval (Item 12, Page C).

LIQUEFACTION ANALYSIS

SM10391.2 VALLEMAR ST MOSS BEACH

Hole No.=4 Water Depth=15 ft Surface Elev.=50.3

Magnitude=8
Acceleration=.896g

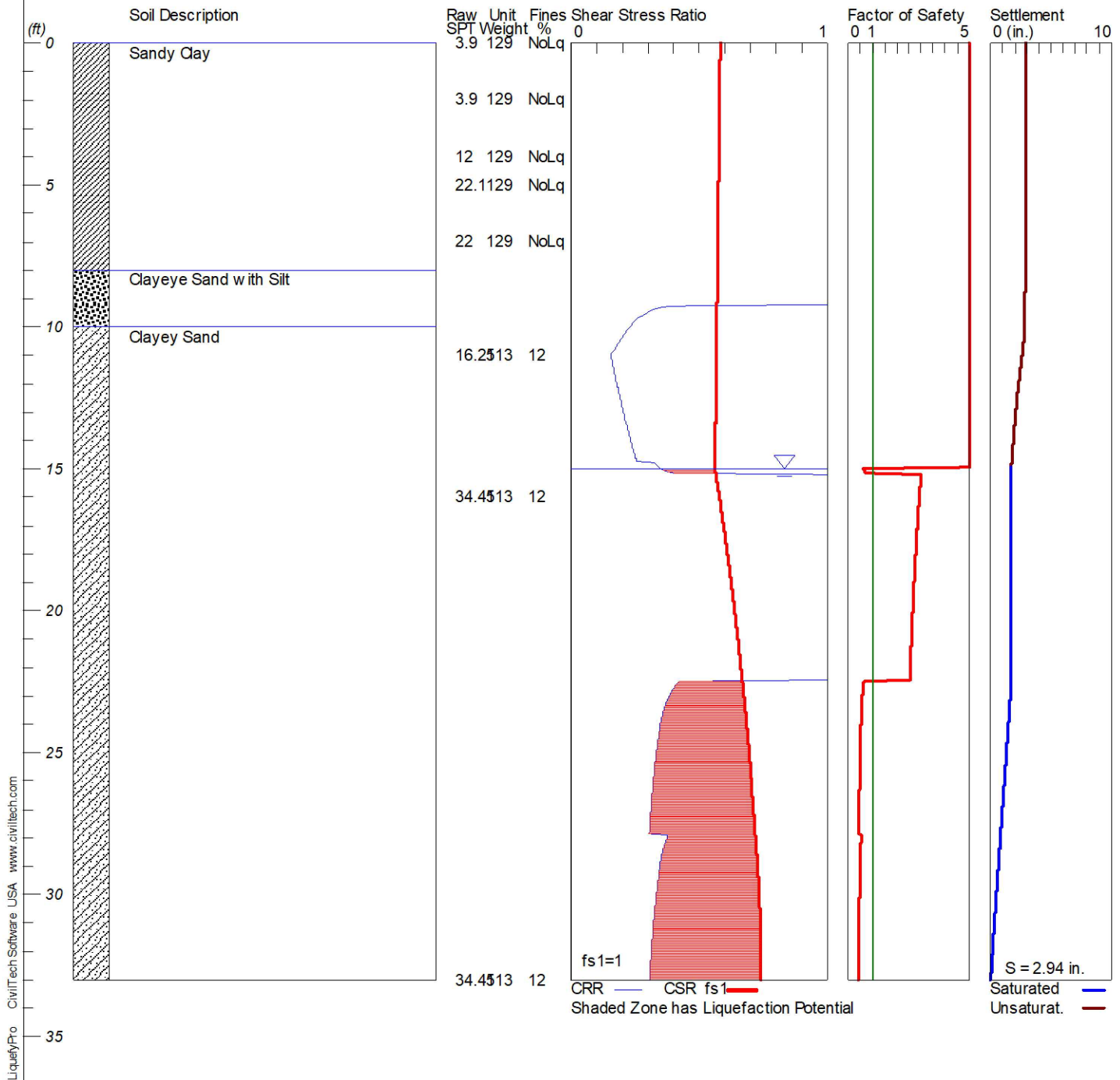


LIQUEFACTION ANALYSIS

SM10391.2 VALLEMAR ST MOSS BEACH

Hole No.=4 Water Depth=15 ft Surface Elev.=50.3

Magnitude=8
Acceleration=.896g



liquefaction B-4.cal

LIQUEFACTION ANALYSIS CALCULATION DETAILS

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Font: Courier New, Regular, Size 8 is recommended for this report.
Licensed to , 6/13/2018 4:38:11 PM

Input File Name: C:\Users\Moses\Documents\Projects\San Mateo\Coastal
Bluff\10391 Vallemor Bluff\2018 Update\Liquefaction\liquefaction B-4.liq
Title: SM10391.2 VALLEMAR ST MOSS BEACH
Subtitle: BORING B-4

Input Data:

Surface Elev.=50.3
Hole No.=4
Depth of Hole=33.00 ft
Water Table during Earthquake= 15.00 ft
Water Table during In-Situ Testing= 15.00 ft
Max. Acceleration=0.9 g
Earthquake Magnitude=8.00
No-Liquefiable Soils: CL, OL are Non-Liq. Soil
1. SPT or BPT Calculation.
2. Settlement Analysis Method: Ishihara / Yoshimine
3. Fines Correction for Liquefaction: Modify Stark/Olson
4. Fine Correction for Settlement: During Liquefaction*
5. Settlement Calculation in: All zones*
6. Hammer Energy Ratio, Ce = .89
7. Borehole Diameter, Cb= 1
8. Sampling Method, Cs= 1
9. User request factor of safety (apply to CSR) , User= 1
Plot one CSR curve (fs1=1)
10. Average two input data between two Depths: Yes*
* Recommended Options

In-Situ Test Data:

Depth ft	SPT	Gamma pcf	Fines %
0.00	3.90	129.00	NoLiq
2.00	3.90	129.00	NoLiq
4.00	12.00	129.00	NoLiq

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5.00	22.10	129.00	NoLiq
7.00	22.00	129.00	NoLiq
11.00	16.25	113.00	12.00
16.00	34.45	113.00	12.00
33.00	34.45	113.00	12.00

Output Results:

Calculation segment, dz=0.050 ft

User defined Print Interval, dp=5.00 ft

Peak Ground Acceleration (PGA), a_max = 0.90g

CSR Calculation:

fs1	Depth =CSRfs ft	gamma pcf	sigma atm	gamma' pcf	sigma' atm	rd	mZ g	a(z) g	CSR	x
-----	-----------------------	--------------	--------------	---------------	---------------	----	---------	-----------	-----	---

—	0.00	129.00	0.000	129.00	0.000	1.00	0.000	0.896	0.58	
1.00	0.58									
	5.00	129.00	0.305	129.00	0.305	0.99	0.000	0.896	0.58	
1.00	0.58									
	10.00	117.00	0.601	117.00	0.601	0.98	0.000	0.896	0.57	
1.00	0.57									
	15.00	113.00	0.869	50.60	0.869	0.97	0.000	0.896	0.56	
1.00	0.56									
	20.00	113.00	1.136	50.60	0.989	0.95	0.000	0.896	0.64	
1.00	0.64									
	25.00	113.00	1.403	50.60	1.108	0.94	0.000	0.896	0.69	
1.00	0.69									
	30.00	113.00	1.670	50.60	1.228	0.93	0.000	0.896	0.74	
1.00	0.74									

CSR is based on water table at 15.00 during earthquake

CRR Calculation from SPT or BPT data:

(N1)60f	Depth CRR7.5 ft	SPT	Cebs	Cr	sigma' atm	Cn	(N1)60	Fines %	d(N1)60
---------	-----------------------	-----	------	----	---------------	----	--------	------------	---------

—	0.00	3.90	0.89	0.75	0.000	1.70	4.43	NoLiq	22.80
---	------	------	------	------	-------	------	------	-------	-------

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27.23	0.32								
	5.00	22.10	0.89	0.75	0.305	1.70	25.08	NoLiq	22.80
47.88	2.00								
	10.00	17.69	0.89	0.85	0.601	1.29	17.26	34.25	7.02
24.28	0.27								
	15.00	30.81	0.89	0.95	0.869	1.07	27.94	12.00	1.68
29.62	0.41								
	20.00	34.45	0.89	0.95	0.989	1.01	29.29	12.00	1.68
30.97	2.00								
	25.00	34.45	0.89	0.95	1.108	0.95	27.67	12.00	1.68
29.35	0.39								
	30.00	34.45	0.89	1.00	1.228	0.90	27.67	12.00	1.68
29.35	0.39								

CRR is based on water table at 15.00 during In-Situ Testing

Factor of Safety, - Earthquake Magnitude= 8.00:

Depth sigC' CRR7.5 x Ksig =CRRv x MSF =CRRm CSRfs
F.S.=CRRm/CSRfs
ft atm

0.00	0.00	0.32	1.00	0.32	0.85	2.00	0.58	5.00 ^
5.00	0.20	2.00	1.00	2.00	0.85	2.00	0.58	5.00 ^
10.00	0.39	0.27	1.00	0.27	0.85	0.23	0.57	5.00
15.00	0.56	0.41	1.00	0.41	0.85	0.35	0.56	0.62 *
20.00	0.64	2.00	1.00	2.00	0.85	1.69	0.64	2.66
25.00	0.72	0.39	1.00	0.39	0.85	0.33	0.69	0.48 *
30.00	0.80	0.39	1.00	0.39	0.85	0.33	0.74	0.45 *

* F.S.<1: Liquefaction Potential Zone. (If above water table: F.S.=5)

^ No-liquefiable Soils or above Water Table.

(F.S. is limited to 5, CRR is limited to 2, CSR is limited to 2)

CPT convert to SPT for Settlement Analysis:

Fines Correction for Settlement Analysis:

Depth	Ic	qc/N60	qc1	(N1)60	Fines	d(N1)60	(N1)60s
ft			atm		%		
0.00	-	-	-	27.23	NoLiq	0.00	27.23
5.00	-	-	-	47.88	NoLiq	0.00	47.88
10.00	-	-	-	24.28	34.25	0.00	24.28
15.00	-	-	-	29.62	12.00	0.00	29.62
20.00	-	-	-	30.97	12.00	0.00	30.97
25.00	-	-	-	29.35	12.00	0.00	29.35
30.00	-	-	-	29.35	12.00	0.00	29.35

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(N1)60s has been fines corrected in liquefaction analysis, therefore
d(N1)60=0.

Fines=NoLiq means the soils are not liquefiable.

Settlement of Saturated Sands:

Settlement Analysis Method: Ishihara / Yoshimine

	Depth	CSRsf	/ MSF*	=CSRm	F.S.	Fines	(N1)60s	Dr	ec	dsz
dsp	S									
	ft					%		%	%	in.
in.	in.									

	32.95	0.74	1.00	0.74	0.41	12.00	28.59	86.95	1.450
8.7E-3	0.009	0.009							
	30.00	0.74	1.00	0.74	0.45	12.00	29.35	88.61	1.370
8.2E-3	0.499	0.508							
	25.00	0.69	1.00	0.69	0.48	12.00	29.35	88.60	1.364
8.2E-3	0.826	1.334							
	20.00	0.64	1.00	0.64	2.66	12.00	30.97	92.30	0.000
0.0E0	0.376	1.710							
	15.00	0.56	1.00	0.56	0.62	12.00	29.62	89.21	1.127
6.8E-3	0.025	1.735							

Settlement of Saturated Sands=1.735 in.

qc1 and (N1)60 is after fines correction in liquefaction analysis

dsz is per each segment, dz=0.05 ft

dsp is per each print interval, dp=5.00 ft

S is cumulated settlement at this depth

Settlement of Unsaturated Sands:

	Depth	sigma'	sigC'	(N1)60s	CSRsf	Gmax	g*Ge/Gm	g_eff	ec7.5	Cec
ec	dsz	dsp	S							
	ft	atm	atm			atm			%	
%	in.	in.	in.							

	14.95	0.87	0.56	29.50	0.56	1035.88	4.7E-4	0.6955	0.4060
1.15	0.4684	5.62E-3	0.006	0.006					
	10.00	0.60	0.39	24.28	0.57	808.65	4.2E-4	0.3758	0.2873
1.15	0.3315	3.98E-3	1.051	1.056					
	5.00	0.30	0.20	47.88	0.58	721.88	2.4E-4	0.0655	0.0207
1.15	0.0239	0.00E0	0.153	1.209					

				liquefaction B-4.cal					
	0.00	0.00	0.00	27.23	0.58	3.43	1.7E-6	0.0010	0.0007
1.15	0.0008	0.00E0	0.000	1.209					

Settlement of Unsaturated Sands=1.209 in.
 dsz is per each segment, dz=0.05 ft
 dsp is per each print interval, dp=5.00 ft
 S is cumulated settlement at this depth

Total Settlement of Saturated and Unsaturated Sands=2.944 in.
 Differential Settlement=1.472 to 1.943 in.

Units: Unit: qc, fs, Stress or Pressure = atm (1.0581tsf); Unit Weight = pcf; Depth = ft; Settlement = in.

1 atm (atmosphere)	= 1.0581 tsf(1 tsf = 1 ton/ft2 = 2 kip/ft2)
1 atm (atmosphere)	= 101.325 kPa(1 kPa = 1 kN/m2 = 0.001 Mpa)
SPT	Field data from Standard Penetration Test (SPT)
BPT	Field data from Becker Penetration Test (BPT)
qc	Field data from Cone Penetration Test (CPT) [atm (tsf)]
fs	Friction from CPT testing [atm (tsf)]
Rf	Ratio of fs/qc (%)
gamma	Total unit weight of soil
gamma'	Effective unit weight of soil
Fines	Fines content [%]
D50	Mean grain size
Dr	Relative Density
sigma	Total vertical stress [atm]
sigma'	Effective vertical stress [atm]
sigC'	Effective confining pressure [atm]
rd	Acceleration reduction coefficient by Seed
a_max.	Peak Ground Acceleration (PGA) in ground surface
mZ	Linear acceleration reduction coefficient X depth
a_min.	Minimum acceleration under linear reduction, mZ
CRRv	CRR after overburden stress correction, CRRv=CRR7.5 * Ksig
CRR7.5	Cyclic resistance ratio (M=7.5)
Ksig	Overburden stress correction factor for CRR7.5
CRRm	After magnitude scaling correction CRRm=CRRv * MSF
MSF	Magnitude scaling factor from M=7.5 to user input M
CSR	Cyclic stress ratio induced by earthquake
CSRfs	CSRfs=CSR*fs1 (Default fs1=1)
fs1	First CSR curve in graphic defined in #9 of Advanced page
fs2	2nd CSR curve in graphic defined in #9 of Advanced page
F.S.	Calculated factor of safety against liquefaction

F.S.=CRRm/CSRsf

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Cebs Energy Ratio, Borehole Dia., and Sampling Method
 Corrections
 Cr Rod Length Corrections
 Cn Overburden Pressure Correction
 (N1)60 SPT after corrections, $(N1)60 = SPT * Cr * Cn * Cebs$
 d(N1)60 Fines correction of SPT
 (N1)60f (N1)60 after fines corrections, $(N1)60f = (N1)60 + d(N1)60$
 Cq Overburden stress correction factor
 qc1 CPT after Overburden stress correction
 dqc1 Fines correction of CPT
 qc1f CPT after Fines and Overburden correction, $qc1f = qc1 + dqc1$
 qc1n CPT after normalization in Robertson's method
 Kc Fine correction factor in Robertson's Method
 qc1f CPT after Fines correction in Robertson's Method
 Ic Soil type index in Suzuki's and Robertson's Methods
 (N1)60s (N1)60 after settlement fines corrections
 CSRm After magnitude scaling correction for Settlement
 calculation $CSRm = CSRsf / MSF^*$
 CSRfs Cyclic stress ratio induced by earthquake with user
 input fs
 MSF* Scaling factor from CSR, $MSF^* = 1$, based on Item 2 of
 Page C.
 ec Volumetric strain for saturated sands
 dz Calculation segment, $dz = 0.050$ ft
 dsz Settlement in each segment, dz
 dp User defined print interval
 dsp Settlement in each print interval, dp
 Gmax Shear Modulus at low strain
 g_eff gamma_eff, Effective shear Strain
 g*Ge/Gm gamma_eff * G_eff/G_max, Strain-modulus ratio
 ec7.5 Volumetric Strain for magnitude=7.5
 Cec Magnitude correction factor for any magnitude
 ec Volumetric strain for unsaturated sands, $ec = Cec * ec7.5$
 NoLiq No-Liquefy Soils

References:

-
1. NCEER Workshop on Evaluation of Liquefaction Resistance of Soils. Youd, T.L., and Idriss, I.M., eds., Technical Report NCEER 97-0022.
 SP117. Southern California Earthquake Center. Recommended Procedures for Implementation of DMG Special Publication 117, Guidelines for Analyzing and Mitigating Liquefaction in California. University of Southern California. March 1999.
 2. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING AND SEISMIC SITE RESPONSE EVALUATION, Paper No. SPL-2, PROCEEDINGS: Fourth International Conference on Recent Advances in Geotechnical Earthquake

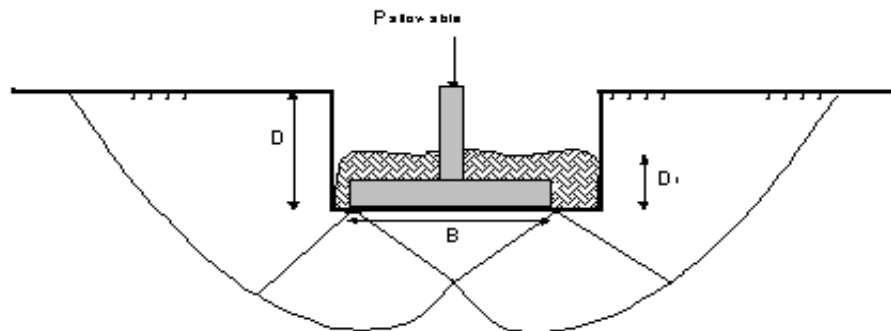
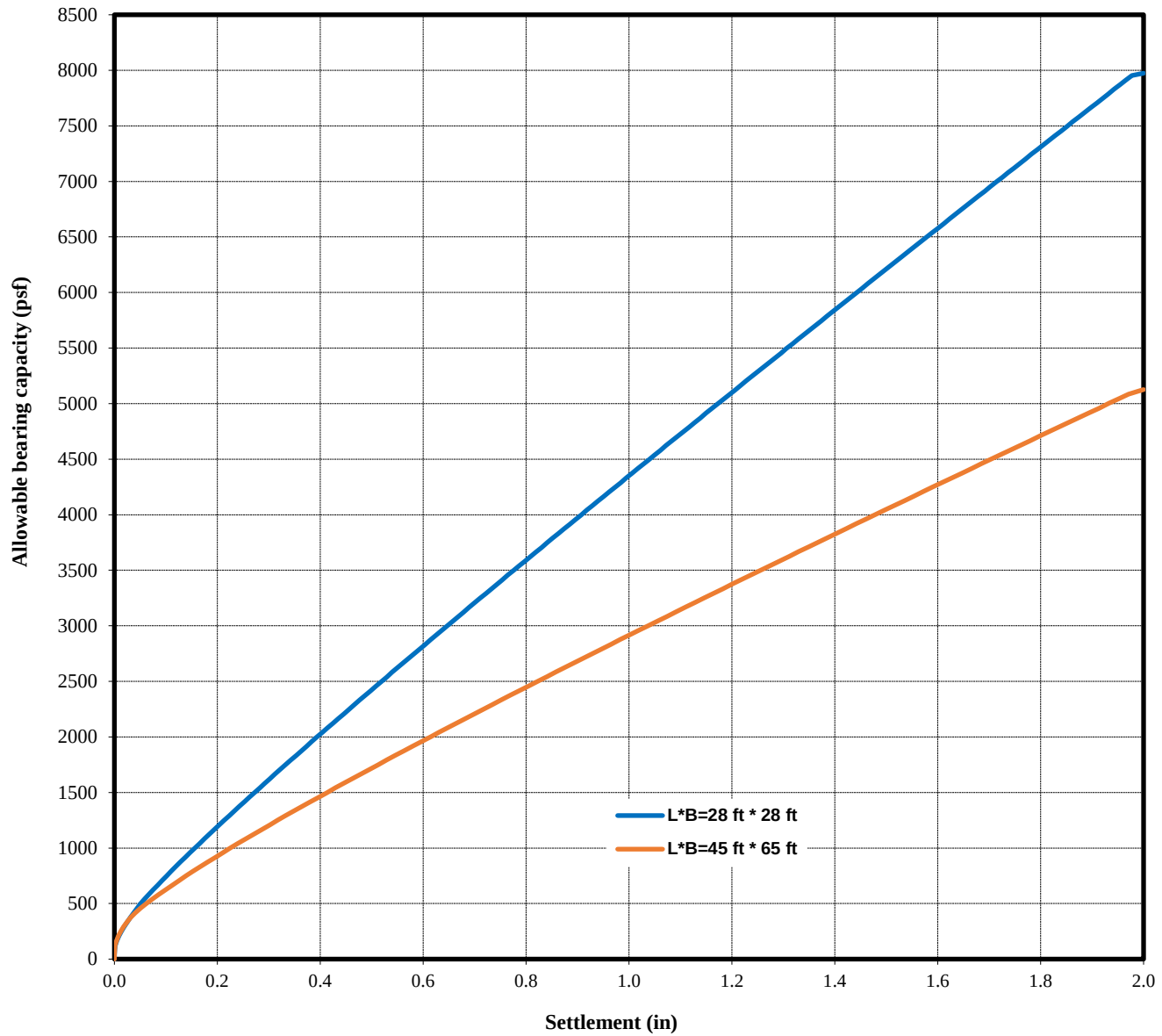
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Engineering and Soil Dynamics, San Diego, CA, March 2001.

3. RECENT ADVANCES IN SOIL LIQUEFACTION ENGINEERING: A UNIFIED AND
CONSISTENT FRAMEWORK, Earthquake Engineering Research Center,
Report No. EERC 2003-06 by R.B Seed and etc. April 2003.

Note: Print Interval you selected does not show complete results. To get
complete results, you should select 'Segment' in Print Interval (Item 12, Page C).

Allowable bearing capacity for Mat Foundation



$D = 1.0 \text{ ft}$
 $D_f = 1.0 \text{ ft}$

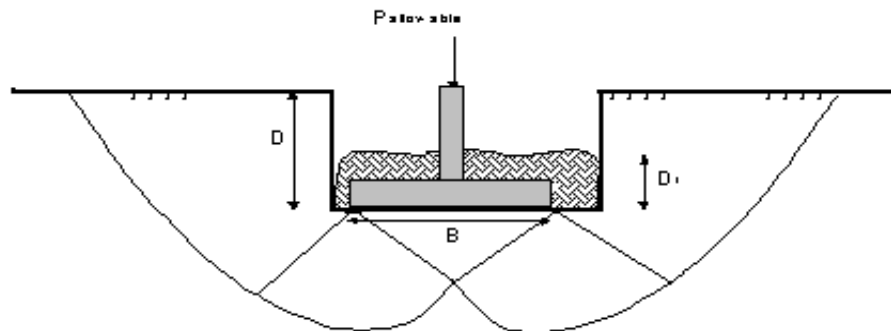
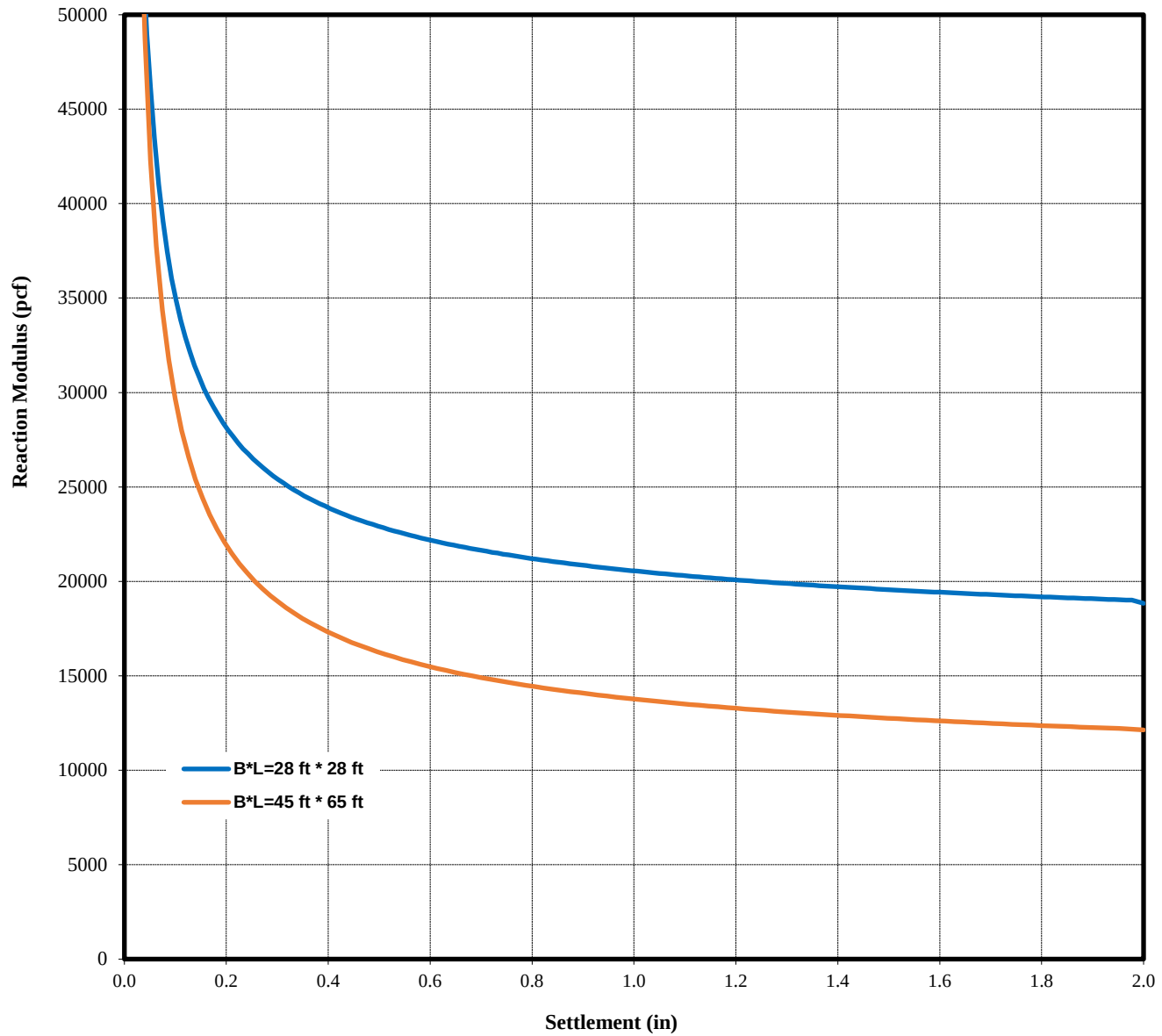
Notes:

D : Depth of footing with respect to ground surface

D_f : Depth of footing embedment

Allowable settlement = 2 inches

Soil Reaction Modulus for Mat Foundation



D = 1.0 ft
D_f = 1.0 ft

Notes:

D : Depth of footing with respect to ground surface
D_f : Depth of footing embedment

Allowable settlement = 2 inches



County of San Mateo - Planning and Building Department

ATTACHMENT T

ATTACHMENT T

DRAFT

Vallemar Bluffs

Botanical Survey Report



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August 201

Vallemar Bluffs Botanical Survey Report

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1 Introduction

1.1 Overview

This report presents an analysis of the potential impacts and benefits of a proposed conservation and development project on special-status plants and natural communities within the Valleamar Bluff Property—a 2.35-acre¹ property in Moss Beach, San Mateo County (Figure 1). The report was prepared to facilitate environmental review of a proposed development project that would build four homes on the eastern portion of the property; the remaining area would be protected via a conservation easement. The report was prepared based on the following:

1. A synthesis of existing information about the site; and
2. A survey of natural communities and plants conducted in spring and early summer 2018; and
3. An analysis of the potential impacts, both positive and negative, of the proposed conservation and development elements, on native plants and natural communities.

The survey was conducted and the report was prepared following the *Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities* prepared by the California Department of Fish and Wildlife (CDFW 2009). It was developed to address questions and issues raised by CDFW (2018a) and the California Coastal Commission (CCC 2018) based on their review of the initial study/mitigated negative declaration (IS/MND) prepared by the County of San Mateo for the proposed development application (County of San Mateo 2018). The report was prepared to facilitate County revision of the IS/MND.

1.2 The Proposed Project

1.2.1 Description

Moss Beach Associates, LLC proposes to build four new single-family residences on a 2.35-acre property located north and west of the intersection of Valleamar Street and Juliana Street in Moss Beach, an unincorporated community in coastal San Mateo County (Figure 1). The houses are proposed to be developed on four parcels that would be reconfigured from the current seven legal parcels. A total of 1.43 acres (61%) on the eastern portion of the property would be developed; the remaining 0.92 acres (39% of the property) would be permanently protected via a conservation easement that would be recorded across all four lots between the west facing sides of the houses and the coastal trail along the ocean bluffs (Figure 1). The conservation area would adjoin the Fitzgerald Marine Reserve—a 402-acre, three-mile long natural resource area that is owned by the County of San Mateo and managed by the County Parks Department for conservation, recreation, and public education. Funding for management of the conservation area would be provided on an annual basis through fees assessed by the Valleamar Bluffs Maintenance Association.

¹ This acreage was derived in GIS from the survey data for the property and may differ slightly from the parcel are recorded on the titles.

1.2.2 Permitting and Environmental Review

To implement the proposed project, Moss Beach Associates submitted to the County of San Mateo in 2017 an application to obtain a Coastal Development Permit (CDP), Resource Management-Coastal Zone (RM-CZ) permit, Grading Permit, and Lot-Line Adjustment (LLA). The application, which included project plans as well as a preliminary outline of the conservation strategy (JMc 2016), integrated the findings of studies of the site's vegetation and plant species (Zander Associates 2015), drainage (Mesiti-Miller Engineering 2017), and geotechnical considerations (HKA 2016). The plans addressed community input obtained through a series of public meetings including those held at the Midcoast Community Council.²

As part of the environmental review process under the California Environmental Quality Act (CEQA), the County of San Mateo (County) prepared an initial study/mitigated negative declaration for the project application in January 2018 (County of San Mateo 2018). In February 2018, the California Department of Fish and Wildlife provided a letter commenting on the IS/MND (CDFW 2018a). The California Coastal Commission submitted a letter regarding the IS/MND in March 2018 (CCC 2018).

Several of the comments in the agency letters address issues related to the natural communities (i.e., vegetation) and rare plant species within the site and the adjacent habitat in the Fitzgerald Marine Reserve. Notably, the letters addressed concerns about the impacts of the proposed project on coast yellow leptosiphon (*Leptosiphon croceus*)—an annual plant known only from an estimated 1,800-square-foot area on the bluffs within the Fitzgerald Marine Reserve (CDFW 2017). Specifically, CDFW (2018b) stated that the prior vegetation mapping study (Zander Associates 2015) was not implemented using a systematic survey methodology necessary to evaluate whether the property supports the rare plant, which a candidate for listing as endangered under the California Endangered Species Act. The letter and accompanying staff report for the listing noted that one individual of coast yellow *Leptosiphon* was observed on the MBA project property (CDFW 2017).

During discussions with MBA and County staff in March 2018, CDFW recommended that MBA conduct a survey of rare plant and natural communities following the CDFW protocols (2009).

1.3 The Survey

Between April and June 2018, Jodi McGraw Consulting (JMc) designed and implemented a survey of the rare plants and natural communities atop Valleamar Bluff. The survey protocol was developed by JMc based on the CDFW protocols (2009) and input from representatives of CDFW, CCC, and the County of San Mateo Parks Department, which manages the FMR. Input was also provided by Toni Corelli, a botanist with expertise in the flora of San Mateo and Santa Clara counties, who prepared the listing petition for coast yellow leptosiphon (Corelli 2016).

The objectives of the survey were to:

1. Compile a list all of all plants within the study area;
2. Map the distribution and estimate the abundance of all rare plants within the study area; and
3. Classify and map the natural communities within the study area.

² The Midcoast Community Council is an elected municipal advisory council to the San Mateo County Board of Supervisors, representing the communities of Montara, Moss Beach, El Granada, Princeton, and Miramar.

1.4 Report

This report documents the methods (Section 2) and results (Section 3) of the survey. It then describes the special-status plants and sensitive natural communities within the study area, and assesses their regional context and significance for conservation (Section 4). Section 5 assesses the potential impacts, both positive and negative, of the proposed project on special-status plants and sensitive natural communities, and for each, identifies measures that can be implemented to avoid, minimize and mitigate them; Section 5 concludes by providing an assessment of the net effects of the proposed conservation and development actions on the sensitive botanical resources in the study area (Section 5.3).

2 Study Methods

This section describes existing information about the study area and the methods used to conduct the survey.

2.1 Study Area

2.1.1 Location

The survey and analysis in this report address a 3.04-acre area referred as Valleamar Bluff. It is bounded on the east by Valleamar Street and on the south by Juliana Street. The study area extended to the edge of the bluff on the west; the northern edge of the study area extended to the MBA property line and included the adjacent bluff area (Figure 1).

2.1.2 Land Ownership

The study area includes a 2.35-acre property owned by Moss Beach Associates, which currently consists of 7 assessors parcels that range between 0.26 and 0.63 acres. The adjacent area to the west is owned by the County and is managed by the County Parks Department as part of the FMR. The study area also includes a strip of land south and east of the MBA property and the adjoining streets, which is apparently part of the County road right-of-way (Figure 1).

The study area included the entire Valleamar Bluff top area, rather than just the MBA property, to ensure that the analysis evaluated plants and communities that may be indirectly affected by the proposed project.

2.1.3 Topography and Elevation

The study area consists of a coastal bluff or terrace, elevated above the Pacific Ocean. Elevation ranges between 41 feet above mean sea level (amsl) in the southwest and 73 feet amsl in the northeast. The bluff slopes gently toward the coast (west) until the western border at the top of the bluff edge where it drops off steeply to the beach below.

2.1.4 Geology and Soils

The study area is located on the edge of a Pleistocene marine terrace (Brabb and Pampeyan 1983). Soils are mapped as part of two units identified by the USDA Soil Conservation Service (USDA undated):

1. **Rock-outcrop orthents (30-75% slopes):** soils derived from sedimentary, serpentine, and basaltic volcanic rock that are found on escarpments (i.e., the bluff face);
2. **Typic argiustolls, loamy-urban land association (5-15% slopes):** dark grayish brown and grayish brown sandy clay loam or sandy loam soils that occur on coastal (fluviomarine) terraces and that are formed from coastal alluvium derived from sedimentary rock. The surface soils on lower terraces, as in the study area, have higher clay content than those on higher terraces.

The rock-outcrop orthent map unit occurs in the western half of the study area, while the argiustolls map unit underlies the eastern half. The soil survey was mapped at the scale of 1:24,000 such that the accuracy of the mapped units is not suitable for differentiating soil types within the study area (USDA undated).

The geotechnical survey for the MBA property included five exploratory test borings for the new home sites and five percolation test holes in the proposed drain fields of the five houses, which were originally proposed to be built on the eastern half and southern portion of the study area (HKA 2016), rather than exclusively on the eastern portion as current. The analysis found clay soil over either silty sand, clayey sand, sand with silt or a combination thereof; all soils overlay a hard bedrock formation encountered approximately 25 feet below the ground surface (HKA 2016).

2.1.5 Land Use Activities

The study area is not developed but features some improvements. Within the FMR, there are two benches near the western end of the bluff; the northern of the two benches is installed on an approximately five-foot-by-8-foot concrete pad. The FMR features a Bluff Trail that extends from Juliana Street to the bluff north of the study area. The natural surface path varies in width from just three feet to up to ten feet, with an average width of approximately four feet. Visitors also use smaller (e.g. 1-3 foot) paths to access the western bluff edge and the beach below.

On the MBA parcel, there is a manhole cover to an unused sewer line installed below the proposed road and a domestic well that was drilled in 1999. A natural surface road that extended from the middle of Juliana Street to the Bluff Trail, which is observed in the 1972 aerial image of the site (Figure 2a) is used as a foot path to provide access to the Bluff Trail. Similarly, there is a trail providing access from Valleamar Street in the northeastern portion of the MBA property to the Bluff Trail; a bicycle jump was constructed along this trail through excavation and mounding of soil in an approximately 10-foot-by-10-foot area.

Between 2005 and 2008, the northwestern edge of the Monterey cypress stand that dominates the eastern portion of the study area (Figure 1) was cut back and the biomass was apparently chipped and scattered in the formerly treed area as well as the adjacent grassland (Figure 2). Base rock and wood chips are found along the southern portion of the MBA property where disturbance is also visible in the 2008 image (Figure 2e); perhaps the artificial materials were installed to facilitate access by tree removal equipment or for other purposes.

Activities to construct Valleamar Street last century may have introduced fill material along the eastern portion of the study area, where the slope is steeper and the cover of exotic plants is greater (Section 3.2.3).

2.1.6 Vegetation

The original vegetation characterization and mapping report prepared by Zander Associates (2015) describes the MBA property as featuring two main vegetation types: remnant coastal prairie on the west, and disturbed/ruderal grounds, mostly under a Monterey cypress (*Hesperocyparis macrocarpa*) canopy on the east and without tree cover on the southwest corner. The vegetation was mapped in three categories (Zander Associates 2015):

- **coastal prairie grassland:** dominated (>75% cover) by native perennial bunchgrasses and native forbs found in coastal grasslands;
- **non-native area:** the area under the Monterey cypress canopy, which features largely non-native understory species including ornamental plants (e.g., *Pittosporum* sp.) and areas featuring dense patches of ice plant (*Carpobrotus edulis*) as well as other invasive herbaceous plants; and
- **transitional area:** areas featuring mostly sparse occurrences (<5%) of native species but that are otherwise dominated by exotic herbaceous plants and ice plant.

Smaller areas dominated by coastal terrace prairie species were mapped within the transitional area.

2.1.7 Rare Plant Species

The vegetation classification and mapping study included a floristic survey and plant species list compiled through three spring surveys in 2013 and two spring surveys in 2015. The list and report noted the occurrence of three rare plants within the study area, two of which were observed in 2015 in the MBA parcel. Johnny nip (*Castilleja ambigua* ssp. *ambigua*), which is on the ‘watch list’ on the California Rare Plant Inventory (California Rare Plant Rank [CRPR] 4.2; CNPS 2018a) was included in the description of species found in the coastal prairie grassland mapped within the MBA property. The report species list includes harlequin lotus (*Hosackia gracilis*), also a CRPR 4.2 plant; however, the report text does not describe its occurrence within the property. Coast yellow leptosiphon, which is a CRPR 1B.1 plant at the time of the survey and is now a candidate for listing as state endangered, was described as occurring on the ‘promontory overlooking the ocean just offsite to the west (on public open space lands)’ but not within the MBA property (Zander Associates 2015).

The 2016 listing petition for coast yellow leptosiphon (Corelli 2016) described the species as co-occurring with Johnny nip as well as Blasdale’s bent grass (*Agrostis blasdalei*) a CRPR List 1B.2 species known from the coastal strand between Santa Cruz and Mendocino counties. The listing petition stated that harlequin lotus and Johnny nip occurred within the MBA property; however, it did not mention the occurrence of coast yellow leptosiphon or Blasdale’s bent grass and instead, described it as being confined to a 60-foot-by-30-foot area on the edge of the cliff in the FMR (Corelli 2016).

The *Status Review of Coast Yellow Leptosiphon* (CDFW 2017) reported that “one individual plant was also identified outside of the mapped population on the MBA property on May 16, 2016 (T. Corelli pers. comm. 2016).” The map therein shows this occurrence as approximately 50 feet east of the main patch, or approximately 10 to 20 feet west of the Bluff Trail (CDFW 2017).

2.2 Survey Methods

2.2.1 Floristic Survey

One objective of this study was to compile a comprehensive list of plant species observed within the study area (Appendix A). On April 1, April 5, May 1, May 20, June 3, June 22, and August 1, Dr. Jodi McGraw walked through the project site and used the observations of plant species to compile a list of plant taxa observed. The surveys were timed to observe plants with a range of phenologies (i.e., early to

late season) including primarily during flowering or fruiting, to maximize detectability of species and facilitate identification of plants using flowers or fruits. Specifically, the surveys were timed to observe:

- Early-season species in flower (April);
- Spring-flowering species in flower or early-season species in fruit (May and June); and
- late-season species in flower (July and August).

The surveys were conducted by walking throughout the study area, and noting the occurrences of plant species. Upon completion of the study, the list was compiled with that of the 2015 assessment (Appendix B). An attempt was made to generally characterize the relative abundance of each plant within the two main portions of the study area, the MBA property and the FMR, based on the field observations.

2.2.2 Plant Community Classification and Mapping

On May 20, 2018, Dr. Jodi McGraw examined plant species composition within the study area to classify and map the natural communities. Dr. McGraw walked throughout the study area and examined plant species composition. Areas featuring notable changes in plant species composition were mapped on a hard-copy map featuring 2017 high-resolution (5.2-inch/pixel) color aerial imagery, which were printed at a scale of 1 inch equals 50 feet. The locations of the boundaries were determined with a Trimble global positioning system running ArcPad that featured the same aerial imagery (ESRI 2010). Where the boundary of a patch could not be differentiated on the hard copy map using aerial image interpretation, the GPS was used to record the boundary.

Each of the 58 vegetation patches (i.e., polygons) was photographed and the following were recorded regarding plant community structure and species composition:

- **Canopy cover:** whether the vegetation features an overstory of trees;
- **Cover of Plant Species:** Species that occur in one of three main abundance levels;
 - o High Cover: Species that occur at high cover, which was typically >50% absolute cover. These were referred to as visually dominant species.
 - o Moderate Cover: Species that occur at moderate levels of cover or from 10-50%.
 - o Low Cover: Other species that were observed in the patch but generally covered < 10%.

The boundaries were then heads-up digitized in ArcGIS (ESRI 2010) using the same aerial image base, with the aid of the GPS data collected for the boundaries that were difficult to locate.

The cover data were used to characterize each patch according to the following three factors:

- **Structure:** woody (trees and shrubs) versus herbaceous/succulent;
- **Dominant-Subdominant Species:** assemblages based on the dominant (high cover) and subdominant (moderate cover) species;
- **Species' Origin:** Five categories based on the abundance of species native to California and naturally occurring (excludes the planted Monterey cypress) versus those that are exotic:
 - o Native Dominated: patches for which only native species achieved high and moderate cover;

- o Native-Exotic Co-Dominated: patches that featured one or more native species in the high cover class, but also had exotic plant species in that class as well;
- o Exotic-Dominated, Natives Subdominant: patches that featured only exotic species in the high cover class but featured native species in the moderate cover class;
- o Exotic-Dominated, Native Species Present: patches that featured only exotic plants in the high and moderate cover classes, and for which one or more native species were noted as having low cover; and
- o Exotic-Dominated, No (or only very low) Natives Present: patches that featured only exotic plants in the high and moderate cover classes and for which no native species were noted in the patch, though they may have occurred at below-detectable levels.

An attempt made to crosswalk the natural communities based on dominant and subdominant species to alliances in *A Manual of California Vegetation* (Sawyer et al. 2009) using the most recent list of California Natural Communities, which also includes pending additions (CDFW 2018a). The natural communities were also generally characterized based on plant community structure and species composition according to vegetation types in the *Terrestrial Vegetation of California* (Barbour and Major 1995), *California Vegetation* (Holland and Keil 1995), and *Preliminary Descriptions of Terrestrial Natural Communities of California* (Holland 1986). All grasslands were broadly classified as coastal terrace prairie for purposes of vegetation classification at the level of the site; however, as described in detail in Section 3.2.3.1, some assemblages might be more appropriately characterized as non-native grassland or ice plant mats.

2.2.3 Rare Plant Survey and Mapping

The objectives of this study element were to: 1) map the occurrences of rare plants, 2) estimate their abundance, and 3) assess factors influencing their distribution within the study area.

To inform the search, JMc compiled a list of rare plant species with the potential to occur on the site (Appendix A). First, a search of the literature and spatial databases was used to identify a draft list based on the following:

1. The California Natural Diversity Database (CDFW 2018d), using records in five United States Geological Survey 7.5-minute quadrangles: Montara Mountain (the quad the site is in) and all adjacent quadrangles to the south (Half Moon Bay), north (San Francisco South), east (San Mateo), and southeast (Woodside);
2. *Sensitive Plants of the California Coastal Prairie* (Hayes 2003), which is a list of rare native plants known to occur in the coastal prairie community; and
3. The Zander Associates (2015) plant species list for the property based on the 2013 and 2015 surveys (Section 2.1.6).

The list was circulated to CDFW, CCC, County Parks, and Toni Corelli, botanist and author of the *Checklist of the Vascular Plants of San Mateo and Santa Clara Counties, California* (Corelli 2011), who is also very familiar with the site. Ms. Corelli provided a list rare plants that she has documented along the San Mateo Coast west of Highway 1. This feedback was appended to the composite list (Appendix A).

The list was annotated to identify the flowering season for each species, which was used to plan the surveys which coincided with the floristic survey, which as noted above were designed to span the phenology of plants at the site (Section 2.2.1).

2.2.3.1 Field Methods

During surveys conducted on May 1, May 20, and June 3, Dr. Jodi McGraw and Assistant Ecologist Nicole Chrislock (May 20 and June 3 only) walked parallel transects approximately six feet apart to search for rare plants.

The initial mapping surveys and abundance estimation were conducted for the four rare plants on the following dates, when the species were in flower:

- harlequin lotus: May 1;
- coast yellow leptosiphon: May 20;
- Johnny nip: May 20 and June 3;
- Blasdale's bent grass: June 3 and 22.

The searches took approximately 4-person hours each, with additional time spent mapping and estimating the abundance of plants in each location, as outlined below.

2.2.3.1.1 Distribution Mapping

Once a rare plant was encountered, the biologists used flags to delimit each occurrence, which was operationally defined as plants that are within four feet of one another. Each occurrence was mapped using the following approach:

1. Individual plants or patches of plants that were less than 10 square feet in area were mapped as points, which were recorded using a Trimble GPS running ArcPad, in which the point was averaged based on 100 readings. The approximate dimensions of the patch were recorded and used to convert the point occurrence to a patch for purposes of area estimation.
2. Patches of plants that were separated by no more than four feet and that occupied an area greater than 10 square feet were mapped as minimum convex polygons by recording the vertices of the outer perimeter of the patch using a Trimble GPS running ArcPad.

All GPS data in this study were recorded in NAD83 datum.

The mapped occurrences were revisited on subsequent surveys to evaluate changes in the boundaries and adjustments were made when appropriate.

2.2.3.1.2 Abundance Estimation

To estimate abundance, the number of plants in each species-specific mapped location was counted and recorded, except for coast yellow leptosiphon which was too abundant and for which a census would have been too destructive.

Notes were recorded about the microhabitat and habitat conditions in which each species occurred, including topography, soils, hydrology, and associated plant species. Photographs were collected to illustrate occurrences and representative habitat conditions.

The abundance of coast yellow leptosiphon individuals was difficult to estimate for three reasons:

- The annual plant was fairly abundant, necessitating sampling rather than a complete census;
- The plant was relatively dense within the mapped area, such that it was difficult to stand in the patch without trampling coast yellow leptosiphon individuals; and
- It is difficult to tell what constitutes an individual, without manually manipulating the plant in a way that may be harmful as well as time consuming.

To estimate plant abundance without trampling the rare plant or causing harm to individuals through extensive probing, Dr. Jodi McGraw implemented a sampling study. On May 20, 20, 0.25 m² quadrats were randomly located within the mapped patch using a random number generator to select the flag on the perimeter and the distance into the patch from the perimeter, which was measured using a meter tape. Sample quadrat centers were flagged to avoid resampling the same area.

The quadrat was gently placed on the soil while Dr. McGraw stood in areas lacking coast yellow leptosiphon, which were mostly commonly gopher mounds. Within each quadrat, Dr. McGraw counted the following:

- number of flowers, which included fading flowers (i.e., those with wilted petals);
- the number of buds (unopened flowers);
- the number of leaf clusters lacking both flowers and buds.

To estimate the number of leaf clusters, flowers, and buds associated with each plant, the number of each were carefully counted on 75 haphazardly chosen plants located throughout the patch. These individual morphometric data were used to calculate the total number of buds and flowers per leaf cluster, and the number of leaf clusters per plant. These individual metrics were then used to estimate the number of leaf clusters by dividing the total number of flowers and buds by the mean number of flowers and buds per leaf cluster and then adding that value to the number leaf clusters that were counted in each quadrat. The total number of leaf clusters was then divided by the mean number of leaf clusters per plant to estimate the number of plants per 0.25m² quadrat. The value was averaged across all 20 quadrats, and the standard error was used to calculate a 95% confidence interval. This value was then scaled to the area of the mapped patch which was then summed with the estimate for the abundance in the mapped point which was confirmed to be the same as through a thorough count (n=6).

2.3 Project Impact Assessment

The assessment of direct impacts of the proposed development project was conducted in a GIS, by intersecting the data for the areal extent mapping for the rare plants and the community map with a composite layer representing the following proposed aspects of the proposed conservation and development project at the site:

- new parcels (lots);
- new conservation area, to be protected through a conservation easement dedicated to a 501(c)(3) land trust;
- Limits of grading, which encompass the area in which all soil disturbance and most construction activities will occur;
- Infiltration spreader area, where perforated pipes will be installed in trenches below grade to prevent concentrated runoff.

Indirect effects were analyzed qualitatively by evaluating potential effects of the development project on the rare plants and natural communities that can occur, over time, away from the immediate construction footprints (limits of grading and spreader areas).

3 Survey Results

3.1 Floristic Survey

In total, 104 plant species were observed in the study area during the 2018 survey, of which 94 were recorded on the Moss Beach Property and 53 were recorded on the FMR property (Table B-1; Appendix B). An additional 12 species were reported as occurring in the study area in 2015 (Zander Associates 2015), but were not detected in 2018; these species, which were primarily ornamentals, may still occur at low abundance (Appendix B-1). Of the total 116 species observed in 2015 and 2018, 55 are native to California while the remaining 61 are exotic; the latter group includes a mix of naturalized species found in natural lands, and ornamental species that likely spread from nearby plantings/landscapes.

Table B-1 in Appendix B lists the plant species and their general relative abundance in late May and early June within the two properties. This table was prepared based on general recollection of observations rather than systematic separate floristic surveys of the two properties, such that some species may be misclassified. However, the information generally illustrates the variation in species composition and abundance between the two sites which likely results in part to the varying abiotic conditions, as well as land use, between the FMR and the MBA property. Notably, of the 94 species observed in 2018, 41 were observed only in the MBA property, 10 were observed only in the FMR property, and 43 were detected in both properties (Table B-1).

3.2 Plant Community Classification and Mapping

The study area features a mosaic of plant communities that likely reflect its varying soil conditions and land use, as well as perhaps other factors including microclimate.

3.2.1 Plant Community Structure

Of the 3.04 acres in the study area, 1.80 acres (59%) are dominated by low-growing herbaceous plants or succulents while 1.17 acres (38%) are dominated by trees and shrubs; specifically, introduced Monterey cypress, Ngaio tree (*Myoporum laetum*) and Japanese pittosporum (*Pittosporum tobira*; Figure 3). The remaining 0.07 acres (2%) consists of the Bluff Trail and the area adjacent to the two benches, which are largely denuded but feature sparse herbaceous plant cover. The trails connecting Juliana and Valleamar streets to the Bluff Trail are narrower and in places feature relatively high (>25%) plant cover, and therefore were not mapped as bare but herbaceous dominated (Figure 3).

Table 1 provides the breakdown of plant community structure within the properties in the study area. As illustrated, 47% (1.1 acres) of the MBA property is dominated by ornamental/planted shrubs and trees, while the remaining 53% (1.24 acres) supports communities dominated by herbaceous plants and succulents (Figure 3).

3.2.2 Plant Assemblages

The 61 vegetation patches delimited within the study area were classified into 43 assemblages based on their dominant and subdominant plant species, as described in Section 2.2.2 (Table 2, Figure 4). Only ten assemblages were mapped in more than one patch, reflecting both the fine-scale nature of the assessment and the variable species composition in the study area.

As illustrated in Table 3, some of the assemblages defined based on dominant and subdominant species can be cross walked (i.e., matched) to nine associations and eight alliances in the California Natural Communities (Sawyer et al. 2009, CDFW 2018a). The remaining types appear to represent plant assemblages that have not yet been classified to the association or alliance level using this system.

3.2.3 Vegetation Types

While it was not possible to use the Manual of California Vegetation system to comprehensively classify and map the vegetation within the study area, the dominant and subdominant plant species were used to aggregate the mapped patches into one of three vegetation types based on Holland and Keil (1995), and Holland (1986) which are commonly used to classify vegetation on California's coast, with remaining types put in a planted/ornamental category, reflecting the fact that these were planted or spread from plantings.

Based on this, the study area features 1.42 acres (47%) of grasslands that were characterized broadly as coastal terrace prairie, 0.296 acres (10%) ruderal communities, 1.26 acres (41%) of communities dominated by ornamental or planted species, and 0.07 acres (2%) of land that is frequently used for recreation and thus largely lacks plant cover (Tables 2 and 4; Figure 4).

The following sections describe the plant species composition and factors influencing the distribution of the three mapped vegetation types.

3.2.3.1 Coastal Terrace Prairie

Within the study area, 1.42 acres (47%) of the land supports assemblages that were generally classified as coastal terrace prairie (Holland 1986), which is a short-statured form of Northern Coastal Grassland (Holland and Keil 1995) that occurs on coastal terraces—relatively flat areas along the coast that have been exposed over geologic time through uplift and declining sea level. Coastal terrace prairie occurs patchily between southern Oregon and the Channel Islands, on generally sandy loam soils of marine terraces near the coast that are within the zone of fog incursion, where the climate is cooler and moister (Heady et al. 1995). It typically features dense perennial grasses, including California oatgrass (*Danthonia californica*) coastal tufted hairgrass (*Deschampsia cespitosa* ssp. *holciformis*) as in the study area, and a mix of annual and perennial herbs (Stromberg et al. 2002).

The coastal terrace prairie in the study area is dominated by a mix of native and exotic plant species, which exhibit small-scale variation in their distribution and abundance that may reflect microclimate, variable soil conditions, including development and hydrology, and disturbance regimes, including land use activities as well as natural disturbances.

Overall, the community is dominated by grasses, though the cover of native versus exotic grasses varies greatly among the mapped assemblages (Table 2, Figure 4). Indeed, as described in greater detail below, some of the assemblages are dominated entirely by exotic grasses and lack native perennial grasses characteristic of intact coastal terrace prairie.

Among the native species, coastal tufted hairgrass is the most widespread and abundant, while California oatgrass, maritime brome (*Bromus maritimus*), and meadow barley (*Hordeum brachyantherum*) are patchily dense but occur at far lower cover and frequency, in terms of the number of mapped patches that were occupied. Italian ryegrass (*Festuca perennis*) is the most widespread exotic

grass and is found throughout most of the coastal prairie east of the Bluff Trail; where it achieves high cover (>50%), the cover and diversity of native herbs is greatly reduced. Exotic annual grasses, including rattail fescue (*Festuca myuros*), ripgut brome (*Bromus diandrus*), soft chess (*Bromus hordeaceus*), and hare barley (*Hordeum murinum* ssp. *leporinum*), are also patchily abundant within the coastal terrace prairie.

Native forbs in the coastal terrace prairie are diverse and also patchily abundant. Perennial species, which occur in and among the native perennial grasses, include sea thrift (*Armeria maritima* ssp. *californica*), purple cudweed (*Gamochaeta ustulata*), Pacific gumplant (*Grindelia stricta* ssp. *platyphylla*), and sea thrift (*Armeria maritima* ssp. *californica*). Native annual forbs, which primarily occur in areas of greater exotic plant cover, include coast tarweed (*Madia sativa*), which is patchily very abundant, and Johnny nip (*Castilleja ambigua* ssp. *ambigua*), which preferentially occurs in shorter-statured vegetation such as occurs along the trails.

Among the exotic forbs and within the coastal terrace prairie, rough cat's ears (*Hypochaeris radicata*), cut leaf plantain (*Plantago coronopus*), English plantain (*Plantago lanceolata*), are fairly widespread and patchily abundant. The community type features freeway iceplant (*Carpobrotus edulis*) and sea fig (*Carpobrotus chilensis*), which form dense mats. The southern portion of the MBA property near the well and along the southern border features higher density of bird's-foot trefoil (*Lotus corniculatus*) prickly ox tongue (*Helminthotheca echioides*), common sow thistle (*Sonchus oleraceus*), and radish (*Raphanus sativus*) than in the north; perhaps these species invaded following disturbances in these areas. The area where a portion of the Monterey cypress stand was removed and chipped between 2005 and 2008 (Section 2.1.5; Figure 2e' Patch 26 in Figure 4) similarly features a higher abundance of annual exotic forbs including California bur clover (*Medicago polymorpha*), sour clover (*Melilotus indicus*), and little hop clover (*Trifolium dubium*), which may have established following the tree work.

As noted above, some areas of the coastal prairie are dominated by dense exotic plant species, including mats of freeway iceplant and sea fig. These assemblages featured one or more native forbs characteristic of coastal prairie, and were therefore classified broadly as part of the coastal terrace prairie community type. However, these grassland patches could also be regarded as non-native grassland or iceplant mats, as they were by Zander Associates (2015). These degraded grassland areas were lumped here along with assemblages that constitute more-intact coastal terrace prairie here as they are part of the more general vegetation mapping and classification for the site.

3.2.3.1.1 Variation in Species Composition

The 0.343 acres of coastal terrace prairie located primarily west of the Bluff Trail, largely within the FMR property, but also on the western edge of the MBA property, supports plant assemblages that differ in species composition from those further inland (Table 2, Figure 4); this may reflect differences in soil conditions, disturbance regimes, and/or the influence of salt spray from the ocean, as described below. Plant cover along the bluff edge is sparser, and short-statured and supports coastal strand species like coast buckwheat (*Eriogonum latifolium*), seaside daisy (*Erigeron glaucus*), sea lettuce (*Dudleya farinosa*), and saltgrass (*Distichlis spicata*) that are not found further inland, where common buttercup (*Ranunculus californicus*), sun cups (*Taraxia ovata*), checker mallow (*Sidalcea malviflora* ssp. *malviflora*), harlequin lotus (*Hosackia gracilis*), and blue eyed grass (*Sisyrinchium bellum*) occur, but are uncommon or not found west of the Bluff Trail. Other species like Pacific gumplant, coyote thistle (*Erygium armatum*), and purple cudweed are more abundant along the bluff edge than further inland. Native perennial grasses, which are much shorter in stature along the bluff edge than further inland, include

primarily coastal tufted hairgrass, maritime brome, and the rare native Blasdale's bent grass (*Agrostis blasdalei*); meadow barley and California oatgrass are far less common here than inland. Finally, the grassland west of the trail includes native annuals not observed further inland, including farewell to spring (*Clarkia amoena*), Chilean trefoil (*Acmispon wrangelianus*), and coast yellow leptosiphon.

In addition to the differences in cover and diversity of native plants noted above, exotic grasses generally occur at only low to moderate cover and lower diversity on the coastal bluff edge; most notably, Italian rye grass, which dominates much of the grassland further inland, occurs at low cover west of the trail. Perennial forbs like cut leaf plantain, rough cat's ears, and English plantain, are fairly widespread and patchily dense along the bluff edge, however, which also features dense patches of as the succulents sea fig and both species of iceplant (i.e., *C. edulis* and *C. chilensis*).

3.2.3.1.2 Ecological Factors Influencing Variation in Species Composition

Differences in plant species composition between the coastal prairie along the bluff edge west of the trail, on the FMR, compared to that further inland, including mostly that on the MBA property, could reflect differences in climate, soils, and disturbance regimes. Because it is closer to the ocean, the grassland vegetation along the immediate bluff edge likely receives more salt-laden moisture (i.e., salt spray) and may also be subject to greater influence of the wind. These factors may limit growth of exotic plants such as Italian ryegrass as well as native perennial species including blue-eyed grass and harlequin lotus found only further inland.

The coastal bluff edge is also subject to more frequent disturbance as a result of its proximity to recreators using the Bluff Trail and benches, and accessing the bluff edge to take in views and go to the beach. The frequently trampled areas support an assemblage dominated by coyote thistle, cut leaf plantain, sea thrift, and coastal tufted hairgrass; these perennial herbs may be relatively resilient to frequent trampling and able to persist in the potentially more compacted soils.

Frequent disturbance by gophers may also play a role in influencing plant species composition differences observed between the bluff edge and further inland. Most notably, the patch of coastal terrace prairie supporting coast yellow leptosiphon (Patch 25 in Figure 4) featured numerous gopher mounds with varying heights and degrees of bare ground versus plant cover, that suggest they were created throughout the growing season. Such chronic disturbance by gophers can prevent dominance by perennial species and create and maintain loose soil that can promote establishment of annual plants, including so called disturbance-adapted species that preferentially occur in areas of recent disturbance and are outcompeted by more dominant perennial species elsewhere.

Finally, observed variation in plant species composition may reflect different soil conditions, as suggested by observations made during the study. The area immediately adjacent to the coast and generally west of the Bluff Trail features light beige soil with a sandier/more gravelly texture than found underlying the coastal terrace prairie in the center of the study area, where the soil appears darker, greyer, and finer textured (i.e., less sand and gravel and more silt and clay). Soil differences within the coastal prairie in the site could be a consequence of the different plant assemblages as a cause; over time, denser plant cover, particularly that from fine-rooted grasses, contributes to soil development.

Differences in soil conditions as well as disturbance, including prior land-use activities, may also explain the differences in plant species composition between the coastal terrace prairie and ruderal assemblages within the study area, as described below.

3.2.3.2 Ruderal

The open, herb-dominated areas north and east of the Monterey cypress and also in the southwestern portion of the study area lack native perennial grasses and most of the other native species found in the coastal prairie. These areas, which total 0.296 acres or 10% of the study area (or 0.265 ac, 11% of the MBA property), were characterized as ruderal, as they are dominated by exotic grasses and forbs including those commonly found in anthropogenically disturbed areas including roadsides. Exotic species composition in these areas differs somewhat from that in the coastal terrace prairie, with species like rattlesnake grass (*Briza maxima*), flax (*Linum bienne*), and panic veldt grass (*Ehrharta erecta*) being common in these communities but virtually absent from the coastal terrace prairie. The ruderal areas on the eastern portion of the study area also feature a fairly high cover of naturalized ornamental species including pincushions (*Scabiosa atropurpurea*), pride of madeira (*Echium candicans*), pine echium (*E. pininana*), and tree houseleek (*Aeonium* sp.). These species may have spread from adjacent landscaping areas, though some also have been historically planted. The ruderal areas feature a low diversity and abundance of native plants, which primarily just include beach strawberry (*Fragaria ciloensis*) and coastal tarweed (*Madia sativa*), which is adapted to chronic disturbance.

Soils underlying the ruderal communities north and west of the Monterey cypress grove are darker and somewhat browner than the light to medium-grey coastal terrace prairie soils. The soils under the ruderal areas along Valleamar Street are also looser, and feature decomposed granite pieces. These soils are likely part of the 'fill wedge' at the site associated with construction of Valleamar Street and Highway 1 (HKA 2016). The absence of native coastal terrace prairie grasses and herbs in the ruderal area may reflect the altered soil conditions, which may be unsuitable; alternatively, or additionally, it may be have resulted from the historic disturbance associated with prior land uses, including road grading and construction and perhaps planting of the Monterey cypress (though these trees may have naturally recruited into the site). These activities may have introduced exotic plants that are more competitive and thus exclude recolonization of the soils by native coastal prairie species.

The patch of ruderal vegetation in the southwestern portion of the study area (Figure 4) may reflect prior vegetation removal or other land use, though no such disturbance is discernable in the historical aerial imagery dating back to 1972 (Figure 2a).

3.2.3.3 Ornamental or Planted Areas

A total of 1.26 acres (41%) of the study area feature trees, shrubs, and herbs that were either planted deliberately, including through seeding, or that spread from other planted/landscaped areas. These include the stand of Monterey cypress, the patch of ornamental shrubs dominated by Ngaio tree on the central, northern border of the MBA property, and the drainage ditch in the County road right-of-way between the southern portion of the MBA property and Juliana Street. Collectively, the ornamental or planted vegetation covers 1.1 acres or 47% of the MBA property (Table 2).

3.2.3.3.1 Monterey Cypress

Within the study area, 1.10 acres (36%) is dominated by Monterey cypress site, which have been present at the site since before 1972 when mature trees were captured in the first-available historical

imager of the site (Figure 2a). Native to just the Monterey Peninsula and Point Lobos in Monterey County, Monterey cypress were widely planted along the coast to create windbreaks and for general landscaping; the species is naturalized outside of its native range as it can naturally recruit in areas where it was not planted (Bartel 2012).

Within the study area, the Monterey cypress understory primarily features a mix of ornamental species, including Japanese pittosporum (*Pittosporum tobira*), Ngaio tree, and *Echium* species, and naturalized exotic plants including panic veldt grass, rattlesnake grass, freeway iceplant, and Cape ivy (*Delairea odorata*). Native plants occur at low diversity and abundance in the understory of the Monterey cypress but include goose grass (*Galium aparine*), beach strawberry, and California blackberry (*Rubus ursinus*).

3.2.3.3.2 Ornamental Shrubs

The northern border of the study area features an 0.7-acre stand of shrubs dominated by Ngaio tree (>60% cover) and that features coyote brush (*Baccharis pilularis* ssp. *consanguinea*) and Monterey pine (*Pinus radiata*), with beach strawberry and California blackberry in the understory. Like Monterey cypress, Monterey pine is narrowly endemic to just four locations on the California and Baja California coasts. While it has been widely planted and has spread along the coast of California, only individuals within the original four locations are protected as special-status species.

3.2.3.3.3 Drainage Ditch

Located entirely within the County road right-of-way, the 0.88-acre drainage ditch north of Juliana Street includes numerous upland and wetland species not otherwise found at the site such as beardless wild rye (*Elymus triticoides*), purple needle grass (*Stipa pulchra*), yarrow (*Achillea millefolium*), and spreading rush (*Juncus patens*). Many of these species were likely seeded or planted as part of work to line the ditch with vegetation that would filter road runoff before it flows to the beach in the southwestern corner of the study area. Much of the cover consists of exotic species including cut leaf plantain, bird's foot trefoil, prickly ox-tongue, sheep sorrel (*Rumex acetosella*).

3.2.3.4 Native and Exotic Dominance

As noted above, the assemblages within each vegetation type vary greatly in terms of their native plant species composition. Table 4 and Figure 5 illustrate the area of mapped patches in each vegetation type according to the five classifications based on whether they are dominated by plants native to California and that naturally occur there (i.e., excludes Monterey cypress and Monterey pine) versus exotic plants or ornamental/planted species, as described in Section 2.2.2.

Of the coastal terrace prairie assemblages within the site, 0.203 acres (7%) are dominated by native plants, 0.432 acres (14%) are co-dominated by native and exotic plants, another 0.368 acre (12%) are dominated by exotic plants but feature native species that are subdominant, and 0.415 acres (14%) are exotic dominated and feature natives at low abundance. As noted in 3.2.3.1.1, assemblages in this latter category could be classified as non-native grassland or alternatively, ice plant mats, as they feature low diversity and cover of native plants. These various conditions occur patchily within the landscape, reflecting the patchy nature of common exotic plants including ice plant and Italian ryegrass.

3.3 Rare Plants

Four plant species that are included on the California Native Plant Society Rare Plant Inventory were observed within the study area during 2018 (Table 5). These include two plant species that are classified as 'rare and endangered in California and elsewhere' (though they are endemic to California), as indicated by their California Rare Plant Rank (RPR) of 1B: coast yellow leptosiphon (CRPR 1B.1) and Blasdale's bent grass (CRPR 1B.2). The other two species, harlequin lotus and Johnny nip, are on a 'watch list' (CRPR 4.2) owing to their limited distributions. All were observed within both the FMR and the Moss Beach Associates property except coast yellow leptosiphon, which was only found on the FMR. None were found in the County right-of-way (Tables 5 and 6).

The following sections describe each species in terms of their distribution and abundance in the study area; they also describe abiotic and biotic habitat factors that appear to be associated with the species, and assess the conditions of the survey and other factors that can influence interpretation of the results. Section 4 describes context for the occurrence within the species' range, while Section 5 assesses the potential impacts, both positive and negative, of the proposed conservation and development project on the species.

3.3.1 Coast yellow leptosiphon

3.3.1.1 Distribution

Coast yellow leptosiphon was mapped within a 746-sf (0.0171-acre) patch and one disjunct point occurrence 6 feet southeast which featured 6 plants in a 2-inch-by-11-inch (22-in²) area (Table 6, Figure 6). The mapped patch is in the northern portion of the larger (est., 1,800 sf) patch depicted in the listing petition (Corelli 2016); this is consistent with observations by Toni Corelli which suggest that the occurrence is perhaps contracting northward/being eliminated from the southern part of its prior area of occupation (T. Corelli, pers. comm. 2018). The patch in 2018 was larger than that mapped by Dr. McGraw in 2016 when the patch of just 306 square feet (0.007 acres) was delimited (Figure 6). That year, mapping was conducted during a single site visit on May 11, 2018 rather than two visits in mid-May and early June during 2018, which may have underestimated its areal extent, such that the patches are entirely comparable.

3.3.1.2 Abundance

The estimated abundance of coast yellow leptosiphon within the study area in 2018 was 23,750 individuals (Table 6). The 95% confidence interval around the mean is 10,340 such that there is a 95% chance that the population is between 13,410 and 34,091 individuals. This abundance was based on an estimated 85.7 per 0.25² quadrat, with a standard deviation of 79.7 individuals. The high standard deviation reflects the range of densities in the 20 quadrats, which had between 6 and 266 plants. The densities were based on plants having an average of 2.32 (SD = 1.24) flowers/buds per leaf cluster, and plants having an average of 1.36 (SD = 1.05) leaf clusters (see Section 2.2.3.1.2 for a description of the abundance estimation methods).

The estimated abundance of leptosiphon in 2018 was 27 to 68 times greater than that estimated by Corelli in 2015, when a reported 500 plants were counted through a census. Interannual variability in abundance may also play a role in the difference reported here for 2018 and by Corelli for 2015; notably, the 2015 survey occurred in the fourth year of drought (2012-2015), which may have reduced

the population. Conversely, the high rainfall in 2017 may have increased seed production and promoted establishment and thus density in 2018.

However, the dramatic difference in abundance estimation is likely largely attributable to the different estimation methods. In 2015, plants were counted using binoculars by standing on the perimeter of the patch and counting the number of plants in 10 sections (Corelli 2016). It is unclear how individuals were differentiated using this method. The morphometric approach used in this study to estimate abundance based on counts of flowers and the leaf clusters that subtend them likely contributes greatly to the increased estimate of abundance relative to a complete census when plants growing close together may have been considered one plant. Sampling populations with high spatial variation in density can also tend to result in less precise estimates of abundance.

Refining the methods to estimate the abundance of coast yellow leptosiphon accurately yet without impacting individuals or their habitat, will help track changes in the population over time and relate them to changes in habitat conditions and interannual variation in weather (e.g., precipitation), herbivory, or other factors that could influence individual demographic performance and thus population density.

3.3.1.3 Abiotic and Biotic Habitat Factors

Coast-yellow leptosiphon co-dominates the coastal terrace prairie assemblage in which it occurs west of the Bluff Trail (#25 in Table 2 and Figure 4) with two exotic perennial forbs, cutleaf plantain and rough cat's ear. Johnny nip, coastal tarweed, coastal tufted hairgrass, and sea thrift occur at moderate cover. Other notable native species include Blasdale's bent grass, purple cudweed, coyote thistle, farewell to spring, maritime brome, meadow barley, and Chilean trefoil; additional exotic plants include Italian ryegrass and English plantain. Plant height within this area is generally low (<15 cm), and roughly 5-10% of the area featured open soil lacking plant cover (bare ground).

The patch occurs approximately 20 feet from the bluff edge to the south, 10 feet from the bluff edge to the west, 17 feet from the northern bench, and immediately adjacent to the Bluff Trail to the east (Figure 6); the patch is at an elevation of 48 feet above mean sea level.

Soil examined just outside of the patch (to avoid impacting coast yellow leptosiphon) was a relatively light colored, as characteristic of the coastal bluff soils compared to the darker, greyer soils underlying the coastal terrace prairie in the middle of the study area. The coast yellow leptosiphon patch featured high incidence of gopher mounds; an estimate 25% of the patch featured bare or nearly bare ground created from the gopher burrow castings. Such disturbances can promote populations of some native plants, particularly annual species, by creating and maintaining open sand soil which disturbance-adapted species require for germination and early seedling establishment (i.e., as a safe site *sensu* Fowler 1988).

On its western border, the patch abuts a dense mat of sea fig that extends to the bluff edge; the patch was not observed in the 1972 or 1986 aerial images and instead, first appears in the 2002 image since which time the size of the patch does not appear to have expanded inland appreciably (Figure 2).

3.3.1.4 Factors Affecting the Survey

The survey was carefully timed to occur when coast yellow leptosiphon was in flower. On May 20, 2018, when the distribution was first mapped and when abundance was sampled, most plants featured

flowers; however, 10 of the 75 individuals (13%) that were randomly chosen for the morphometric analysis did not feature flowers, which make them very easy to locate, and 3 of these did not feature buds that can aid in the location. For this reason, a second search of the entire study area was conducted on June 3, 2018 when the patch was then remapped and the disjunct point location was recensused (resulting in the same count of 6 individuals). The geometry of the two patches was examined in GIS and were very similar, though the patch mapped on June 3 extended further north and east than the patch mapped on May 20. The composite patch was used to depict the distribution (Figure 6). No other flowering or vegetative plants were observed outside of the two mapped locations during the two intensive survey days (May 20 and June 3) or during the other surveys conducted at the site. Given the conspicuous nature of the plant (i.e., bright yellow flowers) and the thorough surveys conducted throughout the season, it is unlikely that the species occurs outside of the two mapped locations.

3.3.2 Blasdale's bent grass

3.3.2.1 Distribution

Blasdale's bent grass was mapped in five locations on the western third of the study area, that range between 0.17 and 365 sf and total 451.7 sf (0.0104 acres; Table 6, Figure 6). Four of the occurrences, which total 374 sf (0.009 acres), were near the bluff edge west of the Bluff Trail on the FMR property, between the northern of the two benches and the coast yellow leptosiphon patch. The fifth patch (78 sf or 0.002 acres) is on the MBA property where the trail from Juliana Street ties into the Bluff Trail (Figure 6).

3.3.2.2 Abundance

A total of 221 Blasdale agrostis plants were counted in the census of the five patches, which had between 5 plants (in the point occurrence) and 116 plants in the large polygon mapped in the coast yellow leptosiphon area. The patch on the MBA property featured 65 plants while the four patches mapped within the FMR featured the remaining 156 individuals (Table 6, Figure 6).

3.3.2.3 Habitat Factors

Within the Study Area, Blasdale's agrostis occurs in short-statured coastal terrace prairie dominated by coastal tufted hairgrass, cut leaf plantain, and sea thrift. Native plants that co-occur with Blasdale's bent grass at moderate cover include Johnny nip, sea thrift, and coastal tarweed, while the exotic rough cat's ears occurs at moderate abundance as well. All occurrences featured a fair amount of bare ground (~10-30%). The open soil conditions are created and maintained by gopher mounds in the largest patch where Blasdale's bent grass co-occurs within coast yellow leptosiphon, and trampling from recreational use, which occurs in the area next to the northern bench in the FMR and in the trail providing access to the Bluff Trail from Juliana Street through the MBA property (Figure 6). This distribution pattern suggests the species may be competitively excluded in areas of denser plant cover, though it is possible that it requires some aspect of the disturbance to complete its life history (e.g., to create a safe site for seedling establishment).

3.3.2.4 Factors Affecting the Survey

All plants censused were in flower during the June 3 survey and mapping of Blasdale's bent grass. The presence of the inflorescence greatly aided detection of the species, which grows in areas of moderate cover from co-occurring species though some bare ground. The patches on the MBA property and the two small patches on the FMR property were recensused on June 22, with the same densities recorded as on June 3.

3.3.3 Johnny Nip

Johnny nip was mapped within 16 locations (10 patches and six point occurrences) in the western half of the study area that total 0.171 acres (Table 6, Figure 6). Of the total area supporting this rare plant, 0.046 acres or 62% is within the MBA Property while 0.066 acres or 38% is in the FMR (Table 6).

3.3.3.1 Abundance

A total of 1,703 Johnny nip plants were counted within the study area. Of these, approximately 931 (55%) were in the MBA property and 772 (45%) were in the FMR. For patches that straddled the two properties, the density in each property was estimated using the proportion of the mapped patch within each property, such that the actual density of plants in each site may differ somewhat from that estimated.

3.3.3.2 Habitat factors

Johnny nip generally occurs in shorter-statured coastal terrace prairie that features bare ground created/maintained by gopher disturbance and/or trampling from recreational use. The species primarily occurs in the western portion of the study area (Figure 6), where soils appear generally lighter and coarser than in the center and east where they are darker and browner. Plant species that occur at high cover in areas occupied by Johnny nip include the natives coyote thistle and coastal tufted hairgrass, and the exotic species cut leaf plantain and rough cat's ears. Species found at moderate cover with Johnny nip include sea thrift and Italian rye grass. The distribution of Johnny nip may be influenced by that of its host plants, as the species is a hemi-parasite; however, *Castilleja* species can be generalist parasites, not host-specific, and parasitize a variety of grasses, legumes, and sagebrush. Moreover, the species may be able to establish and persist without a host if sufficient water is available (Les 2017).

3.3.3.3 Factors Affecting the Survey

Johnny nip was largely in flower during the survey on May 20th though some patches featured up to 50% vegetative plants. Though more difficult to detect than flowering plants, the vegetative plants feature purple pigmented leaves that make them relatively easy to discern from the predominantly green biomass in the grasslands, such that the abundance estimate is likely relatively close to the actual population. To increase accuracy of the mapping and census, the patches mapped on May 20 were re-examined on June 3 and modified slightly based on adjustments observed then. All patches were re-examined on June 22 as well to evaluate changes in distribution, though patch abundance was not recensused. Small vegetative plants may have been missed such that the abundance could be greater than reported; however, no additional plants were found outside of the mapped patches and points from May 20 and June 3, suggesting the abundance estimate as well as distribution is fairly accurate.

3.3.4 Harlequin Lotus

3.3.4.1 Distribution

Harlequin lotus was mapped in 31 locations that total 2,050 sf (0.047 acres; Table 6, Figure 6). Patches ranged between 1 sf (1 plant) and 727.9 sf and were located entirely within the MBA property (Table 6, Figure 6).

3.3.4.2 Abundance

A total of 133 harlequin lotus plants were counted in the patches and points mapped (Table 6).

3.3.4.3 Habitat Factors

Within the study area, harlequin lotus was generally observed in the center and eastern portion of the coastal terrace prairie (Figure 6), where soils appeared to be darker grey suggesting greater development. Unlike the other three rare plants in the study area, which occur in areas of greater bare ground and shorter-statured vegetation, harlequin lotus occurred in areas of dense cover which may reflect its preferential occurring in moister microsites. Plant species that occur at moderate abundance with harlequin lotus include cut leaf plantain, Italian rye grass, rough cat's ears, and Pacific gumplant. Other fairly abundance species include English plantain, purple cudweed, coastal tarweed, California oatgrass, softchess, and freeway iceplant. Harlequin lotus was often found around the skirt of the Monterey cypress, where the species may benefit from partial shade and/or greater soil moisture from fog and rainfall collecting on the tree branches and then falling on the plants and soil below.

3.3.4.4 Factors Affecting the Survey

The survey for harlequin lotus was conducted on May 1 when the plants were largely in flower. The mapped occurrences were rechecked against the distribution on May 20, when two additional point occurrences representing two total plants were added. Individual plants of this species exhibited only limited overlap in their canopies and thus were fairly easy to differentiate from one another, such that the estimate of adult (i.e., flowering plant) abundance is likely fairly close. No vegetative plants lacking flowers were observed; however. If plants in this species require more than one year to reproduce, the abundance estimate would be low as it excluded seedlings and juveniles.

4 Special-Status Plants and Communities

4.1 Rare Plants

According to the Department's *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (CDFW 2009), special-status plants are those that meet one or more of the following criteria:

- Listed or proposed for listing under the federal Endangered Species Act;
- Listed or candidates for listing by the State of California as threatened or endangered under the California Endangered Species Act (CESA; Fish and Game Code Section 2050 *et seq.*)
- Listed as rare under the California Native Plant Protection Act (Fish and Game Code Section 1900 *et seq.*)
- Meet the definition of rare or endangered under the California Environmental Quality Act Section 15380(b) and (d). Species that may meet the definition of rare or endangered include the following:
 - Species considered by the California Native Plant Society (CNPS) to be “rare, threatened, or endangered in California” (Lists 1A, 1B, and 2);
 - Species that may warrant consideration on the basis of local significance or recent biological information; and
 - Some species included on the California Natural Diversity Database's (CNDDB's) *Special Plants, Bryophytes, and Lichens List* (California Department of Fish and Game 2018);
- Considered a locally significant species, that is, a species that is not rare from a statewide perspective but is rare or uncommon in a local context, such as within a county or region, or is so designated in local or regional plans, policies, or ordinances (CEQA Guidelines Appendix G). Examples include a species at the outer limits of its known range or a species occurring on an uncommon soil type.

Based on the criteria above, the study area features two special-status plants: coast yellow leptosiphon and Blasdale's bent grass. The following section discusses them as well as the two watch list plant, harlequin lotus and Johnny nip.

4.1.1 Special-Status Plants

4.1.1.1 Coast Yellow Leptosiphon

4.1.1.1.1 Status

Coast yellow leptosiphon is endemic to California where it is only known from the single occurrence within the study area (CDFW 2017). In recognition of the threat posed by such a limited distribution, the species is a candidate for listing as endangered under the California Endangered Species Act (CESA). It has been assigned a Global Rank of G1 and a State Rank of S1, indicating that it is critically imperiled in California and thus the word, since it is narrowly endemic. The species is listed a California Rare Plant

Rank CRPR rank of 1B.1, which means it is rare or endangered in California and elsewhere (Rank 1B.x) and is seriously threatened (x.1; CNPS 2018a)

4.1.1.1.2 Regional Context and Significance

The occurrence of coast yellow leptosiphon within the study area is the utmost high significance for the persistence of the species, given that it is the only known occurrence for this species in the world (CDFW 2017).

4.1.1.2 Blasdale's bent grass

Blasdale's bent grass is endemic to the coastal strand of California where it is known from 58 element occurrences between Mendocino and Santa Cruz counties (CDFW 2018d). It has been assigned a Nature Serve State Rank of S2 and a Global Rank of S2, both of which indicate its imperiled status (CDFW 2018d). Blasdale's bent grass has a rank of 1B.2 on the California Rare Plant Inventory (CNPS 2018a), meaning it rare, threatened, or endangered in California and elsewhere, and it is fairly threatened in California (x.2). It is regarded as threatened by agriculture, recreation, development, and competition from non-native plants (CNPS 2018a).

4.1.1.2.1 Regional Context and Significance

The occurrence of within the study area is just one of three reported in San Mateo County (CalFlora 2018, CDFW 2018d), the others are located near Pigeon Point Lighthouse and in Bean Hollow State Beach. There is some potential for unreported occurrences to be found in other coastal strand communities in San Mateo County, particularly on private land which may have been less studied than public lands. Other documented occurrences of Blasdale's bent grass occur in the Swanton region in Santa Cruz County to the south, and in Point Reyes National Seashore in Marin County to the north. Given the relatively limited distribution and low number of known occurrences for this species in San Mateo County, which may be more widespread and abundant in counties further north (Marin to Mendocino), this occurrence within the study area is considered of high local importance for persistence of the species south of the Golden Gate. This assumes the species is not found in other protected lands featuring coastal grasslands in San Mateo County, which have been fairly intensively botanized without observation of the species (Corelli 2011).

4.1.2 "Watch List" Plants

4.1.2.1 Johnny Nip

Johnny nip is found along the Pacific Coast between British Columbia and northern Monterey County in California. It has a State Rank of S4 and a Global Rank of G4T5, which mean the species is apparently secure considering populations outside of California and the variety is common, widespread, and abundant. The species is regarded as threatened by development (CNPS 2018a), perhaps owing to its narrow distribution along the coast, which is subject to intensive habitat conversion.

4.1.2.1.1 Regional Context and Significance

Johnny nip has been collected or observed in 28 reported locations dotting much of the length of the San Mateo County coast (CalFlora 2018)³. Relatively recent observations have been reported at Bean Hollow, Pomponio, and Montara state beaches, as well as Año Nuevo State Park, which protect coastal strand habitat. Johnny nip has been collected on the coastal terrace prairie grassland in and near the University of California at Santa Cruz campus in Santa Cruz County, with numerous observations reported for coastal Marin County (CalFlora 2018). Given this species' fairly widespread distribution from Canada to northern Monterey County, and the numerous occurrences in protected habitat elsewhere in San Mateo County, the occurrence with the study area is likely of only limited local importance to the species persistence.

4.1.2.2 Harlequin Lotus

Harlequin lotus is a CRPR 4.2 plant, reflecting that it has a limited distribution in California (Rank 4.x) and that is fairly endangered in California (x.2). It has a state rank of S3, vulnerable, and a global rank of G3G4, reflecting uncertainty as to whether it is at moderate risk of extinction due to a restricted range, very few populations, steep declines or other factors (G3) or apparently secure (G4), a ranking assigned to species that are uncommon but not rare, though there is some cause for long-term concern due to declines or other factors, considering populations outside of California. Within California, harlequin lotus is found primarily in the coastal strand between Del Norte and northern San Luis Obispo counties. It is Designated as Endangered in Canada, and reportedly threatened in California by development, grazing, feral pigs, habitat alteration, and competition (CNPS 2018a).

4.1.2.2.1 Regional Context and Significance

Harlequin lotus has been collected/observed in 29 locations in San Mateo County (CalFlora 2018), with occurrences reported found in the following protected lands in San Mateo County: Año Nuevo State Park, Butano State Park, Bean Hollow State Beach, Pescadero State Beach and Marsh Natural Preserve, and the Peninsula Watershed lands (Corelli 2011). Additional collections/observations have been reported from the coastal terrace prairie in Santa Cruz County, with numerous observations found in the Marin County coastal grasslands (CalFlora). Given this species' fairly widespread distribution from Canada to northern San Luis Obispo County, and the numerous occurrences in protected habitat elsewhere in San Mateo County, the occurrence with the study area is likely of only limited local importance to the species persistence.

4.2 Special-Status Natural Communities

4.2.1 Definition

Special-status natural communities are communities that are of limited distribution statewide or within a county or region and are often vulnerable to environmental effects of projects. These communities, which may or may not contain special-status species or their habitat, are listed on the *List of California*

³ Some of these collections/observations come from the same occurrence and not all are extant; the California Natural Diversity Database (CNDDDB) does not track occurrences for California Rare Plant Rank 4.2 plants (only CRPR 1B and 2).

Terrestrial Natural Communities (CDFW 2018a), which provides the current state of the California classification.

As discussed previously here and further described by CDFW (2017), the communities within the study area have not fully been classified and described in the *Manual of California Vegetation* (Sawyer et al. 2009) including on-line edition (CNPS 2018b) or reflected in the *List of California Terrestrial Natural Communities*. Table 3 lists the natural communities that were cross walked to the types mapped within the study area, of which four are classified as sensitive by CDFW (2018a). One of these, Monterey cypress, refers only to natural occurrences found in two locations in Monterey County, and therefore does not apply to planted (or naturalized) stands such as occur within the study area (Section 3.2.3.1). The three other sensitive communities can be applied to the coastal terrace prairie, in the case of the California oatgrass prairie and tufted hair grass meadows (Table 3).

Coastal Terrace Prairie is also classified as rare in the *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986), which was superseded by the *California Manual of Vegetation* (Sawyer et al. 2009) and *List of California Terrestrial Natural Communities* (CDFW 2018a).

As described in Section 3.2.3.1.1, 0.415 acres of the coastal terrace prairie within the study area is dominated by exotic plants and features native plant species at low diversity and abundance. Though treated as part of coastal terrace prairie, which as a broad classification type for vegetation in the site, the assemblages dominated by ice plant as well as those dominated by exotic grasses and forbs could be classified as ice plant mats, and non-native grassland, respectively, and therefore would not be considered sensitive habitat.

4.2.2 Regional Context and Significance

As a vegetation type, coastal grasslands are rare both as a consequence of their limited distribution in regions featuring a maritime climate, and as a result of the widespread land use conversion those regions. Coastal terrace prairie communities such as found in the study area, which are underlain by soils with greater silt and clay content and that occur on flat terraces, generally feature a greater diversity and abundance of coastal grassland-dependent species than grasslands found on more erosive, sandier soils in the southern part of San Mateo County (R. Morgan, pers. comm. 2012). These more diverse coastal terrace prairies may have been disproportionately converted, owing to their more fertile soils and gentler terrain which make them more suitable for both agriculture and development. As a result of their rich diversity of native plants and habitat for multiple rare plants, including coast yellow leptosiphon which is found nowhere else in the world, the remnant patch of coastal terrace prairie within the study area is of important regional conservation value.

5 Assessment of Potential Project Impacts and Benefits

This section assesses the potential benefits as well as negative impacts associated with the conservation and development project proposed for the MBA property.

5.1 Existing Project Measures to Limit Impacts

Recognizing the occurrence of sensitive natural resources within the MBA property, the project proponents developed a combined conservation and development project that was designed and will be implemented following measures that will limit impacts to the special-status plants and sensitive natural communities. The following sections describe the existing measures.

5.1.1 Project Design

1. Site the project largely within the degraded habitat, including primarily the ruderal and planted/ornamental vegetation on the east side of the property.
2. Minimize alteration of the site's hydrology, including by using permeable pavers to increase infiltration of rainfall, and installing overflow spreaders in trenches to diffuse runoff.
3. Landscape with plant species native to the San Mateo Coast, to limit the potential for the spread of non-native species into the adjacent habitat, and limit the need for irrigation and pesticide use, which could influence nearby natural communities.

5.1.2 Project Construction

1. Prior to commencement of construction, all limits of construction will be delineated with temporary construction fencing, and environmentally sensitive areas will be clearly flagged.
2. Entrance and exit from the construction site by construction equipment and other vehicles will occur from Valleamar Street, and the point of access will be clearly identified.
3. An excavator with a swivel bucket will be used during construction. The excavator will have "street" tracks to minimize site disturbance.
4. Construction lay down areas will be located on the building envelopes not under active construction or within other portions of the construction footprint.
5. Spoil material that will be hauled away may first be stored either on the building envelopes not in active construction or on the paved parking area on Valleamar Street, subject to an encroachment permit from San Mateo County Public Works.
6. A biological monitor will be present during ground disturbing activities to ensure that encroachment into the flagged environmentally sensitive areas does not occur. The biological monitor will have the authority to stop work in the event construction activities are encroaching into environmentally sensitive areas.
7. The erosion control plan for the project includes the following best management practices (BMPs):

- a. Control and prevent the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, washwater or sediments, rinse water from architectural copper, and non-stormwater discharges to storm drains and watercourses.
- b. Store, handle, and dispose of construction materials/wastes properly to prevent contact with storm water.
- c. Do not clean, fuel, or maintain vehicles on-site, except in a designated area where wash water is contained and treated.
- d. Train and provide instruction to all employees/subcontractors RE: construction BMPs.
- e. Protect all storm drain inlets in vicinity of site using sediment controls such as berms, fiber rolls, or filters.
- f. Limit construction access routes and stabilize designated access points.
- g. Perform clearing and earthmoving activities only during dry weather.
- h. Use sediment controls or filtration to remove sediment when dewatering and obtain all necessary permits.
- i. Trap sediment on site, using BMPs such as sediment basins or traps, earthen dikes or berms, silt fences, check dams, soil blankets or mats, covers for soil stockpiles, etc.
- j. Divert on-site runoff around exposed areas; divert off-site runoff around the site (e.g. swells and dikes).
- k. Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.
- l. No land clearing operations where grading operations may take place between October 15 and April 15 unless a separate winter erosion control plan is approved prior to beginning such construction.
- m. Erosion is to be controlled at all times. The specific measures shown are to be implemented at all times. Additional measures will be required for construction between October 15 and April 15.
- n. Erosion control measures shall be monitored, maintained, and replaced as needed to prevent escape of sediment from the site. No turbid runoff shall be allowed to leave the construction site.

5.2 Direct Impacts

Grading and construction of the four proposed residences will impact 0.900 acres within the MBA property while infiltration spreaders will temporarily disturb an additional 0.015 acres (Table 7, Figure 7). In total, of 0.915 acres or 39% of the 2.35-acre MBA Property and 30% of the entire 3.045-acre Valleamar Bluffs Study Area (all within the MBA property), will be directly affected by construction (Table 7, Figure 7).

The impacts within the limits of grading are generally anticipated to be permanent. Following completion of the project, much of the area within the limits of grading will feature the buildings and hardscapes (i.e., driveways and decks) and will be affected by these features and uses. While landscaping will incorporate native plants from the San Mateo Coast, the landscaped area will be available for residential use by the residences, rather than conserved, and is not considered restored. However, a 0.0069-acre (303 sf) area on the western edge of the limits of grading that is within the conservation area will be restored (Section 5.2).

In contrast, the area that will be disturbed through installation of the infiltration spreaders designed to diffuse run off from the development is regarded as temporarily impacted. This area, which will be entirely within the proposed conservation easement area, will be restored using active revegetation techniques designed to establish coastal terrace prairie plants native to the site (Section 5.2).

5.2.1 Impacts to Special-Status Communities and Rare Plants

The two impact areas, the limits of grading and the infiltration spreader trenches, will occur within and thus directly, negatively impact 0.075 acres of land that supports degraded coastal terrace prairie, a special-status natural community, and 339 sf of habitat occupied by harlequin lotus. Though this species does not meet the CDFW criteria for special-status plant (CDFW 2009), impacts to this rare plant were evaluated as part of this analysis to facilitate the design of its conservation element. Based on the 2018 survey, the proposed project is unlikely to directly impact the other three rare plants, which occupy areas outside of the project development footprint (Figure 6).

5.2.1.1 Coastal Terrace Prairie

5.2.1.1.1 Limits of Grading

The limits of grading include 2,831 sf or 0.065 acres of vegetation classified broadly as part of the coastal terrace prairie vegetation type mapped on the site (Table 7, Figure 7). Most (74%) of this area, 0.048 acres, is within Lot 1, where the area of grassland extends further east than in land within the other three proposed lots (Figure 7). Within Lot 1, the vegetation that will be impacted by the development is highly degraded and dominated by exotic plants including freeway ice plant mats and dense cover of exotic grasses and forbs. Specifically, 0.45 acres or 95% of the area is exotic dominated and features native plants at only low diversity and abundance. This area completely lacks native perennial grasses and thus might not be classified as coastal terrace prairie by some. Most of the remaining 0.002 acres (5%) features some native plants as subdominant to more dominant exotic plants (Table 7).

The limits of grading in lots 2, 3, and 4 include 0.005 acres, 0.007 acres, and 0.006 acres of coastal terrace prairie grassland, respectively (Table 7). As in Lot 1, most of these areas are dominated by exotics and feature natives at only low abundance (Table 7). The only exception is in Lot 3 where the grading area includes just over 0.002 acres of coastal terrace prairie vegetation that is dominated by native plants including coastal tufted hairgrass.

5.2.1.1.2 Infiltration Spreaders

Installation of the infiltration spreaders to diffuse runoff will temporarily disturb 420 sf (0.010 acres) of coastal terrace prairie habitat: 0.0034 acres in Lot 1, 0.0028 acres in Lot 2, 0.0035 acres in Lot 4 and <0.00001 acres in Lot 3 (Table 7, Figure 7). Of this area, 0.0038 acres (39%) is in patches where native and exotic plants codominate, 0.003 acres (36%) is in areas dominated by exotics but with native subdominant, and the remaining 25% (0.002 acres) is dominated by exotics with low cover of natives (Table 7, Figure 7).

5.2.2 Harlequin Lotus

As noted above, the project impact areas do not feature coast yellow leptosiphon, Blasdale's bent grass, or Johnny nip, but do feature a small area mapped as supporting harlequin lotus. Although it is not a special-status species as defined by CDFW (2009), as further described in Section 4.1, the direct impacts to this rare plant were evaluated to facilitate the design of conservation element of the project.

The limits of grading overlap small portions of patches of habitat occupied by harlequin lotus in Lot 3 (82 sf) and Lot 4 (202 sf), where a total of 284 sf of habitat occupied aboveground in 2018 would be permanently impacted by the proposed development. These habitat patches contained an estimated 15 plants in 2018: 3 in Lot 3 and 12 in Lot 4. These densities are approximate as they were calculated by multiplying the proportion of the patch that is inside the limits of grading by the total patch density.

An additional 55.3 sf of occupied supporting approximately 5 harlequin lotus are located in the infiltration spreader areas (Table 7, Figure 7). These occur primarily in Lot 4 where part of a patch as well as two point occurrences within five feet of the spreaders were assumed to be impacted during digging to install the spreaders.

5.3 Indirect Impacts

The proposed project has some limited potential to impact the two special-status plants and coastal prairie habitat located outside of the project disturbance envelope. Such indirect effects could occur via one of three interrelated mechanisms:

1. Promoting the invasion and spread of exotic plants;
2. Altering soil moisture conditions; and
3. Increasing trampling associated with human activities including recreational use.

The following sections describe these potential indirect effects, which will be address in the project design (Section 5.1) and proposed mitigations (Section 5.4).

5.3.1 Exotic Plants

Construction and maintenance of the houses and associated improvements including landscaping and, drainage facilities, has some potential to promote the invasion and spread of exotic plants not present at the site. This can occur through a variety of mechanisms including:

1. Introduction of exotic plant seed on equipment and materials during construction and/or use of the houses, including landscaping materials (e.g., mulch and container plants);

2. Disturbances that remove established plant cover and perhaps disturb the soil in ways that can promote establishment of exotic plants that are adapted to open soil conditions;
3. Alteration of soil conditions that make them directly more favorable for exotic plants, such as through the addition of off-site soil, irrigation or altered drainage that can increase soil moisture, and addition of fertilizers that increase nutrient availability; and
4. Deterioration of soil conditions for native plants, as could occur if soil moisture is reduced due to inappropriate drainage, or if soil fertility is reduced through addition of off-site soil, resulting in declines in native plant populations that can invite colonization of the area by exotic plants.

Although already abundant within the study area, exotic plants can further degrade the coastal terrace prairie community and potentially reduce populations of the special-status plants within the study area if their abundance is further increased, through a variety of mechanisms including:

1. Competing for resources aboveground (i.e., light) and belowground (i.e., soil moisture and nutrients);
2. Altering soil conditions, including nutrient availability (e.g., from nitrogen-fixing plants) in ways that can promote other exotic plants, and tip the competitive balance further toward exotic plant species; and
3. Increasing the amount of litter or thatch on the soil surface, which can degrade habitat for many herbaceous plants, particularly annual forbs.

Section 5.4 describes the measures recommended to prevent the invasion and spread of exotic plants and avoid the impacts associated with their proliferation in the site in addition to the BMPs included in the project design (Section 5.1).

5.3.2 Altering Drainage and Soil Moisture Conditions

Construction and habitation of the residences, along with their associated infrastructure, could negatively impact coastal terrace prairie community and the rare plant populations by altering the hydrology of study area in ways that influence soil moisture. Availability of water in the soil may play a role in the variation in plant species composition; it can affect the abundance of the rare plants directly, by influencing their soil-water relations, and also indirectly, by altering their competitive environment as could occur if increased soil moisture promotes plants with greater water demands that are also more competitive (e.g., grow larger). Soil moisture conditions in the site could be altered if the buildings and hardscapes concentrate precipitation into a small area, leaving some areas wetter and other areas drier. Residential water use including landscape irrigation and hoses (e.g., used to wash cars in driveways) could increase soil moisture availability.

Increased or channelized runoff could also hasten coastal bluff erosion, which has occurred at a rate of 0.45 feet per year since 1908 (HKA 2016) and may have reduced the amount of coastal blufftop habitat available for coast yellow leptosiphon, Blasdale's bent grass, and Johnny nip, as well as perhaps harlequin lotus, though that species occurs further inland.

To minimize these potential indirect effects of altered drainage, the project features the following design elements (MME 2016):

1. Infiltration trenches with overflow spreaders, that disperse the runoff over wide areas and maintain the existing hydrology and soil moisture distribution within the site;

2. Pervious pavers for driveways and parking areas, to minimize the impervious area on the site to just 10,850 sf (0.25 acres); and
3. Connections to the existing two-foot deep drainage channel on Juliana Street.

These measures are anticipated to minimize alterations to soil moisture conditions within the site.

5.3.3 Trampling

The development has some potential to increase trampling of the special-status plants and native plants within the coastal terrace prairie, by increasing the frequency of:

1. Recreation during and after construction; and
2. Other human activities that would entail walking atop the bluff, including infrastructure maintenance and vegetation management.

The study area experiences relatively high frequency use for recreation, including hiking, dog walking, bicycling, off-leash dog exercising (e.g., throwing balls and frisbees), and picnicking, as well as access for fishing, surfing and kayaking in the ocean below. These and other activities were all observed to occur on the FMR and MBA properties during the course of plant survey. Visitors to the site included those walking in from the adjacent neighborhoods north and south, as well as many who drove to the site, parking along the north side of Juliana Street which provides a *de facto* parking area for access to the bluff and beach. Bicycles and pedestrians also access the site from Valleamar Street.

Areas of concentrated use, including the Bluff Trail and the trails accessing it from Juliana and Valleamar streets, as well as the two benches on the FMR bluff edge, all feature sparser, and shorter-statured plants. This altered community structure and species composition results from direct trampling, which can kill or reduce the size of plants, as well as soil compaction, which can limit the species that are able to establish and persist.

Construction workers involved in development of the new residences could increase the frequency of use of the property, as could occur following completion of the four new single-family residences. The project could also intensify the use in the coastal terrace prairie in the MBA property, portions of which would be located in each of the new lots. For example, residents seeking to use these areas for their outdoor enjoyment might, for example, conduct vegetation management, such as weed whacking, or install outdoor furniture (e.g., chairs).

Although the incremental increase in trampling associated with the addition of four residences to the site is anticipated to be limited, relative to the high frequency of use already at the site, Section 5.4 identifies measures that are recommended to avoid and minimize human activity and associated trampling of the sensitive communities and special-status rare species.

5.4 Measures to Minimize and Mitigate Impacts

The following measures are recommended to avoid, minimize, or mitigate the direct and indirect impacts of the project. They are in addition to the existing project elements to protect sensitive communities and rare species (Section 5.1).

