MONTEREY COUNTY PLANNING COMMISSION

Meeting: January 30, 2013 Time: 10:30 A.M.	**Agenda Item No.: 5**
Project Description: Consider a Combined Development Permit consisting of: 1) a Coastal Development Permit and Design Approval for restoration of a coastal bluff consisting of a concrete keyway and armored headwall with landscaped Hilfiker wall system; headwall to be surfaced with a textured rock appearance and Hilfiker baskets to be planted with native vegetation consistent with surrounding bluff vegetation; the restoration area to be approximately 45 - 55 feet wide by approximately 33 - 53 feet tall; grading to be approximately 50 cubic yards cut and 740 cubic yards fill; 2) a Coastal Development Permit for development on slopes exceeding 30 percent; 3) a Coastal Development Permit for development within 100 feet of environmentally sensitive habitat; and 4) a Coastal Development Permit for development within 750 feet of known archaeological resources.	
Project Location: 30620 Aurora Del Mar, Carmel	**APN:** 243-331-010-000
Planning File Number: PLN110280	**Owner:** Daniel and Jennifer Niles **Agent:** Anthony Lombardo
Planning Area: Big Sur Coast Land Use Plan	**Flagged and staked:** Yes
Zoning Designation: "RDR/40-D (CZ)" [Rural Density Residential, 40 acres per unit with Design Control overlay (Coastal Zone)]	
CEQA Action: Mitigated Negative Declaration	
Department: RMA - Planning Department	

RECOMMENDATION:
Staff recommends that the Planning Commission adopt a resolution (**Exhibit C**) to:

1) Adopt a Mitigated Negative Declaration;
2) Approve a Combined Development Permit, based on the findings and evidence and subject to the conditions of approval (**Exhibit C**); and
3) Adopt a Mitigation Monitoring and Reporting Plan.

PROJECT OVERVIEW:
The project site is a 1.14 acre lot in a residential subdivision lying between Aurora Del Mar, a private road paralleling Highway 1 immediately to the east and the Pacific Ocean on the west. Located on a small coastal peninsula, the site slopes gently to the west, with steep coastal bluffs to the south, west and north. The lot is developed with a single-family dwelling and garage that are built into the bluff with a green roof at ground level. A recent failure of the slope on the north side of the residence threatens the garage, which lies immediately adjacent to the collapsed bluff. The applicant proposes to repair the slope and protect the structure by construction of a concrete keyway and armored headwall on the lower portion of the slope and a landscaped Hilfiker basket system on the upper portion. For a more detailed discussion, see **Exhibit B**.

OTHER AGENCY INVOLVEMENT: The following agencies and departments reviewed this project:

RMA - Public Works Department
Environmental Health Bureau
Water Resources Agency
Carmel Highlands Fire Protection District
California Coastal Commission

Agencies that submitted comments are noted with a check mark ("√"). None of the reviewing agencies recommended conditions of approval.

On May 22, 2012 the Big Sur Land Use Advisory Committee heard the project at a public hearing and recommended approval of the project by a vote of 6 to 0 subject to the recommendation that invasive species be removed from the construction area as well as other areas on the property.

Note: The decision on this project is appealable to the Board of Supervisors and the California Coastal Commission.

/S/ Delinda G. Robinson

Delinda G. Robinson, Senior Planner
(831) 755-5198, robinsond@co.monterey.ca.us
November 30, 2012

cc: Front Counter Copy; Planning Commission; Carmel Highlands Fire Protection District; Public Works Department; Environmental Health Bureau; Water Resources Agency; California Coastal Commission; Laura Lawrence, Planning Services Manager; Delinda Robinson, Project Planner; Daniel and Jennifer Niles, Owner; Anthony Lombardo, Agent; The Open Monterey Project; LandWatch; Planning File PLN110280

Attachments:

Exhibit A	Project Data Sheet
Exhibit B	Project Discussion
Exhibit C	Draft Resolution, including: • Conditions of Approval and Mitigation Monitoring and Reporting Program • Site Plan, Elevations
Exhibit D	Vicinity Map
Exhibit E	Big Sur Land Use Advisory Committee Minutes
Exhibit F	Mitigated Negative Declaration including: • Initial Study • Technical Reports available electronically
Exhibit G	Comments on Mitigated Negative Declaration
Exhibit H	Project Correspondence

This report was reviewed by Laura Lawrence, Planning Services Manager.

EXHIBIT A

Project Information for PLN110280

Project Information:

Project Name:	NILES DANIEL T & JENNIFER E		
Location:	30620 AURORA DEL MAR CARMEL		
Permit Type:	Combined Development Permit		
Environmental Status:	Mitigated Negative Declaration	**Final Action Deadline (884):**	11/30/2012
Existing Structures (sf):	3175	**Coverage Allowed:**	25%
Proposed Structures (sf):	0	**Coverage Proposed:**	6.4%
Total Sq. Ft.:	3175	**Height Allowed:**	N/A
Tree Removal:	None	**Height Proposed:**	N/A
Water Source:	Public	**FAR Allowed:**	N/A
Water Purveyor:	Cal Am	**FAR Proposed:**	N/A
Sewage Disposal (method):	Septic	**Lot Size:**	49658
Sewer District:	N/A	**Grading (cubic yds.):**	790

Parcel Information:

Primary APN:	243-331-010-000	**Seismic Hazard Zone:**	UNDETERMINED
Applicable Plan:	Big Sur Coast LUP	**Erosion Hazard Zone:**	High, Moderate
Advisory Committee:	Big Sur Coast Advisory Committee	**Fire Hazard Zone:**	Very High
Zoning:	RDR/40-D(CZ)	**Flood Hazard Zone:**	V
Land Use Designation:	Residential, 40 acres/unit	**Archaeological Sensitivity:**	High
Coastal Zone:	Yes	**Viewshed:**	Not Critical Viewshed
Fire District:	Carmel Highlands FPD	**Special Setbacks on Parcel:**	Y

Reports on Project Parcel:

Soils Report #:	LIB120148
Biological Report #:	LIB120149
Geologic Report #:	LIB110262, LIB120148
Forest Management Rpt. #:	N/A
Archaeological Report #:	LIB110042, LIB110043, LIB120150
Traffic Report #:	N/A

EXHIBIT B
DISCUSSION

Project Site

The subject property is located at 30620 Aurora Del Mar, Carmel in the northern section of the Big Sur Coast Land Use Plan area. The site is a 1.14 acre bluff top lot in a residential subdivision lying between Aurora Del Mar, a private road paralleling Highway 1 immediately to the east and the Pacific Ocean on the west. Although the zoning for the subdivision and the site is Rural Density Residential, 40 acres per unit, with Design Control overlay in the Coastal Zone, the residential lots in this area are between 1 and 2 acres in size. Residential uses are located to the north and south of the subject parcel. Located on a small coastal peninsula, the site slopes gently to the west, with steep coastal bluffs to the south, west and north. The lot is developed with a single-family dwelling and garage that were built in the late 1970s. The house and garage are built into the bluff with a green roof at ground level. Landscaping around the property is primarily non-native, drought tolerant species that are able to withstand salt spray and constant winds. Undisturbed sections of the bluff are vegetated with both native and naturalized landscape plants.

Project Description

The project consists of the restoration of a section of coastal bluff, utilizing a Hilfiker Wall system with a concrete keyway and armored head wall. The head wall will be surfaced with textured concrete designed to match the adjacent bluff and the Hilfiker baskets will be planted with native plants consistent with the surrounding bluff vegetation. The restoration area will be approximately 45 feet to 55 feet wide by approximately 33 feet to 53 feet tall. The project will require approximately 50 cubic yards of cut and 740 cubic yards of fill. For a more complete project description, please see Section II.A of the Initial Study (attached as **Exhibit F**).

Entitlements Required

Combined Development Permit consisting of:

1) A Coastal Development Permit and Design Approval for restoration of a coastal bluff;
2) A Coastal Development Permit for development on slopes exceeding 30 percent;
3) A Coastal Development Permit for development within 100 feet of environmentally sensitive habitat; and
4) A Coastal Development Permit for development within 750 feet of known archaeological resources.

Project Issues

As described above, the existing residence and garage are built on a small coastal peninsula with steep bluffs to the south, west and north. The bluff on the north side immediately adjacent to the attached garage has collapsed, placing the garage in danger of being undermined. An Emergency Coastal Development Permit (PLN110071) to allow the construction of a Hilfiker retaining wall system to repair the bluff was issued on July 22, 2011. The Emergency Permit was conditioned to expire on October 21, 2011 unless construction had started by that date. Construction did not start by October 21, 2011 and the Emergency Permit expired. Helical anchors were installed through the garage floor to bedrock to support the foundation as an interim measure to protect the garage. It was determined that the original retaining wall design, which consisted entirely of a landscaped Hilfiker retaining wall system, would probably not withstand the wave run-up in the long term. The applicant re-designed the project to include a concrete keyway built into the bedrock with an armored headwall to approximately 32 feet above sea level and a landscaped Hilfiker retaining wall system above. The headwall is designed with a wave deflector at 23 feet

above sea level to further prevent impacts from wave run-up. This design is the subject of the current application.

The project site does contain cultural resources however, the archaeological reports prepared for the project (see **Finding 2, Evidence b**) conclude that the majority of cultural resources on the site were removed or destroyed during construction of the residence and that because of the disturbed nature of the project site and the fact that the deeper soils were found to be culturally sterile, there is little possibility that the project will affect cultural resources. The standard archaeological condition requiring that if cultural resources are unexpectedly uncovered during construction, work be stopped until the find can be evaluated by a professional archaeologist has been imposed on the project.

Access – The subject site is shown on Figure 2 (Shoreline Access Plan) of the Big Sur Coast Land Use Plan (LUP) as one of the "other areas suitable for access" and the area is designated as "Priority 3" or "areas that have attractive destinations where safety hazards or resource conflicts can be mitigated, and with potential for improved parking." Table 2 of the LUP identifies Otter Cove as an area where the County should "secure offer of lateral access". However, the project site is developed with a single family residence that was approved by the Coastal Commission subject to a Coastal Development Permit in 1977. The construction of the proposed bluff restoration project will not expand the existing structure, nor will it block or impede any existing lateral public access. At the time of the original Coastal Commission approval, the Coastal Commission did not require public access for the individual lot because public access provisions had been negotiated for the subdivision as a whole and because the existing development pattern and subdivision improvements had committed this portion of the Otter Cove tract to private residential developments. Since that time, access easements over the open space parcels within the subdivision that were offered by the developer have expired without being accepted by any public agency and staff has identified no evidence of any public access on or adjacent to this site. The project site does contain two small areas of sandy beach, however they are inaccessible from any public access point along the shore. Because the project will have no adverse impact on lateral public access along the beach or bluff, staff finds no nexus to require public access in this case. Additionally, because of the steepness and instability of the bluff, public access to the shore from the bluff would be inconsistent with public safety and pursuant to LUP Policy 6.1.4.3, a requirement for public access on this site is not appropriate.

Environmental Review

An Initial Study was completed and a Draft Mitigated Negative Declaration ("MND") for PLN110280 was prepared in accordance with CEQA and circulated for public review from November 7, 2012 through December 7, 2012 (SCH#: 2012111017). Issues that were analyzed in the Mitigated Negative Declaration include: aesthetics, biological resources, cultural resources, geology/soils, hydrology/water quality, land use/planning and noise.

Aesthetics – A site visit was conducted on May 22, 2012 and it was determined that the project is not located within the critical viewshed however project to stabilize the bluff will be visible from two residences to the north, the private beach in the cove and visible through vegetation from the gated, private road that serves the subdivision. The visual character of the site is that of coastal bluffs eroding "badlands style" as the project geologist describes it. Where vegetation exists, it is on the upper portion of the bluffs, away from wave run up and actively eroding areas. The project has been designed to mimic the appearance of the natural bluff to the extent possible. However, the Hilfiker wall system is a man-made structure that must be properly vegetated to take on a natural appearance. The biological report for the project includes a list of appropriate

species for the restoration and recommends monitoring of the installation of plantings to ensure success. Implementation of Mitigation Measure No. 1 (**Condition No. 9**) will ensure that the vegetation will becomes established and provide screening for the structure.

Biological Resources - Although no occurrences of special status species will be impacted by the project, the biological report found that some impact to the sensitive plant community known as Northern coastal bluff scrub has already occurred as a result of the slope failure and will continue to occur if the slope failure is not abated. A small amount of native vegetation removal will occur during the repair work. Implementation of Mitigation Measure No. 1 will ensure that the slope is replanted with native species, including Northern coastal bluff scrub and will reduce impacts to this habitat to less than significant. Non-native, invasive exotics such as Mouse-hole tree *(Myoporum laetum)* and Pride of Madeira *(Echium fastuosum)* have colonized the slope, primarily to the east of the project site. The spread of exotic plants can disrupt native vegetation, and thus have an impact on native habitat. Construction will involve disturbing soil that can easily become infested with invasive non-native plants. Eradication of this type of plants is necessary to reduce potential impacts to Northern coastal bluff scrub to a less than significant level. Implementation of Mitigation Measure No. 2 (**Condition No. 10**), which requires the eradication and control of invasive plants, will reduce this impact to less than significant.

Geology/soils - The project site is located on a highly disturbed slope well in excess of 30%. No large equipment will be utilized during construction of the proposed bluff stabilization project. However, the possibility of materials falling to the beach below exists. Implementation of Measure No. 3 (**Condition No. 11**), which requires best management practices for erosion control, will reduce the impact due to soil erosion to less than significant.

Recommendation

Staff recommends that the Planning Commission:

1. Adopt the Mitigated Negative Declaration;
2. Approve the Combined Development Permit based on the findings and evidence and subject to the conditions of approval (**Exhibit C**); and
3. Adopt the Mitigation Monitoring and Reporting Plan.

EXHIBIT C
DRAFT RESOLUTION

Before the Planning Commission in and for the County of Monterey, State of California

In the matter of the application of:
DANIEL AND JENNIFER NILES (PLN110280)
RESOLUTION NO. ----
Resolution by the Monterey County Planning Commission:

1) Adopting a Mitigated Negative Declaration;
2) Approving a Combined Development Permit consisting of: 1) a Coastal Development Permit and Design Approval for restoration of a coastal bluff consisting of a concrete keyway and armored headwall with landscaped Hilfiker wall system; headwall to be surfaced with a textured rock appearance and Hilfiker baskets to be planted with native vegetation consistent with surrounding bluff vegetation; the restoration area to be approximately 45 - 55 feet wide by approximately 33 - 53 feet tall; grading to be approximately 50 cubic yards cut and 740 cubic yards fill; 2) a Coastal Development Permit for development on slopes exceeding 30 percent; 3) a Coastal Development Permit for development within 100 feet of environmentally sensitive habitat; and 4) a Coastal Development Permit for development within 750 feet of known archaeological resources; and
3) Adopting a Mitigation Monitoring and Reporting Plan

[PLN110280, Daniel and Jennifer Niles, 30620 Aurora Del Mar, Carmel, Big Sur Coast Land Use Plan (APN: 243-331-010-000)]

The Niles application (PLN110280) came on for public hearing before the Monterey County Planning Commission on January 30, 2013. Having considered all the written and documentary evidence, the administrative record, the staff report, oral testimony, and other evidence presented, the Planning Commission finds and decides as follows:

FINDINGS

1. **FINDING:** **CONSISTENCY** – The Project, as conditioned, is consistent with the applicable plans and policies which designate this area as appropriate for development.

EVIDENCE: a) During the course of review of this application, the project has been reviewed for consistency with the text, policies, and regulations in:
- the 1982 Monterey County General Plan;
- Big Sur Coast Land Use Plan (LUP);
- Monterey County Coastal Implementation Plan Part 3 (CIP);
- Monterey County Zoning Ordinance (Title 20);

No conflicts were found to exist. No communications were received during the course of review of the project indicating any inconsistencies with the text, policies, and regulations in these documents.

b) The property is located at 30620 Aurora Del Mar, Carmel (Assessor's Parcel Number 243-331-010-000), Big Sur Coast Land Use Plan. The parcel is zoned "RDR/40-D (CZ)" [Rural Density Residential, 40 acres per unit with Design Control overlay (Coastal Zone)], which allows accessory structures and accessory uses to any principal use subject to a Coastal Development Permit in each case. This project consists of the restoration of a coastal bluff and construction of an armored headwall to protect the existing, permitted dwelling on the parcel. Therefore, the project is an allowed land use for this site.

c) The site is subject to design review. Consistent with LUP Policy 3.2.4.A.3 the project has been designed to blend in with the surrounding area by utilizing colors, materials and plant materials that will match the adjacent landforms.

d) The project is located on a coastal bluff that exceeds 30 percent slope therefore pursuant to Section 20.16.030.C, a Coastal Development Permit is required. See also **Finding 8**.

e) The project site is located within 50 feet of the face of a bluff. Pursuant to LUP Policy 3.7.3.A.9 and CIP Section 20.145.080.A.b, a geologic report was prepared for the project (See **Finding 2, Evidence b**). The project is conditioned to require that all development be implemented in accordance with the report (**Condition No. 6**).

f) Archaeological Resources: The project site is located within an area of high archaeological sensitivity and the site is known to contain cultural resources. Pursuant to Section 20.145.120.A, a Coastal Development Permit is required. Pursuant to LUP Policy 3.11.2.4 and CIP Section 20.145.120.B, an archaeological survey was prepared for the project (see **Finding 2, Evidence b**). Previous archaeological reports prepared at the time of the original construction of the residence found that the cultural deposits on the site were shallow and that the main site deposit had been removed during the construction. The project archaeologist did data recovery for the project site and found that no radiocarbon dates could be obtained from the materials recovered on the site and concluded that because of the disturbed nature and limited significance of the site there is no reason to delay development due to archaeological concerns. The standard archaeological condition has been incorporated as a condition of approval (**Condition No. 7**) to address the unanticipated discovery of resources during construction.

g) Environmentally Sensitive Habitat Area (ESHA): The project site is located within an area identified in the LUP as ESHA. Pursuant to Section 20.16.030.E, a Coastal Development Permit is required. Pursuant to LUP Policy 3.3.2.2 and Section 20.145.040.A, a biological

survey was prepared for the project (**Finding 2, Evidence b**). As designed and mitigated, the project is consistent with LUP Policies regarding development within ESHA. See **Finding 7.**

h) Visual Resources: The project, as designed and mitigated is consistent with the LUP Scenic Resources policies. Staff conducted a site inspection on May 22, 2012 and determined that the project is not within the critical viewshed as defined in LUP Policy 3.2.2.1. Pursuant to LUP Policy 3.2.4.A.3, the project has been designed to be subordinate and blend with its environment, using materials and colors that will achieve that effect.

i) The project planner conducted a site inspection on May 22, 2012 to verify that the project on the subject parcel conforms to the plans listed above.

j) The project was referred to the Big Sur Land Use Advisory Committee (LUAC) for review. Based on the LUAC Procedure guidelines adopted by the Monterey County Board of Supervisors per Resolution No. 08-338, this application did warrant referral to the LUAC because the project includes a Design Approval that will be heard at a public hearing and because the project requires CEQA review. On May 22, 2012 the Big Sur Land Use Advisory Committee heard the project at a public hearing and recommended approval of the project by a vote of 6 to 0 subject to the recommendation that invasive species be removed from the construction area as well as other areas on the property.

k) The application, project plans, and related support materials submitted by the project applicant to the Monterey County RMA - Planning Department for the proposed development found in Project File PLN110280.

2. **FINDING:** **SITE SUITABILITY** – The site is physically suitable for the use proposed.

EVIDENCE: a) The project has been reviewed for site suitability by the following departments and agencies: RMA - Planning Department, Carmel Highlands Fire Protection District, Public Works, Environmental Health Bureau, and Water Resources Agency. There has been no indication from these departments/agencies that the site is not suitable for the proposed development. Conditions recommended have been incorporated.

b) Staff identified potential impacts to Biological Resources, Archaeological Resources and Soil/Slope Stability. The following reports have been prepared:

- "Geotechnical and Geologic Coastal Investigation for Coastal Bluff Stabilization Project" (**LIB120148**) prepared by Pacific Crest Engineering Inc., Watsonville, CA, November 15, 2011
- Engineering Geology Investigation" prepared by Zinn Geology, Soquel, CA, November 14, 2011 (included as Exhibit D to **LIB120148**)
- "Geotechnical Review of Proposed Stabilization Plans" (**LIB120151**) prepared by Pacific Crest Engineering Inc.,

Watsonville, CA, April 19, 2012

- "Plan Review Letter – Niles Bluff Repair" (**LIB120402**) prepared by Zinn Geology, Soquel, CA, April 19, 2012
- "Septic and Site Drainage Systems" (**LIB120154**) prepared by Charles E. Potter, P.E., Pacific Grove, CA, September 15, 2011
- "Biological Report" (**LIB120149**) prepared by Regan Biological and Horticultural Consulting LLC, Carmel Valley, CA, March 20, 2012 including addendum dated May 31, 2012
- "Archaeological Test Excavations for a Specific Site on Lot 5, Otter Cove Subdivision" (**LIB110043**) prepared by Archaeological Resource Service, Novato, CA, May 1978
- "Archaeological Monitoring of Preliminary Vegetation Clearance on Lot 5, Otter Cove" (**LIB110042**) prepared by Archaeological Resource Service, Novato, CA, August 8, 1978
- "Archaeological Data Recovery on APN 243-331-010" (**LIB120150**) prepared by Archaeological Consulting, Salinas, CA, October 6, 2011

The above-mentioned technical reports by outside consultants indicated that there are no physical or environmental constraints that would indicate that the site is not suitable for the use proposed. County staff has independently reviewed these reports and concurs with their conclusions.

c) Staff conducted a site inspection on May 22, 2012 to verify that the site is suitable for this use.

d) The application, project plans, and related support materials submitted by the project applicant to the Monterey County RMA - Planning Department for the proposed development found in Project File PLN110280.

3. **FINDING:** **HEALTH AND SAFETY** - The establishment, maintenance, or operation of the project applied for will not under the circumstances of this particular case be detrimental to the health, safety, peace, morals, comfort, and general welfare of persons residing or working in the neighborhood of such proposed use, or be detrimental or injurious to property and improvements in the neighborhood or to the general welfare of the County.

EVIDENCE: a) The project was reviewed by the RMA - Planning Department, Carmel Highlands Fire Protection District, Public Works, Environmental Health Bureau, and Water Resources Agency. The respective agencies have recommended conditions, where appropriate, to ensure that the project will not have an adverse effect on the health, safety, and welfare of persons either residing or working in the neighborhood.

b) Necessary public facilities are available. The existing residence is served domestic water by California American Water Company and wastewater is disposed in an on-site septic system. No additional water use is proposed and no additional wastewater will be generated by the

proposed project. The same connections will continue to be utilized.

c) The septic and site drainage systems on the property were evaluated by a civil engineer (LIB120154), who concluded that neither system contributed to the erosion northerly of the garage (see **Finding 2, Evidence b**).

d) The project has been designed in conformance with the recommendations of the geological and geotechnical reports prepared for the project (see **Finding 2, Evidence b**). The project is conditioned to require that all construction is in conformance with the recommendations of the geological and geotechnical reports prepared for the project (**Condition No. 6**).

e) Staff conducted a site inspection on May 22, 2012 to verify that the site is suitable for this use.

f) The application, project plans, and related support materials submitted by the project applicant to the Monterey County RMA - Planning Department for the proposed development found in Project File PLN110280.

4. **FINDING:** **NO VIOLATIONS** - The subject property is in compliance with all rules and regulations pertaining to zoning uses, subdivision, and any other applicable provisions of the County's zoning ordinance. No violations exist on the property.

EVIDENCE:

a) Staff reviewed Monterey County RMA - Planning Department and Building Services Department records and is not aware of any violations existing on subject property.

b) Staff conducted a site inspection on May 22, 2012 and researched County records to assess if any violation exists on the subject property.

c) There are no known violations on the subject parcel.

d) The application, plans and supporting materials submitted by the project applicant to the Monterey County Planning Department for the proposed development are found in Project File PLN110280.

5. **FINDING:** **CEQA (Mitigated Negative Declaration)** - On the basis of the whole record before the Monterey County Planning Commission, there is no substantial evidence that the proposed project as designed, conditioned and mitigated, will have a significant effect on the environment. The Mitigated Negative Declaration reflects the independent judgment and analysis of the County.

EVIDENCE:

a) Public Resources Code Section 21080.d and California Environmental Quality Act (CEQA) Guidelines Section 15064.a.1 require environmental review if there is substantial evidence that the project may have a significant effect on the environment.

b) The Monterey County Planning Department prepared an Initial Study pursuant to CEQA. The Initial Study is on file in the offices of the Planning Department and is hereby incorporated by reference (PLN110280).

c) The Initial Study identified several potentially significant effects, but revisions have been made to the project and applicant has agreed to proposed mitigation measures that avoid the effects or mitigate the effects to a point where clearly no significant effects would occur.

d) All project changes required to avoid significant effects on the environment have been incorporated into the project and/or are made conditions of approval. A Condition Compliance and Mitigation Monitoring and/or Reporting Plan has been prepared in accordance with Monterey County regulations, is designed to ensure compliance during project implementation, and is hereby incorporated herein by reference. The applicant must enter into an "Agreement to Implement a Mitigation Monitoring and/or Reporting Plan as a condition of project approval.

e) The Draft Mitigated Negative Declaration ("MND") for PLN110280 was prepared in accordance with CEQA and circulated for public review from November 7, 2012 through December 7, 2012 (SCH#: 2012111017).

f) Issues that were analyzed in the Mitigated Negative Declaration include: aesthetics, biological resources, cultural resources, geology/soils, hydrology/water quality, land use/planning and noise.

g) Aesthetics – A site visit was conducted on May 22, 2012 and it was determined that the project is not located within the critical viewshed however project to stabilize the bluff will be visible from two residences to the north, the private beach in the cove and visible through vegetation from the gated, private road that serves the subdivision. The visual character of the site is that of coastal bluffs eroding "badlands style" as the project geologist describes it. Where vegetation exists, it is on the upper portion of the bluffs, away from wave run up and actively eroding areas. The project has been designed to mimic the appearance of the natural bluff to the extent possible. However, the Hilfiker wall system is a man-made structure that must be properly vegetated to take on a natural appearance. The biological report for the project includes a list of appropriate species for the restoration and recommends monitoring of the installation of plantings to ensure success. Implementation of Mitigation Measure No. 1 (**Condition No. 9**) will ensure that the vegetation will becomes established and provide screening for the structure.

h) Biological Resources - Although no occurrences of special status species will be impacted by the project, the biological report found that some impact to the sensitive plant community known as Northern coastal bluff scrub has already occurred as a result of the slope failure and will continue to occur if the slope failure is not abated. A small amount of native vegetation removal will occur during the repair work. Implementation of Mitigation Measure No. 1 (**Condition No. 9**) will ensure that the slope is replanted with native species, including Northern coastal bluff scrub and will reduce impacts to this habitat to less than significant.

Non-native, invasive exotics such as Mouse-hole tree *(Myoporum laetum)* and Pride of Madeira *(Echium fastuosum)* have colonized the slope, primarily to the east of the project site. The spread of exotic plants can disrupt native vegetation, and thus have an impact on native habitat. Construction will involve disturbing soil that can easily become infested with invasive non-native plants. Eradication of this type of plants is necessary to reduce potential impacts to Northern coastal bluff scrub to a less than significant level. Implementation of Mitigation

Measure No. 2 (**Condition No. 10**), which requires the eradication and control of invasive plants, will reduce this impact to less than significant.

i) Geology/soils - The project site is located on a highly disturbed slope well in excess of 30%. No large equipment will be utilized during construction of the proposed bluff stabilization project. However, the possibility of materials falling to the beach below exists. Implementation of Mitigation Measure No. 3 (**Condition No. 11**), which requires best management practices for erosion control, will reduce the impact due to soil erosion to less than significant.

j) Hydrology/Water Quality - There will be a slight change to the drainage pattern that has evolved as a result of the slope failure due to the construction of the buttress, headwalls and Hilfiker walls. The slope and contour of the bluff will be changed as a result of the project, which will cause a change in the drainage pattern across that portion of the repaired slope. The end location of the drainage, the beach below the bluff, will not change. Due to the stepped nature of the Hilfiker wall, drain pipes installed behind the wall and the landscaping that will be done as part of the slope stabilization, drainage down the slope will be slowed. Bare soil will be minimal. As a result, even though there is a slight change in the drainage pattern, drainage will be slowed and erosion will be minimized. On the coast, the site could be subject to tsunami hazards. Pacific Crest Engineering incorporated a projected 55-inch sea-level rise by the year 2100 into the wave run-up evaluation for the site. The buttress and headwalls are within the wave run-up area but have been designed to withstand the effect of potential wave run-up. The Hilfiker walls are designed to be above the run-up area. This will prevent further collapse of the bluff and consequent loss of soil and terrace deposits into the ocean. Impacts to hydrology/water quality will be less than significant.

k) Land Use/Planning - The project site is located in an area identified as an environmentally sensitive habitat area (ESHA). Section 3.3 of the LUP includes a number of policies relative to development within such areas. The Key Policy calls for ESHA to be maintained and restored where possible and for development to be subordinate to ESHA. In this case, the project site includes sensitive Northern coastal bluff scrub habitat. In order to approve development within ESHA, the finding must be made that disruption to the habitat as a result of the development will not be significant. In this case, ESHA has already been disturbed by the collapse of the bluff. Implementation of Mitigation Measures No. 1 (**Condition No. 9**) and 2 (**Condition No. 10**) will reduce impacts to ESHA to less than significant.

The LUP Visual Resources policies require that new development be subordinate to and blend in with the environment. The lower section of the retaining wall will utilize concrete facing that is colored and textured to match the adjacent bluff face and the Hilfiker wall will be planted with native plant materials that are propagated from plant materials on the site. Implementation of Mitigation Measure No. 1 will ensure that impacts to Visual Resources are less than significant.

l) Noise - The construction of the project will not utilize large equipment

that might generate noise however there will be minor temporary noise impacts from drilling into rock for the foundation and small equipment used for moving the fill materials during construction. The construction management plan submitted for the project states that the project will take approximately 4 months to complete and work hours will be from 7:30 a.m. to 4:00 p.m., Monday through Friday. The impacts due to temporary noise will be less than significant.

m) Evidence that has been received and considered includes: the application, technical studies/reports (see Finding 2/Site Suitability), staff reports that reflect the County's independent judgment, and information and testimony presented during public hearings. These documents are on file in the RMA-Planning Department (PLN110280) and are hereby incorporated herein by reference.

n) Staff analysis contained in the Initial Study and the record as a whole indicate the project could result in changes to the resources listed in Section 753.5(d) of the California Department of Fish and Game (CDFG) regulations. All land development projects that are subject to environmental review are subject to a State filing fee plus the County recording fee, unless the Department of Fish and Game determines that the project will have no effect on fish and wildlife resources.
The site supports coastal bluff scrub, birds and other wildlife. For purposes of the Fish and Game Code, the project may have a significant adverse impact on the fish and wildlife resources upon which the wildlife depends. The Initial Study was sent to the California Department of Fish and Game for review, comment, and to recommend necessary conditions to protect biological resources in this area. Therefore, the project will be required to pay the State fee plus a fee payable to the Monterey County Clerk/Recorder for processing said fee and posting the Notice of Determination (NOD).

o) As of the writing of the staff report, one comment was received from Cal Trans during the public review period.

p) The County has considered the comments received during the public review period and they do not alter the conclusions in the Initial Study and Mitigated Negative Declaration.

q) The Monterey County Planning Department, located at 168 W. Alisal, 2nd Floor, Salinas, California, 93901, is the custodian of documents and other materials that constitute the record of proceedings upon which the decision to adopt the negative declaration is based.

6. **FINDING:** **PUBLIC ACCESS** – The project is in conformance with the public access and recreation policies of the Coastal Act (specifically Chapter 3 of the Coastal Act of 1976, commencing with Section 30200 of the Public Resources Code) and Local Coastal Program, and does not interfere with any form of historic public use or trust rights.

EVIDENCE: a) No access is required as part of the project as no substantial adverse impact on access, either individually or cumulatively, as described in Section 20.145.150 of the Monterey County Coastal Implementation Plan can be demonstrated.

b) The subject property is described as an area where the Local Coastal Program requires public access (Figure 2 in the Big Sur Coast Land Use

Plan). The subject property is in an area designated on Figure 2 as "Priority 3 – Other Areas Suitable for Access". "Table 2 – Site Specific Recommendations for Shoreline Access" identifies the Otter Cove as an area where the County is to secure offers of lateral access.

c) The project site is developed with a single family residence that was approved by the Coastal Commission subject to a Coastal Development Permit in 1977. The construction of the proposed bluff restoration project will not expand the existing structure, nor will it block or impede any existing public access. At the time of the original Coastal Commission approval, the Coastal Commission did not require public access for the individual lot because public access provisions had been negotiated for the subdivision as a whole and because the existing development pattern and subdivision improvements had committed this portion of the Otter Cove tract to private residential developments. Since that time, access easements over the open space parcels within the subdivision that were offered by the developer have expired without being accepted by any public agency and there is no record of any public access on or adjacent to this site. The project site does contain two small areas of sandy beach, however they are inaccessible from any public access point along the shore. Because the project will have no adverse impact on lateral public access along the beach or bluff, there is no nexus to require public access in this case.

d) Because of the steepness and instability of the bluff, public access to the shore from the bluff would be inconsistent with public safety and pursuant to LUP Policy 6.1.4.3, a requirement for public access on this site is not appropriate.

e) The application, plans and supporting materials submitted by the project applicant to the Monterey County Planning Department for the proposed development are found in Project File PLN110280

f) The project planner conducted a site inspection on May 22, 2012.

7. **FINDING:** **ESHA** – The subject project minimizes impact on environmentally sensitive habitat areas in accordance with the applicable goals and policies of the applicable area plan and zoning codes.

EVIDENCE:

a) The project includes application for development within 100 feet of environmentally sensitive habitat areas (ESHA). In accordance with the applicable policies of the Big Sur Coast Land Use Plan and the Monterey County Zoning Ordinance (Title 20), a Coastal Development Permit is required and the criteria to grant said permit have been met.

b) The project area is a coastal bluff that has eroded and collapsed. The project will restore approximately 2,250 square feet of essentially vertical bluff by building a concrete keyway and armored headwall on the lower portion and a landscaped Hilfiker wall on top.

c) *LUP Policy 3.3.1 (Key Policy)* – "All practical efforts shall be made to maintain, restore, and if possible, enhance Big Sur's environmentally sensitive habitats. The development of all categories of land use, both public and private, should be subordinate to the protection of these critical areas."

d) *LUP Policy 3.3.2.1* – "Development, including vegetation removal, excavation, grading, filing, and the construction of roads and structures,

shall not be permitted in the environmentally sensitive habitat areas if it results in any potential disruption of habitat value. To approve development within any of these habitats the County must find that disruption of a habitat caused by the development is not significant."

e) As required by *LUP Policy 3.3.2.2*, a field survey of the site was conducted and a biological report prepared for the project (see **Finding 2, Evidence b**).

f) As required by *LUP Policy 3.3.2.4,* the project has been designed to limit the amount of grading (fill) to the minimum amount necessary to complete the structural improvements as recommended by the project engineer.

g) The project site lies adjacent to the Monterey Bay National Marine Sanctuary and the California Sea Otter Game Refuge, which is identified in the LUP as an environmentally sensitive habitat area. The biological report for the project identified sensitive habitat "Northern bluff scrub" and two special status plant species on the site. All of the project work will occur at least 10 feet above the beach and the biological report for the project identified no potential impacts to marine or beach species. Although no occurrences of the special status species will be impacted by the project, the biological report found that some impact to the sensitive plant community known as Northern coastal bluff scrub has already occurred as a result of the slope failure and will continue to occur if the slope failure is not abated. A small amount of native vegetation removal will occur during the repair work. Implementation of Mitigation Measure No. 1 (**Condition No. 9**) which requires that the slope be replanted with native species, including Northern coastal bluff scrub and Mitigation Measure No. 2 (**Condition No. 10**) which requires eradication and control of non-native plant species will reduce impacts to this habitat to less than significant.

h) The project planner conducted a site inspection on May 22, 2012 to verify ESHA locations and potential project impacts to ESHA.

i) The application, plans and supporting materials submitted by the project applicant to the Monterey County Planning Department for the proposed development are found in Project File PLN110280.

8. **FINDING:** **DEVELOPMENT ON SLOPE** – There is no feasible alternative which would allow development to occur on slopes of less than 30%.

EVIDENCE: a) In accordance with the applicable policies of the Big Sur Coast Land Use Plan and the Monterey County Zoning Ordinance (Title 20), a Coastal Development Permit is required and the criteria to grant said permit have been met.

b) The project includes application for development on slopes exceeding 30%. The project is for the restoration of a coastal bluff that has collapsed and includes the construction of a concrete keyway and armored headwall with a landscaped Hilfiker retaining wall system, all on a slope that is essentially vertical. The goal of the project is to repair the section of collapsed bluff adjacent to the existing attached garage on the site in order to prevent damage to the existing structure that would result from undermining of the foundation should the bluff continue to recede. There is no feasible alternative that would allow this repair to

occur on slopes of less than 30 percent because the existing condition of the slope is greater than 30 percent.

c) The Planning Commission shall require such conditions of approval and changes in the development, as it may deem necessary to assure compliance with MCC Section 20.145.080. The project is conditioned to require that the development shall be implemented in accordance with the recommendations of the geotechnical and geological reports prepared for the project (see **Condition No. 6**) and that the project area be designed and maintained in such a manner that blends in with the surrounding environment (see **Condition No. 9**).

d) The application, plans and supporting materials submitted by the project applicant to the Monterey County Planning Department for the proposed development are found in Project File PLN110280.

e) The project planner conducted a site inspection on May 22, 2012.

f) The subject project minimizes development on slopes exceeding 30% in accordance with the applicable goals and policies of the applicable area plan and zoning codes.

9. **FINDING:** **APPEALABILITY** - The decision on this project may be appealed to the Planning Commission/Board of Supervisors and the California Coastal Commission

EVIDENCE:

a) Section 20.86.030.A of the Monterey County Zoning Ordinance states that the proposed project is appealable to the Board of Supervisors.

b) Section 20.86.080.A.1, 20.86.080.A.2 and 20.86.080.A.3 of the Monterey County Zoning Ordinance state that the proposed project is subject to appeal by/to the Coastal Commission because the project is located within 300 feet of the inland extent of a beach or mean high tide line, the project is located within 300 feet of the top of the seaward face of a coastal bluff and the project includes a use that is permitted in the underlying zone as a conditional use.

DECISION

NOW, THEREFORE, based on the above findings and evidence, the Planning Commission does hereby:

1. Adopt a Mitigated Negative Declaration;
2. Approve the Combined Development Permit consisting of: a Combined Development Permit consisting of: 1) Coastal Development Permit and Design Approval for restoration of a coastal bluff consisting of a concrete keyway and armored headwall with landscaped Hilfiker wall system; headwall to be surfaced with a textured rock appearance and Hilfiker baskets to be planted with native vegetation consistent with surrounding bluff vegetation; the restoration area to be approximately 45 - 55 feet wide by approximately 33 - 53 feet tall; grading to be approximately 50 cubic yards cut and 740 cubic yards fill; 2) Coastal Development Permit for development on slopes exceeding 30 percent; 3) Coastal Development Permit for development within 100 feet of environmentally sensitive habitat; and 4) Coastal Development Permit for development within 750 feet of known archaeological resources in general conformance with the attached sketch and subject to the attached conditions, all being attached hereto and incorporated herein by reference; and
3. Adopt the attached Mitigation Monitoring and Reporting Program.

PASSED AND ADOPTED this 30th day of January, 2013 upon motion of xxxx, seconded by xxxx, by the following vote:

AYES:
NOES:
ABSENT:
ABSTAIN:

_____
Mike Novo, Secretary

COPY OF THIS DECISION MAILED TO APPLICANT ON DATE

THIS APPLICATION IS APPEALABLE TO THE BOARD OF SUPERVISORS.

IF ANYONE WISHES TO APPEAL THIS DECISION, AN APPEAL FORM MUST BE COMPLETED AND SUBMITTED TO THE CLERK TO THE BOARD ALONG WITH THE APPROPRIATE FILING FEE ON OR BEFORE [DATE]

(Coastal Projects)
THIS PROJECT IS LOCATED IN THE COASTAL ZONE AND IS APPEALABLE TO THE COASTAL COMMISSION. UPON RECEIPT OF NOTIFICATION OF THE FINAL LOCAL ACTION NOTICE (FLAN) STATING THE DECISION BY THE FINAL DECISION MAKING BODY, THE COMMISSION ESTABLISHES A 10 WORKING DAY APPEAL PERIOD. AN APPEAL FORM MUST BE FILED WITH THE COASTAL COMMISSION. FOR FURTHER INFORMATION, CONTACT THE COASTAL COMMISSION AT (831) 427-4863 OR AT 725 FRONT STREET, SUITE 300, SANTA CRUZ, CA

This decision, if this is the final administrative decision, is subject to judicial review pursuant to California Code of Civil Procedure Sections 1094.5 and 1094.6. Any Petition for Writ of Mandate must be filed with the Court no later than the 90th day following the date on which this decision becomes final.

NOTES

1. You will need a building permit and must comply with the Monterey County Building Ordinance in every respect.

   Additionally, the Zoning Ordinance provides that no building permit shall be issued, nor any use conducted, otherwise than in accordance with the conditions and terms of the permit granted or until ten days after the mailing of notice of the granting of the permit by the appropriate authority, or after granting of the permit by the Board of Supervisors in the event of appeal.

   Do not start any construction or occupy any building until you have obtained the necessary permits and use clearances from the Monterey County Planning Department and Building Services Department office in Salinas.

2. This permit expires 3 years after the above date of granting thereof unless construction or use is started within this period.

Form Rev. 05-09-2012

Monterey County Planning Department

DRAFT Conditions of Approval/Mitigation Monitoring Reporting Plan

PLN110280

1. PD001 - SPECIFIC USES ONLY

Responsible Department: Planning Department

Condition/Mitigation Monitoring Measure: This Combined Development Permit consists of: 1) Coastal Administrative Permit and Design Approval for restoration of a coastal bluff consisting of a concrete keyway and armored headwall with landscaped Hilfiker wall system; headwall to be surfaced with a textured rock appearance and Hilfiker baskets to be planted with native vegetation consistent with surrounding bluff vegetation; the restoration area to be approximately 45 - 55 feet wide by approximately 33 - 53 feet tall; grading to be approximately 50 cubic yards cut and 740 cubic yards fill; 2) Coastal Development Permit for development on a coastal bluff; 3) Coastal Development Permit for development on slopes exceeding 30 percent; 4) Coastal Development Permit for development within 100 feet of environmentally sensitive habitat; and 5) Coastal Development Permit for development within 750 feet of known archaeological resources. The project is located at 30620 Aurora Del Mar, Carmel (Assessor's Parcel Number 243-331-010-000), Big Sur Coast Land Use Plan area (Coastal Zone). This permit was approved in accordance with County ordinances and land use regulations subject to the terms and conditions described in the project file. Neither the uses nor the construction allowed by this permit shall commence unless and until all of the conditions of this permit are met to the satisfaction of the Director of the RMA - Planning Department. Any use or construction not in substantial conformance with the terms and conditions of this permit is a violation of County regulations and may result in modification or revocation of this permit and subsequent legal action. No use or construction other than that specified by this permit is allowed unless additional permits are approved by the appropriate authorities. To the extent that the County has delegated any condition compliance or mitigation monitoring to the Monterey County Water Resources Agency, the Water Resources Agency shall provide all information requested by the County and the County shall bear ultimate responsibility to ensure that conditions and mitigation measures are properly fulfilled. (RMA - Planning Department)

Compliance or Monitoring Action to be Performed: The Owner/Applicant shall adhere to conditions and uses specified in the permit on an ongoing basis unless otherwise stated.

2. PD002 - NOTICE PERMIT APPROVAL

Responsible Department: Planning Department

Condition/Mitigation Monitoring Measure: The applicant shall record a Permit Approval Notice which states: "A Combined Development Permit (Resolution No. _____) was approved by the Monterey County Planning Commission for Assessor's Parcel Number 243-331-010-000 on January 30, 2013. The permit was granted subject to 11 conditions of approval including 3 mitigation measures which run with the land. A copy of the permit is on file with the Monterey County Resource Management Agency - Planning Department." Proof of recordation of this notice shall be furnished to the Director of the RMA - Planning Department prior to issuance of building permits or commencement of the use. (RMA - Planning Department)

Compliance or Monitoring Action to be Performed: Prior to the issuance of grading and building permits or commencement of use, the Owner/Applicant shall provide proof of recordation of this notice to the RMA - Planning Department.

3. PD004 - INDEMNIFICATION AGREEMENT

Responsible Department: Planning Department

Condition/Mitigation Monitoring Measure: The property owner agrees as a condition and in consideration of approval of this discretionary development permit that it will, pursuant to agreement and/or statutory provisions as applicable, including but not limited to Government Code Section 66474.9, defend, indemnify and hold harmless the County of Monterey or its agents, officers and employees from any claim, action or proceeding against the County or its agents, officers or employees to attack, set aside, void or annul this approval, which action is brought within the time period provided for under law, including but not limited to, Government Code Section 66499.37, as applicable. The property owner will reimburse the County for any court costs and attorney's fees which the County may be required by a court to pay as a result of such action. The County may, at its sole discretion, participate in the defense of such action; but such participation shall not relieve applicant of his obligations under this condition. An agreement to this effect shall be recorded upon demand of County Counsel or concurrent with the issuance of building permits, use of property, filing of the final map, whichever occurs first and as applicable. The County shall promptly notify the property owner of any such claim, action or proceeding and the County shall cooperate fully in the defense thereof. If the County fails to promptly notify the property owner of any such claim, action or proceeding or fails to cooperate fully in the defense thereof, the property owner shall not thereafter be responsible to defend, indemnify or hold the County harmless. (RMA - Planning Department)

Compliance or Monitoring Action to be Performed: Upon demand of County Counsel or concurrent with the issuance of building permits, use of the property, recording of the final/parcel map, whichever occurs first and as applicable, the Owner/Applicant shall submit a signed and notarized Indemnification Agreement to the Director of RMA-Planning Department for review and signature by the County.

Proof of recordation of the Indemnification Agreement, as outlined, shall be submitted to the RMA-Planning Department.

4. PD005 - FISH & GAME FEE NEG DEC/EIR

Responsible Department: Planning Department

Condition/Mitigation Monitoring Measure: Pursuant to the State Public Resources Code Section 753.5, State Fish and Game Code, and California Code of Regulations, the applicant shall pay a fee, to be collected by the County, within five (5) working days of project approval. This fee shall be paid before the Notice of Determination is filed. If the fee is not paid within five (5) working days, the project shall not be operative, vested or final until the filing fees are paid.
(RMA - Planning Department)

Compliance or Monitoring Action to be Performed: Within five (5) working days of project approval, the Owner/Applicant shall submit a check, payable to the County of Monterey, to the Director of the RMA - Planning Department.

If the fee is not paid within five (5) working days, the applicant shall submit a check, payable to the County of Monterey, to the Director of the RMA - Planning Department prior to the recordation of the final/parcel map, the start of use, or the issuance of building permits or grading permits.

5. PD006 - MITIGATION MONITORING

Responsible Department: Planning Department

Condition/Mitigation Monitoring Measure: The applicant shall enter into an agreement with the County to implement a Mitigation Monitoring and/or Reporting Plan in accordance with Section 21081.6 of the California Public Resources Code and Section 15097 of Title 14 Chapter 3 of the California Code of Regulations. Compliance with the fee schedule adopted by the Board of Supervisors for mitigation monitoring shall be required and payment made to the County of Monterey at the time the property owner submits the signed mitigation monitoring agreement. The mitigation monitoring agreement shall be recorded.
(RMA - Planning Department)

Compliance or Monitoring Action to be Performed: Within sixty (60) days after project approval or prior to the issuance of building and grading permits, whichever occurs first, the Owner/Applicant shall:

1) Enter into agreement with the County to implement a Mitigation Monitoring Program.

2) Fees shall be submitted at the time the property owner submits the signed mitigation monitoring agreement.

3) Proof of recordation of the mitigation monitoring agreement shall be submitted to the RMA-Planning Department.

6. PD016 - NOTICE OF REPORT

Responsible Department: Planning Department

Condition/Mitigation Monitoring Measure: Prior to issuance of building or grading permits, a notice shall be recorded with the Monterey County Recorder which states:
The following report has been prepared for this parcel:
"Geotechnical and Geologic Coastal Investigation for Coastal Bluff Stabilization Project" (LIB120148) prepared by Pacific Crest Engineering Inc., Watsonville, CA, November 15, 2011, including "Engineering Geology Investigation" prepared by Zinn Geology, Soquel, CA, November 14, 2011 (included as Appendix D to LIB120148) and is on file in the Monterey County RMA - Planning Department. All development shall be in accordance with this report."
(RMA - Planning Department)

Compliance or Monitoring Action to be Performed: Prior to the issuance of grading and building permits, the Owner/Applicant shall submit proof of recordation of this notice to the RMA - Planning Department.

Prior to occupancy, the Owner/Applicant shall submit proof, for review and approval, that all development has been implemented in accordance with the report to the RMA - Planning Department.

7. PDSP001 - CULTURAL RESOURCES POSITIVE ARCHAEOLOGICAL REPORT

Responsible Department: Planning Department

Condition/Mitigation Monitoring Measure: NON-STANDARD - If, during the course of construction, cultural, archaeological, historical or paleontological resources are uncovered at the site (surface or subsurface resources) work shall be halted immediately within 50 meters (165 feet) of the find until a qualified professional archaeologist can evaluate it. The Monterey County RMA - Planning Department and a qualified archaeologist (i.e., an archaeologist registered with the Register of Professional Archaeologists) shall be immediately contacted by the responsible individual present on-site. When contacted, the project planner and the archaeologist shall immediately visit the site to determine the extent of the resources and to develop proper mitigation measures required for recovery.
(RMA - Planning Department)

Compliance or Monitoring Action to be Performed: The Owner/Applicant shall adhere to this condition on an on-going basis.

Prior to the issuance of grading or building permits, the Owner/Applicant shall include requirements of this condition as a note on all grading and building plans. The note shall state "Stop work within 50 meters (165 feet) of uncovered resource and contact the Monterey County RMA - Planning Department and a qualified archaeologist immediately if cultural, archaeological, historical or paleontological resources are uncovered." When contacted, the project planner and the archaeologist shall immediately visit the site to determine the extent of the resources and to develop proper mitigation measures required for the discovery.

8. PD032(A) - PERMIT EXPIRATION

Responsible Department: Planning Department

Condition/Mitigation Monitoring Measure: The permit shall be granted for a time period of 3 years, to expire on January 30, 2016 unless use of the property or actual construction has begun within this period. (RMA-Planning Department)

Compliance or Monitoring Action to be Performed: Prior to the expiration date stated in the condition, the Owner/Applicant shall obtain a valid grading or building permit and/or commence the authorized use to the satisfaction of the Director of Planning. Any request for extension must be received by the Planning Department at least 30 days prior to the expiration date.

9. MM001 - LANDSCAPE RESTORATION

Responsible Department: Planning Department

Condition/Mitigation Monitoring Measure:

Mitigation Measure No. 1: In order to preserve the visual and natural character of the area, all finish and landscape materials shall be designed and maintained in such a manner that blends in with the surrounding environment. The applicant shall submit landscape/restoration plan that:
- Identifies the location, species and size of the proposed landscaping material.
- Includes native species that are botanically appropriate to the area as identified by the project biologist and shall include but not be limited to Northern coastal bluff scrub species.
- Includes maintenance notes for all landscaping materials.
- Includes success criteria for replanting.
- Provides notes on the plans to eradicate invasive vegetation for areas on and near the project area.
- Work with the project biologist to identify appropriate vegetation in the removal area that could be salvaged, potted and out-planted during restoration.

Use flat, earthtone colors for all exposed Hilfiker Wall components.

Compliance or Monitoring Action to be Performed:

Monitoring Action 1a: Prior to issuance of construction permits, the owner/applicant shall note and submit proposed colors and materials for the Hilfiker Wall components to the Director of RMA-Planning for review and approval.

Monitoring Action 1b: At least three weeks prior to installation of plantings, the applicant shall submit a landscape and irrigation plan to the Director of RMA-Planning for review and approval.

Monitoring Action 1c: Prior to final inspection, the owner/applicant shall provide verification from the contractor that the landscaping has been installed as shown on the approved landscape plan.

Monitoring Action 1d: Twice a year for five years following completion, the owner/applicant shall submit to the Director of RMA-Planning for review and approval a report on the status of erosion control and restoration. The reports shall be prepared by a qualified biologist and shall include performance measures and corrective measures needed. Each report shall include a report on the status of any corrective measures previously recommended.

10. MM002 - NON-NATIVE PLANT ERADICATION

Responsible Department: Planning Department

Condition/Mitigation Monitoring Measure:

Mitigation Measure No. 2: In order to maintain and enhance the sensitive habitat in the project area:
a. All non-native, invasive plant species shall be controlled and eradicated from areas within and immediately adjacent to the bluff restoration and replanted with native vegetation to the satisfaction of the Director of RMA-Planning.
b. Disturbed slope areas adjacent to the project area shall require netting and reseeding with native ground cover as determined appropriate by a qualified biologist/ecologist.

Compliance or Monitoring Action to be Performed:

Monitoring Action 2a: During construction, the applicant shall install and maintain silt fencing along disturbed areas. The fencing shall remain in place until the soil is stabilized.

Monitoring Action 2b: Prior to construction, the applicant shall submit a plan from a qualified biologist outlining invasive plant removal protocol and res-seeding protocol to the Director of RMA-Planning for review and approval.

Monitoring Action 2c: Prior to final inspection, the applicant shall provide the Director of RMA-Planning written certification by a qualified biologist that Mitigation Measure 2 has been completed.

Monitoring action 2d: On-going, the applicant shall maintain the bluff restoration area free of invasive vegetation to the satisfaction of the Director of RMA-Planning.

11. MM003 - EROSION CONTROL

Responsible Department: Planning Department

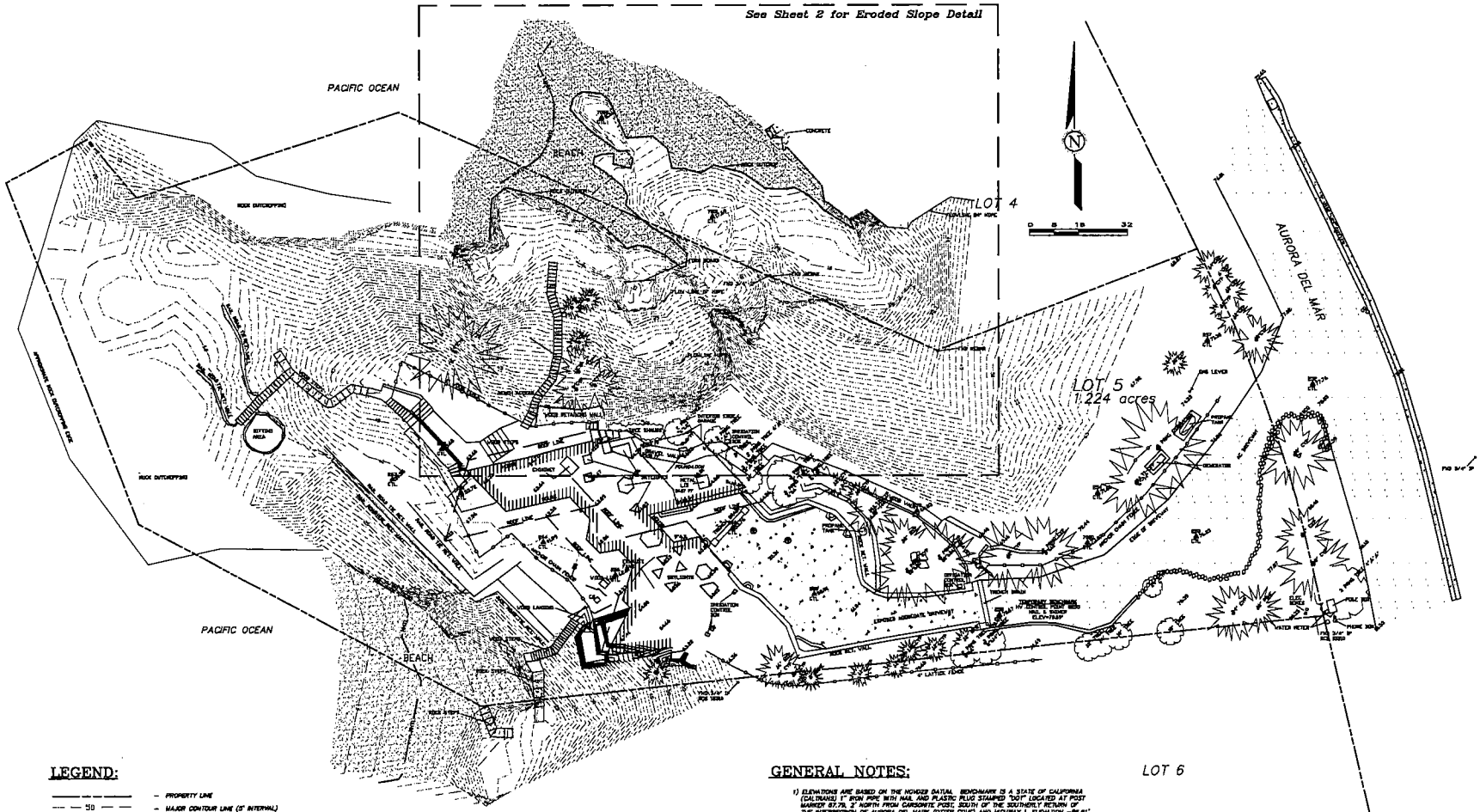
Condition/Mitigation Monitoring Measure:

Mitigation Measure No. 3: In order to avoid erosion and prevent vegetation or debris from falling to the beach below, the owner/applicant shall implement Best Management Practices including but not limited to the following:
a. Install silt-stop fencing and/or coir rolls around all areas where bare soil may be exposed including all staging and stockpile areas.
b. Maintain coir rolls to absorb any slurry sediment and direct water flow into drainage basins designed to capture and settle water during drilling, casting and curing of concrete pier supports. Remove slurry when basins are at capacity.
c. Dispose of materials (slurry, cut vegetation, etc.) off site in an appropriate refuse area.
d. Stabilize areas of loose soil immediately after construction in disturbed areas is complete. Soils may be stabilized with jute netting, seeding, and/or restoration planting.
e. Install temporary irrigation where deemed appropriate by the project biologist and project engineer to maintain restoration planting and seeded areas during the initial establishment period.

Compliance or Monitoring Action to be Performed:

Monitoring Action 3a. Prior to issuance of permits, the owner applicant shall prepare an erosion control plan in accordance with Mitigation Measure No. 3 and that is coordinated with the Restoration Plan identified in Mitigation Measure No. 1.

Monitoring Action 3b. Twice a year for five years following completion, the owner/applicant shall submit to the Director of RMA-Planning for review and approval a report on the status of erosion control and restoration. The reports shall be prepared by a qualified biologist and shall include performance measures and corrective measures needed. The reports shall be coordinated with and may be included in the monitoring reports required in Monitoring Action 1d.



"SITE OVERVIEW"

LEGEND:

- PROPERTY LINE
- 50 — MAJOR CONTOUR LINE (5' INTERVAL)
- MINOR CONTOUR LINE (1' INTERVAL)
- MHTL — MEAN HIGH TIDE LINE
- CONCRETE SURFACE
- SAND SURFACE
- ASPHALT SURFACE
- PINE, UNKNOWN, AND CYPRESS TREE (SIZE AS SHOWN) CANOPIES ARE SCHEMATIC
- HOSE BIB
- GAS UTILITY
- +36.86 — SPOT ELEVATION
- FOUND MONUMENT(AS SHOWN)
- SURVEY H&V CONTROL POINT

GENERAL NOTES:

1) ELEVATIONS ARE BASED ON THE NGVD29 DATUM. BENCHMARK IS A STATE OF CALIFORNIA (CALTRANS) 1" IRON PIPE WITH NAIL AND PLASTIC PLUG STAMPED "007" LOCATED AT POST MARKER 67.78, 2' NORTH FROM CARSONITE POST, SOUTH OF THE SOUTHERLY RETURN OF THE INTERSECTION OF AURORA DEL MAR/ TOTTEN CO/AD AND HIGHWAY 1, ELEVATION =94.61'. A TEMPORARY BENCHMARK WAS SET ON-SITE, SURVEY H&V CONTROL POINT #2301, A NAIL AND WASHER IN THE PAVEMENT, LOCATED TO THE EAST OF THE DRIVEWAY TRENCH DRAIN, ELEVATION=75.87'.

2) NOT ALL UNDERGROUND UTILITIES WERE LOCATED. UNDERGROUND UTILITY LOCATIONS SHOULD BE OBTAINED FROM THE APPROPRIATE UTILITY COMPANIES OR PUBLIC AGENCIES PRIOR TO ANY CONSTRUCTION.

3) NOT ALL BUILDING CORNERS WERE LOCATED. SOME WERE NOT VISIBLE FROM THE OUTSIDE. SHOULD BE OBTAINED FROM THE APPROPRIATE BUILDING PLANS. (AND/OR AS-BUILT DRAWINGS)

4) THIS MAP PORTRAYS THE SITE AT THE TIME OF THE SURVEY AND DOES NOT SHOW SOILS OR GEOLOGY INFORMATION, UNDERGROUND CONDITIONS, EASEMENTS, ZONING OR REGULATORY INFORMATION, OR ANY OTHER ITEMS NOT SPECIFICALLY REQUESTED BY THE PROPERTY OWNER.

