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STAFF REPORT: REGULAR CALENDAR

Application No.:	**1-12-014**
Applicant:	**Glen Berry and Cherie Evans**
Agent:	Quillman Construction
Location:	98 Rayipa Lane, approximately two miles south of the City of Trinidad, Westhaven area, Humboldt County (APN 514-181-63).
Project Description:	(1) Construct a new retaining wall structure to replace and stabilize the remains of two existing retaining walls recently damaged by a fallen tree (one critically damaged and the other with soil undermining) that protect an existing pre-Coastal Act single family residence, and (2) replace a stairway access along the north side of the house also critically damaged by the fallen tree that is necessary for access to the west side of the house.
Staff Recommendation:	Approval with conditions.

SUMMARY OF STAFF RECOMMENDATION

The applicants propose to (1) construct a new retaining wall structure to replace and stabilize the remains of two existing retaining walls recently damaged by a fallen tree (one critically damaged

and the other with soil undermining), and (2) replace a stairway access along the north side of the existing single family residence also critically damaged by the fallen tree that is necessary for access to the western exterior of the house. The existing house was built in approximately the 1930s.

The new retaining wall structure would consist of a lower (down the hillside) keystone wall with a 120-square-foot exposed face area to replace the existing lower critically damaged retaining wall and an upper 8-foot-tall cantilevered concrete wall with a 220-square-foot exposed face area to stabilize the existing upper retaining wall with undermined soil. A portion of the ground between the two new walls would be excavated then backfilled and compacted in layers within a geogrid system to increase stability (see project plans, **Exhibit 4**, and site photos, **Exhibits 5, 6**).

The project site is an approximately 0.35-acre parcel located at 98 Rayipa Lane, a private street, approximately two miles south of the City of Trinidad in Humboldt County (**Exhibits 1-3**). The property is currently developed with a single family residence and on-site sewage disposal system. The site is located on a coastal bluff and is adjacent to and visible from Moonstone Beach County Park, a popular park and recreation area.

The principal Coastal Act issues raised by the development include geologic hazards and visual impacts. The applicant has provided geotechnical information that evaluated the geologic stability of the subject site in relation to the proposed development as well as bluff retreat and erosion rates for the project area. The results of the slope stability evaluation indicate a sufficiently stable slope at the project site to support the proposed development. According to the results of this bluff retreat analysis, there was no discernable retreat rate of the bluff adjacent to the project site between 1942 and 2011. The Commission's geologist reviewed the geotechnical analyses and information and generally agrees with the conclusions and recommendations. Staff recommends **Special Conditions 1**, **2**, and **3** to ensure that the proposed development will not contribute significantly to the creation of any geologic hazards and will not have adverse impacts on slope stability or cause erosion, consistent with Section 30253 of the Coastal Act.

The proposed project will be located on a densely vegetated bluff that is visible to the public from Moonstone Beach (**Exhibit 6**). To ensure that the new development protects public views to and along this scenic coastal area and is visually compatible with the character of surrounding area, consistent with Section 30251 of the Coastal Act, Commission staff recommends **Special Conditions 4** (to require submittal of a landscape plan prepared by a qualified botanist or licensed landscape architect that provides for landscaping, using native, evergreen, regionally appropriate, drought-tolerant vegetation to screen the approved retaining wall structures from public vantage points on Moonstone Beach) and **5** (to require the applicants to provide a specific color plan for the retaining walls that will help blend the structures with the natural bluff face, thereby mitigating the visual impact of the development from the beach below).

In summary, Commission staff believes that the proposed project, as conditioned, is consistent with all applicable Chapter 3 policies of the Coastal Act and recommends **approval** of CDP application 1-12-014, as conditioned. The Motion and Resolution are on page 4.

TABLE OF CONTENTS

I. MOTION AND RESOLUTION 4
II. STANDARD CONDITIONS 4
III. SPECIAL CONDITIONS 5
IV. FINDINGS AND DECLARATIONS 7
- **A.** PROJECT DESCRIPTION AND ENVIRONMENTAL SETTING 8
- **B.** PREVIOUS COMMISSION ACTIONS 8
- **C.** OTHER AGENCY APPROVALS 9
- **D.** GEOLOGIC HAZARDS 9
- **E.** VISUAL RESOURCES 11
- **F.** PROTECTION OF WATER QUALITY & ADJACENT RECREATION AREAS 12
- **G.** PUBLIC ACCESS 13
- **H.** LOCAL COASTAL PROGRAM 14
- **I.** CALIFORNIA ENVIRONMENTAL QUALITY ACT 14

APPENDICES

Appendix A – Substantive File Documents

EXHIBITS

Exhibit 1 – Regional location map
Exhibit 2 – Project vicinity map
Exhibit 3 – Parcel boundaries (approximate)
Exhibit 4 – Proposed project plans
Exhibit 5 – Site photo (with project features)
Exhibit 6 – Photos of site from Moonstone Beach (with project features)
Exhibit 7 – Simulation of wall appearance from Moonstone Beach
Exhibit 8 – Geotechnical reports
Exhibit 9 – Aerial photo chronology (1972-2009)

I. MOTION AND RESOLUTION

The staff recommends that the Commission adopt the following resolution:

Motion:

I move that the Commission approve coastal development permit 1-12-014 pursuant to the staff recommendation.

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in approval of the permit as conditioned and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution:

The Commission hereby approves coastal development permit 1-12-014 and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act and will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

II. STANDARD CONDITIONS

This permit is granted subject to the following standard conditions:

1. **Notice of Receipt and Acknowledgment**: The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.

2. **Expiration**: If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable amount of time. Application for extension of the permit must be made prior to the expiration date.

3. **Interpretation**: Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.

4. **Assignment**: The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.

5. **Terms and Conditions Run with the Land**: These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

III. SPECIAL CONDITIONS

This permit is granted subject to the following special conditions:

1. **Conformance of Final Design and Construction Plans to the Geotechnical Reports**. All final design and construction plans shall be consistent with the recommendations contained in the LACO geologic report dated August 8, 2012 and LACO geotechnical memorandum dated August 23, 2012 prepared for the proposed retaining wall project.
   a. PRIOR TO ISSUANCE OF THIS COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the Executive Director's review and approval, evidence that a licensed professional (Certified Engineering Geologist or Geotechnical Engineer) has reviewed and approved all final design, construction, foundation, and drainage plans and has certified that all plans are consistent with the recommendations specified in the above-referenced geologic reports approved by the California Coastal Commission for the project site.
   b. The permittee shall undertake development in accordance with the approved final plans. Any proposed changes to the approved final plans shall be reported to the Executive Director. No changes to the approved final plans shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

2. **Assumption of Risk, Waiver of Liability, and Indemnity Agreement**. By acceptance of this permit, the applicants acknowledge and agree (i) that the site may be subject to hazards from earthquakes, erosion, landslides, bluff failure, and other geologic hazards; (ii) to assume the risks to the applicants and the property that is the subject of this permit of injury and damage from such hazards in connection with this permitted development; (iii) to unconditionally waive any claim of damage or liability against the Commission, its officers, agents, and employees for injury or damage from such hazards; and (iv) to indemnify and hold harmless the 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.

3. **Deed Restriction Recordation of Permit Conditions**. PRIOR TO ISSUANCE OF THIS 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 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.

4. **Landscape Plan**

   a. PRIOR TO ISSUANCE OF THIS COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and approval of the Executive Director, a plan for landscaping to screen the approved retaining wall structures from public vantage points on Moonstone Beach. The plan shall be prepared by a qualified botanist or licensed landscape architect.

      i. The plan shall demonstrate that (a) native trees and/or shrubs will be installed at the foot of each retaining wall in a manner designed to screen the walls from view from Moonstone Beach with plantings spaced no more than 8 feet apart, (b) all plantings will consist of native, evergreen, regionally appropriate, drought-tolerant tree and/or shrub species that conforms with the requirements of Special Condition 7, (c) all planting will be completed by within 60 days after completion of construction, and (d) all required plantings will be maintained in good growing conditions through-out the life of the project and whenever necessary shall be replaced with new plant materials to ensure continued compliance with the landscape plan.

      ii. The plan shall include, at a minimum, the following components: (a) a map showing the type, size, and location of all plant materials that will be on the developed site, topography of the developed site, and all other landscape features, and (b) a schedule for installation of the proposed plants.

   b. The permittee shall undertake development in accordance with the approved final plan. Any proposed changes to the approved final plan shall be reported to the Executive Director. No changes to the approved final plan shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

5. **Retaining Wall Color Plan**

   a. PRIOR TO ISSUANCE OF THIS COASTAL DEVELOPMENT PERMIT, the applicant shall submit, for the review and written approval of the Executive Director, a plan demonstrating that the colors of the approved retaining walls will be compatible with the adjacent natural hillslope vegetation. The plan shall demonstrate:

      i. The retaining walls will be constructed with keystones and concrete that have been colored with darker earth tones that are compatible with the adjacent natural hillslope vegetation, and

ii. White, light grey, pastels, or other light or non-earth-tone colors will not be used, and

iii. The approved colors will be maintained throughout the life of the retaining wall structure.

b. The permittee shall undertake development in accordance with the approved final plan. Any proposed changes to the approved final plan shall be reported to the Executive Director. No changes to the approved final plan shall occur without a Commission amendment to this coastal development permit unless the Executive Director determines that no amendment is legally required.

6. **Construction Responsibilities.** The applicant shall comply with the following construction-related requirements:

a. Silt screens and/or other appropriate erosion and runoff control devices shall be installed as appropriate in construction areas prior to the initiation of construction activities and shall be maintained throughout project construction;

b. All areas of disturbed soil shall be seeded, in accordance with Special Condition 7, and mulched with weed-free rice straw within three days of completion of construction;

c. No construction materials, debris, or waste shall be placed or stored where it may be subject to entering coastal waters or wetlands;

d. If rainfall is forecast during the time construction activities are being performed, any exposed soil areas shall be promptly mulched with weed-free rice straw and/or covered with plastic sheeting or other appropriate materials before the onset of precipitation; and

e. Any and all debris resulting from construction activities shall be removed from the project site and disposed of at an authorized disposal location within 10 days of project completion.

7. **Revegetation Standards and Restrictions.**

a. Only native plant species shall be used on the property. All proposed plantings and erosion-control seeding shall be obtained from local genetic stocks within Humboldt County. If documentation is provided to the Executive Director that demonstrates that native vegetation from local genetic stock is not available, native vegetation obtained from genetic stock outside of the local area may be used. No plant species listed as problematic and/or invasive by the California Native Plant Society, the California Invasive Plant Council, or as may be identified from time to time by the State of California, shall be employed or allowed to naturalize or persist on the site. No plant species listed as a "noxious weed" by the State of California or the federal government shall be utilized within the property; and

b. Rodenticides containing any anticoagulant compounds, including but not limited to, Bromadiolone, Brodifacoum, or Diphacinone, shall not be used on the property.

IV. FINDINGS AND DECLARATIONS

The Commission hereby finds and declares as follows:

A. PROJECT DESCRIPTION AND ENVIRONMENTAL SETTING

The applicants propose to (1) construct a new retaining wall structure to replace and stabilize the remains of two existing retaining walls recently damaged by a fallen tree (one critically damaged and the other with soil undermining) that protect an existing pre-Coastal Act single family residence, and (2) replace a stairway access along the north side of the existing single family residence also critically damaged by the fallen tree that is necessary for access to the western exterior of the house. According to the applicants' agent, the existing house was built in approximately the 1930s, and the existing concrete landing and stairs that provide access to and around the existing house were constructed in the 1960s. The fallen pine tree that caused the damage to the existing retaining walls fell naturally during the winter of 2011/2012.

The new retaining wall structure would consist of a lower (down the hillside) keystone wall with a 120-square-foot exposed face area to replace the existing lower critically damaged retaining wall and an upper 8-foot-tall cantilevered concrete wall with a 220-square-foot exposed face area to stabilize the existing upper retaining wall with undermined soil. A portion of the ground between the two new walls will be excavated then backfilled and compacted in layers within a geogrid system to increase stability (see project plans, **Exhibit 4**, and site photos, **Exhibits 5** and **6**). The existing lower retaining wall serves to stabilize the soil immediately around the western and northern sides of the existing house foundation. The existing upper retaining wall serves to stabilize the soil immediately adjacent to the existing landing that provides primary entry access to the house.

The project site is an approximately 0.35-acre parcel located at 98 Rayipa Lane, a private street, approximately two miles south of the City of Trinidad in Humboldt County (**Exhibits 1-3**). The property is currently developed with a single family residence and on-site sewage disposal system. The property is served by water from the Westhaven Community Services District.

The site is located on a coastal bluff between the first through public road (Scenic Drive) and the sea, at an elevation of approximately 100 feet above mean sea level. The existing house is situated on the eastern-most portion of the lot, just off the terminus of Rayipa Lane, on a grade break that slopes to the west with gradients ranging from ~10% to 80%.

There are no known environmentally sensitive habitat areas on the parcel. However, the property is located adjacent to and is visible from Moonstone Beach County Park, a popular park and recreation area that provides year-round public access to both rocky and sandy beach areas (see **Exhibits 6** and **7**).

Although Humboldt County has a certified local coastal program (LCP), the property is located in a non-certified area. As a consequence, the Commission retains CDP jurisdiction over the site, and the standard of review for issuance of a CDP is whether the development is consistent with the Chapter 3 policies of the Coastal Act.

B. PREVIOUS COMMISSION ACTIONS

In 1983, the Commission granted coastal development permit 1-83-118 for a lot line adjustment of an approximately 500 square-foot area between the subject parcel and the adjacent parcel to the east. The purpose of the lot line adjustment was to correct an error in the original construction of the existing single family residence across the property boundary. The CDP approval did not include any special conditions.

C. OTHER AGENCY APPROVALS

The proposed project requires no other approvals from other agencies other than a ministerial building permit from Humboldt County.

D. GEOLOGIC HAZARDS

Section 30253 of the Coastal Act states in part:

> *New development shall do all of the following:*
>
> *(a) Minimize risks to life and property in areas of high geologic, flood, and fire hazard.*
>
> *(b) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs…*

The property is situated on an uplifted Pleistocene marine terrace overlooking Moonstone Beach, a popular County park and recreation area. The portion of the property that is developed with the existing residence is gently to moderately sloped westward, with elevations ranging from 120 feet above mean sea level (msl) near the eastern side of the residence to 80 feet above msl near the western side of the residence.

As discussed above, the impetus for the subject CDP application is the recent falling and uprooting, due to natural causes, of a large pine tree, which resulted in the displacement and destabilization of soil and vegetative material that in part underlies two existing retaining walls constructed in the 1960s located near the northwesterly corner of the house. The purpose of the lower (down slope) existing soil retaining wall is to stabilize the soil immediately around the western and northern sides of the existing house foundation. The purpose of the upper existing soil retaining wall is to stabilize the soil immediately adjacent to the existing landing that provides primary entry access to the house. The uprooting of the fallen tree critically damaged the existing lower retaining wall and destabilized soil that underlays the existing upper retaining wall. The applicant proposes to install a new keystone retaining wall with a 120-ft^2 exposed face area to replace the existing lower wall and a new cantilevered concrete wall with a 220-ft^2 exposed face area to stabilize the existing upper wall. A portion of the ground between the two new walls will be excavated then backfilled and compacted in layers within a geogrid system to increase stability.

The applicant has submitted geotechnical information ("Slope Instability Report" by LACO, August 8, 2012 and subsequent geotechnical memorandum prepared by LACO dated August 23, 2012) (**Exhibit 8**) that evaluates the geologic stability of the subject site in relation to the

proposed development as well as bluff retreat and erosion rates for the project area. The geotechnical report documents "highly disturbed fills underlain by non-plastic and non-cemented to weakly-cemented marine terrace deposits" encountered during subsurface explorations of the site of the existing retaining walls. The report estimates sandy terrace deposits to be several tens of feet in depth and bedrock to be over 50 feet below ground surface. No groundwater was encountered during subsoil explorations and no saturated soil conditions are expected to be present in the project area.

The results of the slope stability evaluation indicate a relatively stable slope at the project site (Factor of Safety, F=1.41 for static conditions and 1.07 for seismic conditions). The geotechnical analysis also evaluated bluff retreat and erosion rates for the area. According to the results of this analysis, there was no discernable retreat rate of the bluff adjacent to the project site between 1942 and 2011 (and see **Exhibit 9**). The absence of bluff retreat in this area is attributed to the site's protection from environmental factors such as wind and wave action, which are controlled by the presence of heavy vegetation across the terrace face and the surrounding bedrock outcroppings. Rainfall events and the lack of efficient drainage systems on site and on the surrounding developed residential properties, rather than storm wave action or sea level rise, are more important factors in hillside erosion in the area.

The geotechnical memorandum includes conservative values to be used in the design of the new retaining wall and other recommendations. The geologic reports conclude that the subject site is suitable for the proposed development provided the recommendations contained in the geotechnical investigation prepared by the consultant are implemented in design and construction of the project. The Commission's geologist (Dr. Mark Johnsson) reviewed the geotechnical analyses and information and generally agrees with the conclusions and recommendations.

Adherence to the recommendations contained in the above-mentioned geotechnical investigations is necessary to ensure that the proposed project assures stability and structural integrity, and neither creates nor significantly to erosion, geologic instability, or destruction of the site or surrounding area. Thus, **Special Condition 1** is needed to require the applicant to conform to the geotechnical recommendations in the above mentioned geotechnical reports.

Although adherence to the geotechnical consultant's recommendations will minimize the risk of damage from erosion, the risk is not eliminated entirely. The site is an oceanfront bluff-top lot, which is inherently hazardous. Given that the applicants have chosen to implement the project despite potential risks from bluff erosion and landslides, the applicants must assume the risks. Therefore, the Commission imposes **Special Condition 2** requiring the applicants to assume the risk of the development. In this way, the applicants are notified that the Commission is not liable for damage as a result of approving the permit for development. The condition also requires the applicants to indemnify the Commission in the event that third parties bring an action against the Commission as a result of the failure of the development to withstand the hazards. Additionally, the Commission imposes **Special Condition 3** requiring the applicants to record a deed restriction to ensure that future owners of the property will be informed of the conditions of this permit.

As conditioned, the proposed development will not contribute significantly to the creation of any geologic hazards and will not have adverse impacts on slope stability or cause erosion, consistent with Section 30253 of the Coastal Act.

E. VISUAL RESOURCES

Section 30251 of the Coastal Act states, in applicable part, as follows:

> *The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas…*

The proposed project will be located on a coastal bluff face. The existing bluff is a natural landform that is visible to the public from Moonstone Beach (**Exhibit 6**). As proposed, the project involves minimal grading (a total of 10.9 cubic yards). According to the foundation design recommendations in the LACO geotechnical memorandum, a minimum of 2.5 feet of fill material will be required to be excavated to expose the underlying in-place terrace deposits. However, cut and fill are to be balanced on site, and no soil will be removed from the site. The final grade will be sloped at about 2% in the same direction as the surrounding terrain, and existing drainage patters will remain unchanged. Therefore, the Commission finds that the project as proposed minimizes the alteration of natural land forms.

The proposed new keystone retaining wall, which will be located lower down slope from the cantilevered wall and thus more visible to the public from the beach below, will have an above-ground maximum height of 9 feet and a 120-square-foot exposed face area. The upper cantilevered retaining wall will have an above-ground maximum height of 8 feet and a 220-square-foot exposed face area. A visual simulation of the proposed retaining wall structure, as viewed from Moonstone Beach, is included as **Exhibit 7**.

In order to address the visual impacts of the proposed new retaining wall structure, the applicants propose to plant landscaping that would blend with the extensive natural vegetation that occurs on the bluff to screen the walls from public view (see **Exhibit 4**, typical site section sheet). However, no details have been provided as to the type, size, or location of plants to be installed, when plants would be installed, or other important details. Without this information, there is no assurance that the proposed landscaping will be adequate to effectively screen the new development in a manner that protects public views. Therefore, the Commission attaches **Special Condition 4** to require submittal of a landscape plan prepared by a qualified botanist or licensed landscape architect that provides for landscaping, using native, evergreen, regionally appropriate, drought-tolerant vegetation to screen the approved retaining wall structures from public vantage points on Moonstone Beach. The condition requires that the applicant undertake development in accordance with the approved final landscaping plan.

Although the proposed landscaping, as conditioned, will screen the new development in a manner that protects public views, it will take time, perhaps several years, for the landscaping to

grow to the point where it functions as a complete and effective screen. In the interim, the retaining wall structure, particularly the lower keystone wall, will be visible to beach users looking inland, up the hillslope. The proposed plans do not provide specifications on proposed keystone and concrete colors, but if white, pastels, or other light or non-earth tone colors were to be used, the Commission finds that the walls would be visually prominent and not compatible with the character of the surrounding area. As the hillside vegetation is mostly dark green and other dark earth tones (see photos, **Exhibits 6-7**), constructing the new development in a tone similar to the natural setting will help mute its appearance in the public viewshed.

Thus, the Commission attaches **Special Condition 5**, which requires the applicants to provide a specific color plan for the retaining walls that will help blend the structures with the natural bluff face, thereby mitigating the visual impact of the development from the beach below.

Therefore, the Commission finds that the proposed project, as conditioned, will protect public views to the ocean, minimize the alteration of natural land forms, and be visually compatible with the character of surrounding area, consistent with Section 30251 of the Coastal Act.