- 1. Site all construction materials and staging areas in converted (i.e., paved), ruderal, or planted, areas within the portion of the property proposed for development, to avoid impacts to special-status communities and species.**
- 2. Implement measures to prevent indirect effects of the development project on the adjacent coastal terrace prairie community and rare species during construction.**
 - a. Fence the project disturbance envelop during construction using ESA fencing to clearly delimit the area of work;
 - b. Erect signs on the fences and in other areas to prevent workers from entering them during construction;
 - c. Conduct worker awareness training to educate construction personnel about the sensitive communities and special-status species, as well as the measures that must be implemented to protect them;
 - d. Prevent erosion and manage drainage during construction to prevent concentrated runoff and sediment deposition in the coastal terrace prairie, including by installing, silt fences where needed;
 - e. Monitor compliance with the protection measures during construction, to ensure that fences and signage remain in places, and that the areas outside of the disturbance envelope are not disturbed or otherwise utilized during construction;
 - f. Monitor the site throughout construction period (and in perpetuity, per mitigation measure 5 below) and using early-detection/rapid response to eradicate any new occurrences of exotic plant species.
- 3. Prior to disturbance within any portion of the project area that supports coastal terrace prairie dominated or co-dominated by native plants (Figure 6), including the spreader areas and limits of grading, salvage the sod, topsoil, seed, and individual native plants, where appropriate and feasible. Use the salvaged material to restore areas of temporary disturbance; if the salvaged area is to be permanently impacted, use the material to restore other highly degraded habitat on site (e.g., ice plant mats) where appropriate.**
- 4. Minimize the potential for indirect impacts to coastal terrace prairie and rare plant species that could result from landscaping, by:**
 - a. Avoiding landscaping elements that could degrade adjacent habitat, including pesticides, herbicides, fertilizers, and irrigation beyond that required to establish plantings; and
 - b. Installing plants native to the coastal terrace prairie, coastal strand, and coastal scrub communities in San Mateo County. For plant species found in the native communities in

the study area, use container stock from local (coastal San Mateo County) sources to avoid disrupting locally adapted genetic complexes (i.e., causing genetic erosion or outbreeding depression) within the adjacent remaining habitat onsite and in the FMR.

5. **Compensate for the impacts of the project on coastal terrace prairie by implementing the following measures.**
- a. **Permanently protect 0.92 acres of coastal terrace prairie**, through dedication of a perpetual conservation easement to a tax-exempt nonprofit organization qualified under Section 501(c)(3) of the Internal Revenue Code and qualified to do business in California that has as its primary purpose the preservation, protection, or enhancement of land in its natural, scenic, historical, agricultural, forested, or open-space condition or use.
 - b. **Restore an estimated 0.71 acres within the conservation easement area** that feature planted/ornamental species (i.e., Monterey cypress), are dominated by exotic plant species, and/or have been previously disturbed and feature unnatural topography or materials (e.g. wood chips. Table 9 and Figure 8 illustrate the acreages and approximate locations of restoration treatment areas. The restoration should follow a specific restoration plan that addresses the anthropogenic factors that have degrade native plant community structure and species composition. The restoration plan will also describe how the areas in the conservation easement area that were graded and installed with spreaders will be restored. It will critically evaluate and use, where appropriate, the following approaches:
 - i. Removing the planted/ornamental plant species and ice plant mats;
 - ii. Removing wood chips, base rock, or other non-native material covering the soil;
 - iii. Recreating the natural topography in areas where mounds or swales were created through prior excavation;
 - iv. Controlling other invasive plants (e.g., Italian rye grass and prickly sow thistle) that outcompete native plant species;
 - v. Managing the abundance of disturbance-adapted native plants such as coastal tarweed, where they are dominant (e.g., in the southeastern corner of the property) to promote the establishment and growth of a broader diversity of native grasses and forbs;
 - vi. Establishing native plants in areas previously used as trails to access the bluff trail;
 - vii. Salvaging seed and topsoil from coastal terrace prairie and areas supporting harlequin lotus prior to any ground-disturbing activities and using the material in on-site restoration, where appropriate; and
 - viii. Increasing the cover and diversity of native coastal terrace prairie plant species by sowing native plant seed (or spreading topsoil, where available) into restoration areas.
 - c. **Manage and monitor, in perpetuity, the entire 0.92-acre conservation area** to address anthropogenic factors that degrade native plant community structure and species composition. Management elements should be identified in a management plan

developed for the conservation area based on the site conditions and the literature documenting relevant conservation and management strategies, which are anticipated to include the following:

- i. Controlling exotic plants, and preventing the invasion and spread of new exotic plant species;
- ii. Managing recreation and access on and adjacent to the conservation area, including by:
 1. Installing fencing and signage to deter public access within the conservation area;
 2. Recording in the CC&Rs for the site and in the conservation easement, prohibitions against recreational use and access that are not compatible with conservation and management natural community structure and species composition in the coastal terrace prairie and populations of rare native plants. Installation of permanent or semi-permanent infrastructure and play equipment such as law chairs, umbrellas, trampolines, or any other items that intensify use in one area should be prohibited.
 3. Siting, constructing, and managing any public trails that are all or partially within the conservation area so that the recreational use is compatible with the protection of coastal terrace prairie and adjacent coastal bluff habitat;
 4. Monitoring compliance with the measures to prevent trampling associated with recreational use and taking steps to increase compliance when/if negative impacts are observed.
- iii. Monitoring natural community structure and species composition and rare plant populations within coastal terrace prairie, to gauge the effectiveness of management and inform adjustments as part of the adaptive management framework.

5.5 Summary of Net Effects of the Project

Implementing the measures designed to avoid and minimize project impacts will limit the negative effects on the project on coastal terrace prairie and rare plants. With mitigation, these impacts of the special-status species and communities are anticipated to be outweighed by the benefits of the conservation and mitigation measures, including protecting and managing and monitoring, in perpetuity, the 0.92 acres of habitat and restoring 0.71 acres that have been degraded (Sections 1.2.1 and 5.2).

Table 10 summarizes the analysis of direct and indirect effects of the conservation and development elements of the project, and then assesses their net effects for each rare species and community (i.e., coastal terrace prairie). The following provides some of the general rationale for conclusions outlined in the table.

- **Project Impacts are Largely Avoided through the Project Design:** By siting the improvements on the eastern portion of the property, in planted/ornamental and ruderal plant communities (Figure 7), the project avoids most direct impacts to the special-status species and sensitive natural communities. The project will protect 89% (0.874 acres) of the 0.978 acres that were broadly classified as coastal terrace prairie within the MBA property, though a large proportion of this area (0.068 acres or 92%) is dominated by exotic plants and native plants are subdominant (0.011 acres) or occur at only low abundance (0.057 acres).

In terms of rare plants, it will protect 100% of the 78-sf area occupied by Blasdale's bent grass, 100% of the 0.105-acre area occupied by Johnny nip, and 83% (1,711 sf) of the total 2,050 sf area occupied by harlequin lotus; coast yellow leptosiphon was not observed in the property in 2018 and instead, its entire 746-sf patch is protected within the adjacent Fitzgerald Marine Reserve.

- **A Suite of Avoidance and Minimization Measures will Further Limit Impacts:** Aspects of project description, combined with measures identified in this report, will further limit the impacts of the project on the sensitive natural community and special-status species, including any indirect effects (Section 5.1). Generally speaking, these elements include:
 - Salvaging top soil, sod, and individual plants for use in restoration prior to construction;
 - Implementing species protection measures and best management practices during construction, including installing fencing and signage and conducting trainings and monitoring by a biologist, to prevent the area of disturbance from expanding beyond the designated impact areas (limits of grading and spreader installation areas); and
 - Installing permeable pavers and infiltration spreaders to avoid altering the hydrology in ways that could negatively affect the sensitive community and special-status species directly or indirectly, by altering plant species composition or causing bluff erosion.
- **The project compensates for its limited impacts to degraded coastal terrace prairie and also harlequin lotus, a watch list species, at high mitigation ratios, while avoiding direct impacts to all other sensitive resources in the study area.** The 0.92-acre on-site conservation area, which will be protected through a conservation easement dedicated to a 501(c)(3) land trust, will protect 0.874 acres of coastal prairie, offsetting the direct project impacts to just 0.074 acres of exotic-dominated coastal terrace prairie at a ratio of more than 11:1. Likewise, the conservation area will protect harlequin lotus habitat at a ratio of 5:1; for every one of the 339 square feet impacted by development, 5 square feet (or a total of 1,711 sf) of habitat occupied by the rare herb will be protected. The ratio for individuals is nearly 6:1, as 113 individuals will be protected for the 20 in the development area; this ratio could be increased through the salvage of seed, sod, and/or topsoil prior to development for use in onsite restoration. As noted above, the project will not directly impact Blasdale's bent grass and Johnny-nip, the entire 78 sf and 4,589 sf occupied by each within the property, respectively, will be protected in the conservation easement area.
- **The restoration and management of the conservation area will buffer and expand habitat protected within the FMR, and enhance habitat condition within the coastal terrace prairie community atop Valleamar Bluffs.** Protecting the 0.874 acres of coastal terrace prairie will more than triple the current 0.427-acre area of coastal terrace prairie habitat protected in the FMR

within the study area. Restoration of 0.71 acres with the conservation area, by restoring planted/ornamental areas to prairie and reducing the dominance by exotic plant species such as ice plant, will promote the diversity and abundance of native plants within the MBA property. Increasing their populations can enhance those within protected habitat in the FMR. Land in the FMR is also expected to benefit from active management and monitoring of the 0.92-acre conservation area pursuant a habitat management plan that will address exotic plants and prevent recreation that is not compatible with the coastal terrace prairie and the rare plants that it supports.

For these and other reasons more specifically described for the individual species and community in Table 10, implementation of the proposed conservation and development project may have a net benefit for the coastal terrace prairie community and rare species atop Valleymar Bluffs, when compared to the current conditions, in which the site is unmanaged and impacted by a variety of anthropogenic stressors including exotic plants.

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Tables

Table 1: Community structure								
Community Structure	FMR		MBA Property		ROW		Total	
	Acres	%	Acres	%	Acres	% of Total	Acres	%
Herbs (incl. Succulents)	0.44	87%	1.24	53%	0.12	64%	1.80	59%
Shrubs and Trees		0%	1.10	47%	0.07	36%	1.17	38%
Mostly Bare	0.07	13%	0.00	0%		0%	0.07	2%
Total	0.50	100%	2.35	100%	0.19	100%	3.04	100%

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Table 2: Plant Assemblages by Dominant and Subdominant Species in Three Community Types

Plant Assemblages by Community Type	Map Label (Fig. 3)	FMR		MBA Property		ROW		Total	
		Acres	%	Acres	%	Acres	%	Acres	%
Coastal Terrace Prairie									
Bromus diandrus	1		0.00%	0.031	1.33%		0.00%	0.031	1.0%
Bromus maritimus	2	0.008	1.64%	0.018	0.76%		0.00%	0.026	0.9%
Carpobrotus chilensis	3	0.081	16.04%		0.00%		0.00%	0.081	2.7%
Carpobrotus chilensis-Grindelia stricta/Bromus maritimus	4	0.002	0.42%	0.058	2.45%		0.00%	0.060	2.0%
Carpobrotus edulis (CTP species present)	5	0.035	6.90%	0.038	1.60%	0.007	3.42%	0.079	2.6%
Carpobrotus edulis/Carpobrotus chilensis-Lupinus variicolor	6		0.00%	0.046	1.95%		0.00%	0.046	1.5%
Carpobrotus edulis-Bromus diandrus	7		0.00%	0.017	0.71%		0.00%	0.017	0.6%
Carpobrotus edulis-Grindelia stricta/Bromus mariitimus	8		0.00%	0.017	0.74%		0.00%	0.017	0.6%
Deschampsia cespitosa/Armeria maritima-Festuca perennis/Plantago coronopus	9		0.00%	0.005	0.23%		0.00%	0.005	0.2%
Deschampsia cespitosa/Dantonia californica	10	0.002	0.37%	0.147	6.28%		0.00%	0.149	4.9%
Deschampsia cespitosa-Plantago coronopus	11	0.061	12.19%	0.021	0.90%		0.00%	0.083	2.7%
Eriogonum latifolium-Festuca perennis	12	0.037	7.40%		0.00%		0.00%	0.037	1.2%
Eryngium armatum/Deschampsia cespitosa-Plantago coronopus	13	0.030	5.92%	0.001	0.03%		0.00%	0.031	1.0%
Eryngium armatum-Plantago lanceolata	14	0.007	1.44%		0.00%		0.00%	0.007	0.2%
Festuca perennis	15	0.006	1.14%	0.052	2.20%		0.00%	0.057	1.9%
Festuca perennis/Brachypodium distachyon	16		0.00%	0.037	1.59%		0.00%	0.037	1.2%
Festuca perennis/Bromus diandrus	17		0.00%	0.026	1.12%		0.00%	0.026	0.9%
Festuca perennis/Plantago coronopus	18		0.00%	0.030	1.27%		0.00%	0.030	1.0%
Festuca perennis-Bromus maritimus	19	0.025	4.90%		0.00%		0.00%	0.025	0.8%
Festuca perennis-Hordeum brachyantherum/Madia sativa	20	0.015	2.89%	0.007	0.29%		0.00%	0.021	0.7%
Festuca perennis-Madia sativa/Grindelia stricta	21		0.00%	0.036	1.53%	0.003	1.45%	0.039	1.3%
Festuca perennis-Plantago coronopus-Danthonia californica	22		0.00%	0.151	6.42%		0.00%	0.151	5.0%
Helminthotheca echioides-Madia sativa	23		0.00%	0.017	0.71%	0.002	0.87%	0.018	0.6%
Hypochaeris radicata-Eriogonum latifolium	24	0.011	2.14%		0.00%		0.00%	0.011	0.4%
Leptosiphon croceus-Plantago coronopus	25	0.060	11.96%		0.00%		0.00%	0.060	2.0%

Table 2: Plant Assemblages by Dominant and Subdominant Species in Three Community Types

Plant Assemblages by Community Type	Map Label (Fig. 3)	FMR		MBA Property		ROW		Total	
		Acres	%	Acres	%	Acres	%	Acres	%
Lupinus variicolor-Festuca perennis	26		0.00%	0.031	1.30%		0.00%	0.031	1.0%
Madia sativa	27	0.009	1.73%	0.016	0.70%	0.002	1.23%	0.028	0.9%
Madia sativa-Festuca perennis	28	0.006	1.17%	0.034	1.44%		0.00%	0.040	1.3%
Madia sativa-Festuca perennis/Hypochaeris radicata	29	0.000	0.05%	0.112	4.79%		0.00%	0.113	3.7%
Madia sativa-Hypochaeris radicata	30		0.00%	0.026	1.11%		0.00%	0.026	0.9%
Plantago coronopus-Eriogonum latifolium	31	0.009	1.80%		0.00%		0.00%	0.009	0.3%
Plantago coronopus-Eriogonum latifolium/Grindelia stricta	32	0.017	3.38%		0.00%		0.00%	0.017	0.6%
Raphanus sativus/Festuca perennis	33	0.007	1.34%	0.004	0.19%		0.00%	0.011	0.4%
Subtotal: Coastal Terrace Prairie Assemblages		0.427	84.8%	0.978	41.6%	0.013	7.0%	1.418	46.6%
Ruderal									
Briza maxima/Festuca perennis	34		0.00%	0.072	3.06%		0.00%	0.072	2.4%
Briza maxima/Scabiosa atropurpurea	35		0.00%	0.070	2.99%	0.015	8.02%	0.086	2.8%
Carpobrotus edulis (no CTP Species Present)	36		0.00%	0.025	1.05%		0.00%	0.025	0.8%
Festuca myuros/Festuca perennis	37		0.00%	0.047	2.02%		0.00%	0.047	1.6%
Raphanus sativus/Avena barbata	38	0.009	1.75%		0.00%		0.00%	0.009	0.3%
Scabiosa atropurpurea/Carpobrotus edulis	39		0.00%	0.051	2.18%	0.007	3.55%	0.058	1.9%
Subtotal: Ruderal Assemblages		0.009	1.8%	0.265	11.3%	0.022	11.6%	0.296	9.7%
Planted									
Heperocyparis macrocarpa	40		0.00%	1.034	44.01%	0.069	35.77%	1.103	36.2%
mixed upland/wetland	41	0.000	0.03%		0.00%	0.088	45.68%	0.088	2.9%
Myoporum laetum-Baccharis pilularis	42		0.00%	0.069	2.93%		0.00%	0.069	2.3%
Subtotal: Planted Assemblages		0.000	0.03%	1.103	47.0%	0.157	81.5%	1.260	41.4%
Bluff Trail									
Trail and Adjacent Disturbed Areas (largely denuded)	43	0.067	13.41%	0.003	0.12%		0.0%	0.070	2.3%
Total		0.503	16.5%	2.349	77.2%	0.193	6.3%	3.045	100.0%

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Table 3: California Natural Communities (CDFW 2018a, CNPS 2018b) found within the Study Area

Association Scientific Name	Alliance Scientific Name	Common Name	Mapped Vegetation Types within the Study Area	Alliance Rank		Association Global Rank	Sensitive
				Global	State		
Hesperocyparis macrocarpa	Hesperocyparis macrocarpa	Monterey cypress stands	Non-Native Stands (Planted)	G1	S1		Yes
Brachypodium distachyon	Bromus (diandrus, hordeaceus) – Brachypodium distachyon	Annual brome grasslands	Coastal Terrace Prairie (exotic-dominated areas)				No
Bromus diandrus	Bromus (diandrus, hordeaceus) – Brachypodium distachyon	Annual brome grasslands	Coastal Terrace Prairie (exotic-dominated areas)			G5	No
Danthonia californica	Danthonia californica	California oat grass prairie	Coastal Terrace Prairie	G4	S3		Yes
Deschampsia cespitosa – Eryngium armatum	Deschampsia cespitosa	Tufted hair grass meadows	Coastal Terrace Prairie	G5	S4?		Yes
Deschampsia cespitosa var. holciformis	Deschampsia cespitosa	Tufted hair grass meadows	Coastal Terrace Prairie	G5	S4?		Yes
Lolium perenne	Lolium perenne	Perennial rye grass fields	Coastal Terrace Prairie				No
Lolium perenne	Lolium perenne	Perennial rye grass fields	Coastal Terrace Prairie				No
Carpobrotus (edulis)	Mesembryanthemum spp. – Carpobrotus spp.	Ice plant mats	Coastal Terrace Prairie (exotic-dominated areas)	Unranked	Unranked		No
Briza maxima	Avena spp. – Bromus spp.	Rattlesnake Grass	Ruderal				No

Table 4: Plant Communities by Native/Exotic Dominance Categories

Plant Communities and Dominance Categories	FMR		MBA Property		ROW		Total	
	Acres	% of Total	Acres	% of Total	Acres	% of Total	Acres	%
Coastal Terrace Prairie								
Native Dominated	0.019	4%	0.182	8%	0.002	1%	0.203	7%
Native-Exotic Co-dominated	0.202	40%	0.230	10%		0%	0.432	14%
Exotic Dominated-Natives Subdominant	0.078	16%	0.286	12%	0.004	2%	0.368	12%
Exotic Dominated-Natives Present at Low Abundance	0.128	25%	0.281	12%	0.007	3%	0.415	14%
Subtotal: Coastal Terrace Prairie Assemblages	0.427	85%	0.978	42%	0.013	7%	1.418	47%
Ruderal								
Exotic Dominated-Natives Present	0.009	2%	0.144	6%		0%	0.153	5%
Exotic Dominated-No (or only very low) Natives Present		0%	0.121	5%	0.022	12%	0.144	5%
Subtotal: Ruderal Assemblages	0.009	2%	0.265	11%	0.022	12%	0.296	10%
Planted								
Native-Exotic Co-dominated	0.0001	0.03%		0%	0.088	46%	0.088	3%
Exotic Dominated-Natives Subdominant		0%	0.069	3%		0%	0.069	2%
Exotic Dominated-Natives Present at Low Abundance		0%	0.925	39%	0.061	32%	0.986	32%
Exotic dominated-No (or only very low) Natives Present		0%	0.109	5%	0.008	4%	0.116	4%
Subtotal: Planted Assemblages	0.000	0%	1.103	47%	0.157	81%	1.260	41%
Bluff Trail (Largely Denuded)	0.067	13%	0.003	0.1%		0%	0.070	2%
Total	0.503	100%	2.349	100%	0.193	100%	3.045	100%

Table 5: Summary of Rare Plants Observed in the Valleamar Bluff Study Area¹

Species	Status ²	Life History	Distribution and Habitat	Moss Beach Associates Property	Fitzgerald Marine Reserve
Blasdale's bent grass (<i>Agrostis blasdalei</i>)	CRPR 1B.2	perennial grass	coastal strand between Santa Cruz and Mendocino counties	Present	Present
harlequin lotus (<i>Hosackia gracilis</i>)	CRPR 4.2	perennial forb	coastal communities, British Columbia to central California	Present	Present
Johnny nip (<i>Castilleja ambigua</i> ssp. <i>ambigua</i>)	CRPR 4.2	annual forb	coastal communities, British Columbia to central California	Present	Present
coast yellow leptosiphon (<i>Leptosiphon croceus</i>)	California Candidate for Listing as Endangered, CRPR 1B.1	annual forb	Moss Beach Bluff (single known location)	Absent	Present

¹ No rare plant species were observed in the County right-of-way on the perimeter of the study area.

² California Candidate for Listing as Endangered: Identified as a candidate for listing as endangered under the California Endangered Species Act

California Rare Plant Rank (CRPR): 1B =Rare or endangered in California and elsewhere, 4 ="Watch List" plants with limited distributions or infrequent presence throughout California.

Decimals after the Status categories represent the Threat rank (e.g., "List 1B.1"): X.1 = Seriously threatened populations, X.2 = Marginally threatened populations, X.3 = Populations with limited threats.

Table 6: Rare Plant Occurrences within the Study Area

	FMR			MBA			Total		
	sf	ac	Density	sf	ac	Density	sf	ac	Density
Blasdale's bent grass	374	0.009	156	78	0.002	65	452	0.010	221
coast yellow leptosiphon	746	0.017	13,416 - 34,097 ¹	0	0.000	0	746	0.017	13,416 - 34,097 ¹
Johnny nip	2,877	0.066	772	4,589	0.105	931	7,466	0.171	1,703
harlequin lotus	0	0.000		2,050	0.047	133	2,050	0.047	133

¹ No rare plant species were observed in the County right-of-way on the perimeter of the study area.

² Coast yellow leptosiphon abundance estimated coarsely through sampling of reproductive structures, and may not be accurate

Table 7: Acres within the limits of grading (LOG) and infiltration spreader area (spreader) in each Proposed MBA Parcel

Vegetation Type by Condition	Lot 1		Lot 2		Lot 3		Lot 4		All Parcels		
	LOG	Spreader	LOG	Spreader	LOG	Spreader	LOG	Spreader	LOG	Spreader	Total
Coastal Terrace Prairie											
Native Dominated					0.002	<0.001			0.002	<0.001	0.002
Native-Exotic Co-dominated	<0.001	0.003		<0.001	0.000				<0.001	0.004	0.004
Exotic dominated-Natives Subdominant	0.002		<0.001				0.006	0.003	0.008	0.003	0.011
Exotic Dominated-Natives Present	0.045		0.005	0.002	0.005				0.055	0.002	0.057
Subtotal: Coastal Terrace Prairie	0.048	0.003	0.005	0.003	0.007	0.000	0.006	0.003	0.065	0.010	0.074
Ruderal	0.111		0.028		0.000		0.064		0.204	0.000	0.204
Planted	0.053		0.166	0.001	0.240	0.003	0.173	0.000	0.632	0.005	0.637
Total	0.212	0.003	0.199	0.004	0.247	0.003	0.243	0.004	0.901	0.015	0.915

Table 8: Harlequin Lotus Habitat (in square feet) and Plants Within the Proposed Impact Areas

Impact Area	Lot 3		Lot 4		Total	
	sf	Est. Plants ¹	sf	Est. Plants ¹	sf	Est. Plants ¹
Limits of Grading	81.5	3	202.0	12	283.5	15
Spreader Area	2.8	0	52.5	5	55.3	5
Total	84.3	3	254.5	17	338.8	20

¹ Density estimated based on the proportion of the total patch in the impact area and rounded to the nearest individual.

No occupied habitat or individuals mapped in lots 1 and 2

Table 9: Potential Restoration Areas (Figure 8)

Restoration Treatments	Square Feet	Acres
Address Unnatural Topography (Mound)	1,358	0.0312
Address Unnatural Topography (Swale)	1,297	0.0298
Control Dense Exotic Grasses and Forbs	10,568	0.2426
Control Invasive Plants	1,700	0.0390
Manage Native Disturbance-Adapted Plants	6,747	0.1549
Remove Ice Plant Mats	5,991	0.1375
Remove Planted/Ornamental Species	1,867	0.0429
Remove Wood Chips	1,366	0.0314
Total	30,894	0.7092
Establish Native Plants on <i>De Facto</i> Trails ¹	270 lineal feet	

¹ The trails overlap other restoration areas so their area was not included in the total treatment area

Table 10: Summary of the Effects of the Proposed Conservation and Development Project

Special-Status Resource	Direct Negative Effects of Project	Indirect Negative Effects of Project	Benefits of Conservation and Mitigation	Net Effects of the Project with Mitigation
Coastal Terrace Prairie (sensitive natural community)	• 0.065 ac. of permanent impacts to largely degraded (i.e., exotic dominated) coastal terrace prairie located on the western perimeter of development footprint • 0.01 ac. or temporary impacts to largely degraded coastal terrace prairie resulting from installation of the infiltration spreaders; the habitat will be restored following installation and described at right.	• Potential to promote the invasion and spread of exotic plants, though they will be controlled during implementation of the restoration and management plans. • Potential to affect plant species composition by altering drainage and thus soil moisture, though this will be limited through use of permeable pavers and installation of infiltration spreaders for runoff. • Potential to promote trampling through additional recreational use, though impacts will be limited through active recreation management which is anticipated to actually improve habitat conditions relative to current conditions due to unmanaged public use.	• Permanently protect 0.874 acres of coastal terrace prairie. • Restore 0.71 acres of habitat by addressing a suite of anthropogenic factors that have degraded habitat (Table 9, Figure 8) • Active manage and monitor habitat in the conservation area to address factors that could degrade it, including exotic plants, incompatible recreation, and unanticipated indirect effects of development.	The project will have a net beneficial effect for coastal terrace prairie by: • Protecting coastal terrace prairie habitat at a ratio of more than 11:1. For every square foot of habitat that will be permanently or temporarily impacted, 11.7 square feet will be protected and managed in perpetuity. • Restoring coastal terrace prairie habitat at a ratio of more than 9:1. For every 1 square foot of coastal terrace prairie habitat to be impacted by the project, 9.5 acres will be restored to increase native plant cover and diversity. • Managing and preventing further degradation of habitat that would otherwise be expected to occur if the site is not actively managed to address anthropogenic impacts including unrestricted public access.

Table 10: Summary of the Effects of the Proposed Conservation and Development Project

Special-Status Resource	Direct Negative Effects of Project	Indirect Negative Effects of Project	Benefits of Conservation and Mitigation	Net Effects of the Project with Mitigation
Coast Yellow Leptosiphon (CE, CRPR 1B.1)	Likely None. This species was not observed on the project property during 2018 or during most prior years (Corelli 2016). Habitat in the development area is highly unsuitable due to the dense cover, including woody vegetation; soils are darker and browner and many not be suitable as well. The single plant observed on the property in 2016 (CDFW 2017) may have resulted from mediated dispersal by neighbors who reported dispersing seed atop Valleamar Bluffs to expand the population.	There is a low likelihood of negative indirect effects, which will be mitigated as described. - Potential to promote exotic plants (i.e. through disturbance and introduction of seed in developed areas) will be mitigated through implementation of the restoration and management plans. - Potential for altered drainage to affect soil moisture in ways that could impact the species directly or indirectly, through increased competition, will be reduced through use of permeable pavers and installation of infiltration spreaders. - The addition of four homes is unlikely to increase the frequency or intensity of recreation on the FMR, which already receives high public use. Recreation management, as outlined in the management plan, and enforcement of the easement, as necessary, can help address incompatible recreation uses.	Permanently protecting and managing the 0.92-acre conservation area, and restoring 0.71 acres, including by controlling exotic plants, will enhance coastal terrace prairie and may facilitate expansion of this rare plant; however, much of the coastal terrace prairie in the conservation area supports taller, denser grasses and forbs and features darker soils than observed in the currently occupied area, such that it may not ultimately be suitable for this diminutive rare plant found in light colored soils with sparser plant cover.	The project may have a net beneficial effect for this rare plant by reducing the abundance of exotic plants, which likely compete with the native plant, promoting management of recreation atop Valleamar Bluffs, may also benefit this species, though some level of disturbance by recreators may help maintain suitable habitat.

Table 10: Summary of the Effects of the Proposed Conservation and Development Project				
Special-Status Resource	Direct Negative Effects of Project	Indirect Negative Effects of Project	Benefits of Conservation and Mitigation	Net Effects of the Project with Mitigation
Blasdale's bent grass (CRPR 1B.2)	Likely None. This species was not observed in the development area during the 2018 survey; the only patch on site is on the western edge of the conservation area where habitat is more open and short-statured, as on the FMR property which supports the larger occurrence. The species generally occurs in shorter-statured grasslands that are largely absent from the impact area; therefore, it is unlikely to be present in a below-ground seed bank in the impact area.	Same as for coast yellow leptosiphon	- Permanently protecting the 0.92-acre conservation area, which includes a 78-sf occurrence of Blasdale's bent grass featuring 65 plants in 2018, will expand the 374-sf area of protected, occupied habitat supporting 156 plants in 2018 in the FMR. - Restoring 0.71 acres of coastal terrace prairie and managing the entire 0.92-acre conservation area, to address factors that degrade habitat for Blasdale's bent grass, including incompatible recreation and dense exotic plants, will enhance habitat for the rare plant and expand the population, provided the coastal terrace prairie habitat within the site is suitable.	The project will benefit Blasdale's bent grass, by completing avoiding impacts to the species during development, protecting and managing 78 sf of occupied habitat and an additional 0.92 acres of potentially suitable habitat. Restoration of the 0.71 acres of coastal terrace prairie in the conservation area may provide additional opportunities for species expansion, though some of the habitat in the conservation area may have unsuitable soils or otherwise prove unsuitable for this taxon.

Table 10: Summary of the Effects of the Proposed Conservation and Development Project

Special-Status Resource	Direct Negative Effects of Project	Indirect Negative Effects of Project	Benefits of Conservation and Mitigation	Net Effects of the Project with Mitigation
Harlequin Lotus (CRPR 4.2)	• Permanent loss of 284 sf of occupied habitat supporting ~15 individuals on the western edge of the limits of grading. • Temporary loss of 55 sf of supporting ~5 individuals within the areas where infiltration spreaders will be installed.	Same as for coast yellow leptosiphon (and Blasdale's bent grass), though the potential for indirect impacts is arguably higher for this taxon owing to its closer proximity to the proposed development. Nonetheless, implementation of the mitigation measures recommended here, including development and implementation of management and restoration plans prepared for the site, is anticipated to limit the potential for indirect, negative effects of the development to impact this species of limited distribution.	• Permanently protecting the 0.92-acre conservation area, which includes a 1,711 sf of occupied harlequin lotus habitat supporting 113 plants in 2018. • Restoring 0.71 acres of coastal terrace prairie and managing the entire 0.92-acre conservation area to address factors that degrade habitat for this species, including incompatible recreation and dense exotic plants, may enhance habitat for the rare plant and expand the population, provided the coastal terrace prairie habitat within the site is suitable.	The project will have a net benefit for harlequin lotus. • The conservation area will protect harlequin lotus habitat at a ratio of 5:1; for every one of the 339 square feet impacted by development, 5 sf (1,711 sf total) will be protected. • The ratio for individuals is nearly 6:1 (113 individuals will be protected for the 20 in the development area); this could be increased through the salvage of seed, sod, and/or topsoil prior to development for use in onsite restoration. Management and restoration of 0.92 acres and 0.71 acres within the site, respectively, will create opportunities for population expansion including by reducing competition with dense exotic plants that may outcompete the native plant.
Johnny Nip (CRPR 4.2)	Likely None. This species was not observed in the	Same as for coast yellow leptosiphon (and Blasdale's bent grass), though the potential for indirect impacts is	• Permanently protecting the 0.92-acre conservation area, which features 0.105	The project will benefit Johnny nip by completing avoiding impacts to the species during

Table 10: Summary of the Effects of the Proposed Conservation and Development Project

Special-Status Resource	Direct Negative Effects of Project	Indirect Negative Effects of Project	Benefits of Conservation and Mitigation	Net Effects of the Project with Mitigation
	development area during the 2018 survey; the only occurrences are all within the 0.92-acre conservation area. The species generally occurs in shorter-statured grasslands that are largely absent from the impact area; therefore, it is unlikely to be present in a below-ground seed bank in the impact area.	arguably somewhat higher for this taxon owing to its closer proximity to the proposed development. Nonetheless, implementation of the mitigation measures recommended here, including development and implementation of management and restoration plans prepared for the site, is anticipated to limit the potential for indirect, negative effects of the development to impact this species of limited distribution.	acres of habitat occupied by Johnny Nip and an estimated 931 plants in 2018. Will expand and buffer the 0.066 acres of occupied habitat supporting 772 acres in the FMR. Restoring 0.71 acres of coastal terrace prairie and managing the entire 0.92-acre conservation area to address factors that degrade habitat for this species, including incompatible recreation and dense exotic plants, may enhance habitat for the rare plant and expand the population.	development, protecting, managing and in some places restoring 0.105 acres of occupied habitat; the project will also protect and manage an additional 0.815 acres of habitat potentially suitable for this species. Restoration of the 0.71 acres of coastal terrace prairie in the conservation area may provide additional opportunities for expansion of this species, which occurs in both short and medium-statured grasslands in the study area.

Figures



Figure 1: Study Area

Vallemar Bluffs Botanical Survey Report



Figure 2: Historical Aerial Imagery of the Study Area, showing: a) 1972 b) 1979, c) 2002, and d) 2005.



Figure 2 (cont.): Historical Aerial Imagery of the Study Area, showing: e) 2008, f) 2009, g) 2010, and h) 2013.



Figure 3: Plant Community (Vegetation) Structure

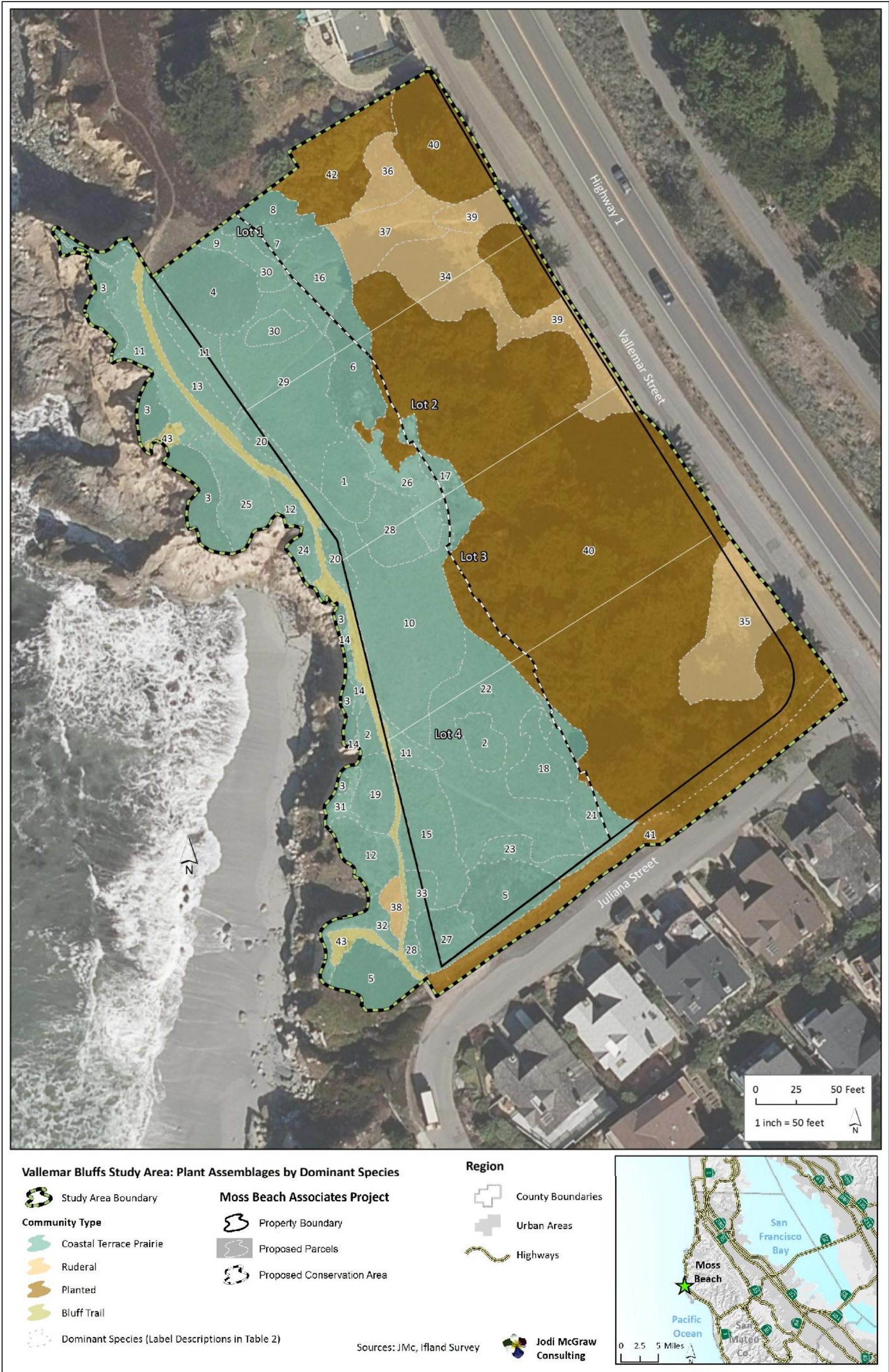


Figure 4: Plant Communities and Assemblages



Figure 5: Plant Communities by Native/Exotic Dominance Categories

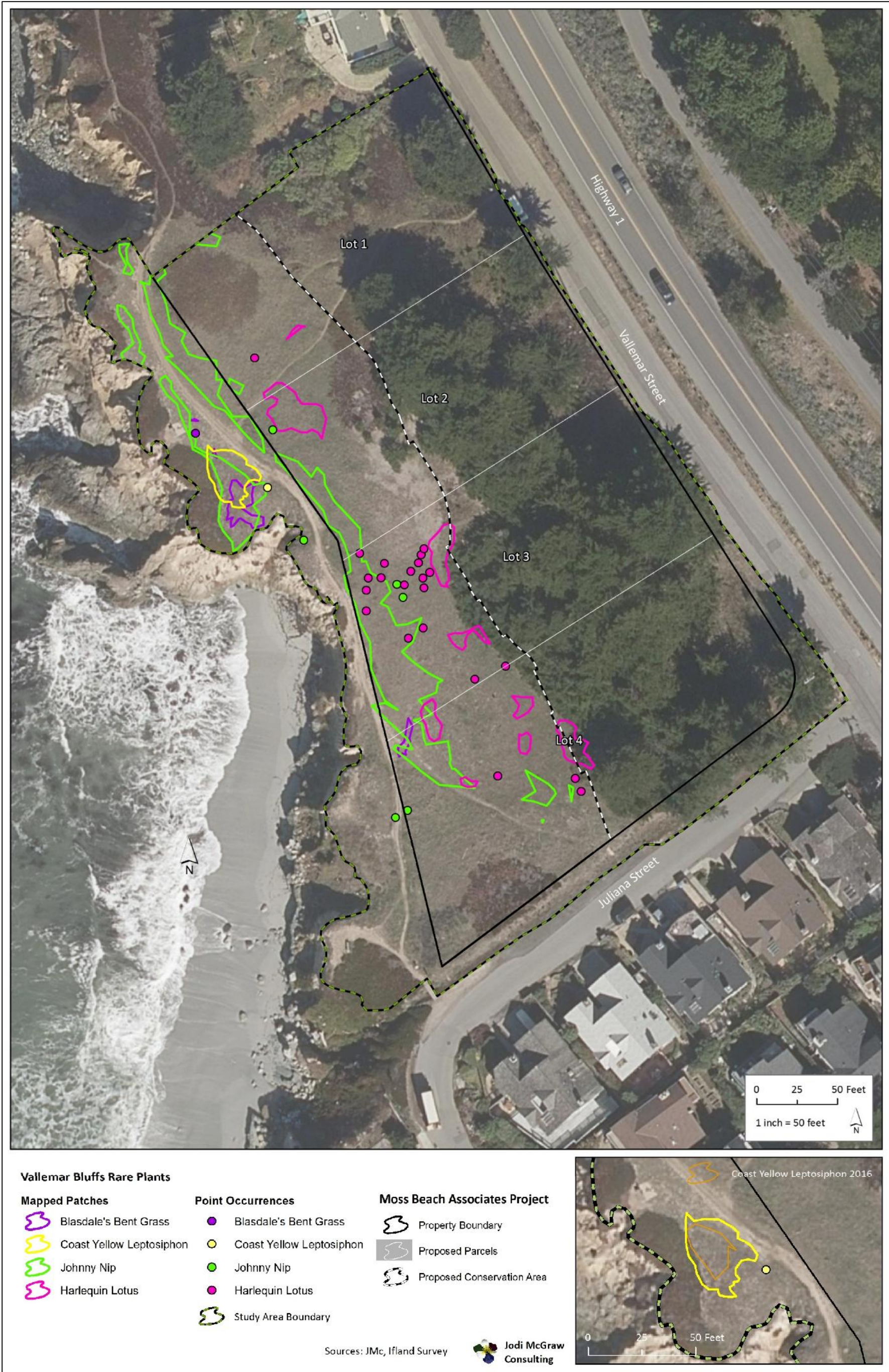


Figure 6: Rare Plants

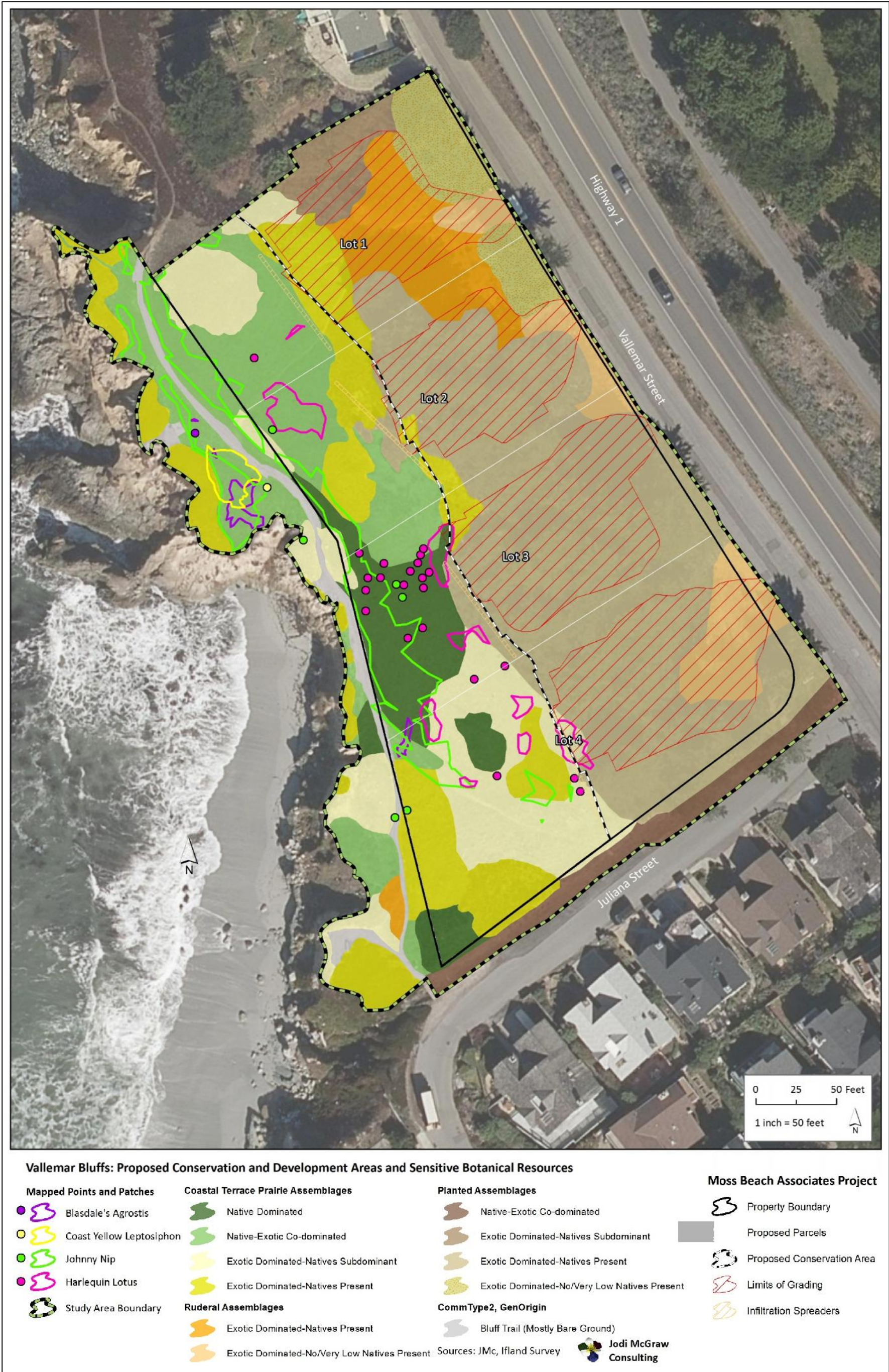


Figure 7: Impact Areas (showing communities and rare plants)

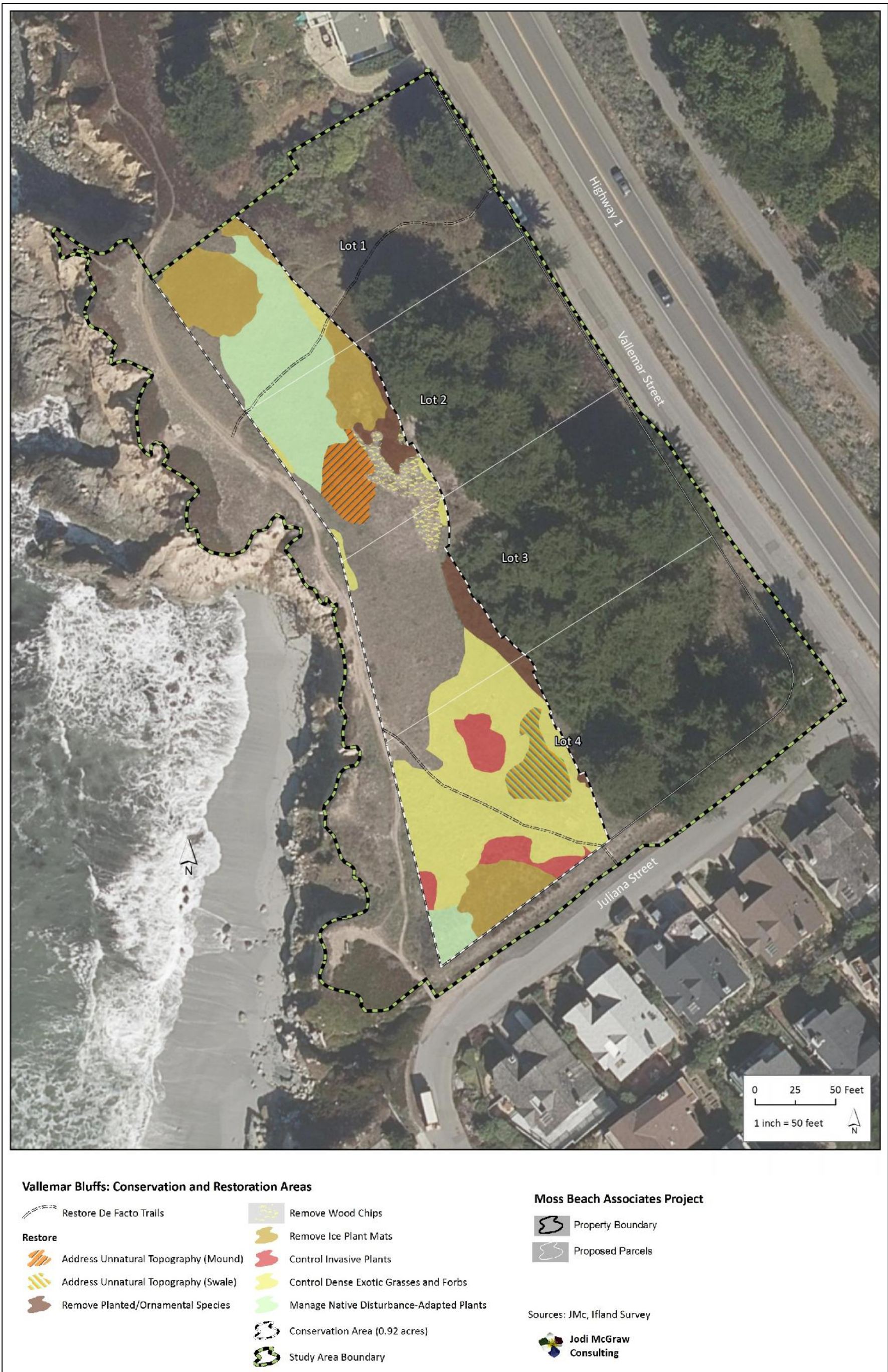


Figure 8: Conservation and Restoration Areas

Appendix A: Rare Plant List

Table A-1: Rare plant species targeted in the survey based upon database searches (CDFW 2018, Corelli 2018) and literature (Hayes 2003)						
Scientific Name	Common Name	Status ¹			Presence in Survey Properties ²	
		State	Federal	CRPR	Moss Beach Assoc. Property	Fitzgerald Marine Reserve
Acanthomintha duttonii	San Mateo thorn-mint	CE	FE	1B.1		
Agrostis blasdalei	Blasdel's bent grass			1B.2	Present	Present
Allium peninsulare var. franciscanum	Franciscan onion			1B.2		
Alopecurus aequalis var. sonomensis	Short-awn Foxtail		FE	1B.1		
Arabis blepharophylla	coast rock cress			4.3		
Amsinckia lunaris	bent-flowered fiddleneck			1B.2		
Arctostaphylos andersonii	Anderson's manzanita			1B.2		
Arctostaphylos franciscana	Franciscan manzanita		FE	1B.1		
Arctostaphylos imbricata	San Bruno Mountain manzanita	CE		1B.1		
Arctostaphylos montana ssp. ravenii	Presidio manzanita	CE	FE	1B.1		
Arctostaphylos montaraensis	Montara manzanita			1B.2		
Arctostaphylos pacifica	Pacific manzanita	CE		1B.1		
Arctostaphylos regismontana	Kings Mountain manzanita			1B.2		
Astragalus pycnostachyus var. pycnostachyus	coastal marsh milk-vetch			1B.2		
Blennosperma nanum var. robustum	Point Reyes Blennosperma	CR		1B.2		
Campanula californica	Swamp harebell			1B.2		
Castilleja ambigua var. ambigua	Johnny-nip			4.2	Present	Present
Centromadia parryi ssp. congdonii	Congdon's tarplant			1B.1		
Centromadia parryi ssp. parryi	pappose tarplant			1B.2		
Chloropyron maritimum ssp. palustre	Point Reyes salty bird's-beak			1B.2		
Chorizanthe cuspidata var. cuspidata	San Francisco Bay spineflower			1B.2		
Chorizanthe cuspidata var. villosa	woolly headed spineflower			1B.2		
Chorizanthe howellii	Howell's spineflower	CT	FE	1B.2		

Table A-1: Rare plant species targeted in the survey based upon database searches (CDFW 2018, Corelli 2018) and literature (Hayes 2003)

Scientific Name	Common Name	Status ¹			Presence in Survey Properties ²	
		State	Federal	CRPR	Moss Beach Assoc. Property	Fitzgerald Marine Reserve
Chorizanthe robusta var. hartwegii	Scott's Valley spineflower		FE	1B.1		
Chorizanthe robusta var. robusta	robust spineflower		FE	1B.1		
Chorizanthe valida	Sonoma spineflower	CE	FE	1B.1		
Cirsium andrewsii	Franciscan thistle			1B.2		
Cirsium fontinale var. fontinale	Crystal Springs fountain thistle	CE	FE	1B.1		
Cirsium occidentale var. compactum	compact cobwebby thistle			1B.2		
Collinsia multicolor	San Francisco collinsia			1B.2		
Dirca occidentalis	western leatherwood			1B.2		
Eriogonum luteolum var. caninum	Tiburon buckwheat			1B.2		
Eriophyllum latilobum	San Mateo woolly sunflower	CE	FE	1B.1		
Erysimum franciscanum	San Francisco wallflower			4.2		
Fritillaria biflora var. ineziana	Hillsborough chocolate lily			1B.1		
Fritillaria liliacea	fragrant fritillary			1B.2		
Gilia capitata ssp. chamissonis	blue coast gilia			1B.1		
Grindelia hirsutula var. maritima	San Francisco gumplant			3.2		
Helianthella castanea	Diablo helianthella			1B.2		
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant			1B.2		
Hemizonia congesta ssp. tracyi	Tracy's tarplant			4.3		
Hesperervax sparsiflora var. brevifolia	short-leaved evax			1B.2		
Hesperocyparis macrocarpa	Monterey cypress			1B.2	Present*	
Hesperolinon congestum	Marin western flax	CT	FT	1B.1		
Holocarpha macradenia	Santa Cruz tarplant	CE	FT	1B.1		
Horkelia cuneata var. sericea	Kellogg's horkelia			1B.1		
Horkelia marinensis	Point Reyes horkelia			1B.2		
Hosackia gracilis	harlequin lotus			4.2	Present	

Table A-1: Rare plant species targeted in the survey based upon database searches (CDFW 2018, Corelli 2018) and literature (Hayes 2003)

Scientific Name	Common Name	Status ¹			Presence in Survey Properties ²	
		State	Federal	CRPR	Moss Beach Assoc. Property	Fitzgerald Marine Reserve
<i>Lasthenia californica</i> ssp. <i>macrantha</i>	perennial goldfields			1B.2		
<i>Leptosiphon acicularis</i>	<i>Linanthus acicularis</i>			4.2		
<i>Leptosiphon croceus</i>	coast yellow leptosiphon	CC		1B.1		Present
<i>Leptosiphon grandiflorus</i>	large-flower linanthus			4.2		
<i>Leptosiphon rosaceus</i>	rose leptosiphon			1B.1		
<i>Lessingia arachnoidea</i>	Crystal Springs lessingia			1B.2		
<i>Lessingia germanorum</i>	San Francisco lessingia	CE	FE	1B.1		
<i>Limnanthes douglasii</i> ssp. <i>ornduffii</i>	Ornduff's meadowfoam			1B.1		
<i>Limnanthes douglasii</i> ssp. <i>sulphurea</i>	Point Reyes meadowfoam	CE		1B.2		
<i>Limnanthes vinculans</i>	Sebastopol meadowfoam	CE	FE	1B.1		
<i>Lupinus arboreus</i> var. <i>eximius</i>	San Mateo tree lupine			3.2		
<i>Malacothamnus aboriginum</i>	Indian Valley bush-mallow			1B.2		
<i>Malacothamnus arcuatus</i>	arcuate bush-mallow			1B.2		
<i>Malacothamnus davidsonii</i>	Davidson's bush-mallow			1B.2		
<i>Malacothamnus hallii</i>	Hall's bush-mallow			1B.2		
<i>Micropus amphibolus</i>	Mt. Diablo cottonweed			3.2		
<i>Monardella sinuata</i> ssp. <i>nigrescens</i>	northern curly-leaved monardella			1B.2		
<i>Monolopia gracilens</i>	woodland woollythreads			1B.2		
<i>Pentachaeta bellidiflora</i>	white-rayed pentachaeta	CE	FE	1B.1		
<i>Perideridia gairdneri</i> ssp. <i>gairdneri</i>	Gairdner's yampa			4.2		
<i>Pinus radiata</i>	Monterey pine			1B.1	Present*	
<i>Piperia michaelii</i>	Michael's rein orchid			4.2		
<i>Plagiobothrys chorisianus</i> var. <i>chorisianus</i>	Choris' popcornflower			1B.2		
<i>Plagiobothrys diffusus</i>	San Francisco popcornflower	CE		1B.1		
<i>Polemonium carneum</i>	Oregon polemonium			2B.2		

Table A-1: Rare plant species targeted in the survey based upon database searches (CDFW 2018, Corelli 2018) and literature (Hayes 2003)

Scientific Name	Common Name	Status ¹			Presence in Survey Properties ²	
		State	Federal	CRPR	Moss Beach Assoc. Property	Fitzgerald Marine Reserve
Polygonum hickmanii	Scotts Valley Polygonum	CE	FE	1B.1		
Potentilla hickmanii	Hickman's cinquefoil	CE	FE	1B.1		
Psilocarphus tenellus var. globiferus	Round Woolly Marbles					
Sanicula maritima	adobe or maritime sanicle	CR		1B.1		
Sidalcea calycosa ssp. rhizomata	Pt. Reyes Checkerbloom			1B.2		
Silene verecunda ssp. verecunda	San Francisco campion			1B.2		
Stebbinsoseris decipiens	Santa Cruz microseris			1B.2		
Trifolium amoenum	showy rancheria clover		FE	1B.1		
Trifolium buckwestiorum	Santa Cruz clover			1B.1		
Trifolium hydrophilum	saline clover			1B.2		
Trifolium polyodon	Pacific Grove clover	CR		1B.1		
Triphysaria floribunda	San Francisco owl's-clover			1B.2		
Triquetrella californica	coastal triquetrella			1B.2		
Usnea longissima	Methuselah's beard lichen			4.2		

¹ Status Designations**State:** Status under California Endangered Species Act (endangered and threatened) or California Native Plant Protection Act (rare)

CE: Endangered

CT: Threatened

CR: Rare

Federal: Status under Federal Endangered Species Act

FE: Endangered

FT: Threatened

California Rare Plant Rank (CRPR):

1B: Rare or endangered in California and elsewhere

2B: Plants rare, threatened, or endangered in California but more common elsewhere

3: Review List: Plants about which more information is needed

Table A-1: Rare plant species targeted in the survey based upon database searches (CDFW 2018, Corelli 2018) and literature (Hayes 2003)

Scientific Name	Common Name	Status ¹			Presence in Survey Properties ²	
		State	Federal	CRPR	Moss Beach Assoc. Property	Fitzgerald Marine Reserve

4 = "Watch List" plants with limited distributions or infrequent presence throughout California.

Decimals after the Status categories represent the Threat rank (e.g., "List 1B.1"):

X.1 = Seriously threatened populations

X.2 = Marginally threatened populations

X.3 = Populations with limited threats.

² Presence in Survey Properties

Present: Found on site as part of a naturally occurring population

Present*: Found on site but almost certainly planted or spread from prior planted area as individuals located outside of natural range

All blank cells represent species not observed on the property in question during the survey in 2018, or in the 2015 survey (Zander Assoc. 2015)

Appendix B: Results of Floristic Survey of Valleamar Bluffs

Table B-1: List of plant species observed in survey area				
Name	Family	Origin, Life Form, and Special Status	Moss Beach Assoc. Property	Fitzgerald Marine Reserve
<i>Achillea millefolium</i> (Yarrow)	Asteraceae	Native Per. forb	L	N
<i>Acmispon wrangelianus</i> (Chilean trefoil)	Fabaceae	Native Ann. Forb	L	L
<i>Aeonium</i> sp. (tree houseleek)	Crassulaceae	Exotic succulent	L	N
<i>Agrostis blasdalei</i> (Blasdale's bent grass)	Poaceae	Native Per. Grass (rhizome) (CRPR 1B.1)	L	L
<i>Allium triquetrum</i> (White flowered onion)	Liliaceae	Exotic Per. bulb	N/R	N
<i>Aptenia cordifolia</i> (baby sun-rose)	Aizoaceae	Exotic Succulent	N/R	N
<i>Armeria maritima</i> ssp. <i>californica</i> (Sea thrift)	Plumbaginaceae	Native Per. Forb	M	M
<i>Avena barbata</i> (Slim oat)	Poaceae	Exotic Ann. Or per. Grass	L	L
<i>Avena fatua</i> (Wild oat)	Poaceae	Exotic Ann. grass	L	L
<i>Baccharis pilularis</i> (Coyote brush)	Asteraceae	Native Shrub	L	N
<i>Brachypodium distachyon</i> (False brome)	Poaceae	Exotic Ann./per. Grass	L	L
<i>Briza maxima</i> (Rattlesnake grass)	Poaceae	Exotic Ann. grass	M	N
<i>Briza minor</i> (Annual quaking grass, small quaking grass)	Poaceae	Exotic Ann. grass	L	N
<i>Bromus carinatus</i> var. <i>carinatus</i> (California brome)	Poaceae	Native Per. Grass	N/R	N
<i>Bromus diandrus</i> (Rip gut brome)	Poaceae	Exotic Ann. Grass	M	L
<i>Bromus hordeaceus</i> (Soft chess)	Poaceae	Exotic Ann. grass	L	L
<i>Bromus maritimus</i> (maritime brome) [formerly <i>B. carinatus</i> var. <i>maritimus</i>]	Poaceae	Native per. Grass	M	M
<i>Calandrinia ciliata</i> (red maids)	Montiaceae	Native Ann. forb	L	L
<i>Carduus pycnocephalus</i> (Italian thistle)	Asteraceae	Exotic Ann. Herb	L	N
<i>Carex</i> sp.	Cyperaceae	(likely) native per. herb	L	N
<i>Carpobrotus chilensis</i> (Sea fig)	Aizoaceae	Exotic Per. Forb (succulent)	M	M
<i>Carpobrotus edulis</i> (Hottentot-fig)	Aizoaceae	Exotic Per. Forb (succulent)	H	H
<i>Castilleja ambigua</i> ssp. <i>ambigua</i> (Johnny nip)	Orobanchaceae	Native Ann. Forb (CRPR 4.2)	M	M
<i>Cerastium glomeratum</i> (Sticky mouse-ear chickweed)	Caryophyllaceae	Exotic Ann. Forb	L	N
<i>Chasmanthe floribunda</i> (chasmanthe)	Iridaceae	Exotic Per. Herb	N/R	N
<i>Clarkia amoena</i>	Onagraceae	Native	N	L

Name	Family	Origin, Life Form, and Special Status	Moss Beach Assoc. Property	Fitzgerald Marine Reserve
<i>Conium maculatum</i> (poison hemlock)	Apiaceae	Exotic Per. Herb	L	N
<i>Cortaderia jubata</i> (Jubata grass)	Poaceae	Exotic Per. Grass	L	N
<i>Crocasmia crocosmiiflora</i> (Montbretia)	Iridaceae	Exotic Per. Herb	N/R	N
<i>Danthonia californica</i> (California oatgrass)	Poaceae	Native Per. Grass	L	N
<i>Daucus pusillus</i> (wild carrot)	Apiaceae	Native Ann. Herb	L	L
<i>Delairea odorata</i> (Cape Ivy)	Asteraceae	Exotic Per. Herb (vine)	L	N
<i>Deschampsia caespitosa</i> ssp. <i>holciformis</i> (Pacific hairgrass or coastal tufted hairgrass)	Poaceae	Native Per. Grass	H	H
<i>Dudleya farinosa</i> (bluff lettuce)	Crassulaceae	Native Per herb (succulent)	N	L
<i>Echium candicans</i> (pride of Madeira)	Boraginaceae	Exotic Shrub	L	N
<i>Echium pininan</i>) pine echium	Boraginaceae	Exotic Shrub	L	N
<i>Ehrharta erecta</i> (Panic veldt grass)	Poaceae	Exotic Per. Grass	M	N
<i>Elymus triticoides</i> (beardless wild rye)	Poaceae	Native Per. Grass	L*	N
<i>Erigeron canadensis</i> (Canada horseweed)	Asteraceae	Native Ann. Herb	N/R	N
<i>Erigeron glaucus</i> (seaside daisy)	Asteraceae	Native Per. Herb (subshrub)	N	L
<i>Eriogonum latifolium</i> (coast buckwheat)	Polygonaceae	Native per. Herb or subshrub	N	M
<i>Eryngium armatum</i> (coastal eryngo or coyote thistle or coastal button celery)	Apiaceae	Native per. Herb	M	M
<i>Epilobium</i> cf. <i>brachycarpum</i> (annual fireweed)	Onagraceae	Native Ann. Herb	L	N
<i>Euphorbia pepus</i>	Euphorbiaceae	Exotic Ann. Herb	L	N
<i>Festuca myuros</i> (rattail fescue)	Poaceae	Exotic Ann. grass	L	L
<i>Festuca perennis</i> (Italian rye grass)	Poaceae	Exotic Ann./per. grass	H	M
<i>Fragaria chiloensis</i> (Beach strawberry)	Rosaceae	Native Per. Forb	M	M
<i>Fumaria parviflora</i> (fine leaved fumitory)	Papaveraceae	Exotic Ann. forb	L	N
<i>Galium aparine</i>	Rubiaceae	Native ann. Herb	L	N
<i>Gamochaeta ustulata</i> (purple cudweed, or featherweed)	Asteraceae	Native Ann. Biennial. Or short-lived per. forb	M	M
<i>Geranium dissectum</i> (cut leaf geranium)	Geraniaceae	Exotic Ann. herb	L	L
<i>Grindelia stricta</i> var. <i>platyphylla</i> (gumplant)	Asteraceae	Native Per. Forb	M	M
<i>Helminthotheca echioides</i> (<i>Picris echioides</i> ; Bristly ox tongue)	Asteraceae	Exotic	M	L
<i>Hesperocyparis macrocarpa</i>	Cupressaceae	Native Tree (though not native to the site)	H	N
<i>Holcus lanatus</i> (velvet grass)	Poaceae	Exotic Per. Grass	L*	N

Table B-1: List of plant species observed in survey area				
Name	Family	Origin, Life Form, and Special Status	Moss Beach Assoc. Property	Fitzgerald Marine Reserve
<i>Hordeum brachyantherum</i> (meadow barley)	Poaceae	Native Ann. Grass	L	L
<i>Hordeum murinum</i> ssp. <i>leporinum</i> (hare barley)	Poaceae	Exotic Ann. Grass	L	L
<i>Hosackia gracilis</i> (Harlequin lotus)	Fabaceae	Native Per. Forb CRPR 4.2)	L	N
<i>Hypochaeris radicata</i> (Hairy cat's ears)	Asteraceae	Exotic Per. Forb	H	H
<i>Juncus bufonius</i> (Common toad rush)	Juncaceae	Native Ann. Graminoid	L*	N
<i>Juncus effusus</i> (common bog rush)	Juncaceae	Native Per. Graminoid	L*	N
<i>Juncus patens</i> (spreading rush)	Juncaceae	Native Per. Graminoid	L*	N
<i>Kickxia elatine</i> (sharp point fluellin)	Plantaginaceae	Exotic per. Herb	N/R	N
<i>Lepidium didymum</i> (Lesser swine cress)	Brassicaceae	Exotic Ann. Herb	N/R	N
<i>Leptosiphon croceus</i> (Coast yellow leptosiphon)	Polemoniaceae	Native Ann. Herb (CPRP 1B.1), CE	N	M
<i>Linum bienne</i> (flax)	Linaceae	Exotic biennial Herb	L	N
<i>Lotus corniculatus</i> (Birds foot trefoil)	Fabaceae	Exotic Per. Herb	M	N
<i>Lupinus versicolor</i>	Fabaceae	Native per. Herb or low-growing subshrub	M	M
<i>Lysimachia arvensis</i> (<i>Anagallis arvensis</i> ; Scarlet pimpernel)	Myrsinaceae	Exotic Ann. Forb	M	L
<i>Madia gracilis</i> (slender tarweed; gumweed)	Asteraceae	Native Ann. forb	N/R	N
<i>Madia sativa</i> (Coastal tarweed)	Asteraceae	Native Ann. forb	H	M
<i>Malva arborea</i> Tree mallow)	Malvaceae	Exotic biennial to subshrub	N	L
<i>Malva pseudolavatera</i> (Cretan mallow)	Malvaceae	Exotic ann, biennial, or subshrub	N	L
<i>Medicago polymorpha</i> (Ca. bur clover)	Fabaceae	Exotic Ann. Forb	M	M
<i>Melilotus indicus</i> (sour clover)	Fabaceae	Exotic Ann. herb	M	M
<i>Myoporum laetum</i> (Ngaio tree)	Myoporaceae	Exotic Shrub/Tree	M	N
<i>Nasturtium officinale</i> (Watercress)	Brassicaceae	Native per herb (aquatic)	L	N
<i>Oenothera</i> cf. <i>glazioviana</i>	Onagraceae	Exotic per. Herb	L	L
<i>Pinus radiata</i> (Monterey pine)	Pinaceae	Native Tree (though not native to the site)	L	N
<i>Pittosporum tobira</i> (Japanese pittosporum)	Pittosporaceae	Exotic Shrub/Tree	M	N
<i>Plantago coronopus</i> (Cut leaf plantain)	Plantaginaceae	Exotic Ann. Or biennial Forb	H	H
<i>Plantago lanceolata</i> (English plantain)	Plantaginaceae	Exotic Per. Forb	H	H
<i>Poa annua</i> (Annual blue grass)	Poaceae	Exotic ann. grass	L	L
<i>Poa douglasii</i> (sand dune blue grass)	Poaceae	Native per. Grass	N/R	L

Table B-1: List of plant species observed in survey area				
Name	Family	Origin, Life Form, and Special Status	Moss Beach Assoc. Property	Fitzgerald Marine Reserve
<i>Poa unilateralis</i> ssp. <i>unilateralis</i> (San Francisco bluegrass)	Poaceae	Native per. Grass	N/R	L
<i>Polygonum paronychia</i> (dune knotweed)	Polygonaceae	Native per. Herb to subshrub	N/R	N
<i>Polypogon monspeliensis</i> (rabbitsfoot grass)	Poaceae	Exotic ann. Grass	L	N
<i>Pseudognaphalium stramineum</i> (Annual cudweed or Cottonballing plant)	Asteraceae	Native ann. or biennial Herb	Y	N
<i>Ranunculus californicus</i> (California buttercup)	Ranunculaceae	Native per. Herb	M	N
<i>Raphanus sativus</i> (wild radish)	Brassicaceae	Exotic ann. or biennial herb	M	M
<i>Rubus ursinus</i> (California blackberry)	Rosaceae	Native Vine, shrub	L	N
<i>Rumex acetosella</i> (common sheep sorrel)	Polygonaceae	Exotic per. Herb	L	N
<i>Rumex crispus</i> (curly doc)	Polygonaceae	Exotic per. Herb	L	L
<i>Rumex salicifolius</i> (willow leaved dock)	Polygonaceae	Native per. Herb	L	N
<i>Sagina apetala</i> (dwarf pearlwort)	Caryophyllaceae	Native ann. herb	N/R	L
<i>Scabiosa atropurpurea</i> (pincushion flower)	Dipsaceae	Exotic Ann. herb	M	N
<i>Scandix pecten-veneris</i> Venus' needle)	Apiaceae	Exotic ann. herb or vine	N/R	N
<i>Senecio vulgaris</i> (common groundsel)	Asteraceae	Exotic ann. herb	N/R	N
<i>Sequoia sempervirens</i> (coast redwood)	Cupressaceae	Native Tree (though unlikely native to the site)	L	
<i>Sidalcea malviflora</i> ssp. <i>malviflora</i> (dwarf checkerbloom)	Malvaceae	Native per. Herb	L	L
<i>Silene gallica</i> (windmill pink, common catchfly)	Caryophyllaceae	Exotic ann. herb	L	N
<i>Silybum marianum</i> (milk thistle)	Asteraceae	Exotic ann. or per. Herb	L	L
<i>Sisyrinchium bellum</i> (blue eyed grass)	Iridaceae	Native Per. Herb	L	N
<i>Sonchus asper</i> (spiny sowthistle)	Asteraceae	Exotic ann. forb	L	N
<i>Sonchus oleraceus</i> (Common sowthistle)	Asteraceae	Exotic Ann. forb	L	N
<i>Spergularia macrotheca</i> var. <i>macrotheca</i> (sticky sand spurrey)	Caryophyllaceae	Native per. Herb	L	L
<i>Stebbinsoseris decipiens</i> (Stebbins microseris)	Asteraceae	Native Ann. herb CRPR 1B.2	L	N
<i>Stellaria media</i> (chickweed)	Caryophyllaceae	Exotic ann. forb	L	N
<i>Stipa pulchra</i> (purple needle grass)	Poaceae	Native per. Grass	L*	N
<i>Symphotrichum chilense</i> (California aster) [formerly <i>Aster chilensis</i>]	Asteraceae	Native per. Herb	L	N
<i>Taraxacum officinale</i> (dandelion)	Asteraceae	Exotic per. Herb	L	N

Table B-1: List of plant species observed in survey area

Name	Family	Origin, Life Form, and Special Status	Moss Beach Assoc. Property	Fitzgerald Marine Reserve
<i>Taraxia ovata</i> (sun cups) [formerly <i>Oenothera ovata</i>]	Onagraceae	Native per. Herb	L	L
<i>Trifolium dubium</i> (little hop clover)	Fabaceae	Exotic ann. herb	L	N
<i>Vicia sativa</i> ssp. <i>sativa</i> (common vetch)	Fabaceae	Exotic ann. herb/vine	L	N
<i>Zeltnera davyi</i> (Davy's centaury)	Gentianaceae	Native ann. herb	L	L

Presence Indications

High (H): Present at relatively high abundance

Moderate (M): Present at moderate abundance

Low (L): Present at relatively low abundance

Not Present (N): Species not present or not observed during survey

Not Present but Previously Recorded (N/R): Species not observed in 2018 survey but recorded by Zander Associates (2015)

* Observed only in County Right-of-Way adjacent to MBA property; separate column for the ROW was not included to simplify the table



County of San Mateo - Planning and Building Department

ATTACHMENT T1

**Valleamar Bluffs Conservation and Development Project
Management Planning Framework
August 2018**

Purpose

This document provides the framework for protection, restoration, and management of the 0.92-acre conservation area that will be established as part of the Valleamar Bluffs Conservation and Development Project. It was developed to provide information about the conservation element for inclusion in the Initial Study/Mitigated Negative Declaration being prepared by the County of San Mateo for the project. The information outlined here will provide a basis for development of, and will be integrated into, a habitat management plan following approval of the development project, and prior to issuance of building permits.

The framework includes the following:

1. **Goals, Objectives, and Success Criteria:** the proposed restoration and management achievements within the 0.92-acre conservation area, including objectives and success criteria for enhancement of 0.71 acres targeted for restoration (Table 1, Figure 1);
2. **Implementation Framework:** a description of how a habitat management plan will be prepared to guide restoration and management, tasks will be scheduled and funded, and the roles and responsibilities for various entities involved on protecting and managing the conservation area.

1 Goals and Objectives

Restoration and management within the 0.92-acre conservation area will be designed to protect, restore, and management native biodiversity in the coastal terrace prairie, including by promoting rare plant populations, while allowing compatible access.

1.1 Biodiversity

1.1.1 Goals

- B1. Enhance the natural community structure and native species composition of the coastal terrace prairie, which is a sensitive natural community.
- B2. Maintain or increase the areal extent and abundance of the Blasdale's bent grass (*Agrostis blasdalei*), to promote persistence of this population within Valleamar Bluffs.
- B3. Maintain or improve habitat for the other rare plant species that occur in the coastal terrace prairie, harlequin lotus (*Hosackia gracilis*) and Johnny nip (*Castilleja ambigua* ssp. *ambigua*), to promote viability of the populations of these species.

1.1.2 Objectives

The following are specific management and restoration objectives for biodiversity conservation. Specific treatment areas for select objectives are illustrated in Table 1 and Figure 1.

1. Increase the cover and diversity of native coastal terrace prairie plants by removing the planted/ornamental plant species within approximately 1,897 sf (0.043 acres)
2. Increase the cover and diversity of native coastal terrace prairie plants by removing ice plant mats covering approximately 5,991 sf (0.138 acres).
3. Increase the cover and diversity of native coastal terrace prairie plants by removing wood chips, base rock, or other non-native material covering approximately 1,700 sf (0.039 acres).
4. Promote native plant community structure and species composition by restoring the natural topography in areas where mounds (~ 1,358 sf or 0.31 acres) or swales (~1,297 sf or 0.030 acres) were created through prior excavation, where doing so will enhance native plant community structure and species composition.
5. Increase the cover and diversity of native coastal terrace prairie plants by controlling invasive plants including prickly sow thistle which outcome native plant species in approximately 923 sf (0.021 acres).
6. Increase the cover and diversity of native coastal terrace prairie plants by controlling dense exotic grasses and forbs where they dominate native species in an additional 10,568 sf (0.243 acres) to promote the abundance and diversity of native plants.
7. Increase the cover and diversity of native coastal terrace prairie plants in 270 lineal feet of *de facto* trails used to access the Bluff Trail from Juliana and Valleymar Streets, where current plant cover is low. Where appropriate, maintain open ground to promote the population of Blasdale's bent grass, a rare species that inhabits low-statured grasslands with high bare ground including where the trail from Juliana Street meets the Bluff Trail.
8. Increase the cover and diversity of native coastal terrace prairie plants reducing the abundance of disturbance-adapted native plants such as coastal tarweed in approximately 9,747 sf (0.155 acres) where they are dominant (e.g., in the southeastern corner of the property) to promote the establishment and growth of a broader diversity of native grasses and forbs.
9. Increase the distribution and abundance of harlequin lotus and coastal terrace prairie species by salvaging seed and topsoil from development for use in on-site restoration, where doing so can enhance the rare plant population and natural community structure and species composition.
10. Monitor natural community structure and species composition and the population of Blasdale's bent grass within coastal terrace prairie, to gauge the effectiveness of management and inform adjustments as part of the adaptive management framework.

1.2 Access

1.2.1 Goals

- A1. Facilitate passive recreation that is compatible with restoration and management of the coastal terrace prairie community and rare plants both in the conservation area, including public access on the Bluff Trail that is largely within the Fitzgerald Marine Reserve.
- A2. Provide access for scientific research, to increase understanding of the natural systems and inform their effective conservation and management.

- A3. Develop and maintain the infrastructure necessary to manage compatible access, including fences and interpretive signage, using approaches that limit impacts to biodiversity and the scenic values of the conservation area.

1.2.2 Objectives

1. Install symbolic fencing along the perimeter of the conservation area, to clearly delimit the boundary between it and the adjacent development areas and Fitzgerald Marine Reserve land.
2. Install signs that provide information about the conservation area including the rationale for its protection, to promote compliance with access restrictions.
3. Record in the CC&Rs for the parcels as well as the conservation easement, prohibitions against access to the conservation area that is not compatible with conservation, restoration, and management of natural community structure and species composition in the coastal terrace prairie and populations of rare native plants. Examples of prohibited activities include: installation of permanent or semi-permanent infrastructure or equipment such as outdoor furniture (e.g., patio furniture, picnic tables, umbrellas), play equipment (trampolines, play structures, etc.) or other items that intensify use or otherwise modify the structure and species composition of the grassland.
4. Work with the County of San Mateo, to coordinate on management of the Bluff Trail, which is largely within the Fitzgerald Marine Reserve but also occurs within a small portion of the conservation easement area, and that provides public access along the bluff edge. Ensure that the recreational use there is managed to be compatible with the restoration and management of the coastal terrace prairie and rare plants in the conservation area.
5. Monitor the effects of access and compliance with the measures to prevent trampling associated with recreational use and taking steps to increase compliance when/if negative impacts are observed.

2 Success Criteria

Success criteria will be used to evaluate whether the restoration and management has been effective at achieving the goals and objectives. The following are proposed success criteria for biodiversity goals and objectives. No separate access success criteria have been identified, since the access limitations are primarily designed to promote achievement of the success criteria related to biodiversity.

1. Within the restoration areas, achieve absolute cover and species richness of native grasses and forbs characteristic of the coastal terrace prairie that is 75% of that found in the intact, native-dominated coastal terrace prairie on site within five years of initiating restoration.
2. Within the management area (i.e., area outside of the restoration area), maintain or increase the cover and richness of native grasses and forbs characteristic of the coastal terrace prairie.
3. Maintain or increase the distribution (i.e., areal extent) and abundance of Blasdale's bent grass with the conservation area.

3 Implementation

This section outlines the approach that will be to restore, manage, and monitor the 0.92-acres conservation area.

3.1 Habitat Management Plan

Restoration, management, and monitoring of the conservation area will be implemented as described in a habitat management plan (HMP), which will be:

- Developed following approval of conservation and development project by the County of San Mateo, and prior to the issuance of building permits and any ground disturbance as part of project implementation;
- Prepared by an ecologist or biologist with experience in the ecology of the coastal terrace prairie community and species, restoration and management of sensitive habitats, and monitoring of rare plant species;
- Developed in coordination with San Mateo County Parks Department (County Parks), to facilitate coordinated management of biodiversity and access within the Valleamar Bluffs Area; and
- Provided to the County of San Mateo, California Department of Fish and Wildlife, and the Coastal Commission for review and input.

The HMP will be developed based upon, and integrate, the goals, objectives, success criteria, and implementation framework outlined in this document. It will include the following sections:

- **Section 1-Introduction:** This approximately two-to-three-page section will provide background information about the conservation area and the management plan, including its purpose, development process, and contents/organization.
- **Section 2-Conservation Area Description:** This approximately 10-page section will describe key aspects of the conservation area that will influence their conservation and management. It will be developed based on a synthesis of information in prior surveys and reports including the *Valleamar Bluffs Botanical Survey Report* (JMc 2018).
- **Section 3-Goals, Objectives and Success Criteria:** This section will identify the desired outcomes of restoration and management of the conservation areas, which may be refined through further planning but are presented in Section 1 of this document.
- **Section 4-Management Approaches and Strategies:** This section will describe the restoration and management strategies and techniques that will be implemented to achieve the goals and objectives and success criteria.
- **Section 5-Monitoring:** This section will describe how the conservation area will be monitored to evaluate the effectiveness of the restoration and management strategies at achieving the goals and objectives, and identify changes that need to be made as part of the adaptive management framework.

- **Section 6-Plan Implementation and Adaptive Management:** This section will:
 - identify a schedule for implementation of restoration and management tasks;
 - estimate the costs for implementation of the restoration and management tasks;
 - describe how the tasks will be implemented by an implementing entity in coordination with the Moss Beach Associates, LLC, a homeowners' association, and the conservation easement holder;
 - outline how management of public access on the Bluff Trail will be coordinated with County Parks, if requested by the agency, to enhance effectiveness of their efforts to conserve rare species and provide public access on the Fitzgerald Marine Reserve lands;
 - outline the adaptive management process through which the plan will be implemented and updated over time, to address changed circumstances and new information.

Section 6 will be developed based upon the framework outlined below.

3.2 Implementation

3.2.1 Tasks and Schedule

Restoration and management will be implemented following a schedule provided in the HMP. The schedule will feature two main phases: initial tasks and ongoing tasks.

3.2.1.1 Initial Tasks

The initial tasks are those that will be initiated during the first 1-3 years to establish the conservation area and work to restore habitat therein.

1. Restoration activities within the estimated 0.71 acres plus the 270-foot-long trail alignments (Table 1, Figure 1) will be initiated during the same year when construction of the new homes begins, with restoration activities timed to occur in appropriate seasons. Restoration and management may begin prior to initiation and construction, in order to reduce costs associated with ongoing habitat degradation (e.g., the spread of ice plant).
2. Management activities to regulate access, including installation of fences and signage and monitoring to evaluate compliance, will be initiated during the first year of plan implementation (which will begin with development, if not prior).
3. Monitoring will be conducted to establish the baseline conditions that will be used to track changes in habitat over time and evaluate achievement of the success criteria for rare plants and habitat management.

3.2.1.2 Ongoing Tasks

Ongoing tasks are those that will be implemented in perpetuity to manage and monitor the habitat within the conservation area. They are anticipated to include:

1. Priority exotic plant control activities, to maintain or enhance the 0.71-acre restoration areas (Table 1, Figure 1) as well as the 0.23 acres within the conservation area.

2. Access management, including work to maintain the fences and signage and ensure that public and private access does not degrade the coastal terrace prairie or negatively impact the rare plant populations; and
3. Monitoring to assess the condition of the natural communities and rare plant populations within the conservation area, as well as identify anthropogenic factors that could impact them. Monitoring is anticipated to include:
 - a. Quarterly assessments of habitat conditions to identify anthropogenic factors are degrading habitat, such as incompatible access and exotic plants; and
 - b. Annual assessments of plant community composition and structure in the coastal terrace prairie and track the status and condition of rare plant populations.

3.2.2 Roles and Responsibilities

The following describes the roles and responsibilities for the parties who will be involved in protecting, restoring, and managing the conservation area, which are anticipated to include the following:

- **Moss Beach Associates, LLC (MBA):** the entity funding the conservation and development project;
- **Homeowners Association (HOA):** the association comprised of representatives of the four owners of the residential parcels that will be developed as part of the project;
- **Land Trust:** the entity that will be granted the conservation easement, which will be a tax-exempt nonprofit organization qualified under Section 501(c)(3) of the Internal Revenue Code and qualified to do business in California that has as its primary purpose the preservation, protection, or enhancement of land in its natural, scenic, historical, agricultural, forested, or open space condition or use.
- **Implementing Entity:** The entity that will be responsible for implementing the HMP by conducting the restoration, management, and monitoring tasks on the ground, in coordination with the other entities, as outlined below.
- **County of San Mateo:** The County Parks Department, which manages the adjacent Fitzgerald Marine Reserve, will be invited to coordinate with the other entities on management of the conservation area to facilitate more effective conservation-based management of the Valleamar Bluffs.

3.2.2.1 Moss Beach Associates, LLC

Moss Beach Associates, LLC, will be responsible for the following:

- Granting the conservation easement to the land trust including by funding the land trust's easement monitoring and defense as well as perhaps other tasks for the land trust such as baseline documentation;
- Establishing the HOA including developing the governing documents, including Covenants, Conditions, and Restricts (CC&Rs) and articles of incorporation, to describe its roles and

responsibilities for implementation of the HMP as well as perhaps other land use and management tasks it may assume;

- Funding implementation of the restoration element of the HMP, which will be initiated during the first three years of plan implementation and is anticipated to be completed within five years, though the actual timeline will be determined based on that required to achieve the success criteria;
- Funding and coordinating the implementation of the other initial conservation area establishment tasks, including installation of the fence and signage to delimit the conservation area;
- Participating in the annual conservation area management group meeting until the restoration success criteria are achieved, to discuss management and monitoring within the conservation area.

The MBA responsibilities will be completed once the restoration and conservation area establishment tasks have been successfully completed and the success criteria achieved. At that point, the HOA will assume responsibility for management and monitoring as described below.

3.2.2.2 Land Trust

The land trust who will be granted the conservation easement will be responsible for the following:

- Documenting the baseline conditions of the conservation easement area;
- Monitoring the conditions of the easement area, and comparing it to the baseline conditions to gauge compliance with the easement terms;
- Coordinating with the HOA and Implementing Entity regarding any easement issues including violations related to activities within the four lots;
- Coordinating with the County and Implementing Entity regarding any easement issues including violations that relate to activities originating on the County land including the right-of-way (Public Works) or Fitzgerald Marine Reserve (County Parks); and
- Participating in the annual conservation area management group meeting to discuss management and monitoring within the conservation area.

3.2.2.3 Homeowners Association

A homeowner's association (HOA) will be established for the four residential properties developed as part of the Valleamar Bluffs Conservation and Development Project. The HOA will be responsible for the following:

- Abiding by the terms of the conservation easement, CC&Rs, and HMP, which will collectively identify allowed and prohibited activities on the conservation area as well as the development areas within the four privately owned parcels;
- Contracting with and funding work by the Implementing Entity during the ongoing management phase (years 3+), including by:
 - Reviewing and approving annual work plans and budgets;

- Reviewing annual reports prepared by the implementing entity and making adjustments to land use activities to address any issues identified;
- Participating in the annual conservation area management group meeting to discuss management and monitoring within the conservation area.

3.2.2.4 Implementing Entity

The Implementing Entity will be a private business or non-profit organization that specializes in restoration ecology, management of conservation lands protected for biodiversity, and rare plant conservation biology. The entity will be responsible for the following:

- Preparing the annual work plans and budgets to implement the HMP, including the restoration plans during the initial management phase;
- Implementing independently and/or with the assistance of subcontractors, the restoration, management, and monitoring tasks outlined in the work plan;
- Preparing annual reports that document the tasks implemented and the status and condition of the habitat, including progress toward achieving success criteria;
- Participating in the annual conservation area management group meeting to discuss management and monitoring within the conservation area;
- Updating the HMP as part of the adaptive management process, to address changed circumstances including newly available scientific information, to ensure that the HMP continues to guide effective management to achieve the goals, objectives, and success criteria for the conservation area.

3.2.2.5 The County of San Mateo

County Parks will be invited to participate in the annual conservation area management group meeting to discuss management and monitoring within the conservation area. The purpose of their participation will be to facilitate more effective, coordinated management of the conservation areas on Valleamar Bluffs by sharing information as part of an adaptive management process. Coordination may also occur on an as needed basis with County Public Works staff, who are responsible for the right of way between the conservation area and Juliana Street.

3.3 Funding

Funding for all tasks associated with protecting, restoring, and managing the conservation area will be funded by Moss Beach Associates, LLC (the project developer) and the HOA.

3.3.1 Moss Beach Associates, LLC

Moss Beach Associates, LLC, will fund all of the initial tasks (Section 3.2.1.1), which are anticipated to include:

- Granting of the conservation easement to a 501(c)(3) land trust, which will require establishment of an endowment or payment of other fees to fund baseline easement documentation, easement monitoring, and legal defense in perpetuity;
- Funding the initial restoration and conservation area establishment and management tasks that will be implemented during the first three years, including but not limited to:
 - Installing infrastructure such as fences and signage to regulate access;
 - Implementing all restoration activities within the estimated 0.71-acre treatment areas, as well as 270 linear feet identified for de facto trail restoration (Table 1, Figure 1, Section 1.1.2);
 - Implementing baseline surveys to document initial conditions and then the initial years of monitoring to evaluate the effectiveness of the restoration treatments over an anticipated three-year period;
 - Conducting remedial restoration and management actions, as needed to achieve the restoration success criteria.

Moss Beach Associates, LLC will also fund the suite of avoidance, minimization, and mitigation measures during project construction, including worker awareness trainings and biological construction monitoring, which will limit the effects of construction on the conservation area and adjacent Fitzgerald Marine Reserve (JMc 2018).

3.3.2 Homeowner's Association

The HOA will be responsible for funding the ongoing management and monitoring costs for the conservation area. Members of the HOA will make monthly contributions to the annual management and monitoring fund, which will be administered by the HOA. The amount that will be paid each year will be based on the estimated annual management and monitoring costs, which will be estimated by the management implementing entity in an annual work plan. The annual work plan tasks will reflect any management needs identified in the prior year's annual report as well as the ongoing management, maintenance, and monitoring tasks as outlined in the HMP and modified through the adaptive management framework. The annual budget will include costs for remedial actions as well as a contingency fund, which will be designed to ensure sufficient funds for management are available should additional needs arise. Any funds that remain at the end of the year will be applied to the subsequent year's management and monitoring.

3.4 Costing

The costs for implementing the HMP will be identified in the HMP using a Property Analysis Record (PAR) or PAR-like analysis. In this approach, the costs for restoration, management, and monitoring will be identified in two main categories:

1. **Initial and Capital Costs:** These are the initial costs to establish the conservation area, and conduct restoration during the first approximately three years of project implementation, which will be borne by Moss Beach Associates (Section 3.3.1); and
2. **Ongoing Costs:** These are the ongoing costs to manage and monitor the conservation area, including to address any emerging conservation and management needs, which will be funded

by the HOA (Section 3.3.2).

The cost estimates will be based on 2018 dollars and account for inflation based on the average consumer price index for the past 5 years, or other appropriate financial forecasting. The cost estimate will include the estimated costs for the specific tasks to restore, manage, and monitor the conservation area, as detailed in the HMP. It will also include the following:

1. **Contingency:** additional funds that may needed to achieve the plan's success criteria by increasing the level of effort, adjusting the techniques used to enhance effectiveness, or implementing additional tasks that were not anticipated. That is, the contingency will be used to address underestimates in the budget line items as well as omitted line items.
2. **Remedial Actions:** An estimate of the additional costs that will be needed to ensure achievement of the plan's success criteria if/when the planned tasks prove insufficient, including as a result of changed circumstances (e.g., invasion of a new exotic plant).

These cost estimates in the HMP will be provided for planning purposes only and will not be designed to define the minimum or maximum financial obligation of the parties who will be funding the restoration, management and monitoring. Instead, Moss Beach Associates, LLC. and the HOA will be responsible for fully funding the actual initial and capital costs (MBA), and the ongoing costs (HOA), which may differ from that estimated in the HMP (Section 3.3).

Table 1: Proposed Restoration Areas

Restoration Treatments	Square Feet	Acres
Address Unnatural Topography (Mound)	1,358	0.0312
Address Unnatural Topography (Swale)	1,297	0.0298
Control Dense Exotic Grasses and Forbs	10,568	0.2426
Control Invasive Plants	1,700	0.0390
Manage Native Disturbance-Adapted Plants	6,747	0.1549
Remove Ice Plant Mats	5,991	0.1375
Remove Planted/Ornamental Species	1,867	0.0429
Remove Wood Chips	1,366	0.0314
Total	30,894	0.7092
Establish Native Plants on <i>De Facto</i> Trails ¹	270 lineal feet	

¹ The trails overlap other restoration areas so their area was not included in the total treatment area

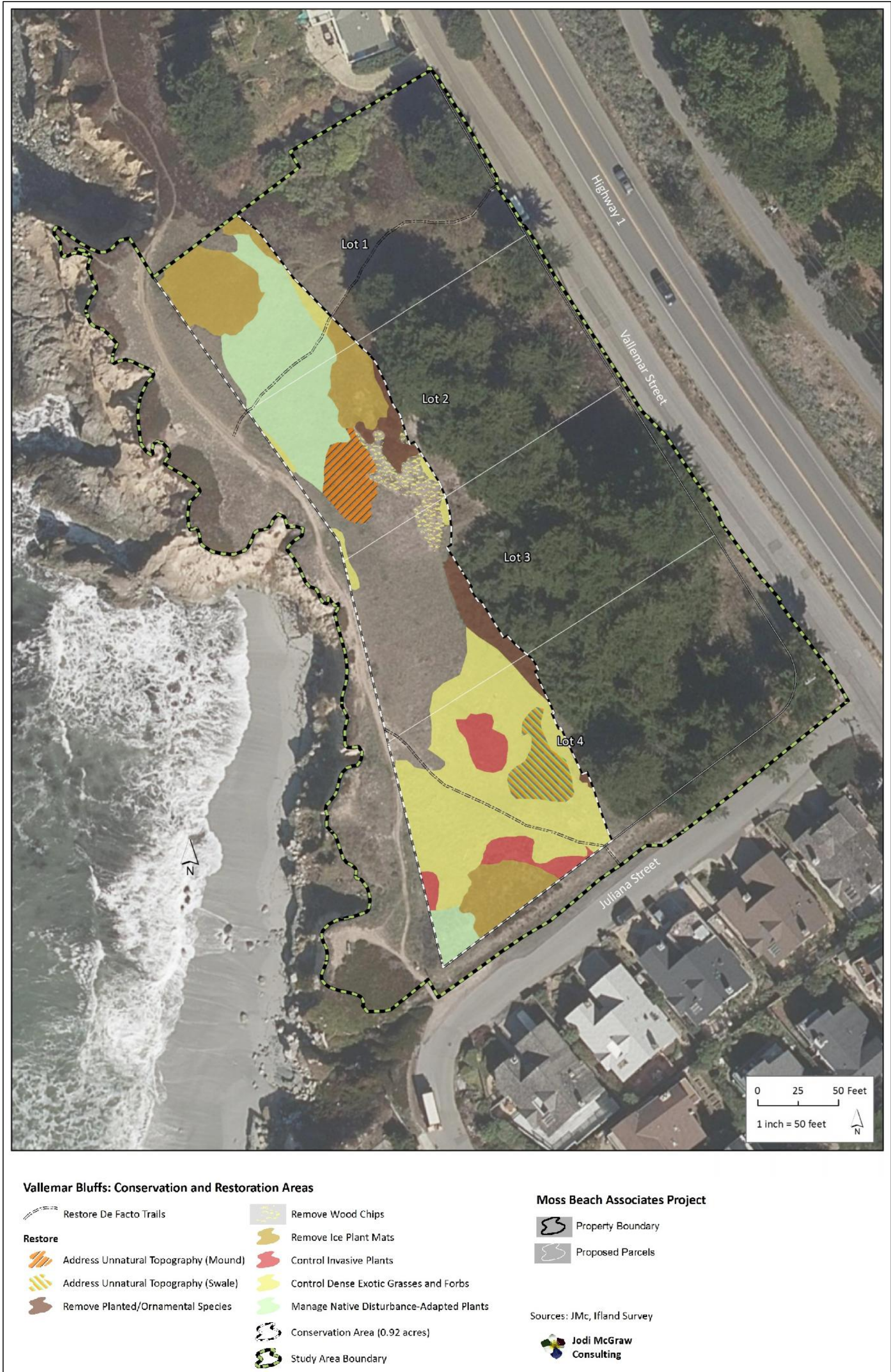


Figure 1: Conservation and Restoration Areas



County of San Mateo - Planning and Building Department

ATTACHMENT T2

Recorded at the request
of and when recorded
return to:
Golden State Land Conservancy
321 South Main Street #525
Sebastopol, CA 95472

CONSERVATION AND OPEN SPACE EASEMENT DECLARATION

THIS CONSERVATION AND OPEN SPACE EASEMENT DECLARATION ("Conservation Easement") is granted this ____ day of _____, 2018 by Moss Beach Associates, LLC, a California limited liability company ("Grantor") to Golden State Land Conservancy, Inc., a California nonprofit public benefit corporation ("Grantee").

RECITALS

A. Grantor is the owner in fee simple of certain real property (the "Subject Property") in the County of San Mateo ("County"), California, described as Lots 1-4 of Tract No. _____, filed for record in the Office of the Recorder of the County of San Mateo, State of California, on _____, in Book ____ of Maps, page(s) ____ ("Map"), a portion of which shall be subject to the terms of this Conservation and Open Space Easement ("Easement Area").

B. The Conservation and Open Space Easement is to be conveyed by Grantor to the Grantee, and is to be operated, managed and maintained by the Vallemar Bluffs Maintenance Association ("Association") pursuant to the provisions of the Vallemar Bluffs Declaration of Covenants, Conditions and Restrictions, filed for record in the Official Records of the County on _____, as Instrument No. _____ ("Project Declaration").

C. The Easement Area possesses native plant habitat and open space values of great importance to Grantee and the people of the State of California. The Easement Area provides high quality habitat for native plant species such as coastal tufted hairgrass (*Deschampsia cespitosa ssp. holciformis*), California oatgrass (*Danthonia californica*), maritime brome (*Bromus maritimus*), sea thrift (*Armeria maritima ssp. californica*), and coast tarweed (*Madia sativa*) and contains coastal terrace prairie. Individually and collectively, these habitat values comprise the "Conservation Values" of the Easement Area. California Civil Code Section 815 states in relevant part that the Legislature finds and declares that the preservation of land in its natural, scenic or open-space condition is among the most important environmental assets of California. The Legislature further finds and declares it to be the public policy and in the public interest of this state to encourage the voluntary conveyance of conservation easements to qualified nonprofit organizations.

D. The preservation of the Easement Area as open space is consistent with the County General Plan's designation of Open Space and Resource Management District zoning.

E. The preservation of the Easement Area as open space is in the best interest of the County because the land is essentially undeveloped, has high scenic value to the public, and supports a significant area of coastal prairie, and a buffer.

F. The parties desire that the Easement Area be used as a conservation and open space area, operated, managed and maintained by the Association pursuant to this Conservation and Open Space Easement and the Project Declaration in a manner compatible with the Conservation Values of the Easement Area.

G. Grantor intends, as owner of the Subject Property to convey an easement to Grantee over the Conservation Property including the right to preserve and protect in perpetuity the Conservation Values of the Easement Area, subject to the restrictions contained herein.

H. Grantee warrants that it is a publicly-supported, tax-exempt nonprofit organization qualified under Sections 501(c)(3) and 170(h) of the Internal Revenue Code, whose primary purpose is the preservation, protection, and enhancement of natural, agricultural, ecologically significant, scenic and open-space areas for scientific, charitable and educational purposes. Grantee's Board of Directors has formally resolved to accept the grant of this Easement.

I. Grantee intends, in accepting this grant, to preserve and protect in perpetuity the Conservation Values of the Easement Area for the benefit of this generation and generations to come.

J. The intention of this Conservation and Open Space Easement is, among other things, to preclude future subdivision or development of the Easement Area, and to provide that it shall be used in perpetuity only as open space.

AGREEMENT

NOW, THEREFORE, in consideration of the above, and the mutual covenants, terms, conditions, and restrictions contained herein, and pursuant to the laws of California (in particular, Sections 815 through 816 of the California Civil Code), Grantor hereby grants to Grantee a conservation easement (the "Conservation Easement") in perpetuity over the Easement Area as follows.

1. Definitions.

- (a) Association: The Vallemar Bluffs Maintenance Association.
- (b) Conservation Values: The conservation and open space values of the Easement Area.
- (c) Easement Area: The portion of the Subject Property described as "Conservation and Open Space Easement" on the Map.
- (d) Grantee: Golden State Land Conservancy, Inc., a California nonprofit public benefit corporation.
- (e) Grantor: Moss Beach Associates, LLC, a California limited liability company.
- (f) Subject Property: Lots 1-4 as shown on the Map.

2. Purpose. The purpose of this Conservation Easement is to assure that the Easement Area will be retained in perpetuity as open space and to prevent any unauthorized uses or activities of the Easement Area that will significantly and materially impair or interfere with its Conservation Values. Accordingly, this Conservation Easement restricts the use and activities of the Easement Area to uses and activities that are consistent with its open space nature and this Conservation Easement.

3. Rights of Grantee. To accomplish the purposes of this Conservation Easement, Grantor conveys to Grantee the right:

(a) To preserve and protect the Conservation Values of the Easement Area.

(b) To enter upon the Easement Area, at reasonable times, subject to 72 hours prior written notice, in order to monitor Grantor's compliance with the terms of this Conservation Easement and to enforce such terms; provided, that such entry shall be upon reasonable prior notice to Grantor and occupants of the Subject Property and that Grantee shall not unreasonably interfere with the use and quiet enjoyment of the Subject Property by the Grantor or its successors in interest or by any persons Grantor has authorized or permitted as occupants of the Subject Property.

