Staff Report to the Zoning Administrator

Application Number: 211316

Applicant: Matson Britton Architects

Owner: Mary Lacerte and Kirk Kozlowski
APN: 043-081-13
Site Address: 266 Cliff Ct, Aptos

Agenda Date: 12/16/22 (continued from 11/18/22 Zoning Administrator hearing)
Agenda Item #: 1
Time: After 9:00 a.m.

Project Description: Proposal to construct an approximately 110 linear foot pin pier retaining wall, on-site with an existing single-family dwelling.

Location: Property is located on the south side of Cliff Court, approximately 150 feet south of the intersection of Cliff Court and Rio Del Mar Blvd (266 Cliff Court)

Permits Required: Coastal Development Permit

Supervisorial District: 2nd District (District Supervisor: Zach Friend)

Staff Recommendation:

- Determine that the proposal is exempt from further Environmental Review under the California Environmental Quality Act.
- Denial of Application 211316, based on the attached findings and conditions.

Project Description & Setting

The subject property is located on an ocean bluff overlooking Rio Del Mar and the Beach Drive neighborhood, in Aptos. Access to the property is via a private road, Cliff Court, which is located on the south side of Rio Del Mar Boulevard, approximately 1000 feet east of the intersection of Rio Del Mar Boulevard and Aptos Beach Drive. The property slopes gently from northeast to southwest, with a portion of land extending onto the steep hillside and bluff. Existing development on the property includes an approximately 2,500 square foot dwelling which was originally developed in the early to mid-1900's as part of the Aptos Beach Inn. Except for a variance to construct an attached garage and bedroom expansion (78-113-V), permit history at the site is limited. The home is presently configured with three bedrooms, an attached garage, and an expansive backyard patio overlooking Beach Drive.

The geologic and geotechnical investigations (Exhibit H and Exhibit I) submitted with the project describe a history of slope failures at the site, some of which can be attributed to natural geological occurrences and some exasperated by runoff generated from stormwater runoff; surface and

The owners have expressed interest in protecting themselves from liability from future slope failures through the installation of a 110-foot pin-pier retaining wall, which would span the south property line. The wall would consist of 19, 30-inch diameter concrete piers driven 40-feet into the hillside, backed by an eight-foot, sub-surface concrete and steel wall. The project would also include the collection of surface drainage on-site, via a two-foot swale above the wall which would divert water to the east side of the property then northward along the property line into a private storm drain system which drains westward towards the Del Mar Shores condominium development.

Zoning & General Plan Consistency

The subject property is a 9,844 square foot lot, located in the R-1-6 (single family residential - 6,000 square feet) zone district, a designation which allows residential uses. The existing dwelling on-site is a principally permitted use in the zone district and the zoning is consistent with the site's R-UL (Urban Low Density Residential) General Plan designation.

Geologic Hazards Ordinance Consistency

In the project completeness letter, dated June 15, 2022 (Exhibit G), County Environmental Planning staff identified conflicts between the proposed project and the County Geologic Hazards Ordinance (Santa Cruz County Code Chapter 16.10). The proposed retaining wall is evaluated under Chapter 16.10 as a "shoreline protection structure" and is therefore subject to compliance with the permit conditions described in 16.10.070, which governs that shoreline protection is only permitted at sites where both adjacent structures are similarly protected and where a significant threat to the existing structure. Where a structure is determined to be threatened, the protection structure must be located as close as possible to the development or structure requiring protection and an alternatives analysis of the project must be provided. The provided geologic report (Exhibit H) does not provide an alternatives analysis and does not state that there is a significant threat to the existing structure on-site.

County Design Criteria for Construction of Storm Drains

The proposed project would direct stormwater into a swale behind the retaining wall (and from downspouts across the site) into a private storm drain system at the northwest corner of the site. The Public Works Design Criteria, which details the acceptable construction methods for streets, storm drains, sanitary sewers, water systems, and driveways in the unincorporated County, states that the altering of drainage patterns from their natural flow path ("diversion") is disallowed without approval by the Director of Public Works.

In the project 30-day evaluation (Exhibit F) and later in the completeness letter (Exhibit G), Public Works Stormwater Management staff requested additional documentation needed to evaluate an exception to the Design Criteria. The evaluation would include analysis of whether the downstream storm drain system is adequate to support the additional drainage proposed to be diverted with the project. The requested information included topographic maps, watershed maps, an engineer's analysis evaluating the adequacy of the condition, stability, and capacity of the entire downstream diversion path, and written certification that the applicant has the legal right to utilize the entire diversion path.

In the absence of this additional information, Public Works Stormwater Management staff cannot evaluate the project for consideration of an exception; thus, the project is in conflict with the Design Criteria as an exception has not been granted

Local Coastal Program Consistency

As proposed, the project conflicts with the adopted Geologic Hazards Ordinance, adopted as part of the LCP. Visually, the completed project would be compatible, in scale with, and integrated with the character of the surrounding neighborhood. Other parcels in the area have retaining walls built on site. The site is not identified a priority acquisition site in the County Local Coastal Program and the installation would not interfere with public access to the beach, ocean, or other nearby body of water.

Conclusion

As proposed and conditioned, the project is in conflict with codes and policies of the Zoning Ordinance and General Plan/LCP, and Planning Staff recommends denial of this application. Please see Exhibit "B" ("Findings") for a complete listing of findings and evidence related to the above discussion.

Staff Recommendation

- Determine that the proposal is exempt from further Environmental Review under the California Environmental Quality Act.

- **DENIAL** of Application Number **211316,** based on the attached findings

Supplementary reports and information referred to in this report are on file and available for viewing at the Santa Cruz County Planning Department, and are hereby made a part of the administrative record for the proposed project.

The County Code and General Plan, as well as hearing agendas and additional information are available online at: www.sccoplanning.com

Report Prepared By: Evan Ditmars
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Santa Cruz CA 95060
Phone Number: (831) 454-3227
E-mail: evan.ditmars@santacruzcounty.us

Exhibits

A. Categorical Exemption (CEQA determination)
B. Findings
C. Project plans
D. Assessor's, Location, Zoning and General Plan Maps
E. Parcel information
F. 30-day Completeness Letter, dated 10/29/21
G. Complete Letter, dated 6/15/22
H. Geologic Investigation, prepared by Zinn Geology, dated 9/1/21
I. Geotechnical Investigation, prepared by Pacific Crest Engineering, dated 4/22/21
J. Acceptance Letter for REV211508, dated 3/17/22

CALIFORNIA ENVIRONMENTAL QUALITY ACT
NOTICE OF EXEMPTION

The Santa Cruz County Planning Department has reviewed the project described below and has determined that it is exempt from the provisions of CEQA as specified in Sections 15061 - 15332 of CEQA for the reason(s) which have been specified in this document.

Application Number: 211316
Assessor Parcel Number: 043-081-13
Project Location: 266 Cliff Ct

Project Description: Proposal to construct a 110 linear foot pin pier retaining wall

Person or Agency Proposing Project: Matson Britton Architects

Contact Phone Number: 831-423-0544

A. _____ The proposed activity is not a project under CEQA Guidelines Section 15378.

B. _____ The proposed activity is not subject to CEQA as specified under CEQA Guidelines Section 15060 (c).

C. _____ **Ministerial Project** involving only the use of fixed standards or objective measurements without personal judgment.

D. **X** **Statutory Exemption** other than a Ministerial Project (CEQA Guidelines Section 15260 to 15285).

E. _____ **Categorical Exemption**

Specify type: Section 15270-Projects Which Are Disapproved

F. Reasons why the project is exempt:

The proposed project is recomemnded for denial by the reviewing agency.

In addition, none of the conditions described in Section 15300.2 apply to this project.

_____ Date:_____
Evan Ditmars, Project Planner

EXHIBIT A

Coastal Development Permit Findings

5. That the project conforms to all other applicable standards of the certified LCP.

This finding cannot be made, in that the project design does not comply with the Geologic Hazards Ordinance of the adopted LCP. The proposal is out of compliance with the following:

Santa Cruz County Code Chapter 16.10.070(H)(3)(b) specifies that "shoreline protection structures shall only be allowed on parcels where both adjacent parcels are already similarly protected, or where necessary to protect existing structures from a significant threat, or on vacant parcels which, through lack of protection threaten adjacent developed lots, or to protect public works, public beaches, and coastal dependent uses." Neither adjacent parcel is similarly protected and the submitted Geologic and Geotechnical Reports do not state that there is a significant threat to the existing structure.

16.10.070(H)(3)(c) further specifies that applications for shoreline protective structures "shall include thorough analysis of all reasonable alternatives to such structures, including but not limited to relocation or partial removal of the threatened structure, protection of only the upper bluff area or the area immediately adjacent to the threatened structure, beach nourishment, and vertical walls. Structural protection measures on the bluff and beach shall only be permitted where nonstructural measures, such as relocating the structure or changing the design, are infeasible from an engineering standpoint or are not economically viable." The applicant did not provide an alternatives analysis which demonstrates all reasonable alternative to the proposed retaining wall.

Lastly, the project does not comply with the requirement of 16.10.070(H)(3)(d), which requires shoreline protection structures "be placed as close as possible to the development of structure requiring protection."

Development Permit Findings

1. That the proposed location of the project and the conditions under which it would be operated or maintained will not be detrimental to the health, safety, or welfare of persons residing or working in the neighborhood or the general public, and will not result in inefficient or wasteful use of energy, and will not be materially injurious to properties or improvements in the vicinity.

This finding cannot be made, in that submitted project materials do not demonstrate that the project would not adversely impact neighboring properties or drainage pathways.

The project proposes the installation of a drainage swale on the high side of the retaining, designed to collect and route water from the southeast corner of the project site to a private storm drain system on the northwest side. Part 3 of the Department of Public Works Design Criteria states that "diversion of runoff resulting in altered stormwater (drainage) patterns from the project site is not allowed without prior approval by the Director of Public Works." For the Director of Public Works to consider an exception to allow the diversion of stormwater, additional information would be required. Absent the exception, the project is in not compliant with the Design Criteria.

2. That the proposed location of the project and the conditions under which it would be operated or maintained will be consistent with all pertinent County ordinances and the purpose of the zone district in which the site is located.

This finding cannot be made, in that the proposal is in conflict with the County Geologic Hazards Ordinance (SCCC 16.10).

Chapter 16.10.070(H)(3)(b) specifies that "shoreline protection structures shall only be allowed on parcels where both adjacent parcels are already similarly protected, or where necessary to protect existing structures from a significant threat, or on vacant parcels which, through lack of protection threaten adjacent developed lots, or to protect public works, public beaches, and coastal dependent uses." Neither adjacent parcel is similarly protected and the submitted Geologic and Geotechnical Reports do not state that there is a significant threat to the existing structure.

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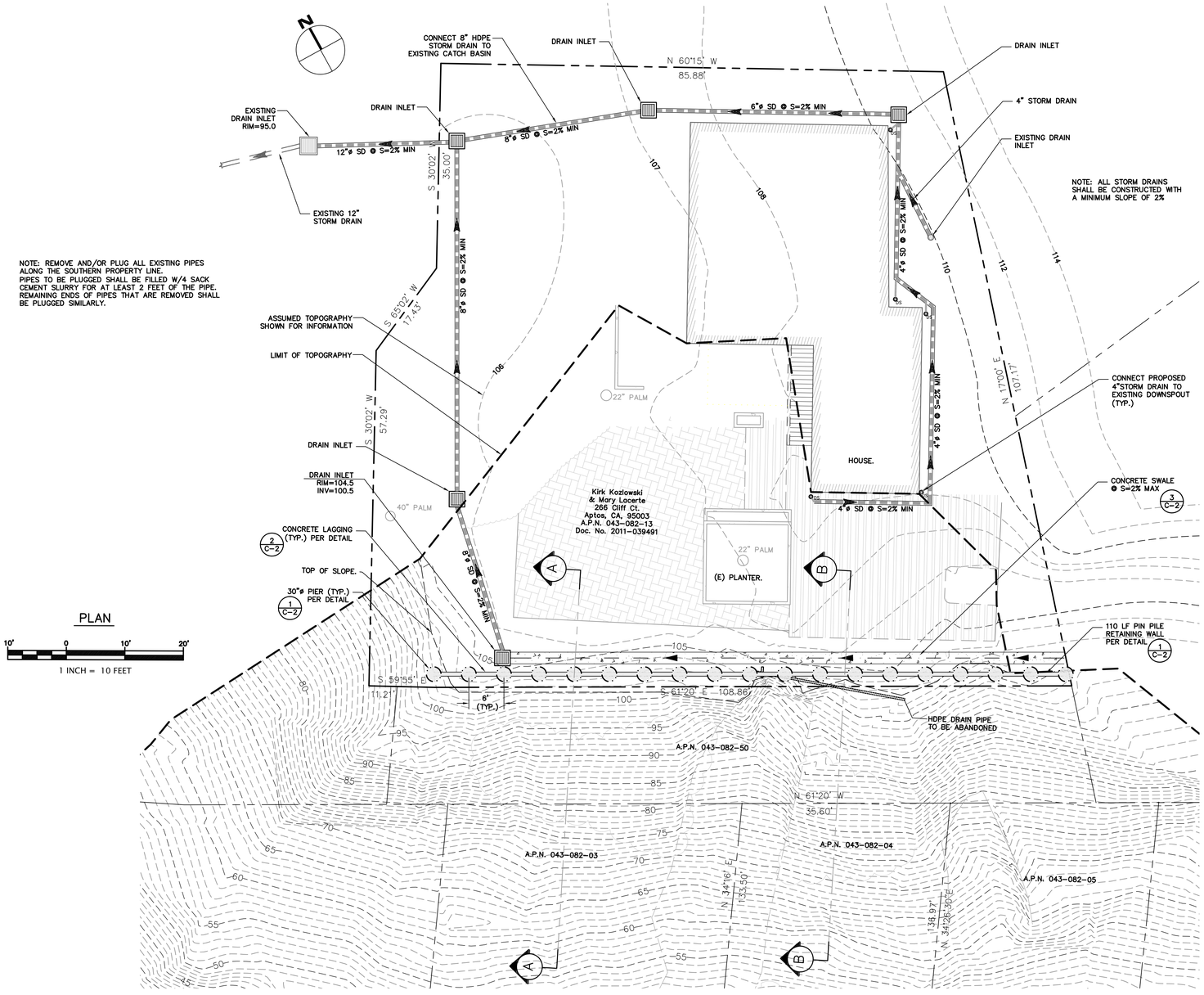
Lastly, the project does not comply with the requirement of 16.10.070(H)(3)(d), which requires shoreline protection structures "be placed as close as possible to the development of structure requiring protection."

3. That the proposed use is consistent with all elements of the County General Plan and with any specific plan which has been adopted for the area.

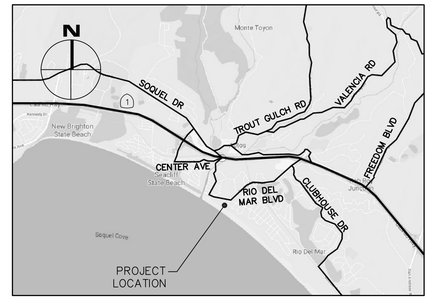
This finding cannot be made, in that the proposal does not comply with Policy 6.2.16 (Structural Shoreline Protection Measures), which limits structural shoreline protection measures to structures which protect existing structures from a significant threat" and requires that "any application for shoreline protection measure include a through analysis of all reasonable alternatives". 6.2.16 also specifies that "the protection structure must be placed as close as possible to the development requiring protection". As submitted the project does not identify a threat to the existing structure on-site, does not provide an alternatives analysis, and is not sited as close as possible to the development requiring protection.



PLAN

10' 0 10' 20'

1 INCH = 10 FEET



VICINITY MAP

NTS

LEGEND

- (E) BRICK PATIO
- (E) DECK
- (E) CONCRETE
- PROPOSED AC
- (E) FLOWLINE
- (E) RETAINING WALL
- PROPERTY LINE
- PROPOSED SETBACK
- LIMIT OF TOPOGRAPHY
- PROPOSED CONCRETE LAGGING
- PROPOSED SWALE
- PROPOSED SD
- PROPOSED PERIMETER SD
- PROPOSED SDCO
- EXISTING CB
- PROPOSED CB
- PROPOSED PIER
- PROPOSED CONCRETE SWALE

ABBREVIATIONS

BW	BOTTOM OF WALL
CB	CATCH BASIN
CONST	CONSTRUCT
DIA, ø	DIAMETER
DS	DOWNSPOUT
DTL	DETAIL
DWY	DRIVEWAY
(E)	EXISTING
EL	ELEVATION
EOP	EDGE OF PAVEMENT
FF	FINISH FLOOR
FG	FINISH GRADE
FS	FIRE SERVICE
HP	HIGH POINT
INV	INVERT
LF	LINEAR FEET
LP	LOW POINT
MAX	MAXIMUM
N.T.S.	NOT TO SCALE
RW	RETAINING WALL
RIM	RIM ELEVATION
S	SLOPE
SCCO	COUNTY OF SANTA CRUZ
SSCO	SANITARY SEWER CLEANOUT
SDCO	STORM DRAIN CLEANOUT
TYP	TYPICAL
TW	TOP OF WALL
WS	WATER SERVICE

SEWER LATERAL NOTES

1. SEWER LATERALS SHALL BE POLYVINYL CHLORIDE (PVC SDR26) AND SHALL HAVE A SMOOTH INTERIOR.

2. SEWER LATERALS SHALL BE SLOPED AT A MINIMUM 2%

STORM DRAIN SYSTEM MAINTENANCE

THE HOME OWNER IS RESPONSIBLE FOR MAINTAINING THE STORM DRAINAGE SYSTEM AND ALL COMPONENTS. EVERY YEAR, PRIOR TO THE WET WEATHER SEASON (OCTOBER 15TH) ALL THE CATCH BASINS AND STORM DRAIN CLEANOUTS SHALL BE INSPECTED AND CLEANED OF ANY DEBRIS, SILT, TRASH AND SEDIMENT.