F. PROTECTION OF WATER QUALITY & ADJACENT RECREATION AREAS

Section 30230 of the Coastal Act states as follows:

> *Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.*

Section 30231 of the Coastal Act states as follows:

> *The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.*

Section 30240(b) of the Coastal Act states as follows:

> *Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.*

As discussed above, the property is located on a bluff-top lot adjacent to Moonstone Beach County Park, a popular park and recreation area that contains both rocky and sandy ocean beach areas. Accordingly, the project must be consistent with Sections 30230 and 30231 of the Coastal

Act, which require in part that marine resources and coastal wetlands and waters be maintained, enhanced, and where feasible restored. These policies specifically call for the maintenance of the biological productivity and quality of marine resources, coastal waters, streams, wetlands, and estuaries necessary to maintain optimum populations of all species of marine organisms and for the protection of human health. In addition, the proposed project must be sited and designed to prevent impacts which would significantly degrade the adjacent park and recreation area and be compatible with the continuance of the recreation area, as Section 30240(b) of the Coastal Act requires.

The project could cause impacts to water quality and other impacts that would significantly degrade the adjacent beach recreation area. For example, in the absence of effective erosion and runoff control measures, sediment and other pollutants entrained in runoff from the construction site would contribute to water quality degradation. The project plans include the installation of a silt fence around the lower (downslope) end of the project area and the seeding and mulching of all areas of exposed soil following construction. The Commission includes **Special Condition 6** to require that the project be undertaken in accordance with these and other construction responsibilities and **Special Condition 7** to require that only native and/or non-invasive plant species be planted and used in erosion-control seeding on the subject property. The Commission finds that the adjacent park and recreation area, which contains wetlands and other environmentally sensitive habitats, could be adversely affected if nonnative, invasive plant species were introduced in landscaping or erosion control seeding at the subject site. If any of the proposed landscaping or seeding were to include introduced invasive exotic plant species, the weedy plants could colonize (e.g., via wind or wildlife dispersal) the nearby park and recreation area over time, displace native vegetation, and significantly degrade the recreation area and the functions and values of its natural habitats. Special Condition 7 also includes a provision prohibiting the use of certain anticoagulant-based rodenticides that are known to pose significant primary and secondary risks to non-target wildlife present in urban and urban/wildland interface areas. As property owners sometimes use such pesticides to prevent wild critters from grazing on landscaping and other vegetation, and as these target species commonly are preyed upon by raptors or other environmentally sensitive predators and scavengers, the pest control compounds can bio-accumulate in the animals that have consumed the rodents to concentrations toxic to the ingesting non-target species. Thus, Special Condition 7-b is intended to avoid this potential cumulative impact to environmentally sensitive wildlife species.

Therefore, the Commission finds that the proposed project, as conditioned, will maintain coastal waters consistent with Sections 30230 and 30231 and will not significantly degrade the adjacent park and recreation area and will be compatible with the its continuance, consistent with Section 30240(b) of the Coastal Act.

G. PUBLIC ACCESS

Coastal Act Sections 30210, 30211, and 30212 require the provision of maximum public access opportunities, with limited exceptions. Coastal Act Section 30210 requires in applicable part that maximum public access and recreational opportunities be provided when consistent with public safety, private property rights, and natural resource protection. Section 30211 requires in applicable part that development not interfere with the public's right of access to the sea where acquired through use (i.e., potential prescriptive rights or rights of implied dedication). Section

30212 requires in applicable part that public access from the nearest public roadway to the shoreline and along the coast be provided in new development projects, except in certain instances, such as when adequate access exists nearby or when the provision of public access would be inconsistent with public safety. In applying Sections 30211 and 30212, the Commission is limited by the need to show that any denial of a permit application based on these sections or any decision to grant a permit subject to special conditions requiring public access is necessary to avoid or offset a project's adverse impact on existing or potential public access.

As discussed above, the subject site is located between the first through public road (Scenic Drive) and the sea adjacent to Moonstone Beach County Park, a popular park and recreation area that provides year-round public access to rocky and sandy beach areas. There is no evidence of public use of the bluff top portions of the property for public access. Rayipa Lane is a private road and there is no evidence of trails on the bluff top and no indication from the public that the site has been used for public access purposes in the past. The terrain is steep and thickly vegetated between the end of Rayipa Lane and the beach located over 100 feet below such that vertical access through the area is infeasible. The public can access Moonstone Beach from a beach access road located approximately 300 feet south of Rayipa Lane. The retaining wall structures will not be located on land subject to the public trust. For all of these reasons, the Commission finds that the proposed project, which does not include provision of public access, is consistent with the public access policies of the Coastal Act.

H. LOCAL COASTAL PROGRAM

Section 30604(a) of the Coastal Act states as follows:

> *(a) Prior to certification of the Local Coastal Program, a coastal development permit shall be issued if the issuing agency, or the commission on appeal, finds that the proposed development is in conformity with the provisions of Chapter 3 (commencing with Section 30200) of this division and that the permitted development will not prejudice the ability of the local government to prepare a Local Coastal Program that is in conformity with the provisions of Chapter 3 (commencing with Section 30200). A denial of a coastal development permit on grounds it would prejudice the ability of the local government to prepare a Local Coastal Program that is in conformity with the provisions of Chapter 3 (commencing with Section 30200) shall be accompanied by a specific finding which sets forth the basis for such conclusion.*

This section of the Act provides that the Commission shall issue a CDP only if the project will not prejudice the ability of the local government having jurisdiction to prepare an LCP that conforms with the Chapter 3 policies of the Coastal Act.

The area around Moonstone Beach, including the subject site, lacks a certified LCP. As conditioned, the proposed development will be consistent with Chapter 3 of the Coastal Act, and approval of the project will not prejudice the ability of Humboldt County to prepare a LCP that is in conformity with the provisions of Chapter 3 of the Coastal Act.

I. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Section 13906 of the Commission's administrative regulation requires Coastal Commission approval of coastal development permit applications to be supported by a finding showing the application, as modified by any conditions of approval, is consistent with any applicable requirements of the California Environmental Quality Act (CEQA). Section 21080.5(d)(2)(A) of CEQA prohibits a proposed development from being approved if there are any feasible alternatives or feasible mitigation measures available, which would substantially lessen any significant adverse effect the proposed development may have on the environment.

The Commission incorporates its findings on Coastal Act consistency at this point as if set forth in full. As discussed above, the proposed project has been conditioned to be consistent with the policies of the Coastal Act. The findings address and respond to all public comments regarding potential significant adverse environmental effects of the project that were received prior to preparation of the staff report. As specifically discussed in these above findings, which are hereby incorporated by reference, mitigation measures that will minimize or avoid all significant adverse environmental impacts have been required. As conditioned, there are no other feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impacts which the activity may have on the environment. Therefore, the Commission finds that the proposed project, as conditioned to mitigate the identified impacts, can be found consistent with the requirements of the Coastal Act to conform to CEQA.

APPENDIX A: SUBSTANTIVE FILE DOCUMENTS

CDP Application 1-12-014 and submitted documents, received April 4, 2012

CDP File No. 1-83-118

LACO Project plans dated 7-18-12 (sheets G1.0A through S2.0B)

LACO Figure G1.0F (Wall appearance from Moonstone Beach) dated 8-24-12

LACO Structural Calculations, April 3, 2012

LACO Slope Instability Report, August 8, 2012

LACO Geotechnical Memorandum, August 23, 2012

Aerial photographs, California Coastal Records Project, Photography and website Copyright © 2002-2012 Kenneth & Gabrielle Adelman, images 7203115, 7905032, 199300196003, 7632, and 200901078

Humboldt County Web GIS Planning (interactive website application): http://gis.co.humboldt.ca.us/Freeance/Client/PublicAccess1/index.html?appconfig=podgis4

Site photographs taken by Commission staff on 5-31-12

County of Humboldt Local Coastal Program (Trinidad Area Plan & Coastal Zoning Regulations)

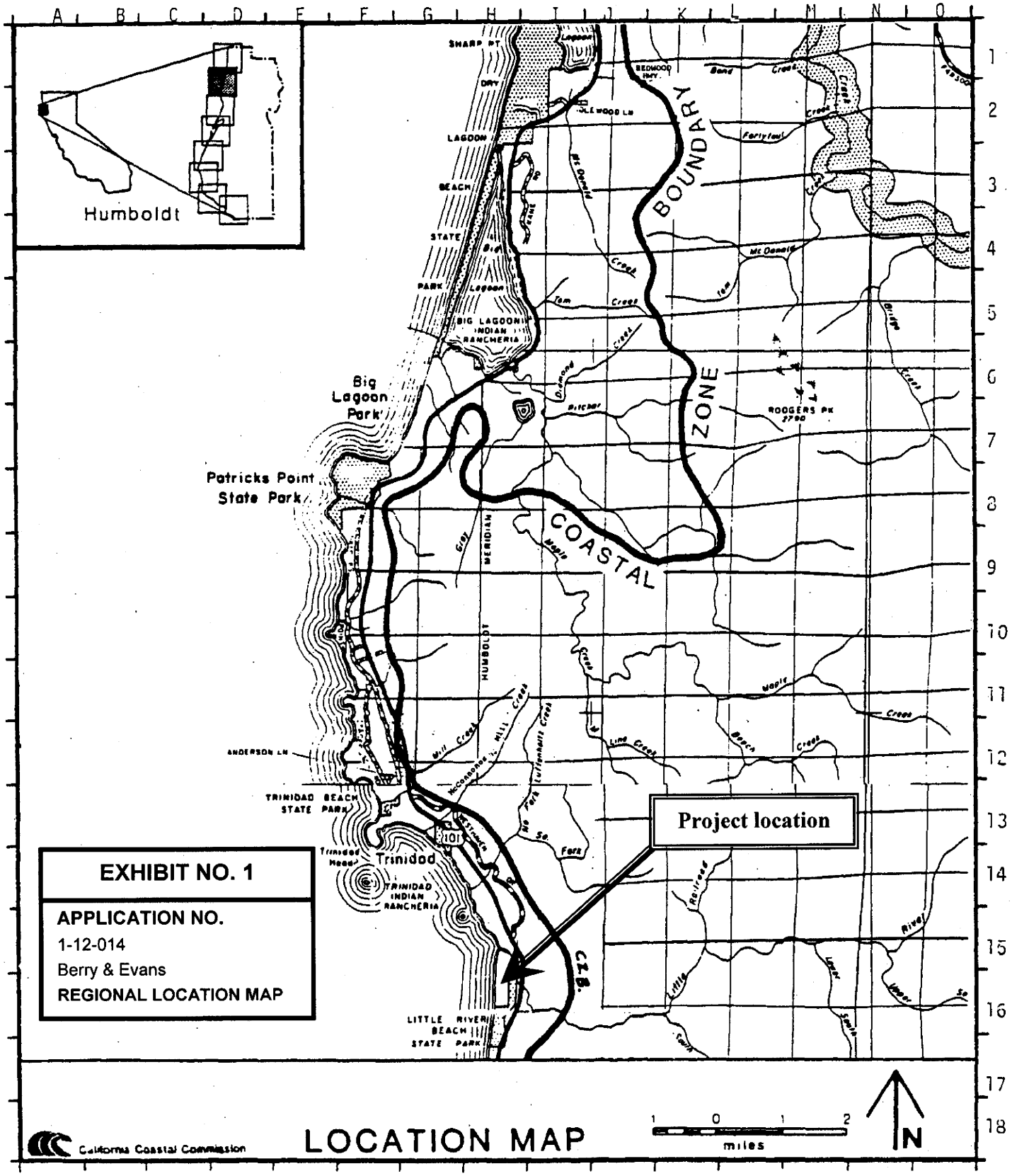
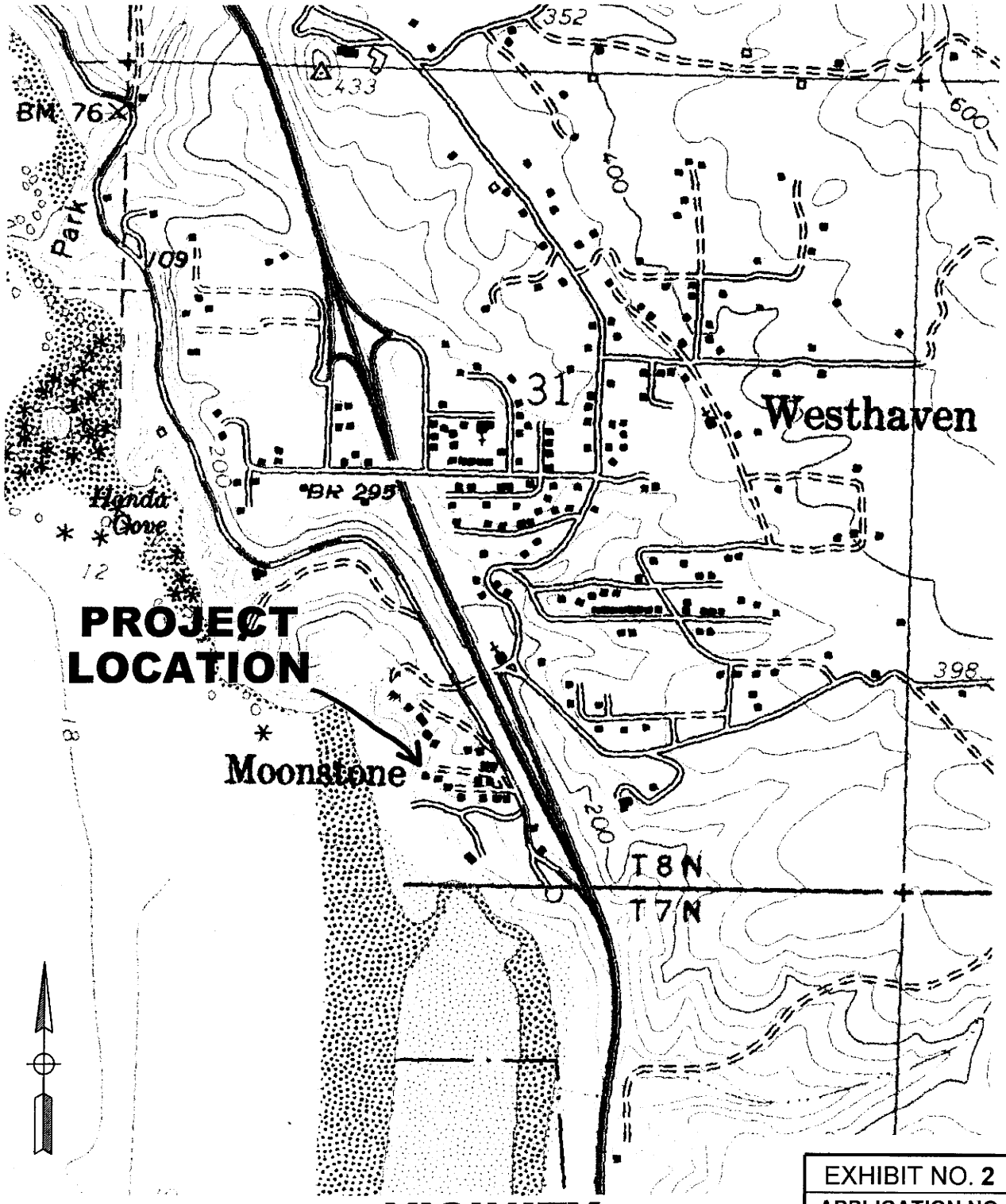


EXHIBIT NO. 1

APPLICATION NO.
1-12-014
Berry & Evans
REGIONAL LOCATION MAP

County of Humboldt

LACO ASSOCIATES EUREKA · UKIAH CONSULTING ENGINEERS 1-800-515-5054 WWW. LACOASSOCIATES.COM	PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE G1.0C
	CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
	LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
		VICINITY MAP	SCALE AS SHOWN	



VICINITY
SCALE: 1" = 1,000'

EXHIBIT NO. 2
APPLICATION NO.
1-12-014
BERRY & EVANS
VICINITY MAP

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PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE G1.0D
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	SITE PARCEL	SCALE AS SHOWN	

SITE PARCEL
SCALE: 1" = 50'

EXHIBIT NO. 3

APPLICATION NO.
1-12-014

BERRY & EVANS

PARCEL BOUNDARIES
(APPROXIMATE)

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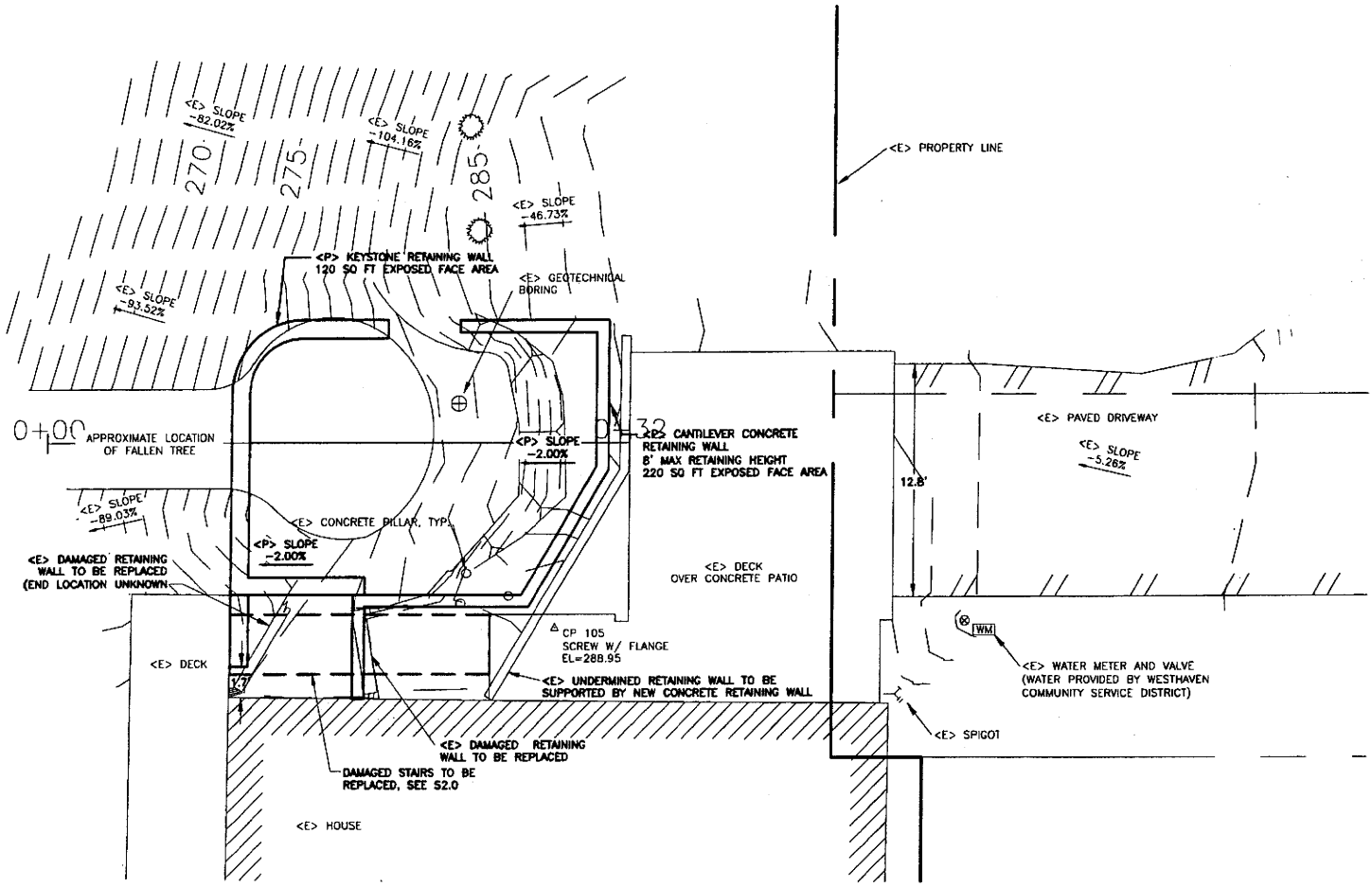
PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE G1.0E
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	PLOT PLAN	SCALE AS SHOWN	



PLOT PLAN
SCALE: 1" = 10'

(SEE "SITE PARCEL" FIGURE FOR PROPERTY LINES.)