(c) Pursuant to paragraph 7 hereof ("Disputes and Remedies"), to prevent any activity on or use of the Easement Area which is inconsistent with the purposes of this Conservation Easement and to require the restoration of such areas or features of the Easement Area that may be damaged by any inconsistent activity or use.

4. Prohibited Uses. Any use of the Easement Area which is inconsistent with the purposes of this Conservation Easement is prohibited. Without limiting the generality of the foregoing, the following activities and uses are expressly prohibited:

(a) Unseasonable watering. There shall be no unseasonable watering, use of chemical fertilizers, pesticides, biocides, herbicides, rodenticides, fungicides or other agents except as provided in the Habitat Management Plan approved by Grantee; weed abatement activities except as provided in the Habitat Management Plan approved by Grantee; incompatible fire protection activities; and any and all other activities and uses which may adversely affect the Conservation Values of the Easement Area or otherwise interfere with the purposes of this Conservation Easement;

(b) Construction. There shall be no building, construction, or other improvements in the Easement Area, including fencing, other than storm water quality facilities, drainage facilities, utility facilities, and fencing that exist thereon as of the date of this Conservation Easement or that have been approved by the County (if any) in conjunction with the Vallemar Bluffs development project. The Easement Area shall not be further subdivided. No residential, commercial or industrial development or use of the Easement Area shall be permitted or allowed. No agricultural use or farming of the Easement Area shall be permitted or allowed. Recreational pedestrian and hiking trails shall be permitted within the Easement Area as approved by County. Altering the surface or general topography of the Easement Area, including building roads or trails (excepting the repair, relocation, and reconstruction of the existing coastal bluff pedestrian trail, consistent with the Habitat Management Plan approved by Grantee), or paving or otherwise covering any portion of the Easement Area;

(c) Soil Erosion or Degradation. There shall be no knowing and intentional use or activity which causes or is likely to cause significant soil degradation or erosion or significant pollution of any surface or subsurface waters;

(d) Dumping. There shall be no dumping or other disposal of wastes, refuse, debris, inoperable vehicles or equipment on the Easement Area;

(e) Exotic Species. There shall be no planting, introduction, or dispersion of non-native or exotic plant or animal species;

(f) No Use or Storage of Motor Vehicles or Equipment. There shall be no use or storage of motor vehicles including but not limited to off-road vehicles and boats, bicycles or other equipment on the Easement Area, other than vehicles and equipment used by the Grantor or the Association, or their designated representatives or contractors, for maintenance of the Easement Area. Modular buildings are not permitted within the Easement Area;

(g) Removing, disturbing, altering, destroying, or cutting of trees, shrubs or other vegetation, except as required by law and in conformance with the Habitat Management Plan approved by Grantee for (1) fire breaks, (2) maintenance of existing foot trails, or (3) prevention or treatment of disease;

(h) Manipulating, impounding or altering any natural water course, body of water or water circulation on the Easement Area, and activities or uses detrimental to water quality, including but not limited to degradation or pollution of any surface or sub-surface waters;

(i) Recreational activities, except such activities as are consistent with the purposes of this Conservation Easement and carried out in accordance with the Habitat Management Plan approved by Grantee;

(j) Any activity or use that may violate or fail to comply with relevant federal, state, or local laws, regulations, or policies applicable to Grantor, the Easement Area, or the activity or use in question;

5. Maintenance of Easement Area. The Association shall maintain the Easement Area as Open Space Areas in accordance with the provisions of the Conservation Easement and Habitat Management Plan and in particular, the Association shall:

(a) Easement Area: Monitor, maintain, and repair the Easement Area consistent with the Conservation Easement as permanent open space;

(b) Native Plants: Monitor and maintain and enhance the native plants and coastal prairie habitat in Easement Area;

(c) Improvements: The Association shall be entitled to make and undertake future improvements or enhancements to the Easement Area, consistent with the Habitat Management Plan approved by Grantee, and as reasonable and necessary for good maintenance and management of the Easement Area, including in response to such events or issues as drainage, geotechnical problems, or native landscape maintenance and replanting.

6. Reserved Rights. The Association shall have the right to enter the Easement Area to maintain the Easement Area and the improvements and facilitates located on the Easement Area that the Association is required to maintain under the terms and provisions of the Project Declaration and this Conservation Easement.

7. Third Party Beneficiary. The County is a third party beneficiary of this Conservation Easement with the right of access to the Property and the right to enforce all obligations of Grantor and all other rights and remedies of Grantee under this Conservation Easement.

8. Discretion of Grantee and County. Enforcement of the terms of this Conservation Easement by Grantee or County shall be at the discretion of the enforcing party, and any forbearance by Grantee or County to exercise its rights under this Conservation Easement in the event of any breach of any term of this Conservation Easement shall not be deemed or construed to be a waiver by Grantee or County of such term or of any subsequent breach of the same or any other term of this Conservation Easement or of any rights of Grantee or County under this Conservation Easement. No delay or omission by Grantee or County in the exercise of any right or remedy shall impair such right or remedy or be construed as a waiver.

9. Disputes and Remedies. If Grantee determines that Grantor, or Grantor's successors in interest of the Subject Property is conducting or allowing a use, activity, or condition in the Easement Area which is prohibited by the terms of this Conservation Easement, or that a violation is threatened, Grantee shall

give at least thirty (30)-days written notice to Grantor or Grantor's successor, including the Association, and to the County of such violation and demand corrective action sufficient to cure the violation, and, where the violation involves injury to the Easement Area resulting from any use or activity inconsistent with the purposes of this Conservation Easement, to restore the portion of the Easement Area so injured within a reasonable period of time.

(a) Consultations Regarding Interpretation and Enforcement of Conservation Easement. When any disagreement, conflict, need for interpretation, or need for enforcement arises between the parties to this Conservation Easement, each party shall first consult with the other party in good faith about the issue and attempt to resolve the issue within thirty (30) days without resorting to arbitration or legal action.

(b) Grantee's Remedies. If Grantor or its successor or Association fails to cure the violation within thirty (30) days after receipt of notice thereof from Grantee, or under circumstances where the violation cannot be cured within the thirty (30) day period or Grantor or its successor or the Association fails to continue diligently to cure such violation until finally cured, Grantee may bring an action at law or in equity in court of competent jurisdiction to enforce the terms of this Conservation Easement, to enjoin the violation, ex parte as necessary, by temporary or permanent injunction, to recover any damages to which it may be entitled for violation of the terms of this Conservation Easement, and to require the restoration of the Easement Area to the condition that existed prior to injury. Without limiting Grantor's liability therefore, Grantee, in its sole discretion, may apply any damages recovered to the cost of undertaking any corrective action on the Easement Area. Grantee's rights under this paragraph apply equally in the event of either actual or threatened violations of the terms of this Conservation Easement, and Grantor agrees that Grantee's remedies at law for any violation of the terms of this Conservation Easement are inadequate and that Grantee shall be entitled to the injunctive relief described in this paragraph, both prohibitive and mandatory, in addition to such other relief to which Grantee may be entitled. Grantee's remedies described in this paragraph 7 shall be cumulative and shall be in addition to all remedies now or hereinafter existing at law or in equity.

(c) Costs of Enforcement. Should either party hereto institute any action or proceeding in court to enforce any provision hereof or for damages or for declaratory or other relief hereunder, the prevailing party shall be entitled to receive from the losing party, in addition to court costs, such amount as the court may adjudge to be reasonable as attorneys' fees, expert witness fees, and related costs, for services rendered to said prevailing party, and said amount may be made a part of the judgment against the losing party. The prevailing party shall be determined under Civil Code Section 1717(b)(1) or any successor statute.

(d) Acts Beyond Grantor's Control. Nothing contained in this Conservation Easement shall be construed to entitle Grantee to bring any action against Grantor or its successors and assigns for any injury to or change in the Easement Area resulting from causes beyond Grantor's or Association's control, including without limitation, fire, flood, storm, and earth movement, or from any prudent action taken by Grantor or the Association under emergency conditions to prevent, abate, or mitigate significant injury to the Easement Area resulting from such causes.

8. Costs and Responsibilities. Grantor and its successor and assigns retain the responsibility for ownership, operation, upkeep, and maintenance of the Easement Area and shall do so as required under the provisions of this Conservation Easement and the Project Declaration.

9. Liability. To the fullest extent permitted by law, Grantor, its successors and assigns shall defend, indemnify and hold Grantee, its officers, agents, and employees harmless from and against any and all allegations, claims, damages, disabilities, or expenses, including attorneys' fees, experts' fees, and witness costs that may be asserted or incurred, as the case may be, by any person or entity, including liability for damages or claims for damage for personal injury, or death, as well as from claims for real or personal property damage arising out of or in connection with (i) the activities of Grantor, its successors and assigns in or on the Easement Area, (ii) Grantor's, its successors and assigns, performance or non-performance under

this Agreement, (iii) Grantor's, its successors and assigns, breaches of this Agreement, (iv) any soils subsidence, land slides or soil movement arising out of Grantor's or its successors and assigns activities hereunder; whether or not there is concurrent, passive negligence on the part of the Grantee, its elective and appointive boards, commissions, officers, agents, and employees. This indemnification clause also shall apply to any case where any work performed in or on the Easement Area is done under a contract entered into by the Grantee as agent of Grantor or its successors and assigns and such work is the proximate cause of any claim against Grantee. Grantor indemnifies the Grantee for any liability, cost, expense, including attorney's fees, incurred by the Grantee in enforcing this Section 9. This Section 9 shall survive termination of this Agreement for any reason.

10. Amendment. If circumstances arise under which an amendment to or modification of this Conservation Easement would be appropriate, Grantor and Grantee may jointly amend this Conservation Easement; provided that no amendment shall be allowed that will affect the qualification of this Conservation Easement or the status of Grantee under any applicable laws, including Sections 815 et. seq. of the California Civil Code, as amended, and any amendment shall be consistent with the purposes of this Conservation Easement. Any such amendment shall be in writing, shall refer to this Conservation Easement by reference to its recordation data, and shall be recorded in the Official Records of the County.

11. Conveyance. Grantee may convey this Conservation Easement in whole but only to an entity that is a qualified entity at the time of transfer under Section 170(h) of the Internal Revenue Code, as amended (or any successor provision then applicable), and the applicable regulations promulgated thereunder, and authorized to acquire and hold conservation easements under Section 815.3 of the California Civil Code (or any successor provision then applicable). As a condition of such transfer, Grantee shall require the transferee to expressly agree in writing to assume Grantee's obligations hereunder in order that the purposes of this Conservation Easement will continue to be carried out. Grantee shall notify Grantor of the name, address, telephone number and name of principal contact person in writing at least 30 days before Grantee's transfer of this Conservation Easement.

12. Estoppel Certificates. Upon request by Grantor, Grantee shall within 21 days after receipt of such request execute and deliver to Grantor any document, including an estoppel certificate, which certifies Grantor's compliance with any obligation of Grantor contained in this Conservation Easement and otherwise evidences the status of this Conservation Easement as may be reasonably requested by Grantor. Grantee's failure to execute or deliver to Grantor an Estoppel Certificate within 21 days after receipt of Grantor's request, shall irrevocably and unconditionally constitute and appoint Grantor as Grantee's Special Attorney-in-Fact to complete, execute and deliver the Estoppel Certificate whose force and effect shall be conclusive upon Grantee that this Conservation Easement is full force and effect as may be represented in writing by Grantor on the Estoppel Certificate delivered to any third party.

13. Notices. Unless otherwise specified in this Conservation Easement, any notice, demand, request, consent, approval, or communication that either party desires or is required to give to the other shall be in writing and either served personally or sent by first class mail, postage prepaid, addressed as follows:

To Grantor: Moss Beach Associates, LLC
P.O. Box 377
Santa Cruz, CA 95061-0377
Attn: Owen Lawlor, Managing Member

To Grantee: Golden State Land Conservancy
321 South Main Street #525
Sebastopol, CA 95472
Attn: Director of Community Development

To County: SMC Planning and Building Department
455 County Center, 2nd Floor
Redwood City, CA 94063
Attn: Community Development Director

or to such other address as either party from time to time shall designate by written notice to the other.

14. Taxes; No Liens. Grantor shall pay before delinquency all taxes, assessments (general and special), fees, and charges of whatever description levied on or assessed against the Property by competent authority (collectively "Taxes"), including any Taxes imposed upon, or incurred as a result of, this Conservation Easement, and shall furnish Grantee and County with satisfactory evidence of payment upon request. Grantor shall keep the Property free from any liens (other than a security interest that is expressly subordinate to this Conservation Easement as provided in Section 22(j)), including those arising out of any obligations incurred by Grantor for any labor or materials furnished or alleged to have been furnished to or for Grantor at or for use on the Property.

15. Recordation. This instrument shall be recorded by Grantee in the Official Records of San Mateo County, California. Grantee may rerecord this Conservation Easement whenever rerecording is required to preserve Grantee's rights in this Conservation Easement.

16. Consideration for Agreement and Dedication of Easement. Grantor shall not receive any payment from County in consideration of the obligations imposed hereunder, it being recognized and agreed that the consideration for the execution of the within Agreement is a substantial public benefit to be derived therefrom and the advantage which will accrue to the Grantor and its successors as a result of any reduction of the assessed value of the Subject Property due to the limitations on its use contained in this Agreement and in the Conservation Easement granted herein.

17. Condemnation. Pursuant to Code of Civil Procedure section 1240.055, this Conservation Easement is "property appropriated to public use," as used in Article 6 (commencing with section 1240.510) and Article 7 (commencing with section 1240.610) of Chapter 3 of Title 7 of the Code of Civil Procedure. A person authorized to acquire property for public use by eminent domain shall seek to acquire the Property, if at all, *only* as provided in Code of Civil Procedure section 1240.055.

18. General Provisions.

(a) Controlling Law. The interpretation and performance of this Conservation Easement shall be governed by the laws of the State of California.

(b) Severability. If any provision of this Conservation Easement, or the application thereof to any person or circumstance, is found to be invalid, the remainder of the provisions of this Conservation Easement, or the application of such provision to persons or circumstances other than those as to which it is found to be invalid, as the case may be, shall not be affected thereby so long as the purposes of this Conservation Easement can still be carried out.

(c) Entire Agreement. This instrument sets forth the entire agreement of the parties with respect to the Conservation Easement and supersedes all prior discussions, negotiations, understandings, or agreements of the parties relating to the Conservation Easement. No alteration or variation of this instrument shall be valid or binding unless contained in an amendment in accordance with Section 10.

(d) No Forfeiture. Nothing contained herein is intended to result in a forfeiture or reversion of Grantor's fee title in any respect. Grantor specifically reserves the right to convey fee title to the Subject Property subject to this Conservation Easement.

(e) Successors. The covenants, terms, conditions, and restrictions of this Conservation Easement shall be binding upon, and inure to the benefit of, the parties hereto and their respective successors and assigns, and shall continue as a servitude running in perpetuity with the Subject Property. The covenants in this Conservation Easement benefitting Grantee shall also benefit the County as third party beneficiary.

(f) Termination of Rights and Obligations. Except as expressly provided otherwise in this instrument, a party's rights and obligations under this Conservation Easement shall terminate upon the transfer of the party's interest in this Conservation Easement or the fee title to the Subject Property, as the case may be, except that rights, obligations, and liability relating to this Conservation Easement and occurring prior to transfer shall survive transfer; provided, however, that any claim with respect to such rights that survive transfer shall only be enforceable against the transferring party if legal action respecting such claim is commenced by the filing of suit within two (2) years after the date of such transfer.

(g) Captions. The captions in this instrument have been inserted solely for convenience of reference and are not a part of this instrument and shall have no effect upon construction or interpretation.

(h) Counterparts. Grantor may execute this instrument in two or more counterparts; each counterpart shall be deemed an original instrument. In the event of any disparity between the counterparts produced, the recorded counterpart shall be controlling.

(j) Warranty. Grantor represents and warrants that Grantor is the sole owner of fee simple title to the Property; that the Property is not subject to any other conservation easement; and there are no outstanding mortgages, liens, encumbrances or other interests in the Property (including, without limitation, water and mineral interests) that may conflict or are otherwise inconsistent with this Conservation Easement and which have not been expressly subordinated to this Conservation Easement by a written, recorded Subordination Agreement approved by Grantee.

IN WITNESS WHEREOF, each party has set their hand on the day and year first written above.

GRANTOR: Moss Beach Associates, LLC, a California limited liability company

By: _____

Its: _____

GRANTEE: Golden State Land Conservancy, Inc., a California nonprofit public benefit corporation

By: _____

Its: _____



County of San Mateo - Planning and Building Department

ATTACHMENT T3

When Recorded Return To:

Hanna & Van Atta
525 University Avenue, Suite 600
Palo Alto, California 94301

VALLEMAR BLUFFS

DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS

THIS DECLARATION CONTAINS A JUDICIAL REFERENCE PROVISION AND A BINDING ARBITRATION PROVISION IN ACCORDANCE WITH THE FEDERAL ARBITRATION ACT. ARBITRATION INCLUDES A WAIVER OF THE CONSTITUTIONAL RIGHT TO A JURY. YOU MUST READ THE JUDICIAL REFERENCE AND ARBITRATION PROVISIONS CAREFULLY AND SHOULD CONSULT LEGAL COUNSEL WITH ANY QUESTIONS.

IF THIS DOCUMENT CONTAINS ANY RESTRICTION BASED ON SEX, GENDER IDENTITY, GENDER EXPRESSION, FAMILIAL STATUS, RACE, COLOR, RELIGION, ANCESTRY, NATIONAL ORIGIN, DISABILITY, MEDICAL CONDITION, GENETIC INFORMATION, MARITAL STATUS, SEXUAL ORIENTATION, CITIZENSHIP, PRIMARY LANGUAGE, IMMIGRATION STATUS, OR SOURCE OF INCOME AS DEFINED IN SUBDIVISION (P) OF SECTION 12955 OF THE GOVERNMENT CODE, OR ANCESTRY, THAT RESTRICTION VIOLATES STATE AND FEDERAL FAIR HOUSING LAWS AND IS VOID, AND MAY BE REMOVED PURSUANT TO SECTION 12956.2 OF THE GOVERNMENT CODE. LAWFUL RESTRICTIONS UNDER STATE AND FEDERAL LAW ON THE AGE OF OCCUPANTS IN SENIOR HOUSING OR HOUSING FOR OLDER PERSONS SHALL NOT BE CONSTRUED AS RESTRICTIONS BASED ON FAMILIAL STATUS.

WORKING DRAFT – DO NOT RECORD

VALLEMAR BLUFFS

DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS

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VALLEMAR BLUFFS

DECLARATION OF COVENANTS, CONDITIONS AND RESTRICTIONS

THIS DECLARATION, made on the date hereinafter set forth, by MOSS BEACH ASSOCIATES, LLC, a California limited liability company, hereinafter referred to as "Declarant," is made with reference to the following facts:

A. **Location of Property.** Declarant is the owner of certain property located in the County of San Mateo ("County"), State of California, more particularly described on the Map entitled Tract No. _____, filed for record in the Office of the Recorder of the County of San Mateo, State of California, on _____, 201____, in Book _____ of Maps, page(s) _____ ("Map").

B. **Owner's Interest.** The development shall be referred to as the "Project" as defined in Section 1.26. Each Lot shall have appurtenant to it a membership in the VALLEMAR BLUFFS HOMEOWNERS ASSOCIATION, a nonprofit mutual benefit corporation.

C. **General Plan of Improvement.** Declarant intends by this Declaration to impose upon the Project, as defined and described in this Declaration, mutually beneficial restrictions under a general plan of improvement for the benefit of all Owners of Lots.

NOW, THEREFORE, Declarant hereby declares that all of the Project described above shall be held, sold, leased, mortgaged, encumbered, rented, used, occupied, improved and conveyed subject to the following declarations, limitations, easements, restrictions, covenants, and conditions, which are imposed as equitable servitudes pursuant to a general plan for the development of the Project for the purpose of enhancing and protecting the value and desirability of the Project and every part thereof, and which shall run with the Project and be binding on Declarant and its successors and assigns, and on all parties having or acquiring any right, title or interest in or to the described Project or any part of it, their heirs, successors and assigns, and shall inure to the benefit of each Owner thereof.

ARTICLE I DEFINITIONS AND INTERPRETATIONS

1.1. **"Articles":** The Articles of Incorporation of the Association, as amended from time to time.

1.2. **"Association":** The VALLEMAR BLUFFS HOMEOWNERS ASSOCIATION, a California nonprofit mutual benefit corporation, the Members of which shall be the Owners of Lots in the Project.

1.3. **"Board" or "Board of Directors":** The governing body of the Association.

1.4. **"Budget":** A written, itemized estimate of the Association's income and Common Expenses prepared and adopted by the Association pursuant to the Bylaws.

1.5. **"Bylaws":** The Bylaws of the Association, as amended from time to time.

1.6. **"Common Expenses":** The actual and estimated expenses the Association incurred for inspecting, maintaining, repairing, operating and replacing the Conservation Easement Area and all sums designated Common Expenses by or pursuant to the Declaration, Articles, or Bylaws.

1.7. **"Conservation Easement Area":** The area within Lots 1-4 designated "Conservation Easement" on the Map.

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- 1.8. "County": The County of San Mateo.
- 1.9. "Declarant": MOSS BEACH ASSOCIATES, LLC, a California limited liability company and any successor or assign that expressly assumes the rights and duties of the Declarant under this Declaration in a recorded written document.
- 1.10. "Declaration": This Declaration, as amended or supplemented from time to time.
- 1.11. "Deed of Conservation Easement": The deed establishing a conservation easement within the Project, recorded the ____ day of _____, 2017, Document No. _____, San Mateo County Records.
- 1.12. "First Lender": Any person, entity, bank, savings and loan association, insurance company, or other financial institution holding a recorded First Mortgage on any Lot.
- 1.13. "First Mortgage": Any Mortgage recorded in the County made in good faith and for value on a Lot with first priority over other Mortgages encumbering the Lot.
- 1.14. "Foreclosure": The legal process by which a Lot owned by an Owner who is in default under a Mortgage is sold, pursuant to California Civil Code section 2924a et seq. or sale by the Court pursuant to California Code of Civil Procedure § 725a et seq. and any other applicable laws.
- 1.15. "Governing Documents": This Declaration, as amended from time to time, the exhibits, if any, that are attached to the Declaration, together with the other basic documents used to create and govern the Project, including the Map, the Articles, the Bylaws, and the Rules, and the Vallemar Bluffs Area Adaptive Management and Monitoring Plan and any Design Guidelines adopted by the Board or the Association.
- 1.16. "Hazardous Materials": Any substance, material or waste which is or becomes: (i) regulated by any local or regional Governmental authority of the State of California or the United States Government as a hazardous waste; (ii) is defined as a "solid waste," "sludge," "hazardous waste," "extremely hazardous waste," "restricted hazardous waste," "non-RCRA hazardous waste," "RCRA hazardous waste," or "recyclable material," under any federal, state or local statute, regulation, or ordinance, including, without limitation, Sections 25115, 25117, 25117.9, 25120.2, 25120.5 or 25122.7, 25140, 25141 of the California Health and Safety Code; (iii) defined as a "Hazardous Substance" under section 25316 of the California Health and Safety Code; (iv) defined as a "Hazardous Material," "Hazardous Substance" or "Hazardous Waste" under Section 25501 of the California Health and Safety Code; (v) defined as a "Hazardous Substance" under Section 25281 of the California Health and Safety Code; (vi) asbestos; (vii) petroleum products, including, without limitation, petroleum, gasoline, used oil, crude oil, waste oil, and any fraction thereof, natural gas, natural gas liquefied, methane gas, natural gas, or synthetic fuels, (viii) materials defined as hazardous or extremely hazardous pursuant to the California Code of Regulations; (ix) pesticides, herbicides and fungicides; (x) polychlorinated biphenyls; (xi) defined as a "Hazardous Substance" pursuant to Section 311 of the Federal Water Pollution Control Act (33 U.S.C. Section 1251 et seq.); (xii) defined as a "Hazardous Waste" pursuant to Section 1004 of the Federal Resource Conservation and Recovery Act, 42 U.S.C. Section 6901 et seq.; (xiii) defined as a "Hazardous Substance" or "Mixed Waste" pursuant to Section 101 of the Comprehensive Environmental Response Compensation and Liability Act, 42 U.S.C. Section 9601 et seq., and regulations promulgated thereunder; (xiv) defined as a "Hazardous Substance" pursuant to Section 401.15 of the Clean Water Act, 40 C.F.R. 116; (xv) defined as an "Extremely Hazardous Substance" pursuant to Section 302 of the Superfund Amendments and Reauthorizations Act of 1986, 42 U.S.C. Section 11002 et seq.; or (xvi) defined as "medical waste" pursuant to Section 25023.2 of the California Health and Safety Code, Chapter 6.1 (Medical Waste Management Act).
- 1.17. "Lot": Each Lot or parcel shown on the Map.

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- 1.18. **"Map":** That Map, described above in Introductory Paragraph A.
- 1.19. **"Member":** An Owner who is entitled to membership in the Association as provided herein.
- 1.20. **"Mortgage":** A mortgage, deed of trust, assignment of rents, issues and profits or other proper instrument (including, without limitation, those instruments and estates created by sublease or assignment) given as security for the repayment of a loan or other financing which encumbers a Lot, made in good faith and for value.
- 1.21. **"Mortgagee":** The holder of a Mortgage including the beneficiary of a deed of trust that constitutes a Mortgage.
- 1.22. **"Mortgagor":** A Person who encumbers his Lot with a Mortgage, including a trustor of a deed of trust that constitutes a Mortgage.
- 1.23. **"Occupant":** A Person who legally occupies a Lot, including, without limitation, a tenant or guest, invitee, renter, lessee, family member, or relative.
- 1.24. **"Owner":** The record Owner, whether one (1) or more persons or entities, of fee simple title to any Lot which is a part of the Project but expressly excluding those persons or entities having an interest merely as security for the performance of an obligation, until such person obtains fee title hereto, and those parties who have leasehold interests in a Lot. If a Lot is sold under a recorded contract of sale, the purchaser under the contract of sale, rather than the holder of the fee interest, be considered the "Owner" from and after the date the Association receives written notice of the recorded contract.
- 1.25. **"Person":** A natural person, a corporation, a partnership, a trust, or other legal entity.
- 1.26. **"Project":** All of the real property above described on the Map including all improvements and structures erected or to be erected on that real property, subject to this Declaration.
- 1.27. **"Residence":** The residential structure that is located within a Lot.
- 1.28. **"Rules":** The rules adopted from time to time by the Board or the Association pursuant to Section 4.2.A.

ARTICLE II. DESCRIPTION OF PROJECT AND CREATION OF PROPERTY RIGHTS

- 2.1. **Description of Project:** The Project consists of four (4) Lots, and all improvements thereon.
- 2.2. **Easements; Conservation Easement Area:** Each of the Lots shown on the Map shall have appurtenant to it as the dominant tenement an easement over the Conservation Easement Area as the servient tenement for ingress and egress, and for use and enjoyment, subject to the Deed of Conservation Easement.

The foregoing easements are granted and reserved subject to the condition that their use and enjoyment shall not unreasonably interfere with the use, occupancy or enjoyment of all or any part of the Lot servient to them or to which they are appurtenant.

- 2.3. **Easements to Accompany Conveyance of Lot:** Easements that benefit or burden any Lot shall be appurtenant to that Lot and shall automatically accompany the conveyance of the Lot, even though the description in the instrument of conveyance may refer only to the fee title to the Lot.

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2.4. Maintenance Easement: An easement over each Lot is reserved by Declarant, and is hereby granted to the Association, for the purpose of entering upon the Project to perform such maintenance, if any, as the Association may do in accordance with the provisions of Section 4.1.A of this Declaration.

2.5. Drainage Easements: An easement over and under each Lot as the servient tenement is reserved in favor of each other Lot as the dominant tenement for the purpose of allowing the Association's agents to enter the Lot to maintain that portion of an in-tract storm drainage system located thereon. No Owner or Occupant shall commit any act that would interfere with the operation of any drainage system (including drainage swales) installed on the Owner's Lot, each Owner shall maintain the system free of debris and other obstacles at all times. Reciprocal appurtenant easements between adjoining Lots are reserved for the flow of surface water.

2.6. Other Easements: Each Lot is subject to all easements, dedications, and rights of way granted or reserved in, on, over and under the Project as shown on the Map.

2.7. Rights of Entry and Use: The Lots shall be subject to the following rights of entry and use:

A. The right of the Association's agents to enter any Lot to cure any violation of the Governing Documents, provided that the Owner has received notice and a hearing as required by the Bylaws (except in the case of an emergency) and the Owner has failed to cure the violation or take steps necessary to cure the violation within thirty (30) days after the finding of a violation by the Association;

B. The access rights of the Association to inspect, maintain, repair or replace improvements or property located in the Conservation Easement Area as described in Section 4.2.B;

C. The easements described in this Article II;

D. The right of the Association's agents to enter any Lot to perform maintenance as described in Section 4.1;

E. The rights of the Declarant during the construction period as described in Section 7.6.

2.8. All Easements Part of Common Plan: Whenever any easements are reserved or created or are to be reserved or created in this Declaration, such easements shall constitute equitable servitudes for the mutual benefit of all property in the Project, even if only certain Lots are specifically mentioned as subject to or benefiting from a particular easement. Easements referred to in this Declaration that are created by grant deeds subsequent to the date of this Declaration shall be part of the common plan created by this Declaration for the benefit of all property Owners within the Project.

ARTICLE III. ASSOCIATION, ADMINISTRATION, MEMBERSHIP AND VOTING RIGHTS

3.1. Association to Manage Conservation Easement Area: The Association shall manage the Conservation Easement Area in accordance with the provisions of the Governing Documents.

3.2. Membership: The Owner of a Lot shall automatically, upon becoming the Owner of same, be a Member of the Association, and shall remain a Member thereof until such time as his ownership ceases for any reason. Membership shall be appurtenant to and may not be separated from ownership of a Lot. Membership shall be held in accordance with the Articles and Bylaws.

3.3. Transferred Membership: Membership in the Association shall not be transferred, encumbered, pledged, or alienated in any way, except upon the sale or encumbrance of the Lot to

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which it is appurtenant, and then only to the purchaser, in the case of a sale, or Mortgagee, in the case of an encumbrance of such Lot. On any transfer of title to an Owner's Lot, including a transfer on the death of an Owner, membership passes automatically with title to the transferee.

A Mortgagee does not have membership rights until it obtains title to the Lot through Foreclosure or deed in lieu of Foreclosure. Any attempt to make a prohibited transfer is void. No Member may resign his membership. On notice of a transfer, the Association shall record the transfer on its books.

3.4. Membership and Voting Rights: Membership and voting rights shall be as set forth in the Bylaws.

3.5. Members' Obligations to Association: Each Owner is responsible for payment of 1/4th share of Common Expenses. The Association does not have assessment and/or lien powers.

ARTICLE IV. DUTIES AND POWERS OF THE ASSOCIATION

4.1. Duties: In addition to the duties enumerated in the Articles and Bylaws, or elsewhere provided for in this Declaration, and without limiting the generality of those duties, the Association shall perform the following duties:

A. Maintenance: The Association shall inspect, maintain and repair the following:

(1) Conservation Easement Area Maintenance: The Conservation Easement Area, all improvements and landscaping thereon, in a manner consistent with the Deed of Conservation Easements.

(2) Conservation Easement Area Landscaping: Landscaping maintenance shall include prudent management practice necessary to sustain and promote the natural habitat and native species.

(3) Cooperation of Owners/Occupants: Each Owner and Occupant shall fully cooperate with the agents of the Association in the performance of the Association's maintenance obligations described above. Such cooperation shall include, but is not limited to, immediate notification to the Board or its managing agent of any maintenance problems for which the Association is responsible and access to the Owner's or Occupant's Lot and as may be necessary to inspect and, if appropriate, to perform any necessary maintenance.

B. Insurance: The Association shall obtain and maintain such policy or policies of insurance as are required by Section 6.1 of this Declaration.

C. Payment of Expenses and Taxes: The Association shall pay all expenses and obligations incurred by the Association in the conduct of its business.

D. Enforcement: The Association and the Board shall be responsible for the enforcement of this Declaration, and for the billing to and collection from the Owners of the Common Expenses.

E. Annual Budget: During the month of December of each year, the Association shall establish a budget for all expenses of the Project for the coming year, including maintenance, insurance and management. Each Lot Owner shall be responsible for payment of its share of the budgeted expenses, and other expenses incurred by the Association during the year. On request of any Owner, the Association shall prepare and distribute any financial statements and reports that may be required by law.

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4.2. Powers: In addition to the powers enumerated in the Articles and Bylaws, or elsewhere provided for herein, and without limiting the generality thereof, the Association and the Board, where applicable, shall have the following powers:

A. Adoption of Rules: The Association or the Board, by majority vote, may adopt reasonable Rules not in conflict with the law, or with the Governing Documents, relating to the use of the Conservation Easement Area and all its facilities, and the conduct of Owners and Occupants with respect to the Project and other Owners. Written copies of such Rules and any schedule of fines and penalties adopted by the Board shall be furnished to Owners. All changes to the Rules will become effective fifteen (15) days after they are sent to the Owners via first-class mail or by any system or technology designed to record and communicate messages.

B. Access: For the purpose of performing inspections and maintenance of the Conservation Easement Area, the Association's agents or employees shall have the right to enter the Conservation Easement Area at reasonable hours. Such entry shall be made with as little inconvenience to the Owner or Occupant as practicable, and any damage caused by such entry shall be repaired at the expense of the Association.

C. Enforcement: The Board shall have the authority to enforce this Declaration as per Section 7.1 hereof.

D. Contracts: The Board shall have the power to contract for goods and/or services for the Conservation Easement Area, subject to limitations set forth in the Bylaws, or elsewhere in this Declaration. The Board shall not enter into any contracts with an independent contractor until it meets the requirements of Section 6.1.A.(2) herein.

E. Other Powers: In addition to the powers contained herein, the Board may exercise the powers granted to a nonprofit mutual benefit corporation under California Corporations Code section 7140.

ARTICLE V. USE RESTRICTIONS

In addition to all of the covenants contained in this Declaration, the use of the Project and each Lot in the Project is subject to the following:

5.1. Use of Lot: No Lot shall be occupied and used except for residential purposes by the Owners or Occupants and no business shall be conducted in any Lot, except that a Lot may be used as a combined Residence and executive or professional office by the Owner or Occupant thereof, so long as such use: (a) does not interfere with the quiet enjoyment by other Owners; (b) does not include visiting clients; (c) business activities take place solely inside the Lot; (d) does not generate in-person visits by suppliers or clientele; (e) complies with all laws, regulations and ordinances applicable to the Property, including zoning, health and licensing requirements; (f) otherwise complies with this Declaration and is consistent with the residential character of the Property; (g) no signs, logos, billboards, or other advertising materials or devices are displayed in the windows of the Lot, or on exterior of the Residence, or on any Conservation Easement Area, to advertise the activity; (h) the existence or operation of the business is not apparent or detectable outside the Lot by sight, sound or odor; and (i) the business does not increase the liability or casualty insurance obligation or premium of the Association. No tent, shack, trailer, basement, garage, outbuilding or structure of a temporary character shall be erected or used on any Lot at any time as a Residence, either temporarily or permanently.

Notwithstanding the foregoing, Declarant, its successors or assigns, may use any Lot or Lots in the Project owned by Declarant for a model home site or sites and display and sales/construction office during construction and until the last Lot is sold by Declarant.

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The number of permanent residents, unless applicable law provides otherwise, shall be limited as follows: No more than two (2) persons per bedroom shall be permitted as permanent residents. A "permanent resident" means any Person residing in the Lot more than sixty (60) days out of any twelve (12) consecutive month period, provided that one (1) person shall be allowed in addition to the maximum number of permanent residents otherwise permitted in each Lot.

No health care facilities operating as a business or charity, unless permitted by law or ordinance which preempts this restriction.

No family day care home shall be permitted within the Project except as specifically authorized by California Health and Safety Code section 1597.40 and other applicable state statutes. The owner/operator of any such day care facility shall comply with all local and state laws regarding the licensing and operating of a day care home and, in addition, shall:

- A. Name the Association as an additional insured on the liability insurance policy or bond carried by the owner/operator of the day care home;
- B. Defend, indemnify and hold the Association harmless from any liability arising out of the existence and operation of the day care home;
- C. Abide by and comply with all of the Association's Rules;
- D. Supervise and be completely responsible for children at all times while they are within the project; and,
- E. Cooperate with the Association if the Association's insurance agent or carrier requires proof of insurance, proof of the agreement of the owner or operator of the day care home to these conditions, or other reasonable requests.

No Lot or Lots or any portion thereof in the Project shall be leased, subleased, occupied, rented, let, sublet, or used for or in connection with any time-sharing agreement, plan, program or arrangement, including, without limitation, any so-called "vacation license," "travel club," "extended vacation," or other membership or time interval ownership arrangement. The term "time sharing" as used herein shall be deemed to include, but shall not be limited to, any agreement, plan, program, or arrangement under which the right to use, occupy, or possess the Lot or Lots or any portion thereof or Residence thereon in the Project rotates among various persons, either corporate, partnership, individual, or otherwise, on a periodically recurring basis for value exchanged, whether monetary or like kind use privileges, according to a fixed or floating interval or period of time. This Section shall not be construed to limit the personal use of any Lot or any portion thereof in the Project by any Owner or Occupant, nor shall it be interpreted to disallow an Owner from trading the temporary use of its Lot for the right to use another dwelling on a temporary basis, provided the frequency of such exchange is in accordance with the Rules.

5.2. Nuisances: No noxious, illegal, or seriously offensive activities shall be carried on within any Lot, or in any part of the Project, nor shall anything be done thereon that may be or may become a serious annoyance or a nuisance to or which may in any way interfere with the quiet enjoyment of the Owners' Lots, or which shall in any way increase the rate of insurance for the Project, or cause any insurance policy to be cancelled or to cause a refusal to renew the same, or which will impair the structural integrity of any Residence or other building in the Project. The Board is entitled to determine if any device, noise, odor or activity constitutes a nuisance.

5.3. Radio, Television, and Internet Antennas: No Owner shall construct, install and/or use and operate a radio and/or television antenna, satellite dish, Internet dish or an antenna one meter or more in diameter or diagonal measurement, other signal reception or transmission devices or related

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equipment in the Project, without the consent of the Board, which the Board shall have the discretion to withhold, subject to applicable legal requirements. In considering whether to approve applications for any such devices to be located, the Board shall consider and give great weight to considerations of aesthetics, safety within the community, uniformity of appearance, and the requirements of any applicable laws. The Board shall, in acting upon requests for approval of a satellite dish or other signal reception or transmission devices comply with Federal Communications Commission regulations. The Board may adopt other Rules for installation and operation of any satellite dish or other signal reception or transmission devices that comply with FCC regulations.

5.4. **Drainage:** No Owner, Member or Occupant shall do or cause anything to be done that would alter or interfere with the Project drainage patterns or block or alter the natural flow or engineered flow of surface water or interfere with drainage patterns within the Project.

ARTICLE VI. INSURANCE; DAMAGE OR DESTRUCTION; CONDEMNATION

6.1. **Insurance:** The Association shall obtain and maintain the following insurance:

A. Association Insurance:

(1) An occurrence version comprehensive general liability policy insuring the Association, its agents, the Owners and their respective family members, against liability incident to the use of the Conservation Easement Area;

(2) workers' compensation insurance (statutory limits) to the extent required by law (or such greater amount as the Board deems necessary). All independent contractors who contract with the Association shall be required to carry appropriate general liability insurance, automobile liability insurance coverage and workers' compensation coverage, and shall indemnify the Association with respect to any claims from such independent contractor, or independent contractor's employees, with regards to claims for liability and workers' compensation claims from any independent contractor who performs any service for the Association. Independent contractors shall be required to carry a minimum of \$1,000,000 per occurrence, \$2,000,000 general aggregate and \$2,000,000 products-completed operations aggregate under the general liability requirement naming the Association as an additional insured for their work. Independent contractors shall also carry a minimum of \$1,000,000 combined single limit for auto liability covering all owned, hired and non-owned automobiles;

(3) fidelity bonds or insurance covering officers, directors, and employees that have access to any Association funds;

(4) directors and officers' liability insurance covering all past, present and future directors and officers of the Association;

(5) such other insurance as the Board in its discretion considers necessary or advisable.

B. Representation for Claims. Each Owner appoints the Association or any insurance trustee designated by the Association to act on behalf of the Owners in connection with all insurance matters arising from any insurance policy maintained by the Association, including without limitation, representing the Owners in any proceeding, negotiation, settlement or agreement.

C. Waiver of Subrogation. Any insurance maintained by the Association shall contain "waiver of subrogation" as to the Association and its officers, Directors and Members, and the Owners and Occupants of the Lots (including Declarant) and Mortgagees; and cross-liability and

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severability of interest coverage insuring each insured against liability to each other insured.

All individually owned insurance shall contain a waiver of subrogation as to the Association and its officers, Directors and Members, and the Owners and Occupants of the Lots and Mortgagees; and all Members are deemed to have waived subrogation rights as to the Association and/or other Members, whether or not their policies so provide.

D. Review of Policies. The Association shall periodically (and not less than annually) review all insurance policies maintained by the Association to determine the adequacy of the coverage and to adjust the policies accordingly.

E. Copies of Policies; Notice to Members. The Association shall distribute annually to the Members a summary of the Association's insurance policies. The Association, as soon as reasonably practical, shall notify its Members by first-class mail if any of the policies have been cancelled and not immediately renewed or restored or if there is a significant change such as a reduction in coverage or limits or an increase in the deductible for any policy. If the Association receives any notice of non-renewal of a policy, the Association immediately shall notify its Members if replacement coverage will not be in effect by the date the existing coverage will lapse.

F. Limitation on Liability. The Association, and its Directors and officers, shall have no liability to any Owner or Mortgagee if, after a good faith effort, it is unable to obtain the insurance required hereunder. In such event, the Board immediately shall notify each Member and any Mortgagee entitled to notice that the insurance will not be obtained or renewed. At the request in writing of any three (3) Members, the Board shall make provisions for a vote of the Members of the Association to uphold or reverse the decision of the Board to cancel or to not renew any insurance the Association is required by this Declaration to carry.

6.2. Condemnation: If all or any part of a Lot is taken by eminent domain, the award shall be disbursed to the Owner of the Lot, subject to the rights of the Owner's Mortgagees. If necessary, the remaining portion of the Project shall be resurveyed to reflect such taking.

ARTICLE VII. GENERAL PROVISIONS

7.1. Enforcement: The Association, or any Owner, shall have the right to enforce, by any proceeding at law or in equity, all restrictions, conditions, covenants, reservations, liens, and charges now or hereafter imposed by the provisions of the Governing Documents, and in such action shall be entitled to recover reasonable attorneys' fees as are ordered by the Court. Failure by the Association or by any Owner to enforce the Governing Documents shall in no event be deemed a waiver of the right to do so thereafter. Failure by the Association to enforce the Governing Documents shall not be deemed to constitute approval of or a consent to any violation or failure to comply with the Governing Documents.

7.2. Invalidity of Any Provision: Should any provision or portion of this Declaration be declared invalid or in conflict with any law of the jurisdiction where this Project is situated, the validity of all other provisions and portions hereof shall remain unaffected and in full force and effect.

7.3. Term: Subject to Section 7.4, the covenants and restrictions of this Declaration shall run with and bind the Project, and shall inure to the benefit of and shall be enforceable by the Association or the Owner of any property subject to this Declaration, their respective legal representatives, heirs, successors and assigns, for a term of thirty (30) years from the date this Declaration is recorded, after which time they shall be automatically extended for successive periods of ten (10) years, unless an instrument in writing, signed by a majority of the then Owners of the Lots, has been recorded within the year preceding the beginning of each successive period of ten (10) years, agreeing to terminate the same.

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7.4. Amendments:

A. **Unilateral Amendment by Declarant:** Notwithstanding any other provisions of this Section, at any time prior to the first Close of Escrow in the Project, Declarant may unilaterally amend or terminate this Declaration by recording a written instrument which effects the amendment or termination and is signed and acknowledged by Declarant. Notwithstanding any other provisions of this Section, Declarant (for so long as Declarant owns any portion of the Project) may unilaterally amend this Declaration by recording a written instrument signed by Declarant in order to: (i) conform this Declaration to the rules, regulations or requirements of VA, FHA, DRE, Fannie Mae, Ginnie Mae or Freddie Mac; (ii) amend, replace or substitute any Exhibit for any purpose to the extent that the Exhibit affects portions of the Project that have not yet been conveyed to the Association or for which there has been no Close of Escrow, as applicable; (iii) amend, replace or substitute any Exhibit to correct typographical or engineering errors; (iv) include any Exhibit that was inadvertently omitted from the Declaration at the time of recording; (v) comply with any city, county, state or federal laws or regulations; and, (vi) correct any typographical errors.

B. **Amendment by Members:** After sale of the first Lot, this Declaration may be amended only by the affirmative vote (in person or by proxy) or written consent of a majority of Members. However, the percentage of voting power necessary to amend a specific Section shall not be less than the prescribed percentage of affirmative votes required for action to be taken under that Section. Any amendment must be certified in writing executed and acknowledged by the President or Vice President of the Association and recorded in the Recorder's Office of the County.

C. **Agreements Among Owners:** In any situation where agreement between or among Owners is required, agreement or consent shall not be withheld unreasonably.

7.5. Rights of First Lenders: No breach of any of the covenants, conditions and restrictions contained in this Declaration shall render invalid the lien of any First Lender on any Lot made in good faith and for value, but all of those covenants, conditions and restrictions shall be binding upon and effective against any Owner whose title is derived through Foreclosure or trustee's sale, or otherwise.

Implied approval may be assumed when a Mortgagee fails to submit a response to any written proposal for an amendment within sixty (60) days after the Mortgagee actually receives proper notice of the proposal, provided the notice was delivered by certified or registered mail, with a "return receipt" requested.

7.6. Limitation of Restrictions on Declarant: Declarant is undertaking the work of construction of a residential development and incidental improvements upon the Project. The completion of that work and the sale, rental, and other disposal of the Lots and Residences is essential to the establishment and welfare of the Project. In order that work may be completed and the Project be established as a fully occupied residential community as rapidly as possible, nothing in this Declaration shall be understood or construed to:

A. Prevent Declarant, its contractors, or subcontractors from doing on the Project or any Lot, whatever is reasonably necessary or advisable in connection with the completion of said work; or,

B. Prevent Declarant or its representatives from erecting, constructing and maintaining on the Project (except within Lots owned by others), such structures as may be reasonable and necessary for developing the Project as a residential community and disposing of the same by sale, lease or otherwise; or,

C. Prevent Declarant from conducting on the Project (except within Lots owned by others) its business of completing the work and of establishing a plan of residential ownership and of

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disposing of the Project in Lots by sale, lease or otherwise; or,

D. Prevent Declarant from maintaining or displaying such sign(s), pennants, banners and flag(s) anywhere in the Project (except within Lots owned by others) as may be necessary for the sale, lease or disposition thereof for the duration of Declarant's marketing.

The foregoing rights of Declarant shall terminate upon sale of Declarant's entire interest in the Project, and, until then, this Section shall not be amended without Declarant's consent. So long as Declarant, or its successors and assigns, owns one (1) or more of the Lots described herein, Declarant, or its successors and assigns, shall be subject to the provisions of this Declaration. Declarant shall make reasonable efforts to avoid disturbing the use and enjoyment of Lots by their Owners, while completing any work necessary to said Lots.

7.7. Termination of Any Responsibility of Declarant and Acceptance of Obligations by the Association: In the event Declarant shall assign or convey all of its rights, title and interest in and to the Project to any successor Declarant, then and in such event, Declarant shall be relieved of the performance of any further duties or obligations under this Declaration arising after such conveyance, and such successor Declarant shall thereafter be obligated to perform all such duties and obligations of the Declarant. The obligations of Declarant to the County contained in the conditions of approval for the Project, which obligations are intended to be on-going after Declarant has sold its interest in the Project, shall become the obligations of the Association, and the Association shall indemnify Declarant against any liability arising out of the performance or non-performance of those obligations after Declarant has sold its interest in the Project and/or turned over the maintenance and management of the Project to the Association.

7.8. Owners' Compliance: Each Owner or Occupant of a Lot shall comply with the provisions of this Declaration, and to the extent they are not in conflict with the Governing Documents, and the decisions and resolutions of the Association or the Board, as lawfully amended from time to time. Failure to comply with any such provisions, decisions, or resolutions shall be grounds for an action (1) to recover sums due, (2) for damages, (3) for injunctive relief, (4) for costs and attorneys' fees, or (5) any combination of the foregoing.

In the event of a violation of the Governing Documents, the Association may if permitted by applicable law, record a Notice of Violation against the Lot of the non-complying Owner. Upon recording a Notice of Violation, the Association shall have complete discretion in deciding whether, when and how to proceed with enforcement, and any delay after recording a Notice of Violation shall not give rise to a defense of waiver or estoppel in favor of a non-complying Owner. The Association may take action to enforce compliance against a subsequent Owner who acquires a Lot with a recorded Notice of Violation. The right of the Association to record a Notice of Violation shall be in addition to all other rights and remedies the Association may have at law or under the Governing Documents.

All agreements and determinations lawfully made by the Association in accordance with the voting percentages established in the Governing Documents shall be deemed to be binding on all Owners, their successors and assigns.

7.9. Notice: Any notice permitted or required by the Declaration or Bylaws may be delivered personally or by mail. If delivery is by mail, it shall be deemed to have been delivered seventy-two (72) hours after a copy of the same has been deposited in the United States mail, first-class or registered, postage prepaid, addressed to the person to be notified at the current address given by such person to the Secretary of the Board or addressed to the Lot of such person if no address has been given to the Secretary.

7.10. Fair Housing: No Owner shall, either directly or indirectly, forbid or restrict the conveyance, encumbrance, leasing, or mortgaging, or occupancy of his Lot to any person of a specified race, sex, sexual orientation, gender, gender identity, gender expression, age, marital status, color, religion, physical handicap, national origin, familial status, source of income or disability of that person.

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7.11. Dispute Resolution: The Board is authorized to resolve any civil claim or action through alternative dispute resolution proceedings such as mediation, binding arbitration, or non-binding arbitration proceedings.

A. Claims for Declaratory Relief or Enforcement of Governing Documents: Prior to the filing of an enforcement action, including a civil action solely for declaratory relief or injunctive relief to enforce the Governing Documents, or for declaratory, injunctive or writ relief in conjunction with a claim for monetary damages, the Board, or any Owner who seeks such relief, shall first endeavor to submit the matter to alternative dispute resolution and in the event that mediation fails to resolve the matter to binding arbitration.

B. Arbitration of Disputes: If a dispute is the subject of binding arbitration under this Declaration, the following shall apply:

(1) Costs and fees of the arbitration, including ongoing costs and fees of the arbitration shall be paid as agreed by the parties, and, if the parties cannot agree, as determined by the arbitrator; provided, however, if the Declarant is a party to the arbitration, then any fee to initiate arbitration shall be paid by Declarant, but the cost of arbitration shall ultimately be borne as determined by the arbitrator;

(2) a neutral and impartial individual with at least ten (10) years' experience in real estate construction arbitration shall be appointed to serve as arbitrator, with the arbitrator to be selected by mutual agreement of the parties. If the parties are unable to agree on an arbitrator within fifteen (15) days after any party initiates the arbitration, a neutral and impartial arbitrator shall be selected by JAMS. In selecting the arbitrator, the provisions of §1297.121 of the California Code of Civil Procedure shall apply. An arbitrator may be challenged for any of the grounds listed in §1297.121, or in §1297.124 of the California Code of Civil Procedure;

(3) venue of the arbitration shall be in the County;

(4) the arbitration shall commence in a prompt and timely manner in accordance with (i) the Commercial Rules of JAMS, or if the rules do not specify a date by which arbitration is to commence, then (ii) by a date agreed upon by the parties, and if they cannot agree as to a commencement date, (iii) a date determined by the arbitrator. The arbitrator shall apply California substantive law in rendering a final decision. The arbitrator shall have the power to grant all legal and equitable remedies and award compensatory damages. When the arbitrator is prepared to make the award, the arbitrator shall first so inform the parties, who shall have ten (10) days to attempt to resolve the matter by a binding agreement between them. If the parties resolve the matter, the arbitrator shall not make any award. If the parties do not so resolve the matter within the ten (10) day period, the arbitrator shall make the award on the eleventh day following the arbitrator's notice of being prepared to make the award;

(5) the arbitration shall be conducted in accordance with the Commercial Rules of JAMS;

(6) the arbitration shall be conducted and concluded in a prompt and timely manner;

(7) the arbitrator(s) shall be authorized to provide all recognized remedies available in law or equity for any cause of action that is the basis of arbitration. The arbitrator(s) shall not have the power to commit errors of law or legal reasoning, and the award may be vacated or corrected on appeal to a court of competent jurisdiction for any such error;

(8) a judgment upon the award rendered by the arbitrator may be entered in

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any court having jurisdiction or application may be made to such court for judicial acceptance of the award and an order of enforcement.

(9) Participation by Other Parties. An Owner, the Association and Declarant, to such extent any such party is defending a claim in the arbitration, may, if it chooses, have all necessary and appropriate parties included as parties to the arbitration; and,

(10) **ARBITRATION OF DISPUTES.** BY EXECUTING THIS DECLARATION, DECLARANT AND BY ACCEPTING A DEED TO ANY PORTION OF THE PROPERTY, EACH OWNER AND THE ASSOCIATION SHALL BE DEEMED TO HAVE AGREED TO HAVE ANY DISPUTE RELATING TO OR BASED UPON CLAIMS FOR DECLARATORY RELIEF OR ENFORCEMENT OF THE GOVERNING DOCUMENTS DECIDED BY NEUTRAL BINDING ARBITRATION IN ACCORDANCE WITH THE FEDERAL ARBITRATION ACT AND THE CALIFORNIA ARBITRATION ACT, TO THE EXTENT THE CALIFORNIA ARBITRATION ACT IS CONSISTENT WITH THE FEDERAL ARBITRATION ACT, AND AS PROVIDED IN SECTION 7.11.B. DECLARANT, THE ASSOCIATION AND EACH OWNER ARE GIVING UP ANY RIGHTS DECLARANT, THE ASSOCIATION AND EACH OWNER MIGHT POSSESS TO HAVE THE DISPUTE LITIGATED IN A JURY TRIAL. DECLARANT, THE ASSOCIATION AND EACH OWNER ARE GIVING UP JUDICIAL RIGHTS TO DISCOVERY AND APPEAL, UNLESS THOSE RIGHTS ARE SPECIFICALLY INCLUDED IN THE "ARBITRATION OF DISPUTES" (SECTION 7.11.B) PROVISION. IF DECLARANT, THE ASSOCIATION OR ANY OWNER REFUSES TO SUBMIT TO ARBITRATION, DECLARANT, THE ASSOCIATION OR SUCH OWNER MAY BE COMPELLED TO SUBMIT TO ARBITRATION UNDER THE AUTHORITY OF THE CALIFORNIA CODE OF CIVIL PROCEDURE.

7.12. "General Rules": This Declaration shall be liberally construed to effectuate its purpose of creating a uniform plan for creating and operating a residential development and maintaining the Conservation Easement Area. As used in this Declaration, the singular includes the plural and the plural the singular. The masculine, feminine and neuter each includes the other, unless the context dictates otherwise.

7.13. "Articles, Sections and Exhibits": The Article and Section headings have been inserted for convenience only and may not be considered in resolving questions of interpretation or construction. Unless otherwise indicated, any references in this Declaration to articles, sections or exhibits are to Articles, Sections and Exhibits of this Declaration.

7.14. "Priorities and Inconsistencies": If there are conflicts or inconsistencies between the Governing Documents, then the provisions of this Declaration shall prevail.

7.15. "Severability": The provisions of this Declaration are independent and severable. A determination of invalidity or partial invalidity or unenforceability of any one provision of this Declaration by a court of competent jurisdiction does not affect the validity or enforceability of any other provisions of this Declaration.

7.16. "Statutory References": All references made in this Declaration to statutes are to those statutes as currently in effect or to subsequently enacted replacement statutes.

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IN WITNESS WHEREOF, the undersigned, being the Declarant herein, has executed this Declaration this ____ day of _____, 201__.

MOSS BEACH ASSOCIATES, LLC,
a California limited liability company

By: _____
Name: _____
Its Manager

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT - CIVIL CODE SECTION 1189

A notary public or other officer completing the certificate verifies only the identity of the individual who signed the document to which the certificate is attached and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA

COUNTY OF _____

On _____, 201__ before me, _____, a Notary Public, personally appeared _____ who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal

(SEAL)



County of San Mateo - Planning and Building Department

ATTACHMENT U



State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Habitat Conservation Planning Branch
1416 Ninth Street, 12th Floor
Sacramento, CA 95814
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



June 6, 2017

Mr. Steve Monowitz, Director
Planning and Building Department
County of San Mateo
455 County Center, 2nd Floor
Redwood City, California 94063

Dear Mr. Monowitz:

Coast Yellow Leptosiphon Status Review

The purpose of this letter is to a) inform you of the presence of a rare plant species, coast yellow leptosiphon (*Leptosiphon croceus*), that is present on San Mateo County-owned property; b) inform you of a petition to the California Fish and Game Commission (Commission) to designate this species as "endangered" under the California Endangered Species Act (CESA); and c) request your help in protecting this plant species from possible extinction.

Coast yellow leptosiphon is a rare plant of the Phlox family that is only known from Vallemar Bluff in Moss Beach, San Mateo County (County). Coast yellow leptosiphon is restricted to coastal prairie habitat and only one small population of this species is known to exist. The majority of the population is located on Assessor's Parcel Number 037-087-050. The enclosed Figure 1 shows the approximate location of the coast yellow leptosiphon population.

On December 8, 2016, the California Fish and Game Commission (Commission) accepted for consideration a petition to list coast yellow leptosiphon as an endangered species pursuant to CESA (Fish & G. Code § 2050 *et seq.*), and as a result, coast yellow leptosiphon became a candidate species on December 23, 2016. The California Department of Fish and Wildlife (CDFW) is now in the process of preparing a report on the status of coast yellow leptosiphon for the Commission to consider before they decide whether or not to list this plant as a threatened or endangered species.

The provisions of CESA apply to coast yellow leptosiphon while it is a candidate species. According to these provisions, import, export, "take", possession, purchase, sale, or attempting to do any of those actions to species that are designated as threatened, endangered, or candidates for listing is illegal, unless authorized by permit by CDFW. "Take" is defined in the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill."

Because there is only one known population of coast yellow leptosiphon, protecting this population is critical for the continued existence of the species. As the landowner, the

Conserving California's Wildlife Since 1870

ATTACHMENT U

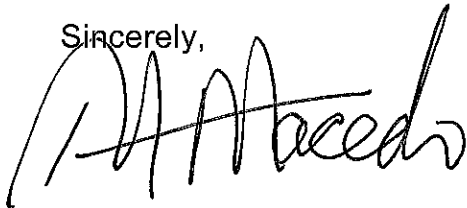
Mr. Steve Monowitz, Director
Planning and Building Department
County of San Mateo
June 6, 2017
Page 2

County plays a significant role as steward and manager of the land that provides habitat for coast yellow leptosiphon. CDFW would like to work with the County to help ensure that the coast yellow leptosiphon population on County property persists into the future. For instance, CDFW would like to work with the County to remove the invasive ice plant that is encroaching into and threatening the coast yellow leptosiphon population. CDFW respectfully asks the County to consult with CDFW before making any changes in the current land use on the property supporting coast yellow leptosiphon to avoid potentially impacting this rare species.

CDFW's petition evaluation report and other documents relating to the petition are available on the Commission's website at:
<http://www.fgc.ca.gov/CESA/index.aspx#II>.

If you have questions about coast yellow leptosiphon, the CESA listing process, or anything else related to this letter, please contact Ms. Cherilyn Burton, Senior Environmental Scientist (Specialist), Habitat Conservation Planning Branch's Native Plant Program, at (916) 651-6508, or by email at cherilyn.burton@wildlife.ca.gov.

Sincerely,



Richard Macedo, Branch Chief
Habitat Conservation Planning Branch

Attachment

ec: County of San Mateo

Ramona Arechiga, Natural Resources Manager
Parks Department
trarechiga@smcgov.org

California Department of Fish and Wildlife

Sandra Morey, Deputy Director
Ecosystem Conservation Division
sandra.morey@wildlife.ca.gov

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Mr. Steve Monowitz, Director
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County of San Mateo
June 6, 2017
Page 3

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PLANNING AND BUILDING
DEPARTMENT



Figure 1. Coast Yellow Leptosiphon Population
Moss Beach, San Mateo County



County of San Mateo - Planning and Building Department

ATTACHMENT U1

21. COAST YELLOW LEPTOSIPHON (CONSENT)**Today's Item****Information** ☒**Action** ☐

Receive DFW's status review report on the petition from Toni Corelli to list coast yellow leptosiphon (*Leptosiphon croceus*) as an endangered species under the California Endangered Species Act (CESA).

Summary of Previous/Future Actions

- | | |
|---|----------------------------------|
| • Receive petition | May 25, 2016 |
| • FGC transmits petition to DFW | May 27, 2016 |
| • Publish notice of receipt of petition | Jun 10, 2016 |
| • Approved 30-day extension | Aug 24-25, 2016; Folsom |
| • Received DFW evaluation of petition | Oct 19-20, 2016; Eureka |
| • Determined that listing may be warranted | Dec 7-8, 2016; San Diego |
| • Today's receive DFW's status review report | Feb 7-8, 2018; Sacramento |
| • Determine if listing is warranted | Apr 18-19, 2018; Ventura |

Background

In May 2016, FGC received a petition from Toni Corelli to list coast yellow leptosiphon as an endangered species under CESA. FGC designated coast yellow leptosiphon as a candidate species at its Dec 8, 2016 meeting. Final consideration is scheduled for Apr 18-19, 2018.

The status review report represents DFW's final written review of the status of coast yellow leptosiphon and is based upon the best scientific information available to DFW. The status review report contains DFW's recommendation that listing of coast yellow leptosiphon as endangered is warranted at this time.

Significant Public Comments (N/A)**Recommendation (N/A)****Exhibits**

1. [DFW's memo and status review report, received Dec 11, 2017](#)

Motion/Direction

Moved by _____ and seconded by _____ that the Commission adopts the consent calendar, items 19-23.

2017 DEC 11 AM 8:30

Memorandum

Date: December 7, 2017

To: Valerie Termini
Executive Director
Fish and Game Commission

From: Charlton H. Bonham
Director



Subject: **Status Review of Coast Yellow Leptosiphon**

The California Department of Fish and Wildlife (Department) has prepared the attached Status Review for the Fish and Game Commission (Commission) regarding the petition from Ms. Toni Corelli and the California Native Plant Society to list coast yellow leptosiphon (*Leptosiphon croceus*) as endangered pursuant to the California Endangered Species Act (CESA, specifically Fish and Game Code Section 2074.6). The Commission received the petition on May 25, 2016. The attached status review represents the Department's final written review of the status of coast yellow leptosiphon and is based upon the best scientific information available to the Department.

The status review contains the Department's recommendation that listing of coast yellow leptosiphon as endangered is warranted. The Department finds that coast yellow leptosiphon is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, competition and other effects from invasive plant species, and other natural occurrences and human-related activities.

If you have questions or need additional information, please contact Richard Macedo, Branch Chief, Habitat Conservation Planning Branch at (916) 653-3861, or by e-mail at richard.macedo@wildlife.ca.gov.

Enclosure

ec: California Department of Fish and Wildlife

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Chief Deputy Director
kevin.hunting@wildlife.ca.gov

Tina Bartlett, Acting Deputy Director
Ecosystem Conservation Division
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Valerie Termini, Executive Director
Fish and Game Commission
December 7, 2017
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Canh Nguyen
Acting Environmental Program Manager
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State of California
Natural Resources Agency
Department of Fish and Wildlife

REPORT TO THE FISH AND GAME COMMISSION

STATUS REVIEW OF COAST YELLOW LEPTOSIPHON (*Leptosiphon croceus*)

December 2017



Coast yellow leptosiphon (*Leptosiphon croceus*), CDFW photo by Cherilyn Burton

Charlton H. Bonham, Director
Department of Fish and Wildlife



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LIST OF ABBREVIATIONS, ACRONYMS AND TERMS

CEQA – California Environmental Quality Act

CESA – California Endangered Species Act

CNDDDB – California Natural Diversity Database

CNPS – California Native Plant Society

Commission – California Fish and Game Commission

CRPR – California Rare Plant Rank

Department – California Department of Fish and Wildlife

Occurrence – CNDDDB Element Occurrence

Evaluation – Initial Evaluation of the Petition to List Coast Yellow Leptosiphon (*Leptosiphon croceus*) as an Endangered Species under the California Endangered Species Act

Id. – “the same”

NEPA – National Environmental Policy Act

Petition - Petition to the State of California Fish and Game Commission from Ms. Toni Corelli Cosponsored by the California Native Plant Society to List Coast Yellow Leptosiphon (*Leptosiphon croceus*) as an Endangered Species Pursuant to the California Endangered Species Act

ssp. – Subspecies

var. – Variety

EXECUTIVE SUMMARY

This Status Review of Coast Yellow Leptosiphon (*Leptosiphon croceus* (Eastw.) Strother & Kersh) (Status Review) has been prepared by the California Department of Fish and Wildlife (Department) for the California Fish and Game Commission (Commission) pursuant to the requirements of the California Endangered Species Act (CESA). This Status Review has been independently reviewed by scientific peers, and is based upon the best scientific information available to the Department.

Coast yellow leptosiphon is a low-growing annual plant in the Phlox family (Polemoniaceae) that was first described in 1904. It is known from only one small population that occupies approximately 167 square meters (1,800 square feet), located on Vallemar Bluff in Moss Beach, San Mateo County. This population is located in coastal prairie habitat atop a sea bluff at the edge of the coastline.

The population of coast yellow leptosiphon occurs in close proximity to urban land use, and has been either directly or indirectly impacted by modification or destruction of habitat. Coast yellow leptosiphon is threatened, both directly and indirectly, by development and other land-use changes; impacts from invasive plant species; and impacts from human activities such as trampling. Bluff-top erosion is also a serious threat to this species, and climate change may accelerate this process. In addition, coast yellow leptosiphon is highly vulnerable to extinction due to its extremely limited distribution and restriction to only one small population. Because of the rarity of coast yellow leptosiphon, the loss of any occupied habitat or any portion of the population would represent the loss of a significant portion of its total range, and could result in extinction of the species.

Scientific information available to the Department indicates that coast yellow leptosiphon is in serious danger of becoming extinct in all or a significant portion of its range due to one or more causes, including loss of habitat, change in habitat, competition and other effects from invasive plant species, and other natural occurrences and human-related activities. The Department recommends that the Commission find that the petitioned action to list coast yellow leptosiphon as an endangered species is warranted, and further recommends implementation of the management recommendations and recovery measures described in this Status Review.

INTRODUCTION

This Status Review addresses coast yellow leptosiphon (*Leptosiphon croceus* (Eastw.) Strother & Kersh).

Petition History

On May 25, 2016, the Commission received a petition (Petition) from Ms. Toni Corelli, cosponsored by the California Native Plant Society (CNPS), to list coast yellow leptosiphon as an endangered species pursuant to CESA (Fish & G. Code, § 2050 *et seq.*).

On May 27, 2016, the Commission referred the Petition to the Department for evaluation.

On June 10, 2016, as required by Fish and Game Code section 2073.3, the Commission published notice of receipt of the Petition in the California Regulatory Notice Register. (Cal. Reg. Notice Register 2016, No. 24-Z, p.1002, <https://www.oal.ca.gov/wp-content/uploads/sites/28/2017/05/24z-2016.pdf>). The Department on July 25, 2016, pursuant to Fish and Game Code Section 2073.5 requested a 30-day extension of time to complete its evaluation report.

On September 26, 2016, the Department provided the Commission with a report, “Evaluation of the Petition from Ms. Toni Corelli and the California Native Plant Society to List Coast Yellow Leptosiphon (*Leptosiphon croceus*) as an Endangered Species under the California Endangered Species Act” (Evaluation). Based upon the information contained in the Petition, the Department concluded, pursuant to Fish and Game Code, section 2073.5, subdivision (a), that sufficient information exists to indicate that the petitioned action may be warranted, and recommended to the Commission that the Petition should be accepted and considered.

On December 8, 2016, at its scheduled public meeting in San Diego, California, the Commission considered the Petition, the Department’s Evaluation and recommendation, and comments received. The Commission found that sufficient information existed to indicate the petitioned action may be warranted and accepted the Petition for consideration.

Subsequently, on December 23, 2016, the Commission published its Notice of Findings for coast yellow leptosiphon in the California Regulatory Notice Register, designating coast yellow leptosiphon as a candidate species. (Cal. Reg. Notice Register 2016, No. 52-Z, p. 2197, <https://www.oal.ca.gov/wp-content/uploads/sites/28/2017/05/52z-2016.pdf>).

Department Review

Following the Commission’s action to designate coast yellow leptosiphon as a candidate species, the Department notified affected and interested parties and solicited data and comments on the petitioned action pursuant to Fish and Game Code section 2074.4 (see also Cal. Code Regs., tit. 14, § 670.1, subd. (f)(2)). All comments received are included in Appendix A to this report. The Department promptly commenced its review of the status of the species as required by Fish and Game Code section 2074.6, which has now concluded with this Status Review document.

The Department sought independent and competent peer review on its draft Status Review report by persons of the scientific and academic community commonly acknowledged to be

experts on coast yellow leptosiphon and possessing the knowledge and expertise to critique the scientific validity of the draft Status Review. Appendix B contains a listing of the individuals and agencies given an opportunity to review the draft Status Report, the specific input provided to the Department by the individual peer reviewers, the Department's written response to the input, and any amendments made to the draft Status Review report (Fish & G. Code, § 2074.6; Cal. Code Regs., tit. 14, § 670.1, subd. (f)(2)).

BIOLOGY

Species Description

The information below is paraphrased from the original species description of coast yellow leptosiphon (Eastwood 1904) and from the Jepson eFlora (Patterson and Battaglia 2017).

Coast yellow leptosiphon is an herbaceous plant that grows to a height of 2 to 7 centimeters (0.8 to 2.8 inches). Its slender stem is much-branched from the base and is covered with white appressed hairs, meaning the hairs are pressed closely against the stem. It has opposite leaves that are palmately-divided, which means that all the lobes of the leaf are fused together at a common point, resembling a fan. The leaves are generally divided into six lobes that are approximately 4 to 7 millimeters (0.16 to 0.28 inches) long on the lower stem and almost twice as long near the flowers, appearing as whorls at the nodes. The lobes are narrowly ovate with the narrower end at the base, sometimes appearing linear. The flowers are arranged in heads that are subtended by palmately-divided leaf-like structures called bracts, with five linear divisions that are approximately 7 millimeters (0.28 inch) long and up to 1 millimeter (0.04 inch) wide. The flowers have bright yellow petals that are fused together at the base and are collectively referred to as a corolla. The corolla lobes are approximately 6 to 8 millimeters (0.24 to 0.31 inch) wide and generally have two bright red dots at the base. The fused corolla forms a long tube that is 26 to 39 millimeters (1.0 to 1.5 inches) long and is covered with fine, scattered, spreading hairs. The calyx lobes, otherwise known as sepals, are generally deltate or triangular-shaped, less than 1 millimeter (0.04 inch) wide at the middle, densely glandular-hairy, and are connected by an obscure thin membrane, forming a tube. Flowers are bisexual, which means they contain both male and female organs in the same flower. The fruit is called a capsule, which is a dry fruit from a compound pistil (female organ) that opens at maturity to release its seeds. Few seeds are produced by each flower. Coast yellow leptosiphon has a chromosome number of $2n=18$.

Taxonomy

Coast yellow leptosiphon is in the Phlox family (Polemoniaceae), which has a long history of taxonomic confusion (Bell and Patterson 2000; Hankamp et al. 2016). *Leptosiphon* was originally recognized as a genus in 1833 (Bell and Patterson 2000; Porter and Johnson 2000). Greene (1889-1892) combined several genera, including *Leptosiphon*, into a single genus, *Linanthus*, based predominantly on the presence of opposite, palmately-lobed leaves (Battaglia and Patterson 2001). Porter and Johnson (2000) reclassified the taxa within Polemoniaceae and divided *Linanthus* into two distinct genera, *Leptosiphon* and *Linanthus*.

Alice Eastwood, botanist and curator of the California Academy of Sciences Herbarium from 1894 until 1949, formally described coast yellow leptosiphon as a species in 1904 (Eastwood 1904; Porter and Johnson 2000). A single specimen collected by Eastwood on May 9, 1901, has been designated as the type specimen for coast yellow leptosiphon (Strother and Kersh

2016), and is maintained at the California Academy of Sciences Herbarium. Eastwood originally labeled the specimen as *Gilia androsacea* var. *crocea* (Corelli 2016; Strother and Kersh 2016), but assigned it the species name *Linanthus croceus* Eastw. when she first formally described the species in 1904. Coast yellow leptosiphon has been reclassified several times. Other names assigned to the species include *Linanthus parviflorus* var. *croceus* (Milliken 1904), *Linanthus androsaceus* var. *croceus* (Jepson 1925), and *Linanthus androsaceus* ssp. *croceus* (Munz 1959). In the 1993 Jepson manual, coast yellow leptosiphon and several other closely-related species were grouped together into a single species called variable linanthus (*Linanthus parviflorus*) (Patterson 1993), until Porter and Johnson revised the entire family based on morphological and molecular data. In Porter and Johnson's publication, *Linanthus parviflorus* was reclassified as *Leptosiphon parviflorus*, and coast yellow leptosiphon was recognized as a distinct species, *Leptosiphon croceus* (Eastw.) (Porter and Johnson 2000). Due to an incorrect citation in Porter and Johnson's publication (2000), *Leptosiphon croceus* was not considered to be a validly published species name until Strother and Kersh (2016) corrected the citation error and validly published the current taxonomic name, *Leptosiphon croceus* (Eastw.) Strother & Kersh (Strother and Kersh 2016; Patterson and Battaglia 2017).

There are 31 species and 9 subspecies of *Leptosiphon*. Geographically, five of these species occur in the same geographic area of central California as coast yellow leptosiphon: bristly leptosiphon (*L. aureus*), false babystars (*L. androsaceus*), true babystars (*L. bicolor*), variable linanthus (*L. parviflorus*), and rose leptosiphon (*L. rosaceus*). Taxonomically, coast yellow leptosiphon is most closely related to variable linanthus and broad-lobed leptosiphon (*L. latisectus*) (Hankamp et al. 2016).

Range and Distribution

Range is the general geographical area where an organism occurs. For purposes of CESA and this Status Review, the range is the species' California range (*Cal. Forestry Assn. v. Cal. Fish and Game Com.* (2007) 156 Cal.App.4th 1535, 1551). Distribution refers to actual sites where individuals and populations of the species occur within the species' range.

The genus *Leptosiphon* occurs primarily in western North America, with one species occurring only in Chile. California is the center of diversity for *Leptosiphon* (Hankamp et al. 2016), where 90 percent of the species occur across diverse habitats in the California Floristic Province and adjacent areas (Bell and Patterson 2000).

Coast yellow leptosiphon occurs only in California. Coast yellow leptosiphon was first collected at "Blenheim" by Alice Eastwood, which was a short-lived place name mapped about 3–5 kilometers (2–3 miles) north of Pillar Point and apparently referred to a place at or near present-day Moss Beach (Strother and Kersh 2016; CNDDDB 2017). There is limited history of collection of plants in the vicinity of Moss Beach, with most collections dating from the early 1900s to the 1940s. A search conducted by the petitioner for coast yellow leptosiphon in the Consortium of California Herbaria database and California herbaria throughout California found 40 collection sheets that were labeled *Leptosiphon croceus* or a synonym of *Leptosiphon croceus*. These specimens were reviewed in 2016 to verify their identification (Corelli 2016). Many plant specimens that were originally identified as coast yellow leptosiphon had been misidentified and actually represent other *Leptosiphon* species. Review of these specimens indicates that only the historic specimens that were collected from Moss Beach represent coast yellow leptosiphon, and that coast yellow leptosiphon is restricted to one colony in Moss Beach, San Mateo County.

The coast of San Mateo County has been frequently visited by botanists and scientific plant collectors, including botanists that specialize in *Leptosiphon* species. Despite their attempts, no additional populations of coast yellow leptosiphon have been discovered (Corelli 2016). Available data indicate that coast yellow leptosiphon has always been limited in its range and restricted to the Moss Beach area.

The distribution of coast yellow leptosiphon is documented in the California Natural Diversity Database (CNDDDB). The CNDDDB documents plant taxa, animal taxa, and natural communities that are of conservation concern within California and refers to these taxa as “elements.” An “element occurrence” (occurrence) is a location record for a site which contains an individual, population, nest site, den, or stand of a special status element. Populations, individuals, or colonies that are located within 1/4 mile of each other generally constitute a single occurrence, sometimes with multiple “parts” (Bittman 2001). The CNDDDB previously contained four occurrences for coast yellow leptosiphon. In March 2016, the CNDDDB updated its database to remove three of these occurrences because they had been incorrectly identified as coast yellow leptosiphon, but actually represented other closely related species (Corelli 2016; Lazar pers. comm. 2016). This update resulted in there being only one valid occurrence for this species in the CNDDDB (see Figure 1).

The CNDDDB documented occurrence and coast yellow leptosiphon population is located within the Fitzgerald Marine Reserve, which is owned by the County of San Mateo and is a San Mateo County Park. The area immediately adjacent to the coast yellow leptosiphon population and the Fitzgerald Marine Reserve consists of several privately owned parcels that are proposed for development as shown in Figure 1 and as described below in the Factors Affecting the Ability to Survive and Reproduce section of this report. The County of San Mateo property and the adjacent private parcels are zoned Resource Management-Coastal Zone (RM-CZ). Development is allowed in an RM-CZ zone, but all development requires approval from the San Mateo County Coastside Design Review Committee (CDRC 2017).

The population of coast yellow leptosiphon is estimated to occupy an area approximately 18 meters by 9 meters (60 feet by 30 feet) or 167 square meters (1,800 square feet) in size (CNDDDB 2017; Department staff observation), which represents the entire distribution and range of the species. In addition to the mapped population of coast yellow leptosiphon shown in the CNDDDB, one individual plant was also identified outside of the mapped population on the adjacent private property on May 16, 2016 (T. Corelli pers. comm. 2016) (see Figure 2). Since annual plants reproduce by seed, a seed bank is potentially present in the area where this plant was identified.

Life History

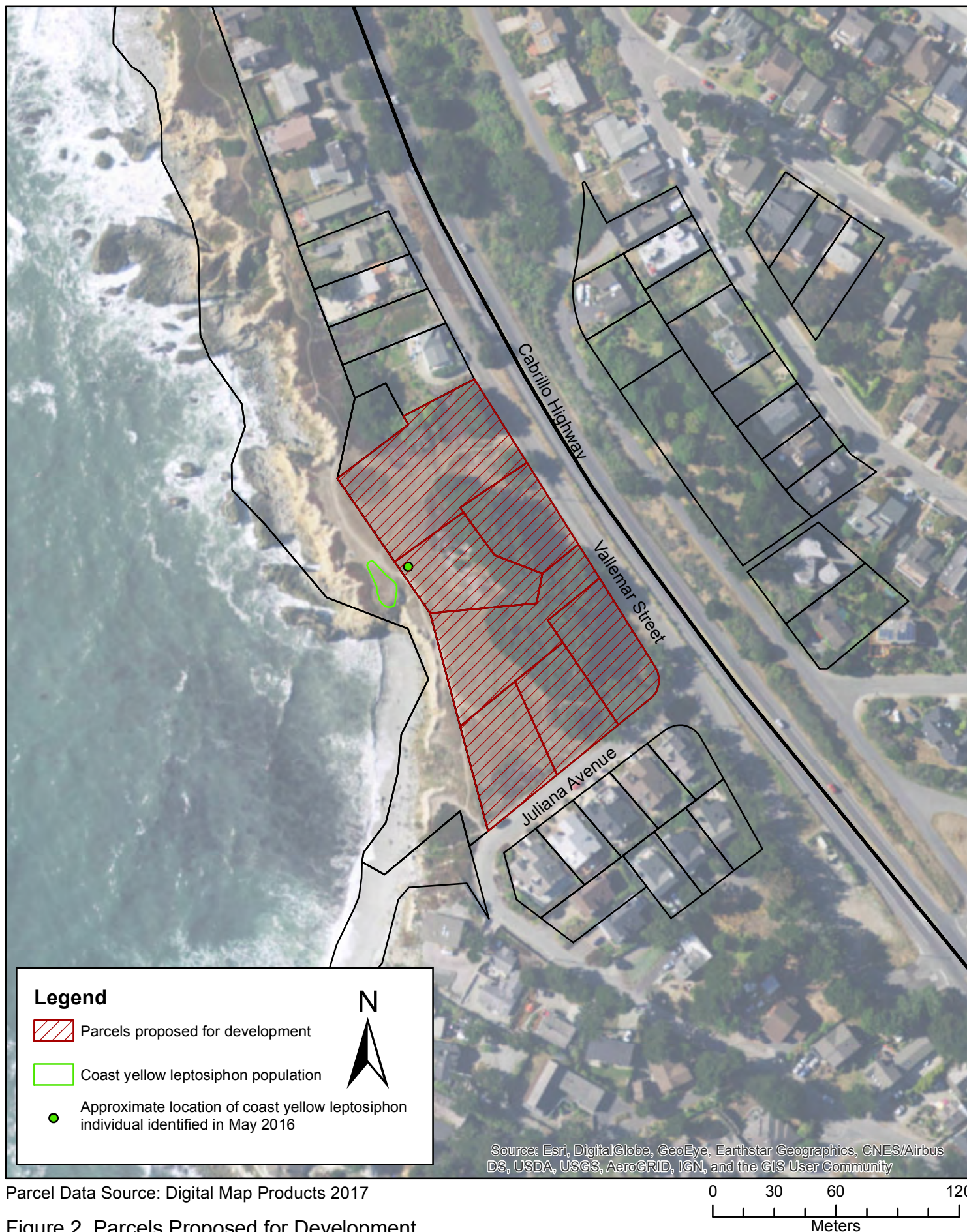
Coast yellow leptosiphon is an annual plant, which means that it completes its life cycle within one year or growing season. It generally flowers from April to June (CNPS 2017; Patterson and Battaglia 2017). Little is known about the mating system of coast yellow leptosiphon. It is closely related to variable linanthus, which is a fully self-incompatible species, meaning it does not self-fertilize (Goodwillie 1999; Weber and Goodwillie 2013). Self-incompatible plants rely on pollinators or are wind-pollinated (Goodwillie 1999). Pollination studies conducted on other species of *Leptosiphon* indicate they are predominantly bee fly- (Bombyliidae) and wind-pollinated (Goodwillie 2001). Other potential pollinators such as a beetle (*Listrus* sp.) in the Melyridae family (soft-wing flower beetles) have been recently observed on coast yellow leptosiphon (Corelli 2016). The Department does not have information on seed dispersal for



Species Occurrence Data Source: California Natural Diversity Database (July 2017)

Figure 1. Vicinity of Coast Yellow Leptosiphon (*Leptosiphon croceus*)

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coast yellow leptosiphon, but like many other plant species, seeds may be dispersed by birds or other animals, gravity, water flow, or other mechanisms.

Similar-looking Plants

Coast yellow leptosiphon shares morphological characteristics with other leptosiphon species, including false baby-stars, broad-lobed leptosiphon, rose leptosiphon, and variable linanthus. One population of variable linanthus located in the Santa Cruz Mountains near Boulder Creek looks particularly similar to coast yellow leptosiphon (A. Schusteff pers. comm. 2017), but the herbarium specimen records which presumably refer to this population have been confirmed as variable linanthus (Corelli 2016). Coast yellow leptosiphon is the shortest of all *Leptosiphon* species, and the width of the corolla lobes is the largest in the complex. Coast yellow leptosiphon can be distinguished from false baby-stars and rose leptosiphon by its densely glandular-hairy calyx lobes throughout the whole surface as opposed to the non-glandular ciliate hairs only on the margins of the calyx lobes of false baby-stars and rose leptosiphon (Patterson and Battaglia 2017). Coast yellow leptosiphon is distinguished from variable linanthus and broad-lobed leptosiphon by its rounded corolla lobes and short habit of less than 7 centimeters (2.8 inches) tall (Battaglia and Patterson 2001). In addition, broad-lobed leptosiphon is not known to occur in the same geographical range as coast yellow leptosiphon (Patterson and Battaglia 2017).

Habitat that may be Essential to the Continued Existence of the Species

Coast yellow leptosiphon grows at the edge of the coastline on a marine terrace supported by sedimentary sandstone-derived soil. It occurs on a bluff at an elevation of 14 meters (46 feet), in habitat that is highly influenced by wind, cool salt-laden air, and fog (CNDDDB 2017).

Vegetation Communities

Coast yellow leptosiphon is associated with a diverse array of native perennial grasses such as maritime brome (*Bromus maritimus*), California oat grass (*Danthonia californica*), tufted hairgrass (*Deschampsia cespitosa* ssp. *holciformis*), and northern barley (*Hordeum brachyantherum* ssp. *brachyantherum*). Other species associated with coast yellow leptosiphon include native species such as sea-pink (*Armeria maritima* ssp. *californica*), seaside wild buckwheat (*Eriogonum latifolium*), coastal button-celery (*Eryngium armatum*), beach strawberry (*Fragaria chiloensis*), purple cudweed (*Gamochaeta ustulata*), coastal gumplant (*Grindelia stricta* var. *platyphylla*), and Davy's centaury (*Zeltnera davyi*). Three other rare species grow in association with coast yellow leptosiphon: Blasdale's bent grass (*Agrostis blasdalei*), harlequin lotus (*Hosackia gracilis*), and Johnny-nip (*Castilleja ambigua* ssp. *ambigua*) (Department observation; Corelli 2016; Jodi McGraw Consulting 2017). Blasdale's bent grass has a California Rare Plant Rank (CRPR) of 1B.2 (rare, threatened or endangered in California and elsewhere; moderately threatened in California), and harlequin lotus and Johnny-nip have a CRPR of 4.2 (plants of limited distribution – a watch list; moderately threatened in California). Several non-native species are associated with coast yellow leptosiphon and are colonizing the bluff top, including freeway iceplant (*Carpobrotus edulis*), rattail sixweeks grass (*Festuca myuros*), rye grass (*Festuca perennis*), hare barley (*Hordeum murinum* ssp. *leporinum*), rough cat's-ear (*Hypochaeris radicata*), cut-leaved plantain (*Plantago coronopus*), and English plantain (*Plantago lanceolata*).

The Department uses A Manual of California Vegetation, Second Edition (Sawyer et al. 2009) to classify natural communities within California. However, the area where coast yellow

leptosiphon occurs has not yet been classified using A Manual of California Vegetation, Second Edition. The habitat where coast yellow leptosiphon occurs would likely be classified as Coastal Terrace Prairie (Element Code 41100) under Robert Holland's Preliminary Descriptions of the Terrestrial Natural Communities of California (1986). Holland's classification system was used by the Department in the past to classify natural communities within California, but has since been superseded by A Manual of California Vegetation, Second Edition (Sawyer et al. 2009). The CNDDDB continues to maintain historic records of the natural community occurrences, although new community occurrences have not been added to the CNDDDB since the 1990s (California Department of Fish and Wildlife 2017). While the Holland system for classifying natural communities is no longer supported by the Department, this information may be useful for describing vegetation in areas of California that have not yet been classified using A Manual of California Vegetation, Second Edition. Information on Holland's Coastal Terrace Prairie community in the CNDDDB is described below but this information should be used with caution as the rankings are no longer updated or reviewed by the CNDDDB.

Coastal Terrace Prairie is a rare natural community described as having a dense, tall grassland dominated by both sod and tussock-forming perennial grasses growing to 1 meter (3.3 feet) tall, with patchy and variable stands that reflect local differences in available soil moisture capacity (Holland 1986). Coastal Terrace Prairie has a natural heritage global rarity rank of G2 (Imperiled) and a state rarity rank of S2.1 (Imperiled and very threatened) in the CNDDDB. A rank of G2 means that an element is at high risk of global extinction or elimination due to a very restricted range, very few populations (often 20 or fewer), very steep declines, or other factors. A state rank of S2 means that an element is imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state, and the ".1" signifies that the element is "very threatened" (CNDDDB 2017).

While the habitat where coast yellow leptosiphon occurs is not yet classified in A Manual of California Vegetation, Second Edition (Sawyer et al. 2009), the species composition overlaps with that listed in the *Deschampsia cespitosa* Herbaceous Alliance (tufted hair grass meadow). The *D. cespitosa* – *Danthonia californica* and *D. cespitosa* – *Eryngium armatum* Associations, which have been described on coastal bluffs and terraces and in other areas in California (Sawyer et al. 2009; Klein et al. 2015), fall within the *Deschampsia cespitosa* Herbaceous Alliance. This alliance includes both the Coastal Terrace Prairie and the Wet Subalpine or Alpine Meadow (Element Code 45210) communities described in the Holland classification system (1986). It is mapped on bluffs and terraces along the central and northern California coast and in montane areas in northern and central California, and is widespread outside of California. The *D. cespitosa* Herbaceous Alliance has a natural heritage global rarity rank of G5 (Secure) and a state rarity rank of S4? (Uncertain but Apparently Secure) (Sawyer et al. 2009; CNDDDB 2017). The specific association type of this vegetation has yet to be defined. However, in the recent study of the vegetation of Sonoma County (Klein et al. 2015) both of the related associations are considered imperiled and/or imperiled and very threatened. The *D. cespitosa* – *Danthonia californica* Association has a Global Rank of G3 (Vulnerable) and a State Rank of S2 (Imperiled), while the other closely related association, the *D. cespitosa* – *Eryngium armatum* Provisional Association is ranked G3G2?/S3S2? (Uncertain but Vulnerable or Imperiled). It is likely that all of the coastal associations of the *D. cespitosa* Herbaceous Alliance are similarly rare and threatened.

East of the coast yellow leptosiphon population, a large stand of Monterey cypress (*Hesperocyparis macrocarpa*) trees is growing on Vallemar Bluff along Vallemar Street. Monterey cypress is known from only two native occurrences, which are in the Monterey area. It

is considered invasive in other parts of California, and it has been widely planted and naturalized in other areas along the coast (Cal-IPC 2017; CNPS 2017). The Monterey cypress trees near the coast yellow leptosiphon population likely represent planted specimens. The understory of this stand is disturbed and consists mostly of non-native plant species including ripgut brome (*Bromus diandrus*), freeway iceplant, panic veldt grass (*Ehrharta erecta*), false brome (*Brachypodium distachyon*), pride of Madeira (*Echium candicans*), Japanese cheesewood (*Pittosporum tobira*), and pincushion flower (*Scabiosa atropurpurea*). Freeway iceplant is present in large patches scattered throughout the Coastal Terrace Prairie, and a large patch is growing on the bluff immediately adjacent to the coast yellow leptosiphon population. North of the coast yellow leptosiphon population, the coastal bluff between the existing homes and the edge of the bluff is completely dominated by large mats of freeway iceplant with very little room for other herbaceous plants to grow. Monterey cypress trees are also scattered along the bluff north of the coast yellow leptosiphon population.

South of the Coastal Terrace Prairie, on the other side of Juliana Drive, the area consists of residential development (Figure 2).

Geology and Soils

Coast yellow leptosiphon grows on the edge of Vallemar Bluff in Moss Beach overlooking the Pacific Ocean. The Natural Resources Conservation Services' soil map unit for this area is rock outcrop-Orthents complex (Soil Survey Staff 2017). Orthents occur on escarpments, which are steep slopes or long cliffs that form as an effect of faulting or erosion and separate two relatively level areas of differing elevations. Orthents parent material consists of mixed sedimentary, serpentine, or basaltic volcanic rock (Soil Survey Staff 2017). The coast yellow leptosiphon population grows on a marine terrace supported by sedimentary sandstone-derived soil underlain by a relatively thin veneer of terrace deposits, consisting primarily of poorly to moderately consolidated gravel, sand, silt, and clay of marine origin (Pampeyan 1994).

The site is in a geologically active region of California, and is located approximately 427 meters (1,400 feet) northeast of the Seal Cove Fault and about 10.9 kilometers (6.8 miles) southwest of the seismically active San Andreas Fault Zone. The active San Andreas, Hayward, and Calaveras Faults are all located within the nearby San Francisco Bay Area and could have active secondary faults with the potential to cause severe shaking at the coast yellow leptosiphon population. A major earthquake could significantly affect the unstable bluffs and soils, causing loose soil on the steep slopes near the coast yellow leptosiphon population to form sloughs or slides (JCP 1990).

Hydrology

The coast yellow leptosiphon population occurs in the Dean Creek catchment, which is approximately 146 hectares (360 acres) in size. Dean Creek is located northeast of the Fitzgerald Marine Reserve and flows into Kelp Cove, approximately 0.6 kilometers (0.3 miles) south of Vallemar Bluff.

The coast yellow leptosiphon population is located near a coastal bluff comprised partially of coastal terrace deposits that are susceptible to erosion, particularly by concentrated uncontrolled runoff of surface drainage. In two areas of the bluff edge, shallow gullies approximately 0.3 to 0.6 meter (1 to 2 feet) deep extend inland from the bluff edge. These gullies were likely formed as a result of overland storm runoff (Haro, Kasunich & Associates, Inc. 2015).

A geotechnical investigation was completed at Vallemar Bluff by Haro, Kasunich & Associates, Inc. in 2016. Test bore holes encountered groundwater at 4 to 5 meters (13 to 17 feet) below the ground surface. The groundwater appears to be perched upon the bedrock and seeping through the terrace (Haro, Kasunich & Associates, Inc. 2015).

Climate

Coast yellow leptosiphon occurs in an area with a maritime Mediterranean climate with distinct wet and dry seasons. Most of the area's precipitation occurs from November through April. Virtually all precipitation occurs as rain, although fog accounts for a small percentage (Brady/LSA 2002). Using PRISM weather data from 1895 to 2015, the average minimum temperature in the vicinity of Vallemar Bluff is 9°C (48°F), the average maximum temperature is 17°C (63°F), the average temperature is 13°C (55°F), and the average precipitation is 69 centimeters (27 inches) per year (PRISM Climate Group 2017).

POPULATION TRENDS

Scientific information on coast yellow leptosiphon's population trends is limited. The species has not been monitored regularly, and the earliest reported survey was conducted by R. Battaglia in 1998, with about 1,000 plants estimated (Battaglia 1998; Corelli 2016; CNDDDB 2017). T. Corelli estimated population numbers in 1999 and 2015. An estimated 400–500 plants were recorded in 1999, and fewer than 400 plants were estimated in 2015 (Corelli 1999, 2015).

Although little is known about population trends of coast yellow leptosiphon, the population that was once described as covering the ground for several acres (Eastwood 1904) is now limited to an area covering approximately 167 square meters (1,800 square feet or 0.04 acre), clearly indicating a significant declining population trend.

FACTORS AFFECTING THE ABILITY TO SURVIVE AND REPRODUCE

Habitat Modification and Destruction

Past Modification and Destruction of Habitat

Habitat loss is considered the primary cause for species extinctions at local, regional, and global scales (Dirzo and Raven 2003). Most of the coastal prairie habitat, which provides potential habitat for coast yellow leptosiphon, has been destroyed or modified due to urban development, agriculture, and invasion of non-native plant species (Ford and Hayes 2007). Coast yellow leptosiphon was likely present over a larger geographic area prior to the development of the San Mateo coast and conversion of coastal prairie habitat. Most of the habitat surrounding the coast yellow leptosiphon population has been eliminated or altered due to road construction, residential development, and invasion by non-native plant species, particularly the invasive freeway iceplant which covers the coastal bluff adjacent to the coast yellow leptosiphon population (Departmental observation). Installation of hardscape and storm drainage systems related to urban development have altered runoff patterns and hydrology in and around occupied coast yellow leptosiphon habitat.

Although it is likely that coast yellow leptosiphon has always been rare and restricted in range, past modification and destruction of habitat has contributed to the limited availability of suitable habitat for this species. These past changes affect the ability of coast yellow leptosiphon to survive and reproduce.

Present and Future Modification and Destruction of Habitat

Development or changes in land use could directly destroy plants and living seeds in the seed bank and destroy both occupied and potential habitat. Threats to coast yellow leptosiphon may occur from development and changes in land use near the existing population. A residential development project is proposed on the parcels immediately adjacent to the coast yellow leptosiphon population (County of San Mateo 2017; Midcoast Community Council 2017). The area proposed for development consists of seven lots, which will be consolidated into four lots for the project. The proposed project will build four, three-story single-family residences, between 4,740 and 4,859 square feet in size, and is pending design review approval by the San Mateo County Coastsides Design Review Committee (CDRC 2017). Figure 2 shows the property proposed for development in relationship to the coast yellow leptosiphon population, and Figure 3 shows the site plan. The developer has erected story poles on the parcels that represent locations and footprints of the proposed houses (Figure 4).

Coast yellow leptosiphon has been buffered from impacts from the adjacent highway by the 1.0-hectare (2.5-acre) undeveloped coastal prairie that provides a natural buffer between Highway 1 and the coast yellow leptosiphon population. Habitat buffers provide protection from edge effects (Saunders et al. 1991; Given 1994), which are changes in community structure that occur at the boundary of two habitats. Habitat buffers also provide extra protection from human activities, allow for a more natural habitat boundary, slow the speed of water runoff, and filter sediments, fertilizers, pesticides, heavy metals, and pathogens from runoff (Given 1994; Godfrey 2015; USDA 2017).

Any change in land use on this adjacent property is expected to result in indirect impacts to the coast yellow leptosiphon population. The proposed development will alter the hydrologic regime of the site. This will involve increased, altered, and unseasonal runoff patterns resulting from addition of hard, impervious surfaces, installation of drainage features such as storm drains and drainage pipes (Mesiti-Miller Engineering, Inc. 2017), and installation and use of landscape irrigation systems. Development often leads to unseasonal summer moisture resulting from watering landscape plants, washing cars, and other human activities. In addition, residential development will lead to an increase in use of fertilizers and nutrients, herbicides, pesticides, and other household chemicals and products which will run off and disperse into habitat occupied by coast yellow leptosiphon and could impact the plants as well as alter the soil chemistry. Increased nutrient load and unseasonal moisture resulting from human activities creates conditions that promote the spread of non-native plant species, which can outcompete the native plants for light, space, nutrients, water, and other factors (Smil 1997; Vitousek et al. 1997; Line and White 2007). Furthermore, development will increase the number of human visitors using the area, result in soil disturbance and compaction, increase garbage and pollution, and create conditions that are favorable for the spread of non-native plant species.

Construction of houses on the parcels adjacent to the coast yellow leptosiphon population will lead to an increase in human use of the area. Walking paths exist on the bluff, and one heavily-used path exists immediately adjacent to the coast yellow leptosiphon population. Increased human use of the area will increase the impacts to the habitat from foot traffic, will increase the spread of weed seeds and introduce nutrients from dog walking, and will increase the risk of



Source: Pearson Design Group (2016)

No Scale



Figure 4. Story Poles Depicting Planned Locations for Four Homes on Vallemar Bluff

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trampling and killing of coast yellow leptosiphon plants. In addition, development of the area will modify the aesthetics and accessibility of the bluff, potentially resulting in alterations of walking patterns in the area. People may create new paths through the remaining portions of the habitat accessible on Vallemar Bluff, potentially through the coast yellow leptosiphon population.

Development of this area may also result in the loss of pollinator habitat and further fragment the habitat adjacent to the coast yellow leptosiphon population. Habitat fragmentation often leads to a disruption in plant and pollinator population dynamics by altering pollinator densities and behavior (Xiao et al. 2016). Information on pollinators and pollinator requirements for coast yellow leptosiphon is currently lacking, but loss of pollinators essential to the reproduction of coast yellow leptosiphon would negatively impact coast yellow leptosiphon, especially if the species is self-incompatible (Goodwillie 1999).

Although the population of coast yellow leptosiphon is not reported in the CNDDDB on the adjacent parcels that are proposed for development, one individual plant was identified on one of the parcels on May 16, 2016 (T. Corelli pers. comm. 2016) (see Figure 2). Since annual plants reproduce by seed, identification of coast yellow leptosiphon on one of the adjacent properties indicates that the plants have distributed seed beyond the currently-mapped occurrence, and that a seed bank is potentially present in the area where this plant was identified. A seed bank constitutes a living plant population, even when above-ground plants are not visible. Presence of a potential seed bank may be an essential element for long-term survival of coast yellow leptosiphon. Development of any of the adjacent properties could result in impacts to coast yellow leptosiphon through the elimination of a soil seed bank for this species or direct impacts to individual plants that may emerge from the seed bank.

In addition to impacts from human activities, habitat modification can result from other activities. Burrowing mammals such as pocket gophers (*Thomomys* spp.) have profound impacts on ecosystems, from consuming vegetation to physically altering the soil (Reichman and Seabloom 2002). Burrowing mammals influence the physical environment, altering patterns and rates of soil development and nutrient availability, microtopography, and the abiotic environment. Burrowing activity can affect the demography and abundance of plant species, altering vegetation patterns and diversity, and thus altering ecosystem structure (Inouye et al. 1987; Huntly and Inouye 1988; Villarreal et al. 2008). Burrowing mammals such as gophers excavate vast burrow systems and deposit tailings in abandoned tunnels and on the ground surface (Reichman and Seabloom 2002), reducing the area of available habitat for plants. Evidence of burrowing mammals is present in the coast yellow leptosiphon population (Department staff observation), but the Department does not have any specific information on the effects of burrowing mammals on the survival of coast yellow leptosiphon.

The Department considers present and future modification and destruction of habitat a serious threat to coast yellow leptosiphon. Habitat modification and destruction will affect the ability of coast yellow leptosiphon to survive and reproduce.

Impacts from Invasive Species (Competition and other Factors)

Invading alien species cause major environmental damages and losses and are a significant risk factor leading to extinction of threatened and endangered species (Pimentel et al. 2004; Conser and Conner 2009), second only to habitat loss and fragmentation (Wilcove et al. 1998; Randall and Hoshovsky 2000). Compared to other threats to biodiversity, invasive non-native plants present a complex problem that is difficult to manage and has long-lasting effects. North America has accumulated the largest number of naturalized plants in the world (van Kleunen et

al. 2015), and many non-native plant species have established within California, dramatically changing the state's ecological landscape (Conser and Connor 2009). Many studies hypothesize or suggest that competition is the process responsible for observed invasive species impacts to biodiversity; however, invasive species may also impact native ecosystems by altering environmental conditions and resource availability (D'Antonio and Vitousek 1992; Levine et al. 2003). Invasive species may threaten native populations through competition for light, water, or nutrients; allelopathic mechanisms; alteration of soil chemistry; thatch accumulation that inhibits seed germination and seedling recruitment; changes in natural fire frequency; disruptions to pollination or seed-dispersal mutualisms; changes in soil microorganisms; or other mechanisms. The magnitude of invasive species impacts in Mediterranean habitats, such as those in California, largely depends on characteristics of the invading species and the habitat being invaded (Fried et al. 2014). The invader's life form and ability to form very dense stands have an effect on the magnitude of impacts, with creeping plant species such as freeway iceplant having greater effect (Gaertner et al. 2009; Fried et al. 2014). Invasive species may also influence native species colonization rates, and may thus lead to declines in local diversity over longer timescales (Yurkonis and Meiners 2004). Studies have not been conducted on the impact of invasive species on coast yellow leptosiphon specifically; however, negative impacts of plant invasions on Mediterranean ecosystems have been well demonstrated (Gaertner et al. 2009; Fried et al. 2014).