5) THE ORIGINAL TOPOGRAPHIC MAPPING FOR THE SITE WAS PERFORMED ON 3/21/08. SUPPLEMENTAL MAPPING FOR THE ERODED AREA LOCATED NORTHERLY OF THE EXISTING RESIDENCE WAS PERFORMED ON 8/19/11. ALL CONTOURS AND SPOT ELEVATIONS FROM PREVIOUS AND SUBSEQUENT MAPPING HAVE BEEN REVISED AND ADJUSTED TO NGVD 29 DATUM.

6) THE CONTOURS SHOWN IN THE ERODED SLOPE AND LOWER BEACH AREAS ARE A GENERAL REPRESENTATION AND DO NOT REFLECT ALL OF THE UNDULATIONS AND IRREGULAR SURFACES DUE TO THE STEEP TERRAIN AND ROCK OUTCROPPINGS.

7) THIS MAP DOES NOT REPRESENT A BOUNDARY SURVEY.

8) THE MEAN HIGH TIDE LINE IS AT ELEVATION 5.04', NGVD29 DATUM. ELEVATION IS BASED UPON NOS TIDAL BENCHMARK, DESIGNATION 941 3460 TIDAL 7, EPOCH 1983-2001, P.L.D. CI 3221, DESIGNATED AS VM 985 BY THE CENTER FOR OPERATIONAL OCEANOGRAPHIC PRODUCTS AND SERVICES.

A.P.N.: 125-021-009

OWNER:
MR. DANIEL NILES
399 SANTA PAULA AVENUE
SAN FRANCISCO, CA. 94127

PROPERTY ADDRESS:
30620 AURORA DEL MAR
CARMEL HIGHLANDS, CA 93921

NO.	DATE	BY	REVISION
3	10/12/11	GWG	DAN FNDN3 — MHTL
2	8/1/11	CDH	Additional Topo
1	3/28/08	JLH	RELEASED TO CLIENT

APPROVED BY:
GUY R. GIRAUDO R.C.E No. 35568

LANDSET ENGINEERS, INC.
3508 CRAZY HORSE CANYON ROAD, SALINAS, CALIFORNIA
(831) 443-8978 LANDSETM@AOL.COM FAX (831) 443-3801

SITE PLAN
OF
LOT 5, CARMEL SUR, TRACT No. 588
VOL 10 C&T PG 6, COUNTY OF MONTEREY, CA.
FOR
MR. DANIEL NILES

SCALE: 1"=16'
DATE: MAR 2008
JOB NO. 492
SHEET 1
OF 2 SHEETS

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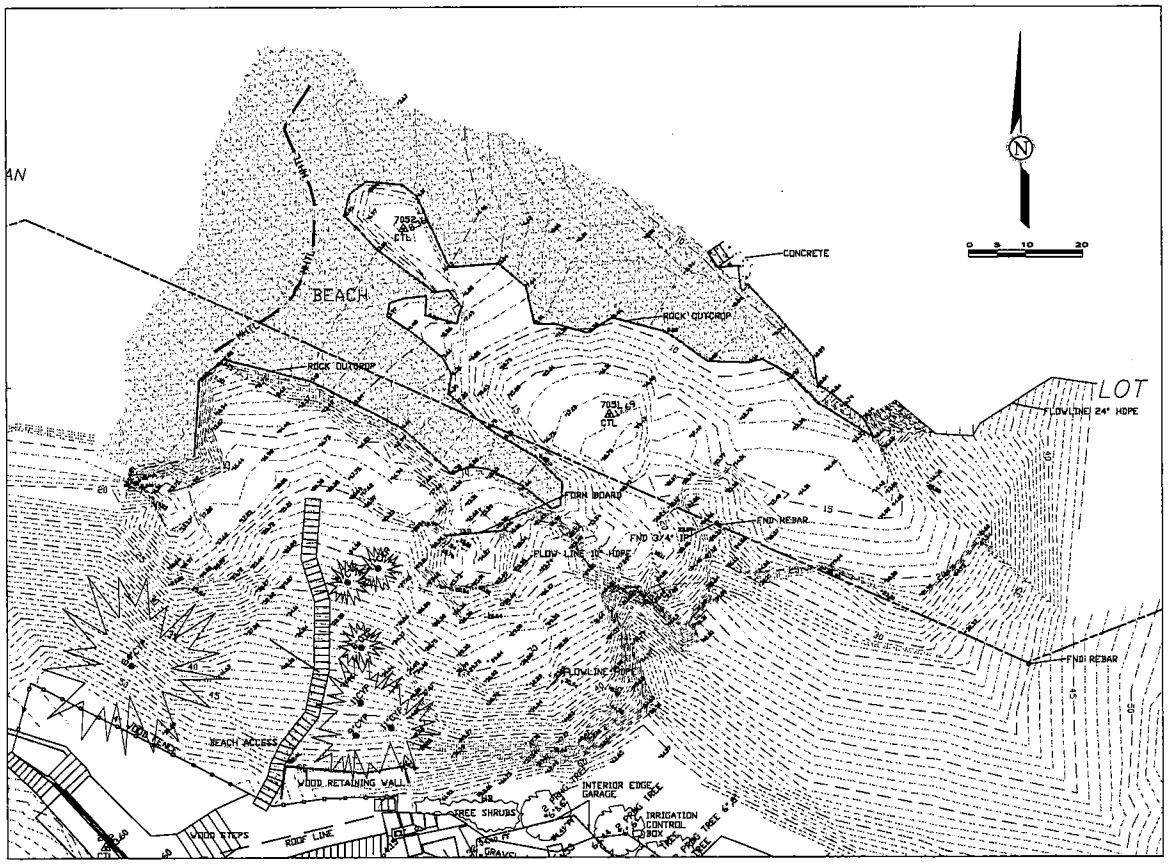


"ERODED SLOPE AREA"

SITE PLAN

OF

LOT 5, CARMEL SUR, TRACT No. 588
VOL 10 C&T PG 6, COUNTY OF MONTEREY, CA.

FOR

MR. DANIEL NILES

LEGEND:

- PROPERTY LINE
- 50 — MAJOR CONTOUR LINE (5' INTERVAL)
- MINOR CONTOUR LINE (1' INTERVAL)
- MHTL — MEAN HIGH TIDE LINE
- CONCRETE SURFACE
- SAND SURFACE
- ASPHALT SURFACE
- PINE, UNKNOWN, AND CYPRESS TREE (SIZE AS SHOWN) CANOPIES ARE SCHEMATIC
- HOSE BIB
- GAS UTILITY
- 99.99 — SPOT ELEVATION
- FOUND MONUMENT(AS SHOWN)
- SURVEY H&V CONTROL POINT

GENERAL NOTES:

1) ELEVATIONS ARE BASED ON THE NGVD29 DATUM. BENCHMARK IS A STATE OF CALIFORNIA (CALTRANS) 1" IRON PIPE WITH NAIL AND PLASTIC PLUG STAMPED "DST" LOCATED AT POST MARKED 87.78, 3' NORTH FROM CARSONITE POST, SOUTH OF THE SOUTHERLY RETURN OF THE INTERSECTION OF AURORA DEL MAR (OTTER COVE) AND HIGHWAY 1, ELEVATION =36.81'. A TEMPORARY BENCHMARK WAS SET ON-SITE, SURVEY H&V CONTROL POINT #2001, A NAIL AND SHINER IN THE PAVEMENT, LOCATED TO THE EAST OF THE DRIVEWAY TRENCH DRAIN. ELEVATION=72.67'.

2) NOT ALL UNDERGROUND UTILITIES WERE LOCATED. UNDERGROUND UTILITY LOCATIONS SHOULD BE OBTAINED FROM THE APPROPRIATE UTILITY COMPANIES OR PUBLIC AGENCIES PRIOR TO ANY CONSTRUCTION.

3) NOT ALL BUILDING CORNERS WERE LOCATED. SOME WERE NOT VISIBLE FROM THE OUTSIDE. SHOULD BE OBTAINED FROM THE APPROPRIATE BUILDING PLANS. (AND/OR AS-BUILT DRAWINGS)

4) THIS MAP PORTRAYS THE SITE AT THE TIME OF THE SURVEY AND DOES NOT SHOW SOILS OR GEOLOGY INFORMATION, UNDERGROUND CONDITIONS, EASEMENTS, ZONING OR REGULATORY INFORMATION, OR ANY OTHER ITEMS NOT SPECIFICALLY REQUESTED BY THE PROPERTY OWNER.

5) THE ORIGINAL TOPOGRAPHIC MAPPING FOR THE SITE WAS PERFORMED ON 3/31/08. SUPPLEMENTAL MAPPING FOR THE ERODED AREA LOCATED NORTHERLY OF THE EXISTING RESIDENCE WAS PERFORMED ON 8/19/11. ALL CONTOURS AND SPOT ELEVATIONS FROM PREVIOUS AND SUBSEQUENT MAPPING HAVE BEEN REVISED AND ADJUSTED TO NGVD 29 DATUM.

6) THE CONTOURS SHOWN IN THE ERODED SLOPE AND LOWER BEACH AREAS ARE A GENERAL REPRESENTATION AND DO NOT REFLECT ALL OF THE UNDULATIONS AND IRREGULAR SURFACES DUE TO THE STEEP TERRAIN AND ROCK OUTCROPPINGS.

7) THIS MAP DOES NOT REPRESENT A BOUNDARY SURVEY.

8) THE MEAN HIGH TIDE LINE IS AT ELEVATION 5.04', NGVD29 DATUM. ELEVATION IS BASED UPON NOS TIDAL BENCHMARK, DESIGNATION 941 3400 TIDAL 7, EPOCH 1983-2001, P.I.D. CU 3221, DESIGNATED AS 'MJ 1953 BY THE CENTER FOR OPERATIONAL OCEANOGRAPHIC PRODUCTS AND SERVICES.

A.P.N.: 152-421-006

OWNER:
MR. DANIEL NILES
289 SANTA PAULA AVENUE
SAN FRANCISCO, CA. 94127

PROPERTY ADDRESS:
30630 AURORA DEL MAR
CARMEL HIGHLANDS, CA. 93921

NO.	DATE	BY	REVISION
3	10/12/11	CRG	OAK FNDNS - MHTL
2	9/1/11	CDH	Additional Topo
1	3/28/08	JLH	RELEASED TO CLIENT

APPROVED BY:

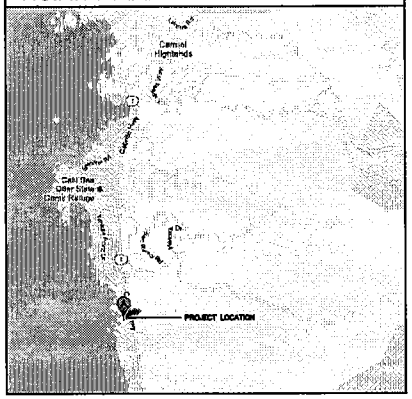
GUY R. GIBAUDO R.C.E. No. 56569

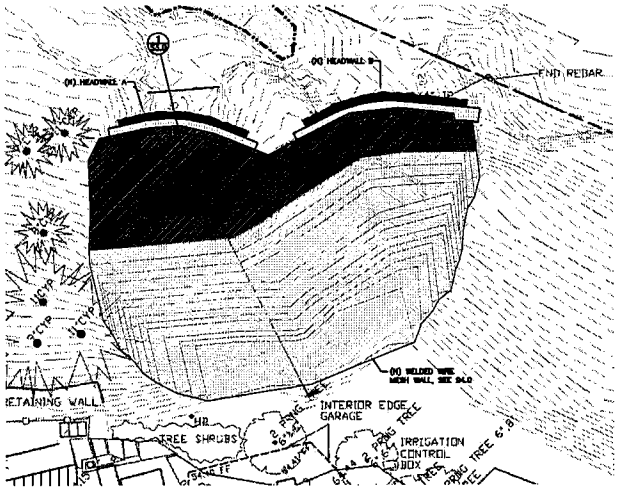
LANDSET
ENGINEERS, INC.
3209 CRACT HORSE CANYON ROAD, SALINAS, CALIFORNIA
(831) 443-8970 LANDSETENGR.COM FAX (831) 443-3801

SCALE: 1"=10'
DATE: MAR 2008
JOB NO. 492
SHEET 2
OF 2 SHEETS

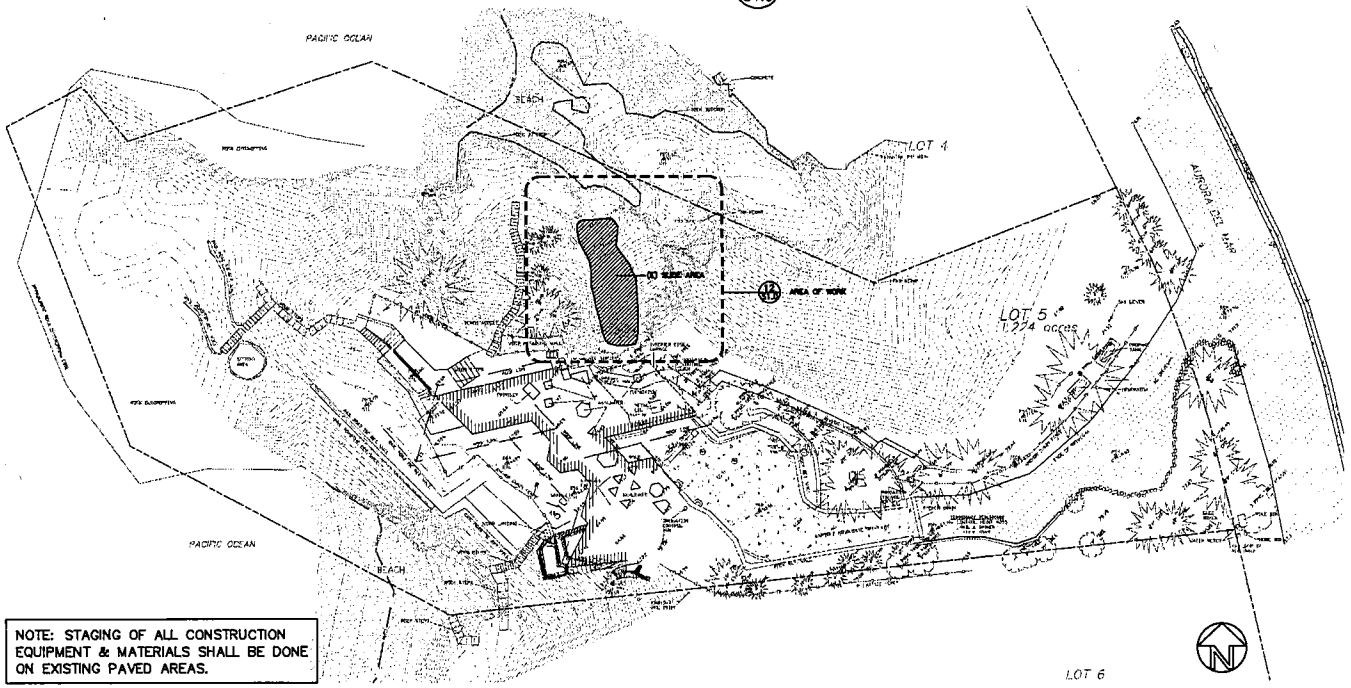
L:/CIVIL/PROJECTS-CARLSON/492NILES/DWG/492TOPOUpdated083111.dwg

VICINITY MAP





12 S1.0 ENLARGED PARTIAL SITE PLAN
SCALE: 1/8" = 1'-0"



NOTE: STAGING OF ALL CONSTRUCTION EQUIPMENT & MATERIALS SHALL BE DONE ON EXISTING PAVED AREAS.

9 S1.0 SITE PLAN
SCALE: 1" = 20'-0"

PROJECT DATA

OWNER:	DANIEL AND JENNIFER NILES
SITE ADDRESS:	30820 AURORA DEL MAR CARMEL, CALIFORNIA
APN:	243-321-010
ZONING:	COASTAL
CONTACT:	MS. GAIL HATTEN-CRAWFORD, Sr LAND USE SPECIALIST LOMBARDO & GILES, LLP 315 CAYUGA ST. SALINAS, CA 93901 Phone: (831) 754-2444 Fax: (831) 754-2011
GEOTECHNICAL ENGINEER:	PACIFIC CREST ENGINEERING 444 AIRPORT BOULEVARD, SUITE 108 WATSONVILLE, CA 95076-2082 Phone: (831) 722-5446 Fax: (831) 722-5158 CONTACT: ELIZABETH M. MITCHELL, PE
GEOLOGIST/ COASTAL ENGINEER	ZINN GEOLOGY 2093 CARRIKER LANE, SUITE B SOQUEL, CA 95073 Phone: (831) 476-3443 Fax: (831) 475-1491 CONTACT: ERIK K. ZINN
STRUCTURAL DESIGN:	PACIFIC ENGINEERING GROUP, INC. 9699 BLUE LARKSPUR LANE, SUITE 104 MONTEREY, CA 93940 Phone: (831) 333-0644 ext 301 Fax: (831) 333-0643 CONTACT: GARY W. KNOTT, PE
GENERAL CONTRACTOR:	SEAN HOGLMAN 191 LIGHTHOUSE AVE. P.O. Box 9 MONTEREY, CA 93940

PROJECT DECRIPTION

COASTAL BLUFF STABILIZATION

SHEET INDEX

STRUCTURAL NOTES

1. ALL CONSTRUCTION not specifically detailed shall conform to the requirements of the 2010 California Building Code (CBC) and any local code requirements. All details, sections and notes shown on the drawings are intended to be typical and shall apply to similar situations elsewhere unless otherwise noted.

2. CHECK ALL DIMENSIONS in relation to site conditions before starting work. The contractor shall coordinate work of all trades. All discrepancies shall be called to the attention of the engineer and resolved before proceeding with work. During construction phase the contractor is responsible for the safety of the building and personnel. Provide adequate shoring and/or bracing in accordance with appropriate Local, State and National safety codes.

3. FOUNDATION shall be as specified in Geotechnical Report, dated November 11, 2011 prepared by Pacific Crest Engineering and Geological Report, dated November 14, 2011 by Zinn Geology.

4. CONCRETE shall be proportioned to give a minimum of 28 days compressive strength of 3000 psi (Design is based on 2500 psi – Special Inspection not Required) unless indicated otherwise. The slump shall be the minimum consistent with placing conditions but shall not exceed 4 1/2".

The concrete mix shall be suitable for a salt water marine environment, with appropriate admixtures to reduce permeability. Submit concrete mix design to Engineer prior to placing concrete.

WORKMANSHIP: Place concrete in accordance with ACI-301. Ensure that reinforcement and embedded items are not disturbing placement of concrete. Top of the floor shall be true to indicated elevations. Variations shall not exceed 1/8" in 10 feet. Machine trowel surface in two directions. Finish impervious. Protect concrete from premature drying, maintain concrete with minimal moisture loss at a relatively constant temperature for period necessary for hydration of cement and hardening of concrete.

5. REINFORCING BARS shall be deformed bars conforming to ASTM standard specification A615-68 Grade 60. #4 and smaller bars may be Grade 40. Bars shall be placed in as long lengths as possible and shall lap 40 diameter at splices unless otherwise shown or noted on plans. Splices shall be staggered and bars may be wired together at splices. All steel shall be rigidly held in place with approved metal devices.

Bar coverage (face of bar to face of concrete) shall be as follows:

Concrete slab on grade	1-1/2" min.
Concrete surface against earth	3" min.
When poured against forms	2" min.
All others	see details.

6. WELDED WIRE WALL system shall be by Hilfiker Retaining Walls and shall be installed per manufacturer's specifications, see sheet S4.0.

APPLICABLE CODES

CALIFORNIA BUILDING CODE	2010 Edition (2009 IBC)
CALIFORNIA FIRE CODE	2010 Edition
CALIFORNIA PLUMBING CODE	2010 Edition
CALIFORNIA MECHANICAL CODE	2010 Edition
CALIFORNIA ELECTRICAL CODE	2010 Edition

ACTION	DATE	BY	DESCRIPTION
a.	10/26/11	GK	RELEASE FOR PLAN REVIEW
b.	10/27/11	GK	RELEASE FOR CONSULTANT REVIEW
c.	11/07/11	GK	RELEASE FOR PERMIT SUBMITTAL

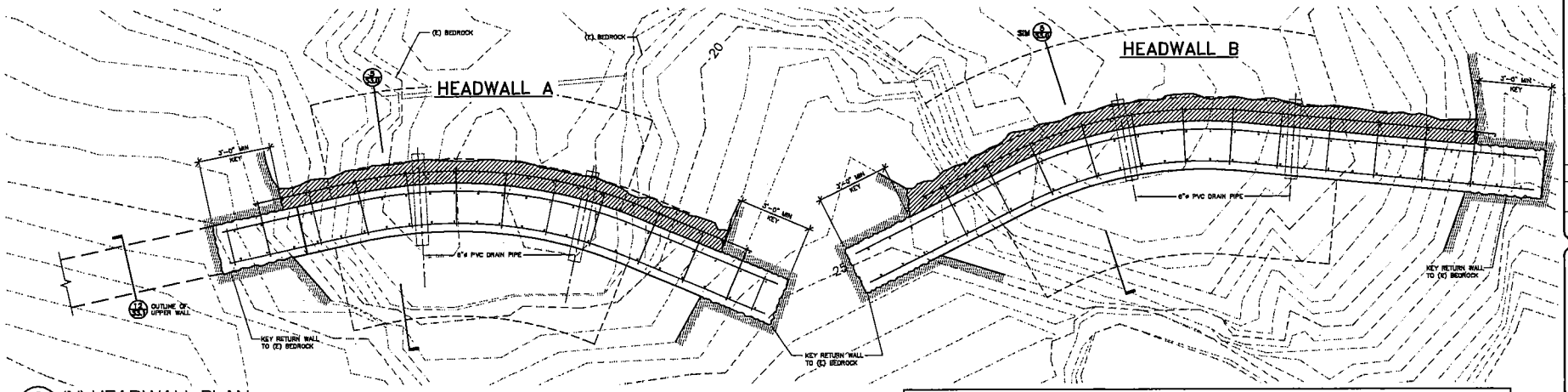
Pacific Engineering Group, Inc.
9699 Blue Larkspur Lane, Ste 104 Monterey, CA 93940
ph: (831) 333-0644 fax: (831) 333-0643

C 34922
Exp. 09-30-13
CIVIL
STATE OF CALIFORNIA
VALID WITH WET SIGNATURE ONLY

Niles Residence - Slide
30620 Aurora Del Mar
Carmel, California

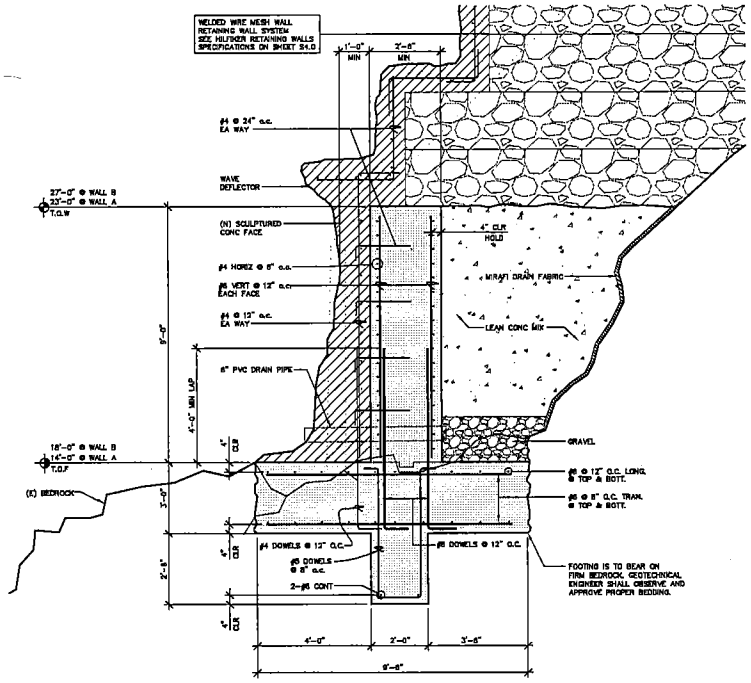
COVER SHEET

DATE	11/07/11
SCALE	AS NOTED
DRAWN	GK/WJ
JOB	11-113
SHEET	S1.0
	1 OF 4 SHEETS

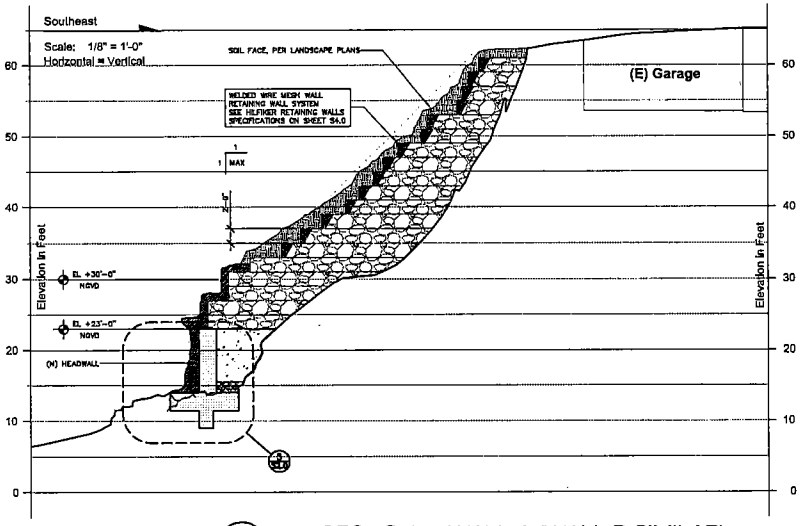


6 / S3.0 (N) HEADWALL PLAN
SCALE: 1/2" = 1'-0"

NOTE: WALL AND FOUNDATION PLACEMENT (INCLUDING KEYS) SHALL BE APPROVED BY GEOTECHNICAL ENGINEER AND GEOLOGIST PRIOR TO POURING CONCRETE.



5 / S3.0 (N) TYP. HEADWALL SECTION
SCALE: 1/2" = 1'-0"



1 / S3.0 SITE SECTION @ WALL A (WALL B SIMILAR)
SCALE: 1/8" = 1'-0"

NO.	DATE	BY	DESCRIPTION
a.	10/24/11	GK	RELEASE FOR PLAN REVIEW
b.	10/27/11	GK	RELEASE FOR CONSULTANT REVIEW
c.	11/7/11	GK	RELEASE FOR PERMIT SUBMITTAL

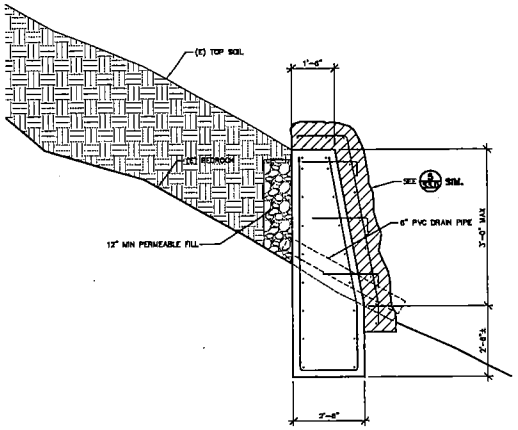
Pacific Engineering Group, Inc.
9699 Blue Larkspur Lane, Ste 104 Monterey, CA 93940
(831) 333-0644 fax: (831) 333-0645

REGISTERED PROFESSIONAL ENGINEER GARY M. KNOX C 34922 Exp. 09-30-13 CIVIL STATE OF CALIFORNIA
WET SIGNATURE ONLY

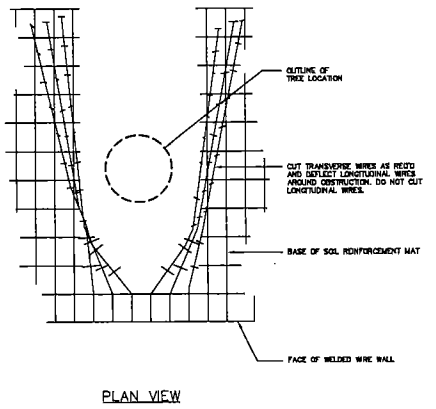
Niles Residence - Slide
30620 Aurora Del Mar
Carmel, California

SECTIONS & DETAILS

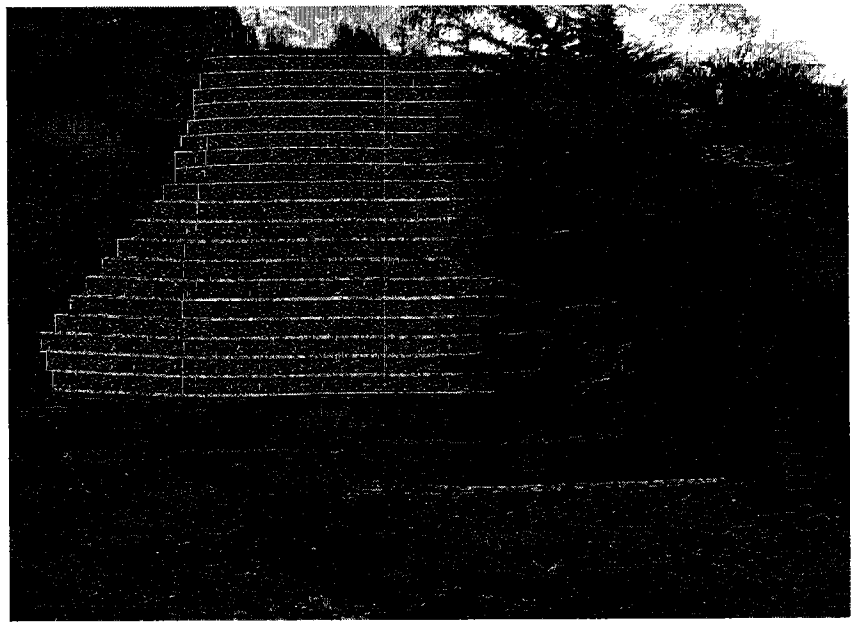
DATE	11/07/11
SCALE	AS NOTED
DRAWN	GK/MJ
JOB	11-113
SHEET	S3.0
	2 OF 4 SHEETS



12 S3.1 UPPER WALL DETAIL
SCALE: 1/2" = 1'-0"



4 S3.1 MAT PENETRATION FOR TREE PLANTING
SCALE: 1/2" = 1'-0"



13 S3.1 PROPOSED ELEVATION (without Landscaping Treatment)
SCALE: N.T.S.

9 S3.1 EXISTING ELEVATION
SCALE: N.T.S.

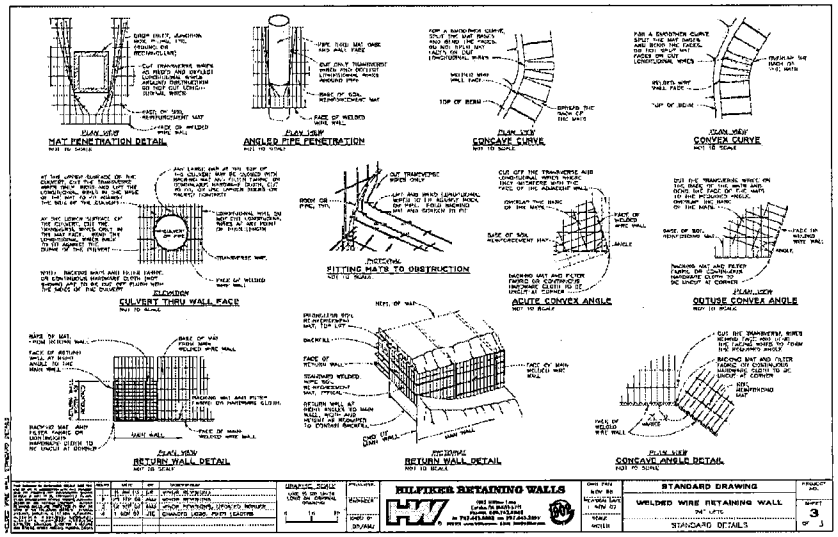
VERSION	DATE	BY	DESCRIPTION
0	01/19/12	CK	RELEASE FOR PLAN REVIEW
A	01/30/12	CK	RELEASE FOR GRADING PERMIT
B	04/19/12	BR	RELEASE FOR PLANT SUBMITTAL

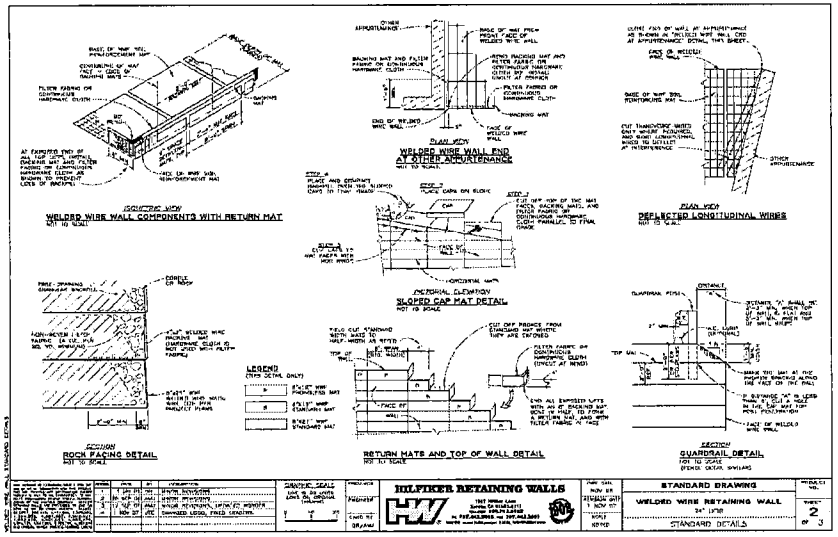
Pacific Engineering Group, Inc.
9699 Blue Larkspur Lane, Ste 104 Monterey, CA 93940
ph: (831) 333-0444 fax: (831) 333-0445

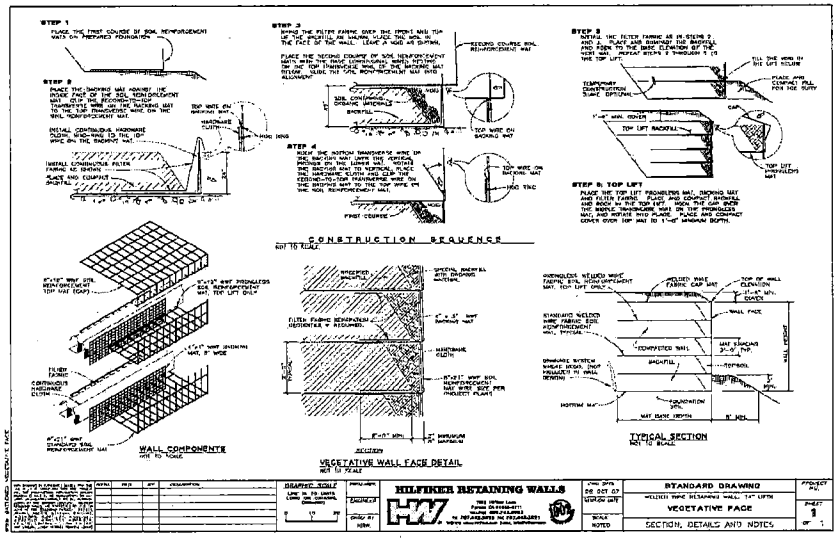
REGISTERED PROFESSIONAL ENGINEER
DAVID W. KNOX
C 34922
Exp. 08-30-13
CIVIL
STATE OF CALIFORNIA
VALID WITH WET SIGNATURE ONLY

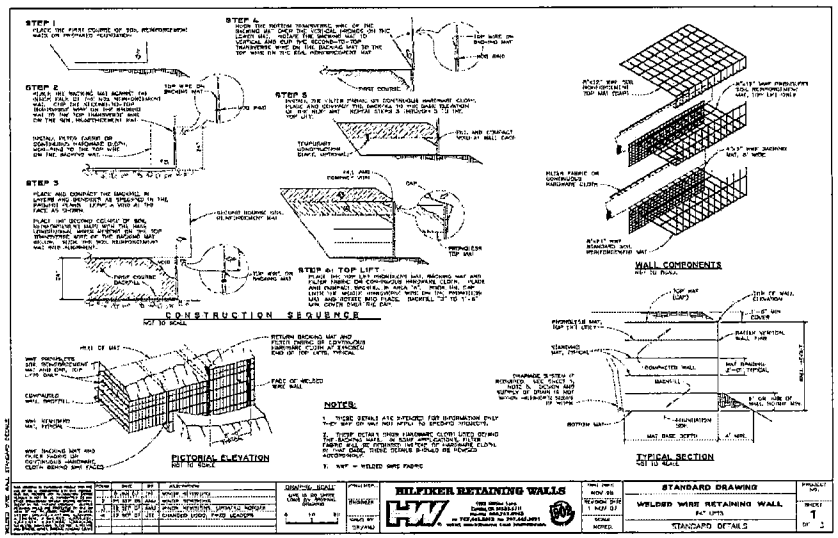
Niles Residence - Slide
30620 Aurora Del Mar
Carmel, California
-
(E) & (P) ELEVATIONS

DATE	11/07/11
SCALE	AS NOTED
DRAWN	GK/rs
JOB	11-113
SHEET	S3.1
	3 OF 4 SHEETS









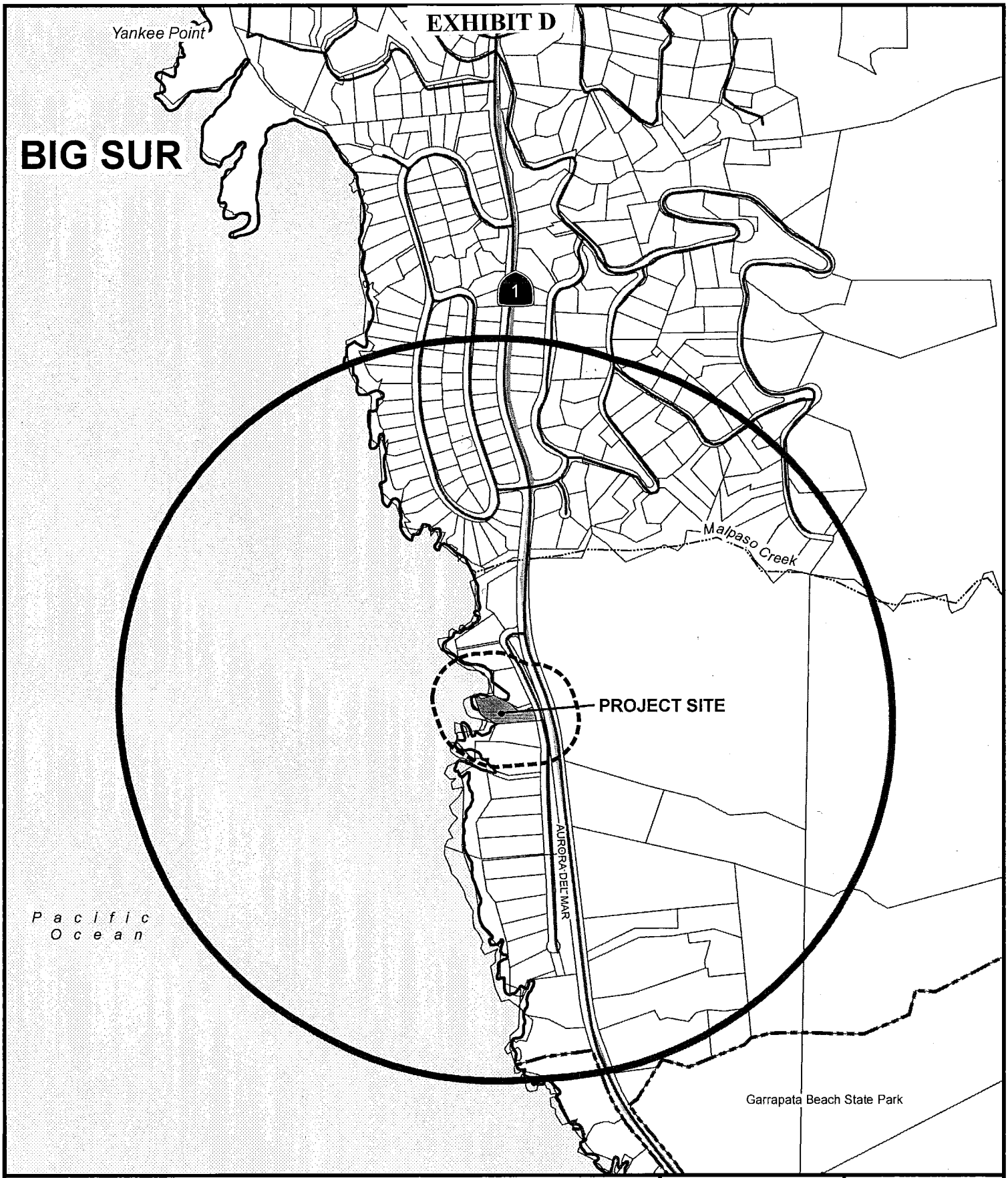
NO.	DATE	BY	DESCRIPTION
5.	11/07/11	GK	RELEASE FOR CONSULTANT REVIEW
4.	10/31/11	GK	RELEASE FOR PLANNING SUBMITTAL
3.	04/26/11	GK	RELEASE FOR POINT SUBMITTAL
2.			
1.			

Pacific Engineering Group, Inc.
9699 Blue Lodgepole Lane, Ste 104 Monterey, CA 93940
ph: (831) 333-0644 fax: (831) 333-0645

REGISTERED PROFESSIONAL ENGINEER
GARY M. KNOX
C 34622
Exp. 09-30-13
CIVIL
STATE OF CALIFORNIA
VALID WITH WET SIGNATURE ONLY

Niles Residence - Slide
30620 Aurora Del Mar
Carmel, California
1
HILFIKER - WELDED WIRE WALL DETAILS

DATE	11/07/11
SCALE	AS NOTED
DRAWN	GK/MJ
JOB	11-113
SHEET	S4.0
	4 OF 4 SHEETS



APPLICANT: NILES

APN: 243-331-010-000 **FILE #** PLN110280

Water | 2500' Limit | 300' Limit | City Limits

N

0 1,000 Feet

MONTEREY COUNTY CALIFORNIA 1850

PLANNER: ROBINSON

EXHIBIT E
MINUTES
Big Sur Land Use Advisory Committee
Tuesday, May 22, 2012

1. **Site visit at 9:00 AM at 30620 AURORA DEL MAR CARMEL (NILES)**

ATTENDEES: Delinda Robinson, Mty County; Gail Hatter-Crawford, Owner Agent; Sean Houlihan, Contractor Ned Callihan, Steve Beck, Mary Trotter, Barbara Layne, Richard Ravich, Dan Priano

2. **Meeting called to order by** Mary Trotter at 10:15 am

3. **Roll Call**

Members Present: Ned Callihan, Steve Beck, Mary Trotter, Barbara Layne, Richard Ravich and Dan Priano

Members Absent: 0

4. **Approval of Minutes:**

A. January 10, 2012 minutes

Motion: Steve Beck (LUAC Member's Name)

Second: Richard Ravich (LUAC Member's Name)

Ayes: Steve Beck, Richard Ravich, Mary Trotter and Dan Priano

Noes: 0

Absent: Ned Callihan, Barbara Layne did not attend January 10th meeting

Abstain: 0

B. February 14, 2012 minutes

Motion: Steve Beck (LUAC Member's Name)

Second: Richard Ravich (LUAC Member's Name)

Ayes: Barbara Layne, Ned Callihan, Steve Beck, Richard Ravich, Mary Trotter and Dan Priano

Noes: 0

Absent: 0

Abstain: 0

C. February 28, 2012 minutes - No quorum was present but minutes were prepared

Motion: Steve Beck (LUAC Member's Name)

Second: Richard Ravich (LUAC Member's Name)

Ayes: Mary Trotter, Steve Beck, Richard Ravich

Noes: 0

Absent: Barbara Layne, Ned Callihan, Dan Priano (Absent February 28, 2012)

Abstain: 0

D. March 13, 2012 minutes

Motion: _____ (LUAC Member's Name)

Second: _____ (LUAC Member's Name)

Ayes: _____

Noes: _____

Absent: _____

Abstain: _____

5. **Public Comments:** The Committee will receive public comment on non-agenda items that are within the purview of the Committee at this time. The length of individual presentations may be limited by the Chair.

None

6. **Scheduled Item(s)**

7. **Other Items:**

A) Preliminary Courtesy Presentations by Applicants Regarding Potential Projects

None

B) Announcements

None

8. **Meeting Adjourned:** 11:30 am

Minutes taken by: Dan Priano

Minutes received via email June 4, 2012

Action by Land Use Advisory Committee
Project Referral Sheet

Monterey County Planning Department
168 W Alisal St 2nd Floor
Salinas CA 93901
(831) 755-5025

Advisory Committee: **Big Sur**

Please submit your recommendations for this application by: **May 22, 2012**

Project Title: NILES DANIEL T & JENNIFER E
File Number: PLN110280
File Type: PC
Planner: ROBINSON
Location: 30620 AURORA DEL MAR CARMEL
Project Description:
Combined Development Permit consisting of: 1) Coastal Administrative Permit for restoration of a coastal bluff consisting of a concrete keyway and armored headwall with landscaped Hilfiker wall system; headwall to be surfaced with a textured rock appearance and Hilfiker baskets to be planted with native vegetation consistent with surrounding bluff vegetation; the restoration area to be approximately 45 - 55 feet wide by approximately 33 - 41 feet tall; grading to be approximately 50 cubic yards cut and 740 cubic yards fill; 2) Coastal Development Permit for development on a coastal bluff; 3) Coastal Development Permit for development on slopes exceeding 30 percent; 4) Coastal Development Permit for development within 100 feet of environmentally sensitive habitat; 5) Coastal Development Permit for development within 750 feet of known archaeological resources; and 6) Design Approval. The property is located at 30620 Aurora Del Mar, Carmel (Assessor's Parcel Number 243-331-010-000), Big Sur Land Use Plan, Coastal Zone.

Was the Owner/Applicant/Representative Present at Meeting? Yes __X__ No _____

Gail Hatter-Crawford, Owner's representative and Sean Houlihan, Contractor

Was a County Staff/Representative present at meeting? _____Delinda Robinson_____ (Name)

PUBLIC COMMENT:

Name	Site Neighbor?		Issues / Concerns (suggested changes)
	YES	NO	

LUAC AREAS OF CONCERN

Concerns / Issues (e.g. site layout, neighborhood compatibility; visual impact, etc)	Policy/Ordinance Reference (If Known)	Suggested Changes - to address concerns (e.g. relocate; reduce height; move road access, etc)
Invasive species on the property and hillside		To remove from contruction area as well as other areas on the property.

ADDITIONAL LUAC COMMENTS

None

RECOMMENDATION :

Motion by: Steve Beck (LUAC Member's Name)

Second by: Dan Priano (LUAC Member's Name)

_X_ Support Project as proposed

_____ Recommend Changes (as noted above)

_____ Continue the Item

Reason for Continuance: _____

Continued to what date: _____

AYES: Barbara Layne, Mary Trotter, Richard Ravich, Steve Beck, Ned Callihan and Dan Priano

NOES: 0

ABSENT: 0

ABSTAIN: 0

EXHIBIT F

County of Monterey
State of California

MITIGATED NEGATIVE DECLARATION

Project Title:	Niles
File Number:	PLN110280
Owner:	Daniel and Jennifer Niles
Project Location:	30620 Aurora Del Mar, Carmel
Primary APN:	243-331-010-000
Project Planner:	Delinda Robinson
Permit Type:	Combined Development Permit
Project Description:	Combined Development Permit consisting of: 1) Coastal Administrative Permit for restoration of a coastal bluff consisting of a concrete keyway and armored headwall with landscaped Hilfiker wall system; headwall to be surfaced with a textured rock appearance and Hilfiker baskets to be planted with native vegetation consistent with surrounding bluff vegetation; the restoration area to be approximately 45 - 55 feet wide by approximately 33 - 53 feet tall; grading to be approximately 50 cubic yards cut and 740 cubic yards fill; 2) Coastal Development Permit for development on a coastal bluff; 3) Coastal Development Permit for development on slopes exceeding 30 percent; 4) Coastal Development Permit for development within 100 feet of environmentally sensitive habitat; 5) Coastal Development Permit for development within 750 feet of known archaeological resources; and 6) Design Approval.

THIS PROPOSED PROJECT WILL NOT HAVE A SIGNIFICANT EFFECT ON THE ENVIRONMENT AS IT HAS BEEN FOUND:

a) That said project will not have the potential to significantly degrade the quality of the environment.

b) That said project will have no significant impact on long-term environmental goals.

c) That said project will have no significant cumulative effect upon the environment.

d) That said project will not cause substantial adverse effects on human beings, either directly or indirectly.

Decision Making Body:	Monterey County Planning Commission
Responsible Agency:	County of Monterey
Review Period Begins:	November 7, 2012
Review Period Ends:	December 7, 2012

Further information, including a copy of the application and Initial Study are available at the Monterey County Planning & Building Inspection Department, 168 West Alisal St, 2nd Floor, Salinas, CA 93901 (831) 755-5025.

Date Printed: 3/12/2002

MONTEREY COUNTY

RESOURCE MANAGEMENT AGENCY – PLANNING DEPARTMENT
168 WEST ALISAL, 2ND FLOOR, SALINAS, CA 93901
(831) 755-5025 FAX: (831) 757-9516

NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION
MONTEREY COUNTY PLANNING COMMISSION

NOTICE IS HEREBY GIVEN that the Monterey County Resource Management Agency – Planning Department has prepared a draft Mitigated Negative Declaration, pursuant to the requirements of CEQA, for a Combined Development Permit (Niles, PLN110280) at 30620 Aurora Del Mar, Carmel (Assessor's Parcel Number 243-331-010-000) (see description below).

The Mitigated Negative Declaration and Initial Study, as well as referenced documents, are available for review at the Monterey County Resource Management Agency – Planning Department, 168 West Alisal, 2nd Floor, Salinas, California. The Mitigated Negative Declaration and Initial Study are also available for review in an electronic format by following the instructions at the following link: http://www.co.monterey.ca.us/planning/docs/environmental/circulating.htm.

The Monterey County Planning Commission will consider this proposal at a meeting on December 12, 2012 at 9:00 A.M. in the Monterey County Board of Supervisors Chambers, 168 West Alisal, 2nd Floor, Salinas, California. Written comments on this Negative Declaration will be accepted from November 7, 2012 to December 7, 2012. Comments can also be made during the public hearing.

Project Description: Combined Development Permit consisting of: 1) Coastal Administrative Permit for restoration of a coastal bluff consisting of a concrete keyway and armored headwall with landscaped Hilfiker wall system; headwall to be surfaced with a textured rock appearance and Hilfiker baskets to be planted with native vegetation consistent with surrounding bluff vegetation; the restoration area to be approximately 45 - 55 feet wide by approximately 33 - 53 feet tall; grading to be approximately 50 cubic yards cut and 740 cubic yards fill; 2) Coastal Development Permit for development on a coastal bluff; 3) Coastal Development Permit for development on slopes exceeding 30 percent; 4) Coastal Development Permit for development within 100 feet of environmentally sensitive habitat; 5) Coastal Development Permit for development within 750 feet of known archaeological resources; and 6) Design Approval. The property is located at 30620 Aurora Del Mar, Carmel (Assessor's Parcel Number 243-331-010-000), Big Sur Land Use Plan, Coastal Zone.

We welcome your comments during the 30-day public review period. You may submit your comments in hard copy to the name and address above. The Department also accepts comments via e-mail or facsimile but requests that you follow these instructions to ensure that the Department has received your comments. To submit your comments by e-mail, please send a complete document including all attachments to:

CEQAcomments@co.monterey.ca.us

An e-mailed document should contain the name of the person or entity submitting the comments and contact information such as phone number, mailing address and/or e-mail address and include any and all attachments referenced in the e-mail. To ensure a complete and accurate record, we request that you also provide a follow-up hard copy to the name and address listed above. If you do not wish to send a follow-up hard copy, then please send a second e-mail requesting confirmation of receipt of comments with enough information to

confirm that the entire document was received. If you do not receive e-mail confirmation of receipt of comments, then please submit a hard copy of your comments to ensure inclusion in the environmental record or contact the Department to ensure the Department has received your comments.

Facsimile (fax) copies will be accepted with a cover page describing the extent (e.g. number of pages) being transmitted. A faxed document must contain a signature and all attachments referenced therein. Faxed document should be sent to the contact noted above at **(831) 757-9516**. To ensure a complete and accurate record, we request that you also provide a follow-up hard copy to the name and address listed above. If you do not wish to send a follow-up hard copy, then please contact the Department to confirm that the entire document was received.

For reviewing agencies: The Resource Management Agency – Planning Department requests that you review the enclosed materials and provide any appropriate comments related to your agency's area of responsibility. The space below may be used to indicate that your agency has no comments or to state brief comments. In compliance with Section 15097 of the CEQA Guidelines, please provide a draft mitigation monitoring or reporting program for mitigation measures proposed by your agency. This program should include specific performance objectives for mitigation measures identified (CEQA Section 21081.6(c)). Also inform this Department if a fee needs to be collected in order to fund the mitigation monitoring or reporting by your agency and how that language should be incorporated into the mitigation measure.

All written comments on the Initial Study should be addressed to:

County of Monterey
Resource Management Agency – Planning Department
Attn: Mike Novo, Director of Planning
168 West Alisal, 2nd Floor
Salinas, CA 93901

Re: Niles Project; File Number PLN110280

From: Agency Name: _____
Contact Person: _____
Phone Number: _____

____ No Comments provided
____ Comments noted below
____ Comments provided in separate letter

COMMENTS: _____

DISTRIBUTION

1. State Clearinghouse (15 CD copies + 1 hard copy of the Executive Summary) – include the Notice of Completion
2. County Clerk's Office
3. CalTrans District 5 – San Luis Obispo office
4. California Coastal Commission
5. Monterey Bay Unified Air Pollution Control District
6. Cal-Fire (Coastal Station), Dennis King
7. California Department of Fish and Game
8. Monterey County Water Resources Agency
9. Monterey County Public Works Department
10. Monterey County Environmental Health Bureau
11. Daniel and Jennifer Niles, Owner
12. Anthony Lombardo & Associates, Agent
13. The Open Monterey Project
14. LandWatch
15. Property Owners within 300 feet (Notice of Intent only)

Revised 02-02-2012

MONTEREY COUNTY

RESOURCE MANAGEMENT AGENCY

PLANNING DEPARTMENT

168 WEST ALISAL ST., 2nd FLOOR, SALINAS, CA 93901

PHONE: (831) 755-5025 FAX: (831) 757-9516

INITIAL STUDY

I. BACKGROUND INFORMATION

Project Title:	Niles
File Number:	PLN110280
Project Location:	30620 Aurora Del Mar, Carmel
Name of Property Owner:	Daniel and Jennifer Niles
Name of Applicant:	Anthony Lombardo & Associates/Attn: Gail Hatter-Crawford
Assessor's Parcel Number(s):	243-331-010-000
Acreage of Property:	1.14 acres
General Plan Designation:	Residential, 40 acres per unit
Zoning District:	RDR/40-D(CZ)
Lead Agency:	Monterey County
Prepared By:	Delinda Robinson and Laura Lawrence
Date Prepared:	November 6, 2012
Contact Person:	Delinda Robinson
Phone Number:	(831) 755-5198

II. DESCRIPTION OF PROJECT AND ENVIRONMENTAL SETTING

A. Description of Project:

The project consists of the restoration of a section of coastal bluff, utilizing a Hilfiker Wall system with a concrete keyway and armored head wall. The head wall will be surfaced with textured concrete designed to match the adjacent bluff and the Hilfiker baskets will be planted with native plants consistent with the surrounding bluff vegetation. The restoration area will be approximately 45 feet to 55 feet wide by approximately 33 feet to 53 feet tall. The project will require approximately 50 cubic yards of cut and 740 cubic yards of fill.

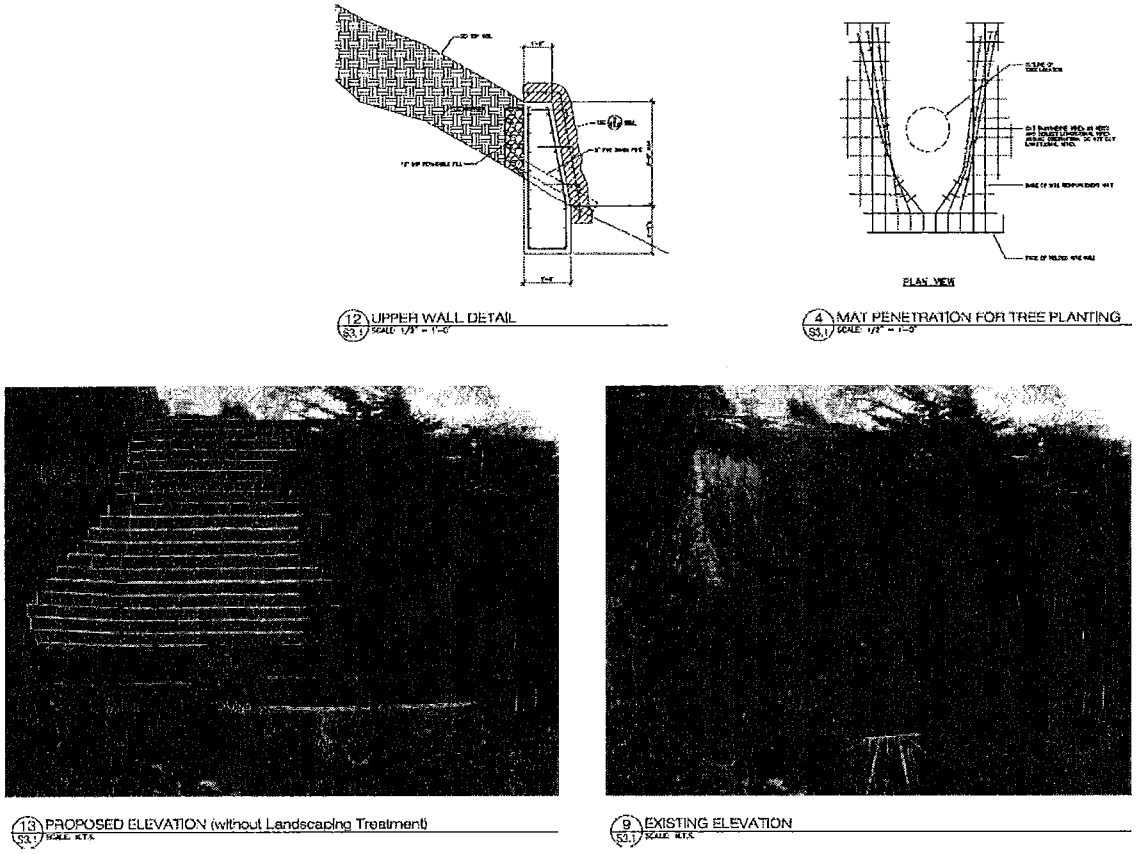


Figure 1: Proposed and Existing Elevations

The bluff is about 63 feet above sea level at the garage and is comprised of marine terrace deposits overlying granite. Granite outcrops are visible around the base of the bluff above the beach and range from 10 to 15 feet above sea level in the restoration area. The existing garage is embedded into the bluff on the northern edge of the lot, with the garage floor approximately 10 feet below the bluff. The proposed project will repair an area where the bluff is failing. As stated in the Geotechnical and Geologic Coastal Investigation (Source IX.10) prepared for the project, "A recent failure of the bluff face immediately adjacent to the back wall of the garage has accelerated the advance of bluff retreat toward the structure, increasing the potential for

undermining the garage foundation. The slope failure occurred entirely within the existing terrace deposit materials and extends from the top of the bluff to the bedrock contact above the beach." Factors contributing to the failure include perched groundwater within the terrace deposits and at the terrace deposit/granite interface and wave run-up. The Engineering Geology Report prepared for the project by Zinn Geology (Source IX.11) notes that the area of the proposed bluff stabilization is subject to occasional wave erosion and that wave scouring has undermined and oversteepened the toe of the marine deposits to an elevation of 18 to 20 feet above mean sea level. A helical anchor system was installed through the garage floor in 2011 to underpin and protect the garage. Absent intervention however, the bluff will continue to fail and will continue to threaten the garage and house.

Construction Detail

The lower end of the repair will be constructed in two sections, one (Headwall A) approximately 24 feet long and the second (Headwall B) approximately 30 feet long. The two will be separated by only about 3 feet. The concrete headwalls will be keyed 2.5 feet into granite and will have footings that are 3 feet thick and 9.5 feet wide. The walls will be 14.5 feet tall from bottom of the keyway to the top of the wall. Concrete armoring, which will be colored and sculpted to blend in with the adjacent natural bluff, will cover the wall and extend up the slope to approximately 30 feet above sea level to prevent damage due to wave runup. The armoring also includes a "wave deflector" at around 23 feet to further protect the wall from wave damage. Drainage from behind the wall will be conveyed through the wall by pipes and discharged to the rock below.

Above the armored headwalls, a Hilfiker welded wire retaining wall system will be installed to the top of the bluff. The Hilfiker retaining wall system consists of interlocking welded wire fabric mats that are placed in 2-foot lifts to create "baskets" that are back filled with base material and topsoil. The system will extend from approximately 8 feet to 24 feet out from the existing face of the bluff and will result in a slope that does not exceed 1:1. The face will be landscaped with native plants that have been propagated from local stock.

Because the base of the bluff is not accessible by large machinery, all materials utilized in the project will be temporarily stockpiled on the driveway above. As needed, the materials will be hand carried or lowered to the area being worked on at the time. Fill materials will be transported to their final location in the wall through a pipe from the top of the slope.

It is anticipated that construction will take approximately 4 months as shown below.
The proposed work hours are from 7:30 am to 4:00 pm, Monday through Friday. There will be a maximum of 15 construction personnel on the site at any one time and an average of 6-8 employees daily on the site. Ample parking exists for all construction personnel vehicles on the site.