EXHIBIT NO. 4
APPLICATION NO.
1-12-014
BERRY & EVANS
PROPOSED PROJECT PLANS (1 of 13)

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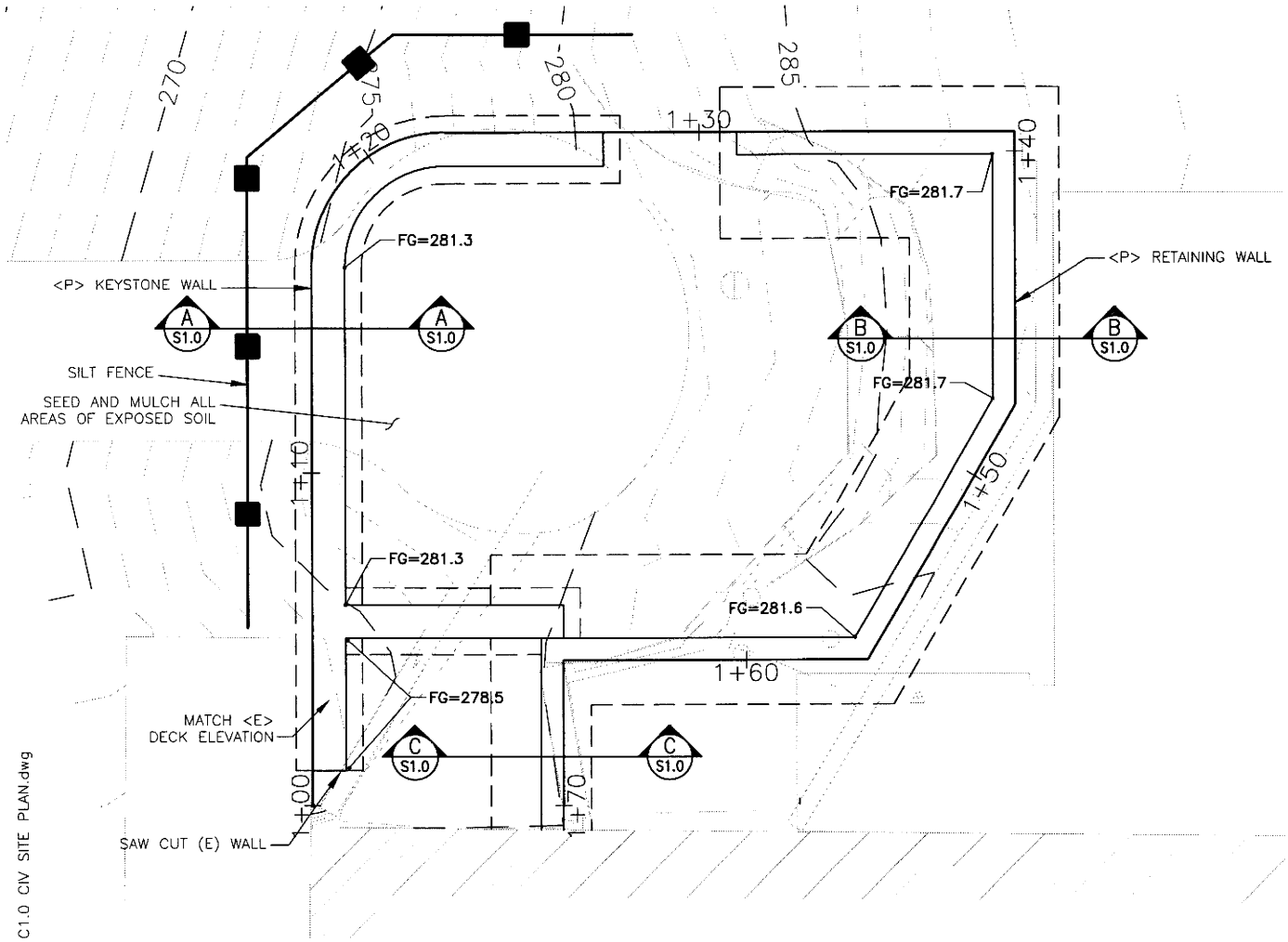
PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE C1.0A
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	WALL PLAN	SCALE AS SHOWN	



WALL PLAN
SCALE: 1"=5'

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2013

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PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE G1.0B
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	PLOT PLAN NOTES	SCALE AS SHOWN	

NOTES:

1. OWNER:
   WILBUR BERRY
   98 RAYIPA LANE
   WESTHAVEN, CA, 95570

   MAP REFERENCE:
   BOOK 61 OF SURVEYS, PAGE 118
   BOOK 37 OF SURVEYS, PAGE 33
   BOOK 41 OF SURVEYS, PAGE 102
   BOOK 58 OF SURVEYS, PAGES 91

2. THE PURPOSE OF THIS PLAN IS TO SHOW THE PROPOSED RETAINING WALL USED TO REPAIR DAMAGED CAUSED BY FALLING TREE. THERE WILL BE NO CHANGES TO THE DRIVEWAY, SIDEWALK, CURB OR GUTTERS.

3. ONE FALLEN TREE WILL BE PARTIALLY REMOVED FROM THE PROPERTY.

4. THERE ARE NO PROPANE OR KEROSENE STORAGE TANKS ON SITE.

5. AN ALTERNATIVE OWNER BUILDER (AOB) / STATE RESPONSIBILITY AREA (SRA) WATER STORAGE FACILITY IS NOT REQUIRED FOR THIS PROJECT.

6. THIS PROPERTY IS WITHIN THE WESTHAVEN COMMUNITY SERVICE DISTRICT.

7. SEWER IS ON-SITE SEPTIC SYSTEM.

8. THE PARCEL IS 0.38 ACRES. THIS IS NOT A BOUNDARY SURVEY; PROPERTY LINES ARE BASED ON RECORD MAPS.

9. THE PROPERTY IS ZONED RESIDENTIAL AND CURRENTLY HAS A SINGLE FAMILY RESIDENCE.

10. FIRE PROTECTION IS PROVIDED BY WESTHAVEN VOLUNTEER DEPARTMENT.

11. THERE ARE NO KNOWN EASEMENTS ON PROJECT SITE.

12. THERE ARE NO KNOWN WETLANDS OF ANY TYPE ON-SITE.

13. EARTHWORK: CUT=10.9 AND FILL=10.9 FOR A BALANCED SITE; NO SOIL WILL BE REMOVED FROM SITE.

14. CONTOURS BASED ON TOPOGRAPHIC SURVEY BY LACO DATED FEBRUARY 28, 2012. CONTOUR INTERVALS ARE AT 1'. ELEVATIONS ARE ASSUMED, THE TEMPORARY PROJECT BENCHMARK IS CP100. ASSUMED ELEVATION = 300.00'.

15. DEVELOPMENT SETBACKS ARE AS FOLLOWS:
    FRONT 20, SIDE 5, BACK 10

16. STORM WATER RUN OFF WILL CONTINUE TO FLOW OFF THE WEST SIDE OF THE PROPERTY; AND WILL NOT BE CHANGED BY THE PROPOSED REPAIRS.

17. THIS PARCEL IS NOT LOCATED WITH IN THE 100 YEAR FLOOD ZONE.

3 of 13

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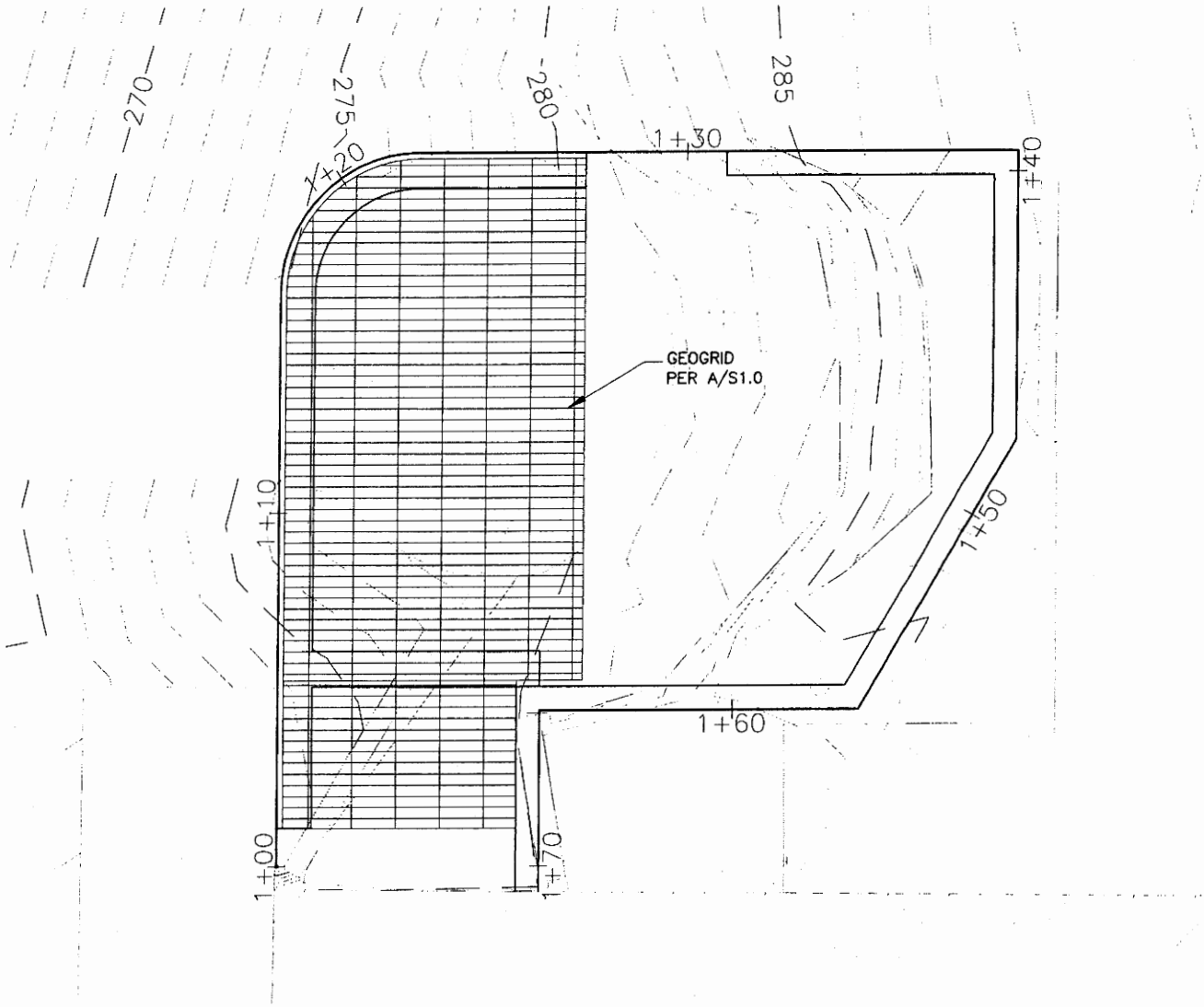
PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE C1.0B
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	GEOGRID LAYOUT	SCALE AS SHOWN	



GEOGRID LAYOUT
SCALE: 1"=5'

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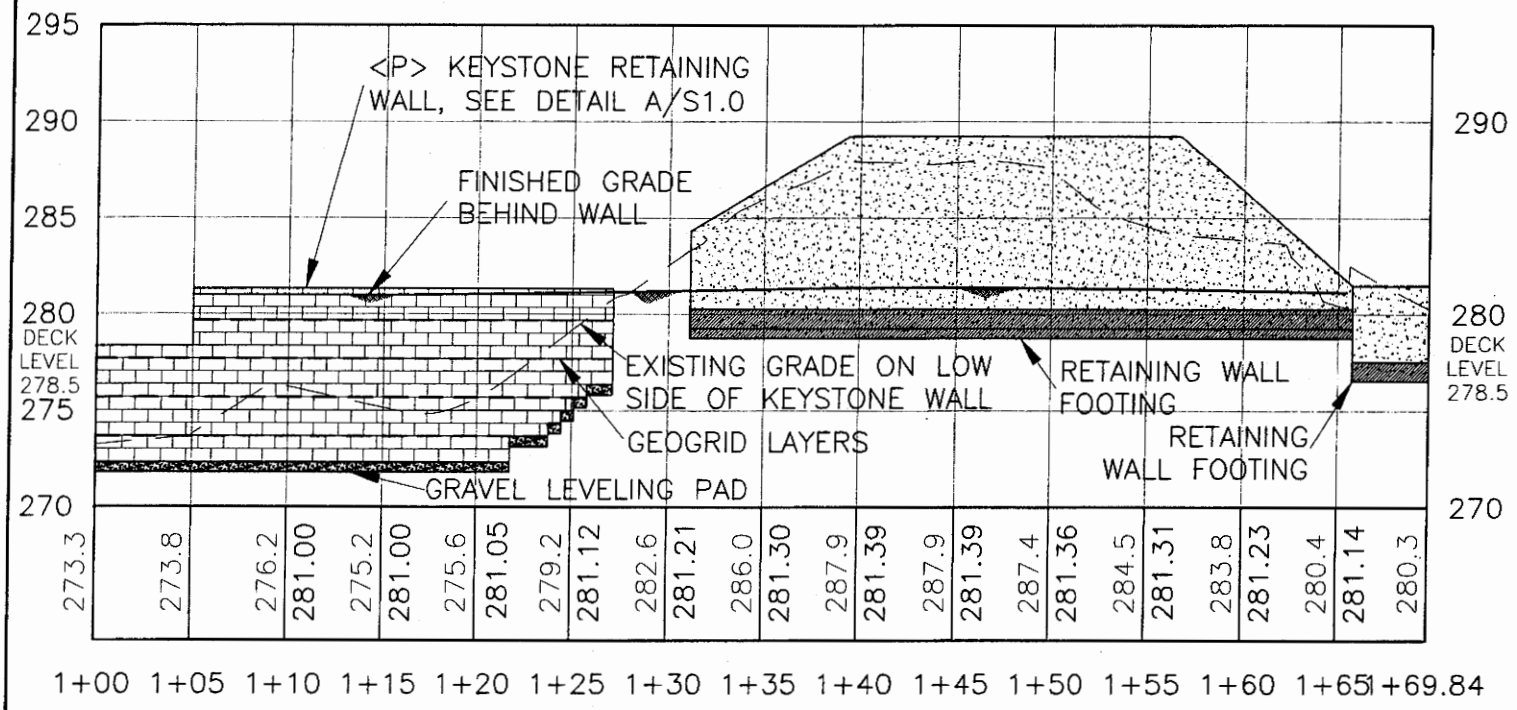
PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE C1.0C
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	RETAINING WALL PROFILE	SCALE AS SHOWN	



RETAINING WALL PROFILE

SCALE: 1"=10'

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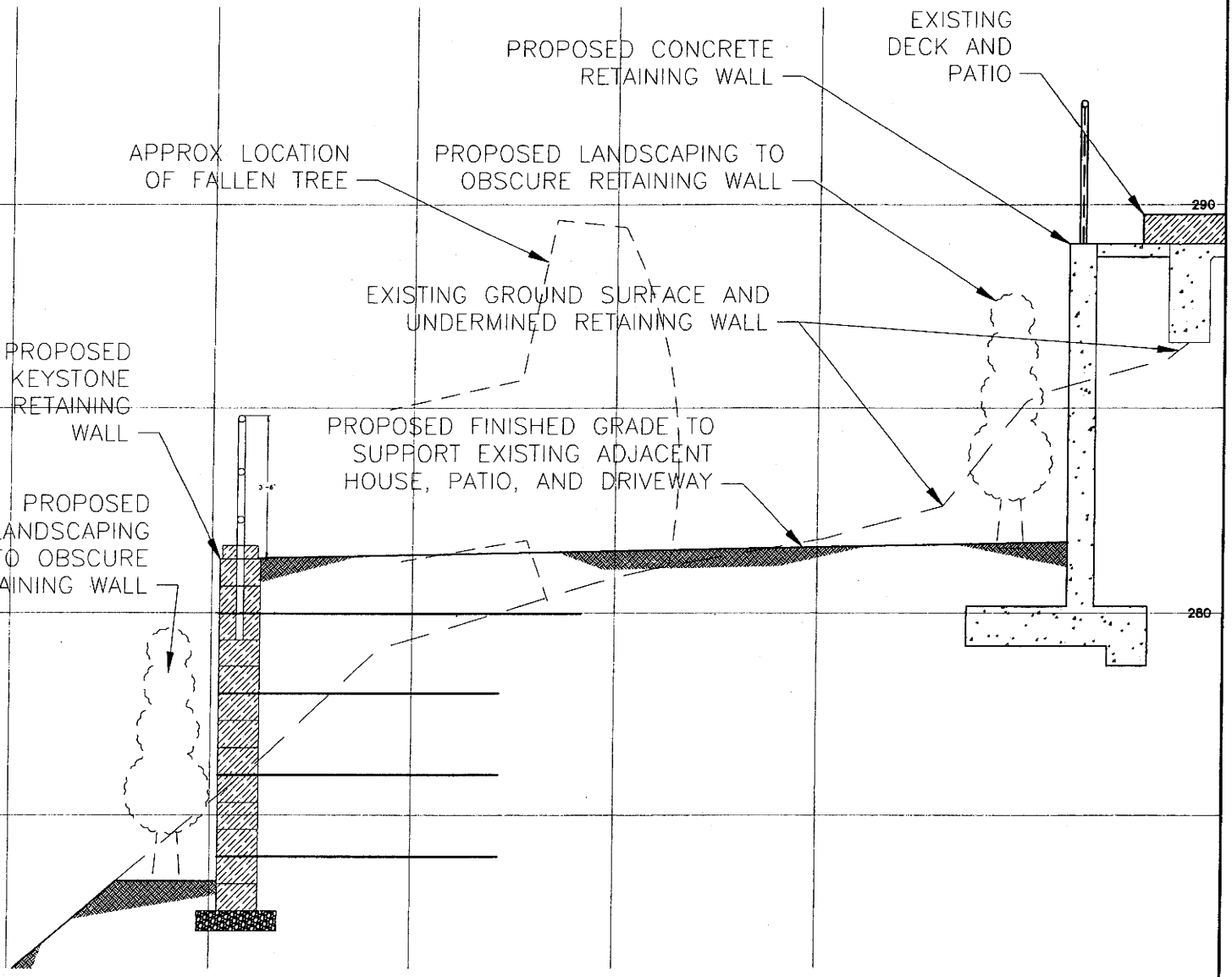
PROJECT	RETAINING WALL REPAIR	BY NKT	FIGURE C1.0D
CLIENT	QUILLMAN CONSTRUCTION	DATE 8/14/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	TYPICAL SITE SECTION	SCALE AS SHOWN	



TYPICAL SITE SECTION

SCALE: 1/4"=1'-0"

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6 of 13

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PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE S0.0A
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	NOTES	SCALE AS SHOWN	

GENERAL NOTES

1. ALL WORK SHALL BE IN CONFORMANCE WITH THE CALIFORNIA BUILDING CODE (CBC) 2010 EDITION.
2. DO NOT USE SCALED DIMENSIONS, USE WRITTEN DIMENSIONS. WHERE NO DIMENSIONS ARE SHOWN, CONSULT ENGINEER FOR CLARIFICATION BEFORE PROCEEDING WITH THE WORK.
3. DETAILS OF CONSTRUCTION NOT FULLY SHOWN SHALL BE OF THE SAME NATURE AS SHOWN FOR SIMILAR CONDITIONS.
4. CONTRACTOR SHALL VERIFY CONDITIONS AND DIMENSIONS AT THE SITE BEFORE STARTING WORK AND IMMEDIATELY NOTIFY THE ENGINEER IF ANY CONDITIONS OR DIMENSIONS ARE UNUSUAL OR NOT AS SHOWN ON THESE PLANS.
5. SAFETY:
   - 5.1. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COMPLY WITH THE PERTINENT SECTIONS OF THE "CONSTRUCTION SAFETY ORDERS" ISSUED BY THE STATE OF CALIFORNIA, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT. THE ENGINEER AND THE OWNER DO NOT ACCEPT ANY RESPONSIBILITY FOR THE CONTRACTOR'S FAILURE TO COMPLY WITH THESE REQUIREMENTS.
   - 5.2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ADEQUATE DESIGN AND CONSTRUCTION OF ALL FORMS AND SHORING.
6. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UNDERGROUND UTILITIES PRIOR TO EXCAVATION AND CONSTRUCTION IN ANY AREA. CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT (USA) AT LEAST TWO WORKING DAYS IN ADVANCE OF ANY EXCAVATION. CONTRACTOR SHALL IMMEDIATELY REPORT ANY DISCREPANCIES IN RECORD INFORMATION TO ENGINEER AND DEVELOPER PRIOR TO START OF CONSTRUCTION.
7. ALL EXISTING STRUCTURES, OR PORTIONS THEROF, NOT SPECIFICALLY DESIGNATED FOR DEMOLITION SHALL BE PROTECTED DURING CONSTRUCTION.
8. THESE PLANS SHALL NOT BE CHANGED OR REUSED WITHOUT WRITTEN APPROVAL BY THE ENGINEER.

FOUNDATION NOTES

1. FOUNDATION BEARING AREAS SHALL BE LEVEL, WITH STEPS PROVIDED TO ACCOUNT FOR CHANGES IN SURROUNDING GRADE.
2. EXCAVATIONS SHALL BE MADE AS NEAR AS POSSIBLE TO THE NEAT LINES REQUIRED BY THE SIZE AND SHAPE OF THE STRUCTURE. NO MATERIAL IS TO BE EXCAVATED UNNECESSARILY.
3. DESIGN ALLOWABLE BEARING PRESSURE = 1500 PSF

STRUCTURAL CONCRETE NOTES

1. CONCRETE MIX DESIGN AND TESTING SHALL MEET THE REQUIREMENTS OF SECTIONS 1903, 1904, AND 1905 OF THE 2010 CBC AND THESE SPECIFICATIONS. MIX DESIGNS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONCRETE PLACEMENT.
2. CONCRETE SHALL BE HARDROCK CONCRETE AND SHALL MEET THE FOLLOWING DESIGN CRITERIA:
   - 2.1. MINIMUM 28-DAY COMPRESSIVE STRENGTH.....3000 PSI
   - 2.2. MINIMUM CEMENT CONTENT.....5.5 SACKS/YD
   - 2.3. MAXIMUM AGGREGATE SIZE.....1"
   - 2.4. SLUMP.....4"±1"
3. CONCRETE SHALL BE MIXED, PLACED, AND CURED IN ACCORDANCE WITH ACI 318, CHAPTERS 3, 4 AND 5, AND THE PROJECT SPECIFICATIONS.
4. REINFORCING SHALL BE PLACED IN ACCORDANCE WITH THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI) "MANUAL OF STANDARD PRACTICE".
5. CONCRETE SHALL NOT BE DROPPED THROUGH REINFORCING STEEL (AS IN WALLS) SO AS TO CAUSE SEGREGATION OF AGGREGATES. IN SUCH CASES, HOPPERS AND VERTICAL CHUTES SHALL BE USED TO PLACE CONCRETE AS CLOSE AS POSSIBLE TO ITS FINAL POSITION IN THE STRUCTURE. THE CONCRETE SHALL BE PLACED SUCH THAT THE SURFACE REMAINS LEVEL AT ALL TIMES.
6. UNLESS OTHERWISE NOTED, THE SURFACE OF THE CONCRETE AT HORIZONTAL CONSTRUCTION JOINTS SHALL BE PRESSURE WASHED OR MECHANICALLY BRUSHED A MINIMUM OF 24 HOURS AND A MAXIMUM OF 72 HOURS AFTER THE CONCRETE IS PLACED. THE CLEANING SHALL BE SUFFICIENT TO EXPOSE CLEAN, SOLIDLY EMBEDDED AGGREGATE. SEE PLANS AND DETAILS FOR LOCATION AND TYPE OF CONSTRUCTION JOINT.