STORM DRAINAGE NOTES

1. CULVERTS SHALL BE POLYVINYL CHLORIDE (PVC SDR35), HIGH DENSITY POLYETHYLENE (HDPE ADS N12 OR EQUAL), OR REINFORCED CONCRETE PIPE (RCP), AND SHALL HAVE A SMOOTH INTERIOR CONFORMING TO SECTION E – STORM DRAINAGE FACILITIES OF COUNTY OF SANTA CRUZ DESIGN CRITERIA.

2. INLETS SHALL BE CHRISTY CONCRETE PRODUCTS OR APPROVED EQUAL WITH SMOOTH CONCRETE BOTTOM.

3. DISCHARGE ALL DOWNSPOUTS TO PERIMETER STORM DRAIN.

TOPOGRAPHIC SURVEY

THE TOPOGRAPHIC SURVEY AND BOUNDARY INFORMATION PROVIDED HEREON WAS COMPLETED BY HANAGAN LAND SURVEYING. RI ENGINEERING INC. MAKES NO GUARANTEE AS TO THE ACCURACY OF BOTH. THE CONTRACTOR SHALL VERIFY THE BOUNDARY LOCATION AND TOPOGRAPHIC INFORMATION PRIOR TO COMMENCING WORK.

BASIS OF BEARINGS

THE BASIS OF BEARING FOR THIS MAP HAS BEEN REESTABLISHED BETWEEN FOUND MONUMENTS ON THE NORTH LINE OF BEACH DRIVE PER RECORD MAP 024-M-26, SANTA CRUZ COUNTY RECORDS.

BASIS OF ELEVATION

COUNTY BENCHMARK NO. 476,
ELEVATION = 13.40', NAVD 88

THE CONTOUR INTERVAL IS 1 FOOT.

EARTHWORK AND GRADING

1. WORK SHALL CONSIST OF ALL CLEARING, GRUBBING, STRIPPING, PREPARATION OF LAND TO BE FILLED, EXCAVATION, SPREADING, COMPACTION AND CONTROL OF FILL, AND ALL SUBSIDIARY WORK NECESSARY TO COMPLETE THE GRADING TO CONFORM TO THE LINES, GRADES, AND SLOPES, AS SHOWN ON THE APPROVED PLANS.

2. ALL GRADING OPERATIONS SHALL CONFORM TO SECTION 19 OF THE CALTRANS STANDARD SPECIFICATIONS, AND SHALL ALSO BE DONE IN CONFORMANCE WITH THE REQUIREMENTS OF THE COUNTY OF SANTA CRUZ. THE MOST STRINGENT GUIDELINE SHALL PREVAIL.

3. REFERENCE IS MADE TO THE GEOTECHNICAL INVESTIGATIONS BY PACIFIC CREST ENGINEERING, ENTITLED "266 CLIFF COURT," DATED MAY 22, 2021. THE CONTRACTOR SHALL MAKE A THOROUGH REVIEW OF THIS REPORT AND SHALL FOLLOW ALL RECOMMENDATIONS THEREIN. THE CONTRACTOR SHALL CONTACT PACIFIC CREST ENGINEERING. FOR ANY CLARIFICATIONS NECESSARY PRIOR TO PROCEEDING WITH THE WORK.

4. THE CONTRACTOR SHALL GRADE TO THE LINE AND ELEVATIONS SHOWN ON THE PLAN AND SHALL SECURE THE SERVICES OF A LICENSED LAND SURVEYOR OR REGISTERED CIVIL ENGINEER TO PROVIDE STAKES FOR LINE AND GRADE.

5. THE GEOTECHNICAL ENGINEER SHOULD BE NOTIFIED AT LEAST FOUR (4) DAYS PRIOR TO ANY SITE CLEARING AND GRADING OPERATIONS.

6. STRIPPED AREAS SHOULD BE SCARIFIED TO A DEPTH OF ABOUT 6", WATER-CONDITIONED TO BRING THE SOILS WATER CONTENT TO ABOUT 2% ABOVE THE OPTIMUM, AND COMPACTED TO A DENSITY EQUIVALENT TO AT LEAST 90% OF THE MAXIMUM DRY DENSITY OF THE SOIL ACCORDING TO ASTM D1557 (LATEST EDITION). SUBGRADES AND AGGREGATE BASE ROCK FOR PAVEMENTS SHOULD BE COMPACTED TO A MINIMUM OF 95%.

7. ENGINEERED FILL SHOULD BE PLACED IN THIN LIFTS NOT EXCEEDING 8" IN LOOSE THICKNESS, MOISTURE CONDITIONED, AND COMPACTED TO AT LEAST 90% RELATIVE COMPACTION.

8. MATERIAL USED FOR ENGINEERED FILL SHALL MEET THE REQUIREMENTS OF THE AFOREMENTIONED REPORTS BY PACIFIC CREST ENGINEERING.

9. IMPORTED FILL MATERIAL USED AS ENGINEERED FILL FOR THE PROJECT SHALL MEET THE REQUIREMENTS OF THE AFOREMENTIONED GEOTECHNICAL INVESTIGATION.

10. ALL FILL MATERIAL SHALL BE APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER PRIOR TO JOBSITE DELIVERY AND PLACEMENT. NO EARTHWORK OPERATIONS SHALL BE PERFORMED WITHOUT THE DIRECT OBSERVATION AND APPROVAL OF THE GEOTECHNICAL ENGINEER.

11. BARE GROUND WITHIN 10' OF FOUNDATIONS SHALL BE SLOPED AWAY @ 5% MINIMUM OR 2% MINIMUM FOR PAVED SURFACES.

Exhibit C

PLANNING SUBMITTAL

REGISTERED PROFESSIONAL ENGINEER RICHARD J. PECH No. 45810 Exp. 12-31-22 CIVIL STATE OF CALIFORNIA

6/3/2021

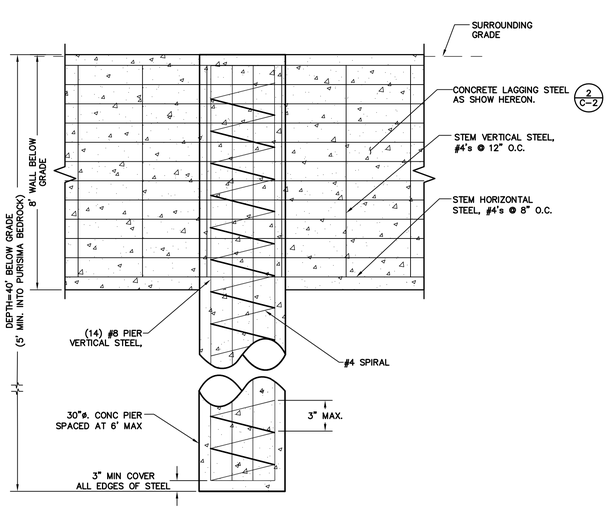
R.I Engineering, Inc.
303 Potrero St., Suite 42-202, Santa Cruz, CA 95060
831-425-3901 www.riengineering.com

RESIDENTIAL ADDITION
FOR
KIRK & MARY KOZLOWSKI
266 CLIFF COURT
APTOS, CA 95003
APN # 043-081-13

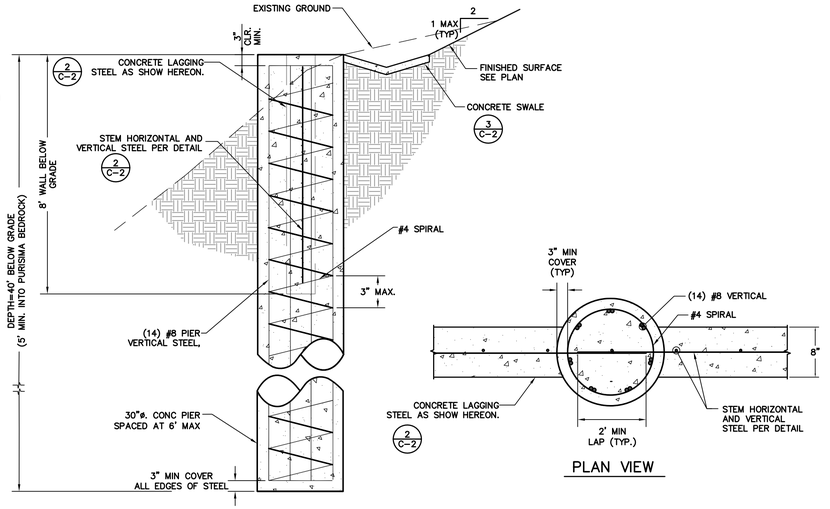
GRADING & DRAINAGE PLAN

project no. 20-074-1
date JUNE 2021
scale AS SHOWN
dwg name CIVIL1.dwg

C-1



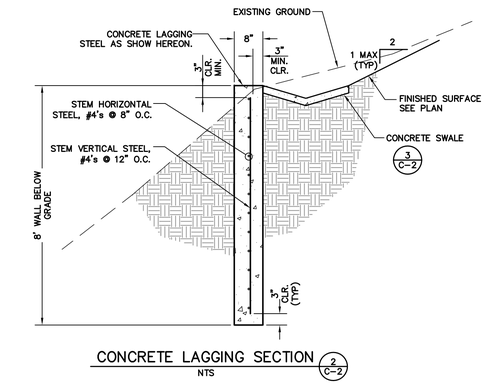
ELEVATION VIEW



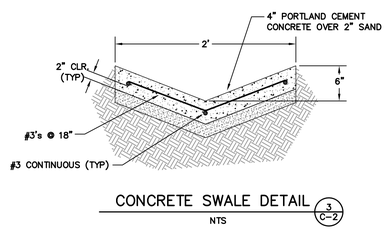
SECTION VIEW

PLAN VIEW

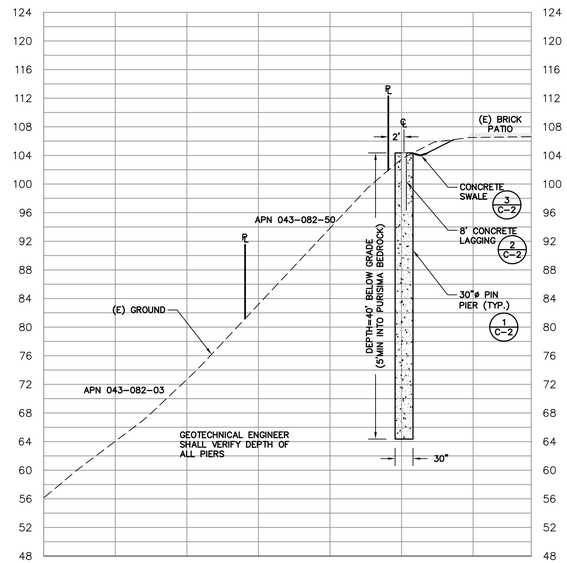
PIN PIER WALL & CONCRETE LAGGING 1 C-2
NTS



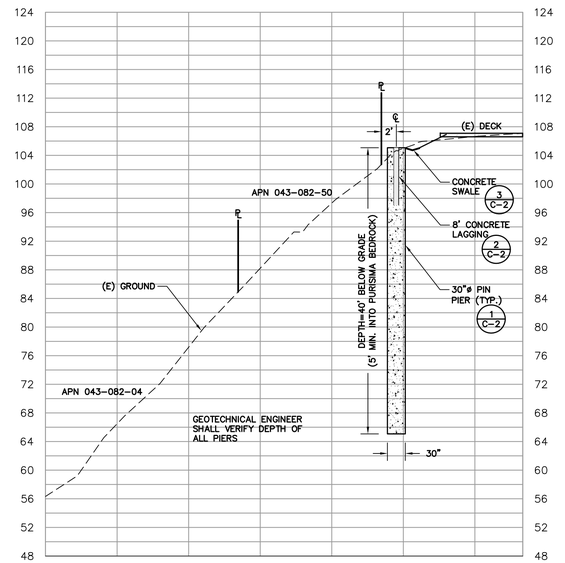
CONCRETE LAGGING SECTION 2 C-2
NTS



CONCRETE SWALE DETAIL 3 C-2
NTS



SECTION A-A
SCALE: 1"=10' HORIZONTAL, VERTICAL



SECTION B-B
SCALE: 1"=10' HORIZONTAL, VERTICAL

SPECIFICATIONS

1. CONCRETE SHALL BE MIXED, PROPORTIONED, CONVEYED AND PLACED IN ACCORDANCE WITH CBC SECTION 1905 AND ACI 301.

2. CONCRETE SHALL BE TYPE V AND HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH OF 4,500 PSI. CONCRETE SHALL HAVE A MAXIMUM WATER TO CEMENT RATIO OF 0.50.

3. STEEL REINFORCING SHALL CONFORM TO ASTM DESIGNATION A614, GRADE 60.

4. PLACEMENT AND HANDLING OF STEEL REINFORCEMENT SHALL CONFORM TO THE REQUIREMENTS OF SECTION 52, "REINFORCEMENT OF THE CALTRANS STANDARD SPECIFICATIONS.

5. ANCHOR BOLTS SHALL CONFORM TO ASTM DESIGNATION A 307 OR ASTM DESIGNATION A36. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN CONFORMANCE WITH SECTION 75-1.05 "GALVANIZING" OF THE CALTRANS STANDARD SPECIFICATIONS.

6. TIMBER CONNECTORS, SHEAR WALL HOLD DOWNS AND OTHER METAL FASTENINGS SHALL BE SIMPSON STRONG TIE COMPANY CONNECTORS OR APPROVED EQUAL. FASTERERS SHALL BE HOT DIP GALVANIZED.

8. EXPOSED POSTS SHALL BE PRESSURE TREATED DOUG FIR LARCH NO.1 OR APPROVED EQUAL.

9. STRUCTURAL LUMBER SHALL BE DOUGLAS FIR-LARCH OR EQUAL. LUMBER AND TIMBER SHALL BE OF THE STRESS GRADE SHOWN ON THE PLANS IF NO DESIGNATION IS SHOWN ON THE PLANS ALL COLUMNS, BEAMS, GIRDERS, JOISTS AND PURLINS SHALL BE #2 GRADE OR BETTER. STRUCTURAL TIMBERS SHALL BE GRADED IN ACCORDANCE WITH THE CURRENT STANDARD GRADING PRACTICES ADOPTED BY THE WESTERN WOOD PRODUCTS ASSOCIATION. ALL SIZES SHOWN ON THE PLANS SHALL REFER TO NOMINAL SIZES, UNLESS OTHERWISE NOTED.

10. PRESERVATIVE TREATMENT OF LUMBER SHALL CONFORM TO THE REQUIREMENTS OF SECTION 58 OF THE CALTRANS STANDARD SPECIFICATIONS. CUT ENDS AND EXPOSED PORTIONS OF PRESSURE TREATED LUMBER SHALL BE IMMERSED A MINIMUM OF 5" INTO PRESERVATIVE SOLUTION. GUARDRAIL POSTS AND BLOCKS SHALL MET THE REQUIREMENTS OF CALTRANS CURRENT SPECIFICATIONS AND THESE PLANS. WHICHEVER STANDARD IS MORE STRINGENT SHALL APPLY.

12. NOTE DOCUMENTATION SHALL BE PROVIDED THAT VERIFIES I-BEAM SOLDIER PILES COMPLY WITH THE REQUIREMENTS OF THE AISC 360 AS SPECIFIED IN CBC, SECTION 2205.1

13. STRUCTURAL STEEL SHALL CONFORM TO ASTM DESIGNATION A36 AND SHALL HAVE A MINIMUM ALLOWABLE BENDING STRESS OF 36,000 PSI. BOLTED AND WELDED CONNECTIONS SHALL CONFORM TO THE REQUIREMENTS OF THE 2016 CALIFORNIA BUILDING CODE AND THESE SPECIFICATIONS.

14. WELDED CONNECTIONS SHALL MEET THE REQUIREMENTS OF FEMA 350 AND THE 2001 CALIFORNIA BUILDING CODE CHAPTER 22, "STEEL."