Rough Grading	10 days
Construction of keyway and headwalls	30 days
Construction of Hilfiker wall system	45 days

During rough grading, mini-excavator equipment and other equipment will be used within the project site boundaries. It is estimated that over the 4 month course of construction, there will be 12 truck trips for delivery and pick up of equipment for the rough grading operations, 30 truck trips for delivery of materials to be stored on site, 15 concrete truck trips and 75 truck trips for the importation and placement of the fill material. All deliveries will access the site through the existing entry gate onto Aurora del Mar off of Highway 1 and all loading and unloading will occur on Aurora del Mar or on the site.

Entitlements Required

The project is a Combined Development Permit including the following entitlements:

1) Coastal Administrative Permit and Design Approval for restoration of a coastal bluff consisting of a concrete keyway and armored headwall with landscaped Hilfiker wall system; headwall to be surfaced with a textured rock appearance and Hilfiker baskets to be planted with native vegetation consistent with surrounding bluff vegetation; the restoration area to be approximately 45 - 55 feet wide by approximately 33 - 53 feet tall; grading to be approximately 50 cubic yards cut and 740 cubic yards fill;
2) Coastal Development Permit for development on a coastal bluff;
3) Coastal Development Permit for development on slopes exceeding 30 percent;
4) Coastal Development Permit for development within 100 feet of environmentally sensitive habitat; and
5) Coastal Development Permit for development within 750 feet of known archaeological resources;

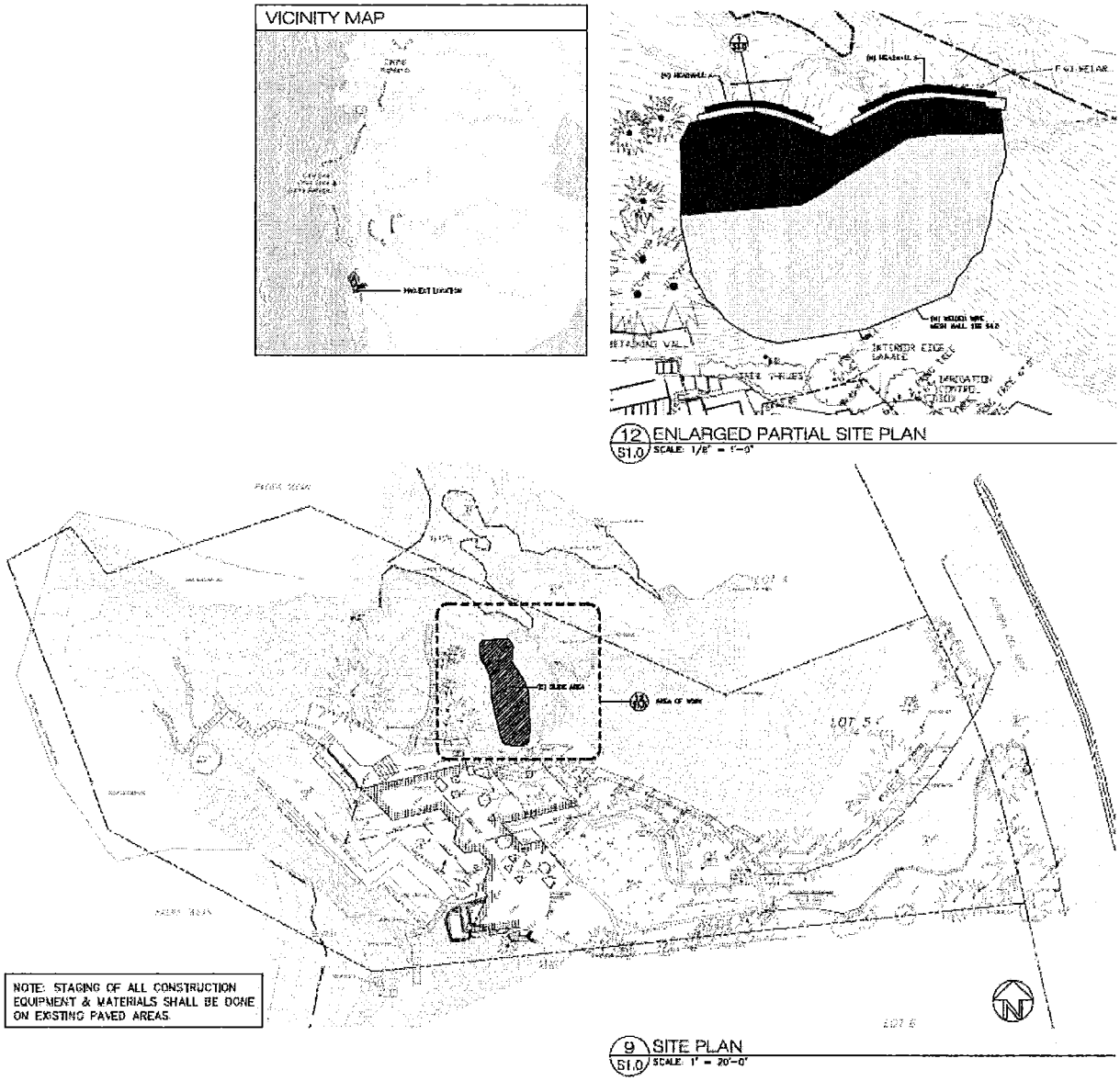


Figure 2: Site Plan

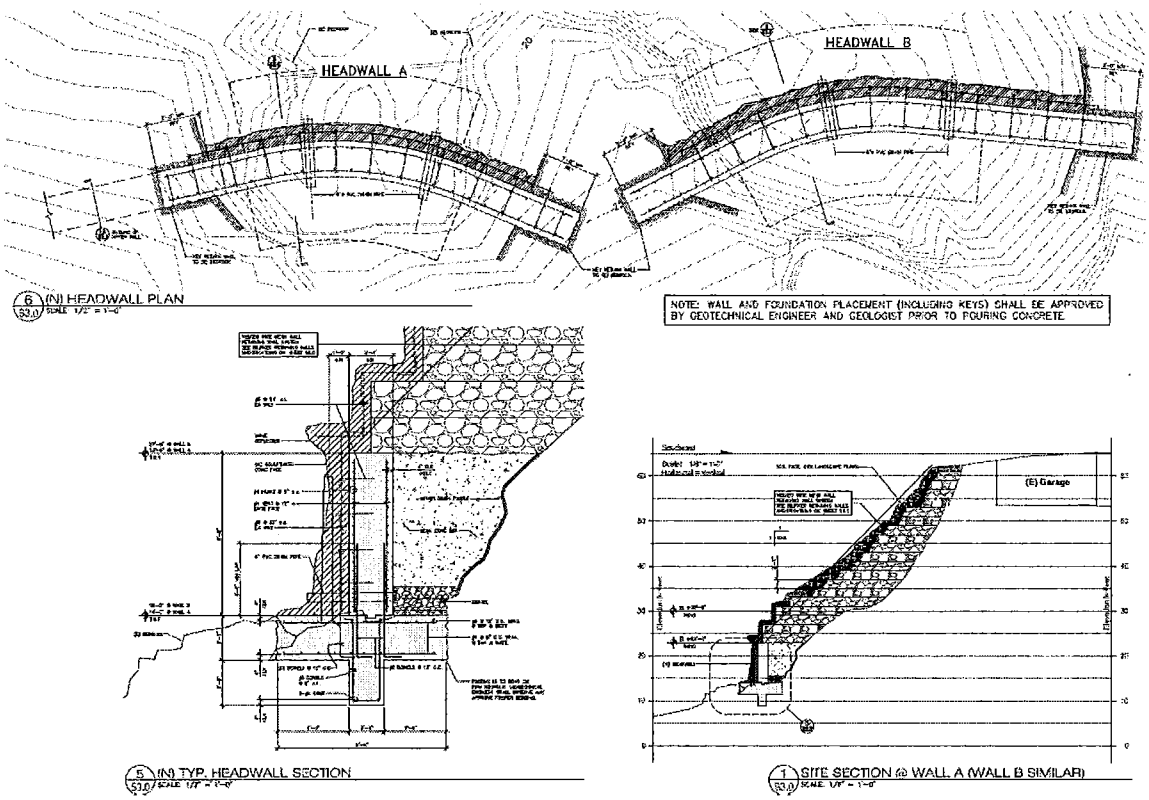


Figure 3: Headwall Plan

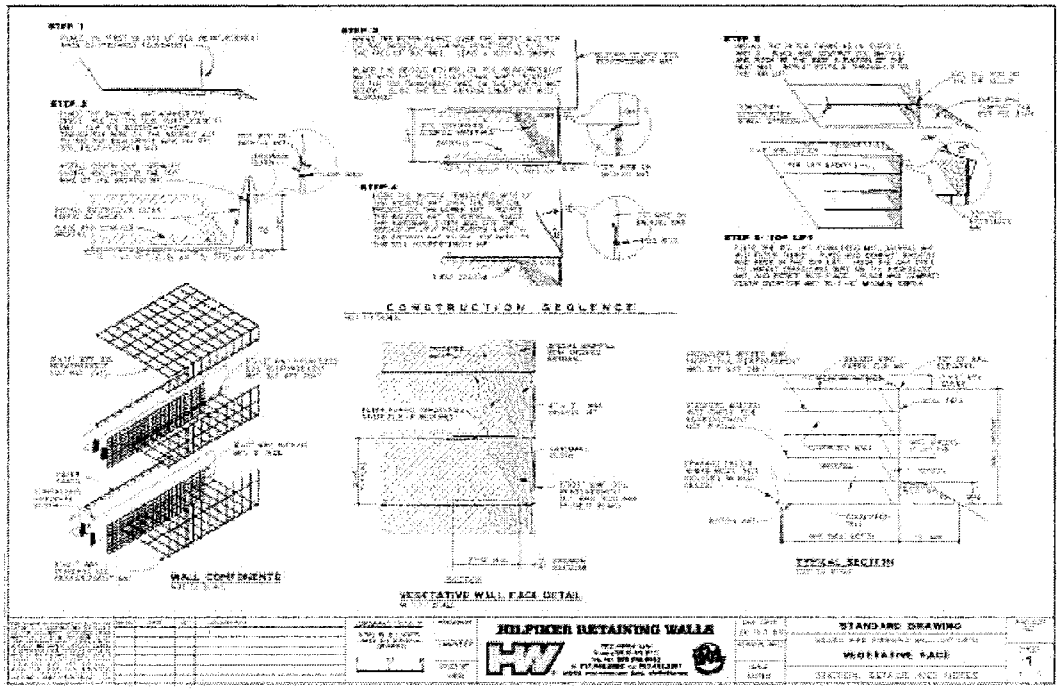


Figure 4: Hilfiker Wall Plan

B. Surrounding Land Uses and Environmental Setting:

The property is located at 30620 Aurora Del Mar, Carmel (Assessor's Parcel Number 243-331-010-000), in the northern section of the Big Sur Coast Land Use Plan area. The site is a 1.14 acre bluff top lot in a residential subdivision lying between Aurora Del Mar, a private road paralleling Highway 1 immediately to the east and the Pacific Ocean on the west. Although the zoning for the subdivision and the site is Rural Density Residential, 40 acres per unit, with Design Control overlay in the Coastal Zone, the residential lots in this area are between 1 and 2 acres in size. Residential uses are located to the north and south of the subject parcel. Located on a small coastal peninsula, the site slopes gently to the west, with steep coastal bluffs to the south, west and north. The lot is developed with a single-family dwelling and garage that were built in the late 1970s. The house and garage are built into the bluff with a green roof at ground level. There are developed paths along the bluff and a wood stairway extends part way to the beach below the bluff. Landscaping around the property is primarily non-native, drought tolerant species that are able to withstand salt spray and constant winds. Undisturbed sections of the bluff are vegetated with both native and naturalized landscape plants. The biological report prepared for the project notes that to the east of the proposed project area, the slope is densely vegetated with coastal bluff scrub species as well as native exotics such as *Echium fatuosum* and *Myoporum laetum*. To the west of the project area, the slope is densely covered with mostly native species.

C. Other public agencies whose approval is required:

The project will require Building and Grading Permits from the RMA-Building Services Department.

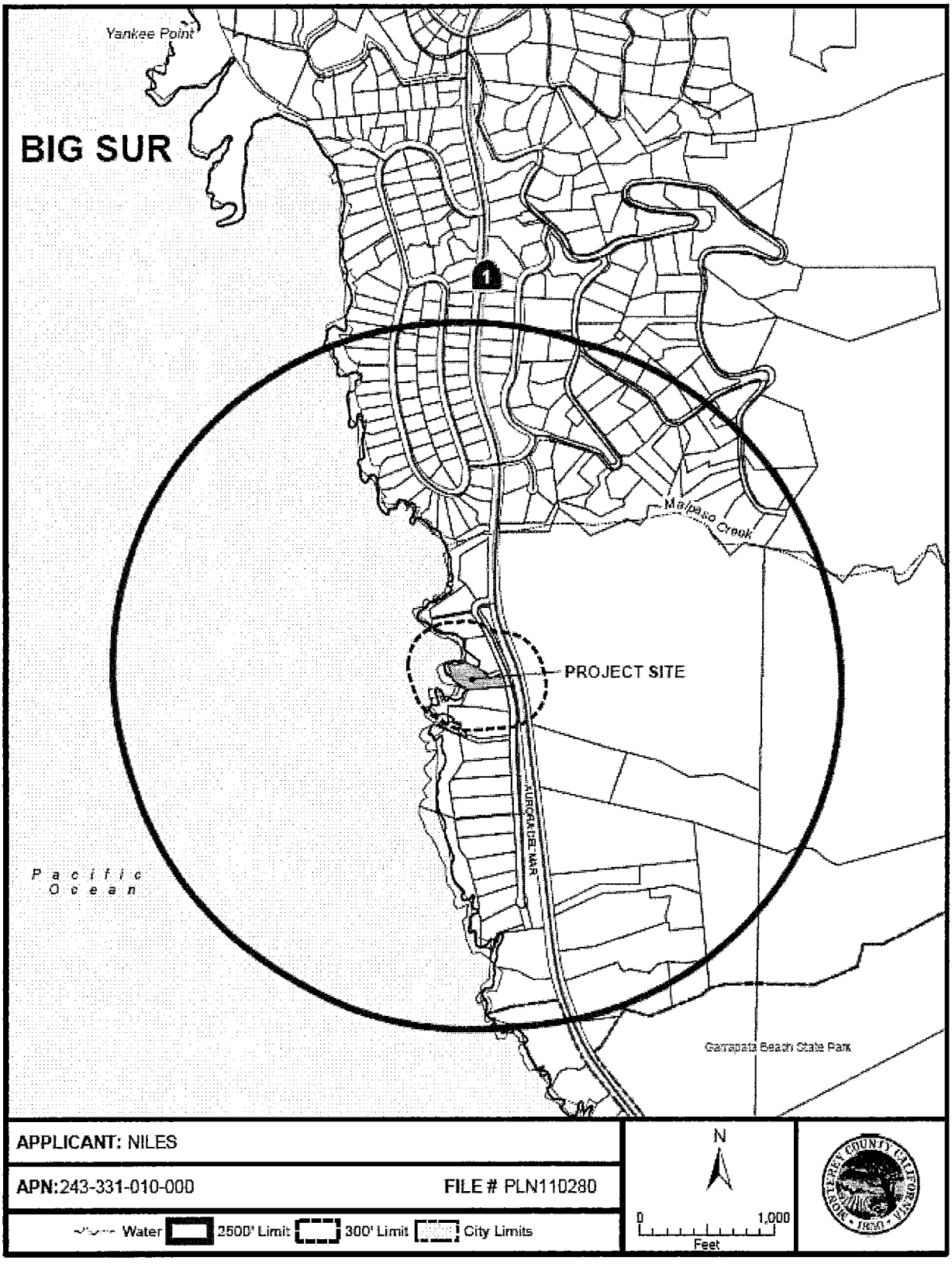


Figure 5: Vicinity Map

III. PROJECT CONSISTENCY WITH OTHER APPLICABLE LOCAL AND STATE PLANS AND MANDATED LAWS

Use the list below to indicate plans applicable to the project and verify their consistency or non-consistency with project implementation.

General Plan/Area Plan	☒	Air Quality Mgmt. Plan	☒
Specific Plan	☐	Airport Land Use Plans	☐
Water Quality Control Plan	☒	Local Coastal Program-LUP	☒

General Plan/Area Plan. The proposed project was reviewed for consistency with the 1982 Monterey County General Plan and the Big Sur Coast Land Use Plan. Section IV.9 (Land Use and Planning) discusses whether the project physically divides and established community; conflicts with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (refer to *Local Coastal Program-LUP* discussion below); or conflicts with any applicable habitat conservation plan or natural community conservation plan. **CONSISTENT**

Water Quality Control Plan. Monterey County is included in the Central Coast Regional Water Quality Control Board – Region 3 (CCRWCB). The CCRWCB regulates the sources of water quality related problems. Because the proposed project would not increase on-site impervious surfaces, nor include land uses that would introduce new sources of pollution, it is not expected to contribute runoff that would exceed the capacity of storm water drainage systems or provide substantial additional sources of polluted runoff. The proposed project would not result in water quality impacts or be inconsistent with objectives of this plan. **CONSISTENT**

Air Quality Management Plan (AQMP). Consistency with the AQMP is an indication of a project's cumulative adverse impact on regional air quality (ozone levels). It is not an indication of project-specific impacts, which are evaluated according to the Air District's adopted thresholds of significance. Inconsistency with the AQMP is determined by comparing the project population at the year of project completion with the population forecast for the appropriate five-year increment that is listed in the AQMP. If the population increase resulting from the project would not cause the estimated cumulative population to exceed the relevant forecast, the project would be consistent with the population forecasts in the AQMP. The project is consistent with the Monterey County 1982 General Plan and with the Association of Monterey Bay Area Governments (AMBAG) regional population and employment forecast. The proposed project will not increase the population of the area nor generate additional permanent vehicle trips. Therefore, the project will be consistent with the AQMP. **CONSISTENT**

Local Coastal Program-LUP. The project was reviewed for consistency with the Big Sur Coast Land Use Plan (LUP). The LUP designates the project site as Residential, 40 acres per unit. Section VI.9 (Land Use and Planning) discusses whether the project physically divides an established community, conflicts with any applicable land use plan, policy or regulation of and agency with jurisdiction over the project or conflicts with any applicable habitat conservation plan or natural community conservation plan. The project is consistent with the Big Sur Coast Land Use Plan as explained below in section IV.A. **CONSISTENT**

IV. ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED AND DETERMINATION

A. FACTORS

The environmental factors checked below would be potentially affected by this project, as discussed within the checklist on the following pages.

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

Some proposed applications that are not exempt from CEQA review may have little or no potential for adverse environmental impact related to most of the topics in the Environmental Checklist; and/or potential impacts may involve only a few limited subject areas. These types of projects are generally minor in scope, located in a non-sensitive environment, and are easily identifiable and without public controversy. For the environmental issue areas where there is no potential for significant environmental impact (and not checked above), the following finding can be made using the project description, environmental setting, or other information as supporting evidence.

☐ Check here if this finding is not applicable

FINDING: For the above referenced topics that are not checked off, there is no potential for significant environmental impact to occur from either construction, operation or maintenance of the proposed project and no further discussion in the Environmental Checklist is necessary.

EVIDENCE:

1) Aesthetics. See Section VI.1 below.

2) Agriculture and Forest Resources. The project site is a residentially-zoned parcel and is not designated as Prime, Unique, of Statewide Importance, or of Local Importance

Farmland. The project is a coastal bluff stabilization project that would not result in the conversion of prime agricultural lands to non-agricultural uses. The site is not under Williamson Act Contract. The project would not result in the loss of forest land or conversion of forest land to non forest use. The project site is not located near any agricultural or forest lands. Therefore, the project will not impact agricultural or forest resources. (Source: 1, 2, 3, 7, 8)

3) Air Quality. The project area is within the North Central Coast Air Basin and is subject to the jurisdictional regulations of the Monterey Bay Unified Air Pollution Control District (MBUAPCD). The MBUAPCD prepared the Air Quality Management Plan (AQMP) for the Monterey Bay Region. The AQMP found that the North Central Coast Air Basin meets the Federal Air Quality standards and meets the state standards for Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), and fine particulate matter ($PM_{2.5}$). Monterey County is in non-attainment for inhalable particulates (PM_{10}) and for the State 1 hour ozone standard. The construction of the wall will not conflict with the implementation of the MBUAPCD AQMP, violate any air quality standard, or result in a cumulatively considerable net increase of criteria pollutants. The primary source of emissions during construction is vehicle traffic and dust. Due to the steepness of the slope, most of the work for the coastal bluff stabilization project will be done by hand. Best Management Practices for construction and erosion control will be implemented throughout the duration of construction. Consequently, the project will not result in construction-related air quality impacts, will not expose sensitive receptors to substantial pollutant concentrations or create objectionable odors affecting a substantial number of people. Therefore, the project will not result in air quality impacts. (Source: 1, 2, 6, 7, 8)

4) Biological Resources. See Section VI.4 below.

5) Cultural Resources. See Section VI.5 below.

6) Geology/Soils. See Section VI.6 below.

7) Greenhouse Gas Emissions. The primary source of greenhouse gas emissions during construction results from the use of heavy equipment. Due to the steepness of the slope, most of the work for the coastal bluff stabilization project will be done by hand with only limited use of heavy equipment. The Hilfiker wall will be replanted with native vegetation. The finished project will not create any greenhouse gas emissions beyond those associated with the residential uses on the property. Consequently, the project will not generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. In addition, the construction and implementation of the project will not conflict with applicable plans, policies or regulations adopted for the purpose of reducing greenhouse gas emissions. Therefore, the project will not result in greenhouse gas impacts. (Source: 1, 2, 6, 7)

8) Hazards/Hazardous Materials. The project is a coastal bluff stabilization project utilizing a Hilfiker wall system with a concrete keyway and armored head wall. The head wall

will be surfaced with a textured rock appearance and the Hilfiker baskets will be planted with native vegetation consistent with the surroundings. The project will not involve the transportation, use, or disposal of hazardous materials that would constitute the threat of explosion or other significant release of materials that would pose a threat to neighboring properties. The project does not involve stationary operations, create hazardous emissions, or handle hazardous materials. The site is a residential property that is not included on a list of hazardous materials sites, and the project or property would have no impact on emergency response or emergency evacuation. The site is not located within two miles of an airport or airstrip. The property is in a very high fire hazard area. The coastal bluff stabilization project will not expose people or structures to a significant risk of loss, injury, or death involving wildfires. Therefore, the project will result in no impacts from hazards or hazardous materials. (Source: 1, 2, 3, 7, 8)

9) Hydrology/Water Quality. See Section VI.9 below.

10) Land Use/Planning. See Section VI.10 below.

11) Mineral Resources. No mineral resources have been identified along the coastal bluff. If mineral resources were present, they have likely eroded away into the ocean. The coastal bluff stabilization project will stabilize the slope from further erosion. The project is residentially-zoned and is not in an area used for aggregate production. Therefore, there will be no impacts to mineral resources. (Source: 1, 2, 3, 7, 8)

12) Noise. See Section VI.12 below.

13) Population/Housing. The property is currently developed with one single-family dwelling. The coastal bluff stabilization project will not induce population growth in the area, displace existing housing, require replacement housing, or displace people. On the contrary, if the project isn't built, continued erosion of the slope could compromise the existing home and displace the residents. Therefore, the project will have no impact on population and housing. (Source: 1, 7, 8, 10)

14) Public Services. The proposed project will not have substantial adverse impacts associated with the provision of new or physically altered governmental facilities nor will it require new or physically altered governmental facilities. New public services such as fire, police, schools or parks are not required in order to stabilize the coastal bluff. Therefore, there will be no impacts to public services. (Source: 1, 2, 3, 7, 8)

15) Recreation. The coastal bluff stabilization will not impact or increase the use of existing neighborhood and regional parks and does not include the construction of regional facilities. New recreational facilities are not required in order to stabilize the coastal bluff. Therefore, there will be no impacts to recreation. (Source: 1, 2, 3, 7)

16) Transportation/Traffic. The temporary increase in traffic during the construction phase of the project will not cause any conflict with the goals, objectives, and policies of the 2010

Regional Transportation Plan for Monterey County. There are no airports in the project vicinity; therefore the project will have no impact on air traffic patterns. The project involves no modification of existing roads or construction of any new roads, therefore the project will not impact hazards due to a design feature. The project will not change access to the site in any way, whether by modification of the existing driveway or any other road. The construction management plan states that all offloading, staging and servicing of the construction equipment will be on site and parking will be on site. Therefore the project will have no impact on emergency access. The project does not propose to modify any public transit, bicycle or pedestrian facilities; therefore there will be no impact. (Source: 1, 2, 3, 7, 8, 9)

17) Utilities/Service Systems. The project will not modify the existing wastewater treatment system or require the construction of new water or wastewater treatment systems. The existing stormwater drainage system drains stormwater to rock surfaces above the beach and the proposed project will do the same. Except for construction water, no water is required for the project. Wastewater is treated by and on-site septic system that is located well away from the project site. There will be no additional solid waste generated by the project over the amount the existing residence currently generates and the project will comply with all federal, state and local statutes and regulations with regard to solid waste. (Source: 1, 2, 3, 4, 7, 9, 10, 11, 12, 13, 14)

B. DETERMINATION

On the basis of this initial evaluation:

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

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

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

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

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately

in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Delinda Robinson
Signature

November 6, 2012
Date

Delinda Robinson

Senior Planner

V. EVALUATION OF ENVIRONMENTAL IMPACTS

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on project-specific screening analysis).

2) All answers must take into account the whole action involved, including offsite as well as onsite, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level mitigation measures from Section XVII, "Earlier Analyses," may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

a) Earlier Analysis Used. Identify and state where they are available for review.
b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) The explanation of each issue should identify:
a) The significance criteria or threshold, if any, used to evaluate each question; and
b) The mitigation measure identified, if any, to reduce the impact to less than significance.

VI. ENVIRONMENTAL CHECKLIST

1. AESTHETICS Would the project:		Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a)	Have a substantial adverse effect on a scenic vista? (Source: 1, 2, 3, 4, 7)	☐	☐	☒	☐
b)	Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? (Source: 1, 7, 8)	☐	☐	☐	☒
c)	Substantially degrade the existing visual character or quality of the site and its surroundings? (Source: 1, 7)	☐	☒	☐	☐
d)	Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? (Source: 1, 7)	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:

Aesthetics 1(a) – Less Than Significant Impact

The Big Sur Coast Land Use Plan (LUP) defines "critical viewshed" as "everything within sight of Highway 1 and other major public viewing area including turnouts, beaches and a number of specific locations. The project for bluff stabilization will not be visible from any public viewing area however it will be within the viewshed of two residences to the north, a private beach and slightly within the viewshed of Aurora Del Mar, the gated private road that serves the subdivision. As such, the project site is not within the critical viewshed, however LUP Policy 3.2.4.A.2 requires that "new applicants, when selecting a building site, must consider the visual effects upon public views as well as the views and privacy of neighbors." Although the project site is a developed building site, the policy clearly intends to protect private views and therefore, the view of this bluff could be considered part of a "scenic vista". Policy 3.2.4.A.3 calls for new development to be "subordinate and blend with its environment using materials or colors that will achieve that effect. Where necessary, appropriate modifications will be required for siting, structural design, size, shape, color, textures, building materials, access and screening." The current view is of an actively eroding bluff that is covered by a massive blue tarp to prevent further erosion. There is no alternative site for the project, which will correct a specific problem in a specific location. However, the project has been re-designed to more closely mimic the look of a natural bluff. As designed, the project incorporates keyways and headwalls that will be contoured and colored to have the appearance of the surrounding bluff faces. The area above the headwalls will be a series of terraced and shaped Hilfiker baskets that will be planted with native species consistent with vegetation in the area and at an elevation consistent with vegetation in the area. The impact will be less than significant.

Aesthetics 1(b) - No Impact

The project site is not located within a state scenic highway. There will be no impact.

Aesthetics 1(c) - Less Than Significant With Mitigation
The subject site is a coastal bluff in a small cove. As discussed above in Section VI.1 (a), the project to stabilize the bluff will be visible from two residences to the north, the private beach in the cove and visible through vegetation from the gated, private road that serves the subdivision. The visual character of the site is that of coastal bluffs eroding "badlands style" as the project geologist describes it. Where vegetation exists, it is on the upper portion of the bluffs, away from wave run up and actively eroding areas. The project has been designed to mimic the appearance of the natural bluff to the extent possible. However, the Hilfiker wall system is a man-made structure that must be properly vegetated to take on a natural appearance. The biological report for the project includes a list of appropriate species for the restoration and recommends monitoring of the installation of plantings to ensure success. Implementation of Mitigation Measure No. 1 will ensure that the vegetation will becomes established and provide screening for the structure.

Mitigation Measure No. 1: In order to preserve the visual and natural character of the area, all finish and landscape materials shall be designed and maintained in such a manner that blends in with the surrounding environment. The applicant shall submit landscape/restoration plan that:

- Identifies the location, species and size of the proposed landscaping material.
- Includes native species that are botanically appropriate to the area as identified by the project biologist and shall include but not be limited to Northern coastal bluff scrub species.
- Includes maintenance notes for all landscaping materials.
- Includes success criteria for replanting.
- Provides notes on the plans to eradicate invasive vegetation for areas on and near the project area.
- Work with the project biologist to identify appropriate vegetation in the removal area that could be salvaged, potted and out-planted during restoration.
- Use flat, earthtone colors for all exposed Hilfiker Wall components.

Monitoring Action 1a: Prior to issuance of construction permits, the owner/applicant shall note and submit proposed colors and materials for the Hilfiker Wall components to the Director of RMA-Planning for review and approval.
Monitoring Action 1b: At least three weeks prior to installation of plantings, the applicant shall submit a landscape and irrigation plan to the Director of RMA-Planning for review and approval.
Monitoring Action 1c: Monitoring Action 1c: Prior to final inspection, the owner/applicant shall provide verification from the contractor that the landscaping has been installed as shown on the approved landscape plan.
Monitoring Action 1d: Twice a year for five years following completion, the owner/applicant shall submit to the Director of RMA-Planning for review and approval a report on the status of erosion control and restoration. The reports shall be prepared by a qualified biologist and shall include performance measures and corrective measures needed. Each report shall include a report on the status of any corrective measures previously recommended.

Aesthetics 1(d) – No impact

The bluff stabilization project will include no new light sources. It is a retaining wall and requires no lighting and the finish materials will be a flat earthtone color that produces no glare. There will be no impact.

2. AGRICULTURAL AND FOREST RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:

See Section IV.A.2 above.

3. AIR QUALITY

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

Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Result in significant construction-related air quality impacts?	☐	☐	☐	☒
e) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
f) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:
See Section IV.A.3 above

4. BIOLOGICAL RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? (Source: 1, 3, 4, 7, 8, 15)	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations or by the California Department of Fish and Game or US Fish and Wildlife Service? (Source: 1, 3, 4, 7, 8, 15, 21)	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? (Source: 1, 7, 8, 10, 15, 22)	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? (Source: 1, 2, 3, 15)	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? (Source: 1, 2, 3, 4, 14)	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? (Source: 1, 2, 3, 8, 14, 19)	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:
The Big Sur Coast Land Use Plan identifies that the Big Sur Coast supports a wealth and diversity of environmentally sensitive habitats. Development is to be subordinated to the protection of areas that have critical habitat. The guiding philosophy is to favor design that limits disturbance and maximizes the natural topography of the site.

Biological Resources 4(a) – Less Than Significant Impact
A biological assessment for the subject site was completed by Patrick Regan, consulting biologist on March 20, 2012, and a supplemental assessment prepared on May 31, 2012. Two special status

species were identified on the project site: Seaside painted cup (*Castilleja latifolia)*, a limited distribution species that is found only along the coast in Monterey and Santa Cruz counties and Monterey cypress *(Hesperocyparis macrocarpa)*, a List 1B.2 species (rare, threatened or endangered in California). The biological report prepared for the project states that the larger Monterey cypresses on the site appear to have been planted and are not native to the site, and that trees growing on the slope in the middle of the main damage area are probably volunteer seedlings that came from the landscape trees on the site. Two of the small, non-native Monterey cypress will be removed for the construction of the Hilfiker wall. Although they are not native to the site, the biologist has included 5 Monterey cypresses in the list of recommended restoration plant species, to be planted at the east edge and near the top of the wall. No specimen of Seaside painted cup was identified within the project area so no impact to this species is anticipated.

Biological Resources 4(b) – Less Than Significant Impact With Mitigation Incorporated
The site is located on the Pacific Coast, with the project area being a coastal bluff. There are no year-round or ephemeral streams on the site and, according to the biological report prepared for the project, no riparian species are present.

The project site lies adjacent to the Monterey Bay National Marine Sanctuary and the California Sea Otter Game Refuge however all of the project work will occur at least 10 feet above the beach. The biological report for the project identified no potential impacts to marine or beach species.

Although no occurrences of special status species will be impacted by the project, the biological report found that some impact to the sensitive plant community known as Northern coastal bluff scrub has already occurred as a result of the slope failure and will continue to occur if the slope failure is not abated. A small amount of native vegetation removal will occur during the repair work. Implementation of Mitigation Measure No. 1 (Section 1(c) above will ensure that the slope is replanted with native species, including Northern coastal bluff scrub and will reduce impacts to this habitat to less than significant.

Non-native, invasive exotics such as Mouse-hole tree *(Myoporum laetum)* and Pride of Madeira *(Echium fastuosum)* have colonized the slope, primarily to the east of the project site. The spread of exotic plants can disrupt native vegetation, and thus have an impact on native habitat. Construction will involve disturbing soil that can easily become infested with invasive non-native plants. Eradication of this type of plants is necessary to reduce potential impacts to Northern coastal bluff scrub to a less than significant level.

> **Mitigation Measure No. 2:** In order to maintain and enhance the sensitive habitat in the project area:
> a. All non-native, invasive plant species shall be controlled and eradicated from areas within and immediately adjacent to the bluff restoration and replanted with native vegetation to the satisfaction of the Director of RMA-Planning.
> b. Disturbed slope areas adjacent to the project area shall require netting and reseeding with native ground cover as determined appropriate by a qualified biologist/ecologist.
> **Monitoring Action 2a: During construction,** the applicant shall install and maintain silt fencing along disturbed areas. The fencing shall remain in place until the soil is stabilized.

Monitoring Action 2b: Prior to construction, the applicant shall submit a plan from a qualified biologist outlining invasive plant removal protocol and res-seeding protocol to the Director of RMA-Planning for review and approval.
Monitoring Action 2c: Prior to final inspection, the applicant shall provide the Director of RMA-Planning written certification by a qualified biologist that Mitigation Measure 2 has been completed.
Monitoring action 2c: On-going, the applicant shall maintain the bluff restoration area free of invasive vegetation to the satisfaction of the Director of RMA-Planning.

Biological Resources 4(c) – No Impact
The U.S. Fish and Wildlife Service Wetlands Geodatabase does not identify any wetlands on the subject site, nor are any wetlands identified in the biological or geotechnical reports prepared for the project. There will be no impact to wetlands.

Biological Resources 4(d) – No Impact
The project will restore approximately 2,250 square feet of essentially vertical coastal bluff that has collapsed. The biological report prepared for the project did not identify any native resident or migratory fish or wildlife species on the site nor did it identify the site as a migratory wildlife corridor or wildlife nursery site. As it currently exists, the bluff consists of freshly sloughed dirt and rock. There will be no impact.

Biological Resources 4(e) – No Impact
Two small non-native Monterey cypress trees will be removed as part of the project. The Big Sur Coast Land Use Plan does not require permits for the removal of non-native trees. No protected trees or other protected biological resources are proposed for removal as part of the project. There will be no impact.

Biological Resources 4(f) – No Impact
A search of the U.S. Fish and Wildlife Service and California Department of Fish and Game websites identified no adopted Habitat Conservation Plan or Natural Community Conservation Plans applicable to the area. A search of County records identified no other local habitat conservation plan. There will be no impact.

5. CULTURAL RESOURCES **Would the project:**	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5? (Source: 1, 2, 3, 8, 16, 17, 18)	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5? (Source: 1, 2, 3, 8, 16, 17, 18)	☐	☐	☒	☐

5. CULTURAL RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? (Source: 1, 2, 3, 8, 16, 17, 18)	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries? (Source: 1, 2, 3, 8, 16, 17, 18)	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:

Cultural Resources 5(a), 5(c) – No Impact
The project site is a collapsed bluff. Archaeological assessments for the project site identified no historical or paleontological resources on the site. Search of County records identified no record of the site being a listed historical resource. The site is does not contain a unique geological feature. The bluff being restored is similar to adjacent bluffs and other coastal bluffs along the coastline. There will be no impact.

Cultural Resources 5(b) – Less Than Significant
According to archaeological reports prepared for the site prior to the original construction of the residence, the project site does contain cultural resources. Archaeological test excavations conducted on the site in 1978 found that the resources on the site were limited to the top 50 to 60 centimeters. An archaeological monitor was on the site during vegetation clearance and initial grading for the residence. The monitoring report prepared in 1978 states that the resources were generally limited to the top 20 centimeters and that soils below that level were found to be culturally sterile. The site was determined to be primarily a temporary, abalone-processing site with limited potential for significance.

The majority of the resources on the site were removed during the original construction of the residence. The project site is an area where the bluff has collapsed and much of the soil has already washed out to sea. The remaining soils are highly disturbed.

In 2011, Gary Breschini of Archaeological Consulting performed archaeological data recovery on the bluff restoration area. The report prepared for this data recovery states that due to the shallow and disturbed nature of the cultural deposit, no radiocarbon dates will be obtained from the materials recovered in the area. As recommended by the report, the standard archaeological condition requiring that work be stopped should significant resources be uncovered during construction will be imposed on the project. The impact to cultural resources will be less than significant.

Cultural Resources 5(d) – No Impact
None of the archaeological reports or testing on the site revealed any human remains or indications that human remains exist on the site. Search of County records does not reveal any

known burial grounds or cemeteries on the site. As stated above in Section 5(b), the standard archaeological condition will be imposed on the project to require that work be stopped should resources be uncovered during construction. There will be no impact to human remains.

6. GEOLOGY AND SOILS Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? (Source: 1, 10, 11, 12, 13) Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking? (Source: 1, 10, 11, 12, 13)	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction? (Source: 1, 10, 11, 12, 13)	☐	☐	☒	☐
iv) Landslides? (Source: 1, 10, 11, 12, 13)	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil? (Source: 1, 10, 11, 12, 13)	☐	☒	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? (Source: 1, 10, 11, 12, 13)	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Chapter 18A of the 2007 California Building Code, creating substantial risks to life or property? (Source: 1, 10, 11, 12, 13)	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? (Source: 1, 14)	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:

Geology and Soils 6 (a.i) – No Impact. Zinn Geology prepared a Geologic Report and for the proposed bluff stabilization project to determine general geologic conditions on the subject property and address geologic policies of the Monterey County Coastal Implementation Plan.

These investigations included reviewing reports, evaluating aerial photographs, topographic mapping, analysis of data from soil borings and consultation with the structural and geotechnical engineers for the project.
The homesite on the Niles property is situated about 60 to 70 feet above the ocean on a small natural point that protrudes out from the coast. The house and garage are built into the marine terrace deposits that overlie granodirite bedrock. The garage is embedded into the bluff, with the floor of the garage approximately 10 feet below the top of the bluff.

Although the project site is located within the general vicinity of a number of faults and fault zones (San Gregorio, Rinconada and Monterey Bay-Tularcitos Fault Zone), no known fault traces exist on the property. The site is not located within a State designated Alquist-Priolo fault zone nor is it located in a County of Monterey active fault zone. The bluff stabilization project does not include any habitable structures. There will be no impacts due to fault rupture.

Geology and Soils 6 (a.ii), (a.iii), (a.iv), (c) – Less than significant. The Zinn Geological Report states that the dominant process affecting the stability of the coastal bluff is mass movement associated with either earthquakes or elevated groundwater within the relatively unconsolidated marine deposits. As recommended by the project geologist and based on the geologic cross section of the coastal bluff through the existing failure surface developed by Zinn Geology and field and laboratory data, Pacific Crest Engineering performed a quantitative slope analysis to evaluate the overall stability of the bluff in its present configuration and following stabilization of the bluff as proposed. The analysis determined that the crest of the oversteepened bluff could be subjected to shallow failures, especially under saturated or partially saturated soil conditions and that continued slope retreat will eventually undermine the foundation of the garage. To minimize risk of slope failure or damage to the garage foundation, the report recommends that the garage be underpinned to supplement foundation support until the bluff can be repaired. This underpinning was completed in January of 2012. The report further recommends restoring the bluff to a more stable gradient by buttressing the slope face. The project has been designed with a stepped buttress system founded into the underlying bedrock as recommended by Pacific Crest Engineering. Zinn Geology reviewed the proposed bluff protective structure plans prepared by the Project Civil and Structural Engineer of Record and found that the proposed plans specifically address the elevated risk of the Niles residence being undermined through the process of long term coastal bluff retreat and provide a long term solution to the risk of damage to the foundation. The impacts due to seismic shaking, seismic related ground failure and landslide will be less than significant.

Geology and Soils 6 (b)- Less Than Significant With Mitigation.
The project site is located on a slope in excess of 30%. No large equipment will be utilized during construction of the proposed bluff stabilization project however, the possibility of materials falling to the beach below exists. Implementation of Mitigation Measure No. 3 will reduce the impact due to soil erosion to less than significant.

> **Mitigation Measure No. 3:** In order to avoid erosion and prevent vegetation or debris from falling to the beach below, the owner/applicant shall implement Best Management Practices including but not limited to the following:
>
> - Install silt-stop fencing and/or coir rolls around all areas where bare soil may be exposed including all staging and stockpile areas.

- Maintain coir rolls to absorb any slurry sediment and direct water flow into drainage basins designed to capture and settle water during drilling, casting and curing of concrete pier supports. Remove slurry when basins are at capacity.
- Dispose of materials (slurry, cut vegetation, etc.) off site in an appropriate refuse area.
- Stabilize areas of loose soil immediately after construction in disturbed areas is complete. Soils may be stabilized with jute netting, seeding, and/or restoration planting.
- Install temporary irrigation where deemed appropriate by the project biologist and project engineer to maintain restoration planting and seeded areas during the initial establishment period.

Monitoring Action 3a. Prior to issuance of permits, the owner applicant shall prepare an erosion control plan in accordance with Mitigation Measure No. 3 and that is coordinated with the Restoration Plan identified in Mitigation Measure No. 1.
Monitoring Action 3b. Twice a year for five years following completion, the owner/applicant shall submit to the Director of RMA-Planning for review and approval a report on the status of erosion control and restoration. The reports shall be prepared by a qualified biologist and shall include performance measures and corrective measures needed. The reports shall be coordinated with and may be included in the monitoring reports required in Monitoring Action 1d.

Geology and Soils (d) – No impact.
The bluff restoration project does not involve the construction of any building that would be affected by expansive soil. The Geotechnical report prepared for the project did not indicate that expansive soils are found on the site and recommends engineered fill for the construction of the proposed retaining wall. There will be no impact.
Geology and Soils (e) – No impact.
The project does not involve any modification to the existing septic system or any intensification of the use of the project site that would require modification to the existing septic system. Septic system components on the project site are located well to the west, south and east of the eroded area and will not be impacted by the bluff restoration. Site reviews performed by LandSet Engineers found that neither the septic system nor the storm drainage system on the site is a contributing factor to the bluff erosion. There will be no impact.

7. GREENHOUSE GAS EMISSIONS Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:
See Section IV.A.7 above.

8. HAZARDS AND HAZARDOUS MATERIALS **Would the project:**	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:
See Section IV.A.8 above.

9. HYDROLOGY AND WATER QUALITY **Would the project:**	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements? (Source: 1, 9, 10, 12, 13, 20)	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? (Source: 1, 9, 10, 12, 13, 20)	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? (Source: 1, 9, 10, 12, 13, 20)	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? (Source: 1, 9, 10, 12, 13, 20)	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? (Source: 1, 9, 10, 12, 13, 20)	☐	☐	☐	☒
f) Otherwise substantially degrade water quality? (Source: 1, 9, 10, 12, 13, 20)	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? (Source: 1, 9, 10, 12, 13, 20)	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows? (Source: 1, 9, 10, 12, 13, 20)	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? (Source: 1, 9, 10, 12, 13, 20)	☐	☐	☐	☒

9. HYDROLOGY AND WATER QUALITY **Would the project:**	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
j) Inundation by seiche, tsunami, or mudflow? (Source: 1, 9, 10, 12, 13, 20)	☐	☐	☒	☐

Discussion/Conclusion/Mitigation:

Hydrology 9(a, b, d-i) – No Impact

As discussed above in Section II, this project is for the stabilization and restoration of a coastal bluff. The project will not result in any additional wastewater or wastewater discharge. No additional water use is proposed as part of the project. All drainage for the site is discharged to hard rock above the beach. No changes are proposed to the drainage that would result in flooding. No new runoff will result from the project. No new housing is proposed as part of the project. No new structures will be placed within a 100-year floodplain. The project site is not located in an area subject to inundation due to failure of any levee or dam. There will be no impact.

Hydrology 9(c, j) – Less Than Significant

There will be a slight change to the drainage pattern that has evolved as a result of the slope failure due to the construction of the buttress, headwalls and Hilfiker walls. The slope and contour of the bluff will be changed as a result of the project, which will cause a change in the drainage pattern across that portion of the repaired slope. Additionally, drain pipes will be installed behind the wall. The end location of the drainage, the beach below the bluff, will not change. Additional work was done by Charles E. Potter, P.E., on the septic and site drainage of the Niles property. Mr. Potter concludes that neither the septic system nor the storm drainage system contributed in any way to the slope failure. No work is required for either the septic system or the storm drainage system as part of the project.

Due to the stepped nature of the Hilfiker wall and the landscaping that will be done as part of the slope stabilization, drainage down the slope will be slowed. Bare soil will be minimal. As a result, even though there is a slight change in the drainage pattern, the amount of drainage will be slowed and erosion will be minimized.

On the coast, the site could be subject to tsunami hazards. Pacific Crest Engineering incorporated a projected 55-inch sea-level rise by the year 2100 into the wave run-up evaluation for the site. The buttress and headwalls are within the wave run-up area but have been designed to withstand the effect of potential wave run-up. The Hilfiker walls are designed to be above the run-up area. This will prevent further collapse of the bluff and consequent loss of soil and terrace deposits into the ocean.

Impacts from alteration of the drainage pattern or tsunami will be less than significant.

10. LAND USE AND PLANNING Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community? (Source: 1, 2, 3, 7, 8)	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? (Source: 1, 2, 3, 4, 5, 7, 8)	☐	☐	☒	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan? (Source: 1, 21, 23)	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:

Land Use and Planning 10(a): No impact.

The project will restore a section of coastal bluff that has collapsed. The existing bluff and the bluff as it previously existed do not provide any connectivity within the community. There will be no impact.

Land Use and Planning 10(b): Less Than Significant With Mitigation Incorporated.

The project site is located within the Big Sur Coast Land Use Plan (LUP) area. The project site is located in an area identified to be environmentally sensitive habitat areas (ESHA). Section 3.3 of the LUP includes a number of policies relative to development within such areas. The Key Policy calls for ESHA to be maintained and restored where possible and for development to be subordinate to ESHA. In this case, the project site includes sensitive Northern coastal bluff scrub habitat. In order to approve development within ESHA, the finding must be made that disruption to the habitat as a result of the development will not be significant. In this case, as discussed above in Sections 4(a) and (b), ESHA has already been disturbed by the collapse of the bluff. Implementation of Mitigation Measures No. 1 and 2 will reduce impacts to ESHA to less than significant.

The LUP Visual Resources policies require that new development be subordinate to and blend in with the environment. The lower section of the retaining wall will utilize concrete facing that is colored and textured to match the adjacent bluff face and the Hilfiker wall will be planted with native plant materials that are propagated from plant materials on the site. Implementation of Mitigation Measure No. 1 will ensure that impacts to Visual Resources are less than significant.

Land Use and Planning 10(c): No impact.

As discussed above in Section 4(f), there are no known habitat conservation plans or natural community conservation plans associated with the project site. There will be no impact.

11. MINERAL RESOURCES Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:
See Section IV.A.11 above.

12. NOISE Would the project result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies? (Source: 1, 2, 7, 9)	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? (Source: 1, 7, 9)	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? (Source: 1, 7, 9)	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? (Source: 1, 7, 9)	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? (Source: 1, 2, 7, 8, 9)	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? (Source: 1, 7, 9)	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:

Noise 12(a-c & e-f) – No impact. Construction of the project will not utilize large equipment that might generate noise. The bluff restoration project will not generate any noise once built. The project site is sufficiently physically removed from adjacent homes so that any ground borne vibration or groundborne vibration noise related to the use of construction equipment would not impact neighbors. The project is not located within an airport land use plan, within two miles of any public airport or within the vicinity of any private airstrips. The project would have no permanent impact from noise, groundborne vibration, or noise related to airports.

Noise 12 (d) – Less than significant. The construction of the project will not utilize large equipment that might generate noise however there will be minor temporary noise impacts from drilling into rock for the foundation and small equipment used for moving the fill materials during construction. The construction management plan submitted for the project states that the project will take approximately 4 months to complete and work hours will be from 7:30 a.m. to 4:00 p.m., Monday through Friday. The impacts due to temporary noise will be less than significant.

13. POPULATION AND HOUSING Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:

See Section IV.A.13 above.

14. PUBLIC SERVICES Would the project result in:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection?	☐	☐	☐	☒
b) Police protection?	☐	☐	☐	☒
c) Schools?	☐	☐	☐	☒
d) Parks?	☐	☐	☐	☒
e) Other public facilities?	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:
See Section IV.A.14 above.

15. RECREATION Would the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:
See Section IV.A.15 above.

16. TRANSPORTATION/TRAFFIC **Would the project:**	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit? (Source: 1, 2, 3, 7, 9)	☐	☐	☐	☒
b) Conflict with the goals, objectives, and policies of the 2010 Regional Transportation Plan for Monterey County, including, but not limited to level of service standards and travel demand measures, or other standards established by the Transportation Agency for Monterey County (TAMC) for designated roads or highways? (Source: 1, 2, 3, 7, 9)	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks? ? (Source: 1, 2, 3, 7, 8,)	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? ? (Source: 1, 7)	☐	☐	☐	☒
e) Result in inadequate emergency access? ? (Source: 1, 7, 9)	☐	☐	☐	☒
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities? ? (Source: 1, 2, 3, 7, 9)	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:
See Section IV.16 above.

17. UTILITIES AND SERVICE SYSTEMS **Would the project:**	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

Discussion/Conclusion/Mitigation:
See Section IV.A.17 above.

VII. MANDATORY FINDINGS OF SIGNIFICANCE

NOTE: If there are significant environmental impacts which cannot be mitigated and no feasible project alternatives are available, then complete the mandatory findings of significance and attach to this initial study as an appendix. This is the first step for starting the environmental impact report (EIR) process.

Does the project:	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory? (Source: 1, 2, 3, 4, 5, 7, 8, 9, 15, 16, 17, 18, 19, 21, 22, 23 24)	☐	☒	☐	☐
b) Have impacts that are individually limited, but cumulatively considerable? (Source: 1-24) ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)? (Source: 1-24)	☐	☐	☐	☒
c) Have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? (Source: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 19, 20, 21, 22, 23, 24)	☐	☐	☒	☐

Discussion/Conclusion/Mitigation:

Mandatory Findings of Significance (a).

As discussed above in Section IV.2, there will be **no impact** on Agriculture and Forest Resources. As discussed above in Section VI.5, above, imposition of a standard condition of approval will result in the project having **less than significant impacts** to cultural resources. Implementation of Mitigation Measures No. 1 and 2 will reduce impacts to biological resources on the site by requiring restoration with native plants and eradication of non-native invasive species.

Mandatory Findings of Significance (b).

The project is to restore a bluff that has failed adjacent to an existing residence. The purpose of the proposed restoration is to prevent further collapse of the bluff and to protect the foundation of the existing residence, specifically, the garage. The project has been designed to mimic the adjacent natural bluff and surrounding and the resulting project is intended to blend in with the surrounding area. The project will have no impacts that are individually insignificant but cumulatively significant.

Mandatory Findings of Significance (c).

As discussed above in Sections IV.3, IV.7, IV.8, IV.13-15 and IV.17, the project will have **no impact** on Air Quality, Greenhouse Gas Emissions, Hazards and Hazardous materials, Mineral Resources, Population and Housing, Public Services, Recreation, Transportation/Traffic or

Utilities and Service Systems. As discussed above in Section VI.9, the project will have a **less than significant impact** on Hydrology and Water Quality. As discussed above in Section VI.1, Implementation of Mitigation Measure No. 1 will reduce impacts to Aesthetics to less than significant by requiring that all finish and landscape materials be designed in such a manner that blends in with the surrounding environment. As discussed above in Section VI.10, implementation of Mitigation Measures 1 and 2 will reduce impacts to Land Use Planning to less than significant by protecting biological and visual and scenic resources as called for in the Big Sur Coast Land Use Plan.

Note: Authority cited: Sections 21083 and 21083.05, Public Resources Code. Reference: Section 65088.4, Gov. Code; Sections 21080(c), 21080.1, 21080.3, 21082.1, 21083, 21083.05, 21083.3, 21093, 21094, 21095, and 21151, Public Resources Code; *Sundstrom v. County of Mendocino*, (1988) 202 Cal.App.3d 296; *Leonoff v. Monterey Board of Supervisors* (1990) 222 Cal.App.3d 1337; *Eureka Citizens for Responsible Govt. v. City of Eureka* (2007) 147 Cal.App.4th 357; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th at 1109; *San Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656.

VIII. FISH AND GAME ENVIRONMENTAL DOCUMENT FEES

Assessment of Fee:

The State Legislature, through the enactment of Senate Bill (SB) 1535, revoked the authority of lead agencies to determine that a project subject to CEQA review had a "de minimis" (minimal) effect on fish and wildlife resources under the jurisdiction of the Department of Fish and Game. Projects that were determined to have a "de minimis" effect were exempt from payment of the filing fees.

SB 1535 has eliminated the provision for a determination of "de minimis" effect by the lead agency; consequently, all land development projects that are subject to environmental review are now subject to the filing fees, unless the Department of Fish and Game determines that the project will have no effect on fish and wildlife resources.

To be considered for determination of "no effect" on fish and wildlife resources, development applicants must submit a form requesting such determination to the Department of Fish and Game. Forms may be obtained by contacting the Department by telephone at (916) 631-0606 or through the Department's website at www.dfg.ca.gov.

Conclusion: The project will be required to pay the fee.

Evidence: Based on the record as a whole as embodied in the Planning Department files pertaining to PLN110280 and the attached Initial Study / Proposed (Mitigated) Negative Declaration.

IX. REFERENCES

1. Project Application/Plans
2. Monterey County General Plan
3. Big Sur Coast Land Use Plan
4. Monterey County Coastal Implementation Plan, Part 3 (Regulations for Development in the Big Sur Coast Land Use Plan
5. Title 20 of the Monterey County Code (Zoning Ordinance)
6. CEQA Air Quality Guidelines, Monterey Bay Unified Air Pollution Control District, Revised February 2008
7. Site Visit conducted by the project planner May 22, 2012
8. Monterey County Geographic Information System
9. Construction Management Plan, prepared by applicant, March, 2012
10. "Geotechnical and Geologic Coastal Investigation for Coastal Bluff Stabilization Project" (**LIB120148**) prepared by Pacific Crest Engineering Inc., Watsonville, CA, November 15, 2011
11. Engineering Geology Investigation" prepared by Zinn Geology, Soquel, CA, November 14, 2011 (included as Appendix D to **LIB120148**)
12. "Geotechnical Review of Proposed Stabilization Plans" (**LIB120151**) prepared by Pacific Crest Engineering Inc., Watsonville, CA, April 19, 2012
13. "Plan Review Letter – Niles Bluff Repair" (**LIB120402**) prepared by Zinn Geology, Soquel, CA, April 19, 2012
14. "Septic and Site Drainage Systems" (**LIB120154**) prepared by Charles E. Potter, P.E., Pacific Grove, CA, September 15, 2011
15. "Biological Report" (**LIB120149**) prepared by Regan Biological and Horticultural Consulting LLC, Carmel Valley, CA, March 20, 2012 including addendum dated May 31, 2012
16. "Archaeological Test Excavations for a Specific Site on Lot 5, Otter Cove Subdivision" (LIB110043) prepared by Archaeological Resource Service, Novato, CA, May 1978
17. "Archaeological Monitoring of Preliminary Vegetation Clearance on Lot 5, Otter Cove" (LIB110042) prepared by Archaeological Resource Service, Novato, CA, August 8, 1978
18. "Archaeological Data Recovery on APN 243-331-010" (LIB120150) prepared by Archaeological Consulting, Salinas, CA, October 6, 2011
19. United States Fish and Wildlife Service Habitat Conservation Plan Page http://ecos.fws.gov/conserv_plans/PlanReportSelect?region=1&type=HCP, accessed October 10, 2012;

20. Letter from Chuck Potter, P.E., Salinas, CA, September 2011;

21. California Department of Fish and Game Website http://www.dfg.ca.gov/biogeodata/vegcamp/natural_communities.asp , accessed October 30, 2012;

22. U.S. Fish and Wildlife Website http://www.fws.gov/wetlands/Data/Google-Earth.html , accessed October 30, 2012;

23. U.S. Fish and Wildlife Website http://ecos.fws.gov/conserv_plans/PlanReport , accessed October 30, 2012;

24. California Department of Fish and Game Website http://www.dfg.ca.gov/habcon/nccp, accessed October 30, 2012;

Attachments Provided With Electronic Copies:

1. "Geotechnical and Geologic Coastal Investigation for Coastal Bluff Stabilization Project" (**LIB120148**) prepared by Pacific Crest Engineering Inc., Watsonville, CA, November 15, 2011, including Engineering Geology Investigation" prepared by Zinn Geology, Soquel, CA, November 14, 2011 (included as Appendix D to **LIB120148**)
2. "Geotechnical Review of Proposed Stabilization Plans" (**LIB120151**) prepared by Pacific Crest Engineering Inc., Watsonville, CA, April 19, 2012
3. "Plan Review Letter – Niles Bluff Repair" (**LIB120402**) prepared by Zinn Geology, Soquel, CA, April 19, 2012;
4. "Septic and Site Drainage Systems" (**LIB120154**) prepared by Charles E. Potter, P.E., Pacific Grove, CA, September 15, 2011
5. "Biological Report" (**LIB120149**) prepared by Regan Biological and Horticultural Consulting LLC, Carmel Valley, CA, March 20, 2012 including addendum dated May 31, 2012

To access the reports prepared for the project, please follow these steps:

1) Go to the Quick Link "Citizen Access – Look up Permits On-line" at https://aca.accela.com/monterey/Default.aspx

2) Click on Search Applications under Planning

3) Fill in the Library Number (LIB) and select the Permit Type (Library), then click Search

4) When the result appears, click on the Library Number (LIB)

5) Click on Attachments and select/view documents

Please note that archaeological reports are confidential and are not available to the public.

DEPARTMENT OF TRANSPORTATION
50 HIGUERA STREET
SAN LUIS OBISPO, CA 93401-5415
PHONE (805) 549-3101
FAX (805) 549-3077
TDD (805) 549-3259
http://www.dot.ca.gov/dist05/

EXHIBIT G

Flex your power!
Be energy efficient!

November 26, 2012

MON-1-67.80
SCH# 2012111017

Delinda Robinson
Monterey County Planning Department
168 West Alisal, 2nd Floor
Salinas, CA 93902

Dear Ms. Robinson:

COMMENTS TO NILES RESIDENCE – APN 243-331-010-000

The California Department of Transportation (Caltrans), District 5, Development Review, has reviewed the above referenced project and offers the following comments in response to your summary of impacts.

- Any work within the State right-of-way will require an encroachment permit issued from Caltrans. Detailed information such as complete drawings, biological and cultural resource findings, hydraulic calculations, environmental reports, traffic study, etc., may need to be submitted as part of the encroachment permit process.

If you have any questions, or need further clarification on items discussed above, please don't hesitate to call me at (805) 542-4751.

Sincerely,

JOHN J. OLEJNIK
Associate Transportation Planner
District 5 Development Review Coordinator
john.olejnik@dot.ca.gov

EXHIBIT H

Robinson, Delinda x5198

From: Dale Ellis [dale@alombardolaw.com]
Sent: Tuesday, January 15, 2013 9:15 AM
To: Robinson, Delinda x5198
Cc: jen.niles@comcast.net; dan.niles@comcast.net; Gail Hatter-Crawford; Tony Lombardo
Subject: Niles

Delinda – after our meeting Wednesday Gail contacted the Niles regarding the idea of them agreeing to not oppose some future trail through the HOA owned property along the Highway as part of their permit approval. They will not agree to do that. They cannot be expected to agree to not oppose a trail plan when no one knows when that may happen, what that trail might look like, how it will operate, who will be responsible for maintenance and safety, or what liability the HOA or the Niles personally may have for anything that might happen future trail. That is tantamount to signing a blank check and the Niles, understandably, cannot not do that.

We also have to point out that there is no nexus between the Niles project and a future trail. The approval of the Niles project will not affect any existing access. The future trail, should it ever happen, would not be on the Niles property nor would it be on any property over which the Niles have any control.