ALL ITEMS TO BE CAST IN CONCRETE SUCH AS REINFORCING DOWELS, BOLTS, ANCHORS, PIPES AND SLEEVES SHALL BE SECURELY POSITIONED IN FORMS BEFORE PLACEMENT OF CONCRETE.

KEYSTONE RETAINING WALL NOTES

UNIT DRAINAGE FILL

UNIT DRAINAGE FILL SHALL CONSIST OF CLEAN 1" MINUS CRUSHED STONE OR CRUSHED GRAVEL MEETING THE FOLLOWING GRADATION TESTED IN ACCORDANCE WITH ASTM D-422:

SIEVE SIZE	PERCENT PASSING
1 INCH	100
3/4 INCH	75-100
NO. 4	0 - 10
NO. 50	0 - 5

ONE CUBIC FOOT, MINIMUM, OF DRAINAGE FILL SHALL BE USED FOR EACH SQUARE FOOT OF WALL FACE. DRAINAGE FILL SHALL BE PLACED WITHIN CORES OF, BETWEEN, AND BEHIND UNITS TO MEET THIS REQUIREMENT.

REINFORCED BACKFILL

REINFORCED BACKFILL SHALL BE FREE OF DEBRIS AND MEET THE FOLLOWING GRADATION TESTED IN ACCORDANCE WITH ASTM D-422:

SIEVE SIZE	PERCENT PASSING
2 INCH	100-75
3/4 INCH	100-75
NO. 40	0-60
NO. 200	0-35

PLASTICITY INDEX (PI) <15 AND LIQUID LIMIT <40 PER ASTM D-4318.

THE MAXIMUM AGGREGATE SIZE SHALL BE LIMITED TO 3/4 INCH UNLESS FIELD TESTS HAVE BEEN PERFORMED TO EVALUATE POTENTIAL STRENGTH REDUCTIONS TO THE GEOGRID DESIGN DUE TO DAMAGE DURING CONSTRUCTION.

MATERIAL CAN BE SITE EXCAVATED SOILS WHERE THE ABOVE REQUIREMENTS CAN BE MET. UNSUITABLE SOILS FOR BACKFILL (HIGH PLASTIC CLAYS OR ORGANIC SOILS) SHALL NOT BE USED IN THE BACKFILL OR IN THE REINFORCED SOIL MASS.

CONTRACTOR SHALL SUBMIT REINFORCED FILL SAMPLE AND LABORATORY TEST RESULTS TO THE ARCHITECT/ENGINEER FOR APPROVAL PRIOR TO THE USE OF ANY PROPOSED REINFORCED FILL MATERIAL.

DRAINAGE PIPE SHALL BE PERFORATED OR SLOTTED PVC PIPE MANUFACTURED IN ACCORDANCE WITH ASTM D-3034 OR CORRUGATED HDPE PIPE MANUFACTURED IN ACCORDANCE WITH ASTM D-1248.

EXCAVATION

CONTRACTOR SHALL EXCAVATE TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS. OWNER'S REPRESENTATIVE SHALL INSPECT THE EXCAVATION AND APPROVE PRIOR TO PLACEMENT OF LEVELING MATERIAL OR FILL SOILS. PROOF ROLL FOUNDATION AREA AS DIRECTED TO DETERMINE IF REMEDIAL WORK IS REQUIRED.

BASE LEVELING PAD

LEVELING PAD MATERIAL SHALL BE PLACED TO THE LINES AND GRADES SHOWN ON THE CONSTRUCTION DRAWINGS, TO A MINIMUM THICKNESS OF 6 INCHES AND EXTEND LATERALLY A MINIMUM OF 6" IN FRONT AND BEHIND THE MODULAR WALL UNIT.

LEVELING PAD SHALL BE PREPARED TO INSURE FULL CONTACT TO THE BASE SURFACE OF THE CONCRETE UNITS.

MODULAR UNIT INSTALLATION

FIRST COURSE OF UNITS SHALL BE PLACED ON THE LEVELING PAD AT THE APPROPRIATE LINE AND GRADE. ALIGNMENT AND LEVEL SHALL BE CHECKED IN ALL DIRECTIONS AND INSURE THAT ALL UNITS ARE IN FULL CONTACT WITH THE BASE AND PROPERLY SEATED.

PLACE THE FRONT OF UNITS SIDE-BY-SIDE. DO NOT LEAVE GAPS BETWEEN ADJACENT UNITS. LAYOUT OF CORNERS AND CURVES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

INSTALL SHEAR/CONNECTING DEVICES PER MANUFACTURER'S RECOMMENDATIONS.

PLACE AND COMPACT DRAINAGE FILL WITHIN AND BEHIND WALL UNITS. PLACE AND COMPACT BACKFILL SOIL BEHIND DRAINAGE FILL. FOLLOW WALL ERECTION AND DRAINAGE FILL CLOSELY WITH STRUCTURE BACKFILL.

MAXIMUM STACKED VERTICAL HEIGHT OF WALL UNITS, PRIOR TO UNIT DRAINAGE FILL AND BACKFILL PLACEMENT AND COMPACTION, SHALL NOT EXCEED TWO COURSES.

STRUCTURAL GEOGRID INSTALLATION

GEOGRID SHALL BE ORIENTED WITH THE HIGHEST STRENGTH AXIS PERPENDICULAR TO THE WALL ALIGNMENT.

GEOGRID REINFORCEMENT SHALL BE PLACED AT THE STRENGTHS, LENGTHS, AND ELEVATIONS SHOWN ON THE CONSTRUCTION DESIGN DRAWINGS OR AS DIRECTED BY THE ENGINEER.

THE GEOGRID SHALL BE LAID HORIZONTALLY ON COMPACTED BACKFILL AND ATTACHED TO THE MODULAR WALL UNITS. PLACE THE NEXT COURSE OF MODULAR CONCRETE UNITS OVER THE GEOGRID. THE GEOGRID SHALL BE PULLED TAUT, AND ANCHORED PRIOR TO BACKFILL PLACEMENT ON THE GEOGRID.

GEOGRID REINFORCEMENTS SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTHS AND PLACED SIDE-BY-SIDE TO PROVIDE 100% COVERAGE AT EACH LEVEL. SPLICED CONNECTIONS BETWEEN SHORTER PIECES OF GEOGRID OR GAPS BETWEEN ADJACENT PIECES OF GEOGRID ARE NOT PERMITTED.

REINFORCED BACKFILL PLACEMENT

REINFORCED BACKFILL SHALL BE PLACED, SPREAD, AND COMPACTED IN SUCH A MANNER THAT MINIMIZES THE DEVELOPMENT OF SLACK IN THE GEOGRID AND INSTALLATION DAMAGE.

REINFORCED BACKFILL SHALL BE PLACED AND COMPACTED IN LIFTS NOT TO EXCEED 6 INCHES WHERE HAND COMPACTION IS USED, OR 8 - 10 INCHES WHERE HEAVY COMPACTION EQUIPMENT IS USED. LIFT THICKNESS SHALL BE DECREASED AS REQUIRED TO ACHIEVE THE REQUIRED DENSITY.

REINFORCED BACKFILL SHALL BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AS DETERMINED BY ASTM D698. THE MOISTURE CONTENT OF THE BACKFILL MATERIAL PRIOR TO AND DURING COMPACTION SHALL BE UNIFORMLY DISTRIBUTED THROUGHOUT EACH LAYER AND SHALL BE DRY OF OPTIMUM, + 0%, - 3%.

ONLY LIGHTWEIGHT HAND-OPERATED EQUIPMENT SHALL BE ALLOWED WITHIN 3 FEET OF THE TAIL OF THE MODULAR CONCRETE UNIT.

TRACKED CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY UPON THE GEOGRID REINFORCEMENT. A MINIMUM FILL THICKNESS OF 6 INCHES IS REQUIRED PRIOR TO OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TRACKED VEHICLE TURNING SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND DAMAGING THE GEOGRID.

RUBBER TIRED EQUIPMENT MAY PASS OVER GEOGRID REINFORCEMENT AT SLOW SPEEDS, LESS THAN 10 MPH. SUDDEN BRAKING AND SHARP TURNING SHALL BE AVOIDED.

AT THE END OF EACH DAY'S OPERATION, THE CONTRACTOR SHALL SLOPE THE LAST LIFT OF REINFORCED BACKFILL AWAY FROM THE WALL UNITS TO DIRECT RUNOFF AWAY FROM WALL FACE. THE CONTRACTOR SHALL NOT ALLOW SURFACE RUNOFF FROM ADJACENT AREAS TO ENTER THE WALL CONSTRUCTION SITE.

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PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE S0.0B
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	NOTES	SCALE AS SHOWN	

REINFORCING STEEL NOTES

1. REINFORCING GRADES FOR CONCRETE AND MASONRY:
   1.1. ALL BARS UNLESS NOTED OTHERWISE.....ASTM A615 GRADE 60
   1.2. TIES AND STIRRUPS.....ASTM A615 GRADE 40
   1.3. WELDED WIRE FABRIC.....ASTM A185
2. REINFORCING STEELSHALL NOT BE WELDED
3. STEEL SHALL BE KEPT CLEAN AND FREE OF RUST.
4. SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO FABRICATION AND DELIVERY OF REINFORCING STEEL.
5. SPLICES IN CONTINUOUS REINFORCING AS USED IN WALLS, WALL FOOTINGS, ETC., SHALL HAVE CLASS "B" LAP SPLICES (24" MIN) AND SPLICES IN ADJACENT BARS SHALL BE NOT LESS THAN 60" APART. VERTICAL WALL BARS SHALL BE SPLICED AT OR NEAR FLOOR LINES. BARS SHALL BE WIRED TOGETHER AT SPLICES OR LAPS, EXCEPT FOR TOP REINFORCING OF BEAMS AND SLABS OR WHERE DEFINITELY DETAILED TO BE SEPARATED. SEE BEAM DETAILS OR SCHEDULES FOR SEPARATION OF BEAM OR GIRDER BARS OVER SUPPORTS. WELDED WIRE FABRIC SHALL BE LAPPED 12" MINIMUM.
6. REINFORCEMENT PROTECTION:
   6.1. CONCRETE POURED AGAINST EARTH.....3"
   6.2. CONCRETE PLACED IN FORMS, BUT EXPOSED TO WEATHER OR EARTH:
      6.2.1. IF BARS ARE LARGER THAN #5.....3"
      6.2.2. IF BARS ARE #5 OR SMALLER.....1-1/2"
   6.3. COLUMNS, GIRDERS, AND BEAMS.....1-1/2"
   6.4. INTERIOR WALLS AND SLABS.....1-1/2"
   6.5. STRUCTURAL SLABS ON GRADE.....2" FROM BOTTOM
   .....1" FROM TOP
   6.6. NON-STRUCTURAL SLABS ON GRADE.....2" FROM TOP
7. EACH REINFORCING BAR SHALL BE WIRED TO A CROSS BAR AT A MAXIMUM SPACING OF 24"
8. ALL REINFORCING BARS SHALL BE TERMINATED IN LAPS, 90 DEGREE BENDS, OR WITH DOWELS INTO (E) CONCRETE. BEND TOP FOOTING BARS DOWN TO BOTTOM STEEL. BEND BOTTOM FOOTING BARS UP WITH STANDARD 90 DEGREE BENDS. PROVIDE DOWELS INTO WALLS OF THE SAME SIZE AND SPACING AS WALL VERTICAL REINFORCEMENT. REINFORCING STEEL MAY LAP WITH COUPLERS WHICH ARE 125% OF BAR STRENGTH. AN ICBO REPORT MUST BE SUBMITTED FOR COUPLERS.
9. DETAIL BARS IN ACCORDANCE WITH ACI DETAILING MANUAL, 1994. PROVIDE ALL ACCESSORIES NECESSARY TO SUPPORT REINFORCING STEEL IN THE POSITIONS SHOWN ON THE PLANS.
10. ALL DOWELS, ANCHOR BOLTS, AND OTHER HARDWARE TO BE SET IN CONCRETE SHALL BE TIED IN PLACE PRIOR TO PLACEMENT OF CONCRETE.

SPECIAL INSPECTION NOTES

THE FOLLOWING WORK SHALL BE INSPECTED BY THE ENGINEER IN ACCORDANCE WITH THE 2010 CBC, WITH A FINAL REPORT TO BE PROVIDED TO THE BUILDING OFFICIAL AT THE COMPLETION OF CONSTRUCTION. BUILDER SHALL NOTIFY THE ENGINEER AT LEAST THREE WORKING DAYS IN ADVANCE OF REQUIRED INSPECTIONS:

1. STRUCTURAL CONCRETE PLACEMENT SHALL BE OBSERVED BY THE INSPECTOR. THE FOLLOWING TESTS SHALL BE PERFORMED:
   1.1. SLUMP TEST – ONE TEST PER TRUCK
   1.2. FABRICATE CYLINDERS FOR STRENGTH TESTS – ONE SET PER 50CY OR FRACTION THEREOF
2. EPOXY ADHESIVE INSTALLATION
3. FOOTING EXCAVATIONS AND REINFORCING STEEL
4. GEOGRID INSTALLATION

SUBMITTALS

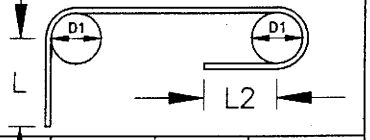
THE FOLLOWING INFORMATION SHALL BE SUBMITTED TO THE ENGINEER AT LEAST ONE WEEK IN ADVANCE OF CONSTRUCTION:

1. CONCRETE MIX DESIGN
2. REINFORCED FILL SAMPLE

ABBREVIATIONS

AB	ANCHOR BOLT
ARCH	ARCHITECTURAL
ATS	ANCHOR TIEDOWN SYSTEM (SIMPSON)
AWS	AMERICAN WELDING SOCIETY
BLDG	BUILDING
BLK'G	BLOCKING
BM	BEAM
CB	COLUMN BASE
CL	CENTERLINE
CJ	CONSTRUCTION JOINT
CLR	CLEAR
COL	COLUMN
CONN	CONNECTION
CONT	CONTINUOUS
CJP	COMPLETE JOINT PENETRATION
CTR	CENTER
DET	DETAIL
DF	DOUGLAS FIR
DWG	DRAWING
EA	EACH
EF	EACH FAE
ELEV	ELEVATION
ELECT	ELECTRICAL
EL	END LENGTH
EN	END OR EDGE NAIL
EW	EACH WAY
EXT	EXTERIOR
FDN	FOUNDATION
FL	FLOOR
FTG	FOOTING
GA	GAUGE
GALV	HOT-DIP GALVANIZED
GLB	GLULAM BEAM
HGR	HANGER
HORIZ	HORIZONTAL
HSS	HOLLOW STRUCTURAL SECTION
INT	INTERIOR
ID	INSIDE DIAMETER
LN	LINE
LFRS	LATERAL FORCE RESISTING SYSTEM
MB	UNFINISHED MACHINE BOLT
MAX	MAXIMUM
MECH	MECHANICAL
MTL	METAL
MIN	MINIMUM
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPP	OPPOSITE
PL	PLATE
PLY	PLYWOOD
PT	POST-TENSIONED
REQ	REQUIRED
SCHED	SCHEDULE
SECT	SECTION
SIM	SIMILAR
SPEC	SPECIFICATION
SQ	SQUARE
STRUCT	STRUCTURAL
SYMM	SYMMETRICAL
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOP	TOP OF PLATE
TOS	TOP OF STEEL
TOW	TOP OF WALL
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
W/	WITH
W/O	WITHOUT
WF	WIDE FLANGE BEAM
WWF	WELDED WIRE FABRIC

STANDARD HOOKS AND BENDS



BAR SIZE	90° HOOK LENGTH "L"	INSIDE DIA. "D1"	180° HOOK LENGTH "L2"
3	4.5"	2.25"	2.5"
4	6"	3"	2.5"
5	7.5"	3.75"	2.5"
6	9"	4.5"	3"
7	10.5"	5.25"	3.5"
8	12"	6"	4"
9	13.5"	9.5"	4.5"
10	15.25"	10.75"	5.25"
11	17"	12"	5.75"

REBAR LAP SPLICES

BAR NO.	CLASS-A SPLICE	CLASS-B SPLICE
3	18"	24"
4	24"	32"
5	30"	40"
6	36"	48"
7	54"	70"
8	60"	78"

Fc'=3000PSI MIN, Fy = 60KSI

8 of 13

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CONSULTING ENGINEERS
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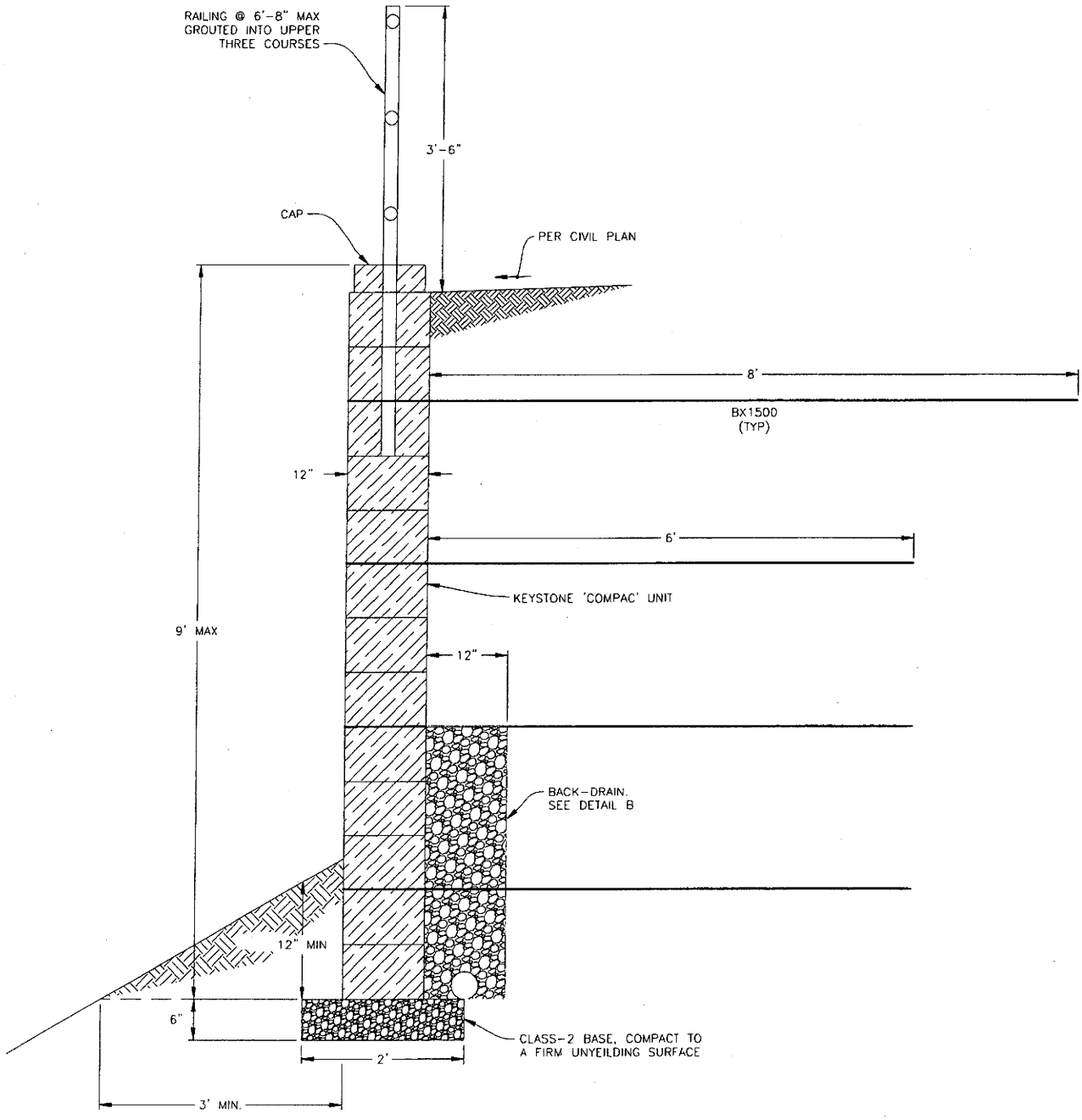
PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE S1.0A
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	KEYSTONE WALL DETAIL	SCALE AS SHOWN	



A

KEYSTONE WALL

1/2"=1'