15. ALL NAILS AND ANCHOR BOLTS THAT WILL BE IN CONTACT WITH PRESSURE TREATED WOOD SHALL BE HOT-DIPPED GALVANIZED PER ASTM A153. FASTENERS AND CONNECTORS EXPOSED TO WET WEATHER SHALL BE STAINLESS STEEL, TYPE A304

REGISTERED PROFESSIONAL ENGINEER RICHARD J. IGNAT No. 45020 Exp. 6-30-22 CIVIL STATE OF CALIFORNIA

6/3/2021

RI Engineering, Inc.
303 Potrero St., Suite 42-202, Santa Cruz, CA 95060
831-425-3901 www.riengineering.com

RESIDENTIAL ADDITION
FOR
KIRK & MARY KOZLOWSKI
266 CLIFF COURT
APTOS, CA 95003
APN # 043-081-13

DETAILS

project no. 20-074-1
date JUNE 2021
scale AS SHOWN
dwg name CIVIL1.dwg

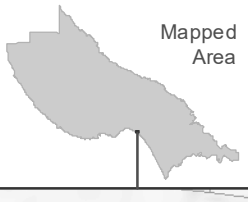
C-2

Exhibit C

PLANNING SUBMITTAL

SANTA CRUZ COUNTY PLANNING DEPARTMENT

Parcel Location Map



RIO DEL MAR BL

CLIFF CT

043-081-13

KINGSBURY DR

BEACH DR

Seacliff
State Beach

Parcel: 04308113

- Study Parcel
- Assessor Parcel Boundary
- Existing Park

Map printed: 26 Oct. 2022

Exhibit D

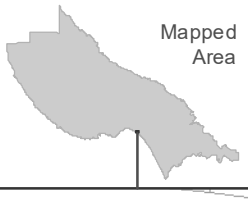
N

0 20 40

Feet

SANTA CRUZ COUNTY PLANNING DEPARTMENT

Parcel General Plan Map



R-UH

R-UL

043-081-13
(R-UL)

O-U

R-UL

O-R

O-R *Parks, Recreation & Open Space*
O-U *Urban Open Space*
R-UH *Res. Urban High Density*
R-UL *Res. Urban Low Density*

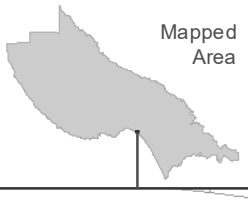
Exhibit D

N

0 20 40
Feet

SANTA CRUZ COUNTY PLANNING DEPARTMENT

Parcel Zoning Map



RM-2.5

R-1-6

043-081-13
(R-1-6)

PR

R-1-6

PR

PR *Parks, Recreation, & Open Space*
R-1 *Single-Family Residential*
RM *Residential Multi-Family*

N

0 20 40
Feet

Exhibit D

Parcel Information

Services Information

Urban/Rural Services Line:	_X_ Inside __ Outside
Water Supply:	Soquel Creek Water District
Sewage Disposal:	Santa Cruz Sanitation District
Fire District:	Central Fire Protection District
Drainage District:	Flood Control Zone 6

Parcel Information

Parcel Size:	9,844 square feet
Existing Land Use - Parcel:	Residential
Existing Land Use - Surrounding:	Residential
Project Access:	Private, via Cliff Ct and Rio Del Mar Blvd
Planning Area:	Aptos
Land Use Designation:	R-UL (Urban Low Density Residential)
Zone District:	R-1-6 (Single family residential - 6,000 square feet)
Coastal Zone:	_X_ Inside __ Outside
Appealable to Calif. Coastal Comm.	_X_ Yes __ No

Technical Reviews: Geotechnical Report Review (REV211508)

Environmental Information

Geologic Hazards:	Known hazard (bluff failure) on south side of property
Fire Hazard:	Not a mapped constraint
Slopes:	0-15% on majority of site, greater than 50% on bluff side (south property line)
Env. Sen. Habitat:	Not mapped/no physical evidence on site
Grading:	Grading for retaining wall only
Tree Removal:	No trees proposed to be removed
Scenic:	Not a mapped resource
Archeology:	Portion of site is mapped archeological resource, project area is not mapped

COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT

701 OCEAN STREET - 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131
PAIA LEVINE, ACTING PLANNING DIRECTOR

October 29, 2021

Cove Britton
728 N Branciforte Dr
Santa Cruz, Ca 95062

Subject: **Incomplete Application - Additional Information Required**
Application #: **211316**; Assessor's Parcel #: **043-081-13**
Owner: **Kozlowski**

Dear Cove Britton:

This letter is to inform you of the status of your application. On 9/29/21, the above-referenced application was submitted for a development permit with the Santa Cruz County Planning Department. The Planning Department and reviewing agencies have examined your application and determined that it is **incomplete** and additional information is required.

***** Please submit all requested materials digitally through the ePlan portal at this time. Additional physical (paper) copies of plans and materials will be required prior to the public hearing for the project. *****

For your proposal to proceed, please submit the following items:

1. Please submit revised plans (and two 8.5" x 11" reduced sets) which include the following information:

   a. All revisions required by each of the reviewing agencies listed below.

2. This application is associated with a geotechnical report review (REV211508), which is currently in process. Please note that the result of this review may include a request for additional information if there are technical issues that were not fully addressed in the report. The results of the report review may affect project design and/or the CEQA documentation and process that will apply to the proposed project. Environmental Planning staff will notify you of the outcome of the technical review when it is completed. If you would like to appeal a staff determination regarding the acceptability of any technical report associated with your discretionary permit application, as to its consistency with applicable County Codes and technical standards, that appeal is considered by the Planning Director pursuant to County Code section 18.10.320 (administrative appeals). To appeal, submit the required fee and a letter addressed to the Planning Director, stating the reasons you believe that the staff determination regarding the technical report(s) is erroneous and/or unjustified, with supporting information.

Exhibit F

3. Please review the attached comments from all agencies. Material responsive to "completeness" comments must be submitted prior to your application being considered complete and able to move forward with further review and processing. The agencies listed below have comments which will require additional information to be submitted. Questions related to these comments and the specific information that is required should be addressed to each separate agency:

- Stormwater Management (Allyson Toms 831-454-2160):
    1. Provide topographic and survey information adequate for describing the current drainage facilities and patterns on and around the project site, including at a minimum the following: all existing drainage facilities on the site and which areas drain to these facilities; how existing runoff from upstream areas east of the site is currently routed through/around the project site; and the current extent of all existing drainage facilities (both on and offsite) that will be removed as part of this project and those that will remain. The note to remove and/or plug all existing pipes is insufficient. Please update the plan/s to show all existing pipes in vicinity of the southerly property identified in the photo in the geologic investigation.

    2. Provide topographic information that extends at least to the inlet on the property to the west that the proposed system will tie into. Provide detailed information about the diversion path (pathway, materials, slope, ownership, etc.) from the site to the point at which the path ties into the existing downstream path, or to the beach/ocean outfall, whichever is shorter.

    3. Provide existing and proposed watershed area map/s. The existing map shall show the extent of on and offsite area/s that drain to the existing drainage facilities that will be removed as part of this project. The proposed watershed map shall show the extent of the on and offsite area/s that will drain to the proposed drainage system. Provide a map that shows what existing and proposed watershed areas being proposed to drain to the diversion path.

    4. Provide a signed and stamped engineer's analysis evaluating the adequacy of the condition, stability and capacity (at least 25 year safe overflow is required) of the entire diversion path (see comment No. 2 above)– including private and public portions. Provide photo, video, and survey information used for the analysis. If any inadequacies are identified the applicant shall update the project scope to include upgrades/repairs/replacements as needed. If the diversion path terminates at Rio Del Mar Boulevard, the proposal will not be approved.

    5. Provide recorded easement/s from all private property owner/s along the diversion path accepting the proposal to divert runoff into their system/s and to establish maintenance responsibilities for the system/s.

    6. If the proposed diversion path ends at Rio Del Mar Boulevard; or if the proposed diversion path is found to be inadequate and repairs/upgrades/replacement are not feasible; or if the applicant is unable to obtain easement/s for the diversion from all private property owner/s

Exhibit F

whose properties are included in the proposed diversion path, applicant shall propose/implement an alternative stormwater management design. Such an alternate design shall consider either a new system that utilizes existing drainage patterns (which will require designing and installing an engineered drainage system as well as obtaining easements from downstream owners), or installing deep dry wells sized to handle 25-year storm flows from all on- and off-site watershed areas and consistent with recommendation No. 4 from the Geologic Investigation. Other alternatives may be considered.

7. Based on the applicant's response to these comments, additional completeness and/or compliance and conditions of approval may be provided.

- Environmental Planning (Jessica DeGrassi 831-454-2130):

1. Please pay the review fees of $3616.00 on application REV211508 (Geotechnical Report Review). Please note that further comments may be made once this fee has been paid and the report has been reviewed

4. Please submit an annotated list detailing where the required information has been provided in your next submittal. Please affix a copy of the annotated list and copies of the required submittal materials (technical reports, drainage calculations, arborist report, etc.) to each agency plan set prior to re-submittal of all the plans to ensure that requested materials are routed to the appropriate agencies.

5. Please note that you will be required to install signage on the subject property that notifies the public of your development permit application. Please refer to the Neighborhood Notification Guidelines for the standards for preparing your sign. Please do not prepare or install the sign until all other completeness issues have been resolved as the project description may change during the review process. Guidelines for Neighborhood Notification (including sign format and installation certificate) online: www.sccoplanning.com (under Handouts & Forms > Zoning & Development). If you do not have internet access and require a paper copy, please let us know and one can be provided to you.

You must submit the required materials to the Planning Department at one time. Revisions to plans must be included in complete, updated sets of plans. All plan sets must be individually stapled and folded into an ~ 9" x 12" format (per Folding Plans handout). To reduce waste and to aid in recycling, plan sets should be printed on bond (white) paper and should not include colored binding material of any kind. You have until **12/28/21**, to submit all of the information required in this letter. Pursuant to Section 18.10.430 of the Santa Cruz County Code, failure to submit the required information may lead to abandonment of your application and forfeiture of fees. Alternatively, you may withdraw the application and any unused fees will be refunded to you. If you wish to withdraw the application, please notify me in writing.

If it has been determined that your application remains incomplete more than once, then you have the right to appeal the determination that the application is incomplete pursuant to Section 65943 of the Government Code. Appeals of application completeness determinations are considered by

Exhibit F

the Board of Supervisors. To appeal, submit the required fee for appeals to the Board and a letter addressed to the Clerk of the Board of Supervisors, with a copy also provided to the Planning Director, stating the determination appealed from and the reasons you believe the completeness determination is erroneous and/or unjustified. The appeal letter and fee must be received by the Clerk of the Board and the Planning Department no later than 5:00 p.m., 11/12/21.

Other Comments or Information regarding your application from Reviewers

The following items are included as general information, are intended to assist you in understanding county requirements, and do not need to be addressed in order for your application to be declared complete.

A. Please review the attached other comments from all agencies (i.e. items that are not related to the Application Completeness determination, and which are not identified as "significant compliance issues"). Comments may specify anticipated Conditions of Approval for this permit, if approved, or other requirements which must be met prior to approval of any Building or Grading Permit(s) for this project. Questions related to these comments can be addressed to each separate agency.

B. Please note that additional sets of revised full size plans and two sets of revised reduced (8.5" x 11") plan sets will be required prior to the public hearing for this project.

Should you have further questions concerning this application, please contact me at:
(831) 454-3227, or e-mail: evan.ditmars@santacruzcounty.us

Sincerely,

Evan Ditmars

Evan Ditmars
Project Planner
Development Review

Exhibit F

County of Santa Cruz

DEPARTMENT OF COMMUNITY DEVELOPMENT AND INFRASTRUCTURE

701 OCEAN STREET, FOURTH FLOOR, SANTA CRUZ, CA 95060-4070
Planning (831) 454-2580 Public Works (831) 454-2160

Matt Machado, Deputy CAO, Director of Community Development and Infrastructure

Carolyn Burke	Stephanie Hansen	Kent Edler	Steve Wiesner	Travis Cary	Kim Moore
Assistant Director	*Assistant Director*	*Assistant Director*	*Assistant Director*	*Director*	*Assistant Director*
Unified Permit Center	*Housing & Policy*	*Special Services*	*Transportation*	*Capital Projects*	*Administration*

June 15th, 2022

Cove Britton
728 N Branciforte Dr
Santa Cruz, Ca 95062

Subject: **Complete Application Submittal**
Application #: **211316**; Assessor's Parcel #: **043-081-13**
Owner: **Kozlowski**

Dear Cove Britton:

On March 21, 2022, you applied for a development permit with the County of Santa Cruz. The first phase in the processing of your application is the determination of the "completeness" of the application. The determination of "completeness" is made based on the preliminary review of the materials that you have submitted, by all the reviewing agencies, and site visits by Planning staff. As of this time, the reviewing agencies and Planning staff have made comments on the materials that you have submitted. This letter is to inform you of the status of your application.

As of May 14, 2022, this application has been considered **complete** for further processing. It is important to understand that although your application has been found to be complete for further processing, the Department of Community Development and Infrastructure may, in the course of processing the application, request that you clarify, amplify, correct, or otherwise supplement the information required for this application, or to submit additional information comply with the provisions of Division 13 (California Environmental Quality Act) of the Public Resources Code. Please note that the environmental determination for this project has not been made at this time and the environmental determination for this project, required by the California Environmental Quality Act, shall be made at the time the final action is taken on this project by the appropriate decision-making body.

Significant Compliance Issues

In addition to evaluating the completeness of your application, an initial review has identified areas in which your proposal appears to be in significant conflict with applicable codes and policies. Planning staff strongly suggest that the proposed project be modified to address significant compliance issues. The areas of apparent conflict with applicable codes and policies identified in this preliminary review are listed below:

Exhibit G

- Environmental Planning (Jessica DeGrassi- 831-454-3162):
  The project is complete for review. The Geology and Soils Reports have been reviewed and accepted. The following are Compliance Comments, which outline reasons why the proposed project cannot be approved:

  - 16.10.040 defines "shoreline protection structure" as any structure or material, including but not limited to riprap or a seawall, placed in an area where coastal processes operate. And the definition of "coastal hazard areas" are areas which are subject to physical hazards as a result of coastal processes such as landsliding, erosion of a coastal bluff, and inundation or erosion of a beach by wave action.

  - 16.10.070(H)(3) Shoreline protection structures shall be governed by the following: (a) Shoreline protection structures shall only be allowed on parcels where both adjacent parcels are already similarly protected, or where necessary to protect existing structures from a significant threat, or on vacant parcels which, through lack of protection threaten adjacent developed lots, or to protect public works, public beaches, and coastal dependent uses.

    - Comment: Both adjacent parcels are not similarly protected, therefore the project does not comply with this section of County Code.

  - (b) Seawalls, specifically, shall only be considered where there is a significant threat to an existing structure and both adjacent parcels are already similarly protected.

    - Comment: The Geologic and Geotechnical Reports do not state that there is a significant threat to the existing structure and that the proposed retaining wall is a "soil retention system", therefore the project does not comply with this section of County Code.

  - (c) Application for shoreline protective structures shall include thorough analysis of all reasonable alternatives to such structures, including but not limited to relocation or partial removal of the threatened structure, protection of only the upper bluff area or the area immediately adjacent to the threatened structure, beach nourishment, and vertical walls. Structural protection measures on the bluff and beach shall only be permitted where nonstructural measures, such as relocating the structure or changing the design, are infeasible from an engineering standpoint or are not economically viable.

    - Comment: An alternatives analysis has not been provided which demonstrates all reasonable alternative to the proposed retaining wall, therefore the project does not comply with this section of County Code.

  - (d) Shoreline protection structures shall be placed as close as possible to the development or structure requiring protection.

Exhibit G

- Comment: As stated above the existing structure has not been determined to require protection, therefore the project does not comply with this section of County Code.

- Public Works Stormwater Management (Alyson Tom- 831-454-2364):

  The project is complete for review. The following are Compliance Comments, which outline reasons why the proposed project cannot be approved:

  - Per Part 3 of the County Design Criteria, all development and redevelopment projects shall clearly show that proposed drainage patterns will not result in diversion of stormwater and will not adversely impact neighboring properties or drainage pathways.

    - The project design conflicts with Part 3 of the Santa Cruz County Design Criteria since diversion of stormwater is proposed and is therefore not in compliance. In order to bring the project into compliance with the County Design Criteria, the project needs to be changed so that it does not result in diversion of stormwater.

    - The County Design Criteria does allow for an exception to be considered for approval of diversion of stormwater. It states, "Diversion of runoff resulting in altered stormwater (drainage) patterns from the project site is not allowed without prior approval by the Director of Public Works."

      In order for the Director of Public Works to consider an exception to allow diversion of stormwater, the following information must be provided for review:

      1. Provide topographic information that extends at least to the inlet on the property to the west that the proposed system will tie into. Provide detailed information about the diversion path (pathway, materials, slope, ownership, etc.) from the site to the point at which the path ties into the existing downstream path, or to the beach/ocean outfall, whichever is shorter.

      2. Provide existing and proposed watershed area map/s. The existing map shall show the extent of on and offsite area/s that drain to the existing drainage facilities that will be removed as part of this project. The proposed watershed map shall show the extent of the on and offsite area/s that will drain to the proposed drainage system.

      3. Provide a signed and stamped engineer's analysis evaluating the adequacy of the condition, stability, and capacity (at least 25-year safe overflow is required) of the entire diversion path (see comment No. 2 above) – including private and public portions. Provide photo, video, and survey information used for the analysis. If any inadequacies are identified the applicant shall update the project scope to include upgrades/repairs/replacements

Exhibit G

as needed.

