\Tillamook County

DEPARTMENT OF COMMUNITY DEVELOPMENT
BUILDING, PLANNING & ON-SITE SANITATION SECTIONS

1510 – B Third Street
Tillamook, Oregon 97141
www.tillamook.or.us
Building (503) 842-3407
Planning (503) 842-3408
Sanitation (503) 842-3409
FAX (503) 842-1819
Toll Free 1(800) 488-8280

Land of Cheese, Trees and Ocean Breeze

Neskowin Coastal Hazard Area Permit #851-21-000054-PLNG: Erickson

NOTICE TO MORTGAGEE, LIENHOLDER, VENDOR OR SELLER:
ORS 215 REQUIRES THAT IF YOU RECEIVE THIS NOTICE,
IT MUST BE PROMPTLY FORWARDED TO THE PURCHASER

NOTICE OF ADMINISTRATIVE REVIEW
Date of Notice: September 17, 2021

Notice is hereby given that the Tillamook County Department of Community Development is considering the following:

#851-21-000054-PLNG: A request for approval of a Neskowin Coastal Hazard Area Permit for a remodel project of an existing single-family dwelling on a property located within the Unincorporated Community Boundary of Neskowin, zoned Neskowin Low Density Residential (NeskR-1) and within the Neskowin Coastal Hazards Overlay (Nesk-CH) Zone. The subject property is addressed as 49670 Surf Road and designated as Tax Lot 1900 of Section 36BC in Township 5 South, Range 11 West of the Willamette Meridian, Tillamook County, Oregon.

Notice of the application, a map of the subject area, and the applicable criteria are being mailed to all property owners within 250 feet of the exterior boundaries of the subject parcel for which the application has been made and other appropriate agencies at least 14 days prior to this Department rendering a decision on the request.

Written comments received by the Department of Community Development prior to 4:00p.m. on October 1, 2021 will be considered in rendering a decision. Comments should address the criteria upon which the Department must base its decision. A decision will be rendered no sooner than October 4, 2021.

A copy of the application, along with a map of the request area and the applicable standards/criteria for review are available for inspection on the Tillamook County Department of Community Development website: https://www.co.tillamook.or.us/commdev/landuseapps and is also available for inspection at the Department of Community Development office located at 1510-B Third Street, Tillamook, Oregon, 97141.

If you have any questions about this application, please contact Sarah Absher, CFM, Director at 503-842-3408 x 3317 or by email: sabsher@co.tillamook.or.us.