The coast yellow leptosiphon population is threatened by encroachment of non-native invasive plants, especially invasive freeway iceplant that is a highly-rated noxious weed by the California Invasive Plant Council (Cal-IPC 2017). Freeway iceplant is a low-growing, creeping succulent perennial plant that roots at the nodes and often forms deep mats covering large areas. It originates from South Africa, but is one of the most widespread non-native plants in the Mediterranean coastal ecosystems throughout the world, and is considered a severe threat to the native plant communities it invades (Albert 1995; Santoro et al. 2011). In California, it occurs along the coast and on the Channel Islands, especially in areas with a warm winter climate (Cal-IPC 2017). It was originally introduced into California in the early 1900s to stabilize soil along railroad tracks, and the California Department of Transportation soon began using it widely to line highways. It has also been widely promoted as an ornamental plant for home gardens (Albert 1995, 2000). Because this plant spreads easily by seed and vegetative means, it has spread beyond landscape plantings and has invaded coastal habitats, including the coastal prairie where coast yellow leptosiphon grows. Freeway iceplant forms nearly impenetrable mats that dominate the landscape, and it competes directly with native plant species for light, nutrients, water, and space (D'Antonio and Haubensak 1998). The fleshy fruits often bear more than one thousand small seeds (Bartomeus and Vilà 2009) that are eaten and widely dispersed by several mammals such as rabbits (D'Antonio 1990) and rats (Bourgeois et al. 2005). It competes aggressively with native plant species, achieving high rates of space colonization, which suppresses growth and establishment of other plants (D'Antonio and Mahall 1991; Albert 1995; Suehs et al. 2004; Vilà et al. 2006). Furthermore, it also interacts indirectly with native vegetation by altering soil chemistry by lowering pH (Conser and Connor 2009). Although freeway iceplant was originally used to stabilize soil and control erosion, it can actually contribute to erosion and landslides. It has shallow roots that do not hold soil well, and it absorbs ample water during rain events, becoming so heavy that it can slump off of steep hillsides and cliffs, pulling soil down with it (Spitzer 2002). Freeway iceplant covers the bluffs in much of the habitat near the coast yellow leptosiphon population, and it is growing on the bluff immediately adjacent to the coast yellow leptosiphon population and is encroaching into the population (see Figure 5).



Photo 1: Freeway iceplant (*Carpobrotus edulis*) dominating Vallemar Bluff north of the coast yellow leptosiphon (*Leptosiphon croceus*) population

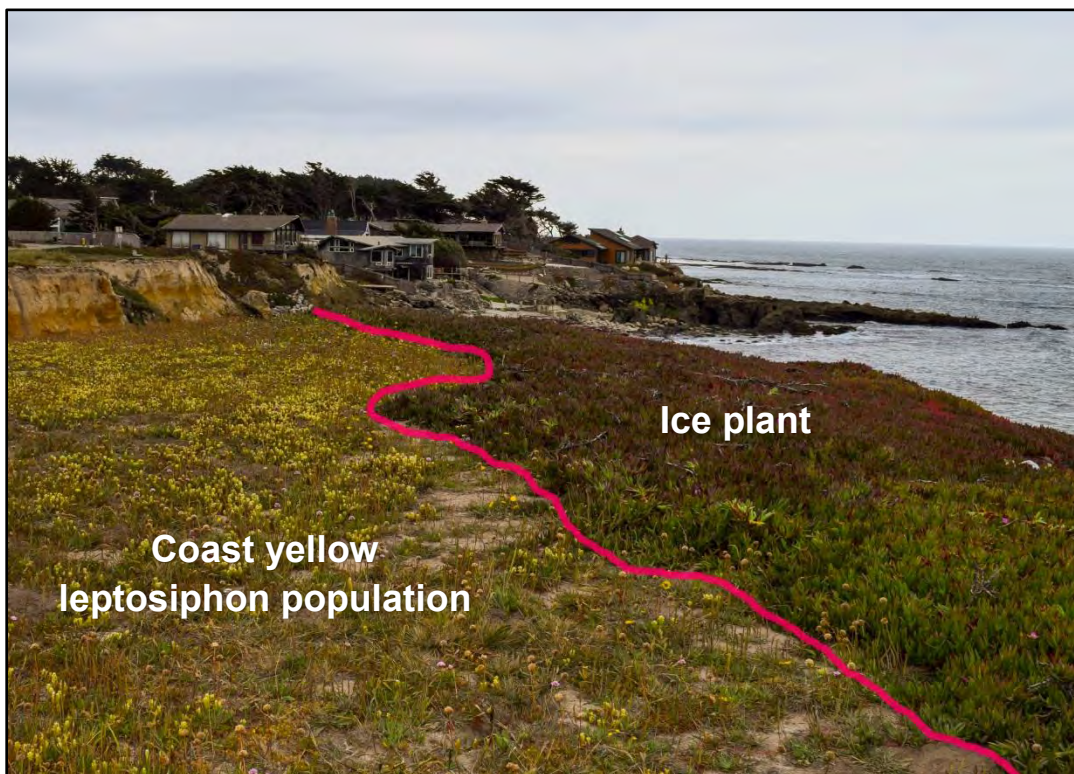


Photo 2: Freeway iceplant (*Carpobrotus edulis*) encroachment into coast yellow leptosiphon (*Leptosiphon croceus*) population

Figure 5. Freeway Iceplant Invasion

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Other non-native plant species, such as rough cat's ear, rye grass, hare barley, and cut-leaved plantain, are also present growing in and around the coast yellow leptosiphon population. These invasive species may threaten the coast yellow leptosiphon population through a variety of mechanisms, including competition for light, water, or nutrients; thatch accumulation that inhibits seed germination and seedling recruitment; disruptions to pollination or seed-dispersal mutualisms; or other mechanisms (D'Antonio and Haubensak 1998).

The coast yellow leptosiphon population will likely continue to experience ongoing and increasing inputs of invasive plant propagules from nearby populations and other sources. The area is frequently used by pedestrians, who can serve as vectors for invasive species into the area. Habitat disturbances resulting from the close proximity of the population to urban development also provides opportunities for invasive species populations to establish and expand. In addition, the proposed development on the adjacent property would likely increase the input of invasive plant species from the spread of landscape plants into the area, and will increase disturbance and habitat modification, providing favorable habitat for invasive species.

Bluff-Top Erosion and Rising Ocean Levels

The coast yellow leptosiphon population is located on Vallemar Bluff, approximately 8 meters (27 feet) from the edge of the bluff, and bluff-top erosion and rising ocean levels pose a serious threat to this species. Rainfall and wave splash or spray cause erosion of the bluff face. Additionally, slope instability results in landslides along the coastal bluff face, resulting in landward recession of the top edge of the coastal bluff. Coastal bluff landslides are caused by undermining the base of the bluff or from saturation of the bluff edge or bluff face (Haro, Kasunich & Associates, Inc. 2015).

A coastal bluff recession study was prepared by Haro, Kasunich & Associates, Inc., Consulting Geotechnical and Coastal Engineers (2015). Historical satellite photos and maps were reviewed and compared with the bluff edge position as surveyed in 2014. The results indicated that the coastal bluff had receded inland up to 14.6 meters (48 feet) between 1908 and 2014, which is a long term historical bluff recession rate of about 0.14 meter (0.45 foot) per year. Results of the study also indicated that about 3 to 5 meters (10 to 18 feet) of bluff recession occurred between 1986 and 2014, which is a long term historical bluff recession rate of about 0.11 to 0.20 meters (0.36 to 0.64 feet) per year.

Future bluff and coastal recession risk was estimated using the long-term historical average annual erosion rates as a minimum. Results suggested that a minimum of 6.9 meters (22.5 feet) of bluff recession will occur at Vallemar Bluff in the next 50 years (by the year 2065). Mean sea level along the California coast is expected to rise between 1.0 to 1.4 meters (3.3 to 4.6 feet) by the year 2100 due to climate change (Heberger et al. 2009), and the accelerating rate of sea level rise will likely result in increased future recession rates compared to average historical rates (Haro, Kasunich & Associates, Inc. 2015). Accelerated future sea level rise is expected to result in an estimated additional 1.7 meters (5.5 feet) of recession over the next 50 years, for a total of 8.6 meters (28 feet) of recession (Haro, Kasunich & Associates, Inc. 2015).

Projected future bluff edge recession was measured from where the bluff is considered stable as determined by Haro, Kasunich & Associates, Inc. (2015) (see Figure 6). They used the projected stable edge to project future recession and arrived at an estimated 50-year coastal recession setback line for development on Vallemar Bluff using the projected rates of recession described above. The 50-year setback is considered the minimum distance necessary to provide a stable building site of a 50-year lifetime of a proposed structure. The portion of the



Source: Haro, Kasunich, & Associates, Inc. (2015)

Figure 6. Coastal Bluff Recession at Vallemar Bluff

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bluff seaward of the 50-year setback line, which supports a large portion of the coast yellow leptosiphon population, is considered to be vulnerable to erosion over the next 50 years. It is likely that the coast yellow leptosiphon population, which is perched near the bluff edge, has been steadily reduced by cliff erosion. Based on the study conducted by Haro, Kasunich & Associates, Inc., the coast yellow leptosiphon population is located on a portion of the bluff that is highly susceptible to erosion over the next 50 years. If the bluff erodes to the 50-year setback line that accounts for rising sea level, approximately 80 percent of the coast yellow leptosiphon population will be destroyed (see Figure 6). Erosion of the bluff presents a significant threat to coast yellow leptosiphon and could lead to the extinction of the species.

Other Human-related Activities

The coast yellow leptosiphon population is threatened by other human-related activities, specifically trampling from foot traffic. People commonly walk on the bluff where the coast yellow leptosiphon population occurs, which may damage or kill coast yellow leptosiphon individuals through direct trampling of plants. In addition, there is nothing to prevent people from riding their bicycles on the bluff, which would further impact the coast yellow leptosiphon population. The property is easily accessible to the public, and a foot trail has been worn along the bluff that passes along the edge of the coast yellow leptosiphon population. A bench is present near the population overlooking the ocean, attracting visitors to cut through the coast yellow leptosiphon population to view the ocean. In addition to direct trampling of plants, human use of the site also increases disturbance and compaction of soil and facilitates the spread of invasive plant species. No barriers exist around the coast yellow leptosiphon population to protect plants from foot traffic and trampling. The proposed development will result in increased human activity in the area, thus increasing the threat to coast yellow leptosiphon from foot traffic and other human impacts.

Climate Change

Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia (IPCC 2014). Climate change presents a major challenge to the conservation of California's natural resources, and it will intensify existing threats and create new threats to natural systems.

Department staff conducted an assessment of the vulnerability of coast yellow leptosiphon to climate change using the NatureServe Climate Change Vulnerability Index Version 3.02 (NatureServe 2016). Based upon the Department's assessment, coast yellow leptosiphon likely has a climate change vulnerability index value of Highly Vulnerable (HV), indicating that available evidence suggests that abundance and/or range extent within the geographical area of the species is likely to decrease significantly by the year 2050. However, some ecological and life history information used for the climate change vulnerability assessment is not yet known for coast yellow leptosiphon. In particular, the Department does not know the mechanisms or species required for effective pollination of coast yellow leptosiphon, the mechanisms used by coast yellow leptosiphon for seed dispersal, or coast yellow leptosiphon's seed dispersal distance. Furthermore, the Department does not know whether or to what extent competing plant species such as freeway iceplant will be favored by projected future climates. Despite the lack of information about some of the ecological and life history information for coast yellow leptosiphon, the confidence in the vulnerability index score is very high based on the results of the Monte Carlo simulation used in the index (Young et al. 2015).

Vulnerability of Small Populations

Coast yellow leptosiphon has an exceptionally limited distribution, with only one population that occupies a very small area. The Department recognizes that species with small numbers of populations and small population sizes are highly vulnerable to extinction due to stochastic (chance) demographic, environmental, and genetic events (Shaffer 1981, 1987; Dirzo and Raven 2003; Groom et al. 2006; Primack 2006). Chance events such as a landslide at the bluff edge could result in the loss of all or a significant part of the coast yellow leptosiphon population.

Species with small numbers of populations or small populations may also be subject to increased genetic drift and inbreeding, which can affect population viability (Menges 1991; Ellstrand and Elam 1993).

Due to the vulnerability and rarity of coast yellow leptosiphon, the loss of any portion of the population would represent the loss of a significant portion of this species' genetic diversity and total range, and could result in its extinction.

Predation

The introduction of non-native slugs into the area from neighboring residential landscapes could pose a threat to the coast yellow leptosiphon population (A. Schusteff pers. comm. 2017). Non-native slugs are generalist herbivores that have been shown to negatively affect seedling survival of a wide range of plant species (Rathcke 1985; Buschmann et al. 2005; Strauss et al. 2009), and could potentially be grazing on coast yellow leptosiphon. Generalist herbivores such as slugs can reduce plant density and biomass, as well as alter species diversity within vegetation communities (Buschmann et al. 2005). The Department does not have any specific information on the impacts of non-native slugs to coast yellow leptosiphon, but it is possible that herbivory from slugs could negatively impact this species' survival.

Disease and Parasites

The Department does not have any information on diseases or parasites affecting coast yellow leptosiphon.

Overexploitation

The Department does not have any information on overexploitation affecting coast yellow leptosiphon.

REGULATORY AND LISTING STATUS

Federal

Coast yellow leptosiphon is not protected pursuant to the federal Endangered Species Act.

State

On December 23, 2016, the Commission published its Notice of Findings for coast yellow leptosiphon in the California Regulatory Notice Register, designating this species as a candidate

pursuant to CESA. The provisions of CESA apply to coast yellow leptosiphon while it is a candidate species (Fish & G. Code, § 2085). CESA prohibits the import, export, take, possession, purchase or sale of coast yellow leptosiphon, or any part or product of thereof, except in limited circumstances, such as through a permit or agreement issued by the Department under the authority of the Fish and Game Code. For example, the Department may issue permits that allow the incidental take of listed and candidate species if the take is minimized and fully mitigated, the activity will not jeopardize the continued existence of the species, and other conditions are met (Fish & G. Code, § 2081 subd. (b)). The Department may also authorize the take and possession of coast yellow leptosiphon for scientific, educational, or management purposes (Fish & G. Code, § 2081 subd. (a)).

Natural Heritage Program Ranking

All natural heritage programs, such as the CNDDDB, use the same ranking methodology originally developed by The Nature Conservancy and now maintained by NatureServe (NatureServe 2012). This ranking methodology consists of a global rank describing the rank for a given taxon over its entire distribution, and a state rank describing the rank for the taxon over its state distribution. Both global and state ranks reflect a combination of rarity, threat, and trend factors. Coast yellow leptosiphon has been assigned a global rank of G1 and a state rank of S1 (CNDDDB 2017), indicating that the species is critically imperiled both within California and throughout its entire range, with a very high risk of extinction due to extreme rarity (often five or fewer populations), very steep declines, or other factors.

California Rare Plant Rank

Some plants in California are assigned a California Rare Plant Rank (CRPR) to identify them as species of conservation concern. The Department works in collaboration with CNPS and botanical experts throughout the state to assign rare and endangered plants a CRPR reflective of their status. Coast yellow leptosiphon has been assigned a CRPR of 1B.1 (CNDDDB 2017).

Plants with a CRPR of 1B are rare throughout their range with the majority of them endemic to California. Most of the plants that are ranked 1B have declined significantly over the last century. The threat code extension of “.1” indicates that the species is seriously threatened in California, with over 80 percent of occurrences threatened or a high degree and immediacy of threat (CNDDDB 2017).

EXISTING MANAGEMENT EFFORTS

Resource Management Plans

The Department is not aware of any resource management plans prepared for coast yellow leptosiphon.

The coast yellow leptosiphon population is located within the Fitzgerald Marine Reserve, which is a San Mateo County Park, and is also adjacent to the Montara State Marine Reserve, which is a California Marine Protected Area that is located in California state waters below the mean high tide line. San Mateo County released a Master Plan for the Fitzgerald Marine Reserve in 2002, but the area where the coast yellow leptosiphon occurs on Vallemar Bluff was not surveyed, and coast yellow leptosiphon is not accounted for in the Master Plan (Brady/LSA 2002). San Mateo County Parks Department has been contacted about the omission and the

presence of coast yellow leptosiphon and the other rare plants located on the property. The County of San Mateo intends to revise the Master Plan to include management and protection of coast yellow leptosiphon and other rare plants located within the Fitzgerald Marine Reserve (Corelli 2016; R. Arechiga pers. comm. 2016, 2017).

Monitoring and Research

Petitioner and botanist, Toni Corelli, continues to visit and observe the coast yellow leptosiphon population at least once per year and observational information is being collected. The Department is not aware of any other ongoing coast yellow leptosiphon research or monitoring of the coast yellow leptosiphon population.

Habitat Restoration Projects

The Department has discussed the potential for seed collection, reintroduction, and habitat restoration for coast yellow leptosiphon with the County of San Mateo (R. Arechiga pers. comm. 2016, 2017). The County of San Mateo is interested in identifying nearby suitable habitat owned by the County of San Mateo to introduce coast yellow leptosiphon seed (Arechiga 2017). University of California Botanical Garden at Berkeley has approximately 870 seeds from 53 individual coast yellow leptosiphon plants in conservation storage (H. Forbes pers. comm. 2016, 2017). No efforts have been initiated for habitat restoration.

Impacts of Existing Management Efforts

Since its inception, the Fitzgerald Marine Reserve has been managed for multiple purposes, including education, research and scientific study, recreation, collection of seashore animals and plants, and fishing. However, the area where coast yellow leptosiphon occurs was not surveyed during preparation of the Master Plan, and currently no management is taking place on this portion of the Fitzgerald Marine Reserve (Brady/LSA 2002; Arechiga pers. comm. 2016, 2017).

SCIENTIFIC DETERMINATIONS REGARDING THE STATUS OF COAST YELLOW LEPTOSIPHON IN CALIFORNIA

CESA directs the Department to prepare this report regarding the status of coast yellow leptosiphon based upon the best scientific information available to the Department (Fish & G. Code, § 2074.6). CESA's implementing regulations identify key factors that are relevant to the Department's analyses. Specifically, a "species shall be listed as endangered or threatened ... if the Commission determines that its continued existence is in serious danger or is threatened by any one or any combination of the following factors: 1. present or threatened modification or destruction of its habitat; 2. overexploitation; 3. predation; 4. competition; 5. disease; or 6. other natural occurrences or human-related activities" (Cal. Code Regs., tit. 14, § 670.1, subd. (i)(1)(A)).

The definitions of endangered and threatened species in the Fish and Game Code provide key guidance to the Department's scientific analysis. An endangered species under CESA is one "which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, over exploitation, predation, competition, or disease" (Fish & G. Code, § 2062). A threatened species under CESA is one "that, although not presently threatened with extinction, is likely to become an

endangered species in the foreseeable future in the absence of special protection and management efforts required by [CESA]" (*Id.*, § 2067).

The preceding sections of this Status Review report describe the best scientific information available to the Department, with respect to the key factors identified in the regulations.

Present or Threatened Modification or Destruction of Habitat

Habitats along the San Mateo Coast have been impacted by a history of modification and destruction from development, agriculture, grazing, and other land use. Most of the coastal prairie habitat, which provides potential habitat for coast yellow leptosiphon, has been destroyed or modified due to urban development, agriculture, and invasion by non-native plant species. The proposed development on the property adjacent to the coast yellow leptosiphon population will result in habitat degradation and modification that will negatively impact the species and could result in a severe decline or extirpation of the population, thus leading to the extinction of the species. In addition, human use within and in the vicinity of the coast yellow leptosiphon population has resulted in habitat degradation that is evident on the ground and is visible from aerial imagery (see Figure 7). The proposed development will lead to an increase in human use of the area, resulting in additional impacts from trampling and habitat disturbance. In addition, burrowing mammals such as gophers are present at the coast yellow leptosiphon population and may be impacting coast yellow leptosiphon. The Department considers modification and destruction of habitat to be a significant threat to the continued existence of coast yellow leptosiphon.

Overexploitation

The Department does not consider overexploitation to be a significant threat to the continued existence of coast yellow leptosiphon.

Predation

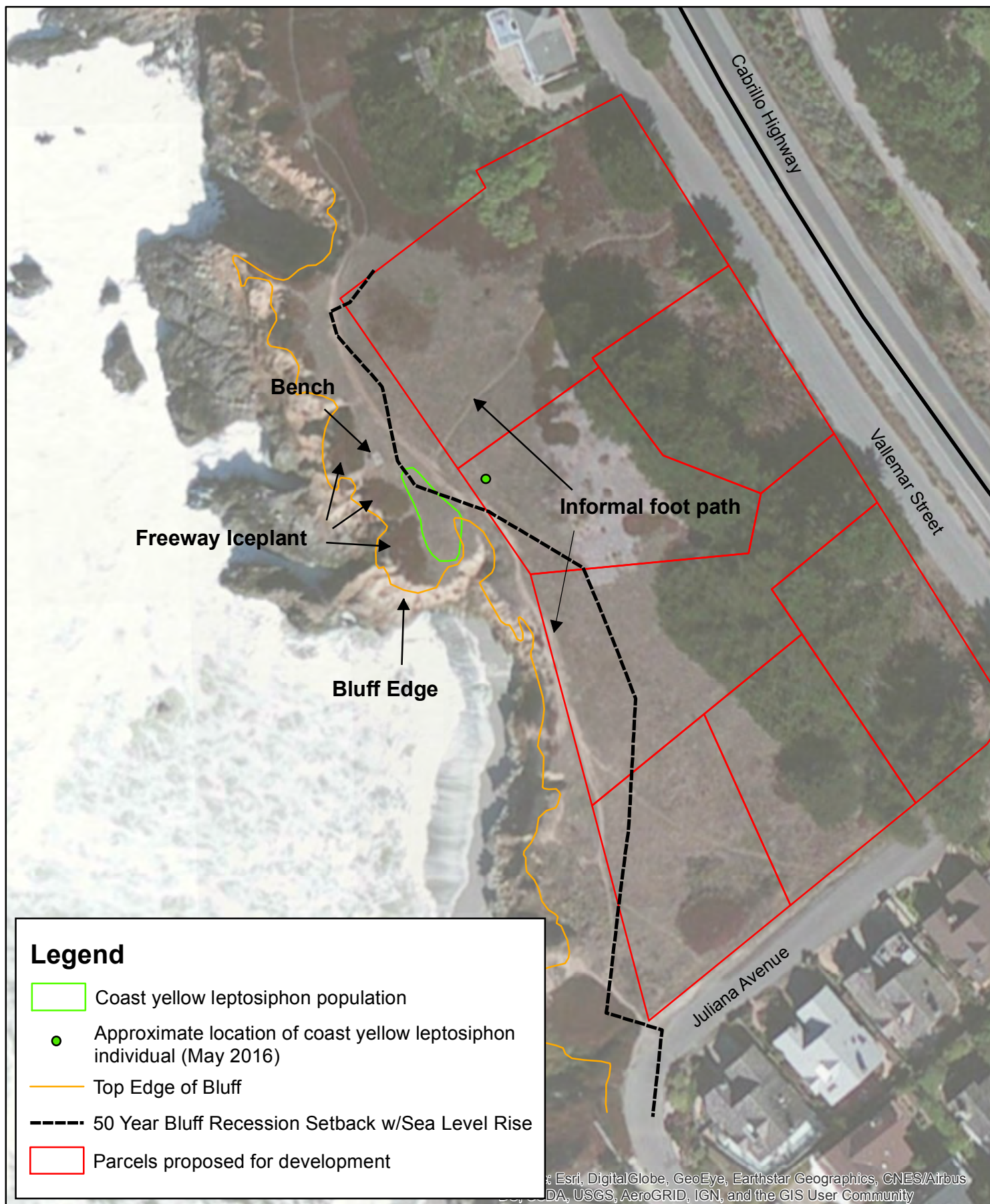
Herbivory from introduced non-native slugs could impact the survival of coast yellow leptosiphon, although limited information is available. The Department considers that predation could threaten the continued existence of coast yellow leptosiphon, but the degree of the threat is unknown.

Competition

Invasive plant species have been documented to pose serious threats to biodiversity around the world, and are a particularly pervasive problem in Mediterranean-type habitats like those in California. Invasive mat-forming freeway iceplant and other invasive plants, such as rough cat's ear and English plantain, occur within and in close proximity to the coast yellow leptosiphon population. The Department considers invasive plant species, particularly freeway iceplant, to be a significant threat to the continued existence of coast yellow leptosiphon.

Disease

There are no diseases known to be threats to the continued existence of coast yellow leptosiphon. The Department does not consider disease to be a significant threat to the continued existence of coast yellow leptosiphon.



Parcel Data Source: Digital Map Products 2017

0 15 30 60

Meters



Figure 7. Proximity of Threats to Coast Yellow Leptosiphon (*Leptosiphon croceus*)

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Other Natural Occurrences or Human-related Activities

The coast yellow leptosiphon population is located near the edge of Vallemar Bluff, and bluff-top erosion and rising ocean levels pose a serious threat to this species. The climate of California is certain to change due to warming of the global climate system, which could lead to an accelerated rate of bluff erosion. Coast yellow leptosiphon has an extremely narrow distribution consisting of one population that occupies an extremely small area. Coast yellow leptosiphon's rarity and extremely limited distribution, and its occurrence in only one area that is partially surrounded by development, makes the species very vulnerable to stochastic events such as erosion, landslides, and drought, and to all other threats. Therefore, the loss of all or a significant portion of the coast yellow leptosiphon population would represent the loss of all or a significant portion of coast yellow leptosiphon's total range, and could result in the extinction of the species. Impacts from pedestrian traffic and trampling also pose a threat to coast yellow leptosiphon, and the proposed development would likely increase human use of the area. The Department considers erosion, other natural occurrences, and human-related activities to be a significant threat to the continued existence of coast yellow leptosiphon.

SUMMARY OF KEY FINDINGS

Coast yellow leptosiphon is an extremely rare species known from only one small population. The population occurs in close proximity to urban land use, and has been either directly or indirectly impacted by modification or destruction of habitat. Based upon current land use practices that include the potential development of the adjacent property, the modification, destruction, and impacts to coast yellow leptosiphon habitat are likely to continue into the future. The coast yellow leptosiphon population is being impacted by invasive plant species and human activities, such as pedestrian use of the area. Bluff-top erosion is also a serious and imminent threat to this species, and climate change may accelerate that process. Bluff-top erosion alone could lead to near extinction of the species in 50 years based on current bluff-top recession predictions. Compounding the threats to the species is the inherent vulnerability of small populations to extirpation due to stochastic events. The entire distribution of coast yellow leptosiphon is limited to one site that occupies an area approximately 167 square meters (1,800 square feet) in size (CNDDDB 2017; Department staff observation), with population estimates over the years ranging between 400 and 1,000 individual plants; it is found nowhere else in the world. Due to the extremely limited distribution of coast yellow leptosiphon and its small population size, the loss of any portion of its population would be considered the loss of a significant portion of the species total range and would likely result in the extinction of this species.

The information available to the Department regarding the status of coast yellow leptosiphon indicates that there are significant threats to the continued existence of the species. Proximity of threats to the coast yellow leptosiphon population are illustrated in Figure 7.

RECOMMENDATION FOR PETITIONED ACTION

CESA directs the Department to prepare this report regarding the status of coast yellow leptosiphon in California based upon the best scientific information available to the Department (Fish & G. Code, § 2074.6). CESA also directs the Department to indicate in this Status Review whether the petitioned action is warranted (Fish & G. Code, § 2074.6; Cal. Code Regs., tit. 14, § 670.1, subd. (f)). The Department includes and makes its recommendation in this Status Review

as submitted to the Commission in an advisory capacity based on the best available science. Based on the criteria described above, the best scientific information available to the Department indicates that coast yellow leptosiphon is in serious danger of becoming extinct in all or a significant portion of its range due to one or more causes including loss of habitat, change in habitat, competition and other effects from invasive plant species, and other natural occurrences and human-related activities.

The Department recommends that the Commission find the petitioned action to list coast yellow leptosiphon as an endangered species to be warranted.

PROTECTION AFFORDED BY LISTING

It is the policy of the state to conserve, protect, restore and enhance any endangered or any threatened species and its habitat (Fish & G. Code, § 2052). If listed as an endangered or threatened species, unauthorized “take” of coast yellow leptosiphon will be prohibited, making the conservation, protection, and enhancement of the species and its habitat an issue of statewide concern. As noted earlier “take” is defined under CESA as hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill (*Id.*, § 86). Any person violating the take prohibition would be punishable under state law. The Fish and Game Code provides the Department with related authority to authorize “take” under certain circumstances (*Id.*, §§ 2081, 2081.1, 2086, 2087, 2089.6, 2089.10 and 2835). As authorized through an incidental take permit, however, impacts of the taking on coast yellow leptosiphon caused by the activity must be minimized and fully mitigated according to state standards.

Additional protection of coast yellow leptosiphon following listing would also occur during required public agency environmental review under the California Environmental Quality Act (CEQA), and its federal counter-part, the National Environmental Policy Act (NEPA). CEQA and NEPA both require affected public agencies to analyze and disclose project-related environmental effects, including potentially significant impacts on endangered, rare, and threatened special status species. Under CEQA’s “substantive mandate,” for example, state and local agencies in California must avoid or substantially lessen significant environmental effects to the extent feasible. With that mandate, and the Department’s regulatory jurisdiction generally, the Department expects related CEQA and NEPA review will likely result in increased information regarding the status of coast yellow leptosiphon in California as a result of, among other things, updated occurrence and abundance information for individual projects. Where significant impacts are identified under CEQA, the Department expects project-specific required avoidance, minimization and mitigation measures will also benefit the species. While both CEQA and NEPA would require analysis of potential impacts to coast yellow leptosiphon regardless of their listing status under CESA, the acts contain specific requirements for analyzing and mitigating impacts to listed species. In common practice, potential impacts to listed species are examined more closely in CEQA and NEPA documents than potential impacts to unlisted species. State listing, in this respect, and required consultation with the Department during state and local agency environmental review under CEQA, is also expected to benefit the species in terms of related impacts for individual projects that might otherwise occur absent listing.

If coast yellow leptosiphon is listed under CESA, it may increase the likelihood that state and federal land and resource management agencies will allocate funds towards protection and recovery actions. However, funding for species recovery and management is limited, and there is a growing list of threatened and endangered species.

MANAGEMENT RECOMMENDATIONS AND RECOVERY MEASURES

CESA directs the Department in its Status Review to recommend management activities and other recommendations for recovery of coast yellow leptosiphon (Fish & G. Code, § 2074.6; Cal. Code Regs., tit. 14, § 670.1, subd. (f)). The utility of current data on coast yellow leptosiphon is limited by being largely anecdotal and qualitative. Studies designed to provide quantitative data on the coast yellow leptosiphon population, and the factors that affect the potential for coast yellow leptosiphon to survive and reproduce, are necessary for species management. Department staff with suggestions from local agencies, non-profits, and interested parties generated the following list of recommended management actions:

- Collect and bulk seeds of coast yellow leptosiphon for long term conservation storage and potential introduction into suitable habitat;
- Identify and restore degraded potential coast yellow leptosiphon habitat near the existing population. Collect and distribute seed into nearby suitable habitat;
- Permanently protect the coast yellow leptosiphon population on County of San Mateo property and on the private parcel where one individual coast yellow leptosiphon individual was observed from modification and destruction via fee title acquisition, conservation easements or similar protective measures;
- Permanently protect the private parcels adjacent to the coast yellow leptosiphon population from modification and destruction via fee title acquisition, conservation easements or similar protective measures to provide a buffer adjacent to the coast yellow leptosiphon population;
- Remove and control the freeway iceplant invasion adjacent to the coast yellow leptosiphon population;
- Restrict public access in the vicinity of the coast yellow leptosiphon population through installation of protective fencing and/or signs, or other suitable means;
- Remove or relocate the bench adjacent to the coast yellow leptosiphon population, or provide other creative foot-traffic influencing features in the area to encourage people to avoid walking through the coast yellow leptosiphon population;
- Research the life history characteristics of coast yellow leptosiphon, including factors related to pollination, seed dispersal, seed longevity and soil seed bank, seed productivity, growth, propagation, and microhabitat requirements for germination and recruitment;
- Implement monitoring and adaptive management programs for the coast yellow leptosiphon population. Ensure that monitoring results trigger appropriate management responses such as implementing other measures to control invasive species or controlling recreational activities. Make the data and reports from monitoring and adaptive management programs available to resource agencies and to those who are directly involved in coast yellow leptosiphon management;
- Implement a program to detect coast yellow leptosiphon population trends using statistically-valid population estimates; and
- Survey for additional populations of coast yellow leptosiphon.

PUBLIC RESPONSE

Comments were invited in response to the Petition in letters mailed on June 6, 2017, to property owners where the coast yellow leptosiphon population occurs and adjacent property owners,

and in a Department Press Release dated August 9, 2017. The Department received three comments in response to the press release and letters, which are included in Appendix A.

PEER REVIEW

Independent botany experts were invited to review the Status Review report before submission to the Fish and Game Commission. A list of names and affiliations of invited peer reviewers, the letters of invitation, all comments received by the Department's deadline, and the Department's responses to comments are included in Appendix B.

ACKNOWLEDGEMENTS

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APPENDIX A: Comments from Affected and Interested Parties on the Petitioned Action

✓RAM 6/28/17

Moss Beach Associates, LLC

June 19, 2017

RECEIVED

JUN 29 2017

HABITAT CONSERVATION
PLANNING BRANCH

Richard Macedo
Branch Chief
Habitat Conservation Planning Branch
California Department of Fish and Wildlife
1416 Ninth Street, 12th Floor
Sacramento, CA 95814

RE: Coast Yellow Leptosiphon

Dear Mr. Macedo:

Thank you for your letter dated June 6, 2017 regarding the status review of coast yellow leptosiphon (*Leptosiphon croceus*). Moss Beach Associates, LLC received the listing notice dated December 8, 2016 and are aware of current candidate status and imminent listing of this rare species.

We have observed that coast yellow leptosiphon occurs on the Fitzgerald Marine Reserve located west (seaward) of our parcel (APN 037-086-250), as described in greater detail in the listing petition. Since 2013, prior to the listing, my associates and I have worked with a multidisciplinary team of experts including biologists, and have coordinated with representatives of local conservation agencies and organizations including the San Mateo County Parks Department, the local California Native Plant Society, and the Committee for Green Foothills, to craft a conservation strategy for the site. The strategy is designed to completely avoid impacts to coast yellow leptosiphon and protect coastal prairie habitat through a series of conservation measures.

First, the project will permanently protect (through a conservation easement) 0.91 acres on the western portion of the parcel, adjacent to the coast yellow leptosiphon occurrence and the Fitzgerald Marine Reserve. This new Preserve, which will feature high-quality coastal prairie habitat will be restored and then managed in perpetuity to promote biodiversity conservation goals for coastal prairie habitat. The specific management goals and strategies will be identified in an Adaptive Management and Monitoring Plan (AMMP), which our team has offered to develop in coordination with San Mateo County Parks Department, which manages the adjacent Fitzgerald Marine Reserve which supports the coast yellow leptosiphon, to address management of the larger coastal prairie community on the bluff. The AMMP is anticipated to include measures to protect coastal prairie habitat, including controlling exotic plants and managing public access to limit impacts on rare plants and coastal bluff erosion.

We intend to construct four homes on the property in the landward (eastern) portion of the parcel, which is largely dominated by exotic and ornamental plants. The development proposal includes the following additional measures to avoid impacts to coast yellow leptosiphon: development will be sited in largely unsuitable habitat; storm water and drainage will be managed to limit impacts to the coastal prairie, erosive bluff edge, and the near-shore marine environment; landscaping will be conducted with

Moss Beach Associates, LLC

plants native to coastal San Mateo County; and use restrictions will be recorded on the deeds to protect the preserve and adjacent reserve, including preventing invasive species installation and restricting the use of pesticides and fertilizers.

The potential effects of this development project on rare species, including coast yellow leptosiphon, will be thoroughly evaluated in the California Environmental Quality Act (CEQA) document for the project, which will document complete avoidance of impacts to coast yellow leptosiphon, and thereby also be consistent with the Sensitive Habitat Section of San Mateo County's LCP. As a result of the conservation strategy that has been developed for the site, we are confident that all potential effects to coast yellow leptosiphon will be avoided and that the portion of the site dedicated for the protection and long-term management of coastal prairie will increase the probability of the persistence of the rare plant species occurring in the Fitzgerald Marine Reserve, including coast yellow leptosiphon. As such, we expect that the CEQA evaluation will conclude that all effects will be avoided and that the effects of the project are less than significant.

Sincerely,



Owen Lawlor

Managing Member

Moss Beach Associates, LLC

Cc:

Ramona Arechiga, Natural Resources Manager San Mateo County Parks 455 County Center,
Redwood City, CA 94063

Jodi M. McGraw, Ph.D., Ecologist and Principal, Jodi McGraw Consulting, PO Box 221, Freedom,
CA 95019

Mike Zander, Zander Associates, 1569 Solano Avenue, #255 Berkeley, CA 94707

From: [REDACTED]
Sent: Thursday, August 10, 2017 9:54 AM
To: Wildlife Native Plants
Subject: Coast Yellow Leptosiphon
Attachments: FINAL-Winter2016.pdf; 2015-12-04-VB-Rare-Plant-Corelli.pdf; 20170810_081043.jpg; 20170810_081604.jpg; 20170810_081950.jpg; 20170810_082019.jpg

To whom it may concern:

My name is Marcia Yeates and I am a resident of Moss Beach CA. I live about 5 minutes walking distance from the site which I think is the California Coast Prairie which is the habitat of the Coast Yellow Leptosiphon . Developers are in the permitting process of building 4 large scale houses on the backside of this area. I have attached articles and photos. Please protect this rare beautiful area and it's rare, delicate flora.

Thank you, Marcia yeates



greenfootnotes

COMMITTEE FOR GREEN FOOTHILLS

Vallemar Bluffs: A Coastal Jewel

BY LENNIE ROBERTS LEGISLATIVE ADVOCATE



Vallemar Bluffs, a small but significant piece of the coast in Moss Beach that we are working to protect.

Perched above the rocky coastal bluffs in northern Moss Beach is the 2.4-acre Vallemar Bluffs. Neighbors and visitors alike enjoy the spectacular views of the cliffs, pocket beach, and intertidal reefs. An informal public trail begins at Juliana Avenue and follows the edge of the bluffs along a historic street called “The Strand,” a street that existed only on developers’ plans. Neighbors have built three benches overlooking the coast, adding to the trail’s charm.

Several attempts to develop this property over the past 25 years have been unsuccessful, primarily due to the lack of community water. Now, however, the Montara Water and Sanitary District has found a new, reliable water source, and the landowners are moving ahead with development plans for five homes.

While we and many others would love to see this coastal gem added to the adjacent Fitzgerald Marine Reserve in its entirety, we recognize that due to lack of sufficient funding available for acquisition, some development is likely to be permitted here.

FULLY PROTECTING COASTAL PRAIRIE HABITAT AND AVOIDING BLUFF EROSION IS KEY

Committee for Green Foothills has been pushing for maximum protection of the site’s rare coastal prairie grassland and wildflower habitat and establishment of adequate setbacks from future cliff and bluff erosion. Ensuring these two protections would preserve most of the scenic views along the shore and the existing public access. The new plans already include a proposal to conserve permanently some of the western area of the property. However, development of “Lot D” remains a significant problem.

Continued on Page 4

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Sierra Club honors Lennie Roberts	p. 8
2017 Events	p. 9
Wins for local open space and parks ballot measures	p. 10



THE COAST YELLOW LEPTOSIPHON

The coast yellow leptosiphon is a rare plant which is found nowhere else in the world.

This beautiful species was collected May 9, 1901 by Alice Eastwood. From her notes: *"it covered the ground for several acres, but was seen in no other place...It is perhaps the most strikingly beautiful species of the group...The great masses almost monopolized the ground."*

Half Moon Bay Botanist Toni Corelli has petitioned the State for listing of this rare species.



Continued from Page 1

The western area of the property is comprised of increasingly rare coastal prairie habitat, which supports four rare and endangered plants, one of which is found nowhere else in the world. The coast yellow leptosiphon, a plant first described by Alice Eastwood in the early 1900s, is now only found clinging to the edge of the Vallemar Bluffs. We are asking that the entire coastal prairie be protected, with adequate buffers to allow the habitat to migrate inland as the bluffs erode.

A dynamic interface between ocean and land operates in this area. The cliffs and bluffs are eroding, and the future erosion of the coastal terrace marine deposits is a major constraint to building in the western portion of this property. The County's Local Coastal Program and the Coastal Act require that new development must be set back far enough to avoid projected bluff erosion. We believe that building a house on "Lot D" fails this requirement.

We have engaged two experts in coastal erosion processes to provide an independent evaluation of the projected bluff erosion, taking into consideration sea level rise and other factors that the developer's consultants appear to have underestimated.

SOME MORE LEGAL AND PRACTICAL CONCERNS

An "antiquated subdivision map" filed with the county in the early 1900s created 42 tiny lots on Vallemar Bluffs, without regard to topography, habitats, public services, access, or any other modern planning constraints. In 1990 the county consolidated these 42 lots into seven through a "Lot Merger and Lot Line Adjustment," without any public notice and review. Whether this process was legal is debatable. Coastal Commission staff has written to the county planning office questioning why a Coastal Development



Committee for Green Foothills' Legislative Advocate Lennie Roberts and Surfrider's Rob Caughlan on a section of Moss Beach coast we're trying to protect.

Permit was not required. We have raised similar questions.

Another concern is whether the proposed long term management and monitoring of the coastal prairie habitat will be successful over time. Even the best-written plans depend upon adequate funding, and enforcement inevitably requires vigilance and oversight of overworked environmentalists.

While we are pleased that the revisions to the project are a step in the right direction, we continue to oppose development on "Lot D", as it is perilously close to the bluffs and is covered with significant area of coastal prairie habitat. Further, any development on this lot would completely block coastal views from much of Juliana Avenue.

NEXT STEPS

We are urging the county to require a focused Environmental Impact Report that includes a revised plan that fully addresses our concerns, as well as those of many members of the public. Winning protection of this coastal jewel's sensitive habitats and scenic beauty will be a high priority for us in the upcoming year. 🌿

For nearly 40 years, Lennie Roberts has been our voice in San Mateo County. One of the Bay Area's most respected environmental leaders, Lennie has led countless critical open space battles on the San Mateo county coast and along Skyline Boulevard.



December 4, 2015

To: Dave Holbrook, Senior Planner, County of San Mateo
San Mateo County Planning and Building
455 County Center, 2nd Floor
Redwood City, CA 94063

Proposed development of Juliana & Vallemar, Moss Beach also known as Vallemar Bluff (PLN2015-00380).

Dear Dave,

As the Rare Plant Chairperson in San Mateo County, for the Santa Clara Valley Chapter of the California Native Plant Society (CNPS) we are concerned about the proposed development of Juliana & Vallemar, Moss Beach, also referred to as Vallemar Bluff (Planning Case File No. PLN2015-00380, <http://planning.smcgov.org/six-residences-juliana-vallemar-moss-beach>). This proposal would greatly disturb and eliminate much of the coastal prairie grassland and rare plant habitat on the bluff top. A map showing rare plants and habitat is attached. A small section of the bluff, the western edge is San Mateo County Property, a part of Fitzgerald Marine Reserve. (APN-037-087-050)

This year the California Native Plant Society documented the rare plants that occur on the Vallemar bluff top and we discovered a new population of *Agrostis blasdalei* (BLASDALE'S BENT GRASS). This species is very rare in San Mateo County with only one other population documented near Franklin Point. We also documented *Castilleja ambigua* ssp. *ambigua* (JOHNNY-NIP), *Hosackia gracilis* (HARLEQUIN LOTUS), and *Leptosiphon croceus* (COAST YELLOW LEPTOSIPHON) occurrence #2.

Leptosiphon croceus (COAST YELLOW LEPTOSIPHON) is a very rare plant. There are two other historical occurrences #1 and #3 documented along the San Mateo Coast. Other botanists and I have looked for these occurrences for a number of years and have not found them. These two occurrences are now presumed extinct and a report was sent to CNDDB documenting this. The Vallemar Bluff, occurrence #2 occupies a very small area between the cliff edge and a local trail on San Mateo County property, this is the last known remaining extant population in the world.

The proposed development of Vallemar Bluff in Moss Beach would destroy much of the rare coastal prairie grassland and rare plant habitat on the bluff top (see the attached VallemarBluff-parcels map and proposed development plan map). There would be very little habitat left for the *Leptosiphon croceus* (COAST YELLOW LEPTOSIPHON) and *Agrostis blasdalei* (BLASDALE'S BENT GRASS) to spread as the bluff tops erode. If this plan is approved most of the coastal prairie and rare plant habitat will be lost. It is important that the County of San Mateo have a management plan for the preservation of the rare plants and habitat that occur on the County property.

It is hoped that these biological factors be considered before development of the Vallemar Bluff. Attached are the field survey forms submitted for the 4 rare plants occurring on the Vallemar Bluff.

Sincerely,

Toni Corelli, Botanist
San Mateo County Rare Plant Chairperson
Santa Clara Valley Chapter CNPS
250 Granelli Avenue
Half Moon Bay, California 94019
corelli@coastside.net



Burton, Cherilyn@Wildlife

From: [REDACTED]
Sent: Sunday, August 27, 2017 7:00 PM
To: Wildlife Native Plants
Subject: d: Moss Beach

-----Original Message-----

[REDACTED]
To: nativeplants <nativeplants@wildlife.ca.gov>
Sent: Sun, Aug 27, 2017 6:58 pm
Subject: Moss Beach

The coast yellow leptosiphon is as worthy of most to be placed under protection. There is too much development now and anything to help stop the degradations to wild nature of all sorts is to be desired.

Beauty for some reason is always a threat to some who look at land as something to scrape down and lay bare.

My vote is yes and thank you for caring.

Katie murdock
[REDACTED]

APPENDIX B: External Peer Review Invitation Letters and Comments from Peer Reviewers on the Coast Yellow Leptosiphon Status Review Report

Names and Affiliations of Invited Peer Reviewers

Name	Affiliation
Robyn Battaglia*	Current affiliation unknown
Neal Kramer	Kramer Botanical
Robert Patterson, Ph.D.	Department of Biology, San Francisco State University
Aaron Schusteff, Ph.D.	Mathematics Department, City College of San Francisco

*No comments received by Department deadline.

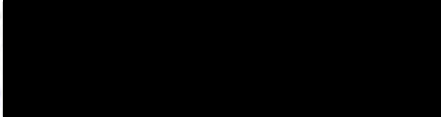


State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Habitat Conservation Planning Branch
1416 Ninth Street, 12th Floor
Sacramento, CA 95814
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



October 2, 2017

Ms. Robyn Battaglia


Dear Ms. Battaglia:

Coast Yellow Leptosiphon (*Leptosiphon croceus*); California Department of Fish and Wildlife, Peer Review Status Report

Thank you for agreeing to serve as a scientific peer reviewer for the California Department of Fish and Wildlife (Department) Status Review of coast yellow leptosiphon (*Leptosiphon croceus*). Please review the copy of the Department's peer review draft report dated October 2, 2017, that is included with this letter. The Department seeks your expert analysis and input regarding the scientific validity of the report and its assessment of the status of coast yellow leptosiphon in California based on the best scientific information currently available. The Department respectfully requests that you focus your peer review effort on the body of relevant scientific information and the Department's related assessment of the population and life history elements prescribed in the California Endangered Species Act (CESA). **The Department would appreciate receiving your peer review input on or before October 31, 2017.**

The Department seeks your scientific peer review as part of formal proceedings pending before the California Fish and Game Commission (Commission) under CESA. As you may know, the Commission is a constitutionally established entity distinct from the Department, exercising exclusive statutory authority under CESA to list species as endangered or threatened (Fish & G. Code, § 2070). The Department serves in an advisory capacity during CESA listing proceedings, charged by the Fish and Game Code to focus on the best scientific information available to make related recommendations to the Commission (Fish & G. Code, § 2074.6).

The Commission received the petition to list coast yellow leptosiphon under CESA on May 25, 2016. On December 23, 2016, the Commission published findings formally designating coast yellow leptosiphon as a candidate for listing as threatened or endangered under CESA. Coast yellow leptosiphon is currently protected under CESA in California in that capacity.

The peer review draft report forwarded to you today reflects the Department's effort to identify and analyze the best scientific information available regarding the status of coast yellow leptosiphon in California. At this time, the Department believes that the

Ms. Robyn Battaglia

October 2, 2017

Page 2

best available science indicates that listing the species as endangered under CESA is warranted. We underscore, however, that scientific peer review plays a critical role in the Department's effort to develop and finalize its recommendation to the Commission as required by the Fish and Game Code. Our expected recommendation to the Commission at this point may change following your input.

We ask you to focus your peer review on the best scientific information available regarding the status of coast yellow leptosiphon in California. As with our own effort to date, your peer review of the science and analysis regarding each of the population and life history categories prescribed in CESA are particularly important (Cal. Code Regs., tit. 14, § 670.1(i)(1)(A)) (i.e., present or threatened habitat modification, overexploitation, predation, competition, disease, and other natural occurrences or human-related activities that could affect the species) as well as whether it indicates, in your opinion, that coast yellow leptosiphon is at serious risk of becoming extinct throughout all or a significant portion of its range in California, or whether the species is likely to become so in California in the foreseeable future. Please note that the Department releases this peer review report to you solely as part of the peer review process, and it is not yet public.

A Microsoft Word version and a PDF version of the report are included with this letter; however, only the PDF version includes figures and appendices. For ease of review, you may submit your comments in "track changes" format, or in list form by page and line number. Please submit your comments electronically to Ms. Cherilyn Burton, Senior Environmental Scientist (Specialist) at cherilyn.burton@wildlife.ca.gov. Ms. Burton may also be reached at (916) 651-6508. If there is anything the Department can do to facilitate your review, please let us know.

Following receipt and consideration of peer review comments, the Department will prepare and submit its final report and related recommendation to the Commission. After at least a 30 day public review period, the Commission will consider the petition to list coast yellow leptosiphon, the Department's report and related recommendations including peer review, and public testimony during a regularly scheduled Commission meeting prior to making their decision.

Thank you again for your contribution to the status review effort and the important input it provides during the Commission's related proceedings.

Sincerely,



Richard Macedo, Branch Chief
Habitat Conservation Planning Branch

Enclosures

ec: California Department of Fish and Wildlife

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EDMUND G. BROWN JR., Governor
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October 2, 2017

Mr. Neal Kramer
Botanist/Ecologist
Kramer Botanical
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El Granada, California 94018
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Dear Mr. Kramer:

Coast Yellow Leptosiphon (*Leptosiphon croceus*); California Department of Fish and Wildlife, Peer Review Status Report

Thank you for agreeing to serve as a scientific peer reviewer for the California Department of Fish and Wildlife (Department) Status Review of coast yellow leptosiphon (*Leptosiphon croceus*). Please review the copy of the Department's peer review draft report dated October 2, 2017, that is included with this letter. The Department seeks your expert analysis and input regarding the scientific validity of the report and its assessment of the status of coast yellow leptosiphon in California based on the best scientific information currently available. The Department respectfully requests that you focus your peer review effort on the body of relevant scientific information and the Department's related assessment of the population and life history elements prescribed in the California Endangered Species Act (CESA). **The Department would appreciate receiving your peer review input on or before October 31, 2017.**

The Department seeks your scientific peer review as part of formal proceedings pending before the California Fish and Game Commission (Commission) under CESA. As you may know, the Commission is a constitutionally established entity distinct from the Department, exercising exclusive statutory authority under CESA to list species as endangered or threatened (Fish & G. Code, § 2070). The Department serves in an advisory capacity during CESA listing proceedings, charged by the Fish and Game Code to focus on the best scientific information available to make related recommendations to the Commission (Fish & G. Code, § 2074.6).

The Commission received the petition to list coast yellow leptosiphon under CESA on May 25, 2016. On December 23, 2016, the Commission published findings formally designating coast yellow leptosiphon as a candidate for listing as threatened or endangered under CESA. Coast yellow leptosiphon is currently protected under CESA in California in that capacity.

The peer review draft report forwarded to you today reflects the Department's effort to identify and analyze the best scientific information available regarding the status of

Conserving California's Wildlife Since 1870

coast yellow leptosiphon in California. At this time, the Department believes that the best available science indicates that listing the species as endangered under CESA is warranted. We underscore, however, that scientific peer review plays a critical role in the Department's effort to develop and finalize its recommendation to the Commission as required by the Fish and Game Code. Our expected recommendation to the Commission at this point may change following your input.

We ask you to focus your peer review on the best scientific information available regarding the status of coast yellow leptosiphon in California. As with our own effort to date, your peer review of the science and analysis regarding each of the population and life history categories prescribed in CESA are particularly important (Cal. Code Regs., tit. 14, § 670.1(i)(1)(A)) (i.e., present or threatened habitat modification, overexploitation, predation, competition, disease, and other natural occurrences or human-related activities that could affect the species) as well as whether it indicates, in your opinion, that coast yellow leptosiphon is at serious risk of becoming extinct throughout all or a significant portion of its range in California, or whether the species is likely to become so in California in the foreseeable future. Please note that the Department releases this peer review report to you solely as part of the peer review process, and it is not yet public.

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Thank you again for your contribution to the status review effort and the important input it provides during the Commission's related proceedings.

Sincerely,



Richard Macedo, Branch Chief
Habitat Conservation Planning Branch

Mr. Neal Kramer
Kramer Botanical
October 2, 2017
Page 3

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**State of California
Natural Resources Agency
Department of Fish and Wildlife**

REPORT TO THE FISH AND GAME COMMISSION

STATUS REVIEW OF COAST YELLOW LEPTOSIPHON (*Leptosiphon croceus*)

December 2017



Coast yellow leptosiphon (*Leptosiphon croceus*), CDFW photo by Cherilyn Burton

**Charlton H. Bonham, Director
Department of Fish and Wildlife**



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APPENDIX A. Comments from Affected and Interested Parties on the Petitioned Action

APPENDIX B. External Peer Review Invitation Letters and Comments from Peer Reviewers on the Coast Yellow Leptosiphon Status Review Report

LIST OF ABBREVIATIONS, ACRONYMS AND TERMS

CEQA – California Environmental Quality Act

CESA – California Endangered Species Act

CNDDDB – California Natural Diversity Database

CNPS – California Native Plant Society

Commission – California Fish and Game Commission

CRPR – California Rare Plant Rank

Department – California Department of Fish and Wildlife

Occurrence – CNDDDB Element Occurrence

Evaluation – Initial Evaluation of the Petition to List Coast Yellow Leptosiphon (*Leptosiphon croceus*) as an Endangered Species under the California Endangered Species Act

Id. – “the same”

NEPA – National Environmental Policy Act

Petition - Petition to the State of California Fish and Game Commission from Ms. Toni Corelli Cosponsored by the California Native Plant Society to List Coast Yellow Leptosiphon (*Leptosiphon croceus*) as an Endangered Species Pursuant to the California Endangered Species Act

ssp. – Subspecies

var. – Variety

EXECUTIVE SUMMARY

This Status Review of Coast Yellow Leptosiphon (*Leptosiphon croceus* (Eastw.) Strother & Kersh) (Status Review) has been prepared by the California Department of Fish and Wildlife (Department) for the California Fish and Game Commission (Commission) pursuant to the requirements of the California Endangered Species Act (CESA). This Status Review has been independently reviewed by scientific peers, and is based upon the best scientific information available to the Department.

Coast yellow leptosiphon is a low-growing annual plant in the Phlox family (Polemoniaceae) that was first described in 1904. It is known from only one small population that occupies approximately 167 square meters (1,800 square feet), located on Vallemar Bluff in Moss Beach, San Mateo County. This population is located in coastal prairie habitat atop a sea bluff at the edge of the coastline.

The population of coast yellow leptosiphon occurs in close proximity to urban land use, and has been either directly or indirectly impacted by modification or destruction of habitat. Coast yellow leptosiphon is threatened, both directly and indirectly, by development and other land-use changes; impacts from invasive plant species; and impacts from human activities such as trampling. Bluff-top erosion is also a serious threat to this species, and climate change may accelerate this process. In addition, coast yellow leptosiphon is highly vulnerable to extinction due to its extremely limited distribution and restriction to only one small population. Because of the rarity of coast yellow leptosiphon, the loss of any occupied habitat or any portion of the population would represent the loss of a significant portion of its total range, and could result in extinction of the species.

Scientific information available to the Department indicates that coast yellow leptosiphon is in serious danger of becoming extinct in all or a significant portion of its range due to one or more causes, including loss of habitat, change in habitat, competition and other effects from invasive plant species, and other natural occurrences and human-related activities. The Department recommends that the Commission find that the petitioned action to list coast yellow leptosiphon as an endangered species is warranted, and further recommends implementation of the management recommendations and recovery measures described in this Status Review.

1 INTRODUCTION

2 This Status Review addresses coast yellow leptosiphon (*Leptosiphon croceus* (Eastw.) Strother
3 & Kersh).

4 Petition History

5 On May 25, 2016, the Commission received a petition (Petition) from Ms. Toni Corelli,
6 cosponsored by the California Native Plant Society (CNPS), to list coast yellow leptosiphon as
7 an endangered species pursuant to CESA (Fish & G. Code, § 2050 *et seq.*).
8

9 On May 27, 2016, the Commission referred the Petition to the Department for evaluation.
10

11 On June 10, 2016, as required by Fish and Game Code section 2073.3, the Commission
12 published notice of receipt of the Petition in the California Regulatory Notice Register. (Cal. Reg.
13 Notice Register 2016, No. 24-Z, p.1002, [https://www.oal.ca.gov/wp-](https://www.oal.ca.gov/wp-content/uploads/sites/28/2017/05/24z-2016.pdf)
14 [content/uploads/sites/28/2017/05/24z-2016.pdf](https://www.oal.ca.gov/wp-content/uploads/sites/28/2017/05/24z-2016.pdf)). The Department on July 25, 2106, pursuant to
15 Fish and Game Code Section 2073.5 requested a 30-day extension of time to complete its
16 evaluation report.
17

18 On September 26, 2016, the Department provided the Commission with a report, "Evaluation of
19 the Petition from Ms. Toni Corelli and the California Native Plant Society to List Coast Yellow
20 Leptosiphon (*Leptosiphon croceus*) as an Endangered Species under the California
21 Endangered Species Act" (Evaluation). Based upon the information contained in the Petition,
22 the Department concluded, pursuant to Fish and Game Code, section 2073.5, subdivision (a),
23 that sufficient information exists to indicate that the petitioned action may be warranted, and
24 recommended to the Commission that the Petition should be accepted and considered.
25

26 On December 8, 2016, at its scheduled public meeting in San Diego, California, the
27 Commission considered the Petition, the Department's Evaluation and recommendation, and
28 comments received. The Commission found that sufficient information existed to indicate the
29 petitioned action may be warranted and accepted the Petition for consideration.
30

31 Subsequently, on December 23, 2016, the Commission published its Notice of Findings for
32 coast yellow leptosiphon in the California Regulatory Notice Register, designating coast yellow
33 leptosiphon as a candidate species. (Cal. Reg. Notice Register 2016, No. 52-Z, p. 2197,
34 <https://www.oal.ca.gov/wp-content/uploads/sites/28/2017/05/52z-2016.pdf>).

35 Department Review

36 Following the Commission's action to designate coast yellow leptosiphon as a candidate
37 species, the Department notified affected and interested parties and solicited data and
38 comments on the petitioned action pursuant to Fish and Game Code section 2074.4 (see also
39 Cal. Code Regs., tit. 14, § 670.1, subd. (f)(2)). All comments received are included in Appendix
40 A to this report. The Department promptly commenced its review of the status of the species as
41 required by Fish and Game Code section 2074.6, which has now concluded with this Status
42 Review document.
43

44 The Department sought independent and competent peer review on its draft Status Review
45 report by persons of the scientific and academic community commonly acknowledged to be

experts on coast yellow leptosiphon and possessing the knowledge and expertise to critique the scientific validity of the draft Status Review. Appendix B contains a listing of the individuals and agencies given an opportunity to review the draft Status Report, the specific input provided to the Department by the individual peer reviewers, the Department's written response to the input, and any amendments made to the draft Status Review report (Fish & G. Code, § 2074.6; Cal. Code Regs., tit. 14, § 670.1, subd. (f)(2)). [This will be included in the final report]

BIOLOGY

Species Description

The information below is paraphrased from the original species description of coast yellow leptosiphon (Eastwood 1904) and from the Jepson eFlora (Patterson and Battaglia 2017).

Coast yellow leptosiphon is an herbaceous plant that grows to a height of 2 to 7 centimeters (0.8 to 2.8 inches). Its slender stem is much-branched from the base and is covered with white appressed hairs, meaning the hairs are pressed closely against the stem. It has opposite leaves that are generally divided into six lobes and are palmately compound, which means that all the sections or lobes of the leaf, called leaflets, are connected at a common point, resembling a fan. The leaflets are approximately 4 to 7 millimeters (0.16 to 0.28 inches) long on the lower stem and almost twice as long near the flowers, appearing as whorls at the nodes. The leaflets are narrowly oval with the narrower end at the base. The flowers are arranged in heads that are subtended by palmately-divided leaf-like structures called bracts, with five linear divisions that are approximately 7 millimeters (0.28 inch) long and up to 1 millimeter (0.04 inch) wide. The flowers have bright yellow petals that are approximately 6 to 8 millimeters (0.24 to 0.31 inch) wide and generally have two faint red dots at the base. The petals, which collectively are referred to as the corolla, are fused at the base, forming a long funnel-shaped tube that is 26 to 39 millimeters (1.0 to 1.5 inches) long and covered with fine, scattered, spreading hairs. The calyx lobes, otherwise known as sepals, are generally deltate or triangular-shaped, less than 1 millimeter (0.04 inch) wide at the middle, densely glandular-hairy, and have an obscure thin membrane between the lobes. Flowers are bisexual, which means they contain both male and female flower parts in the same flower. The fruit is called a capsule, which is a dry fruit from a compound pistil (female flower part) that opens at maturity to release its seeds. Few seeds are produced by each flower. Coast yellow leptosiphon has a chromosome number of $2n=18$.

Taxonomy

Coast yellow leptosiphon is in the Phlox family (Polemoniaceae), which has a long history of taxonomic confusion (Bell and Patterson 2000; Hankamp et al. 2016). *Leptosiphon* was originally recognized as a genus in 1833 (Bell and Patterson 2000; Porter and Johnson 2000). Greene (1889-1892) combined several genera, including *Leptosiphon*, into a single genus, *Linanthus*, based predominantly on the presence of opposite, palmately-lobed leaves (Battaglia and Patterson 2001). Porter and Johnson (2000) reclassified the taxa within Polemoniaceae and divided *Linanthus* into two distinct genera, *Leptosiphon* and *Linanthus*.

Alice Eastwood, botanist and curator of the California Academy of Sciences Herbarium from 1894 until 1949, formally described coast yellow leptosiphon as a species in 1904 (Eastwood 1904; Porter and Johnson 2000). A single specimen collected by Eastwood on May 9, 1901, has been designated as the type specimen for coast yellow leptosiphon (Strother and Kersh 2016), and is maintained at the California Academy of Sciences Herbarium. Eastwood originally

1 labeled the specimen as *Gilia androsacea* var. *crocea* (Corelli 2016; Strother and Kersh 2016),
2 but assigned it the species name *Linanthus croceus* Eastw. when she first formally described
3 the species in 1904. Coast yellow leptosiphon has been reclassified several times. Other names
4 assigned to the species include *Linanthus parviflorus* var. *croceus* (Milliken 1904), *Linanthus*
5 *androsaceus* var. *croceus* (Jepson 1925), and *Linanthus androsaceus* ssp. *croceus* (Munz
6 1959). In the 1993 Jepson manual, coast yellow leptosiphon and several other closely-related
7 species were grouped together into a single species called variable linanthus (*Linanthus*
8 *parviflorus*) (Hickman 1993), until Porter and Johnson revised the entire family based on
9 morphological and molecular data. In Porter and Johnson's publication, *Linanthus parviflorus*
10 was reclassified as *Leptosiphon parviflorus*, and coast yellow leptosiphon was recognized as a
11 distinct species, *Leptosiphon croceus* (Eastw.) (Porter and Johnson 2000). Due to an incorrect
12 citation in Porter and Johnson's publication (2000), *Leptosiphon croceus* was not considered to
13 be a validly published species name until Strother and Kersh (2016) corrected the citation error
14 and validly published the current taxonomic name, *Leptosiphon croceus* (Eastw.) Strother &
15 Kersh (Strother and Kersh 2016; Patterson and Battaglia 2017).

16
17 There are 31 species and 9 subspecies of *Leptosiphon*. Geographically, five of these species
18 occur in the same geographic area of central California as coast yellow leptosiphon: bristly
19 leptosiphon (*L. acicularis*), false babystars (*L. androsaceus*), true babystars (*L. bicolor*), variable
20 linanthus, and rose leptosiphon (*L. rosaceus*). Taxonomically, coast yellow leptosiphon is most
21 closely related to variable linanthus and broad-lobed leptosiphon (*L. latisectus*) (Hankamp et al.
22 2016).

23 Range and Distribution

24 Range is the general geographical area where an organism occurs. For purposes of CESA and
25 this Status Review, the range is the species' California range (*Cal. Forestry Assn. v. Cal. Fish*
26 *and Game Com.* (2007) 156 Cal.App.4th 1535, 1551). Distribution refers to actual sites where
27 individuals and populations of the species occur within the species' range.

28
29 The genus *Leptosiphon* occurs primarily in western North America, with one species occurring
30 only in Chile. California is the center of diversity for *Leptosiphon* (Hankamp et al. 2016), where
31 90 percent of the species occur across diverse habitats in the California Floristic Province and
32 adjacent areas (Bell and Patterson 2000).

33
34 Coast yellow leptosiphon occurs only in California. Coast yellow leptosiphon was first collected
35 at "Blenheim" by Alice Eastwood, which was a short-lived place name mapped about 3-5
36 kilometers (2-3 miles) north of Pillar Point and apparently referred to a place at or near present-
37 day Moss Beach (Strother and Kersh 2016; CNDDDB 2017). There is limited history of collection
38 of plants in the vicinity of Moss Beach, with most collections dating from the early 1900's to the
39 1940's. A search conducted by the petitioner for coast yellow leptosiphon in the Consortium of
40 California Herbaria database and California herbaria throughout California found 40 collection
41 sheets that were labeled *Leptosiphon croceus* or a synonym of *Leptosiphon croceus*. These
42 specimens were reviewed in 2016 to verify their identification (Corelli 2016). Many plant
43 specimens that were originally identified as coast yellow leptosiphon had been misidentified and
44 actually represent other *Leptosiphon* species. Review of these specimens indicates that only the
45 historic specimens that were collected from Moss Beach represent coast yellow leptosiphon,
46 and that coast yellow leptosiphon is restricted to one colony in Moss Beach, San Mateo County.

47
48 The coast of San Mateo County has been frequently visited by botanists and scientific plant
49 collectors, including botanists that specialize in *Leptosiphon* species. Despite their attempts, no

1 additional populations of coast yellow leptosiphon have been discovered (Corelli 2016).
2 Available data indicate that coast yellow leptosiphon has always been limited in its range and
3 restricted to the Moss Beach area.
4

5 The distribution of coast yellow leptosiphon is documented in the California Natural Diversity
6 Database (CNDDDB). The CNDDDB documents plant taxa, animal taxa, and natural communities
7 that are of conservation concern within California and refers to these taxa as “elements.” An
8 “element occurrence” (occurrence) is a location record for a site which contains an individual,
9 population, nest site, den, or stand of a special status element. Populations, individuals, or
10 colonies that are located within 1/4 mile of each other generally constitute a single occurrence,
11 sometimes with multiple “parts” (Bittman 2001). The CNDDDB previously contained four
12 occurrences for coast yellow leptosiphon. In March 2016, the CNDDDB updated its database to
13 remove three of these occurrences because they had been incorrectly identified as coast yellow
14 leptosiphon, but actually represented other closely related species (Corelli 2016; Lazar pers.
15 comm. 2016). This update resulted in there being only one valid occurrence for this species in
16 the CNDDDB (see Figure 1).
17

18 The CNDDDB documented occurrence and coast yellow leptosiphon population is located within
19 the Fitzgerald Marine Reserve, which is owned by the County of San Mateo and is a San Mateo
20 County Park. The area immediately adjacent to the coast yellow leptosiphon population and the
21 Fitzgerald Marine Reserve consists of several privately owned parcels that are proposed for
22 development as shown in Figure 1 and as described below in the Factors Affecting the Ability to
23 Survive and Reproduce section of this report. The County of San Mateo property and the
24 adjacent private parcels are zoned Resource Management-Coastal Zone (RM-CZ).
25 Development is allowed in an RM-CZ zone, but all development requires approval from the San
26 Mateo County Coastside Design Review Committee (CDRC 2017).
27

28 The population of coast yellow leptosiphon is estimated to occupy an area approximately 18
29 meters by 9 meters (60 feet by 30 feet) or 167 square meters (1,800 square feet) in size
30 (CNDDDB 2017; Department staff observation), which represents the entire distribution and
31 range of the species. In addition to the mapped population of coast yellow leptosiphon shown in
32 the CNDDDB, one individual plant was also identified outside of the mapped population on the
33 adjacent private property on May 16, 2016 (T. Corelli pers. comm. 2016) (see Figure 2). Since
34 annual plants reproduce by seed, a seed bank is potentially present in the area where this plant
35 was identified.

36 Life History

37 Coast yellow leptosiphon is an annual plant, which means that it completes its life cycle within
38 one year or growing season. It generally flowers from April to June (CNPS 2017; Patterson and
39 Battaglia 2017). Little is known about the mating system of coast yellow leptosiphon. It is closely
40 related to variable linanthus, which is a fully self-incompatible species, meaning it does not self-
41 fertilize (Goodwillie 1999; Weber and Goodwillie 2013). Self-incompatible plants rely on
42 pollinators or are wind-pollinated (Goodwillie 1999). Pollination studies conducted on other
43 species of *Leptosiphon* indicate they are predominantly bee fly- (Bombyliidae) and wind-
44 pollinated (Goodwillie 2001). Other potential pollinators such as a beetle (*Listrus* sp.) in the
45 Melyridae family (soft-wing flower beetles) have been recently observed on coast yellow
46 leptosiphon (Corelli 2016). The Department does not have information on seed dispersal for
47 coast yellow leptosiphon, but like many other plant species, seeds may be dispersed by birds or
48 other animals, gravity, water flow, or other mechanisms.

1 *Figure 1 - Vicinity of Coast Yellow Leptosiphon*

DRAFT

1 *Figure 2 - Parcels Proposed for Development*

DRAFT

1 Similar-looking Plants

2 Coast yellow leptosiphon shares morphological characteristics with other leptosiphon species,
3 including false baby-stars, broad-lobed leptosiphon, rose leptosiphon, and variable linanthus.
4 Coast yellow leptosiphon is the shortest of all *Leptosiphon* species, and the width of the corolla
5 lobes is the largest in the complex. Coast yellow leptosiphon can be distinguished from false
6 baby-stars and rose leptosiphon by its densely glandular-hairy calyx lobes throughout the whole
7 surface as opposed to the non-glandular ciliate hairs only on the margins of the calyx lobes of
8 false baby-stars and rose leptosiphon (Patterson and Battaglia 2017). Coast yellow leptosiphon
9 is distinguished from variable linanthus and broad-lobed leptosiphon by its rounded corolla
10 lobes and short habit of less than 7 centimeters (2.8 inches) tall (Battaglia and Patterson 2001).
11 In addition, broad-lobed leptosiphon is not known to occur in the same geographical range as
12 coast yellow leptosiphon (Patterson and Battaglia 2017).

13 Habitat that may be Essential to the Continued Existence of the Species

14 Coast yellow leptosiphon grows at the edge of the coastline on a marine terrace supported by
15 sedimentary sandstone-derived soil. It occurs on a bluff at an elevation of 14 meters (46 feet), in
16 habitat that is highly influenced by wind, cool salt-laden air, and fog (CNDDDB 2017).

17 Vegetation Communities

18 Coast yellow leptosiphon is associated with a diverse array of native perennial grasses such as
19 maritime brome (*Bromus maritimus*), California oat grass (*Danthonia californica*), tufted
20 hairgrass (*Deschampsia cespitosa* ssp. *holciformis*), and northern barley (*Hordeum*
21 *brachyantherum* ssp. *brachyantherum*). Other species associated with coast yellow leptosiphon
22 include native species such as sea-pink (*Armeria maritima* ssp. *californica*), seaside wild
23 buckwheat (*Eriogonum latifolium*), coastal button-celery (*Eryngium armatum*), beach strawberry
24 (*Fragaria chiloensis*), purple cudweed (*Gamochaeta ustulata*), coastal gumplant (*Grindelia*
25 *stricta* var. *platyphylla*), and Davy's centauray (*Zeltnera davyi*). Three other rare species grow in
26 association with coast yellow leptosiphon, Blasdale's bent grass (*Agrostis blasdalei*), harlequin
27 lotus (*Hosackia gracilis*), and Johnny-nip (*Castilleja ambigua* ssp. *ambigua*) (Department
28 observation; Corelli 2016; Jodi McGraw Consulting 2017). Blasdale's bent grass has a
29 California Rare Plant Rank (CRPR) of 1B.2 (rare, threatened or endangered in California and
30 elsewhere; moderately threatened in California), and harlequin lotus and Johnny-nip have a
31 CRPR of 4.2 (plants of limited distribution – a watch list; moderately threatened in California).
32 Several non-native species are associated with coast yellow leptosiphon and are colonizing the
33 bluff top, including freeway iceplant (*Carpobrotus edulis*), rattail sixweeks grass (*Festuca*
34 *myuros*), rye grass (*Festuca perennis*), hare barley (*Hordeum murinum* ssp. *leporinum*), rough
35 cat's-ear (*Hypochaeris radicata*), cut-leaved plantain (*Plantago coronopus*), and English plantain
36 (*Plantago lanceolata*).

37
38 The Department uses A Manual of California Vegetation, Second Edition (Sawyer et al. 2009) to
39 classify natural communities within California. However, the area where coast yellow
40 leptosiphon occurs has not yet been classified using A Manual of California Vegetation, Second
41 Edition. The habitat where coast yellow leptosiphon occurs would likely be classified as Coastal
42 Terrace Prairie (Element Code 41100) under Robert Holland's Preliminary Descriptions of the
43 Terrestrial Natural Communities of California (1986). Holland's classification system was used
44 by the Department in the past to classify natural communities within California, but has since
45 been superseded by A Manual of California Vegetation, Second Edition (Sawyer et al. 2009).
46 The CNDDDB continues to maintain historic records of the natural community occurrences,

Commented [A1]: The description below is thorough and consistent with my experience

Deleted: of

1 although new community occurrences have not been added to the CNDDDB since the 1990's
2 (California Department of Fish and Wildlife 2017). While the Holland system for classifying
3 natural communities is no longer supported by the Department, this information may be useful
4 for describing vegetation in areas of California that have not yet been classified using A Manual
5 of California Vegetation, Second Edition. Information on Holland's Coastal Terrace Prairie
6 community in the CNDDDB is described below but this information should be used with caution
7 as the rankings are no longer updated or reviewed by the CNDDDB.

8
9 Coastal Terrace Prairie is a rare natural community described as having a dense, tall grassland
10 dominated by both sod and tussock-forming perennial grasses growing to 1 meter (3.3 feet) tall,
11 with patchy and variable stands that reflect local differences in available soil moisture capacity
12 (Holland 1986). Coastal Terrace Prairie has a natural heritage global rarity rank of G2
13 (Imperiled) and a state rarity rank of S2.1 (Imperiled and very threatened) in the CNDDDB. A rank
14 of G2 means that an element is at high risk of global extinction or elimination due to a very
15 restricted range, very few populations (often 20 or fewer), very steep declines, or other factors.
16 A state rank of S2 means that an element is imperiled in the state because of rarity due to very
17 restricted range, very few populations (often 20 or fewer), steep declines, or other factors
18 making it very vulnerable to extirpation from the state, and the ".1" signifies that the element is
19 "very threatened" (CNDDDB 2017).

20
21 While the habitat where coast yellow leptosiphon occurs is not yet classified in A Manual of
22 California Vegetation, Second Edition (Sawyer et al. 2009), the species composition overlaps
23 with that listed in the *Deschampsia cespitosa* Herbaceous Alliance (tufted hair grass meadow).
24 The *D. cespitosa* – *Danthonia californica* and *D. cespitosa* – *Eryngium armatum* Associations,
25 which have been described on coastal bluffs and terraces and in other areas in California
26 (Sawyer et al. 2009; Klein et al. 2015), fall within the *Deschampsia cespitosa* Herbaceous
27 Alliance. This alliance includes both the Coastal Terrace Prairie and the Wet Subalpine or
28 Alpine Meadow (Element Code 45210) communities described in the Holland classification
29 system (1986). It is mapped on bluffs and terraces along the central and northern California
30 coast and in montane areas in northern and central California, and is widespread outside of
31 California. The *D. cespitosa* Herbaceous Alliance has a natural heritage global rarity rank of G5
32 (Secure) and a state rarity rank of S4? (Uncertain but Apparently Secure) (Sawyer et al. 2009,
33 CNDDDB 2017). The specific association type of this vegetation has yet to be defined. However,
34 in the recent study of the vegetation of Sonoma County (Klein et al. 2015) both of the related
35 associations are considered imperiled and/or imperiled and very threatened. The *D. cespitosa* –
36 *Danthonia californica* Association has a Global Rank of G3 (Vulnerable) and a State Rank of S2
37 (Imperiled), while the other closely related association, the *D. cespitosa* – *Eryngium armatum*
38 Provisional Association is ranked G3G2?/S3S2? (Uncertain but Vulnerable or Imperiled). It is
39 likely that all of the coastal associations of the *D. cespitosa* Herbaceous Alliance are similarly
40 rare and threatened.

41
42 East of the coast yellow leptosiphon population, a large stand of Monterey cypress
43 (*Hesperocyparis macrocarpa*) trees is growing on Vallemar Bluff along Vallemar Street.
44 Monterey cypress is known from only two native occurrences, which are in the Monterey area. It
45 is considered invasive in other parts of California, and it has been widely planted and
46 naturalized in other areas along the coast (Cal-IPC 2017; CNPS 2017). The Monterey cypress
47 trees near the coast yellow leptosiphon population likely represent planted specimens. The
48 understory of this stand is disturbed and consists mostly of non-native plant species including
49 ripgut brome (*Bromus diandrus*), freeway iceplant, panic veldt grass (*Ehrharta erecta*), false
50 brome (*Brachypodium distachyon*), pride of Madeira (*Echium candicans*), Japanese
51 cheesewood (*Pittosporum tobira*), and pincushion flower (*Scabiosa atropurpurea*).

Freeway iceplant is present in large patches scattered throughout the Coastal Terrace Prairie, and a large patch is growing on the bluff immediately adjacent to the coast yellow leptosiphon population. North of the coast yellow leptosiphon population, the coastal bluff between the existing homes and the edge of the bluff is completely dominated by large mats of freeway iceplant with very little room for other herbaceous plants to grow. Monterey cypress trees are also scattered along the bluff north of the coast yellow leptosiphon population.

South of the Coastal Terrace Prairie, on the other side of Juliana Drive, the area consists of residential development (Figure 2).

Geology and Soils

Coast yellow leptosiphon grows on the edge of Vallemar Bluff in Moss Beach overlooking the Pacific Ocean. The Natural Resources Conservation Services' soil map unit for this area is rock outcrop-Orthents complex (Soil Survey Staff 2017). Orthents occur on escarpments, which are steep slopes or long cliffs that form as an effect of faulting or erosion and separate two relatively level areas of differing elevations. Orthents parent material consists of mixed sedimentary, serpentine, or basaltic volcanic rock (Soil Survey Staff 2017). The coast yellow leptosiphon population grows on a marine terrace supported by sedimentary sandstone-derived soil underlain by a relatively thin veneer of terrace deposits, consisting primarily of poorly to moderately consolidated gravel, sand, silt, and clay of marine origin (Pampeyan 1994).

The site is in a geologically active region of California, and is located approximately 427 meters (1,400 feet) northeast of the Seal Cove Fault and about 10.9 kilometers (6.8 miles) southwest of the seismically active San Andreas Fault Zone. The active San Andreas, Hayward, and Calaveras Faults are all located within the nearby San Francisco Bay Area and could have active secondary faults with the potential to cause severe shaking at the coast yellow leptosiphon population. A major earthquake could significantly affect the unstable bluffs and soils, causing loose soil on the steep slopes near the coast yellow leptosiphon population to form sloughs or slides (JCP 1990).

Hydrology

The coast yellow leptosiphon population occurs in the Dean Creek catchment, which is approximately 146 hectares (360 acres) in size. Dean Creek is located northeast of the Fitzgerald Marine Reserve and flows into Kelp Cove, approximately 0.6 kilometers (0.3 miles) south of Vallemar Bluff.

The coast yellow leptosiphon population is located near a coastal bluff comprised partially of coastal terrace deposits that are susceptible to erosion, particularly by concentrated uncontrolled runoff of surface drainage. In two areas of the bluff edge, shallow gullies approximately 0.3 to 0.6 meter (1 to 2 feet) deep extend inland from the bluff edge. These gullies were likely formed as a result of overland storm runoff (Haro, Kasunich & Associates, Inc. 2015).

A geotechnical investigation was completed at Vallemar Bluff by Haro, Kasunich & Associates, Inc. in 2016. Test bore holes encountered groundwater at 4 to 5 meters (13 to 17 feet) below the ground surface. The groundwater appears to be perched upon the bedrock and seeping through the terrace (Haro, Kasunich & Associates, Inc. 2015).

1 Climate

2 Coast yellow leptosiphon occurs in an area with a maritime Mediterranean climate with distinct
3 wet and dry seasons. Most of the area's precipitation occurs from November through April.
4 Virtually all precipitation occurs as rain, although fog accounts for a small percentage
5 (Brady/LSA 2002). Using PRISM weather data from 1895 to 2015, the average minimum
6 temperature in the vicinity of Vallemar Bluff is 9°C (48°F), the average maximum temperature is
7 17°C (63°F), the average temperature is 13°C (55°F), and the average precipitation is 69
8 centimeters (27 inches) per year (PRISM Climate Group 2017).

9 **POPULATION TRENDS**

10 Scientific information on coast yellow leptosiphon's population trends is limited. The species has
11 not been monitored regularly, and the earliest reported survey was conducted by R. Battaglia in
12 1998, with about 1,000 plants estimated (Battaglia 1998; Corelli 2016; CNDDDB 2017). T. Corelli
13 estimated population numbers in 1999 and 2015. An estimated 400-500 plants were recorded in
14 1999, and fewer than 400 plants were estimated in 2015 (Corelli 1999, 2015).

15
16 Although little is known about population trends of coast yellow leptosiphon, the population that
17 was once described as covering the ground for several acres (Eastwood 1904) is now limited to
18 an area covering approximately 167 square meters (1,800 square feet or 0.04 acre), clearly
19 indicating a significant declining population trend.

20 **FACTORS AFFECTING THE ABILITY TO SURVIVE AND REPRODUCE**

21 **Habitat Modification and Destruction**

22 Past Modification and Destruction of Habitat

23 Habitat loss is considered the primary cause for species extinctions at local, regional, and global
24 scales (Dirzo and Raven 2003). Most of the coastal prairie habitat, which provides potential
25 habitat for coast yellow leptosiphon, has been destroyed or modified due to urban development,
26 agriculture, and invasion of non-native plant species (Ford and Hayes 2007). Coast yellow
27 leptosiphon was likely present over a larger geographic area prior to the development of the
28 San Mateo coast and conversion of coastal prairie habitat. Most of the habitat surrounding the
29 coast yellow leptosiphon population has been eliminated or altered due to road construction,
30 residential development, and invasion by non-native plant species, particularly the invasive
31 freeway iceplant which covers the coastal bluff adjacent to the coast yellow leptosiphon
32 population (Departmental observation). Installation of hardscape and storm drainage systems
33 related to urban development have altered runoff patterns and hydrology in and around
34 occupied coast yellow leptosiphon habitat.

35
36 Although it is likely that coast yellow leptosiphon has always been rare and restricted in range,
37 past modification and destruction of habitat has contributed to the limited availability of suitable
38 habitat for this species. These past changes affect the ability of coast yellow leptosiphon to
39 survive and reproduce.

Present and Future Modification and Destruction of Habitat

Development or changes in land use could directly destroy plants and living seeds in the seed bank and destroy both occupied and potential habitat. Threats to coast yellow leptosiphon may occur from development and changes in land use near the existing population. A residential development project is proposed on the parcels immediately adjacent to the coast yellow leptosiphon population (County of San Mateo 2017; Midcoast Community Council 2017). The area proposed for development consists of seven lots, which will be consolidated into four lots for the project. The proposed project will build four, three-story single-family residences, between 4,740 and 4,859 square feet in size, and is pending design review approval by the San Mateo County Coastsides Design Review Committee (CDRC 2017). Figure 2 shows the property proposed for development in relationship to the coast yellow leptosiphon population, and Figure 3 shows the site plan. The developer has erected story poles on the parcels that represent locations and footprints of the proposed houses (Figure 4).

Coast yellow leptosiphon has been buffered from impacts from the adjacent highway by the 1.0-hectare (2.5-acre) undeveloped coastal prairie that provides a natural buffer between Highway 1 and the coast yellow leptosiphon population. Habitat buffers provide protection from edge effects (Saunders et al. 1991; Given 1994), which are changes in community structure that occur at the boundary of two habitats. Habitat buffers also provide extra protection from human activities, allow for a more natural habitat boundary, slow the speed of water runoff, and filter sediments, fertilizers, pesticides, heavy metals, and pathogens from runoff (Given 1994; Godfrey 2015; USDA 2017).

Any change in land use on this adjacent property is expected to result in indirect impacts to the coast yellow leptosiphon population. The proposed development will alter the hydrologic regime of the site. This will involve increased, altered, and unseasonal runoff patterns resulting from addition of hard, impervious surfaces, installation of drainage features such as storm drains and drainage pipes (Mesity-Miller Engineering, Inc. 2017), and installation and use of landscape irrigation systems. Development often leads to unseasonal summer moisture resulting from watering landscape plants, washing cars, and other human activities. In addition, residential development will lead to an increase in use of fertilizers and nutrients, herbicides, pesticides, and other household chemicals and products which will run off and disperse into habitat occupied by coast yellow leptosiphon and could impact the plants as well as alter the soil chemistry. Increased nutrient load and unseasonal moisture resulting from human activities creates conditions that promote the spread of non-native plant species, which can outcompete the native plants for light, space, nutrients, water and other factors (Smil 1997; Vitousek et al. 1997; Line and White 2007). Furthermore, development will increase the number of human visitors using the area, result in soil disturbance and compaction, increase garbage and pollution, and create conditions that are favorable for the spread of non-native plant species.

Construction of houses on the parcels adjacent to the coast yellow leptosiphon population will lead to an increase in human use of the area. Walking paths exist on the bluff, and one heavily-used path exists immediately adjacent to the coast yellow leptosiphon population. Increased human use of the area will increase the impacts to the habitat from foot traffic, will increase the spread of weed seeds and introduce nutrients from dog walking, and will increase the risk of trampling and killing of coast yellow leptosiphon plants. In addition, development of the area will modify the aesthetics and accessibility of the bluff, potentially resulting in alterations of walking patterns in the area. People may create new paths through the remaining portions of the habitat accessible on Vallemar Bluff, potentially through the coast yellow leptosiphon population.

1 *Figure 3 - Proposed Development Project on Vallemar Bluff - Site Plan*

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1 *Figure 4 - Story Poles for Proposed Development Project on Vallemar Bluff*

2

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1 Development of this area may also result in the loss of pollinator habitat and further fragment
2 the habitat adjacent to the coast yellow leptosiphon population. Habitat fragmentation often
3 leads to a disruption in plant and pollinator population dynamics by altering pollinator densities
4 and behavior (Xiao et al. 2016). Information on pollinators and pollinator requirements for coast
5 yellow leptosiphon is currently lacking, but loss of pollinators essential to the reproduction of
6 coast yellow leptosiphon would negatively impact coast yellow leptosiphon, especially if the
7 species is self-incompatible (Goodwillie 1999).

8
9 Although the population of coast yellow leptosiphon is not reported in the CNDDDB on the
10 adjacent parcels that are proposed for development, one individual plant was identified on one
11 of the parcels on May 16, 2016 (T. Corelli pers. comm. 2016) (see Figure 2). Since annual
12 plants reproduce by seed, identification of coast yellow leptosiphon on one of the adjacent
13 properties indicates that the plants have distributed seed beyond the currently-mapped
14 occurrence, and that a seed bank is potentially present in the area where this plant was
15 identified. A seed bank constitutes a living plant population, even when above-ground plants are
16 not visible. Development of this property could result in impacts to coast yellow leptosiphon
17 through the elimination of a soil seed bank for this species or direct impacts to individual plants
18 that may emerge from the seed bank.

Commented [A2]: Ultimately, this potential seed bank may be an essential element for long term survival of the species.

19
20 In addition to impacts from human activities, habitat modification can result from other activities.
21 Burrowing mammals such as pocket gophers (*Thomomys* spp.) have profound impacts on
22 ecosystems, from consuming vegetation to physically altering the soil (Reichman and Seabloom
23 2002). Burrowing mammals influence the physical environment, altering patterns and rates of
24 soil development and nutrient availability, microtopography, and the abiotic environment.
25 Burrowing activity can affect the demography and abundance of plant species, altering
26 vegetation patterns and diversity, and thus altering ecosystem structure (Inouye et al. 1987;
27 Huntly and Inouye 1988; Villarreal et al. 2008). Burrowing mammals such as gophers excavate
28 vast burrow systems and deposit tailings in abandoned tunnels and on the ground surface
29 (Reichman and Seabloom 2002), reducing the area of available habitat for plants. Evidence of
30 burrowing mammals is present in the coast yellow leptosiphon population (Department staff
31 observation), and burrowing mammals could impact coast yellow leptosiphon.

Commented [A3]: Any evidence that this would be a net positive or negative impact? The leptosiphon might benefit from soil tilling or seed dispersal by burrowing mammals.

32
33 The Department considers present and future modification and destruction of habitat a serious
34 threat to coast yellow leptosiphon. Habitat modification and destruction will affect the ability of
35 coast yellow leptosiphon to survive and reproduce.

36 **Impacts from Invasive Species (Competition and other Factors)**

37 Invading alien species cause major environmental damages and losses and are a significant
38 risk factor leading to extinction of threatened and endangered species (Pimentel et al. 2004;
39 Conser and Connor 2009), second only to habitat loss and fragmentation (Wilcove et al. 1998;
40 Randall and Hoshovsky 2000). Compared to other threats to biodiversity, invasive non-native
41 plants present a complex problem that is difficult to manage and has long-lasting effects. North
42 America has accumulated the largest number of naturalized plants in the world (van Kleunen et
43 al. 2015), and many non-native plant species have established within California, dramatically
44 changing the state's ecological landscape (Conser and Connor 2009). Many studies
45 hypothesize or suggest that competition is the process responsible for observed invasive
46 species impacts to biodiversity; however, invasive species may also impact native ecosystems
47 by altering environmental conditions and resource availability (D'Antonio and Vitousek 1992;
48 Levine et al. 2003). Invasive species may threaten native populations through competition for
49 light, water, or nutrients; allelopathic mechanisms; alteration of soil chemistry; thatch

1 accumulation that inhibits seed germination and seedling recruitment; changes in natural fire
2 frequency; disruptions to pollination or seed-dispersal mutualisms; changes in soil
3 microorganisms; or other mechanisms. The magnitude of invasive species impacts in
4 Mediterranean habitats, such as those in California, largely depends on characteristics of the
5 invading species and the habitat being invaded (Fried et al. 2014). The invader's life form and
6 ability to form very dense stands have an effect on the magnitude of impacts, with creeping
7 plant species such as freeway iceplant having greater effect (Gaertner et al. 2009; Fried et al.
8 2014). Invasive species may also influence native species colonization rates, and may thus lead
9 to declines in local diversity over longer timescales (Yurkonis and Meiners 2004). Studies have
10 not been conducted on the impact of invasive species on coast yellow leptosiphon specifically;
11 however, negative impacts of plant invasions on Mediterranean ecosystems have been well
12 demonstrated (Gaertner et al. 2009; Fried et al. 2014).

13
14 The coast yellow leptosiphon population is threatened by encroachment of non-native invasive
15 plants, especially invasive freeway iceplant that is a highly-rated noxious weed by the California
16 Invasive Plant Council (Cal-IPC 2017). Freeway iceplant is a low-growing, creeping succulent
17 perennial plant that roots at the nodes and often forms deep mats covering large areas. It
18 originates from South Africa, but is one of the most widespread non-native plants in the
19 Mediterranean coastal ecosystems throughout the world, and is considered a severe threat to
20 the native plant communities it invades (Albert 1995; Santoro et al. 2011). In California, it occurs
21 along the coast and on the Channel Islands, especially in areas with a warm winter climate (Cal-
22 IPC 2017). It was originally introduced into California in the early 1900's to stabilize soil along
23 railroad tracks, and the California Department of Transportation soon began using it widely to
24 line highways. It has also been widely promoted as an ornamental plant for home gardens
25 (Albert 1995, 2000). Because this plant spreads easily by seed and vegetative means, it has
26 spread beyond landscape plantings and has invaded coastal habitats, including the coastal
27 prairie where coast yellow leptosiphon grows. Freeway iceplant forms nearly impenetrable mats
28 that dominate the landscape, and it competes directly with native plant species for light,
29 nutrients, water and space (D'Antonio and Haubensak 1998). The fleshy fruits often bear more
30 than one thousand small seeds (Bartomeus and Vilà 2009) that are eaten and widely dispersed
31 by several mammals such as rabbits (D'Antonio 1990) and rats (Bourgeois et al. 2005). It
32 competes aggressively with native plant species, achieving high rates of space colonization,
33 which suppresses growth and establishment of other plants (D'Antonio and Mahall 1991; Albert
34 1995; Suehs et al. 2004; Vilà et al. 2006). Furthermore, it also interacts indirectly with native
35 vegetation by altering soil chemistry by lowering pH (Conser and Connor 2009). Although
36 freeway iceplant was originally used to stabilize soil and control erosion, it can actually
37 contribute to erosion and landslides. It has shallow roots that do not hold soil well, and it
38 absorbs ample water during rain events, becoming so heavy that it can slump off of steep
39 hillsides and cliffs, pulling soil down with it (Spitzer 2002). Freeway iceplant covers the bluffs in
40 much of the habitat near the coast yellow leptosiphon population, and it is growing on the bluff
41 immediately adjacent to the coast yellow leptosiphon population and is encroaching into the
42 population (see Figure 5).

43
44 Other non-native plant species, such as rough cat's ear, rye grass, hare barley, and cut-leaved
45 plantain, are also present growing in and around the coast yellow leptosiphon population. These
46 invasive species may threaten the coast yellow leptosiphon population through a variety of
47 mechanisms, including competition for light, water, or nutrients; thatch accumulation that inhibits
48 seed germination and seedling recruitment; disruptions to pollination or seed-dispersal
49 mutualisms; or other mechanisms (D'Antonio and Haubensak 1998).

1 *Figure 5 – Freeway Iceplant Invasion*

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The coast yellow leptosiphon population will likely continue to experience ongoing and increasing inputs of invasive plant propagules from nearby populations and other sources. The area is frequently used by pedestrians, who can serve as vectors for invasive species into the area. Habitat disturbances resulting from the close proximity of the population to urban development also provides opportunities for invasive species populations to establish and expand. In addition, the proposed development on the adjacent property would likely increase the input of invasive plant species from the spread of landscape plants into the area, and will increase disturbance and habitat modification, providing favorable habitat for invasive species.

Bluff-Top Erosion and Rising Ocean Levels

The coast yellow leptosiphon population is located on Vallemar Bluff, approximately 8 meters (27 feet) from the edge of the bluff, and bluff-top erosion and rising ocean levels pose a serious threat to this species. Rainfall and wave splash or spray cause erosion of the bluff face. Additionally, slope instability results in landslides along the coastal bluff face, resulting in landward recession of the top edge of the coastal bluff. Coastal bluff landslides are caused by undermining the base of the bluff or from saturation of the bluff edge or bluff face (Haro, Kasunich & Associates, Inc. 2015).

A coastal bluff recession study was prepared by Haro, Kasunich & Associates, Inc., Consulting Geotechnical and Coastal Engineers (2015). Historical satellite photos and maps were reviewed and compared with the bluff edge position as surveyed in 2014. The results indicated that the coastal bluff had receded inland up to 14.6 meters (48 feet) between 1908 and 2014, which is a long term historical bluff recession rate of about 0.14 meter (0.45 foot) per year. Results of the study also indicated that about 3 to 5 meters (10 to 18 feet) of bluff recession occurred between 1986 and 2014, which is a long term historical bluff recession rate of about 0.11 to 0.20 meters (0.36 to 0.64 feet) per year.

Future bluff and coastal recession risk was estimated using the long-term historical average annual erosion rates as a minimum. Results suggested that a minimum of 6.9 meters (22.5 feet) of bluff recession will occur at Vallemar Bluff in the next 50 years (by the year 2065). Mean sea level along the California coast is expected to rise between 1.0 to 1.4 meters (3.3 to 4.6 feet) by the year 2100 due to climate change (Heberger et al. 2009), and the accelerating rate of sea level rise will likely result in increased future recession rates compared to average historical rates (Haro, Kasunich & Associates, Inc. 2015). Accelerated future sea level rise is expected to result in an estimated additional 1.7 meters (5.5 feet) of recession over the next 50 years, for a total of 8.6 meters (28 feet) of recession (Haro, Kasunich & Associates, Inc. 2015).

Projected future bluff edge recession was measured from where the bluff is considered stable as determined by Haro, Kasunich & Associates, Inc. (2015) (see Figure 6). They used the projected stable edge to project future recession and arrived at an estimated 50-year coastal recession setback line for development on Vallemar Bluff using the projected rates of recession described above. The 50-year setback is considered the minimum distance necessary to provide a stable building site of a 50-year lifetime of a proposed structure. The portion of the bluff seaward of the 50-year setback line, which supports a large portion of the coast yellow leptosiphon population, is considered to be vulnerable to erosion over the next 50 years.

1 *Figure 6 - Coastal Bluff Recession at Vallemar Bluff*

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1 It is likely that the coast yellow leptosiphon population, which is perched near the bluff edge, has
2 been steadily reduced by cliff erosion. Based on the study conducted by Haro, Kasunich &
3 Associates, Inc., the coast yellow leptosiphon population is located on a portion of the bluff that
4 is highly susceptible to erosion over the next 50 years. If the bluff erodes to the 50-year setback
5 line that accounts for rising sea level, approximately 80 percent of the coast yellow leptosiphon
6 population will be destroyed (see Figure 6). Erosion of the bluff presents a significant threat to
7 coast yellow leptosiphon and could lead to the extinction of the species.

8 **Other Human-related Activities**

9 The coast yellow leptosiphon population is threatened by other human-related activities,
10 specifically trampling from foot traffic. People commonly walk on the bluff where the coast
11 yellow leptosiphon population occurs, which may damage or kill coast yellow leptosiphon
12 individuals through direct trampling of plants. In addition, there is nothing to prevent people from
13 riding their bicycles on the bluff, which would further impact the coast yellow leptosiphon
14 population. The property is easily accessible to the public, and a foot trail has been worn along
15 the bluff that passes along the edge of the coast yellow leptosiphon population. A bench is
16 present near the population overlooking the ocean, attracting visitors to cut through the coast
17 yellow leptosiphon population to view the ocean. In addition to direct trampling of plants, human
18 use of the site also increases disturbance and compaction of soil and facilitates the spread of
19 invasive plant species. No barriers exist around the coast yellow leptosiphon population to
20 protect plants from foot traffic and trampling. The proposed development will result in increased
21 human activity in the area, thus increasing the threat to coast yellow leptosiphon from foot traffic
22 and other human impacts.

23 **Climate Change**

24 Warming of the climate system is unequivocal, and since the 1950s, many of the observed
25 changes are unprecedented over decades to millennia (IPCC 2014). Climate change presents a
26 major challenge to the conservation of California's natural resources, and it will intensify existing
27 threats and create new threats to natural systems.

28
29 Department staff conducted an assessment of the vulnerability of coast yellow leptosiphon to
30 climate change using the NatureServe Climate Change Vulnerability Index Version 3.02
31 (NatureServe 2016). Based upon the Department's assessment, coast yellow leptosiphon likely
32 has a climate change vulnerability index value of Highly Vulnerable (HV), indicating that
33 available evidence suggests that abundance and/or range extent within the geographical area of
34 the species is likely to decrease significantly by the year 2050. However, some ecological and
35 life history information used for the climate change vulnerability assessment is not yet known for
36 coast yellow leptosiphon. In particular, the Department does not know the mechanisms or
37 species required for effective pollination of coast yellow leptosiphon, the mechanisms used by
38 coast yellow leptosiphon for seed dispersal, or coast yellow leptosiphon's seed dispersal
39 distance. Furthermore, the Department does not know whether or to what extent competing
40 plant species such as freeway iceplant will be favored by projected future climates. Despite the
41 lack of information about some of the ecological and life history information for coast yellow
42 leptosiphon, the confidence in the vulnerability index score is very high based on the results of
43 the Monte Carlo simulation used in the index (Young et al. 2015).

1 **Vulnerability of Small Populations**

2 Coast yellow leptosiphon has an exceptionally limited distribution, with only one population that
3 occupies a very small area. The Department recognizes that species with small numbers of
4 populations and small population sizes are highly vulnerable to extinction due to stochastic
5 (chance) demographic, environmental, and genetic events (Shaffer 1981, 1987; Dirzo and
6 Raven 2003; Groom et al. 2006; Primack 2006). Chance events such as a landslide at the bluff
7 edge could result in the loss of all or a significant part of the coast yellow leptosiphon
8 population.
9

10 Species with small numbers of populations or small populations may also be subject to
11 increased genetic drift and inbreeding, which can affect population viability (Menges 1991;
12 Ellstrand and Elam 1993).
13

14 Due to the vulnerability and rarity of coast yellow leptosiphon, the loss of any portion of the
15 population would represent the loss of a significant portion of this species' genetic diversity and
16 total range, and could result in its extinction.