4. Applicant shall be required to certify in writing that they have sufficient legal rights to utilize the entire diversion path as proposed and shall further be required to execute a written agreement in a form acceptable to the County to defend, indemnify and hold harmless the County for all claims related to or arising out of applicant's proposed use of the diversion path."

5. If items 1-4 above are not addressed as specified, diversion to the private system will not be approved and the project proposal shall be updated so that there is no diversion of stormwater.

The next phase in the processing of your application will be the preparation of a staff report with recommendations to the appropriate decision-making body, and the scheduling of a public hearing. You will receive notice of the public hearing and a copy of the staff report prior to the hearing date. At the public hearing you will have the opportunity to discuss your project with the decision-making body and a decision will be made. Due to the compliance issues, if not fully addressed through a resubmittal within 30 days, staff will proceed with drafting a report with a recommendation of denial of your proposed project. Decisions of the Zoning Administrator can be appealed to the Planning Commission, and decisions of the Planning Commission can be appealed to the Board of Supervisors. This project is also appealable to the California Coastal Commission.

Should you have further questions concerning this application, please contact me at:
(831) 454-3227 or e-mail: **evan.ditmars@santacruzcounty.us**

Sincerely,

Evan Ditmars

Evan Ditmars
Project Planner
Development Review

Exhibit G

1 September 2021 Job #2020001-G-SC

Kirk and Mary Kozlowski
139 Vineyard Court
Los Gatos, CA 95032

Re: Focused geologic investigation of coastal bluff erosion and landsliding
266 Cliff Court
Aptos, CA 95003
County of Santa Cruz APN 043-081-13

Dear Mr. And Mrs. Kozlowski:

This letter summarizes the results of our focused geologic investigation of the retreat of the portion of the coastal bluff that lies below the subject property.

SCOPE OF INVESTIGATION

Work performed during this study included:

1. A review of published and unpublished literature relevant to past landsliding on the coastal bluff fronting the subject property.

2. Examination and interpretation of select historical stereo-pair vertical aerial photographs to assess the past effects of earthquakes and storms on the coastal bluff fronting the subject property.

3. Co-logging and review of the small-diameter exploratory boring data and field location of all the borings advanced by the Project Geotechnical Engineer Of Record, Pacific Crest Engineering.

4. Construction of a geologic map and cross section for the property.

5. Issuance of an email containing drafts of the map and sections, along with our preliminary findings and recommendations.

6. Final analysis and interpretation of the geologic data and preparation of this letter and attendant graphics.

We were provided with the following documents for this investigation:

"Boundary & Topographic Map, the Lands of Kirk Kozlowski - 266 Cliff Ct., Aptos, CA 95003", prepared by Hanagan Land Surveying, dated 18 February 2020, 2 sheets, intended publication scale 1"=10'.

"Geotechnical Investigation - 266 Cliff Court - Aptos, California - For Kirk and Mary Kozlowski - Los Gatos, California", prepared by Pacific Crest Engineering, dated 22 April 2021.

"Site Improvements for Kirk & Mary Kozlowski - 266 Cliff Court - Aptos, CA 95003 - APN #043-081-13", prepared by R.I. Engineering, dated June 2021, 2 sheets.

"Declaration of Elizabeth Mathieson", dated 11 June 2013.

OVERVIEW

The Kozlowskis have been sued by their neighbors (downslope AND on the marine terrace down coast) regarding landslides issuing out of the bluff below the Kozlowski property, moving downslope and in some instances, striking the residences that lie below the Kozlowski property. The Kozlowski residence is very old and the issue of landslides moving out of the coastal bluff has been ongoing for decades, well before they purchased the residence.

The coastal bluff that fronts their property is comprised, from top to bottom, of artificial fill, marine terrace deposits, Purisima Formation and a wedge of colluvium (see Plates 1 and 2). There are also landslide deposits that have moved part way down the slope and are temporarily frozen mid-slope, that will reactivate in the future. Pockets of colluvium are also scattered across the slope that lies below their property.

As noted above, the coastal bluff has failed repeatedly in the past, primarily in response to large rainfall events following high antecedent seasonal rainfall. Slope failures have also been triggered by poorly controlled storm water runoff (although it was concluded by the geological expert for the Kozlowskis, Ms. Betsy Mathieson, that the "lawsuit" debris flow was solely triggered by rainfall). The bluff will continue to incrementally fail in a piecemeal fashion, gradually driving the face of the bluff landward over time. These future landslides have a high likelihood of striking the residences that lie below along Beach Drive.

It is important to understand the array of properties and their ownership of the bluff in order to comprehend the responsibility and duties of the property owners. The Kozlowskis mostly do not own the bluff face (see the base map prepared by Hanagan Land Surveying in 2020 that was used

for Plate 1). Their seaward property line flirts with the top of the bluff for most of its alignment. The Beach Drive homes own most of the bluff, with the exception of a peculiar rectangular-shaped "buffer" parcel that lies near the top of the bluff between the Beach Drive resident properties and the Kozlowski property. The buffer property owner is an absentee owner - it is our understanding that no one has been able to contact him so that he can be made aware that landslides are issuing from his property and striking the residences below. Although the Kozlowski property lies just along the top of the bluff, there is perception by the downslope neighbors that their water and soil is triggering the landslides. As the bluff continues to lay back, the Kozlowskis will eventually own a larger fraction of the face of the bluff and that perception by the downslope neighbors is likely to grow.

There are existing storm water systems located in different locations across the Kozlowski property, one of which includes a french drain that purportedly moves storm water to a storm water system on Cliff Court. One of the systems was commissioned by the Kozlowskis, designed by Ifland Engineering and constructed in 2011. We have been unable to find any plans for that system.

There are some storm water pipes that cut across the bluff face near the top of the bluff, one of which was mapped by Hanagan Surveying. Some pipes are exposed in the landslide scars while others are draped on the bluff face. All of this can be seen in the field and on the historical oblique photo included in this letter.

PROJECT OBJECTIVES

The Kozlowskis do not want to be sued in the future for landslides issuing out of the bluff and striking the houses below, whether the landslides are truly triggered by water or soil from their property, or whether the Beach Drive homeowners simply perceive that the landslides were triggered by mismanagement of soil and water on the Kozlowskis property. Subsequently, we have been asked to provide the geological input to the design team for a soil retention system.

Since the Kozlowskis do not really own the bluff face and do not have permission from the "buffer" property owner to work on that property, any system installed for this project will need to stop at the Kozlowski property line, right at the top of bluff or slightly below it.

The storm water system is also of concern, because there are pipes on the bluff of unknown origin that could give downslope owners the perception that the Kozlowskis are draining water down the face of the bluff. A second objective should be to capture all water that falls on the Kozlowski property and direct it away from the bluff, at least as much as is practicable.

It is important to note that the proposed soil retention system and changes to the storm water system are not needed to protect the existing Kozlowski residence or access to the residence. The impetus for this work is to prevent the soil, weathered bedrock and water that the

Kozlowskis own from moving downslope on to the neighboring properties. This proposed soil retention system is solely to prevent the soil from mobilizing from the Kozlowski property and striking the residences that lie below. It is therefore a health and safety issue, as well as liability issue that the Kozlowskis are trying to resolve.

FINDINGS

1. The coastal bluff that fronts Kirk and Mary's property is comprised of artificial fill, marine terrace deposits, Purisima Formation, colluvium and landslide deposits (see Plates 1 and 2).

2. The coastal bluff below their property has repeatedly failed incrementally in the form of debris flows and shallow landslides, some of which have struck the residences below the property.

3. The coastal bluff will continue to retreat in the future via continued incremental, piecemeal landslide events.

4. The landslides out of the coastal bluff appear to be triggered by large rainfall events coming on top of high antecedent rainfall.

5. Landslides may also be triggered by seismic shaking coming from large magnitude earthquakes on any of the nearby active faults.

6. The package of artificial fill, marine terrace deposits, Purisima Formation and colluvium will fail incrementally and repeatedly until overall the slope reaches a **conservative** slope angle of approximately 30 degrees. We have drawn this future projected bluff configuration line on our geological cross sections (Plate 2).

7. Seismic shaking at the subject property will be intense during the next major earthquake along one of the local fault systems. It is important that the recommendations regarding seismic shaking be considered in the design for the proposed developments where applicable.

8. The Kozlowskis wish to limit their future liability from the Beach Drive homeowners by retaining the soil and weathered bedrock that lies on their property.

RECOMMENDATIONS

1. The Project Geotechnical Engineer and Project Civil Engineer should design a retention system that lies on the property and will prevent the soil and weathered bedrock owned by Kirk and Mary from failing as the coastal bluff retreats, as least as much as practicable.

2. Our geological map and cross sections should be considered by the Project Geotechnical Engineer and Project Civil Engineer for the retention and storm water system designs. The projected future bluff profile shown on the cross sections should also be taken into consideration for the design (see Plate 2). This recommendation does NOT preclude more conservative numerical analyses by the Project Geotechnical Engineer if such an analysis is warranted.

3. Structural elements should, at a minimum, be designed for the prescriptive seismic shaking values to be issued by the Project Geotechnical Engineer in their report.

4. We request the opportunity to review any forthcoming drainage plans for consistency with our geologic findings and recommendations.

We recommend that all drainage from the property, including improved surfaces such as walkways, patios, roofs and driveways be collected in impermeable gutters or pipes and carried away from the bluff and to whatever storm water system is needed to dispose of the water in drains that do not travel to the bluff. At no time should any concentrated discharge be allowed to spill directly onto the ground adjacent to the bluff. Any water landing on paved areas should not be allowed to flow toward the bluff. The control of runoff is essential for erosion control and prevention of ponding water against the foundation.

We do NOT recommend that collected storm water be infiltrated into the soils that mantle the bedrock on the property. Doing so will create an unnatural condition that may trigger landsliding within the soil on the bluff face.

If the storm water cannot be diverted away from the bluff for bureaucratic reasons (i.e. County of Santa Cruz Public Works attempts to block the disposal and refuses to allow the clients to lower the risk to Beach Drive residents), than deep dry wells may be considered. If this option is pursued, the wells will need to be installed in such a fashion as to drive the water down to sea level (110 feet below the ground surface) and the design of the dry wells will need to be based on site specific deep borings, piezometers and hydraulic conductivity testing.

5. We recommend that all pipes coming from the subject property that traverse the bluff be removed.

6. We recommend that the Project Civil Engineer characterize the existing storm drainage system and ensure that the system can be adapted to whatever modifications are made for this

project. If a new system is designed and installed, we recommend that the piping and drains from the old system be removed or otherwise demolished and said removal be documented in detail. The intent of this recommendation is to destroy any future perception by the downslope neighbors that the old system could be capturing or carrying water that could trigger landslides out of the face of the bluff.

7. We request the privilege of reviewing the any changes or supplements to the geotechnical report for the site and all new civil engineering plans pertaining to the proposed project.

Sincerely,
ZINN GEOLOGY

Erik N. Zinn
Principal Geologist
P.G. #6854, C.E.G. #2139

Attachments: Figure 1 - 2019 color oblique photo
Plate 1 - Geologic Site Map Of Top Of bluff1982 Geological Site Map By WCA
Plate 2 - 1982 Geological Cross Sections

ec: Elizabeth Mitchell - Pacific Crest Engineering
Richard Irish - R.I. Engineering
Cove Britton - Matson Britton Architects

FIGURE 1 - 2019 PHOTO

SOURCE: digitally excerpted from oblique aerial photo archives owned and maintained by California Coastal Records Project; https://www.californiacoastline.org/

Sincerely,
ZINN GEOLOGY

Erik N. Zinn
Principal Geologist
P.G. 6854, C.E.G. 2139

CERTIFIED ENGINEERING GEOLOGIST
ERIK N. ZINN
No. 2139
STATE OF CALIFORNIA

PROFESSIONAL GEOLOGIST
ERIK N. ZINN
No. 6854
STATE OF CALIFORNIA

Exhibit H

NORTH

GRAPHIC SCALE

10' 0' 10' 20'

1 INCH = 10 FEET

Sincerely,
ZINN GEOLOGY

Erik N. Zinn
Principal Geologist
P.G. #6854, C.E.G. #2139

CERTIFIED ENGINEERING GEOLOGIST · ERIK N. ZINN · No. 2139 · STATE OF CALIFORNIA

PROFESSIONAL GEOLOGIST · ERIK N. ZINN · No. 6854 · STATE OF CALIFORNIA

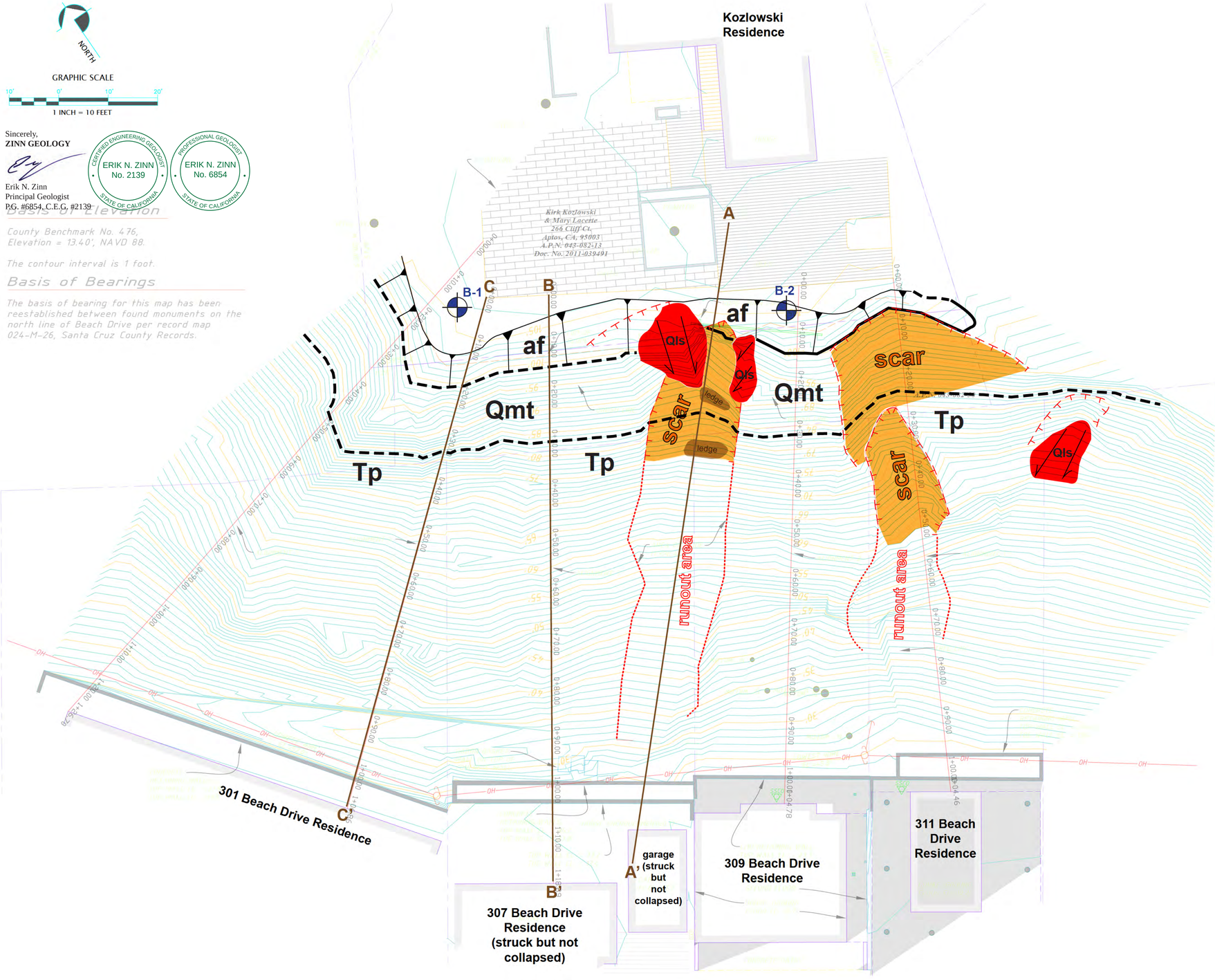
Basis of Elevation

County Benchmark No. 476,
Elevation = 13.40', NAVD 88.

The contour interval is 1 foot.

Basis of Bearings

The basis of bearing for this map has been reestablished between found monuments on the north line of Beach Drive per record map 024-M-26, Santa Cruz County Records.



BASE MAP: Excerpted from *"Boundary & Topographic Map, The Lands Of Kirk Kozlowski - 266 Cliff Ct. - Aptos, CA 95003"* by Hanagan Land Surveying, dated 18 February 2020, intended publication scale 1"=10'.