9 of 13

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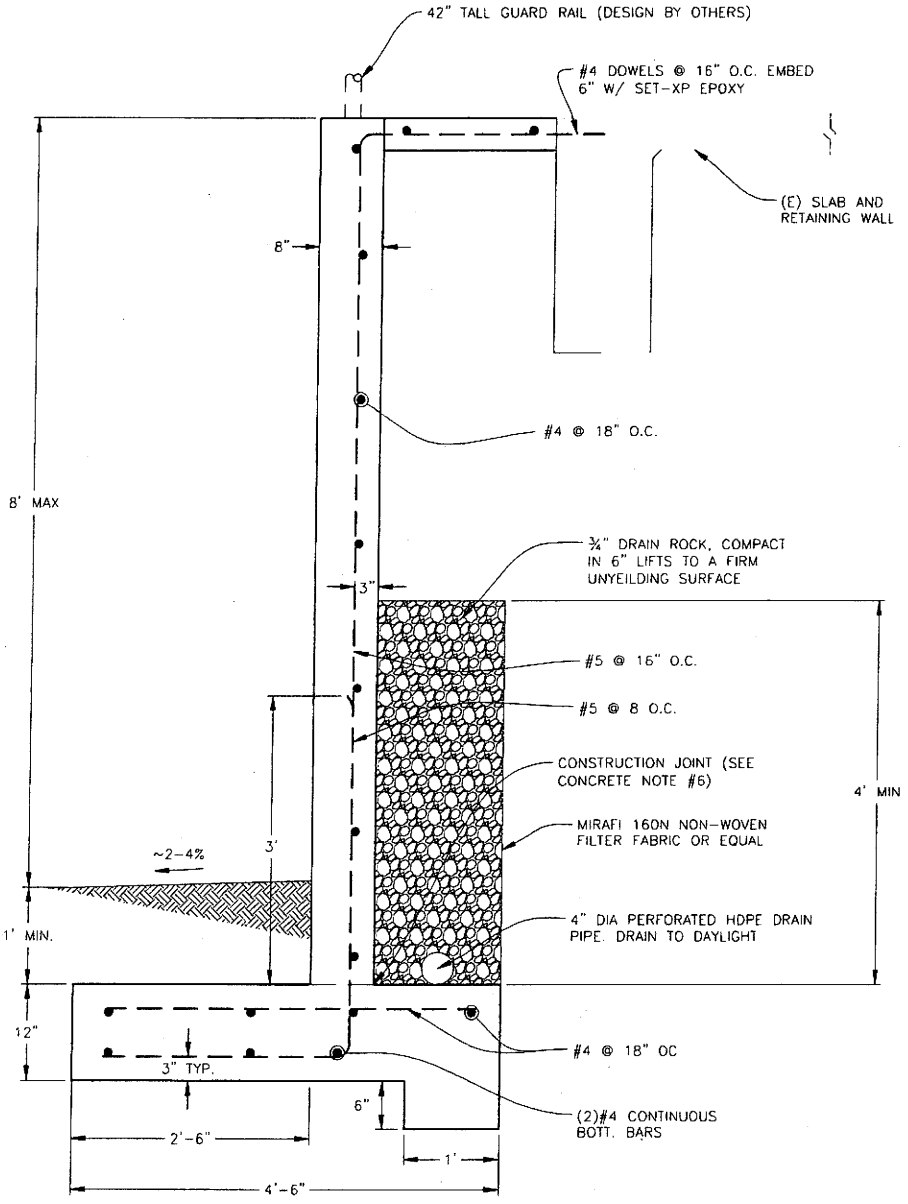
PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE S1.0B
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	CANTILEVER RETAINING WALL DETAIL	SCALE AS SHOWN	



B — CANTILEVER RETAINING WALL

1/2"=1'

10413

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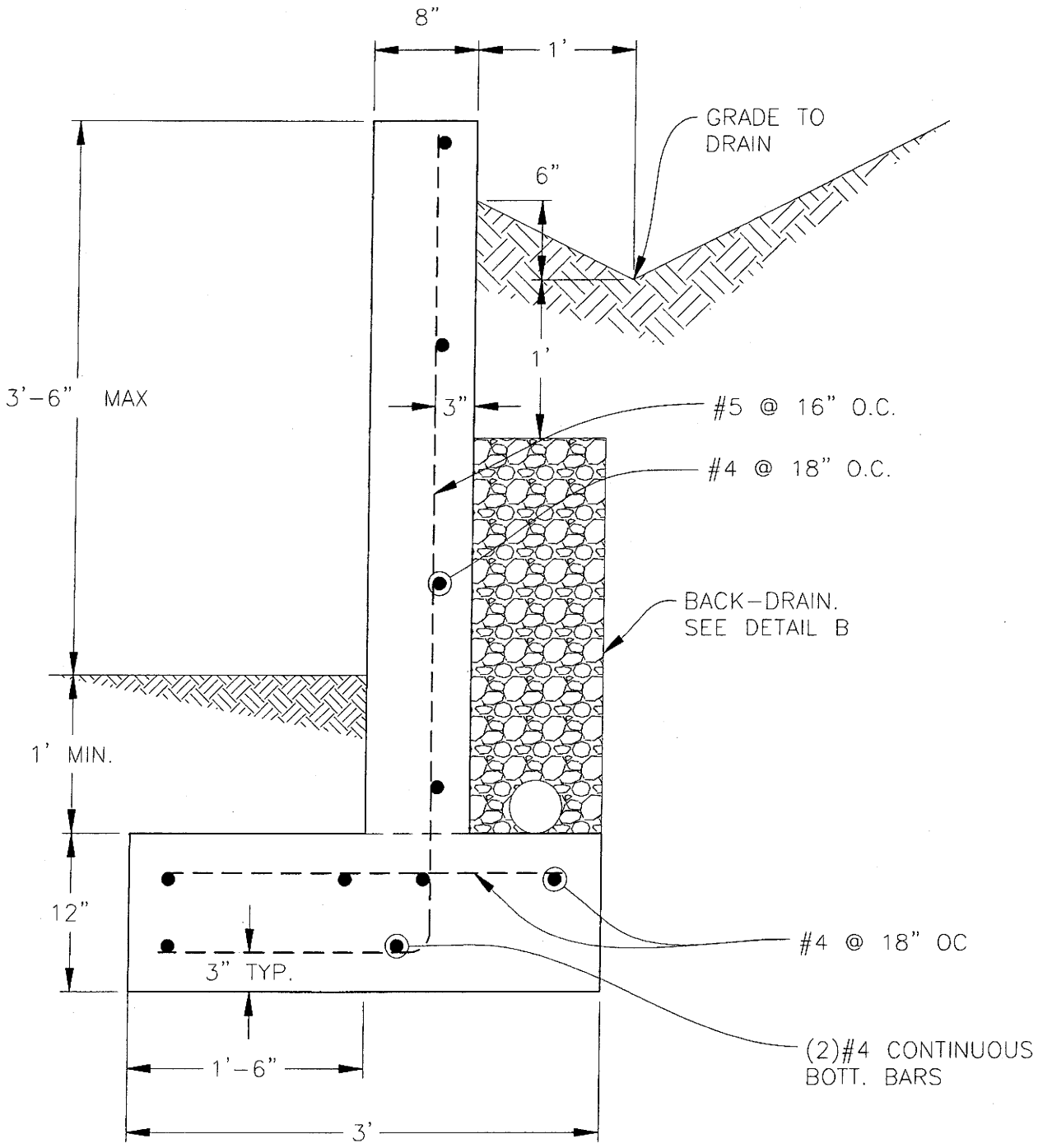
PROJECT	RETAINING WALL REPAIR	BY JDB	FIGURE S1.0C
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	CANTILEVER RETAINING WALL DETAIL	SCALE AS SHOWN	



C / - **CANTILEVER RETAINING WALL**

1"=1'

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11913

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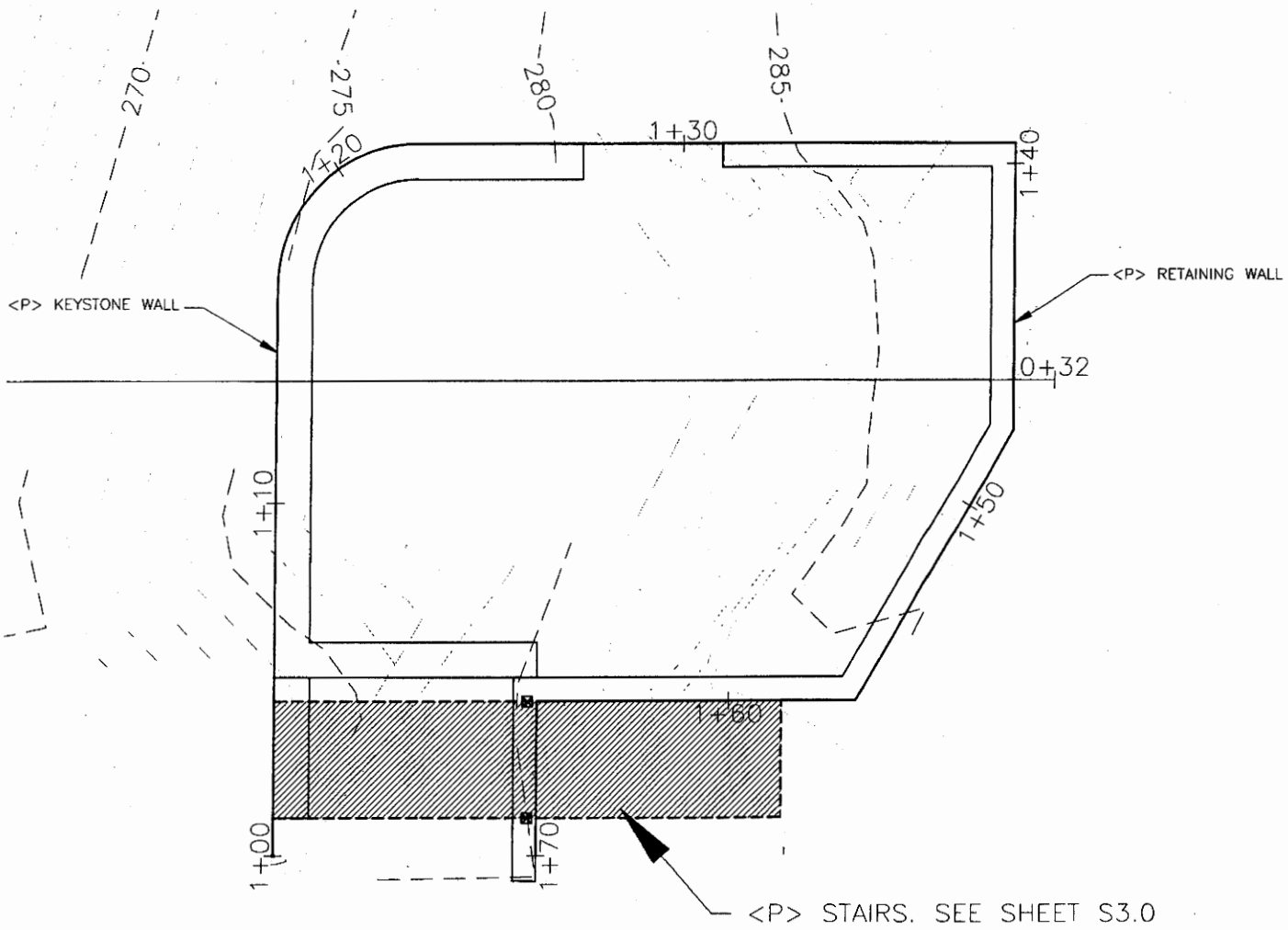
PROJECT	RETAINING WALL REPAIR	BY TAM	FIGURE S2.0A
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	STAIR PLAN	SCALE AS SHOWN	



STAIR PLAN
SCALE: 1"=5'

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12413

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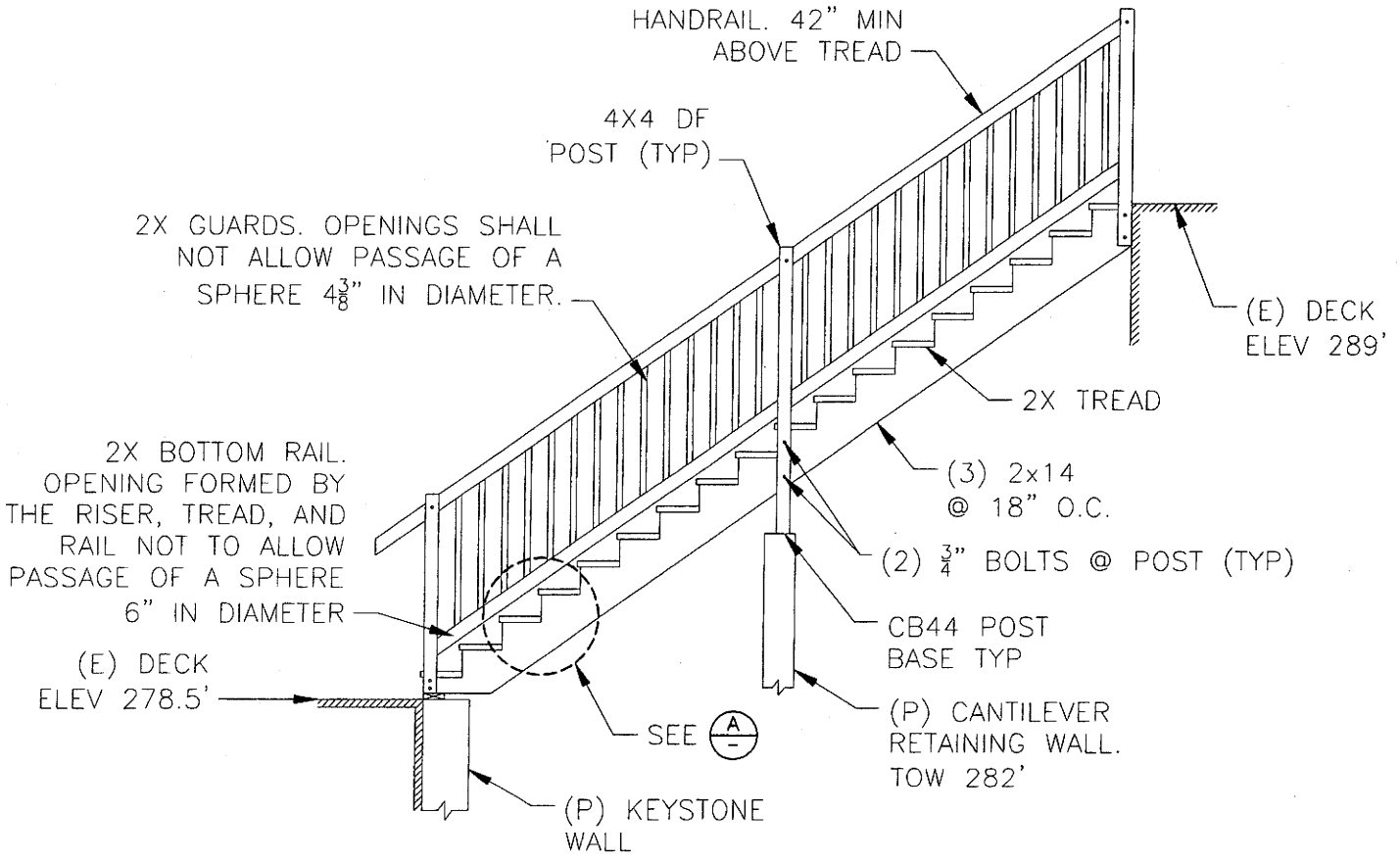
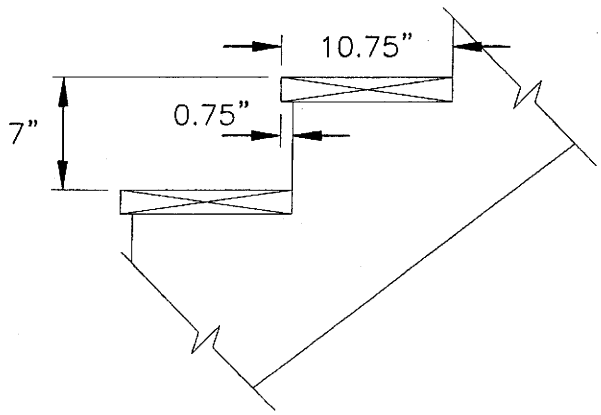
PROJECT	RETAINING WALL REPAIR	BY TAM	FIGURE S2.0B
CLIENT	QUILLMAN CONSTRUCTION	DATE 7/18/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	STAIR DETAILS	SCALE AS SHOWN	

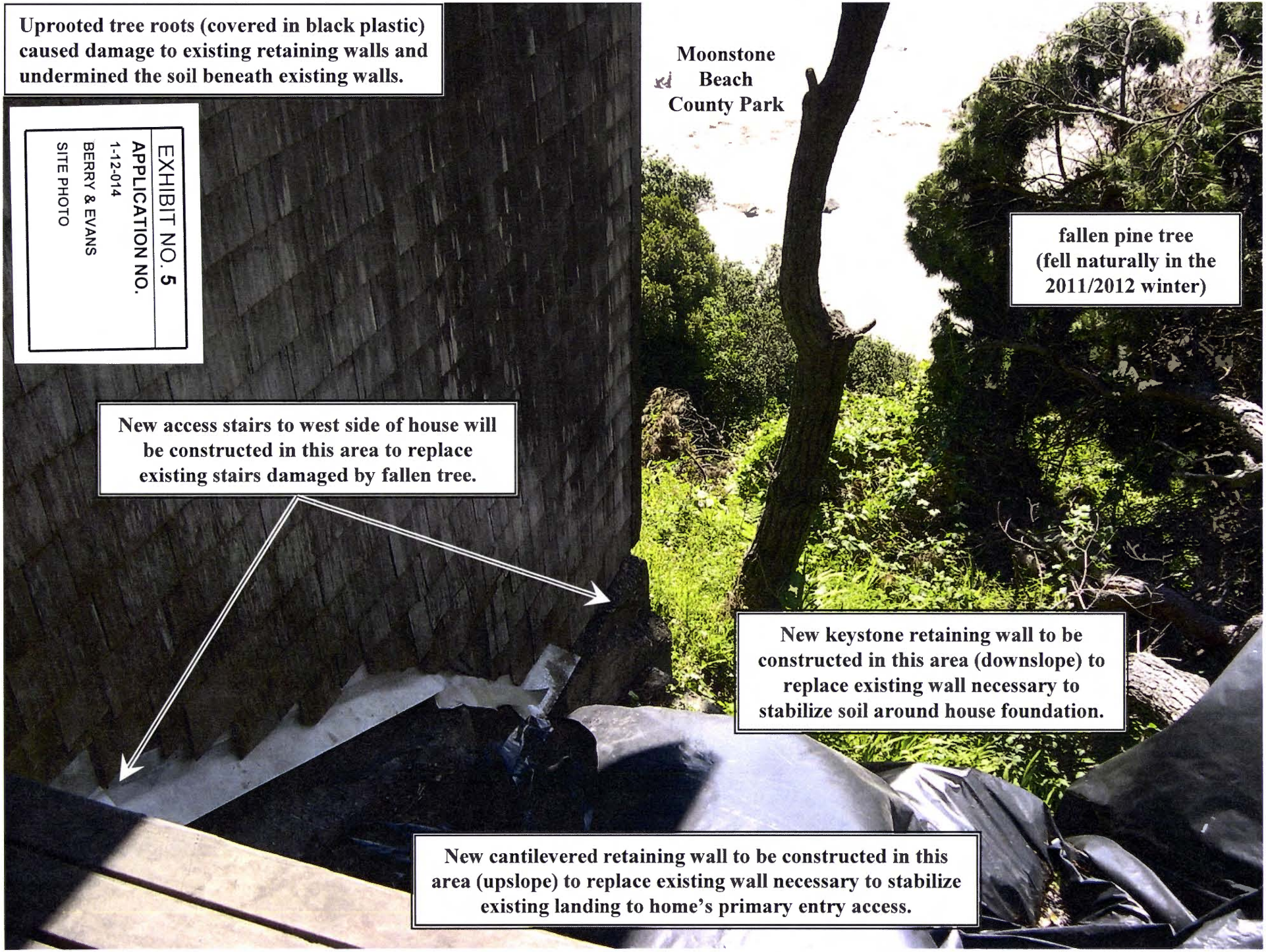


STAIR PROFILE
SCALE: 1/4"=1'



A/- **STAIR GEOMETRY**
1"=1'

13413


Uprooted tree roots (covered in black plastic) caused damage to existing retaining walls and undermined the soil beneath existing walls.
EXHIBIT NO. 5
APPLICATION NO.
1-12-014
BERRY & EVANS
SITE PHOTO
Moonstone Beach County Park
fallen pine tree (fell naturally in the 2011/2012 winter)
New access stairs to west side of house will be constructed in this area to replace existing stairs damaged by fallen tree.
New keystone retaining wall to be constructed in this area (downslope) to replace existing wall necessary to stabilize soil around house foundation.
New cantilevered retaining wall to be constructed in this area (upslope) to replace existing wall necessary to stabilize existing landing to home's primary entry access.