17 **Predation**

18 The Department does not have any information on predation affecting coast yellow leptosiphon.

19 **Disease and Parasites**

20 The Department does not have any information on diseases or parasites affecting coast yellow
21 leptosiphon.

22 **Overexploitation**

23 The Department does not have any information on overexploitation affecting coast yellow
24 leptosiphon.

25 **REGULATORY AND LISTING STATUS**

26 **Federal**

27 Coast yellow leptosiphon is not protected pursuant to the federal Endangered Species Act.

28 **State**

29 On December 23, 2016, the Commission published its Notice of Findings for coast yellow
30 leptosiphon in the California Regulatory Notice Register, designating this species as a candidate
31 pursuant to CESA. The provisions of CESA apply to coast yellow leptosiphon while it is a
32 candidate species (Fish & G. Code, § 2085). CESA prohibits the import, export, take,
33 possession, purchase or sale of coast yellow leptosiphon, or any part or product of thereof,
34 except in limited circumstances, such as through a permit or agreement issued by the
35 Department under the authority of the Fish and Game Code. For example, the Department may
36 issue permits that allow the incidental take of listed and candidate species if the take is
37 minimized and fully mitigated, the activity will not jeopardize the continued existence of the
38 species, and other conditions are met (Fish & G. Code, § 2081 subd. (b)). The Department may

1 also authorize the take and possession of coast yellow leptosiphon for scientific, educational, or
2 management purposes (Fish & G. Code, § 2081 subd. (a)).

3 **Natural Heritage Program Ranking**

4 All natural heritage programs, such as the CNDDB, use the same ranking methodology
5 originally developed by The Nature Conservancy and now maintained by NatureServe
6 (NatureServe 2012). This ranking methodology consists of a global rank describing the rank for
7 a given taxon over its entire distribution, and a state rank describing the rank for the taxon over
8 its state distribution. Both global and state ranks reflect a combination of rarity, threat, and trend
9 factors. Coast yellow leptosiphon has been assigned a global rank of G1 and a state rank of S1
10 (CNDDB 2017), indicating that the species is critically imperiled both within California and
11 throughout its entire range, with a very high risk of extinction due to extreme rarity (often five or
12 fewer populations), very steep declines, or other factors.

13 **California Rare Plant Rank**

14 Some plants in California are assigned a California Rare Plant Rank (CRPR) to identify them as
15 species of conservation concern. The Department works in collaboration with CNPS and
16 botanical experts throughout the state to assign rare and endangered plants a CRPR reflective
17 of their status. Coast yellow leptosiphon has been assigned a CRPR of 1B.1 (CNDDB 2017).

18
19 Plants with a CRPR of 1B are rare throughout their range with the majority of them endemic to
20 California. Most of the plants that are ranked 1B have declined significantly over the last
21 century. The threat code extension of “.1” indicates that the species is seriously threatened in
22 California, with over 80 percent of occurrences threatened or a high degree and immediacy of
23 threat (CNDDB 2017).

24 **EXISTING MANAGEMENT EFFORTS**

25 **Resource Management Plans**

26 The Department is not aware of any resource management plans prepared for coast yellow
27 leptosiphon.

28
29 The coast yellow leptosiphon population is located within the Fitzgerald Marine Reserve, which
30 is a San Mateo County Park, and is also adjacent to the Montara State Marine Reserve, which
31 is a California Marine Protected Area that is located in California state waters below the mean
32 high tide line. San Mateo County released a Master Plan for the Fitzgerald Marine Reserve in
33 2002, but the area where the coast yellow leptosiphon occurs on Vallemar Bluff was not
34 surveyed, and coast yellow leptosiphon is not accounted for in the Master Plan (Brady/LSA
35 2002). San Mateo County Parks Department has been contacted about the omission and the
36 presence of coast yellow leptosiphon and the other rare plants located on the property. The
37 County of San Mateo intends to revise the Master Plan to include management and protection
38 of coast yellow leptosiphon and other rare plants located within the Fitzgerald Marine Reserve
39 (Corelli 2016; R. Arechiga pers. comm. 2016, 2017).

1 **Monitoring and Research**

2 Petitioner and botanist, Toni Corelli, continues to visit and observe the coast yellow leptosiphon
3 population at least once per year and observational information is being collected. The
4 Department is not aware of any other ongoing coast yellow leptosiphon research or monitoring
5 of the coast yellow leptosiphon population.

Commented [A4]: I would be happy to contribute to any formal monitoring activities proposed.

6 **Habitat Restoration Projects**

7 The Department has discussed the potential for seed collection, reintroduction, and habitat
8 restoration for coast yellow leptosiphon with the County of San Mateo (R. Arechiga pers. comm.
9 2016, 2017). The County of San Mateo is interested in identifying nearby suitable habitat owned
10 by the County of San Mateo to introduce coast yellow leptosiphon seed (Arechiga 2017).
11 University of California Botanical Garden at Berkeley has approximately 870 seeds from 53
12 individual coast yellow leptosiphon plants in conservation storage (H. Forbes pers. comm. 2016,
13 2017). No efforts have been initiated for habitat restoration.

14 **Impacts of Existing Management Efforts**

15 Since its inception, the Fitzgerald Marine Reserve has been managed for multiple purposes,
16 including education, research and scientific study, recreation, collection of seashore animals
17 and plants, and fishing. However, the area where coast yellow leptosiphon occurs was not
18 surveyed during preparation of the Master Plan, and currently no management is taking place
19 on this portion of the Fitzgerald Marine Reserve (Brady/LSA 2002; Arechiga pers. comm. 2016,
20 2017).

21 **SCIENTIFIC DETERMINATIONS REGARDING THE STATUS OF COAST YELLOW** 22 **LEPTOSIPHON IN CALIFORNIA**

23 CESA directs the Department to prepare this report regarding the status of coast yellow
24 leptosiphon based upon the best scientific information available to the Department (Fish & G.
25 Code, § 2074.6). CESA's implementing regulations identify key factors that are relevant to the
26 Department's analyses. Specifically, a "species shall be listed as endangered or threatened ... if
27 the Commission determines that its continued existence is in serious danger or is threatened by
28 any one or any combination of the following factors: 1. present or threatened modification or
29 destruction of its habitat; 2. overexploitation; 3. predation; 4. competition; 5. disease; or 6. other
30 natural occurrences or human-related activities" (Cal. Code Regs., tit. 14, § 670.1, subd.
31 (i)(1)(A)).

Commented [A5]: The case is clearly made that factors 1., 4., and 6. apply.

32
33 The definitions of endangered and threatened species in the Fish and Game Code provide key
34 guidance to the Department's scientific analysis. An endangered species under CESA is one
35 "which is in serious danger of becoming extinct throughout all, or a significant portion, of its
36 range due to one or more causes, including loss of habitat, change in habitat, over exploitation,
37 predation, competition, or disease" (Fish & G. Code, § 2062). A threatened species under CESA
38 is one "that, although not presently threatened with extinction, is likely to become an
39 endangered species in the foreseeable future in the absence of special protection and
40 management efforts required by [CESA]" (*Id.*, § 2067).

41
42 The preceding sections of this Status Review report describe the best scientific information
43 available to the Department, with respect to the key factors identified in the regulations.

1 **Present or Threatened Modification or Destruction of Habitat**

2 Habitats along the San Mateo Coast have been impacted by a history of modification and
3 destruction from development, agriculture, grazing, and other land use. Most of the coastal
4 prairie habitat, which provides potential habitat for coast yellow leptosiphon, has been destroyed
5 or modified due to urban development, agriculture, and invasion by non-native plant species.
6 The proposed development on the property adjacent to the coast yellow leptosiphon population
7 will result in habitat degradation and modification that will negatively impact the species and
8 could result in a severe decline or extirpation of the population, thus leading to the extinction of
9 the species. In addition, human use within and in the vicinity of the coast yellow leptosiphon
10 population has resulted in habitat degradation that is evident on the ground and is visible from
11 aerial imagery (see Figure 7). The proposed development will lead to an increase in human use
12 of the area, resulting in additional impacts from trampling and habitat disturbance. In addition,
13 burrowing mammals such as gophers are present at the coast yellow leptosiphon population
14 and may be impacting coast yellow leptosiphon. The Department considers modification and
15 destruction of habitat to be a significant threat to the continued existence of coast yellow
16 leptosiphon.

17 **Overexploitation**

18 The Department does not consider overexploitation to be a significant threat to the continued
19 existence of coast yellow leptosiphon.

20 **Predation**

21 The Department does not consider predation to be a significant threat to the continued
22 existence of coast yellow leptosiphon.

23 **Competition**

24 Invasive plant species have been documented to pose serious threats to biodiversity around the
25 world, and are a particularly pervasive problem in Mediterranean-type habitats like those in
26 California. Invasive mat-forming freeway iceplant and other invasive plants, such as rough cat's
27 ear and English plantain, occur within and in close proximity to the coast yellow leptosiphon
28 population. The Department considers invasive plant species, particularly freeway iceplant, to
29 be a significant threat to the continued existence of coast yellow leptosiphon.

30 **Disease**

31 There are no diseases known to be threats to the continued existence of coast yellow
32 leptosiphon. The Department does not consider disease to be a significant threat to the
33 continued existence of coast yellow leptosiphon.

34 **Other Natural Occurrences or Human-related Activities**

35 The coast yellow leptosiphon population is located near the edge of Vallemar Bluff, and bluff-top
36 erosion and rising ocean levels pose a serious threat to this species. The climate of California is

1 *Figure 7 - Proximity of Threats to Coast Yellow Leptosiphon*

DRAFT

certain to change due to warming of the global climate system, which could lead to an accelerated rate of bluff erosion. Coast yellow leptosiphon has an extremely narrow distribution consisting of one population that occupies an extremely small area. Coast yellow leptosiphon's rarity and extremely limited distribution, and its occurrence in only one area that is partially surrounded by development, makes the species very vulnerable to stochastic events such as erosion, landslides, and drought, and to all other threats. Therefore, the loss of all or a significant portion of the coast yellow leptosiphon population would represent the loss of all or a significant portion of coast yellow leptosiphon's total range, and could result in the extinction of the species. Impacts from pedestrian traffic and trampling also pose a threat to coast yellow leptosiphon, and the proposed development would likely increase human use of the area. The Department considers erosion, other natural occurrences, and human-related activities to be a significant threat to the continued existence of coast yellow leptosiphon.

SUMMARY OF KEY FINDINGS

Coast yellow leptosiphon is an extremely rare species known from only one small population. The population occurs in close proximity to urban land use, and has been either directly or indirectly impacted by modification or destruction of habitat. Based upon current land use practices that include the potential development of the adjacent property, the modification, destruction and impacts to coast yellow leptosiphon habitat are likely to continue into the future. The coast yellow leptosiphon population is being impacted by invasive plant species and human activities, such as pedestrian use of the area. Bluff-top erosion is also a serious and imminent threat to this species, and climate change may accelerate that process. Bluff-top erosion alone could lead to near extinction of the species in 50 years based on current bluff-top recession predictions. Compounding the threats to the species is the inherent vulnerability of small populations to extirpation due to stochastic events. The entire distribution of coast yellow leptosiphon is limited to one site that occupies an area approximately 167 square meters (1,800 square feet) in size (CNDDDB 2017; Department staff observation), with population estimates over the years ranging between 400 and 1,000 individual plants; it is found nowhere else in the world. Due to the extremely limited distribution of coast yellow leptosiphon and its small population size, the loss of any portion of its population would be considered the loss of a significant portion of the species total range and would likely result in the extinction of this species.

The information available to the Department regarding the status of coast yellow leptosiphon indicates that there are significant threats to the continued existence of the species. Proximity of threats to the coast yellow leptosiphon population are illustrated in Figure 7.

RECOMMENDATION FOR PETITIONED ACTION

CESA directs the Department to prepare this report regarding the status of coast yellow leptosiphon in California based upon the best scientific information available to the Department (Fish & G. Code, § 2074.6). CESA also directs the Department to indicate in this Status Review whether the petitioned action is warranted (Fish & G. Code, § 2074.6; Cal. Code Regs., tit. 14, § 670.1, subd. (f)). The Department includes and makes its recommendation in this Status Review as submitted to the Commission in an advisory capacity based on the best available science. Based on the criteria described above, the best scientific information available to the Department indicates that coast yellow leptosiphon is in serious danger of becoming extinct in all or a significant portion of its range due to one or more causes including loss of habitat,

change in habitat, competition and other effects from invasive plant species, and other natural occurrences and human-related activities.

The Department recommends that the Commission find the petitioned action to list coast yellow leptosiphon as an endangered species to be warranted.

PROTECTION AFFORDED BY LISTING

It is the policy of the state to conserve, protect, restore and enhance any endangered or any threatened species and its habitat (Fish & G. Code, § 2052). If listed as an endangered or threatened species, unauthorized “take” of coast yellow leptosiphon will be prohibited, making the conservation, protection, and enhancement of the species and its habitat an issue of statewide concern. As noted earlier “take” is defined under CESA as hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill (*Id.*, § 86). Any person violating the take prohibition would be punishable under state law. The Fish and Game Code provides the Department with related authority to authorize “take” under certain circumstances (*Id.*, §§ 2081, 2081.1, 2086, 2087, 2089.6, 2089.10 and 2835). As authorized through an incidental take permit, however, impacts of the taking on coast yellow leptosiphon caused by the activity must be minimized and fully mitigated according to state standards.

Additional protection of coast yellow leptosiphon following listing would also occur during required public agency environmental review under the California Environmental Quality Act (CEQA), and its federal counter-part, the National Environmental Policy Act (NEPA). CEQA and NEPA both require affected public agencies to analyze and disclose project-related environmental effects, including potentially significant impacts on endangered, rare, and threatened special status species. Under CEQA’s “substantive mandate,” for example, state and local agencies in California must avoid or substantially lessen significant environmental effects to the extent feasible. With that mandate, and the Department’s regulatory jurisdiction generally, the Department expects related CEQA and NEPA review will likely result in increased information regarding the status of coast yellow leptosiphon in California as a result of, among other things, updated occurrence and abundance information for individual projects. Where significant impacts are identified under CEQA, the Department expects project-specific required avoidance, minimization and mitigation measures will also benefit the species. While both CEQA and NEPA would require analysis of potential impacts to coast yellow leptosiphon regardless of their listing status under CESA, the acts contain specific requirements for analyzing and mitigating impacts to listed species. In common practice, potential impacts to listed species are examined more closely in CEQA and NEPA documents than potential impacts to unlisted species. State listing, in this respect, and required consultation with the Department during state and local agency environmental review under CEQA, is also expected to benefit the species in terms of related impacts for individual projects that might otherwise occur absent listing.

If coast yellow leptosiphon is listed under CESA, it may increase the likelihood that state and federal land and resource management agencies will allocate funds towards protection and recovery actions. However, funding for species recovery and management is limited, and there is a growing list of threatened and endangered species.

MANAGEMENT RECOMMENDATIONS AND RECOVERY MEASURES

CESA directs the Department in its Status Review to recommend management activities and other recommendations for recovery of coast yellow leptosiphon (Fish & G. Code, § 2074.6; Cal. Code Regs., tit. 14, § 670.1, subd. (f)). The utility of current data on coast yellow leptosiphon is limited by being largely anecdotal and qualitative. Studies designed to provide quantitative data on the coast yellow leptosiphon population, and the factors that affect the potential for coast yellow leptosiphon to survive and reproduce, are necessary for species management. Department staff with suggestions from local agencies, non-profits, and interested parties generated the following list of recommended management actions:

- Collect and bulk seeds of coast yellow leptosiphon for long term conservation storage and potential introduction into suitable habitat;
- Identify and restore degraded potential coast yellow leptosiphon habitat near the existing population. Collect and distribute seed into nearby suitable habitat;
- Permanently protect the coast yellow leptosiphon population on County of San Mateo property and on the private parcel where one individual coast yellow leptosiphon individual was observed from modification and destruction via fee title acquisition, conservation easements or similar protective measures;
- Permanently protect the private parcels adjacent to the coast yellow leptosiphon population from modification and destruction via fee title acquisition, conservation easements or similar protective measures to provide a buffer adjacent to the coast yellow leptosiphon population;
- Remove and control the freeway iceplant invasion adjacent to the coast yellow leptosiphon population;
- Restrict public access in the vicinity of the coast yellow leptosiphon population through installation of protective fencing and/or signs, or other suitable means;
- Remove or relocate the bench adjacent to the coast yellow leptosiphon population, or provide other creative foot-traffic influencing features in the area to encourage people to avoid walking through the coast yellow leptosiphon population;
- Research the life history characteristics of coast yellow leptosiphon, including factors related to pollination, seed dispersal, seed longevity and soil seed bank, seed productivity, growth, propagation, and microhabitat requirements for germination and recruitment;
- Implement monitoring and adaptive management programs for the coast yellow leptosiphon population. Ensure that monitoring results trigger appropriate management responses such as implementing other measures to control invasive species or controlling recreational activities. Make the data and reports from monitoring and adaptive management programs available to resource agencies and to those who are directly involved in coast yellow leptosiphon management;
- Implement a program to detect coast yellow leptosiphon population trends using statistically-valid population estimates; and
- Survey for additional populations of coast yellow leptosiphon.

Commented [A6]: Protection for at least some portion of the adjacent parcels, nearest to and/or with habitat best suited for the leptosiphon, is urgent!

PUBLIC RESPONSE

Comments were invited in response to the Petition in letters mailed on June 6, 2017, to property owners where the coast yellow leptosiphon population occurs and adjacent property owners,

and in a Department Press Release dated August 9, 2017. The Department received three comments in response to the press release and letters, which are included in Appendix A.

PEER REVIEW

Independent botany experts were invited to review the Status Review report before submission to the Fish and Game Commission. The letters of invitation and all comments received are included in Appendix B [Will be included in the final draft].

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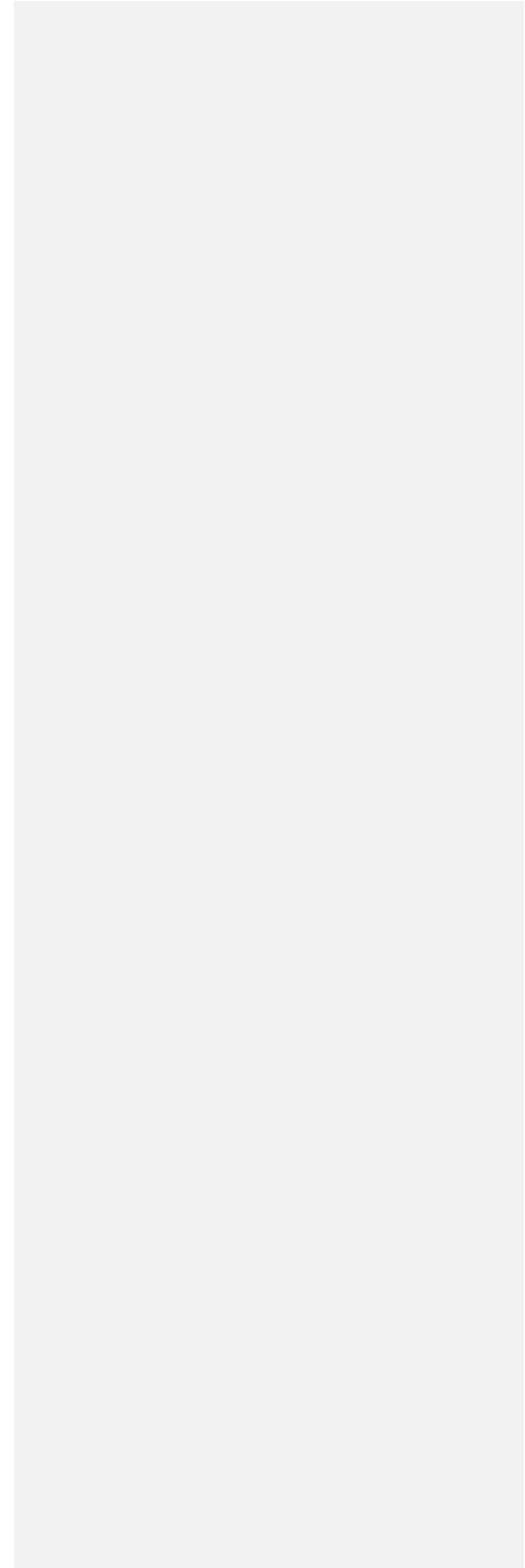
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APPENDIX A: Comments from Affected and Interested Parties on the Petitioned Action



APPENDIX B: External Peer Review Invitation Letters and Comments from Peer Reviewers on the Coast Yellow Leptosiphon Status Review Report

DRAFT

Peer Review Comments from Neal Kramer and Department Responses

Page	Line	Reviewer Comment	Department Response
7	17	The description below is thorough and consistent with my experience.	Comment noted. No response needed.
7	45	Typo corrected.	Text updated.
14	15	Ultimately, this potential seed bank may be an essential element for long term survival of the species.	Text added to this section: "Presence of a potential seed bank may be an essential element for long-term survival of coast yellow leptosiphon."
14	31	Any evidence that this would be a net positive or negative impact? The leptosiphon might benefit from soil tilling or seed dispersal by burrowing mammals.	The Department does not have information on how burrowing mammals would specifically affect coast yellow leptosiphon, only general references on the negative impacts of burrowing mammals to plant populations and species diversity. Text modified to indicate the Department does not have any specific information on the effects of burrowing mammals on the survival of coast yellow leptosiphon.
22	4	I would be happy to contribute to any formal monitoring activities proposed.	Comment noted. No response needed.
22	28	The case is clearly made that factors 1., 4., and 6. apply.	Comment noted. No response needed.
27	19	Protection for at least some portion of the adjacent parcels, nearest to and/or with habitat best suited for the leptosiphon, is urgent!	Comment noted. No response needed.
27	31	"and soil seed bank" added to text.	Text updated.



State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Habitat Conservation Planning Branch
1416 Ninth Street, 12th Floor
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EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



October 2, 2017

Robert Patterson, Ph.D.
Department of Biology
San Francisco State University
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San Francisco, California 94132
patters@sfsu.edu

Dear Dr. Patterson:

Coast Yellow Leptosiphon (*Leptosiphon croceus*); California Department of Fish and Wildlife, Peer Review Status Report

Thank you for agreeing to serve as a scientific peer reviewer for the California Department of Fish and Wildlife (Department) Status Review of coast yellow leptosiphon (*Leptosiphon croceus*). Please review the copy of the Department's peer review draft report dated October 2, 2017, that is included with this letter. The Department seeks your expert analysis and input regarding the scientific validity of the report and its assessment of the status of coast yellow leptosiphon in California based on the best scientific information currently available. The Department respectfully requests that you focus your peer review effort on the body of relevant scientific information and the Department's related assessment of the population and life history elements prescribed in the California Endangered Species Act (CESA). **The Department would appreciate receiving your peer review input on or before October 31, 2017.**

The Department seeks your scientific peer review as part of formal proceedings pending before the California Fish and Game Commission (Commission) under CESA. As you may know, the Commission is a constitutionally established entity distinct from the Department, exercising exclusive statutory authority under CESA to list species as endangered or threatened (Fish & G. Code, § 2070). The Department serves in an advisory capacity during CESA listing proceedings, charged by the Fish and Game Code to focus on the best scientific information available to make related recommendations to the Commission (Fish & G. Code, § 2074.6).

The Commission received the petition to list coast yellow leptosiphon under CESA on May 25, 2016. On December 23, 2016, the Commission published findings formally designating coast yellow leptosiphon as a candidate for listing as threatened or endangered under CESA. Coast yellow leptosiphon is currently protected under CESA in California in that capacity.

The peer review draft report forwarded to you today reflects the Department's effort to identify and analyze the best scientific information available regarding the status of

Robert Patterson, Ph.D.
San Francisco State University
October 2, 2017
Page 2

coast yellow leptosiphon in California. At this time, the Department believes that the best available science indicates that listing the species as endangered under CESA is warranted. We underscore, however, that scientific peer review plays a critical role in the Department's effort to develop and finalize its recommendation to the Commission as required by the Fish and Game Code. Our expected recommendation to the Commission at this point may change following your input.

We ask you to focus your peer review on the best scientific information available regarding the status of coast yellow leptosiphon in California. As with our own effort to date, your peer review of the science and analysis regarding each of the population and life history categories prescribed in CESA are particularly important (Cal. Code Regs., tit. 14, § 670.1(i)(1)(A)) (i.e., present or threatened habitat modification, overexploitation, predation, competition, disease, and other natural occurrences or human-related activities that could affect the species) as well as whether it indicates, in your opinion, that coast yellow leptosiphon is at serious risk of becoming extinct throughout all or a significant portion of its range in California, or whether the species is likely to become so in California in the foreseeable future. Please note that the Department releases this peer review report to you solely as part of the peer review process, and it is not yet public.

A Microsoft Word version and a PDF version of the report are included with this letter; however, only the PDF version includes figures and appendices. For ease of review, you may submit your comments in "track changes" format, or in list form by page and line number. Please submit your comments electronically to Ms. Cherilyn Burton, Senior Environmental Scientist (Specialist) at cherilyn.burton@wildlife.ca.gov. Ms. Burton may also be reached at (916) 651-6508. If there is anything the Department can do to facilitate your review, please let us know.

Following receipt and consideration of peer review comments, the Department will prepare and submit its final report and related recommendation to the Commission. After at least a 30 day public review period, the Commission will consider the petition to list coast yellow leptosiphon, the Department's report and related recommendations including peer review, and public testimony during a regularly scheduled Commission meeting prior to making their decision.

Thank you again for your contribution to the status review effort and the important input it provides during the Commission's related proceedings.

Sincerely,



Richard Macedo, Branch Chief
Habitat Conservation Planning Branch

Robert Patterson, Ph.D.
San Francisco State University
October 2, 2017
Page 3

Enclosures

cc: California Department of Fish and Wildlife

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**State of California
Natural Resources Agency
Department of Fish and Wildlife**

REPORT TO THE FISH AND GAME COMMISSION

STATUS REVIEW OF COAST YELLOW LEPTOSIPHON (*Leptosiphon croceus*)

December 2017



Coast yellow leptosiphon (*Leptosiphon croceus*), CDFW photo by Cherilyn Burton

**Charlton H. Bonham, Director
Department of Fish and Wildlife**



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APPENDIX B. External Peer Review Invitation Letters and Comments from Peer Reviewers on the Coast Yellow Leptosiphon Status Review Report

LIST OF ABBREVIATIONS, ACRONYMS AND TERMS

CEQA – California Environmental Quality Act

CESA – California Endangered Species Act

CNDDDB – California Natural Diversity Database

CNPS – California Native Plant Society

Commission – California Fish and Game Commission

CRPR – California Rare Plant Rank

Department – California Department of Fish and Wildlife

Occurrence – CNDDDB Element Occurrence

Evaluation – Initial Evaluation of the Petition to List Coast Yellow Leptosiphon (*Leptosiphon croceus*) as an Endangered Species under the California Endangered Species Act

Id. – “the same”

NEPA – National Environmental Policy Act

Petition - Petition to the State of California Fish and Game Commission from Ms. Toni Corelli Cosponsored by the California Native Plant Society to List Coast Yellow Leptosiphon (*Leptosiphon croceus*) as an Endangered Species Pursuant to the California Endangered Species Act

ssp. – Subspecies

var. – Variety

EXECUTIVE SUMMARY

This Status Review of Coast Yellow Leptosiphon (*Leptosiphon croceus* (Eastw.) Strother & Kersh) (Status Review) has been prepared by the California Department of Fish and Wildlife (Department) for the California Fish and Game Commission (Commission) pursuant to the requirements of the California Endangered Species Act (CESA). This Status Review has been independently reviewed by scientific peers, and is based upon the best scientific information available to the Department.

Coast yellow leptosiphon is a low-growing annual plant in the Phlox family (Polemoniaceae) that was first described in 1904. It is known from only one small population that occupies approximately 167 square meters (1,800 square feet), located on Vallemar Bluff in Moss Beach, San Mateo County. This population is located in coastal prairie habitat atop a sea bluff at the edge of the coastline.

The population of coast yellow leptosiphon occurs in close proximity to urban land use, and has been either directly or indirectly impacted by modification or destruction of habitat. Coast yellow leptosiphon is threatened, both directly and indirectly, by development and other land-use changes; impacts from invasive plant species; and impacts from human activities such as trampling. Bluff-top erosion is also a serious threat to this species, and climate change may accelerate this process. In addition, coast yellow leptosiphon is highly vulnerable to extinction due to its extremely limited distribution and restriction to only one small population. Because of the rarity of coast yellow leptosiphon, the loss of any occupied habitat or any portion of the population would represent the loss of a significant portion of its total range, and could result in extinction of the species.

Scientific information available to the Department indicates that coast yellow leptosiphon is in serious danger of becoming extinct in all or a significant portion of its range due to one or more causes, including loss of habitat, change in habitat, competition and other effects from invasive plant species, and other natural occurrences and human-related activities. The Department recommends that the Commission find that the petitioned action to list coast yellow leptosiphon as an endangered species is warranted, and further recommends implementation of the management recommendations and recovery measures described in this Status Review.

1 INTRODUCTION

2 This Status Review addresses coast yellow leptosiphon (*Leptosiphon croceus* (Eastw.) Strother
3 & Kersh).

4 Petition History

5 On May 25, 2016, the Commission received a petition (Petition) from Ms. Toni Corelli,
6 cosponsored by the California Native Plant Society (CNPS), to list coast yellow leptosiphon as
7 an endangered species pursuant to CESA (Fish & G. Code, § 2050 *et seq.*).
8

9 On May 27, 2016, the Commission referred the Petition to the Department for evaluation.
10

11 On June 10, 2016, as required by Fish and Game Code section 2073.3, the Commission
12 published notice of receipt of the Petition in the California Regulatory Notice Register. (Cal. Reg.
13 Notice Register 2016, No. 24-Z, p.1002, [https://www.oal.ca.gov/wp-](https://www.oal.ca.gov/wp-content/uploads/sites/28/2017/05/24z-2016.pdf)
14 [content/uploads/sites/28/2017/05/24z-2016.pdf](https://www.oal.ca.gov/wp-content/uploads/sites/28/2017/05/24z-2016.pdf)). The Department on July 25, 2106, pursuant to
15 Fish and Game Code Section 2073.5 requested a 30-day extension of time to complete its
16 evaluation report.
17

18 On September 26, 2016, the Department provided the Commission with a report, "Evaluation of
19 the Petition from Ms. Toni Corelli and the California Native Plant Society to List Coast Yellow
20 Leptosiphon (*Leptosiphon croceus*) as an Endangered Species under the California
21 Endangered Species Act" (Evaluation). Based upon the information contained in the Petition,
22 the Department concluded, pursuant to Fish and Game Code, section 2073.5, subdivision (a),
23 that sufficient information exists to indicate that the petitioned action may be warranted, and
24 recommended to the Commission that the Petition should be accepted and considered.
25

26 On December 8, 2016, at its scheduled public meeting in San Diego, California, the
27 Commission considered the Petition, the Department's Evaluation and recommendation, and
28 comments received. The Commission found that sufficient information existed to indicate the
29 petitioned action may be warranted and accepted the Petition for consideration.
30

31 Subsequently, on December 23, 2016, the Commission published its Notice of Findings for
32 coast yellow leptosiphon in the California Regulatory Notice Register, designating coast yellow
33 leptosiphon as a candidate species. (Cal. Reg. Notice Register 2016, No. 52-Z, p. 2197,
34 <https://www.oal.ca.gov/wp-content/uploads/sites/28/2017/05/52z-2016.pdf>).

35 Department Review

36 Following the Commission's action to designate coast yellow leptosiphon as a candidate
37 species, the Department notified affected and interested parties and solicited data and
38 comments on the petitioned action pursuant to Fish and Game Code section 2074.4 (see also
39 Cal. Code Regs., tit. 14, § 670.1, subd. (f)(2)). All comments received are included in Appendix
40 A to this report. The Department promptly commenced its review of the status of the species as
41 required by Fish and Game Code section 2074.6, which has now concluded with this Status
42 Review document.
43

44 The Department sought independent and competent peer review on its draft Status Review
45 report by persons of the scientific and academic community commonly acknowledged to be

1 experts on coast yellow leptosiphon and possessing the knowledge and expertise to critique the
2 scientific validity of the draft Status Review. Appendix B contains a listing of the individuals and
3 agencies given an opportunity to review the draft Status Report, the specific input provided to
4 the Department by the individual peer reviewers, the Department's written response to the input,
5 and any amendments made to the draft Status Review report (Fish & G. Code, § 2074.6; Cal.
6 Code Regs., tit. 14, § 670.1, subd. (f)(2)). [This will be included in the final report]

7 BIOLOGY

8 Species Description

9 The information below is paraphrased from the original species description of coast yellow
10 leptosiphon (Eastwood 1904) and from the Jepson eFlora (Patterson and Battaglia 2017).

11
12 Coast yellow leptosiphon is an herbaceous plant that grows to a height of 2 to 7 centimeters
13 (0.8 to 2.8 inches). Its slender stem is much-branched from the base and is covered with white
14 appressed hairs, meaning the hairs are pressed closely against the stem. It has opposite leaves
15 that are generally divided into six lobes and are palmately compound, which means that all the
16 sections or lobes of the leaf, called leaflets, are connected at a common point, resembling a fan.
17 The leaflets are approximately 4 to 7 millimeters (0.16 to 0.28 inches) long on the lower stem
18 and almost twice as long near the flowers, appearing as whorls at the nodes. The leaflets are
19 narrowly oval with the narrower end at the base. The flowers are arranged in heads that are
20 subtended by palmately-divided leaf-like structures called bracts, with five linear divisions that
21 are approximately 7 millimeters (0.28 inch) long and up to 1 millimeter (0.04 inch) wide. The
22 flowers have bright yellow petals that are approximately 6 to 8 millimeters (0.24 to 0.31 inch)
23 wide and generally have two faint red dots at the base. The petals, which collectively are
24 referred to as the corolla, are fused at the base, forming a long funnel-shaped tube that is 26 to
25 39 millimeters (1.0 to 1.5 inches) long and covered with fine, scattered, spreading hairs. The
26 calyx lobes, otherwise known as sepals, are generally deltate or triangular-shaped, less than 1
27 millimeter (0.04 inch) wide at the middle, densely glandular-hairy, and have an obscure thin
28 membrane between the lobes. Flowers are bisexual, which means they contain both male and
29 female flower parts in the same flower. The fruit is called a capsule, which is a dry fruit from a
30 compound pistil (female flower part) that opens at maturity to release its seeds. Few seeds are
31 produced by each flower. Coast yellow leptosiphon has a chromosome number of $2n=18$.

32 Taxonomy

33 Coast yellow leptosiphon is in the Phlox family (Polemoniaceae), which has a long history of
34 taxonomic confusion (Bell and Patterson 2000; Hankamp et al. 2016). *Leptosiphon* was
35 originally recognized as a genus in 1833 (Bell and Patterson 2000; Porter and Johnson 2000).
36 Greene (1889-1892) combined several genera, including *Leptosiphon*, into a single genus,
37 *Linanthus*, based predominantly on the presence of opposite, palmately-lobed leaves (Battaglia
38 and Patterson 2001). Porter and Johnson (2000) reclassified the taxa within Polemoniaceae
39 and divided *Linanthus* into two distinct genera, *Leptosiphon* and *Linanthus*.

40
41 Alice Eastwood, botanist and curator of the California Academy of Sciences Herbarium from
42 1894 until 1949, formally described coast yellow leptosiphon as a species in 1904 (Eastwood
43 1904; Porter and Johnson 2000). A single specimen collected by Eastwood on May 9, 1901,
44 has been designated as the type specimen for coast yellow leptosiphon (Strother and Kersh
45 2016), and is maintained at the California Academy of Sciences Herbarium. Eastwood originally

Commented [A1]: No, the leaves are not compound.

Commented [A2]: This is an incorrect use of the term. Leaflets are divisions of a compound leaf. Leptosiphon has deeply lobed simple leaves. Lobes are simply called lobes.

Commented [A3]: lobes

Commented [A4]: lobes

Commented [A5]: Here you're referring to corolla lobes. The term "petal" should be reserved for corolla parts that are not fused to each other.

Commented [A6]: I would call these dots pretty bright, not faint at all (cf your photo).

Commented [A7]: The tube isn't really funnel-shaped. It's tubular. The corolla is actually salverform.

Commented [A8]: The calyx lobes are actually connected by the membrane so that the entire calyx is a tube.

Commented [A9]: organs

Commented [A10]: organ

1 labeled the specimen as *Gilia androsacea* var. *crocea* (Corelli 2016; Strother and Kersh 2016),
2 but assigned it the species name *Linanthus croceus* Eastw. when she first formally described
3 the species in 1904. Coast yellow leptosiphon has been reclassified several times. Other names
4 assigned to the species include *Linanthus parviflorus* var. *croceus* (Milliken 1904), *Linanthus*
5 *androsaceus* var. *croceus* (Jepson 1925), and *Linanthus androsaceus* ssp. *croceus* (Munz
6 1959). In the 1993 Jepson manual, coast yellow leptosiphon and several other closely-related
7 species were grouped together into a single species called variable linanthus (*Linanthus*
8 *parviflorus*) (Hickman 1993), until Porter and Johnson revised the entire family based on
9 morphological and molecular data. In Porter and Johnson's publication, *Linanthus parviflorus*
10 was reclassified as *Leptosiphon parviflorus*, and coast yellow leptosiphon was recognized as a
11 distinct species, *Leptosiphon croceus* (Eastw.) (Porter and Johnson 2000). Due to an incorrect
12 citation in Porter and Johnson's publication (2000), *Leptosiphon croceus* was not considered to
13 be a validly published species name until Strother and Kersh (2016) corrected the citation error
14 and validly published the current taxonomic name, *Leptosiphon croceus* (Eastw.) Strother &
15 Kersh (Strother and Kersh 2016; Patterson and Battaglia 2017).

16
17 There are 31 species and 9 subspecies of *Leptosiphon*. Geographically, five of these species
18 occur in the same geographic area of central California as coast yellow leptosiphon: bristly
19 leptosiphon (*L. acicularis*), false babystars (*L. androsaceus*), true babystars (*L. bicolor*), variable
20 linanthus, and rose leptosiphon (*L. rosaceus*). Taxonomically, coast yellow leptosiphon is most
21 closely related to variable linanthus and broad-lobed leptosiphon (*L. latisectus*) (Hankamp et al.
22 2016).

23 Range and Distribution

24 Range is the general geographical area where an organism occurs. For purposes of CESA and
25 this Status Review, the range is the species' California range (*Cal. Forestry Assn. v. Cal. Fish*
26 *and Game Com.* (2007) 156 Cal.App.4th 1535, 1551). Distribution refers to actual sites where
27 individuals and populations of the species occur within the species' range.

28
29 The genus *Leptosiphon* occurs primarily in western North America, with one species occurring
30 only in Chile. California is the center of diversity for *Leptosiphon* (Hankamp et al. 2016), where
31 90 percent of the species occur across diverse habitats in the California Floristic Province and
32 adjacent areas (Bell and Patterson 2000).

33
34 Coast yellow leptosiphon occurs only in California. Coast yellow leptosiphon was first collected
35 at "Blenheim" by Alice Eastwood, which was a short-lived place name mapped about 3-5
36 kilometers (2-3 miles) north of Pillar Point and apparently referred to a place at or near present-
37 day Moss Beach (Strother and Kersh 2016; CNDDDB 2017). There is limited history of collection
38 of plants in the vicinity of Moss Beach, with most collections dating from the early 1900's to the
39 1940's. A search conducted by the petitioner for coast yellow leptosiphon in the Consortium of
40 California Herbaria database and California herbaria throughout California found 40 collection sheets that
41 were labeled *Leptosiphon croceus* or a synonym of *Leptosiphon croceus*. These specimens were reviewed
42 in 2016 to verify their identification (Corelli 2016). Many plant specimens that were originally identified
43 as coast yellow leptosiphon had been misidentified and actually represent other *Leptosiphon* species.
44 Review of these specimens indicates that only the historic specimens that were collected from Moss
45 Beach represent coast yellow leptosiphon, and that coast yellow leptosiphon is restricted to one colony
46 in Moss Beach, San Mateo County.

47
48 The coast of San Mateo County has been frequently visited by botanists and scientific plant
49 collectors, including botanists that specialize in *Leptosiphon* species. Despite their attempts, no

Commented [A11]: The correct citation is Patterson 1993. Hickman was the editor of TJM1, Patterson authored the treatment.

Commented [A12]: This species is now known as *L. aureus* (see Porter and Patterson, 2014, *Aliso* 32(2), 55–88.

Commented [A13]: Insert (*L. parviflorus*)

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1 additional populations of coast yellow leptosiphon have been discovered (Corelli 2016).
2 Available data indicate that coast yellow leptosiphon has always been limited in its range and
3 restricted to the Moss Beach area.

4
5 The distribution of coast yellow leptosiphon is documented in the California Natural Diversity
6 Database (CNDDB). The CNDDB documents plant taxa, animal taxa, and natural communities
7 that are of conservation concern within California and refers to these taxa as “elements.” An
8 “element occurrence” (occurrence) is a location record for a site which contains an individual,
9 population, nest site, den, or stand of a special status element. Populations, individuals, or
10 colonies that are located within 1/4 mile of each other generally constitute a single occurrence,
11 sometimes with multiple “parts” (Bittman 2001). The CNDDB previously contained four
12 occurrences for coast yellow leptosiphon. In March 2016, the CNDDB updated its database to
13 remove three of these occurrences because they had been incorrectly identified as coast yellow
14 leptosiphon, but actually represented other closely related species (Corelli 2016; Lazar pers.
15 comm. 2016). This update resulted in there being only one valid occurrence for this species in
16 the CNDDB (see Figure 1).

17
18 The CNDDB documented occurrence and coast yellow leptosiphon population is located within
19 the Fitzgerald Marine Reserve, which is owned by the County of San Mateo and is a San Mateo
20 County Park. The area immediately adjacent to the coast yellow leptosiphon population and the
21 Fitzgerald Marine Reserve consists of several privately owned parcels that are proposed for
22 development as shown in Figure 1 and as described below in the Factors Affecting the Ability to
23 Survive and Reproduce section of this report. The County of San Mateo property and the
24 adjacent private parcels are zoned Resource Management-Coastal Zone (RM-CZ).
25 Development is allowed in an RM-CZ zone, but all development requires approval from the San
26 Mateo County Coastside Design Review Committee (CDRC 2017).

27
28 The population of coast yellow leptosiphon is estimated to occupy an area approximately 18
29 meters by 9 meters (60 feet by 30 feet) or 167 square meters (1,800 square feet) in size
30 (CNDDB 2017; Department staff observation), which represents the entire distribution and
31 range of the species. In addition to the mapped population of coast yellow leptosiphon shown in
32 the CNDDB, one individual plant was also identified outside of the mapped population on the
33 adjacent private property on May 16, 2016 (T. Corelli pers. comm. 2016) (see Figure 2). Since
34 annual plants reproduce by seed, a seed bank is potentially present in the area where this plant
35 was identified.

36 Life History

37 Coast yellow leptosiphon is an annual plant, which means that it completes its life cycle within
38 one year or growing season. It generally flowers from April to June (CNPS 2017; Patterson and
39 Battaglia 2017). Little is known about the mating system of coast yellow leptosiphon. It is closely
40 related to variable linanthus, which is a fully self-incompatible species, meaning it does not self-
41 fertilize (Goodwillie 1999; Weber and Goodwillie 2013). Self-incompatible plants rely on
42 pollinators or are wind-pollinated (Goodwillie 1999). Pollination studies conducted on other
43 species of *Leptosiphon* indicate they are predominantly bee fly- (Bombyliidae) and wind-
44 pollinated (Goodwillie 2001). Other potential pollinators such as a beetle (*Listrus* sp.) in the
45 Melyridae family (soft-wing flower beetles) have been recently observed on coast yellow
46 leptosiphon (Corelli 2016). The Department does not have information on seed dispersal for
47 coast yellow leptosiphon, but like many other plant species, seeds may be dispersed by birds or
48 other animals, gravity, water flow, or other mechanisms.

1 *Figure 1 - Vicinity of Coast Yellow Leptosiphon*

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1 *Figure 2 - Parcels Proposed for Development*

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1 Similar-looking Plants

2 Coast yellow leptosiphon shares morphological characteristics with other leptosiphon species,
3 including false baby-stars, broad-lobed leptosiphon, rose leptosiphon, and variable linanthus.
4 Coast yellow leptosiphon is the shortest of all *Leptosiphon* species, and the width of the corolla
5 lobes is the largest in the complex. Coast yellow leptosiphon can be distinguished from false baby-
6 stars and rose leptosiphon by its densely glandular-hairy calyx lobes throughout the whole surface as
7 opposed to the non-glandular ciliate hairs only on the margins of the calyx lobes of false baby-stars and
8 rose leptosiphon (Patterson and Battaglia 2017). Coast yellow leptosiphon is distinguished from variable
9 linanthus and broad-lobed leptosiphon by its rounded corolla lobes and short habit of less than 7
10 centimeters (2.8 inches) tall (Battaglia and Patterson 2001). In addition, broad-lobed leptosiphon is not
11 known to occur in the same geographical range as coast yellow leptosiphon (Patterson and Battaglia
12 2017).

13 Habitat that may be Essential to the Continued Existence of the Species

14 Coast yellow leptosiphon grows at the edge of the coastline on a marine terrace supported by
15 sedimentary sandstone-derived soil. It occurs on a bluff at an elevation of 14 meters (46 feet), in
16 habitat that is highly influenced by wind, cool salt-laden air, and fog (CNDDDB 2017).

17 Vegetation Communities

18 Coast yellow leptosiphon is associated with a diverse array of native perennial grasses such as
19 maritime brome (*Bromus maritimus*), California oat grass (*Danthonia californica*), tufted
20 hairgrass (*Deschampsia cespitosa* ssp. *holciformis*), and northern barley (*Hordeum*
21 *brachyantherum* ssp. *brachyantherum*). Other species associated with coast yellow leptosiphon
22 include native species such as sea-pink (*Armeria maritima* ssp. *californica*), seaside wild
23 buckwheat (*Eriogonum latifolium*), coastal button-celery (*Eryngium armatum*), beach strawberry
24 (*Fragaria chiloensis*), purple cudweed (*Gamochaeta ustulata*), coastal gumplant (*Grindelia stricta* var.
25 *platyphylla*), and Davy's centaury (*Zeltnera davyi*). Three other rare species grow in association with
26 coast yellow leptosiphon, Blasdale's bent grass (*Agrostis blasdalei*), harlequin lotus (*Hosackia*
27 *gracilis*), and Johnny-nip (*Castilleja ambigua* ssp. *ambigua*) (Department observation; Corelli
28 2016; Jodi McGraw Consulting 2017). Blasdale's bent grass has a California Rare Plant Rank
29 (CRPR) of 1B.2 (rare, threatened or endangered in California and elsewhere; moderately
30 threatened in California), and harlequin lotus and Johnny-nip have a CRPR of 4.2 (plants of
31 limited distribution – a watch list; moderately threatened in California). Several non-native
32 species are associated with coast yellow leptosiphon and are colonizing the bluff top, including
33 freeway iceplant (*Carpobrotus edulis*), rattail sixweeks grass (*Festuca myuros*), rye grass (*Festuca*
34 *perennis*), hare barley (*Hordeum murinum* ssp. *leporinum*), rough cat's-ear (*Hypochaeris radicata*), cut-
35 leaved plantain (*Plantago coronopus*), and English plantain (*Plantago lanceolata*).
36

37 The Department uses A Manual of California Vegetation, Second Edition (Sawyer et al. 2009) to
38 classify natural communities within California. However, the area where coast yellow
39 leptosiphon occurs has not yet been classified using A Manual of California Vegetation, Second
40 Edition. The habitat where coast yellow leptosiphon occurs would likely be classified as Coastal
41 Terrace Prairie (Element Code 41100) under Robert Holland's Preliminary Descriptions of the
42 Terrestrial Natural Communities of California (1986). Holland's classification system was used
43 by the Department in the past to classify natural communities within California, but has since
44 been superseded by A Manual of California of Vegetation, Second Edition (Sawyer et al. 2009).
45 The CNDDDB continues to maintain historic records of the natural community occurrences,
46 although new community occurrences have not been added to the CNDDDB since the 1990's

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Should read 1990s.

(California Department of Fish and Wildlife 2017). While the Holland system for classifying natural communities is no longer supported by the Department, this information may be useful for describing vegetation in areas of California that have not yet been classified using A Manual of California Vegetation, Second Edition. Information on Holland's Coastal Terrace Prairie community in the CNDDDB is described below but this information should be used with caution as the rankings are no longer updated or reviewed by the CNDDDB.

Coastal Terrace Prairie is a rare natural community described as having a dense, tall grassland dominated by both sod and tussock-forming perennial grasses growing to 1 meter (3.3 feet) tall, with patchy and variable stands that reflect local differences in available soil moisture capacity (Holland 1986). Coastal Terrace Prairie has a natural heritage global rarity rank of G2 (Imperiled) and a state rarity rank of S2.1 (Imperiled and very threatened) in the CNDDDB. A rank of G2 means that an element is at high risk of global extinction or elimination due to a very restricted range, very few populations (often 20 or fewer), very steep declines, or other factors. A state rank of S2 means that an element is imperiled in the state because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation from the state, and the ".1" signifies that the element is "very threatened" (CNDDDB 2017).

While the habitat where coast yellow leptosiphon occurs is not yet classified in A Manual of California Vegetation, Second Edition (Sawyer et al. 2009), the species composition overlaps with that listed in the *Deschampsia cespitosa* Herbaceous Alliance (tufted hair grass meadow). The *D. cespitosa* – *Danthonia californica* and *D. cespitosa* – *Eryngium armatum* Associations, which have been described on coastal bluffs and terraces and in other areas in California (Sawyer et al. 2009; Klein et al. 2015), fall within the *Deschampsia cespitosa* Herbaceous Alliance. This alliance includes both the Coastal Terrace Prairie and the Wet Subalpine or Alpine Meadow (Element Code 45210) communities described in the Holland classification system (1986). It is mapped on bluffs and terraces along the central and northern California coast and in montane areas in northern and central California, and is widespread outside of California. The *D. cespitosa* Herbaceous Alliance has a natural heritage global rarity rank of G5 (Secure) and a state rarity rank of S4? (Uncertain but Apparently Secure) (Sawyer et al. 2009, CNDDDB 2017). The specific association type of this vegetation has yet to be defined. However, in the recent study of the vegetation of Sonoma County (Klein et al. 2015) both of the related associations are considered imperiled and/or imperiled and very threatened. The *D. cespitosa* – *Danthonia californica* Association has a Global Rank of G3 (Vulnerable) and a State Rank of S2 (Imperiled), while the other closely related association, the *D. cespitosa* – *Eryngium armatum* Provisional Association is ranked G3G2?/S3S2? (Uncertain but Vulnerable or Imperiled). It is likely that all of the coastal associations of the *D. cespitosa* Herbaceous Alliance are similarly rare and threatened.

East of the coast yellow leptosiphon population, a large stand of Monterey cypress (*Hesperocyparis macrocarpa*) trees is growing on Vallemar Bluff along Vallemar Street. Monterey cypress is known from only two native occurrences, which are in the Monterey area. It is considered invasive in other parts of California, and it has been widely planted and naturalized in other areas along the coast (Cal-IPC 2017; CNPS 2017). The Monterey cypress trees near the coast yellow leptosiphon population likely represent planted specimens. The understory of this stand is disturbed and consists mostly of non-native plant species including ripgut brome (*Bromus diandrus*), freeway iceplant, panic veldt grass (*Ehrharta erecta*), false brome (*Brachypodium distachyon*), pride of Madeira (*Echium candicans*), Japanese cheesewood (*Pittosporum tobira*), and pincushion flower (*Scabiosa atropurpurea*).

Freeway iceplant is present in large patches scattered throughout the Coastal Terrace Prairie, and a large patch is growing on the bluff immediately adjacent to the coast yellow leptosiphon population. North of the coast yellow leptosiphon population, the coastal bluff between the existing homes and the edge of the bluff is completely dominated by large mats of freeway iceplant with very little room for other herbaceous plants to grow. Monterey cypress trees are also scattered along the bluff north of the coast yellow leptosiphon population.

South of the Coastal Terrace Prairie, on the other side of Juliana Drive, the area consists of residential development (Figure 2).

Geology and Soils

Coast yellow leptosiphon grows on the edge of Vallemar Bluff in Moss Beach overlooking the Pacific Ocean. The Natural Resources Conservation Services' soil map unit for this area is rock outcrop-Orthents complex (Soil Survey Staff 2017). Orthents occur on escarpments, which are steep slopes or long cliffs that form as an effect of faulting or erosion and separate two relatively level areas of differing elevations. Orthents parent material consists of mixed sedimentary, serpentine, or basaltic volcanic rock (Soil Survey Staff 2017). The coast yellow leptosiphon population grows on a marine terrace supported by sedimentary sandstone-derived soil underlain by a relatively thin veneer of terrace deposits, consisting primarily of poorly to moderately consolidated gravel, sand, silt, and clay of marine origin (Pampeyan 1994).

The site is in a geologically active region of California, and is located approximately 427 meters (1,400 feet) northeast of the Seal Cove Fault and about 10.9 kilometers (6.8 miles) southwest of the seismically active San Andreas Fault Zone. The active San Andreas, Hayward, and Calaveras Faults are all located within the nearby San Francisco Bay Area and could have active secondary faults with the potential to cause severe shaking at the coast yellow leptosiphon population. A major earthquake could significantly affect the unstable bluffs and soils, causing loose soil on the steep slopes near the coast yellow leptosiphon population to form sloughs or slides (JCP 1990).

Hydrology

The coast yellow leptosiphon population occurs in the Dean Creek catchment, which is approximately 146 hectares (360 acres) in size. Dean Creek is located northeast of the Fitzgerald Marine Reserve and flows into Kelp Cove, approximately 0.6 kilometers (0.3 miles) south of Vallemar Bluff.

The coast yellow leptosiphon population is located near a coastal bluff comprised partially of coastal terrace deposits that are susceptible to erosion, particularly by concentrated uncontrolled runoff of surface drainage. In two areas of the bluff edge, shallow gullies approximately 0.3 to 0.6 meter (1 to 2 feet) deep extend inland from the bluff edge. These gullies were likely formed as a result of overland storm runoff (Haro, Kasunich & Associates, Inc. 2015).

A geotechnical investigation was completed at Vallemar Bluff by Haro, Kasunich & Associates, Inc. in 2016. Test bore holes encountered groundwater at 4 to 5 meters (13 to 17 feet) below the ground surface. The groundwater appears to be perched upon the bedrock and seeping through the terrace (Haro, Kasunich & Associates, Inc. 2015).

1 Climate

2 Coast yellow leptosiphon occurs in an area with a maritime Mediterranean climate with distinct
3 wet and dry seasons. Most of the area's precipitation occurs from November through April.
4 Virtually all precipitation occurs as rain, although fog accounts for a small percentage
5 (Brady/LSA 2002). Using PRISM weather data from 1895 to 2015, the average minimum
6 temperature in the vicinity of Vallemar Bluff is 9°C (48°F), the average maximum temperature is
7 17°C (63°F), the average temperature is 13°C (55°F), and the average precipitation is 69
8 centimeters (27 inches) per year (PRISM Climate Group 2017).

9 **POPULATION TRENDS**

10 Scientific information on coast yellow leptosiphon's population trends is limited. The species has
11 not been monitored regularly, and the earliest reported survey was conducted by R. Battaglia in 1998,
12 with about 1,000 plants estimated (Battaglia 1998; Corelli 2016; CNDDDB 2017). T. Corelli estimated
13 population numbers in 1999 and 2015. An estimated 400-500 plants were recorded in 1999, and fewer
14 than 400 plants were estimated in 2015 (Corelli 1999, 2015).

15
16 Although little is known about population trends of coast yellow leptosiphon, the population that
17 was once described as covering the ground for several acres (Eastwood 1904) is now limited to
18 an area covering approximately 167 square meters (1,800 square feet or 0.04 acre), clearly
19 indicating a significant declining population trend.

20 **FACTORS AFFECTING THE ABILITY TO SURVIVE AND REPRODUCE**

21 **Habitat Modification and Destruction**

22 Past Modification and Destruction of Habitat

23 Habitat loss is considered the primary cause for species extinctions at local, regional, and global
24 scales (Dirzo and Raven 2003). Most of the coastal prairie habitat, which provides potential
25 habitat for coast yellow leptosiphon, has been destroyed or modified due to urban development,
26 agriculture, and invasion of non-native plant species (Ford and Hayes 2007). Coast yellow
27 leptosiphon was likely present over a larger geographic area prior to the development of the
28 San Mateo coast and conversion of coastal prairie habitat. Most of the habitat surrounding the
29 coast yellow leptosiphon population has been eliminated or altered due to road construction,
30 residential development, and invasion by non-native plant species, particularly the invasive
31 freeway iceplant which covers the coastal bluff adjacent to the coast yellow leptosiphon
32 population (Departmental observation). Installation of hardscape and storm drainage systems
33 related to urban development have altered runoff patterns and hydrology in and around
34 occupied coast yellow leptosiphon habitat.

35
36 Although it is likely that coast yellow leptosiphon has always been rare and restricted in range,
37 past modification and destruction of habitat has contributed to the limited availability of suitable
38 habitat for this species. These past changes affect the ability of coast yellow leptosiphon to
39 survive and reproduce.

Present and Future Modification and Destruction of Habitat

Development or changes in land use could directly destroy plants and living seeds in the seed bank and destroy both occupied and potential habitat. Threats to coast yellow leptosiphon may occur from development and changes in land use near the existing population. A residential development project is proposed on the parcels immediately adjacent to the coast yellow leptosiphon population (County of San Mateo 2017; Midcoast Community Council 2017). The area proposed for development consists of seven lots, which will be consolidated into four lots for the project. The proposed project will build four, three-story single-family residences, between 4,740 and 4,859 square feet in size, and is pending design review approval by the San Mateo County Coastside Design Review Committee (CDRC 2017). Figure 2 shows the property proposed for development in relationship to the coast yellow leptosiphon population, and Figure 3 shows the site plan. The developer has erected story poles on the parcels that represent locations and footprints of the proposed houses (Figure 4).

Coast yellow leptosiphon has been buffered from impacts from the adjacent highway by the 1.0-hectare (2.5-acre) undeveloped coastal prairie that provides a natural buffer between Highway 1 and the coast yellow leptosiphon population. Habitat buffers provide protection from edge effects (Saunders et al. 1991; Given 1994), which are changes in community structure that occur at the boundary of two habitats. Habitat buffers also provide extra protection from human activities, allow for a more natural habitat boundary, slow the speed of water runoff, and filter sediments, fertilizers, pesticides, heavy metals, and pathogens from runoff (Given 1994; Godfrey 2015; USDA 2017).

Any change in land use on this adjacent property is expected to result in indirect impacts to the coast yellow leptosiphon population. The proposed development will alter the hydrologic regime of the site. This will involve increased, altered, and unseasonal runoff patterns resulting from addition of hard, impervious surfaces, installation of drainage features such as storm drains and drainage pipes (Mesiti-Miller Engineering, Inc. 2017), and installation and use of landscape irrigation systems. Development often leads to unseasonal summer moisture resulting from watering landscape plants, washing cars, and other human activities. In addition, residential development will lead to an increase in use of fertilizers and nutrients, herbicides, pesticides, and other household chemicals and products which will run off and disperse into habitat occupied by coast yellow leptosiphon and could impact the plants as well as alter the soil chemistry. Increased nutrient load and unseasonal moisture resulting from human activities creates conditions that promote the spread of non-native plant species, which can outcompete the native plants for light, space, nutrients, water and other factors (Smil 1997; Vitousek et al. 1997; Line and White 2007). Furthermore, development will increase the number of human visitors using the area, result in soil disturbance and compaction, increase garbage and pollution, and create conditions that are favorable for the spread of non-native plant species.

Construction of houses on the parcels adjacent to the coast yellow leptosiphon population will lead to an increase in human use of the area. Walking paths exist on the bluff, and one heavily-used path exists immediately adjacent to the coast yellow leptosiphon population. Increased human use of the area will increase the impacts to the habitat from foot traffic, will increase the spread of weed seeds and introduce nutrients from dog walking, and will increase the risk of trampling and killing of coast yellow leptosiphon plants. In addition, development of the area will modify the aesthetics and accessibility of the bluff, potentially resulting in alterations of walking patterns in the area. People may create new paths through the remaining portions of the habitat accessible on Vallemar Bluff, potentially through the coast yellow leptosiphon population.

1 *Figure 3 - Proposed Development Project on Vallemar Bluff - Site Plan*

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1 *Figure 4 - Story Poles for Proposed Development Project on Vallemar Bluff*

2

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1 Development of this area may also result in the loss of pollinator habitat and further fragment
2 the habitat adjacent to the coast yellow leptosiphon population. Habitat fragmentation often
3 leads to a disruption in plant and pollinator population dynamics by altering pollinator densities
4 and behavior (Xiao et al. 2016). Information on pollinators and pollinator requirements for coast
5 yellow leptosiphon is currently lacking, but loss of pollinators essential to the reproduction of
6 coast yellow leptosiphon would negatively impact coast yellow leptosiphon, especially if the
7 species is self-incompatible (Goodwillie 1999).

8
9 Although the population of coast yellow leptosiphon is not reported in the CNDDDB on the
10 adjacent parcels that are proposed for development, one individual plant was identified on one
11 of the parcels on May 16, 2016 (T. Corelli pers. comm. 2016) (see Figure 2). Since annual
12 plants reproduce by seed, identification of coast yellow leptosiphon on one of the adjacent
13 properties indicates that the plants have distributed seed beyond the currently-mapped
14 occurrence, and that a seed bank is potentially present in the area where this plant was
15 identified. A seed bank constitutes a living plant population, even when above-ground plants are
16 not visible. Development of this property could result in impacts to coast yellow leptosiphon
17 through the elimination of a soil seed bank for this species or direct impacts to individual plants
18 that may emerge from the seed bank.

19
20 In addition to impacts from human activities, habitat modification can result from other activities.
21 Burrowing mammals such as pocket gophers (*Thomomys* spp.) have profound impacts on
22 ecosystems, from consuming vegetation to physically altering the soil (Reichman and Seabloom
23 2002). Burrowing mammals influence the physical environment, altering patterns and rates of
24 soil development and nutrient availability, microtopography, and the abiotic environment.
25 Burrowing activity can affect the demography and abundance of plant species, altering
26 vegetation patterns and diversity, and thus altering ecosystem structure (Inouye et al. 1987;
27 Huntly and Inouye 1988; Villarreal et al. 2008). Burrowing mammals such as gophers excavate
28 vast burrow systems and deposit tailings in abandoned tunnels and on the ground surface
29 (Reichman and Seabloom 2002), reducing the area of available habitat for plants. Evidence of
30 burrowing mammals is present in the coast yellow leptosiphon population (Department staff
31 observation), and burrowing mammals could impact coast yellow leptosiphon.

32
33 The Department considers present and future modification and destruction of habitat a serious
34 threat to coast yellow leptosiphon. Habitat modification and destruction will affect the ability of
35 coast yellow leptosiphon to survive and reproduce.

36 **Impacts from Invasive Species (Competition and other Factors)**

37 Invading alien species cause major environmental damages and losses and are a significant
38 risk factor leading to extinction of threatened and endangered species (Pimentel et al. 2004;
39 Conser and Connor 2009), second only to habitat loss and fragmentation (Wilcove et al. 1998;
40 Randall and Hoshovsky 2000). Compared to other threats to biodiversity, invasive non-native
41 plants present a complex problem that is difficult to manage and has long-lasting effects. North
42 America has accumulated the largest number of naturalized plants in the world (van Kleunen et
43 al. 2015), and many non-native plant species have established within California, dramatically
44 changing the state's ecological landscape (Conser and Connor 2009). Many studies
45 hypothesize or suggest that competition is the process responsible for observed invasive
46 species impacts to biodiversity; however, invasive species may also impact native ecosystems
47 by altering environmental conditions and resource availability (D'Antonio and Vitousek 1992;
48 Levine et al. 2003). Invasive species may threaten native populations through competition for
49 light, water, or nutrients; allelopathic mechanisms; alteration of soil chemistry; thatch

1 accumulation that inhibits seed germination and seedling recruitment; changes in natural fire
2 frequency; disruptions to pollination or seed-dispersal mutualisms; changes in soil
3 microorganisms; or other mechanisms. The magnitude of invasive species impacts in
4 Mediterranean habitats, such as those in California, largely depends on characteristics of the
5 invading species and the habitat being invaded (Fried et al. 2014). The invader's life form and
6 ability to form very dense stands have an effect on the magnitude of impacts, with creeping
7 plant species such as freeway iceplant having greater effect (Gaertner et al. 2009; Fried et al.
8 2014). Invasive species may also influence native species colonization rates, and may thus lead
9 to declines in local diversity over longer timescales (Yurkonis and Meiners 2004). Studies have
10 not been conducted on the impact of invasive species on coast yellow leptosiphon specifically;
11 however, negative impacts of plant invasions on Mediterranean ecosystems have been well
12 demonstrated (Gaertner et al. 2009; Fried et al. 2014).

13
14 The coast yellow leptosiphon population is threatened by encroachment of non-native invasive
15 plants, especially invasive freeway iceplant that is a highly-rated noxious weed by the California
16 Invasive Plant Council (Cal-IPC 2017). Freeway iceplant is a low-growing, creeping succulent
17 perennial plant that roots at the nodes and often forms deep mats covering large areas. It
18 originates from South Africa, but is one of the most widespread non-native plants in the
19 Mediterranean coastal ecosystems throughout the world, and is considered a severe threat to
20 the native plant communities it invades (Albert 1995; Santoro et al. 2011). In California, it occurs
21 along the coast and on the Channel Islands, especially in areas with a warm winter climate (Cal-
22 IPC 2017). It was originally introduced into California in the early 1900's to stabilize soil along
23 railroad tracks, and the California Department of Transportation soon began using it widely to
24 line highways. It has also been widely promoted as an ornamental plant for home gardens
25 (Albert 1995, 2000). Because this plant spreads easily by seed and vegetative means, it has
26 spread beyond landscape plantings and has invaded coastal habitats, including the coastal
27 prairie where coast yellow leptosiphon grows. Freeway iceplant forms nearly impenetrable mats
28 that dominate the landscape, and it competes directly with native plant species for light,
29 nutrients, water and space (D'Antonio and Haubensak 1998). The fleshy fruits often bear more
30 than one thousand small seeds (Bartomeus and Vilà 2009) that are eaten and widely dispersed
31 by several mammals such as rabbits (D'Antonio 1990) and rats (Bourgeois et al. 2005). It
32 competes aggressively with native plant species, achieving high rates of space colonization,
33 which suppresses growth and establishment of other plants (D'Antonio and Mahall 1991; Albert
34 1995; Suehs et al. 2004; Vilà et al. 2006). Furthermore, it also interacts indirectly with native
35 vegetation by altering soil chemistry by lowering pH (Conser and Connor 2009). Although
36 freeway iceplant was originally used to stabilize soil and control erosion, it can actually
37 contribute to erosion and landslides. It has shallow roots that do not hold soil well, and it
38 absorbs ample water during rain events, becoming so heavy that it can slump off of steep
39 hillsides and cliffs, pulling soil down with it (Spitzer 2002). Freeway iceplant covers the bluffs in
40 much of the habitat near the coast yellow leptosiphon population, and it is growing on the bluff
41 immediately adjacent to the coast yellow leptosiphon population and is encroaching into the
42 population (see Figure 5).

43
44 Other non-native plant species, such as rough cat's ear, rye grass, hare barley, and cut-leaved
45 plantain, are also present growing in and around the coast yellow leptosiphon population. These
46 invasive species may threaten the coast yellow leptosiphon population through a variety of
47 mechanisms, including competition for light, water, or nutrients; thatch accumulation that inhibits
48 seed germination and seedling recruitment; disruptions to pollination or seed-dispersal
49 mutualisms; or other mechanisms (D'Antonio and Haubensak 1998).

1 *Figure 5 – Freeway Iceplant Invasion*

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The coast yellow leptosiphon population will likely continue to experience ongoing and increasing inputs of invasive plant propagules from nearby populations and other sources. The area is frequently used by pedestrians, who can serve as vectors for invasive species into the area. Habitat disturbances resulting from the close proximity of the population to urban development also provides opportunities for invasive species populations to establish and expand. In addition, the proposed development on the adjacent property would likely increase the input of invasive plant species from the spread of landscape plants into the area, and will increase disturbance and habitat modification, providing favorable habitat for invasive species.

Bluff-Top Erosion and Rising Ocean Levels

The coast yellow leptosiphon population is located on Vallemar Bluff, approximately 8 meters (27 feet) from the edge of the bluff, and bluff-top erosion and rising ocean levels pose a serious threat to this species. Rainfall and wave splash or spray cause erosion of the bluff face. Additionally, slope instability results in landslides along the coastal bluff face, resulting in landward recession of the top edge of the coastal bluff. Coastal bluff landslides are caused by undermining the base of the bluff or from saturation of the bluff edge or bluff face (Haro, Kasunich & Associates, Inc. 2015).

A coastal bluff recession study was prepared by Haro, Kasunich & Associates, Inc., Consulting Geotechnical and Coastal Engineers (2015). Historical satellite photos and maps were reviewed and compared with the bluff edge position as surveyed in 2014. The results indicated that the coastal bluff had receded inland up to 14.6 meters (48 feet) between 1908 and 2014, which is a long term historical bluff recession rate of about 0.14 meter (0.45 foot) per year. Results of the study also indicated that about 3 to 5 meters (10 to 18 feet) of bluff recession occurred between 1986 and 2014, which is a long term historical bluff recession rate of about 0.11 to 0.20 meters (0.36 to 0.64 feet) per year.

Future bluff and coastal recession risk was estimated using the long-term historical average annual erosion rates as a minimum. Results suggested that a minimum of 6.9 meters (22.5 feet) of bluff recession will occur at Vallemar Bluff in the next 50 years (by the year 2065). Mean sea level along the California coast is expected to rise between 1.0 to 1.4 meters (3.3 to 4.6 feet) by the year 2100 due to climate change (Heberger et al. 2009), and the accelerating rate of sea level rise will likely result in increased future recession rates compared to average historical rates (Haro, Kasunich & Associates, Inc. 2015). Accelerated future sea level rise is expected to result in an estimated additional 1.7 meters (5.5 feet) of recession over the next 50 years, for a total of 8.6 meters (28 feet) of recession (Haro, Kasunich & Associates, Inc. 2015).

Projected future bluff edge recession was measured from where the bluff is considered stable as determined by Haro, Kasunich & Associates, Inc. (2015) (see Figure 6). They used the projected stable edge to project future recession and arrived at an estimated 50-year coastal recession setback line for development on Vallemar Bluff using the projected rates of recession described above. The 50-year setback is considered the minimum distance necessary to provide a stable building site of a 50-year lifetime of a proposed structure. The portion of the bluff seaward of the 50-year setback line, which supports a large portion of the coast yellow leptosiphon population, is considered to be vulnerable to erosion over the next 50 years.

1 *Figure 6 - Coastal Bluff Recession at Vallemar Bluff*

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1 It is likely that the coast yellow leptosiphon population, which is perched near the bluff edge, has
2 been steadily reduced by cliff erosion. Based on the study conducted by Haro, Kasunich &
3 Associates, Inc., the coast yellow leptosiphon population is located on a portion of the bluff that
4 is highly susceptible to erosion over the next 50 years. If the bluff erodes to the 50-year setback
5 line that accounts for rising sea level, approximately 80 percent of the coast yellow leptosiphon
6 population will be destroyed (see Figure 6). Erosion of the bluff presents a significant threat to
7 coast yellow leptosiphon and could lead to the extinction of the species.

8 **Other Human-related Activities**

9 The coast yellow leptosiphon population is threatened by other human-related activities,
10 specifically trampling from foot traffic. People commonly walk on the bluff where the coast
11 yellow leptosiphon population occurs, which may damage or kill coast yellow leptosiphon
12 individuals through direct trampling of plants. In addition, there is nothing to prevent people from
13 riding their bicycles on the bluff, which would further impact the coast yellow leptosiphon
14 population. The property is easily accessible to the public, and a foot trail has been worn along
15 the bluff that passes along the edge of the coast yellow leptosiphon population. A bench is
16 present near the population overlooking the ocean, attracting visitors to cut through the coast
17 yellow leptosiphon population to view the ocean. In addition to direct trampling of plants, human
18 use of the site also increases disturbance and compaction of soil and facilitates the spread of
19 invasive plant species. No barriers exist around the coast yellow leptosiphon population to
20 protect plants from foot traffic and trampling. The proposed development will result in increased
21 human activity in the area, thus increasing the threat to coast yellow leptosiphon from foot traffic
22 and other human impacts.

23 **Climate Change**

24 Warming of the climate system is unequivocal, and since the 1950s, many of the observed
25 changes are unprecedented over decades to millennia (IPCC 2014). Climate change presents a
26 major challenge to the conservation of California's natural resources, and it will intensify existing
27 threats and create new threats to natural systems.

28
29 Department staff conducted an assessment of the vulnerability of coast yellow leptosiphon to
30 climate change using the NatureServe Climate Change Vulnerability Index Version 3.02
31 (NatureServe 2016). Based upon the Department's assessment, coast yellow leptosiphon likely
32 has a climate change vulnerability index value of Highly Vulnerable (HV), indicating that
33 available evidence suggests that abundance and/or range extent within the geographical area of
34 the species is likely to decrease significantly by the year 2050. However, some ecological and
35 life history information used for the climate change vulnerability assessment is not yet known for
36 coast yellow leptosiphon. In particular, the Department does not know the mechanisms or
37 species required for effective pollination of coast yellow leptosiphon, the mechanisms used by
38 coast yellow leptosiphon for seed dispersal, or coast yellow leptosiphon's seed dispersal
39 distance. Furthermore, the Department does not know whether or to what extent competing
40 plant species such as freeway iceplant will be favored by projected future climates. Despite the
41 lack of information about some of the ecological and life history information for coast yellow
42 leptosiphon, the confidence in the vulnerability index score is very high based on the results of
43 the Monte Carlo simulation used in the index (Young et al. 2015).

1 **Vulnerability of Small Populations**

2 Coast yellow leptosiphon has an exceptionally limited distribution, with only one population that
3 occupies a very small area. The Department recognizes that species with small numbers of
4 populations and small population sizes are highly vulnerable to extinction due to stochastic
5 (chance) demographic, environmental, and genetic events (Shaffer 1981, 1987; Dirzo and
6 Raven 2003; Groom et al. 2006; Primack 2006). Chance events such as a landslide at the bluff
7 edge could result in the loss of all or a significant part of the coast yellow leptosiphon
8 population.
9

10 Species with small numbers of populations or small populations may also be subject to
11 increased genetic drift and inbreeding, which can affect population viability (Menges 1991;
12 Ellstrand and Elam 1993).
13

14 Due to the vulnerability and rarity of coast yellow leptosiphon, the loss of any portion of the
15 population would represent the loss of a significant portion of this species' genetic diversity and
16 total range, and could result in its extinction.

17 **Predation**

18 The Department does not have any information on predation affecting coast yellow leptosiphon.

19 **Disease and Parasites**

20 The Department does not have any information on diseases or parasites affecting coast yellow
21 leptosiphon.

22 **Overexploitation**

23 The Department does not have any information on overexploitation affecting coast yellow
24 leptosiphon.

25 **REGULATORY AND LISTING STATUS**

26 **Federal**

27 Coast yellow leptosiphon is not protected pursuant to the federal Endangered Species Act.

28 **State**

29 On December 23, 2016, the Commission published its Notice of Findings for coast yellow
30 leptosiphon in the California Regulatory Notice Register, designating this species as a candidate
31 pursuant to CESA. The provisions of CESA apply to coast yellow leptosiphon while it is a
32 candidate species (Fish & G. Code, § 2085). CESA prohibits the import, export, take,
33 possession, purchase or sale of coast yellow leptosiphon, or any part or product of thereof,
34 except in limited circumstances, such as through a permit or agreement issued by the
35 Department under the authority of the Fish and Game Code. For example, the Department may
36 issue permits that allow the incidental take of listed and candidate species if the take is
37 minimized and fully mitigated, the activity will not jeopardize the continued existence of the
38 species, and other conditions are met (Fish & G. Code, § 2081 subd. (b)). The Department may

1 also authorize the take and possession of coast yellow leptosiphon for scientific, educational, or
2 management purposes (Fish & G. Code, § 2081 subd. (a)).

3 **Natural Heritage Program Ranking**

4 All natural heritage programs, such as the CNDDB, use the same ranking methodology
5 originally developed by The Nature Conservancy and now maintained by NatureServe
6 (NatureServe 2012). This ranking methodology consists of a global rank describing the rank for
7 a given taxon over its entire distribution, and a state rank describing the rank for the taxon over
8 its state distribution. Both global and state ranks reflect a combination of rarity, threat, and trend
9 factors. Coast yellow leptosiphon has been assigned a global rank of G1 and a state rank of S1
10 (CNDDB 2017), indicating that the species is critically imperiled both within California and
11 throughout its entire range, with a very high risk of extinction due to extreme rarity (often five or
12 fewer populations), very steep declines, or other factors.

13 **California Rare Plant Rank**

14 Some plants in California are assigned a California Rare Plant Rank (CRPR) to identify them as
15 species of conservation concern. The Department works in collaboration with CNPS and
16 botanical experts throughout the state to assign rare and endangered plants a CRPR reflective
17 of their status. Coast yellow leptosiphon has been assigned a CRPR of 1B.1 (CNDDB 2017).

18
19 Plants with a CRPR of 1B are rare throughout their range with the majority of them endemic to
20 California. Most of the plants that are ranked 1B have declined significantly over the last
21 century. The threat code extension of “.1” indicates that the species is seriously threatened in
22 California, with over 80 percent of occurrences threatened or a high degree and immediacy of
23 threat (CNDDB 2017).

24 **EXISTING MANAGEMENT EFFORTS**

25 **Resource Management Plans**

26 The Department is not aware of any resource management plans prepared for coast yellow
27 leptosiphon.

28
29 The coast yellow leptosiphon population is located within the Fitzgerald Marine Reserve, which
30 is a San Mateo County Park, and is also adjacent to the Montara State Marine Reserve, which
31 is a California Marine Protected Area that is located in California state waters below the mean
32 high tide line. San Mateo County released a Master Plan for the Fitzgerald Marine Reserve in
33 2002, but the area where the coast yellow leptosiphon occurs on Vallemar Bluff was not
34 surveyed, and coast yellow leptosiphon is not accounted for in the Master Plan (Brady/LSA
35 2002). San Mateo County Parks Department has been contacted about the omission and the
36 presence of coast yellow leptosiphon and the other rare plants located on the property. The
37 County of San Mateo intends to revise the Master Plan to include management and protection
38 of coast yellow leptosiphon and other rare plants located within the Fitzgerald Marine Reserve
39 (Corelli 2016; R. Arechiga pers. comm. 2016, 2017).

1 **Monitoring and Research**

2 Petitioner and botanist, Toni Corelli, continues to visit and observe the coast yellow leptosiphon
3 population at least once per year and observational information is being collected. The
4 Department is not aware of any other ongoing coast yellow leptosiphon research or monitoring
5 of the coast yellow leptosiphon population.

6 **Habitat Restoration Projects**

7 The Department has discussed the potential for seed collection, reintroduction, and habitat
8 restoration for coast yellow leptosiphon with the County of San Mateo (R. Arechiga pers. comm.
9 2016, 2017). The County of San Mateo is interested in identifying nearby suitable habitat owned
10 by the County of San Mateo to introduce coast yellow leptosiphon seed (Arechiga 2017).
11 University of California Botanical Garden at Berkeley has approximately 870 seeds from 53
12 individual coast yellow leptosiphon plants in conservation storage (H. Forbes pers. comm. 2016,
13 2017). No efforts have been initiated for habitat restoration.

14 **Impacts of Existing Management Efforts**

15 Since its inception, the Fitzgerald Marine Reserve has been managed for multiple purposes,
16 including education, research and scientific study, recreation, collection of seashore animals
17 and plants, and fishing. However, the area where coast yellow leptosiphon occurs was not
18 surveyed during preparation of the Master Plan, and currently no management is taking place
19 on this portion of the Fitzgerald Marine Reserve (Brady/LSA 2002; Arechiga pers. comm. 2016,
20 2017).

21 **SCIENTIFIC DETERMINATIONS REGARDING THE STATUS OF COAST YELLOW**
22 **LEPTOSIPHON IN CALIFORNIA**

23 CESA directs the Department to prepare this report regarding the status of coast yellow
24 leptosiphon based upon the best scientific information available to the Department (Fish & G.
25 Code, § 2074.6). CESA's implementing regulations identify key factors that are relevant to the
26 Department's analyses. Specifically, a "species shall be listed as endangered or threatened ... if
27 the Commission determines that its continued existence is in serious danger or is threatened by
28 any one or any combination of the following factors: 1. present or threatened modification or
29 destruction of its habitat; 2. overexploitation; 3. predation; 4. competition; 5. disease; or 6. other
30 natural occurrences or human-related activities" (Cal. Code Regs., tit. 14, § 670.1, subd.
31 (i)(1)(A)).

32 The definitions of endangered and threatened species in the Fish and Game Code provide key
33 guidance to the Department's scientific analysis. An endangered species under CESA is one
34 "which is in serious danger of becoming extinct throughout all, or a significant portion, of its
35 range due to one or more causes, including loss of habitat, change in habitat, over exploitation,
36 predation, competition, or disease" (Fish & G. Code, § 2062). A threatened species under CESA
37 is one "that, although not presently threatened with extinction, is likely to become an
38 endangered species in the foreseeable future in the absence of special protection and
39 management efforts required by [CESA]" (*Id.*, § 2067).

40 The preceding sections of this Status Review report describe the best scientific information
41 available to the Department, with respect to the key factors identified in the regulations.
42
43

1 **Present or Threatened Modification or Destruction of Habitat**

2 Habitats along the San Mateo Coast have been impacted by a history of modification and
3 destruction from development, agriculture, grazing, and other land use. Most of the coastal
4 prairie habitat, which provides potential habitat for coast yellow leptosiphon, has been destroyed
5 or modified due to urban development, agriculture, and invasion by non-native plant species.
6 The proposed development on the property adjacent to the coast yellow leptosiphon population
7 will result in habitat degradation and modification that will negatively impact the species and
8 could result in a severe decline or extirpation of the population, thus leading to the extinction of
9 the species. In addition, human use within and in the vicinity of the coast yellow leptosiphon
10 population has resulted in habitat degradation that is evident on the ground and is visible from
11 aerial imagery (see Figure 7). The proposed development will lead to an increase in human use
12 of the area, resulting in additional impacts from trampling and habitat disturbance. In addition,
13 burrowing mammals such as gophers are present at the coast yellow leptosiphon population
14 and may be impacting coast yellow leptosiphon. The Department considers modification and
15 destruction of habitat to be a significant threat to the continued existence of coast yellow
16 leptosiphon.

17 **Overexploitation**

18 The Department does not consider overexploitation to be a significant threat to the continued
19 existence of coast yellow leptosiphon.

20 **Predation**

21 The Department does not consider predation to be a significant threat to the continued
22 existence of coast yellow leptosiphon.

23 **Competition**

24 Invasive plant species have been documented to pose serious threats to biodiversity around the
25 world, and are a particularly pervasive problem in Mediterranean-type habitats like those in
26 California. Invasive mat-forming freeway iceplant and other invasive plants, such as rough cat's
27 ear and English plantain, occur within and in close proximity to the coast yellow leptosiphon
28 population. The Department considers invasive plant species, particularly freeway iceplant, to
29 be a significant threat to the continued existence of coast yellow leptosiphon.

30 **Disease**

31 There are no diseases known to be threats to the continued existence of coast yellow
32 leptosiphon. The Department does not consider disease to be a significant threat to the
33 continued existence of coast yellow leptosiphon.

34 **Other Natural Occurrences or Human-related Activities**

35 The coast yellow leptosiphon population is located near the edge of Vallemar Bluff, and bluff-top
36 erosion and rising ocean levels pose a serious threat to this species. The climate of California is

1 *Figure 7 - Proximity of Threats to Coast Yellow Leptosiphon*

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certain to change due to warming of the global climate system, which could lead to an accelerated rate of bluff erosion. Coast yellow leptosiphon has an extremely narrow distribution consisting of one population that occupies an extremely small area. Coast yellow leptosiphon's rarity and extremely limited distribution, and its occurrence in only one area that is partially surrounded by development, makes the species very vulnerable to stochastic events such as erosion, landslides, and drought, and to all other threats. Therefore, the loss of all or a significant portion of the coast yellow leptosiphon population would represent the loss of all or a significant portion of coast yellow leptosiphon's total range, and could result in the extinction of the species. Impacts from pedestrian traffic and trampling also pose a threat to coast yellow leptosiphon, and the proposed development would likely increase human use of the area. The Department considers erosion, other natural occurrences, and human-related activities to be a significant threat to the continued existence of coast yellow leptosiphon.

SUMMARY OF KEY FINDINGS

Coast yellow leptosiphon is an extremely rare species known from only one small population. The population occurs in close proximity to urban land use, and has been either directly or indirectly impacted by modification or destruction of habitat. Based upon current land use practices that include the potential development of the adjacent property, the modification, destruction and impacts to coast yellow leptosiphon habitat are likely to continue into the future. The coast yellow leptosiphon population is being impacted by invasive plant species and human activities, such as pedestrian use of the area. Bluff-top erosion is also a serious and imminent threat to this species, and climate change may accelerate that process. Bluff-top erosion alone could lead to near extinction of the species in 50 years based on current bluff-top recession predictions. Compounding the threats to the species is the inherent vulnerability of small populations to extirpation due to stochastic events. The entire distribution of coast yellow leptosiphon is limited to one site that occupies an area approximately 167 square meters (1,800 square feet) in size (CNDDDB 2017; Department staff observation), with population estimates over the years ranging between 400 and 1,000 individual plants; it is found nowhere else in the world. Due to the extremely limited distribution of coast yellow leptosiphon and its small population size, the loss of any portion of its population would be considered the loss of a significant portion of the species total range and would likely result in the extinction of this species.

The information available to the Department regarding the status of coast yellow leptosiphon indicates that there are significant threats to the continued existence of the species. Proximity of threats to the coast yellow leptosiphon population are illustrated in Figure 7.

RECOMMENDATION FOR PETITIONED ACTION

CESA directs the Department to prepare this report regarding the status of coast yellow leptosiphon in California based upon the best scientific information available to the Department (Fish & G. Code, § 2074.6). CESA also directs the Department to indicate in this Status Review whether the petitioned action is warranted (Fish & G. Code, § 2074.6; Cal. Code Regs., tit. 14, § 670.1, subd. (f)). The Department includes and makes its recommendation in this Status Review as submitted to the Commission in an advisory capacity based on the best available science. Based on the criteria described above, the best scientific information available to the Department indicates that coast yellow leptosiphon is in serious danger of becoming extinct in all or a significant portion of its range due to one or more causes including loss of habitat,

change in habitat, competition and other effects from invasive plant species, and other natural occurrences and human-related activities.

The Department recommends that the Commission find the petitioned action to list coast yellow leptosiphon as an endangered species to be warranted.

PROTECTION AFFORDED BY LISTING

It is the policy of the state to conserve, protect, restore and enhance any endangered or any threatened species and its habitat (Fish & G. Code, § 2052). If listed as an endangered or threatened species, unauthorized "take" of coast yellow leptosiphon will be prohibited, making the conservation, protection, and enhancement of the species and its habitat an issue of statewide concern. As noted earlier "take" is defined under CESA as hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill (*Id.*, § 86). Any person violating the take prohibition would be punishable under state law. The Fish and Game Code provides the Department with related authority to authorize "take" under certain circumstances (*Id.*, §§ 2081, 2081.1, 2086, 2087, 2089.6, 2089.10 and 2835). As authorized through an incidental take permit, however, impacts of the taking on coast yellow leptosiphon caused by the activity must be minimized and fully mitigated according to state standards.

Additional protection of coast yellow leptosiphon following listing would also occur during required public agency environmental review under the California Environmental Quality Act (CEQA), and its federal counter-part, the National Environmental Policy Act (NEPA). CEQA and NEPA both require affected public agencies to analyze and disclose project-related environmental effects, including potentially significant impacts on endangered, rare, and threatened special status species. Under CEQA's "substantive mandate," for example, state and local agencies in California must avoid or substantially lessen significant environmental effects to the extent feasible. With that mandate, and the Department's regulatory jurisdiction generally, the Department expects related CEQA and NEPA review will likely result in increased information regarding the status of coast yellow leptosiphon in California as a result of, among other things, updated occurrence and abundance information for individual projects. Where significant impacts are identified under CEQA, the Department expects project-specific required avoidance, minimization and mitigation measures will also benefit the species. While both CEQA and NEPA would require analysis of potential impacts to coast yellow leptosiphon regardless of their listing status under CESA, the acts contain specific requirements for analyzing and mitigating impacts to listed species. In common practice, potential impacts to listed species are examined more closely in CEQA and NEPA documents than potential impacts to unlisted species. State listing, in this respect, and required consultation with the Department during state and local agency environmental review under CEQA, is also expected to benefit the species in terms of related impacts for individual projects that might otherwise occur absent listing.

If coast yellow leptosiphon is listed under CESA, it may increase the likelihood that state and federal land and resource management agencies will allocate funds towards protection and recovery actions. However, funding for species recovery and management is limited, and there is a growing list of threatened and endangered species.

1 MANAGEMENT RECOMMENDATIONS AND RECOVERY MEASURES

2 CESA directs the Department in its Status Review to recommend management activities and
3 other recommendations for recovery of coast yellow leptosiphon (Fish & G. Code, § 2074.6; Cal.
4 Code Regs., tit. 14, § 670.1, subd. (f)). The utility of current data on coast yellow leptosiphon is
5 limited by being largely anecdotal and qualitative. Studies designed to provide quantitative data
6 on the coast yellow leptosiphon population, and the factors that affect the potential for coast
7 yellow leptosiphon to survive and reproduce, are necessary for species management.
8 Department staff with suggestions from local agencies, non-profits, and interested parties
9 generated the following list of recommended management actions:

- 10
- 11 • Collect and bulk seeds of coast yellow leptosiphon for long term conservation storage
- 12 and potential introduction into suitable habitat;
- 13 • Identify and restore degraded potential coast yellow leptosiphon habitat near the existing
- 14 population. Collect and distribute seed into nearby suitable habitat;
- 15 • Permanently protect the coast yellow leptosiphon population on County of San Mateo
- 16 property and on the private parcel where one individual coast yellow leptosiphon
- 17 individual was observed from modification and destruction via fee title acquisition,
- 18 conservation easements or similar protective measures;
- 19 • Permanently protect the private parcels adjacent to the coast yellow leptosiphon
- 20 population from modification and destruction via fee title acquisition, conservation
- 21 easements or similar protective measures to provide a buffer adjacent to the coast
- 22 yellow leptosiphon population;
- 23 • Remove and control the freeway iceplant invasion adjacent to the coast yellow
- 24 leptosiphon population;
- 25 • Restrict public access in the vicinity of the coast yellow leptosiphon population through
- 26 installation of protective fencing and/or signs, or other suitable means;
- 27 • Remove or relocate the bench adjacent to the coast yellow leptosiphon population, or
- 28 provide other creative foot-traffic influencing features in the area to encourage people to
- 29 avoid walking through the coast yellow leptosiphon population;
- 30 • Research the life history characteristics of coast yellow leptosiphon, including factors
- 31 related to pollination, seed dispersal, seed longevity, seed productivity, growth,
- 32 propagation, and microhabitat requirements for germination and recruitment;
- 33 • Implement monitoring and adaptive management programs for the coast yellow
- 34 leptosiphon population. Ensure that monitoring results trigger appropriate management
- 35 responses such as implementing other measures to control invasive species or
- 36 controlling recreational activities. Make the data and reports from monitoring and
- 37 adaptive management programs available to resource agencies and to those who are
- 38 directly involved in coast yellow leptosiphon management;
- 39 • Implement a program to detect coast yellow leptosiphon population trends using
- 40 statistically-valid population estimates; and
- 41 • Survey for additional populations of coast yellow leptosiphon.

42 PUBLIC RESPONSE

43 Comments were invited in response to the Petition in letters mailed on June 6, 2017, to property
44 owners where the coast yellow leptosiphon population occurs and adjacent property owners,
45 and in a Department Press Release dated August 9, 2017. The Department received three
46 comments in response to the press release and letters, which are included in Appendix A.

PEER REVIEW

Independent botany experts were invited to review the Status Review report before submission to the Fish and Game Commission. The letters of invitation and all comments received are included in Appendix B [Will be included in the final draft].

ACKNOWLEDGEMENTS

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Commented [A18]: Leptosiphon

20 **Personal Communication**

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APPENDIX A: Comments from Affected and Interested Parties on the Petitioned Action

APPENDIX B: External Peer Review Invitation Letters and Comments from Peer Reviewers on the Coast Yellow Leptosiphon Status Review Report

DRAFT

Peer Review Comments from Dr. Robert Patterson and Department Responses

Page	Line	Reviewer Comment	Department Response
2	15	The leaves are not compound	Text revised: "It has opposite leaves that are palmately-divided..."
2	16	This is an incorrect use of the term. Leaflets are divisions of a compound leaf. Leptosiphon has deeply lobed simple leaves. Lobes are simply called lobes.	Text revised to reflect proper terminology: "It has opposite leaves that are palmately-divided, which means that all the lobes of the leaf are fused together at a common point, resembling a fan. The leaves are generally divided into six lobes that are approximately 4 to 7 millimeters (0.16 to 0.28 inches) long on the lower stem and almost twice as long near the flowers, appearing as whorls at the nodes."
2	17	"Leaflets" corrected to "lobes."	Text revised to replace "leaflets" with "lobes".
2	18	"Leaflets" corrected to "lobes."	Text revised to replace "leaflets" with "lobes".
2	22	Here you're referring to corolla lobes. The term "petal" should be reserved for corolla parts that are not fused to each other.	Text revised to reflect proper terminology: "The flowers have bright yellow petals that are fused together at the base and are collectively referred to as a corolla. The corolla lobes are approximately 6 to 8 millimeters (0.24 to 0.31 inch) wide and generally have two bright red dots at the base. The fused corolla forms a long tube that is 26 to 39 millimeters (1.0 to 1.5 inches) long and is covered with fine, scattered, spreading hairs."
2	23	I would call these dots pretty bright, not faint at all (cf your photo).	Text revised to replace the word "faint" with "bright".
2	24	The tube isn't really funnel-shaped. It's tubular. The corolla is actually salverform.	Text revised: "funnel-shaped" removed.
2	27-28	The calyx lobes are actually connected by the membrane so that the entire calyx is a tube.	Text revised: "The calyx lobes, otherwise known as sepals, are generally deltate or triangular-shaped, less than 1 millimeter (0.04 inch) wide at the middle, densely glandular-hairy, and are connected by an obscure thin membrane, forming a tube."
2	29	Female "flower parts" corrected to female "organs"	Text revised to reflect the correction.
2	30	Female "flower part" corrected to female "organ"	Text revised to reflect the correction.
3	8	The correct citation is Patterson 1993. Hickman was the editor of TJM1, Patterson authored the treatment.	Citation corrected in text and in Literature Cited section.

3	19	Referring to bristly leptosiphon (<i>Leptosiphon acicularis</i>) - This species is now known as <i>L. aureus</i> (see Porter and Patterson, 2014, Aliso 32(2), 55–88.)	Text updated to reflect the current name of this species.
3	20	Insert (<i>L. parviflorus</i>)	Text revised to add (<i>L. parviflorus</i>).
3	36	A minor issue, but here and throughout ranges should be expressed by an en-dash, not a hyphen.	Text revised throughout the document to replace hyphens with en-dash when referring to ranges.
8	1	Here and elsewhere, no apostrophe. Should read 1990s.	Apostrophe removed in this instance and throughout the document as appropriate.
28	15	“ <i>Carbobrotus</i> ” corrected to “ <i>Carpobrotus</i> ”	Text corrected
33	48	“Mammology” corrected to “Mammalogy”	Text corrected
34	1	“ <i>Leptosipon</i> ” corrected to “ <i>Leptosiphon</i> ”	Text corrected



State of California – Natural Resources Agency
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EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



October 2, 2017

Aaron Schusteff, Ph.D.

Dear Dr. Schusteff:

Coast Yellow Leptosiphon (*Leptosiphon croceus*); California Department of Fish and Wildlife, Peer Review Status Report

Thank you for agreeing to serve as a scientific peer reviewer for the California Department of Fish and Wildlife (Department) Status Review of coast yellow leptosiphon (*Leptosiphon croceus*). Please review the copy of the Department's peer review draft report dated October 2, 2017, that is included with this letter. The Department seeks your expert analysis and input regarding the scientific validity of the report and its assessment of the status of coast yellow leptosiphon in California based on the best scientific information currently available. The Department respectfully requests that you focus your peer review effort on the body of relevant scientific information and the Department's related assessment of the population and life history elements prescribed in the California Endangered Species Act (CESA). **The Department would appreciate receiving your peer review input on or before October 31, 2017.**

The Department seeks your scientific peer review as part of formal proceedings pending before the California Fish and Game Commission (Commission) under CESA. As you may know, the Commission is a constitutionally established entity distinct from the Department, exercising exclusive statutory authority under CESA to list species as endangered or threatened (Fish & G. Code, § 2070). The Department serves in an advisory capacity during CESA listing proceedings, charged by the Fish and Game Code to focus on the best scientific information available to make related recommendations to the Commission (Fish & G. Code, § 2074.6).

The Commission received the petition to list coast yellow leptosiphon under CESA on May 25, 2016. On December 23, 2016, the Commission published findings formally designating coast yellow leptosiphon as a candidate for listing as threatened or endangered under CESA. Coast yellow leptosiphon is currently protected under CESA in California in that capacity.

The peer review draft report forwarded to you today reflects the Department's effort to identify and analyze the best scientific information available regarding the status of

coast yellow leptosiphon in California. At this time, the Department believes that the best available science indicates that listing the species as endangered under CESA is warranted. We underscore, however, that scientific peer review plays a critical role in the Department's effort to develop and finalize its recommendation to the Commission as required by the Fish and Game Code. Our expected recommendation to the Commission at this point may change following your input.

We ask you to focus your peer review on the best scientific information available regarding the status of coast yellow leptosiphon in California. As with our own effort to date, your peer review of the science and analysis regarding each of the population and life history categories prescribed in CESA are particularly important (Cal. Code Regs., tit. 14, § 670.1(i)(1)(A)) (i.e., present or threatened habitat modification, overexploitation, predation, competition, disease, and other natural occurrences or human-related activities that could affect the species) as well as whether it indicates, in your opinion, that coast yellow leptosiphon is at serious risk of becoming extinct throughout all or a significant portion of its range in California, or whether the species is likely to become so in California in the foreseeable future. Please note that the Department releases this peer review report to you solely as part of the peer review process, and it is not yet public.

A Microsoft Word version and a PDF version of the report are included with this letter; however, only the PDF version includes figures and appendices. For ease of review, you may submit your comments in "track changes" format, or in list form by page and line number. Please submit your comments electronically to Ms. Cherilyn Burton, Senior Environmental Scientist (Specialist) at cherilyn.burton@wildlife.ca.gov. Ms. Burton may also be reached at (916) 651-6508. If there is anything the Department can do to facilitate your review, please let us know.

Following receipt and consideration of peer review comments, the Department will prepare and submit its final report and related recommendation to the Commission. After at least a 30 day public review period, the Commission will consider the petition to list coast yellow leptosiphon, the Department's report and related recommendations including peer review, and public testimony during a regularly scheduled Commission meeting prior to making their decision.

Thank you again for your contribution to the status review effort and the important input it provides during the Commission's related proceedings.

Sincerely,



Richard Macedo, Branch Chief
Habitat Conservation Planning Branch

Aaron Schusteff, Ph.D.
City College of San Francisco
October 2, 2017
Page 3

Enclosures

cc: California Department of Fish and Wildlife

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Leptosiphon Croceus Report: Line Item Comments

Submitted by Aaron Schusteff

Page 2, Line 19: “The leaflets are **narrowly oval**...”

Suggestion: Seems to me the leaflet shape in *Leptosiphon croceus* is better described as *linear* rather than *oval*...the latter meaning somewhat *widely* rounded (e.g. with width at least half the length), which does not conform with my experience (or photos) of *L. croceus*.

Page 4: Pertaining to “Life History”

I just want to share a number of remarks here (some of which I mentioned in a previous email) which perhaps fit best under “Life History”.

First, from the salverform corolla morphology alone, one might reasonably speculate that *L. croceus* is likely pollinated by a bee or fly with a long proboscis. In this context, it's perhaps worth noting that Grant & Grant(1965) state (on pg. 110) that the small-headed fly *Eulonchus smaragdinus* was observed visiting flowers of “*Linanthus adrosaceus croceus*” at Pt. Reyes. And I have observed a congener, *Eulonchus tristis*, not far from Moss Beach on San Pedro Mountain (though in very different habitat...namely, dense, undisturbed coastal scrub).

But the Pt. Reyes plants that the Grants referred to as “*Linanthus androsaceus croceus*” would not be placed as *Leptosiphon croceus* under current circumscriptions. J. T. Howell referred to those Pt. Reyes plants as *Linanthus parviflorus* ssp. *rosaceus*. And for a while (a few years back) some botanists were tentatively referring to those same Pt. Reyes plants as *Leptosiphon rosaceus* (Hooker f.) Battaglia, though I believe the latter name is now only applied to a few populations at Mori Point and Pillar Point, both not far from the Moss Beach station for *Leptosiphon croceus* (see Jepson eFlora web page here). In the fairly recent 2007 revised version of Howell's original “Marin Flora” by Almeda, Follette, & Best, the Pt. Reyes plants are simply referred to as *Leptosiphon parviflorus*, and the discussion there includes the following intriguing remark:

Wednesday, November 1, 2017

"Leptosiphon croceus (Eastw.) J.M. Porter & L.A. Johnson, a yellow-flowered coastal plant may also occur in Marin County near Bolinas."

I don't know whether a thorough search has been made for *Leptosiphon croceus* in the Bolinas area, though I have seen habitat quite similar to the Moss Beach station in that area. (By the way, some images of these Pt. Reyes plant appear on [this CalPhotos web page](#), under the name "*Leptosiphon longitubus*"...for an explanation of that name, which is not formally published or recognized, see the "manifesto" at [this link](#), written by the late naturalist and CNPS fellow Randy Morgan.)

But returning to the question of the pollination syndrome for *Leptosiphon croceus*...perhaps surprisingly, it seems more likely to me that this species is wind-pollinated rather than insect-pollinated. This is because during many hours of observation of the Moss Beach population...during favorable conditions (i.e. calm and warm) at peak bloom...I never saw a single bee (or bee-fly, or acrocerid, etc.) visit any of the flowers, even though I found large colonies of both *Anthrophora bomboides* and a *Lasioglossum* species in very close proximity to the *L. croceus*. All I was able to observe were beetles visiting the flowers, and they are more likely net pollen predators rather than effective pollinators for the *Leptosiphon* (they tend to feed on single flowers for hours and do not efficiently transfer pollen among many flowers.) Images can be seen at the following links:

<<http://bugguide.net/node/view/246717>>

<<http://bugguide.net/node/view/148098>>

<<http://bugguide.net/node/view/136293>>

Wind-pollination in the very closely related species *L. parviflorus* and *L. jepsonii* is discussed in various papers by Carol Goodwillie and others:

<<http://www.amjbot.org/content/86/7/948.full>>

<<http://www.journals.uchicago.edu/doi/10.1086/322946>>

<<http://www.ecu.edu/cs-cas/biology/upload/Aaron-Wallace-Final-Poster.pdf>>

I think it may be fruitful to engage Carol Goodwillie in a discussion of the possibilities of wind-pollination in *L. croceus*, and what ramifications that may have for conservation issues relating to the *Leptosiphon*.