ZINN GEOLOGY
8331 48th Avenue
Santa Cruz, CA 95043
Tel. 831.334.4833
enzinn@gmail.com

GEOLOGIC SITE MAP OF TOP OF BLUFF

Lands of Kozlowski
266 Cliff Court
Aptos, California 95003

Date: 19 February 2021	Revised: 1 September 2021
Job #2020001-G-SC	
Scale: 1"=10'	**Plate 1**
Drawn by: ENZ/enz	

CERTIFIED ENGINEERING GEOLOGIST · ERIK N. ZINN · No. 2139 · STATE OF CALIFORNIA

PROFESSIONAL GEOLOGIST · ERIK N. ZINN · No. 6854 · STATE OF CALIFORNIA

EXPLANATION

EARTH MATERIALS

Qls	Landslide deposit
af	Artificial fill
Qmt	Marine terrace deposits
Tp	Purisima Formation

SYMBOLS

A — A' Location of geologic cross sections

Earth materials contact - dashed where approximate, queried where uncertain

B-2 Location of small-diameter exploratory test borings advanced by Pacific Crest Engineering

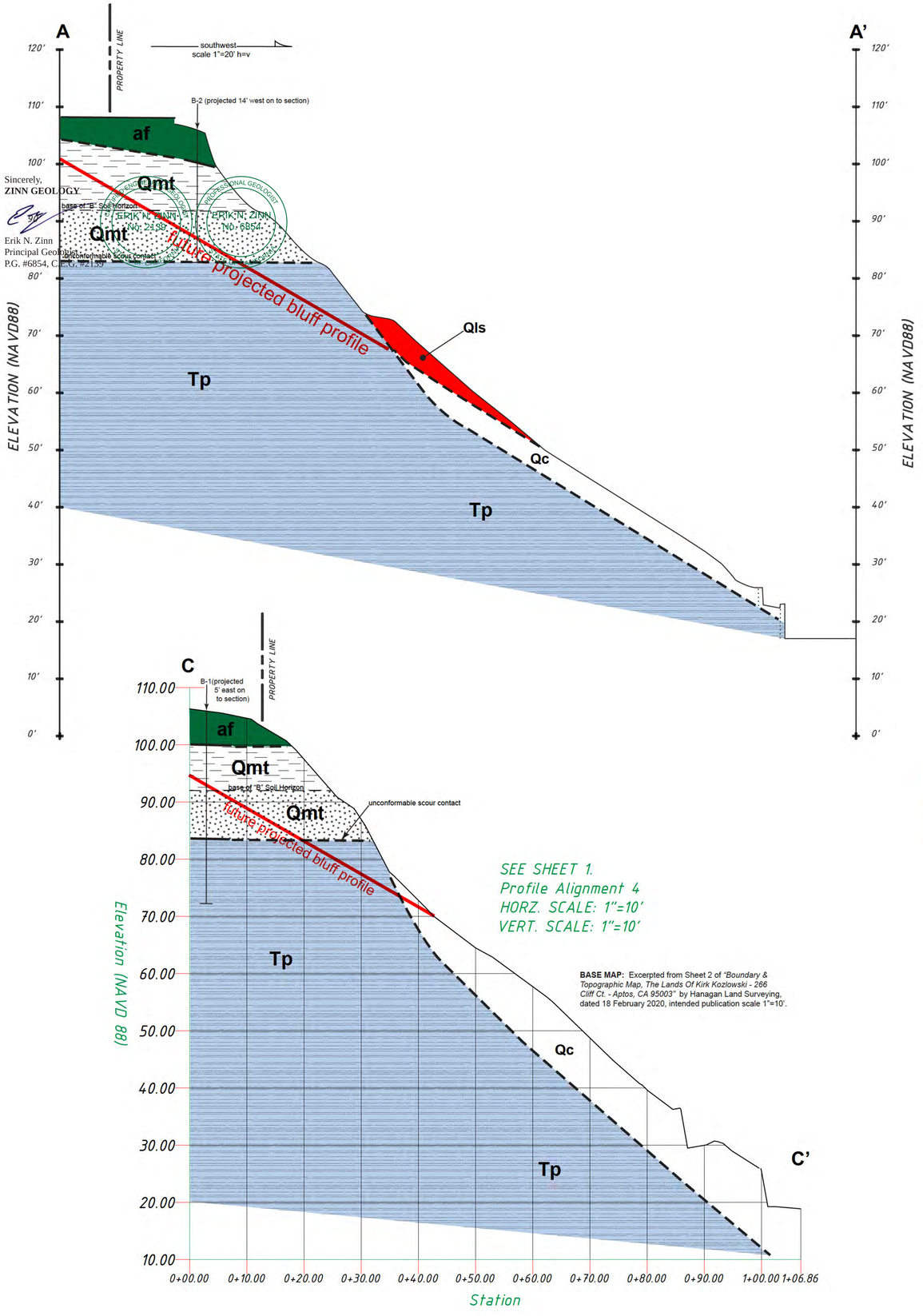
Top of landslide scar

Debris flow scar/evacuation area

Boundary of debris flow runout area

Landslide deposit - arrows indicate direction of movement

Exhibit H

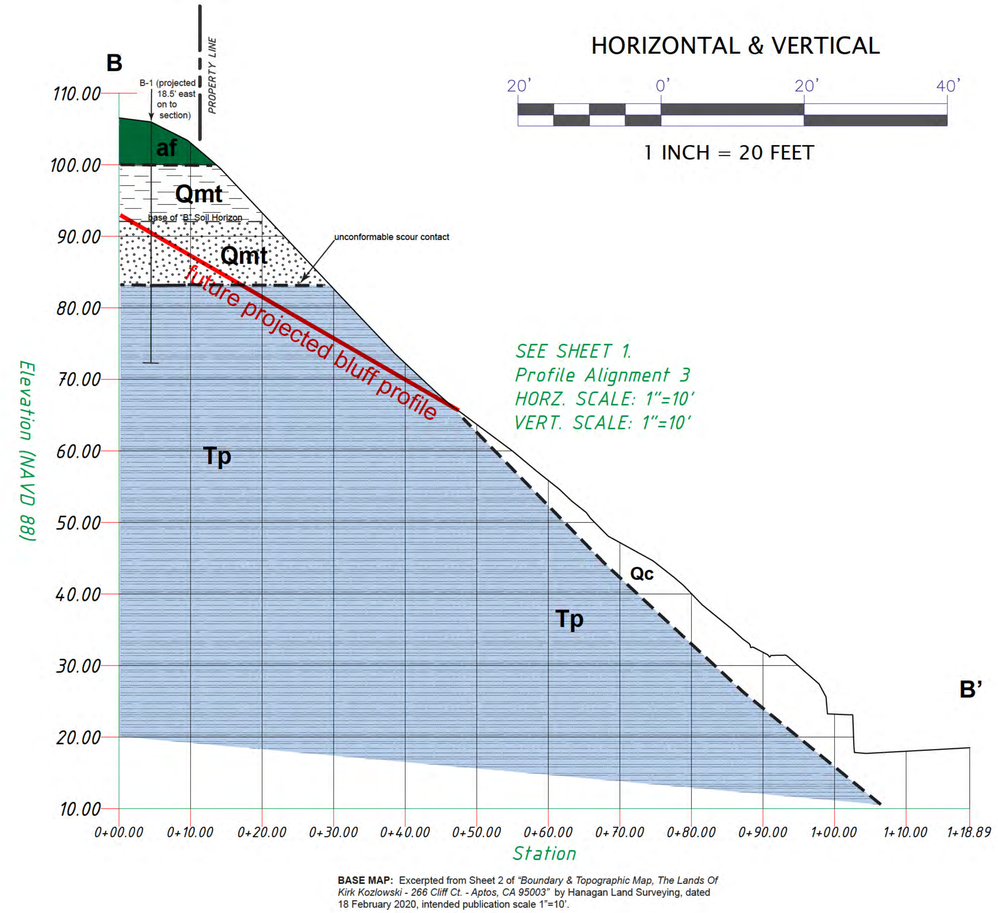


Sincerely,
ZINN GEOLOGY

Erik N. Zinn
Principal Geologist
P.G. #6854, C.E.G. #2139

SEE SHEET 1.
Profile Alignment 4
HORZ. SCALE: 1"=10'
VERT. SCALE: 1"=10'

BASE MAP: Excerpted from Sheet 2 of *"Boundary & Topographic Map, The Lands Of Kirk Kozlowski - 266 Cliff Ct. - Aptos, CA 95003"* by Hanagan Land Surveying, dated 18 February 2020, intended publication scale 1"=10'.



SEE SHEET 1.
Profile Alignment 3
HORZ. SCALE: 1"=10'
VERT. SCALE: 1"=10'

BASE MAP: Excerpted from Sheet 2 of *"Boundary & Topographic Map, The Lands Of Kirk Kozlowski - 266 Cliff Ct. - Aptos, CA 95003"* by Hanagan Land Surveying, dated 18 February 2020, intended publication scale 1"=10'.

Basis of Elevation

County Benchmark No. 476,
Elevation = 13.40', NAVD 88.

The contour interval is 1 foot.

EXPLANATION

EARTH MATERIALS

Qls	Landslide deposit
Qc	Colluvium
af	Artificial fill
Qmt	Marine terrace deposit
Tp	Purisima Formation

SYMBOLS

Earth materials contact - dashed where approximate, queried where uncertain

B-2

Location of small-diameter exploratory test borings advanced by Pacific Crest Engineering - see their report for logs of borings

CERTIFIED ENGINEERING GEOLOGIST · ERIK N. ZINN No. 2139 · STATE OF CALIFORNIA

PROFESSIONAL GEOLOGIST · ERIK N. ZINN No. 6854 · STATE OF CALIFORNIA

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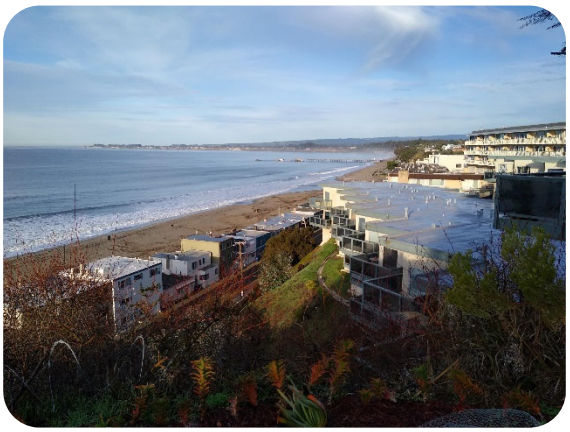
Geological Cross Sections
Lands of Kozlowski
266 Cliff Court
Aptos, California 95003

Date: 3 March 2021	Revised: 1 September 2021
Job #2020001-G-SC	
Scale: 1"=10', h=v	**Plate 2**
Drawn by: ENZ	

Exhibit H



GEOTECHNICAL INVESTIGATION

266 CLIFF COURT
APTOS, CALIFORNIA

FOR
KIRK AND MARY KOZLOWSKI
LOS GATOS, CALIFORNIA

Pacific Crest
ENGINEERING INC

CONSULTING GEOTECHNICAL ENGINEERS

2008-SZ70-B45
APRIL 2021
www.4pacific-crest.com

Exhibit I

April 22, 2021 Project No. 2008-SZ70-B45

Kirk and Mary Kozlowski
139 Vineyard Court
Los Gatos, CA 95032

Subject: **Geotechnical Investigation – Design Phase**
266 Cliff Court
Aptos, California
A.P.N. 043-081-13

Dear Mr. and Mrs. Kozlowski,

In accordance with your authorization, we have performed a geotechnical investigation for the proposed soil retention system on your property at 266 Cliff Court in Aptos, California.

The accompanying report presents our conclusions and recommendations as well as the results of the geotechnical investigation on which they are based. The conclusions and recommendations presented in this report are contingent upon our review of the plans during the design phase of the project, and our observation and testing during the construction phase of the project.

Very truly yours,

PACIFIC CREST ENGINEERING INC.

Elizabeth M. Mitchell, GE
President/Principal Geotechnical Engineer
GE 2718, Expires 12/31/22

Copies: 1 to Client
1 to RI Engineering (e-copy)
1 to Zinn Geology (e-copy)
1 to Matson-Britton Architects (e-copy)

Exhibit I

TABLE OF CONTENTS

Exhibit H

GEOTECHNICAL INVESTIGATION REPORT
266 Cliff Court, Aptos

I. INTRODUCTION

PURPOSE AND SCOPE

This report describes the geotechnical investigation and presents our conclusions and recommendations for the proposed soil retention system located at 266 Cliff Court in Aptos, California. For purposes of this report, "site" refers to the subject property located landward of the southwest property boundary.

Our scope of services for this project has consisted of:

1. Site reconnaissance to observe the existing conditions.

2. Review of the following reports and published maps:
   - Email correspondence from Zinn Geology entitled, *Cliff Court draft geology map and cross sections* dated March 3rd and April 22, 2021.
   - Geologic Map of Santa Cruz County, California, Brabb, 1997.
   - Geographic Information System – Santa Cruz County, "GISWEB Interactive Mapping Application" http://gis.co.santa-cruz.ca.us/internet/wwwgisweb/ viewer.htm

3. The drilling and logging of 2 test borings.

4. Laboratory analysis of retrieved soil samples.

5. Engineering analysis of the field and laboratory test results.

6. Preparation of this report documenting our investigation and presenting geotechnical recommendations for the design and construction of the project.

PROJECT LOCATION

The subject site is located at the south terminus of Cliff Court, in the community of Aptos in Santa Cruz County. Please refer to the Regional Site Map, Figure No. 1, in Appendix A for the general vicinity of the project site, which is approximately located by the following coordinates:

Latitude = 36.967530 degrees
Longitude = -121.902028 degrees

PROPOSED IMPROVEMENTS

The subject property is comprised of a relatively flat parcel fronted by a steep coastal bluff along the southwestern property boundary. The coastal bluff is subject to repeated landsliding, primarily in response to large rainfall events following high antecedent rainfall.

The majority of the bluff face is owned by the downslope (Beach Drive) properties; the seaward (southwest) edge of the subject property (Kozlowski) occupies a small portion of the bluff top. Mr. and Mrs. Kozlowski wish to limit their future liability from the Beach Drive homeowners by constructing a soil retention system along their southwest property boundary. The purpose of the retention system will be to confine, as much as possible, the bluff materials on their property in order to keep them from impacting downslope residential properties. Based on the results of our investigation it appears that constructing a row of soldier piles along the southwest edge of the of the property is the most reasonable approach to stabilize the portion of bluff that occupies the subject property. Also proposed are drainage improvements intended to collect all drainage around the site and divert it away from the bluff top.

II. INVESTIGATION METHODS

FIELD INVESTIGATION

Two, 4-inch diameter test borings were drilled at the site on January 28, 2020. The approximate locations of the test borings are shown on Figure No. 2, in Appendix A. The borings were advanced using limited-access "Minute-Man" drilling equipment with continuous flight augers. A geologist from Pacific Crest Engineering Inc. was present during the drilling operations to log the soil encountered and to choose sampler 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 hammer a vertical height of 30 inches. The hammer was actuated with a wire winch. The number of blows required to drive the sampler each 6-inch increment and the total number of blows required to drive the last 12 inches was recorded by the field engineer. The outside diameter of the samplers used was 3-inch, 2.5-inch or 2-inch and is designated on the Boring Logs as "L", "M", or "T", respectively.

The field blow counts in 6-inch increments are reported on the Boring Logs adjacent to each sample as well as the Standard Penetration Test data (SPT). All SPT data has been normalized to a 2-inch O.D. sampler and is reported on the Boring Logs as SPT "N" values. 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 dependent on the weight of the hammer, height of hammer drop, outside diameter of sampler, and inside diameter of sample.

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) as described in the Boring Log Explanation, Figures No. 3 and 4, in Appendix A. The soil classification was verified upon completion of laboratory testing in accordance with ASTM D2487.

Appendix A contains the site plan showing the locations of the test borings, our borings logs and an explanation of the soil classification system used. Stratification lines on the boring logs are approximate as the actual transition between soil types may be gradual.

LABORATORY TESTING

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

- Moisture Density relationships in accordance with ASTM D2937.
- Gradation testing in accordance with ASTM D1140.
- Atterberg Limits testing in accordance with ASTM D4318.
- Direct Shear testing in accordance with ASTM D3080.
- Unconfined Compression testing in accordance with ASTM D2166.

The results of the laboratory testing are presented on the boring logs opposite the sample tested and/or presented graphically in Appendix A.

III. FINDINGS AND ANALYSIS

GEOLOGIC SETTING

For a detailed presentation of the geologic setting please refer to the April 2021 geologic report prepared by Zinn Geology. A brief summary is presented below.

The property is located at the top of a coastal bluff. The bluff and the entire property are mapped as being underlain by coastal marine terrace and Purisima sandstone described as "*very thick bedded yellowish-gray tuffaceous and diatomaceous siltstone containing thick interbeds of blueish-gray, semi-friable, fine-grained andesitic sandstone*" (Brabb, 1997). The bedrock encountered during our field investigation is consistent with the mapped bedrock description and the native soils overlying the bedrock are consistent with marine terrace deposits.

SURFACE CONDITIONS

The subject property is a relatively flat parcel located at the top of a coastal bluff. A single family residence presently occupies the north side of the property, with attendant patio and landscaping

features that extend seaward toward the top of the bluff. Adjacent properties to the west, south and east occupy the coastal bluff and slope moderately to steeply down to Beach Drive.

There appear to be a few vintages of storm water systems that traverse the property, including a shallow french drain around the east and south sides of the house and a storm drain system that appears to move roof runoff to an existing storm drain at the south corner of the property (Ifland Engineers, 2011). There are some storm water pipes that cut across the bluff, one of which was mapped in 2020 by Hanagan Surveying. Some pipes are exposed in landslide scars while others are draped on the bluff face.