Sincerely,

Sarah Absher

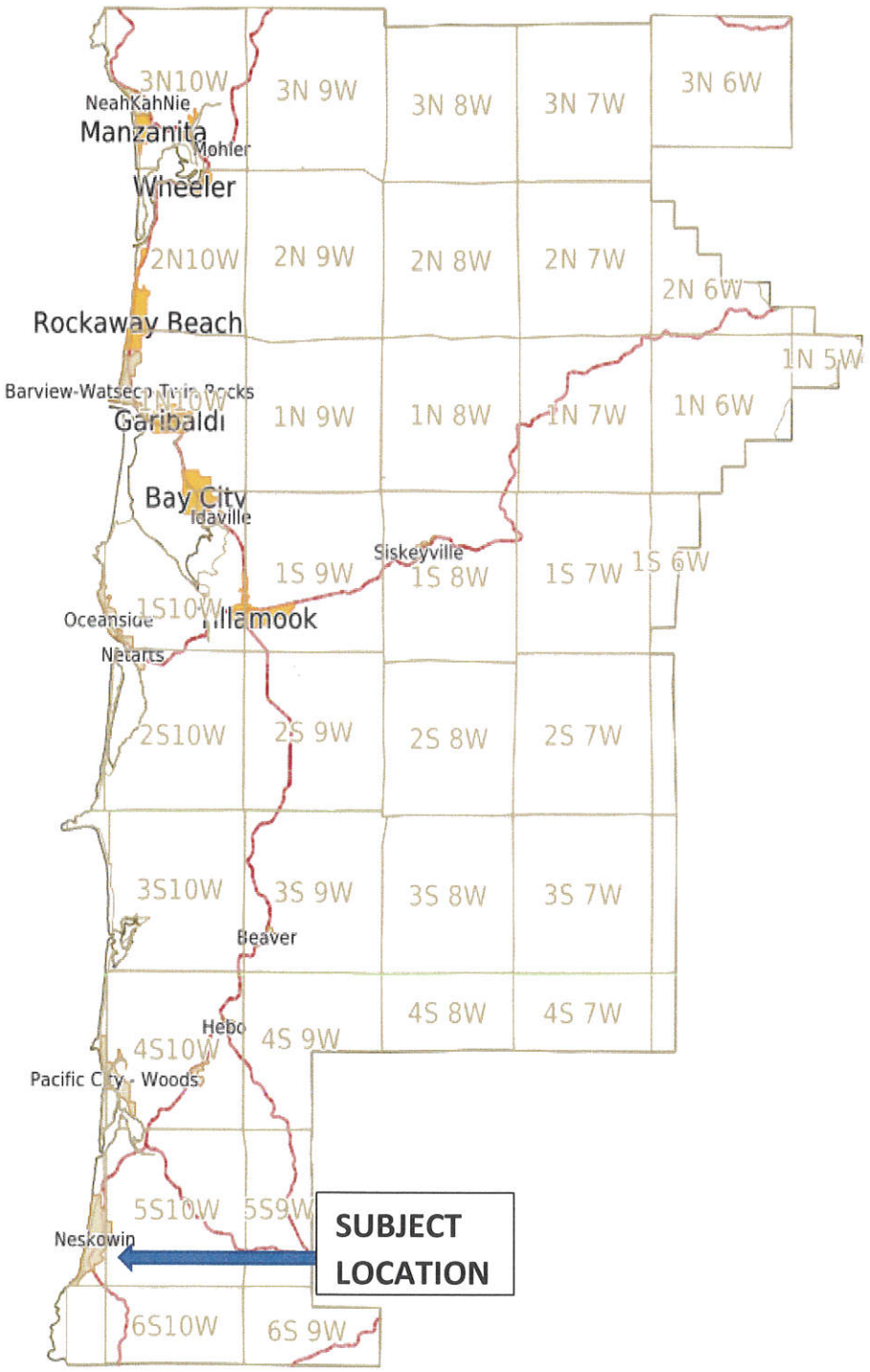
Sarah Absher, CFM, Director

Enc. Applicable Ordinance Standards/Criteria
Maps

TCLUO SECTION 3.570(4)(e): A decision to approve a Neskowin Coastal Hazard Area Permit shall be based upon findings of compliance with the following standards:

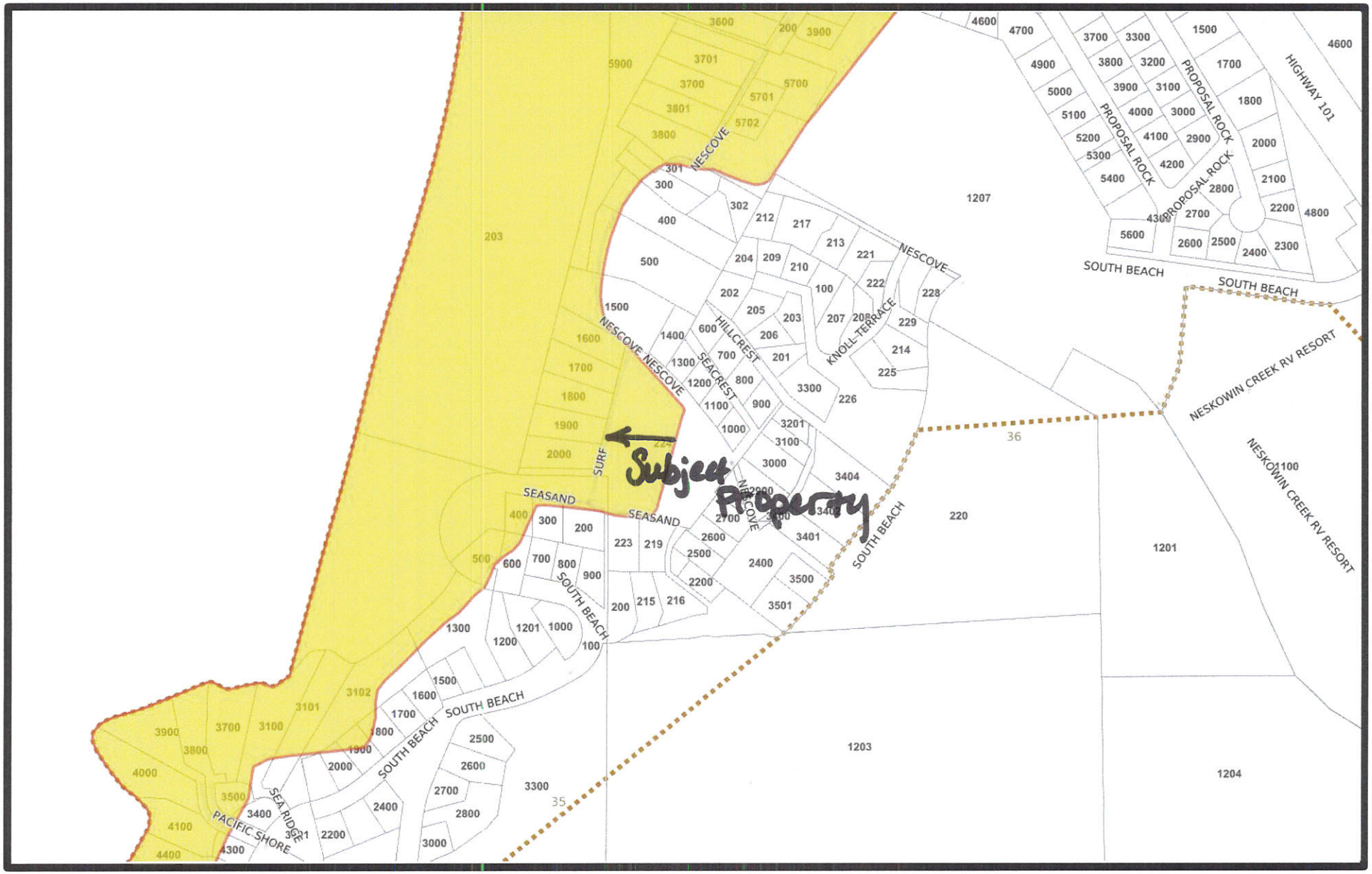
(A) The proposed development is not subject to the prohibition of development on beaches and certain dune forms as set forth in subsection (8) of this section;
(B) The proposed development complies with the applicable requirements and standards of subsections (6), (7), (8), and (10) of this section;
(C) The geologic report conforms to the standards for such reports set forth in subsection (5) of this section;
(D) The development plans for the application conform, or can be made to conform, with all recommendations and specifications contained in the geologic report; and
(E) The geologic report provides a statement that, in the professional opinion of the engineering geologist, the proposed development will be within the acceptable level of risk established by the community, as defined in subsection (5)(c) of this section, considering site conditions and the recommended mitigation.