Page 7, Line 12: Pertaining to “Similar Looking Plants”

I believe the entity that is most similar-looking to *Leptosiphon croceus* is the population, formally placed as *Leptosiphon parviflorus*, that occurs in a wet meadow within surrounding forest north of Boulder Creek, in the Santa Cruz Mountains. Like the Moss Beach population of *L. croceus*, this entity is known from only a single population (of about the same size)...but in a very different inland habitat. See photos and remarks at the link below:

<https://calphotos.berkeley.edu/cgi/img_query?where-kwid=0000+0000+0512+1723&one=T>

Page 7, Line 23: “*Eriogonum latifolium*, coastal celery-button (*Eryngium armatum*),...”

Also growing intermingled with *L. croceus* (near the southwest corner of the population) at least in 2006 and for a few years afterwards, was the native forb *Clarkia rubicunda* ssp. *blasdalei* (a coastal form of *Clarkia rubicunda* that has been synonymized with the nominate form). Also, in my experience, the *Eryngium* used to mainly grow on the east side of the beaten foot path...near to, but disjoint from, the *L. croceus* population, which was restricted to the west side of the walking path. However, the *Eryngium* may now have spread to the west side of the foot path as well.

Page 9: Pertaining to “Geology and Soils”

During a visit to the site, Randy Morgan once remarked that the presence of the *Leptosiphon* and many other native plants to the west of the beaten foot path may owe to the soil there having never been plowed. Agricultural use of the coastal prairies adjacent to bluffs had been common earlier in the last century all along the coast from south of San Francisco to Santa Cruz, and farmers often plowed right up to the use paths that followed the top of the bluffs. “Never

plowed soil” may be a habitat characteristic to keep in mind when considering optimal sites for possible seeding of new populations.

Page 20, Line 17: Predation (or perhaps “Herbivory”?)

I think it’s VERY IMPORTANT to include somewhere in the report mention of the possible threat of the introduction of non-native slugs into the population (e.g. from neighboring residential landscaping, or other venues), which could quickly devastate the population (and may provide an explanation for the very rapid decrease in number of plants in the population over the previous few years).

Slugs can eat the small seedlings early in the season when they’re barely noticeable to humans. And the slugs nocturnal and winter “wet-cycle” phenology might make them a relatively cryptic threat to most observers. Simple experimental sampling (e.g. setting down flat pieces of plywood or other such attractive slug shelters, and checking underneath them in the morning) should be done, especially during early rains.

If slugs are present, a judicious program of elimination and control (e.g. use of a targeted and relatively non-toxic slug bait like “sluggo”) could be effective (and essential) for protecting the *Leptosiphon* population!

Peer Review Comments from Dr. Aaron Schusteff and Department Responses

Page	Line	Reviewer Comment	Department Response
2	19	“The leaflets are narrowly oval...” <i>Suggestion</i>: Seems to me the leaflet shape in <i>Leptosiphon croceus</i> is better described as <i>linear</i> rather than <i>oval</i>...the latter meaning somewhat <i>widely</i> rounded (e.g. with width at least half the length), which does not conform with my experience (or photos) of <i>L. croceus</i>.	In the species description in the Jepson eflora (Patterson and Battaglia 2017), the leaves are described as narrowly obovate, which means narrowly “egg shaped” with the widest part above the middle (i.e., away from the base). “Linear” is defined in the Jepson Manual 2nd edition as “elongate, with nearly parallel sides; narrower than elliptic or oblong”. The description in the Jepson Manual 2nd edition is accurate, since the sides of the leaves are not parallel, but widen toward the tip of the leaves. The text has been revised as follows: “The lobes are narrowly ovate with the narrower end at the base,” since “ovate” is a more descriptive term for this shape.
4	Pertaining to “Life History”	I just want to share a number of remarks here (some of which I mentioned in a previous email) which perhaps fit best under “Life History”. First, from the salverform corolla morphology alone, one might reasonably speculate that <i>L. croceus</i> is likely pollinated by a bee or fly with a long proboscis. In this context, it’s perhaps worth noting that Grant & Grant(1965) state (on pg. 110) that the small-headed fly <i>Eulonchus smaragdinus</i> was observed visiting flowers of “<i>Linanthus adrosaceus croceus</i>” at Pt. Reyes. And I have observed a congener, <i>Eulonchus tristis</i>, not far from Moss Beach on San Pedro Mountain (though in very different habitat...namely, dense, undisturbed coastal scrub).	Comment noted. No response needed.

4	Pertaining to “Life History” (continued)	But the Pt. Reyes plants that the Grants referred to as “<i>Linanthus androsaceus croceus</i>” would not be placed as <i>Leptosiphon croceus</i> under current circumscriptions. J. T. Howell referred to those Pt. Reyes plants as <i>Linanthus parviflorus</i> ssp. <i>rosaceus</i>. And for a while (a few years back) some botanists were tentatively referring to those same Pt. Reyes plants as <i>Leptosiphon rosaceus</i> (Hooker f.) Battaglia, though I believe the latter name is now only applied to a few populations at Mori Point and Pillar Point, both not far from the Moss Beach station for <i>Leptosiphon croceus</i> (see Jepson eFlora web page here). In the fairly recent 2007 revised version of Howell’s original “Marin Flora” by Almeda, Follette, & Best, the Pt. Reyes plants are simply referred to as <i>Leptosiphon parviflorus</i>, and the discussion there includes the following intriguing remark: “<i>Leptosiphon croceus</i> (Eastw.) J.M. Porter & L.A. Johnson, a yellow-flowered coastal plant may also occur in Marin County near Bolinas.” I don’t know whether a thorough search has been made for <i>Leptosiphon croceus</i> in the Bolinas area, though I have seen habitat quite similar to the Moss Beach station in that area. (By the way, some images of these Pt. Reyes plant appear on this CalPhotos web page, under the name “Leptosiphon longitubus”...for an explanation of that name, which is not formally published or recognized, see the “manifesto” at this link, written by the late naturalist and CNPS fellow Randy Morgan.)	<i>Leptosiphon croceus</i> had previously been reported in Bolinas, Marin County, and this location was previously tracked in the California Natural Diversity Database (CNDDB) as Element Occurrence #4. In a review of herbarium specimens conducted by botanist and petitioner Toni Corelli (2016), no herbarium sheets were found that were labeled <i>L. croceus</i> from Bolinas, and this population was not confirmed; therefore, the Element Occurrence was considered erroneous and was removed from the CNDDB. Two voucher specimens were located from Point Reyes, Marin County (Specimen numbers RSA12224 and RSA148677), which were reviewed and the identifications were corrected to <i>Leptosiphon parviflorus</i>. No other collections have been found from Marin County, and <i>L. croceus</i> is not confirmed as historically or currently present there. No changes made to the document.
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4	Pertaining to "Life History" (continued)	But returning to the question of the pollination syndrome for <i>Leptosiphon croceus</i>...perhaps surprisingly, it seems more likely to me that this species is wind-pollinated rather than insect-pollinated. This is because during many hours of observation of the Moss Beach population...during favorable conditions (i.e. calm and warm) at peak bloom...I never saw a single bee (or bee-fly, or acrocerid, etc.) visit any of the flowers, even though I found large colonies of both <i>Anthrophora bomboides</i> and a <i>Lasioglossum</i> species in very close proximity to the <i>L. croceus</i>. All I was able to observe were beetles visiting the flowers, and they are more likely net pollen predators rather than effective pollinators for the <i>Leptosiphon</i> (they tend to feed on single flowers for hours and do not efficiently transfer pollen among many flowers.) Images can be seen at the following links: <http://bugguide.net/node/view/246717> <http://bugguide.net/node/view/148098> <http://bugguide.net/node/view/136293> Wind-pollination in the very closely related species <i>L. parviflorus</i> and <i>L. jepsonii</i> is discussed in various papers by Carol Goodwillie and others: <http://www.amjbot.org/content/86/7/948.full> <http://www.journals.uchicago.edu/doi/10.1086/322946> <http://www.ecu.edu/cs-cas/biology/upload/Aaron-Wallace-Final-Poster.pdf> I think it may be fruitful to engage Carol Goodwillie in a discussion of the possibilities of wind-pollination in <i>L. croceus</i>, and what ramifications that may have for conservation issues relating to the <i>Leptosiphon</i>.	Comments on pollination noted. The Status Review indicates that <i>L. croceus</i> may be wind pollinated, but that little is known about the mating system of this species. More research on pollination is needed. No changes made to the document. The Department will attempt to contact Carol Goodwillie to discuss wind-pollination and the conservation implications it may have for <i>L. croceus</i>.
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7	12	Pertaining to “Similar Looking Plants” I believe the entity that is most similar-looking to <i>Leptosiphon croceus</i> is the population, formally placed as <i>Leptosiphon parviflorus</i>, that occurs in a wet meadow within surrounding forest north of Boulder Creek, in the Santa Cruz Mountains. Like the Moss Beach population of <i>L. croceus</i>, this entity is known from only a single population (of about the same size)...but in a very different inland habitat. See photos and remarks at the link below: <https://calphotos.berkeley.edu/cgi/img_query?where-kwid=0000+0000+0512+1723&one=T>	The voucher specimens that presumably refer to this population (UCR197844, UCD38190) were reviewed by Toni Corelli in 2016, and the identifications of these collections were determined as <i>Leptosiphon parviflorus</i>. Text added to this section: “One population of variable linanthus located in the Santa Cruz Mountains near Boulder Creek looks particularly similar to coast yellow leptosiphon (A. Schusteff pers. comm. 2017), but the herbarium specimen records which presumably refer to this population have been confirmed as variable linanthus (Corelli 2016).”
7	23	“<i>Eriogonum latifolium</i>, coastal celery-button (<i>Eryngium armatum</i>),...”: Also growing intermingled with <i>L. croceus</i> (near the southwest corner of the population) at least in 2006 and for a few years afterwards, was the native forb <i>Clarkia rubicunda</i> ssp. <i>blasdalei</i> (a coastal form of <i>Clarkia rubicunda</i> that has been synonymized with the nominate form). Also, in my experience, the <i>Eryngium</i> used to mainly grow on the east side of the beaten foot path...near to, but disjoint from, the <i>L. croceus</i> population, which was restricted to the west side of the walking path. However, the <i>Eryngium</i> may now have spread to the west side of the foot path as well.	Department staff did not observe <i>Clarkia rubicunda</i> at the population during site visits, and the species was not listed on the plant list of Vallemar Bluff provided by Toni Corelli. The species may still occur there but was not included in the report since it was not recorded during site visits. Department staff observed <i>Eryngium armatum</i> growing within the <i>L. croceus</i> population west of the foot path. No changes made to the document.
9	“Geology and Soils”	During a visit to the site, Randy Morgan once remarked that the presence of the <i>Leptosiphon</i> and many other native plants to the west of the beaten foot path may owe to the soil there having never been plowed. Agricultural use of the coastal prairies adjacent to bluffs had been common earlier in the last century all along the coast from south of San Francisco to Santa Cruz, and farmers often plowed right up to the use paths that followed the top of the bluffs. “Never plowed soil” may be a habitat characteristic to keep in mind when considering optimal sites for possible seeding of new populations.	Comment noted. No response needed.

20	17	Predation (or perhaps "Herbivory"?) I think it's VERY IMPORTANT to include somewhere in the report mention of the possible threat of the introduction of non-native slugs into the population (e.g. from neighboring residential landscaping, or other venues), which could quickly devastate the population (and may provide an explanation for the very rapid decrease in number of plants in the population over the previous few years). Slugs can eat the small seedlings early in the season when they're barely noticeable to humans. And the slugs nocturnal and winter "wet-cycle" phenology might make them a relatively cryptic threat to most observers. Simple experimental sampling (e.g. setting down flat pieces of plywood or other such attractive slug shelters, and checking underneath them in the morning) should be done, especially during early rains. If slugs are present, a judicious program of elimination and control (e.g. use of a targeted and relatively non-toxic slug bait like "sluggo") could be effective (and essential) for protecting the Leptosiphon population!	Added text to the "Predation" sections of the document to describe the potential threat from introduced non-native slugs to coast yellow leptosiphon. Citations and references added to the text and literature cited.
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County of San Mateo - Planning and Building Department

ATTACHMENT U2



State of California – The Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Bay Delta Region
7329 Silverado Trail
Napa, CA 94558
(707) 944-5500
www.wildlife.ca.gov

EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director



February 7, 2018

Mr. Steve Monowitz, Director
Planning and Building Department
County of San Mateo
455 County Center, 2nd Floor
Redwood City, CA 94063

Dear Mr. Monowitz:

Subject: Four Residences on Vallemar at Julianna, Moss Beach, Initial Study/Mitigated Negative Declaration, San Mateo County Case No. PLN2015-00380

The California Department of Fish and Wildlife (CDFW) reviewed the Initial Study/Mitigated Negative Declaration (IS/MND) provided for the Four Residences on Vallemar at Julianna, Moss Beach (Project) located at Vallemar Street at Julianna Avenue, in unincorporated Moss Beach, San Mateo County. The IS/MND was received in our office on January 17, 2018.

CDFW is a Trustee Agency under the California Environmental Quality Act (CEQA) section 15386 for projects that could impact fish, plant and wildlife resources. CDFW is also considered a Responsible Agency if a project would require discretionary approval under the California Endangered Species Act (CESA; Fish and Game Code, § 2050 *et seq.*), the Native Plant Protection Act, the Lake and Streambed Alteration (LSA) Program or other provisions of Fish and Game Code that afford protection to the State's fish and wildlife trust resources. Pursuant to our jurisdiction, CDFW has the following concerns, comments, and recommendations regarding the Project and potential impacts to coast yellow leptosiphon, a CESA candidate species.

PROJECT DESCRIPTION AND LOCATION

The Project includes construction of four new residences, with a total building footprint of 15,985 square feet on a 2.48-acre parcel. Construction of the residences would require a Coastal Development Permit (CDP), Resource Management-Coastal Zone Permit, Grading Permit, and Lot Line Adjustment (LLA). The residences are proposed on what would be four reconfigured parcels (via the LLA) from the seven legal parcels that currently exist. The Project involves the removal of 30 Monterey cypress trees, as well as a total grading of 600 cubic yards (cy) of cut and 3,100 cy of fill. The CDP is appealable to the California Coastal Commission.

The property is bordered to the north by residentially zoned and developed parcels, to the east by Vallemar Street, to the south by Julianna Avenue, and to the west by the coastal bluffs along the Pacific Ocean. The Project site slopes to the southwest at an average slope of approximately 10% and ranges from about 26% near Vallemar to about 3% closer to the bluffs.

COAST YELLOW LEPTOSIPHON – LEGAL STATUS AND THREATS

A petition to list coast yellow leptosiphon as an endangered species pursuant to CESA was submitted to the Fish and Game Commission (Commission) on May 25, 2016 by

Ms. Toni Corelli and the California Native Plant Society (CNPS). On December 23, 2016, the Commission published its Notice of Findings for coast yellow leptosiphon in the California Regulatory Notice Register, designating coast yellow leptosiphon as a candidate species. (Cal. Reg. Notice Register 2016, No. 52-Z, p. 2197). A candidate species is afforded the same protections as a CESA-listed threatened or endangered species. (Fish and Game Code, § 2085). CDFW promptly commenced its review of the status of the species as required by Fish and Game Code section 2074.6, which concluded with a peer-reviewed status review report that was submitted to the Commission. The Commission will receive the report at its February 7-8, 2018 meeting in Sacramento and will determine at a future meeting whether to list coast yellow leptosiphon as endangered. The status review report and its listed references are incorporated into this letter and provided as Exhibit A.

As further described in the status review report, coast yellow leptosiphon (*Leptosiphon croceus*) is a low-growing annual plant in the Phlox family (Polemoniaceae) that was first described in 1904. The sole population of this plant is limited to approximately 167 square meters (1,800 square feet) located in coastal prairie habitat atop Vallemar Bluff at the edge of the coastline and adjacent to the Project site. The population of coast yellow leptosiphon occurs in close proximity to urban land use, and has been either directly or indirectly impacted by modification or destruction of habitat. Coast yellow leptosiphon is threatened, both directly and indirectly, by development and other land-use changes; impacts from invasive plant species; and impacts from human activities such as trampling. Bluff-top erosion is also a serious threat to this species, and climate change may accelerate this process. In addition, coast yellow leptosiphon is highly vulnerable to extinction due to its extremely limited distribution and restriction to only one small population. Because of the rarity of coast yellow leptosiphon, the loss of any occupied habitat or any portion of the population would represent the loss of a significant portion of its total range, and would likely lead to extinction of the species.

CEQA CONSULTATION, NOTIFICATION AND REVIEW REQUIREMENTS

CEQA and the CEQA Guidelines define a trustee agency as a state agency with jurisdiction by law over natural resources affected by a proposed project. CEQA's circulation, notice, and consultation requirements play a critical role in CDFW's trustee mandate to conserve the State's fish and wildlife resources for all the people of California (Fish and Game Code, §§ 711.7, 1802). Public agencies are required to consult with CDFW in its capacity as a trustee agency for fish and wildlife resources. [CEQA Guidelines,¹ §§ 15072, subd. (a) and 15073, subd. (c)]. To the extent CDFW exercises discretionary approval power over a project for CESA purposes, CDFW is considered a CEQA responsible agency. (Pub. Resources Code, § 21069; CEQA Guidelines, § 15381). The consultation process provides a public agency with the opportunity to ask CDFW whether a proposed action may have a significant effect on or cause jeopardy to a species protected under CESA.

CEQA specifies minimum notice requirements for Mitigated Negative Declarations. (Pub. Resources Code, § 21091; CEQA Guidelines, §§ 15072 and 15205). A lead agency must submit a draft Mitigated Negative Declaration to the State Clearinghouse for a 30-day review period if a state agency would be a CEQA responsible agency or if a project is of statewide,

¹ Cal. Code of Regs., tit. 14, § 15000 et seq.

regional, or areawide significance. [CEQA Guidelines, §§ 15073, 15105 and 15205, subd. (b)]. A project that would substantially affect sensitive wildlife habitats, including habitat for a rare or CESA-protected species, is one of statewide, regional, or areawide significance. [CEQA Guidelines, § 15206, subd. (b)(5)]. A public agency's failure to give the notice required by law may constitute a prejudicial abuse of discretion resulting in an adopted Mitigated Negative Declaration being set aside. (*Fall River Wild Trout Foundation v. County of Shasta* (1999) 70 Cal.App.4th 482, 491-93).

A Mitigated Negative Declaration may be appropriate when an Initial Study identifies potentially significant effects on the environment, but the project is revised to avoid or mitigate the effects and there is no substantial evidence that the revised project may have a significant effect on the environment. (Pub. Resources Code, § 21064.5). If there is substantial evidence in the record to support a fair argument that mitigation measures for the revised project may not mitigate impacts to a level of insignificance, then a Mitigated Negative Declaration is not appropriate. (*San Bernardino Valley Audubon Society v. Metropolitan Water District* (1999) 71 Cal.App.4th 382, 391-92). Further, if there is substantial evidence that a project has the potential to "cause a fish or wildlife population to drop below self-sustaining levels; threaten to eliminate a plant or animal community; [or] substantially reduce the number or restrict the range of an endangered, rare or threatened species," then a lead agency is required to prepare an EIR. (CEQA Guidelines, § 15065, subd. (a); see also Pub. Resources Code, §§ 21001, subd. (c) and 21083; CEQA Guidelines, §§ 15064 and 15380).

PROCEDURAL BACKGROUND

A pre-application public meeting for an earlier version of the Project was conducted in December 2015. The Project was redesigned in October 2016 and again in July 2017. The County Design Review Committee reviewed the plans in October 2017, recommending approval. The County did not consult with CDFW after redesigning the Project. A consultation may have occurred prior to 2015; however, we have no records of such an occurrence, and the Project has evolved significantly since that time.

On June 6, 2017, CDFW sent a letter to the County Planning and Building Department informing the County of the presence of coast yellow leptosiphon on a County property adjacent to the Project site, informing the County of the petition to list the plant as endangered, and asking the County for its help in protecting the plant from possible extinction. The letter provided an overview of CESA candidacy and informed the County that CDFW would be preparing a status review report, to include detailed information about the species, best management practices, threats, and CDFW's recommendation to the Fish and Game Commission as to whether species listing is warranted. The letter requested that the County consult with CDFW prior to making any changes to its property.

In response, County staff emailed Cheryl Burton, Senior Environmental Scientist Specialist on November 7, 2017 to inquire about the status of CDFW's decision to list coast yellow leptosiphon under CESA. Ms. Burton works in CDFW's Native Plant Program, which provides technical guidance to the public and CDFW regional staff on issues pertaining to special-status plants. The Native Plant Program does not typically provide review of CEQA documents, which is handled by regional offices. Ms. Burton informed the County that CDFW was finalizing a status review report and that the status review report was estimated to be complete by the end

of December. The County did not request further consultation with CDFW staff regarding the Project and how it might affect the plant population on the adjacent site. Instead, the County proceeded with preparation of the IS/MND.

Ms. Randi Adair, a Senior Environmental Scientist (Supervisory) in CDFW's Bay Delta Region, the regional office responsible for reviewing the Project, contacted the County via email on December 5, 2017, inquiring about the status of the Project and CEQA document, offering to provide technical assistance, and asking to consult with the County on the Project as described in CEQA consultation requirements [Pub. Resources Code, §§ 21080.3, 21104.2; CEQA Guidelines §§ 15006, subd. (g), 15022, 15060.5 and 15063, subd. (g)]. Ms. Adair informed the County that CDFW had received comments from the public regarding this Project and expressed concern that mitigation measures described by the County in the email exchange - fencing, signage and other similar measures - would not be effective in addressing all Project impacts, resulting in significant and unavoidable effects to the coast yellow leptosiphon. Ms. Adair also advised the County that preparation of an EIR might be warranted. Ms. Adair offered to provide a detailed comment letter prior to preparation of the environmental document to assist County staff in evaluating and mitigating the Project's potential impacts and determining whether an EIR should be prepared. County staff responded that an IS/MND was in preparation and that CDFW would be provided with a copy to review during the public comment period.

Initially, the County adopted a review period of 20 calendar days for this Project. The County did not submit the IS/MND to the State Clearinghouse for a 30-day review period. As previously noted, CDFW had emailed the County to express concerns regarding the impacts of the Project, also indicating that the Project was likely to be controversial. The County emailed a copy of the IS/MND to CDFW staff on January 17, 2018. On January 18, 2018, CDFW emailed the County to request that the review period be extended to cover, at a minimum, the standard 30 days. The County accordingly extended the review period by ten days. County staff indicated that they would email interested parties about the change.

CDFW is concerned that it was not consulted with regarding potential impacts to the CESA-candidate species coast yellow leptosiphon, that the Project was not appropriately noticed, and that the Project may not mitigate potential impacts to coast yellow leptosiphon to a level of insignificance. CDFW has prepared the below comments on the Project's impacts and proposed mitigation approach to highlight our concerns. We ask that our comments be immediately posted on the County's website for public review and maintained as part of the Project file, and that this letter be made available to any member of the public requesting information on the Project.

GENERAL ISSUES

Substantial Evidence: Coast Yellow Leptosiphon Status Review

As described above, CDFW staff informed the County that a status review for the coast yellow leptosiphon would be completed in late December. The status review is a detailed report prepared by CDFW staff and reviewed by a panel of external experts that compiles the best available science on a candidate species' habitat and life history needs, best management practices, threats, and CDFW's recommendation to the Fish and Game Commission as to whether CESA listing is warranted. The status review was received by the Fish and Game Commission at its public meeting on February 7-8, 2018.

The status review report represents substantial evidence, as defined in CEQA Guidelines section 15064, subdivision (a)(1), necessary to fully evaluate the Project's effects on the environment. The County was informed of the timing of release of this document and could expect this document would be part of the record for the IS/MND. Although the status review report was not yet available to the public, the County was aware of the coast yellow leptosiphon's candidacy under CESA and ongoing status review.

Project Description

The IS/MND describes the footprint of the proposed new residences and some accessory features but does not provide a description of features such as landscaping, stormwater management features, outbuildings, utilities, ingress and egress roads, fencing, etc. Such features would result in permanent conversion of undeveloped areas and could have a number of other effects (see Impact Analysis and Mitigation Measures section below). Impacts may also result during construction or as a result of foreseeable future maintenance. The IS/MND does not provide detail on Project construction, including staging, earth-moving, or handling of spoils and groundwater (although the document does attempt to address some impacts through non-location-specific mitigation). Without this information, CDFW is unable to evaluate the adequacy of the impact analysis or proposed mitigation measures. Impacts may occur that have not been fully disclosed.

IMPACT ANALYSIS AND MITIGATION MEASURES

California Endangered Species Act Status: Coast Yellow Leptosiphon

The IS/MND does not reference the correct CESA listing status for the coast yellow leptosiphon, referring to the plant only as "rare". This species is a candidate for listing, which affords the plant the full protections of CESA. This omission may lead the public to draw inaccurate conclusions about the gravity of potential impacts to this species. Any harm to this small, isolated population – including habitat loss – is likely to put the plant in jeopardy of extinction.

Notice of Intent States "No Effect" on Biological Resources

The Notice of Intent to Adopt a Mitigated Negative Declaration (Notice of Intent) states that the Project would have no effect on biological resources. The "Environmental Factors Potentially Affected" checklist on page 3 of the IS/MND does not indicate any potential effects on biological resources. However, the Biological Resources analysis beginning on page 14 indicates that several impacts would be either less-than-significant or potentially significant if not mitigated. It may be that the "no effect" statement for biological resources in the Notice of Intent and checklist was included in error. Please clarify.

Analysis of Project Impacts

Due to the coast yellow leptosiphon's limited distribution and small population size, any impact to this species or its habitat, regardless of magnitude, should be considered significant under CEQA. Effects that might be considered less-than-significant in other contexts may directly or indirectly threaten the plant's continued existence.

CDFW has identified the following significant concerns regarding the IS/MND Biological Resources analysis:

- The IS/MND states that the coast yellow leptosiphon “does not extend onto any portion of the project site”. The document does not clearly indicate the basis of this finding; however, it appears that this conclusion may have been drawn from a botanical report (Zander 2015) referenced in the analysis. CDFW has two concerns regarding the use of this document in the IS/MND analysis:
 - First, this document was not circulated for public review. CDFW obtained a copy of this report when preparing the status review and has included a copy as an exhibit to this letter (Exhibit B). This report should be included in the public record, and the public should be given adequate time for review.
 - Secondly, the IS/MND uses the Zander 2015 biological report beyond its intended use. The methods described in the Zander 2015 biological report are not adequate to conclusively establish the absence of the coast yellow leptosiphon and/or other special-status species from the Project site. The biologists mapped the extent of the coast yellow leptosiphon population on the adjacent property, but efforts on the Project site appear to have been focused primarily on habitat mapping. Systematic survey methodologies, including duration of survey, level of effort and approach (e.g. transects, plots), are not specified in the report. The findings documented in the report consist solely of a list of plants observed. Adverse conditions and other confounding factors are not discussed. Please refer to CDFW’s “Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities” (CDFW, 2009) on our website at:
<http://wildlife.ca.gov/Conservation/Plants>
- Based on our review of the available evidence, the IS/MND has not ruled out the possibility that the coast yellow leptosiphon and/or other special-status species may be present on the Project site. In fact, one individual coast yellow leptosiphon plant was observed growing on the Project site during botanical surveys conducted on May 16, 2016 (T. Corelli pers. comm. 2016, also described in the status review). Habitat conditions are currently suitable on several parts of the site. The site supports a number of coastal prairie plants, including low-growing forbs and bunch grasses, which are known to grow in association with this species. Vegetative cover conditions are similar to those on the adjacent property, where presence has been confirmed. Although little is known about the life history of coast yellow leptosiphon, evidence suggests that it may be wind-pollinated, and the Project site is within reasonable dispersal distance for airborne pollen. Plant populations, particularly annuals, may shift spatially from year to year. Since annual plants reproduce by seed, identification of coast yellow leptosiphon on the Project site indicates that the plants have distributed seed beyond the currently-mapped occurrence, and that a seed bank is potentially present in the area where this plant was identified. A seed bank constitutes a living plant population, even when above-ground plants are not visible. As described above, reconnaissance-level survey techniques have a high potential to miss individual plants. The coast yellow leptosiphon is a tiny plant, only 2 to 7 centimeters in height. Since the species has been found in one area of the Project site and may be found in others, the Project could result in take, a significant impact and potential violation of CESA. Conclusions that rely on the assumption that the species is absent from the site should be revisited.

- Native plant species may utilize disturbed habitats depending on the nature and magnitude of the disturbance. The IS/MND should explain why areas proposed for development are unsuitable for the coast yellow leptosiphon and native plant communities. In other words, the IS/MND should describe why on-site conditions permanently preclude the species' future use of the site, with recognition that the coast yellow leptosiphon is an annual plant whose distribution is likely to shift from year to year. Development of areas that are currently suitable or could be restored would reduce the overall habitat available to the species. Other effects could occur, such as a net loss of pollinator habitat.
- The IS/MND indicates that the Project would minimize direct effects to coastal prairie grassland by siting development within disturbed/ruderal areas. The IS/MND does not describe the thresholds and characteristics used to distinguish between "disturbed" habitat and coastal prairie grassland habitat that merits Environmentally Sensitive Habitat Area (ESHA) protection under the California Coastal Act. The text under the heading "Transitional Area" may have been intended to answer this question; however, the text cuts off in mid-sentence.
- The California Coastal Act defines an ESHA as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments" (CA Coastal Act § 30107.5). In areas adjacent to ESHAs, the California Coastal Act states that "[e]nvironmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas." As described in this section, it is not clear from the IS/MND analysis that implementation of the Project would be consistent with these requirements.
- The IS/MND states that the Project plans would minimize direct effects on coastal prairie grassland. This word "minimize" implies that an unspecified amount of coastal prairie grassland would be impacted, potentially in conflict with ESHA protection requirements. As stated above, the only remaining habitat for the coast yellow leptosiphon is within the immediate Project vicinity. Any habitat loss, regardless of acreage, could affect this species' survival and should be considered significant.
- IS/MNDs do not typically provide a large amount of detail regarding stormwater, landscaping, irrigation, fencing, site occupancy and use, construction staging and access, etc.; however, for this Project, such details may have potential to adversely impact the coast yellow leptosiphon. Incorporation of Project plans is not adequate; the IS/MND should also include a narrative analysis reviewing the effects of these features.
- It is unclear from the Project Description whether ground-disturbing activities, such as construction staging or spoils storage, would occur in sensitive habitat areas. Please note that ground-disturbing activities should not be considered "temporary" or "less-than-significant" if they could affect a special-status plant population or its seedbank, regardless of whether the site would be restored to pre-project contours.

- As described in the status review (Exhibit A), there are a number of serious threats to the coast yellow leptosiphon associated with coastal bluff erosion and noxious weed encroachment. A coastal bluff recession study was prepared by Haro, Kasunich & Associates, Inc., Consulting Geotechnical and Coastal Engineers in 2015 (HKA 2015, Appendix P). Based on results of this study, the coast yellow leptosiphon population is located on a portion of the bluff that is highly susceptible to erosion, and most of the population could be lost to erosion by 2065. A subsequent report prepared by Environmental Science Associates (ESA 2016, Appendix Q) found that the erosion rate is actually projected to be greater than found in the 2015 report (HKA 2015), indicating an even greater threat to coast yellow leptosiphon. The coast yellow leptosiphon population is also threatened by encroachment of the highly invasive freeway iceplant growing on the edge of the bluff. Freeway iceplant forms nearly impenetrable mats that dominate the landscape, and it competes aggressively with native plant species for light, nutrients, water, and space (D'Antonio and Haubensak 1998). Iceplant has shallow roots that are ineffective for erosion control, and the weight of the plant itself may actually accelerate erosive processes (Spitzer 2002). While such conditions as erosion and noxious weed encroachment are not directly related to the Project, the Project would contribute to habitat stresses on the coast yellow leptosiphon associated with these conditions. The amount of available habitat on Vallemar Bluff is rapidly diminishing. By developing areas adjacent to the current population, the Project would prevent recolonization of previously occupied habitat areas, precluding habitat and species recovery.
- In addition to impacts associated with habitat loss, the Project would intensify current recreational usage in the immediate vicinity of the coast yellow leptosiphon population. People or pets venturing off trail may damage the plant or its habitat. The IS/MND claims that disturbance would not be any higher than under current circumstances but does not provide any evidence to substantiate this claim. Pass-through trail users and stationary residents are likely to utilize the bluff area in different ways. For example, residents are more likely to utilize the area regularly than visitors due to proximity. Residents may also increase the use of pets in the area, which would cause further disturbance to the habitat. Development of the area would modify the aesthetics and accessibility of the bluff, potentially resulting in alterations of walking patterns in the area. People may create new paths through the remaining portions of the habitat accessible on Vallemar Bluff, potentially through the coast yellow leptosiphon population. These concerns also apply to the easement areas proposed by the IS/MND. As described in the Mitigation Measures subsection, the proposed easement appears to be an unenforceable and ineffective method of protecting coastal prairie habitat from foot traffic.
- All claims made in the analysis should rely on the best available scientific literature. Documents cited in the Biological Resources analysis were supplied by the applicant. There is no indication that these documents were independently reviewed and field verified by a qualified botanist. As previously mentioned, the coast yellow leptosiphon status review prepared by CDFW and reviewed by a panel of outside experts provides a comprehensive review and summary of the best available scientific literature pertaining to this species. The status review has been included in this letter as Exhibit A.

- The IS/MND references a number of studies and plans that purportedly incorporate, or will incorporate, protective measures (e.g., County Parks protection plan, conservation strategy, landscaping and irrigation plan, adaptive management and monitoring plan, drainage plan). Most of these plans are preliminary, have not yet been prepared, are not included for public review, and/or depend on implementation by a third party. Funding, monitoring and enforcement mechanisms are largely unspecified. Given the imperiled nature of the adjacent coast yellow leptosiphon population, this level of uncertainty and deferral is not appropriate and does not satisfy the requirements of CEQA.
- The analysis includes a discussion of site hydrology and indicates that the project will include infiltration and detention features (not described) to prevent a net increase in surface runoff from the Project site. Other hydrological effects, including soil saturation and effects of increased subsurface flows on erosive processes, are not addressed. As indicated in the geotechnical analysis (Appendix P), test bore holes encountered groundwater at a depth of 4 to 5 meters. Additional seepage at the bluff face may increase the rate of erosion.
- The site plan avoids impacts to Monterey cypress, a species that generally provides aesthetic rather than high ecological value, while impacting restorable open grassland. Monterey cypress is known from only two native occurrences, which are in the Monterey area. It is considered invasive in other parts of California, and it has been widely planted and naturalized in other areas along the coast (Cal-IPC 2017; CNPS 2017). The Monterey cypress trees on the Project site likely represent planted specimens.
- No protective measures are provided to avoid impacts to the coast yellow leptosiphon during construction.
- Special-status species that are known to occur on the Project site and vicinity, including Blasdale's bent grass (*Agrostis blasdalei*), Johnny nip (*Castilleja ambigua* ssp. *ambigua*) and harlequin lotus (*Hosackia gracilis*), were not disclosed in the IS/MND and impacts were not evaluated.

Adequacy of Proposed Mitigation Measures

The bar for success of mitigation measures protecting the coast yellow leptosiphon and its habitat is high. Any residual impact to this species or its habitat could lead to the species' extinction. Residual impacts should therefore not be considered "less-than-significant" even if all feasible mitigation has been applied.

CDFW has several concerns about the clarity, enforceability and effectiveness of mitigation measures proposed in the Biological Resources section, as described below.

Mitigation Measure 3: This mitigation measure tasks the County Parks Department with preparing a plan responding to the potential impacts of the Project. The scope of the plan is unclear; the measure only indicates that it will likely include fencing and signage and that such features will "ideally be implemented" prior to the final construction inspection of the new residences.

This measure defers mitigation to a future date and places the burden of mitigation on a public agency. This mitigation measure does not outline clear performance standards or Project applicant responsibilities, and as such, is largely unenforceable. No funding or monitoring mechanisms are specified. It is not certain that the measure will be in place before anticipated impacts occur.

As written, this mitigation measure would not offset potential impacts to coast yellow leptosiphon or its habitat. CDFW recommends that this mitigation measure be significantly revised, in consultation with our agency.

Mitigation Measure 4: This mitigation measure indicates that the applicant shall implement a conservation strategy developed by one of the applicant's consultants (McGraw 2017). The measure also implies that an easement will be granted to a non-profit conservation or governmental agency to protect coastal grassland habitat.

The draft conservation strategy (an appendix to Appendix S) provides conceptual conservation measures, but does not provide details on how to implement measures or how the measures would offset impacts. The strategy refers to an adaptive management and monitoring plan that will be prepared for "the preserve" that will follow a draft outline that was prepared in 2016 (McGraw 2016). The draft outline for the plan was not provided to CDFW for review. In addition, it is unclear what is meant by "the preserve", as it is not described or defined.

CDFW is concerned that the easement requirement, a measure that is heavily relied upon to support a less-than-significant finding for habitat loss and degradation, has not been fully fleshed out or vetted. The IS/MND indicates that the easement will describe restricted and allowable uses; however, such uses are not incorporated into the mitigation measure itself. The measure alludes to restrictions on pesticide, fertilizers and pet access, but does not explain what the restrictions would entail. It is unclear how the effectiveness of the easement will be monitored or enforced or what long-term funding mechanisms would be put in place for management, monitoring, and enforcement. Elsewhere in the IS/MND, the text posits that homeowners' association (HOA) fee might be an appropriate source of funding. HOA fees are a non-binding funding mechanism; therefore, CDFW recommends a non-wasting endowment based on a long-term management plan. The endowment should also fund any off-site costs incurred by the County Parks Department to protect the coast yellow leptosiphon population against potential Project impacts.

CDFW has a long history of reviewing, managing and enforcing easements. We recommend that the County consult with our agency to discuss revision of this measure to provide clearer, more enforceable protections. The easement terms, easement holder, long-term management plan, management responsibilities, permanent funding mechanisms, monitoring, and enforcement should be agreed upon prior to approval of the Project. The easement should be recorded and funding should be in place before any construction occurs.

Mandatory Findings of Significance

Please review our comments on the Impact Analysis and Mitigation Measures to determine whether mandatory findings of significance under the Public Resources Code section 15065

apply to the Project given the vulnerability of coast yellow leptosiphon to extinction as described above and in the status review report.

OTHER CONSIDERATIONS

Appropriateness of a Mitigated Negative Declaration

Comments regarding substantial evidence and the significance of potential effects are provided above. After reviewing CDFW comments on the potential effects of the Project, please consider the standards identified in CEQA Guidelines section 15073.5, which describe the process for adding and expanding mitigation measures, and as necessary, recirculation of an MND or preparation of an EIR.

Use Of IS/MND as CEQA Document for Discretionary Permits

As described in this letter, CDFW has identified a number of inadequacies in the IS/MND, both in procedure and content. As such, responsible agencies expected to issue discretionary permits for the Project may need to conduct additional environmental review prior to finalization of such permits.

Filing Fees

CDFW anticipates that the Project will have an impact on fish or wildlife and assessment of filing fees is necessary (Fish and Game Code, § 711.4; Pub. Resources Code, § 21089). Fees are payable upon filing of the Notice of Determination by the lead agency and serve to help defray the cost of environmental review by CDFW.

RECOMMENDATIONS

We urge the County to address the concerns described above regarding resources within our jurisdiction. CDFW strongly encourages a meeting between CDFW, County Planning and Parks staff, the California Coastal Commission, and any other agencies expected to issue discretionary permits for the Project to address and resolve concerns. If the County chooses not to consult with responsible and trustee agencies, we recommend that the County provide a written response to our concerns, posting the letter on the County website for public review and maintaining a copy with the Project file.

It may be necessary to revise and recirculate the IS/MND or prepare an EIR to address procedural or content deficiencies addressed above. Some of the Project's impacts may be unavoidable. If you have any questions, please contact Ms. Randi Adair, Senior Environmental Scientist (Supervisory), at (707) 576-2786 or randi.adair@wildlife.ca.gov; or Mr. Craig Weightman, Environmental Program Manager, at (707) 944-5577 or craig.weightman@wildlife.ca.gov.

Sincerely,



Gregg Erickson
Acting Regional Manager
Bay Delta Region

cc:

State Clearinghouse

San Francisco Bay Area Regional Water Quality Control Board

Renee Ananda, California Coastal Commission – renee.ananda@coastal.ca.gov

Susan Craig, California Coastal Commission – susan.craig@coastal.ca.gov

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Lt. James Ober, CDFW Law Enforcement Division

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Personal Communication

Corelli, Toni. Personal e-mail communication. June 8, 2016.

Mr. Steve Monowitz
February 7, 2018
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EXHIBITS (via email only)

Exhibit A. Status Review

California Department of Fish and Wildlife, 2017. Report to the Fish and Game Commission, Status Review of Coast Yellow Leptosiphon (*Leptosiphon croceus*).

Exhibit B. Biological Report

Zander Associates, 2015. Vegetation Characterization and Mapping, Moss Beach Lots.
Provided to Owen Lawlor, Manager, Moss Beach Associates, LLC on May 21, 2015.



County of San Mateo - Planning and Building Department

ATTACHMENT V



Tree Assessment

**Juliana Way
Moss Beach CA**

Prepared for:
Verde Design
2455 The Alameda Suite 200
Santa Clara CA 95050

Prepared by:
HortScience, Inc.
325 Ray Street
Pleasanton, CA 94566

May 2015



Tree Assessment

Juliana Way
Moss Beach CA

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Attachments

Tree Assessment Form

Tree Assessment Map

Introduction and Overview

Verde Design is designing a new landscape for the proposed development of a property at the intersection of Juliana Way and Vallemar Street in Moss Beach CA. The site is currently undeveloped. HortScience, Inc. was asked to assess the health and structural condition of existing trees and summarize their potential to be retained in the new landscape.

This report presents the following information:

1. Evaluation of tree health and structural condition.
2. Assessment of tree suitability for preservation.

Survey Methods

Trees were surveyed in May 2015. Each tree larger than 6" in diameter was visually assessed from the ground and evaluated as follows:

1. Identifying the tree as to species.
2. Attaching a numerically coded metal tag on the trunk of each tree.
3. Recording the tree's location on a map.
4. Measuring the trunk diameter at a point 54" above grade.
5. Evaluating the health and structural condition using a scale of 0 – 5 where 0 = dead, 1 = poor and 5 = excellent.
6. Comment on presence of defects in structure, insects or diseases and other aspects of development.
7. Assess tree suitability for preservation as high, moderate or Low.
8. Identify arboricultural treatments to reduce the likelihood of failure and improve tree health, structure, stability and longevity.

Description of Trees

Forty-four (44) trees were evaluated: 41 Monterey cypress (*Hesperocyparis macrocarpa*) and 3 Monterey pine (*Pinus radiata*). Trees appeared to have been planted but it is possible that smaller trees arose as chance seedlings. Neither Monterey cypress nor Monterey pine is native to San Mateo County.

Cypresses were not uniformly distributed across the site but were found in several groups:

- #153 – 160 formed an irregular line running from east to west, parallel to Juliana St. In addition to the standing trees, there were numerous stumps in between existing cypresses (Photo 1). Stumps lean towards Juliana St., suggesting that trees failed in that direction and were then cut off.

Photo 1. Looking west at trees #155, 156 and 157. Juliana St. is on the left.

Cypresses in this group were generally single-stemmed with trunk diameters between 6" (#154) and 37" (#157). Most trees were in fair condition. Exceptions included #153 which was 18" and good.

Trees #156 and 160 were in poor condition. Trees #160 had failed at the base and was laying on the ground.



- #162 – 177 formed a well-defined row on the south side of the property. Trees had been planted close together and were mature in development. Crowns were very asymmetric (Photo 2). On the west, low branches ran along the ground for some distance from the trunk. On the east, no low branches were present leaving trunks exposed to the top of the trees. On the south, trees #162, 163 and 164 had numerous failed but still green branches laying on the ground.



Photo 2. Crowns of cypresses #163 – 177 were very asymmetric. Left: west side. Right: east side.

Tree structure was characterized by 2 or more stems that arose near the base of the trunk. Stems varied widely in orientation, ranging from vertical to sharply leaning from the base to bowed almost flat. Branch failures were common. Eleven trees were in poor condition while #166, 173, 174, 175 and 178 were fair.

- #179 – 188 formed a second row on the north side of the property (Photo 3). Trees were farther apart than in the group above but as mature in development. Low branches had been removed leaving numerous pruning wounds and high canopies of foliage. Six trees were in poor condition while #179, 180, 183 and 186 were fair.

Photo 3. Looking southwest along trees #179 – 188. Tree #188 leans to the southeast (red arrow).



- Cypresses #161, 189, 178, 193 and 194 were large mature trees growing alone rather than in a group (Photo 4, following page). As a result, trees were shorter but crowns were much larger. This group ranged from a single stem (#189) to codominant stems (#193) to multiple stems arising near the base (#161, 178, 194). Tree #178 had the largest single stem of any cypress on the site: 54". Condition was poor for #189, 193, 194 but fair for #161 and 178. Trees #178, 193, 194 had been pruned to clear the overhead/adjacent electrical lines.

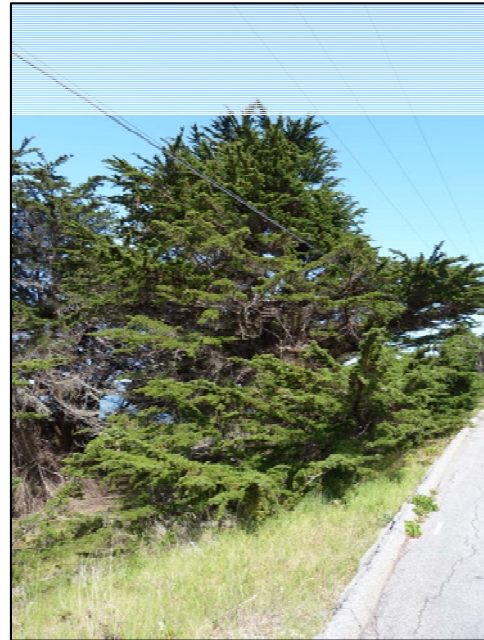


Photo 4. Above: looking east at cypress #161. Right: looking north along Vallemar St. at cypress #178. Note numerous low branches in the foreground.

- #190, 191, 195 were small trees (7"). Trees #190 and 191 were in poor condition; #195 was fair.

Monterey pines #150, 151 and 152 were located on Vallemar St. near the intersection with Juliana. Trees were small with diameters between 9" and 13". All were in poor condition having been topped to clear the overhead electrical lines. Trees #152 had failed at the base and laying on the ground.

Description of individual trees is found on the enclosed **Tree Assessment Form**. Tree locations are found on the **Tree Assessment Map**. Both are included as **Attachments**

San Mateo County has several regulations regarding trees:

- A Significant tree has a trunk diameter of 12" or greater measured at 54" above grade. Based on my measurements of the trees 37 Monterey cypresses and 2 Monterey pines met this criterion.
- An Indigenous tree is one that is known to occur naturally in San Mateo County. Neither Monterey cypress nor Monterey pine are indigenous to the County.
- A Heritage tree may be designated by the Board of Supervisors or meet certain criteria of size and species. None of the trees at the site appear to have Heritage status.

Suitability for Preservation

Trees that are preserved on development sites must be carefully selected to make sure that they may survive development impacts, adapt to a new environment and perform well in the landscape. Our goal is to identify trees that have the potential for long-term health, structural stability and longevity. Evaluation of suitability for preservation considers several factors:

- **Tree health**
Healthy, vigorous trees are better able to tolerate impacts such as root injury, demolition of existing structures, changes in soil grade and moisture, and soil compaction than are non-vigorous trees. Twenty-four (24) of the 41 cypresses were in poor condition.
- **Structural integrity**
Trees with significant amounts of wood decay and other structural defects that cannot be corrected are likely to fail. Such trees should not be preserved in areas where damage to people or property is likely.
- **Species response**
There is a wide variation in the response of individual species to construction impacts and changes in the environment. Monterey pine and Monterey cypress are intolerant of construction impacts.
- **Tree age and longevity**
Old trees, while having significant emotional and aesthetic appeal, have limited physiological capacity to adjust to an altered environment. Young trees are better able to generate new tissue and respond to change. Trees were generally mature in development.
- **Species invasiveness**
Species which spread across a site and displace desired vegetation are not always appropriate for retention. This is particularly true when indigenous species are displaced. The California Invasive Plant Inventory Database (<http://www.cal-ipc.org/paf>) lists species identified as having being invasive. Moss Beach is part of the Central West Floristic Province. Neither Monterey cypress nor Monterey pine are noted as having invasive potential.

Each tree was rated for suitability for preservation based upon its age, health, structural condition and ability to safely coexist within a development environment (Table 1).

Table 1. Tree suitability for preservation. Juliana Way. Verde Design. Moss Beach CA.

High	Trees with good health and structural stability that have the potential for longevity at the site. None of the trees was rated as having high suitability for preservation.
Moderate	Trees in fair health and/or possessing structural defects that may be abated with treatment. Trees in this category require more intense management and monitoring, and may have shorter life-spans than those in the "high" category. Monterey cypress #178 and 195 were rated as having moderate suitability for preservation.

Table 1, continued. Tree suitability for preservation. Juliana Way. Verde Design. Moss Beach CA.

Low	Trees in poor health or possessing significant defects in structure that cannot be abated with treatment. These trees can be expected to decline regardless of management. The species or individual tree may possess either characteristics that are undesirable in landscape settings or be unsuited for use areas. Thirty-nine (39) Monterey cypresses and 3 Monterey pines were rated as having low suitability for preservation.
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We consider trees with high suitability for preservation to be the best candidates for preservation. We do not generally recommend retention of trees with low suitability for preservation. Retention of trees with moderate suitability for preservation depends upon the intensity of proposed site changes.

Monterey cypress

The species is widely planted throughout coastal California and other area of the world. It is native to several small locations along the central coast. The species is well-adapted to coastal conditions of strong winds, moderate temperatures, summer fog and salt spray.

Monterey cypress is moderately long-lived. The oldest documented cypress was estimated to be 284 years. Most trees can be considered mature at 100 years. Growth rates in youth are fast, up to 2' per year in good growing condition.

The species is widely available from nurseries and found in many landscape settings. Survival rates are dependent upon after-care but can be high. Monterey cypress does not, however, transplant well.

The species is also intolerant of construction impacts such as root severance and grade change. Adequate protection and avoiding injury during construction are the keys to preservation during development. I know of no mitigation treatments that can be successfully applied to injured trees.

Within its native range, there are few insect or disease problems.

Branch and trunk failures are common. Most failures occur during periods of high wind and rain.

Tree Preservation Guidelines

Plans for development of subject property have not yet been prepared. Based on my observations and assessment, I suggest that some areas have better potential for preservation than others.

Under normal circumstances, the best opportunities for tree preservation are trees with high suitability for preservation. No trees with high suitability for preservation were located on the site. Only Monterey cypress #178 and 195 had moderate suitability for preservation. The key messages from this finding are: 1) trees had significant structural effects that predispose them to failure and 2) Monterey cypress requires a large tree protection zone. Based on my observations, any development should remain outside the dripline at a minimum. It would not be appropriate to place homes or grading within the dripline of any mature cypress.

Trees could be pruned to remove failed and structurally weak branches and stems. Support systems in the form of cables and braces may enhance tree structure by providing additional support. Trees could also be pruned to reduce the size of the canopy, particularly for branches that grow along the ground.

The following are recommendations for design and construction phases that will assist in successful tree preservation.

Design recommendations

1. Verify the location and tag numbers of all trees. Include trunk locations and tag numbers on all plans.
2. Allow the Consulting Arborist the opportunity to review project plans, including but not limited to, site, grading, drainage and landscape plans
3. Use only herbicides safe for use around trees and labeled for that use, even below pavement.
4. Design irrigation systems so that no trenching will occur within the **TREE PROTECTION ZONE**.

Pre-construction and demolition treatments and recommendations

1. Establish a **TREE PROTECTION ZONE** around each tree to be preserved. For design purposes, the **TREE PROTECTION ZONE** shall be the dripline of 1' for every 1" of trunk diameter whichever is larger. No grading, excavation, construction or storage of materials shall occur within that zone.
2. Install protection around all trees to be preserved. Stack and secure hay bales 6' high around tree trunks. As an alternative, employ 6' chain link with posts sunk into the ground. No entry is permitted into a tree protection zone without permission of the project manager.
3. Trees to be removed shall be felled so as to fall away from **TREE PROTECTION ZONE** and avoid pulling and breaking of roots of trees to remain. If roots are entwined, the consultant may require first severing the major woody root mass before extracting the trees, or grinding the stump below ground.

4. Trees to be retained will require pruning to provide clearance and/or correct defects in structure. All pruning is to be performed by an ISA Certified Arborist or Certified Tree Worker and shall adhere to the latest editions of the ANSI Z133 and A300 standards as well as the ISA Best Management Practices for Tree Pruning. Pruning contractor shall have the C25/D61 license specification. I've enclosed general pruning guidelines.

Tree protection during construction

1. Prior to beginning work, the contractors working in the vicinity of trees to be preserved are required to meet with the Consulting Arborist at the site to review all work procedures, access routes, storage areas and tree protection measures.
2. Any grading, construction, demolition or other work that is expected to encounter tree roots should be monitored by the Consulting Arborist.
3. If injury should occur to any tree during construction, it should be evaluated as soon as possible by the Consulting Arborist so that appropriate treatments can be applied.
4. Fences have been erected to protect trees to be preserved. Fences are to remain until all site work has been completed. Fences may not be relocated or removed without permission of the project manager.
5. Any additional tree pruning needed for clearance during construction must be performed by a qualified arborist and not by construction personnel.
6. All trees shall be irrigated on a schedule to be determined by the Consulting Arborist. Each irrigation shall wet the soil within the **TREE PROTECTION ZONE** to a depth of 30".

Summary

I assessed the health and structural condition of 44 trees including 41 Monterey cypress and 3 Monterey pine. Cyprresses were generally mature in development. Growing conditions ranged from specimen trees growing in the open to crowded rows. It seems likely that trees were installed to serve as a wind-break. Tree form and structure generally reflected growing conditions. Trees in the open had larger crowns, often with foliage to the ground. Trees in crowded rows tended to have asymmetric canopies as well as leaning and bowed stems.

History of management varied but consisted almost exclusively of pruning. The northern row of trees had been pruned many years ago to remove low branches. The southern row had a similar treatment only on the east, not on the west. As a result, trees in the southern row had wide canopies consisting of low branches that grew along the ground for some distance. This did not occur in the northern row. Cyprresses #178 and 194 also had large sections of the canopy growing along the ground.

Trees have a strong history of failure. A number of cyprresses along Juliana St. appear to have failed at the base and were removed. Most of the trees in this area leaned to the south, southeast and southwest. I expect more tree failures will occur in the future.

Elsewhere all large trees experienced numerous branch failures. This is not unusual in Monterey cypress. What is so striking with the assessed trees was the number of failures, which reduced trees such as #162 and 163 to little more than collapsed trees. Branches failed by near the base of the trunk as well as high in the crown.

The most striking thing about the assessed trees was how beautiful they appeared from a distance and how poorly they were structured when viewed up close. The rows of trees possess great visual appeal, particularly on the south. But individual trees were in poor condition.

HortScience, Inc.



James R. Clark, Ph.D.
Certified Arborist WE-0846
Registered Consulting Arborist #357

ATTACHMENTS

Tree Pruning Guidelines

Tree Assessment Form

Tree Assessment Map



Tree Pruning Guidelines

Juliana Avenue
Moss Beach CA

Qualifications

An I.S.A. (International Society of Arboriculture) Certified Arborist or Tree Worker is to be present at all times during pruning. Arborist must have a State of Calif. Contractor's License for Tree Service (C61-D49) and provide proof of workman's compensation and general liability insurance.

Objectives

The following is the primary objective:

1. Clean the crown of dead, dying, diseased, broken or otherwise structurally unsound branches to 2" diameter class.
2. Reduce the length of long-heavy branches by up to 25%.

Specifications

1. All pruning shall be in accordance with the most recent editions of the *Best Management Practices for Pruning* (International Society of Arboriculture) and the American National Standard for Tree Care Operations (Z133.1) and Pruning (A300).
2. Interior branches shall not be stripped out.
3. No more than 20% of live foliage shall be removed from any tree at any one time.
4. Trees shall not be climbed with spurs.
5. Branch removal or reduction cuts (thinning cuts) are to be employed rather than heading cuts. Trees shall not be topped or headed back.
6. Pruning operations shall be conducted in a manner that does not damage surrounding understory plants and structures.
7. All branches and brush shall be removed from the site.
8. Work area shall be hand-raked and restored to pre-pruning condition.
9. Vehicles and equipment such as chain saws will be serviced and fueled only on paved surfaces, not on turf or other landscape material.
10. While in the tree, the arborist shall perform an aerial inspection to identify any defects in structure that require treatment. Any additional work needed shall be reported to the property owner.

Jim Clark
Certified Arborist WE-0846
Registered Consulting Arborist #357

jim@hortscience.com



County of San Mateo - Planning and Building Department

ATTACHMENT W

COUNTY OF SAN MATEO
PLANNING AND BUILDING

County Government Center
455 County Center, 2nd Floor
Redwood City, CA 94063
650-363-4161 T
650-363-4849 F
www.planning.smcgov.org

October 31, 2017

Owen Lawlor
Moss Beach Associates, LLC
612 Spring Street
Santa Cruz, CA 95060

Dear Mr. Lawlor:

SUBJECT: Coastside Design Review Recommendation of Approval
Vallemar Street at Juliana Avenue, Moss Beach
APNs: 037-086-230, -240, -250, -260, -270, -280, and -290
County File No. PLN 2015-00380

At its meeting of October 12, 2017, the San Mateo County Coastside Design Review Committee (CDRC) considered your application for a Design Review recommendation to allow construction of four new homes on four reconfigured lots, described as follows:

Lot 1: Construction of a new two-story¹, 3,997 sq. ft., single-family residence (with a 239 sq. ft. "catwalk" area providing access to a roof deck), with an attached (by covered walkway) two-car 576 sq. ft. garage, including 510 sq. ft. of covered decks and 949 sq. ft. of exterior uncovered decks, located on a 23,473 sq. ft. parcel². This specific case includes the removal of one significant (Monterey cypress) tree and associated grading (250 cu/yds. of cut and 400 cu/yds. of fill; net import 150 cu/yds.).

Lot 2: Construction of a new two-story¹, 3,994 sq. ft., single-family residence (with a 461 sq. ft. "catwalk"/conditioned floor area providing access to a roof deck and storage area above the garage), with a 586 sq. ft. attached two-car garage, including 403 sq. ft. of covered decks and 420 sq. ft. of exterior uncovered decks, located on a 22,220 sq. ft. parcel². This specific case includes the removal of nine significant and two non-significant (Monterey cypress) trees and associated grading (300 cu/yds. of cut and 500 cu/yds. of fill; net import 200 cu/yds.).

Lot 3: Construction of a new two-story¹, 3,997 sq. ft., single-family residence (with a 239 sq. ft. "catwalk" providing access to a roof deck), with an attached (by covered walkway) 576 sq. ft. two-car garage, including 519 sq. ft. of covered decks and 1,047 sq. ft. of exterior uncovered decks, located on a 24,211 sq. ft. parcel².

¹ With the removal of dormers and this upper access area leading only to the roof deck, staff would no longer consider this a three-story residence.

² Via a proposed Lot Line Adjustment, which will adjust the existing seven legal lots down to four lots of sizes indicated.

ATTACHMENT W



This specific case includes the removal of nine significant (Monterey cypress) trees and associated grading (0 cu/yds. of cut and 1100 cu/yds. of fill; net import 1,100 cu/yds.).

Lot 4: Construction of a new two-story¹, 3,997 sq. ft., single-family residence (includes a 239 sq. ft. "catwalk" providing access to a roof deck), with a 576 sq. ft. attached (by covered walkway) two-car garage, including 476 sq. ft. of covered decks and 1,049 sq. ft. of exterior uncovered decks, located on a 32,324 sq. ft. parcel². This specific case includes the removal of 11 significant (Monterey cypress) trees and associated grading (50 cu/yds. of cut and 1,100 cu/yds. of fill; net import 1,050 cu/yds.).

These four new houses represent the primary development of an application process consisting of a Coastal Development Permit (CDP), a Resource Management-Coastal Zone, and a Grading permit for the new single-family residences on four reconfigured parcels² on a 2.48-acre site zoned RM-CZ/DR, located within a County Scenic Corridor. The CDRC does not render a decision, but makes a recommendation regarding the project's compliance with Design Review standards, which the recommendation will be incorporated into staff's further consideration and recommendation for the project. Further, CEQA review (completion and circulation for review and comments of an Initial Study and Negative Declaration) will be followed by a hearing before the Planning Commission. The associated CDP is appealable to the California Coastal Commission.

Based on the plans, application forms, and accompanying materials submitted, the Coastsides Design Review Committee recommended approval of your project based on and subject to the following findings and conditions of approval:

FINDINGS

The Coastsides Design Review Committee (DRC) found that:

For the Design Review

The project has been reviewed under and found to be in general compliance with the Design Review Standards for One-Family and Two-Family Residential Development in the Midcoast, pursuant to Section 6565.20 of the San Mateo County Zoning Regulations, specifically elaborated as is applicable, as follows:

1. SECTION 6565.20.(C). SITE PLACEMENT AND STRUCTURE PLACEMENT:

To the extent feasible, site new buildings and associated development on a parcel that a) minimizes tree and vegetation removal; b) minimizes filling or placement of earth materials; c) considers how such new development will appear as viewed from adjacent designated open space areas; the structures' placement shall harmonize with the natural setting with regard to massing and materials; d) locating, orienting, and designing windows, entrances, decks, and balconies to minimize and mitigate direct views into neighboring houses and outdoor decks/patios and proposing

rooftop decks when they are designed to avoid direct views into neighboring houses and outdoor decks/patios and are accessed by interior means and integrated into the roof design; and e) when designing a new home, an effort should be made to minimize the effect on views from neighboring houses.

The proposed four lots (to be created via a Lot line adjustment) allow for the four residences to be moved easterly, as far away from the bluff tops and bluff-top trail as reasonably possible. As a result, the new houses and driveways (all coming off Vallemar) have been sited on the respective lots in locations that minimize tree removal to the extent necessary for the construction of the structures. While many significant Monterey cypress trees would be removed (to accommodate the house locations and their direct access from Vallemar), many others will be preserved, retaining some portion of the tree canopy and providing a degree of screening of the houses as seen from Cabrillo Highway and Vallemar.

The new houses and driveways have been sited on the respective lots to minimize filling or placement of earth materials (except to accommodate the garages, which needed to be placed at an adequate raised elevation to accommodate a compliant sloping driveway coming off Vallemar), generally limiting grading to the footprint of the structures and immediate vicinity.

The location of the four houses as close to Vallemar as reasonably possible provides a distance from the bluff-top trail ranging from about 120 to 160 feet, as well as the provision of a permanent open space conservation easement whose purpose is to both protect this stretch of open space (and protect the coastal prairie and other biotic vegetation resources on the site), which the DRC concluded was adequate to preserve the views of this area in general.

Many efforts were made to change and alter the exterior articulations (of all four houses) in order to break up the appearance of mass and bulk, specifically as seen from the oceanside elevations, and the bluff-top trail in particular, as well as on the garages and walkways to the living quarters of the structures. As a result, the DRC's 2 to 1 vote recommending approval was based on the project's compliance with many Design Review standards and in response to changes as requested by the DRC. The dissenting DRC member still believed that the houses were too large relative to the size of houses in the surrounding vicinity.

Due to the location of the four houses as close to Vallemar as reasonably possible, as well as on the (once adjusted) sized parcels (ranging from 22,220 sq. ft. to 32,324 sq. ft.), together with the ample distances of the houses from the closest houses on Juliana Avenue (ranging from 95 feet to 105 feet) and of the closest house to the north, their respective windows, decks, and entrances generally avoid views into any of these residences. Further, the roof decks all face outwards toward the oceans, generally too far westerly to pose any privacy issues with surrounding

houses. These decks are also only accessible from the interior of each proposed house.

Finally, the four houses have been sited such that their lower elevations relative to Vallemar prevent, and some remaining tree canopy generally minimizes, the effect on views as seen from houses located east of Vallemar and Cabrillo Highway, and from Juliana Avenue, as well as from the houses to the north, accessed off Vallemar.

2. SECTION 6565.20 (D). ELEMENTS OF DESIGN: *To the extent feasible:*
- a) structures shall conform to the existing topography of the site by requiring the portion of the house above the existing grade or step down the hillside in the same direction; b) new homes should respect the scale of the neighborhood through building dimensions, shape and form, façade articulation, or architectural details that appear proportional and complementary to other homes in the neighborhood; c) new residential development (with RM-CZ zoning) shall conform to the façade articulation option, where such articulation shall occur on all building sides and where projecting or recessing architectural details and changes in building materials are encouraged to break up building walls; d) architectural styles shall complement the coastal, semi-rural, and diverse small town context, where architectural styles that complement the natural setting are encouraged; e) avoid making the garage the dominant feature as seen from the street; f) pitched roofs are encouraged along with the use of non-reflective roof materials and colors; and g) use non-reflective exterior materials and colors that complement and improve the neighborhood with the architecture of the house, using warm, muted colors, and natural appearing materials that blend with the surrounding natural features when viewed from a distance.*

Overall, the DRC found that the four houses are proportionate to each other but remain exclusive in aesthetics and size/mass relative to the immediate neighboring context. Also, while the size of each of the houses (in floor area) still exceeds that of neighboring homes in the surrounding R-1 Zoning District, the DRC recommendation cites the following issues that supported their decision: a) the houses have been moved as close to Vallemar as the required 50-ft. front setback allows, with the garages detached on the site where the topography drops at its greatest slope, with the primary residences being generally stepped down along a downward sloping grade; b) the project lots (once adjusted) are significantly larger than the surrounding R-1 Zoning District (5,000-6000 sq. ft. lot sizes); c) the garages are generally detached and do not contribute to the bulk and mass of the primary residences, nor are they prominent features as seen from Vallemar (also due to the grade drop from the roadway); d) all four houses are well articulated on all sides, which include many exterior changes in articulation on the south- and west-facing facades, elimination of some garage storage areas and exterior elevated walkways to living quarters, and elimination of dormers from the garage structures and above

the second story; e) the roofs of all four houses are sloped with non-reflective materials that blend with the surrounding environment; and f) the exterior colors and materials of all four houses are variable, natural, and blend well with the surrounding environment.

RECOMMENDED CHANGES

1. Consider a lower-growing understory rather than additional trees to better blend with the existing landforms and terrain. Reassess the elimination of all but one Monterey Cypress tree between Lots 3 and 4 to preserve the natural habitat of the resident raptor community.
2. Consider reducing the overall mass, height, and/or square footage of the houses where possible without degrading the aesthetic of the overall design.
3. Consider reviewing the roof lines/pitches of the garages to achieve additional height reductions.
4. Consider exploring options in articulation, materials, and size of the exterior upper level chimneys to decrease their visibility and contrast to the respective houses.

RECOMMENDED CONDITIONS

Current Planning Section

1. The project shall be constructed in compliance with the plans recommended for approval by the Coastside Design Review Committee on October 12, 2017. Any changes or revisions to the approved plans shall be submitted to the Design Review Officer for review and approval prior to implementation. Minor adjustments to the project may be approved by the Design Review Officer if they are consistent with the intent of and are in substantial conformance with this approval. Alternatively, the Design Review Officer may refer consideration of any such revisions back to the Coastside Design Review Committee for further review and recommendation, with applicable fees to be paid.
2. Revise the variable color scheme to be neutral so as to blend with the immediate landscape so that the structures' exteriors weather naturally. Weathered (pickled) wood, stucco or cementitious hardy are acceptable options. Any such changes shall require the submittal of material samples for review by the Community Development Director.
3. Submit revised plans to show modified deck specifications to include the floor area of the mezzanine decks (for all houses that include such decks) pursuant to the second revision plans presented on October 12, 2017 (definitive deck square

footage was delineated only for entry, rear, and garage decks in all versions of previously submitted plans).

4. Any additional exterior lighting (in addition to the single fixtures shown at the entry and garage locations) shall be dark sky compliant fixtures, which shall be mounted or recessed under the soffits at other openings and allowed only as required by building code (for safety). No additional site, building, or landscape lighting is proposed.
5. All paved pathways and patios shall be shown as dimensioned, on the plans, with identified materials.
6. The applicant shall submit the revised plans that include the recommended conditions above (2 through 5) to the project planner. Such plans shall also include any additional revisions pursuant to any of the recommended changes (items 1 through 4) that the applicant chooses to make.
7. During project construction, the applicant shall, pursuant to Chapter 4.100 of the San Mateo County Ordinance Code, minimize the transport and discharge of stormwater runoff from the construction site into storm drain systems and water bodies by:
 - a. Using filtration materials on storm drain covers to remove sediment from dewatering effluent.
 - b. Stabilizing all denuded areas and maintaining erosion control measures continuously between October 1 and April 30.
 - c. Removing spoils promptly, and avoiding stockpiling of fill materials, when rain is forecast. If rain threatens, stockpiled soils and other materials shall be covered with a tarp or other waterproof material.
 - d. Storing, handling, and disposing of construction materials and wastes so as to avoid their entry to the storm drain system or water body.
 - e. Avoiding cleaning, fueling, or maintaining vehicles on-site, except in an area designated to contain and treat runoff.
 - f. Limiting and timing application of pesticides and fertilizers to avoid polluting runoff.
8. The applicant shall provide "finished floor elevation verification" to certify that the structure is actually constructed at the height shown on the submitted plans.

The applicant shall have a licensed land surveyor or engineer establish a baseline elevation datum point in the vicinity of the construction site.

- a. The applicant shall maintain the datum point so that it will not be disturbed by the proposed construction activities until final approval of the building permit.
 - b. This datum point and its elevation shall be shown on the submitted site plan. This datum point shall be used during construction to verify the elevation of the finished floors relative to the existing natural or to the grade of the site (finished grade).
 - c. Prior to Planning approval of the building permit application, the applicant shall also have the licensed land surveyor or engineer indicate on the construction plans: (1) the natural grade elevations at the significant corners (at least four) of the footprint of the proposed structure on the submitted site plan, and (2) the elevations of proposed finished grades.
 - d. In addition, (1) the natural grade elevations at the significant corners of the proposed structure, (2) the finished floor elevations, (3) the topmost elevation of the roof, and (4) the garage slab elevation must be shown on the plan, elevations, and cross-section (if one is provided).
 - e. Once the building is under construction, prior to the below floor framing inspection or the pouring of the concrete slab (as the case may be) for the lowest floor(s), the applicant shall provide to the Building Inspection Section a letter from the licensed land surveyor or engineer certifying that the lowest floor height, as constructed, is equal to the elevation specified for that floor in the approved plans. Similarly, certifications on the garage slab and the topmost elevation of the roof are required.
 - f. If the actual floor height, garage slab, or roof height, as constructed, is different than the elevation specified in the plans, then the applicant shall cease all construction and no additional inspections shall be approved until a revised set of plans is submitted to and subsequently approved by both the Building Official and the Community Development Director.
9. The applicant shall include an erosion and sediment control plan to comply with the County's Erosion Control Guidelines on the plans submitted for the building permit. This plan shall identify the type and location of erosion control measures to be installed upon the commencement of construction in order to maintain the stability of the site and prevent erosion and sedimentation off-site.
 10. All new power and telephone utility lines from the street or nearest existing utility pole to the project structures on the property shall be placed underground.

11. The applicant shall apply for a building permit and shall adhere to all requirements from the Building Inspection Section, the Department of Public Works, and the Coastside Fire Protection District.
12. No site disturbance shall occur, including any grading or vegetation removal, until a building permit has been issued.
13. To reduce the impact of construction activities on neighboring properties, comply with the following:
 - a. All debris shall be contained on-site; a dumpster or trash bin shall be provided on-site during construction to prevent debris from blowing onto adjacent properties. The applicant shall monitor the site to ensure that trash is picked up and appropriately disposed of daily.
 - b. The applicant shall remove all construction equipment from the site upon completion of the use and/or need of each piece of equipment which shall include but not be limited to tractors, back hoes, cement mixers, etc.
 - c. The applicant shall ensure that no construction-related vehicles shall impede through traffic along the right-of-ways on Vallemar Street and Juliana Avenue. All construction vehicles shall be parked on-site outside the public right-of-way or in locations which do not impede safe access on Vallemar Street and Juliana Avenue. There shall be no storage of construction vehicles in the public right-of-way.
14. The exterior materials and color samples submitted to the CDRC are generally approved, with the exception of reconsideration cited in Condition No. 2. Material and color verification shall occur in the field, as confirmed by the Planning Department, after the applicant has applied the approved materials and colors to the structures and before a final building inspection has been scheduled.
15. Noise sources associated with demolition, construction, repair, remodeling, or grading of any real property shall be limited to the hours from 7:00 a.m. to 6:00 p.m., weekdays and 9:00 a.m. to 5:00 p.m., Saturdays. Said activities are prohibited on Sundays, Thanksgiving, and Christmas (San Mateo Ordinance Code Section 4.88.360).
16. Plans shall demonstrate compliance with the Water Efficient Landscape Ordinance (WELO). Installation of the approved landscape plan is required prior to final inspection.

Building Inspection Section

17. The applicant shall apply for a building permit for each of the four houses and related development.

Montara Water and Sanitary District

18. Prior to the issuance of building permits, the applicant shall provide proof of having obtained the required water and sanitary sewer permits for each proposed residence.
19. The location of the proposed development indicates that a sewer mainline extension and pressurized laterals with grinder pumps may be required.
20. Unless already provided, proof of well abandonment from the County Environmental Health Division will be required.

Department of Public Works

21. Drainage - Analysis. The applicant shall have prepared, by a Registered Civil Engineer, a drainage analysis of the proposed subdivision and submit it to the Department of Public Works for review and approval. The drainage analysis shall consist of a written narrative and a plan. The flow of the stormwater onto, over, and off of the property being subdivided shall be detailed on the plan and shall include adjacent lands as appropriate to clearly depict the pattern of flow. The analysis shall detail the measures necessary to certify adequate drainage. Post-development flows and velocities shall not exceed those that existed in the pre-developed state. Recommended measures shall be designed and included in the street improvement plans and submitted to the Department of Public Works for review and approval.
22. Driveway - Plan and Profile. Prior to the issuance of the building permit or planning permit (if applicable), the applicant shall submit a driveway "Plan and Profile," to the Department of Public Works, showing the driveway access to the parcel (garage slab) complying with County Standards for driveway slopes (not to exceed 20%) and to County Standards for driveways (at the property line) being the same elevation as the center of the access roadway. When appropriate, as determined by the Department of Public Works, this plan and profile shall be prepared from elevations and alignment shown on the roadway improvement plans. The driveway plan shall also include and show specific provisions and details for both the existing and the proposed drainage patterns and drainage facilities.

23. Erosion and Sediment - Engineered Grading Plan. Erosion and sediment control during the course of this grading work shall be according to a plan prepared and signed by the Engineer of Record, and approved by the Department of Public Works and the Planning Department. Revisions to the approved erosion and sediment control plan shall be prepared and signed by the Engineer.
24. Erosion and Sediment - Inspection Responsibility. It shall be the responsibility of the applicant's Engineer to regularly inspect the erosion control measures and determine that they are functioning as designed and that proper maintenance is being performed. Deficiencies shall be immediately corrected.
25. Mitigation Fees - Roadway. Prior to the issuance of the Building Permit, the applicant will be required to provide payment of "roadway mitigation fees" based on the square footage (assessable space) of the proposed building per Ordinance #3277.
26. Easements - Documentation. The applicant shall submit to the Department of Public Works and the Planning Department for their review and approval, wording for deed restrictions for the conservation easement and applicable coastal access, as needed.

Coastside Fire Protection District

27. Addressing. All buildings that have a street address shall have the number of that address on the building, mailbox, or other type of sign at the driveway entrance in such a manner that the number is easily and clearly visible from either direction of travel from the street. Residential buildings shall have internally illuminated address numbers contrasting with the background so as to be seen from the public way fronting the building. Residential address numbers shall be at least six feet above the finished surface of the driveway. An address sign shall be placed at each break of the road where deemed applicable by the Coastside Fire Protection District. Numerals shall be contrasting in color to their background and shall be no less than 4 inches in height, and have a minimum 3/4-inch stroke. Remote signage shall be a 6" x 18" green reflective metal sign.
28. Combustibles. No combustibles shall be on-site prior to the required fire protection water supply and fire department access provided.
29. Fuelbreak/Firebreak. Maintain around and adjacent to such buildings or structures a fuelbreak/firebreak made by removing and clearing away flammable vegetation for a distance of not less than 30 feet and up to 100 feet around the perimeter of all structures, or to the property line, if the property line is less than 30 feet from any structure.

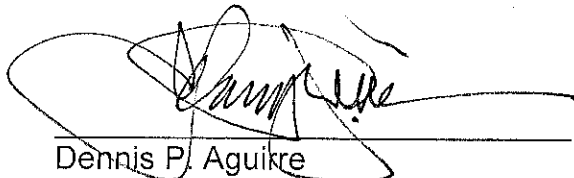
30. Occupancy. The applicant shall install the proper occupancy separations, as per current California Building and Residential Codes. Plans at the building permit application stage shall include listing and construction details. Inspections will occur throughout construction and prior to Fire's final approval of the building permit.
31. Roof Assembly. All roof assemblies shall have a minimum CLASS-B fire resistive rating and be installed in accordance with the manufacturer's specifications and current California Building and Residential Codes.
32. Smoke Detection Installation. Smoke alarms and carbon monoxide detectors shall be installed in accordance with the California Building and Residential Codes. This includes the requirement for hardwired, interconnected detectors equipped with battery backup, and placement in each sleeping room in addition to the corridors and on each level of the residence.
33. Sprinklers. An approved Automatic Fire Sprinkler System meeting the requirements of NFPA-13D shall be required to be installed for the project. Plans shall be submitted to the San Mateo County Building Department for review and approval by the authority having jurisdiction. A statement that the building will be equipped and protected by automatic fire sprinklers, must appear on the title page, of the first story of the buildings as measured by an approved access route around the exterior of the building or facility.
34. Access. The Fire Department access shall be to within 150 ft. of all exterior portions of the exterior walls of the first story of the buildings as measured by an approved access route around the exterior of the building or facility. Access shall be Asphalt and be a minimum of 20 ft. wide, with roadway and able to support a fire apparatus weighing 75,000 lbs. Where a fire hydrant is located in the access, a minimum of 26 ft. is required for a minimum of 20 ft. on each side of the hydrant. Fire Department access less than 26 feet in width shall require NO PARKING FIRE LANE CVC 22500, one posted on both sides of the roadway.
35. Final Inspection. Contact the Fire Marshal's Office to schedule Inspections prior to occupancy and Final Inspection by a Building Inspector. Allow for a minimum of 72-hour notice to the Fire Department at 650/726-5213. This project will require the formation of a Mello-Roos Community Facilities District (CFD) before final.
36. Fire Flow. A fire flow of 1,000 gpm for 2 hours with a 20-psi residual operating pressure must be available as specified by additional project conditions to the project site. The applicant shall provide documentation including hydrant location, main size, and fire flow report at the building permit application stage. Inspection required prior to Fire's final approval of the building permit or before combustibles are brought on-site.

37. Hydrant. The required fire flow shall be available from a Clow 960 Standard 6" Wet Barrel Fire Hydrant. The configuration of the hydrant shall have a minimum of one each 4 1/2" outlet and one each 2 1/2" outlet located not more than 250 feet from the building measured by way of approved drivable access to the project site.

Please note that the decision of the Coastside Design Review Committee is a recommendation regarding the project's compliance with Design Review standards, not the final decision on this project, which requires a Hearing-Level CDP, Grading Permit, RM-CZ Development Review Permit, and a Lot Line Adjustment. The final decision on this project will take place at a later date. For more information, please contact the project planner, David Holbrook, at 650/363-1837 or by email at dholbrook@smcgov.org.

To provide feedback, please visit the Department's Customer Survey at the following link: <http://planning.smcgov.org/survey>.

Sincerely,



Dennis P. Aguirre
Design Review Officer

DPA:DJH:jlh – DJHBB0633_WJN.DOCX

cc: Stuart Grunow, CDRC Member Architect
Bruce Chan, CDRC Member Architect
Melanie Hohnbaum, CDRC Moss Beach Community Representative
Kris Liang, CDRC Moss Beach Community Alternate Representative
Lisa Ketcham, MCCC
Kathy and James Lockhart, Moss Beach Resident
Mike Schelp, Moss Beach Resident
Charles Halterman, Moss Beach Resident
Gail Erwin, Moss Beach Resident



County of San Mateo - Planning and Building Department

ATTACHMENT X

CALIFORNIA COASTAL COMMISSION

NORTH CENTRAL COAST DISTRICT OFFICE
45 FREMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105
PHONE: (415) 904-5260
FAX: (415) 904-5400
WEB: WWW.COASTAL.CA.GOV



March 1, 2018

Dave Holbrook, Senior Planner
County of San Mateo – Planning and Building Department
455 County Center, 2nd Floor
Redwood City, CA 94063-1665

RE: Notice of Intent (NOI) to Adopt Mitigated Negative Declaration (MND) Vallemar Bluffs at Vallemar Street and Juliana Avenue, Moss Beach (PLN2015-00380)

Dear Mr. Holbrook (Dave):

Thank you for forwarding the NOI Initial Study/MND (IS/MND) for our review. We appreciate the extended public review period. Comments on the IS/MND are provided below. The applicant is requesting a Coastal Development Permit, Grading Permit, Resource Management/Coastal Zone Permit, and Lot Line Adjustment for construction of four new, two-story, residences on a 2.48-acre piece of land located at Vallemar Street and Julian Avenue in Moss Beach. The proposed project includes the grading 600 cubic yards of cut and 3,100 cubic yards of fill; and removal of approximately 32 Monterey Cypress trees (this includes 30 significant-size trees). The proposed project site is currently undeveloped and zoned as RM-CZ/DR/CD.

The coastal bluff where the proposed project is sited has the only known/documented extant population of coast yellow leptosiphon and includes coastal prairie grassland (coastal terrace prairie). Coast yellow leptosiphon is a Candidate Species under the California Endangered Species Act (CESA), as detailed by the California Department of Fish and Wildlife (CDFW) Acting Regional Director's letter to Community Development Director Steve Monowitz, dated February 7, 2018. The biological resources discussion on page 14 of the IS/MND states that the County plays a significant role as steward and manager of the land where this population is found and the protection of coast yellow leptosiphon is critical for its continued existence. San Mateo County's Local Coastal Program (LCP) Policies 7.1, 7.3, and 7.4 prohibit any development that would result in significant adverse impacts on Environmentally Sensitive Habitat areas (ESHA). Residential development is not allowable in ESHA. Commission staff concurs with CDFW that any impacts to this species is significant and supports the County's role to review the proposed project to ensure the protection of coast yellow leptosiphon and coastal terrace prairie habitat. The County must evaluate the proposed project's consistency with the LCP's policies for the protection of ESHA, including Policies 7.1, 7.3, and 7.4.

The Applicant proposes an Adaptive Management and Monitoring Plan for "management of the larger coastal prairie community on the site". Please clarify whether this includes both the proposed project site and the adjacent bluff top area not within the limits of the proposed project site. The Conservation Strategy (on page 4) states that the Adaptive Management Plan outline prepared by McGraw in 2016 is more detailed. The 2016 outline was not available for staff's

review at this time; however, we recommend that the County require the plan include performance criteria and quantitative-based measures to monitor and protect coastal prairie habitat. The IS/MND discussion of biological resources (on page 14) indicates that coast yellow leptosiphon "does not extend onto any portion of the project site". The Applicant should be required to conduct a detailed biological survey of the project site consistent with the CDFW protocols for the coast yellow leptosiphon and coastal terrace prairie habitat. A reconnaissance-level survey is not sufficient to determine the presence or absence of coast yellow leptosiphon within the proposed project site; or to assess the quality of coastal terrace prairie habitat and impacts of the proposed project on this sensitive habitat.

The "Transitional Area" discussion on page 15 of the IS/MND appears to be incomplete. This should be clarified. Page 4 of the Applicant's Conservation Strategy indicates that the proposed development is "largely sited within the exotic-dominated vegetation on the eastern portion of the parcel..." The Applicant proposes establishment of a conservation easement to permanently protect a 0.91-acre area outside of the development envelop. It is not clear what extent of non-exotic dominant area would contain the proposed development. We recommend that the County require the Applicant to better quantify and describe in detail the non-exotic (non-native) and native areas to be affected by the development. The Applicant should clarify whether or not restoration is included for the transitional areas and the non-native areas; if so, we suggest that restoration plans include, but not be limited to, a detailed description of the schedule, proposed methods, and funding source.

The proposed project originally included the construction of six residential structures that extended more seaward on the bluff top. The Applicant made revisions that down-scaled the project to four residences sited further landward toward Valleamar Street, as currently proposed. The Applicant proposes a "biotic" (conservation) easement for the permanent protection. Plan Sheet L3.3 (Tree and Shrub Planting Plan) indicates a 100-ft buffer for coast yellow leptosiphon. Staff recommends that the County require the applicant provide for the protection of coastal terrace prairie habitat including but not limited to the establishment of clearly-defined buffers for this sensitive habitat. The County should require the Applicant to identify proposed staging locations, access routes to be used during construction, and temporary construction fencing. All of these elements must be clearly depicted on the project plans and submitted to the County and CDFW for review and approval to ensure that the proposed protection of the coast yellow leptosiphon and coastal terrace prairie habitat is appropriate. We suggest that Coastal Commission staff have an opportunity to review the plans as part of the recommended interagency effort.

The Applicant installed story poles at the locations of the proposed four residences. The poles show that portions of the proposed residences will be seen from Highway 1 and also from the western portion of the bluff. The Applicant has included a proposed Tree Replacement Plan, as shown on Plan Sheet L3.2. The proposed plan would help to reduce the visual appearance of the four new structures. We recommend that Applicant maximize the planting of native species to replace the removal of Monterey cypress.

The proposed site is located on a coastal bluff top that is susceptible to erosion. The IS/MND indicates that the proposed project reflects a revision of the original proposal as it now shows the

Dave Holbrook
PLN2015-00380 (Valleamar Bluffs)
IS/MND
March 1, 2018

proposed residences re-located easterly to an area of the bluff top that is more stable. We suggest that the County analysis include a discussion of the proposed project with respect to geologic hazards and its consistency with LCP Policy 9.8. LCP Policy 9.8 regulates development on coastal bluff tops and prohibits land divisions or new structures that would require the need for bluff protection work. The County should ensure that the proposed project does not allow for the construction of any shoreline protection to armor the development against future erosion or sea-level rise.

The IS/MND discussion on page 33 indicates that the proposed project would result in significant impacts to hydrology and water quality due to alteration of the existing drainage patterns from grading and construction of the new residences, unless mitigated. LCP Policy 1.35 requires that land use development and activities protect coastal water quality. The proposed project should be evaluated for consistency with LCP Policy 1.35. The County analysis must include a discussion of water quality impacts with respect to ESHA at the project site, in adjacent areas of the bluff top, and Fitzgerald Marine Reserve. The LCP requires that proposed new development have adequate water supplies and wastewater treatment facilities. The proposed project must be analyzed for consistency with LCP Policy 1.19 to ensure that adequate public services and the infrastructure is available for the new residences. The proposed residences must not result in overburdening of the existing roads, utilities, schools and other public works facilities and community infrastructure. The four new residences must be in conformity with LCP Policy 1.23 that limits the number of new dwelling units to 40 per calendar year. The County analysis should evaluate the proposed project's consistency with LCP Policy 1.23.

We previously recommended, with respect to lot legality, that the County provide evidence that the proposed project qualifies as a lot line adjustment under, and is otherwise consistent with, all applicable laws in effect when in approximately 1990 40 lots were merged and lines altered to result in seven lots. A copy of our previous comment letter, dated February 12, 2016, is attached for your reference. The County analysis must include a discussion of the legality of the lots and demonstrate that the proposed LLA is consistent with the LCP component for planning and locating development, regarding parcel legalization including LCP Policies, 1.28, 1.29, and 1.3.

We appreciate the opportunity to provide you with our comments during the public review period for the IS/MND, as required by the California Environmental Quality Act (CEQA). Staff may provide additional comments as the County proceeds with its project review and approval process. Please feel free to contact me via e-mail at rananda@coastal.ca.gov or call me at 415-904-5292 if you have questions regarding our comments.

Sincerely,



Renée Ananda, Coastal Program Analyst
Coastal Commission - North Central Coast District

Attachment

CALIFORNIA COASTAL COMMISSION

NORTH CENTRAL COAST DISTRICT OFFICE
45 FRIMONT STREET, SUITE 2000
SAN FRANCISCO, CA 94105
PHONE: (415) 904-5260
FAX: (415) 904-5400
WEB: WWW.COASTAL.CA.GOV



February 12, 2016

Dave Holbrook, Senior Planner
County of San Mateo – Planning and Building Department
455 County Center, 2nd Floor
Redwood City, CA 94063-1665

RE: Vallemar Bluffs at Vallemar and Juliana, Moss Beach (PLN2015-00380)

Dear Mr. Holbrook (Dave):

This letter serves as Commission Staff's response to your request for our comments regarding proposed new residential development and the legality of the lots proposed for the new residential development, currently assigned APNs 037-086-230 through 290, in Moss Beach at the intersection of Vallemar Street and Juliana Avenue. The total land area in question is approximately 2.4 acres, is currently undeveloped, and zoned as RM-CZ/DR/CD. New development currently proposed for the lots would include the construction of six homes. The following are our preliminary comments in response to your inquiry about lot legality and sewer capacity for the proposed project site.

The results of our review of the materials you provided show that the County issued a Certificate of Exemption or Exclusion from Requirement for Coastal Development Permit ("CDX") for a project described as "lot merger and lot line adjustment" for APNs 037-086-160 and 037-086-170 which at the time were comprised of 40 lots. The County tentatively approved Lot Line Adjustment (LLA) 89-21 on February 7, 1990, subject to several conditions which merged and altered lot lines for the 40 lots into seven resultant lots ("Lots A through G"). The materials provided by the County do not indicate whether or not all conditions of approval were fully satisfied, however, a record of survey was recorded on May 7, 1991 as required by Condition 7. Approval LLA 89-21 was recorded (Document 91064892) with the County Recorder May 28, 1991. A corrected LLA Approval (Document 94008766) was recorded in January 1994, superseding the original (due to a typographical error and the omission of one of the required signatories).

The materials submitted indicate that California Government Code Section 66412 of the Subdivision Map Act regulated LLAs in 1989. Section 66412(d) currently states that the Map Act shall not apply in situations that involve a lot line adjustment between four or fewer existing adjoining parcels, where the land taken from one parcel is added to an adjoining parcel, and where a greater number of parcels than originally existed is not thereby created, if the lot line is approved by the local agency, or advisory agency.

First, there is a question as to whether this LLA met the definition of a lot line adjustment under the Subdivision Map Act, specifically under the then-applicable language of Section 66412(d). The LLA appears to be a merger and re-subdivision of land. Second, if the LLA is in fact a lot line adjustment per the Subdivision Map Act, it is unclear how no additional parcels were created

Dave Holbrook
PLN2015-00380 (Valleamar Bluffs)
February 12, 2016

or if another exemption to the Subdivision Map Act applied. Third, regardless of compliance with the Subdivision Map Act, the County also needs to provide evidence that the project, and subsequent CDX issued, is consistent with the County's Subdivision Ordinance and Local Coastal Program (LCP) in effect in 1989 including the zoning regulations applicable to the Resource Management (RM) zoning district. Therefore, we recommend that the County provide evidence that the proposed project qualifies as a lot line adjustment under, and is otherwise consistent with, all applicable laws in effect at the time.

In approval of any subsequent development of the lots, the County must ensure that there is adequate sewer service available. The Sewer Authority Mid-Coastside (SAM), which includes the Granada Sanitary District, the City of Half Moon Bay, and the Montara Water and Sanitary District, was created in 1976 by way of a Joint Powers Exercise of Powers Agreement (JPA). Municipal wastewater treatment for Moss Beach is provided by SAM which owns and operates the regional wastewater treatment plant. The proposed project site is in Moss Beach, which is within the Montara Water and Sanitary District service area. SAM's 1976 Amendment Number 1 indicates that the service area boundaries are the "current corporate City limits of the City and all lands within the Districts not zoned RM (Resource Management)." The County has been presented with the argument that the proposed site is zoned "RM" therefore service is not allowed to the proposed project site. The result of our preliminary review is that any sewer service connections to the subject lots from Montara Water and Sanitary District would be allowable as long as they are consistent with the existing LCP and Public Works Plan, which do not indicate that sewer service is not allowed to the RM-CZ zone.

The use of the land, aside from the issues of lot legality and availability of a sewer connection, raises additional concerns pertaining to sensitive habitat, visual resources, public access, and hazards. Our comments are therefore preliminary in nature and are provided in an effort to assist County staff with the pre-application process in response to the two questions posed to us by County staff. We appreciate the opportunity to provide you with our thoughts at this time and reserve the right to provide additional comments as the County further processes the applicant's permit application. Please feel free to contact me via e-mail at rananda@coastal.ca.gov or call me at 415-904-5292 if you have questions regarding our comments.

Sincerely,



Renée Ananda, Coastal Program Analyst
Coastal Commission - North Central Coast District

Cc: Lennie Roberts, Committee for Green Foothills
Lisa Ketcham, Midcoast Community Council
Owen Lawlor, Lawlor Land Use (Applicant)



County of San Mateo - Planning and Building Department

ATTACHMENT Y

CALIFORNIA COASTAL COMMISSION

NORTH CENTRAL COAST DISTRICT OFFICE
 45 FREMONT STREET, SUITE 2000
 SAN FRANCISCO, CA 94105
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 WEB: WWW.COASTAL.CA.GOV



RECEIVED

2018 NOV 19 P 3: 58 November 15, 2018

SAN MATEO COUNTY
 PLANNING AND BUILDING
 DEPARTMENT

Dave Holbrook, Senior Planner
 County of San Mateo – Planning and Building Department
 455 County Center, 2nd Floor
 Redwood City, CA 94063-1665

RE: Notice of Intent (NOI) to Adopt Revised Mitigated Negative Declaration (MND) Vallemar Bluffs at Vallemar Street and Juliana Avenue, Moss Beach (PLN2015-00380)

Dear Mr. Holbrook (Dave):

Thank you for forwarding the NOI for the revised Initial Study/MND (IS/MND) for our review. We received the document in our San Francisco office on October 12, 2018. Our comments on the IS/MND are provided below. The applicant is requesting a Coastal Development Permit, Grading Permit, Resource Management/Coastal Zone (RM-CZ) Permit, and Lot Line Adjustment (LLA) for construction of four new, two-story, single-family residences on a 2.48-acre piece of land located at Vallemar Street and Julian Avenue in Moss Beach. The proposed project site comprises seven APNs that would be re-configured into four parcels (via the LLA). The proposed project includes the grading 600 cubic yards of cut and 3,100 cubic yards of fill; and removal of approximately 32 Monterey Cypress trees (this includes 30 significant-size trees). The proposed project site is currently undeveloped and zoned as RM-CZ/DR/CD. We previously provided you with written comments in our letters dated February 12, 2016 and March 1, 2018. A copy of each letter is attached for your convenience.

The County re-circulated the IS/MND as it is revised to include proposed mitigation measures that address Biological Resources; as well as incorporation of updated geologic information to reflect the County Geotechnical Engineer's final review and acceptance of the project's latest geotechnical investigation (dated June 13, 2018).

Biological Resources

The proposed development/four residences on the 2.48-acre site would occur on 1.43 acres on its eastern portion and the remaining 0.92 acres would be permanently protected by a Conservation and Open Space Easement (Easement). Commission staff (including Dr. Lauren Garske-Garcia, Ecologist) coordinated with County Planning staff, the California Department of Fish and Wildlife, and the Applicant to identify sensitive resources at the site, including Coastal Prairie Grassland, the endangered coast yellow leptosiphon, and rare plant species (Johnny nip, harlequin lotus and Blasdale's bent grass). Local Coastal Program LCP Policy 7.3 requires the protection of Sensitive Habitats and prohibits any land use or development that will result in significant adverse impact to such areas. This LCP policy requires that development in areas adjacent to Sensitive Habitats shall be sited and designed to prevent impacts that could significantly degrade the sensitive habitats. All uses shall be compatible with the maintenance of

biologic productivity of the habitats. We recommend that the County analyze the proposed project's consistency with the LCP Policy 7.3. Further, mentioned in our correspondence to you dated March 1, 2018, the County review must discuss consistency with LCP Policy 7.5 which requires appropriate conditions and that the applicant has demonstrated that the proposed project will not result in significant impact on sensitive habitats. LCP Policy 7.5 requires that applicants provide mitigation measures which protect resources and comply with the policies of the Shoreline Access, Recreation/Visitor-Serving Facilities and Sensitive Habitats Components, and a monitoring program to assess the effectiveness of mitigation measures. Proposed Mitigation Measure 7 is to ensure that the recreational use along the entire length of bluff trail at the Project site is managed to be compatible with the restoration and management of the coastal terrace prairie and rare plants in the conservation area. This Mitigation Measure also requires that the effect of the recreational use on the habitat be monitored. The Applicant's proposed Management Framework provides for a Habitat Management Plan that identifies the various parties involved in protecting, restoring, and managing the proposed conservation area. The parties include the Moss Beach Associates, LLC, the Home Owners Association, Land Trust (a non-profit that will be granted the conservation easement), an implementing entity, and the County. We suggest that the County require the Applicant to clearly identify to whom monitoring reports will be submitted and that those reports meet the requirements of the California Department of Fish and Wildlife to ensure protection of the sensitive species identified in the project area.

The Management Planning Framework included in the IS/MND is to provide the basis for development of and integration into a Habitat Management Plan "following approval" of the proposed project and prior to issuance of building permits. We suggest that County require that this occur prior to issuance of the proposed CDP. Finally, Proposed Mitigation Measure 4 requires that the Easement together with the final Habitat Management Plan and associated Valleamar Bluffs Declaration of Covenants, Conditions and Restrictions" (CC&Rs) be submitted to the County Community Development Director for final review and, upon approval, recorded with the Final Lot Line Adjustment/Parcel Map associated with the proposed project. We suggest that Coastal Commission staff be included in final review of the Habitat Management Plan required by Mitigation Measure 4.

Geologic Hazard

The project site is located on a coastal bluff that is experiencing erosion that will continue into the future. We reiterate the suggestion from our March 2018 letter that the County, consistent with LCP Policy 9.8, require that the Applicant be prohibited from placement of any bluff protection.

Visual

The LCP provides for the protection of visual resources within the Coastal Zone. We recommend that the proposed project be evaluated for consistency with LCP Policies 8.12 and 8.13, as the proposed project site is located within the coastal zone (specifically between the first public road and the sea). LCP Policy 8.13 outlines special design guidelines for coastal communities, which includes Moss Beach. The County's analysis of the proposed project should

Dave Holbrook

PLN2015-00380 (Valleamar Bluffs)

IS/MND

November 15, 2018

include an evaluation of the proposed project's consistency with LCP Policy 8.13, which requires that structures be designed to fit the topography of the site and do not require extensive cutting, grading; or filling for construction; and that are in scale with the character of their setting and blend rather than dominate or distract from the overall view of the urban scape.

We appreciate the opportunity to provide you with our comments on the IS/MND, as required by the California Environmental Quality Act (CEQA). Please feel free to contact me via e-mail at rananda@coastal.ca.gov or call me at 415-904-5292 if you have questions regarding our comments.

Sincerely,



Renee Ananda, Coastal Program Analyst
Coastal Commission - North Central Coast District

Attachment



County of San Mateo - Planning and Building Department

ATTACHMENT Z

Midcoast Community Council

*An elected Advisory Council to the San Mateo County Board of Supervisors
representing Montara, Moss Beach, El Granada, Princeton, and Miramar*

P.O. Box 248, Moss Beach, CA 94038-0248 - www.MidcoastCommunityCouncil.org

Dave Olson . **Claire Toutant** . **Lisa Ketcham** . **Dan Haggerty** . **Chris Johnson** . **Brandon Kwan** . **Barbra Mathewson**
Chair Vice-Chair Secretary Treasurer

Date: January 24, 2018

To: Dave Holbrook, Project Planner

Cc: Owen Lawlor, Lawlor Land Use
Jonathan Gervais, SMC Parks Director
Renée Ananda, CCC Coastal Program Analyst

From: Midcoast Community Council/ Dave Olson, Chair

Subject: **Valleamar Bluff Four-House Development - PLN2015-00380 –**
for 2.5-acres zoned RM/CZ, at Valleamar & Juliana, Moss Beach

The remaining comments MCC has on this project relate to LCP and Coastal Act issues that were included in our 7/26/17 memo. These are conditions that the applicant agrees to, although the coastal hazard conditions that the Coastal Commission routinely applies to blufftop development on appeal (attached) have not previously been applied by the County.

Biotic easement (Mitigation Measure 4) for the Coastal Prairie should have a deadline when it must be finalized, such as before issuance of any Building Permits.

Perimeter fence and public trail: A condition of approval should be added that requires determination by County Parks of a safe minimum width for the public trail between cliff edge and private fence, which distance should also be included as deed restricted floating easement on the four lots. Included in the trail easement should be provision for the County to monitor and enforce any necessary relocation of the private fence. Please also add condition of approval requiring minimum 50% transparency for this fence.

Coastal hazard conditions should be included, consistent with Coastal Commission requirements for other shoreline development, particularly in light of Sea Level Rise:

- Prohibit future shoreline armoring.
- Require removal of development if it becomes unsafe to occupy due to threat of coastal hazards.
- Require removal of debris that falls from blufftop onto beach.
- Require assumption of all risks of coastal hazards, waiver of liability, and indemnification agreement.
- Require recordation of deed restriction imposing coastal hazard conditions as covenants, conditions and restrictions on the use and enjoyment of the property.

Thank you for your consideration of our comments.

California Coastal Commission -- Coastal Hazard Conditions of Approval routinely applied to blufftop development on appeal.