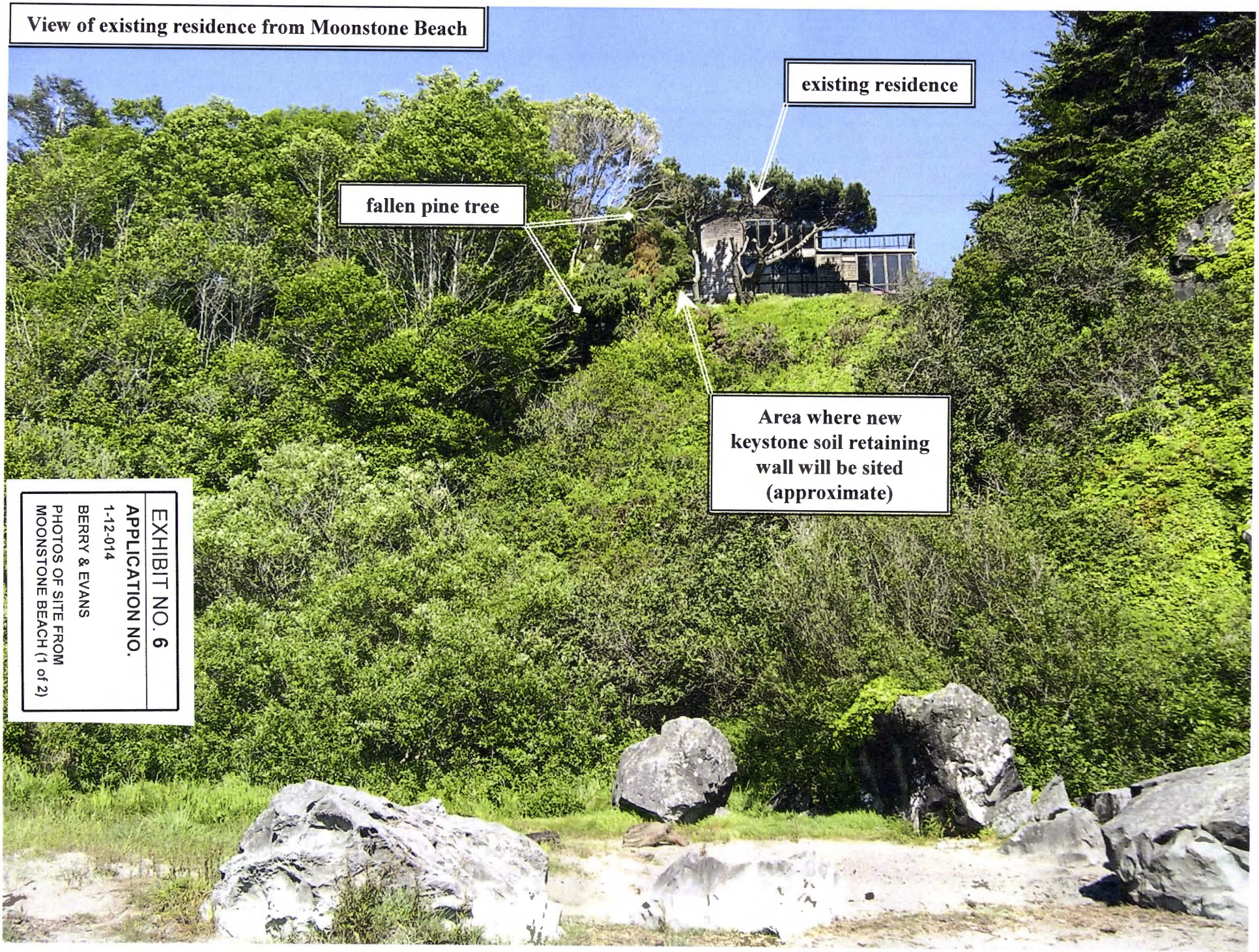
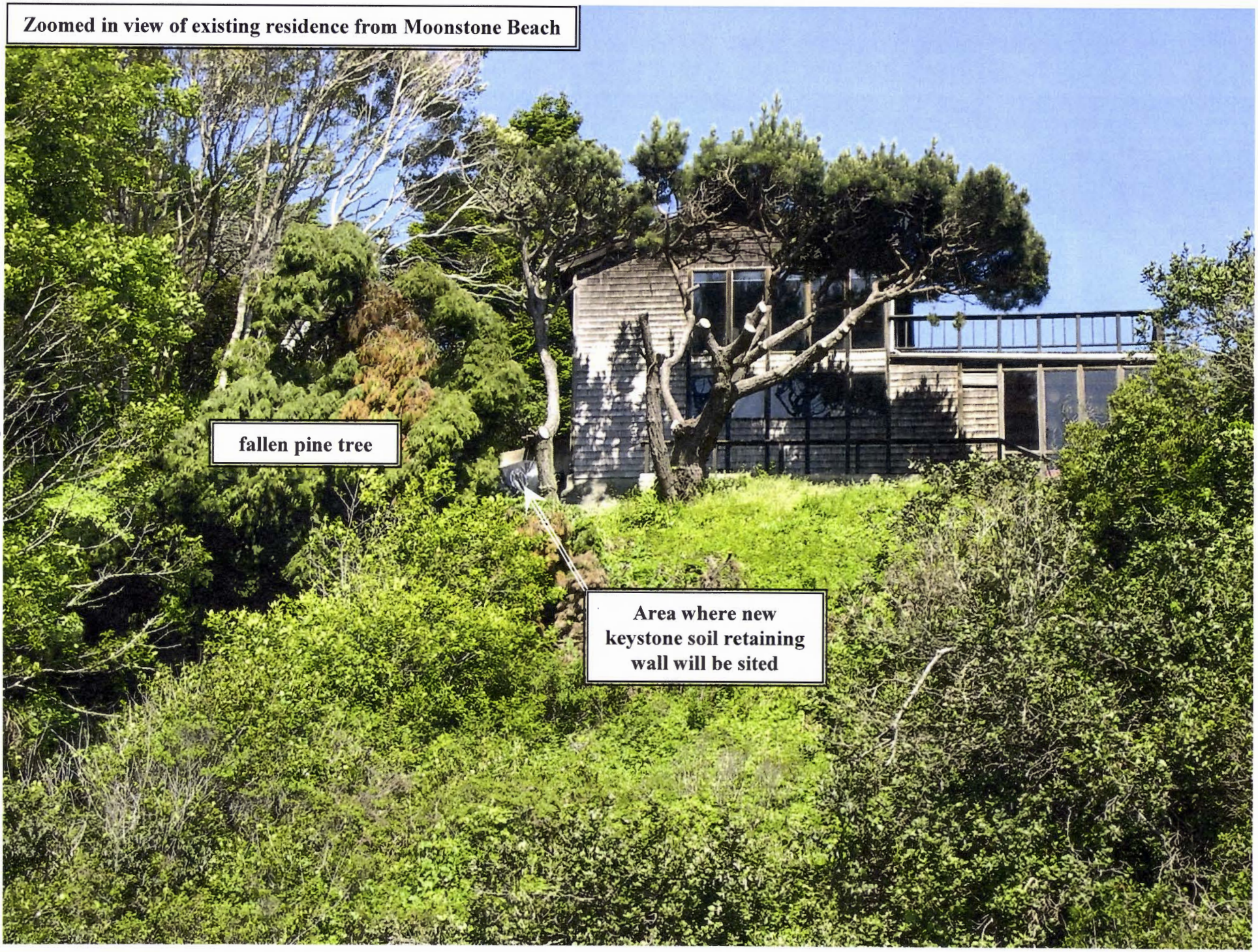


EXHIBIT NO. 6
APPLICATION NO.
1-12-014
BERRY & EVANS
PHOTOS OF SITE FROM MOONSTONE BEACH (1 of 2)


Zoomed in view of existing residence from Moonstone Beach
fallen pine tree
Area where new keystone soil retaining wall will be sited

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PROJECT	RETAINING WALL REPAIR	BY NKT	FIGURE G1.0F
CLIENT	QUILLMAN CONSTRUCTION	DATE 8/24/12	
LOCATION	98 RAYIPA LANE, WESTHAVEN, CA	CHECK NKT	JOB NO. 7584.00
	WALL APPEARANCE FROM MOONSTONE BEACH	SCALE AS SHOWN	

PROPOSED RETAINING WALLS (LANDSCAPING, DECK, AND STAIRWAY NOT SHOWN FOR CLARITY)

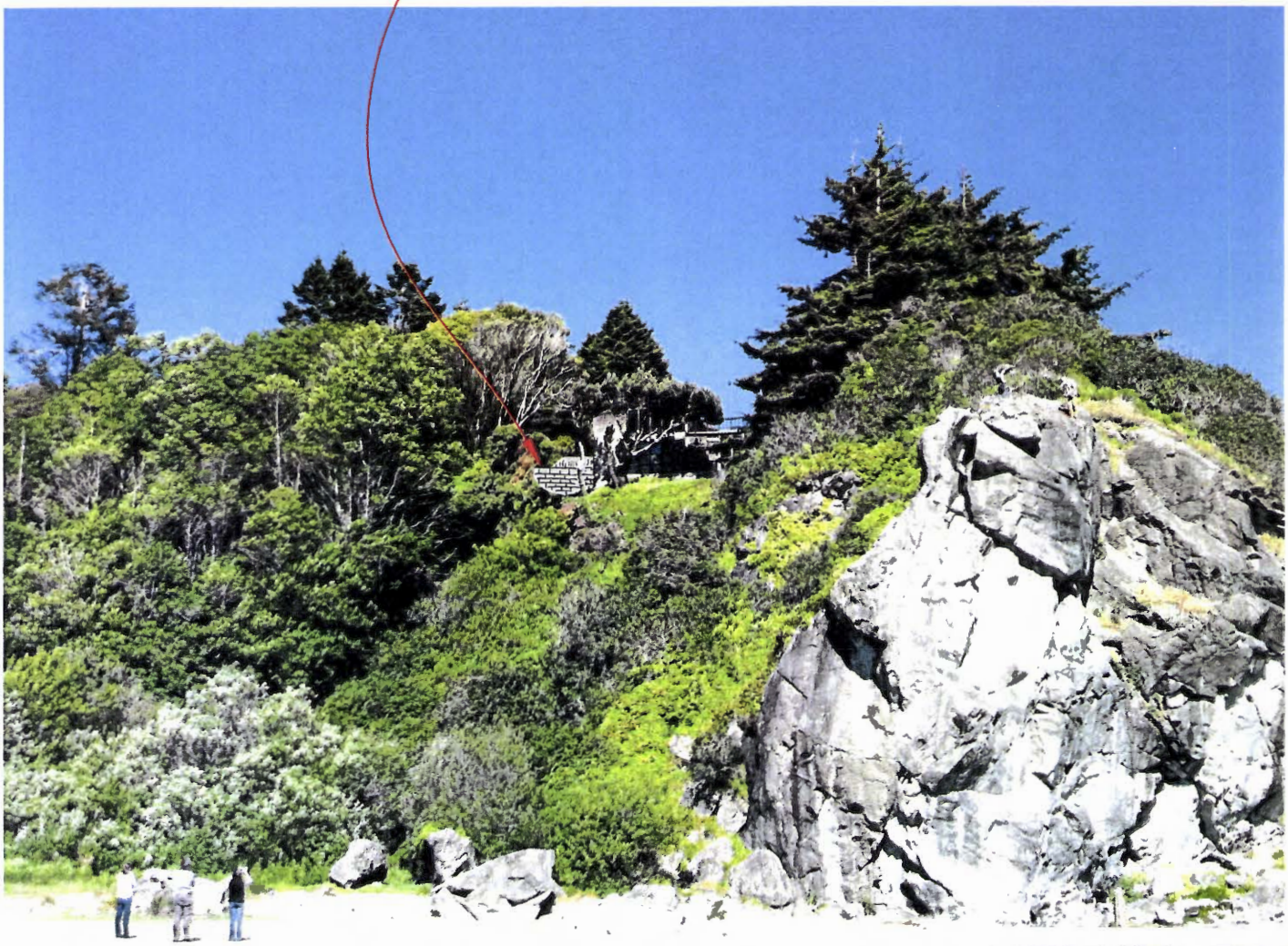

EXHIBIT NO. 7
APPLICATION NO.
1-12-014
BERRY & EVANS
SIMULATION OF WALL APPEARANCE FROM MOONSTONE BEACH

F
–

WALL APPEARANCE FROM MOONSTONE BEACH

NO SCALE

GEOTECHNICAL MEMORANDUM

RECEIVED
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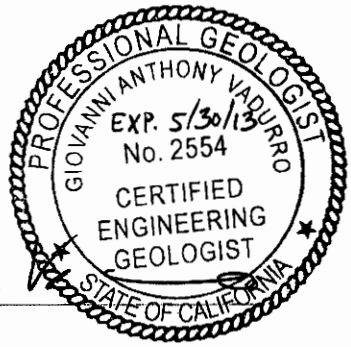
COASTAL COMMISSION

Limited-Scope Soil Exploration
Quillman Construction - Retaining Wall Design
Charlie Quillman

Assessor's Parcel Number 514-181-063

Date: August 23, 2012
Project No.: 7584.00



Prepared By: Giovanni Vadurro, CEG

INTRODUCTION

The following memo documents findings from our limited-scope soils exploration conducted at 98 Rayipa Lane, Trinidad, California. The services described in this memo were performed in accordance with the scope of Engineering Services outlined in our Agreement dated and approved February 27 and 28, 2012, respectively. The primary purpose of our services was to support the design of the new soil retaining wall(s). Services included exploration and visual characterization of subsurface soil conditions, including a measurement of the thickness of disturbed fill material, and the depth to firm, in-place granular soils,

A Certified Engineering Geologist from LACO Associates (LACO) conducted the field exploration in conjunction with a topographic survey of the project site on February 28, 2012. One hand-augered borehole was advanced to a depth of 5 feet below existing ground surface near the location of the base of the concrete deck footing. Cuttings from the hand-augered borehole were logged in the field. The soil profile log, denoted as TH-1, is enclosed with this memo.

SOIL AND GROUNDWATER CONDITIONS

In summary, highly disturbed fills underlain by non-plastic and non-cemented marine terrace deposits were encountered at the location of our boring. Sand and gravel marine terrace deposits are anticipated to be present to depths in excess of several tens of feet. Bedrock was not encountered in our explorations but is interpreted to be in excess of 50 feet below ground surface as recorded in bluff exposures visible from Moonstone Beach. Free groundwater was not encountered within our test boring. Saturated soil conditions

are not likely to be present within the working areas due to the presence of well-drained granular soils and the a nearby slope free face. No evidence of seeps or springs was observed within the areas reviewed by LACO on the project site.

The observed fill soils are composed of a mix of silty topsoil and imported gravel that is fine to coarse, and subrounded. Fill soils are soft to loose, and of relatively low density. Marine terrace deposits are composed predominantly of alternating layers of medium-dense silty sand and poorly-graded sand. The deposits generally grade coarser with depth. Terrace deposits are non-plastic, and non-cemented with single grain soil structure. The sand fraction is fine to medium, with trace amounts of coarse sand.

FOUNDATION DESIGN RECOMMENDATIONS

While we did not perform laboratory tests on samples from the site, the following conservative values should be used in the new retaining wall design:

Cohesion = 0
Friction angle = 30 degrees
Dry unit weight of soil = 110 lb/ft3

New retaining wall(s) used to support new engineered fill and the existing concrete deck footing should bear on, and be embedded into the undisturbed native granular soil (terrace deposits) encountered below the disturbed fill material. A minimum of 2.5 feet of fill material will be required to be excavated to expose the underlying in-place terrace deposits.

GAV:kc

Enclosures

P:\7500\7584 Charlie Quillman\7584.00 Quillman Construction-Retaining Wall Design\08 Geology\Reports\7584.00 20120823 Limited Scope Soil Exp Tech Memorandum.doc

2926

LACO

KEY TO SYMBOLS

LACO ASSOCIATES
ENGINEERS · GEOLOGISTS · ENVIRONMENTAL CONSULTANTS

CLIENT QUILLMAN CONSTRUCTION
PROJECT NAME SOIL EXPLORATION
PROJECT NUMBER 7584.00
PROJECT LOCATION 98 RAYIPA LANE, WESTHAVEN, CA

LITHOLOGIC SYMBOLS
(Unified Soil Classification System)


FILL: Fill (made ground)


SP: USCS Poorly-graded Sand


SP-SM: USCS Poorly-graded Sand with Silt

SAMPLER SYMBOLS

WELL CONSTRUCTION SYMBOLS

ABBREVIATIONS

LL - LIQUID LIMIT (%)
PI - PLASTIC INDEX (%)
W - MOISTURE CONTENT (%)
DD - DRY DENSITY (PCF)
NP - NON PLASTIC
-200 - PERCENT PASSING NO. 200 SIEVE
PP - POCKET PENETROMETER (TSF)

TV - TORVANE
PID - PHOTOIONIZATION DETECTOR
UC - UNCONFINED COMPRESSION
ppm - PARTS PER MILLION
▽ Water Level at Time Drilling, or as Shown
▼ Water Level at End of Drilling, or as Shown
▼ Water Level After 24 Hours, or as Shown

3 of 26

KEY TO SYMBOLS - GINT STD US LAB.GDT - 3/14/12 09:04 - P:\7500\7584 CHARLIE QUILLMAN\7584.00 QUILLMAN CONSTRUCTION-RETAINING WALL DESIGN\08 GEOLOGY\FIELD DATA\7584 QUILLMAN - WESTHAVEN.GPJ

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BORING NUMBER TH-1

CLIENT QUILLMAN CONSTRUCTION
PROJECT NAME SOIL EXPLORATION
PROJECT NUMBER 7584.00
PROJECT LOCATION 98 RAYIPA LANE, WESTHAVEN, CA
DATE STARTED 2/28/12 **COMPLETED** 2/28/12
GROUND ELEVATION 120 feet MSL **HOLE SIZE** 3.25 inches
DRILLING CONTRACTOR
GROUND WATER LEVELS:
DRILLING METHOD HAND AUGER
AT TIME OF DRILLING ---
LOGGED BY GAV **CHECKED BY**
AT END OF DRILLING ---
NOTES PLEISTOCENE MARINE TERRACE DEPOSITS

DEPTH (ft)	SAMPLE TYPE NUMBER	U.S.C.S.	GRAPHIC LOG	MATERIAL DESCRIPTION	
0.0				Disturbed fill soil; mix of Dark Brown silty topsoil and fine to coarse, subrounded gravel; soft to loose, moist, non-plastic, non-cemented, no dry strength.	
2.5					117.5
		SP-SM		POORLY GRADED SAND WITH SILT, (SP-SM) 2.5Y 4/4 Olive Brown, moist, medium dense, non-plastic, non-cemented, granular structure, sand fraction fine to medium.	
3.5					116.5
		SP		POORLY GRADED SAND, (SP) 2.5Y 5/6 Light Olive Brown, moist, medium dense, non-plastic, non-cemented, single grain structure, sand fraction fine to medium, faint mottling; similar soil material continues at depth based on slope face exposures; depth to groundwater unknown but likely to be tens of feet below ground surface based on lack of evidence of seeps and springs.	
5.0					115.0

Bottom of borehole at 5.0 feet.

4 of 26

Slope Instability Report

Retaining Wall Replacement
98 Rayipa Lane, Westhaven, California
Assessor's Parcel Number 514-181-063

August 8, 2012

Prepared for:
Charlie Quillman

LACO Project No. 7584.01

LACO

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Santa Rosa, CA 95403
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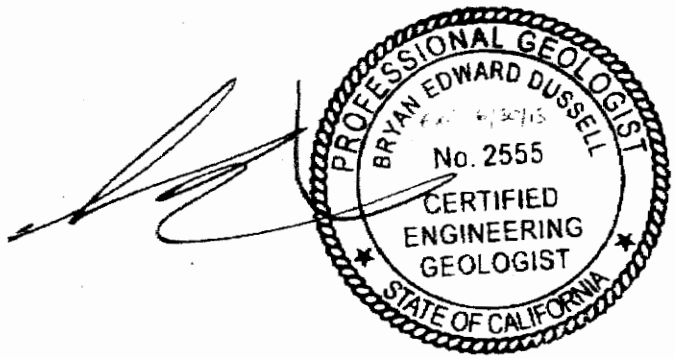
Slope Instability Report

Retaining Wall Replacement
98 Rayipa Lane, Westhaven, California
Assessor's Parcel Number 514-181-063

August 8, 2012

Prepared for:
Charlie Quillman

LACO Project No. 7584.01



Bryan E. Dussell, CEG

Matthew R. Love, EIT

LACO

TABLE OF CONTENTS

		Page
1.0	INTRODUCTION	1
1.1	Purpose	1
1.2	Limitations	2
2.0	PROJECT DESCRIPTION	2
2.1	Project Location	2
2.2	Proposed Development	2
3.0	SITE AND SUBSURFACE CONDITIONS	3
3.1	Site Conditions	3
3.2	Geologic Setting	3
3.3	Field Exploration	3
3.4	Soil Conditions	4
3.5	Laboratory Results	4
3.6	Groundwater Conditions	4
3.7	Existing Bluff Face and Slope Instability	5
4.0	QUANTITATIVE SLOPE INSTABILITY ANALYSIS	5
4.1	Discussion and Methodology	5
4.2	Results of Factor of Safety Analysis	6
5.0	BLUFF RETREAT/EROSION RATES	6
5.1	Discussion and Methodology	6
5.2	Results of Bluff Retreat/Erosion Rates	7
6.0	CONCLUSIONS	8
7.0	REFERENCES	8

FIGURES AND APPENDICES

Figure 1: Location Map

Appendix A: Boring Logs
Appendix B: Laboratory Results
Appendix C: Slope Instability Results
Appendix D: Historic Aerial Photographs References

7926

SLOPE INSTABILITY REPORT

Retaining Wall Replacement
98 Rayipa Lane, Westhaven, California
Assessor's Parcel Number 514-181-063
LACO Project Number 7584.01

1.0 INTRODUCTION

1.1 Purpose

This Report presents the assessments and information requested by the California Coastal Commission in a letter dated May 4, 2012, in regards to Coastal Development Permit Application No. 1-12-014 for the replacement construction of two retaining walls, exterior deck, and stairs at 98 Rayipa Lane, Westhaven, California (Figure 1).

This report was prepared in accordance with our Engineering Services Agreement dated June 28, 2012, with Mr. Charles Quillman (Client). Our scope of services included:

- Review of existing published geologic maps pertinent to the site and available unpublished soils and geologic reports within LACO Associates' (LACO) files.
- Conduct a field exploration program as follows:
    - Subsoil explorations with hand tools (hand auger/shovels) to characterize and sample soils within the project development area. A minimum of two borings (at locations along the bluff slope) were drilled to an anticipated target depth of 10 feet below the ground surface (bgs). Upon completion, the borings were backfilled with the native soil cuttings; excess soil cuttings, if any, will be left on the site.
    - Log soils encountered per ASTM 2488 standards under the direction of a Certified Engineering Geologist.
    - Collect samples for laboratory analysis. LACO project geologist to determine sampling locations based on field conditions. Anticipated analysis will include two moisture density (ASTM D2216) and one direct shear (ASTM D3080).
- Review and compile existing soil laboratory data for strength characteristics available in our Geotechnical Investigation Report for the site and published documents for use in a mathematical slope instability analysis.
- Perform a mathematical slope instability analysis of the slope adjacent to the proposed retaining walls using the Spencers Method per California Coastal Commission publication W11.5 recommended method. Soil strength parameters will be based on data from our data base, lab testing, and published literature.
- Conduct a time-series, aerial-photographic analysis and review existing published data to estimate and establish historic bluff retreat rates.
- Deliverable includes the following technical memorandum documenting the result of the slope stability analysis and the results of any lab testing completed.