VICINITY MAP



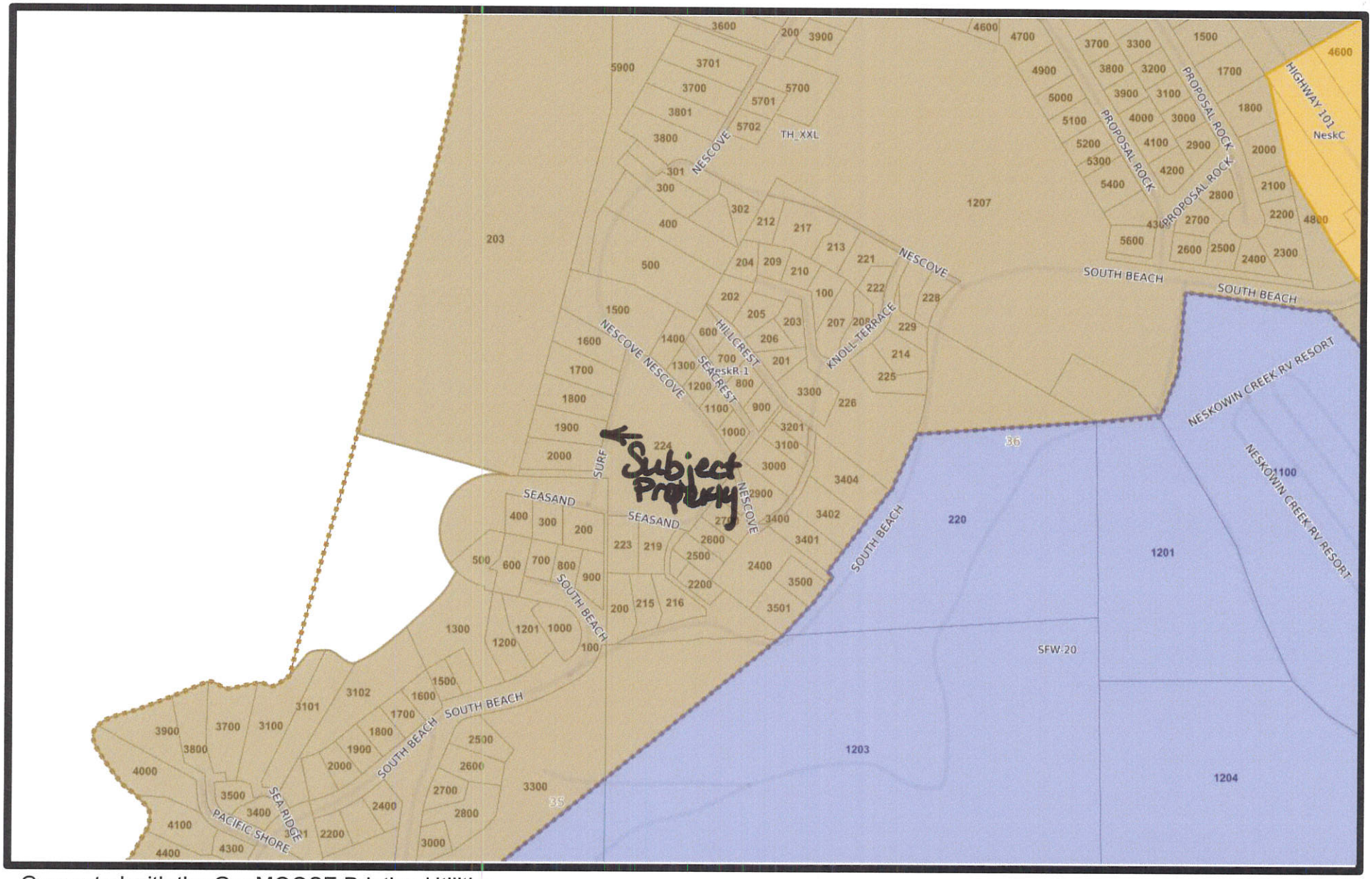
#851-21-000054-PLNG: ERICKSON

Map



Generated with the GeoMOOSE Printing Utilities

Map



Generated with the GeoMOOSE Printing Utilities

Tillamook County Department of Community Development
1510-B Third Street. Tillamook, OR 97141 | Tel: 503-842-3408 Fax: 503-842-1819
www.co.tillamook.or.us

PLANNING APPLICATION

OFFICE USE ONLY
Date Stamp
FEB 17 2021 Drop Box
☐Approved ☐Denied
Received by: SS
Receipt #:
Fees: 615
Permit No: 851-21-000054-PLNG

Applicant ☐ *(Check Box if Same as Property Owner)*

Name: Ben Kibler Phone: 503-559-3899
Address: 3780 Boone Rd SE.
City: Salem State: OR Zip: 97317
Email: Bkibler@live.com

Property Owner

Name: Mike Ericksen Phone: 503-781-9082
Address: 255 Stampker Rd
City: Lake Oswego State: OR Zip: 97034
Email: Mike.Ericksen@AFMS.com

Request: Home remodel

Type II	Type III	Type IV
☐ Farm/Forest Review	☐ Appeal of Director's Decision	☐ Appeal of Planning Commission Decision
☐ Conditional Use Review	☐ Extension of Time	☐ Ordinance Amendment
☐ Variance	☐ Detailed Hazard Report	☐ Large-Scale Zoning Map Amendment
☐ Exception to Resource or Riparian Setback	☐ Conditional Use (As deemed by Director)	☐ Plan and/or Code Text Amendment
☐ Nonconforming Review (Major or Minor)	☐ Ordinance Amendment	
☐ Development Permit Review for Estuary Development	☐ Map Amendment	
☐ Non-farm dwelling in Farm Zone	☐ Goal Exception	
☐ Foredune Grading Permit Review		
☒ Neskowin Coastal Hazards Area		