[Aug 2014, CCC appeal A-2-SMC-09-006 & -008 -- 354 & 358 Princeton Ave, Princeton]

Assumption of Risk, Waiver of Liability, and Indemnity Agreement. By acceptance of this permit, the Permittee acknowledges and agrees on behalf of himself and all successors and assigns:

- a. **Coastal Hazards.** That the site is subject to coastal hazards including but not limited to episodic and long-term shoreline retreat and coastal erosion, high seas, ocean waves, storms, tsunامي, coastal flooding, landslides, bluff and geologic instability, and the interaction of same;
- b. **Assume Risks.** To assume the risks, to the Permittee and the property that is the subject of this permit, of injury and damage from such hazards in connection with this permitted development;
- c. **Waive Liability.** To unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards;
- d. **Indemnification.** To indemnify and hold harmless the Coastal Commission, its officers, agents, and employees with respect to the Commission's approval of the project against any and all liability, claims, demands, damages, costs (including costs and fees incurred in defense of such claims), expenses, and amounts paid in settlement arising from any injury or damage due to such hazards;
- e. **Property Owner Responsible.** That any adverse effects to property caused by the permitted project shall be fully the responsibility of the Permittee; and
- f. **Future Armoring Prohibited.** That the Permittee shall not construct, now or in the future, any shoreline protective device(s) for the purpose of protecting the development approved pursuant to CDP A-2-SMC-09-006 including, but not limited to, the approved building and associated foundations in the event that these structures are threatened with imminent damage or destruction from coastal hazards including but not limited to episodic and long-term shoreline retreat and coastal erosion, high seas, ocean waves, storms, tsunامي, coastal flooding, landslides, bluff and geologic instability, and the interaction of same or other natural hazards in the future, and by acceptance of this permit, the Permittee hereby waives any rights to construct such devices that may exist under Public Resources Code Section 30235 or the San Mateo County LCP.
- g. **Removal Required.** If the development approved pursuant to CDP A-2-SMC-09-006 is threatened by coastal hazards in the future that would typically bring about a shoreline armoring response (e.g., when the bluff has retreated to a point such that the building is unsafe to occupy), the Permittee shall remove/relocate threatened elements of the development away from such danger. Such removal/relocation shall require a separate CDP authorization.
- h. **Debris.** Any debris, including that related to the approved development, that falls from the bluff top site onto the beach or into the waters of Pillar Point Harbor shall be immediately removed and disposed of properly.

Deed Restriction. PRIOR TO ISSUANCE OF THE COASTAL DEVELOPMENT PERMIT, the Applicant shall submit to the Executive Director for review and approval documentation demonstrating that the Applicant has executed and recorded against the parcel(s) governed by this permit a deed restriction, in a form and content

acceptable to the Executive Director: (1) indicating that, pursuant to this coastal development permit, the California Coastal Commission has authorized development on the subject property, subject to terms and conditions that restrict the use and enjoyment of that property; and (2) imposing the Special Conditions of this permit as covenants, conditions and restrictions on the use and enjoyment of the property. The deed restriction shall include a legal description of the entire parcel or parcels governed by this permit. The deed restriction shall also indicate that, in the event of an extinguishment or termination of the deed restriction for any reason, the terms and conditions of this permit shall continue to restrict the use and enjoyment of the subject property so long as either this permit or the development it authorizes, or any part, modification, or amendment thereof, remains in existence on or with respect to the subject property.



County of San Mateo - Planning and Building Department

ATTACHMENT AA

County of San Mateo
Planning and Building Department

REVISED INITIAL STUDY
ENVIRONMENTAL EVALUATION CHECKLIST
(To Be Completed by Planning Department)

1. **Project Title:** Four Residences on Vallemar @ Julianna, Moss Beach
2. **County File Number:** PLN 2015-00380
3. **Lead Agency Name and Address:**

San Mateo County Planning and Building Department
455 County Center, 2nd Floor
Redwood City, CA 94063
4. **Contact Person and Phone Number:**

David Holbrook, Senior Planner
650/363-1837
dholbrook@smcgov.org
5. **Project Location:** Vallemar Street @ Julianna Avenue (west of Cabrillo Highway),
Unincorporated Moss Beach
6. **Assessor's Parcel Numbers and Size of Parcels:** 037-086-230, -240, -250, -260, -270, -280,
and -290; 2.48 acres (combined parcels)
7. **Project Sponsor's Name and Address:**

Owen Lawlor
Moss Beach Associates, LLC
612 Spring Street
Santa Cruz, CA 95060
8. **General Plan Designation:** Open Space (Urban)
9. **Zoning:** Resource Management-Coastal Zone (RM-CZ)
10. **Description of the Project:**

Four new single-family residences (as specifically described below) are proposed on a 2.48-acre property (comprised of the seven APNs cited above; the "project site"). The houses represent the primary development of an application process consisting of a Coastal Development Permit (CDP), Resource Management-Coastal Zone (RM-CZ) permit, Grading Permit and Lot Line Adjustment (LLA). The houses are proposed on what would be four reconfigured parcels (via the LLA) from the seven legal parcels that current exist.

Lot 1: Construction of a new two-story¹, 3,997 sq. ft., single-family residence (with a 239 sq. ft. “catwalk” area providing access to a roof deck), with an attached (by covered walkway) two-car 576 sq. ft. garage, including 510 sq. ft. of covered decks and 949 sq. ft. of exterior uncovered decks, located on a 23,473 sq. ft. parcel². This specific case includes the removal of one (1) significant (Monterey cypress) tree and associated grading (250 cubic yards (cu/yds) of cut and 400 cu/yds of fill; net import 150 cu/yds).

Lot 2: Construction of a new two-story¹, 3,994 sq. ft. single-family residence (with a 461 sq. ft. “catwalk”/conditioned floor area providing access to a roof deck and storage area above the garage), with a 586 sq. ft. attached two-car garage, including 403 sq. ft. of covered decks and 420 sq. ft. of exterior uncovered decks, located on a 22,220 sq. ft. parcel². This specific case includes the removal of nine (9) significant and two (2) non-significant (Monterey cypress) trees and associated grading (300 cu/yds of cut and 500 cu/yds of fill; net import 200 cu/yds).

Lot 3: Construction of a new two-story¹, 3,997 sq. ft. single-family residence (with a 239 sq. ft. “catwalk” providing access to a roof deck), with an attached (by covered walkway) 576 sq. ft. two-car garage, including 519 sq. ft. of covered decks and 1,047 sq. ft. of exterior uncovered decks, located on a 24,211 sq. ft. parcel². This specific case includes the removal of nine (9) significant (Monterey cypress) trees and associated grading (0 cu/yds of cut and 1,100 cu/yds of fill; net import 1,100 cu/yds).

Lot 4: Construction of a new two-story¹, 3,997 sq. ft. single-family residence (includes a 239 sq. ft. “catwalk” providing access to a roof deck), with a 576 sq. ft. attached (by covered walkway) two-car garage, including 476 sq. ft. of covered decks and 1,049 sq. ft. of exterior uncovered decks, located on a 32,324 sq. ft. parcel². This specific case includes the removal of eleven (11) significant (Monterey cypress) trees and associated grading (50 cu/yds of cut and 1,100 cu/yds of fill; net import 1,050 cu/yds).

¹ With no roof dormers and the roof deck only accessible from the house interior, staff considers this a two-story residence.

² Via a proposed LLA which will adjust the existing seven legal lots down to four lots of sizes indicated.

Of the total 2.48-acre site, 1.43 acres (61%) on its eastern portion would be developed with the four residences; the remaining 0.92 acres (39% of the site) would be permanently protected via a Conservation and Open Space Easement (Easement). Together with a final “Habitat Management Plan” developed from the “Valleamar Bluffs Conservation and Development Project Management Planning Framework” document (Management Plan) and “Valleamar Bluffs Declaration of Covenants, Conditions and Restrictions” (CC&Rs), all documents would be recorded along with and as part of the Lot Line Adjustment Map across and affecting all four lots. The Easement area would be located between the west-facing sides of the houses (including their outside patio areas) and the site’s westerly property boundary, beyond which lies a coastal trail running along the ocean bluffs and the beach down below. The Easement’s primary purpose would be to protect the Coastal Prairie Grassland prominent on the project site, to preserve and protect three rare plant species (Johnny nip, harlequin lotus and Blasdale’s bent grass) also located on the site, as well as to reduce future impacts to the endangered coast yellow leptosiphon located just off the project site to the west, on the County Parks-managed Fitzgerald Marine Reserve property. The Easement’s purpose is also to provide a critical scenic buffer between the beach area below and bluff top trail above and the four proposed residences on the project site’s eastern-most portion. The Easement would preclude future subdivision or development of the encumbered area, include specific restrictions of its use by the owners/residents of the proposed four homes, and provide for its use in perpetuity only as open space.

11. **Surrounding Land Uses and Setting:** The undeveloped project site is zoned RM-CZ, surrounded to the north, east and south by single-family residential zoning (R-1/S-17/DR) where the minimum parcel size is 5,000 square feet. The project site is bordered to the east by Vallemar Street (with Cabrillo Highway parallel and just east of that), to the south by Julianna Avenue (Vallemar and Julianna are County-maintained roadways), to the west by the Fitzgerald Marine Reserve (encompassing the coastal bluff tops to the beach below the bluffs), and to the north by R-1/S-17 zoned and developed parcels. The property lies within the Cabrillo Highway County Scenic Corridor. The project site topography slopes to the southwest at an average of approximately 10%, ranging from about 26% near Vallemar to about 3% closer to the coastal bluffs.

A long-established and well-used trail runs along and close to the coastal bluff-top, with most of the trail located within the eastern half of the abandoned The Strand road right-of-way (whose title legally resides with the project owner), with some brief trail portions extending within the The Strand's westerly half (whose title legally resides with the County as part of the Reserve. The trail extends from Juliana to the bluff north of the project site. From the westerly half of The Strand across a breadth of coastal bluff top area (ranging from 20 to 50 feet to bluffs' edge) toward the ocean is the Fitzgerald Marine Reserve (FMR), a 402-acre, 3-mile long natural resource area owned by San Mateo County and managed by the County Parks Department for conservation, recreation, and public education purposes, in accordance with their adopted (2002) Fitzgerald Marine Reserve Master Plan.

Along the property's easterly side (closest to and generally parallel with Vallemar) is a dense grove of non-native Monterey cypress trees. The area in between the bluff-tops and trees is generally comprised of coastal prairie grasslands and other native plants (including some special status plant species and a recently identified endangered plant), as well as non-native and invasive species of groundcover. The only development that has ever been approved on the property was that of a domestic well approved and drilled in 1999 (Case No. CDP97-0016/RMD97-0013); that well has subsequently been capped (but not yet formally abandoned) pursuant to the standards of the County Environmental Health Services (EHS). It cannot be reactivated and used for either domestic or landscaping water purposes, and will be permanently abandoned to the satisfaction and requirements of EHS, as a condition of this project.

12. **Other Public Agencies Whose Approval is Required:** County Building Inspection, County Department of Public Works, County Environmental Health Services, Montara Water and Sanitary District, and Coastside Fire Protection District.
13. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, has consultation begun?:** No. *(NOTE: Conducting consultation early in the CEQA process allows tribal governments, lead agencies, and project proponents to discuss the level of environmental review, identify and address potential adverse impacts to tribal cultural resources, and reduce the potential for delay and conflict in the environmental review process (see Public Resources Code Section 21083.3.2.). Information may also be available from the California Native American Heritage Commission's Sacred Lands File per Public Resources Code section 5097.96 and the California Historical Resources Information System administered by the California Office of Historic Preservation. Please also note that Public Resources Code section 21082.3(c) contains provisions specific to confidentiality).*

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” or “Significant Unless Mitigated” as indicated by the checklist on the following pages.

X	Aesthetics		Hazards and Hazardous Materials		Recreation
	Agricultural and Forest Resources	X	Hydrology/Water Quality		Transportation/Traffic
X	Air Quality	X	Land Use/Planning		Tribal Cultural Resources
X	Biological Resources		Mineral Resources	X	Utilities/Service Systems
X	Cultural Resources		Noise	X	Mandatory Findings of Significance
X	Geology/Soils		Population/Housing		
X	Climate Change		Public Services		

EVALUATION OF ENVIRONMENTAL IMPACTS

1. A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).
2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
4. “Negative Declaration: Less Than Significant with Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from “Earlier Analyses,” as described in 5. below, may be cross-referenced).

5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration (Section 15063(c)(3)(D)). In this case, a brief discussion should identify the following:
 - a. Earlier Analysis Used. Identify and state where they are available for review.
 - b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c. Mitigation Measures. For effects that are “Less Than Significant with Mitigation Measures Incorporated,” describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
7. Supporting Information Sources. Sources used or individuals contacted should be cited in the discussion.

1. AESTHETICS. Would the project:				
	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a. Have a significant adverse effect on a scenic vista, views from existing residential areas, public lands, water bodies, or roads?			X	
Discussion: The project site includes an existing and publically utilized coastal bluff-top trail on its west side; the four houses will be prominently visible from this trail as viewed from it looking in an easterly direction. Additionally, portions of the four houses would be visible from the residential area fronting onto Julianna Avenue to the south. From Cabrillo Highway and the residential areas to the east, portions of the four houses would be visible. While the garages of all four houses would be set back 50 feet from Vallemar Street, the primary houses themselves are setback at distances ranging from about 120 feet (Lot 1) to 140 feet (Lot 4) from Vallemar. That said, the project would be partially visible (e.g., the upper story and roof portions of the houses and upper roof portions of the garages) as viewed from Vallemar, looking westerly toward the ocean, as well as from residential areas east of Cabrillo Highway, which are located at a higher elevation. The four houses will be fully visible from the bluff-top trail looking easterly; the houses range in distance (set back easterly) from the established coastal trail from approximately 112 feet (Lot 1)				

to 185 feet (Lot 4). Residential development fronting onto the bluff tops to the north and south is generally far closer to the bluffs than these four house are proposed.

On October 12, 2017, the Coastsides Design Review Committee (CDRC) recommended approval of the four houses, based on findings that included project conformance with several applicable Design Review (DR) standards. One such standard (Site Planning and Structure Placement; pursuant to Section 6565.20 (C),d., "Ridgelines, Skylines and View Corridors") considers how the new homes will appear as viewed from adjacent designated open space areas (e.g., the public bluff-top trail), "where structure placement and design shall harmonize with the natural setting with regard to massing and materials." Throughout the three Design Review meetings where the CDRC reviewed this project, the applicant responded to their concerns with improved massing, articulation, slightly reduced height and exterior materials/colors, including changes to proposed landscaping. As a result, the CDRC was able to make the findings that the project complied with this and other applicable Design Review standards.

From all these viewpoints, the visual impact will not be significant pursuant to the plans submitted in response to the CDRC's last recommendation comments, which would include changes affecting massing, articulation, exterior material/color changes, exterior lighting, tree preservation and additional tree planting.

Additionally, the proposed biotic easement will preserve a significant share of each lot, both for views and protection of the prairie grassland and other special plant species existing on the property. As a result, it is concluded that if the four residences are designed as the CDRC approved – with their recommended modifications - the project's visual impact would be less than significant.

Source: Project Plans and Location; Coastsides Design Review Recommendation Letter (of the October 12, 2017 meeting)

b. Significantly damage or destroy scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

X

Discussion: The project is not located within a County – not State – scenic corridor. That said, and addition to the discussion provided to Question 1.a. above, the project would result in the removal of 30 significant sized Monterey cypress trees (and trimming of many others) within a dense hedge of Monterey cypress trees located on the project site's easterly side along Vallemar. This hedge of trees is most visible from along Vallemar looking westerly, from Julianna looking northerly and towards the ocean and from along the bluff-top trail looking easterly. However, many of the trees will be preserved with others replanted.

Source: Project Plans; Project Location; County General Plan Scenic Corridors Map; County GIS Resource Maps; Coastsides Design Review Recommendation Letter (of the October 12, 2017 meeting)

c. Significantly degrade the existing visual character or quality of the site and its surroundings, including significant change in topography or ground surface relief features, and/or development on a ridgeline?

X

Discussion: In addition to the discussion to Question 1.a., the four residences will each incur grading as cited in the project description above. While the total grading amounts for the entire

project is approximately 600 cu/yds of cut and 3,100 cu/yds of fill, this amount of grading is mostly to accommodate the driveways from Vallemar down to all four houses along with their respective driveway/back-up areas, up to the east facing sides of the main houses, which fall within those portions of the respective (proposed) lots that represent the greatest topographical drop. The following table describes this:

	Lot Average Depth (generally from east to west)	Average slope (approximate) Measured from Eastern Boundary to Vallemar-facing Main House Side	Average Slope (approximate) Measured from Main House to Lot's Westernmost Boundary	Average Depth of Conservation/Open Space Easement and Approximate % of Total Lot Depth Placed within Easement
Lot 1	210 ft.	15%	8%	97 ft./ 46%
Lot 2	200 ft.	17%	9%	115 ft./ 57%
Lot 3	220 ft.	21%	5%	110 ft./ 50%
Lot 4	262 ft.	17%	4%	173 ft./ 66%

Most of the grading (for each of all four lots) occurs within the greater sloping areas as cited in the above middle column. This area is generally located within the dense grove of Monterey cypress trees (even though there will be tree removal within this area, both due to the grading and construction of the four residences). However, such grading will not represent a significant change in the topography of the property. And no grading will occur beyond the footprint of the four houses within the proposed conservation easement to protect and restore the coastal prairie grassland (see detailed discussion of this in Question 4.a.). As seen from the bluff-top trail looking easterly, the grading will not represent a significant change in topography as seen from that view point or as seen from Julianna. Finally, as a result of the project design, its associated grading as discussed, and the extent of the proposed biotic easement (where no project disturbance can occur) as cited in the table above, the project will not pose a significant impact to the site's visual character.

As a result, it is concluded that with the following mitigation measures, the project's visual impact would be less than significant.

Source: Project Plans and Location; Coastsides Design Review Recommendation Letter (of the October 12, 2017 meeting)

d. Create a new source of significant light or glare that would adversely affect day or nighttime views in the area?			X	
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Discussion: The plans recommended for approval by the CDRC included exterior lighting as associated with all four houses, both their respective location on the four residences and fixture design. The CDRC's decision acknowledged the project's compliance with the Design Review standards (6565.20(E)4, as regards exterior lighting, which state: "All exterior, landscape and site lighting shall be designed and located so that light and glare are directed away from neighbors and confined to the site," "Exterior lighting should be minimized and designed with a specific activity in mind so that outdoor areas will be illuminated no more than is necessary to support the activity designed for that area," and "Minimize light and glare as viewed from scenic corridors and other public view corridors." The proposed location, purposes and design of all such lighting will not

create a new source of significant light or glare that would adversely affect day or nighttime views in the area.

Source: Project Plans and Location; Coastsides Design Review Recommendation Letter (of the October 12, 2017 meeting)

e. Be adjacent to a designated Scenic Highway or within a State or County Scenic Corridor?

X

Discussion: The project site is located within the Cabrillo Highway County Scenic Corridor. Based on the discussion provided to Questions 1.a. and b., the project poses no significant impacts due to its location alongside and within the County Scenic Corridor.

Source: Project Plans and Location; County General Plan Scenic Corridors Map; County GIS Resource Maps

f. If within a Design Review District, conflict with applicable General Plan or Zoning Ordinance provisions?

X

Discussion: The project site's RM-CZ zoning includes the Design Review (DR) Overlay District. Based on the discussion provided to Questions 1.a., c. and d., the project is in compliance with all applicable Design Review standards. Additionally, the RM-CZ Zoning District requires that development comply with the County Zoning Regulations, Chapter 20A.2. (Development Review Criteria). Most applicable to the project are the "Environmental Quality (EQ)," "Site Design (SD)," "Utilities (U)," "Cultural Resources (CR)," "Primary Scenic Resources Areas (PSRA)" and "Primary Natural Vegetative Areas (PNVA)" criteria.

While the Design Review standards (as discussed previously and pursuant to the CDRC's recommendation) generally cover the criteria required under the SD and PSRA criteria, the EQ criteria requires that "all development should be designed and located to conserve energy resources...Such efforts might include the clustering or location of development to reduce paving, grading, runoff...and structural designs which maximize use of solar energy..." The project located all four residences toward the far eastern third or more of the respective lots, with all access driveways coming off Vallemar. As cited in the table in the discussion to 1.c., the grading is also confined to this general area. Further, all four houses are positioned and designed to be able to take advantage of solar energy. Regarding the U criteria, all utilities to all four residences will be undergrounded. Regarding the CR criteria, the project is compliant, with mitigation measures added as discussed in Question 5.a. Regarding the PNVA criteria, the project is compliant, with mitigation measures added as discussed in Question 4.a. below.

Being located within the Coastal Zone, the project requires a CDP and would comply with the policies of several applicable Local Coastal Program (LCP) components, most specifically (in this case) with the "Visual Resources" component. For development within the Midcoast communities (including Moss Beach), that policy primarily defers to compliance with the Design Review standards, which have previously been discussed in this section. As a result, and with the following mitigation measures (taken from the CDRC's October 12, 2017 decision letter as they affect design only), the project's impact would be less than significant.

Mitigation Measure 1: All development on all four proposed lots shall comply with the last plans approved by the Coastsides Design Review Committee on October 12, 2017, whose recommendation included that the following minor revisions occur on the submitted building plans and that other Design Review-related conditions occur:

- a. Revise the variable color scheme to be neutral so as to blend with the immediate landscape so that the structures' exteriors weather naturally. Weathered (pickled) wood, stucco or cementitious hardy sidings are acceptable options. Any such changes shall require the submittal of material samples for review by the Community Development Director.
- b. Submit revised plans to show modified deck specifications to include the floor area of the mezzanine decks (for all houses that include such decks) pursuant to the second revision plans presented [to the DRC] on October 12, 2017 (definitive deck square footage was delineated only for entry, rear, and garage decks in all versions of previously submitted plans).
- c. Any additional exterior lighting (in addition to the single fixture shown at the entry and garage locations) shall be dark sky compliant fixtures, which shall be mounted or recessed under the soffits at other openings and allowed only as required by building code (for safety). No additional site, building, or landscape lighting is proposed.
- d. All paved pathways and patios shall be shown as dimensioned, on the plans, with identified materials [which shall be of a pervious nature].
- e. The applicant shall provide "finished floor elevation verification" to certify that the structure is actually constructed at the height shown on the submitted plans. The applicant shall have a licensed land surveyor or engineer establish a baseline elevation datum point in the vicinity of the [four] construction sites.
 - (1) The applicant shall maintain the datum point so that it will not be disturbed by the proposed construction activities until final approval of the building permit.
 - (2) This datum point and its elevation shall be shown on the submitted site plan. This datum point shall be used during construction to verify the elevation of the finished floors relative to the existing natural or to the grade of the site (finished grade).
 - (3) Prior to Planning approval of the building permit application, the applicant shall also have the licensed land surveyor or engineer indicate on the construction plans: (a) the natural grade elevations at the significant corners (at least four) of the footprint of the proposed structure on the submitted site plan, and (b) the elevations of proposed finished grades.
 - (4) In addition, (a) the natural grade elevations at the significant corners of the proposed structure, (b) the finished floor elevations, (c) the topmost elevation of the roof, and (d) the garage slab elevation must be shown on the plan, elevations, and cross-section (if one is provided).
 - (5) Once the building is under construction, prior to the below floor framing inspection or the pouring of the concrete slab (as the case may be) for the lowest floor(s), the applicant shall provide to the Building Inspection Section a letter from the licensed land surveyor or engineer certifying that the lowest floor height, as constructed, is equal to the elevation specified for that floor in the approved plans. Similarly, certifications on the garage slab and the topmost elevation of the roof are required.
 - (6) If the actual floor height, garage slab, or roof height, as constructed, is different than the elevation specified in the plans, then the applicant shall cease all construction and no additional inspections shall be approved until a revised set of plans is submitted to and subsequently approved by both the Building Official and the Community Development Director.
- f. All new power and telephone utility lines from the street or nearest existing utility pole to the project structures on the property shall be placed underground.

Source: Project Plans and Location; County Zoning Regulations; Coastsides Design Review Recommendation Letter (of the October 12, 2017 meeting)

g. Visually intrude into an area having natural scenic qualities?			X	
Discussion: The project site is located is an undeveloped property that includes the cited coastal bluff trail on tis western edge, affording unobstructed views of both the ocean as well as view to existing Monterey cypress tree grove to the east. While the four residences will impact the Monterey cypress trees, their location to site's eastern side, together with the proposed conservation easement, will ensure that the site's primary scenic quality (ocean views) will be preserved. With additional discussion of this issue provided to Question 1.a. above, the project's impact would be less than significant. Source: Project Plans and Location; Coastside Design Review Recommendation Letter (of the October 12, 2017 meeting)				

2. AGRICULTURAL AND FORESTRY RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies 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:				
	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a. For lands outside the Coastal Zone, 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?				X
Discussion: The project site is located <u>within</u> the Coastal Zone. Thus, the question is not relevant to this project at this site. That said, the parcel is not mapped or designated as Prime or Unique Farmland or Farmland of Statewide Importance. Thus, the project poses no impact. Source: California Department of Conservation Farmland Mapping and Monitoring Program				
b. Conflict with existing zoning for agricultural use, an existing Open Space Easement, or a Williamson Act contract?				X

Discussion: While the project parcel is zoned RM-CZ, there is not presently any ongoing agriculture on the project site. Nor does there exist an Open Space Easement or Williamson Act contract on the parcel. Thus, the project poses no impact. Source: San Mateo County Zoning Regulations and Maps; County Agricultural Preserves Map				
c. 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?				X
Discussion: In addition to the discussion provided to Questions 2.a. and b., the project site does not represent nor is designated as “Farmland.” Thus, the project poses no impact. Source: Project Location; California Department of Conservation Farmland Mapping and Monitoring Program				
d. For lands within the Coastal Zone, convert or divide lands identified as Class I or Class II Agriculture Soils and Class III Soils rated good or very good for artichokes or Brussels sprouts?				X
Discussion: While the project site is located within the Coastal Zone (and in addition to the discussion provided to Questions 2.a. and b.), there are no Class I, II or II soils on the site. Thus, the question is not relevant to this project at this site and the project poses no impact. Source: Project Location; Natural Resources Conservation Service; County GIS Resource Maps				
e. Result in damage to soil capability or loss of agricultural land?				X
Discussion: As previously stated in this section, there is no designated “agricultural” soils on the project site. Thus, the project poses no impact. Source: Project Location; Natural Resources Conservation Service; County GIS Resource Maps				
f. 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))? Note to reader: This question seeks to address the economic impact of converting forest land to a non-timber harvesting use.				X

Discussion: The subject parcel is RM-CZ, not TPZ-CZ. There is also no “forest land” on the parcel. Thus, the question is not relevant to this project at this site and poses no impact.

Source: County Zoning Regulations and Maps; County GIS Resource Maps; State Public Resources Code Section 12220(g)

3. 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:

	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a. Conflict with or obstruct implementation of the applicable air quality plan?			X	

Discussion: The Bay Area 2010 Clean Air Plan (CAP), developed by the Bay Area Air Quality Management District (BAAQMD), is the applicable air quality plan for San Mateo County. The CAP was created to improve Bay Area air quality and to protect public health and the climate.

The project will not conflict with or obstruct the implementation of the BAAQMD’s 2010 CAP. Once constructed, ongoing use of the four residences would have minimal impacts to the air quality standards set forth for the region by the BAAQMD. Also see the discussion to Question 7.1. (Climate Change; Greenhouse Gas Emissions), relative to the project’s compliance with the County Energy Efficiency Climate Action Plan. Thus the project impact is expected to be less than significant. That said, The following mitigation measure will ensure that the project impact is less than significant.

Source: Project Plans; BAAQMD 2010 Clean Air Plan

b. Violate any air quality standard or contribute significantly to an existing or projected air quality violation?		X		
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Discussion: During project construction, air emissions will be generated from site grading, construction equipment, and construction worker vehicles. However, any such construction-related emissions will be temporary and localized.

The BAAQMD has established thresholds of significance for construction emissions and operational emissions. As defined in the BAAQMD’s 1999 California Environmental Quality Act (CEQA) Guidelines, the BAAQMD does not require quantification of construction emissions due to the number of variables that can impact the calculation of construction emissions. Instead, the BAAQMD emphasizes implementation of all feasible control measures to minimize emissions from construction activities. The BAAQMD provides a list of construction-related control measures that they have determined when fully implemented would significantly reduce construction-related air emissions to a less than significant level. These control measures have been combined into Mitigation Measure 1 below. Furthermore, Section 2-1-113 (Exemption, Sources and Operations) of the BAAQMD General Requirements exempts sources of air pollution associated with the construction of a single-family residence used solely for residential purposes, as well as road construction, from obtaining an Authority to Construct or Permit to Operate.

Mitigation Measure 2: The applicant shall submit an Air Quality Best Management Practices Plan to the Planning and Building Department prior to the issuance of any grading “hard card” or building permit that, at a minimum, includes the “Basic Construction Mitigation Measures” as listed in Table 8-1 of the BAAQMD California Environmental Quality Act (CEQA) Guidelines (May 2011). These measures shall be implemented prior to beginning any grading and/or construction activities and shall be maintained for the duration of the project grading and/or construction activities:

- a. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access road) shall be watered two times per day.
- b. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- c. All visible mud or dirt track-out onto adjacent paved roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- d. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).
- e. Roadways and building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- f. Idling times shall be minimized either by shutting equipment or vehicles off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.
- g. All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications.
- h. Minimize the idling time of diesel powered construction equipment to two minutes.

Source: Project Plans; BAAQMD CEQA Guidelines, December 1999; BAAQMD CEQA Guidelines, May 2011; BAAQMD Regulation 2, Rule 1

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)?		X		
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Discussion: The Bay Area Air Basin is designated as non-attainment for Ozone, Particulate Matter (PM₁₀), and Particulate Matter – Fine (PM_{2.5}), according to the BAAQMD. Therefore, any increase in these criteria pollutants is significant. Implementation of the project will generate temporary increases in these criteria pollutants due to construction vehicle emissions and dust generated from earthwork activities. Mitigation Measure 1 will minimize increases in non-attainment criteria pollutants generated from project construction to a less than significant level. Furthermore, the California Air Resources Board (CARB) provides regulation over vehicles of residents in the State of California, including the operation of any vehicles that would be associated with the proposed single-family residence, to ensure vehicle operating emissions are minimized in the effort toward reaching attainment for Ozone, among other goals.

Source: Project Plans; BAAQMD Air Quality Standards and Attainment Status, URL (2017)

d. Expose sensitive receptors to significant pollutant concentrations, as defined by BAAQMD?		X		
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Discussion: Any pollutant emissions generated from the project will primarily be temporary in nature. The project site is in a rural area with few sensitive receptors (i.e., single-family residences) located within the nearby project vicinity. Additionally, the surrounding tree canopy and vegetation will help to insulate the project area from nearby sensitive receptors. Furthermore, Mitigation Measure 1 will minimize any potential significant exposure to nearby sensitive receptors to a less than significant level.

Source: Project Plans; Project Location

e. Create objectionable odors affecting a significant number of people?		X		
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Discussion: The project proposes development of four residences, on lots ranging from 22,220 sq. ft. to 32,324 sq. ft. in an urbanized area of the Midcoast. Once constructed, their daily use as residences will not generate objectionable odors that could affect a significant number of people. Furthermore, Mitigation Measure 1 will minimize any construction-related odors affecting nearby residents to a less than significant level.

Source: Project Plans

f. Generate pollutants (hydrocarbon, thermal odor, dust or smoke particulates, radiation, etc.) that will violate existing standards of air quality on-site or in the surrounding area?		X		
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Discussion: The project would involve minimal hydrocarbon (carbon monoxide; CO₂) air emissions and dust, whose source would be: (a) from vehicles and equipment (whose primary fuel source is gasoline) during the construction phase of the four residences, and (b) from vehicles (post-construction) of those living in and visiting the four residences. See staff's discussion and recommended Mitigation Measure 1, in Questions 3.b. and 3.c. above. Additionally, the following mitigation measure will ensure that any such pollutants during project construction will be to a less than significant level.

Mitigation Measure 3: The applicant shall submit a dust control plan to the Planning Department for review and approval prior to the issuance of a building permit for the project. The approved plan shall be implemented for the duration of any grading, demolition, and construction activities that generate dust and other airborne particles. The plan shall include the following control measures:

- a. Water all active construction areas at least twice daily.
- b. Water or cover stockpiles of debris, soil, sand, or other materials that can be blown by the wind.
- c. Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least 2 feet of freeboard.
- d. Apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking and staging areas at construction sites. Also, hydroseed or apply non-toxic soil stabilizers to inactive construction areas.
- e. Sweep daily (preferably with water sweepers) all paved access roads, parking and staging areas at construction sites.
- f. Sweep adjacent public streets daily (preferably with water sweepers) if visible soil material is carried onto them.

- g. Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).
- h. Limit traffic speeds on unpaved roads within the project parcel to 15 miles per hour (mph).
- i. Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- j. Replant vegetation in disturbed areas as quickly as possible.

Source: Project Plans; BAAQMD Air Quality Standards and Attainment Status, URL (2017)

4. BIOLOGICAL RESOURCES. Would the project:

	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
4.a. Have a significant adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		

Discussion: The project site is located adjacent to and just east of the County Fitzgerald Marine Reserve (Reserve). The Reserve's consideration as an Area of Special Biological Significance (ASBS), together with the project site's location adjacent to and within the watershed of the Preserve, triggers the need for adequate erosion control during the period of project construction and any related site disturbance. . With regard to the question of special status species,, the applicant's initial biological report (Zander Associates; 2015), as well as the 2016 observations by Corelli in 2016, confirmed the occurrence of rare coast yellow leptosiphon (CYL) located on the coastal bluff promontory just west of the project site's westernmost property line and several feet west of the coastal bluff trail, in an area located within the limits of the Reserve., CYL is listed by the California Native Plant Society as seriously threatened in California. However, since that initial survey, the California Department of Fish and Wildlife (in its June 6, 2017 letter; Attachment T) petitioned the California Fish and Game Commission (Attachment T.1) to designate this species as "endangered" under the California Endangered Species Act (CESA). On April 3, 2018, the Commission voted to list the plant as endangered (although they still need to issue findings, a procedural step, before the listing goes into effect). In the meantime, the species is technically still considered a candidate.

Because there is only one known population of CYL, protecting it is critical for the continued existence of the species, where County efforts, together with mitigation measures as presented with this project, will be critical to ensure preservation of this plant.

In response to the County's first circulation of this Initial Study/Mitigated Negative Declaration (IS/MND), the California Department of Fish and Wildlife (CDFW) provided comments that specifically stated that the prior vegetation survey mapping study (Zander Associates 2015), was not implemented using a systematic survey methodology necessary to evaluate whether the project site supports the CYL, as well as providing a broader and more accurate survey for three other rare plant species.

The following represents a summary of CDFW's comments to the initial circulation of this document (letter dated February 7, 2018; Attachment T.2), with discussion and proposed mitigations as noted:

1. *An updated survey of the Project site by the applicant's biologist, Jodie McGraw, to thoroughly assess the presence and potential to accommodate future distribution of the CYL and/or other special-status species on the project site, based on systematic survey methodologies, with reference to the CDFW's (2009) "Protocols for Surveying and Evaluating Impacts to Special-Status Native Plant Populations and Natural Communities." The revised survey should discuss why areas proposed for development are unsuitable for the CYL and native plant communities. The survey shall also assess special-status species known to occur on the Project site and vicinity, including Blasdale's bent grass (classified as rare and endangered on the California Native Plant Society Rare Plant Inventory), Johnny nip and Harlequin lotus (both on the Society's 'watch list').*
2. *An assessment of (within the new survey) the thresholds and characteristics used to distinguish between "disturbed" habitat and coastal prairie grassland habitat, which merits Environmentally Sensitive Habitat Area (EHSa) protection under the California Coastal Act and the County Local Coastal Program. Where proposed development may even impact a minimal area of coastal prairie grassland – which is also habitat that can support the CYL – might any such loss of acreage affect this species' survival, in conflict with ESHA protection requirements?*

Response: In response to the above comments and issues, the applicant's biologist (Jodi McGraw, Ph.D., of Jodi McGraw Consulting) submitted the "Valleamar Bluffs Botanical Survey," dated August 2018 (2018 Survey), Attachment S. The objectives of the Survey were to:

- a. From a survey of natural communities and plants conducted in spring and early summer 2018, compile a list of all plants within the study area (including the project site and the adjacent Reserve area where the CYL population exists);
- b. Map the distribution and estimate the abundance of all rare plants within the study area; and
- c. Classify and map the natural plant communities within the study area.
- d. Analyze the potential positive and negative potential impacts of the proposed conservation and development elements, on native plants and natural communities.

The 2018 McGraw Survey generally concurred with the 2015 Zander Associates survey relative to the characterization of two main vegetative types on the project site: remnant coastal prairie on the western portion, and disturbed/ruderal grounds, mostly under the Monterey cypress canopy on the site's southwest corner. That report mapped the vegetation in three categories:

- Coastal Prairie Grassland: Areas dominated (>75% cover) by native perennial bunchgrasses and native forbs found in coastal grasslands;
- Non-Native Areas: the areas beneath the Monterey cypress canopy, which features largely non-native understory species including ornamental plants and areas with dense patches of ice plant and other invasive plants;
- Transitional Area: Areas featuring mostly sparse occurrences (5%) of native species but that are otherwise dominated by exotic plants and ice plant. Smaller areas dominated by coastal terrace prairie species were also mapped in this area.

While the 2018 Survey does not disagree with these general vegetative categories, the Survey renames the Transitional Zones as "Degraded Coastal Terrace Prairie" (CTP) using the presence of any native perennial grasses or native forbs characteristic of the CTP as sufficient to call it CTP, even if they are at very low abundance or subdominant to exotic plant species.

With some limited intrusions of CTP from the Easement into the building site areas of all four lots, the building site area was otherwise found to be primarily comprised of ruderal and planted vegetation, including ornamental or planted areas comprised of the Monterey cypress grove, with an understory that features a mix of ornamental species and naturalized exotic plants.

Through the rare plant survey together with the approved field methodology (pursuant Section 2, “Study Methods”, 2018 Survey), McGraw mapped the following throughout the Study Area:

Coastal Terrace Prairie: The Coastal Terrace Prairie in the Study Area is dominated by a mix of native and exotic plant species. It is dominant within the Easement area (where CTP groups ranged from “Native dominated” to “Exotic dominated - natives present,” Figure 5 of the 2018 Survey), with portions of CTP extending into the westerly portions of the Project Site’s proposed lots as follows:

Lot 1 - Nearly 28 feet, species comprised of “Exotic dominated - natives subdominant”, and “Exotic dominated - natives present”;

Lot 2 - Nearly 15 feet, species comprised of “Native-Exotic - co-dominated”, “Exotic dominated - natives subdominant”, and “Exotic dominated - natives present;”

Lot 3 - Nearly 25 feet, species comprised of “exotic dominated - native present” and “Native dominated;”

Lot 4 - Nearly 18 feet, species comprised of “exotic dominated - natives subdominant;”

Coastal Bluff (Reserve) Area - Besides species of “Exotic dominated-natives present,” this area was primarily populated with all species categories of CTP.

Blasdale’s Bent Grass, Johnny Nip, Harlequin Lotus: The 2018 McGraw Survey mapped these three rare-listed native plants as to their locations throughout the Study Area. Blasdale’s bent grass (221 plants counted) was mapped in five locations, with four near the CYL patch on the Coastal Bluff (Reserve) area and the fifth occurring within the Easement area crossing Lot 4, near the trail. Johnny nip (1,703 plants counted) was mapped in 16 locations, with 55% occurring within the Project site’s Easement area and 45% occurring within the FMR area. Harlequin lotus (133 plants counted) was mapped in 31 locations near entirely on the Project site’s Easement area across all four lots, with a slight intrusion on Lot 4 (nearly 15 feet) into the building site area.

Coast Yellow Leptosiphon (CYL): The only known location of the endangered CYL was located on the Coastal Bluff (Reserve) area, just west of the coastal bluff trail. The Survey stated that the CYL occurred within a 746 sq. ft. patch with one “disjunct point occurrence” 6 feet southeast, which featured six plants within a very narrow area (see Figure 6 of 2018 Survey, Attachment T). The estimated abundance of CYL in 2018 was significantly greater than that estimated by Corelli in 2015; this change is likely and largely attributable to the different estimation methods. The Survey concluded this discussion on abundance, stating: “Refining the methods to estimate the abundance of CYL accurately yet without impacting individual plants or their habitat, will help track changes in the population over time and relate them to changes in habitat conditions and inter-annual variation in weather (e.g., precipitation), herbivory, or other factors that could influence individual demographics performance and thus population density”.

The assessment of the Project’s direct impacts to the subject rare plants and natural vegetative communities located within the Study Area boundaries, occurred relative to: (1) the proposed orientation of the four proposed lots, (2) the proposed Conservation Easement, (3) the limits of project-related grading and site disturbance, and (4) the proposed extension – into the Easement area – of the infiltration spreader area, where perforated pipes would be installed in trenches below grade to prevent concentrated stormwater runoff.

The assessment of the Project’s indirect effects was analyzed by evaluating potential impacts of the Project on the rare plants and natural communities that could occur, over time, after all immediate

development activity (grading, drainage installation, tree removal/trimming, house construction).

3. *Greater details regarding stormwater, landscaping, irrigation, fencing, site occupancy and use (including within the proposed Conservation and Open Space Easement area), construction staging and access are necessary to ensure there is no adverse impact to the CYL. Such plans shall include protective measures (i.e., fencing) to be in place during all construction and grading activities to avoid impacts to the CYL.*

Response: Stormwater and erosion control measures are critical to prevent water runoff from adversely affecting both the CYL and the Fitzgerald Marine Reserve (including the bluff top area) immediately adjacent to and east of the Project site.

While the Project includes an Erosion Control Plan, the 2018 Survey recommended several such measures that would augment the Project plans to be implemented prior to and during all grading and construction activity to limit impact to both the CYL and CTP on the FMR property, as well as the CTP and other special-status plants within the Easement area. Additionally, the submitted Stormwater Drainage Report (Attachment O), proposes extensive drainage measures to ensure that all new post-construction drainage measures will adequately capture and contain stormwater from all new impervious surfaces (resulting from development on each of the four lots), ensuring that no such drainage will create erosion or otherwise adversely impact the coastal bluffs to the west of the four lots, nor to the plant resources within the Easement area. Those measures have been incorporated as Mitigation Measures at the end of this section.

4. *An assessment on how the Project may contribute (due to the CYL's diminishing habitat on the Vallemar bluff area) to habitat stresses on the CYL as associated with bluff erosion and the invasive iceplant. While the CYL's existing habitat is off the project site, would the Project prevent recolonization of previously occupied habitat areas, precluding habitat and species recovery?*
5. *An assessment of both the County's and Project applicant's plans (both off and on the Project site, and specifically within the proposed Conservation and Open Space Easement area) for measures to protect the CYL, including how such mechanisms would be funded, monitored and enforced.*

Response: As previously discussed, the Project includes the designation of a Conservation and Open Space Easement (Easement) that extends from the west-facing sides of the development footprints of all four lots to the Project's westernmost property boundary (see Attachments F and S.2).

While the 2018 Survey concluded that the soil conditions within the Easement area were not likely conducive to supporting population of the CYL, the protection, restoration and management measures that will be implemented with the Easement area could result in an environment that may support migration of the CYL from its current location on the FMR property. Additionally, the Project stormwater drainage plans and use of permeable pavers on the four building sites - together with the infiltration trenches with overflow spreader to be located within the Easement area - should be adequate to limit any adverse impacts to the CYL from project related drainage. Finally, mitigation measures are also recommended to limit any adverse impacts to the CYL from all Project construction and grading activities.

The primary purpose of the "Vallemar Bluffs Conservation and Development Project Management Planning Framework" (Attachment S.1), besides being the framework for a final Habitat Management Plan, is restoration and management within the 0.92-acre Conservation Easement area in such a manner as to protect, restore and manage the area's native biodiversity in the CTP, including the promotion of existing rare plant populations, while allowing for compatible access.

With regard to access into this area, the Framework document cites goals that would:

- 1) Facilitate passive recreation that is compatible with restoration and management of the coastal terrace prairie community and rare plants both in the conservation area, including public access on the Bluff Trail that is largely within the FMR;
- 2) Provide access for scientific research, to increase understanding of the natural systems and inform their effective conservation and management; and
- 3) Develop and maintain the infrastructure necessary to manage compatible access, including fences and interpretive signage, using approaches that limit impacts to biodiversity and the scenic values of the conservation area.

Its associated objectives (to be incorporated as mitigation measures) include:

- 1) Install symbolic fencing along the perimeter of the conservation area, to clearly delimit the boundary between it and the adjacent development areas and Fitzgerald Marine Reserve land;
- 2) Install signs that provide information about the conservation area including the rationale for its protection, to promote compliance with access restrictions;
- 3) Record in the CC&Rs for the parcels as well as the conservation easement, prohibitions against access to the conservation area that is not compatible with conservation, restoration, and management of natural community structure and species composition in the coastal terrace prairie and populations of rare native plants. Examples of prohibited activities include: installation of permanent or semi-permanent infrastructure or equipment such as outdoor furniture (e.g., patio furniture, picnic tables, umbrellas), play equipment (trampolines, play structures, etc.) or other items that intensify use or otherwise modify the structure and species composition of the grassland;
- 4) Work with the County of San Mateo, to coordinate on management of the Bluff Trail, which is largely within the Fitzgerald Marine Reserve but also occurs within a small portion of the conservation easement area, and that provides public access along the bluff edge. Ensure that the recreational use there is managed to be compatible with the restoration and management of the coastal terrace prairie and rare plants in the conservation area; and
- 5) Monitor the effects of access and compliance with the measures to prevent trampling associated with recreational use and taking steps to increase compliance when/if negative impacts are observed.

The addition of four new homes is unlikely to increase the frequency or intensity of recreation on the FMR, which already receives high public use. Recreation management, as outlined in the Habitat Management Plan, together with enforcement of the recreation activities within the Easement area, should also reduce any potential impacts. Finally, low-profile, interpretive signs could be placed at the southwesterly corner of the Easement area (near the bluff-top trail heading northerly at the bottom of Julianna) informing public trail users of the CYL located up ahead just west of the trail.

6. *An assessment of the Project's potential to intensify the current recreational use in the immediate vicinity of the CYL population, including within the proposed Conservation and Open Space Easement area. What measures affecting pedestrian and recreational use within the Easement area be and how would they be effectively regulated and enforced to ensure protection of coastal prairie habitat?*

Response: The Project's potential to increase the current recreational use in the vicinity of the CYL's population falls into two areas: (a) an increase of people using the bluff-top trail (to which the currently existing CYL population is located several feet east of the trail on FMR property) during construction and after the four proposed residences are completed and occupied, and (b) an increase of people using what is currently the large open field area west of the bluff-top trail (part of the Project site) during construction and after the four residences are completed and occupied.

With regard to the former, staff doesn't conclude that the additional visitors/trail users associated by four new residences alone will result in a significant increase of activity along the trail. That said, County Parks is willing to work together with CDFW and the Project applicant to collaborate on the plant's management and preservation (at its current location), provided the Project applicant (or as could be stipulated in the Project's Draft CC&Rs; Attachment S.3.) fund the development of a recovery plan and long-term funding for implementation of such a plan.

With regard to the latter, the activity currently occurring within the open field area will be greatly restricted relative to its use and activity, pursuant to the constraints specified in the Project's proposed Easement as previously cited). The Easement (together with the CC&Rs and pursuant to the Habitat Management Plan) specifies prohibited uses within the Easement and ensures proper oversight and management of the native plant populations within the Easement area.

7. *A better description and assessment of the Project's proposed hydrological impacts, such as infiltration and detention features to prevent a net increase in surface water run-off from the Project site, and soil saturation effects of increased subsurface flows on erosive processes.*

Response: The Project includes a Stormwater Drainage Plan (Attachment O) that will capture, detain and perk all post-construction drainage from new impermeable areas created from the construction of four residences, garages, and associated driveways, walkways and patios.

Increased or channelized runoff could also hasten coastal bluff erosion, which has occurred at an average rate of 0.45 feet per year since 1908 and may have reduced the amount of coastal blufftop habitat available for CYL, Blasdale's bent grass, and Johnny nip, as well as perhaps Harlequin lotus, though that species occurs further inland.

To minimize these potential indirect effects of altered drainage, the drainage plan features the following design elements: (1) infiltration trenches with overflow spreaders, that disperse the runoff over wide areas and maintain the existing hydrology and soil moisture distribution within the site; (2) pervious pavers for driveways and parking areas, to minimize the impervious area on the site to just 10,850 sq. ft. (0.25 acres); and (3) connections to the existing two-foot deep drainage channel on Juliana Street. These measures are anticipated to minimize alterations to soil moisture conditions within the site.

Assessment of Potential Project Impacts and Benefits

The 2018 Survey summarized the project's design and implementation measures that would limit impact to the special-status plants and sensitive natural communities in such a manner that:

- Locates the four project building sites primarily within the degraded habitat, including mostly the ruderal and planted/ornamental vegetation towards the east side of the property.
- Minimizes alteration of the site's hydrology, including use of permeable pavers (driveways/patios/walkways) to increase infiltration of stormwater, and installing overflow spreaders in trenches (into the Easement area) to further diffuse runoff
- Landscape with plant species native to the San Mateo Coast, to limit the potential for the spread of non-native plants into the adjacent habitat, and limit the need for irrigation and pesticide use.

Table 9 of the 2018 Survey documents negative direct and indirect effects of the project, as well as the benefits of the Conservation Easement and added mitigation measures on the CTP, the CYL, and the Blasdale's bent grass, Harlequin Lotus and Johnny Nip plants. Project impacts and benefits are summarized as follows:

Summary of Net Effects of the Project

The 2018 Survey summarized the net effects of the project as follows:

- Project impacts are largely avoided through project design: Locating the residential development on the eastern portion of the Project site (east of the Easement's easterly boundary), in planted/ornamental and ruderal plant communities, avoids most direct impacts to the special-status species and sensitive natural communities. The project will protect 89% of the 0.97 acres classified as CTP within the entire Project site. Regarding rare plants, the Project will protect 100% of the 78 sq. ft. area occupied by Blasdale's bent grass, 100% of the 0.105-acre area occupied by Johnny nip, and 83% of the total 2,050 sq. ft. area occupied by Harlequin lotus. The CYL was not observed or found on the Project site, and instead, its entire 746 sq. ft. patch is protected within the adjacent FMR area, under the management of the County Parks Department.
- The project compensates for its limited impacts to degraded coastal terrace prairie and also harlequin lotus at high mitigation ratios, while avoiding direct impact to all other sensitive resources in the Study Area. The proposed 0.92-acre on-site conservation area will be protected through the Conservation and Open Space Easement dedicated to a 501(c)(3) land trust (identified as Golden State Land Conservancy).
- The Easement area will protect 0.874 acres of CTP, thus limiting the Project's direct impacts to just 0.075 acres of exotic-dominated CTP at a ratio of more than 11:1. Likewise, the Easement area will protect Harlequin lotus habitat at a ratio of 5:1 (for every one of the 339 sq. ft. impacted by development, 5 sq. ft. of its habitat will be protected; this ratio could be increased through the salvage of seed, sod, and/or topsoil prior to development for use in off-site restoration). The project will not directly impact Blasdale's bent grass and Johnny-nip, with their entire respective populations protected within the Easement area.

The proposed Easement (Attachment S.3) would be conveyed by the Grantor (current property owner: Moss Beach Associates, LLC) to the grantee (Golden Gate Land Conservancy, Inc.).

The Golden State Land Conservancy (GSLC) is a statewide California land trust incorporated in 1999. It is a member of the Land Trust Alliance and adheres to its Standards and Practices. GSLC has applied for and is expecting their certification from the Land Trust Accreditation Commission in 2019; they are currently certified by CDFW. GSLC helps landowners conserve their property for the future, by meeting regulatory and professional requirements. To date, their work has resulted in 57 conservation easements (donated or required by public agencies) covering over 35,000 acres throughout the State of California.

The Easement specifies prohibited uses and restrictions within its boundaries, including (a) unseasonable watering and use of fertilizers/herbicides, (b) restriction on construction/development and uses (i.e., excluding even placement and use of temporary lawn furniture, BBQs, and other related outdoor furniture and items), (c) any activity that might cause soil erosion or degradation, (d) dumping, (e) planting or introduction of exotic plant/animal species, and (f) motor vehicle/equipment storage. The Easement specifies the Easement holder as the Golden State Land Conservancy, which will take on the responsibilities of protecting, storing and managing the Easement area, pursuant to the goals and objectives (as evaluated against specific success criteria) stipulated in the "Valleamar Bluffs Conservation and Development Project Management Planning Framework" document (Attachment S.1). From this framework, a final Conservation Habitat Management Plan will be developed. The Easement, final Habitat Management Plan and associated CC&Rs will be recorded together with the Project Lot Line Adjustment/Parcel Map.

The Easement ranges in average depth from 97 feet (Lot 1; covering approximately 46% of lot) to 173 feet (Lot 4; covering approximately 66% of lot). Besides functioning as a visual buffer between the proposed residential development and visitors walking down along the beach or along the bluff-top trail (as previously discussed in the "Aesthetics" Section of this document), the Easement will also serve to preserve and protect CTP and other native and special-status plant communities

located within the Easement area.

* A combination of avoidance and minimization Measures will further limit impacts: Elements of the project design, together with the measures identified in the 2018 Survey, will further limit the impacts if the project on the sensitive natural community and specials-status species, including any indirect effects, included in this document, such as (1) salvaging top soil sod, and individual plants for use in restoration prior to the commencement of any project-related disturbance on the Project site; (2) implementing species protection measures and best management practices during such activities, including installation of fencing and signage and conducting trainings and monitoring by a biologist, to prevent the area of disturbance from expanding beyond the designated impact areas (limits of project-related grading and infiltration spreader areas); and (3) installing permeable pavers and infiltration spreaders to avoid altering the hydrology in ways that could negatively affect the sensitive community and special-status species directly or indirectly, by altering plant species composition or causing bluff erosion.

* Restoration and management of the Conservation Easement area will buffer and expand habitat protected within the FMR and enhance habitat condition within the CTP community atop Vallemar Bluffs: Protecting the 0.874 acres of CTP will more than triple the current 0.427-acre area of CTP protected in the FMR portion of the Study Area. Restoration of 0.56 acres within the Easement area, by restoring planted/ornamental areas to prairie and reducing the dominance of exotic plant species such as ice plant, will promote the diversity and abundance of native plants within the Project site. Increasing their populations can enhance those within protected habitat in the FMR, which is also expected to benefit from active management and monitoring of the 0.92-acre Easement area pursuant to a habitat management plan (as cited above) which will address exotic plants and prevent recreation that is not compatible with the CTP and the rare plants that it supports. Aside from protection fencing to be in place during all grading and construction activities, a permanent, non-solid fence (i.e., wire or split rail; not to exceed three feet in height) will be placed around the full perimeter of the Easement area, including the Easement's eastern boundary adjacent to the four home sites (allowing for their respective access into the Easement area).

As a result of the 2018 Survey data and recommendations, the project impact to sensitive and special status plant species located on and adjacent to the Project site will be reduced to less than significant with the following mitigation measures:

Mitigation Measure 4: The "Conservation and Open Space Easement Declaration" (Easement), together with the final Habitat Management Plan and associated "Vallemar Bluffs Declaration of Covenants, Conditions and Restrictions" (CC&Rs), shall be submitted for final review by the Community Development Director and, upon approval, recorded with the Final Lot Line Adjustment/Parcel Map associated with the Project. The Easement shall be conveyed from the Project owner to the Golden State Land Conservancy, to be operated, managed and maintained by the Vallemar Bluffs Maintenance Association (Association); (comprised of the future property owners of the four lots), pursuant to the provisions of the CC&Rs. Funding needs for long-term management of the Easement area will be calculated using a Property Analysis Record (PAR) or PAR-like analysis, and the funding will be provided on an annual basis through fees assessed by the Vallemar Bluffs Homeowners Association.

Mitigation Measure 5: Prior to the final building inspection approval of all four residences, a permanent fence – not to exceed three (3) feet in height and of a construction and non-solid design (i.e. wood split-rail) as approved by the Community Development Director – shall be placed along all the boundaries of the Easement area, to include respective access points on its eastern boundaries adjacent to the west-facing building site areas for each of the four lots. The purpose of this fencing – together with the specific use constraints to be included in the Easement language and CC&Rs – will be to not only prevent the public from accessing the Easement area, but to clearly demarcate all

boundaries for both the public and the residences of the four new homes. Such fencing shall include the installation of signs (not to exceed 3 feet in height) that provide information about the conservation area including the rationale for its protection and to promote compliance with access restrictions.

Mitigation Measure 6: Include in the CC&Rs for the parcels as well as in the Conservation Easement, prohibitions against access to the Easement area that are not compatible with conservation, restoration, and management of its natural community structure and species composition in the coastal terrace prairie and populations of rare native plants. Examples of prohibited activities include: installation of permanent or semi-permanent infrastructure or equipment such as outdoor furniture (e.g., patio furniture, picnic tables, umbrellas), play equipment (trampolines, play structures, etc.) or other items that intensify use or otherwise modify the structure and species composition of the grassland.

Mitigation Measure 7: Work with the County of San Mateo, to coordinate on management of the bluff trail, whose northerly portion is largely within the Fitzgerald Marine Reserve (nearest to the surveyed CYL population) but primarily is located within the easterly half of The Strand (adjacent to the Easement's western boundary), and that provides public access along the bluff edge. Ensure that the recreational use along the entire length of bluff trail at the Project site is managed to be compatible with the restoration and management of the coastal terrace prairie and rare plants in the conservation area. Monitor the effects of access and compliance with the measures to prevent trampling associated with recreational use and taking steps to increase compliance when/if negative impacts are observed.

Mitigation Measure 8: The respective building plans for each of the four residences shall include a landscape plan that identifies tree removal, new trees, shrubs and other landscaping, and (if applicable) irrigation. Landscaping shall be with plant species native to the San Mateo Coast, to limit the potential for the spread of non-native species into the adjacent habitat, and limit the need for irrigation and pesticide use, which could influence nearby natural communities, upon recommendation and review by the applicant's biologist. (This mitigation measure is also referenced and required as part of the "Conservation and Open Space Easement" (Easement), and associated "Draft Covenants, Conditions and Restrictions" (CC&Rs), pursuant to the goals and objectives cited in the "Valleamar Bluffs Conservation and Development Project Management Planning Framework" (to be revised into the final "Habitat Management Plan").

Mitigation Measure 9: Prior to the issuance of any respective building permit for the four residences, the applicant shall submit to the Planning Department for review and approval an erosion control plan (to be included in each respective set of building plans for the four residences) that shows how the transport and discharge of soil and pollutants from and within the project site shall be minimized on each respective lot, as tailored to the approved development on that lot. The plan shall generally follow the Erosion Control Plan as included and shown on Page C6.0, C7.0 of the Project Plans, and shall be designed to minimize potential sources of sediment, control the amount of runoff and its ability to carry sediment by diverting incoming flows and impeding internally generated flows, and retain sediment that is picked up on the project site through the use of sediment-capturing devices. The plan shall minimize impacts from stormwater and urban runoff on the biological integrity of the natural drainage systems leading to and within the adjacent Fitzgerald Marine Reserve. The plan shall also limit application, generation and migration of toxic substances, ensure the proper storage and disposal of toxic materials, and apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters. Such measures shall be confirmed to have been implemented (by a qualified contractor and under the supervision of the project's civil engineer) prior to the issuance of the respective building permits for the four residences, to the satisfaction of the Planning and Building Department. The County will monitor compliance of this mitigation measure by conducting weekly construction inspections during the rainy season (October 1 through May 1) for the period covering all land disturbance activities, as

required by the State Water Board's Special Protections. Such measures shall be kept in place for each of the lots through the duration of the construction activities on that lot, up to the final inspection approval of the respective building permit for development on that lot. Said plan shall adhere to the San Mateo Countywide Stormwater Pollution Prevention Program "General Construction and Site Supervision Guidelines," including:

- a. Sequence construction to install sediment-capturing devices first, followed by runoff control measures and runoff conveyances. No construction activities shall begin until after all proposed measures are in place.
- b. Minimize the area of bare soil exposed at one time (phased grading).
- c. Clear only areas essential for construction.
- d. Within five (5) days of clearing or inactivity in construction, stabilize bare soils through either non-vegetative best management practices (BMPs), such as mulching, or vegetative erosion control methods, such as seeding. Vegetative erosion control shall be established within two (2) weeks of seeding/planting.
- e. Construction entrances shall be stabilized immediately after grading and frequently maintained to prevent erosion and control dust.
- f. Control wind-born dust through the installation of wind barriers such as hay bales and/or sprinkling.
- g. Soil and/or other construction-related material stockpiled on-site shall be placed a minimum of 200 feet from all wetlands and drain courses. Stockpiled soils shall be covered with tarps at all times of the year.
- h. Intercept runoff above disturbed slopes and convey it to a permanent channel or storm drains by using earth dikes, perimeter dikes or swales, or diversions. Use check dams where appropriate.
- i. Provide protection for runoff conveyance outlets by reducing flow velocity and dissipating flow energy.
- j. Use silt fence and/or vegetated filter strips to trap sediment contained in sheet flow. The maximum drainage area to the fence should be 0.5-acre or less per 100 feet of fence. Silt fences shall be inspected regularly and sediment removed when it reaches 1/3 the fence height. Vegetated filter strips should have relatively flat slopes and be vegetated with erosion resistant species.

Mitigation Measure 10: Prior to commencement of any project-related site disturbance, grading/clearing, tree removal/trimming or construction activities, and in conjunction with an approved Erosion Control Plan, the applicant shall place adequate temporary construction fencing along all boundaries of the proposed Conservation Easement and surrounding all limits of the four building sites. No such activity shall extend beyond that fenced perimeter. All environmentally sensitive areas shall be clearly flagged. Additional measures shall also be included in the plan narrative and implemented as follows:

- a. Entrance and exit from the construction site by construction equipment and other vehicles shall occur from Vallemar Street, and the point of access shall be clearly identified.
- b. An excavator with a swivel bucket shall be used during construction. The excavator will have "street" tracks to minimize site disturbance.
- c. Construction lay down areas shall be located on the building envelopes not under active construction or within other portions of the construction footprint.
- d. Spoil material that will be hauled away may first be stored either on the building envelopes not

in active construction or on the paved parking area on Vallemar Street, subject to an encroachment permit from San Mateo County Public Works.

- e. A biological monitor will be present during ground disturbing activities to ensure that encroachment into the flagged environmentally sensitive areas does not occur. The biological monitor will have the authority to stop work in the event construction activities are encroaching into environmentally sensitive areas.

Mitigation Measure 11: The erosion control plan for the project shall include the following best management practices (BMPs) and shall be implemented and maintained (under the supervision of the project civil engineer) as described:

- a. Control and prevent the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, washwater or sediments, rinse water from architectural copper, and non-stormwater discharges to storm drains and watercourses.
- b. Store, handle, and dispose of construction materials/wastes properly to prevent contact with storm water.
- c. Do not clean, fuel, or maintain vehicles on-site, except in a designated area where wash water is contained and treated.
- d. Train and provide instruction to all employees/subcontractors RE: construction BMPs.
- e. Protect all storm drain inlets in vicinity of site using sediment controls such as berms, fiber rolls, or filters.
- f. Limit construction access routes and stabilize designated access points.
- g. Perform clearing and earthmoving activities only during dry weather.
- h. Use sediment controls or filtration to remove sediment when dewatering and obtain all necessary permits.
- i. Trap sediment on site, using BMPs such as sediment basins or traps, earthen dikes or berms, silt fences, check dams, soil blankets or mats, covers for soil stockpiles, etc.
- j. Divert on-site runoff around exposed areas; divert off-site runoff around the site (e.g. swells and dikes).
- k. Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.
- l. No land clearing operations where grading operations may take place between October 15 and April 15 unless a separate winter erosion control plan is approved prior to beginning such construction.
- m. Erosion is to be controlled at all times. The specific measures shown are to be implemented at all times. Additional measures will be required for construction between October 15 and April 15.

Mitigation Measure 12: Site all construction materials and staging areas in converted (i.e., paved), ruderal, or planted, areas within the portion of the property proposed for development, to avoid impacts to special-status communities and species.

Mitigation Measure 13: Implement measures to prevent indirect effects of the development project on the adjacent coastal terrace prairie community and rare species during construction, including:

- a. Fence the project disturbance envelop during construction using ESA fencing to clearly delimit the area of work;
- b. Erect signs on the fences and in other areas to prevent workers from entering them during

construction;

- c. Conduct worker awareness training to educate construction personnel about the sensitive communities and special-status species, as well as the measures that must be implemented to protect them;
- d. Prevent erosion and manage drainage during construction to prevent concentrated runoff and sediment deposition in the coastal terrace prairie, including by installing, silt fences where needed;
- e. Monitor compliance with the protection measures during construction, to ensure that fences and signage remain in places, and that the areas outside of the disturbance envelope are not disturbed or otherwise utilized during construction;
- f. Monitor the site throughout construction period (and in perpetuity, per Mitigation Measure 5 below) and using early-detection/rapid response to eradicate any new occurrences of exotic plant species.

Mitigation Measure 14: Prior to disturbance within any portion of the project area that supports coastal terrace prairie dominated or co-dominated by native plants (2018 McGraw Survey; Figure 6), including the stormwater infiltration spreader areas and limits of grading, salvage the sod, topsoil, seed, and individual native plants, where appropriate and feasible. Use the salvaged material to restore areas of temporary disturbance; if the salvaged area is to be permanently impacted, use the material to restore other highly degraded habitat on site (e.g., ice plant mats) where appropriate.

Mitigation Measure 15: Minimize the potential for indirect impacts to coastal terrace prairie and rare plant species that could result from landscaping, by:

- a. Avoiding landscaping elements that could degrade adjacent habitat, including pesticides, herbicides, fertilizers, and irrigation beyond that required to establish plantings; and
- b. Installing plants native to the coastal terrace prairie, coastal strand, and coastal scrub communities in San Mateo County. For plant species found in the native communities in the study area, use container stock from local (coastal San Mateo County) sources to avoid disrupting locally adapted genetic complexes (i.e., causing genetic erosion or outbreeding depression) within the adjacent remaining habitat on-site and in the adjacent FMR.

Mitigation Measure 16: Compensate for the impacts of the project on coastal terrace prairie by implementing the following measures:

- a. Permanently protect 0.92 acres of coastal terrace prairie, through dedication of a perpetual conservation easement (as required in Mitigation Measure 4) to a tax-exempt nonprofit organization qualified under Section 501(c)(3) of the Internal Revenue Code and qualified to do business in California that has as its primary purpose the preservation, protection, or enhancement of land in its natural, scenic, historical, agricultural, forested, or open-space condition or use.
- b. Restore an estimated 0.71 acres within the conservation easement area that feature planted/ornamental species (i.e., Monterey cypress), are dominated by exotic plant species, and/or have been previously disturbed and feature unnatural topography or materials (e.g., wood chips). Table 9 and Figure 8 (2018 McGraw Survey) illustrate the acreages and approximate locations of restoration treatment areas. The restoration should follow a specific restoration plan that addresses the anthropogenic factors that have degrade native plant community structure and species composition. The restoration plan will also describe how the areas in the conservation easement area that were graded and installed with spreaders will be restored. It will critically evaluate and use, where appropriate, the following approaches:
 - i. Removing the planted/ornamental plant species and ice plant mats;

- ii. Removing wood chips, base rock, or other non-native material covering the soil;
 - iii. Recreating the natural topography in areas where mounds or swales were created through prior excavation;
 - iv. Controlling other invasive plants (e.g., Italian rye grass and prickly sow thistle) that outcompete native plant species;
 - v. Managing the abundance of disturbance-adapted native plants such as coastal tarweed, where they are dominant (e.g., in the southeastern corner of the property) to promote the establishment and growth of a broader diversity of native grasses and forbs;
 - vi. Establishing native plants in areas previously used as trails to access the bluff trail;
 - vii. Salvaging seed and topsoil from coastal terrace prairie and areas supporting harlequin lotus prior to any ground-disturbing activities and using the material in on-site restoration, where appropriate; and
 - viii. Increasing the cover and diversity of native coastal terrace prairie plant species by sowing native plant seed (or spreading topsoil, where available) into restoration areas.
- c. Manage and monitor, in perpetuity, the entire 0.92-acre conservation area to address anthropogenic factors that degrade native plant community structure and species composition. Management elements should be identified in a management plan developed for the conservation area based on the site conditions and the literature documenting relevant conservation and management strategies, which are anticipated to include the following:
- i. Controlling exotic plants, and preventing the invasion and spread of new exotic plant species;
 - ii. Managing recreation and access on and adjacent to the conservation area, including by:
 - (1) Installing fencing and signage to deter public access within the conservation area;
 - (2) Recording in the CC&Rs for the site and in the conservation easement, prohibitions against recreational use and access that are not compatible with conservation and management natural community structure and species composition in the coastal terrace prairie and populations of rare native plants. Installation of permanent or semi-permanent infrastructure and play equipment such as law chairs, umbrellas, trampolines, or any other items that intensify use in one area should be prohibited;
 - (3) Siting, constructing, and managing any public trails that are all or partially within the conservation area so that the recreational use is compatible with the protection of coastal terrace prairie and adjacent coastal bluff habitat;
 - (4) Monitoring compliance with the measures to prevent trampling associated with recreational use and taking steps to increase compliance when/if negative impacts are observed.
 - iii. Monitoring natural community structure and species composition and rare plant populations within coastal terrace prairie, to gauge the effectiveness of management and inform adjustments as part of the adaptive management framework.

Mitigation Measure 17: The erosion control plan for the project shall include the following best management practices (BMPs) and shall be implemented and maintained (under the supervision of the project civil engineer) as described:

- a. Control and prevent the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, washwater or sediments, rinse water from architectural copper, and non-stormwater discharges to storm drains and watercourses.

- b. Store, handle, and dispose of construction materials/wastes properly to prevent contact with stormwater.
- c. Do not clean, fuel, or maintain vehicles on-site, except in a designated area where wash water is contained and treated.
- d. Train and provide instruction to all employees/subcontractors regarding construction BMPs.
- e. Protect all storm drain inlets in vicinity of site using sediment controls such as berms, fiber rolls, or filters.
- f. Limit construction access routes and stabilize designated access points.
- g. Perform clearing and earthmoving activities only during dry weather.
- h. Use sediment controls or filtration to remove sediment when dewatering and obtain all necessary permits.
- i. Trap sediment on site, using BMPs such as sediment basins or traps, earthen dikes or berms, silt fences, check dams, soil blankets or mats, covers for soil stockpiles, etc.
- j. Divert on-site runoff around exposed areas; divert off-site runoff around the site (e.g. swells and dikes).
- k. Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.
- l. No land clearing operations where grading operations may take place between October 15 and April 15 unless a separate winter erosion control plan is approved prior to beginning such construction.
- m. Erosion is to be controlled at all times. The specific measures shown are to be implemented at all times. Additional measures will be required for construction between October 15 and April 15.

Mitigation Measure 18: The applicant shall implement the drainage improvement recommendations of the Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report to limit impacts to the Coastal Terrace Prairie grass, erosive bluff edge, and the near-shore marine environment (within the Fitzgerald Marine Reserve adjacent and just west of the project site, including the surveyed area of the endangered coast yellow leptosiphon on the coastal bluff promontory just west of the project site's westernmost property line) utilizing (within the Easement Area as shown) infiltration trenches with overflow spreaders on each lot to disperse the runoff over wide areas and maintain existing hydrology and soil moisture on the site, and using pervious pavers and detention areas to control peak runoff. The respective building permits for each of the four residences shall include a drainage plan that incorporates and implements all drainage measures cited in the report by Mesiti-Miller Engineering, Inc. The project shall minimize alteration of the site's hydrology, including by using permeable pavers (in all driveways, walkways and patio areas) to increase infiltration of rainfall, and installing overflow spreaders in trenches to diffuse runoff.

Source: Project Plans; California Natural Diversity Database; 2015 Zander Associates Biological Report; Amended Zander Report (dated June 6, 2017); Biological Survey Report, Jodi McGraw Consulting (August 2018); California Department of Fish and Wildlife Letter (dated June 6, 2017); 2002 Fitzgerald Marine Reserve Master Plan; Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report; County Drainage Policy

4.b.	Have a significant 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 Wildlife or U.S. Fish and Wildlife Service?		X		
Discussion: While the 2018 McGraw Survey found no riparian habitat on the Project site, discussion regarding other sensitive natural communities was provided to Question 4.a., with cited mitigation measures to ensure that the project impact is the cited sensitive natural communities is less than significant. Source: Same as cited in Question 4.a					
4.c.	Have a significant 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?				X
Discussion: The 2018 McGraw Survey found no wetlands on the Project site, as defined either by Section 404 or in the County Local Coastal Program. As a result, the Project poses no impact. Source: Project Plans, California Natural Diversity Database; Biological Survey Report, Jodi McGraw Consulting (August 2018)					
4.d.	Interfere significantly with the movement of any native resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		
Discussion: The project site does not include any creeks or water ways, nor does it fall within any established native resident or migratory wildlife corridors or include any native wildlife nursery. However, the project site contains a significant grove of Monterey cypress trees (albeit not a native tree species to this area), which may host some species of nesting birds. Given that the site is located adjacent to and just east of the Fitzgerald Marine Reserve (discussed in greater detail in Question 4.f. below), the 2002 Fitzgerald Marine Reserve Master Plan includes discussion regarding the Monterey cypress groves located in the Reserve's northerly areas, specifically that the upper canopy layer of these trees can provide night roost and foraging roost for ravens and American crows, hawks and possibly owls. While the Monterey cypress grove on the project site is more dense and closer to the ground than those groves cited in the Plan, it's to be expected that the project sites Monterey cypress grove may be host to the same bird species for the same purposes. Since the project includes the removal and trimming of many of these trees (as well as noise and other construction impacts), the following mitigation measure will ensure that the impact is less than significant. Mitigation Measure 19: Prior to any ground disturbing activities, including vegetation/tree removal or tree trimming, that would occur during the nesting/breeding season of native bird species					

potentially nesting/roosting on the site (typically February 1 through August 31 in the project region), a survey for nesting birds shall be conducted by a qualified biologist experienced with the nesting behavior of bird species of the region. The intent of the survey would be to determine if active nests of special-status bird species or other species protected by the Migratory Bird Treaty Act and/or the California Fish and Wildlife Code are present in the construction zone or within 500 feet of the construction zone. The surveys shall be timed such that the last survey is concluded no more than 2 weeks prior to initiation of construction or tree removal work. If ground disturbance activities are delayed, then an additional pre-construction survey shall be conducted such that no more than 2 weeks will have elapsed between the last survey and the commencement of ground disturbance activities.

If active nests are found in areas that could be directly affected or subject to prolonged construction-related noise, a no-disturbance buffer zone shall be created around active nests during the breeding season or until a qualified biologist determines that all young have fledged. The size of the buffer zones and types of construction activities restricted within them will be determined through consultation with the California Department of Fish and Wildlife (CDFW), taking into account factors such as the following:

- a. Noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity;
- b. Distance and amount of vegetation or other screening between the construction site and the nest; and
- c. Sensitivity of individual nesting species and behaviors of the nesting birds.

Limits of construction to avoid an active nest shall be established in the field with flagging, fencing, or other appropriate barriers and construction personnel shall be instructed on the sensitivity of nest areas. A qualified biologist shall serve as a construction monitor during those periods when construction activities would occur near active nest areas of special-status bird species and all birds covered by the Migratory Bird Act to ensure that no impacts on these nests occur.

Source: Project Plans, Zander Biological Report (2015); 2002 Fitzgerald Marine Reserve Master Plan

4.e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (including the County Heritage and Significant Tree Ordinances)?		X		
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Discussion: As acknowledged in discussion to Question 4.a., the project site is host to a significant grove of Monterey cypress trees, many of which qualify as significant size (12" diameter or greater) trees as defined in the County Significant Tree Regulations (Section 12,012). The submitted Tree Assessment report (by Hort Science, dated May 2015; Attachments E. and U.) reviewed all trees greater than 12" in diameter, with an evaluation as to health specifically of 44 trees (41 Monterey cypress, 3 Monterey pines, neither of which are native to San Mateo County). To accommodate the proposed four residences, a total of 31 significant sized trees are to be removed due to conflict with associated building footprints, garage and driveways (leading to Vallemar), and associated grading. Of those trees, most were rated in poor condition (due to poor structure and where they'd be expected to decline regardless of management). However, 14 trees are proposed for protection and preservation. Additionally, 75 new trees will be planted, including 20 (24" box size) Monterey cypress trees and 55 other (24" box) trees. The loss of the trees due to project development is not considered a significant impact with the following mitigation measures that will ensure replanting of the additional trees (as cited) and preservation of remaining trees. Additionally, the following

mitigation measure will ensure that the impact to such resources is less than significant.

Mitigation Measure 20: The new trees indicated on the applicant's Tree Replacement Plan and Tree and Shrub Replanting Plan (found in the Project Plans) shall be planted prior to Planning final approval of the respective building permits for the four residences. Tree removal (identified by tree numbers), new trees and shrubs, additional landscaping, and tree preservation shall be shown on the submitted building plans for each of the four respective residences. The landscaping plan (for tree replacement and all other proposed landscaping) shall include plants that are pest- and/or disease-resistant, drought-tolerant, and attractive to beneficial insects. Upon implementation of the plan (for each of the four residences), the use of quick-release fertilizers shall be minimized. The associated irrigation system shall be designed to efficiently distribute water and minimize runoff. The planting of all new trees shall occur pursuant to the standards for such planting (depth of holes dug, fertilizing at planting and watering for respective tree types) and under the observation of a qualified, licensed arborist. The arborist shall confirm (via letter and/or email) that this has occurred for all trees prior to final inspection approval of the respective building permits for the four residences, to the satisfaction of the Community Development Director.

Mitigation Measure 21: Any plan modifications to the subsequent development on the four lots (assuming they are deemed "minor" by the Community Development Director) that occur post issuance of any of the respective building permits for the four residences shall be reviewed by the arborist to assess any potential impacts to existing trees, trees that are being preserved, and/or new trees to be planted affecting trees should be reviewed by the project consulting arborist (arborist) with regard to tree Impacts.

Mitigation Measure 22: The submitted building plans for each of the four respective residences shall demarcate a Tree Protection Zone, to be established for all trees to be preserved, in which no disturbance is permitted. These plans shall indicate the method and measures of such protection (i.e., 6-foot high fencing placed at the trees' dripline) pursuant to the design and confirmed observation by the arborist. All such tree protection measures shall be reviewed and approved by the Community Development Director prior to issuance of the respective building permits for the four residences. No grading, excavation, construction or storage of materials, equipment, spoils, waste or wash-out water may be deposited, stored, or parked within the Tree Protection Zone. All underground services, including utilities, sub-drains (and other drainage features), irrigation lines, water and sewer laterals, shall be routed around the Tree Protection Zone. All tree protection measures shall be confirmed by the County to have been implemented prior to the issuance of any of the respective building permits for the four residences. All tree protection measures shall remain until all construction on each respective lot is completed.

Mitigation Measure 23: Any herbicides placed under paving materials must be safe for use around trees (as determined and confirmed by the arborist) and labeled for that use.

Mitigation Measure 24: All tree pruning shall be done by skilled tree or landscape contractors pursuant to the specific standards (adhering to the latest edition for Best Management Practices – and Tree Pruning as published by the International Society of Arboriculture), directions and under the supervision of the arborist.

Mitigation Measure 25: Prior to the initiation of any site disturbance activities (prior to issuance of the building permits), the project contractors working in the vicinity of trees to be preserved shall meet with the arborist at the site to review all work procedures, access routes, storage areas and tree protection measures.

Mitigation Measure 26: Upon issuance of the building permits, any excavation within the dripline or other work that is expected to encounter tree roots should be approved and monitored by the arborist. Any roots requiring cutting (including the type of backfill soil, compaction, fertilizing and watering) shall be the standards and under the supervision of the arborist to ensure that such root

cutting does not damage the long term health of the tree.

Mitigation Measure 27: Should any tree or its roots be damaged during construction, it should be evaluated as soon as possible by the arborist so that appropriate treatments can be applied.

Mitigation Measure 28: Any additional or unanticipated tree pruning needed for clearance during construction shall be performed to the standards and under the supervision by the arborist.

Source: Project Plans; Project (2015) Tree Assessment Report

4.f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, other approved local, regional, or State habitat conservation plan?		X		
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Discussion: The project site is adjacent to and west of the Fitzgerald Marine Reserve (FMR), a 402-acre natural resource area extending along San Mateo County's north coast, from just above the project site running south to Pillar Point Marsh (just east of the Princeton area), and extending 1,000 feet west into the ocean from the mean high tide line. Part of the Monterey Bay National Marine Sanctuary, the Reserve includes 370 acres of intertidal and subtidal marine habitat below the high tide line and 32 acres of upland coastal bluffs. The Reserve is under joint custodianship of the County Parks Department and the California Department of Fish and Wildlife, and is operated pursuant to the policies and guidelines of the 2002 Fitzgerald Marine Reserve Master Plan. The Reserve is both a "Marine Life Refuge" and an "Area of Biological Significance (ASBS)", designated by the State of California.

The FMR boundary extends up to and includes the bluff top trail cited previously (the project sites' westernmost boundary is adjacent to the County owned Reserve boundary). The project's proposed Open Space and Conservation Easement is located between the project site's western property boundary (near the bluff top trail) and the west-facing fronts of the four residences (ranging is distance of approximately 97 to 173 feet). With the purpose of the easement being to: (1) prohibit project disturbance and residential use, (2) preserve the coastal prairie grass and other biotic species, and (3) to set back the four houses from the trail to reduce visual impacts, the project will not be encumbered by the FMR. However, it is understood that during construction of the four residences (which includes grading activities, construction vehicles, equipment and associated personnel), there could be adverse impact to the FMR area if adequate construction barriers and erosion measures are not implemented. Also, once all such construction is completed, the project shall include a permanent fence (as discussed in Question 4.a) to be erected to limit and reduce the impact to the area protected by the Easement from both those living in the four residences as well as those walking along the bluff top trail.

An additional potential impact to the FMR would be stormwater runoff and erosion during: (1) all site disturbance and construction activities, and (2) post-construction, permanent drainage runoff not properly mitigated such that all such runoff is contained on each of the respective lots and none drains towards or onto the FMR area. Besides the previously cited mitigation measures to ensure erosion control during construction activities, , the submitted Preliminary Storm Drainage Report (dated April 26, 2017), prepared by Mesiti-Miller Engineering, Inc.), proposes a drainage strategy comprised of permanent drainage measures to collect and control all post-construction stormwater flows (cited under Mitigation Measure 10). The report acknowledged that runoff from the project site currently flows over the coastal bluffs to the southwest. An earlier version of the project (comprised of five residences, some of which were located closer to the bluff top with no yet proposed conservation area) presented problems with such drainage measures, with the potential for stormwater runoff and associated development drainage to saturate and possibly further erode the

coastal bluffs. However, with the project as currently proposed, and based on recommendations from the project biologist (Jodi McGraw), the 2017 drainage plan calls for infiltration trenches with overflow spreaders (extending into the Easement area) to disperse the stormwater runoff over wide areas and maintain existing hydrology and soil moisture distribution on the site. This will also help to prevent concentrated runoff from flowing over the bluffs and reduce the potential for soil erosion.

Preliminary hydrologic calculations for the drainage areas for each of the four lots were done for both pre- and post-development conditions. With the mitigation provided, runoff rates will be controlled to pre-development levels per County requirements. The plan included preparation of a detailed hydrologic and hydraulic model to examine proposed drainage conditions and determine the infiltration and detention facility details required to cause no net increase in runoff flow off the site due to the project. Based on those results, the net runoff from the site will decrease with the proposed drainage improvements. The Low Impact Design (LID) objectives of the drainage plan were to slow down and filter stormwater to reduce the impact of development on water resources. LID drainage techniques recommended for the project (as applied to each lot) include the use of pervious pavers for driveways and parking areas, infiltration trenches with overflow spreaders to disperse runoff, and detention facilities, all intended to mitigate runoff from the impervious surfaces (where proposed impervious area for entire 2.48-acre site is reduced to about 10,850 sf (0.25 acres of the total Project site area. The project has been reviewed and preliminarily approved by the Department of Public Works for compliance with all County drainage policies, the County's Municipal Stormwater Regional Permit, and the Ocean Plan regulating drainage within the watershed of the James Fitzgerald Area of Special Biological Significance (ASBS).

The applicable Mitigation Measures cited in Question 4.a. and above will ensure that those impacts are reduced to less than significant.

Source: Project Plans, Final Draft (2002) of Fitzgerald Marine Reserve Master Plan; Mesiti-Miller Engineering, Inc., (April 26, 2017) Preliminary Storm Drainage Report; County Drainage Policy; San Mateo Countywide Stormwater Pollution Prevention Program "General Construction and Site Supervision Guidelines"

4.g. Be located inside or within 200 feet of a marine or wildlife reserve?		X		
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Discussion: As acknowledged in discussion to Question 4.f., the project site is located adjacent to and just east of the Fitzgerald Marine Reserve (FMR). Again, the mitigation measures cited there (from Question 4.a.) will ensure that the project's impact is less than significant.

Source:: Project Plans, Final Draft (2002) of Fitzgerald Marine Reserve Master Plan

4.h. Result in loss of oak woodlands or other non-timber woodlands?				X
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Discussion: The project parcel includes no oak woodlands or other timber woodlands. Thus, the project poses no impact.

Source: Project Plans; 2015 Zander Biological Report

5. CULTURAL RESOURCES. Would the project:				
	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a. Cause a significant adverse change in the significance of a historical resource as defined in CEQA Section 15064.5?				X
Discussion: Neither the project parcel nor the project site hosts any known historical resources, neither by County, State or Federal listings. Thus, the project poses no impact. Source: Project Plans; County General Plan Historical and Archaeological Resources Element; Sonoma State Northwest Information Center				
b. Cause a significant adverse change in the significance of an archaeological resource pursuant to CEQA Section 15064.5?		X		
Discussion: Upon referral and review, the Sonoma State Northwest Information Center responded that while an earlier study had indicated no presence of archaeological resources on the project site, they recommended that care be taken upon all project activity related excavation. Thus, the following mitigation measure is recommended to ensure that the impact is less than significant: Mitigation Measure 29: Prior to building permit issuance for construction of residences on all or any of the respective lots, the applicant shall incorporate, via a note on the first page of the building construction plans, that in the event that archaeological resources are inadvertently discovered during construction, work in the immediate vicinity (within 25 feet) of the find must stop until a qualified archaeologist can evaluate the significance of the find. Construction activities may continue in other areas beyond the 25-foot stop work area. A qualified archaeologist is defined as someone who meets the Secretary of the Interior's Professional Qualifications Standards in archaeology. The Community Development Director shall be notified of such findings, and no additional work shall be done in the stop work area until the archaeologist has recommended appropriate measures, and those measures have been approved by the Current Planning Section and implemented. Disposition of Native American remains shall comply with CEQA Guidelines Section 15064.5(e). Source: County General Plan Historical and Archaeological Resources Element; Sonoma State Northwest Information Center				
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		
Discussion: The project site does not consist of any known paleontological resources, sites or geologic features. Due to earthwork associated with the project, the project may have the potential to impact any unknown paleontological resources. Therefore, the following mitigation measure is recommended to minimize any potential unearthing and impact to any such resources in the project area. Mitigation Measure 30: In the event that paleontological resources are inadvertently discovered during construction, work in the immediate vicinity (within 25 feet) of the find must stop until a qualified paleontologist can evaluate the significance of the find. The Community Development				

Director shall be notified of such findings, and no additional work shall be done in the stop work area until the paleontologist has recommended appropriate measures, and those measures have been approved by the Current Planning Section and implemented.

Source: County General Plan Historical and Archaeological Resources Element; Sonoma State Northwest Information Center

d. Disturb any human remains, including those interred outside of formal cemeteries?		X		
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Discussion: The project site does not contain any known human remains, including those interred outside of formal cemeteries. However, there is a possibility for the discovery of human remains during project-related ground disturbance and/or construction activities. Therefore, the following mitigation measure is recommended to ensure the project impact is less than significant:

Mitigation Measure 31: Should any human remains be discovered during construction, all ground disturbing work shall cease and the County Coroner be immediately notified, pursuant to Section 7050.5 of the State of California Health and Safety Code. Work must stop until the County Coroner can make a determination of origin and disposition of the remains pursuant to California Public Resources Code Section 5097.98. If the County Coroner determines the remains to be Native American, the Native American Heritage Commission shall be contacted within 24 hours. A qualified archaeologist, in consultation with the Native American Heritage Commission, shall recommend subsequent measures for disposition of the remains.

Source: County General Plan Historical and Archaeological Resources Element; Sonoma State Northwest Information Center

6. GEOLOGY AND SOILS. Would the project:

	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a. Expose people or structures to potential significant adverse effects, including the risk of loss, injury, or death involving the following, or create a situation that results in:				
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 significant evidence of a known fault? <i>Note: Refer to Division of Mines and Geology Special Publication 42 and the County Geotechnical Hazards Synthesis Map.</i>		X		

Discussion: The project site is located approximately 6.75 miles due east of the San Andreas Fault, about 4.5 miles east of the Pilarcitos Fault, and generally surrounded (but not including) fault

lines from the Seal Cover Fault system (which reaches from the northerly part of coastline in Montara south to the Princeton Harbor. The project's submitted Geotechnical Investigation (August 2016, by Haro, Kasunich and Associates, Inc. (HKA)). While the report investigation found no on-site fault traces from any of the cited fault zones, the report acknowledged that the primary geotechnical considerations at the project site would include strong seismic shaking, the need for adequate foundation support of the proposed four residences, temporary cut slopes during construction, the presence of expansion clay soil in the foundation zones, subsurface seepage, coastal bluff erosion, and the need to control concentrated surface runoff (during and after construction activities).

With a change of County Geotechnical staff since this project was initially reviewed, the current County Geotechnical Engineer (GE) reviewed the report and plans submitted by HKA in February 2018. In response to the County GE's comments, HKA submitted a "Geotechnical and Geologic Response to Project Comments" (dated April 18, 2018). From that document, the County GE continued to discuss issues and review data with HKA's representative engineer, which resulted in HKA's final "Geotechnical Investigation Update (dated June 13, 2018; Attachment R.1). To the satisfaction of the County GE (particularly with regard to potential geologic hazards contributed to by liquefaction and slope stability affecting Lot 4), this updated report adequately responded to and offered acceptable mitigations to ensure that future development of all lots at this site - and specifically of Lot 4 - comply with applicable engineering standards pursuant to County geotechnical comments and requirements. Therefore, based on the proximity of the subject site to nearby faults, the planned improvements are anticipated to experience strong seismic ground shaking in an earthquake, the following mitigation measure is recommended to ensure that the level of risk is not beyond what is considered ordinary, and that such impacts are less than significant:

Mitigation Measure 32: The project design for the development of each of the four lots (at the time of the submitted respective building permits), shall each include lot-specific geotechnical reports and shall carefully follow the geotechnical recommendations presented in the subject Haro, Kasunich and Associates (HKA) geotechnical report (pages 25 through 46, except where such recommendations affect Lot 4), covering the following categories: General Site Grading (including Cut and Fill Slopes); Foundations (including Conventional Spread and Skin Friction Pier Foundations); Perched Groundwater Drainage (including Concrete Slab-On-Ground); Retaining Walls (including Lateral Pressures and use of Tie-Backs); Utility Trenches; Surface Drainage (including use of Curtain Drains); Pavement Design; and Plan Review, Construction Observation and Testing. Additionally, and more specifically, the project design for the development on Lot 4 shall carefully follow the recommendations presented in the HKA Geotechnical Investigation Update, dated June 13, 2018. Specifically, the proposed residence and other structures on Lot 4 are recommended to be supported by shallow stiffened grid foundations or structural mat foundations, either of which is capable of withstanding the estimated liquefaction induced vertical ground settlement (from an earthquake) and capable of being re-leveled after such an event. Shallow stiffened foundations are recommended by geotechnical consultants for single-family dwelling construction on sites with potentially liquefiable soils as an alternative to ground improvements (i.e., stone columns, compaction grouting) or deep driven piles, either of which would have a much higher environmental impact to the site. Any such changes to the recommendations by the project geotechnical engineer presented in this report shall be pursuant to the review and approval of the County's geotechnical engineer.

Source: San Mateo County (1973) Geotechnical Synthesis Maps; Geotechnical Investigation Report (dated August 2016) by Haro, Kasunich and Associates, Inc.; Geotechnical Investigation Update by HKA (dated June 13, 2018)

ii. Strong seismic ground shaking?		X		
Discussion: While the discussion to Question 6.i. acknowledges that strong seismic ground shaking could occur, the mitigation measure previously cited will ensure that the impact is less than significant. Source: Geotechnical Investigation Report (August 2016) by Haro, Kasunich and Associates, Inc.; Geotechnical Investigation Update by HKA (dated June 13, 2018)				
iii. Seismic-related ground failure, including liquefaction and differential settling?		X		
Discussion: While the project geotechnical report concludes that the project parcel is not located in an area with known liquefaction potential, the mitigation measure cited in Question 6.i. and its associated mitigation measure will ensure that the impact to less than significant landslides. Source: Geotechnical Investigation Report (August 2016) by Haro, Kasunich and Associates, Inc.				
iv. Landslides?			X	
Discussion: The project geotechnical report concludes that the project parcel is not located in an area of known landslides. Therefore, the project impact would be less than significant. Source: San Mateo County (1972) Landslide Susceptibility (MF-360) Map; Geotechnical Investigation Report (August 2016) by Haro, Kasunich and Associates, Inc.; Geotechnical Investigation Update by HKA (dated June 13, 2018)				
v. Coastal cliff/bluff instability or erosion? <i>Note: This question is looking at instability under current conditions. Future, potential instability is looked at in Section 7 (Climate Change).</i>		X		
Discussion: The westerly boundaries of the project site is located adjacent to coastal cliffs/bluffs, at distances ranging from as far away as 40 feet to as close as 10 feet. As stated earlier, the County Fitzgerald Marine Reserve includes the lands from the proposed lots' westerly boundaries to and including the bluff tops (and continuing down to the beach and outward). While the project's initial (September 2015) submittal located two of five proposed residences within 30 and 20 feet, respectively, from the project site's westerly boundary, the current project places the proposed residence on the southernmost Lot 4 approximately 198 to 240 feet back from the coastal bluff edge. The coastal bluffs of the project site's southern half are identified as "low" stability in both the San Mateo County LCP Hazards Map and the County Geotechnical Hazards Map. LCP Policy 9.8 requires adequate setbacks to assure stability and structural integrity of development for a minimum 50-year life. While the initial 2016 HKA Report estimated bluff retreat at 28 feet over the next 50 years, the Committee for Green Foothills had commissioned Environmental Science Associates (ESA) of San Francisco (acknowledged as experts in coastal erosion processes and consistent with California Coastal Commission guidance on this issue, and as exacerbated by rising sea level estimates), to do an independent evaluation of the projected bluff retreat in the area of then-proposed Lot D (the southernmost lot to have been developed with a house). That report concluded the proposed house on Lot D would be subject to hazards from bluff/cliff retreat, citing the existence of several year-round seeps or springs on the bluff face below that lot. Any increase in subsurface drainage or surface runoff as proposed, into the drainage ditch along Julianna, would likely contribute to accelerated erosion, which would be in violation of LCP Hazards Policies 9.8.b. (6) and				

(8), as well as other adopted stormwater regulations.

As a result of this information, as well as other issues of the initially submitted project, the project was significantly revised, reducing the number of proposed lots to four, with all four residences moved to the easterly half of the project site, all taking access off Vallemar. Together with the previously cited and discussed proposed Conservation Easement to be located between the four house sites and the respective westerly lot boundaries (and coastal bluff tops beyond), the development was generally set back far enough to mitigate for the coastal erosion issues cited by ESA.

This project revision, together with proposed on-site drainage measures (discussed in Question 4.a.) and the additional data provided by HKA's June 13, 2018 Geotechnical Investigation Update as accepted by the County's GE, effectively reduces the project's impact to cliff/bluff instability or erosion. Thus the revised plans, together with the applicable Mitigation Measures cited in Question 4.a. will ensure that the project impact is less than significant.

Source: Project Plans; Coastal Bluff Recession Study (dated April 24, 2015) by Haro, Kasunich and Associates, Inc.; Vallemar Bluffs Coastal Hazards Assessment (October 26, 2016) by ESA; Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report; Geotechnical Investigation Update by HKA (dated June 13, 2018)

b. Result in significant soil erosion or the loss of topsoil?		X		
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Discussion: Pursuant to the discussion to Questions 4.a., f. and 6.a. and associated Mitigation Measures, whose purpose will be to control erosion during both project construction activities through to permanent on-site drainage measures to capture and retain/drain stormwater, the project impact will be less than significant.

Source: Project Plans; Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report

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, severe erosion, liquefaction or collapse?		X		
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Discussion: Pursuant to the discussion to Questions 4.a., f. and 6.a., the associated Mitigation Measures will assure that the does not result in an on- or off-site landslide, lateral spreading, subsidence, severe erosion, liquefaction or collapse. Therefore, the mitigation measures will assure that the project impact will be less than significant

Source: Project Plans; Coastal Bluff Recession Study (dated April 24, 2015) by Haro, Kasunich and Associates, Inc.; Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report; Geotechnical Investigation Report (August 2016) by HKA; Geotechnical Investigation Update (dated June 13, 2018)

d. Be located on expansive soil, as noted in the 2010 California Building Code, creating significant risks to life or property?				X
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Discussion: The project geotechnical report, in addition to the June 13, 2018 HKA Geotechnical Investigation Update, concludes that while expansive soils the project parcel is not located on

expansive soils. Thus, the project impact poses no impact. Source: Geotechnical Investigation Report (August 2016) by Haro, Kasunich and Associates, Inc.; Geotechnical Investigation Update by HKA (dated June 13, 2018)				
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X
Discussion: All four residences will have sanitary sewer service connections from the Montara Water and Sanitary District. Thus the project neither requires nor includes any septic tanks or wastewater disposal systems and poses no such impact. Source: Project plans and Location; San Mateo County GIS (Sanitary District Service Area) Resource Data; Montara Water and Sanitary District				

7. CLIMATE CHANGE. Would the project:				
	Potentially Significant Impacts	Significant Unless Mitigated	Less Than Significant Impact	No Impact
a. Generate greenhouse gas (GHG) emissions (including methane), either directly or indirectly, that may have a significant impact on the environment?		X		
Discussion: Greenhouse Gas Emissions (GHG) include hydrocarbon (carbon monoxide; CO₂) air emissions from vehicles and machines that are fueled by gasoline. Project-related grading and construction of the four houses will result in the temporary generation of GHG emissions along travel routes and at the project site. In general, construction involves GHG emissions mainly from exhaust from vehicle trips (e.g., construction vehicles and personal vehicles of construction workers). Even assuming construction vehicles and workers are based in and traveling from urban areas, the potential project GHG emission levels from construction would be less than significant with Mitigation Measure 1 cited in Question 3.b. The project would introduce four new residences to the area. Any increase in GHG emissions associated with new single-family residential use are not expected to be significant as residential use does not generate a high demand for traffic. Furthermore, the project is required to comply with all current California Codes, including California Building Code (as administered, reviewed and enforced through the County Building Inspection Section) and all mandatory requirements under the California Green Building Standards Code. As previously discussed in Question 4.e., a total of 31 significant sized trees are to be removed due to conflict with associated building footprints, garage and driveways, and associated grading for the four residences. Pursuant to the number of trees remaining and to be preserved, as well as an additional 75 trees to be planted, staff concludes that, together with the mitigation measure cited above, the removal of the 31 trees will not release significant amounts of GHG emissions or significantly reduce GHG sequestering in the area, resulting in a less than significant impact.				

Source: San Mateo County (2013) Energy Efficiency Climate Action Plan				
b. Conflict with an applicable plan (including a local climate action plan), policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?		X		
Discussion: To ensure new development projects are compliant with the County's 2013 Energy Efficiency Climate Action Plans (EECAP), the Plan provides the EECAP Development Checklist, which includes both mandatory and voluntary greenhouse gas reduction measures. While the checklist excludes supportive and non-quantifiable measures identified in the EECAP, or measures that are not universally applicable to all projects, the checklist does provide the quantitative criteria as would be applicable to a single project. County staff has the flexibility to determine on a case-by-case basis when projects nonetheless demonstrate consistency with the overall intent of the EECAP. Pursuant to the discussion provided to question 7.a., together with Mitigation Measure 1 and the following mitigation measure, the project impact would be less than significant. Mitigation Measure 33: The applicant's architect shall complete and submit the County 2013 Energy Efficiency Climate Action Plans (EECAP) Development Checklist (Appendix F), and shall incorporate applicable measures and performance criteria into the submitted building plans for each of the four residences. Source: San Mateo County (2013) Energy Efficiency Climate Action Plan				
c. Result in the loss of forest land or conversion of forest land to non-forest use, such that it would release significant amounts of GHG emissions, or significantly reduce GHG sequestering?				X
Discussion: The project parcel is not considered forest land, nor does it host any such forest canopy. Therefore the project poses no impact. Source: Project Plans; San Mateo County GIS Resource Data; County General Plan Maps				
d. Expose new or existing structures and/or infrastructure (e.g., leach fields) to accelerated coastal cliff/bluff erosion due to rising sea levels?				X
Discussion: The discussion in Question 6.a. (v.) acknowledged the project relative to coastal cliff/bluff instability and erosion issues affecting the site. As cited in that discussion, the ESA report included the contributing issues around rising sea levels on the bluffs. Additionally, the County (2013) Energy Efficiency Climate Action Plan dedicates substantive discussion around the issues of rising sea levels. While the project site is located on a plateau, at an elevation ranging from 42 to 48 feet above sea level, projected rising sea levels would be expected to contribute to greater erosion to the non-hardened shoreline cliffs from higher wave activity. With the LCP's requirement that the integrity along coastal bluff sites meet a minimum of 50 years, the EECAP projects rising sea levels to increase (based on estimates from 2050 to 2100) an average of about 27" along the County's coastline. The project as it is currently described has the four residences moved an adequate distance easterly and away from the bluff tops, at distances ranging from approximately 85 to 120 feet. The project includes no leach fields or other new infrastructure within this area.				