The Niles do appreciate the change in the staff's position on the beach access and that you will not be requiring an offer to dedicate access as a condition of approval of their bluff repair and restoration work

Dale Ellis
ANTHONY LOMBARDO & ASSOCIATES
A Professional Corporation
450 Lincoln Avenue, Suite 101
Salinas, CA 93901
Phone (831) 751-2330
Fax (831) 751-2331
Email dale@alombardolaw.com

Robinson, Delinda x5198

From: Locklin, Linda@Coastal [Linda.Locklin@coastal.ca.gov]
Sent: Tuesday, December 18, 2012 3:36 PM
To: Watson, Michael@Coastal; Robinson, Delinda x5198
Subject: RE: Maps for Aurora Del Mar Area

Here is a VERY basic way to say what Mike is suggesting. This is from the 1974 permit we issued to Steinhardt, Lot 14 (btw in foreclosure so if you were thinking about moving to the coast this might be the time....foreclosure price is a mere $ 4M).

4. Applicant shall also cooperate with Otter Cove Associates to ensure a grant, as an irrevocable option, of an easement for public access generally within the scenic easement area between Highway 1 and Aurora del Mar, and for connections with designated trail segments to the north and south. The grant shall be made in writing prior to June 1, 1974 and said option shall be exercised by the appropriate federal, state or local agency only as part of a coastal trail system, or regional segment thereof.

Since I am leaving on vacation and Mike is working on report deadlines, I 'd suggest we let this one rest for now and return to it after the holidays.
Linda

From: Watson, Michael@Coastal
Sent: Tuesday, December 18, 2012 2:56 PM
To: Locklin, Linda@Coastal; Robinson, Delinda x5198
Subject: RE: Maps for Aurora Del Mar Area

Although there appears to be enough room, it's uncertain that Caltrans would allow formal public access in the Hwy 1 right of way. My preference would be for a license to traverse the parcel held in common by Carmel Sur Assoc. (i.e., between Hwy 1 and Aurora del Mar).

Mike Watson, Coastal Program Analyst
California Coastal Commission
Central Coast Office
725 Front Street, Suite 300 v. 831/ 427-4898
Santa Cruz, CA 95060 f. 831/ 427-4877
michael.watson@coastal.ca.gov

From: Locklin, Linda@Coastal
Sent: Tuesday, December 18, 2012 12:20 PM
To: Robinson, Delinda x5198; Watson, Michael@Coastal
Subject: RE: Maps for Aurora Del Mar Area

Delinda-
Sorry for the delay in response.
And now that I have researched the actual documents, I find I confused matters. So sorry--

The easements that I previously found were for Scenic Easements, NOT public access easements.
They are the Scenic Easements located on Parcels A, B and C, so this is nothing new to you.
My read of the 1969 Otter Cove Assoc Scenic Easement Deed which gives these 3 scenic parcels, restricts them for scenic use but does provide for future public access improvements. But since the 1974 Agreement to Give

Property by Otter Cove Assoc was never recorded, there is no public access to allow.
(and just fyi I presume you know that the Otter Cove Assoc transferred Parcels A, B, and C to the Big Sur Land Trust in 1980?)

Does this clear it up?

And as for what kind of public access, If any, to require on the current proposal, last I talked with Mike Watson we seemed to be looking at trail maybe within the Highway ROW but I have copied him so that he can respond more completely.

Linda

From: Robinson, Delinda x5198 [mailto:robinsond@co.monterey.ca.us]
Sent: Thursday, December 13, 2012 9:27 AM
To: Locklin, Linda@Coastal
Subject: Maps for Aurora Del Mar Area

Linda,

I've attached copies of the recorded map for the Carmel Sur subdivision as well as the current APN maps for the area. In one of your phone messages you left a list of APNs for which you said there were easements or offers. One of them was 243-331-009, which I believe is part of a legal lot that includes 243-331-004 (created when a lot line adjustment was done between subdivision lots 4 & 5). The offer to give land covered the scenic easement parcels that each have more than one APN. Is there an offer or easement on 243-331-009 or is it maybe on 243-341-009?

The applicant's agent requested that the hearing be continued so I have a couple of weeks to figure out if I should or can require them to offer to dedicate access. On other projects I've done on Yankee Point, the offer was for a 10 foot strip along the street frontage for a future coastal trail. If no one ever accepted the offer for the strip between the highway and Aurora Del Mar, would something similar be appropriate for this area as well?

Delinda Robinson
Senior Planner
Monterey County RMA-Planning Department
168 West Alisal Street, Second Floor
Salinas, CA 93901
(831) 755-5198

The Monterey County Resource Management Agency – Planning Department offices are closed in observance of the county-wide winter recess December 24, 2012 through January 2, 2013. During this period, regular planning department services are not available. For emergency fire damage reports, emergency planning permits, major building damage or other emergency situations, please call 755-4744 between 8 a.m. and 5 p.m., Monday through Friday. Your request will be forwarded to the appropriate planning on-call staff member. Regular planning services will resume on Wednesday, January 2, 2013.

Happy Holidays!

Website: www.co.monterey.ca.us/planning

To access our permit database, please go to: https://aca.accela.com/monterey/Default.aspx

Attachment 1

LIB120148

GEOTECHNICAL AND GEOLOGIC COASTAL INVESTIGATION
FOR
COASTAL BLUFF STABILIZATION PROJECT
CARMEL, CALIFORNIA

FOR
DANIEL AND JENNIFER NILES
CARMEL, CALIFORNIA

BY
PACIFIC CREST ENGINEERING INC.
CONSULTING GEOTECHNICAL ENGINEERS
1158-M255-F62
N 2011
www.4pacific-crest.com

TABLE OF CONTENTS

Pacific Crest Engineering Inc. www.4pacific-crest.com

444 Airport Blvd, Suite 106
Watsonville, CA 95076
Phone: 831-722-9446
Fax: 831-722-9158

November 15, 2011 Project No. 1158-M255-F62

Daniel and Jennifer Niles
c/o Ms. Gail Hatter-Crawford, Senior Land Use Specialist
Lombardo & Giles, LLP
318 Cayuga Street
Salinas, CA 93901

Subject: **Geotechnical and Geologic Coastal Investigation Report**
Coastal Bluff Stabilization Project
Niles Residence
A.P.N. 243-331-010
30620 Aurora Del Mar
Carmel, California

Dear Mr. and Mrs. Niles,

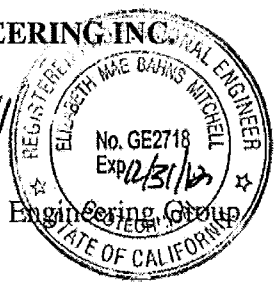
In accordance with your authorization, we have performed a geotechnical and geologic coastal investigation for the proposed coastal bluff stabilization project located at 30620 Aurora Del Mar in Carmel, California. The firm of Zinn Geology performed the engineering geology portion of this study as our subconsultant. Their report is included herein as Appendix D.

The accompanying report presents our conclusions and recommendations as well as the results of the geotechnical investigation on which they are based. **It is our professional opinion that the garage structure is subject to undermining by continued retreat of the adjacent bluff; therefore we recommend that protective measures be implemented immediately to protect the garage structure until the bluff can be stabilized.**

If you have any questions concerning the data, conclusions or recommendations presented in this report, please call our office.

Very truly yours,

PACIFIC CREST ENGINEERING INC.



Elizabeth M. Mitchell, P.E.
Vice-President, Geotechnical Engineering Group
G.E. 2718, Exp. 12/31/12

Copies: 3 to Client
1 to Ms. Gail Hatter-Crawford, Lombardo & Giles, LLP
1 to Mr. Erik Zinn, Zinn Geology
1 to Mr. Gary Knott

GEOTECHNICAL INVESTIGATION

PURPOSE AND SCOPE

This report describes our geotechnical and geologic investigation and presents results, including recommendations, for the proposed coastal bluff repair located 30620 Aurora Del Mar in Carmel, California. The purpose of our study was to assess geotechnical and geologic considerations in order to develop recommendations for stabilization and repair of the failed coastal bluff directly to the north of the garage.

The engineering geology firm of Zinn Geology has been retained as our sub-consultant to provide the geologic portion of these services. Zinn Geology's report is included herein as Appendix D.

Our scope of services for this project has consisted of:

1. Discussions with members of the design team, including Mr. Erik Zinn of Zinn Geology, and Ms. Gail Hatter-Crawford of Lombardo & Giles, LLP. We also met at the site with Ms. Lesley Ewing and Ms. Katie Butler from the California Coastal Commission as well as representatives from the County of Monterey.

2. Review of pertinent published material concerning the site, including preliminary site plans, geologic and topographic maps, documents generated by the former design team and other available literature.

3. The drilling and logging of 2 test borings advanced to depths of 12 to 34 feet.

4. Laboratory analysis of selected soil samples.

5. Preparation of a Geologic Investigation Report by our subconsultant Zinn Geology (Appendix D).

6. Quantitative wave runup and wave force analysis, using geologic cross section data provided by Zinn Geology and computer software developed by the Army Corps of Engineers (ACES).

7. Quantitative slope stability analyses, using our field and laboratory data as well as Zinn Geology's geologic cross section traversing the proposed repair area.

8. Engineering analysis of the field and laboratory results.

9. Preparation of a geotechnical and geologic coastal investigation report, presenting the results of our investigation, recommendations stabilization and repair of the bluff, and geotechnical design criteria for general site grading, structural foundations, retaining walls, and general site drainage

LOCATION AND DESCRIPTION

The subject site is comprised of coastal property located on the western side of Aurora Del Mar in the Sea Otter Cove residential community of Carmel, California. Please refer to Figure No. 1, Regional Site Map for the general vicinity of the project site.

The site is located at the following coordinates:

Latitude = 36.47873 degrees
Longitude = -121.93750 degrees

The property is occupied by a single-family residence that has been constructed into, and on top of, a moderately steep coastal bluff overlooking the Pacific Ocean. Small beach coves have been incised into the base of the bluff to the north and southwest of the residence. The bluff terrace typically slopes gently to the west, towards the ocean.

The existing residence and garage have been constructed below the top of the bluff and contains a living roof at ground level. The bluff terrace is approximately 65 feet above sea level at the garage. The site is nicely landscaped and contains numerous paths and decks along the bluffs and staircases leading down to the beach below. Native vegetation includes pine and cypress trees, which are typical fauna found on bluffs and terraces within the coastal areas of Monterey County.

The coastal bluff is comprised of marine terrace deposits overlying granodiorite bedrock. The bedrock outcrops are clearly visible around the base of bluff above the beach. The marine terrace deposits extend about 30 to 40 feet below the top of the bluff.

The existing garage has been embedded into the bluff on the downcoast side of the northern cove. Recent survey data indicates that the garage floor is approximately 10 feet below the top of the bluff. A recent failure of the bluff face immediately adjacent to the back wall of the garage has accelerated the advance of bluff retreat toward the structure, increasing the potential for undermining the garage foundation. The slope failure occurred entirely within the existing terrace deposit materials and extends from the top of the bluff to the bedrock contact above the beach.

FIELD INVESTIGATION

Soil Borings

Two, 4-inch diameter test borings were drilled on the site on August 25, 2011. The location of the test borings are shown on Figure No. 2, Site Map Showing Test Borings. The drilling was accomplished by means of a limited access Minute-Man drill rig with a solid stem auger. A geologist from Pacific Crest Engineering Inc. was present during the drilling operations to log the soil encountered and to choose soil sampling type and locations.

Relatively undisturbed soil samples were obtained at various depths by driving a split spoon sampler 18 inches into the ground. This was achieved by dropping a 140 pound downhole

safety hammer through a vertical height of 30 inches. The number of blows needed to drive the sampler for each 6 inch portion is recorded and the total number of blows needed to drive the last 12 inches is reported as the Standard Penetration Test (SPT) value. The outside diameter of the samplers used in this investigation was 3 inches, 2½ inches, or 2 inches, and is noted respectively as "L", "M" or "T" on the boring logs.

All standard penetration test data has been normalized to a 2 inch O.D. sampler so as to reflect a SPT "N" value. The normalization method used was derived from the second edition of the Foundation Engineering Handbook (H.Y. Fang, 1991). The method utilizes a Sampler Hammer Ratio which is noted as either R_s for non-cohesive soils, or R_c for cohesive soils. This ratio is dependent on the weight of the hammer, height of hammer drop, outside diameter of sampler, and inside diameter of sample. Using the Sampler Hammer Ratio a correlation can be made from the samplers used in the field to the standard SPT "N" Value.

The soils encountered in the borings were continuously logged in the field and visually described in accordance with the Unified Soil Classification System (ASTM D2488 (Modified), Figure No. 3). The soil classification was verified and or modified upon completion of laboratory testing in accordance with ASTM D2487.

Appendix A contains the site plan showing the locations of the test borings and the Log of Test Borings presenting the soil profile explored in each boring, the sample locations, and the SPT "N" values for each sample. Stratification lines on the boring logs are approximate as the actual transition between soil types may be gradual.

LABORATORY INVESTIGATION

The laboratory testing program was developed to help in evaluating the engineering properties of the materials encountered on the site. Laboratory tests performed include:

a. Moisture Density relationships in accordance with ASTM test D2937.

b. Direct Shear tests in accordance with ASTM test D3080.

c. Atterberg Limits tests in accordance with ASTM test D4318.

d. Gradation tests in accordance with ASTM test D1140 and D422.

The results of the laboratory tests are presented on the boring logs opposite the sample tested in Appendix A.

SOIL CONDITIONS

As discussed in the enclosed geology report, the property is generally underlain by older alluvial terrace deposits overlying granodiorite bedrock. The native soils encountered in the test borings were generally composed of the marine terrace and colluvial/landslide materials overlying the local quartz diorite to granodiorite bedrock.

Soil Borings

Our borings encountered a variety of soil types within the marine terrace deposit materials, ranging from sandy clay to clayey sands. Boring No. 1 was drilled near the toe of the slope failure. Boring No. 2 was drilled on the bluff top directly above the slope failure and adjacent to the existing garage. The following describes the subsurface conditions encountered within each test boring.

Boring No. 1 encountered loose, dark yellowish brown clayey sand landslide material in the upper 4½ feet. The sand was typically very fine to fine grained and poorly graded. Trace rootlets, trace angular to sub-rounded shaped gravels up to ¼ inch in diameter, and mica flakes were noted within the obtained samples. The clay exhibited low plastic characteristics. From 4½ feet to 6 feet the soil was described as medium dense, mottled, silty sand fill. The sand was very fine grained and micaceous. Trace granitic gravels up to ¼ inch in diameter were randomly distributed throughout the obtained sample.

From 6 feet to the maximum explored depth of 12 feet, dense to very dense, native, dark grayish sand with silt was encountered. The sand was medium to very coarse grained, sub-angular to sub-rounded shaped, and well graded. Mica flakes were scattered throughout the collected samples and cuttings. The sand typically coarsened with depth and trace gravels up to ¼ inch in diameter were noted from 7 ½ to 12 feet. The moisture content of the soil also increased with depth.

Boring No. 2 encountered medium dense, variegated, clayey sand with gravel in the upper 2½ feet. The sand was very fine to fine grained with trace medium grains, and poorly graded. Angular to sub-angular shaped gravels up to ¼ inch in diameter were noted within the sample. From 2½ feet to 4½ feet, the soil was described as medium dense, variegated clayey sand. The sand was very fine to fine grained and poorly graded. The clay portion of the exhibited low plasticity characteristics.

Medium dense, mottled clayey sand was noted from 4½ feet to 10½ feet; the sand was very fine to fine grained and the gravels were granitic, angular to sub-angular shaped, and up to ¼ inch in diameter. Sub-angular shaped gravels up to 1¼ inches in diameter appeared in the cuttings near 10 feet and may have been part of a subsurface drain system next to the garage retaining wall. .

From 10½ feet to 14½ feet the boring encountered medium dense, strong brown to reddish orange, clayey sand with gravel. The sand was generally fine to medium grained and the gravels were angular to sub-angular shaped and coarse to very coarse grained. The clay exhibited low plasticity characteristics.

From 14½ feet to 19½ feet, the soil was described as medium dense, fine to medium grained, mottled sandy clay/clayey sand. The sand was typically sub-angular to sub-rounded shaped and poorly graded. The gravels were angular to sub-rounded shaped and coarse to very coarse grained. Mica flakes were scattered throughout the sample and trace binder was noted near 16½ feet.

Very stiff, mottled clay with gravel was noted from 19½ to 24 feet; the gravels were angular to sub-angular shaped, coarse to very coarse grained, and embedded within a moderately smooth clay matrix. From 24 feet to the maximum explored depth of 34 feet the boring encountered dense, grayish to reddish brown clayey sand with gravel. The sand was generally very fine to fine grained and poorly graded. The gravels were typically chert, quartz, and granitic, sub-angular to sub-rounded shaped, and coarse to very coarse grained. A seep zone was noted near 25½ feet.

No free groundwater was encountered within Boring No.1 or Boring No. 2 to the maximum explored depths of 12 feet and 34 feet, respectively, however seepage was noted near the bedrock contact. Due to the contrast in permeability between the overlying terrace and the granite bedrock, perched groundwater conditions can be expected to develop, at least seasonally, at the bedrock contact as well as locally within less permeable terrace deposit strata.

REGIONAL SEISMIC SETTING/GEOLOGIC HAZARDS

The Zinn Geology report in Appendix D should be consulted for a comprehensive discussion of the geologic setting, seismicity, and the expected geologic hazards at the site. Geotechnical aspects of these issues are discussed below.

Ground Shaking

Ground shaking will be felt on the site. Structures founded on thick soft soil deposits are more likely to experience more destructive shaking, with higher amplitude and lower frequency, than structures founded on bedrock. Generally, shaking will be more intense closer to earthquake epicenters. Thick soft soil deposits large distances from earthquake epicenters, however, may result in seismic accelerations significantly greater than expected in bedrock. Structures built in accordance with the latest edition of the California Building Code have an increased potential for experiencing relatively minor damage which should be repairable.

Structural seismic design aspects of the project should be based on the 2010 California Building Code (CBC) as it has incorporated the most recent seismic design parameters:

TABLE No. 1, The 2010 CBC Seismic Design Parameters

Design Parameter	**Specific to Site ASCE 7-05**	**Reference (See Note 1)**
Site Class	D, Stiff Soil	Table 1613.5.2
Mapped Spectral Acceleration for Short Periods (**See Note 2**)	Ss = 1.922 g	Fig. 22-1 ASCE 7-05
Mapped Spectral Acceleration for 1-second Period	S_1 = 0.845 g	Fig. 22-2 ASCE 7-05
Short Period Site Coefficient	Fa = 1.0	Table 1613.5.3(1)
1-Second Period Site Coefficient	Fv = 1.5	Table 1613.5.3(2)
MCE Spectral Response Acceleration for Short Period	S_{MS} = 1.922 g	Section 1613.5.3
MCE Spectral Response Acceleration for 1-Second Period	S_{M1} = 1.267 g	Section 1613.5.3
5% Damped Spectral Response Acceleration for Short Period	S_{DS} = 1.281 g	Section 1613.5.4
5% Damped Spectral Response Acceleration for 1-Second Period	S_{D1} = 0.845 g	Section 1613.5.4
Seismic Design Category (**Notes 3 and 4**)	D	Section 1613.5.6
Seismic Design Category, California *Residential* Code (**Note 5**)	D_2	Section R301.2.2.1

Note 1: Design values may also have been obtained by using the Ground Motion Parameter Calculator available on the USGS website at https://geohazards.usgs.gov/secure/designmaps/us/signup.php

Note 2: Per Section 12.8.1.3 of ASCE 7-05 the S_s value can be reduced to 1.5 for the purposes of calculating C_S for regular structures five stories or less in height and having a period T of 0.5 seconds or less.

Note 3: Seismic Design Category assumes the structure **is** Category II occupancy as defined by Table 1604.5 of the 2010 CBC. Pacific Crest Engineering Inc. should be contacted for revised Table 2 seismic design parameters if the building has a different occupancy rating from the one assumed.

Note 4: Based on Section 1613.5.6 of the 2010 CBC, the S_1 value exceeds 0.75g. Therefore, the appropriate Seismic Design Category is E rather than D assuming this building is a Category II structure.

Note 5: As outlined in the 2010 CBC, the Seismic Design Category is D. Under the 2010 California *Residential* Code, the Seismic Design Category can be classified as D_2 (Section R301.2.2.1).

The recommendations of this report are intended to reduce the potential for structural damage to an acceptable risk level, however strong seismic shaking could result in the need for post-earthquake repairs

Coastal Flooding and Erosion

As discussed in the Zinn report, wave action has eroded and scoured the terrace deposits 18 to 20 feet above mean sea level. During severe storms, large surf will runup the bedrock platform and subject the exposed slopes to wave splash and/or spray, further exacerbating oversteepening and erosion of the failed bluff. Any proposed slope repair will need to consider the maximum elevation at which coastal flooding (wave runup) can be expected to occur during the design life of the project. Proposed repair schemes should include provisions for protective armoring below the elevation of projected wave runup.

To estimate the runup elevation, we performed a quantitative wave runup analysis using the computer software ACES 4.03 by Veri-Tech. ACES is an interactive, computer-based design and analysis system originally developed by the Army Corps of Engineers in the field of coastal engineering.

The following factors and conditions were evaluated in our runup analysis:

Stillwater elevation
Bedrock shore configuration
Design breaking wave height (Hi)
Design wave period (T)

Stillwater level is the elevation that the ocean surface would assume in the absence of wave action. The stillwater elevation is a combination of astronomical high tide, storm surge, wave setup, and long-term sea level rise. Excluding long term sea level rise, stillwater levels between 5.5 and 7.0 feet NGVD are typically used by the design professionals along the California coastline. The highest recorded water level at Monterey Station was 5.3 feet NGVD on January 27, 1983 (NOAA), and the highest astronomical tide of 4.4 feet NGVD occurred on December 31, 1986. Assuming a projected sea level rise of 55 inches by 2100 as

recommended by the October 2010 "State of California Sea-Level Rise Interim Guidance Document" issued by the State of California Ocean Protection Council (et al), a design stillwater elevation of 11.5 feet NGVD was used in our analysis to conservatively account for long term sea level rise and extreme high tides above predicted levels.

Based on buoy data available at The Coastal Data Information Program (http://cdip.ucsd.edu), deepwater significant wave heights on the order of 27.0 feet were conservatively estimated for this area of the coast, approaching from a northwest direction with a peak period of 15 seconds. These conditions result would result in an estimated 18.0 feet of maximum wave runup on the completely scoured beach platform. Larger breaking waves will increase the projected runup, but are unlikely due to the depth-limited nature of waves seaward of the shoreline.

The following parameters were used in calculating wave runup elevations at the site:

Design Stillwater Elevation	11.5 Feet NGVD
Nearshore Slope Configuration	3%
Deepwater Significant Wave Height	27.0 feet
Design Wave Period:	15 seconds

The results of our analysis indicate that during simultaneous periods of high tide and strong swell conditions, when the sand is completely stripped from the beach exposing the scoured bedrock platform, wave runup could attain elevations of 29.5 feet NGVD in the next 50 to 100 years. We therefore recommend that slope mitigation measures or repairs consider armoring the base of the slope against wave action and scour to a minimum elevation of 30 feet NGVD. The results of our wave runup analysis are included in Appendix B of this report.

Slope Instability

As discussed, the coastal bluff adjacent to the garage structure has been subjected to past landsliding. In conjunction with the geologic cross section developed by Zinn Geology and our field and laboratory data, a quantitative slope stability analysis was performed to evaluate the overall stability of the bluff in its present configuration and following stabilization of the bluff with a gravity system keyed into the granite bedrock.

Model Overview and Method of Analysis

Zinn Geology developed a geologic cross section of the coastal bluff through the existing failure surface. A quantitative slope stability analysis was performed on Cross Section A-A' as delineated in Plate 2 of the Zinn Geology report in Appendix D. The cross section is comprised of alluvial and marine terrace deposits overlying granodiorite bedrock.

The analysis was performed in general accordance with the procedures outlined in the *State of California "Guidelines for Evaluating and Mitigating Seismic Hazards in California, Special Publication (SP)117A (2008).*

The depth and thickness of the subsurface strata delineated on the cross section were generalized and interpolated from test bore locations and laboratory test results. The transition between materials may be more or less gradual than indicated. The cross section was evaluated quantitatively for both static and pseudo-static (seismic) conditions, using the computer program GSTABL7 by Gregory Geotechnical Software.

In an effort to identify potential failure mechanisms, we allowed the program to search for critical failure surfaces with the lowest factors of safety, assuming circular failures and the Modified Bishop Method of Slices.

A perched seepage zone was noted at the bedrock contact. Due to a high contrast in permeability between the terrace deposits and the bedrock, perched groundwater conditions are expected to fluctuate seasonally at the site. We therefore added a perched ground water condition at the bedrock contact, which was assumed to extend 5 feet above the bedrock contact. Any mitigation scheme to be implemented for the project must include adequate drainage provisions.

Screening Analysis and Seismic Coefficient

Horizontal forces generated by a design seismic event are typically modeled by applying a seismic coefficient value to the analysis, in order to develop a "pseudo-static" condition intended to represent earthquake effects on the slope model.

Given the coastal bluff setting, a site-specific seismic coefficient was developed for this project using the procedures outlined in the Simplified Method for Evaluating Seismic Stability of Steep Slopes (Ashford and Sitar, February 2002).

The basis for development of the seismic coefficient is the maximum horizontal bedrock acceleration (MHA_r) expected to occur at the site during the design lifetime of the project. A MHA_r with a 10% probability of being exceeded in 50 years was determined for this property, using the probabilistic seismic hazard deaggregation procedure available at the USGS website (https://geohazards.usgs.gov). For this site, a MHA_r of 0.338g was assigned to our model.

Using the method prescribed by Ashford and Sitar (2002), the mean peak horizontal bedrock acceleration (MHA_r) is multiplied by 1.5 to account for topographic amplification at the crest of the slope. The seismic coefficient is then formulated from equations developed on the basis of slope geometry and the distance from the crest to the base of a failure surface, resulting in a seismic coefficient of 0.278 for this site.

Soil Properties

On the basis of our experience with local coastal properties, the soil stratigraphy can be highly variable within the marine and alluvial terrace deposit materials, with resulting variations in laboratory-derived soil strength parameters. Engineering judgment therefore becomes necessary when assigning a singular homogeneous soil strength to a highly variable heterogeneous soil deposit. In consideration of these issues, strength values were selected from laboratory test results and assigned to the dominant soil types as follows:

SOIL TYPE	COHESION (psf)	PHI ANGLE (deg)
Qmt – Clayey Sand with Gravel	100	42
Qmt – SandyClay/Clayey Sand	500	27
Qmt – Clayey Sand/Sandy Clay	700	45
Granodiorite Bedrock	2000	45

Based on laboratory testing, field penetration tests, field observations and our experience with local coastal soil conditions, we believe our model represents a reasonable estimate of in-situ soil properties within the bluff.

Appendix C, Slope Stability Calculations, presents the cross sections analyzed, the critical failure planes with their respective factors of safety, and the computer slope stability printouts.

Slope Stability Analysis Results

The results of our stability analysis indicates that the crest of the oversteepend bluff could continue to be subjected to shallow failures, especially under saturated or partially saturated soil conditions. Continued slope retreat toward the garage structure will eventually undermine the foundation.

Generally accepted practices for seismic evaluation of slope stability require a minimum safety factor of 1.2 under the design earthquake forces. The minimum computed safety factor for the design *pseudo-static* condition was 0.5 and suggests a strong possibility for slope failures to expose and/or damage the garage foundation during an earthquake.

Due to the potential for continued bluff instability, the garage should be underpinned in order to supplement foundation support for the structure until the adjacent bluff can be repaired. Geotechnical recommendations for underpinning are provided in this report.

Our analysis indicates that restoring the bluff to a more stable gradient by buttressing the slope face will result in safety factors that meet or exceed minimum industry standards of 1.5 and 1.2 for static and pseudostatic conditions, respectively. Routine and continued

maintenance will be an essential component in maintaining adequate safety factors over the long term and maintaining a relatively low rate of bluff retreat.

It must be cautioned that slope stability analysis is an inexact science and the mathematical models of the slopes and soils contain many simplifying assumptions, not the least of which are isotropy and homogeneity. Engineering judgment is often necessary when assigning a singular homogeneous soil strength to a variable heterogeneous soil deposit. Density, moisture content and shear strength may vary within a soil type. There may be localized areas of loose, cohesionless sands or perched ground water within a soil. Developed ground water conditions which differ from those modeled in our analysis could result in a lower factor of safety. Slope stability analyses and the generated factors of safety should be used as indicating trend lines. A slope with a safety factor less than one will not necessarily fail, but the probability of slope movement will be greater than a slope with a higher safety factor. Conversely, a slope with a safety factor greater than one may fail, but the probability of stability is higher than a slope with a lower safety factor.

DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

GENERAL

1. Based upon the results of the investigation performed by Pacific Crest Engineering and Zinn Geology, as well as our discussions with project team members, we offer the following considerations and recommendations for repair and stabilization of the failed coastal bluff.

2. The recommendations of this report assume that, once constructed, the repaired slope will be adequately maintained and routinely inspected. Inspections should be conducted by a qualified professional every 5 years and after damaging storms. Repairs recommended by the inspector should be completed in a timely manner and prior to the next winter season.

3. The failed bluff in its present configuration has become oversteepened and as such is subject to continued failures, under both static and seismic conditions, as the slope tries to return to a more stable gradient. The base of the marine terrace layer is exposed to erosion due to wave scour and coastal flooding, further exacerbating the slope retreat process.

4. A common method for protecting erodible terrace deposits is to spray or trowel a shotcrete facing over the slope face, however unless the shotcrete system is engineered to retain the entire forty feet of marine terrace materials (which is probably cost prohibitive), it is our opinion this is a temporary measure at best and will not perform well over the long term.

5. Allowing the current processes of landsliding and slope retreat to continue unabated (i.e., the "do nothing" alternative) presents a strong possibility for undermining and/or settlement of the garage situated near the top of the bluff. This option is not recommended by our firm.

6. We recommend stabilizing the failed bluff by constructing a sloped and/or stepped buttress system founded into the underlying bedrock. Such a system could consist of gabion baskets filled with stone, a Hilfiker wall system, or some combination of the two. The interconnected wire baskets will provide a free draining system that could essentially contain the slope at a more stable gradient than its current configuration. Above the projected runup elevation, the system could include provisions for a vegetated cover intended to eventually obscure the rock baskets and provide a more natural appearance. Geosynthetic products such as Geoweb cellular confinement systems work well for this purpose. Please refer to Figure No. 8.

7. It is anticipated that excavation of a keyway and an engineered foundation into the bedrock will be required for foundation support. The foundation system should be engineered to resist the design wave forces and include protective armoring up to Elevation 30 feet NGVD. The armor can be faced with artificial rockwork (such as Cemrock) to match the surrounding outcrops and blend in with the surrounding seascape. The gabion wall or Hilfiker system design should consider the geotechnical criteria outlined in this report as well

as the recommendations of the product manufacturers, who should be consulted during final design and bidding phases.

8. We strongly recommend underpinning the garage foundation to extend the foundation loads below potential failure planes until the adjacent slope can be repaired. Provided our recommendations are incorporated into the design and construction of the underpinning operations, it is our opinion that this work will also provide added stability beneath the structure during a design seismic event. Due to limited access at the garage, it is anticipated that helix piers or micropiles will be required.

9. Design plans should be reviewed by Pacific Crest Engineering Inc. during their preparation and prior to contract bidding.

10. Pacific Crest Engineering Inc. should be notified at least ten (10) working days prior to any site clearing and grading operations on the property in order to observe the stripping and disposal of unsuitable materials, and to coordinate this work with the grading contractor. During this period, a pre-construction conference should be held on the site, with at least the grading contractor, a county representative and one of our engineers present. At this meeting, the project specifications and the testing and inspection responsibilities will be outlined and discussed.

11. Field observation and testing must be provided by a representative of Pacific Crest Engineering Inc., to enable them to form an opinion as to the degree of conformance of the exposed site conditions to those foreseen in this report, the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the specification requirements. **Any work related to grading or foundation excavation that is performed without the full knowledge and direct observation of Pacific Crest Engineering Inc., the Geotechnical Engineer of Record, will render the recommendations of this report invalid, unless the Client hires a new Geotechnical Engineer who agrees to take over complete responsibility for this report's findings, conclusions and recommendations.** The new Geotechnical Engineer must agree to prepare a Transfer of Responsibility letter. This may require additional test borings and laboratory analysis if the new Geotechnical Engineer does not completely agree with our prior findings, conclusions and recommendations.

SITE PREPARATION AND SLOPE RESTORATION

12. Initial preparation of the site will consist of the removal of brush, trees, surface vegetation, fill, debris and organically contaminated topsoil from the proposed repair area. Tree removal, if required, should include the entire stump and root ball. The required extent of stripping and grubbing must be based upon visual observations of a representative of Pacific Crest Engineering Inc. in the field. This material must be removed from the site. **It is recommended that the foundation system for the wall be completed prior to upslope grading operations.**

13. Any voids created by removal of tree and root balls, concrete debris or other deleterious materials must be backfilled with properly compacted native soil that is free of organic and other deleterious materials or with approved imported fill.

14. After removal of all debris, loose soil and strippings, **the foundation system should be constructed before proceeding with upslope work.** A base keyway should be excavated into competent bedrock along the toe of the area to be repaired. The configuration and dimensions of the keyway will depend upon the ultimate design of the structure, but in all cases the keyway depth shall extend a minimum of 3 feet into competent bedrock, as determined solely by the Geotechnical Engineer. The base of the keyway should be sloped a minimum of 2% **into** the hillside.

15. Once the keyway and foundation base has been constructed, the slope face may be reconstructed using Hilfiker or gabion baskets filled with rock. The finished slope gradient should not exceed the manufacturer's recommendations for stability; however it is our understanding that the design slope gradient is expected to be on the order of 40 degrees from horizontal. If the final slope angle is expected to exceed this gradient, our office should be contacted for review.

16. The slope face above the runup elevation may be vegetated to allow native plant growth to establish and eventually obscure the rock.

17. All engineered fill on the project should be compacted to a minimum of 90% of its maximum dry density, except for landscaped areas where 85% is acceptable. The maximum dry density will be obtained from a laboratory compaction curve run in accordance with ASTM Procedure #D1557. This test will also establish the optimum moisture content of the material. Field density testing will be performed in accordance with ASTM Test #D6938 (nuclear method).

18. Native or imported soil used as engineered fill on this project should meet the following requirements:

a. free of organics, debris, and other deleterious materials,
b. free of "recycled" materials such as asphaltic concrete, concrete, brick, etc.,
c. granular in nature, well graded, and contain sufficient binder to allow utility trenches to stand open,
d. free of rocks in excess of 2 inches in size.

In addition to the above requirements, import fill should have a Plasticity Index between 4 and 12, and a minimum Resistance "R" Value of 30, and be non-expansive.

19. All native and import fill should be placed in maximum 8 inch lifts, before compaction, at a water content which is within 1 to 3 percent of the laboratory optimum value.

20. Samples of any proposed imported fill planned for use on this project should be submitted to Pacific Crest Engineering Inc. for appropriate testing and approval not less than

ten (10) working days before the anticipated jobsite delivery. Imported fill material delivered to the project site without prior submittal of samples for appropriate testing and approval must be removed from the project site.

TEMPORARY SHORING

21. There is a possibility that temporary construction shoring may become necessary on this project. The design, construction and installation of the shoring system is the sole responsibility of the Contractor.

22. Excavations should have temporary sidewall slopes in accordance with CAL-OSHA guidelines or be mechanically shored. Excavation safety and shoring is the sole responsibility of the contractor. Excavation design and shoring systems should be submitted to the geotechnical engineer and the civil engineer a minimum of 3 weeks prior to construction for a review to determine the conformance of the design with standard engineering practices and specific site conditions.

23. The "top" of any temporary cut slope should be set-back at least ten feet (measured horizontally) from any nearby structure or property line. Any planned excavation which cannot meet the necessary side slope gradients and setback requirements will need to have a shoring system designed to support steeper sidewall gradients.

24. It should be understood that on-site safety is the *sole responsibility* of the Contractor, and that the Contractor shall designate a *competent person* (as defined by CAL-OSHA) to monitor the slope excavation prior to the start of each work day, and throughout the work day as conditions change. The competent person designated by the Contractor shall determine if flatter slope gradients are more appropriate, or if shoring should be installed to protect workers in the vicinity of the slope excavation. Refer to Title 8, California Code of Regulations, Sections 1539-1543.

25. The temporary shoring should be fully drained and should not obstruct nor significantly change the normal flow of moisture or groundwater through the project soils. Wall drainage should discharge to an approved location. Drainage geotextile such as Miradrain is neither sufficient nor appropriate drainage for walls on this project and should not be used.

26. All shoring backfill to be placed in maximum 8 inch lifts, at a water content which is 1 to 3 percent above the laboratory optimum value. The material should be compacted to at least 90 percent relative compaction. If a clean gravel backfill is utilized as shoring backfill, it should be compacted in maximum 1 to 2 foot lifts using a vibra-plate or similar equipment. **It is recommended that all voids behind the shoring system be completely filled with soil or gravel backfill while the shoring work is in progress.**

27. The temporary shoring wall system chosen by the designer should be designed using the geotechnical design criteria presented in the "Lateral Pressures" section of this report.

GEOTECHNCIAL DESIGN CRITERIA – PROPOSED SLOPE REPAIR

28. The proposed slope repair should be designed and constructed in accordance with the following criteria, assuming fully drained conditions:

a. The following lateral earth pressure values should be used for design:

TABLE No. 2, Active and At-Rest Earth Pressure Values

Backfill Slope (H:V)	Active Earth Pressure (psf/ft of depth)	At-rest Earth Pressure (psf/ft of depth)
Level	45	70

Active earth pressure values may be used when walls are free to yield an amount sufficient to develop the active earth pressure condition (about ½% of height). The effect of wall rotation should be considered for areas behind the planned retaining wall (pavements, foundations, slabs, etc.). **When walls are restrained at the top or to design for minimal wall rotation, use the at-rest earth pressure values. We recommend designing for an at-rest condition for this project.**

b. Any live or dead loads which will transmit a force to the wall, refer to Figure No. 9. A minimum surcharge of 250 psf should be used due to existing structures located within 20 feet of top of slope.

c. For flexible (yielding) conditions, the resultant seismic force on the wall is $10*H^2$ and acts at a point 0.6H up from the base of the wall. This force has been estimated using the Mononobe-Okabe method of analysis as modified by Whitman (1990), and assumes a yielding wall condition.

d. For rigid (non-yielding) conditions, the resultant seismic force on the wall is $14*H^2$ and acts at a point 0.6H up from the base of the wall.

e. Passive resistance due to competent bedrock of 600 pcf (EFW) may be used. The wall system should be keyed a minimum of 36 inches into competent bedrock.

f. The foundation system supporting the proposed retaining system should be embedded a minimum of three feet (3') into competent bedrock and may be assumed to act with an allowable bearing capacity of 10,000 psf, with a one-third increase for short term wind and/or seismic loads.

g. A coefficient of friction of 0.4 may be utilized between the base of the foundation and the granitic bedrock.

h. We recommend an ultimate lateral wave force of 16.2 kips per foot length within the design runup zone . The wave force should be assumed to act at the SWL (elevation +11.5 NGVD).

Please note: Should the slope behind the retaining walls be other than shown in Table No.2, supplemental design criteria will be provided for the active earth or at rest pressures for the particular slope angle.

29. The above criteria are based on **fully drained conditions.** Gabion baskets or Hilfiker retaining systems are considered fully drained. All other retaining systems should be drained using permeable material meeting the State of California Standard Specification Section 68-1.025, Class 1, Type A, placed behind the wall with a minimum width of 12 inches and extending for the full height of the wall to within 1 foot of the ground surface. The permeable material should be covered with Mirafi 140N filter fabric or equivalent and then compacted native soil placed to the ground surface. A 4 inch diameter perforated rigid plastic drain pipe should be installed within 3 inches of the bottom of the permeable material and be discharged to a suitable, approved location such as the project storm drain system. The perforations should be located and oriented on the lower half of the pipe. Neither the pipe nor the permeable material should be wrapped in filter fabric. Please refer to Figure No. 10, Typical Retaining Wall Drain Detail.

30. The area behind the wall and beyond the permeable material should be compacted with approved material to a minimum relative dry density of 90%.

GARAGE STRUCTURE - UNDERPINNING

31. At the time we prepared this report, the grading plans and structure foundation details had not been finalized. We request an opportunity to review these items during the design stages to determine if supplemental recommendations will be required.

32. Based on the results of our investigation, we recommend underpinning the garage with foundation support that extends a sufficient depth into competent native soil. Since site access will be limited for pier drilling equipment, helix piers or micropiles are expected to be the most viable option for foundation support. We recommend, as a minimum that the underpinning extend along the entire side of the structure parallel the top of the bluff. Both vertical and battered (15-30 degrees into the hillside) piers should be provided at each pier location.

33. Foundation plans should be reviewed by Pacific Crest Engineering Inc. during their preparation and prior to contract bidding.

34. The installation of all foundation elements must be observed by a representative of Pacific Crest Engineering Inc. Pacific Crest Engineering Inc. should be notified at least four (4) working days prior to any site work operations and in order to coordinate our work with the foundation contractor. **Any foundation work related to grading or foundation excavation that is performed without the full knowledge and direct observation of Pacific Crest Engineering Inc., the Geotechnical Engineer of Record, will render the recommendations of this report invalid, unless the Client hires a new Geotechnical Engineer who agrees to take over complete responsibility for this report's findings, conclusions and recommendations.** The new geotechnical engineer must agree to prepare a

Transfer of Responsibility letter. This may require additional test borings and laboratory analysis if the new Geotechnical Engineer does not completely agree with our prior findings, conclusions and recommendations.

35. We recommend a pre-construction conference be held on the site, with at least the client or their representative, the contractor, structural engineer, and one of our engineers present. At this meeting, the project specifications and the testing and inspection responsibilities will be outlined and discussed.

Helix Piers

36. The advantage of helix piers is they can be advanced in areas of limited access.

37. All helix piers should be advanced to a minimum depth of 20 feet, or until the minimum torque indicates that the required capacity has been achieved, whichever results in the greatest depth. Maximum spacing should be 6 feet.

38. In our opinion the anticipated bearing stratum is able to achieve up to 25 kips *ultimate* capacity between depths of 15 to 20 feet. These are *ultimate* values; a safety factor of 2.0 is considered appropriate for design of helix piers.

39. Helical piers should be A.B. Chance or an acceptable equivalent pre-approved by the Structural Engineer of Record, and shall be installed by a certified installer recognized by an authorized distributor. Helical pier type and size should consider difficult and/or very dense subsurface conditions. A helical pier with a higher torque rating which exceeds the design loads may be required in order to achieve the design depths.

40. The installer shall measure torque head hydraulic pressure and shall have a current calibration certificate for conversion of hydraulic pressure to installation torque. The installer shall keep a record of depth versus torque for each anchor installation.

41. The number of helix blades, spacing and pier configuration is the responsibility of the Contractor, based on the axial and lateral design loads. The pier shafts may be rounded or square; if tubular shafts are used they should be grouted.

42. The axial capacity of each pier should be based upon the installation torque achieved. All helix piers shall be installed at the appropriate torque as required by the Structural Engineer, based on the actual loads transmitted to the foundation, up to a maximum ultimate capacity of 30 kips. The manufacturer's recommendations should be followed regarding the torque and bearing capacity relationship for the particular pier selected.

43. Helical anchors which lose their torque while being drilled to the minimum depth required will be rejected and a new anchor shall be installed at the contractor's expense.

44. Helical piers supporting axial loads should be installed within 2 percent of a vertically plumb condition.

45. The subsurface soils should be considered corrosive and helical pier design should incorporate a factor for corrosion loss. Corrosion protection should be maintained at all times during installation; if anchors are cut or scraped corrosion protection should be re-applied to all areas of exposed steel.

46. The piers should be structurally attached to the garage foundation as determined by the project structural engineer.

47. Continuous special inspection is required for helical pier installation and shall be provided by the Project Geotechnical Engineer.

Micropiles

48. Another option for foundation support would be the use of concrete and steel micropiles that derive their capacities from friction within the competent native soils beneath the site. The micropiles should be structurally attached to the garage foundation as determined by the Project Structural Engineer.

49. Minimum micropile embedment should be 15 feet. Actual depths could depend upon a lateral force analysis performed by your Structural Engineer and the depths needed to obtain the required bearing capacity.

50. Micropiles supporting axial compressive or uplift loads should be designed in accordance with the publication from the Federal Highway Administration FHWA NHI – 05-039, "Micropile Design and Construction", as well as in accordance with the recommendations presented below. The micropiles should be designed to resist axial compressive loads through friction only between the shaft walls and the surrounding native soil.

51. We recommend using micropiles with a minimum diameter of eight inches. Micropiles should have a minimum center-to-center spacing of six feet.

52. The average ultimate bond stress for a micropile embedded into the native sands underlying the site is in the range of 1,000 psf to 1,500 psf, depending upon the grouting technique. The ultimate bond stress is a function of the Contractor's methods and workmanship on the above listed values. The value for final design should therefore be selected by the Contractor and verified by performance tests.

53. The average compressive axial capacity for dead plus live loads can be obtained by dividing the ultimate capacity by a factor of safety of 2.0. The compressive axial capacity for dead plus live plus seismic loads can be obtained by increasing the corresponding axial capacity for dead plus live loads by one-third. The axial uplift capacity can be obtained by multiplying the axial compressive load capacity for the same load type by two-thirds.

54. We recommend that permanent casing (API 5CT-N80 with Fy = 80 ksi) be provided, as a minimum, over the upper five feet of micropile length, in order to increase the axial stiffness and flexural rigidity of the micropile and to minimize the effects of seismically-induced curvature in the micropile.

55. The axial capacity of the micro-pile should be based on the assumption the soils in the site vicinity are corrosive and that some loss of the steel shell will occur over time.
56. The axial capacities of the micropiles will depend largely on the installation methods used during construction. The Contractor is responsible for choosing the drilling, grouting, and other installation procedures. Because of the influence of the installation procedures on the capacity of the micropiles, the Contractor is also responsible for the as-built capacities of the micropile and must therefore select the bond lengths at each micropile location.

57. The Contractor can also choose to make provisions for post-grouting of the micropile if necessary. The micropile installation process should be observed by the Geotechnical Engineer to verify the subsurface conditions assumed in developing the micropile design recommendations. Couplers should be available in the field to allow for adjustments to be made to the length of the center bar in the field.

58. Performance and Proof Testing should be performed in accordance with the methods outlined in the FHWA manual, FHWA – NHI – 05 – 039, " Micropile Design and Construction".

59. Drilled Pier Field Observation and Reporting (2010 CBC Section 1803.5.5-5):

a. All pier construction must be observed by a Pacific Crest Engineering Inc. Any piers constructed without the full knowledge and continuous observation of a representative from Pacific Crest Engineering Inc. will render the recommendations of this report invalid.

b. **Continuous** observation of pier drilling operations is required by 2010 CBC Chapter 17, Section 1704.9. You should notify your Contractor and drilling Subcontractor regarding this requirement. A representative from our firm should be on-site **at all times** while pier drilling operations are in progress.

c. Reporting will include a Daily Field Report (DFR) maintained by an on-site representative from Pacific Crest Engineering Inc. The DFR will maintain a record of each pier drilled, and note pier diameters, depths, plumbness, and embedment into suitable soil or bedrock bearing strata, as required by the Geotechnical Report.

SLAB-ON-GRADE CONSTRUCTION

60. New concrete slab-on-grade construction, if required, should be structurally integrated with the footings.

61. All new concrete slabs-on-grade should be underlain by a minimum 6-inch thick capillary break of ¾ inch clean crushed rock (no fines). It is recommended that neither Class II baserock nor sand be employed as the capillary break material.

62. Where floor coverings are anticipated or vapor transmission may be a problem, a vapor retarder/membrane should be placed between the capillary break layer and the floor slab in order to reduce the potential for moisture condensation under floor coverings. We recommend a high quality vapor retarder at least 10 mil thick and puncture resistant (Stego Wrap or equivalent). The vapor retarder must meet the minimum specifications for ASTM E-1745, Standard Specification For Water Vapor Retarder. Please note that low density polyethylene film (such as Visqueen) may meet minimum current standards for permeability but not puncture resistance. Laps and seams should be overlapped at least six inches and properly sealed to provide a continuous layer beneath the entire slab that is free of holes, tears or gaps. Joints and penetrations should also be properly sealed.

63. Floor coverings should be installed on concrete slabs that have been constructed according to the guidelines outlined in ACI 302.2R and the recommendations of the flooring material manufacturer.

64. Currently, ACI 302-1R recommends that concrete slabs to receive moisture sensitive floor coverings be placed directly upon the vapor retarder, with **no sand cushion**. ACI states that vapor retarders are not effective in preventing residual moisture within the concrete slab from migrating to the surface. Including a low water-to-cement ratio (less than 0.50) and/or admixtures into the mix design are generally necessary to minimize water content, reduce soluble alkali content, and provide workability to the concrete. As noted in CIP 29 (*Concrete in Practice by the National Ready Mixed Concrete Association*), placing concrete directly on the vapor retarder can also create potential problems. If environmental conditions do not permit rapid drying of bleed water from the slab surface then the excess bleeding can delay finishing operations (refer to CIP 13, 19 and 20). Most of these problems can be alleviated by using a concrete with a low water content, moderate cement factor, and well-graded aggregate with the largest possible size. **With the increased occurrence of moisture related floor covering failures, minor cracking of floors placed on a vapor retarder and other problems discussed here are considered a more acceptable risk than failure of floor coverings, and these potential risks should be clearly understood by the Client and Project Owner.**

65. If a sand layer is chosen as a cushion for slabs without floor coverings, it should consist of a clean sand. Clean sand is defined as 100 percent passing the #4 sieve, and less than 5 percent passing the #200 sieve.

66. Requirements for pre-wetting of the subgrade soils prior to the pouring of the slabs will depend on the specific soils and seasonal moisture conditions and will be determined by a representative of Pacific Crest Engineering Inc. at the time of construction. It is important that the subgrade soils be properly moisture conditioned at the time the concrete is poured. Subgrade moisture contents should not be allowed to exceed our moisture recommendations for effective compaction, and should be maintained until the slab is poured.

Please Note: Recommendations given above for the reduction of moisture transmission through the slab are general in nature and present good construction practice. Moisture protection measures for concrete slabs-on-grade should meet applicable ACI and ASTM standards. Pacific Crest Engineering Inc. are not waterproofing experts. For a more complete and specific discussion of moisture protection within the structure, a qualified waterproofing expert should be consulted to evaluate the general and specific moisture vapor transmission paths and any impact on the proposed construction. The waterproofing consultant should provide recommendations for mitigation of potential adverse impacts of moisture vapor transmission on various components of the structure as deemed appropriate.

67. Slab thickness, reinforcement, and doweling should be determined by the Project Civil or Structural Engineer. The use of welded wire mesh is not recommended for slab reinforcement.

SURFACE DRAINAGE

68. Following completion of the project we recommend that storm drainage provisions and performance of permanent erosion control measures be closely observed through the first season of significant rainfall, to determine if these systems are performing adequately and, if necessary, resolve any unforeseen issues.

69. Surface drainage should be strictly controlled. Surface water must not be allowed to pond at the top of the bluff or become trapped behind retaining walls.

70. No storm or surface water should be allowed to sheet drain or concentrate over the top of the slope. Wall drainage should be discharged in a controlled manner to avoid erosion of exposed soils.

71. The retaining walls and surface drainage facilities must not be altered nor any filling or excavation work performed in the area without first consulting Pacific Crest Engineering Inc. Surface drainage improvements developed by the project civil engineer must be maintained at all times, as improper drainage provisions can produce undesirable affects.

PLAN REVIEW

72. We respectfully request an opportunity to review the project plans and specifications during preparation and before bidding to ensure that the recommendations of this report have been included and to provide additional recommendations, if needed. These plan review services are also typically required by the reviewing agency. Misinterpretation of our recommendations or omission of our requirements from the project plans and specifications may result in changes to the project design during the construction phase, with the potential for additional costs and delays in order to bring the project into conformance with the requirements outlined within this report. Services performed for review of the project plans and specifications are considered "post-report" services and billed on a "time and materials" fee basis in accordance with our latest Standard Fee Schedule.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. This Geotechnical Investigation was prepared specifically for Daniel and Jennifer Niles and for the specific project and location described in the body of this report. This report and the recommendations included herein should be utilized for this specific project and location exclusively. This Geotechnical Investigation should not be applied to nor utilized on any other project or project site. Please refer to the ASFE "Important Information about Your Geotechnical Engineering Report" attached with this report.

2. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the time, our firm should be notified so that supplemental recommendations can be provided.

3. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and that the necessary steps are taken to ensure that the Contractors and Subcontractors carry out such recommendations in the field.

4. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural process or the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside of our control. This report should therefore be reviewed in light of future planned construction and then current applicable codes. This report should not be considered valid after a period of two (2) years without our review.

5. This report was prepared upon your request for our services in accordance with currently accepted standards of professional geotechnical engineering practice. No warranty as to the contents of this report is intended, and none shall be inferred from the statements or opinions expressed.

6. The scope of our services mutually agreed upon for this project did not include any environmental assessment or study for the presence of hazardous or toxic materials in the soil, surface water, groundwater, or air, on or below or around this site.

Important Information about Your

Geotechnical Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

Geotechnical Services Are Performed for Specific Purposes, Persons, and Projects

Geotechnical engineers structure their services to meet the specific needs of their clients. A geotechnical engineering study conducted for a civil engineer may not fulfill the needs of a construction contractor or even another civil engineer. Because each geotechnical engineering study is unique, each geotechnical engineering report is unique, prepared *solely* for the client. No one except you should rely on your geotechnical engineering report without first conferring with the geotechnical engineer who prepared it. *And no one — not even you* — should apply the report for any purpose or project except the one originally contemplated.

Read the Full Report

Serious problems have occurred because those relying on a geotechnical engineering report did not read it all. Do not rely on an executive summary. Do not read selected elements only.

A Geotechnical Engineering Report Is Based on A Unique Set of Project-Specific Factors

Geotechnical engineers consider a number of unique, project-specific factors when establishing the scope of a study. Typical factors include: the client's goals, objectives, and risk management preferences; the general nature of the structure involved, its size, and configuration; the location of the structure on the site; and other planned or existing site improvements, such as access roads, parking lots, and underground utilities. Unless the geotechnical engineer who conducted the study specifically indicates otherwise, do not rely on a geotechnical engineering report that was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

Typical changes that can erode the reliability of an existing geotechnical engineering report include those that affect:

- the function of the proposed structure, as when it's changed from a parking garage to an office building, or from a light industrial plant to a refrigerated warehouse,
- elevation, configuration, location, orientation, or weight of the proposed structure,
- composition of the design team, or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project changes—even minor ones—and request an assessment of their impact. *Geotechnical engineers cannot accept responsibility or liability for problems that occur because their reports do not consider developments of which they were not informed.*

Subsurface Conditions Can Change

A geotechnical engineering report is based on conditions that existed at the time the study was performed. *Do not rely on a geotechnical engineering report* whose adequacy may have been affected by: the passage of time; by man-made events, such as construction on or adjacent to the site; or by natural events, such as floods, earthquakes, or groundwater fluctuations. *Always* contact the geotechnical engineer before applying the report to determine if it is still reliable. A minor amount of additional testing or analysis could prevent major problems.

Most Geotechnical Findings Are Professional Opinions

Site exploration identifies subsurface conditions only at those points where subsurface tests are conducted or samples are taken. Geotechnical engineers review field and laboratory data and then apply their professional judgment to render an opinion about subsurface conditions throughout the site. Actual subsurface conditions may differ—sometimes significantly—from those indicated in your report. Retaining the geotechnical engineer who developed your report to provide construction observation is the most effective method of managing the risks associated with unanticipated conditions.

A Report's Recommendations Are *Not* Final

Do not overrely on the construction recommendations included in your report. *Those recommendations are not final,* because geotechnical engineers develop them principally from judgment and opinion. Geotechnical engineers can finalize their recommendations only by observing actual

subsurface conditions revealed during construction. *The geotechnical engineer who developed your report cannot assume responsibility or liability for the report's recommendations if that engineer does not perform construction observation.*

A Geotechnical Engineering Report Is Subject to Misinterpretation

Other design team members' misinterpretation of geotechnical engineering reports has resulted in costly problems. Lower that risk by having your geotechnical engineer confer with appropriate members of the design team after submitting the report. Also retain your geotechnical engineer to review pertinent elements of the design team's plans and specifications. Contractors can also misinterpret a geotechnical engineering report. Reduce that risk by having your geotechnical engineer participate in prebid and preconstruction conferences, and by providing construction observation.

Do Not Redraw the Engineer's Logs

Geotechnical engineers prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. To prevent errors or omissions, the logs included in a geotechnical engineering report should *never* be redrawn for inclusion in architectural or other design drawings. Only photographic or electronic reproduction is acceptable, *but recognize that separating logs from the report can elevate risk.*

Give Contractors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can make contractors liable for unanticipated subsurface conditions by limiting what they provide for bid preparation. To help prevent costly problems, give contractors the complete geotechnical engineering report, *but* preface it with a clearly written letter of transmittal. In that letter, advise contractors that the report was not prepared for purposes of bid development and that the report's accuracy is limited; encourage them to confer with the geotechnical engineer who prepared the report (a modest fee may be required) and/or to conduct additional study to obtain the specific types of information they need or prefer. A prebid conference can also be valuable. *Be sure contractors have sufficient time* to perform additional study. Only then might you be in a position to give contractors the best information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions.

Read Responsibility Provisions Closely

Some clients, design professionals, and contractors do not recognize that geotechnical engineering is far less exact than other engineering disciplines. This lack of understanding has created unrealistic expectations that have led to disappointments, claims, and disputes. To help reduce the risk of such outcomes, geotechnical engineers commonly include a variety of explanatory provisions in their reports. Sometimes labeled "limitations" many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The equipment, techniques, and personnel used to perform a *geoenvironmental* study differ significantly from those used to perform a *geotechnical* study. For that reason, a geotechnical engineering report does not usually relate any geoenvironmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated environmental problems have led to numerous project failures.* If you have not yet obtained your own geoenvironmental information, ask your geotechnical consultant for risk management guidance. *Do not rely on an environmental report prepared for someone else.*

Obtain Professional Assistance To Deal with Mold

Diverse strategies can be applied during building design, construction, operation, and maintenance to prevent significant amounts of mold from growing on indoor surfaces. To be effective, all such strategies should be devised for the *express purpose* of mold prevention, integrated into a comprehensive plan, and executed with diligent oversight by a professional mold prevention consultant. Because just a small amount of water or moisture can lead to the development of severe mold infestations, a number of mold prevention strategies focus on keeping building surfaces dry. While groundwater, water infiltration, and similar issues may have been addressed as part of the geotechnical engineering study whose findings are conveyed in this report, the geotechnical engineer in charge of this project is not a mold prevention consultant; ***none of the services performed in connection with the geotechnical engineer's study were designed or conducted for the purpose of mold prevention. Proper implementation of the recommendations conveyed in this report will not of itself be sufficient to prevent mold from growing in or on the structure involved.***

Rely, on Your ASFE-Member Geotechncial Engineer for Additional Assistance

Membership in ASFE/The Best People on Earth exposes geotechnical engineers to a wide array of risk management techniques that can be of genuine benefit for everyone involved with a construction project. Confer with your ASFE-member geotechnical engineer for more information.