SUBSURFACE CONDITIONS

The following describes general subsurface conditions encountered during our field exploration program. The Logs of Test Borings in Appendix A provide, in more descriptive terms, the soil profiles encountered.

Our subsurface exploration consisted of two borings drilled in the yard area just landward of the coastal bluff. The borings ranged in depth from 23 to 34 feet below existing grade. As identified on the Zinn Geology cross sections, the property is underlain by two distinct geologic units consisting of marine terrace deposits underlain by Purisima formation bedrock. The marine terrace deposits are estimated to be approximately 18 feet in thickness, and are comprised of interbedded layers of sand and clay. The sand is typically medium dense and contains varying proportions of silt and clay. The clay materials are typically sandy, stiff to very stiff in consistency, and possess low to intermediate expansive properties. The Purisima sandstone has weathered to a medium dense, poorly graded sand with silt near the contact with the overlying marine deposits and markedly increases in density with increasing depth.

As described by Zinn Geology, the coastal bluff that fronts the subject property is comprised of artificial fill, marine terrace deposits, Purisima bedrock, colluvium, and landslide deposits. Our borings encountered approximately 6 feet of clayey sand fill that appears to mantle the top of bluff along the southwest side of the property. The fill is underlain by approximately 18 feet of marine terrace deposits overlying Purisima formation bedrock.

Groundwater was not encountered in any of the test borings to a maximum explored depth of 34 feet. In our opinion, perched groundwater can be expected to develop, at least seasonally, where a contrast in permeability occurs between the marine terrace deposits and Purisima bedrock.

It should be noted that the groundwater level was not allowed to stabilize for more than a few hours; therefore, the actual groundwater level may be higher or lower than initially encountered. The groundwater conditions described in this report reflect the conditions encountered during our drilling

investigation in January of 2020 at the specific location drilled. It must be anticipated that the perched and regional groundwater tables may vary with location and could fluctuate with variations in rainfall, runoff, irrigation, and other changes to the conditions existing at the time our measurements were made. It should be anticipated that the groundwater table may rise significantly in the winter of non-drought years.

FAULTING AND SEISMICITY

Faulting

Mapped faults which have the potential to generate earthquakes that could significantly affect the subject site are listed in Table No. 1. The fault distances are approximate distances based on the U.S. Geological Survey and California Geological Survey, Quaternary fault and fold database, accessed in August 2019 from the USGS website (http//earthquake.usgs.gov/hazards/qfaults/) and overlaid onto Google Earth.

Table No. 1 - Distance to Significant Faults

Fault Name	Distance (miles)	Direction
Zayante-Vergeles	4½	Northeast
Monterey Bay-Tularcitos	11	Southwest
San Andreas	7½	Northeast
Sargent	10½	Northeast
San Gregorio	15½	Southwest

Seismic Shaking and CBC Design Parameters

Due to the proximity of the site to active and potentially active faults, it is reasonable to assume the site will experience high intensity ground shaking during the lifetime of the project. 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.

Selection of seismic design parameters should be determined by the project structural designer. The site coefficients and seismic ground motion values shown in the table below were developed based on CBC 2019 incorporating the ASCE 7-16 standard, and the project site location.

Table No. 2 - 2019 CBC Seismic Design Parameters [Notes 1, 2]

Seismic Design Parameter	ASCE 7-16 Value
Site Class	D
Spectral Acceleration for Short Periods	S_s = 1.971g
Spectral Acceleration for 1-second Period	S_1 = 0.757g
Short Period Site Coefficient	F_a = 1.0
1-Second Period Site Coefficient	F_v = **Note 2**
MCE Spectral Response Acceleration for Short Period	S_{MS} = 1.971g
MCE Spectral Response Acceleration for 1-Second Period	S_{M1} = **Note 2**
Design Spectral Response Acceleration for Short Period	S_{DS} = 1.314g
Design Spectral Response Acceleration for 1-Second Period	S_{D1} = **Note 2**

Note 1: Design values have been obtained by using the ASCE Hazard Tool at https://asce7hazardtool.online

Note 2: Per Section 11.4.8 of ASCE 7-16, a ground motion hazard analysis may be required for Site Class D sites with S_1 greater than or equal to 0.2. The values provided in this table assume that the value of the seismic response coefficient Cs can be determined by the structural designer based on the Exceptions as detailed in Section 11.4.8. This should be verified by the structural designer and Pacific Crest Engineering, Inc. should be contacted for revised Table 2 parameters if these Exceptions are not applicable to the project.

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 damage to improvements and the need for post-earthquake repairs.

GEOTECHNICAL HAZARDS

A quantitative analysis of geotechnical hazards was beyond our scope of services for this project. In general, the geotechnical hazards associated with the project site include seismic shaking (discussed above), ground surface fault rupture, liquefaction, lateral spreading, landsliding, and expansive soils.

The April 2021 Zinn Geology report should be consulted for a comprehensive discussion of the geologic setting, seismicity, and the expected seismic hazards at the site. Geologic hazards affecting the project site include intense seismic shaking and slope retreat driven primarily by landsliding and terrestrial erosion. Geotechnical aspects of these issues are discussed below.

Ground Surface Fault Rupture

Pacific Crest Engineering Inc. has not performed a specific investigation for the presence of active faults at the project site. Based upon our review of the Santa Cruz County GIS Hazard Maps, the project site is not mapped within a fault hazard zone.

Ground surface fault rupture typically occurs along the surficial traces of active faults during significant seismic events. Since the nearest known active, or potentially active fault trace is mapped

approximately 4½ miles from the site, it is our opinion that the potential for ground surface fault rupture to occur at the site may be considered low.

Liquefaction and Lateral Spreading

Based upon our review of the Santa Cruz County GIS Hazard Maps, the project site is not mapped within a liquefaction hazard zone.

Liquefaction tends to occur in loose, saturated fine-grained sands and coarse silt, or clay with low plasticity. We did not encounter potentially liquefiable soils and the project site is underlain by marine terrace deposits and sandstone bedrock, earth materials that are not susceptible to liquefaction. Consequently, it is our opinion that liquefaction is not a hazard associated with the subject site.
Liquefaction induced lateral spreading occurs when a liquefied soil mass fails toward an open slope face or fails on an inclined topographic slope. Our analysis indicates that the site has a low potential for liquefaction, consequently the potential for lateral spreading is also considered low.

Landsliding/Coastal Bluff Retreat

The coastal bluff that forms the southwest side of the property appears to be actively subject to on-going coastal processes that include shallow debris flows, soil creep of loose soils blanketing the bluff face, and erosion of the terrace deposits. This report presents geotechnical recommendations for retaining the coastal bluff materials on the Kozlowski property, in order to restrain them from impacting downslope properties on Beach Drive. An evaluation of coastal bluff stability beyond the limits of the subject property was outside of our scope of services and was not performed.

The bluff will continue to retreat in the future by way of continued incremental landslide events. Please refer to the Zinn Geology report for their postulated future project bluff profile. The potential future bluff profile should be considered in the design of any proposed soil retention system and storm water improvements.

Slope failures can also occur where surface drainage is allowed to concentrate onto unprotected slopes. Appropriate landscaping and strict control of surface drainage around the project area becomes very important to minimize the potential for shallow landsliding within the surficial bluff materials. Under no circumstances should surface runoff from the subject property be allowed to discharge toward or onto the bluff face. All existing drainage pipes coming from the subject property that traverse the bluff should be completely removed or abandoned by a method acceptable to the project geotechnical engineer and geologist. Any existing storm water systems that collect and convey water to these pipes should also be abandoned and the water redirected to approved outlets to the north, well landward of the bluff.

Expansive Soils

Based on the results of our investigation, the clayey materials underlying the project site exhibit low to intermediate moderate expansion characteristics. Expansive soils tend to heave during the rainy season and contract during the summer. This cyclical volume change within the soil will occur whenever the moisture content of the soil fluctuates, whether it occurs seasonally or otherwise. Seasonal moisture fluctuation and subsequent expansion and contraction of these types of soils typically occurs more so near the ground surface.

IV. DISCUSSION AND CONCLUSIONS

GENERAL

1. The results of our investigation indicate that the proposed improvements are feasible from a geotechnical engineering standpoint, provided our recommendations and those provided by Zinn Geology are included in the design and construction of the project.

2. At the time we prepared this report, the grading plans had not been completed and the 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.

3. Pacific Crest Engineering Inc. should be notified at least four (4) 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 client or their representative, the contractor(s) and one of our engineers present. At this meeting, the project specifications and the testing and inspection responsibilities will be outlined and discussed.

4. The findings, conclusions and recommendations provided in this report are based on the understanding that Pacific Crest Engineering will remain as Geotechnical Engineer of Record throughout the design and construction phase of the project. The validity of the findings, conclusions and recommendations contained in this report are dependent upon our review of project plans as well as an adequate testing and observation program during the construction phase. Field observation and testing must therefore be provided by a representative of Pacific Crest Engineering Inc., to enable us to form an opinion as to whether the extent of work related to earthwork or foundation excavation complies with the project plans, specifications and our geotechnical recommendations. Pacific Crest Engineering assumes no responsibility for any site work that is performed without the full knowledge and direct observation of Pacific Crest Engineering Inc.

PRIMARY GEOTECHNICAL CONSIDERATIONS

5. Based upon the results of our investigation, it is our opinion that the primary geotechnical issues associated with the design and construction of the proposed project are the following:

a. *Landsliding/Coastal Bluff Retreat:* The coastal bluff that abuts the southwest side of the property appears to be actively subject to on-going coastal processes of shallow landsliding and erosion. These processes will continue to contribute to the long-term bluff retreat.

   Mr. and Mrs. Kozlowski wish to retain the bluff materials on their property in order to keep them from impacting downslope residential properties. In our opinion the installation of a pin-pile soil retention system would be an effective measure for stabilizing the bluff materials on the Kozlowski property and restrain them from impacting downslope properties on Beach Drive. The pin-pile wall should be located along the top of the bluff, as close to the Kozlowski property line as possible, and extend the full property width with "returns" constructed at roughly the intersecting property lines. Zinn Geology estimates that the portion of the slope underlain by fill and marine terrace deposits will continue to fail until it reaches its natural angle of repose of about 30 degrees. The pin pile wall should be designed to rely on soil support located below this line projection (see Plate 2 of the Zinn Geology report). Detailed recommendations are presented in the following sections of this report.

b. *Surface Drainage*: An engineered drainage plan is recommended for this project. All drainage from the property, including runoff from improved surfaces such as walkways, patios, roofs, and driveways, should be collected and conveyed via solid conduits to appropriate discharge locations away from the coastal bluff. Under no circumstances should drainage be directed toward, over the top of, or upon the slopes below this property.

   All existing drainage pipes coming from the subject property that traverse the bluff should be completely removed or abandoned by a method acceptable to the project geotechnical engineer and geologist. Any existing storm water systems that collect and convey water to these pipes should also be abandoned and the water redirected to approved outlets to the north, well landward of the bluff.

c. *Strong Seismic Shaking:* The project site is located within a seismically active area and strong seismic shaking is expected to occur within the design lifetime of the project. Improvements should be designed and constructed in accordance with the most current CBC and the recommendations of this report to minimize reaction to seismic shaking. 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, however strong seismic shaking could result in damage to improvements and the need for post-earthquake repairs.

V. RECOMMENDATIONS

PIN-PILE SOIL RETENTION SYSTEM

General

6. To reduce the hazard of future slope failures issuing from the Kozlowski property to impact the downslope properties on Beach Drive, a row of soldier piles should be constructed at the top of the bluff along the southwest property line.

7. The row of soldier piles should be designed to act as a continuous retaining wall through the mechanism of soil arching. The upper 4 feet of the soldier piers should be "stitched" together with a reinforced grade beam.

8. The pin-pile system should be located along the top of the bluff, as close to the Kozlowski property line as possible, and extend the full property width with "returns" constructed at roughly the intersecting property lines.

9. It must be understood that the soldier piles will **not** stabilize the hillside downslope of the piers and that it should be anticipated that the area downslope of the piers will continue to fail. It may be necessary to place lagging between the piers to prevent erosion or raveling if slope retreat exposes the section of the piers below the grade beam. If downhill slope retreat exposes the soldier piers, Pacific Crest Engineering Inc. should be consulted in order to provide supplemental measures, as necessary.

Soldier Pile Design Criteria

10. For design purposes the depth of soil retention and depth to passive soil resistance was estimated using Zinn Geology's future projected bluff profile (see Zinn Geology Plate 2).

11. Soldier piles should be designed for the following criteria:

a. The piles should be designed using the lateral earth pressures as outlined in this report; however we recommend a minimum embedment of 30 feet below the top-of-slope, or 5 feet into Purisima bedrock whichever is greater. Actual depths could be greater depending upon a lateral force analysis performed by your structural engineer.

b. Minimum pile size should be 24 inches in diameter and all pier holes must be free of loose material on the bottom. Maximum pier spacing should be 2.5 pier diameters apart, center to center. This will result in 24-inch diameter piers spaced 5 foot on center. Closer spacing may be acceptable.

c. Soldier piers constructed along the top-of-slope should be designed to retain the depths of soil as shown in the table below. Depth to passive soil pressure should also be determined as shown in this table. The interval between the active and passive soil forces may be modelled as air (e.g. neither imposing nor resisting loads).

Table No 3. Depth to Active and Passive Soil Pressures

Depth Retained (feet below top of bluff)	Depth to Passive Soil Resistance (feet below top of bluff)
15 feet	18

d. Design depth of soil retention is the depth from the top of slope down to the future projected bluff profile line depicted by Zinn Geology. Design depth to passive soil resistance in the above table is estimated by the depth of material above a 5 foot horizontal distance between the face of the pier and the future projected bluff face.

e. Soldier piers with a horizontal back-slope and free to yield an amount sufficient to develop the active earth pressure condition (about ½% of height), should be designed for an active earth pressure of 45 psf. The active pressure tributary load for each pier is equivalent to the center to center spacing of the piers.

f. Passive soil pressures may be simulated by an equivalent fluid pressure of 400 psf/ft of depth acting over a plane 2 times the pier diameter. Passive soil resistance for the upper 18 feet of the pier should be neglected (see table above). The project structural engineer should make the final determination whether tie-backs are required for pier design using the above mentioned soil design parameters above.

g. Timber or concrete lagging should be installed to span between piers where piers are exposed or may possibly become exposed due to future downslope movement. We recommend that lagging between the piers be embedded to a depth where the face of the lagging is separated at least 8 feet horizontally from the slope face. To further reduce the possibility that erosion and soil creep on steep slopes will expose the base of the lagging, potentially undermining the retained area, this minimum depth should be increased.

h. Pier design using an allowable skin friction capacity for the section of pier embedded in soil/bedrock of 400 pounds per square foot of surface area, with a 1/3rd increase for wind and seismic loads. When calculating skin friction capacity, skin friction between the pier and the adjacent soil should be neglected for the upper 15 feet.

i. If the structural designer determines that seismic forces should be used in the design of soldier piers, the piers may be designed using the above active soil pressures plus a horizontal

seismic force of $14H^2$ pounds per lineal foot (where H is the height of retained material). The resultant seismic force should be applied at a point one-third above the base of the wall. This force has been estimated using the Mononobe-Okabe method of analysis as modified by Whitman (1990) and Lew and Sitar (2010). A reduced factor of safety for overturning and sliding may be used in seismic design as determined by the structural designer.

12. All pier excavation spoils must be removed from slope areas.

13. All piers must be constructed within ½ percent of a vertically plumb condition.

14. Due to the close pile spacing, it should be anticipated that pile construction will need to occur in two phases, with every other pile drilled and poured in each phase.

15. It is possible that the piers will need to be cased during drilling and that the water will have to either be pumped before steel and concrete placement or the concrete placed through a tremie. If the casing is pulled during the concrete pour, it must be pulled slowly with a minimum of 4 feet of casing remaining embedded within the concrete at all times.

16. The contractor should expect dense soil and/or bedrock drilling conditions beginning at an approximate depth of 25 feet, based on the findings outlined in our test borings. Therefore; appropriately sized drilling equipment should be selected for these drilling conditions so that the piers may extend to the full depth outlined in the geotechnical report and the project plans and specifications.

17. 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.

18. The piers should contain steel reinforcement as determined by the project civil or structural engineer.

Tie-Back Anchors

19. Given the recommended retained height tie-back anchors may be required to support the soldier piles. Tie-back systems should be designed to resist the pressure distribution and magnitude shown on Figure No. 9 of Appendix A.

20. The tie-back wall design should incorporate all geotechnical design criteria outlined within the preceding section, including seismic design criteria, if appropriate. Tie-back design and the construction techniques for installing them are the responsibility of the specialty tie-back contractor.

21. Preliminary design of the tie-backs should be based on an ultimate soil/grout bond value of 1000 psf. Final bonded length should be based on field conditions and pull out tests. Actual strengths developed will depend upon the actual material in which the tie-backs are embedded, diameter of the tie-back hole, roughness of the hole grouting technique, grout strength and other construction factors. It is the Contractor's responsibility to construct tie-backs which develop the required tie-back capacity.

22. Tie-backs should be installed at an inclination of about 10 to 20 degrees below horizontal.

23. The bonded length of the tie-back anchor should begin outside the "active" soil wedge. We recommend a minimum unbonded length of 10 feet and a minimum bonded length extending at least 15 feet beyond the active wedge.