1.2 Limitations

This Report has been prepared for the exclusive use of our Client, his contractors and subconsultants, and appropriate public authorities for specific application to development of the site.

The analyses and recommendations contained in this Report are based on data available in published and unpublished documents along with assumptions about subsurface conditions. LACO has endeavored to comply with the generally accepted geotechnical engineering standard of care common to the local area. LACO makes no other warranty, express, or implied.

Do not apply any of this Report's conclusions or recommendations if the nature, design, or location of the development is changed. If changes are contemplated, LACO should be consulted to review their impact on the applicability of the recommendation in this Report. Also note that LACO is not responsible for any claims, damages, or liability associated with any other party's interpretation of the subsurface data or reuse of this Report for other projects or at other locations without our express written authorization.

2.0 PROJECT DESCRIPTION

2.1 Project Location

Pertinent project site location information is listed in Table 1 below.

Table 1 – Project Location Information

Latitude and Longitude*	41.0303°N and -124.1113°W
Legal Description	Assessor Parcel Number 514-181-063
Parcel Size	0.3 acres
United States Geologic Survey Quadrangle	Crannell 7.5-minute topographic quadrangle

*Based on coordinates provided by Humboldt County Planning and Building GIS Portal for parcel centroid

2.2 Proposed Development

The project site is currently developed with a single-family residence. Two retaining walls located near the northwesterly corner of the house have recently been damaged by a fallen tree (one critically damaged and one with soil undermining). The owner is proposing to replace the existing critically-damaged retaining wall with a Keystone retaining wall, and the existing undermined retaining wall with a cantilever wall. Both walls are necessary for protection of the existing structures from damages associated with the soil undermining caused by the fallen tree.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

The project site is located on an uplifted Pleistocene marine terrace surface, and is situated on a grade break that slopes to the west with gradients ranging from approximately 10 to 80 percent. Topographically, the portion of terrace surface within the project site boundaries is situated between the 80-foot and 120-foot topographic contours as depicted on the Crannell 7.5-minute series topographic quadrangle (USGS, 1966).

3.2 Geologic Setting

The Trinidad and Westhaven area is generally characterized by a sequence of emergent Pleistocene marine terraces that ascend to an elevation of 1,400 feet above mean sea level (msl) (Rust, 1982). Individual marine terraces are typically comprised of a wave cut abrasion platform formed in the underlying regional bedrock consisting of Jurassic to late Cretaceous-aged Franciscan Complex mélange. Former sea stacks composed of resistant lithologies, including metamorphosed oceanic crust and graywacke sandstone, outcrop on most terrace surfaces including that within the project site vicinity.

The underlying marine terrace deposits, from older to younger, are composed primarily of medium-dense, poorly-graded sand (SP) and poorly-graded gravels with sand (GP), medium-dense, silty sand with minor amounts of fine gravel (SM), and firm, massively bedded silt with fine sand (ML). The terrace sands and gravels are typically stratified.

3.3 Field Exploration

On February 28, 2012, a Certified Engineering Geologist (CEG) from LACO conducted a site visit to document site conditions and to explore retaining wall soils with a hand auger. An internal technical memorandum describing the findings of the site visit was completed on March 14, 2012. LACO returned to the site on July 13, 2012, to perform a site reconnaissance and to collect soils samples for laboratory testing.

The subsurface exploration includes one hand auger boring located near the damaged retaining wall. Hand auger borings were advanced to a maximum depth of 10 feet bgs. Soil Logs are included in Appendix A.

3.4 Soil Conditions

Highly disturbed fills underlain by non-plastic and non-cemented to weakly-cemented marine terrace deposits were encountered at the location of the existing retaining walls on our February 28 and July 13, 2012, subsurface explorations. Sandy terrace deposits are anticipated to be present to depths in excess of several tens of feet. The depth to bedrock is unknown and is interpreted to be in excess of 50 feet bgs based on bluff exposures visible from Moonstone Beach. No groundwater was encountered within our test boring. Saturated soil conditions are not likely to be present within the working areas due to the presence of well-drained, granular soils and the nearby slope free face.

Marine terrace deposits underlying the project site are composed predominantly of alternating layers of medium-dense silty sand (SM) and poorly-graded sand (SP). The deposits generally grade coarser with depth. Terrace deposits are non-plastic, and weakly-cemented with single-grain soil structure. The sand fraction is fine to medium, with trace amounts of coarse sand. Boring logs are included as Appendix A.

3.5 Laboratory Results

Soil samples collected from the site were submitted to LACO's materials testing laboratory. The intent of the laboratory analyses was to determine representative index and strength properties of the soils encountered. The laboratory tests conducted for this investigation at the site included:

- *In-situ* moisture/density (ASTM D2216 and D2937); and,
- Direct Shear (ASTM D3080)

A summary of geotechnical laboratory test results is also presented in Table 2 below:

Table 2: Laboratory Test Results

			ASTM D2216 and D2937		ASTM D3080		
Boring Number	Depth (inches)	USCS Classification	Wet Density (pcf)	Moisture Content (% water)	Wet Density (pcf)	Friction Angle (degrees)	Cohesion (psf)
TH-1	72-84	SM	82.5	12.1	95.0	31.7	497

Laboratory Test Result Worksheets and Reports are included as Appendix B.

3.6 Groundwater Conditions

Groundwater was not encountered during our subsoil explorations (February 28 and July 13, 2012). Additionally, the Humboldt County Department of Environmental Health reports that there are no currently active groundwater wells in the site vicinity, and that generally there is not enough consistent groundwater for well development in the Westhaven area (HCDEH, 2012). Groundwater seepage was observed at the toe of the slope and is interpreted to be groundwater flowing across the bedrock unit.

11926

The groundwater level at the site is assumed to descend along a potentiometric surface from an elevation of 80 feet to the elevation of observed seep, over a horizontal distance of approximately 375 feet for an average gradient of 16 percent. The groundwater surface was developed by adjusting groundwater levels until slope conditions resembled previous slope failure conditions, which is discussed in the following section.

3.7 Existing Bluff Face and Slope Instability

Evidence of historic slope failures can be observed in historic photos of the project area; slope failures within 150 feet of the project site were observed in aerial photos of the area from 1972 (Kenneth & Gabrielle Adelman, 2004-2010). The failures observed were very shallow in nature and appear to be consistent with a debris flow (primarily vegetation/shallow soils) type failure. No other slope failures were observed for the project area during our historic aerial photographic review.

4.0 QUANTITATIVE SLOPE INSTABILITY ANALYSIS

4.1 Discussion and Methodology

Table 1 of Memorandum W11.5 (Johnsson, 2003) presents the guidelines for performing quantitative slope stability analysis for purposes of establishing setback distances. Although the purpose of this report is not for determination of setback requirements, the methods in W11.5 are still considered applicable for determining the slopes stability. Simplified, the guidelines state the following:

- The effects of earthquakes on slope stability may be addressed through psuedostatic slope analysis assuming a horizontal seismic coefficient of 0.15g.
- All slope stability analyses should be undertaken with water table or potentiometric surfaces for the highest groundwater conditions.
- Circular failure surfaces should be sought using methods such as Spencer's (Spencer 1967; 1973) or Morgenstern-Price (Morgenstern and Price, 1965).

To evaluate the stability of the bluff under both static and dynamic conditions, LACO performed a quantitative slope stability analysis of the bluff using Slide (version 5.0) slope stability software. The software assesses the stability of the slope using the Spencer Method to compare the forces resisting failure to the forces driving failure. The ratio of the two forces is defined as a Factor of Safety (F). In a stable slope, the forces resisting failure exceed the driving forces and the resultant F is greater than 1.0. When the two forces are equal, the F is equal to 1.0 and slope failure is imminent. The greater the F, the greater the stability of the slope.

12926

The stability analysis for this site used slope geometry obtained from publicly available LIDAR data (CCC, 2009-2011) and a simplified model of the slope soil materials. The cross section used to develop the slope profile is included on Figure 1. As stated in the Soil Conditions section of this Report, the encountered soils underlying the site are composed predominantly of alternating layers of medium-dense silty sand (SM) and poorly-graded sand (SP).

For conservatism in the instability analysis, the slope was modeled as a single-soil unit of silty sand (SM), which has a lower strength value (friction angle, cementation) than the other presumed underlying soils. Unit weight and friction angle values used in the analysis are based on results from our laboratory testing program, as presented in the Soil Conditions section. Cohesion used for the silty sand (SM) soil unit was back-calculated using the Infinite Slope method (Duncan et al. 1987) for failure conditions (FS=1.0), as to replicate conditions of the historic debris slides within the project vicinity. Additionally, soil units for the beach sand and the underlying bedrock were included in the model. Strength properties for the beach sand and bedrock were adapted from published text (Hunt, 2005). The following Table 3 summarizes the soil parameters used in the slope instability analysis for the site.

Table 3: Soil Parameters Used in the Factor of Safety Analysis

Description	Silty Sand (SM)	Bluff Colluvium/Alluvium	Bedrock (Franciscan Melange)
Dry Unit Weight	95.0 pounds per cubic foot (pcf)	90.0 pounds per cubic foot (pcf)	150 pcf
Saturated Unit Weight	110 pcf	110 pcf	---
Cohesion	330 pounds per square foot (psf)	0 psf	---
Friction Angle	31.7°	29.0°	---

4.2 Results of Factor of Safety Analysis

Graphic results from the F analysis are included in Appendix C. The model analysis reflects the existing minimum slope failure surface with an F equal to 1.41 under static conditions (termed F_s) and F equal to 1.07 under dynamic conditions (termed F_d).

5.0 BLUFF RETREAT/EROSION RATES

5.1 Discussion and Methodology

Bluff retreat rates are typically estimated using measurements from historic photographs and maps. Although rates are commonly presented as linear (constant through time), they typically tend to be episodic due to a variety of internal and external factors, including 1) temporary weather patterns (El Nino, heavy rainfall periods), 2) seismic events, 3) climate change and 4) rise in sea level.

13 of 26

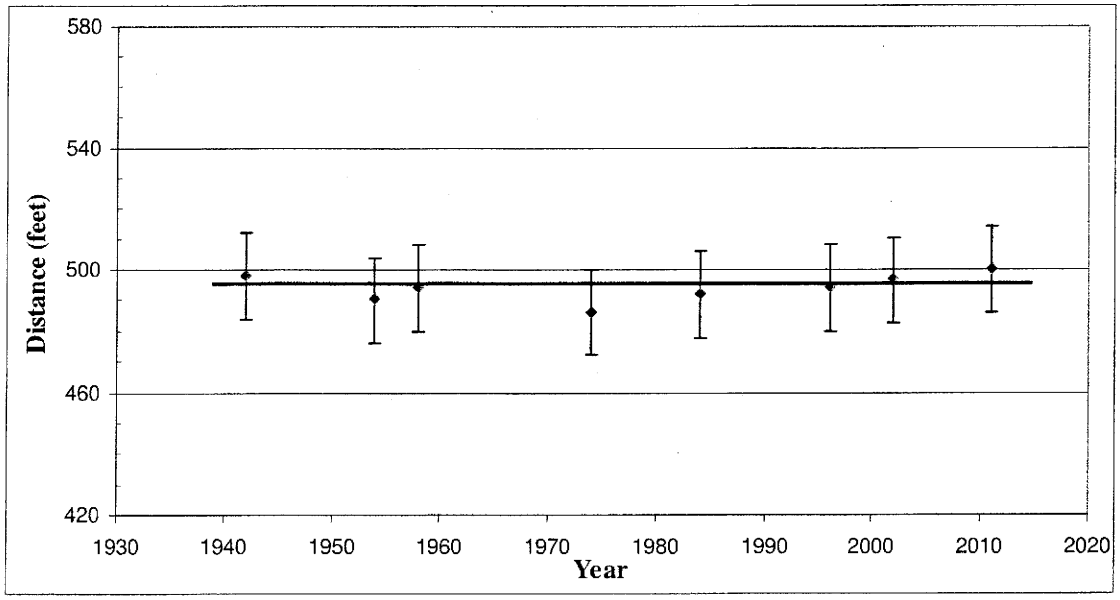
A long-term bluff retreat rate was estimated for this site by performing a site specific aerial photographic review covering approximately 69 years from 1942 to 2011. A list of the aerial photographs referenced is included as Appendix D.

The site specific aerial photograph review utilized constant transect through the site to measure changes in distance to the bluff from fixed locations over time. The fixed referenced locations utilized included edges of roadway pavement and geologic features (bedrock outcropping) that were identifiable in each photograph reviewed.

5.2 Results of Bluff Retreat/Erosion Rates

The bluff edge adjacent to the project site has not had any discernable retreat between 1942 and 2011, which results in the assumption that the site bluff is not actively retreating (rate=0.0 feet/year). The long-term historic retreat rates were determined by dividing the total amount of coastal retreat measured by the total length of time spanned by the aerial photographs reviewed (69 years). To address scaling limitations and reproduction distortions of the photographs, an error bar (+/-14 feet) was included in our aerial photograph measurements. Graph A below presents the results and interpretations of the bluff retreat rate as determined by historic aerial photographs (with error bars).

Graph A: Historic Bluff Retreat Rate



Note: "Distance" refers to the distance between the bluff crest and Scenic Drive.

14426

The absence of bluff retreat at the project site can be attributed to protection from environmental factors (wind, wave action) provided by heavy vegetation and the surrounding bedrock outcroppings. No other bluff retreat studies in the immediate vicinity of the project were available for comparison of bluff retreat rates.

6.0 CONCLUSIONS

The results of the qualitative slope stability analysis calculated a F_S of 1.41 for static conditions and F_D of 1.07 for seismic conditions. In Memorandum W11.5, it is recommended that the F_S and F_D for new developments be 1.5 and 1.1, respectively. The F_S and F_D calculated for the site are not within, but near the range of values recommended by the Coastal Commission. Based on the lack of measurable bluff retreat during the period covered by the aerial photographic analysis, we judge that the potential for bluff retreat/erosion to negatively impact the proposed new development during the economic lifespan is low.

7.0 REFERENCES

CCC [California Coastal Conservancy] 2009-2011, Coastal LIDAR Project, accessed via web [http://csc.noaa.gov/dataviewer/index.html?action=advsearch&qType=in&qFld=projectid&qVal=1005#] in June 2012

CDMG [California Division of Mines and Geology], 1966, State of California Special Studies Zones, Crannell 7.5' Quadrangle, Humboldt County, California

Humboldt County Department of Environmental Health (HCDEH) 2012, Personal correspondence via phone (Adam Molofski), July 2012

Hunt, R. Y., 2005, Geotechnical Engineering Investigation Handbook, published by CRC Press in 2005

Johnsson, M. J., 2003, Establishing Development Setbacks From Coastal Bluffs, Proceedings, California and the World Ocean'02. Orville Magoon (ed.), 21 p.

Kenneth & Gabrielle Adelman, 2004-2010, California Coastal Records Project, Image 7203115

Morgenstern, N. R. and Price, V. E., 1965, The analysis of the stability of general slip surfaces, *Geotechnique*, pg. 15, 79-93.

Rust, Derek (1982). Coastal Faulting and Erosion Hazards in Humboldt County, Northern California.

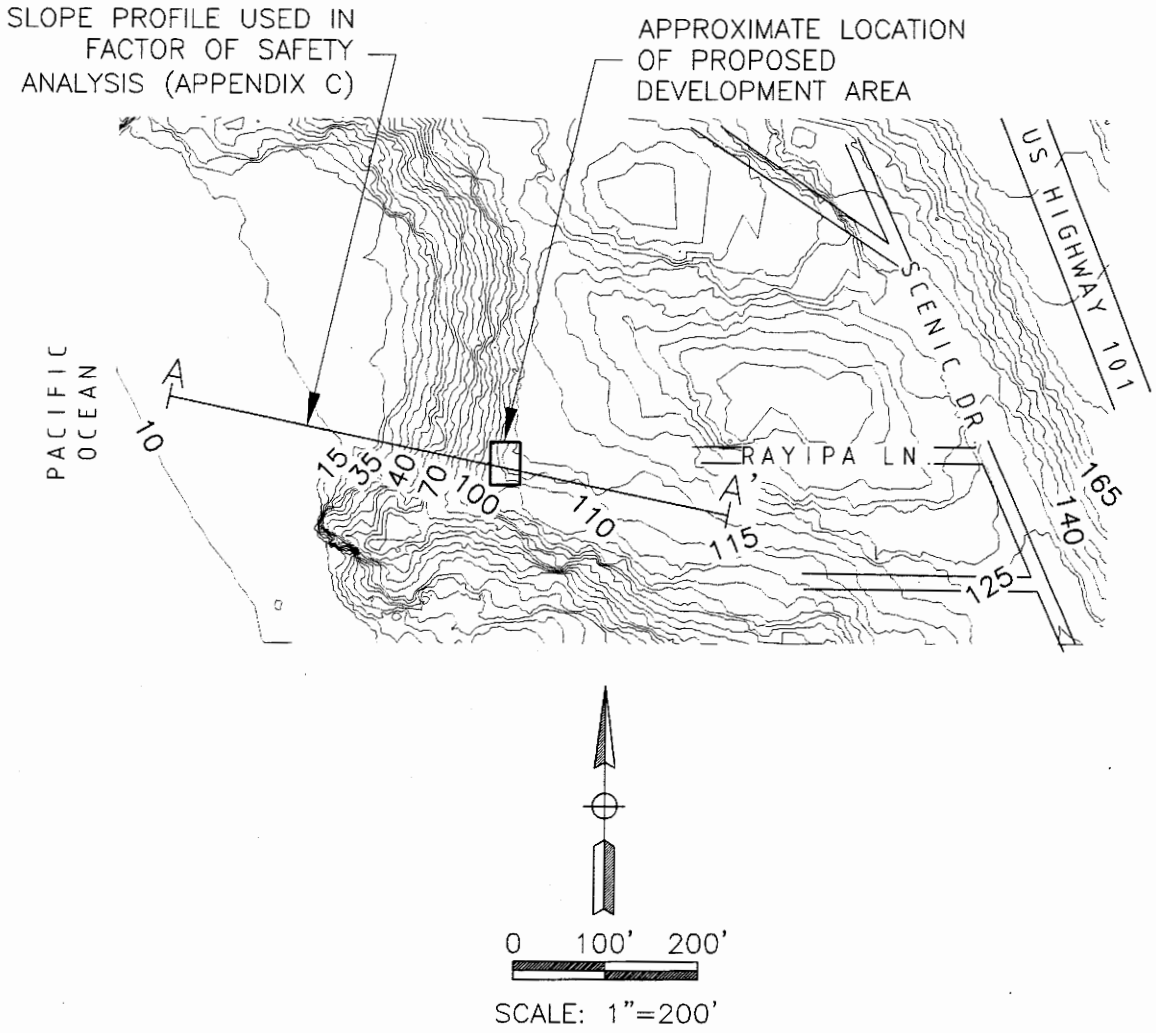
Spencer, E., 1967, A method analysis of the stability of embankments assuming parallel interslice forces, *Geotechnique*, pg. 17, 11-26.

Spencer, E., 1973, Thrust line criterion in embankment stability analysis, *Geotechnique*, pg. 23, 85-100.

P:\7500\7584 Charlie Quillman\7584.01 Quillman Retaining Wall Repairs - CC Permitting Support\08 Geology\7584.01 20120808 Slope Instability Report.doc

15 of 26

LACO	PROJECT SLOPE STABILITY REPORT	BY JB/JDB	FIGURE 1
EUREKA • UKIAH • SANTA ROSA	CLIENT QUILLMAN CONSTRUCTION	DATE 7/27/12	
1-800-515-5054 www.lacoassociates.com	LOCATION APN 514-181-063	CHECK BED	JOB NO. 7584.01
	LOCATION MAP	SCALE AS SHOWN	



NOTES:

1. BASE MAP ADAPTED FROM DATA AVAILABLE THROUGH THE 2009–2011 CALIFORNIA COASTAL CONSERVANCY LiDAR PROJECT.
2. CONTOUR INTERVAL IS 5'.
3. ELEVATION DATUM IS NAVD88.
4. ALL LOCATIONS APPROXIMATE.

11 04 26

Aug 08,2012-9:50am T:\Cadfiles\7500\7584 Quillman\DWG\ 7584 GEO FIG 1.dwg

Appendix A
Boring Logs

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BORING NUMBER TH-1

CLIENT QUILLMAN CONSTRUCTION
PROJECT NAME SLOPE STABILITY REPORT
PROJECT NUMBER 7584.01
PROJECT LOCATION 98 RAYIPA LANE, WESTHAVEN, CA
DATE STARTED 7/13/12 **COMPLETED** 7/13/12
GROUND ELEVATION 120 feet MSL **HOLE SIZE** 3.25 inches
DRILLING CONTRACTOR
GROUND WATER LEVELS:
DRILLING METHOD HAND AUGER
AT TIME OF DRILLING ---
LOGGED BY MRL **CHECKED BY**
AT END OF DRILLING ---
NOTES PLEISTOCENE MARINE TERRACE DEPOSITS

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	WET UNIT WT. (pcf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS: LIQUID LIMIT	ATTERBERG LIMITS: PLASTIC LIMIT	ATTERBERG LIMITS: PLASTICITY INDEX	FINES CONTENT (%)
0.0		FILL: Disturbed fill soil; mix of Dark Brown silty topsoil and fine to coarse, subrounded gravel; soft to loose, moist, non-plastic, non-cemented, no dry strength.										
2.5		(SP-SM) POORLY GRADED SAND WITH SILT: 2.5Y 4/4 Olive Brown, moist, medium dense, non-plastic, non-cemented, granular structure, sand fraction fine to medium.										
5.0		(SM) SILTY SAND: 2.5Y 5/6 Light Olive Brown, moist, medium dense, non-plastic, weakly cemented, single grain structure, sand fraction fine to medium, faint mottling; similar soil material continues at depth based on slope face exposures; depth to groundwater unknown but likely to be tens of feet below ground surface based on lack of evidence of seeps and springs.	SH SH-1			95	85	12				
7.5		(SM) SILTY SAND WITH GRAVEL: 2.5Y 3/4 Dark reddish brown, moist, medium dense to dense, non-plastic, weakly cemented, encountered 3" minus rounded gravels										
10.0			GB GB-1									

Bottom of borehole at 10.0 feet.