ASFE
THE BEST PEOPLE ON EARTH

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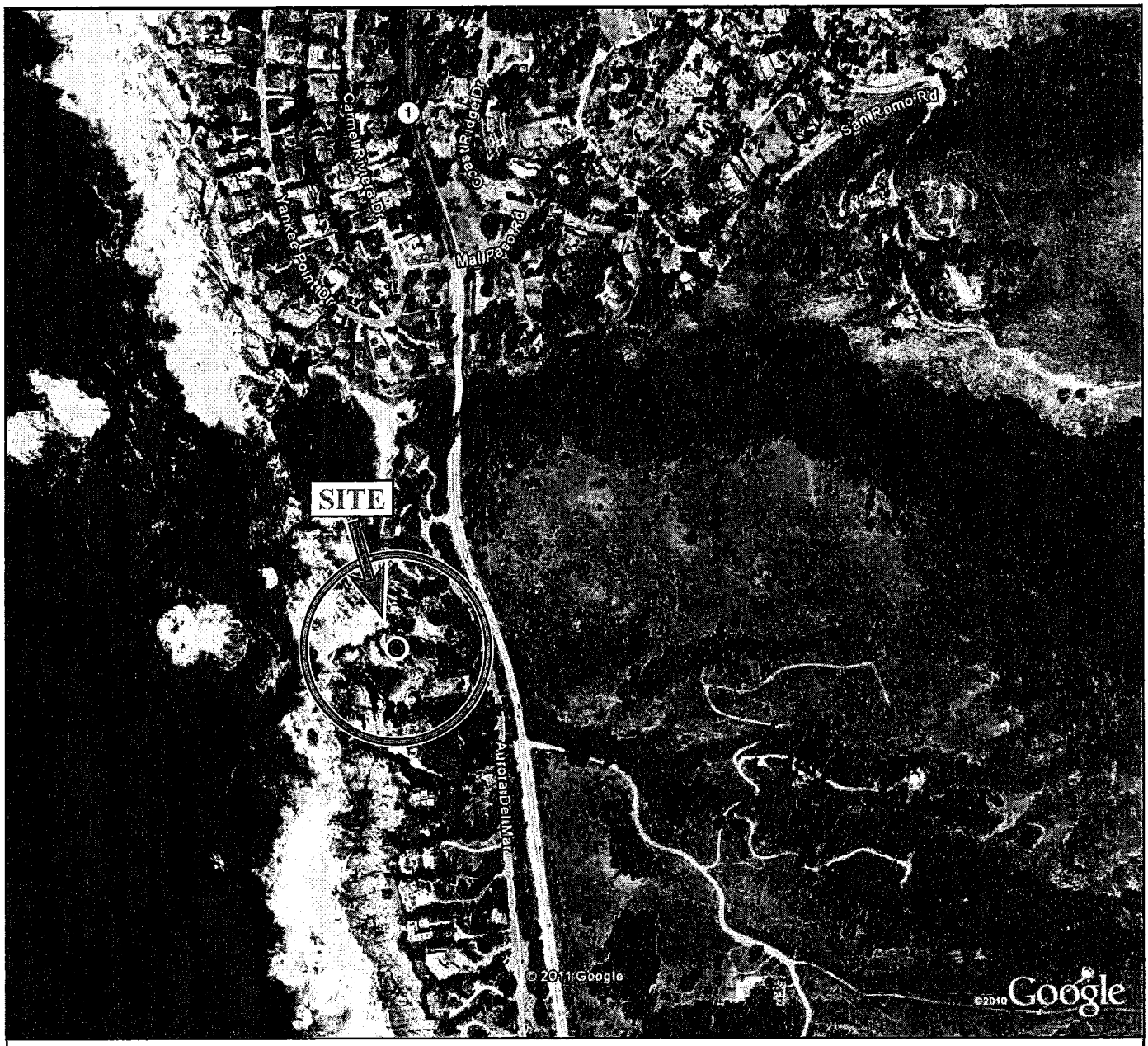
APPENDIX A

Regional Site Map
Site Map Showing Test Borings
Boring Log Explanation
Log of Test Borings
Atterberg Limits
Slope Repair Schematic
Surcharge Pressure Diagram
Typical Retaining Wall Drain Detail



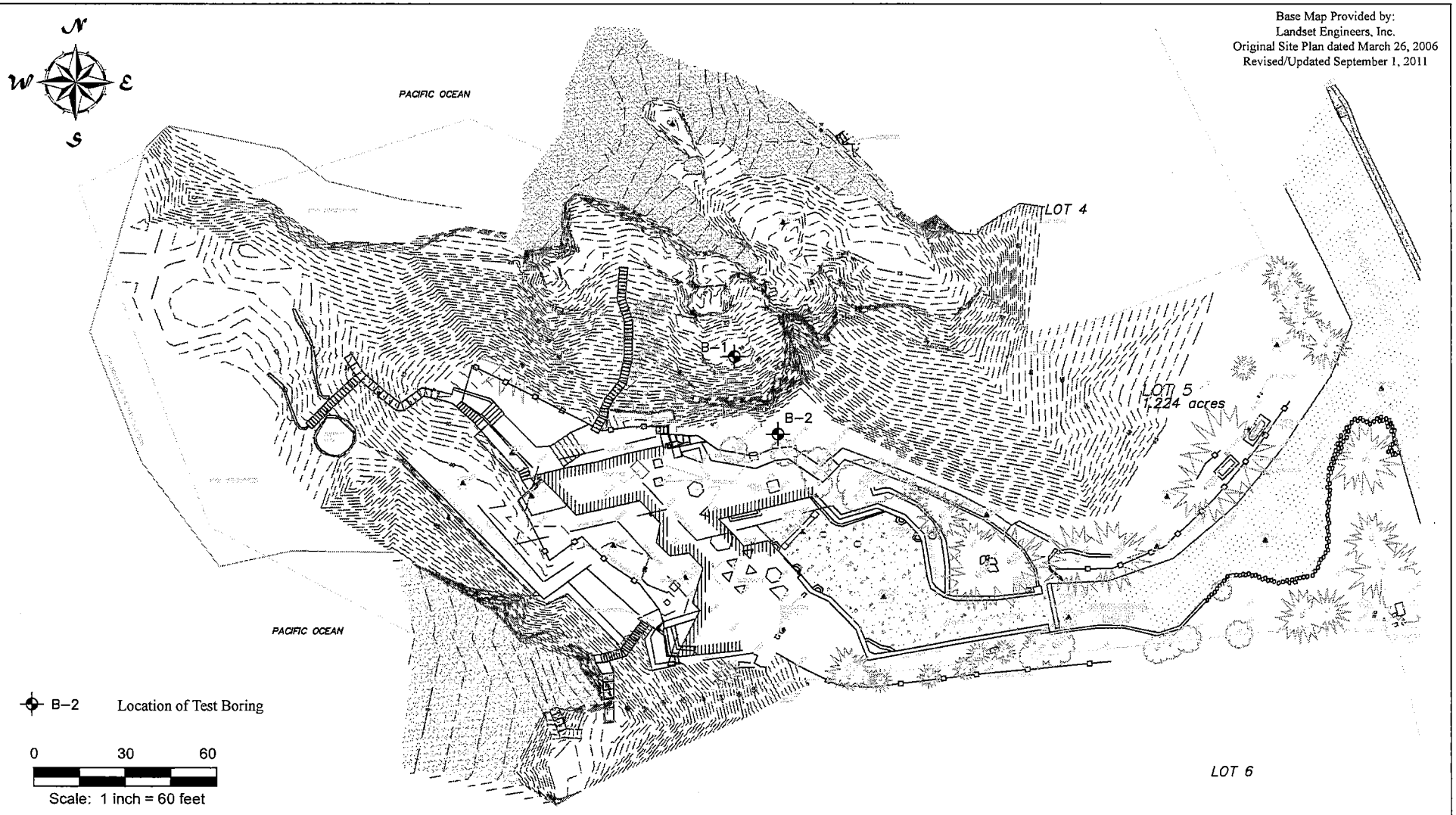
0 610 ft.

Approximate Scale

N

Base Map from Google Maps

Pacific Crest Engineering Inc. 444 Airport Blvd., Suite 106 Watsonville, CA 95076	**Regional Site Map** Niles Residence Carmel, California	Figure No. 1 Project No. 1158 Date: 11/15/2011



Pacific Crest Engineering Inc. 444 Airport Blvd., Suite 106 Watsonville, CA 95076	**Site Map Showing Test Boring Locations** Niles Residence Carmel, California	Figure No. 2 Project No. 1158 Date: 11/15/2011

UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2488 (Modified)

PRIMARY DIVISIONS			GROUP SYMBOL	SECONDARY DIVISIONS
COARSE GRAINED SOILS MORE THAN HALF OF MATERIAL IS LARGER THAN #200 SIEVE SIZE	**GRAVELS** MORE THAN HALF OF COARSE FRACTION IS LARGER THAN #4 SIEVE	**CLEAN GRAVELS** (LESS THAN 5% FINES)	GW	Well graded gravels, gravel-sand mixtures, little or no fines
			GP	Poorly graded gravels or gravels-sand mixtures, little or no fines
		GRAVELS (MORE THAN 12% FINES)	GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines
			GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines
	SANDS MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN #4 SIEVE	**CLEAN SANDS** (LESS THAN 5% FINES)	SW	Well graded sands, gravelly sands, little or no fines
			SP	Poorly graded sands or gravelly sands, little or no fines
		SANDS (MORE THAN 12% FINES)	SM	Silty sands, sand-silt mixtures, non-plastic fines
			SC	Clayey sands, sand-clay mixtures, plastic fines
FINE GRAINED SOILS MORE THAN HALF OF MATERIAL IS SMALLER THAN #200 SIEVE SIZE	**SILTS AND CLAYS** LIQUID LIMIT IS LESS THAN 35%		ML	Inorganic silts and very fine clayey sand silty sands, with slight plasticity
			CL	Inorganic clays of low to medium plasticity, gravelly, sand, silty or lean clays
			OL	Organic silts and organic silty clays of low plasticity
	SILTS AND CLAYS LIQUID LIMIT IS BETWEEN 35% AND 50%		MI	Inorganic silts, clayey silts and silty fine sands of intermediate plasticity
			CI	Inorganic clays, gravelly/sandy clays and silty clays of intermediate plasticity
			OI	Organic clays and silty clays of intermediate plasticity
	SILTS AND CLAYS LIQUID LIMIT IS GREATER THAN 50%		MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
			CH	Organic clays of high plasticity, fat clays
			OH	Organic clays of medium to high plasticity, organic silts
HIGHLY ORGANIC SOILS			PT	Peat and other highly organic soils

BORING LOG EXPLANATION

Depth, ft.	Sample No. and Type	Symbol	SOIL DESCRIPTION	Unified Soil Classification	SPT "N" Value	Plasticity Index	Dry Density, p.c.f.	Moisture % of Dry Wt.	MISC. LAB RESULTS
1			← Ground water elevation						
2	1-1 L		←Soil Sample Number ←Soil Sampler Size/Type L = 3" Outside Diameter M = 2.5" Outside Diameter T = 2" Outside Diameter ST = Shelby Tube BAG = Bag Sample	NOTE: All blows/foot are normalized to 2" outside diameter sampler size					
3									
4									
5									

RELATIVE DENSITY

SANDS AND GRAVELS	BLOWS/FOOT
VERY LOOSE	0-4
LOOSE	4-10
MEDIUM DENSE	10-30
DENSE	30-50
VERY DENSE	OVER 50

CONSISTENCY

SILTS AND CLAYS	BLOWS/FOOT
VERY SOFT	0-2
SOFT	2-4
FIRM	4-8
STIFF	8-16
VERY STIFF	16-32
HARD	OVER 32

Pacific Crest Engineering Inc. 444 Airport Blvd., Suite 106 Watsonville, CA 95076	**Boring Log Explanation** Niles Residence Carmel, California	Figure No. 3 Project No. 1158 Date: 11/15/2011

LOGGED BY CLA DATE DRILLED 8/25/11 BORING DIAMETER 4" SS BORING NO. 1

Depth (feet)	Sample No. and Type	Symbol	Soil Description	Unified Soil Classification	SPT "N" Value	Plasticity Index	Dry Density (pcf)	Moisture % of Dry Wt.	Misc. Lab Results
1	1-1 L		FILL; Landslide Deposits: Dark yellowish brown Clayey SAND, very fine to fine grained sand, poorly graded, trace angular to sub-rounded shaped gravels up to 1/4 inch in diameter, trace rootlets, very small mica flakes scattered throughout the sample, damp, loose	SC	4				Gravel = 2.8% Sand = 67.0% Fines = 30.2%
2	1-2 L		Increase in clay content, clay exhibits low plastic charcteristics, slight increase in gravel content, gravels are supported in a clayey sand matrix, moist, loose		7	14	106.8	11.1	
3	1-3 L		Color change to strong yellowish brown, trace reddish yellow oxidation patches scattered throughout the sample, lack of rootlets, decrease in clay content, trace silt, gravels up to 1 inch in diameter, moist, loose		9				Direct Shear: C = 450 psf ϕ = 39.0°
4									
5	1-4 L		FILL; Mottled dark yellowish brown and dark gray Silty SAND, silt has a moderately smooth texture, micaceous, trace grainitic gravels that are angular to sub-angular shaped and up to 1/4 inch in diameter, sand is very fine grained, moist, medium dense	SM					Gravel = 0.5% Sand = 59.2% Fines = 40.3%
6	1-5 M		NATIVE; Dark grayish brown SAND with Silt, medium to very coarse grained, sub-angular to sub-rounded shaped, well graded mica flakes scattered throughout the sample, moist, dense	SM-SW	13		116.6	16.9	
7									7.6% Passing
8	1-6 M		Slight increase in coarseness of sand, predominately coarse to very coarse grained, trace gravels up to 1/4 inch in diameter, increase in moisture content, very moist/wet, very dense		32		115.0	6.4	#200 Sieve
9	1-7 T		Very moist/wet, very dense		50/5"		113.0	10.0	7.2% Passing #200 Sieve
10									
11	1-8 T		Color change to dark yellowish orange near 11 1/2 feet, very moist/wet, very dense		48			12.0	
12					50/4.5"			17.2	
13			Boring Terminated at 12 feet due to refusal upon what is presumed to be granite bedrock. Sampler bounced at a depth of 12 feet below ground surface and a blow count of 50/0" was recorded. Not groundwater encountered. Depth to beach (at the location of the plywood retaining wall form) is approximately 15 feet below the location of the test boring.						
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									

Pacific Crest Engineering Inc.
444 Airport Blvd., Suite 106
Watsonville, CA 95076

Log of Test Borings
Niles Residence
Carmel, California

Figure No. 4
Project No. 1158
Date: 11/15/2011

LOGGED BY CLA DATE DRILLED 8/25/11 BORING DIAMETER 4" SS BORING NO. 2

Depth (feet)	Sample No. and Type	Symbol	Soil Description	Unified Soil Classification	SPT "N" Value	Plasticity Index	Dry Density (pcf)	Moisture % of Dry Wt.	Misc. Lab Results
1	2-1 L		Variegated strong brown, dark yellowish brown, and orange Clayey SAND with Gravel, very fine to fine grained sand with trace medium grains, poorly graded, angular to sub-angular shaped granitic gravels up to 1/4 inch in diameter, large root in the third liner, damp, medium dense	SC	21		118.3	6.8	Gravel = 8.5% Sand = 61.2% Fines = 30.3%
3	2-2 T		Variegated strong brown, dark yellowish brown, and, orange Clayey SAND, very fine to fine grained sand, poorly graded, trace gray to dark gray clay lenses randomly distributed throughout the sample, clay exhibitis low plastic charcteristics, increase in moisture content, very damp, medium dense	SC	11	14		8.3	Gravel = 1.7% Sand = 70.0% Fines = 28.6%
5	2-3 L		Mottled brown, dark orangish brown, and dark brown Clayey SAND, sand is very fine to fine grained, gravels are granitic, angular to sub-angular shaped, and up to 1/4 inch in diameter, rootlets randomly distributed throughout the sample, very small mica flakes scattered throughout the sample, moist, medium dense	SC	11				Direct Shear C = 100 psf Φ = 42 °
10	2-4 T		Sub-angular shaped granitic gravels up to 1 1/4 inches in diameter came up with the cuttings near 10 feet (resembles baserock), lens of Sandy GRAVEL baserock at 10 feet					2.0	Gravel = 1.8%
11			Strong brown to reddish orange Clayey SAND with Gravel, slight sticky texture, clay exhibits low plastic charcteristics, fine to medium grained sand, gravels are angular to sub-angular shaped and coarse to very coarse grained, moist, medium dense	SC	27	15		12.5	Sand = 62.3% Fines = 35.9%
15	2-5 L		Mottled strong brown, dark brown, and dark brownish red Sandy Clay/Clayey SAND with Gravel, fine to medium grained sand, sub-angular to sub-rounded shaped, poorly graded, gravels are angular to sub-rounded shaped and predominately coarse to very coarse grained with trace gravels up to 1/4 inch in diameter, very small mica flakes scattered through-out the sample, sample fines with depth, trace clay/binder near 16 1/2 feet, moist, medium dense Driller commented that drilling became denser between 15 and 20 feet	SC/CL	29				Direct Shear C_{shear} = 2110 psf Φ_{shear} = 27° C_{ult} = 1090 psf Φ_{ult} = 28°
20	2-6 T		Mottled grayish brown, dark yellowish brown, and reddish orange CLAY with Gravel, clay has a moderately smooth texture, the gravels are embedded in a clay matrix and are angular to sub-angular shaped and coarse to very coarse grained, very small mica flakes scattered throughout the sample, black clay streaking and patches randomly distributed throughout the sample, moist, very stiff	CL	29				
24									

Pacific Crest Engineering Inc. 444 Airport Blvd., Suite 106 Watsonville, CA 95076	**Log of Test Borings** Niles Residence Carmel, California	Figure No. 5 Project No. 1158 Date: 11/15/2011

LOGGED BY CLA DATE DRILLED 8/25/11 BORING DIAMETER 4" SS BORING NO. 2

Depth (feet)	Sample No. and Type	Symbol	Soil Description	Unified Soil Classification	SPT "N" Value	Plasticity Index	Dry Density (pcf)	Moisture % of Dry Wt.	Misc. Lab Results
25	2-7 L		Grayish brown grading to dark reddish brown Clayey SAND with Gravel, sand is very fine to fine grained and poorly graded, gravels are quartz, chert, and granitic, sub-angular to sub-rounded shaped, and coarse to very coarse grained with trace gravels up to 1/4 inch in diameter, apparent seep zone near 25 1/2 feet and indicated by very moist/wet soil conditions, mica flakes scattered throughout the sample, moist, dense	SC-SP	38				Direct Shear: C = 700 psf ϕ = 45°
30	2-8 T		Slight decrease in clay content, sample is more friable than the previous sample, trace oxidation patches scattered throughout the sample, increase in gravel content, moist, dense		44			12.0	26.2% Passing #200 Sieve
32	2-9 T		Slight increase in moisture content, slight increase in clay content, micaceous, slight increase in oxidation patches, moist, dense		38			12.9	
34			Boring terminated at 34 feet. No free standing groundwater encountered.						
35									
36									
37									
38									
39									
40									
41									
42									
43									
44									
45									
46									
47									
48									

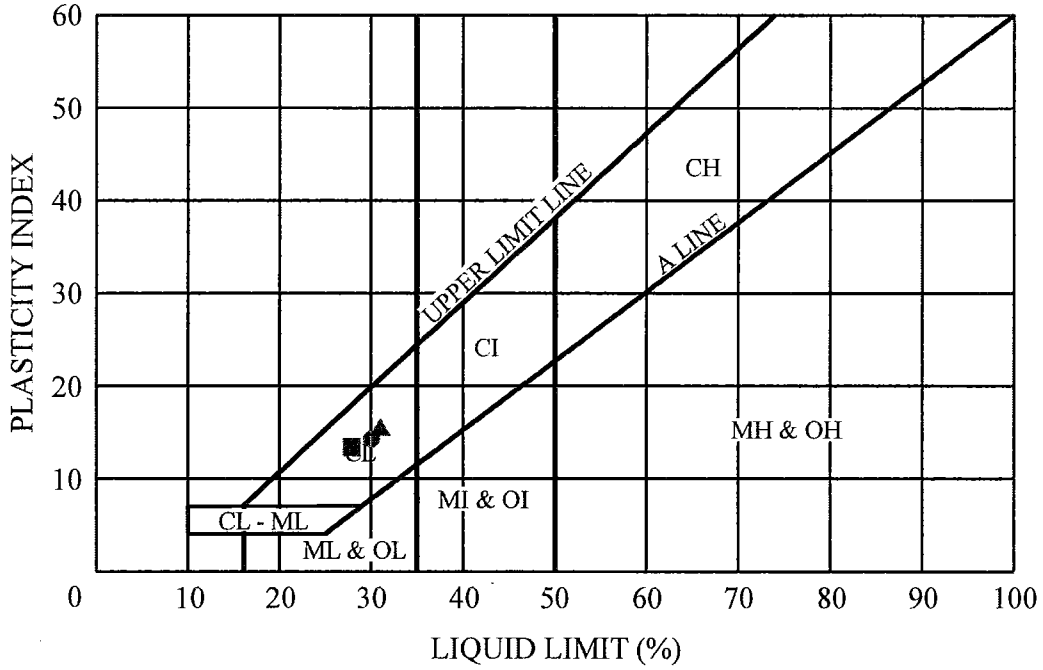
Pacific Crest Engineering Inc.
444 Airport Blvd., Suite 106
Watsonville, CA 95076

Log of Test Borings
Niles Residence
Carmel, California

Figure No. 6
Project No. 1158
Date: 11/15/2011

ATTERBERG LIMITS - ASTM D4318

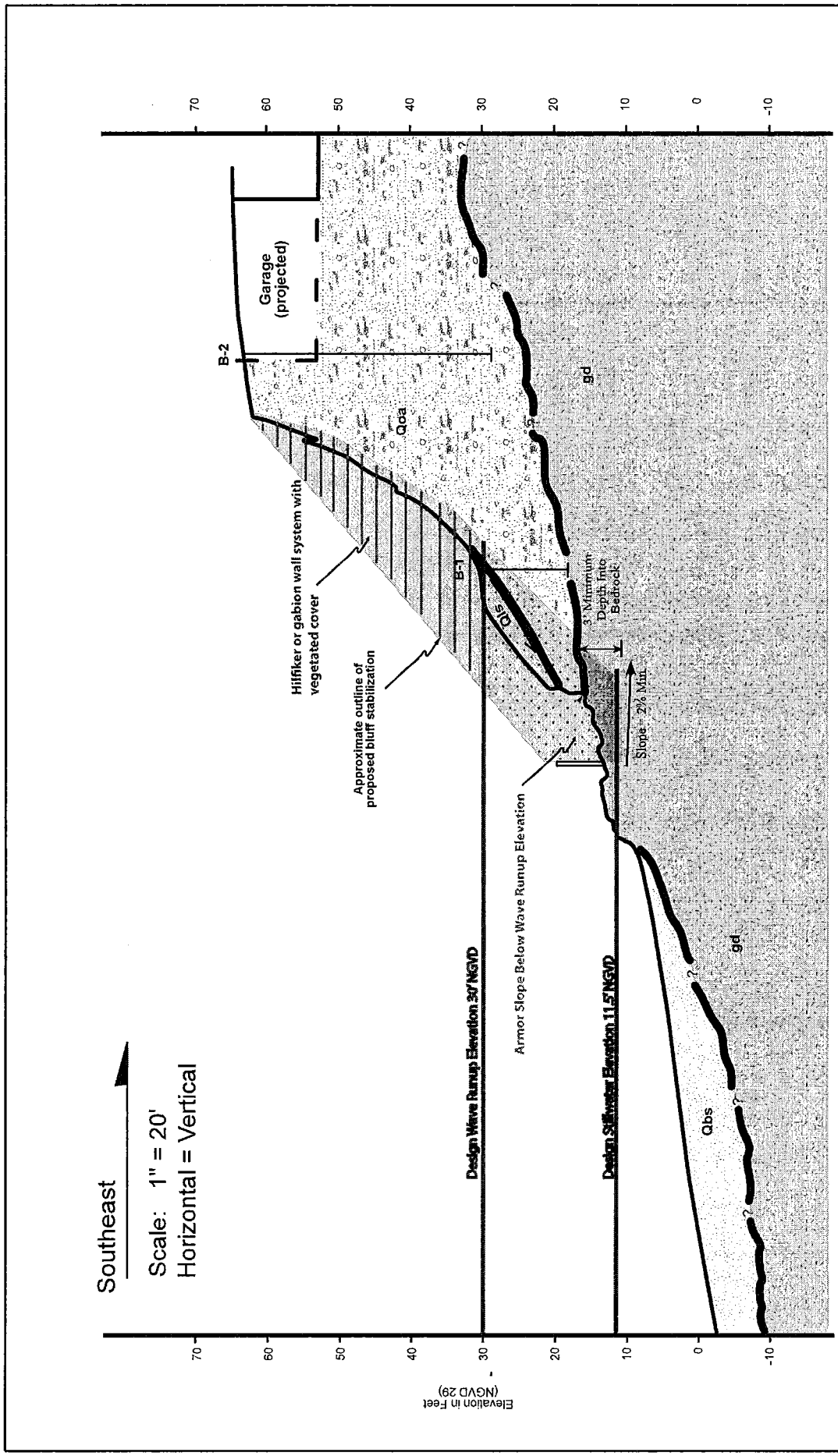
PLASTICITY CHART



*This chart has been modified to include the intermediate classifications CI, MI and OI for clays and silts with liquid limits between 35 and 50.

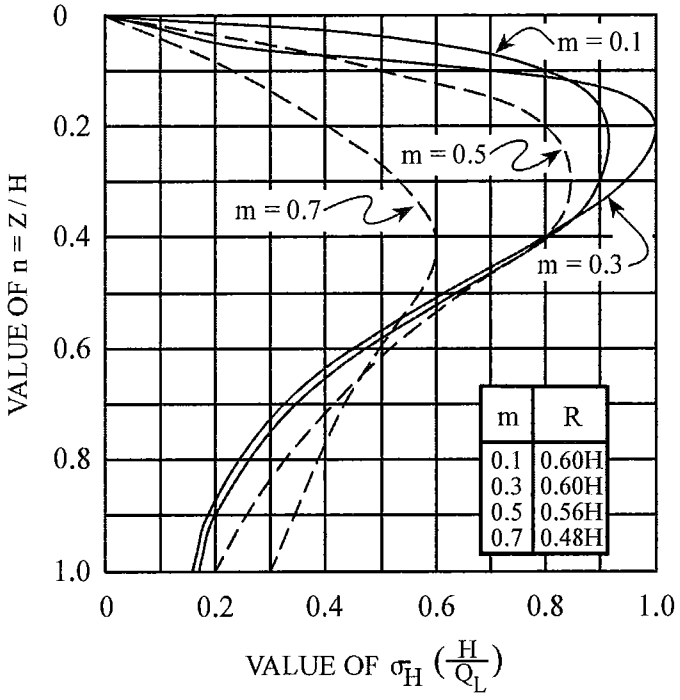
SYMBOL	SAMPLE #	LL (%)	PL (%)	PI
●	**1-2-1**	**30**	**16**	**14**
■	**2-2**	**27**	**14**	**13**
▲	**2-4**	**31**	**15**	**16**

Pacific Crest Engineering Inc. 444 Airport Blvd., Suite 106 Watsonville, CA 95076	**Atterberg Limits** Niles Residence Carmel, California	Figure No. 7 Project No. 1158 Date: 11/15/2011

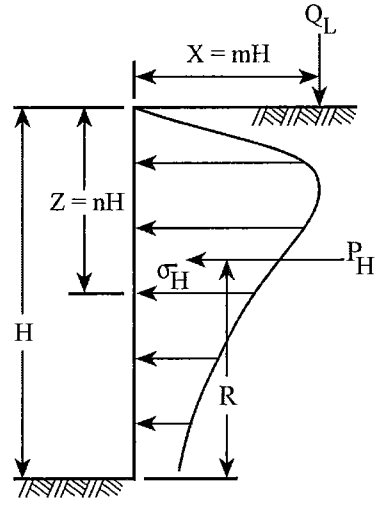


Pacific Crest Engineering Inc. 444 Airport Blvd., Suite 106 Watsonville, CA 95076	Proposed Slope Repair Schematic Niles Residence Carmel, California	Figure No. 8 Project No. 1158 Date: 11/15/2011

LINE LOAD



m	R
0.1	0.60H
0.3	0.60H
0.5	0.56H
0.7	0.48H



FOR $m \leqq 0.4$:

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

$$P_H = 0.55\,Q_L$$

FOR $m > 0.4$:

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

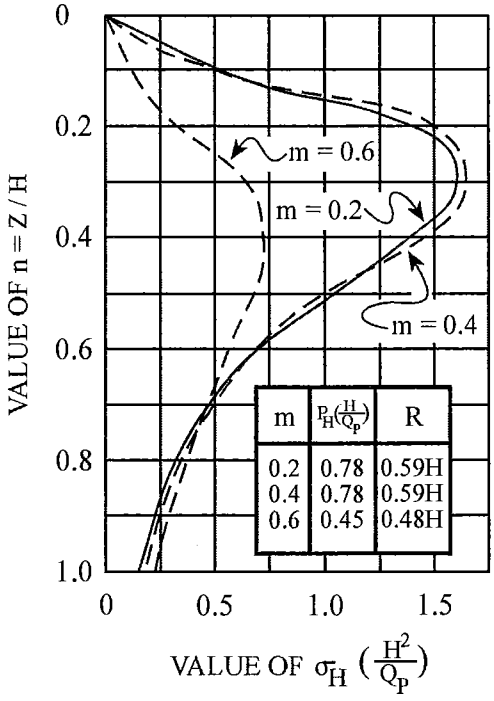
RESULTANT $P_H = \dfrac{0.64\,Q_L}{(m^2 + 1)}$

PRESSURES FROM LINE LOAD Q_L

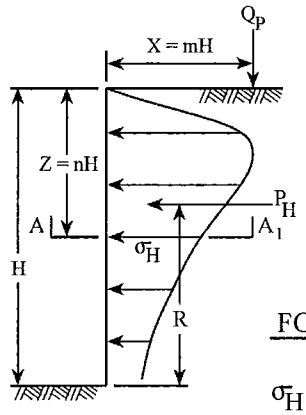
(BOISSINESQ EQUATION MODIFIED BY EXPERMENT)

REFERENCE: Design Manual
NAVFAC DM-7.02
Figure 11
Page 7.2-74

POINT LOAD



m	$P_H\left(\frac{H}{Q_P}\right)$	R
0.2	0.78	0.59H
0.4	0.78	0.59H
0.6	0.45	0.48H



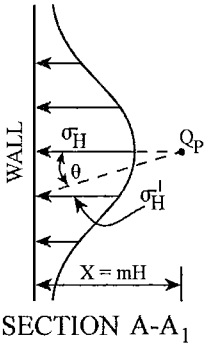
FOR $m \leqq 0.4$:

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

FOR $m > 0.4$:

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

$$\sigma_H^1 = \sigma_H \cos^2(1.1\,\theta)$$

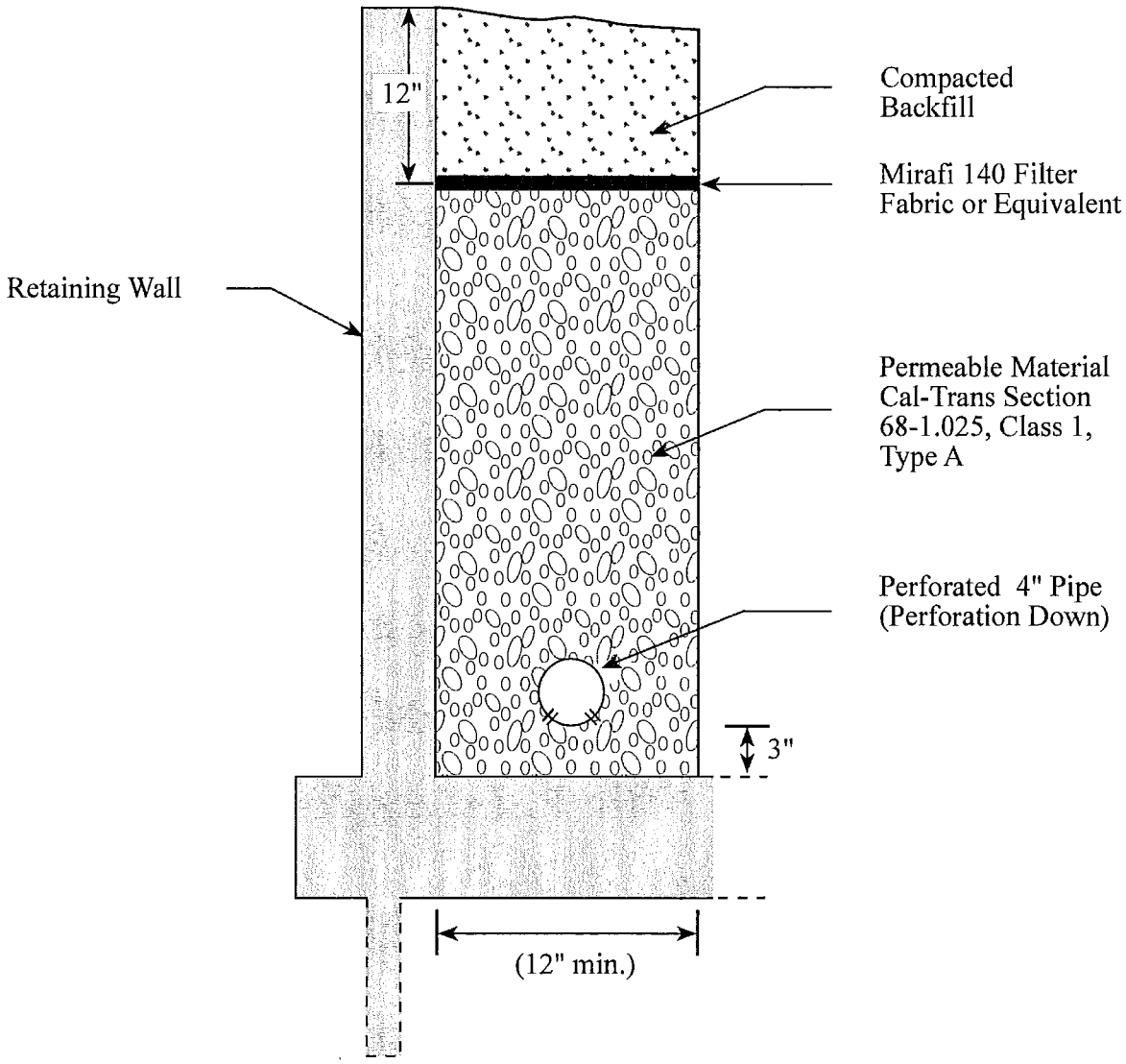


SECTION $A\text{-}A_1$

PRESSURES FROM POINT LOAD Q_P

(BOISSINESQ EQUATION MODIFIED BY EXPERMENT)

Pacific Crest Engineering Inc. 444 Airport Blvd., Suite 106 Watsonville, CA 95076	**Surcharge Pressure Diagram-1** Niles Residence Carmel, California	Figure No. 9 Project No. 1158 Date: 11/15/11



Not to Scale

Pacific Crest Engineering Inc. 444 Airport Blvd., Suite 106 Watsonville, CA 95076	**Typical Retaining Wall Drain Detail** Niles Residence Carmel, California	Figure No. 10 Project No. 1158 Date: 11/15/11

APPENDIX B

Wave Runup Analysis Results

Wave Transformation Data For Determining Significant Wave Height Parameters:

(Data obtained from Buoy 157, located 13 miles SW of site)

Case: Significant Wave Height

Irregular Wave Transformation (Goda's Method)

Item	Subject Wave	Deepwater Wave	Units	Item	Subject Wave	Deepwater Wave
Wave height (Ho)		20.000	ft	Hs	21.750	20.054
Sig wave period (Ts)	15.000	15.000	sec	Hmean	13.715	12.517
Water depth (d)	45.000	1151.570	ft	Hrms	15.367	14.124
Nearshore slope (cot phi)	33.000	33.000		H10%	26.996	25.443
Principal dir (theta)	9.101	19.000	deg	H02%	31.624	31.255
				Hmax	34.269	36.125
Shoaling Coeff. (Ks)	1.117	1.000		Effec refract coeff (Kr)	0.941	
Surf Beat RMS (zeta)	0.844	0.198	ft	Depth/height (d/Ho)	2.247	57.579
Wave setup (Sw)	-0.219	-0.008	ft	Rel water depth (d/Lo)	0.039	1.000
Wave steepness (Ho/Lo)	0.017	0.017				

Wave Runup Elevation on Beach:

Irregular Wave Runup on Smooth Slope Linear Beaches

Hs_{max} from peak direction, period and Hs data
(Buoy 157, 13 miles SW):
(Estimated refracted wave height at site, Ho)

Deepwater significant wave height:	27.00	ft
Peak energy wave period:	15.00	
Cotangent of beach slope:	33.00	
Maximum wave runup:	18.00	ft
Runup exceeded by 2% of runups:	15.90	ft
Average of highest 1/10 of runups:	14.53	ft
Average of highest 1/3 of runups	11.99	ft
Average wave runup:	7.77	ft

Estimated maximum wave runup on beach: +18 feet SWL (29.5'NGVD)

APPENDIX C

Slope Stability Results

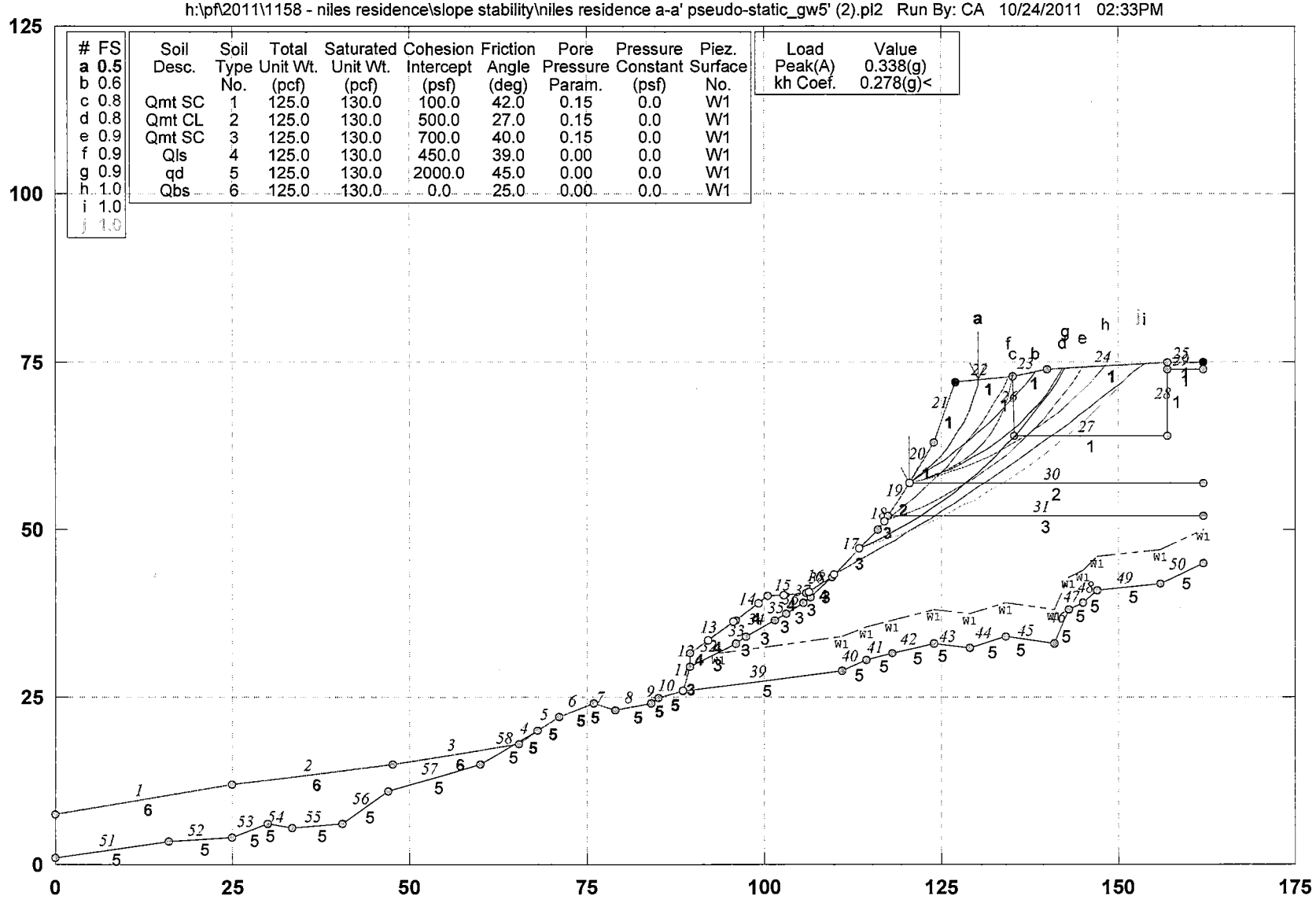
Existing Bluff - Pseudostatic Analysis Cross Section A-A'

h:\pf\2011\1158 - niles residence\slope stability\niles residence a-a' pseudo-static_gw5' (2).pl2 Run By: CA 10/24/2011 02:33PM

#	FS
a	0.5
b	0.6
c	0.8
d	0.8
e	0.9
f	0.9
g	0.9
h	1.0
i	1.0
j	1.0

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Qmt SC	1	125.0	130.0	100.0	42.0	0.15	0.0	W1
Qmt CL	2	125.0	130.0	500.0	27.0	0.15	0.0	W1
Qmt SC	3	125.0	130.0	700.0	40.0	0.15	0.0	W1
Qls	4	125.0	130.0	450.0	39.0	0.00	0.0	W1
qd	5	125.0	130.0	2000.0	45.0	0.00	0.0	W1
Qbs	6	125.0	130.0	0.0	25.0	0.00	0.0	W1

Load	Value
Peak(A)	0.338(g)
kh Coef.	0.278(g)<



GSTABL7 v.2 FSmin=0.5

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

***** GSTABL7 *****

** GSTABL7 by Garry H. Gregory, P.E. **

** Original Version 1.0, January 1996; Current Version 2.005, Sept. 2006 **

****

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/24/2011
Time of Run: 02:33PM
Run By: CA
Input Data Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a' pseudo-static_gw5' (2).in
Output Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a' pseudo-static_gw5' (2).OUT
Unit System: English
Plotted Output Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a' pseudo-static_gw5' (2).PLT
PROBLEM DESCRIPTION: Existing Bluff - Pseudostatic Analysis
Cross Section A-A'

BOUNDARY COORDINATES
25 Top Boundaries
58 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	7.50	24.90	12.00	6
2	24.90	12.00	47.50	15.00	6
3	47.50	15.00	65.50	18.00	6
4	65.50	18.00	68.00	20.00	5
5	68.00	20.00	71.10	22.10	5
6	71.10	22.10	76.00	24.00	5
7	76.00	24.00	79.00	23.00	5
8	79.00	23.00	84.00	24.00	5
9	84.00	24.00	85.00	25.00	5
10	85.00	25.00	88.50	26.00	5
11	88.50	26.00	89.50	29.50	3
12	89.50	29.50	89.50	31.50	4
13	89.50	31.50	95.90	36.50	4
14	95.90	36.50	100.50	40.00	4
15	100.50	40.00	106.00	40.50	4
16	106.00	40.50	109.50	43.00	4
17	109.50	43.00	116.00	50.00	3
18	116.00	50.00	117.50	52.00	3
19	117.50	52.00	120.50	57.00	2
20	120.50	57.00	124.00	63.00	1
21	124.00	63.00	127.00	72.00	1
22	127.00	72.00	135.00	73.00	1
23	135.00	73.00	140.00	74.00	1
24	140.00	74.00	157.00	75.00	1
25	157.00	75.00	162.00	75.00	1
26	135.00	73.00	135.25	64.00	1
27	135.25	64.00	156.90	64.00	1
28	156.90	64.00	156.99	74.00	1
29	156.99	74.00	161.90	74.00	1
30	120.50	57.00	162.00	57.00	2
31	117.50	52.00	162.00	52.00	3
32	89.50	29.50	96.00	33.00	3
33	96.00	33.00	97.50	34.00	3
34	97.50	34.00	101.50	36.50	3
35	101.50	36.50	103.00	37.50	3
36	103.00	37.50	105.50	39.00	3
37	105.50	39.00	106.50	39.90	3
38	106.50	39.90	109.50	43.00	3
39	88.50	26.00	111.00	29.00	5
40	111.00	29.00	114.50	30.50	5

41	114.50	30.50	118.00	31.50	5
42	118.00	31.50	124.00	33.00	5
43	124.00	33.00	129.00	32.50	5
44	129.00	32.50	134.00	34.00	5
45	134.00	34.00	141.00	33.00	5
46	141.00	33.00	143.00	38.00	5
47	143.00	38.00	145.00	39.00	5
48	145.00	39.00	147.00	41.00	5
49	147.00	41.00	156.00	42.00	5
50	156.00	42.00	162.00	45.00	5
51	0.00	1.00	16.00	3.50	5
52	16.00	3.50	25.00	4.00	5
53	25.00	4.00	30.00	6.00	5
54	30.00	6.00	33.50	5.50	5
55	33.50	5.50	40.50	6.00	5
56	40.50	6.00	47.00	11.00	5
57	47.00	11.00	60.00	15.00	5
58	60.00	15.00	68.00	20.00	5

Default Y-Origin = 0.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)

ISOTROPIC SOIL PARAMETERS

6 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	125.0	130.0	100.0	42.0	0.15	0.0	1
2	125.0	130.0	500.0	27.0	0.15	0.0	1
3	125.0	130.0	700.0	40.0	0.15	0.0	1
4	125.0	130.0	450.0	39.0	0.00	0.0	1
5	125.0	130.0	2000.0	45.0	0.00	0.0	1
6	125.0	130.0	0.0	25.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 13 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	93.50	31.50
2	111.00	34.00
3	114.50	35.50
4	118.00	36.50
5	124.00	38.00
6	129.00	37.50
7	134.00	39.00
8	141.00	38.00
9	143.00	43.00
10	145.00	44.00
11	147.00	46.00
12	156.00	47.00
13	162.00	50.00

Specified Peak Ground Acceleration Coefficient (A) = 0.338(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.278(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
100 Trial Surfaces Have Been Generated.
10 Surface(s) Initiate(s) From Each Of 10 Points Equally Spaced
Along The Ground Surface Between X = 88.50(ft)
and X = 120.50(ft)
Each Surface Terminates Between X = 127.00(ft)
and X = 162.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
2.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *

Total Number of Trial Surfaces Attempted = 100
Number of Trial Surfaces With Valid FS = 100
Statistical Data On All Valid FS Values:
FS Max = 2.575 FS Min = 0.543 FS Ave = 1.437
Standard Deviation = 0.395 Coefficient of Variation = 27.46 %
Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	120.500	57.000
2	122.081	58.225
3	123.554	59.577
4	124.911	61.047
5	126.140	62.625
6	127.234	64.299
7	128.186	66.058
8	128.988	67.890
9	129.635	69.783
10	130.122	71.723
11	130.235	72.404

Circle Center At X = 106.563 ; Y = 76.615 ; and Radius = 24.062
Factor of Safety
*** 0.543 ***
Individual data on the 12 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	1.6	146.7	0.0	27.8	0.	0.	40.8	0.0	0.0
2	1.5	381.6	0.0	77.7	0.	0.	106.1	0.0	0.0
3	0.4	155.9	0.0	34.5	0.	0.	43.3	0.0	0.0
4	0.9	433.9	0.0	96.0	0.	0.	120.6	0.0	0.0
5	1.2	882.1	0.0	215.2	0.	0.	245.2	0.0	0.0
6	0.9	798.4	0.0	218.9	0.	0.	222.0	0.0	0.0
7	0.2	231.1	0.0	63.4	0.	0.	64.2	0.0	0.0
8	1.0	821.8	0.0	259.1	0.	0.	228.4	0.0	0.0
9	0.8	523.7	0.0	195.9	0.	0.	145.6	0.0	0.0
10	0.6	279.2	0.0	129.5	0.	0.	77.6	0.0	0.0
11	0.5	98.0	0.0	60.3	0.	0.	27.2	0.0	0.0
12	0.1	4.7	0.0	4.3	0.	0.	1.3	0.0	0.0

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	120.500	57.000
2	122.172	58.097
3	123.811	59.244
4	125.414	60.440
5	126.980	61.684
6	128.508	62.975
7	129.996	64.311
8	131.443	65.692
9	132.847	67.115
10	134.208	68.581
11	135.524	70.087
12	136.794	71.632
13	138.017	73.215
14	138.347	73.669

Circle Center At X = 85.148 ; Y = 112.737 ; and Radius = 66.003
Factor of Safety
*** 0.645 ***
Failure Surface Specified By 13 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	120.500	57.000
2	122.440	57.486
3	124.315	58.182
4	126.102	59.080
5	127.779	60.169
6	129.326	61.437
7	130.725	62.867
8	131.957	64.442

9	133.008	66.143
10	133.866	67.950
11	134.520	69.840
12	134.961	71.791
13	135.100	73.020

Circle Center At X = 117.073 ; Y = 74.816 ; and Radius = 18.142

Factor of Safety

*** 0.797 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	120.500	57.000
2	122.421	57.556
3	124.306	58.224
4	126.149	59.001
5	127.944	59.883
6	129.684	60.870
7	131.363	61.956
8	132.976	63.138
9	134.517	64.413
10	135.981	65.776
11	137.363	67.221
12	138.659	68.745
13	139.863	70.342
14	140.971	72.007
15	141.981	73.734
16	142.182	74.128

Circle Center At X = 111.971 ; Y = 90.082 ; and Radius = 34.164

Factor of Safety

*** 0.840 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	116.944	51.259
2	118.824	51.944
3	120.675	52.700
4	122.496	53.528
5	124.283	54.425
6	126.035	55.391
7	127.747	56.424
8	129.419	57.521
9	131.047	58.683
10	132.629	59.907
11	134.163	61.191
12	135.645	62.533
13	137.075	63.931
14	138.450	65.384
15	139.767	66.889
16	141.026	68.443
17	142.223	70.045
18	143.358	71.692
19	144.428	73.382
20	144.957	74.292

Circle Center At X = 100.204 ; Y = 100.170 ; and Radius = 51.696

Factor of Safety

*** 0.888 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	116.944	51.259
2	118.521	52.489
3	120.055	53.773
4	121.543	55.109
5	122.985	56.496
6	124.377	57.931
7	125.720	59.414
8	127.010	60.942
9	128.246	62.514
10	129.428	64.127
11	130.553	65.781

12	131.621	67.472
13	132.629	69.199
14	133.577	70.960
15	134.464	72.753
16	134.551	72.944

Circle Center At X = 82.161 ; Y = 97.491 ; and Radius = 57.856

Factor of Safety

*** 0.937 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	113.389	47.188
2	115.188	48.062
3	116.959	48.992
4	118.700	49.975
5	120.411	51.011
6	122.089	52.100
7	123.732	53.240
8	125.340	54.429
9	126.910	55.668
10	128.441	56.954
11	129.933	58.287
12	131.382	59.665
13	132.788	61.087
14	134.150	62.552
15	135.466	64.058
16	136.735	65.604
17	137.956	67.188
18	139.128	68.809
19	140.249	70.465
20	141.319	72.155
21	142.336	73.877
22	142.484	74.146

Circle Center At X = 85.909 ; Y = 106.027 ; and Radius = 64.940

Factor of Safety

*** 0.938 ***

Failure Surface Specified By 18 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	120.500	57.000
2	122.445	57.467
3	124.368	58.014
4	126.267	58.642
5	128.139	59.348
6	129.979	60.131
7	131.785	60.991
8	133.553	61.925
9	135.281	62.932
10	136.965	64.010
11	138.603	65.158
12	140.192	66.373
13	141.728	67.653
14	143.210	68.997
15	144.634	70.401
16	145.999	71.863
17	147.301	73.381
18	148.168	74.480

Circle Center At X = 110.319 ; Y = 103.751 ; and Radius = 47.847

Factor of Safety

*** 0.961 ***

Failure Surface Specified By 29 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	109.833	43.359
2	111.564	44.361
3	113.287	45.376
4	115.003	46.404
5	116.711	47.445
6	118.411	48.499
7	120.103	49.565

8	121.787	50.644
9	123.463	51.736
10	125.130	52.840
11	126.789	53.956
12	128.440	55.085
13	130.083	56.227
14	131.716	57.381
15	133.341	58.546
16	134.957	59.725
17	136.565	60.915
18	138.163	62.117
19	139.752	63.331
20	141.333	64.557
21	142.903	65.795
22	144.465	67.045
23	146.017	68.306
24	147.560	69.579
25	149.093	70.863
26	150.616	72.159
27	152.130	73.467
28	153.633	74.785
29	153.654	74.803

Circle Center At X = -22.861 ; Y = 274.537 ; and Radius = 266.554

Factor of Safety

*** 0.974 ***

Failure Surface Specified By 26 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	113.389	47.188
2	115.283	47.829
3	117.162	48.516
4	119.023	49.248
5	120.866	50.024
6	122.690	50.845
7	124.494	51.709
8	126.276	52.616
9	128.036	53.566
10	129.773	54.558
11	131.485	55.592
12	133.172	56.666
13	134.833	57.780
14	136.466	58.935
15	138.071	60.128
16	139.647	61.359
17	141.193	62.628
18	142.708	63.934
19	144.191	65.276
20	145.641	66.653
21	147.058	68.065
22	148.441	69.510
23	149.788	70.988
24	151.099	72.498
25	152.374	74.039
26	152.942	74.761

Circle Center At X = 87.704 ; Y = 126.189 ; and Radius = 83.071

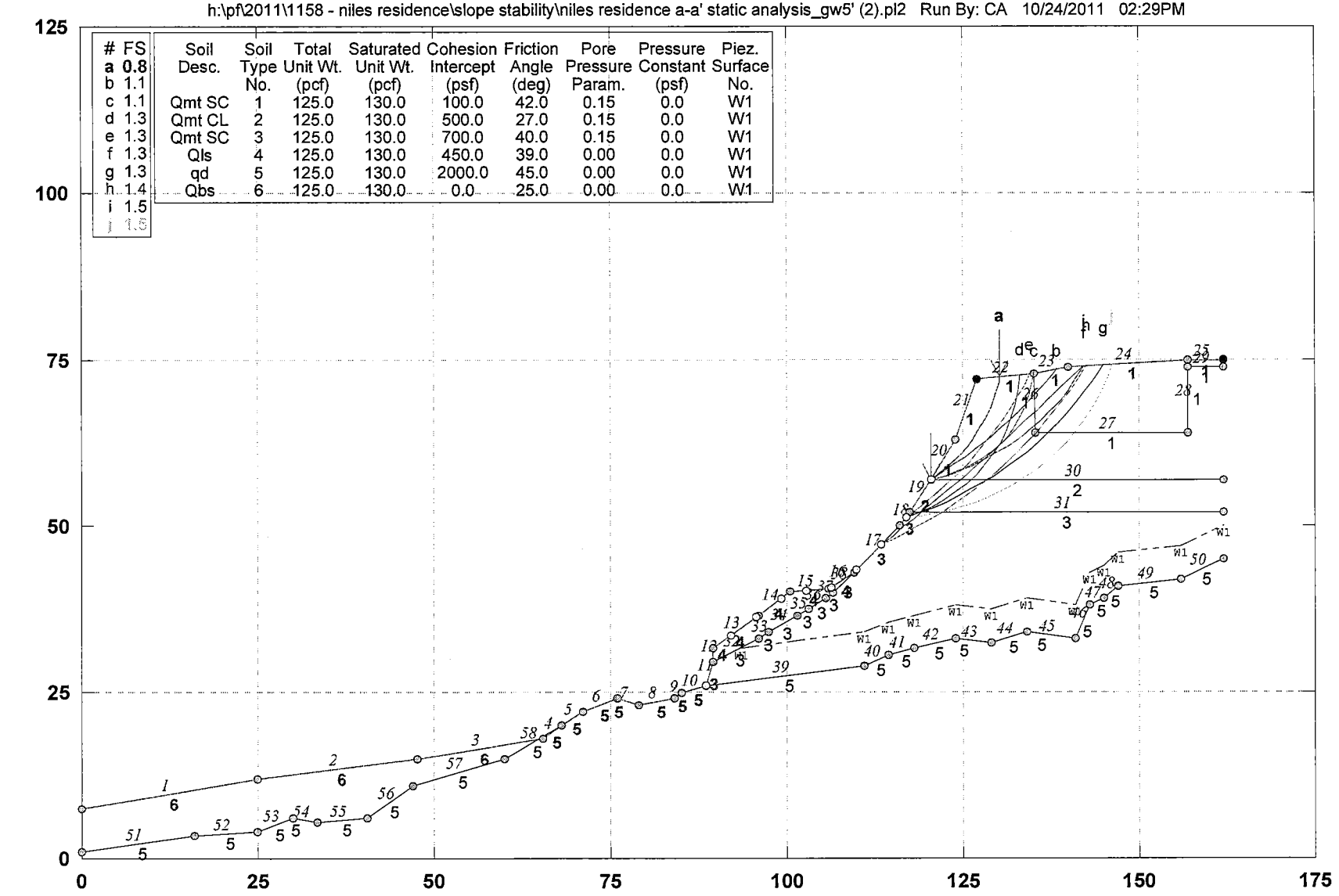
Factor of Safety

*** 0.979 ***

**** END OF GSTABL7 OUTPUT ****

Existing Bluff - Static Analysis Cross Section A-A'

h:\pf\2011\1158 - niles residence\slope stability\niles residence a-a' static analysis_gw5' (2).pl2 Run By: CA 10/24/2011 02:29PM



#	FS
a	0.8
b	1.1
c	1.1
d	1.3
e	1.3
f	1.3
g	1.3
h	1.4
i	1.5
j	1.5

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Qmt SC	1	125.0	130.0	100.0	42.0	0.15	0.0	W1
Qmt CL	2	125.0	130.0	500.0	27.0	0.15	0.0	W1
Qmt SC	3	125.0	130.0	700.0	40.0	0.15	0.0	W1
Qls	4	125.0	130.0	450.0	39.0	0.00	0.0	W1
qd	5	125.0	130.0	2000.0	45.0	0.00	0.0	W1
Qbs	6	125.0	130.0	0.0	25.0	0.00	0.0	W1

GSTABL7 v.2 FSmin=0.8

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

*** GSTABL7 ***
** GSTABL7 by Garry H. Gregory, P.E. **
** Original Version 1.0, January 1996; Current Version 2.005, Sept. 2006 **

****
SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.
****

Analysis Run Date: 10/24/2011
Time of Run: 02:40PM
Run By: CA
Input Data Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a' static analysis_gw5' (2).in
Output Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a' static analysis_gw5' (2).OUT
Unit System: English
Plotted Output Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a' static analysis_gw5' (2).PLT
PROBLEM DESCRIPTION: Existing Bluff - Static Analysis
Cross Section A-A'

BOUNDARY COORDINATES
25 Top Boundaries
58 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	7.50	24.90	12.00	6
2	24.90	12.00	47.50	15.00	6
3	47.50	15.00	65.50	18.00	6
4	65.50	18.00	68.00	20.00	5
5	68.00	20.00	71.10	22.10	5
6	71.10	22.10	76.00	24.00	5
7	76.00	24.00	79.00	23.00	5
8	79.00	23.00	84.00	24.00	5
9	84.00	24.00	85.00	25.00	5
10	85.00	25.00	88.50	26.00	5
11	88.50	26.00	89.50	29.50	3
12	89.50	29.50	89.50	31.50	4
13	89.50	31.50	95.90	36.50	4
14	95.90	36.50	100.50	40.00	4
15	100.50	40.00	106.00	40.50	4
16	106.00	40.50	109.50	43.00	4
17	109.50	43.00	116.00	50.00	3
18	116.00	50.00	117.50	52.00	3
19	117.50	52.00	120.50	57.00	2
20	120.50	57.00	124.00	63.00	1
21	124.00	63.00	127.00	72.00	1
22	127.00	72.00	135.00	73.00	1
23	135.00	73.00	140.00	74.00	1
24	140.00	74.00	157.00	75.00	1
25	157.00	75.00	162.00	75.00	1
26	135.00	73.00	135.25	64.00	1
27	135.25	64.00	156.90	64.00	1
28	156.90	64.00	156.99	74.00	1
29	156.99	74.00	161.90	74.00	1
30	120.50	57.00	162.00	57.00	2
31	117.50	52.00	162.00	52.00	3
32	89.50	29.50	96.00	33.00	3
33	96.00	33.00	97.50	34.00	3
34	97.50	34.00	101.50	36.50	3
35	101.50	36.50	103.00	37.50	3
36	103.00	37.50	105.50	39.00	3
37	105.50	39.00	106.50	39.90	3
38	106.50	39.90	109.50	43.00	3
39	88.50	26.00	111.00	29.00	5
40	111.00	29.00	114.50	30.50	5

41	114.50	30.50	118.00	31.50	5
42	118.00	31.50	124.00	33.00	5
43	124.00	33.00	129.00	32.50	5
44	129.00	32.50	134.00	34.00	5
45	134.00	34.00	141.00	33.00	5
46	141.00	33.00	143.00	38.00	5
47	143.00	38.00	145.00	39.00	5
48	145.00	39.00	147.00	41.00	5
49	147.00	41.00	156.00	42.00	5
50	156.00	42.00	162.00	45.00	5
51	0.00	1.00	16.00	3.50	5
52	16.00	3.50	25.00	4.00	5
53	25.00	4.00	30.00	6.00	5
54	30.00	6.00	33.50	5.50	5
55	33.50	5.50	40.50	6.00	5
56	40.50	6.00	47.00	11.00	5
57	47.00	11.00	60.00	15.00	5
58	60.00	15.00	68.00	20.00	5

Default Y-Origin = 0.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)
ISOTROPIC SOIL PARAMETERS
6 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	125.0	130.0	100.0	42.0	0.15	0.0	1
2	125.0	130.0	500.0	27.0	0.15	0.0	1
3	125.0	130.0	700.0	40.0	0.15	0.0	1
4	125.0	130.0	450.0	39.0	0.00	0.0	1
5	125.0	130.0	2000.0	45.0	0.00	0.0	1
6	125.0	130.0	0.0	25.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 13 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	93.50	31.50
2	111.00	34.00
3	114.50	35.50
4	118.00	36.50
5	124.00	38.00
6	129.00	37.50
7	134.00	39.00
8	141.00	38.00
9	143.00	43.00
10	145.00	44.00
11	147.00	46.00
12	156.00	47.00
13	162.00	50.00

Specified Peak Ground Acceleration Coefficient (A) = 0.338(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.278(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000
EARTHQUAKE DATA HAS BEEN SUPPRESSED
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
100 Trial Surfaces Have Been Generated.
10 Surface(s) Initiate(s) From Each Of 10 Points Equally Spaced
Along The Ground Surface Between X = 88.50(ft)
and X = 120.50(ft)
Each Surface Terminates Between X = 127.00(ft)
and X = 162.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
2.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.

* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 100
Number of Trial Surfaces With Valid FS = 100
Statistical Data On All Valid FS Values:
FS Max = 4.716 FS Min = 0.812 FS Ave = 2.138
Standard Deviation = 0.607 Coefficient of Variation = 28.38 %
Failure Surface Specified By 11 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	120.500	57.000
2	122.081	58.225
3	123.554	59.577
4	124.911	61.047
5	126.140	62.625
6	127.234	64.299
7	128.186	66.058
8	128.988	67.890
9	129.635	69.783
10	130.122	71.723
11	130.235	72.404

Circle Center At X = 106.563 ; Y = 76.615 ; and Radius = 24.062
Factor of Safety
*** 0.812 ***
Individual data on the 12 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	1.6	146.7	0.0	27.8	0.	0.	0.0	0.0	0.0
2	1.5	381.6	0.0	77.7	0.	0.	0.0	0.0	0.0
3	0.4	155.9	0.0	34.5	0.	0.	0.0	0.0	0.0
4	0.9	433.9	0.0	96.0	0.	0.	0.0	0.0	0.0
5	1.2	882.1	0.0	215.2	0.	0.	0.0	0.0	0.0
6	0.9	798.4	0.0	218.9	0.	0.	0.0	0.0	0.0
7	0.2	231.1	0.0	63.4	0.	0.	0.0	0.0	0.0
8	1.0	821.8	0.0	259.1	0.	0.	0.0	0.0	0.0
9	0.8	523.7	0.0	195.9	0.	0.	0.0	0.0	0.0
10	0.6	279.2	0.0	129.5	0.	0.	0.0	0.0	0.0
11	0.5	98.0	0.0	60.3	0.	0.	0.0	0.0	0.0
12	0.1	4.7	0.0	4.3	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 14 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	120.500	57.000
2	122.172	58.097
3	123.811	59.244
4	125.414	60.440
5	126.980	61.684
6	128.508	62.975
7	129.996	64.311
8	131.443	65.692
9	132.847	67.115
10	134.208	68.581
11	135.524	70.087
12	136.794	71.632
13	138.017	73.215
14	138.347	73.669

Circle Center At X = 85.148 ; Y = 112.737 ; and Radius = 66.003
Factor of Safety
*** 1.062 ***
Failure Surface Specified By 13 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	120.500	57.000
2	122.440	57.486
3	124.315	58.182
4	126.102	59.080
5	127.779	60.169
6	129.326	61.437
7	130.725	62.867

8	131.957	64.442
9	133.008	66.143
10	133.866	67.950
11	134.520	69.840
12	134.961	71.791
13	135.100	73.020

Circle Center At X = 117.073 ; Y = 74.816 ; and Radius = 18.142

Factor of Safety

*** 1.138 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	116.944	51.259
2	118.817	51.962
3	120.622	52.823
4	122.347	53.835
5	123.978	54.993
6	125.504	56.286
7	126.913	57.705
8	128.194	59.241
9	129.339	60.881
10	130.339	62.613
11	131.186	64.425
12	131.874	66.302
13	132.399	68.232
14	132.755	70.200
15	132.942	72.192
16	132.946	72.743

Circle Center At X = 109.750 ; Y = 73.318 ; and Radius = 23.203

Factor of Safety

*** 1.291 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	116.944	51.259
2	118.521	52.489
3	120.055	53.773
4	121.543	55.109
5	122.985	56.496
6	124.377	57.931
7	125.720	59.414
8	127.010	60.942
9	128.246	62.514
10	129.428	64.127
11	130.553	65.781
12	131.621	67.472
13	132.629	69.199
14	133.577	70.960
15	134.464	72.753
16	134.551	72.944

Circle Center At X = 82.161 ; Y = 97.491 ; and Radius = 57.856

Factor of Safety

*** 1.301 ***

Failure Surface Specified By 16 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	120.500	57.000
2	122.421	57.556
3	124.306	58.224
4	126.149	59.001
5	127.944	59.883
6	129.684	60.870
7	131.363	61.956
8	132.976	63.138
9	134.517	64.413
10	135.981	65.776
11	137.363	67.221
12	138.659	68.745
13	139.863	70.342
14	140.971	72.007

15	141.981	73.734
16	142.182	74.128

Circle Center At X = 111.971 ; Y = 90.082 ; and Radius = 34.164

Factor of Safety

*** 1.335 ***

Failure Surface Specified By 20 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	116.944	51.259
2	118.824	51.944
3	120.675	52.700
4	122.496	53.528
5	124.283	54.425
6	126.035	55.391
7	127.747	56.424
8	129.419	57.521
9	131.047	58.683
10	132.629	59.907
11	134.163	61.191
12	135.645	62.533
13	137.075	63.931
14	138.450	65.384
15	139.767	66.889
16	141.026	68.443
17	142.223	70.045
18	143.358	71.692
19	144.428	73.382
20	144.957	74.292

Circle Center At X = 100.204 ; Y = 100.170 ; and Radius = 51.696

Factor of Safety

*** 1.341 ***

Failure Surface Specified By 22 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	113.389	47.188
2	115.188	48.062
3	116.959	48.992
4	118.700	49.975
5	120.411	51.011
6	122.089	52.100
7	123.732	53.240
8	125.340	54.429
9	126.910	55.668
10	128.441	56.954
11	129.933	58.287
12	131.382	59.665
13	132.788	61.087
14	134.150	62.552
15	135.466	64.058
16	136.735	65.604
17	137.956	67.188
18	139.128	68.809
19	140.249	70.465
20	141.319	72.155
21	142.336	73.877
22	142.484	74.146

Circle Center At X = 85.909 ; Y = 106.027 ; and Radius = 64.940

Factor of Safety

*** 1.367 ***

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	113.389	47.188
2	114.925	48.469
3	116.453	49.759
4	117.974	51.058
5	119.486	52.367
6	120.990	53.685
7	122.486	55.012
8	123.974	56.349

9	125.454	57.695
10	126.925	59.049
11	128.388	60.413
12	129.843	61.786
13	131.289	63.167
14	132.726	64.558
15	134.155	65.957
16	135.576	67.365
17	136.988	68.782
18	138.390	70.207
19	139.785	71.641
20	141.170	73.084
21	142.160	74.127

Circle Center At X = -94.069 ; Y = 297.600 ; and Radius = 325.185

Factor of Safety

*** 1.515 ***

Failure Surface Specified By 21 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	116.944	51.259
2	118.934	51.461
3	120.908	51.782
4	122.859	52.222
5	124.781	52.777
6	126.665	53.447
7	128.506	54.230
8	130.296	55.121
9	132.030	56.119
10	133.700	57.219
11	135.301	58.417
12	136.827	59.710
13	138.273	61.091
14	139.633	62.558
15	140.903	64.103
16	142.077	65.722
17	143.152	67.409
18	144.124	69.157
19	144.989	70.960
20	145.743	72.812
21	146.271	74.369

Circle Center At X = 114.584 ; Y = 84.430 ; and Radius = 33.255

Factor of Safety

*** 1.520 ***

**** END OF GSTABL7 OUTPUT ****

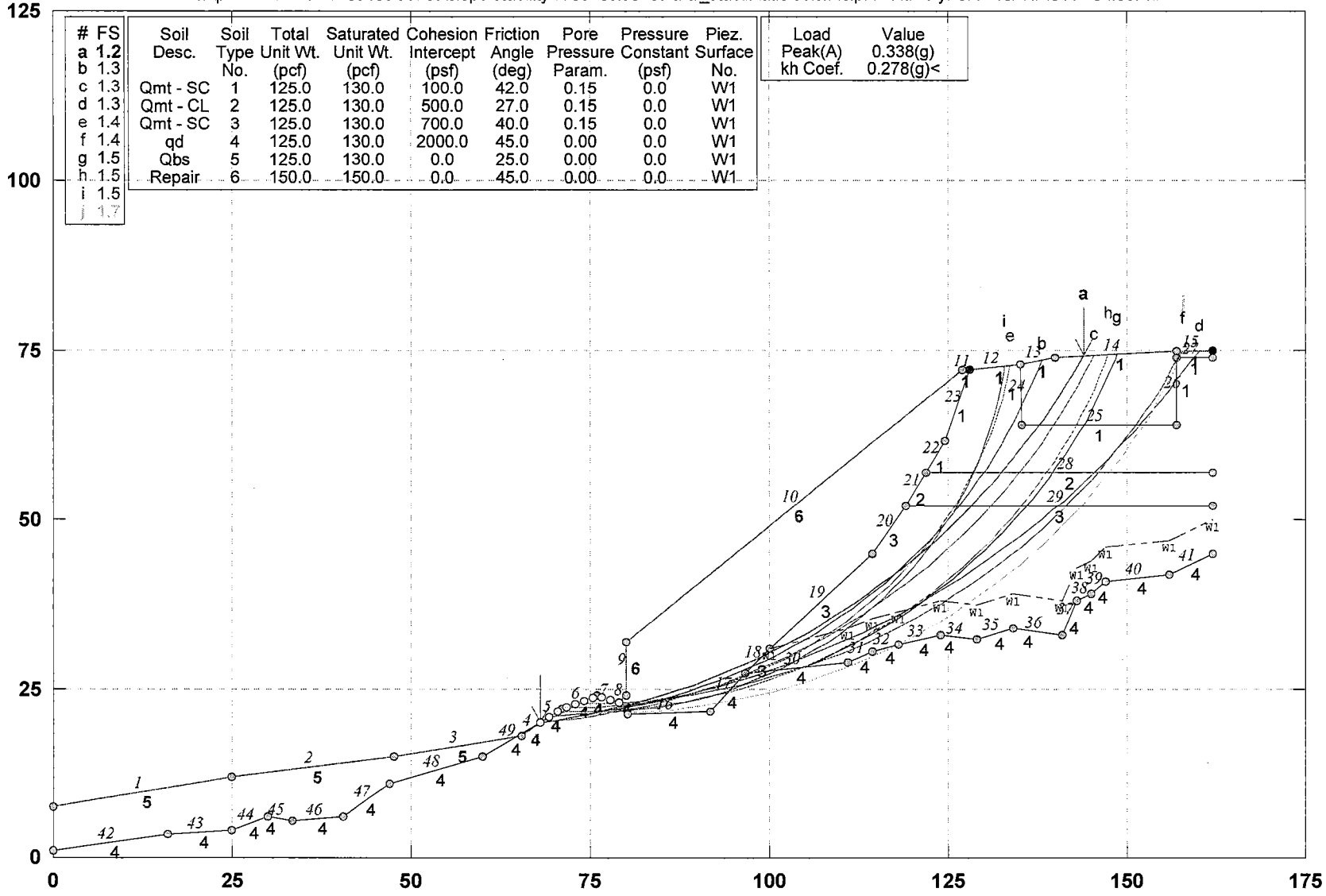
Stabilized Bluff Pseudostatic Analysis Cross Section A-A'

h:\pf\2011\1158 - niles residence\slope stability\niles residence a-a'_stabilizatio seismic.pl2 Run By: CA 10/24/2011 02:35PM

#	FS
a	1.2
b	1.3
c	1.3
d	1.3
e	1.4
f	1.4
g	1.5
h	1.5
i	1.5
j	1.7

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Qmt - SC	1	125.0	130.0	100.0	42.0	0.15	0.0	W1
Qmt - CL	2	125.0	130.0	500.0	27.0	0.15	0.0	W1
Qmt - SC	3	125.0	130.0	700.0	40.0	0.15	0.0	W1
qd	4	125.0	130.0	2000.0	45.0	0.00	0.0	W1
Qbs	5	125.0	130.0	0.0	25.0	0.00	0.0	W1
Repair	6	150.0	150.0	0.0	45.0	0.00	0.0	W1

Load	Value
Peak(A)	0.338(g)
kh Coef.	0.278(g)<



GSTABL7 v.2 FSmin=1.2

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

*** GSTABL7 ***
** GSTABL7 by Garry H. Gregory, P.E. **
** Original Version 1.0, January 1996; Current Version 2.005, Sept. 2006 **

SLOPE STABILITY ANALYSIS SYSTEM
Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

Analysis Run Date: 10/24/2011
Time of Run: 02:35PM
Run By: CA
Input Data Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a'_stabilizatio seismic.in
Output Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a'_stabilizatio seismic.OUT
Unit System: English
Plotted Output Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a'_stabilizatio seismic.PLT
PROBLEM DESCRIPTION: Stabilized Bluff Pseudostatic Analysis
Cross Section A-A'

BOUNDARY COORDINATES
15 Top Boundaries
49 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	7.50	24.90	12.00	5
2	24.90	12.00	47.50	15.00	5
3	47.50	15.00	65.50	18.00	5
4	65.50	18.00	68.00	20.00	4
5	68.00	20.00	71.10	22.10	4
6	71.10	22.10	76.00	24.00	4
7	76.00	24.00	79.00	23.00	4
8	79.00	23.00	80.00	24.00	4
9	80.00	24.00	80.01	32.00	6
10	80.01	32.00	127.00	72.00	6
11	127.00	72.00	128.00	72.10	1
12	128.00	72.10	135.00	73.00	1
13	135.00	73.00	140.00	74.00	1
14	140.00	74.00	157.00	75.00	1
15	157.00	75.00	162.00	75.00	1
16	80.10	21.25	91.75	21.75	4
17	91.75	21.75	96.50	27.25	4
18	96.50	27.25	100.00	31.00	3
19	100.00	31.00	114.50	45.00	3
20	114.50	45.00	119.00	52.00	3
21	119.00	52.00	122.00	57.00	2
22	122.00	57.00	124.50	61.50	1
23	124.50	61.50	128.00	72.10	1
24	135.00	73.00	135.25	64.00	1
25	135.25	64.00	156.90	64.00	1
26	156.90	64.00	156.99	74.00	1
27	156.99	74.00	161.90	74.00	1
28	122.00	57.00	162.00	57.00	2
29	119.00	52.00	162.00	52.00	3
30	96.50	27.25	111.00	29.00	4
31	111.00	29.00	114.50	30.50	4
32	114.50	30.50	118.00	31.50	4
33	118.00	31.50	124.00	33.00	4
34	124.00	33.00	129.00	32.50	4
35	129.00	32.50	134.00	34.00	4
36	134.00	34.00	141.00	33.00	4
37	141.00	33.00	143.00	38.00	4
38	143.00	38.00	145.00	39.00	4
39	145.00	39.00	147.00	41.00	4
40	147.00	41.00	156.00	42.00	4

41	156.00	42.00	162.00	45.00	4
42	0.00	1.00	16.00	3.50	4
43	16.00	3.50	25.00	4.00	4
44	25.00	4.00	30.00	6.00	4
45	30.00	6.00	33.50	5.50	4
46	33.50	5.50	40.50	6.00	4
47	40.50	6.00	47.00	11.00	4
48	47.00	11.00	60.00	15.00	4
49	60.00	15.00	68.00	20.00	4

Default Y-Origin = 0.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)
ISOTROPIC SOIL PARAMETERS
6 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	125.0	130.0	100.0	42.0	0.15	0.0	1
2	125.0	130.0	500.0	27.0	0.15	0.0	1
3	125.0	130.0	700.0	40.0	0.15	0.0	1
4	125.0	130.0	2000.0	45.0	0.00	0.0	1
5	125.0	130.0	0.0	25.0	0.00	0.0	1
6	150.0	150.0	0.0	45.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 13 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	100.00	31.00
2	111.00	34.00
3	114.50	35.50
4	118.00	36.50
5	124.00	38.00
6	129.00	37.50
7	134.00	39.00
8	141.00	38.00
9	143.00	43.00
10	145.00	44.00
11	147.00	46.00
12	156.00	47.00
13	162.00	50.00

Specified Peak Ground Acceleration Coefficient (A) = 0.338(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.278(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
100 Trial Surfaces Have Been Generated.
10 Surface(s) Initiate(s) From Each Of 10 Points Equally Spaced
Along The Ground Surface Between X = 68.00(ft)
and X = 79.00(ft)
Each Surface Terminates Between X = 128.00(ft)
and X = 162.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
2.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 100
Number of Trial Surfaces With Valid FS = 100
Statistical Data On All Valid FS Values:
FS Max = 2.918 FS Min = 1.219 FS Ave = 2.433
Standard Deviation = 0.482 Coefficient of Variation = 19.79 %
Failure Surface Specified By 50 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	68.000	20.000

2	69.974	20.322
3	71.941	20.682
4	73.901	21.079
5	75.853	21.515
6	77.796	21.989
7	79.730	22.500
8	81.653	23.048
9	83.566	23.634
10	85.466	24.256
11	87.355	24.915
12	89.230	25.611
13	91.091	26.342
14	92.938	27.110
15	94.770	27.913
16	96.585	28.752
17	98.385	29.625
18	100.166	30.534
19	101.930	31.476
20	103.676	32.453
21	105.402	33.463
22	107.108	34.506
23	108.794	35.582
24	110.459	36.691
25	112.101	37.832
26	113.722	39.004
27	115.319	40.207
28	116.893	41.441
29	118.443	42.706
30	119.968	44.000
31	121.467	45.323
32	122.941	46.676
33	124.388	48.056
34	125.808	49.464
35	127.201	50.900
36	128.565	52.362
37	129.901	53.850
38	131.208	55.364
39	132.486	56.903
40	133.733	58.467
41	134.950	60.054
42	136.136	61.664
43	137.290	63.297
44	138.413	64.953
45	139.503	66.629
46	140.561	68.327
47	141.585	70.044
48	142.577	71.781
49	143.534	73.537
50	143.894	74.229

Circle Center At X = 52.381 ; Y = 122.080 ; and Radius = 103.268

Factor of Safety

*** 1.219 ***

Individual data on the 69 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	2.0	125.3	0.0	0.0	0.	0.	34.8	0.0	0.0
2	1.1	182.1	0.0	0.0	0.	0.	50.6	0.0	0.0
3	0.8	174.4	0.0	0.0	0.	0.	48.5	0.0	0.0
4	2.0	471.8	0.0	0.0	0.	0.	131.2	0.0	0.0
5	2.0	553.2	0.0	0.0	0.	0.	153.8	0.0	0.0
6	0.1	44.7	0.0	0.0	0.	0.	12.4	0.0	0.0
7	1.8	433.6	0.0	0.0	0.	0.	120.5	0.0	0.0
8	1.2	158.4	0.0	0.0	0.	0.	44.0	0.0	0.0
9	0.7	87.8	0.0	0.0	0.	0.	24.4	0.0	0.0
10	0.3	44.8	0.0	0.0	0.	0.	12.4	0.0	0.0
11	0.0	8.1	0.0	0.0	0.	0.	2.3	0.0	0.0
12	1.6	2436.9	0.0	0.0	0.	0.	677.5	0.0	0.0
13	1.9	3118.7	0.0	0.0	0.	0.	867.0	0.0	0.0

14	1.9	3390.1	0.0	0.0	0.	0.	942.5	0.0	0.0
15	1.9	3643.3	0.0	0.0	0.	0.	1012.8	0.0	0.0
16	1.9	3878.0	0.0	0.0	0.	0.	1078.1	0.0	0.0
17	1.9	4094.2	0.0	0.0	0.	0.	1138.2	0.0	0.0
18	1.8	4291.8	0.0	0.0	0.	0.	1193.1	0.0	0.0
19	1.8	4470.9	0.0	0.0	0.	0.	1242.9	0.0	0.0
20	1.8	4631.3	0.0	0.0	0.	0.	1287.5	0.0	0.0
21	1.8	4773.2	0.0	0.0	0.	0.	1326.9	0.0	0.0
22	0.6	1723.8	0.0	0.0	0.	0.	479.2	0.0	0.0
23	1.0	2701.8	0.0	454.9	0.	0.	751.1	0.0	0.0
24	0.2	461.8	0.0	77.7	0.	0.	128.4	0.0	0.0
25	1.8	4957.5	0.0	843.1	0.	0.	1378.2	0.0	0.0
26	0.2	499.9	0.0	85.9	0.	0.	139.0	0.0	0.0
27	1.6	4513.2	0.0	775.7	0.	0.	1254.7	0.0	0.0
28	1.7	5053.7	0.0	878.3	0.	0.	1404.9	0.0	0.0
29	1.7	5079.8	0.0	893.1	0.	0.	1412.2	0.0	0.0
30	1.7	5091.4	0.0	906.1	0.	0.	1415.4	0.0	0.0
31	1.7	5088.9	0.0	917.1	0.	0.	1414.7	0.0	0.0
32	1.6	5072.7	0.0	926.3	0.	0.	1410.2	0.0	0.0
33	1.6	5043.1	0.0	933.7	0.	0.	1402.0	0.0	0.0
34	0.8	2432.9	0.0	456.9	0.	0.	676.4	0.0	0.0
35	0.8	2562.6	0.0	481.3	0.	0.	712.4	0.0	0.0
36	1.6	4908.0	0.0	935.5	0.	0.	1364.4	0.0	0.0
37	1.5	4805.4	0.0	930.3	0.	0.	1335.9	0.0	0.0
38	0.6	1719.7	0.0	338.3	0.	0.	478.1	0.0	0.0
39	1.0	2971.9	0.0	584.7	0.	0.	826.2	0.0	0.0
40	1.5	4563.8	0.0	913.1	0.	0.	1268.7	0.0	0.0
41	0.5	1608.1	0.0	327.4	0.	0.	447.0	0.0	0.0
42	0.9	2817.4	0.0	573.6	0.	0.	783.2	0.0	0.0
43	1.4	4274.1	0.0	886.0	0.	0.	1188.2	0.0	0.0
44	0.1	327.9	0.0	69.3	0.	0.	91.2	0.0	0.0
45	1.3	3761.0	0.0	794.5	0.	0.	1045.6	0.0	0.0
46	1.2	3316.5	0.0	714.4	0.	0.	922.0	0.0	0.0
47	0.2	532.1	0.0	114.6	0.	0.	147.9	0.0	0.0
48	0.8	2071.5	0.0	455.4	0.	0.	575.9	0.0	0.0
49	0.2	575.2	0.0	126.5	0.	0.	159.9	0.0	0.0
50	0.3	843.3	0.0	185.4	0.	0.	234.4	0.0	0.0
51	1.3	3198.4	0.0	718.2	0.	0.	889.2	0.0	0.0
52	1.3	2911.4	0.0	668.3	0.	0.	809.4	0.0	0.0
53	1.3	2628.3	0.0	617.3	0.	0.	730.7	0.0	0.0
54	0.1	151.9	0.0	36.5	0.	0.	42.2	0.0	0.0
55	1.2	2198.1	0.0	528.7	0.	0.	611.1	0.0	0.0
56	1.2	2077.0	0.0	512.1	0.	0.	577.4	0.0	0.0
57	0.1	81.1	0.0	20.5	0.	0.	22.6	0.0	0.0
58	0.2	397.9	0.0	100.7	0.	0.	110.6	0.0	0.0
59	0.9	1336.8	0.0	338.2	0.	0.	371.6	0.0	0.0
60	1.2	1567.4	0.0	407.3	0.	0.	435.7	0.0	0.0
61	0.5	587.1	0.0	156.9	0.	0.	163.2	0.0	0.0
62	0.6	738.3	0.0	197.3	0.	0.	205.2	0.0	0.0
63	1.1	1090.5	0.0	300.0	0.	0.	303.2	0.0	0.0
64	0.5	430.0	0.0	122.0	0.	0.	119.5	0.0	0.0
65	0.6	430.4	0.0	122.1	0.	0.	119.6	0.0	0.0
66	1.0	624.7	0.0	182.9	0.	0.	173.7	0.0	0.0
67	1.0	397.7	0.0	120.4	0.	0.	110.6	0.0	0.0
68	1.0	181.9	0.0	57.0	0.	0.	50.6	0.0	0.0
69	0.4	15.1	0.0	4.9	0.	0.	4.2	0.0	0.0

Failure Surface Specified By 47 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	69.222	20.828
2	71.215	20.996
3	73.203	21.215
4	75.185	21.485
5	77.159	21.804
6	79.125	22.174
7	81.080	22.593
8	83.025	23.062
9	84.956	23.580
10	86.874	24.146
11	88.777	24.762

12	90.664	25.425
13	92.533	26.136
14	94.384	26.894
15	96.215	27.699
16	98.025	28.551
17	99.812	29.448
18	101.577	30.389
19	103.317	31.376
20	105.031	32.406
21	106.718	33.480
22	108.378	34.595
23	110.009	35.753
24	111.610	36.952
25	113.180	38.191
26	114.718	39.469
27	116.223	40.786
28	117.695	42.141
29	119.131	43.532
30	120.532	44.960
31	121.896	46.423
32	123.222	47.920
33	124.510	49.450
34	125.759	51.012
35	126.968	52.605
36	128.135	54.229
37	129.262	55.882
38	130.346	57.562
39	131.387	59.270
40	132.384	61.004
41	133.337	62.762
42	134.245	64.544
43	135.108	66.349
44	135.924	68.174
45	136.694	70.020
46	137.417	71.885
47	138.034	73.607

Circle Center At X = 63.584 ; Y = 99.430 ; and Radius = 78.804

Factor of Safety

*** 1.260 ***

Failure Surface Specified By 51 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	68.000	20.000
2	69.991	20.192
3	71.977	20.427
4	73.958	20.704
5	75.932	21.022
6	77.899	21.383
7	79.858	21.785
8	81.809	22.229
9	83.749	22.714
10	85.678	23.241
11	87.596	23.808
12	89.502	24.416
13	91.394	25.064
14	93.271	25.752
15	95.134	26.481
16	96.981	27.248
17	98.811	28.055
18	100.624	28.900
19	102.418	29.784
20	104.193	30.705
21	105.948	31.664
22	107.682	32.660
23	109.395	33.693
24	111.085	34.762
25	112.753	35.867
26	114.396	37.007
27	116.015	38.181
28	117.608	39.390

29	119.176	40.632
30	120.717	41.907
31	122.230	43.215
32	123.715	44.554
33	125.171	45.925
34	126.598	47.327
35	127.995	48.758
36	129.361	50.219
37	130.695	51.709
38	131.998	53.226
39	133.268	54.771
40	134.505	56.343
41	135.708	57.940
42	136.877	59.563
43	138.012	61.210
44	139.111	62.881
45	140.174	64.575
46	141.201	66.291
47	142.192	68.029
48	143.145	69.787
49	144.061	71.565
50	144.938	73.362
51	145.379	74.316

Circle Center At X = 59.949 ; Y = 113.754 ; and Radius = 94.099

Factor of Safety

*** 1.261 ***

Failure Surface Specified By 56 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	69.222	20.828
2	71.212	21.030
3	73.198	21.264
4	75.180	21.530
5	77.158	21.829
6	79.131	22.159
7	81.097	22.522
8	83.058	22.916
9	85.012	23.343
10	86.959	23.801
11	88.898	24.291
12	90.829	24.812
13	92.751	25.364
14	94.664	25.948
15	96.567	26.563
16	98.460	27.209
17	100.342	27.885
18	102.213	28.592
19	104.072	29.329
20	105.919	30.096
21	107.754	30.893
22	109.575	31.720
23	111.382	32.577
24	113.175	33.462
25	114.954	34.377
26	116.717	35.321
27	118.465	36.293
28	120.197	37.293
29	121.912	38.322
30	123.611	39.378
31	125.292	40.462
32	126.955	41.572
33	128.599	42.710
34	130.226	43.875
35	131.833	45.065
36	133.420	46.282
37	134.987	47.524
38	136.534	48.792
39	138.061	50.084
40	139.566	51.401
41	141.049	52.743

42	142.510	54.108
43	143.949	55.497
44	145.365	56.910
45	146.758	58.345
46	148.128	59.802
47	149.474	61.282
48	150.795	62.783
49	152.092	64.306
50	153.364	65.849
51	154.610	67.413
52	155.831	68.997
53	157.026	70.601
54	158.195	72.224
55	159.337	73.866
56	160.099	75.000

Circle Center At X = 57.818 ; Y = 143.271 ; and Radius = 122.973

Factor of Safety

*** 1.291 ***

Failure Surface Specified By 45 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	71.667	22.320
2	73.667	22.298
3	75.666	22.342
4	77.663	22.451
5	79.656	22.625
6	81.641	22.864
7	83.618	23.168
8	85.584	23.536
9	87.537	23.968
10	89.474	24.463
11	91.395	25.021
12	93.296	25.642
13	95.176	26.325
14	97.033	27.068
15	98.864	27.872
16	100.668	28.735
17	102.443	29.656
18	104.188	30.635
19	105.899	31.670
20	107.575	32.761
21	109.215	33.905
22	110.817	35.103
23	112.379	36.352
24	113.899	37.651
25	115.377	39.000
26	116.809	40.396
27	118.195	41.838
28	119.533	43.324
29	120.822	44.853
30	122.061	46.423
31	123.247	48.033
32	124.381	49.681
33	125.460	51.365
34	126.483	53.084
35	127.450	54.834
36	128.359	56.616
37	129.210	58.426
38	130.001	60.263
39	130.732	62.124
40	131.401	64.009
41	132.009	65.914
42	132.554	67.839
43	133.036	69.780
44	133.455	71.735
45	133.651	72.827

Circle Center At X = 73.326 ; Y = 83.582 ; and Radius = 61.285

Factor of Safety

*** 1.352 ***

Failure Surface Specified By 54 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	72.889	22.794
2	74.889	22.813
3	76.888	22.874
4	78.885	22.977
5	80.880	23.123
6	82.871	23.310
7	84.858	23.539
8	86.839	23.810
9	88.815	24.123
10	90.783	24.477
11	92.744	24.873
12	94.695	25.310
13	96.638	25.787
14	98.569	26.306
15	100.489	26.865
16	102.397	27.465
17	104.292	28.104
18	106.174	28.783
19	108.040	29.502
20	109.891	30.260
21	111.725	31.057
22	113.543	31.892
23	115.342	32.765
24	117.122	33.676
25	118.883	34.624
26	120.624	35.609
27	122.343	36.631
28	124.041	37.688
29	125.716	38.781
30	127.367	39.909
31	128.995	41.072
32	130.597	42.269
33	132.174	43.499
34	133.725	44.762
35	135.249	46.057
36	136.745	47.384
37	138.213	48.743
38	139.652	50.132
39	141.061	51.551
40	142.440	52.999
41	143.789	54.476
42	145.106	55.981
43	146.391	57.514
44	147.643	59.073
45	148.863	60.659
46	150.048	62.269
47	151.200	63.904
48	152.316	65.564
49	153.398	67.246
50	154.444	68.951
51	155.454	70.677
52	156.427	72.424
53	157.363	74.192
54	157.770	75.000

Circle Center At X = 72.985 ; Y = 117.743 ; and Radius = 94.949

Factor of Safety

*** 1.409 ***

Failure Surface Specified By 52 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.444	21.656
2	72.444	21.627
3	74.444	21.648
4	76.443	21.717
5	78.439	21.836
6	80.432	22.005
7	82.420	22.222
8	84.403	22.488

9	86.378	22.803
10	88.344	23.166
11	90.302	23.578
12	92.248	24.038
13	94.183	24.545
14	96.104	25.100
15	98.011	25.703
16	99.903	26.352
17	101.778	27.047
18	103.635	27.789
19	105.474	28.576
20	107.293	29.408
21	109.090	30.285
22	110.866	31.205
23	112.618	32.169
24	114.346	33.176
25	116.049	34.225
26	117.725	35.316
27	119.374	36.448
28	120.995	37.620
29	122.586	38.832
30	124.147	40.082
31	125.676	41.371
32	127.174	42.697
33	128.638	44.059
34	130.068	45.457
35	131.464	46.890
36	132.823	48.357
37	134.146	49.857
38	135.432	51.389
39	136.680	52.952
40	137.888	54.545
41	139.057	56.168
42	140.186	57.819
43	141.274	59.497
44	142.320	61.202
45	143.324	62.932
46	144.285	64.686
47	145.202	66.463
48	146.075	68.262
49	146.904	70.082
50	147.688	71.922
51	148.426	73.781
52	148.695	74.511

Circle Center At X = 72.616 ; Y = 102.792 ; and Radius = 81.165

Factor of Safety

*** 1.466 ***

Failure Surface Specified By 51 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.444	21.656
2	72.444	21.620
3	74.444	21.635
4	76.443	21.700
5	78.440	21.816
6	80.433	21.982
7	82.421	22.199
8	84.403	22.466
9	86.378	22.782
10	88.344	23.149
11	90.300	23.565
12	92.245	24.031
13	94.178	24.545
14	96.097	25.108
15	98.001	25.720
16	99.889	26.379
17	101.760	27.086
18	103.613	27.840
19	105.445	28.641
20	107.257	29.488

21	109.047	30.380
22	110.814	31.317
23	112.557	32.298
24	114.274	33.324
25	115.965	34.392
26	117.628	35.503
27	119.263	36.655
28	120.868	37.848
29	122.442	39.082
30	123.985	40.355
31	125.495	41.666
32	126.971	43.015
33	128.413	44.402
34	129.819	45.824
35	131.189	47.281
36	132.521	48.772
37	133.816	50.297
38	135.071	51.854
39	136.287	53.442
40	137.463	55.060
41	138.597	56.707
42	139.688	58.383
43	140.738	60.086
44	141.744	61.814
45	142.706	63.568
46	143.623	65.345
47	144.495	67.145
48	145.321	68.966
49	146.101	70.808
50	146.834	72.669
51	147.481	74.440

Circle Center At X = 72.859 ; Y = 100.742 ; and Radius = 79.123

Factor of Safety

*** 1.469 ***

Failure Surface Specified By 46 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.444	21.656
2	72.441	21.546
3	74.441	21.504
4	76.441	21.531
5	78.439	21.625
6	80.432	21.788
7	82.419	22.018
8	84.396	22.316
9	86.363	22.681
10	88.316	23.113
11	90.253	23.611
12	92.171	24.175
13	94.070	24.804
14	95.946	25.497
15	97.797	26.254
16	99.622	27.073
17	101.417	27.954
18	103.182	28.896
19	104.913	29.897
20	106.609	30.957
21	108.268	32.074
22	109.888	33.247
23	111.468	34.474
24	113.004	35.754
25	114.496	37.086
26	115.942	38.468
27	117.340	39.898
28	118.688	41.376
29	119.985	42.898
30	121.230	44.464
31	122.420	46.071
32	123.555	47.717
33	124.633	49.402

34	125.654	51.122
35	126.615	52.876
36	127.515	54.662
37	128.355	56.477
38	129.132	58.320
39	129.846	60.188
40	130.496	62.080
41	131.081	63.992
42	131.600	65.923
43	132.053	67.871
44	132.440	69.834
45	132.760	71.808
46	132.877	72.727

Circle Center At X = 74.671 ; Y = 80.185 ; and Radius = 58.682

Factor of Safety

*** 1.514 ***

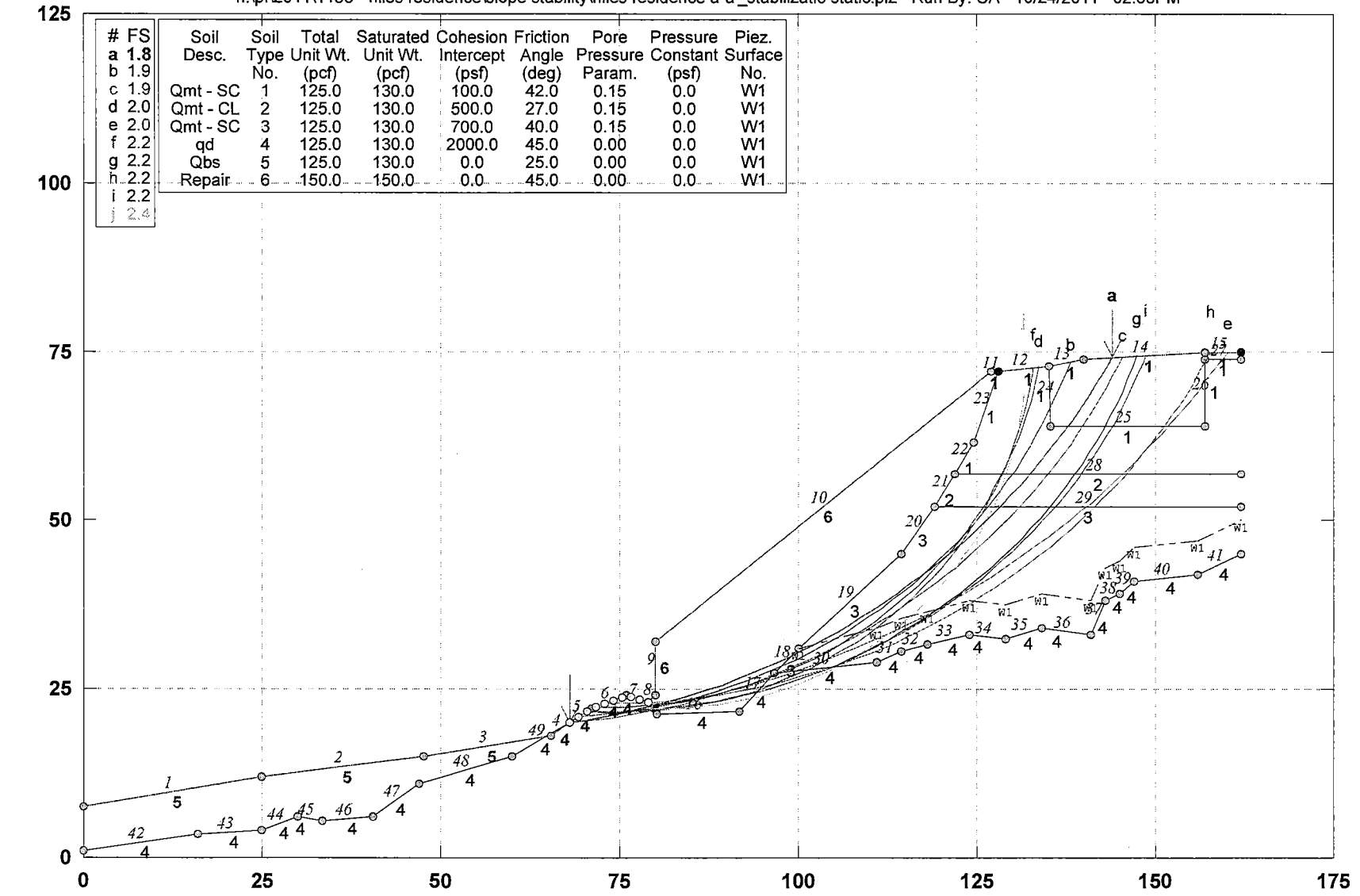
Failure Surface Specified By 56 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.444	21.656
2	72.441	21.535
3	74.439	21.460
4	76.439	21.429
5	78.439	21.444
6	80.438	21.505
7	82.435	21.610
8	84.430	21.761
9	86.420	21.957
10	88.405	22.198
11	90.385	22.484
12	92.357	22.815
13	94.322	23.190
14	96.277	23.610
15	98.223	24.074
16	100.157	24.582
17	102.080	25.134
18	103.989	25.729
19	105.884	26.367
20	107.765	27.048
21	109.630	27.771
22	111.477	28.536
23	113.307	29.343
24	115.118	30.192
25	116.910	31.081
26	118.681	32.010
27	120.430	32.980
28	122.157	33.989
29	123.861	35.036
30	125.540	36.122
31	127.195	37.246
32	128.823	38.407
33	130.425	39.605
34	131.999	40.838
35	133.545	42.107
36	135.062	43.411
37	136.549	44.748
38	138.005	46.119
39	139.430	47.523
40	140.822	48.958
41	142.182	50.425
42	143.508	51.922
43	144.800	53.449
44	146.057	55.005
45	147.278	56.588
46	148.464	58.199
47	149.612	59.837
48	150.723	61.500
49	151.796	63.188
50	152.830	64.899
51	153.826	66.634

```
   52        154.782       68.391
   53        155.698       70.169
   54        156.573       71.967
   55        157.407       73.785
   56        157.932       75.000
Circle Center At X =    76.778 ; Y =   109.683 ; and Radius =    88.254
      Factor of Safety
     ***    1.703   ***
         **** END OF GSTABL7 OUTPUT ****
```

Stabilized Bluff Static Analysis Cross Section A-A'

h:\pf\2011\1158 - niles residence\slope stability\niles residence a-a'_stabilizatio static.pl2 Run By: CA 10/24/2011 02:38PM



#	FS
a	1.8
b	1.9
c	1.9
d	2.0
e	2.0
f	2.2
g	2.2
h	2.2
i	2.2
j	2.4

Soil Desc.	Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
Qmt - SC	1	125.0	130.0	100.0	42.0	0.15	0.0	W1
Qmt - CL	2	125.0	130.0	500.0	27.0	0.15	0.0	W1
Qmt - SC	3	125.0	130.0	700.0	40.0	0.15	0.0	W1
qd	4	125.0	130.0	2000.0	45.0	0.00	0.0	W1
Qbs	5	125.0	130.0	0.0	25.0	0.00	0.0	W1
Repair	6	150.0	150.0	0.0	45.0	0.00	0.0	W1

GSTABL7 v.2 FSmin=1.8

Safety Factors Are Calculated By The Modified Bishop Method

GSTABL7

***** GSTABL7 *****

** GSTABL7 by Garry H. Gregory, P.E. **

** Original Version 1.0, January 1996; Current Version 2.005, Sept. 2006 **

****

SLOPE STABILITY ANALYSIS SYSTEM

Modified Bishop, Simplified Janbu, or GLE Method of Slices.
(Includes Spencer & Morgenstern-Price Type Analysis)
Including Pier/Pile, Reinforcement, Soil Nail, Tieback,
Nonlinear Undrained Shear Strength, Curved Phi Envelope,
Anisotropic Soil, Fiber-Reinforced Soil, Boundary Loads, Water
Surfaces, Pseudo-Static & Newmark Earthquake, and Applied Forces.

****

Analysis Run Date: 10/24/2011
Time of Run: 02:38PM
Run By: CA
Input Data Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a'_stabilizatio static.in
Output Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a'_stabilizatio static.OUT
Unit System: English
Plotted Output Filename: H:\PF\2011\1158 - Niles Residence\Slope Stability\niles residence a-a'_stabilizatio static.PLT
PROBLEM DESCRIPTION: Stabilized Bluff Static Analysis
Cross Section A-A'

BOUNDARY COORDINATES
15 Top Boundaries
49 Total Boundaries

Boundary No.	X-Left (ft)	Y-Left (ft)	X-Right (ft)	Y-Right (ft)	Soil Type Below Bnd
1	0.00	7.50	24.90	12.00	5
2	24.90	12.00	47.50	15.00	5
3	47.50	15.00	65.50	18.00	5
4	65.50	18.00	68.00	20.00	4
5	68.00	20.00	71.10	22.10	4
6	71.10	22.10	76.00	24.00	4
7	76.00	24.00	79.00	23.00	4
8	79.00	23.00	80.00	24.00	4
9	80.00	24.00	80.01	32.00	6
10	80.01	32.00	127.00	72.00	6
11	127.00	72.00	128.00	72.10	1
12	128.00	72.10	135.00	73.00	1
13	135.00	73.00	140.00	74.00	1
14	140.00	74.00	157.00	75.00	1
15	157.00	75.00	162.00	75.00	1
16	80.10	21.25	91.75	21.75	4
17	91.75	21.75	96.50	27.25	4
18	96.50	27.25	100.00	31.00	3
19	100.00	31.00	114.50	45.00	3
20	114.50	45.00	119.00	52.00	3
21	119.00	52.00	122.00	57.00	2
22	122.00	57.00	124.50	61.50	1
23	124.50	61.50	128.00	72.10	1
24	135.00	73.00	135.25	64.00	1
25	135.25	64.00	156.90	64.00	1
26	156.90	64.00	156.99	74.00	1
27	156.99	74.00	161.90	74.00	1
28	122.00	57.00	162.00	57.00	2
29	119.00	52.00	162.00	52.00	3
30	96.50	27.25	111.00	29.00	4
31	111.00	29.00	114.50	30.50	4
32	114.50	30.50	118.00	31.50	4
33	118.00	31.50	124.00	33.00	4
34	124.00	33.00	129.00	32.50	4
35	129.00	32.50	134.00	34.00	4
36	134.00	34.00	141.00	33.00	4
37	141.00	33.00	143.00	38.00	4
38	143.00	38.00	145.00	39.00	4
39	145.00	39.00	147.00	41.00	4
40	147.00	41.00	156.00	42.00	4

41	156.00	42.00	162.00	45.00	4
42	0.00	1.00	16.00	3.50	4
43	16.00	3.50	25.00	4.00	4
44	25.00	4.00	30.00	6.00	4
45	30.00	6.00	33.50	5.50	4
46	33.50	5.50	40.50	6.00	4
47	40.50	6.00	47.00	11.00	4
48	47.00	11.00	60.00	15.00	4
49	60.00	15.00	68.00	20.00	4

Default Y-Origin = 0.00(ft)
Default X-Plus Value = 0.00(ft)
Default Y-Plus Value = 0.00(ft)
ISOTROPIC SOIL PARAMETERS
6 Type(s) of Soil

Soil Type No.	Total Unit Wt. (pcf)	Saturated Unit Wt. (pcf)	Cohesion Intercept (psf)	Friction Angle (deg)	Pore Pressure Param.	Pressure Constant (psf)	Piez. Surface No.
1	125.0	130.0	100.0	42.0	0.15	0.0	1
2	125.0	130.0	500.0	27.0	0.15	0.0	1
3	125.0	130.0	700.0	40.0	0.15	0.0	1
4	125.0	130.0	2000.0	45.0	0.00	0.0	1
5	125.0	130.0	0.0	25.0	0.00	0.0	1
6	150.0	150.0	0.0	45.0	0.00	0.0	1

1 PIEZOMETRIC SURFACE(S) SPECIFIED
Unit Weight of Water = 62.40 (pcf)
Piezometric Surface No. 1 Specified by 13 Coordinate Points
Pore Pressure Inclination Factor = 0.50

Point No.	X-Water (ft)	Y-Water (ft)
1	100.00	31.00
2	111.00	34.00
3	114.50	35.50
4	118.00	36.50
5	124.00	38.00
6	129.00	37.50
7	134.00	39.00
8	141.00	38.00
9	143.00	43.00
10	145.00	44.00
11	147.00	46.00
12	156.00	47.00
13	162.00	50.00

Specified Peak Ground Acceleration Coefficient (A) = 0.338(g)
Specified Horizontal Earthquake Coefficient (kh) = 0.278(g)
Specified Vertical Earthquake Coefficient (kv) = 0.000(g)
Specified Seismic Pore-Pressure Factor = 0.000
EARTHQUAKE DATA HAS BEEN SUPPRESSED
A Critical Failure Surface Searching Method, Using A Random
Technique For Generating Circular Surfaces, Has Been Specified.
100 Trial Surfaces Have Been Generated.
10 Surface(s) Initiate(s) From Each Of 10 Points Equally Spaced
Along The Ground Surface Between X = 68.00(ft)
and X = 79.00(ft)
Each Surface Terminates Between X = 128.00(ft)
and X = 162.00(ft)
Unless Further Limitations Were Imposed, The Minimum Elevation
At Which A Surface Extends Is Y = 0.00(ft)
2.00(ft) Line Segments Define Each Trial Failure Surface.
Following Are Displayed The Ten Most Critical Of The Trial
Failure Surfaces Evaluated. They Are
Ordered - Most Critical First.
* * Safety Factors Are Calculated By The Modified Bishop Method * *
Total Number of Trial Surfaces Attempted = 100
Number of Trial Surfaces With Valid FS = 100
Statistical Data On All Valid FS Values:
FS Max = 4.414 FS Min = 1.843 FS Ave = 3.635
Standard Deviation = 0.744 Coefficient of Variation = 20.46 %
Failure Surface Specified By 50 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)

1	68.000	20.000
2	69.974	20.322
3	71.941	20.682
4	73.901	21.079
5	75.853	21.515
6	77.796	21.989
7	79.730	22.500
8	81.653	23.048
9	83.566	23.634
10	85.466	24.256
11	87.355	24.915
12	89.230	25.611
13	91.091	26.342
14	92.938	27.110
15	94.770	27.913
16	96.585	28.752
17	98.385	29.625
18	100.166	30.534
19	101.930	31.476
20	103.676	32.453
21	105.402	33.463
22	107.108	34.506
23	108.794	35.582
24	110.459	36.691
25	112.101	37.832
26	113.722	39.004
27	115.319	40.207
28	116.893	41.441
29	118.443	42.706
30	119.968	44.000
31	121.467	45.323
32	122.941	46.676
33	124.388	48.056
34	125.808	49.464
35	127.201	50.900
36	128.565	52.362
37	129.901	53.850
38	131.208	55.364
39	132.486	56.903
40	133.733	58.467
41	134.950	60.054
42	136.136	61.664
43	137.290	63.297
44	138.413	64.953
45	139.503	66.629
46	140.561	68.327
47	141.585	70.044
48	142.577	71.781
49	143.534	73.537
50	143.894	74.229

Circle Center At X = 52.381 ; Y = 122.080 ; and Radius = 103.268

Factor of Safety

*** 1.843 ***

Individual data on the 69 slices

Slice No.	Width (ft)	Weight (lbs)	Water Force Top (lbs)	Water Force Bot (lbs)	Tie Force Norm (lbs)	Tie Force Tan (lbs)	Earthquake Force Hor (lbs)	Earthquake Force Ver (lbs)	Surcharge Load (lbs)
1	2.0	125.3	0.0	0.0	0.	0.	0.0	0.0	0.0
2	1.1	182.1	0.0	0.0	0.	0.	0.0	0.0	0.0
3	0.8	174.4	0.0	0.0	0.	0.	0.0	0.0	0.0
4	2.0	471.8	0.0	0.0	0.	0.	0.0	0.0	0.0
5	2.0	553.2	0.0	0.0	0.	0.	0.0	0.0	0.0
6	0.1	44.7	0.0	0.0	0.	0.	0.0	0.0	0.0
7	1.8	433.6	0.0	0.0	0.	0.	0.0	0.0	0.0
8	1.2	158.4	0.0	0.0	0.	0.	0.0	0.0	0.0
9	0.7	87.8	0.0	0.0	0.	0.	0.0	0.0	0.0
10	0.3	44.8	0.0	0.0	0.	0.	0.0	0.0	0.0
11	0.0	8.1	0.0	0.0	0.	0.	0.0	0.0	0.0
12	1.6	2436.9	0.0	0.0	0.	0.	0.0	0.0	0.0

13	1.9	3118.7	0.0	0.0	0.	0.	0.0	0.0	0.0
14	1.9	3390.1	0.0	0.0	0.	0.	0.0	0.0	0.0
15	1.9	3643.3	0.0	0.0	0.	0.	0.0	0.0	0.0
16	1.9	3878.0	0.0	0.0	0.	0.	0.0	0.0	0.0
17	1.9	4094.2	0.0	0.0	0.	0.	0.0	0.0	0.0
18	1.8	4291.8	0.0	0.0	0.	0.	0.0	0.0	0.0
19	1.8	4470.9	0.0	0.0	0.	0.	0.0	0.0	0.0
20	1.8	4631.3	0.0	0.0	0.	0.	0.0	0.0	0.0
21	1.8	4773.2	0.0	0.0	0.	0.	0.0	0.0	0.0
22	0.6	1723.8	0.0	0.0	0.	0.	0.0	0.0	0.0
23	1.0	2701.8	0.0	454.9	0.	0.	0.0	0.0	0.0
24	0.2	461.8	0.0	77.7	0.	0.	0.0	0.0	0.0
25	1.8	4957.5	0.0	843.1	0.	0.	0.0	0.0	0.0
26	0.2	499.9	0.0	85.9	0.	0.	0.0	0.0	0.0
27	1.6	4513.2	0.0	775.7	0.	0.	0.0	0.0	0.0
28	1.7	5053.7	0.0	878.3	0.	0.	0.0	0.0	0.0
29	1.7	5079.8	0.0	893.1	0.	0.	0.0	0.0	0.0
30	1.7	5091.4	0.0	906.1	0.	0.	0.0	0.0	0.0
31	1.7	5088.9	0.0	917.1	0.	0.	0.0	0.0	0.0
32	1.6	5072.7	0.0	926.3	0.	0.	0.0	0.0	0.0
33	1.6	5043.1	0.0	933.7	0.	0.	0.0	0.0	0.0
34	0.8	2432.9	0.0	456.9	0.	0.	0.0	0.0	0.0
35	0.8	2562.6	0.0	481.3	0.	0.	0.0	0.0	0.0
36	1.6	4908.0	0.0	935.5	0.	0.	0.0	0.0	0.0
37	1.5	4805.4	0.0	930.3	0.	0.	0.0	0.0	0.0
38	0.6	1719.7	0.0	338.3	0.	0.	0.0	0.0	0.0
39	1.0	2971.9	0.0	584.7	0.	0.	0.0	0.0	0.0
40	1.5	4563.8	0.0	913.1	0.	0.	0.0	0.0	0.0
41	0.5	1608.1	0.0	327.4	0.	0.	0.0	0.0	0.0
42	0.9	2817.4	0.0	573.6	0.	0.	0.0	0.0	0.0
43	1.4	4274.1	0.0	886.0	0.	0.	0.0	0.0	0.0
44	0.1	327.9	0.0	69.3	0.	0.	0.0	0.0	0.0
45	1.3	3761.0	0.0	794.5	0.	0.	0.0	0.0	0.0
46	1.2	3316.5	0.0	714.4	0.	0.	0.0	0.0	0.0
47	0.2	532.1	0.0	114.6	0.	0.	0.0	0.0	0.0
48	0.8	2071.5	0.0	455.4	0.	0.	0.0	0.0	0.0
49	0.2	575.2	0.0	126.5	0.	0.	0.0	0.0	0.0
50	0.3	843.3	0.0	185.4	0.	0.	0.0	0.0	0.0
51	1.3	3198.4	0.0	718.2	0.	0.	0.0	0.0	0.0
52	1.3	2911.4	0.0	668.3	0.	0.	0.0	0.0	0.0
53	1.3	2628.3	0.0	617.3	0.	0.	0.0	0.0	0.0
54	0.1	151.9	0.0	36.5	0.	0.	0.0	0.0	0.0
55	1.2	2198.1	0.0	528.7	0.	0.	0.0	0.0	0.0
56	1.2	2077.0	0.0	512.1	0.	0.	0.0	0.0	0.0
57	0.1	81.1	0.0	20.5	0.	0.	0.0	0.0	0.0
58	0.2	397.9	0.0	100.7	0.	0.	0.0	0.0	0.0
59	0.9	1336.8	0.0	338.2	0.	0.	0.0	0.0	0.0
60	1.2	1567.4	0.0	407.3	0.	0.	0.0	0.0	0.0
61	0.5	587.1	0.0	156.9	0.	0.	0.0	0.0	0.0
62	0.6	738.3	0.0	197.3	0.	0.	0.0	0.0	0.0
63	1.1	1090.5	0.0	300.0	0.	0.	0.0	0.0	0.0
64	0.5	430.0	0.0	122.0	0.	0.	0.0	0.0	0.0
65	0.6	430.4	0.0	122.1	0.	0.	0.0	0.0	0.0
66	1.0	624.7	0.0	182.9	0.	0.	0.0	0.0	0.0
67	1.0	397.7	0.0	120.4	0.	0.	0.0	0.0	0.0
68	1.0	181.9	0.0	57.0	0.	0.	0.0	0.0	0.0
69	0.4	15.1	0.0	4.9	0.	0.	0.0	0.0	0.0

Failure Surface Specified By 47 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	69.222	20.828
2	71.215	20.996
3	73.203	21.215
4	75.185	21.485
5	77.159	21.804
6	79.125	22.174
7	81.080	22.593
8	83.025	23.062
9	84.956	23.580
10	86.874	24.146

11	88.777	24.762
12	90.664	25.425
13	92.533	26.136
14	94.384	26.894
15	96.215	27.699
16	98.025	28.551
17	99.812	29.448
18	101.577	30.389
19	103.317	31.376
20	105.031	32.406
21	106.718	33.480
22	108.378	34.595
23	110.009	35.753
24	111.610	36.952
25	113.180	38.191
26	114.718	39.469
27	116.223	40.786
28	117.695	42.141
29	119.131	43.532
30	120.532	44.960
31	121.896	46.423
32	123.222	47.920
33	124.510	49.450
34	125.759	51.012
35	126.968	52.605
36	128.135	54.229
37	129.262	55.882
38	130.346	57.562
39	131.387	59.270
40	132.384	61.004
41	133.337	62.762
42	134.245	64.544
43	135.108	66.349
44	135.924	68.174
45	136.694	70.020
46	137.417	71.885
47	138.034	73.607

Circle Center At X = 63.584 ; Y = 99.430 ; and Radius = 78.804

Factor of Safety

*** 1.857 ***

Failure Surface Specified By 51 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	68.000	20.000
2	69.991	20.192
3	71.977	20.427
4	73.958	20.704
5	75.932	21.022
6	77.899	21.383
7	79.858	21.785
8	81.809	22.229
9	83.749	22.714
10	85.678	23.241
11	87.596	23.808
12	89.502	24.416
13	91.394	25.064
14	93.271	25.752
15	95.134	26.481
16	96.981	27.248
17	98.811	28.055
18	100.624	28.900
19	102.418	29.784
20	104.193	30.705
21	105.948	31.664
22	107.682	32.660
23	109.395	33.693
24	111.085	34.762
25	112.753	35.867
26	114.396	37.007
27	116.015	38.181

28	117.608	39.390
29	119.176	40.632
30	120.717	41.907
31	122.230	43.215
32	123.715	44.554
33	125.171	45.925
34	126.598	47.327
35	127.995	48.758
36	129.361	50.219
37	130.695	51.709
38	131.998	53.226
39	133.268	54.771
40	134.505	56.343
41	135.708	57.940
42	136.877	59.563
43	138.012	61.210
44	139.111	62.881
45	140.174	64.575
46	141.201	66.291
47	142.192	68.029
48	143.145	69.787
49	144.061	71.565
50	144.938	73.362
51	145.379	74.316

Circle Center At X = 59.949 ; Y = 113.754 ; and Radius = 94.099

Factor of Safety

*** 1.900 ***

Failure Surface Specified By 45 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	71.667	22.320
2	73.667	22.298
3	75.666	22.342
4	77.663	22.451
5	79.656	22.625
6	81.641	22.864
7	83.618	23.168
8	85.584	23.536
9	87.537	23.968
10	89.474	24.463
11	91.395	25.021
12	93.296	25.642
13	95.176	26.325
14	97.033	27.068
15	98.864	27.872
16	100.668	28.735
17	102.443	29.656
18	104.188	30.635
19	105.899	31.670
20	107.575	32.761
21	109.215	33.905
22	110.817	35.103
23	112.379	36.352
24	113.899	37.651
25	115.377	39.000
26	116.809	40.396
27	118.195	41.838
28	119.533	43.324
29	120.822	44.853
30	122.061	46.423
31	123.247	48.033
32	124.381	49.681
33	125.460	51.365
34	126.483	53.084
35	127.450	54.834
36	128.359	56.616
37	129.210	58.426
38	130.001	60.263
39	130.732	62.124
40	131.401	64.009

41	132.009	65.914
42	132.554	67.839
43	133.036	69.780
44	133.455	71.735
45	133.651	72.827

Circle Center At X = 73.326 ; Y = 83.582 ; and Radius = 61.285

Factor of Safety

*** 1.952 ***

Failure Surface Specified By 56 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	69.222	20.828
2	71.212	21.030
3	73.198	21.264
4	75.180	21.530
5	77.158	21.829
6	79.131	22.159
7	81.097	22.522
8	83.058	22.916
9	85.012	23.343
10	86.959	23.801
11	88.898	24.291
12	90.829	24.812
13	92.751	25.364
14	94.664	25.948
15	96.567	26.563
16	98.460	27.209
17	100.342	27.885
18	102.213	28.592
19	104.072	29.329
20	105.919	30.096
21	107.754	30.893
22	109.575	31.720
23	111.382	32.577
24	113.175	33.462
25	114.954	34.377
26	116.717	35.321
27	118.465	36.293
28	120.197	37.293
29	121.912	38.322
30	123.611	39.378
31	125.292	40.462
32	126.955	41.572
33	128.599	42.710
34	130.226	43.875
35	131.833	45.065
36	133.420	46.282
37	134.987	47.524
38	136.534	48.792
39	138.061	50.084
40	139.566	51.401
41	141.049	52.743
42	142.510	54.108
43	143.949	55.497
44	145.365	56.910
45	146.758	58.345
46	148.128	59.802
47	149.474	61.282
48	150.795	62.783
49	152.092	64.306
50	153.364	65.849
51	154.610	67.413
52	155.831	68.997
53	157.026	70.601
54	158.195	72.224
55	159.337	73.866
56	160.099	75.000

Circle Center At X = 57.818 ; Y = 143.271 ; and Radius = 122.973

Factor of Safety

*** 2.045 ***

Failure Surface Specified By 46 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.444	21.656
2	72.441	21.546
3	74.441	21.504
4	76.441	21.531
5	78.439	21.625
6	80.432	21.788
7	82.419	22.018
8	84.396	22.316
9	86.363	22.681
10	88.316	23.113
11	90.253	23.611
12	92.171	24.175
13	94.070	24.804
14	95.946	25.497
15	97.797	26.254
16	99.622	27.073
17	101.417	27.954
18	103.182	28.896
19	104.913	29.897
20	106.609	30.957
21	108.268	32.074
22	109.888	33.247
23	111.468	34.474
24	113.004	35.754
25	114.496	37.086
26	115.942	38.468
27	117.340	39.898
28	118.688	41.376
29	119.985	42.898
30	121.230	44.464
31	122.420	46.071
32	123.555	47.717
33	124.633	49.402
34	125.654	51.122
35	126.615	52.876
36	127.515	54.662
37	128.355	56.477
38	129.132	58.320
39	129.846	60.188
40	130.496	62.080
41	131.081	63.992
42	131.600	65.923
43	132.053	67.871
44	132.440	69.834
45	132.760	71.808
46	132.877	72.727

Circle Center At X = 74.671 ; Y = 80.185 ; and Radius = 58.682

Factor of Safety

*** 2.162 ***

Failure Surface Specified By 51 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.444	21.656
2	72.444	21.620
3	74.444	21.635
4	76.443	21.700
5	78.440	21.816
6	80.433	21.982
7	82.421	22.199
8	84.403	22.466
9	86.378	22.782
10	88.344	23.149
11	90.300	23.565
12	92.245	24.031
13	94.178	24.545
14	96.097	25.108
15	98.001	25.720

16	99.889	26.379
17	101.760	27.086
18	103.613	27.840
19	105.445	28.641
20	107.257	29.488
21	109.047	30.380
22	110.814	31.317
23	112.557	32.298
24	114.274	33.324
25	115.965	34.392
26	117.628	35.503
27	119.263	36.655
28	120.868	37.848
29	122.442	39.082
30	123.985	40.355
31	125.495	41.666
32	126.971	43.015
33	128.413	44.402
34	129.819	45.824
35	131.189	47.281
36	132.521	48.772
37	133.816	50.297
38	135.071	51.854
39	136.287	53.442
40	137.463	55.060
41	138.597	56.707
42	139.688	58.383
43	140.738	60.086
44	141.744	61.814
45	142.706	63.568
46	143.623	65.345
47	144.495	67.145
48	145.321	68.966
49	146.101	70.808
50	146.834	72.669
51	147.481	74.440

Circle Center At X = 72.859 ; Y = 100.742 ; and Radius = 79.123

Factor of Safety

*** 2.192 ***

Failure Surface Specified By 54 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	72.889	22.794
2	74.889	22.813
3	76.888	22.874
4	78.885	22.977
5	80.880	23.123
6	82.871	23.310
7	84.858	23.539
8	86.839	23.810
9	88.815	24.123
10	90.783	24.477
11	92.744	24.873
12	94.695	25.310
13	96.638	25.787
14	98.569	26.306
15	100.489	26.865
16	102.397	27.465
17	104.292	28.104
18	106.174	28.783
19	108.040	29.502
20	109.891	30.260
21	111.725	31.057
22	113.543	31.892
23	115.342	32.765
24	117.122	33.676
25	118.883	34.624
26	120.624	35.609
27	122.343	36.631
28	124.041	37.688

29	125.716	38.781
30	127.367	39.909
31	128.995	41.072
32	130.597	42.269
33	132.174	43.499
34	133.725	44.762
35	135.249	46.057
36	136.745	47.384
37	138.213	48.743
38	139.652	50.132
39	141.061	51.551
40	142.440	52.999
41	143.789	54.476
42	145.106	55.981
43	146.391	57.514
44	147.643	59.073
45	148.863	60.659
46	150.048	62.269
47	151.200	63.904
48	152.316	65.564
49	153.398	67.246
50	154.444	68.951
51	155.454	70.677
52	156.427	72.424
53	157.363	74.192
54	157.770	75.000

Circle Center At X = 72.985 ; Y = 117.743 ; and Radius = 94.949

Factor of Safety

*** 2.194 ***

Failure Surface Specified By 52 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	70.444	21.656
2	72.444	21.627
3	74.444	21.648
4	76.443	21.717
5	78.439	21.836
6	80.432	22.005
7	82.420	22.222
8	84.403	22.488
9	86.378	22.803
10	88.344	23.166
11	90.302	23.578
12	92.248	24.038
13	94.183	24.545
14	96.104	25.100
15	98.011	25.703
16	99.903	26.352
17	101.778	27.047
18	103.635	27.789
19	105.474	28.576
20	107.293	29.408
21	109.090	30.285
22	110.866	31.205
23	112.618	32.169
24	114.346	33.176
25	116.049	34.225
26	117.725	35.316
27	119.374	36.448
28	120.995	37.620
29	122.586	38.832
30	124.147	40.082
31	125.676	41.371
32	127.174	42.697
33	128.638	44.059
34	130.068	45.457
35	131.464	46.890
36	132.823	48.357
37	134.146	49.857
38	135.432	51.389

39	136.680	52.952
40	137.888	54.545
41	139.057	56.168
42	140.186	57.819
43	141.274	59.497
44	142.320	61.202
45	143.324	62.932
46	144.285	64.686
47	145.202	66.463
48	146.075	68.262
49	146.904	70.082
50	147.688	71.922
51	148.426	73.781
52	148.695	74.511

Circle Center At X = 72.616 ; Y = 102.792 ; and Radius = 81.165

Factor of Safety

*** 2.197 ***

Failure Surface Specified By 45 Coordinate Points

Point No.	X-Surf (ft)	Y-Surf (ft)
1	72.889	22.794
2	74.868	22.507
3	76.857	22.298
4	78.853	22.168
5	80.852	22.117
6	82.852	22.146
7	84.849	22.253
8	86.841	22.440
9	88.823	22.705
10	90.793	23.048
11	92.748	23.469
12	94.686	23.967
13	96.601	24.541
14	98.493	25.191
15	100.357	25.915
16	102.192	26.712
17	103.993	27.581
18	105.759	28.520
19	107.486	29.529
20	109.171	30.605
21	110.813	31.747
22	112.409	32.953
23	113.955	34.221
24	115.450	35.550
25	116.892	36.936
26	118.277	38.379
27	119.604	39.875
28	120.871	41.422
29	122.076	43.019
30	123.217	44.662
31	124.291	46.348
32	125.299	48.076
33	126.237	49.843
34	127.104	51.645
35	127.900	53.480
36	128.622	55.345
37	129.270	57.237
38	129.843	59.153
39	130.339	61.090
40	130.759	63.046
41	131.100	65.016
42	131.364	66.999
43	131.549	68.990
44	131.654	70.988
45	131.676	72.573

Circle Center At X = 81.134 ; Y = 72.665 ; and Radius = 50.548

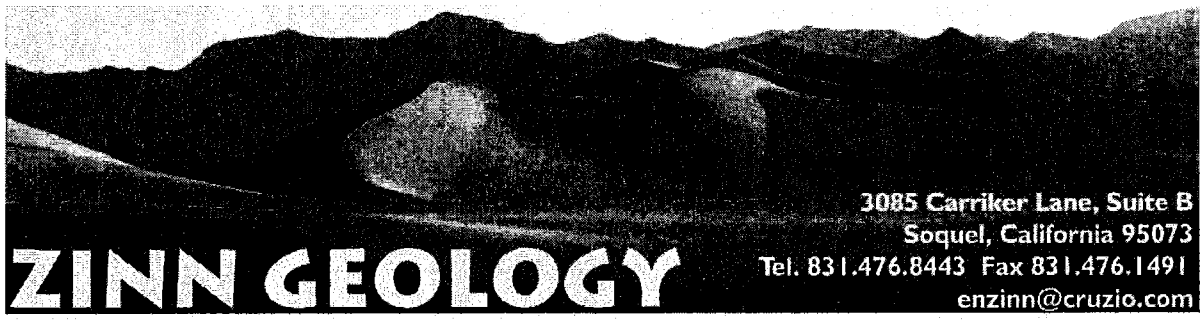
Factor of Safety

*** 2.420 ***

**** END OF GSTABL7 OUTPUT ****

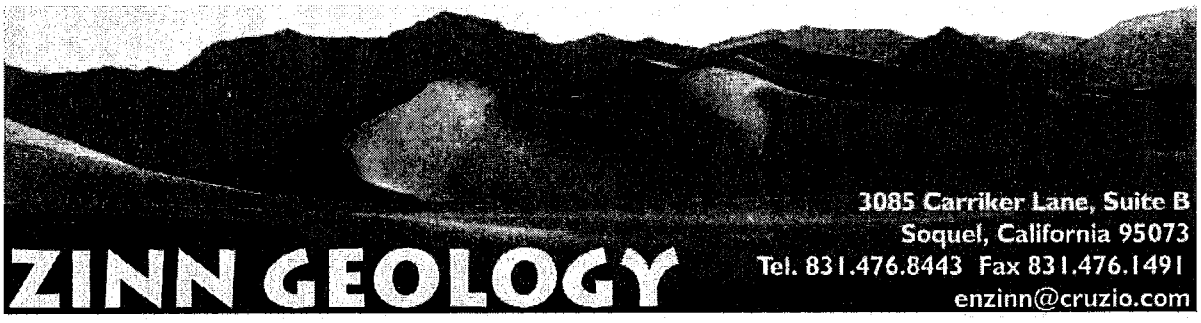
APPENDIX D

Zinn Geology Report



ENGINEERING GEOLOGY INVESTIGATION
Proposed Coastal Bluff Stabilization
Lands Of Niles
30620 Aurora Del Mar
Carmel, California 95010
Monterey County APN 243-331-010

Job #2011013-G-MT
14 November 2011



14 November 2011 Job #2011013-G-MT

Pacific Crest Engineering
Attention: Elizabeth Mitchell
444 Airport Boulevard, Suite 106
Watsonville, CA 95076-2062

Re: Geologic investigation for proposed coastal bluff stabilization
Lands of Niles
30620 Aurora Del Mar
Carmel, California 95010
Monterey County APN 243-331-010

Dear Mrs. Mitchell:

Our geologic report on the property referenced above is attached. This report documents geologic conditions at the proposed bluff stabilization site and addresses potential geological hazards and associated risks. The purpose of the proposed bluff stabilization is to reduce the potential for future bluff failures that may result in the undermining and failure of the existing garage.