24. All spoils from the tie-back drilling work must be removed from the site. Tieback spoils should not be cast onto the existing slopes below the proposed wall. These materials may not be placed on the slope area below the retaining wall.

25. The computed bond length of the tiebacks should be confirmed by a performance- and proof-testing program performed under the observation of the geotechnical engineer. The performance test is used to verify the capacity and the load-deformation behavior of the tiebacks. It is also used to separate and identify the causes of tieback movement, and to check that the design unbonded length has been established. A proof test is a simple test used to measure the total movement of the tieback during one cycle of incremental loading. The first two production tiebacks and two percent of the remaining tiebacks should be performance tested to 1.33 times the design load. All of the remaining tiebacks should be confirmed by a proof-test to 1.33 times the design load. Testing and acceptance criteria should be based on that presented by the latest Post Tensioning Institute ("Recommendations for Prestressed Rock and Soil Anchors"). The geotechnical engineer will evaluate the tieback test results and determine whether the tiebacks are acceptable. Tiebacks that fail to meet the test criteria may be assigned a reduced capacity or rejected. Any rejected tieback shall be replaced at the contractor's expense.

26. Tie-back anchors should be locked off at a value of at least 80 to 90 percent of the design load for the tie-back anchor, or as determined by the Design Engineer.

27. Tie-back designs, construction details and corrosion protection systems must be submitted for review to the civil engineer and the geotechnical engineer a minimum of three weeks in advance of the commencement of tie-back construction.

28. All tie-back anchor construction and testing must be observed by a representative from Pacific Crest Engineering Inc. Any tie-back anchors constructed without the full knowledge and continuous

Exhibit I

observation of Pacific Crest Engineering Inc., will render the recommendations of this report invalid. The Contractor and drilling subcontractor should be notified regarding this requirement.

SURFACE DRAINAGE

29. Surface water drainage is the responsibility of the project civil engineer. The following should be considered by the civil engineer in design of the project.

30. An engineered drainage plan is recommended for this project. All drainage from the property, including runoff from improved surfaces such as walkways, patios, roofs, and driveways, should be collected and conveyed via solid conduits to approved discharge locations away from the coastal bluff. Under no circumstances should drainage be directed toward, over the top of, or upon the slopes below this property.

31. All existing drainage pipes coming from the subject property that traverse the bluff should be completely removed or abandoned by a method acceptable to the project geotechnical engineer and geologist. Any existing storm water systems that collect and convey water to these pipes should also be abandoned and the water redirected to approved outlets to the north, well landward of the bluff.

32. Surface water must not be allowed to pond or be trapped adjacent to foundations, or on building pads and parking areas. Surface water must not be allowed to flow toward the bluff.

33. All roof eaves should be guttered, with the outlets from the downspouts provided with adequate capacity to carry the storm water away from structures to reduce the possibility of soil saturation and erosion. The connection should be in a closed conduit which discharges at an approved location away from structures, graded areas, and the coastal bluff.

34. Slope failures can occur where surface drainage is allowed to concentrate onto unprotected slopes. Appropriate landscaping and strict control of surface drainage around the project area becomes very important to minimize the potential for shallow landsliding within the surficial bluff materials. Under no circumstances should surface runoff from the subject property be allowed to discharge toward or onto the bluff face as discussed previously

EROSION CONTROL

35. The surficial soils that mantle the coastal bluff are classified as having a high potential for erosion. Therefore, the finished bluff face should be planted with ground cover and maintained to minimize surface erosion. Erosion control blankets designed for use on steep slopes should be installed and securely fixed to the slope. For specific and detailed recommendations regarding erosion control on and surrounding the project site, the project civil engineer or an erosion control specialist should be consulted.

36. Existing slide scars, and/or other areas of exposed soils remaining on the property following construction should be "smoothed" out to avoid the concentration of runoff and promote sheet flow. Smoothing of the slope should be done with as little disturbance as possible to the soils that are to remain. This "sculpting" should be done in a manner that minimizes soil disturbance wherever possible and at the same time removes fill material and blocks of soil that presently protrude from the slope due to adjacent erosion or slumping. Sculpting should also taper at the property lines so as not to disturb the existing neighbors' bluff face and structures.

37. Fill removal and sculpting should be observed and directed by the project geotechnical engineer and geologist.

38. Disturbance of adjacent soils and the slope in general during construction should be minimized as much as possible. All materials should be prevented from falling down the slope and on to the properties below.

39. Vegetation and erosion control should be installed on the finished slope. Vegetation and erosion control should be designed and installed by erosion control specialists with local experience on coastal bluffs. We suggest the use of vegetation with sufficient root structures to help bind the soil together and plants that do not become so large or heavy as to load the slope. Seeding and/or hydroseeding should be performed. Installation of an erosion control blanket that is capable of lasting several years and is staked firmly into the slope face should be considered.

40. A temporary summer and fall season watering system should be designed so that the vegetation and seed are well established on the slope prior to the winter rains. Depth of watering should be monitored to provide enough water for establishing growth without overwatering or saturating the slope. Under no circumstances should any irrigation be left in place on the face of the bluff once the winter rains begin. The intent of this recommendation is to prevent the rupture of irrigation lines on the bluff face and the subsequent exacerbation of erosion and landsliding following the rupture.

PLAN REVIEW

41. We respectfully request an opportunity to review the project plans and specifications during preparation and before bidding to verify 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.

Exhibit I

VI. LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. This Geotechnical Investigation was prepared specifically for Kirk and Mary Kozlowski 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.

The following information is provided to help you manage your risks.

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

Exhibit I

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 you ASFE-member geotechnical engineer for more information.

ASFE
The Best People on Earth

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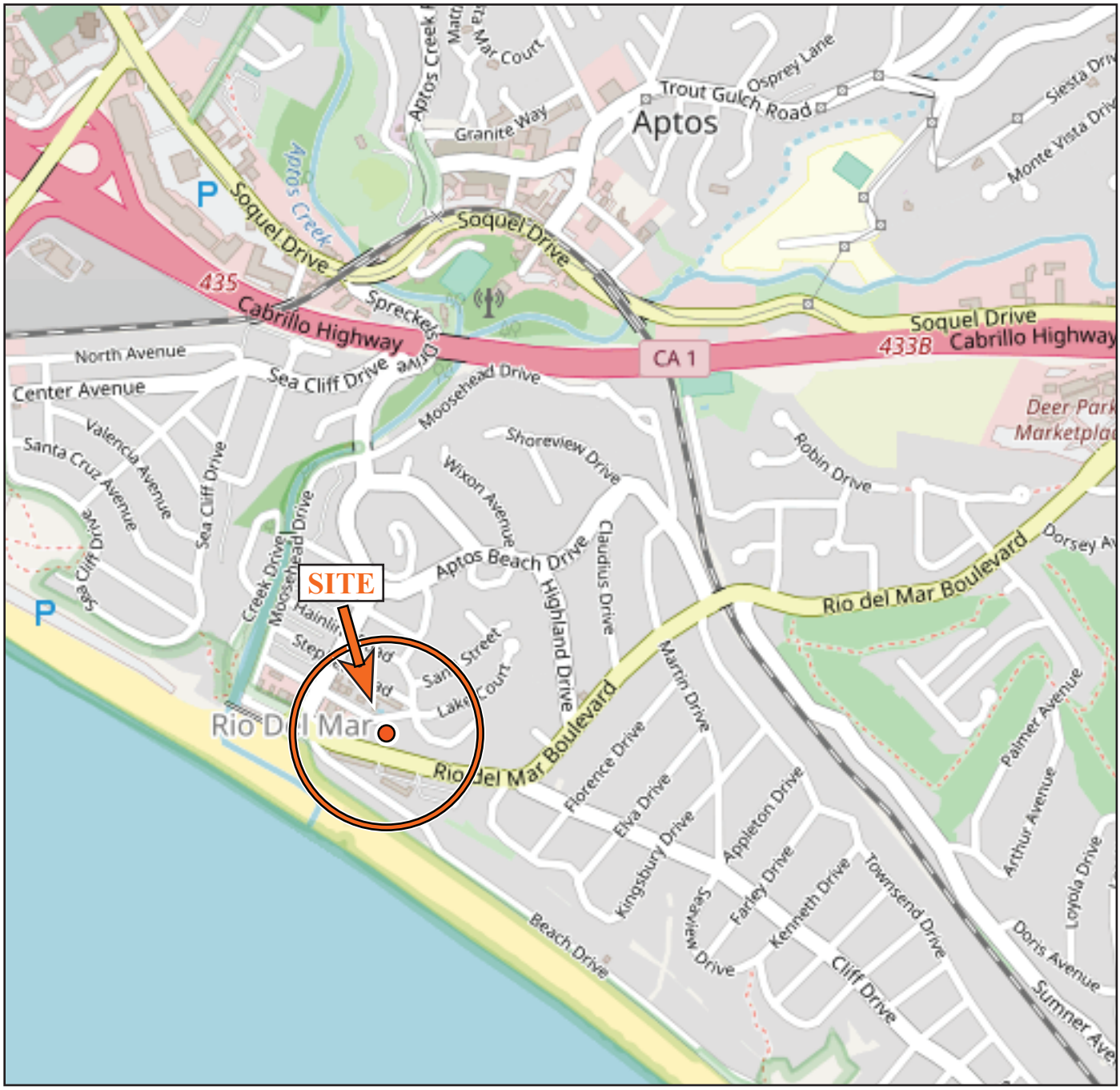
Exhibit I

APPENDIX A

Regional Site Map
Site Map Showing Test Borings
Key to Soil Classification
Log of Test Borings
Atterberg Limits
Apparent Earth Pressure Diagram



Base Map: © OpenStreetMap contributors

Pacific Crest ENGINEERING INC	Regional Site Map 266 Cliff Court Aptos, California	Figure No. 1 Project No. 2008 Date: 4/22/21

Exhibit I

LEGEND

B-2 — Approximate location of test boring

N

0 20 40

Scale: 1 inch = 20 feet

Basemap Provided By: Hanagan Land Surveying dated 2-18-20

Pacific Crest ENGINEERING INC

Site Map Showing Test Borings
266 Cliff Court
Aptos, California

Figure No. 2
Project No. 2008
Date: 4/22/21

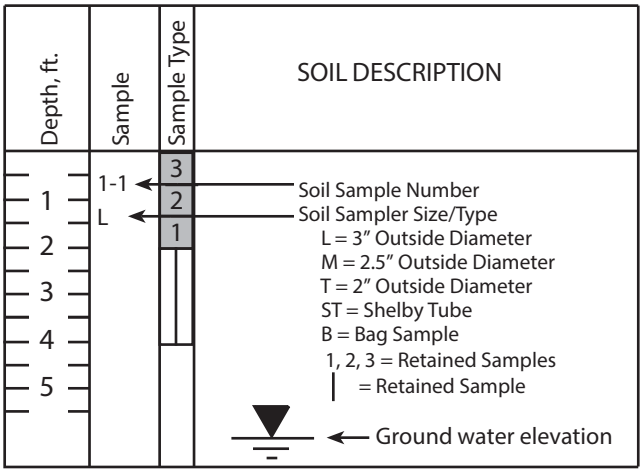
Exhibit I

KEY TO SOIL CLASSIFICATION - FINE GRAINED SOILS (FGS)
UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2487 (Modified)

MAJOR DIVISIONS		SYMBOL	FINES	COARSENESS	SAND/GRAVEL	GROUP NAME
SILT AND CLAY	*LL < 35% Low Plasticity	CL Lean Clay PI > 7 Plots Above A Line -OR- ML Silt PI > 4 Plots Below A Line	<30% plus No. 200	<15% plus No. 200		Lean Clay / Silt
				15-30% plus No. 200	% sand ≥ % gravel	Lean Clay with Sand / Silt with Sand
					% sand < % gravel	Lean Clay with Gravel / Silt with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Lean Clay / Sandy Silt
					≥ 15% gravel	Sandy Lean Clay with Gravel / Sandy Silt with Gravel
				% sand < % gravel	< 15% sand	Gravelly Lean Clay / Gravelly Silt
					≥ 15% sand	Gravelly Lean Clay with Sand / Gravelly Silt with Sand
		CL - ML 4 < PI < 7	<30% plus No. 200	<15% plus No. 200		Silty Clay
				15-30% plus No. 200	% sand ≥ % gravel	Silty Clay with Sand
					% sand < % gravel	Silty Clay with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Silty Clay
					≥15% gravel	Sandy Silty Clay with Gravel
				% sand < % gravel	< 15% sand	Gravelly Silty Clay
					≥15% sand	Gravelly Silty Clay with Sand
	35% ≤ *LL < 50% Intermediate Plasticity	CI	<30% plus No. 200	<15% plus No. 200		Clay
				15-30% plus No. 200	% sand ≥ % gravel	Clay with Sand
					% sand < % gravel	Clay with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Clay
					≥ 15% gravel	Sandy Clay with Gravel
				% sand < % gravel	< 15% sand	Gravelly Clay
					≥ 15% sand	Gravelly Clay with Sand
	*LL > 50% High Plasticity	CH Fat Clay Plots Above A Line -OR- MH Elastic Silt Plots Below A Line	<30% plus No. 200	<15% plus No. 200		Fat Clay or Elastic Silt
				15-30% plus No. 200	% sand ≥ % gravel	Fat Clay with Sand Elastic Silt with Sand
					% sand < % gravel	Fat Clay with Gravel / Elastic Silt with Gravel
			≥30% plus No. 200	% sand ≥ % gravel	< 15% gravel	Sandy Fat Clay / Sandy Elastic Silt
					≥ 15% gravel	Sandy Fat Clay with Gravel / Sandy Elastic Silt with Gravel
				% sand < % gravel	< 15% sand	Gravelly Fat Clay / Gravelly Elastic Silt
					≥ 15% sand	Gravelly Fat Clay with Sand / Gravelly Elastic Silt with Sand

* LL = Liquid Limit
* PI = Plasticity Index

BORING LOG EXPLANATION



MOISTURE

DESCRIPTION	CRITERIA
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp, but no visible water
WET	Visible free water, usually soil is below the water table

CONSISTENCY

DESCRIPTION	UNCONFINED SHEAR STRENGTH (KSF)	STANDARD PENETRATION (BLOWS/FOOT)
VERY SOFT	< 0.25	< 2
SOFT	0.25 - 0.5	2 - 4
FIRM	0.5 - 1.0	5 - 8
STIFF	1.0 - 2.0	9 - 15
VERY STIFF	2.0 - 4.0	16 - 30
HARD	> 4.0	> 30

Pacific Crest ENGINEERING INC

Boring Log Explanation - FGS
266 Cliff Court
Aptos, California

Figure No. 3
Project No. 2008
Date: 4/22/21

Exhibit I

KEY TO SOIL CLASSIFICATION - COARSE GRAINED SOILS
UNIFIED SOIL CLASSIFICATION SYSTEM - ASTM D2487 (Modified)

MAJOR DIVISIONS		FINES	GRADE/TYPE OF FINES	SYMBOL	GROUP NAME *
GRAVEL	More than 50% of coarse fraction is larger than No. 4 sieve size	<5%	Cu ≥ 4 and 1 ≤Cc ≤ 3	GW	Well-Graded Gravel / Well-Graded Gravel with Sand
			Cu < 4 and/or 1 > Cc > 3	GP	Poorly Graded Gravel /Poorly Graded Gravel with Sand
		5-12%	ML or MH	GW - GM	Well-Graded Gravel with Silt / Well- Graded Gravel with Silt and Sand
				GP - GM	Poorly Graded Gravel with Silt / Poorly Graded Gravel with Silt and Sand
			CL, CI or CH	GW - GC	Well-Graded Gravel with Clay / Well-Graded Gravel with Clay and Sand
				GP - GC	Poorly Graded Gravel with Clay / Poorly Graded Gravel with Clay and Sand
		>12%	ML or MH	GM	Silty Gravel / Silty Gravel with Sand
			CL, CI or CH	GC	Clayey Gravel / Clayey Gravel with Sand
			CL - ML	GC - GM	Silty, Clayey Gravel / Silty, Clayey Gravel with Sand
SAND	50% or more of coarse fraction is smaller than No. 4 sieve size	<5%	Cu ≥ 6 and 1 ≤Cc ≤3	SW	Well-Graded Sand / Well-Graded Sand with Gravel
			Cu < 6 and/or 1 > Cc > 3	SP	Poorly Graded Sand / Poorly Graded Sand with Gravel
		5-12%	ML or MH	SW - SM	Well-Graded Sand with Silt / Well- Graded Sand with Silt and Gravel
				SP - SM	Poorly Graded Sand with Silt / Poorly Graded Sand with Silt and Gravel
			CL, CI or CH	SW - SC	Well-Graded Sand with Clay / Well-Graded Sand with Clay and Gravel
				SP - SC	Poorly Graded Sand with Clay / Poorly Graded Sand with Clay and Gravel
		>12%	ML or MH	SM	Silty Sand / Silty Sand with Gravel
			CL, CI or CH	SC	Clayey Sand / Clayey Sand with Gravel
			CL - ML	SC - SM	Silty, Clayey Sand / Silty, Clayey Sand with Gravel

* The term "with sand" refers to materials containing 15% or greater sand particles within a gravel soil, while the term "with gravel" refers to materials containing 15% or greater gravel particles within a sand soil.