18 of 26

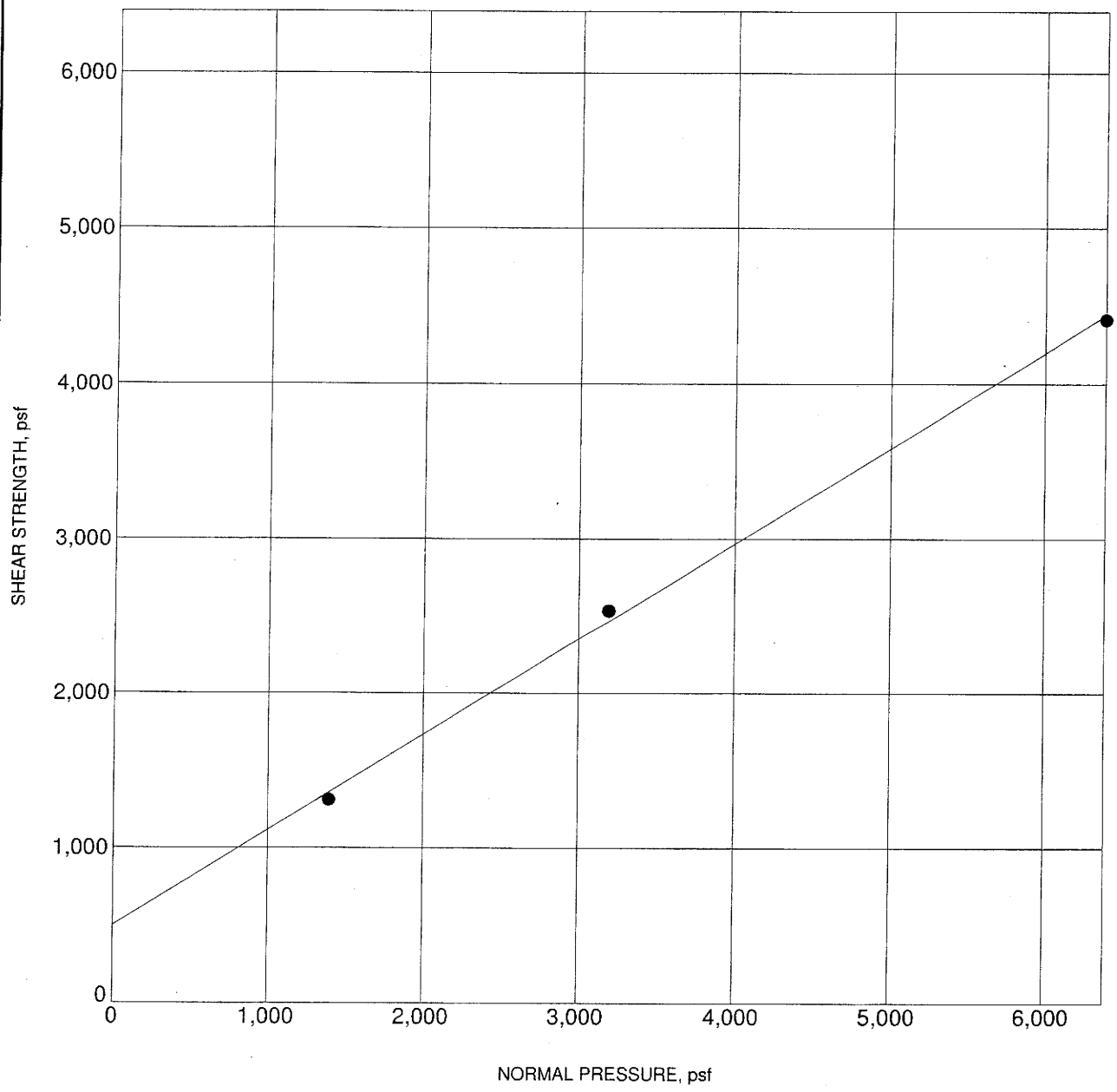
Appendix B
Laboratory Results

19426

DIRECT SHEAR TEST

LACO

CLIENT QUILLMAN CONSTRUCTION
PROJECT NAME SLOPE STABILITY REPORT
PROJECT NUMBER 7584.01
PROJECT LOCATION 98 RAYIPA LANE, WESTHAVEN, CA

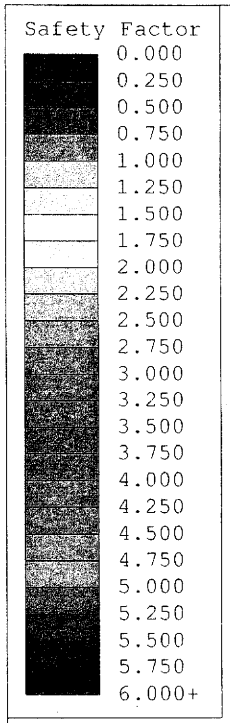


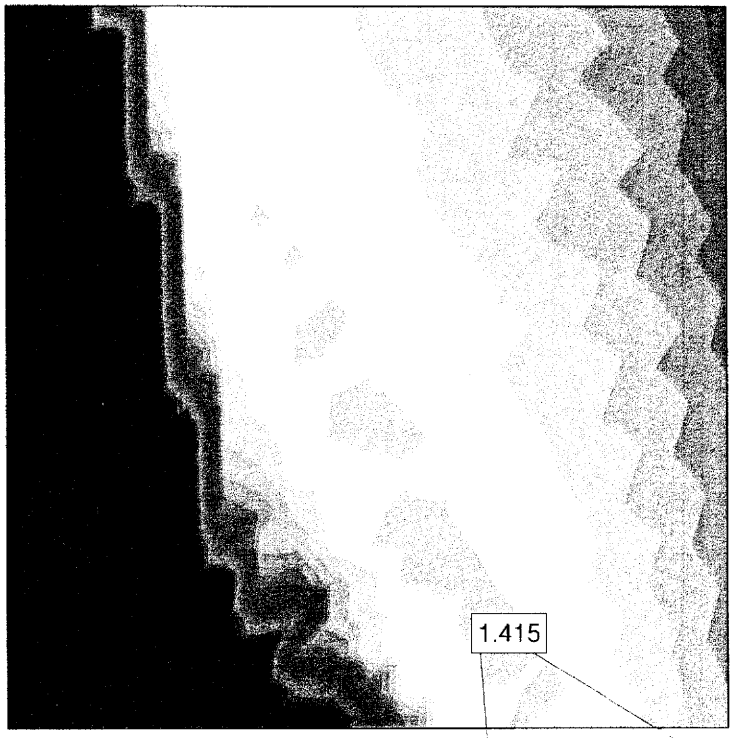
BOREHOLE	DEPTH	Classification	γ_d	MC%	c	ϕ
● TH-1	6.0	SM	85	12	497.0	32

DIRECT SHEAR - GINT STD US LAB.GDT - 8/2/12 10:37 - P:\GINT FILES\PROJECTS\7584 QUILLMAN - WESTHAVEN.GPJ

Appendix C

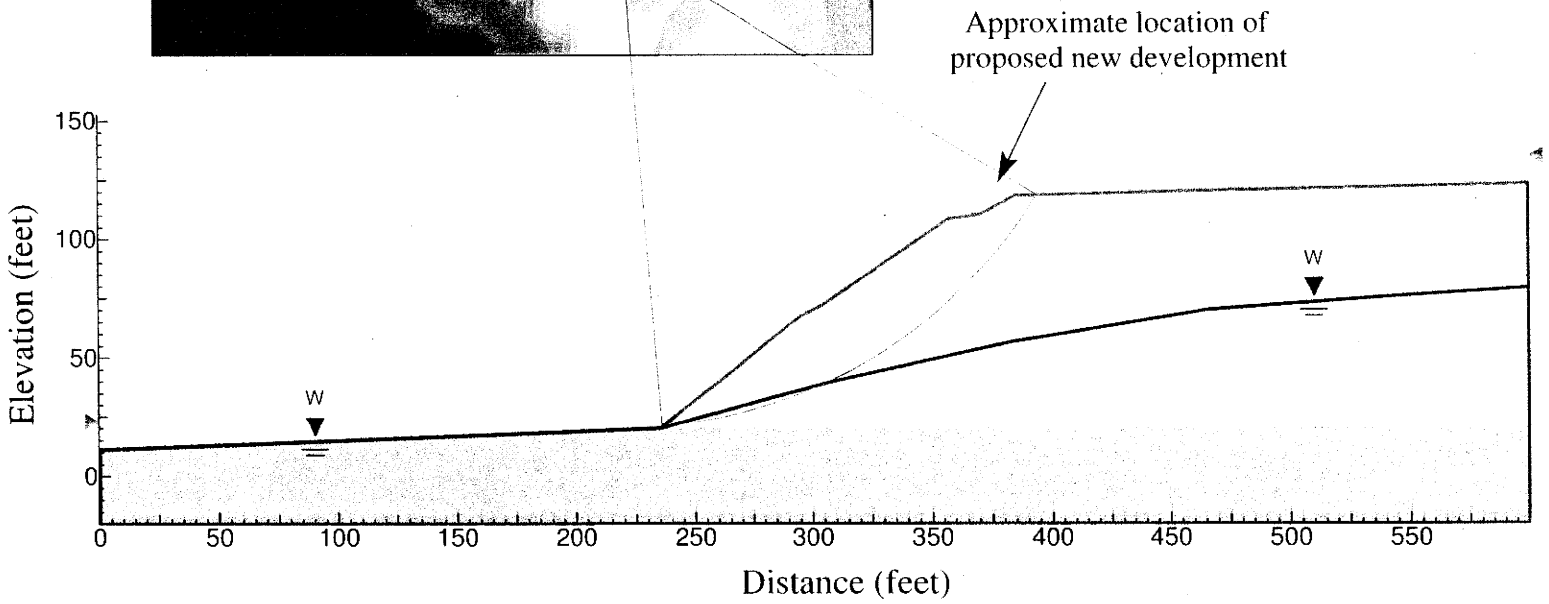
Slope Instability Results



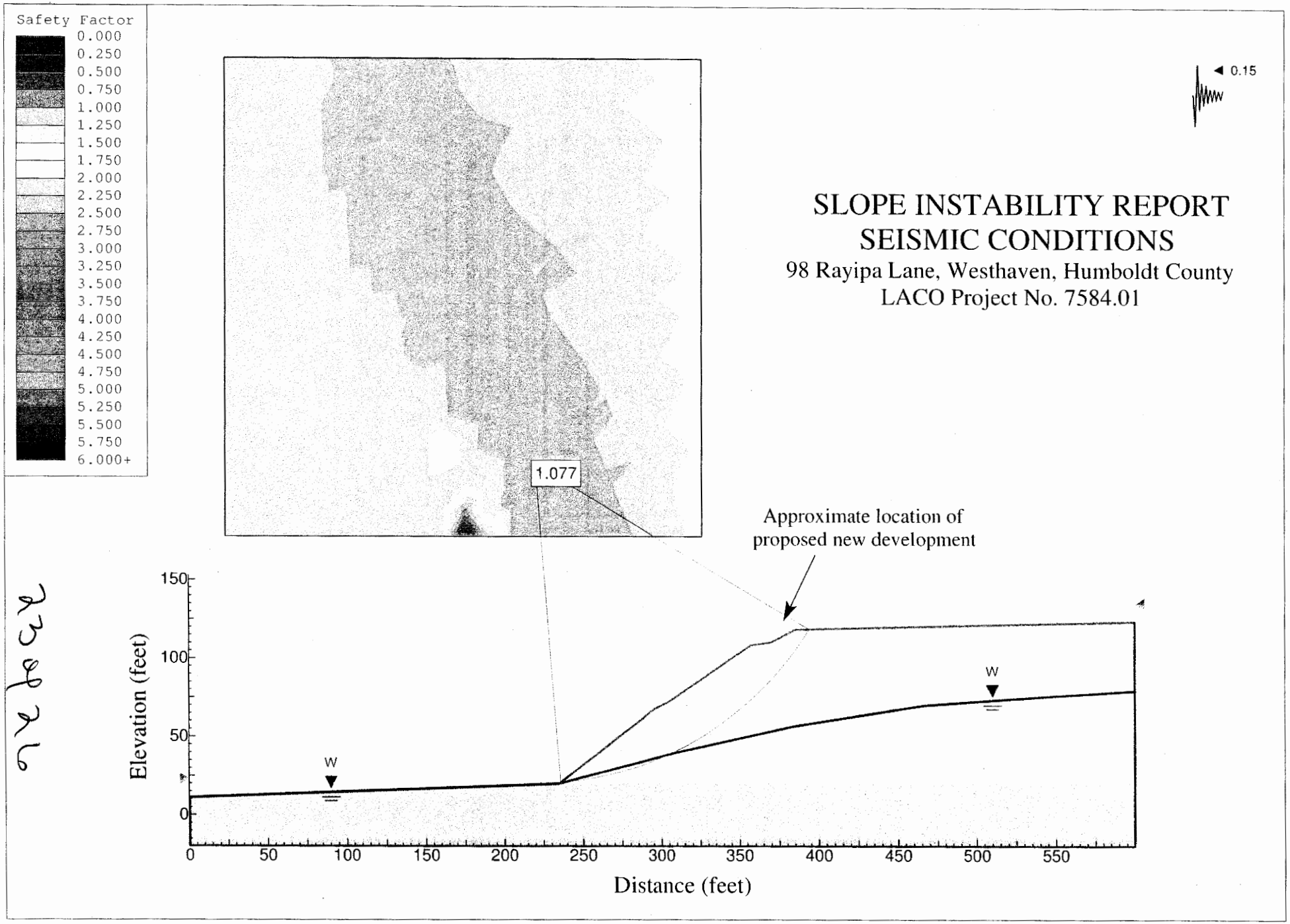


SLOPE INSTABILITY REPORT
STATIC CONDITIONS

98 Rayipa Lane, Westhaven, Humboldt County
LACO Project No. 7584.01



22 of 22



SLOPE INSTABILITY REPORT
SEISMIC CONDITIONS

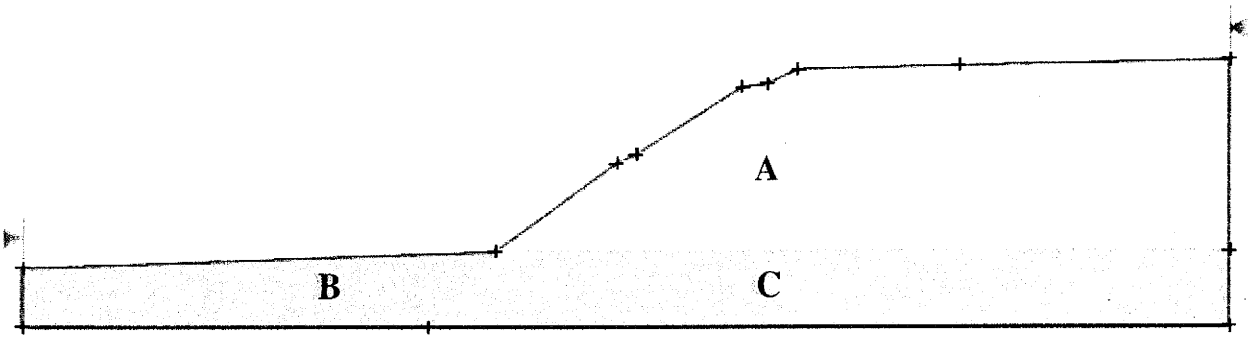
98 Rayipa Lane, Westhaven, Humboldt County
LACO Project No. 7584.01

Page 22

SLOPE INSTABILITY REPORT

SLOPE STABILITY - KEY TO SOIL LAYERS AND MATERIAL DESCRIPTIONS

LACO Project No. 7584.01



Layer	Material	Dry Unit Weight (pcf)	Sat. Unit Weight (pcf)	Friction Angle (degrees)	Cohesion (psf)
A	SM: Weakly Cemented Silty Sand	95.0	110.0	31.7	330
B	Bluff Colluvium/Alluvium	90.0	110.0	29.0	0
C	Bedrock	150.0	---	---	---

Notes:

- Cohesion for SM layer estimated using Infinite Slope method for FS=1.0
- Horizontal seismic coefficient = 0.15
- Unit weight and friction angle assumed based on laboratory results and data from Hunt (2006)
- Slope generated from California Coastal Conservancy LIDAR Project (2009-2011)

Appendix D

Historic Aerial Photographs

References

Aerial Photograph References

1942 – Corps of Engineers, Scale 1:20,000, Line 9B, Photo 121

1954 – USDA, Scale 1:20,000, Line 13N, Photo 99

1958 – Delano (HV), Scale 1:12,000, Line 10, Photo 44

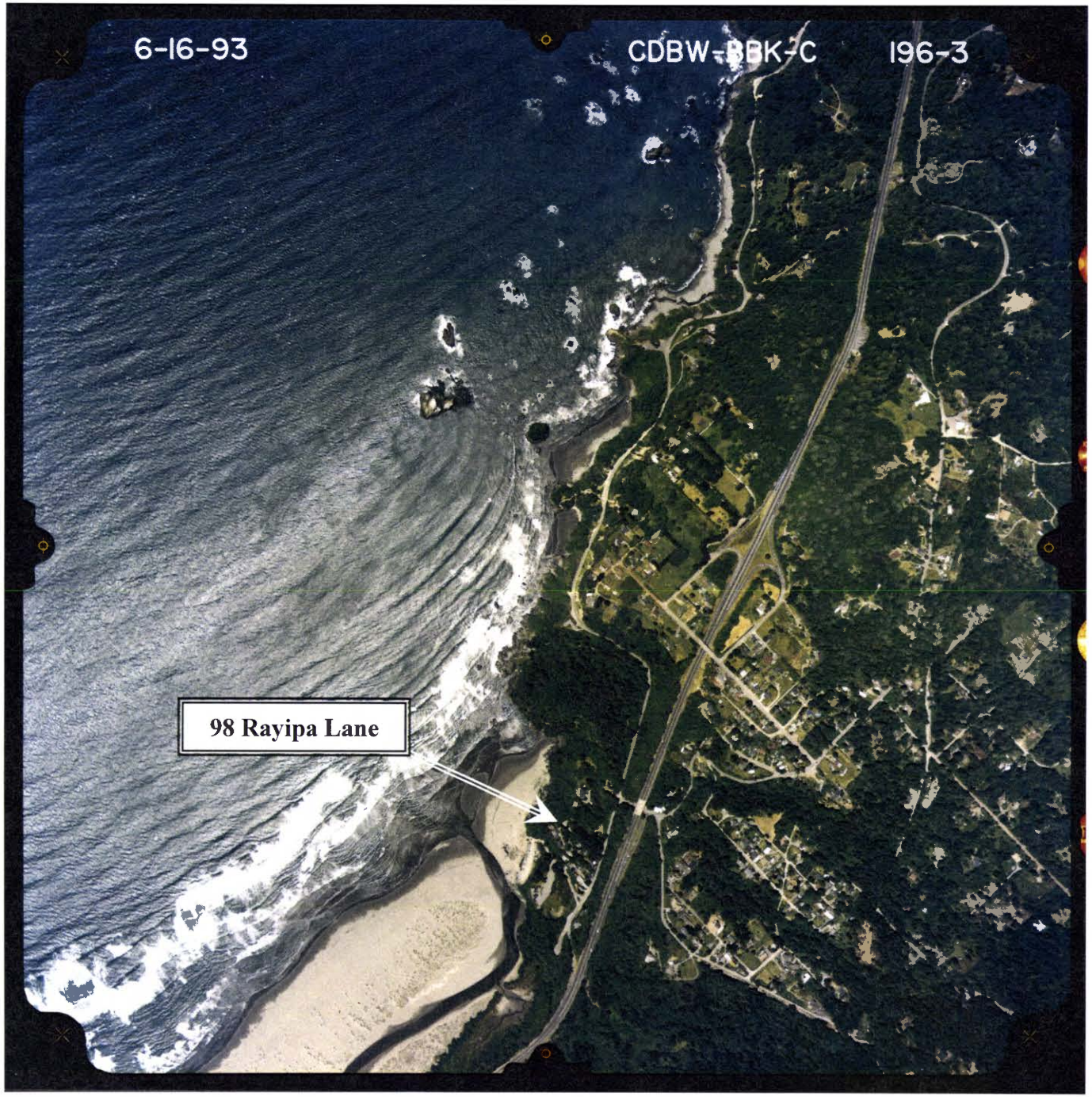
1974 – Humboldt County Assessor, Scale 1:12,000, Line 15A, Photo 61

1984 – Davis, R., Scale 1:12,000, Line 2, Photo 1

1996 – Geonex, Scale 1:12,000, Line 1-14, Photo 2

2002 – CDF, Scale 1:4,800, Line 3, Photo 3

EXHIBIT NO. 9
APPLICATION NO.
1-12-014
BERRY & EVANS
AERIAL PHOTO CHRONOLOGY (1972-2009)
(1 of 5)


6-16-93
CDBW-BBK-C
196-3
98 Rayipa Lane

1979 aerial

7 of 51

1972 aerial

51
&
51