Location:

Site Address: 49670 Surf Rd Neskowin OR. 97149
Map Number: 05S (Township) 11W (Range) 36BC (Section) 01900 (Tax Lot(s))

Clerk's Instrument #: _____

Authorization

This permit application does not assure permit approval. The applicant and/or property owner shall be responsible for obtaining any other necessary federal, state, and local permits. The applicant verifies that the information submitted is complete, accurate, and consistent with other information submitted with this application.

Property Owner Signature (Required) — Date: 2-15-21

Applicant Signature — Date

Schwabe
WILLIAMSON & WYATT®

August 11, 2021

Garrett H. Stephenson
Admitted in Oregon
T: 503-796-2893
C: 503-320-3715
gstephenson@schwabe.com

VIA E-MAIL

Ms. Sarah Absher, Director
Tillamook County Department of Community Development
1510-B Third Street
Tillamook, OR 97141

RE: Response to Incompleteness Determination for Erickson Vacation Homes (casefile 851-21-000054-PLNG)

Dear Ms. Absher:

This office represents Erickson Vacation Homes, LLC (the "Applicant"). Our client has submitted a land use application for an addition onto their home in Neskowin (Neskowin Coastal Hazards Area Permit #851-21-000054-PLNG) (the "Application"). This letter is in response to your email dated March 25, 2021, which deemed the Application incomplete. As explained below, the enclosed materials respond to your request for information. In light of limited time remaining within the 180-day completeness timeline and pursuant to ORS 215.427(4), Erickson hereby requests that the Application be deemed complete. The Applicant is happy to respond to additional information requests during the review period.

Your email requested the following additional information:

"Specifically, discussion and analysis of the following sections is missing in their entirety or in part:

"Section 3.570(4)(d)(A)-(E)

"Section 3.570(4)(e)(A)-(E)

"Section 3.570(5)(c)(A)-(E) *(A)(i), (iii) and (ix) are moderately addressed

"Section 3.570(5)(c)(B)-(E)"

"Starting on Page 91, a statement of the engineering geologist's professional opinion as to whether the proposed development will be within the acceptable level of risk established by the community, considering site conditions and the recommended mitigation is missing from the geologic hazard report as well as statements regarding the highlighted sections on Page 92.

"Additionally, Section 3.570(7) is not addressed in the report and the Certification of compliance outlined in Section 3.570(11)(a) is also missing from the application."

We respond to each of the above-identified items as follows:

- **"Section 3.570(4)(d)(A)-(E)"**

Exhibit 1 is a new site plan showing all of the items requested in subsection (A). In response to subsection (B), excavation for the project will be to native soil underneath the proposed addition, to a depth of approximately 2.5 feet, with approximately 180 sq. yds. of soil to be removed. **Exhibit 2**. In response to subsection (C), the County should be aware that the *entire* Property is within the Neskowin Coastal Hazard Overlay Zone, and therefore, the hazard zone lines cannot be shown on the site plan. There are no other hazard zones mapped on the Property. Site-specific hazards are described in **Exhibit 3**, the Applicant's new Geologic Hazards and Geotechnical Investigation Report. Subsection (E) requires an engineering report provided by a registered civil engineer, geotechnical engineer, or engineering geologist. This is provided as **Exhibit 3**.

- **"Section 3.570(4)(e)(A)-(E)"**

TCLUO section 3.570(4)(e) includes the approval criteria for a Neskowin Coastal Hazards Area Permit. These criteria are addressed below:

(A) The proposed development is not subject to the prohibition of development on beaches and certain dune forms as set forth in subsection (8) of this section;

RESPONSE: Subsection (8) generally deals with foredune breaching and grading. The proposed addition will be located landward of the foredune face (which is protected by a riprap revetment) and landward of the existing house. Therefore, the Director can find that the project is not prohibited by subsection (8), and consequently, that this criterion is met.