US STANDARD SIEVE SIZE:	3 inch	¾ inch	No. 4	No. 10	No. 40	No. 200	0.002 µm
	COARSE	FINE	COARSE	MEDIUM	FINE		
COBBLES AND BOULDERS	GRAVEL		SAND			SILT	CLAY

RELATIVE DENSITY

DESCRIPTION	STANDARD PENETRATION (BLOWS/FOOT)
VERY LOOSE	0 - 4
LOOSE	5 - 10
MEDIUM DENSE	11 - 30
DENSE	31 - 50
VERY DENSE	> 50

MOISTURE

DESCRIPTION	CRITERIA
DRY	Absence of moisture, dusty, dry to the touch
MOIST	Damp, but no visible water
WET	Visible free water, usually soil is below the water table

Pacific Crest ENGINEERING INC

Boring Log Explanation - CGS
266 Cliff Court
Aptos, California

Figure No. 4
Project No. 2008
Date: 4/22/21

Exhibit I

LOGGED BY MWL | DATE DRILLED 1/28/20 | BORING DIAMETER 4" SS | BORING NO. 1

DRILL RIG ASD - Minute Man | HAMMER TYPE 140lb Hammer w/ Cathead

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
1	1-1 L	2	FILL: CLAYEY SAND WITH GRAVEL: Very dark brown (10YR 2/2), very fine to fine-grained sand, low plasticity, roots and rootlets, abundant gravels up to 1" in diameter, highly organic, moist, very loose	SC	2			42.2		24.5		
		1			3	3		7.3	108.6	16.6		
2	1-2 L		CLAYEY SAND: Very dark brown (10YR 2/2), very fine to fine-grained sand, low plasticity, roots and rootlets, gravels up to 1" in diameter, moist, loose	SC	4							
3		2			4		1.4	15.4	104.0	47.4	12	
		1			6	5	2.5	14.9	104.8	35.5		
4	1-3 M				4							Direct Shear = 33° c = 50 psf
5		2			5							
		1			5	9	1.1	17.1	103.4	47.0		
6	1-4 M		NATIVE: SANDY CLAY: Dark brown (7.5YR 3/3), intermediate plasticity, very fine to fine-grained sand, blocky texture, trace rootlets, moist, very stiff	CL	6							
7		2			8		2.0	15.8	111.1	57.2	10	
8		1			12	16	2.4	16.6	111.3	58.2		Qu = 1965 psf
	1-5 T		CLAY WITH SAND: Dark yellowish-brown (10YR 4/6 & 3/4), intermediate plasticity, very fine-grained sand, moist, very stiff	CI	5							
9					7							
					9							
10					13	22		27.7		73.8	25	
	1-6 T		Dark yellowish-brown (10YR 4/6), very fine to fine-grained sand, poorly-graded, grain size increases with depth, moist, dense		15							
11					13							
					20							
12					20	40		22.9		74.5	16	
	1-7 L		SILTY SAND: Dark yellowish-brown (10YR 4/6 & 3/4), very fine to fine-grained sand, poorly-graded, grain size increases with depth, moist, medium dense	SM	9							
13		2			12							
		1			15							Direct Shear = 29° c = 220 psf
14					19	18		16.5	100.5	19.2		
	1-8 L				17							
15			Color change to olive-brown (2.5Y 4/3), very fine to fine-grained sand, poorly-graded, grain size decreases with depth, moist, medium dense		18							
		2			19			15.3	96.2	22.1		
16		1			19	20						
	1-9 M		FAT CLAY: Olive-gray (5Y 5/2) with red/orange oxidation staining, moist, stiff	CH	4							
17		3			6			35.1	82.9			
		2			7							
		1			8	14	1.5	41.7	76.4	97.2	46	
18	1-10 M				7							
19					8							
		2	SANDY CLAY: Olive-gray (5Y 5/2), oxidation staining, intermediate to high plasticity, moist, very stiff	CI	13							
20		1			18	26	2.6	27.5	88.3			Qu = 1950 psf
	1-11 T				15							
21			SILTY SAND: Yellowish-brown (10YR 5/8), very fine to fine-grained sand, poorly-graded, oxidation staining, gravels up to 1½" in diameter, moist, very dense	SM	21							
					29							
22					42	71		12.6				
	1-12 T				21							
23					28							
					31							

Pacific Crest ENGINEERING INC

Log of Test Borings
266 Cliff Court
Aptos, California

Figure No. 5
Project No. 2008
Date: 4/22/21

Exhibit I

LOGGED BY MWL DATE DRILLED 1/28/20 BORING DIAMETER 4" SS BORING NO. 1

DRILL RIG ASD - Minute Man HAMMER TYPE 140lb Hammer w/ Cathead

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
24	1-12 T		SILTY SAND: Yellowish-brown (10YR 5/8), very fine to fine-grained sand, poorly-graded, oxidation staining, gravels up to 1½" in diameter, moist, very dense	SM	31 33	64		11.1				
	1-13 L	1			45 50/4"	50/4"						
25			PURISIMA FORMATION COMPLETELY WEATHERED TO POORLY GRADED SAND WITH SILT: Olive brown (2.5Y 4/3), very fine-grained, poorly-graded, micaceous, slightly moist, very dense		51							
26	1-14 M	1			50/5"	50/5"		28.0	90.3	36.3		
	1-15 T		Color change to variegated yellowish brown, white and black, moist, very dense		26 31							
27					42							
28					48	90		5.5				
29												
30	1-16 L		Moist, very dense									
		2										
31		1						6.9	101.1	3.6		
32	1-17 M		Moist, very dense		24 42							
		1			50/4"	50/4"		8.8	93.6			
33	1-18 T		Moist, very dense		27 34							
34					50/6"	50/6"		7.6				
			Boring terminated at 34'2". No groundwater encountered.									
35												
36												
37												
38												
39												
40												
41												
42												
43												
44												
45												
46												

Pacific Crest ENGINEERING INC

Log of Test Borings
266 Cliff Court
Aptos, California

Figure No. 6
Project No. 2008
Date: 4/22/21

Exhibit I

LOGGED BY MWL DATE DRILLED 1/28/20 BORING DIAMETER 4" SS BORING NO. 2

DRILL RIG ASD - Minute Man HAMMER TYPE

Depth (feet)	Sample	Sample Type	Soil Description	USCS	Field Blow Counts	SPT "N" Value	Pocket Pen. (tsf)	Moisture Content (%)	Dry Density (pcf)	% Passing #200	Plasticity Index	Additional Lab Results
1			FILL: CLAYEY SAND: Very dark brown (10YR 2/2), intermediate plasticity, very fine to fine-grained sand, roots and rootlets, gravels up to 1" in diameter, moist,	SC								
2												
3												
4												
5												
6			Lack of gravels/rootlets									
7			NATIVE: CLAYEY SAND: Very dark brown (10YR 2/2), moist	SC								
8												
9												
10												
11												
12			Increased drilling resistance at 12'									
13			SILTY SAND: Olive-brown (2.5Y 4/3), very fine to fine-grained sand, poorly-graded, moist	SM								
14												
15												
16			Increased drilling resistance at 16'									
17												
18												
19			Hard, shaky drilling, color change to yellowish-brown (10YR 5/8), gravels up to 1" in diameter									
20												
21			Increased drilling resistance at 22.5'									
22			PURISIMA FORMATION COMPLETELY WEATHERED TO POORLY GRADED SAND WITH SILT: Olive brown (2.5Y 4/3), very fine-grained, poorly-graded, micaceous, slightly moist									
23			Boring terminated at 23 feet. No groundwater encountered.									

Pacific Crest ENGINEERING INC

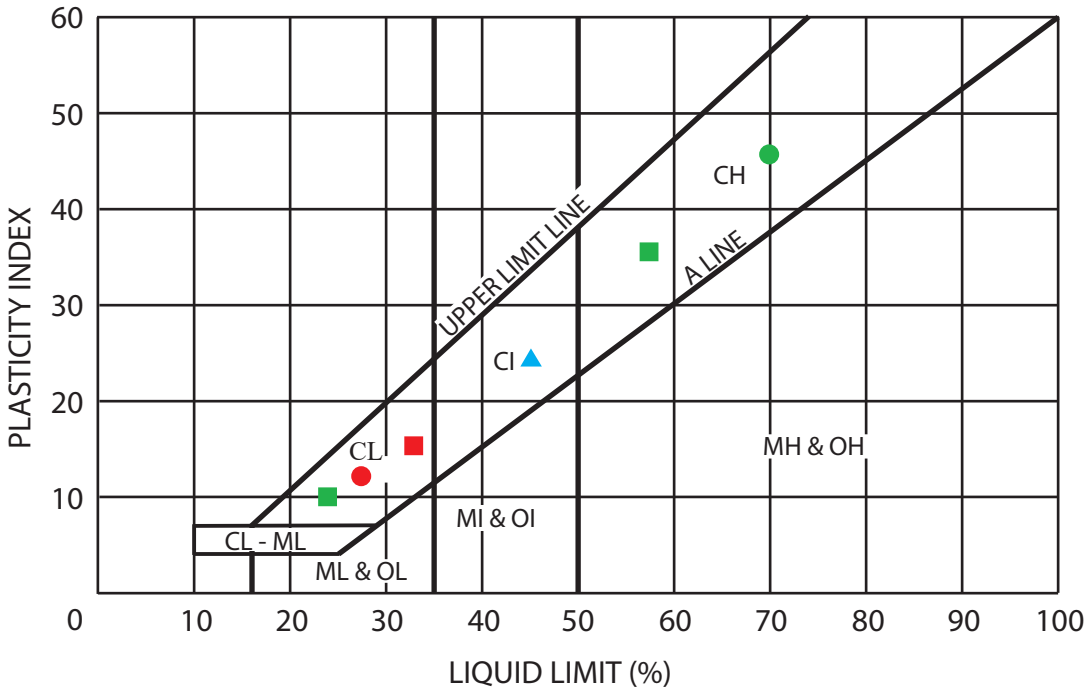
Log of Test Borings
266 Cliff Court
Aptos, California

Figure No. 7
Project No. 2008
Date: 4/22/21

Exhibit I

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.

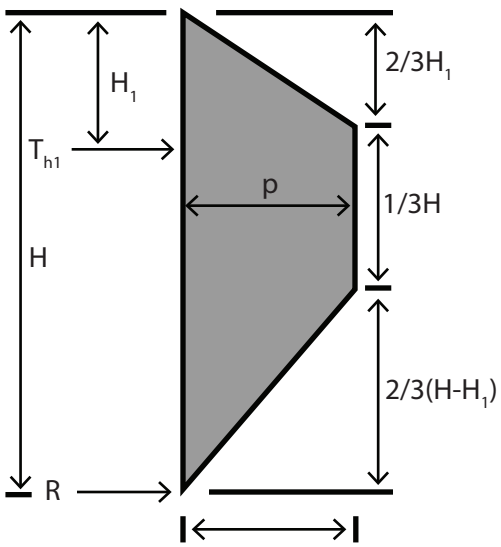
SYMBOL	SAMPLE #	LL (%)	PL (%)	PI
●	1-2-2	28	16	12
■	1-4-2	24	14	10
▲	1-5	45	20	25
■	1-6	33	18	16
●	1-9-1	70	24	46

Pacific Crest ENGINEERING INC	Atterberg Limits 266 Cliff Court Aptos, California	Figure No. Project No. 2008 Date: 4/22/21

Exhibit I

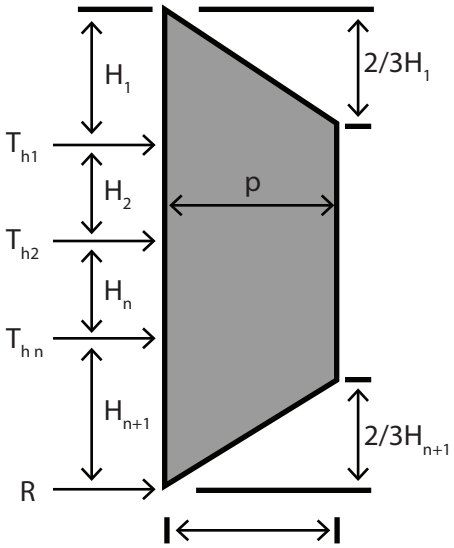
Apparent Earth Pressure Diagram for Stiff to Hard Clays

(FHWA NHI-IF-99-015, Figure 27)



$p \approx 0.4\gamma H$

Walls with one level of ground anchors



$p \approx 0.4\gamma H$

Walls with multiple levels of ground anchors

H_1 = Distance from ground surface to uppermost ground anchor
H_{n+1} = Distance from base of excavation to lowermost ground anchor
T_{h1} = Horizontal load in ground anchor 1
R = Reaction force to be resisted by subgrade (i.e.; below base of excavation)
p = Maximum ordinate of diagram

Recommended Soil Parameters:

γ = 127 pcf

Pacific Crest ENGINEERING INC	Apparent Earth Pressure Diagram 266 Cliff Court Aptos, California	Figure No. 9 Project No. 2008 Date: 4/22/21

Exhibit I

COUNTY OF SANTA CRUZ

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

17 March 2022

Kirk and Mary Kozlowski
139 Vineyard Court
Los Gatos, CA 95032

Subject: Review of the Focused geologic investigation of coastal bluff erosion and landsliding, 266 Cliff Court, Aptos, California, County of Santa Cruz/APN 043-081-13 dated 1 September 2021 by Zinn Geology, Project #2020001-G-SC; and the

Review of the Geotechnical Investigation – Design Phase for 266 Cliff Court, Aptos, California/APN 043-081-13 dated 22 April 2021, Project #2008-SZ70-B45

Project Site: 266 Cliff Court
APN 043-081-13
Application No. REV211508

Dear Applicants:

The purpose of this letter is to inform you that the Planning Department has accepted the above referenced reports. The following items shall be required for the project site Building Permit Application:

1. All project design and construction shall comply with the recommendations of the reports;

2. Final plans shall reference the subject reports by titles, authors, and dates. Final Plans should also include a statement that the project shall conform to the reports' recommendations;

3. After plans are prepared that are acceptable to all reviewing agencies, please request both your project engineering geologist and geotechnical engineer submit a completed Consultant Plan Review Form (PLG300) to Environmental Planning. The authors of the geology and geotechnical reports shall sign and stamp their completed forms. Please note that the plan review forms must reference the final plan set by last revision date. Any updates to report recommendations necessary to address conflicts between the reports and plans must be provided via a separate addendum to the soils and geology reports; and

4. After project plans have been completed and prior to the issuance of the Building Permit, a Monitoring and Maintenance Agreement for the proposed pin pile retaining wall system shall be recorded by the owners. Please contact Rick Parks at (831) 454-3168/email: Rick.Parks@santacruzcounty.us for a copy of the project site monitoring and maintenance agreement and instructions for recording.

Exhibit J

Electronic copies of all forms required to be completed by the Geotechnical Engineer and Geologist may be found on our website: www.sccoplanning.com, under "Environmental", "Geology & Soils", and "Assistance & Forms".

After building permit issuance the soils engineer and engineering geologist *must remain involved with the project* during construction. Please review the Notice to Permits Holders (attached).

Our acceptance of the reports is limited to their technical content. Other project issues such as zoning, fire safety, septic or sewer approval, etc. may require resolution by other agencies.

Please note that this determination may be appealed within 14 calendar days of the date of service. Additional information regarding the appeals process may be found online at: http://www.sccoplanning.com/html/devrev/plnappeal_bldg.htm

Please contact Rick Parks at (831) 454-3168/email: Rick.Parks@santacruzcounty.us or Jeff Nolan at (831) 454-3175/Jeff.Nolan@santacruzcounty.us if we can be of any further assistance.

Respectfully,

Rick Parks, GE 2603
Civil Engineer – Environmental Planning
County of Santa Cruz Planning Department

Jeffrey Nolan, CEG 2247
County Geologist– Environmental Planning
County of Santa Cruz Planning Department

Cc: Environmental Planning, Attn: Jessica deGrassi
Zinn Geology, Attn: Erik Zinn, CEG
Pacific Crest Engineering, Inc., Attn: Elizabeth Mitchell, GE
Primary Contact: Cove Britton

Attachments: Notice to Permit Holders

Exhibit J

NOTICE TO PERMIT HOLDERS WHEN SOILS AND GEOLOGY REPORTS HAVE BEEN PREPARED, REVIEWED AND ACCEPTED FOR THE PROJECT

After issuance of the building permit, the County requires your soils engineer and engineering geologist to be involved during construction.

1. **At the completion of construction,** a *Soils (Geotechnical) Engineer Final Inspection Form* and a *Geologist Final Inspection Form* are required to be submitted to Environmental Planning that includes copies of all observations made during construction and is stamped and signed, certifying that the project was constructed in conformance with the recommendations of the soils and geology reports.

   If the *Final Inspection Form* identifies any portions of the project that were not observed by the soils engineer and/or geologist, you may be required to perform destructive testing in order for your permit to obtain a final inspection. The soils engineer and/or geologist then must complete and initial an *Exceptions Addendum Form* that certifies that the features not observed will not pose a life safety risk to occupants.

Exhibit J