Based on the information gathered and analyzed in the steps outlined above, it is our opinion that the garage is subject to a greater than "ordinary" level of risk with respect to future erosion and shallow landsliding of the upper coastal bluff, as outlined in Appendix B. This level of risk is commensurate with the County of Monterey characterization of "emergency" for the garage. The currently proposed coastal bluff stabilization method of using solely a Hilfiker retaining wall system (an earthen wall reinforced with welded wire) is not geologically suitable and will likely be undermined or outflanked by coastal wave erosion in the near future. A retaining wall system should clearly be installed in the bluff fronting the garage to lower the risk to "ordinary". If the upcoming revised retaining wall system is appropriately armored from coastal erosion, then the wall will be geologically suitable and will provide a level of "ordinary" risk, provided our recommendations are followed. Appendix B should be reviewed in detail to determine whether this level of risk is acceptable. If it is unacceptable, then the geologic hazards in question should be mitigated to reduce the corresponding risks to an acceptable level.

The subject property lies on the lowest emergent marine terrace. The property is underlain by marine terrace deposits, up to approximately 30 to 40 feet in thickness, comprised primarily of sands and gravels with abundant rounded granitic rock cobbles near the base of the unit. The marine terrace deposits in turn overlie a fossil wave-cut platform incised into the underlying granitic bedrock. Groundwater perches within the marine terrace deposits on top of the less

permeable granitic bedrock at about 16 feet above mean sea level in the area of the proposed bluff stabilization.

RECOMMENDATIONS

1. If a Hilfiker retaining wall system is utilized to lower the risk to the garage, we recommend that the proposed Hilfiker retaining wall be properly armored to reduce the potential for wave erosion to undermine or outflank the wall. The minimum elevation of the armoring should be based upon the forthcoming wave run-up analysis performed by the current Geotechnical Engineer Of Record, Pacific Crest Engineering (PCE). Their analysis should incorporate Geologic Cross Sections (Plate 2) and a projected future 55-inch sea-level rise (by 2100). The projected near shore slope should be 3%.

2. We recommend that the Project Geotechnical Engineer analyze the stability of the project site coastal bluff utilizing the methods prescribed in *CGS Special Publication 117A*. Our geological cross section through the project bluff (see Plate 2) should be utilized for performing the quantitative stability analysis using the stipulated geometry of formational contacts. The quantitative analysis should include a specific focus on the stability of the surficial older alluvium deposits and incorporate elevated ground water levels.

3. The proposed wall, once constructed, must be adequately maintained. Inspection of the wall and surrounding coastal bluff by a qualified licensed professional should be performed at a minimum of every 5 years as well as after damaging winter storms.

4. We request the opportunity to review any drainage plans for consistency with our geologic findings and recommendations. We have listed our drainage recommendations for this project below.

   We recommend that all drainage from improved surfaces, such as walkways, patios, roofs and driveways, at the top of the bluff should be collected in impermeable gutters or pipes and either carried to the base of the bluff via closed conduit or discharged into an established storm drain system that does not issue onto the bluff. At no time should any concentrated discharge be allowed to spill directly onto the ground adjacent to the existing residence. Any drain water on paved areas should not be allowed to flow toward the residence or toward the bluff top. The control of runoff is essential for control of erosion and prevention of ponding.

5. We recommend that our firm be provided the opportunity to review the final design and specifications in order that our recommendations may be properly interpreted and implemented in the design and specification. If our firm is not accorded the privilege of making the recommended review we can assume no responsibility for misinterpretation of our recommendations.

6. We recommend that Zinn Geology be retained to observe any and all excavations, including pier drilling. Field observation must be provided by a representative of Zinn

Geology to enable us to form an opinion as to the degree of conformance of the site conditions exposed during excavation to those described in our geologic report. Any excavation performed without the full knowledge and direct observation of Zinn Geology, the Project Geologist Of Record, will render the recommendations of our report invalid.

If you have any questions or comments regarding this report, please contact us at your earliest convenience.

Sincerely,

ZINN GEOLOGY

PROFESSIONAL GEOLOGIST
JAMES A. OLSON
No. 7267
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

James A. Olson
Senior Geologist
P.G. #7244, C.E.G. #2267

PROFESSIONAL GEOLOGIST
ERIK N. ZINN
No. 2139
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GEOLOGIST
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Erik N. Zinn
Principal Geologist
P.G. #6854, C.E.G. #2139

TABLE OF CONTENTS

NOTE: Plates must accompany text of report in order for report to be considered complete.

INTRODUCTION

This report presents the results of our geologic investigation for the proposed Hilfiker retaining wall at 30620 Aurora Del Mar in Carmel, California (Monterey County APN 243-331-010). The development area on the property is located at 36.47873° north latitude and 121.93750° west longitude (Figure 1).

The purpose of this investigation was to evaluate the geologic feasibility of the proposed coastal bluff stabilization scheme. We have only investigated the potential geologic hazards relevant to the proposed bluff stabilization. We have not addressed the hazards and attendant risks to any facilities or ancillary structures, such as the existing house on the property. As such the bulk of our work and this report focus primarily on the area of the proposed stabilization site.

The currently proposed bluff stabilization scheme incorporates a Hilfiker retaining wall (an earthen wall reinforced with welded wire) which is armored to prevent undermining due to wave erosion.

We were provided with the following documents associated with this project:

A digital copy of "Site Plan of Lot 5, Carmel Sur, Tract No. 588, Vol 10 C&T PG 6, County of Monterey, CA. for Mr. Daniel Niles", with a release date of 28 March 2011 (Revised 1 September 2011), 2 Sheets, by Landset Engineers Inc., for an intended publication scale of one inch equals 16 feet for Sheet 1 and one inch equals 10 feet for Sheet 2.

A paper copy of "Otter Cove 30620 Aurora Del Mar, Carmel, Highlands, California. A.P.N. 243-331-010, IMPROVEMENT PLANS", dated June 16, 2011, 4 Sheets, by Grice Engineering Inc., various scales.

We have worked in an integrated fashion with the design team throughout the project. We have coordinated our services throughout the project with the Project Geotechnical Engineer, Elizabeth Mitchell of Pacific Crest Engineering, and our report conclusions and recommendations reflect this coordinated effort.

SCOPE OF INVESTIGATION

Work performed during this study included:

1. A review of geologic and geotechnical engineering literature pertinent to the subject property.

2. Examination and interpretation historical vertical stereo pair aerial photographs.

3. Geologic reconnaissance of the property and surrounding area, including site-specific geological mapping.

4. Review of small-diameter boring data by PCE.

5. Multiple meetings and teleconferences with the following members of the design team: Elizabeth Mitchell and Mike Kleames of PCE; Gail Hatter-Crawford and Dale Ellis of Lombardo & Gilles, LLP; Guy Giraudo of Landset Engineering; Charles Potter, Professional Engineer; and Katie Butler and Leslie Ewing of the California Coastal Commission.

6. Analysis and interpretation of the geologic data and preparation of this report.

REGIONAL GEOLOGIC SETTING

The subject property is located in the central Santa Lucia Range. The Santa Lucia Range is formed by a series of rugged, linear ridges and valleys following the pronounced northwest to southeast structural grain of central California geology. Underlying most of the Santa Lucia Range is a large, elongate prism of granitic and metamorphic basement rocks, known collectively as the Salinian Block (Figure 2). These rocks are separated from contrasting basement rock types to the northeast and southwest, respectively, by the San Andreas and San Gregorio strike-slip fault systems.

Throughout the Cenozoic Era, this portion of California has been dominated by tectonic forces associated with lateral or "transform" motion between the North American and Pacific lithospheric plates, producing long, northwest-trending faults such as the San Andreas and San Gregorio, with horizontal displacements measured in tens to hundreds of miles. Accompanying the horizontal (strike-slip) movement of the plates have been episodes of compressive stress, reflected by repeated uplift, deformation, erosion and deposition.

REGIONAL SEISMIC SETTING

California's broad system of strike-slip faulting has had a long and complex history. Some of these faults present a seismic hazard to the proposed development. The most important of these are the San Gregorio, Rinconada and Monterey Bay-Tularcitos faults (Figures 2 and 3). These faults are either active or considered potentially active (Working Group On Northern California Earthquake Potential (WGONCEP), 1996; Working Group on California Earthquake Probabilities (WGOCEP), 1999; Working Group On California Earthquake Probabilities, 2003; Cao et al., 2003). Each fault is discussed below. Locations of epicenters associated with the faults are shown in Figure 3. The intensity of seismic shaking that could affect the site in the event of a future earthquake on one of these faults will be discussed in a later section.

San Gregorio Fault

The San Gregorio fault, as mapped by Greene (1977), Weber and Lajoie (1974), and Weber et al. (1995) skirts the coastline of Santa Cruz County northward from Monterey Bay, and trends onshore at Point Año Nuevo. Northward from Año Nuevo, it passes offshore again, to connect with the San Andreas fault near Bolinas. Southward from Monterey Bay, it may trend onshore north of Big Sur (Greene, 1977) to connect with the Palo Colorado fault, or continue southward through Point Sur to connect with the Hosgri fault in south-central California. Based on these

two proposed correlations, the San Gregorio fault zone has a length of at least 100 miles and possibly as much as 250 miles.

The landward extension of the San Gregorio fault at Point Año Nuevo shows evidence of late Pleistocene (Buchanan-Banks et al., 1978) and Holocene displacement (Weber and Cotton, 1981). Although stratigraphic offsets indicate a history of horizontal and vertical displacements, the San Gregorio is considered predominantly right-lateral strike slip by most researchers (Greene, 1977; Weber and Lajoie, 1974; and Graham and Dickinson, 1978).

In addition to stratigraphic evidence for Holocene activity, the historical seismicity in the region is partially attributed to the San Gregorio fault (Greene, 1977). Due to inaccuracies of epicenter locations, even the magnitude 6+ earthquakes of 1926, tentatively assigned to the Monterey Bay fault zone, may have actually occurred on the San Gregorio fault (Greene, 1977).

The WGONCEP (1996) has divided the San Gregorio fault into the "San Gregorio" and "San Gregorio, Sur Region" segments. The segmentation boundary is located west of the Monterey Bay, where the fault appears to have a right step-over. The San Gregorio fault has been assigned a slip rate that results in a M_w 7.3 earthquake with a recurrence interval of 400 years. This is based on the preliminary results of a paleoseismic investigation at Seal Cove by Lettis and Associates (see WGONCEP, 1996) and on regional mapping by Weber et al. (1995). The Sur Region segment has been assigned a slip rate that results in a M_w 7.0 earthquake with an effective recurrence interval of 400 years (coinciding with the recurrence interval for the other segment). The Sur Region earthquake was derived from an assumed slip rate similar to that of the Hosgri fault.

WGOCEP, 2003 and Cao et al. (2003) have adopted a model similar to the WGONCEP (1996), essentially renaming the San Gregorio segment the "San Gregorio North" segment, and downgrading the forecasted earthquake on this segment to a Mw 7.2, and renaming the San Gregorio, Sur Region segment the San Gregorio South segment, retaining the forecasted earthquake of Mw 7.0.

Rinconada Fault

The Rinconada fault zone has been mapped by various researchers as stretching from Spreckels to King City, encompassing the Reliz fault. Durham (1965) and Dibblee (1976) have interpreted the Rinconada fault as a significant tectonic component of the Coast Ranges, with total right-lateral strike-slip displacement estimates ranging between 11 and 25 miles.

It appears that the fault has definitely moved in the late Quaternary, but evidence of Holocene surface rupture has never been conclusively demonstrated. Tinsley (1975) has interpreted the fault as deforming late Quaternary age Paso Robles Formation near Spreckels, while Dibblee (1976) cites right-lateral offset of streams near Espinosa Canyon. Hart (1985) has interpreted the fault as truncating probable late Pleistocene age alluvial fan deposits and surfaces near Williams Hill, which appears to be somewhat supported by work performed by Klaus (1999), which

estimated as much as 16 feet of vertical offset of alluvial fan surfaces with an *estimated* age of 300,000 to 400,000 years.

In spite of the lack of evidence indicating Holocene activity, Petersen et al. (1996) and Cao et al. (2003) have adopted forecasted earthquake magnitudes of Mw 7.3 and 7.5, respectively.

Monterey Bay-Tularcitos Fault Zone

The Monterey Bay-Tularcitos fault zone is 6 to 9 miles wide, about 25 miles long, and consists of many en échelon faults identified during shipboard seismic reflection surveys (Greene, 1977). The fault zone trends northwest-southeast and intersects the coast in the vicinity of Seaside and Ford Ord. At this point, several onshore fault traces have been tentatively correlated with offshore traces in the heart of the Monterey Bay-Tularcitos fault zone (Greene, 1977; Clark et al., 1974; Burkland and Associates, 1975). These onshore faults are, from southwest to northeast, the Tularcitos-Navy, Berwick Canyon, Chupines, Seaside, and Ord Terrace faults. Only the larger of these faults, the Tularcitos-Navy and Chupines, are shown on Figure 2. It must be emphasized that these correlations between onshore and offshore portions of the Monterey Bay-Tularcitos fault zone are only tentative; for example, no concrete geologic evidence for connecting the Navy and Tularcitos faults under the Carmel Valley alluvium has been observed, nor has a direct connection between these two faults and any offshore trace been found.

Outcrop evidence indicates a variety of strike-slip and dip-slip movement associated with onshore and offshore traces. Earthquake studies suggest the Monterey Bay-Tularcitos fault zone is predominantly right-lateral, strike-slip in character (Greene, 1977). Stratigraphically, both offshore and onshore fault traces in this zone have displaced Quaternary beds and, therefore, are considered potentially active (Buchanan-Banks et al., 1978). One offshore trace, which aligns with the trend of the Navy fault, has displaced Holocene beds and is therefore active by definition (Buchanan-Banks et al., 1978).

Seismically, the Monterey Bay-Tularcitos fault zone may be historically active. The largest historical earthquakes *tentatively* located in the Monterey Bay-Tularcitos fault zone are two events, estimated at 6.2 on the Richter Scale, in October 1926 (Greene, 1977). Because of possible inaccuracies in locating the epicenters of these earthquakes, it is possible that they actually occurred on the nearby San Gregorio fault zone (Greene, 1977).

Another earthquake in April 1890 might be attributed to the Monterey Bay-Tularcitos fault zone (Burkland and Associates, 1975); this earthquake had an estimated Modified Mercalli Intensity of VII (Table 1) for Monterey County on a whole.

TABLE 1
Modified Mercalli Intensity Scale

The modified Mercalli scale measures the intensity of ground shaking as determined from observations of an earthquake's effect on people, structures, and the Earth's surface. Richter magnitude is not reflected. This scale assigns to an earthquake event a Roman numeral from I to XII as follows:

I	Not felt by people, except rarely under especially favorable circumstances.
II	Felt indoors only by persons at rest, especially on upper floors. Some hanging objects may swing.
III	Felt indoors by several. Hanging objects may swing slightly. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV	Felt indoors by many, outdoors by few. Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing automobiles rock. Windows, dishes, doors rattle. Wooden walls and frame may creak.
V	Felt indoors and outdoors by nearly everyone; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset; some dishes and glassware broken. Doors swing; shutters, pictures move. Pendulum clocks stop, start, change rate. Swaying of tall trees and poles sometimes noticed.
VI	Felt by all. Damage slight. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks and books fall off shelves; pictures off walls. Furniture moved or overturned. Weak plaster and masonry cracked.
VII	Difficult to stand. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary buildings; considerable in badly designed or poorly built buildings. Noticed by drivers of automobiles. Hanging objects quiver. Furniture broken. Weak chimneys broken. Damage to masonry; fall of plaster, loose bricks, stones, tiles, and unbraced parapets. Small slides and caving in along sand or gravel banks. Large bells ring.
VIII	People frightened. Damage slight in specially designed structures; considerable in ordinary substantial buildings, partial collapse; great in poorly built structures. Steering of automobiles affected. Damage or partial collapse to some masonry and stucco. Failure of some chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed pilings broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	General panic. Damage considerable in specially designed structures; great in substantial buildings, with some collapse. General damage to foundations; frame structures, if not bolted, shifted off foundations and thrown out of plumb. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground; liquefaction.
X	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Landslides on river banks and steep slopes considerable. Water splashed onto banks of canals, rivers, lakes. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI	Few, if any masonry structures remain standing. Bridges destroyed. Broad fissures in ground; earth slumps and landslides widespread. Underground pipelines completely out of service. Rails bent greatly.
XII	Damage nearly total. Waves seen on ground surfaces. Large rock masses displaced. Lines of sight and level distorted. Objects thrown upward into the air.

The WGONCEP (1996) has assigned an earthquake of M_w 7.1 with an effective recurrence interval of 2,600 years to the Monterey Bay-Tularcitos fault zone, based on Holocene offshore offsets. Petersen et al. (1996) have a similar earthquake magnitude, but for a recurrence interval of 2,841 years. Their earthquake is based on a composite slip rate of 0.5 millimeters per year (after Rosenberg and Clark, 1995).

Cao et al. (2003) has developed a model for the Monterey Bay fault zone that combines slip rates of the different segments, resulting in a composite slip rate of 0.5 mm per year and a forecasted earthquake of Mw 7.3, with no stated recurrence interval. The Cao et al. (2003) model adopted implicitly assumes that all the assessed segments in the Monterey Bay fault zone each have an independent slip rate of 0.1 mm per year (based upon the one slip rate developed by Rosenberg and Clark, 1995 for the Tularcitos segment), and essentially assigns the composite slip rate to the Tularcitos trace of the Monterey Bay fault zone.

SITE GEOLOGIC SETTING

The Site Geologic Map (Plate 1) and Site Geologic Cross Sections (Plate 2) graphically depict relevant geologic information for the site. See also the attached figures for information of a more general nature.

Earth Materials

The subject property is mapped by Dibblee (1999) as being underlain by elevated and dissected older alluvial deposits (Qoa) of Pleistocene to Holocene age, unconformably overlying Mesozoic aged granodiorite to quartz monzonite (gd) (Figure 4). Both granodiorite and quartz monzonite are a type of "granitic" rock. Greene (1977) mapped marine terrace deposits underlain by granitic rocks at the subject property. Both Dibblee (1999) and Greene (1977) respectively mapped most of the surrounding coastal topographic benches as older alluvium and marine terraces; however, it appears that Greene (1977) differentiated between material deposited on wave-cut platforms and within stream channels, whereas Dibblee (1999) elected to group the two units together. There is no real compositional difference between the two units, particularly on the subject property, since marine terrace deposits are typically partially comprised of old alluvium.

We mapped older alluvium (Qoa), also referred to as marine terrace deposits, unconformably overlying an irregular fossil wave-cut platform developed on fractured granitic bedrock (gd) at the subject property (Plates 1 and 2). This terrace likely represents the lowest emergent marine terrace, corresponding to a sea-level high stand dated at approximately 80,000 to 125,000 years ago (Lajoie et al., 1991). The basal contact of the terrace deposits with the underlying granitic bedrock is sharp, unconformable and irregular, indicating that the fossil wave-cut platform was subject to differential surf erosion along old fractures and shears, as well as localized down cutting by streams as the shoreline receded following the highstand. The lowermost 3 to 5 feet of the terrace deposits are increasingly cobble-supported, indicating deposition by a rapidly-moving stream. Below the coastal bluff, beach sand deposits (Qbs) cover portions of the active, wave-cut platform. The contact between the beach sand and granitic bedrock is sharp and irregular, filling

in irregularities in the current day wave-cut platform. We mapped two small landslide deposits (Qls), composed of material from failed marine terrace deposits. One of the landslides occurred recently (oral communication with property owner) (see Plate 2; Cross Section A-A'). The second landslide is older and appears to have been reworked by wave action (see Plate 2; Cross Section B-B').

In addition to our field mapping, we reviewed boring logs by Pacific Crest Engineering. Boring B-1 showed bedrock at 12 feet in depth below the recent landslide deposit. Boring B-2 was drilled at the top of the bluff and encountered only marine terrace deposits to a depth of 34 feet (Plate 2).

Physiographic Setting

Marine terraces develop as a result of relative sea-level changes combined with tectonic uplift. A shoreline generally consists of a landward coastal bluff and a gently-sloping wave-cut platform, that may be covered with beach sand deposits, on the seaward side. Where the bedrock is relatively uniform in erosion resistance, wave-cut platforms dip uniformly seaward at 2 to 4 percent slope gradients (Bradley and Griggs, 1976). If the local bedrock is highly variable in erosion resistance (for example, at the subject property, where fractured and faulted granitic bedrock erodes more rapidly than the more competent, intact granitic rock), the wave-cut platforms are abraded irregularly, resulting in sea stacks, overhangs, benches, peninsulas and coves. As sea levels rise, coastal bluffs and wave-cut platforms advance landward. The record of sea-level high stands (the point where relative sea levels transition from rising to falling) is preserved as a fossil wave-cut platform, elevated above the retreating sea level. As sea level retreats, the wave-cut platform is covered with beach and alluvial deposits derived from the meandering streams and landward-advancing sand dunes, forming marine terraces. This record of a sea-level high stand is typically only preserved in regions which are being actively tectonically uplifted, since subsequent sea-level high stands will simply erase the fossil wave-cut platform and marine terrace deposits. In the case of the actively uplifting central coastal California region, however, successive sea-level advances and retreats have left behind a sequence of emergent marine terraces, with higher terraces preserved from older relative sea-level high stands (Bradley and Griggs, 1976; Lajoie et al., 1991). Local drainages, issuing from the resulting mountains (tectonic uplift), cut through the fossil marine terrace deposits and wave-cut platforms and backfill as they adjust to the changes in sea levels.

The difference in erosion resistance between intact and fractured granitic bedrock results in preferential coastal retreat along fracture zones. This produces an irregular coastline with minor coastal inlets and peninsulas (and sea stacks, which are stranded peninsulas) that are aligned with fracture zones. There is a dominant northwest-oriented set of sub-vertical shears and fractures within the granitic rocks underlying the region that can be seen on Figure 1.

The subject property is located on a small coastal peninsula (Figure 1). The upper surface of the peninsula is formed by a marine terrace located approximately 60 to 70 feet above mean sea level. The terrace surface slopes gently to the west and is truncated to the north, west and south by very steep coastal bluffs. Portions of the bluff are well vegetated and show no signs of active

erosion. However, much of the bluff face is exposed and actively eroding in a badlands type fashion (Plate 1).

The proposed coastal bluff stabilization site is located within a minor coastal inlet and immediately north of the subject garage (Plates 1 and 2). Slopes within the upper bluff at the site are very steep and oriented about 0.5 to 1 (horizontal to vertical); slopes within the lower bluff are about 1 to 1. The bluff face is composed entirely of older alluvium and is actively eroding and failing in small slumps. A thin mound of recent landslide debris covers the marine terrace deposits at base of the bluff. Below the bluff and the area of the proposed stabilization, granitic bedrock forms an irregular bench that is in places covered by a thin mantle of beach sand.

Drainage and Groundwater

Site drainage is via sheet flow across the terrace to the west and down the coastal bluff to the north, west and south. No groundwater was encountered in either of the borings advanced by Pacific Crest Engineering. Although, we observed a minor groundwater seep located at the contact of the marine terrace deposits with the underlying granitic bedrock and below the area of recent landsliding (Plates 1 and 2)

Groundwater is clearly perching within the marine terrace deposits and on top of the less permeable granitic bedrock. We observed numerous seeps at this contact all around the Aurora Del Mar area. The mottled gleying present within the marine terrace deposits near the contact is additional evidence that the lower marine terrace deposits are continually saturated.

Future Sea-Level Rise And Governmental Policy

There has been a very large body of work performed by scientists and different agencies in the United States for research on the future postulated accelerated sea-level rise, driven in part by anthropogenic contribution of carbon to the atmosphere. This body of work is far too large to list for the purposes of this report.

Recent work by the Sea-Level Rise Task Force [SLRTF] of the Coastal and Ocean Working Group of the California Climate Action Team [CO-CAT], led by the State of California Ocean Protection Council [OPC] has resulted in the issuance of the *"STATE OF CALIFORNIA SEA-LEVEL RISE INTERIM GUIDANCE DOCUMENT"*, published October 2010. This document can be accessed in an Adobe Acrobat format here:
http://www.opc.ca.gov/webmaster/ftp/project_pages/Climate/SLR_Guidance_Document.pdf file

In an OPC meeting this past spring, this document was discussed at length and was the subject of several agenda items. We have taken the liberty of listing below the germane agenda items from this meeting, since its outcome will shape the near-future state and local jurisdictional policy with respect to the processes and procedures that will need to be followed by consultants and coastal building permit applicants. The minutes in their entirety may be accessed in Adobe Acrobat format here:
http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20110311/March_2011_meeting_summary.pdf

1. The OPC Science Advisory Team issued a position statement on climate change. The minutes on this item read as follows:

> *10. DISCUSSION: Ocean Protection Council Science Advisory Team Position Statement on Climate Change*
> *Skyli McAfee introduced Dr. Gary Griggs, OPC Science Advisory Team (SAT) co-chair, who presented the SAT's Position Statement on Climate Change. The Council received the Position Statement and thanked Dr. Griggs for his work on this project. Secretary Laird directed staff to draft a response to the statement for presentation at a future meeting.*

2. Amber Mace, OPC Executive Director, **reported** (emphasis added) to the Council on the development of an Interim Sea-Level Rise Guidance Document. The minutes on this agenda item read as follows:

> *11. Sea-Level Rise Guidance*
>
> *Amber Mace, OPC Executive Director, reported to the Council on the development of an Interim Sea-Level Rise Guidance Document. The guidance document provides science-based projections of sea-level rise and identifies important considerations for assessing sea-level rise impacts and vulnerabilities and incorporating them into planning.*
>
> *Garth Hopkins, Chief of the Office of Regional and Interagency Planning at the California Department of Transportation (Caltrans), indicated that Caltrans needs data on sea-level rise projections to consider how to adjust designs of transportation projects and that it is helpful to have state agencies come to agreement on the projections of sea-level rise. He said that Caltrans will soon have guidance for staff on how to incorporate sea-level rise into planning for transportation projects.*
>
> *Susan Hansch, Chief Deputy Director at the California Coastal Commission, discussed how many of the Coastal Act policies guide consideration of climate change issues and that the California Adaptation Strategy identifies Local Coastal Programs (LCPs) as one of the key implementing tools for addressing sea-level rise. She said that it is important to have more detailed information to support amendments of LCPs. She said that the guidance document is helpful because it is science-based and having agreement among the sixteen state agencies shows that the Commission is not alone in identifying projections for sea-level rise. She said that it is difficult now with limited staff at the Coastal Commission and asked for support in avoiding further staffing reductions.*

3. The OPC did NOT adopt the "State of California Sea-Level Rise Interim Guidance Document" outright. Instead they actually requested that OPC staff outline a public process for expanding upon the California Adoption Strategy and provide a report on the stakeholder process to bring a more comprehensive resolution on climate change at a subsequent OPC meeting later this year.

12. Resolution on Sea-Level Rise

Abe Doherty, OPC Project Specialist, presented the resolution on sea-level rise to the Council. ***Based on the Council's requests for more specific actions on how to address sea-level rise, OPC Executive Director Amber Mace stated that OPC staff will outline a public process for expanding upon the CA Adaptation Strategy and will provide a report on the stakeholder process and bring a more comprehensive resolution on climate change at a subsequent OPC meeting later this year.*** (emphasis added)

Public Comment:

• Sarah Newkirk– The Nature Conservancy – Spoke in support, recommended commencement of a stakeholder process immediately, asked for identification of goals and objectives of the stakeholder process, recommended development of spatially-explicit guidance on adaptation actions and other actions to provide guidance on how to implement the California Adaptation Strategy.

• Lesli Daniel – Sierra Club – Spoke in support, asked for commitment to develop guidance on implementation of the California Adaptation Strategy by the end of the year and asked for criteria and goals for the stakeholder process, encouraged state to emphasize use of natural systems instead of seawalls.

• Sara Aminzadeh – California Coastkeeper Alliance – Spoke in support, urged OPC to take additional action to address issues raised in previous comment letter to OPC on the draft resolution, emphasized the need for guidance on how to implement the Adaptation Strategy, requested that the next OPC meeting include an update on the public stakeholder process to clarify and expand upon the Adaptation Strategy.

• Leila Monroe – Natural Resources Defense Council – Spoke in support, urged OPC to address comments raised in previous comment letter to OPC on the draft resolution, requested more specific strong directions for implementation of the Adaptation Strategy.

• Kaitilin Gaffney – Ocean Conservancy – Spoke in support; noted the link with coastal flooding hazards from the tsunami, called for widespread and significant action, emphasized the importance of moving forward promptly with the stakeholder process.

The item was moved for approval by Golding, seconded by Adams, and approved unanimously.

APPROVED: Ayes: 5 Nays: 0

Discussion Of OPC Resolution

It is important to note that even the OPC is concerned that the recent findings of the task force with respect to sea-level rise and the subsequent modifications to the state's adaption strategy be

properly vetted through the various stakeholders in the state and done so in a public and transparent manner.

The Chief Deputy Director of the California Coastal Commission indicated that *"it is important to have more detailed information to support amendments of LCPs..."* and that *"the guidance document is helpful because it is science-based and having agreement among the sixteen state agencies shows that the Commission is not alone in identifying projections for sea-level rise."* Once again this points toward a sequential process for developing and adopting guidelines, rules, statutes and ordinances that works from the state at the top, down to the local jurisdictional level for Local Coastal Plans.

It is important to note that we are not taking umbrage with the concept of contemplating the potential impacts that accelerated long-term sea-level rise might have upon proposed developments in general and for this project in particular. It seems reasonable at this point to use the accelerated sea-level rise values issued by the CO-CAT task force to assess the potential hazards and risks that might be posed to the proposed development for this project. ***This was the upshot of our conversation in the field with Leslie Ewing of the California Coastal Commission and we have therefore incorporated the projection of a 55-inch sea-level rise by the year 2100 into our analysis.***

GEOLOGIC HAZARDS

In our opinion, the primary geologic hazards that could potentially affect the proposed bluff stabilization are wave erosion and bluff instability generated from seismic shaking and/or elevated ground water.

Wave Erosion

The toe of the coastal bluff within the coastal inlet and the area of the proposed bluff stabilization is subject to occasional wave erosion. This is evidenced by beach sand that covers most of the coastal inlet (Plate 1). In addition, wave scouring has undermined and oversteepened of the toe of the marine terrace deposits to an elevation of 18 to 20 feet above mean sea level (see Plate 2).

In an effort to evaluate the impact of long term wave erosion on the coastal bluff we examined eight sets of vertical stereo pair aerial photographs, dating from 1949 through 2003. There was no measurable retreat of the coastal bluff top along the bluff that is north of the garage. We did not observe evidence of catastrophic failures occurring along the coastal bluff in the vicinity of the subject property during this time period. However, the area of the proposed bluff stabilization has been actively eroding in a badlands type fashion for as long as the photographic record. The overall rate of coastal erosion is slow. But failure of the marine terrace deposits does occur, as evidenced by the recent landslide.

It is important to note that the original premise of the installation of a Hilfiker retaining wall triggered our initial involvement due to concern of the long term durability of such a wall in the active surf zone. As currently designed, the proposed Hilfiker retaining wall will be short lived

and will likely fail due to wave erosion. In our opinion, any portion of the Hilfiker retaining wall placed below the elevation of calculated wave run-up should be armored from wave erosion.

As currently proposed, the toe of the retaining wall keyway is about 10 feet horizontally from the current day shoreline angle (see "Approximate outline of proposed bluff stabilization" on Plate 2; Cross Section A-A'). Given its location and the slow rate of platform abrasion within the granitic bedrock, scour and undermining of the proposed Hilfiker retaining wall is not an immediate concern. However, the proposed wall, once constructed, must be adequately maintained. Inspection of the wall and surrounding coastal bluff by a qualified licensed professional should be performed at a minimum of every 5 years as well as after damaging winter storms.

Wave Run-Up

We discussed the impacts of recent resolutions by the OPC in an earlier section. During our on-site discussion with Leslie Ewing of the California Coastal Commission, Ms. Ewing supported the concept of evaluating the impacts of wave run-up and wave erosion with respect to a projected 55-inch sea-level rise by the year 2100. We therefore recommend that Pacific Crest Engineering incorporate this projected sea-level rise into their quantitative wave run-up analysis. Their quantitative wave run-up analysis should incorporate our Geologic Cross Sections (Plate 2). The projected near shore slope should be 3%.

Additionally, any retaining wall constructed in the area of concern should be armored in the zone of the projected wave run-up.

Bluff Instability

As noted above, the toe of the coastal bluff within the coastal inlet is only occasionally impacted by wave erosion and the overall rate of coastal erosion is relatively slow. Where the rate of coastal erosion is slow, such as the subject site, the dominant process affecting the stability of the coastal bluff is mass movement associated with either earthquakes or elevated groundwater within the relatively unconsolidated marine terrace deposits. The climactic cycles, seismic setting and the site-specific geology influence the magnitude and frequency of such bluff failures. As previously mentioned, the subject property will be subjected to strong ground shaking in the event of a large magnitude earthquake. Past ground shaking has triggered numerous failures of varying size along the coastal bluffs in the area. The sea cliff is also subject to slope failure under aseismic conditions. Not all of the materials that are loosened by earthquakes fail as landslides; some remains on the bluff. This "earthquake weakening" together with weathering of the bluff can produce loose debris on the slope. Subsequent rain storms can mobilize this loose debris.

There is no evidence of slope instability on the subject property other than relatively minor sloughing and slumping that has occurred within the alluvial deposits. Over time, however, we expect the slopes underlain by alluvial deposits to flatten to a stable angle of repose of 2 to 1 (horizontal to vertical).

As the slope continues to erode and fail in a piecemeal fashion, it will eventually undermine the garage foundation, which may cause structural damage or collapse, particularly if a large portion of the upper bluff fails during a large magnitude earthquake on one of the nearby faults. This process therefore poses a greater than ordinary risk to the garage and should be mitigated to lower the risk to an ordinary level.

The County of Monterey Planning Department definition of "emergency" in section 20.06.425 of the "Monterey County Zoning - Coastal Implementation Plan - Title 20" is as follows: *"Emergency means a situation arising from fire, explosion, act of god or act of public enemy which, if not corrected immediately, will potentially result in the loss of life, property or environmental resources."* The reader may access this code at the following web address: http://www.co.monterey.ca.us/planning/docs/ordinances/Title20/20.06%20Definitions.htm In this particular instance, it is our opinion that the word "emergency" is applicable to the greater than ordinary risk posed to the garage by continued failure of the bluff. This situation should be immediately rectified through an appropriate mitigation scheme, as recommended by the Project Geotechnical Engineer and Project Structural Engineer.

CONCLUSIONS

Based on the information gathered and analyzed in the steps outlined above, it is our opinion that the garage is subject to a greater than "ordinary" level of risk with respect to future erosion and shallow landsliding of the upper coastal bluff, as outlined in Appendix B. This level of risk is commensurate with the County of Monterey characterization of "emergency" for the garage. The currently proposed coastal bluff stabilization method of using solely a Hilfiker retaining wall system is not geologically suitable and will likely be undermined or outflanked by coastal wave erosion in the near future. A retaining wall system should clearly be installed in the bluff fronting the garage to lower the risk to "ordinary". If the upcoming revised retaining wall system is appropriately armored from coastal erosion, then the wall will be geologically suitable and will provide a level of "ordinary" risk, provided our recommendations are followed. Appendix B should be reviewed in detail to determine whether this level of risk is acceptable. If it is unacceptable, then the geologic hazards in question should be mitigated to reduce the corresponding risks to an acceptable level.

The subject property lies on the lowest emergent marine terrace. The property is underlain by marine terrace deposits, up to approximately 30 to 40 feet in thickness, comprised primarily of sands and gravels with abundant rounded granitic rock cobbles near the base of the unit. The marine terrace deposits in turn overlie a fossil wave-cut platform incised into the underlying granitic bedrock. Groundwater perches within the marine terrace deposits on top of the less permeable granitic bedrock at about 16 feet above mean sea level in the area of the proposed bluff stabilization.

RECOMMENDATIONS

1. We recommend that the proposed Hilfiker retaining wall be properly armored to reduce the potential for wave erosion to undermine or outflank the wall. The minimum elevation of the armoring should be based upon the forthcoming wave run-up analysis performed by the current Geotechnical Engineer Of Record, Pacific Crest Engineering (PCE). Their analysis should incorporate Geologic Cross Sections (Plate 2) and a projected future 55-inch sea-level rise (by 2100). The projected near shore slope should be 3%.

2. We recommend that the Project Geotechnical Engineer analyze the stability of the project site coastal bluff utilizing the methods prescribed in *CGS Special Publication 117A*. Our geological cross section through the project bluff (see Plate 2) should be utilized for performing the quantitative stability analysis using the stipulated geometry of formational contacts. The quantitative analysis should include a specific focus on the stability of the surficial older alluvium deposits and incorporate elevated ground water levels.

3. The proposed wall, once constructed, must be adequately maintained. Inspection of the wall and surrounding coastal bluff by a qualified licensed professional should be performed at a minimum of every 5 years as well as after damaging winter storms.

4. We request the opportunity to review any drainage plans for consistency with our geologic findings and recommendations. We have listed our drainage recommendations for this project below.

   We recommend that all drainage from improved surfaces, such as walkways, patios, roofs and driveways, at the top of the bluff should be collected in impermeable gutters or pipes and either carried to the base of the bluff via closed conduit or discharged into an established storm drain system that does not issue onto the bluff. At no time should any concentrated discharge be allowed to spill directly onto the ground adjacent to the existing residence. Any drain water on paved areas should not be allowed to flow toward the residence or toward the bluff top. The control of runoff is essential for control of erosion and prevention of ponding.

5. We recommend that our firm be provided the opportunity to review the final design and specifications in order that our recommendations may be properly interpreted and implemented in the design and specification. If our firm is not accorded the privilege of making the recommended review we can assume no responsibility for misinterpretation of our recommendations.

6. We recommend that Zinn Geology be retained to observe any and all excavations, including pier drilling. Field observation must be provided by a representative of Zinn Geology to enable us to form an opinion as to the degree of conformance of the site conditions exposed during excavation to those described in our geologic report. Any excavation performed without the full knowledge and direct observation of Zinn Geology, the Project Geologist Of Record, will render the recommendations of our report invalid.

INVESTIGATIVE LIMITATIONS

1. Our services consist of professional opinions and recommendations made in accordance with generally accepted engineering geology principles and practices. No warranty, expressed or implied including any implied warranty of merchantability or fitness for the purpose is made or intended in connection with our services or by the proposal for consulting or other services, or by the furnishing of oral or written reports or findings.

2. The analysis and recommendations submitted in this report are based on the geologic information derived from the steps outlined in the scope of services section of this report. The information is derived from necessarily limited natural and artificial exposures. Consequently, the conclusions and recommendations should be considered preliminary.

3. The conclusions and recommendations noted in this report are based on probability and in no way imply the site will not possibly be subjected to ground failure or seismic shaking so intense that structures will be severely damaged or destroyed. The report does suggest that building structures at the subject site, in compliance with the recommendations noted in this report, will subject the structures to the level of "lowest possible risk to occupants of the structure" as defined in Appendix B.

4. This report is issued with the understanding that it is the duty and responsibility of the owner or his representative or agent to ensure that the recommendations contained in this report are brought to the attention of the architect and engineer for the project, incorporated into the plans and specifications, and that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

5. The findings of this report are valid as of the present date. However, changes in the conditions of property and its environs can occur with the passage of time, whether they be due to natural processes or to the works of man. In addition, changes in applicable or appropriate standards occur whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside our control. Therefore, the conclusions and recommendations contained in this report cannot be considered valid beyond a period of two years from the date of this report without review by a representative of this firm.

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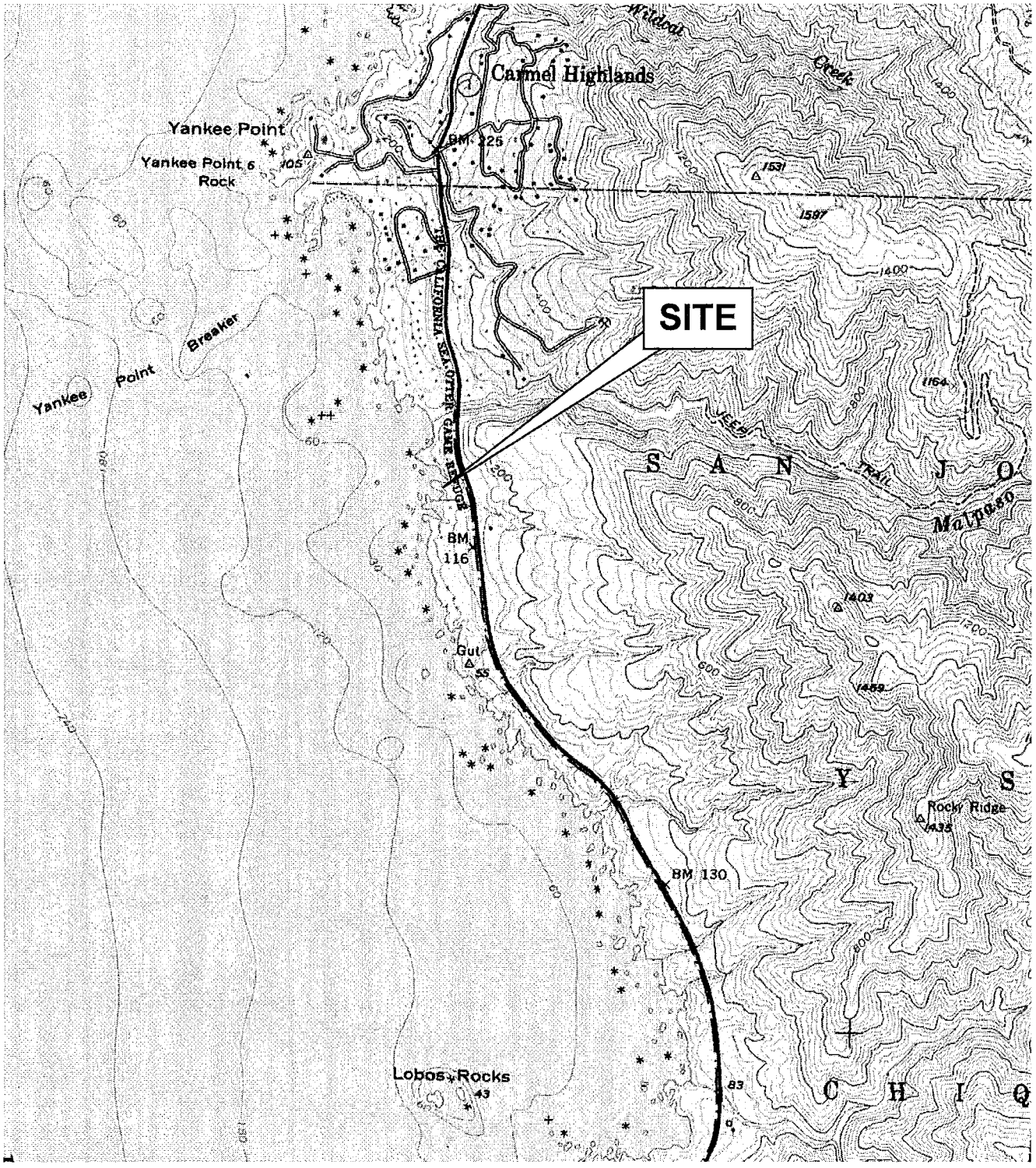
APPENDIX A

FIGURES



BASE MAP: U.S. Geological Survey, 1956 (photo revised 1983), Soberanes Point Quadrangle, California, U.S. Geological Survey 7.5' topographic series, scale 1:24,000.

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SCALE 1:24,000

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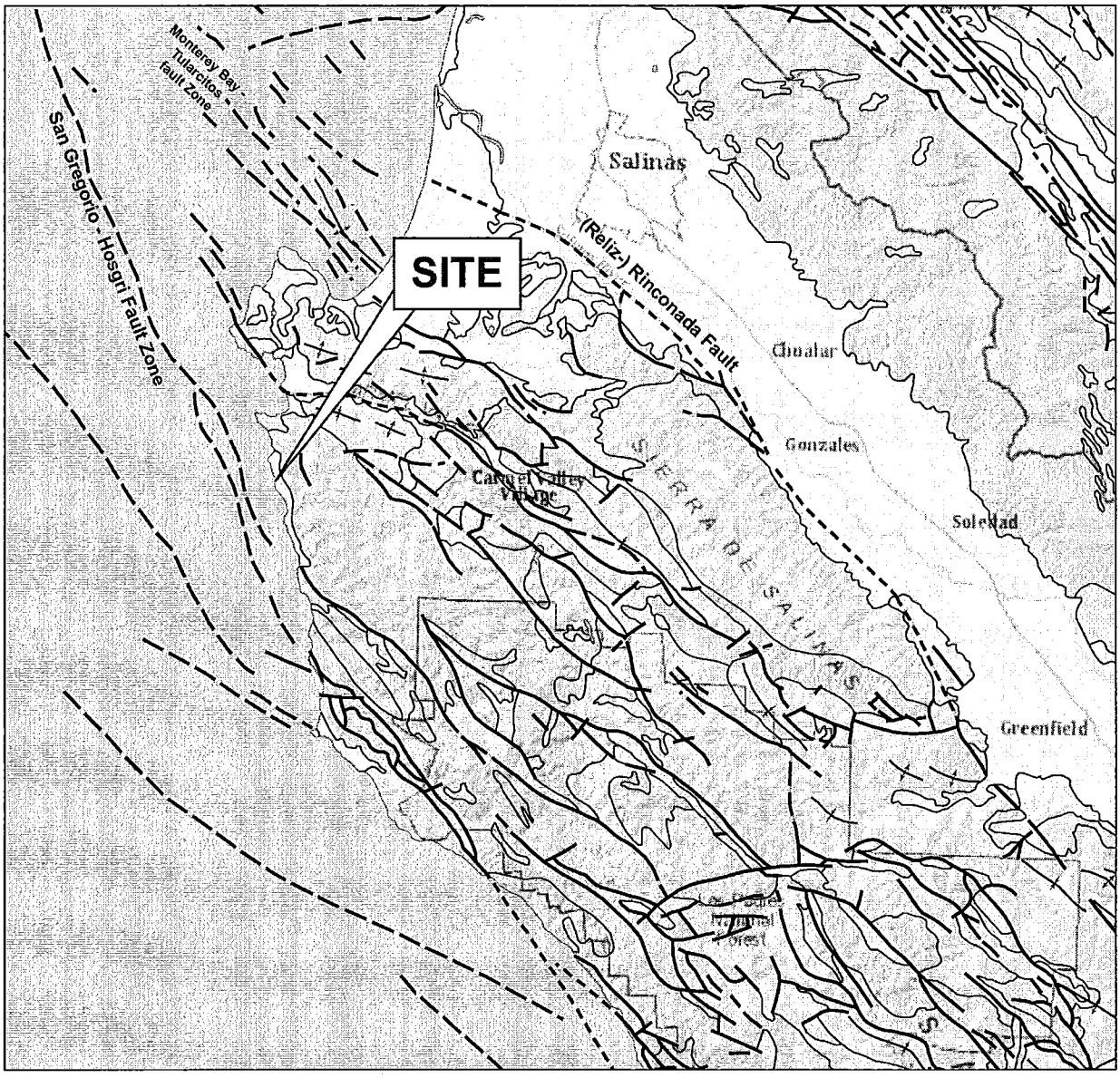
ZINN GEOLOGY

Topographic Index Map
Niles Residence
30620 Aurora Del Mar
Carmel, California

FIGURE #
1
JOB #
2011013-G-MT



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SCALE 1:500,000
10 Miles 0

Legend

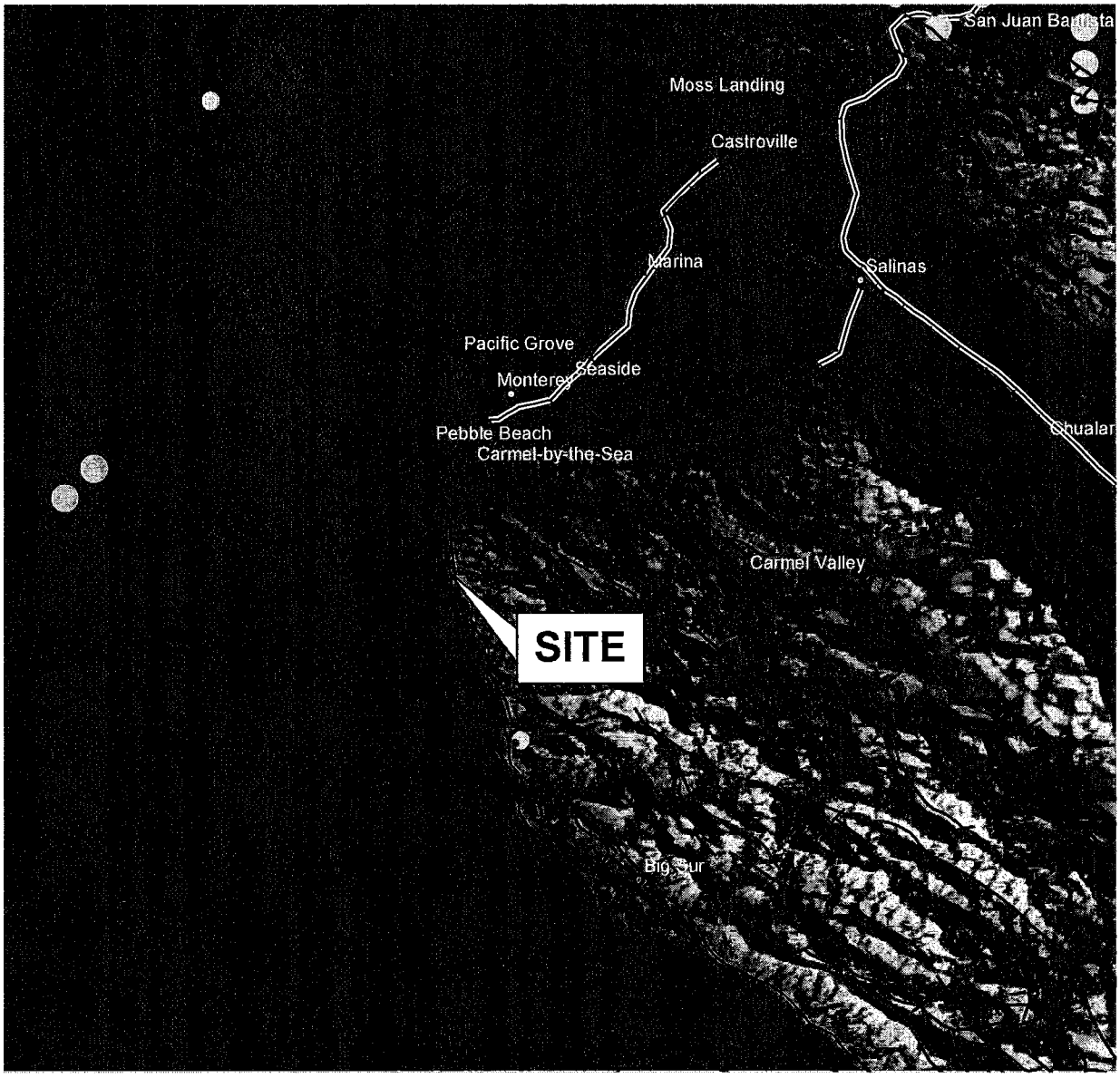
Geologic Units
- Quaternary Deposits
- Quaternary Volcanics
- Tertiary Sedimentary Rocks
- Tertiary Volcanic Rocks
- Pre-Tertiary Sedimentary Rocks
- Pre-Tertiary Volcanic Rocks
- Grantic Intrusive Rocks
- Franciscan Complex
- Ultramafic Rocks
- Pre-Tertiary Metamorphic Rock
- Pre-Cambrian Metamorphic and Igneous Rocks

Symbols
- contact
- fault, certain
- fault,approx. located
- fault, concealed or inferred
- anticline
- monocline
- syncline

Zinn Geology

Regional Geologic Map
Niles Residence
30620 Aurora Del Mar
Carmel, California

FIGURE # 2
JOB # 2011013-G-MT



Seismicity Information: Magnitude 4 and greater earthquakes, compiled from various sources, 1769 to 2000; available at www.consrv.cagov/CGS/rghm/quakes/cgs2000_fnl.txt
Fault Information: Jennings, C.W., 1977, Geologic map of California: California Department of Conservation, Division of Mines and Geology, scale 1:750,000

EXPLANATION

Symbols

——— fault, certain

– – – fault,approx. located

----- fault, concealed or inferred

Earthquake Magnitude

• 4.0 to 4.99

5.0 to 5.99

6.0 to 6.99

7.0 +

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SCALE 1:500,000

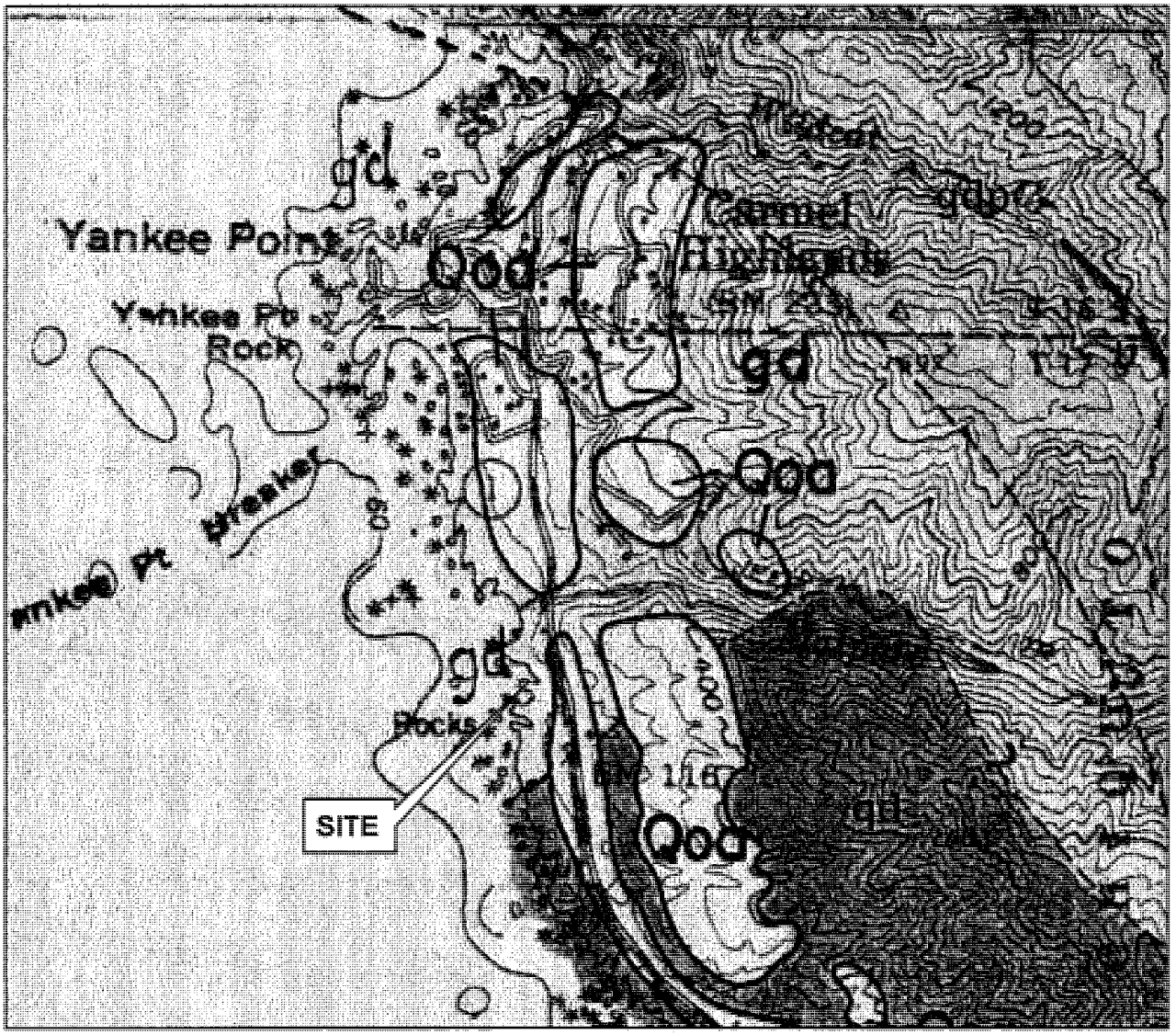
0 5 10 20

Miles

Zinn Geology

Regional Seismicity Map
Niles Residence
30620 Aurora Del Mar
Carmel, California

FIGURE #
3
JOB #
2011013-G-MT



EXPLANATION

Qoa	elevated, dissected older alluvium
gd	granodiorite to quartz monzonite
gdp	granodiorite, porphyritic
qd	quartz diorite to granodiorite, biotite-rich

earth materials contact: dashed where inferred, queried where uncertain

fault: dashed where inferred or existence uncertain, dotted where concealed, queried where existence is doubtful; arrows indicate strike-slip movement

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SCALE 1:24,000

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Base Map: Dibblee, T.W., 1999, Geologic Map of the Monterey Peninsula and Vicinity, Monterey, Salinas, Point Sur, and Jamesburg 15-Minute Quadrangles, Monterey County, California: Dibblee Geological Foundation Map #DF-71, scale 1:62,500.