Therefore the projected sea rise and associated erosion occurring to the bluff face should not impact the project development in the cited 50 year time frame. That said, applicable Mitigation Measures cited in Question 4.a. will ensure that the project impact is less than significant. Source: San Mateo County (2013) Energy Efficiency Climate Action Plan				
e. Expose people or structures to a significant risk of loss, injury or death involving sea level rise?				X
Discussion: Pursuant to the discussion in Question 7.d., the projected sea rise along this portion of the County coastline will not pose a significant risk the proposed four residences. Therefore, and with the recommended mitigation measures cited in that discussion, the project impact would be less than significant. Source: San Mateo County (2013) Energy Efficiency Climate Action Plan				
f. Place structures within an anticipated 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?			X	
Discussion: The subject parcel is not located in an anticipated 100-year flood hazard area as mapped by FEMA. It is located in a FEMA Flood Zone X, which is considered a minimal flood hazard (Panel No. 06081C0119F, effective October 16, 2012). These areas have a 0.2% annual chance of flooding, with areas of 1% annual chance of flooding with average depths of less than 1-foot. The FEMA flood Designation for the coast itself, just beyond the coastal bluffs, is Flood Zone VE – which covers coastal areas with a 1% or greater chance of flooding and an additional hazard associated with storm waves. These areas have a 26% chance of flooding over the life a 30-year mortgage. Base flood elevations derived from detailed analyses are shown at selected intervals within these zones. However, as disused earlier, the project site is elevated over 40 feet above the mean sea level, with the four residences set back a considerable distance from the bluff edge. Therefore, the project impact would be less than significant. Source: County GIS (FEMA) Resource Data; FEMA (Online) Map Service Center: Flood Zone Designation				
g. Place within an anticipated 100-year flood hazard area structures that would impede or redirect flood flows?				X
Discussion: Pursuant to the discussion provided to Question 7.f., and given the project site topography, drainage patterns and location of the four residences, the project poses no impact. Source: County GIS Resource Data; Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report				

8. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
	Potentially Significant Impacts	Significant Unless Mitigated	Less Than Significant Impact	No Impact
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (e.g., pesticides, herbicides, other toxic substances, or radioactive material)?				X
Discussion: The project does not involve the use, transport, or disposal of hazardous materials. Source: Project Plans				
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?				X
Discussion: Pursuant to the discussion provided to Question 8.a., the project poses no impact. Source: Project Plans				
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
Discussion: The project parcel is not located within any such distance to an existing or proposed school. Pursuant to the discussion provided to Question 8.a., the project poses no impact. Source: Project Plans				
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?				X
Discussion: The project site is not included on a list of hazardous materials compiled pursuant to the cited Government Code Section. Thus, the project poses no impact. Source: Project Plans; San Mateo County (1992) Hazardous Waste Management Plan; California Department of Toxic Substances, Hazardous Waste and Substances Site List, URL (2017)				

e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area?				X
Discussion: The project parcel is located about 2,500 feet (0.47 miles) north of the northerly boundary of the Half Moon Bay Airport, a public airport operated by the County Department of Public Works. Development within certain proximities of the airport are regulated by applicable policies and requirements of the Final Half Moon Bay Airport Land Use Compatibility Plan (ALUCP), as adopted by the City/County Association of Governments (C/CAG) on October 9, 2014. Upon review of the provisions of the ALUCP, the project site is located in the Airport Influence Area (Runway Safety Zone 7), where aircraft accident risk level is considered low according to the ALUCP (per Exhibit 4c). Also, the project site is not within any mapped noise exposure area (per Exhibit 4B). Finally, the heights of the four residences, averaging around 30 feet, are well under the Plan's Airspace Terrain Penetration zone (which dictates height limits for structures, trees and other objects) of 216 feet. Therefore, staff has determined that the project complies with the safety, noise, and height limit criteria for compatibility and the project poses no impact. Source: Project Plans and Location; Final (2014) Half Moon Bay Airport Land Use Compatibility Plan					
f.	For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area?				X
Discussion: Pursuant to the discussion in Question 8.e. above, the project poses no impact. Source: Project Plans and Location; Final (2014) Half Moon Bay Airport Land Use Compatibility Plan					
g.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
Discussion: The project will be located on a privately-owned parcel where all improvements will be located within the parcel boundaries. All four residences are proposed to have access directly from Vallemar, a public maintained street with access point to Cabrillo Highway approximately 525 feet to the south. Driveway access off Vallemar will be built to applicable driveway standards set forth by the Department of Public Works and California Department of Forestry (Cal-Fire) to ensure it will not interfere with emergency response services in the area. Thus, the project poses no impact. Source: Project Plans and Location; Department of Public Works; California Department of Forestry					
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?				X

Discussion: The project site is not located within a Fire Hazard Severity Zone (State Responsibility Area). The project was reviewed by the Cal-Fire and received conditional approval subject to compliance with Chapter 7A of the California Building Code for ignition resistant construction and materials and acceptable slope and material for the driveway, among other fire prevention requirements. No further mitigation, beyond compliance with the standards and requirements of the Fire Protection District, are necessary. Thus, the project poses no impact. Source: California Department of Forestry, Fire Hazard Severity Zones Map				
i.	Place housing within an existing 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?			X
Discussion: Pursuant to the discussion in Question 7.f., the project poses no impact. Source: County GIS (FEMA) Resource Data				
j.	Place within an existing 100-year flood hazard area structures that would impede or redirect flood flows?			X
Discussion: Pursuant to the discussion in Question 7.f., the project poses no impact. Source: San Mateo County GIS (FEMA) Resource Data				
k.	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?			X
Discussion: Aside from the discussion provided in response to Question 7.f., no dam or levee is located in any proximity near the subject parcel, nor is there risk of flooding onto this parcel due to the failure of a levee or dam. Therefore, the project poses no impact. Source: Project Plans and Location; San Mateo County General Plan Hazards Map				
l.	Inundation by seiche, tsunami, or mudflow?			X
Discussion: According to the San Mateo County General Plan Hazards Map and GIS (FEMA) Resource Data, the project site is not located in a tsunami or seiche inundation area. Furthermore, the project site is not located in an area of high landslide susceptibility (which could contribute to mudflow). Therefore, the project poses no impact. Source: Project Plans and Location; San Mateo County General Plan Hazards Map				

9. HYDROLOGY AND WATER QUALITY. Would the project:				
	Potentially Significant Impacts	Significant Unless Mitigated	Less Than Significant Impact	No Impact
a. Violate any water quality standards or waste discharge requirements (consider water quality parameters such as temperature, dissolved oxygen, turbidity and other typical stormwater pollutants (e.g., heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash)?				X
Discussion: The project has the potential to generate polluted stormwater runoff during site grading and construction-related activities. The permanent project will be required to comply with the County's Drainage Policy requiring post-construction stormwater flows to be at, or below, pre-construction flow rates. Additionally, the project must include Low Impact Development (LID) site design measures in compliance with Provision C.3.i. of the County's Municipal Regional Stormwater Permit as the project is comprised of four residences that would introduce 17,070 sq. ft. of new impervious surface (approximately 15% of the total 248-acre project site). These guiding standards will ensure that post-construction water runoff does not violate any water quality standard as the project proposes to direct roof, driveway, and patio runoff to vegetated areas. However, pursuant to the discussion in Questions 4.a. and f., these impacts would be reduced to a less than significant level with the implementation of applicable Mitigation Measures cited in Question 4.a. Source: Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report; San Mateo County Drainage Policy				
b. Significantly deplete groundwater supplies or interfere significantly 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)?				X
Discussion: The project is not expected to deplete any groundwater supplies or interfere with groundwater recharge. Water and sanitary sewer service for the project will be provided by Montara Water and Sanitary District. Furthermore, the geotechnical investigation included soil borings to depths adequate to accommodate construction, without encountering groundwater. Therefor the project poses no impact. Source: Geotechnical Investigation Report (August 2016) by Haro, Kasunich and Associates, Inc.				

c.	Significantly 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 that would result in significant erosion or siltation on- or off-site?		X		
Discussion: The project does not involve the alteration of the course of a stream or river. An existing drainage ditch to the south of the project site (along Julianna) will not be affected or altered by the project. Existing drainage patterns, consisting of sheet flow, will be slightly altered by proposed grading and development to accommodate residences on each of the four lots. Pursuant to the discussion in Question 4, and associated mitigation measures, the project impact to existing drainage patterns (both during and post project construction) will be less than significant. Source: Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report; San Mateo County Drainage Policy					
d.	Significantly alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or significantly increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?			X	
Discussion: Pursuant to the discussion provided to Question 9.c. above and cited mitigation measures, the project impact will be less than significant. Source: Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report; San Mateo County Drainage Policy					
e.	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide significant additional sources of polluted runoff?			X	
Discussion: Pursuant to the discussion provided to Questions 4.f. and 9.c., with associated mitigation measures, the project impact will be less than significant. Source: Project Plans; Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report; San Mateo County Drainage Policy					
f.	Significantly degrade surface or groundwater water quality?				X
Discussion: Pursuant to the discussion provided to Question 9.b. above, the project impact will be less than significant. Source: Project Plans; Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report; San Mateo County Drainage Policy					

g. Result in increased impervious surfaces and associated increased runoff?			X	
Discussion: Pursuant to the discussion provided to question 9.c. above, the project impact will be less than significant. Source: Project Plans; Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report; San Mateo County Drainage Policy				

10. LAND USE AND PLANNING. Would the project:				
	Potentially Significant Impacts	Significant Unless Mitigated	Less Than Significant Impact	No Impact
a. Physically divide an established community?			X	
Discussion: While the project is located within the Moss Beach community, the project site is located between Vallemar and, along its westerly side, the Pacific Ocean. The existing and unaffected trail along the coastal bluffs will continue to provide access along and through this area. The requirement of the proposed Conservation and Open Space Easement will also serve to preserve much of the visual and open space of the project site. Taken all together, the project does not divide the established and immediately surrounding Moss Beach community and will pose a less than significant impact. Source: Project Plans and Location, Proposed Conservation and Open Space Easement				
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?			X	
Discussion: The project has been reviewed for conformance, and found to not conflict with applicable policies of the County Local Coastal Program (LCP) and applicable RM-CZ zoning regulations as discussed in Question 1.f. The project site's RM-CZ zoning includes the Design Review (DR) Overlay District. Based on the discussion provided to Questions 1.a., c. and d., the project is in compliance with all applicable Design Review standards. Additionally, the RM-CZ Zoning District requires that development comply with the County Zoning Regulations, Chapter 20A.2. (Development Review Criteria). The project has been reviewed against and found to comply with the most applicable those criteria. Therefore, with the project built pursuant to the plans approved by the CDRC, the project impact will be less than significant. Source: San Mateo County LCP; County Zoning Regulations; Coastside Design Review Recommendation Letter (of the October 12, 2017 meeting)				

c.	Conflict with any applicable habitat conservation plan or natural communities conservation plan?		X		
Discussion: The project site is not located in an area with a habitat conservation or natural communities conservation plan. As discussed in Question 4.f., the project site is located adjacent to and just east of the County Fitzgerald Marine Reserve. However, the project as proposed, together with the intent of the proposed Conservation Easement (as discussed in the Biological Resources section of this document), and along with the mitigation measures cited in that question, will not adversely affect the Reserve, pursuant to the policies and standards of the 2002 Fitzgerald Marine Reserve Master Plan. Therefore, the project impact will be less than significant. Source: 2002 Fitzgerald Marine Reserve Master Plan; Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report					
d.	Result in the congregating of more than 50 people on a regular basis?				X
Discussion: With the project comprised of the construction of four new residences, it's not expected that their occupancy capacity would result in the congregating of over 50 people on a regular basis. Therefore the project poses no impact. Source: Project Plans and Location					
e.	Result in the introduction of activities not currently found within the community?				X
Discussion: The proposal of four new residences does not result in the introduction of activities not already found within the community. The project site is surrounded by similar single-family residential development to the north, east and south. Therefore, the project poses no such impact. Source: Project Plans and Location					
f.	Serve to encourage off-site development of presently undeveloped areas or increase development intensity of already developed areas (examples include the introduction of new or expanded public utilities, new industry, commercial facilities or recreation activities)?				X
Discussion: While there are some smaller, more standard sized (R-1-zoned) lots still undeveloped in the immediate Moss Beach Montara area, the development of four residences on the project site (within a unique "island" of RM-CZ zoning), the project will not serve to encourage additional off-site development or otherwise significantly increase intensity of already developed areas. The project does not trigger or require the construction of new or expansion of existing roadways. Therefore, the project poses no impact. Source: Project Plans and Location					
g.	Create a significant new demand for housing?				X

Discussion: The project does not create any new demand for housing; it therefore poses no impact.

Source: Project Plans and Location

11. MINERAL RESOURCES. Would the project:

	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a. Result in the loss of availability of a known mineral resource that would be of value to the region or the residents of the State?				X

Discussion: The project neither involves nor results in any extraction or loss of mineral resources. Therefore, the project poses no impact.

Source: San Mateo County General Plan (Mineral Resources Map)

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?				X
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Discussion: Pursuant to the discussion provided to question 11.a., the project poses no impact.

Source: San Mateo County General Plan (Mineral Resources Map)

12. NOISE. Would the project result in:

	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	

Discussion: The project will generate short term noise associated with grading and construction activities as the four residences are built. However, such noises will be temporary, where volume and hours are regulated by Section 4.88.360 (Exemptions) of the County Ordinance Code for Noise Control (which limits construction-generated noise to certain hours on specific days). Otherwise, any increased long-term project related noise impacts will be minimal as it would be limited to typical noise associated with four new single-family residences. Furthermore, the proposed development is oriented such that exterior activities associated with the residence (i.e., driveway/garage, patio areas) will be somewhat insulated from neighboring residences east of Cabrillo Highway by their sheer distance away and lower elevations below Vallemar (due to drop in topography along the

easterly side of the project site). Likewise, associated noise levels from the residences once built and occupied would be minimized from residences to the north and south, by both the distances between the new residences and surrounding development and the remaining and new tree cover around the new residences. Therefore, the project impact will be less than significant. Source: Project Plans and Location; County Ordinance Code, Section 4.88.360 for Noise Control				
b.	Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?			X
Discussion: Pursuant to the discussion provided to question 12.a. above, the project poses a less than significant impact. Source: Project Plans and Location; County Ordinance Code, Section 4.88.360 for Noise Control				
c.	A significant permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X
Discussion: Pursuant to the discussion provided to question 12.a. above, the project poses a less than significant impact. Source: Project Plans and Location; County Ordinance Code, Section 4.88.360 for Noise Control				
d.	A significant temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X
Discussion: Pursuant to the discussion provided to question 12.a. above, the project poses a less than significant impact. Source: Project Plans and Location; County Ordinance Code, Section 4.88.360 for Noise Control				
e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, exposure to people residing or working in the project area to excessive noise levels?			X
Discussion: The project site is located approximately 0.47 miles north of the Half Moon Bay Airport. As discussed in Question 8.e., the Half Moon Bay ALUCP showed that the project site was located well beyond the airport's cited noise exposure contours cited in its "Extremely noise-sensitive areas," e.g., in an area where the airport-generated noise levels are less than 60 CNEL (Community Noise Equivalent Level; a weighted average of noise level over time). Thus, those either associated with construction activity or residing in completed residences at the project site would not be exposed to excessive noise levels. Therefore, the project poses a less than significant impact. Source: Project Plans and Location; Final (2014) Half Moon Bay Airport Land Use Compatibility Plan				

f.	For a project within the vicinity of a private airstrip, exposure to people residing or working in the project area to excessive noise levels?				X
Discussion: Pursuant to discussion to Question 8.e., Half Moon Bay Airport is a public-operated airport, not a private facility. Additionally, there are no known privately owned/operated airstrips within any proximity of the project site. Therefore, the project poses no impact. Source: Project Plans and Location; Final (2014) Half Moon Bay Airport Land Use Compatibility Plan					

13. POPULATION AND HOUSING. Would the project:					
		Potentially Significant Impacts	Significant Unless Mitigated	Less Than Significant Impact	No Impact
a.	Induce significant 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)?				X
Discussion: All improvements associated with the proposed project are completely within the subject parcel's boundaries and are only sufficient to serve the proposed four single-family residences. The additional population created by those living in the proposed four residences is not significant, nor would the development induce any significant population growth or necessitate any addition or expanded roads or other infrastructure (as also discussed in Question 10.f.). Therefore, the project poses no impact. Source: Project Plans and Location					
b.	Displace existing housing (including low- or moderate-income housing), in an area that is substantially deficient in housing, necessitating the construction of replacement housing elsewhere?				X
Discussion: The proposed four residences on the presently undeveloped subject site will not displace any existing housing. Additionally, the Midcoast area is not an area that has been designated as substantially deficient in housing. Therefore, the project poses no impact. Source: San Mateo County General Plan (2014 Housing Element)					

14. PUBLIC SERVICES. Would the project result in significant adverse physical impacts associated with the provision of new or physically altered government facilities, the 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:				
	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a. Fire protection?				X
b. Police protection?				X
c. Schools?				X
d. Parks?				X
e. Other public facilities or utilities (e.g., hospitals, or electrical/natural gas supply systems)?				X
Discussion: The project does not involve nor is it associated with the provision of new or physically altered government facilities, nor will it generate a need for an increase in any such facilities. The project will not disrupt acceptable service ratios, response times or performance objectives of fire (County Coastside Fire Authority has reviewed the plans), police, schools, parks or any other public facilities or energy supply systems. Therefore, the project poses no impact. Source: Coastside Fire Authority; San Mateo County General Plan (Park and Recreation Resources Element)				

15. RECREATION. Would the project:				
	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
a. Increase the use of existing neighborhood or regional parks or other recreational facilities such that significant physical deterioration of the facility would occur or be accelerated?				X
Discussion: The project (future occupants of and visitors to four new residences) would not increase the use of existing parks or other recreational facilities. The current accessibility to and use of the coastal trail (located just beyond the project site's westerly boundary on Fitzgerald Marine Reserve lands) will not be affected by the project. Therefore, the project poses no impact. Source: San Mateo County General Plan (Park and Recreation Resources Element); 2002 Fitzgerald Marine Reserve Master Plan				

b. Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X
Discussion: The project neither includes nor requires the construction or expansion of recreational facilities. Pursuant to the discussion provided to Question 15.a. above, the project poses no impact. Source: San Mateo County General Plan (Park and Recreation Resources Element); 2002 Fitzgerald Marine Reserve Master Plan				

16. TRANSPORTATION/TRAFFIC. Would the project:				
	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
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?			X	
Discussion: The project will not conflict with the County (2005) Traffic Congestion Management Plan, nor other traffic-related policies or regulations (e.g., as cited in County's LCP or General Plan). The County LCP (Policy 2.52) exempts the development of single-family dwellings from the development and implementation of a traffic impact analysis and mitigation plan. The traffic trips (comprised of both owners of and guests/visitors to) generated by four completed residences will not introduce any significant increase in vehicles on Cabrillo Highway (south or northbound, at its intersection with Vallemar), and thus will pose no significant safety impact to other vehicles, pedestrians or bicycles. The adequacy of access, along Vallemar, to and from the site has been reviewed by both the County Department of Public Works and the Coastsides Fire Authority, who have concluded that such access complies with their respective policies and requirements. Therefore, the project poses a less than significant impact. Source: Project Plans and Location; San Mateo County (2005) Traffic Congestion Management Plan; County Local Coastal Program (Public Works Component)				

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?			X	
Discussion: Pursuant to the discussion provided to question 16.a. above, the project poses a less than significant impact. Source: Project Plans and Location; San Mateo County (2005) Traffic Congestion Management Plan; County Local Coastal Program (Public Works Component)					
c.	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in significant safety risks?			X	
Discussion: Pursuant to the discussion provided to question 16.a. above, the project poses a less than significant impact. Source: Project Plans and Location; San Mateo County (2005) Traffic Congestion Management Plan; County Local Coastal Program (Public Works Component)					
d.	Significantly increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
Discussion: The County Department of Public Works, upon their review of the project, have concluded that the project does not increase any road design feature (i.e., Vallemar's intersection with Cabrillo Highway). Pursuant to the discussion provided to question 16.a. above, the project poses a less than significant impact. Source: Project Plans and Location; San Mateo County (2005) Traffic Congestion Management Plan; County Local Coastal Program (Public Works Component)					
e.	Result in inadequate emergency access?				X
Discussion: In addition to the discussion provided to question 16.a. above, the County Coastside Fire Authority has reviewed and approved the proposed access to the project site. Therefore, the project poses no impact. Source: Coastside Fire Authority Requirements and Project Review					
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?			X	
Discussion: The 2011 San Mateo County Comprehensive Bicycle and Pedestrian Plan was adopted by the City/County Association of Governments (C/CAG) on September 8, 2011. This plan					

(as indicated on their designates Cabrillo Hwy. as a Class III Bicycle Route, which is the primary bike route extending from the north end of the Midcoast area down through Half Moon Bay. That said, bicycles (as well as pedestrians) also use Vallemar for the limited distance it provides access apart from Cabrillo Highway. While the driveways of all four new residences will connect directly to Vallemar (with distances of 60, 70 and 110 feet part from one another), such access will not impede the ability of bicycles or pedestrians their use of Vallemar, nor will it create any significant hazards to such use. Therefore, the project poses a less than significant impact.

Source: Project Plans and Location; San Mateo County (2005) Traffic Congestion Management Plan; County Local Coastal Program (Public Works Component); San Mateo County (2011) Comprehensive Bicycle and Pedestrian Plan

g. Cause noticeable increase in pedestrian traffic or a change in pedestrian patterns?			X	
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Discussion: The project will not cause a significant increase in pedestrian traffic to or from the four residences (upon completion), nor will it generally change pedestrian patterns around the project site. Therefore (and pursuant to the discussion in Question 16.f. above, the project poses a less than significant impact.

Source: Project Plans and Location; San Mateo County (2005) Traffic Congestion Management Plan; County Local Coastal Program (Public Works Component)

h. Result in inadequate parking capacity?				X
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Discussion: Each of the proposed four residences includes zoning-compliant (two-car) covered parking, as well as adequate back-up and turn-around capacity (so that vehicles can exit onto Vallemar 'nose-first') and on-site guest parking. Therefore, the project poses no impact.

Source: Project Plans; San Mateo County Zoning (Parking) Regulations

17. TRIBAL CULTURAL RESOURCES. Would the project:				
	<i>Potentially Significant Impacts</i>	<i>Significant Unless Mitigated</i>	<i>Less Than Significant Impact</i>	<i>No Impact</i>
Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)				X

Discussion: The project site is not listed or eligible for listing in the California Register of Historical Resources. Furthermore, the project is not listed in a local register of historical resources, pursuant to any local ordinance or resolution as defined in Public Resources Code Section 5020.1(k).

Source: Project Location; State Parks Office of Historic Preservation (Listed California Historical Resources); County General Plan (Background, Historical and Archaeological Resources Element and Appendices)

ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in Subdivision (c) of Public Resources Code Section 5024.1. (In applying the criteria set forth in Subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.)

X

Discussion: The project is not subject to Assembly Bill 52 for California Native American tribal consultation requirements, as no traditionally or culturally affiliated tribe has requested, in writing, to the County to be informed of proposed projects in the geographic project area. However, a “Sacred Lands File and Native American Contacts List Request” was sent to the Native American Heritage Council (NAHC), but as of the date of preparation of this document, no response has been received. Therefore, while the project is not expected to cause a substantial adverse change to any potential tribal cultural resources, the following mitigation measures are recommended to minimize any potential significant impacts to unknown tribal cultural resources:

Mitigation Measure 34: Should any traditionally or culturally affiliated Native American tribe respond to the County’s issued notification for consultation, such process shall be completed and any resulting agreed upon measures for avoidance and preservation of identified resources be taken prior to implementation of the project.

Mitigation Measure 35: In the event that tribal cultural resources are inadvertently discovered during project implementation, all work shall stop until a qualified professional can evaluate the find and recommend appropriate measures to avoid and preserve the resource in place, or minimize adverse impacts to the resource, and those measures shall be approved by the Current Planning Section prior to implementation and continuing any work associated with the project.

Mitigation Measure 36: Any inadvertently discovered tribal cultural resources shall be treated with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, protecting the cultural character and integrity of the resource, protecting the traditional use of the resource, and protecting the confidentiality of the resource.

Source: Project Plans; Native American Heritage Commission; State Assembly Bill 52

18. UTILITIES AND SERVICE SYSTEMS. Would the project:				
	Potentially Significant Impacts	Significant Unless Mitigated	Less Than Significant Impact	No Impact
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
Discussion: All four residences will be connecting to and receiving sewerage service from the Montara Water and Sanitary District. The project neither involves nor requires any water or wastewater treatment facilities that would exceed any requirements of the Regional Water Quality Control Board. Therefore, the project poses no impact. Source: Montara Water and Sanitary District				
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?				X
Discussion: Pursuant to the discussion provided to Question 18.a. above, the project poses no impact. Source: Montara Water and Sanitary District				
c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?		X		
Discussion: As discussed in Question 4.f., permanent on-site stormwater drainage measures for each of the four residences are found in the submitted Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report. The implementation of Mitigation Measure 5 will ensure that those measures are included on each of the respective building plans for the residences, reviewed and approved by the Department of Public Works and implemented, inspected and maintained. Therefore, with such mitigation the project impact will be less than significant. Source: Project Plans; Mesiti-Miller Engineering, Inc., (2017) Preliminary Storm Drainage Report				
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
Discussion: All four residences will each have adequate water service connections from the Montara Water and Sanitary District. Therefore, the project poses no impact. Source: Montara Water and Sanitary District				

e.	Result in a determination by the waste-water 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?				X
Discussion: The Montara Water and Sanitary District has indicated that they have adequate capacity to serve the project's sanitary sewerage demands. Therefore, the project poses no impact. Source: Montara Water and Sanitary District					
f.	Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs?			X	
Discussion: The construction of the four residences will generate some solid waste both during construction and after the four residences are completed (on an ongoing basis typical for that generated by residential uses). Similar to all other properties in the Midcoast area, the four residences will receive municipal trash and recycling pick-up service by Recology. The County's local landfill facility is the Corinda Los Trancos (Ox Mountain) Landfill, located at 12310 San Mateo Road (State Highway 92), a few miles east of Half Moon Bay. This landfill facility has permitted capacity/service life until 2034. Therefore, the project impact is less than significant. Source: San Mateo County Department of Environmental Health Services					
g.	Comply with Federal, State, and local statutes and regulations related to solid waste?			X	
Discussion: Solid waste generated by four new single-family residences is expected to be minimal. The project site will receive solid waste service by Recology. The landfill cited in Question 18.f., is licensed and operates pursuant to all Federal, State and local statutes and regulations as overseen by the Environmental Health Department. Therefore, the project impact will be less than significant. Source: San Mateo County Department of Environmental Health Services					
h.	Be sited, oriented, and/or designed to minimize energy consumption, including transportation energy; incorporate water conservation and solid waste reduction measures; and incorporate solar or other alternative energy sources?			X	
Discussion: The proposed residences are all cited in such a fashion such that the driveways provide vehicle access directly onto Vallemar, and that they could each accommodate solar energy components into their design. Additionally, the residences will be required to comply with all currently adopted building (where all building materials must meet minimum insulation and energy conserving requirements), electrical, plumbing (where water conservation fixtures shall be implemented), and mechanical codes. Therefore, the project impact will be less than significant. Source: Project Plans					

i. Generate any demands that will cause a public facility or utility to reach or exceed its capacity?				X
Discussion: Pursuant to discussion to other questions in this section, the project will not cause a public facility or utility to reach or exceed its capacity. Therefore, the project poses no impact. Source: Project Plans				

19. MANDATORY FINDINGS OF SIGNIFICANCE.				
	Potentially Significant Impacts	Significant Unless Mitigated	Less Than Significant Impact	No Impact
a. Does the project have the potential to degrade the quality of the environment, significantly 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?		X		
Discussion: As discussed in the Biological Resources Section (4) of this document, the project as currently designed, together with the conclusions and recommended mitigation measures from the 2018 McGraw Survey, including the required recordation of the Conservation Easement, and accompanying and finalized Habitat Management Plan & CC&R's, will ensure that project impacts to the on-site coastal terrace prairie, Monterey cypress trees, the rare coast yellow leptosiphon (located on the adjacent FMR property), and other on- and off-site rare plant species are less than significant. Source: All applicable sources previously cited in this document.				
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.)				X
Discussion: Based on the previous discussion to those questions where either the project impact was less than significant or required mitigation measures to ensure a "less than significant" impact, none of those impacts rise to the level of being cumulatively considerable. Source: All applicable sources previously cited in this document.				

c.	Does the project have environmental effects which will cause significant adverse effects on human beings, either directly or indirectly?			X	
Discussion: Based on the previous discussion to those questions where there was no project impact, or where the project impact was less than significant or required mitigation measures to ensure a 'less than significant' impact, the project would not cause significant adverse effects on human beings, either directly or indirectly. Source: All sources previously cited in this document.					

RESPONSIBLE AGENCIES. Check what agency has permit authority or other approval for the project.

AGENCY	YES	NO	TYPE OF APPROVAL
U.S. Army Corps of Engineers (CE)		X	
State Water Resources Control Board		X	
Regional Water Quality Control Board		X	
State Department of Public Health		X	
San Francisco Bay Conservation and Development Commission (BCDC)		X	
U.S. Environmental Protection Agency (EPA)		X	
County Airport Land Use Commission (ALUC)		X	
CalTrans		X	
Bay Area Air Quality Management District		X	
U.S. Fish and Wildlife Service		X	
Coastal Commission		X	Only if local decision is appealed would have final permit authority
City (Half Moon Bay)		X	
Sewer/Water District:		X	Non-Discretionary at Building permit stage
Other: California Department of Fish & Wildlife		X	Although they have designated the Coast yellow leptosiphon as an endangered plant

<u>MITIGATION MEASURES</u>		
	<u>Yes</u>	<u>No</u>
Mitigation measures have been proposed in project application.	X	
Other mitigation measures are needed.	X	
The following mitigation measures are included in the project plans or proposals pursuant to Section 15070(b)(1) of the State CEQA Guidelines: <u>Mitigation Measure 1:</u> All development on all four proposed lots shall comply with the last plans approved by the Coastside Design Review Committee on October 12, 2017, whose recommendation included that the following minor revisions occur on the submitted building plans and that other Design Review-related conditions occur: - Revise the variable color scheme to be neutral so as to blend with the immediate landscape so that the structures' exteriors weather naturally. Weathered (pickled) wood, stucco or cementitious hardy sidings are acceptable options. Any such changes shall require the submittal of material samples for review by the Community Development Director. - Submit revised plans to show modified deck specifications to include the floor area pf the mezzanine decks (for all houses that include such decks) pursuant to the second revision plans presented [to the DRC] on October 12, 2017 (definitive deck square footage was delineated only for entry, rear, and garage decks in all versions of previously submitted plans). - Any additional exterior lighting (in addition to the single fixture shown at the entry and garage locations) shall be dark sky compliant fixtures, which shall be mounted or recessed under the soffits at other openings and allowed only as required by building code (for safety). No additional site, building, or landscape lighting is proposed. - All paved pathways and patios shall be shown as dimensioned, on the plans, with identified materials [which shall be of a pervious nature]. - The applicant shall provide "finished floor elevation verification" to certify that the structure is actually constructed at the height shown on the submitted plans. The applicant shall have a licensed land surveyor or engineer establish a baseline elevation datum point in the vicinity of the [four] construction sites. - The applicant shall maintain the datum point so that it will not be disturbed by the proposed construction activities until final approval of the building permit. - This datum point and its elevation shall be shown on the submitted site plan. This datum point shall be used during construction to verify the elevation of the finished floors relative to the existing natural or to the grade of the site (finished grade). - Prior to Planning approval of the building permit application, the applicant shall also have the licensed land surveyor or engineer indicate on the construction plans: (a) the natural grade elevations at the significant corners (at least four) of the footprint of the proposed structure on the submitted site plan, and (b) the elevations of proposed finished grades. - In addition, (a) the natural grade elevations at the significant corners of the proposed structure, (b) the finished floor elevations, (c) the topmost elevation of the roof, and (d) the garage slab elevation must be shown on the plan, elevations, and cross-section (if one is provided).		

- (5) Once the building is under construction, prior to the below floor framing inspection or the pouring of the concrete slab (as the case may be) for the lowest floor(s), the applicant shall provide to the Building Inspection Section a letter from the licensed land surveyor or engineer certifying that the lowest floor height, as constructed, is equal to the elevation specified for that floor in the approved plans. Similarly, certifications on the garage slab and the topmost elevation of the roof are required.
- (6) If the actual floor height, garage slab, or roof height, as constructed, is different than the elevation specified in the plans, then the applicant shall cease all construction and no additional inspections shall be approved until a revised set of plans is submitted to and subsequently approved by both the Building Official and the Community Development Director.

- f. All new power and telephone utility lines from the street or nearest existing utility pole to the project structures on the property shall be placed underground.

Mitigation Measure 2: The applicant shall submit an Air Quality Best Management Practices Plan to the Planning and Building Department prior to the issuance of any grading “hard card” or building permit that, at a minimum, includes the “Basic Construction Mitigation Measures” as listed in Table 8-1 of the BAAQMD California Environmental Quality Act (CEQA) Guidelines (May 2011). These measures shall be implemented prior to beginning any grading and/or construction activities and shall be maintained for the duration of the project grading and/or construction activities:

- a. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access road) shall be watered two times per day.
- b. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.
- c. All visible mud or dirt track-out onto adjacent paved roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.
- d. All vehicle speeds on unpaved roads shall be limited to 15 miles per hour (mph).
- e. Roadways and building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.
- f. Idling times shall be minimized either by shutting equipment or vehicles off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations). Clear signage shall be provided for construction workers at all access points.
- g. All construction equipment shall be maintained and properly tuned in accordance with manufacturer’s specifications.
- h. Minimize the idling time of diesel powered construction equipment to two minutes.

Mitigation Measure 3: The applicant shall submit a dust control plan to the Planning Department for review and approval prior to the issuance of a building permit for the project. The approved plan shall be implemented for the duration of any grading, demolition, and construction activities that generate dust and other airborne particles. The plan shall include the following control measures:

- a. Water all active construction areas at least twice daily.
- b. Water or cover stockpiles of debris, soil, sand, or other materials that can be blown by the wind.
- c. Cover all trucks hauling soil, sand and other loose materials or require all trucks to maintain at least 2 feet of freeboard.

- d. Apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking and staging areas at construction sites. Also, hydroseed or apply non-toxic soil stabilizers to inactive construction areas.
- e. Sweep daily (preferably with water sweepers) all paved access roads, parking and staging areas at construction sites.
- f. Sweep adjacent public streets daily (preferably with water sweepers) if visible soil material is carried onto them.
- g. Enclose, cover, water twice daily or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).
- h. Limit traffic speeds on unpaved roads within the project parcel to 15 miles per hour (mph).
- i. Install sandbags or other erosion control measures to prevent silt runoff to public roadways.
- j. Replant vegetation in disturbed areas as quickly as possible.

Mitigation Measure 4: The “Conservation and Open Space Easement Declaration” (Easement), together with the final Habitat Management Plan and associated “Valleamar Bluffs Declaration of Covenants, Conditions and Restrictions” (CC&Rs), shall be submitted for final review by the Community Development Director and, upon approval, recorded with the Final Lot Line Adjustment/Parcel Map associated with the Project. The Easement shall be conveyed from the Project owner to the Golden State Land Conservancy, to be operated, managed and maintained by the Valleamar Bluffs Maintenance Association (Association); (comprised of the future property owners of the four lots), pursuant to the provisions of the CC&Rs. Funding needs for long-term management of the Easement area will be calculated using a Property Analysis Record (PAR) or PAR-like analysis, and the funding will be provided on an annual basis through fees assessed by the Valleamar Bluffs Homeowners Association.

Mitigation Measure 5: Prior to the final building inspection approval of all four residences, a permanent fence – not to exceed three (3) feet in height and of a construction and non-solid design (i.e. wood split-rail) as approved by the Community Development Director – shall be placed along all the boundaries of the Easement area, to include respective access points on its eastern boundaries adjacent to the west-facing building site areas for each of the four lots. The purpose of this fencing – together with the specific use constraints to be included in the Easement language and CC&Rs – will be to not only prevent the public from accessing the Easement area, but to clearly demarcate all boundaries for both the public and the residences of the four new homes. Such fencing shall include the installation of signs (not to exceed 3 feet in height) that provide information about the conservation area including the rationale for its protection and to promote compliance with access restrictions.

Mitigation Measure 6: Include in the CC&Rs for the parcels as well as in the Conservation Easement, prohibitions against access to the Easement area that are not compatible with conservation, restoration, and management of its natural community structure and species composition in the coastal terrace prairie and populations of rare native plants. Examples of prohibited activities include: installation of permanent or semi-permanent infrastructure or equipment such as outdoor furniture (e.g., patio furniture, picnic tables, umbrellas), play equipment (trampolines, play structures, etc.) or other items that intensify use or otherwise modify the structure and species composition of the grassland.

Mitigation Measure 7: Work with the County of San Mateo, to coordinate on management of the bluff trail, whose northerly portion is largely within the Fitzgerald Marine Reserve (nearest to the surveyed CYL population) but primarily is located within the easterly half of The Strand (adjacent to the Easement’s western boundary), and that provides public access along the bluff edge. Ensure that the recreational use along the entire length of bluff trail at the Project site is managed to be

compatible with the restoration and management of the coastal terrace prairie and rare plants in the conservation area. Monitor the effects of access and compliance with the measures to prevent trampling associated with recreational use and taking steps to increase compliance when/if negative impacts are observed.

Mitigation Measure 8: The respective building plans for each of the four residences shall include a landscape plan that identifies tree removal, new trees, shrubs and other landscaping, and (if applicable) irrigation. Landscaping shall be with plant species native to the San Mateo Coast, to limit the potential for the spread of non-native species into the adjacent habitat, and limit the need for irrigation and pesticide use, which could influence nearby natural communities, upon recommendation and review by the applicant's biologist. (This mitigation measure is also referenced and required as part of the "Conservation and Open Space Easement" (Easement), and associated "Draft Covenants, Conditions and Restrictions" (CC&Rs), pursuant to the goals and objectives cited in the "Valleamar Bluffs Conservation and Development Project Management Planning Framework" (to be revised into the final "Habitat Management Plan").

Mitigation Measure 9: Prior to the issuance of any respective building permit for the four residences, the applicant shall submit to the Planning Department for review and approval an erosion control plan (to be included in each respective set of building plans for the four residences) that shows how the transport and discharge of soil and pollutants from and within the project site shall be minimized on each respective lot, as tailored to the approved development on that lot. The plan shall generally follow the Erosion Control Plan as included and shown on Page C6.0, C7.0 of the Project Plans, and shall be designed to minimize potential sources of sediment, control the amount of runoff and its ability to carry sediment by diverting incoming flows and impeding internally generated flows, and retain sediment that is picked up on the project site through the use of sediment-capturing devices. The plan shall minimize impacts from stormwater and urban runoff on the biological integrity of the natural drainage systems leading to and within the adjacent Fitzgerald Marine Reserve. The plan shall also limit application, generation and migration of toxic substances, ensure the proper storage and disposal of toxic materials, and apply nutrients at rates necessary to establish and maintain vegetation without causing significant nutrient runoff to surface waters. Such measures shall be confirmed to have been implemented (by a qualified contractor and under the supervision of the project's civil engineer) prior to the issuance of the respective building permits for the four residences, to the satisfaction of the Planning and Building Department. The County will monitor compliance of this mitigation measure by conducting weekly construction inspections during the rainy season (October 1 through May 1) for the period covering all land disturbance activities, as required by the State Water Board's Special Protections. Such measures shall be kept in place for each of the lots through the duration of the construction activities on that lot, up to the final inspection approval of the respective building permit for development on that lot. Said plan shall adhere to the San Mateo Countywide Stormwater Pollution Prevention Program "General Construction and Site Supervision Guidelines," including:

- a. Sequence construction to install sediment-capturing devices first, followed by runoff control measures and runoff conveyances. No construction activities shall begin until after all proposed measures are in place.
- b. Minimize the area of bare soil exposed at one time (phased grading).
- c. Clear only areas essential for construction.
- d. Within five (5) days of clearing or inactivity in construction, stabilize bare soils through either non-vegetative best management practices (BMPs), such as mulching, or vegetative erosion control methods, such as seeding. Vegetative erosion control shall be established within two (2) weeks of seeding/planting.

- e. Construction entrances shall be stabilized immediately after grading and frequently maintained to prevent erosion and control dust.
- f. Control wind-born dust through the installation of wind barriers such as hay bales and/or sprinkling.
- g. Soil and/or other construction-related material stockpiled on-site shall be placed a minimum of 200 feet from all wetlands and drain courses. Stockpiled soils shall be covered with tarps at all times of the year.
- h. Intercept runoff above disturbed slopes and convey it to a permanent channel or storm drains by using earth dikes, perimeter dikes or swales, or diversions. Use check dams where appropriate.
- i. Provide protection for runoff conveyance outlets by reducing flow velocity and dissipating flow energy.
- j. Use silt fence and/or vegetated filter strips to trap sediment contained in sheet flow. The maximum drainage area to the fence should be 0.5-acre or less per 100 feet of fence. Silt fences shall be inspected regularly and sediment removed when it reaches 1/3 the fence height. Vegetated filter strips should have relatively flat slopes and be vegetated with erosion resistant species.

Mitigation Measure 10: Prior to commencement of any project-related site disturbance, grading/clearing, tree removal/trimming or construction activities, and in conjunction with an approved Erosion Control Plan, the applicant shall place adequate temporary construction fencing along all boundaries of the proposed Conservation Easement and surrounding all limits of the four building sites. No such activity shall extend beyond that fenced perimeter. All environmentally sensitive areas shall be clearly flagged. Additional measures shall also be included in the plan narrative and implemented as follows:

- a. Entrance and exit from the construction site by construction equipment and other vehicles shall occur from Vallemar Street, and the point of access shall be clearly identified.
- b. An excavator with a swivel bucket shall be used during construction. The excavator will have "street" tracks to minimize site disturbance.
- c. Construction lay down areas shall be located on the building envelopes not under active construction or within other portions of the construction footprint.
- d. Spoil material that will be hauled away may first be stored either on the building envelopes not in active construction or on the paved parking area on Vallemar Street, subject to an encroachment permit from San Mateo County Public Works.
- e. A biological monitor will be present during ground disturbing activities to ensure that encroachment into the flagged environmentally sensitive areas does not occur. The biological monitor will have the authority to stop work in the event construction activities are encroaching into environmentally sensitive areas.

Mitigation Measure 11: The erosion control plan for the project shall include the following best management practices (BMPs) and shall be implemented and maintained (under the supervision of the project civil engineer) as described:

- a. Control and prevent the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, washwater or sediments, rinse water from architectural copper, and non-stormwater discharges to storm drains and watercourses.

- b. Store, handle, and dispose of construction materials/wastes properly to prevent contact with storm water.
- c. Do not clean, fuel, or maintain vehicles on-site, except in a designated area where wash water is contained and treated.
- d. Train and provide instruction to all employees/subcontractors RE: construction BMPs.
- e. Protect all storm drain inlets in vicinity of site using sediment controls such as berms, fiber rolls, or filters.
- f. Limit construction access routes and stabilize designated access points.
- g. Perform clearing and earthmoving activities only during dry weather.
- h. Use sediment controls or filtration to remove sediment when dewatering and obtain all necessary permits.
- i. Trap sediment on site, using BMPs such as sediment basins or traps, earthen dikes or berms, silt fences, check dams, soil blankets or mats, covers for soil stockpiles, etc.
- j. Divert on-site runoff around exposed areas; divert off-site runoff around the site (e.g. swells and dikes).
- k. Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.
- l. No land clearing operations where grading operations may take place between October 15 and April 15 unless a separate winter erosion control plan is approved prior to beginning such construction.
- m. Erosion is to be controlled at all times. The specific measures shown are to be implemented at all times. Additional measures will be required for construction between October 15 and April 15.

Mitigation Measure 12: Site all construction materials and staging areas in converted (i.e., paved), ruderal, or planted, areas within the portion of the property proposed for development, to avoid impacts to special-status communities and species.

Mitigation Measure 13: Implement measures to prevent indirect effects of the development project on the adjacent coastal terrace prairie community and rare species during construction, including:

- a. Fence the project disturbance envelop during construction using ESA fencing to clearly delimit the area of work;
- b. Erect signs on the fences and in other areas to prevent workers from entering them during construction;
- c. Conduct worker awareness training to educate construction personnel about the sensitive communities and special-status species, as well as the measures that must be implemented to protect them;
- d. Prevent erosion and manage drainage during construction to prevent concentrated runoff and sediment deposition in the coastal terrace prairie, including by installing, silt fences where needed;
- e. Monitor compliance with the protection measures during construction, to ensure that fences and signage remain in places, and that the areas outside of the disturbance envelope are not disturbed or otherwise utilized during construction;

- f. Monitor the site throughout construction period (and in perpetuity, per Mitigation Measure 5 below) and using early-detection/rapid response to eradicate any new occurrences of exotic plant species.

Mitigation Measure 14: Prior to disturbance within any portion of the project area that supports coastal terrace prairie dominated or co-dominated by native plants (2018 McGraw Survey; Figure 6), including the stormwater infiltration spreader areas and limits of grading, salvage the sod, topsoil, seed, and individual native plants, where appropriate and feasible. Use the salvaged material to restore areas of temporary disturbance; if the salvaged area is to be permanently impacted, use the material to restore other highly degraded habitat on site (e.g., ice plant mats) where appropriate.

Mitigation Measure 15: Minimize the potential for indirect impacts to coastal terrace prairie and rare plant species that could result from landscaping, by:

- a. Avoiding landscaping elements that could degrade adjacent habitat, including pesticides, herbicides, fertilizers, and irrigation beyond that required to establish plantings; and
- b. Installing plants native to the coastal terrace prairie, coastal strand, and coastal scrub communities in San Mateo County. For plant species found in the native communities in the study area, use container stock from local (coastal San Mateo County) sources to avoid disrupting locally adapted genetic complexes (i.e., causing genetic erosion or outbreeding depression) within the adjacent remaining habitat on-site and in the adjacent FMR.

Mitigation Measure 16: Compensate for the impacts of the project on coastal terrace prairie by implementing the following measures:

- a. Permanently protect 0.92 acres of coastal terrace prairie, through dedication of a perpetual conservation easement (as required in Mitigation Measure 4) to a tax-exempt nonprofit organization qualified under Section 501(c)(3) of the Internal Revenue Code and qualified to do business in California that has as its primary purpose the preservation, protection, or enhancement of land in its natural, scenic, historical, agricultural, forested, or open-space condition or use.
- b. Restore an estimated 0.71 acres within the conservation easement area that feature planted/ornamental species (i.e., Monterey cypress), are dominated by exotic plant species, and/or have been previously disturbed and feature unnatural topography or materials (e.g., wood chips). Table 9 and Figure 8 (2018 McGraw Survey) illustrate the acreages and approximate locations of restoration treatment areas. The restoration should follow a specific restoration plan that addresses the anthropogenic factors that have degraded native plant community structure and species composition. The restoration plan will also describe how the areas in the conservation easement area that were graded and installed with spreaders will be restored. It will critically evaluate and use, where appropriate, the following approaches:
 - i. Removing the planted/ornamental plant species and ice plant mats;
 - ii. Removing wood chips, base rock, or other non-native material covering the soil;
 - iii. Recreating the natural topography in areas where mounds or swales were created through prior excavation;
 - iv. Controlling other invasive plants (e.g., Italian rye grass and prickly sow thistle) that outcompete native plant species;
 - v. Managing the abundance of disturbance-adapted native plants such as coastal tarweed, where they are dominant (e.g., in the southeastern corner of the property) to promote the establishment and growth of a broader diversity of native grasses and forbs;

- vi. Establishing native plants in areas previously used as trails to access the bluff trail;
 - vii. Salvaging seed and topsoil from coastal terrace prairie and areas supporting harlequin lotus prior to any ground-disturbing activities and using the material in on-site restoration, where appropriate; and
 - viii. Increasing the cover and diversity of native coastal terrace prairie plant species by sowing native plant seed (or spreading topsoil, where available) into restoration areas.
- c. Manage and monitor, in perpetuity, the entire 0.92-acre conservation area to address anthropogenic factors that degrade native plant community structure and species composition. Management elements should be identified in a management plan developed for the conservation area based on the site conditions and the literature documenting relevant conservation and management strategies, which are anticipated to include the following:
- i. Controlling exotic plants, and preventing the invasion and spread of new exotic plant species;
 - ii. Managing recreation and access on and adjacent to the conservation area, including by:
 - (1) Installing fencing and signage to deter public access within the conservation area;
 - (2) Recording in the CC&Rs for the site and in the conservation easement, prohibitions against recreational use and access that are not compatible with conservation and management natural community structure and species composition in the coastal terrace prairie and populations of rare native plants. Installation of permanent or semi-permanent infrastructure and play equipment such as law chairs, umbrellas, trampolines, or any other items that intensify use in one area should be prohibited;
 - (3) Siting, constructing, and managing any public trails that are all or partially within the conservation area so that the recreational use is compatible with the protection of coastal terrace prairie and adjacent coastal bluff habitat;
 - (4) Monitoring compliance with the measures to prevent trampling associated with recreational use and taking steps to increase compliance when/if negative impacts are observed.
 - iii. Monitoring natural community structure and species composition and rare plant populations within coastal terrace prairie, to gauge the effectiveness of management and inform adjustments as part of the adaptive management framework.

Mitigation Measure 17: The erosion control plan for the project shall include the following best management practices (BMPs) and shall be implemented and maintained (under the supervision of the project civil engineer) as described:

- a. Control and prevent the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, washwater or sediments, rinse water from architectural copper, and non-stormwater discharges to storm drains and watercourses.
- b. Store, handle, and dispose of construction materials/wastes properly to prevent contact with stormwater.
- c. Do not clean, fuel, or maintain vehicles on-site, except in a designated area where wash water is contained and treated.
- d. Train and provide instruction to all employees/subcontractors regarding construction BMPs.

- e. Protect all storm drain inlets in vicinity of site using sediment controls such as berms, fiber rolls, or filters.
- f. Limit construction access routes and stabilize designated access points.
- g. Perform clearing and earthmoving activities only during dry weather.
- h. Use sediment controls or filtration to remove sediment when dewatering and obtain all necessary permits.
- i. Trap sediment on site, using BMPs such as sediment basins or traps, earthen dikes or berms, silt fences, check dams, soil blankets or mats, covers for soil stockpiles, etc.
- j. Divert on-site runoff around exposed areas; divert off-site runoff around the site (e.g. swells and dikes).
- k. Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.
- l. No land clearing operations where grading operations may take place between October 15 and April 15 unless a separate winter erosion control plan is approved prior to beginning such construction.
- m. Erosion is to be controlled at all times. The specific measures shown are to be implemented at all times. Additional measures will be required for construction between October 15 and April 15.

Mitigation Measure 18: The applicant shall implement the drainage improvement recommendations of the Mesiti-Miller Engineering, Inc. (2017) Preliminary Storm Drainage Report to limit impacts to the Coastal Terrace Prairie grass, erosive bluff edge, and the near-shore marine environment (within the Fitzgerald Marine Reserve adjacent and just west of the project site, including the surveyed area of the endangered coast yellow leptosiphon on the coastal bluff promontory just west of the project site's westernmost property line) utilizing (within the Easement Area as shown) infiltration trenches with overflow spreaders on each lot to disperse the runoff over wide areas and maintain existing hydrology and soil moisture on the site, and using pervious pavers and detention areas to control peak runoff. The respective building permits for each of the four residences shall include a drainage plan that incorporates and implements all drainage measures cited in the report by Mesiti-Miller Engineering, Inc. The project shall minimize alteration of the site's hydrology, including by using permeable pavers (in all driveways, walkways and patio areas) to increase infiltration of rainfall, and installing overflow spreaders in trenches to diffuse runoff.

Mitigation Measure 19: Prior to any ground disturbing activities, including vegetation/tree removal or tree trimming, that would occur during the nesting/breeding season of native bird species potentially nesting/roosting on the site (typically February 1 through August 31 in the project region), a survey for nesting birds shall be conducted by a qualified biologist experienced with the nesting behavior of bird species of the region. The intent of the survey would be to determine if active nests of special-status bird species or other species protected by the Migratory Bird Treaty Act and/or the California Fish and Wildlife Code are present in the construction zone or within 500 feet of the construction zone. The surveys shall be timed such that the last survey is concluded no more than 2 weeks prior to initiation of construction or tree removal work. If ground disturbance activities are delayed, then an additional pre-construction survey shall be conducted such that no more than 2 weeks will have elapsed between the last survey and the commencement of ground disturbance activities.

If active nests are found in areas that could be directly affected or subject to prolonged construction-related noise, a no-disturbance buffer zone shall be created around active nests during the breeding season or until a qualified biologist determines that all young have fledged. The size of the buffer zones and types of construction activities restricted within them will be determined

through consultation with the California Department of Fish and Wildlife (CDFW), taking into account factors such as the following:

- a. Noise and human disturbance levels at the construction site at the time of the survey and the noise and disturbance expected during the construction activity;
- b. Distance and amount of vegetation or other screening between the construction site and the nest; and
- c. Sensitivity of individual nesting species and behaviors of the nesting birds.

Limits of construction to avoid an active nest shall be established in the field with flagging, fencing, or other appropriate barriers and construction personnel shall be instructed on the sensitivity of nest areas. A qualified biologist shall serve as a construction monitor during those periods when construction activities would occur near active nest areas of special-status bird species and all birds covered by the Migratory Bird Act to ensure that no impacts on these nests occur.

Mitigation Measure 20: The new trees indicated on the applicant's Tree Replacement Plan and Tree and Shrub Replanting Plan (found in the Project Plans) shall be planted prior to Planning final approval of the respective building permits for the four residences. Tree removal (identified by tree numbers), new trees and shrubs, additional landscaping, and tree preservation shall be shown on the submitted building plans for each of the four respective residences. The landscaping plan (for tree replacement and all other proposed landscaping) shall include plants that are pest- and/or disease-resistant, drought-tolerant, and attractive to beneficial insects. Upon implementation of the plan (for each of the four residences), the use of quick-release fertilizers shall be minimized. The associated irrigation system shall be designed to efficiently distribute water and minimize runoff. The planting of all new trees shall occur pursuant to the standards for such planting (depth of holes dug, fertilizing at planting and watering for respective tree types) and under the observation of a qualified, licensed arborist. The arborist shall confirm (via letter and/or email) that this has occurred for all trees prior to final inspection approval of the respective building permits for the four residences, to the satisfaction of the Community Development Director.

Mitigation Measure 21: Any plan modifications to the subsequent development on the four lots (assuming they are deemed "minor" by the Community Development Director) that occur post issuance of any of the respective building permits for the four residences shall be reviewed by the arborist to assess any potential impacts to existing trees, trees that are being preserved, and/or new trees to be planted affecting trees should be reviewed by the project consulting arborist (arborist) with regard to tree Impacts.

Mitigation Measure 22: The submitted building plans for each of the four respective residences shall demarcate a Tree Protection Zone, to be established for all trees to be preserved, in which no disturbance is permitted. These plans shall indicate the method and measures of such protection (i.e., 6-foot high fencing placed at the trees' dripline) pursuant to the design and confirmed observation by the arborist. All such tree protection measures shall be reviewed and approved by the Community Development Director prior to issuance of the respective building permits for the four residences. No grading, excavation, construction or storage of materials, equipment, spoils, waste or wash-out water may be deposited, stored, or parked within the Tree Protection Zone. All underground services, including utilities, sub-drains (and other drainage features), irrigation lines, water and sewer laterals, shall be routed around the Tree Protection Zone. All tree protection measures shall be confirmed by the County to have been implemented prior to the issuance of any of the respective building permits for the four residences. All tree protection measures shall remain until all construction on each respective lot is completed.

Mitigation Measure 23: Any herbicides placed under paving materials must be safe for use around trees (as determined and confirmed by the arborist) and labeled for that use.

Mitigation Measure 24: All tree pruning shall be done by skilled tree or landscape contractors pursuant to the specific standards (adhering to the latest edition for Best Management Practices – and Tree Pruning as published by the International Society of Arboriculture), directions and under the supervision of the arborist.

Mitigation Measure 25: Prior to the initiation of any site disturbance activities (prior to issuance of the building permits), the project contractors working in the vicinity of trees to be preserved shall meet with the arborist at the site to review all work procedures, access routes, storage areas and tree protection measures.

Mitigation Measure 26: Upon issuance of the building permits, any excavation within the dripline or other work that is expected to encounter tree roots should be approved and monitored by the arborist. Any roots requiring cutting (including the type of backfill soil, compaction, fertilizing and watering) shall be the standards and under the supervision of the arborist to ensure that such root cutting does not damage the long term health of the tree.

Mitigation Measure 27: Should any tree or its roots be damaged during construction, it should be evaluated as soon as possible by the arborist so that appropriate treatments can be applied.

Mitigation Measure 28: Any additional or unanticipated tree pruning needed for clearance during construction shall be performed to the standards and under the supervision by the arborist.

Mitigation Measure 29: Prior to building permit issuance for construction of residences on all or any of the respective lots, the applicant shall incorporate, via a note on the first page of the building construction plans, that in the event that archaeological resources are inadvertently discovered during construction, work in the immediate vicinity (within 25 feet) of the find must stop until a qualified archaeologist can evaluate the significance of the find. Construction activities may continue in other areas beyond the 25-foot stop work area. A qualified archaeologist is defined as someone who meets the Secretary of the Interior's Professional Qualifications Standards in archaeology. The Community Development Director shall be notified of such findings, and no additional work shall be done in the stop work area until the archaeologist has recommended appropriate measures, and those measures have been approved by the Current Planning Section and implemented. Disposition of Native American remains shall comply with CEQA Guidelines Section 15064.5(e).

Mitigation Measure 30: In the event that paleontological resources are inadvertently discovered during construction, work in the immediate vicinity (within 25 feet) of the find must stop until a qualified paleontologist can evaluate the significance of the find. The Community Development Director shall be notified of such findings, and no additional work shall be done in the stop work area until the paleontologist has recommended appropriate measures, and those measures have been approved by the Current Planning Section and implemented.

Mitigation Measure 31: Should any human remains be discovered during construction, all ground disturbing work shall cease and the County Coroner be immediately notified, pursuant to Section 7050.5 of the State of California Health and Safety Code. Work must stop until the County Coroner can make a determination of origin and disposition of the remains pursuant to California Public Resources Code Section 5097.98. If the County Coroner determines the remains to be Native American, the Native American Heritage Commission shall be contacted within 24 hours. A qualified archaeologist, in consultation with the Native American Heritage Commission, shall recommend subsequent measures for disposition of the remains.

Mitigation Measure 32: The project design for the development of each of the four lots (at the time of the submitted respective building permits), shall each include lot-specific geotechnical reports and shall carefully follow the geotechnical recommendations presented in the subject Haro, Kasunich and Associates (HKA) geotechnical report (pages 25 through 46, except where such recommendations affect Lot 4), covering the following categories: General Site Grading (including

Cut and Fill Slopes); Foundations (including Conventional Spread and Skin Friction Pier Foundations); Perched Groundwater Drainage (including Concrete Slab-On-Ground); Retaining Walls (including Lateral Pressures and use of Tie-Backs); Utility Trenches; Surface Drainage (including use of Curtain Drains); Pavement Design; and Plan Review, Construction Observation and Testing. Additionally, and more specifically, the project design for the development on Lot 4 shall carefully follow the recommendations presented in the HKA Geotechnical Investigation Update, dated June 13, 2018. Specifically, the proposed residence and other structures on Lot 4 are recommended to be supported by shallow stiffened grid foundations or structural mat foundations, either of which is capable of withstanding the estimated liquefaction induced vertical ground settlement (from an earthquake) and capable of being re-leveled after such an event. Shallow stiffened foundations are recommended by geotechnical consultants for single-family dwelling construction on sites with potentially liquefiable soils as an alternative to ground improvements (i.e., stone columns, compaction grouting) or deep driven piles, either of which would have a much higher environmental impact to the site. Any such changes to the recommendations by the project geotechnical engineer presented in this report shall be pursuant to the review and approval of the County's geotechnical engineer.

Mitigation Measure 33: The applicant's architect shall complete and submit the County 2013 Energy Efficiency Climate Action Plans (EECAP) Development Checklist (Appendix F), and shall incorporate applicable measures and performance criteria into the submitted building plans for each of the four residences.

Mitigation Measure 34: Should any traditionally or culturally affiliated Native American tribe respond to the County's issued notification for consultation, such process shall be completed and any resulting agreed upon measures for avoidance and preservation of identified resources be taken prior to implementation of the project.

Mitigation Measure 35: In the event that tribal cultural resources are inadvertently discovered during project implementation, all work shall stop until a qualified professional can evaluate the find and recommend appropriate measures to avoid and preserve the resource in place, or minimize adverse impacts to the resource, and those measures shall be approved by the Current Planning Section prior to implementation and continuing any work associated with the project.

Mitigation Measure 36: Any inadvertently discovered tribal cultural resources shall be treated with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, protecting the cultural character and integrity of the resource, protecting the traditional use of the resource, and protecting the confidentiality of the resource.

DETERMINATION (to be completed by the Lead Agency).

On the basis of this initial evaluation:

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

X

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 of the mitigation measures in the discussion have been included as part of the proposed project. A 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.

September 26, 2018

(Signature)

Senior Planner

ATTACHMENTS

- A. Location Map*
- B. Project Site Plan*
- C. Site Sections*
- D. Existing Trees and Vegetation*
- E. Tree Removal and Tree Replacement Plan*
- F. Tree and Shrub Planting Plan on House Sites (see Attachment S.1. for Vegetation Plan on Conservation Easement Area)*
- G. Grading Plans*
- H. Drainage Areas* (also see Attachment O)
- I. Erosion Control Plan*
- J. Site Plan and Elevations (Lot 1)*
- K. Site Plan and Elevations (Lot 2)*
- L. Site Plan and Elevations (Lot 3)*
- M. Site Plan and Elevations (Lot 4)*
- N. Project Photo Simulations*
- O. Preliminary Storm Drainage Report, Mesiti-Miller Engineering, Inc. (April 26, 2017).
- P. Coastal Bluff Recession Study, Haro, Kasunich and Associates (April 24, 2015)*
- Q. Vallemar Bluffs Coastal Hazards Assessment, Environmental Science Associates (October 26, 2016)*
- R. Geotechnical Investigation, Haro, Kasunich and Associates (August 2016)*
 - R.1 (New) Geotechnical Investigation Update, Haro, Kasunich and Associates (June 18, 2018)*
- S. (New) Biological Survey Report, Jodi McGraw Consulting (August 2018)*
 - S.1 (New) Vallemar Bluffs Conservation and Development Project Management Planning Framework (August 2018)*

- S.2. (New) Proposed Conservation and Open Space Easement
- S.3. (New) Draft Covenants, Conditions and Restrictions (CC&Rs)
- T. California Department of Fish and Wildlife Letter (June 6, 2017)*
 - T.1 (New) California Department of Fish and Wildlife, Memorandum to Fish and Game Commission (December 7, 2017)*
 - T.2 (New) California Department of Fish and Wildlife Letter/Response (February 7, 2018)*
- U. Moss Beach Tree Survey (May 2015)*
- V. Coastside Design Review Committee Recommendation (October, 12 2017)*
- W. California State Coastal Commission Letter/Response (March 1, 2018)*
- X. Midcoast Community Council Comments (January 24, 2018)

** These documents can be found at the Planning and Building office or on-line on the Planning and Building's website at: <http://planning.smcgov.org/major-projects>. Under Major Projects, go to the "Four Residences on Vallemar at Julianna, Moss Beach", where these documents can be found under labeled pdf files.*

Note: *Unless preceded by (New), all other attachments are as they appeared in the IS/MND that was initially circulated in February 2018.*

DH:pac - DJHCC0417_WPH.DOCX



County of San Mateo - Planning and Building Department

ATTACHMENT BB

ATTACHMENT BB

Date: Feb. 5, 2018

To: Dave Holbrook Project Planner

From: James & Katharine Lockhart (jmlock@aol.com); 235 Wienke Way, Moss Beach, CA

Subject: Comments on Environmental Impact Initial Study/Mitigated Negative Declaration - Four Houses at Vallemar & Juliana (PLN2015-00380)

We have comments on eight sections of the Initial Study/Mitigated Negative Declaration (IS) for PLN2015-00380.

A. IS p. 3 - *Environmental Factors Potentially Affected*

The "*Biological Resources*" factor is not checked, but certainly must be since there are "significant unless mitigated" impacts involving coastal prairie plant life (including the extremely rare coast yellow leptosiphon), tree removal, and habitat destruction.

The "*Land Use/Planning*" factor is not checked, but should be since on p. 36, Factor 10(c) is listed as "significant unless mitigated."

B. IS p. 5 - 1. *Aesthetics: a. Would the project have a significant adverse effect on a scenic vista, views from existing residential areas, public lands, water bodies, or roads?*

The Study claims that "the project's visual impact would be less than significant." This finding is not supported by the facts and the project as submitted will in fact have a significant adverse impact on views from existing residential areas, from public lands (Fitzgerald Marine Reserve, including Wienke Cove Beach), from water bodies (Pacific Ocean), and from roads (Highway 1, Vallemar St., Juliana Ave., and Wienke Way). The proposed houses would intrude massively onto all these views. Any new houses built on previously undeveloped partially-forested land lying between the ocean and public roads will necessarily have some adverse effect on such views, but this project has unnecessarily large adverse effects on such views due to aspects of the house designs. Such features as enclosed third-story "catwalks" and two-story-high garages make the proposed houses considerably higher than nearby houses without adding habitable floor area. The added height is a prime contributor to the excessive adverse effect on views from public lands and roads.

The adverse effect could be reduced significantly via mitigations requiring:

- (a) Elimination of the third floor enclosed "catwalks"
- (b) Substantial lowering of rooflines;
- (c) Elimination of all external seaside patio fireplaces and accompanying tall chimneys;
- (d) Elimination of the second story portion of the two-story-high garages.

This environmental factor should be listed as "Significant Unless Mitigated" and mitigations (a), (b), (c), and (d) above should be required.

C. IS p. 7-8 - 1. Aesthetics: f. *Would the project, if within a Design Review District, conflict with applicable General Plan or Zoning Ordinance provisions?*

The Study claims that the project's impact on the Visual Resources component of the Local Coastal Program "would be less than significant." This finding is not supported by the facts and the project as submitted will in fact have a significant adverse impact on Visual Resources. This environmental factor should be listed as "Significant Unless Mitigated" and mitigations (a), (b), (c), and (d) from Comment B above should be required.

D. IS p. 8 - 1. Aesthetics: g. *Would the project visually intrude into an area having natural scenic qualities.*

The Study claims that the project's visual intrusion into an area having natural scenic qualities "would be less than significant." This finding is not supported by the facts and the project as submitted will in fact have a very significant intrusion into a naturally scenic area currently having a grove of Monterey Cypress trees (many of which are to be removed) as well as unobstructed views of the ocean. This environmental factor should be listed as "Significant Unless Mitigated" and mitigations (a), (b), (c), and (d) above should be required and an additional mitigation should be added requiring a reduction in the number of trees to be removed. (It appears that mature trees # 161, 167, 169, and 170 could be saved without encroaching onto the house footprints.)

E. IS p. 15 - Mitigation Measure 4

Conservation easement description, boundaries, and language should be formalized and recorded prior to granting of a Coastal Development Permit. California Code of Regulations (CCR) §15126.4 (a)(2) states "Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally-binding instruments."

F. IS p. 16 - Mitigation Measure 7

The requirements of this mitigation measure should be completed prior to project approval and prior to the granting of a Coastal Development Permit. Again, the measure must be fully enforceable through conditions or other binding instruments..

G. IS p. 16 - Biological Resources: d. *Would the project... impede the use of native wildlife nursery sites?*

An additional mitigation should be added requiring a reduction in the number of trees to be removed. (It appears that mature trees # 161, 167, 169, and 170 could be saved without encroaching onto the house footprints.)

H. IS p. 35 - 10. Land Use and Planning: b. *Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project...?*

The Study claims that the project's impact on the Visual Resources component of the Local Coastal Program "would be less than significant." This finding is not supported by the facts and the project as submitted will in fact have a significant adverse impact on Visual Resources and is thus in conflict with the applicable policies of the County Local Coastal Program. Factor 10.b should be listed as "Significant Unless Mitigated" and additional mitigations (a), (b), (c), and (d) from Comment B above should be required.

Hi Mr. Holbrook,

The comments below regarding the Vallemar Bluff proposed development (PLN2015-00380) are in addition to our earlier response to the Environmental Impact Initial Study and Mitigated Negative Declaration.

In early January, we expressed our concern to you about the significant negative impact of the proposed Vallemar Bluff development on the visuals from the Wienke Cove beach. This beach, with good tide pools, caves at both north and south ends, and unique geological formations, is a gem of the San Mateo County coast. Many regulations (Local Coastal Program (e.g. 8.13-5), SM County RMCZ zoning (section 6325.5), California Coastal Act (30251)) state that views along the ocean are to be protected and that development near the shoreline must be designed to insure that such development is not visually obtrusive when viewed from a public beach. It cannot be argued legitimately that the proposed massive three-story buildings with towering two-story external patio chimneys would not cause harm to views from Wienke Cove beach. All of the four proposed towering houses will be clearly visible from the beach (see photo below). This needs to be considered when reviewing the developer's proposed plans for these four new houses.



Looking east from Wienke Cove beach. Lot 1 (left) has full story poles; others partial height/number.

We are very heartened that the applicant has agreed to a moveable trail easement with provision for the county to monitor and enforce trail relocation, a biotic easement for protection of the coastal prairie, and a perpetual limitation on height, placement, and transparency of fences. These conditions are essential for the protection of public access to the bluffs and protection of the visual beauty of this wonderful site. However, additional conditions are needed to mitigate the impact of the proposed development on the views from Wienke Cove beach. The additional needed conditions include:

- (1) Elimination of the "mezzanine" third floors
- (2) Substantially lowered rooflines, including garage rooflines
- (3) Elimination of all external seaside patio fireplaces with chimneys

This is a truly extraordinary place which requires all possible protection. There is in San Mateo County no other site like this. Vallemar Bluff has, in addition to spectacular bluffs, both coastal prairie and a Monterey Cypress grove. It is bordered by a public park, the California Coastal trail, and a beloved public trail. It is adjacent to unique flora and unique geological formations, all close to the dense populations of bayside cities. Members of the public from San Mateo County's ever-increasing population will want to enjoy its natural beauty.

Planning decisions and conditions mandated for this Vallemar Bluff development need the highest standards of regulatory protection. These decisions are for the ages.

We very much appreciate your consideration of our concerns.

Sincerely,

Jim and Kathy Lockhart

Dave Holbrook

From: dedehistand@yahoo.com
Sent: Saturday, February 03, 2018 9:55 AM
To: Dave Holbrook
Subject: Houses proposed for Vallemar Bluff

Dear Mr Holbrook,

My husband, Michael Histan, and I purchased our house at 200 Wienke Way, Moss Beach almost 22 years ago. Before we even saw the house, we fell in love with the bluff and the beach below, realizing what a unique area it is. Due to the flu, we weren't able to be at the last MCC meeting, but did send our remarks via e mail. First of all, we want to express our appreciation for all the time and the communication there has been concerning this project and the proposed houses for the bluff. As neighbors who will deeply feel the impact the buildings will make in this very special area, we feel we must express our feelings.

We are grateful that the public trail and the rare coastal prairie will be protected and preserved. From disabled people to artists with their easels, to walkers like ourselves, this trail and area along the cliff is used constantly. The solitude of the area is what draws many of us. And with that in mind, we must express our concern about the height of the houses proposed. From the beach, for example, the house proposed for Lot #1 can be seen entirely from the ground to the top floor. We in the neighborhood are pleading with you to consider eliminating the 3rd floor "catwalks" so that the houses would be less intrusive on the bluff. With aesthetics in mind, please also consider reducing the number of the beautiful Monterey Cypress that will be eliminated. Please reconsider keeping more than just one in tact.

Going forward, we understand that you have limitations as to what can be legislated. We are just trying to minimize the dramatic effect that these proposed buildings will have on this unique property. Thank you so much for reading this and considering our concerns.

Sincerely,
Deana and Michael Histan (owners)
200 Wienke Wy (PO Box 951)
Moss Beach

Tel: 650-728-2515

Sent from my iPad

Richard Vallejos

From: Stephanie Sills <maiurano@hotmail.com>
Sent: Monday, February 05, 2018 4:37 PM
To: Dave Holbrook
Subject: Vallemar Bluff Development
Attachments: IMG_3755.JPG; IMG_3758.JPG

Dear Mr. Holbrook,

My husband and I have been residents of the Wienke Way neighborhood in Moss Beach since May 2006. We have treasured the 12 years we've lived here and consider ourselves stewards of both the beach and bluffs. We walk them regularly, picking up stray trash and appreciating the flora and fauna around us. We've seen dramatic changes over this relatively short period time, but nothing compares to the housing development planned for Vallemar Bluff.

It is in a spirit of care and concern that we write to you today, to express our dismay over the size, height and placement of the four homes planned, as well as the dramatic and detrimental impact they will surely have on this special place.

Please see attached photographs that I took from Wienke Beach showing how imposing and obtrusive these houses appear, given their extreme height and girth. The story poles show a mere outline, which is presently softened by the beautiful cypress grove bordering Vallemar. When the bluffs are denuded of nearly all the mature trees and the thin lines of poles are replaced by solid structures 3 stories high, that this pristine coastal prairie will be forever transformed into something, well, less special.

I understand that the developer has been open to receiving input from the community and Midcoast Community Council, and has kindly made concessions in the number and the placement of the planned homes. While I am grateful for those concessions, more could be done to protect and preserve the aesthetics of this sensitive habitat and its inhabitants without significant impact to the profit they stand to make from the project. Furthermore, I'm concerned the MCC seems reluctant to press for anything further, despite unanimous agreement by council members that the development is excessive.

To paraphrase a discussion at the Jan 24th MCC meeting, there was some fear that this developer *'may become fed up with all of the requests to revise their plans and retaliate in some way, such as by selling the project to a less community-minded firm, resulting in a less agreeable solution.'*

While I have always been very impressed by the intelligent and thoughtful governance I've witnessed by the MCC, as a resident of this community – and not an elected representative – I don't share the same reluctance. Therefore, I'm writing to you directly, to propose three design changes of my own:

1. Eliminate the 3rd level. The developer purports that this is not meant as living space. If that is the case, there should be no problem lowering the roof lines to just 2 stories, in keeping with the heights of other homes in the neighborhood. This would greatly minimize the obtrusive appearance from the beach.

2. Preserve more of the mature cypress trees (and the raptors that nest in them.) For example, saving the trees numbered 161, 167, 169 and 170 would help to obscure the dominance of these homes and to provide each with more privacy.
3. Implement eco-friendly solutions to mitigate water pooling and runoff issues. For example, aquatic gardens, green roofs, permeable paving, etc., may help to offset the removal of plants and trees necessary to build these houses.

On a final note, please consider the point that any one of these homes taken individually feels greatly out of scale and character with the surrounding neighborhood. Multiplying the impacts fourfold will surely have a compounding negative effect.

Thank you for taking the time to read and carefully consider this letter.

Sincerely,

Stephanie Sills
650-678-5707

Richard Vallejos

From: SORFLEET/CROIX <fleeter@comcast.net>
Sent: Saturday, February 10, 2018 11:42 PM
To: Dave Holbrook
Subject: Vallemar Bluff Development

Dr. Mr. Holbrook

My husband and I have resided on Wienke Way in Moss Beach for 24 years. I have walked the bluffs and Vallemar Street almost every day since I moved to this area. It never ceases to amaze me how beautiful the Vallemar bluffs are both along the trail as well as the view while walking along Vallemar. looking through the trees. My children have learned valuable life lessons and a deep appreciation for nature from growing up close to the bluffs. My family has a deeper understanding of erosion, ornithology, dendrology, and astronomy as this area allows one to experience many things that cannot be done along other areas of coastal Moss Beach. One can see unobstructed constellations without the light of multiple houses. Sitting on the bench, one can watch the blue heron groom itself, hunt for voles, or rest in the meadow.. In the very early morning before the sun rises the red fox can be seen hunting in the field and along the cypress trees. These are just a few of the things one can experience if they take the opportunity to hang out along the Vallemar bluffs. These bluffs have been a gathering spot for neighbors as well as strangers to socialize, watch sunsets, take photographs, play with children, walk dogs and learn about the coast. Travelers staying at the youth hostel frequently travel along the bluffs on their walk to the marine reserve. At least once a week, one of these travelers will stop me to express how beautiful the bluffs and the field are and how lucky I am to have them as my backyard.

With all of that said, I hope you have taken the time to experience the Vallemar bluffs, meadow, and cypress grove because it is truly a magical place as you will not find another area like it from Half Moon Bay to Montara. I understand it will be built upon and that I cannot change. I will always be grateful for all the time my family has had to enjoy it. I would, however, like to see some changes to the developers plan.

Please consider the following:

1. Reduce the square footage of these homes to fit in with the rest of the homes in the area.
2. Preserve more of the cypress grove for the nesting birds and animals.
3. Eliminate the 3rd level and lower the roof line to 2 stories. The nocturnal animals would appreciate a little less light.

By doing these 3 things, there will be less of an impact to the birds and animals that hunt and nest here, the flora which grow here, and to the community that has grown to love this area for its natural beauty. I can only hope future generations can experience some of the Vallemar Bluffs and meadow.

Please take the time to experience this area both during the day and night before making a decision about this area.

Thank you.

Sincerely,

Donna Croix

650-580-1397

Richard Vallejos

From: Debbie McCarthy <debbiemccarthy4@gmail.com>
Sent: Wednesday, February 07, 2018 3:19 PM
To: Dave Holbrook
Subject: Vallemar Bluff Development

Dear Mr. Holbrook,

My husband and I are residents of the Weinke neighborhood in Moss Beach and I am writing concerning the home project slated for the Vallemar Bluff. We've been in the neighborhood for 8 years.

We attended some of the meetings when the project was still going through the design review. It was disheartening that there was little concern for the size, scope and overall design scale that will impact the small bluff. The size of the homes are out of character for the neighborhood and will change the nature of the bluff, neighborhood and environment.

We understand that people can choose to do whatever they want with their property within the guidelines of the planning commission and we support that right. We simply struggle with having people who are not residents and plan to be, who show little regard for their new neighbors, the make-up of the neighborhood, and the beauty of the environment that gives so much pleasure to so many and has for many, many years. Weddings, reunions, picnics all happen on that bluff. The Blue Heron are spectacular to watch this time of the year.

When we looked at the set back from the bluff, fortunately one of our neighbors painstakingly ran tape at the edge of the properties to illustrate just how little bluff /trail would be left for public use, we were astounded. With the bluff erosion happening in little time there may be no trail to maintain.

The story poles were a complete misrepresentation, the story poles did not show anyone how the trees, which provide relief to many of us when the wind whips through the area, will be gone or the mass of the homes.

We would like to ask that you consider the following changes to these homes:

- 1) Remove the 3rd floor, and keep with the height of the homes in the immediate neighborhood. The architect/builder all but acknowledged at a meeting the 3rd story was not living quarters, more for aesthetic purposes.
- 2) Keep as many Cypress trees as possible, this is home to hawks and raptors, and would give each home more privacy.

Thank you, and we simply do not want to become known as the Malibu Beach of the northern California coastline.

Sincerely yours,

Jim and Debbie McCarthy

Richard Vallejos

From: Gail Erwin <gailerw@comcast.net>
Sent: Tuesday, February 06, 2018 1:50 PM
To: Dave Holbrook
Subject: The New Houses proposed for the Vallemar Bluffs

Febr. 6, 2018

Dear Mr. Holbrook,

As residents of this Moss Beach neighborhood for twenty years, we have been heartened by the reduction in number of the proposed development on the Vallemar Bluffs. We also applaud the conservation efforts to preserve the rare coastal prairie.

We are, however, alarmed by the size and height of the proposed houses. A mezzanine is another floor, plain and simple. The outdoor patio configurations feature their own fireplaces and increase the footprint of the buildings.

We fear that the size of these houses will change the character of our neighborhood, encouraging weekend, part time residents without the commitment to the area that would be ideal.

We are also concerned that any kind of armoring of the cliffs be strictly prohibited, and that the public use trail should be a protected area subject to reconfiguration due to erosion.

Thank you for your time and attention. We appreciate your consideration.

Sincerely,

Gail Erwin and Paul Smith
21 Julianna Ave.
Moss Beach, CA

650-728-7821

Dave Holbrook

From: Mike Schelp <mike@hmbmike.com>
Sent: Tuesday, February 06, 2018 2:42 PM
To: Dave Holbrook
Cc: Gail Erwin; Dede Histan; Jim & Kathy Lockhart; Stephanie Sills
Subject: The New Houses proposed for the Vallemar Bluffs

Hi Dave,

I absolutely agree with Gail Erwin with regards to the new homes proposal. I was dismayed at one of the design review meetings that one of the panel members stood up to say that the charter of the "Design Review Committee" was not to evaluate size but only to address design. As part of the design review they have considered siding, dormers, paint colors, etc. The size of the homes is no different than these other criteria in terms of how the homes fit the neighborhood. For the review committee not to seriously take size into consideration is a major mistake in their mission as I understand it. As they said in the OJ trial, "If it doesn't fit...."

Thanks again for your consideration.

Mike Schelp

From: Gail Erwin <gailerw@comcast.net>

Subject: The New Houses proposed for the Vallemar Bluffs

Date: February 6, 2018 at 1:50:14 PM PST

To: Dave Holbrook <dholbrook@smcgov.org>

Febr. 6, 2018

Dear Mr. Holbrook,

As residents of this Moss Beach neighborhood for twenty years, we have been heartened by the reduction in number of the proposed development on the Vallemar Bluffs. We also applaud the conservation efforts to preserve the rare coastal prairie.

We are, however, alarmed by the size and height of the proposed houses. A mezzanine is another floor, plain and simple. The outdoor patio configurations feature their own fireplaces and increase the footprint of the buildings.

We fear that the size of these houses will change the character of our neighborhood, encouraging weekend, part time residents without the commitment to the area that would be ideal.

We are also concerned that any kind of armoring of the cliffs be strictly prohibited, and that the public use trail should be a protected area subject to reconfiguration due to erosion.

Thank you for your time and attention. We appreciate your consideration.
Sincerely,

Gail Erwin and Paul Smith
21 Julianna Ave.
Moss Beach, CA
650-728-7821



County of San Mateo - Planning and Building Department

ATTACHMENT CC

STATE OF CALIFORNIA

Edmund G. Brown Jr., Governor

NATIVE AMERICAN HERITAGE COMMISSION

Environmental and Cultural Department
1550 Harbor Blvd., Suite 100
West Sacramento, CA 95691
Phone (916) 373-3710
Fax (916) 373-5471



October 22, 2018

David Holbrook
San Mateo County Planning Department
455 County Center, 2nd Floor
Redwood City, CA 98063

Also sent via e-mail: dholbrook@smcgov.org

Re: SCH# 2018102027, Four Residences at Vallemar Bluffs Project, Community of Mos Beach; San Mateo County, California

Dear Mr. Holbrook:

The Native American Heritage Commission (NAHC) has reviewed the Mitigated Negative Declaration (MND) prepared for the project referenced above. The review included the Project Description; and the Revised Initial Study/ Environmental Evaluation Checklist, section 5, Cultural Resources, and section 17, Tribal Cultural Resources prepared by the San Mateo County Planning Department. We have the following concerns:

- In the Discussion section of Tribal Cultural Resources, the statement that "The project is not subject to Assembly Bill 52" is inaccurate. While the tribal consultation requirements portion of AB52 are not applicable because tribes have not submitted letters requesting contact for projects, other portions of AB52 do apply to the project.
- Mitigation for inadvertent finds of human remains in MM 31 is inaccurate. There is no time limit on when the inspection by the MLD can take place. The MLD has 48 hours from the time they are given access to the site to make recommendations. Please refer to California Public Resources Code § 5097.98 for the process of designating a MLD for human remains determined to be Native American.

Please contact me at gayle.totton@nahc.ca.gov or call (916) 373-3714 if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Gayle Totton".

Gayle Totton, B.S., M.A., Ph.D.
Associate Governmental Project Analyst

Attachment

cc: State Clearinghouse



County of San Mateo - Planning and Building Department

ATTACHMENT DD

ATTACHMENT DD

COUNTY OF SAN MATEO
DEPARTMENT OF PUBLIC WORKS

James C. Porter
Director

County Government Center
555 County Center, 5th Floor
Redwood City, CA 94063
650-363-4100 T
650-361-8220 F
www.smcgov.org

January 23, 2018

David Holbrook, Senior Planner
Planning & Building Dept.
455 County Center, 2nd Floor
Redwood City, CA 94063

Re: Notice of Intent to Adopt Mitigated Negative Declaration for four (4) New Residences in Moss Beach

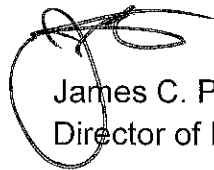
Mr. Holbrook,

We appreciate the opportunity to comment on the Notice of Intent to Adopt Mitigated Negative Declaration for the proposed four new residences in Moss Beach on Vallemar Street and Julianna Avenue. Our comments are included below:

The location of the proposed new residences is less than one mile from the departure end of Runway 30 at the Half Moon Bay Airport (Airport) and directly under the departure flight path for Runway 30 (used 90% of the time). According to the Federal Aviation Administration, the Half Moon Bay Airport has approximately 22,500 departures from Runway 30 per year. Any new residences in this location will be markedly impacted by aircraft departure noise.

Section 5(d) of the Mitigated Negative Declaration states that the "*Project will not create environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly.*" Due to the proposed project's location, proximity to the Airport, and Runway 30 departure activity listed above, we request that aircraft noise impacts be added to Section 5(d) of the Mitigated Negative Declaration.

Sincerely,



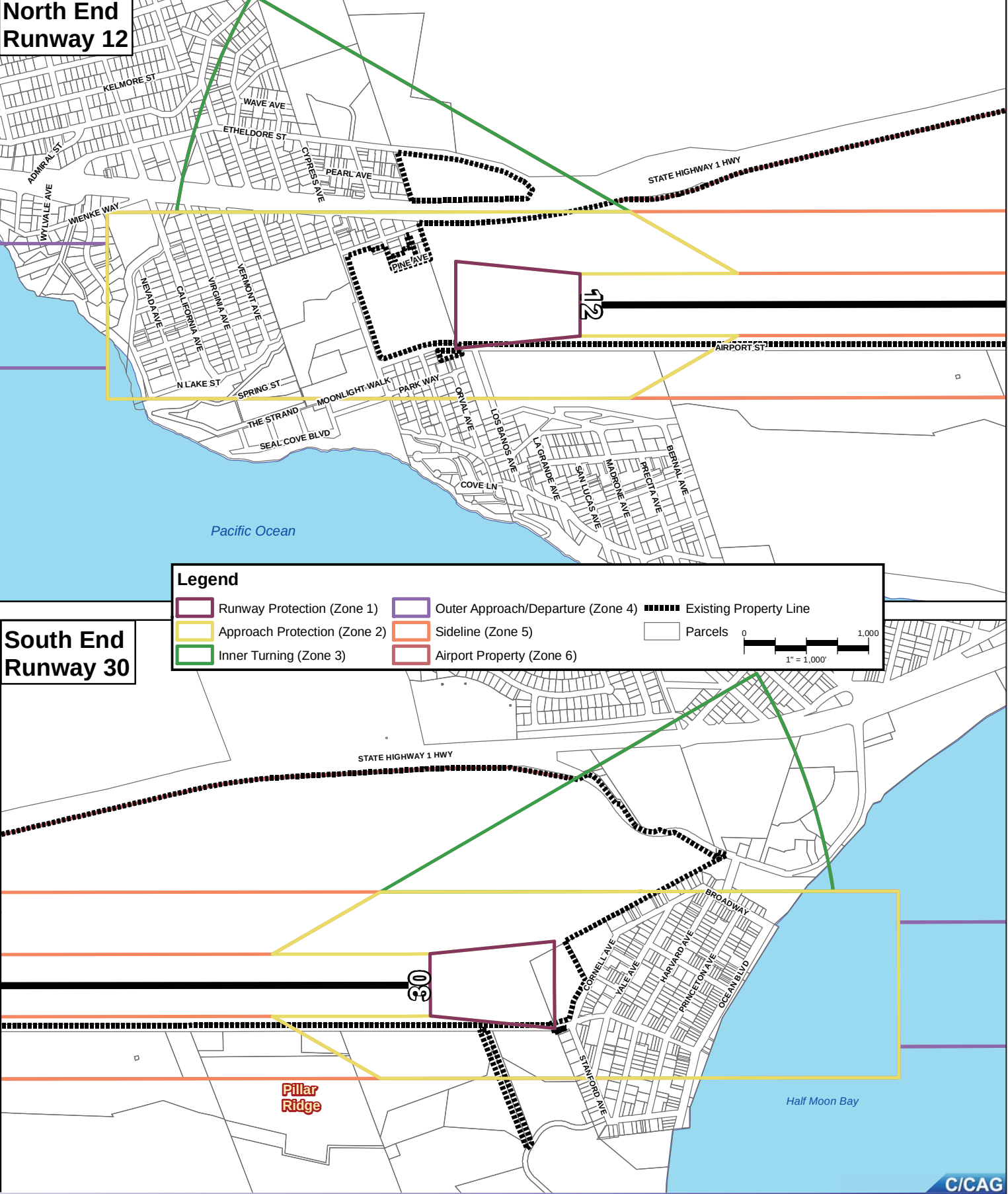
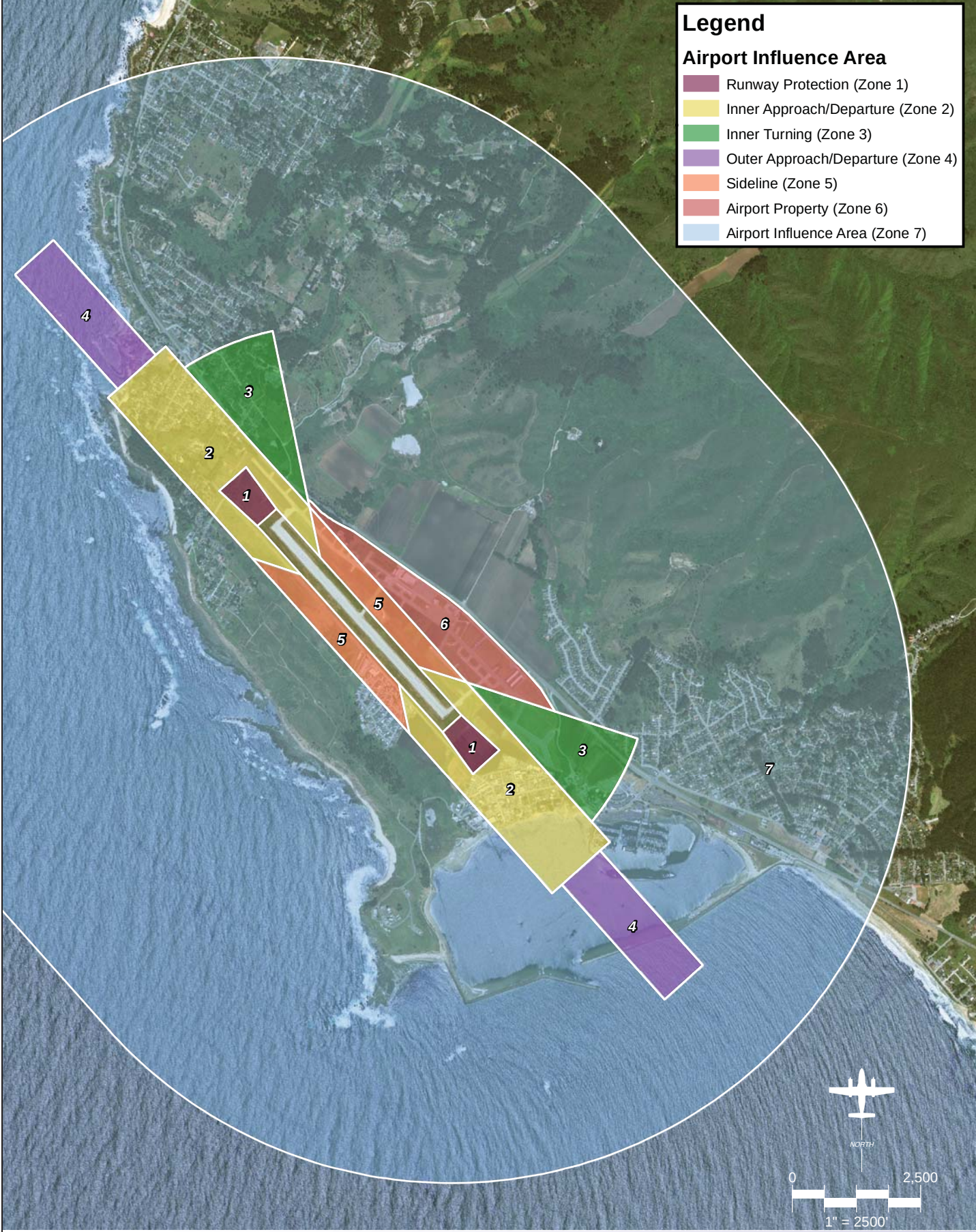
James C. Porter
Director of Public Works





County of San Mateo - Planning and Building Department

ATTACHMENT DD1





County of San Mateo - Planning and Building Department

ATTACHMENT EE

San Mateo County Planning & Building Department

Maximum Building Heights in Unincorporated San Mateo County

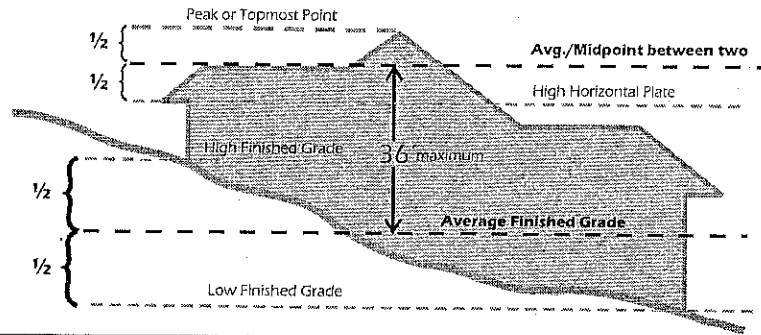
Heights Verification, per County procedures, is required for all homes, designed within 2 feet of the maximum height limit, and is required for all homes in Design Review Districts, regardless of proposed height. See Planner for additional information.

NOTE: All elevation exhibits shown below are intended only as examples to illustrate how height is generally calculated for the cited zoning districts; height compliance confirmation is applicable to all elevation plans (critical with variable topography). Always refer to the respective building height regulations for the applicable zoning district.

Zoning/Combining Districts: S-1 thru S-11, S-81, S-83, SS-103, S-108, RM RM-CZ, TPZ, TPZ-CZ, PAD:

35 ft./36 ft. Height Limit

(Average Finished Grade to Average Roofline)



Project's Method of Height Measurement

Zoning/Combining Districts:
S-17, S-50, S-72 thru S-74, S-82, S-90, S-92 thru S-94, S-100, S-105

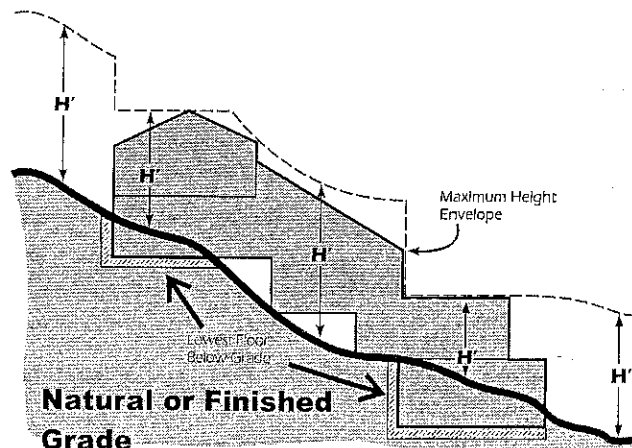
(Natural Grade² to topmost point of building immediately above).

28 ft. to 33 ft. Height Limit

Zoning/Combining Districts:
S-95, S-101, S-104, S-106, S-110

(Natural Grade² or Finished Grade¹ to topmost point of building immediately above, whichever is lower).

28 ft. to 30 ft. Height Limit



¹ Finished Grade (pursuant to sec. 6102.14) is defined as the topographic contours which result after completion of construction on the site. Average finished grade is the average level of the finished grade adjacent to building walls. The outer edges of projecting decks & balconies shall not be counted as "walls" if they are unenclosed below (supporting posts OK) & uncovered above. The average grade shall be calculated by topographic elevations noted at all building wall corners, noted both on the site plan & corresponding elevation plans.

² Natural Grade is defined as the topographic contours which exist prior to any disturbance related to construction on the site.



County of San Mateo - Planning and Building Department

ATTACHMENT FF

CHRONOLOGY OF CREATION OF PARCELS COMPRISING PROJECT SITE

1908 - Subject parcels created as part of recorded Moss Beach Heights subdivision (specifically lots 10 thru 49).

7/6/1965 - BOS adopts Midcoast General Plan; subject parcels designated Single-Family ("Medium Density Res."); zoning: R-1/S-7.

Early/mid-1970s (specific date unknown) - Subject parcels zoned "C-1", "Parking" & "R-1/S-7".

1973 - Subject parcels' General Plan designation of "Open Space" & zoned "RM".

1980 - LCP certified by CA Coastal Commission (CCC); followed by many subsequent rezonings; in the Coastal Zone (including where applicable in the Midcoast); "RM" zone parcels changed to "RM-CZ". Zoning Regulations (*Coastal Development District*), Section 6328.5 (*Exemptions*), subsection (i) exempts lot line adjustments.

10/4/1988 - Subject parcels (previously 037-086-160 & -170) purchased by Richard Charnock.

9/11/1989 - Charnock applies for Lot Line Adjustment (LLA) to reconfigure parcels into 7 lots. The LLA qualifies for a CDX because the County's exemption criteria specifically cites such exemptions. Also, LLA's can be processed administratively, with County policy for notification followed.

2/2/1990 - County approves LLA, which creates 7 parcels.

5/7/1991 - Record of Survey recorded (condition of LLA).

5/28/1991 - Approved LLA recorded.

1/20/1994 - Corrected LLA recorded

1997 - CDP submitted (Case # CDP97-0016) on 037-086-260 for domestic well. Appealed to CA Coastal Commission (CCC).

7/8/1998 - CCC approves domestic well on appeal. Its approval cites no issues with the project parcel's legal status.

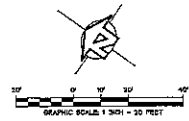
11/25/1998 - Letter from CCC (Jack Liebster) regarding the proposed well cited above (CDP97-0016) stating that the CCC doesn't believe the previously approved and recorded LLA qualified for a CDX, but requires a CDP. Staff meets with CCC staff in the next few weeks. This letter includes copy of a 6/5/1998 CCC letter regarding their same position, but on an entirely different LLA project (file # LLA96-0004) in Montara. There is no further correspondence from or action by the CCC regarding the legal status of the subject parcels.



County of San Mateo - Planning and Building Department

ATTACHMENT GG

ATTACHMENT GG



Tentative Map Sheet Index

- TM-1 SITE PLAN
- TM-2 EXISTING TREES & VEGETATION
- TM-3 TREE REMOVAL PLAN
- TM-4 TREE REPLACEMENT PLAN
- TM-5 TREE & SHrub PLANTING PLAN
- TM-6 SITE PLAN
- TM-7 GRADING PLAN
- TM-8 UTILITY AND DRAINAGE PLAN
- TM-9 DRAINAGE PROFILES
- TM-10 SEWER PROFILES
- TM-11 SITE PLAN

Flood Zone

DEVELOPER: MOSS BEACH ASSOCIATES, LLC
 COMMUNITY: SAN MATEO COUNTY
 PROJECT: 037-086-330
 SHEET: 1
 DATE: 07/17/18
 EFFECTIVE DATE: OCTOBER 18, 2012
 BASE MAP: AERIAL PHOTOGRAPHY DATED 2008
 FLOOD ZONE: 1% ANNUAL CHANCE FLOODPLAIN

Ownership Data

ALL TO THE FOLLOWING ASSessor PARCELS ARE
 VESTED IN MOSS BEACH ASSOCIATES, LLC
 APN 037-086-330
 APN 037-086-340
 APN 037-086-350
 APN 037-086-360
 APN 037-086-370
 APN 037-086-380
 APN 037-086-390

Vicinity Map



Project Data

Owner & Subdivider

MOSS BEACH ASSOCIATES, LLC
 P.O. BOX 337
 SANTA CRUZ, CA 95061-1331

Legal Description

BEING LOTS 1 THROUGH 5 INCLUSIVE, AS SHOWN
 ON THE RECORD OF SURVEY MAP, FILED ON
 MAY 7, 2018, IN VOLUME 13 OF MAPS, AT PAGE
 86, SAN MATEO COUNTY RECORDS

Existing Zoning

RM-02, DR, C2

Existing Use

URBAN, OPEN SPACE

Proposed Use

SINGLE FAMILY RESIDENTIAL

Sanitary Sewer

MONTARA WATER & SANITARY DISTRICT

Storm Water

MICROBEST COMMUNITY COUNCIL

Water Service

MONTARA WATER & SANITARY DISTRICT

Gas & Electric

PACIFIC GAS & ELECTRIC (PG&E)

Total Area

102,226 SQUARE FEET (2.35 ACRES)

Basis of Bearings

THE BASIS OF BEARINGS FOR THIS SURVEY IS BETWEEN
 MONUMENTS PLACING ALONG THE NORTHEASTLY LINE OF THE
 STRAND AS SHOWN ON THE RECORD OF SURVEY MAP FILED
 FOR RECORD IN VOLUME 13 OF MAPS, AT PAGE 86, SAN
 MATEO COUNTY RECORDS.

BASE OF BEARINGS = S150°10'00"

Benchmark

THE ELEVATIONS SHOWN ON THIS SURVEY ARE BASED ON
 MONUMENT MARK 6 FINAL A 2-1/2" HIGH BRASS DISK
 STAKED TO POINT "1993". SET IN THE CONCRETE MONUMENT
 OF A 24" HIGH DIAMETER PIPE (CONCRETE) END AT THE
 INTERSECTION OF STATE HIGHWAY 101 AND FUTURE
 STREET.

BENCHMARK ELEVATION = 86.01' (NAD 83)

Legend

- MONUMENT FOUND AS NOTED - SEE SHEET TM-2
- BUILDING OVERLAP, OR AVOIDING
- BUILDING FOOTPRINT
- ASPHALT CONCRETE, AC (24"X24")
- CONCRETE
- PRIORITY BOUNDARY
- PROPOSED LOT LINES
- EXISTING LOT LINES
- EXISTING EASEMENT LINES
- ALL DISTANCES SHOWN ARE IN FEET AND DECIMALS THEREOF.

PROPOSED SITE PLAN
Vallejo Bluffs
 Vallejo Street, Moss Beach, CA

APN: 037-086-330 THRU -390
 SHEET: 07/10/17
 SCALE: 1/2"=30'

DATE: 07/10/17
 SHEET: 07/10/17
 SCALE: 1/2"=30'

SHEET: TM-1
 OF 1 SHEETS
 JOB NO. 613009

APPROVED: [Signature]
 IFLAND SURVEY
 Surveying - Mapping - GIS
 2000 Inland Avenue, Suite 100, Santa Cruz, CA 95061
 Tel: 408-426-8888 Fax: 408-426-8889

APPROVED: [Signature]
 MOSS BEACH ASSOCIATES, LLC
 2000 Inland Avenue, Suite 100, Santa Cruz, CA 95061
 Tel: 408-426-8888 Fax: 408-426-8889