Zinn Geology

Local Geologic Map
Niles Residence
30620 Aurora Del Mar
Carmel, California

FIGURE #
4
JOB #
2011013-G-MT

APPENDIX B

SCALE OF ACCEPTABLE RISKS FROM GEOLOGIC HAZARDS

SCALE OF ACCEPTABLE RISKS FROM SEISMIC GEOLOGIC HAZARDS		
Risk Level	Structure Types	Extra Project Cost Probably Required to Reduce Risk to an Acceptable Level
Extremely low[1]	Structures whose continued functioning is critical, or whose failure might be catastrophic: nuclear reactors, large dams, power intake systems, plants manufacturing or storing explosives or toxic materials.	No set percentage (whatever is required for maximum attainable safety).
Slightly higher than under "Extremely low" level.[1]	Structures whose use is critically needed after a disaster: important utility centers; hospitals; fire, police and emergency communication facilities; fire station; and critical transportation elements such as bridges and overpasses; also dams.	5 to 25 percent of project cost.[2]
Lowest possible risk to occupants of the structure.[3]	Structures of high occupancy, or whose use after a disaster would be particularly convenient: schools, churches, theaters, large hotels, and other high rise buildings housing large numbers of people, other places normally attracting large concentrations of people, civic buildings such as fire stations, secondary utility structures, extremely large commercial enterprises, most roads, alternative or non-critical bridges and overpasses.	5 to 15 percent of project cost.[4]
An "ordinary" level of risk to occupants of the structure.[3,5]	The vast majority of structures: most commercial and industrial buildings, small hotels and apartment buildings, and single family residences.	1 to 2 percent of project cost, in most cases (2 to 10 percent of project cost in a minority of cases).[4]

1 Failure of a single structure may affect substantial populations.

2 These additional percentages are based on the assumptions that the base cost is the total cost of the building or other facility when ready for occupancy. In addition, it is assumed that the structure would have been designed and built in accordance with current California practice. Moreover, the estimated additional cost presumes that structures in this acceptable risk category are to embody sufficient safety to remain functional following an earthquake.

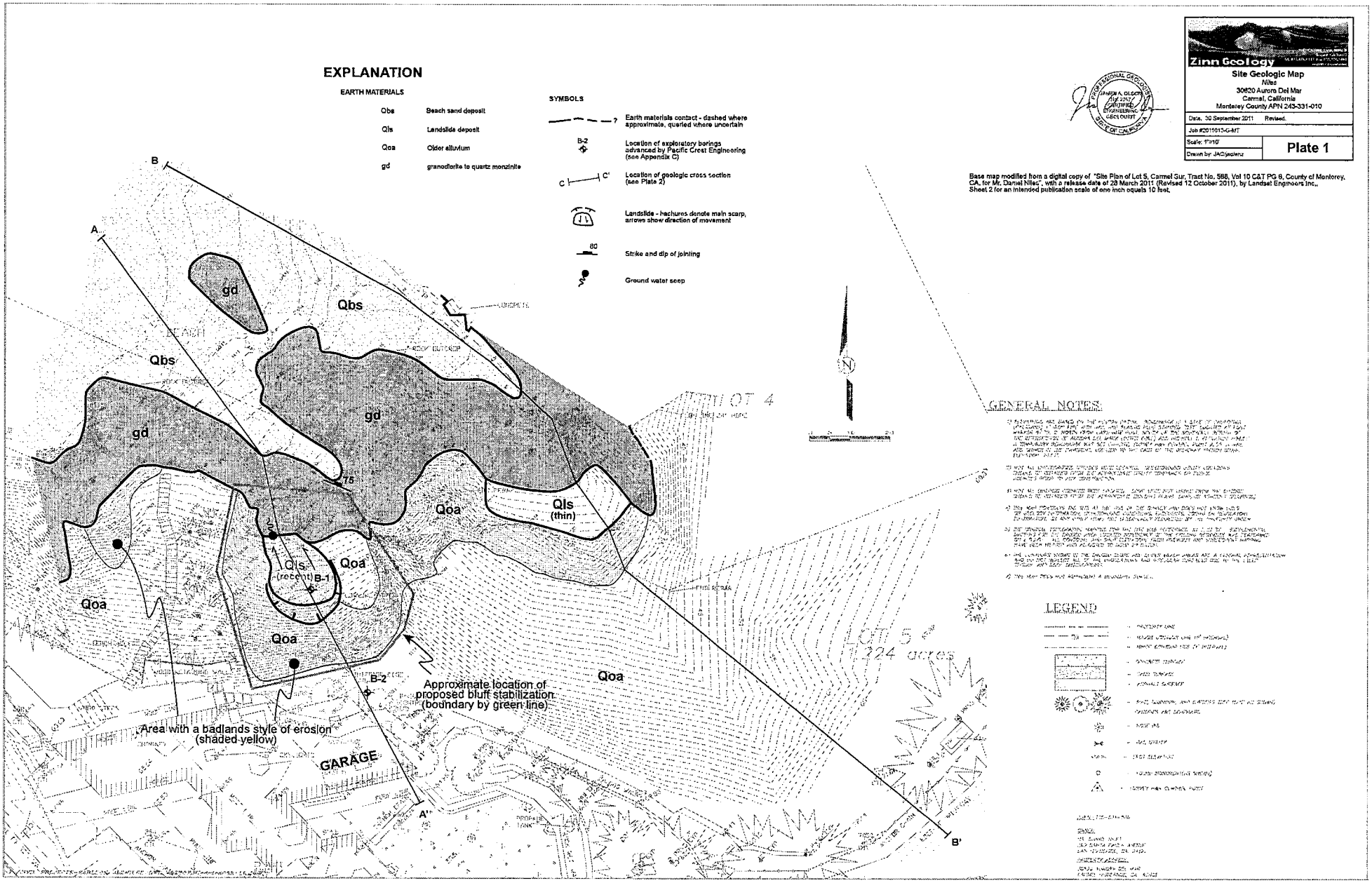
3 Failure of a single structure would affect primarily only the occupants.

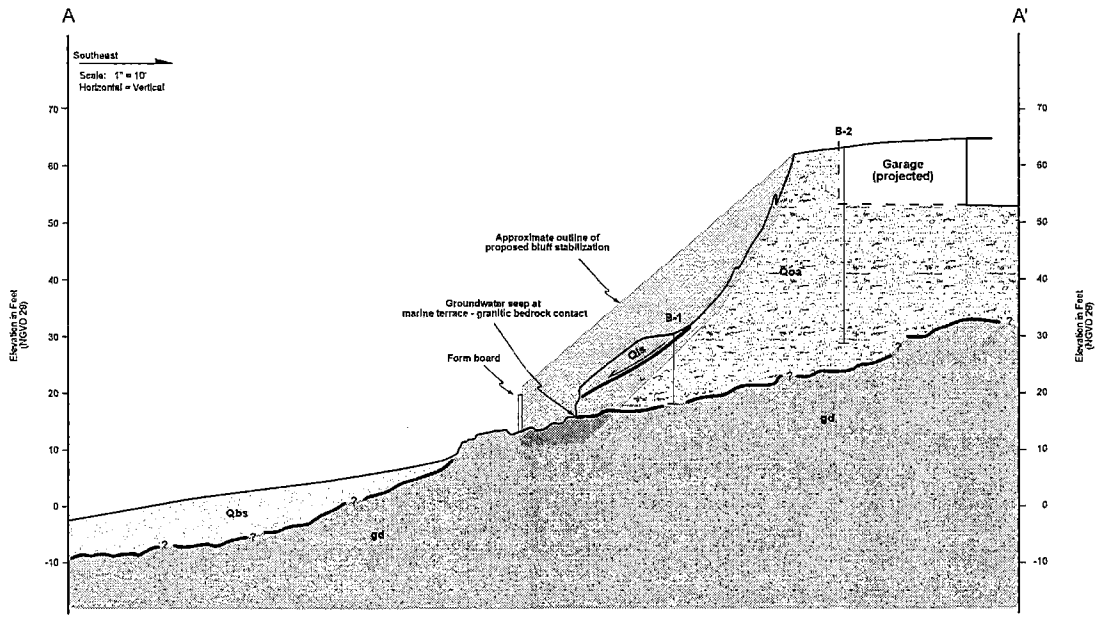
4 These additional percentages are based on the assumption that the base cost is the total cost of the building or facility when ready for occupancy. In addition, it is assumed that the structures would have been designed and built in accordance with current California practice. Moreover the estimated additional cost presumes that structures in this acceptable-risk category are to be sufficiently safe to give reasonable assurance of preventing injury or loss of life during and following an earthquake, but otherwise not necessarily to remain functional.

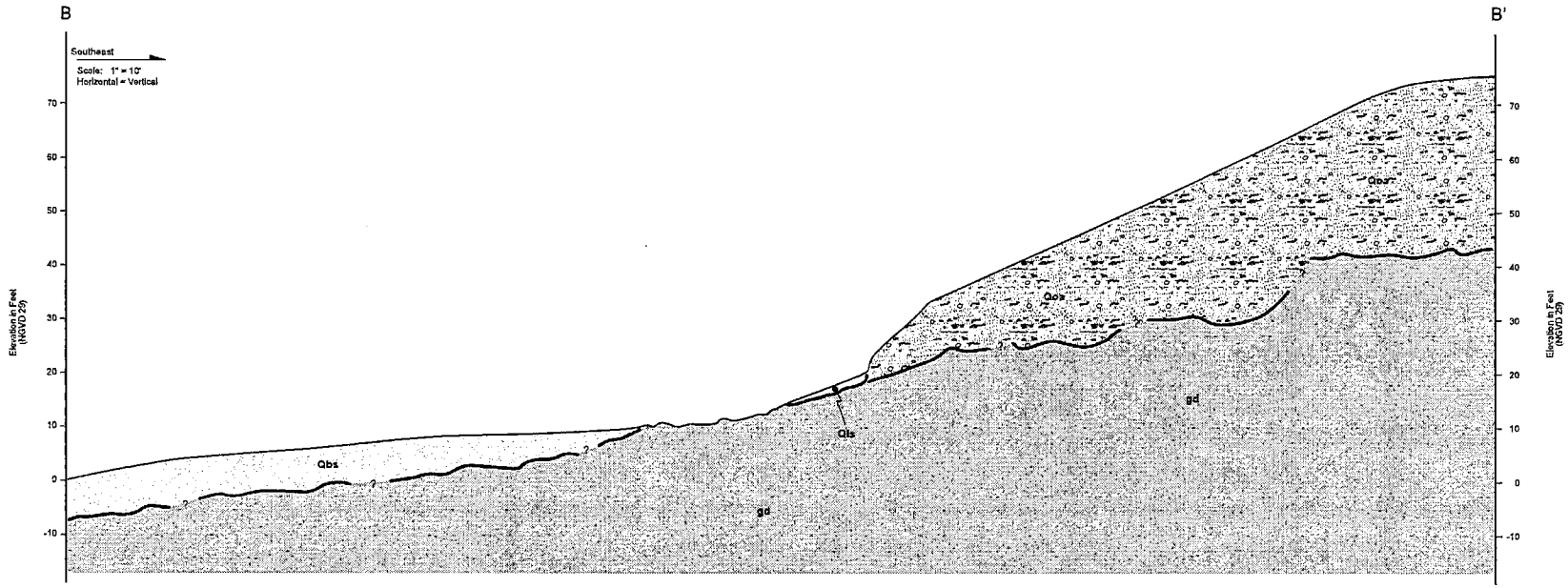
5 "Ordinary risk": Resist minor earthquakes without damage: resist moderate earthquakes without structural damage, but with some non-structural damage; resist major earthquakes of the intensity or severity of the strongest experienced in California, without collapse, but with some structural damage as well as non-structural damage. In most structures it is expected that structural damage, even in a major earthquake, could be limited to repairable damage. (Structural Engineers Association of California)

Source: ***Meeting the Earthquake,*** Joint Committee on Seismic Safety of the California Legislature, Jan. 1974, p.9.

SCALE OF ACCEPTABLE RISKS FROM NON-SEISMIC GEOLOGIC HAZARDS[6]		
Risk Level	Structure Type	Risk Characteristics
Extremely low risk	Structures whose continued functioning is critical, or whose failure might be catastrophic: nuclear reactors, large dams, power intake systems, plants manufacturing or storing explosives or toxic materials.	1. Failure affects substantial populations, risk nearly equals nearly zero.
Very low risk	Structures whose use is critically needed after a disaster: important utility centers; hospitals; fire, police and emergency communication facilities; fire station; and critical transportation elements such as bridges and overpasses; also dams.	1. Failure affects substantial populations. Risk slightly higher than 1 above.
Low risk	Structures of high occupancy, or whose use after a disaster would be particularly convenient: schools, churches, theaters, large hotels, and other high rise buildings housing large numbers of people, other places normally attracting large concentrations of people, civic buildings such as fire stations, secondary utility structures, extremely large commercial enterprises, most roads, alternative or non-critical bridges and overpasses.	1. Failure of a single structure would affect primarily only the occupants.
"Ordinary" risk	The vast majority of structures: most commercial and industrial buildings, small hotels and apartment buildings, and single family residences.	1. Failure only affects owners /occupants of a structure rather than a substantial population. 2. No significant potential for loss of life or serious physical injury. 3. Risk level is similar or comparable to other ordinary risks (including seismic risks) to citizens of coastal California. 4. No collapse of structures; structural damage limited to repairable damage in most cases. This degree of damage is unlikely as a result of storms with a repeat time of 50 years or less.
Moderate risk	Fences, driveways, non-habitable structures, detached retaining walls, sanitary landfills, recreation areas and open space.	1. Structure is not occupied or occupied infrequently. 2. Low probability of physical injury. 3. Moderate probability of collapse.
[6] Non-seismic geologic hazards include flooding, landslides, erosion, wave runup and sinkhole collapse		


EXPLANATION
EARTH MATERIALS
Qbs Beach sand deposit
Qls Landslide deposit
Qoa Older alluvium
gd granodiorite to quartz monzonite
SYMBOLS
Earth materials contact - dashed where approximate, queried where uncertain
B-2 Location of exploratory borings advanced by Pacific Crest Engineering (see Appendix C)
C C' Location of geologic cross section (see Plate 2)
Landslide - hachures denote main scarp, arrows show direction of movement
80 Strike and dip of jointing
Ground water seep
Zinn Geology
Site Geologic Map
Niles
30820 Aurora Del Mar
Carmel, California
Monterey County APN 243-331-010
Date: 30 September 2011 Revised:
Job #2011013-G-MT
Scale: 1"=10'
Drawn by: JACbastenz
Plate 1
Base map modified from a digital copy of "Site Plan of Lot 5, Carmel Sur, Tract No. 568, Vol 10 C&T PG 8, County of Monterey, CA, for Mr. Daniel Niles", with a release date of 28 March 2011 (Revised 12 October 2011), by Landset Engineers Inc., Sheet 2 for an intended publication scale of one inch equals 10 feet.
GENERAL NOTES
LEGEND
A
A'
B
B'
gd
Qbs
Qls (thin)
Qls (recent)
Qoa
B-1
B-2
75
Lot 4
Lot 5
7.224 acres
GARAGE
Approximate location of proposed bluff stabilization (boundary by green line)
Area with a badlands style of erosion (shaded yellow)





EXPLANATION

EARTH MATERIALS

Qbs	Beach sand deposit
Qls	Landslide deposit
Qoa	Older alluvium
gd	granodiorite to quartz monzinite

SYMBOLS

Earth materials contact - dashed where approximate, queried where uncertain

B-2 — Location of exploratory borings advanced by Pacific Crest Engineering (see Appendix C)

Zinn Geology

Site Geologic Cross Section

Niles
30620 Aurora Del Mar
Carmel, California
Monterey County APN 243-331-010

Date: 16 September 2011 Revised:
Job #2011013-G-MT
Scale: 1"=10'
Drawn by: JAO/pa/enr

Plate 2

PROFESSIONAL GEOLOGIST — JAMES A. OLDERSHAW — No. 2317 — CERTIFIED ENGINEERING GEOLOGIST — STATE OF CALIFORNIA

Attachment 2

LIB120151

Pacific Crest Engineering Inc. www.4pacific-crest.com

444 Airport Blvd, Suite 106
Watsonville, CA 95076
Phone: 831-722-9446
Fax: 831-722-9158

April 19, 2012 Project No. 1158.1-M255-F62

Daniel and Jennifer Niles
c/o Ms. Gail Hatter-Crawford, Senior Land Use Specialist
Anthony Lombardo & Associates
450 Lincoln Avenue, Suite 101
Salinas, CA 93901

Subject: **Geotechnical Review of Proposed Stabilization Plans**
Coastal Bluff Stabilization Project
Niles Residence
A.P.N. 243-331-010
30620 Aurora Del Mar
Carmel, California

Reference: **Pacific Engineering Group, Inc.**
Plan Set For Niles Residence - Slide
Sheets S1.0, S3.0, S3.1 and S4.0, revised 4/16/12

Dear Mr. and Mrs. Niles,

As requested, Pacific Crest Engineering has reviewed the above referenced plans for stabilization of the failed coastal bluff immediately adjacent to an existing garage. The plans were reviewed for conformance with the recommendations of our Geotechnical and Geologic Coastal Investigation Report, dated November 15, 2011.

Past instability of the coastal bluff immediately adjacent to the existing garage has greatly increased the potential for undermining of the garage foundation. The garage foundation was subsequently underpinned in January 2012 as a temporary protection measure against undermining while the failing bluff is being stabilized.

As outlined in our report, a projected wave runup elevation of 30 feet NGVD has been calculated for this project. Wave action and scour of the exposed bluff below the projected runup elevation will be resisted by a reinforced concrete headwall system keyed into competent bedrock. The failing bluff above Elevation 30 feet NGVD will be buttressed and stabilized by a Hilfiker retaining wall system.

A reinforced concrete, decorative rock facing will be provided below the projected wave runup elevation to blend with the surrounding natural rockscape. Above Elevation 30 feet, the Hilfiker system will include soil retention provisions to establish a landscape screen and provide a more natural appearance.

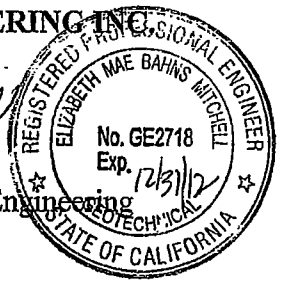
PLN110278

Our report recommendations were intended to meet the applicable development standards set forth in the Big Sur Land Use Plan, Section 20.145.080 and to establish an "ordinary" level of risk to life, property and damage to the natural environment. Based upon our review, it is our professional opinion that the plans are in general conformance with our recommendations.

Pacific Crest Engineering will provide earthwork observation and testing services during construction in order to provide, upon completion, written documentation that the proposed improvements have been constructed in general conformance with the project plans, specifications and the referenced report. Our services will include field verification of foundation depths into competent bedrock, observation and testing of compaction efforts as necessary for wall backfill, and observation of surface and subsurface drainage provisions.

We appreciate the opportunity to be of service. If you have any questions, I can be reached at (831) 722-9446.

Sincerely,
PACIFIC CREST ENGINEERING INC.

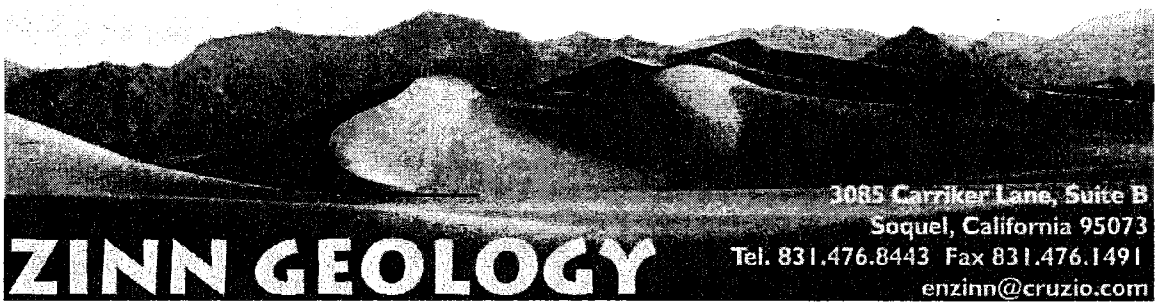


Elizabeth M. Mitchell, GE
Vice-President, Geotechnical Engineering
GE 2718; Expires 12/31/12

Copies: 2 to Client
1 to Pacific Engineering Group
1 to Zinn Geology

Attachment 3

LIB120402



19 April 2012

Job #2011013-G-MT

Pacific Crest Engineering
Attention: Elizabeth Mitchell
444 Airport Boulevard, Suite 106
Watsonville, CA 95076-2062

Re: Review of plans for proposed coastal bluff stabilization
Lands of Niles
30620 Aurora Del Mar
Carmel, California 95010
Monterey County APN 243-331-010

Dear Mrs. Mitchell:

At your request we have reviewed the coastal bluff protective structure plans prepared by the Project Civil and Structural Engineer Of Record, Mr. Gary Knott of Pacific Engineering Group, Inc.

We have reviewed the following plans submitted to our firm by you and prepared by the Project Civil and Structural Engineer Of Record, Mr. Gary Knott of Pacific Engineering Group, Inc.:

"Niles Residence - Slide 30620 Aurora Del Mar - Cover Sheet", Sheet 1.0, Revision date of 16 April 2012;

"Niles Residence - Slide 30620 Aurora Del Mar - Sections & Details", Sheets 3.0, Revision date of 16 April 2012;

"Niles Residence - Slide 30620 Aurora Del Mar - (E) & (P) Elevations", Sheets 3.1, Revision date of 16 April 2012;

"Niles Residence - Slide 30620 Aurora Del Mar - Hilfiker Welded Wire Wall Details", Sheet 4.0, Revision date of 16 April 2012.

PLN110280

The purpose of our review was to ascertain if the plans and report cited above are in general conformance with geologic conditions encountered during our geological investigation and with the conclusions and recommendations issued in our report dated 14 November 2011.

It is important to note the recently issued plans cited in this review supercede the original civil and structural engineering plans that were repeatedly referenced in our original 14 November 2011 geology report for this project. It is our understanding the recently issued revised plans were prepared to better satisfy the geological recommendations issued by our firm in our original report, as well as the geotechnical engineering recommendations issued by your firm. The revised plans specifically address the elevated risk of the Niles residence being undermined through the process of long term coastal bluff retreat, as well as provide a long term solution to this problem that was only temporarily resolved in January 2012 through the underpinning of the residence.

In our opinion, the newly designed coastal bluff protection structure depicted on the plans more thoroughly accomplishes the objective of "blending with the surrounding environment" than the original plans, as per the Monterey County Coastal Implementation Plan, Part 3 - Regulations for Development in the Big Sur Coast Land Use Plan, Section 20.145.080.C.2.C. This is due to the fact that the lower portion of the wall facing has been specifically redesigned to blend in better with the surrounding granitic bedrock.

It is our opinion that geological aspects of the plans and report reviewed are in general conformance with the geological conditions encountered during our geological investigation and with the recommendations issued in our report. Furthermore, the recently revised plans cited in this letter supercede the plans cited in our original geology report and more effectively fulfill the intent of our original recommendations.

RECOMMENDATIONS

The recommendations presented herein and in the referenced report should not preclude more restrictive criteria by the governing agencies or by structural considerations.

1. In the event that any further changes are made to the plans, the revised plans should be forwarded to the Project Geologist Of Record to review for conformance with the previous recommendations.

LIMITATIONS

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

Our review of the plans cited at the beginning of this letter was limited to the **geological aspects only**. Review of all other aspects of the plans was beyond our purview on the project and are specifically excluded from the scope of this review. Our firm makes no warranty, expressed or implied, as to the adequacy of other aspects of the plans.

Conditions revealed during construction may vary with respect to the findings in the original investigation. Should this occur, the changed conditions must be evaluated by the Project Geologist Of Record and revised recommendations provided as required.

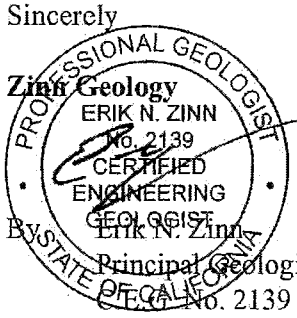
This letter is issued with the understanding that it is the responsibility of the Owner, or his Representative, to ensure that the information and recommendations presented herein are brought to the attention of the Architect and Engineers for the project and incorporated into the plans, and that the Contractor and Subcontractors implement such recommendations in the field.

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

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

If you have any questions regarding this letter, please do not hesitate to contact our office.

Sincerely



Zinn Geology

By Erik N. Zinn
Principal Geologist
C.E.G. No. 2139

Attachment 4

LIB120154

Charles E. Potter, P.E.
Consulting Civil Engineer
853 17 Mile Drive
Pacific Grove, CA 93950

12 September 2011

Mr. & Mrs. Daniel Niles
c/o Ms. Gail Hatter-Crawford
Lombardo & Gilles LLP
318 Cayuga Street
Salinas, CA 93901

Subject: **Septic and Site Drainage Systems**
Niles Property, 30620 Aurora Del Mar ~~(APN 125-621-009)~~
Carmel Highlands, Monterey County, California

Reference: **Site Plan, Job No. 492**
Sheet 1 of 1, Prepared by LandSet Engineers, Inc.,
Latest Revision Date 9/7/11

Dear Mr. & Mrs. Niles:

As requested, several site reviews were performed at the above referenced property as well as a review of the topographic map prepared by LandSet Engineers, latest revision dated 9/1/11, to determine the type and location of the septic system and storm drainage system serving the site and to determine if said systems were contributing to the erosion problem located north of the garage foundation. During these reviews there were discussions with the site contractor, Mr. Sean Houlihan of Houlihan Development and Consulting, and with Peninsula Septic Tank Service (PSTS) who determined the location of the septic tank and leechfield. Based on the site reviews, discussions, and topographic map review, locations of the septic and storm drain systems were determined and indicated on the above referenced site plan prepared under my supervision by LandSet Engineers. This site plan is included as part of this report.

As can be seen from the attached site plan, the major septic system components are located well to the west, south, and east of the eroded area. Inspection of the septic system by PSTS did not indicate any leakage problems and the leechfield, located far to the east in the access road, Aurora Del Mar, was dry at the time of the inspection due to the infrequent use of the Niles residence. Based on these facts, our opinion is that the septic system is not a contributing factor to the erosion problem.

The storm drain system, as depicted on the attached plan, consists of trench drains, catch basins, a roof drainage system, and three drainage outlets. The upper trench drain, which serves to collect all driveway drainage above it easterly to the westerly edge of Aurora Del Mar (asphalt concrete surfaced area), discharges northerly

to a rocky beach area located to the east and below the eroded area. The northerly and southerly portions of roof drainage areas, as well as the trench drain and catch basins located southerly of the garage entrance which serves the remaining driveway drainage, are collected and conveyed to discharge outlets located to the west and below the eroded area. Both of these outlets discharge to rocky beach areas. Consideration of the location of the storm drainage components and their discharge outlets indicates that the storm drainage system does not contribute to the erosion problem located north of the garage foundation.

In summary, based on all information available at the time of this report, neither the septic system or storm drainage system have had any effect or have contributed to the erosion that is occurring northerly of the garage foundation. If you have any questions or require additional information, please contact me at your convenience.

Sincerely,

Charles E. Potter, P.E

Enc.

Cc: Ms. Gail Hatter Crawford

Attachment 5

LIB120149

Regan Biological and Horticultural Consulting LLC, PO Box 337, Carmel Valley CA 93924

Delinda Robinson, Senior Planner
Monterey County Planning
168 W. Alisal St.
2nd Floor
Salinas, CA 93901

May 31, 2012

Re: Niles residence Coastal Bluff stabilization: PLN 110280

Dear Delinda,

Gail Hatter Crawford, Senior Land Use Specialist at Anthony Lombardo & Associates, representative for home owners Daniel and Jennifer Niles has asked me to write a follow-up letter in regards to restoration aspects of the Niles slope repair project. It is my understanding that a visit to the site by the Land use advisory committee raised a few concerns about nonnative plants on the project site as well as timing details I had included in my Biological assessment and restoration recommendations.

Specifically it was mentioned that members of the LUAC expressed concern about the existing exotic plants on the bluff that are known to be invasive and the brevity of the follow-up monitoring period for the plants going in to the new retaining wall. I will address these individually in this letter and in revisions to my Biological report.

The Landscape around the Niles property is dominated by species from other Mediterranean regions of the world. These shrubs are drought resistant and able to withstand salt spray and constant winds. Some of them have proven to be quick to naturalize along the Central coast and even to become somewhat invasive in local native habitat. The two primary species of concern on the Niles property are the Pride of Madeira (Echium candicans) and Mouse-hole tree (Myoporum laetum). These two long lived shrubs have spread from landscaped areas all along the Monterey County coastline and are colonizing areas of the Niles property on both the East and West side of the slope area that is to be repaired. This

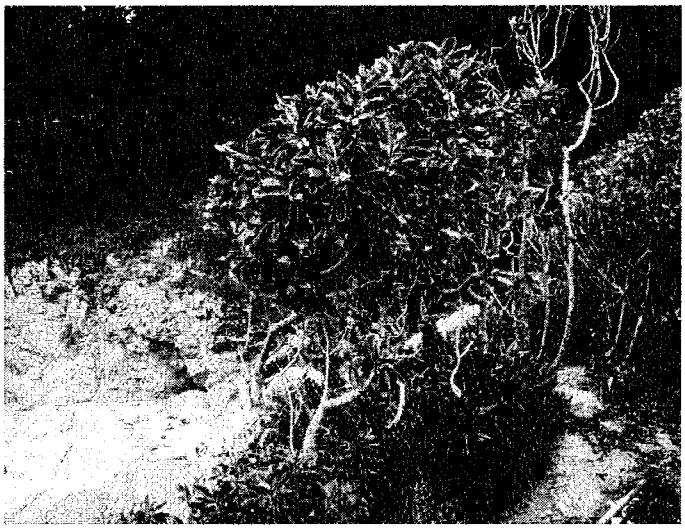
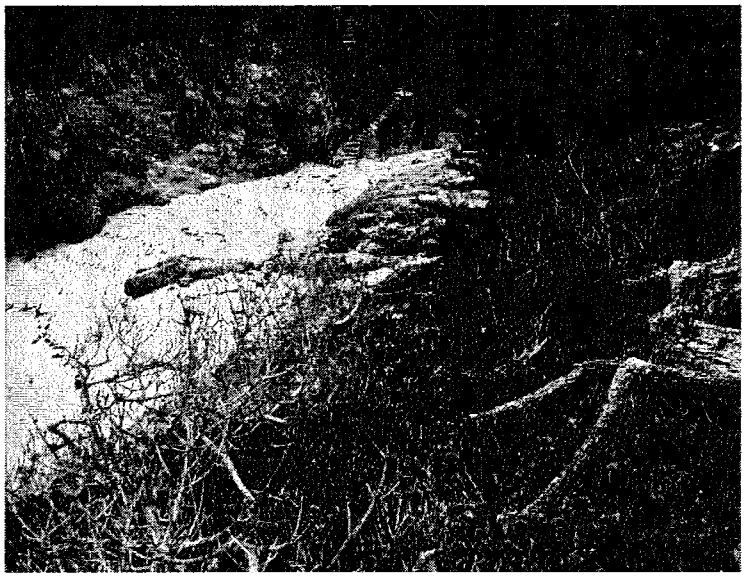


photo is along the top of the slope on the East side of the repair section. The Myoporum is in the upper middle and the Echium is below it. The specific mentioned area of concern was on the west side of the slope repair. I searched the west side very thoroughly and found 3 or 4 smaller Echium growing within a short distance of the stairway that leads to the cove below. These should be removed as soon as feasible so they cannot spread additional seed in this area. They are small enough to remove by hand and should be removed as soon as feasible to avoid spreading more seed in this

area. A row of Myoporum shrubs lines the top of the bluff along the fence as a physical and visual screen. These plants really should stay as removal now would destabilize the top of the slope and remove the screening. I did not see additional seedlings volunteering below the plants, so at this time they do not appear to be creating additional problems on this particular section of the bluff. There are about 5 standing dead pine trees that have been dead for quite some time, scattered down the slope on the West side of the stairway. The photographs above (looking west) and below (looking east down slope) show a few of the dead trees in the midst of dense native perennials and shrubs. These trees pose a conundrum. Removal of the entire trees could cause a significant amount of erosion and destabilize the fragile layer of soil over the granite bedrock, but leaving them in place means that at some point when the root systems have decomposed sufficiently they will collapse and fall down the slope. One or two have already collapsed and are currently laying on their sides over the native vegetation. Perhaps from a safety and aesthetics perspective they should be carefully cut at the soil level and removed during the dry season when erosion damage can be minimized. At the very least, those pieces that are not resting on the ground or on top of other vegetation, should be trimmed off and removed and the pieces that may actually decompose on site with falling down slope can be left.



The area where both Myoporum and Echium have become dominant and pose a risk for invading the new plantings on the Hilfiker retaining wall is on the East side of the repair section. This area is currently somewhat separated from the west end of the slope by the slump and a narrow ridge of sandstone. When the Hilfiker wall is erected it will connect all the way across to this Echium dominated section and will be easily invaded by the Echium and Myoporum seed drop. I would recommend clearing both Echium and Myoporum back from the wall edge at least 10 feet and extending the planting of the native perennials and shrubs all the way to the end of this cleared area to provide some stability and

competition for invasive plants. I do not believe it is a realistic or reasonable to expect complete eradication of these two species from the slope, but maintaining the planted areas of the slope repair by keeping them free of invasion of Myoporum and Echium is a reasonable goal. This photo below shows the density of the Echium on the slope and the Myoporum screen above it just east of the repair site. It is the dominant shrub from here to the back end of the cove. It will be most critical to maintain the repaired section weed free in the first two years to allow the natives to spread and achieve sufficient density to keep the exotic species from finding open soil to germinate in.

With that in mind, the second concern mentioned was the monitoring period for the planted area of the repair wall. I believe it is reasonable to extend the monitoring period from 1 year to 2 years to insure the success of the native plant survival as well as preventing the invasion of nonnative shrubs and perennials. I have adjusted the restoration monitoring timeline in my report to include quarterly monitoring visits through year two after completion of planting and to include 3 biannual reports and one final report to be created at the end of year two.

Please contact me if you have any questions.

Patrick J Regan

Pat Regan - Project Biologist

Regan Biological and Horticultural Consulting LLC, PO Box 337, Carmel Valley CA 93924

Delinda Robinson, Senior Planner
Monterey County Planning
168 W. Alisal St.
2nd Floor
Salinas, CA 93901

March 20, 2012

Re: Niles residence Coastal Bluff stabilization: PLN 110280

Dear Delinda,

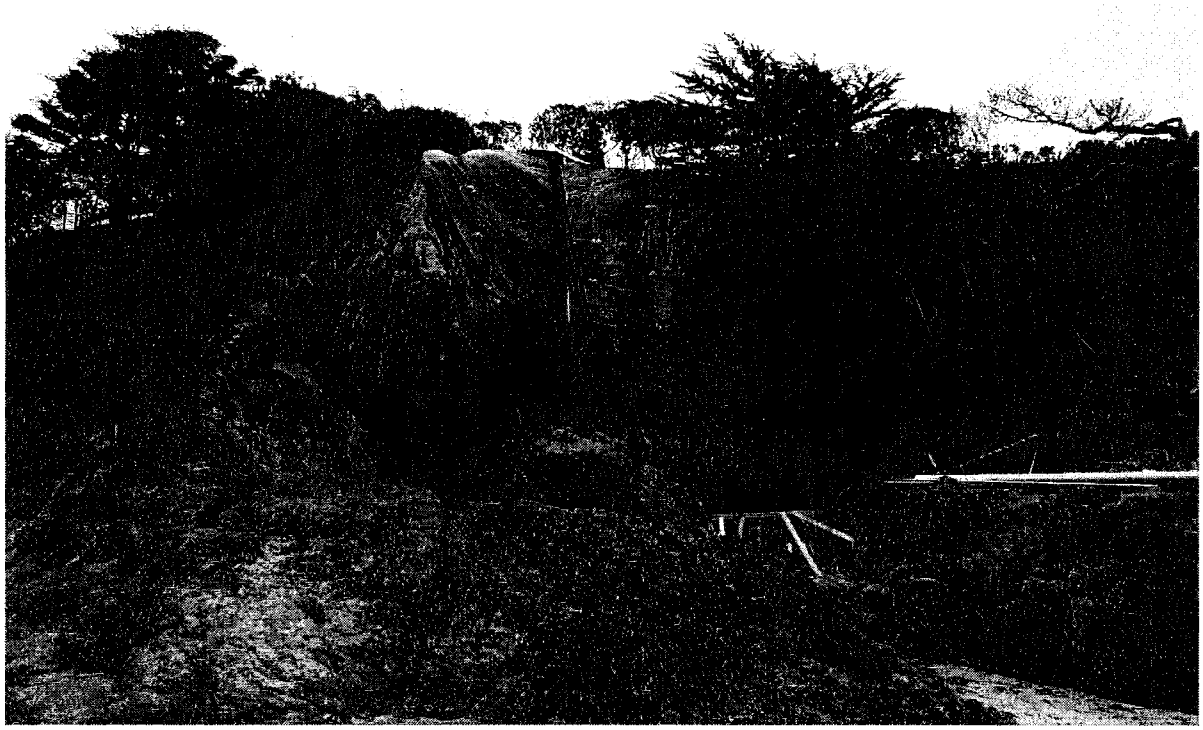
Gail Hatter Crawford, Senior Land Use Specialist at Anthony Lombardo & Associates, representative for home owners Daniel and Jennifer Niles has asked me to conduct a Biological assessment of a slope on the north side of a bluff over Otter Cove in Carmel Highlands CA. The slope is just north of the house structure that was built into the Bluff in 1980 and has gradually eroded away over the years. A scar approximately 25 feet wide and 60 feet remains where sandstone and sandy soil have eroded from the slope below the garage. Water seepage down the slope may have had some influence on the erosion and the question has been raised as to where this water is coming from. More severe slope failure has occurred in the last year and the site has been temporarily covered with a large tarp to prevent additional erosion. The Niles' were granted an emergency permit by the Planning department last summer for a prior wall design. However, to abate the emergency temporarily, the garage was underpinned and tarping was maintained throughout this past winter. During that time, the slope stabilization plan and wall plans were more thoroughly designed and engineered taking into account the geological and geotechnical aspects of the site, as well as the effects of ocean tides, wave crash, and projected ocean rise.

The Niles' have proposed a slope stabilization and repair using the Hilfiker retaining wall system that will cover over the entire damage area and extend further east and west on the coastal bluff. The retaining wall will be anchored at the base of the bluff with concrete head walls approximately 75 feet wide and gradually narrow as it rises up the bluff to about 40' wide at the high point. The existing sandstone surface of the slope will be terraced to provide horizontal surfaces to rest the Hilfiker baskets on and help retain fill soil within the baskets. The Terracing and Drilling will all be done by light weight equipment brought down by hand. The Drilling Equipment is anchored above and run by 3 workers. The Terracing is going to be a basic cut/fill until more fill is needed and then all fill will be bought down in a pipe system. Heavy Equipment will not be used on the hillside at any time. Hilfiker retaining wall systems incorporate the wall face and soil reinforcing mechanism as one unit. The reinforcement mats "stand alone," and are backfilled once in place. They require no extra external bracing or internal supports.

The Niles residence is built into the western edge of a bluff over a small cove along the Pacific Ocean at the northern end of the Gated community known as Otter Cove along Highway 1 in Carmel Highlands California. Historically the vegetation type in this area would have been Coastal sage scrub and Coastal bluff scrub, dominated by low growing shrubs and perennials that thrive in the windy, salt misted

conditions along the coast line. These same conditions and the steep sided bluffs limit the habitat value of the site for all but a handful of wildlife species.

On August 2, 2011 I visited the Niles property and surveyed for plant and animal species at the site where the slope failure has occurred, the slopes on either side of it and the beach area below it. This time period would be appropriate for identifying flower or foliage of all the special status species that could potentially occur on the Niles property. An inventory list of species found is attached to this report. Prior to my visit I queried the California natural Diversity Database (CNDDB) to determine what special status species had previously been documented in the area near the Niles residence. This database includes documented occurrences of species and plant communities that are considered rare, threatened or endangered by local, state and federal agencies or special interest societies such as the California native plant society. The lists are organized by United States Geological survey (USGS)



Quadrants. The Niles residence is near the northern boundary of the Soberanes point and Monterey Quadrants so I created a search list from the combined data of both quadrants. The list includes 53 different species or plant communities including 33 plants, 6 unique plant communities and 15 animal species including 3 insects, 5 birds, 2 amphibians, 2 reptiles, 1 fish and 1 mammal. This is a large list which is accounted for by the fact that these two quads extend a fair distance from the coast into the Santa Lucia and Sierra de Salinas mountain ranges and are two of the more highly developed quads in Coastal Monterey County. More development in these quads means more Biological assessment and more documentation of special status species native to this region. Many of these species are ruled out by the specific conditions of this particular site; essentially a Rocky promontory extending out over an ocean cove. Because of this unique location there are very few species on the list that would ever have been found here even before development occurred. I have attached the list at the end of this report and indicated in the far right column whether suitable habitat exists for the particular species on the

Niles property. The entire site has been impacted for decades by introduced landscape species and overall development of the property. It no longer supports sufficient protected native habitat to support any of the noted species that may have at one time occurred here. The one species from this list found on the project site is the Monterey Cypress (seen at right and below blue tarp in photo above) which will be discussed in more detail later. No other rare, threatened or endangered species were found on the project site during my survey of August 9, 2011. No detrimental impacts to special status species or plant communities will result from the construction of this retaining wall.

Geologically this is a multi-faceted site with part of the bluff being composed of large grained granitic bedrock of igneous origin and the portion further east being composed of sedimentary layers of sandstone, sand and larger cobble. The boundary appears to be along the west side of the Blue tarp in the photo above. The softer sandy strata to the right protrudes out away from the top in a small ridge and shows signs of consistent erosion and supports very little vegetation. Further to the east, where the slope is less extreme and more actual soil is available, the conditions change significantly and the slope is densely vegetated with a mix of typical coastal scrub species like Seaside wooly sunflower (*Eriophyllum staechadifolium*), and seaside daisy (*Erigeron glaucus*) as well as abundant invasive exotics like Pride of Madeira (*Echium fastuosum*) and Mouse-hole tree (*Myoporum laetum).* Pride of Madeira is a plant introduced from North Africa that has become very popular as a landscape plant throughout California. In the mild Mediterranean conditions along the Central coast it has become a rampant volunteer in wild areas adjacent to landscapes utilizing it. Mouse-hole tree has been introduced to the United States from New Zealand as a very drought resistant landscape shrub. It is considered an invasive exotic species by the California Exotic Pest Plant Council. It readily reseeds and spreads in coastal dunes and bluffs from central to southern California.

To the west of the subject area, the slope is also densely covered with mostly native species like Douglas' iris (*Iris douglasiana*), Seaside daisy (*Erigeron glaucus),* Sea lettuce *(Dudleya caespitosa),* seaside wooly sunflower *(Eriophyllum staechadifolium),* seaside painted cup *(Castilleja latifolia)* and Monterey Cypress (*Hesperocyparis macrocarpa)* which is native to the region but not on this site and was probably planted. Aside from the Monterey Cypress, this is the group of species that I would recommend for re-vegetating the adjacent slope after repair work is done. The base of the wall will be above high tide line along the beach and no marine species or beach species will be detrimentally impacted by the construction of the retaining wall.

Special Status species

Two of these plants are considered by the California native plant society to be special status species: *Castilleja latifolia* and *Hesperocyparis macrocarpa.*

The **Seaside painted cup** (*Castilleja latifolia*) is a LIST 4.3 Limited distribution (Watch List, California endemic, not very endangered.) species found only along the coast in Monterey and Santa Cruz counties. It is not state or federal protected at this time. It is impossible to say whether this plant previously occurred historically where the slope failed, but none of the plants currently existing on site near the proposed slope repair will be detrimentally impacted by this project.

Monterey Cypress (*Hesperocyparis macrocarpa;* previously classified in Genus *Cupressus*) is known from only two native occurrences in the Monterey area; Cypress Point and Point Lobos, but is widely planted in other areas throughout Coastal Monterey County and rest of the state. It is a list 1B.2 species (Rare, threatened, or endangered in California and elsewhere, fairly endangered in California). While the Niles residence is geographically quite close to Point Lobos, the trees on site are most likely not native to the site but clearly of nearby local origin. A few old dead trunks on the slope west of the slide area appear to have been originally planted as part of the landscape. Trees growing on the slope in the middle of the main damage area are probably volunteer seedlings that came from landscape trees on site. The trees currently growing on the bank west of where the slope failed are not proposed for removal and will have minor impact from the construction of the Hilfiker wall, but will be stabilized and better protected from erosion when the wall is completed. A pair of smaller Cypress trees with a cluster of smaller plants including *Dudleya caespitosa*, *Eriophyllum staechadifolium*, *Erigeron glaucus*, and the non-native *Echium fastuosum* will be removed from the site in order to fully span the width of the slope from one stable point to another. The photo above depicts the group of plants in the middle of the area that will be covered and stabilized by the Hilfiker retaining wall system. This impact is minimal and will not affect any special status species occurring naturally on the site. The native species in this location are all part of the restoration plan list that will be replanted post construction. The small succulent *Dudleya caespitosa* can be salvaged from this site and held for replanting post construction as well. Monterey Cypress,

though they are not native to the site can be included in the replanting of the site at the east edge and even near the top of the wall.

No other special status species or plant communities were observed on the Niles property.

Impacts analysis and mitigation recommendation

While no native occurrence of special status species will be impacted by the slope repair, some impact to the plant community known as Northern coastal bluff scrub has already occurred as a result of the slope failure and will continue to occur if slope failure is not abated. A small amount of native vegetation removal will occur during the repair work. With the construction of the slope repair system and replanting with appropriate native plant species outlined in the table below, continuing losses will be abated and restoration of plants presumed lost in the slope failure will occur.

Restoration plan plant species

Botanical name	Common name	Container size	Quantity	Location on slope
Agrostis exarata	western bent grass	6" leach tube	100	Middle
Armeria maritima	sea pink	6" leach tube	100	Top, middle
Artemisia californica		6" leach tube	100	Top, middle
Camissonia cheiranthifolia	beach evening primrose	6" leach tube	50	Middle, bottom
Castilleja latifolia	seaside painted brush	6" leach tube	50	Middle, top
Dudleya caespitosa	sea lettuce	6" leach tube	200	Middle, bottom
Erigeron glaucus	seaside daisy	6" leach tube	200	All
Eriophyllum staechadifolium	seaside wooly sunflower	6" leach tube	200	Top, middle
Iris douglasiana	Douglas's iris	6" leach tube	50	Top , middle
Leymus condensatus	giant wild rye	6 or 8" leach tube	100	Middle, bottom
Plantago maritima	Pacific seaside plantain	6" leach tube	50	Middle bottom
Hesperocyparis macrocarpa	Monterey Cypress	8" leach tube	5	Top, middle (east edge)

The table above gives quantities and recommended locations on the slope for each species. Those that are more typical of bluff top or closed cone woodland plant communities are to be kept in the upper reaches of the slope and those more typical of dune scrub are in the middle and lower portions. Plants

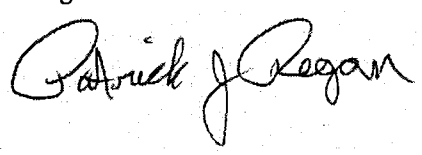
used for the retaining wall structure should be from local genetic stock. Plants grown from seed collected from along Carmel Bay south to Point Sur will be considered sufficiently local ecotypes

Final placement of plants should be determined on site by a restoration specialist or the project biologist. Plants should be installed as soon as physically possible after the completion of the retaining wall construction to insure best erosion control. Plants are to be evenly spaced and planted directly into soil inside Hilfiker baskets. Plants will be planted into both horizontal and vertical planes on the wall. The tubular shape of the root systems will facilitate easy planting through the openings in the wire mesh baskets. Planting shall occur between October 15 and March 15 (depending on timing of onset of rainy season) to take advantage of natural rainfall to establish plants on the retaining wall. These species are naturally adapted to getting the majority of their necessary water during the rainy season and to survive through typical 4-7 month long periods with little more than occasional fog drip for irrigation.

If planting occurs after March 1 of the year, supplemental irrigation may be required to get the plant roots established and maintain health and vigor. Plants may need supplemental irrigation approximately two times per month through the first year after planting. Irrigation should be used sparingly to avoid encouraging weed infestation from occurring on the slope and to avoid creating an erosion problem within the baskets. Irrigation should be discontinued altogether by December 1 of the year in which the wall construction and planting is completed.

Bi-monthly monitoring of the repaired slope should occur through the first 12 months after installation to determine success of planting and erosion control as well as water and weed control needs. Success of planting will be indicated by a 70% or better survival rate. A survival rate of less than 70% of planted species will be considered as a requirement for remedial planting and likely indication of need for revision of the irrigation schedule. This monitoring should be conducted by an experienced restoration ecologist or biologist approved by the County of Monterey. Reports on the results of these monitoring visits, including any management or remediation recommendations shall be delivered to the property owner representative, the Monterey County Resource management agency and the California Coastal Commission. At the conclusion of one calendar year from the installation completion date, a final report will be produced combining observations and recommendations from the 6 bimonthly visits. If at this time survival of planted species is less than 70%, additional planting will be required and monitoring will continue for another calendar year from replanting.

Pat Regan



Project Biologist

Plant species observed on site

*Acacia sp**.- Acacia
Agrostis exarata. - Western bent grass
Armeria maritima - sea pink
Castilleja latifolia - seaside painted brush
Cupressus (Hesperocyparis) macrocarpa- Monterey Cypress (CNPS list 1, C2)
Dudleya caespitosa - sea lettuce
*Echium fastuosum** - Pride of Madeira
Erigeron glaucus - seaside daisy
Eriophyllum staechadifolium- seaside wooly sunflower
Horkelia californica ssp. frondosa - leafy horkelia
Iris douglasiana - Douglas' iris
Leymus condensatus - giant wild rye
*Lobularia maritima** - sweet alyssum
Myoporum laetum *- Myoporum
Plantago maritima - Pacific seaside plantain
Polypodium californicum - California polypody fern
Rubus ursinus - California blackberry

* Not native to California

References

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Niles residence Slope Repair CNDDB output

QUAD NAME	SCIENTIFIC NAME	COMMON NAME	FED STATUS	CAL STATUS	DFG STATUS	CNPS LIST	HABITAT ON SITE	SEEN ON SITE
Monterey	Allium hickmanii	Hickman's onion	None	None		1B.2	no	no
Monterey	Ambystoma californiense	California tiger salamander	Threatened	Threatened	SSC		no	no
Monterey	Anniella pulchra nigra	black legless lizard	None	None	SSC		in cove	no
Soberanes Pt.	Arctostaphylos edmundsii	Little Sur manzanita	None	None		1B.2	no	no
Monterey	Arctostaphylos hookeri ssp. hookeri	Hooker's manzanita	None	None		1B.2	no	no
Soberanes Pt.	Arctostaphylos hookeri ssp. hookeri	Hooker's manzanita	None	None		1B.2	no	no
Monterey	Arctostaphylos pumila	sandmat manzanita	None	None		1B.2	no	no
Monterey	Astragalus tener var. titi	coastal dunes milk-vetch	Endangered	Endangered		1B.1	no	no
Monterey	Athene cunicularia	burrowing owl	None	None	SSC		no	no
Monterey	Castilleja ambigua ssp. insalutata	pink johnny-nip	None	None		1B.1	no	no
Monterey	Central Dune Scrub	Central Dune Scrub	None	None			yes	yes
Monterey	Central Maritime Chaparral	Central Maritime Chaparral	None	None			no	no
Soberanes Pt.	Central Maritime Chaparral	Central Maritime Chaparral	None	None			no	no
Monterey	Charadrius alexandrinus nivosus	western snowy plover	Threatened	None	SSC		in cove	no
Monterey	Chorizanthe pungens var. pungens	Monterey spineflower	Threatened	None		1B.2	no	no
Monterey	Clarkia jolonensis	Jolon clarkia	None	None		1B.2	no	no
Soberanes Pt.	Clarkia jolonensis	Jolon clarkia	None	None		1B.2	no	no
Monterey	Coelus globosus	globose dune beetle	None	None			in cove	no
Monterey	Collinsia multicolor	San Francisco collinsia	None	None		1B.2	no	no
Monterey	Cordylanthus rigidus ssp. littoralis	seaside bird's-beak	None	Endangered		1B.1	no	no
Soberanes Pt.	Cordylanthus rigidus ssp. littoralis	seaside bird's-beak	None	Endangered		1B.1	no	no
Monterey	Cypseloides niger	black swift	None	None	SSC		no	no
Monterey	Danaus plexippus	monarch butterfly	None	None			no	no
Monterey	Danaus plexippus	monarch butterfly	None	None			no	no
Soberanes Pt.	Danaus plexippus	monarch butterfly	None	None			no	no
Monterey	Delphinium hutchinsoniae	Hutchinson's larkspur	None	None		1B.2	no	no
Soberanes Pt.	Delphinium hutchinsoniae	Hutchinson's larkspur	None	None		1B.2	no	no
Monterey	Emys marmorata	western pond turtle	None	None	SSC		no	no
Monterey	Ericameria fasciculata	Eastwood's goldenbush	None	None		1B.1	no	no
Soberanes Pt.	Eriogonum nortonii	Pinnacles buckwheat	None	None		1B.3	no	no
Monterey	Erysimum menziesii ssp. menziesii	Menzies' wallflower	Endangered	Endangered		1B.1	no	no
Monterey	Euphilotes enoptes smithi	Smith's blue butterfly	Endangered	None			no	no

Niles residence Slope Repair CNDDB output

QUAD NAME	SCIENTIFIC NAME	COMMON NAME	FED STATUS	CAL STATUS	DFG STATUS	CNPS LIST	HABITAT ON SITE	SEEN ON SITE
Soberanes Pt.	Euphilotes enoptes smithi	Smith's blue butterfly	Endangere	None			no	no
Monterey	Fritillaria liliacea	fragrant fritillary	None	None		1B.2	no	no
Monterey	Gilia tenuiflora ssp. arenaria	sand gilia	Endangere	Threatened		1B.2	no	no
Monterey	Hesperocyparis goveniana	Gowen cypress	Threatenec	None		1B.2	no	no
Monterey	Hesperocyparis macrocarpa	Monterey cypress	None	None		1B.2	no	yes
Monterey	Horkelia cuneata ssp. sericea	Kellogg's horkelia	None	None		1B.1	no	no
Monterey	Lasiurus cinereus	hoary bat	None	None			no	no
Monterey	Layia carnosa	beach layia	Endangere	Endangered		1B.1	no	no
Monterey	Lupinus tidestromii	Tidestrom's lupine	Endangere	Endangered		1B.1	no	no
Monterey	Malacothamnus p. var. involucratus	Carmel Valley bush-mallow	None	None		1B.2	no	no
Monterey	Malacothamnus p. var. palmeri	Santa Lucia bush-mallow	None	None		1B.2	no	no
Monterey	Microseris paludosa	marsh microseris	None	None		1B.2	no	no
Monterey	Monolopia gracilens	woodland woollythreads	None	None		1B.2	no	no
Monterey	Monterey Cypress Forest	Monterey Cypress Forest	None	None			no	no
Monterey	Monterey Pine Forest	Monterey Pine Forest	None	None			no	no
Soberanes Pt.	Monterey Pine Forest	Monterey Pine Forest	None	None			no	no
Monterey	Monterey Pygmy Cypress Forest	Monterey Pygmy Cypress Fore	None	None			no	no
Monterey	Northern Bishop Pine Forest	Northern Bishop Pine Forest	None	None			no	no
Soberanes Pt.	Oceanodroma homochroa	ashy storm-petrel	None	None	SSC		no	no
Monterey	Oncorhynchus mykiss irideus	steelhead - south/central Calif	Threatenec	None	SSC		no	no
Soberanes Pt.	Oncorhynchus mykiss irideus	steelhead - south/central Calif	Threatenec	None	SSC		no	no
Monterey	Pelecanus occidentalis californicus	California brown pelican	Delisted	Delisted	FP		no	no
Monterey	Pinus radiata	Monterey pine	None	None		1B.1	no	yes
Soberanes Pt.	Pinus radiata	Monterey pine	None	None		1B.1	no	yes
Monterey	Piperia yadonii	Yadon's rein orchid	Endangere	None		1B.1	no	no
Soberanes Pt.	Piperia yadonii	Yadon's rein orchid	Endangere	None		1B.1	no	no
Monterey	Potentilla hickmanii	Hickman's cinquefoil	Endangere	Endangered		1B.1	no	no
Monterey	Rana draytonii	California red-legged frog	Threatenec	None	SSC		no	no
Soberanes Pt.	Rana draytonii	California red-legged frog	Threatenec	None	SSC		no	no
Monterey	Rosa pinetorum	pine rose	None	None		1B.2	no	no
Soberanes Pt.	Rosa pinetorum	pine rose	None	None		1B.2	no	no
Monterey	Sidalcea malachroides	maple-leaved checkerbloom	None	None		4.2	no	no

Niles residence Slope Repair CNDDB output

QUAD NAME	SCIENTIFIC NAME	COMMON NAME	FED STATUS	CAL STATUS	DFG STATUS	CNPS LIST	HABITAT ON SITE	SEEN ON SITE
Soberanes Pt.	Sidalcea malachroides	maple-leaved checkerbloom	None	None		4.2	no	no
Soberanes Pt.	Tortula californica	California screw moss	None	None		1B.2	no	no
Monterey	Trifolium polyodon	Pacific Grove clover	None	Rare		1B.1	no	no
Monterey	Trifolium trichocalyx	Monterey clover	Endangere	Endangered		1B.1	no	no

SSC = California species of special concern, candidate for more study.

CNPS LIST 4.2 = LIST 4: Limited distribution (Watch List).

0.2: Fairly endangered in California

CNPS LIST 1B: Rare, threatened, or endangered in California and elsewhere.

0.1: Seriously endangered in California

0.2: Fairly endangered in California