(B) The proposed development complies with the applicable requirements and standards of subsections (6), (7), (8), and (10) of this section;

RESPONSE: The Application satisfies subsection (6) as follows:

a) "Moveable structure design." The proposed addition is to an existing home. As this is not a new structure, moveable structure design requirements do not (and as a practical matter, could not) apply because the house is already fixed to a foundation.

b) "Safest site requirement." The proposed addition is landward of the existing home. Section 5.2 of the Geologic Hazard Report explains that the proposed addition is well east of the minimum recommended setback from the top of the existing revetment. **Exhibit 3**. For this reason, the Director can find that this standard is met.

c) Subsection (C) does not apply because the Application does not involve creation of a new lot or parcel.

d) Residential density requirements do not apply because the Application will neither increase or no decrease existing residential density.

The Application satisfies subsection (7) (oceanfront setbacks) because the addition is landward of the existing home, and therefore behind any identified setback line. Subsection (8) is not applicable to the Application because the proposed addition will not impact the existing foredune or vegetation line. Subsection (10) is not applicable because a land division is not proposed.

For the above reasons, the Director can find that this criterion is met.

(C) The geologic report conforms to the standards for such reports set forth in subsection (5) of this section;

RESPONSE: **Exhibit 3**, the Geologic Hazard Report, includes all information required under TCLUO 3.570(5)(c). This criterion is met.

(D) The development plans for the application conform, or can be made to conform, with all recommendations and specifications contained in the geologic report; and

RESPONSE: The recommendations in the Geologic Hazard Report are set forth in Section 5 of the report. They include the following:

- Maintain a minimum 40-foot setback from the foredune.
- Remove disturbed topsoil and debris and place footings and foundations on native soil or engineered fill.
- Make no temporary cuts steeper than 1.5H:1V and no permanent cuts steeper than 2H:1V.
- Recommendations for structural fill, vegetation removal, drainage, and erosion control.

The site plan already exceeds the proposed 40-foot foredune/revetment setback. The addition will be constructed in an existing parking and lawn area, meaning that no slope issues can preclude or otherwise impact development. The addition is to be constructed on native soil similar to the original house, which will meet the recommendations of the Geologic Hazard Report. Therefore, the Director can find that all of the Geologic Hazard Report's recommendations can be implemented through construction, and therefore, find that this criterion is met.

(E) The geologic report provides a statement that, in the professional opinion of the engineering geologist, the proposed development will be within the acceptable level of risk established by the community, as defined in subsection (5)(c) of this section, considering site conditions and the recommended mitigation.

RESPONSE: This statement is set forth in Section 6 of the Geologic Hazard Report. This criterion is met.

- **"Section 3.570(5)(c)(A)-(E) *(A)(i), (iii) and (ix) are moderately addressed"**
- **"Section 3.570(5)(c)(B)-(E)"**

RESPONSE: The above sections describe the required contents and findings of a Geologic Hazard Report. **Exhibit 3**, the Applicant's new Geologic Hazard Report, is organized according to those code sections and includes all elements required under TCLUO section 3.570(5)(c).

- **"Starting on Page 91, a statement of the engineering geologist's professional opinion as to whether the proposed development will be within the acceptable level of risk established by the community, considering site conditions and the recommended mitigation is missing from the geologic hazard report as well as statements regarding the highlighted sections on Page 92."**

RESPONSE: This statement is included in Section 6 "Summary Findings and Conclusions" of the new Geologic Hazard Report (**Exhibit 3**).

- **"Additionally, Section 3.570(7) is not addressed in the report and the Certification of compliance outlined in Section 3.570(11)(a) is also missing from the application."**

RESPONSE: Subsection (7)(a)(A) allows an ocean setback to be specified in a required geologic report. The new Geologic Hazard Report at Section 5.2 concludes that a minimum setback of 40 feet from the existing riprap revetment should be required and observes that the addition is proposed to be at least 85 feet from the top of the revetment.

Section 3.570(11)(a) applies to plans submitted for building permit. The Applicant had submitted building permit plans, which were subsequently rejected for lack of approved Neskowin Hazard Area permit. The Applicant shall provide the required written statement confirming acceptance of those plans by the Applicant's new Engineering Geologist with the re-submittal of its building permit plans. For the reason, the Director can find that this requirement can be met.

To any extent that the requirement for an engineering review of building plans must be conducted as part of this land use permit application, the Director can and should defer

satisfaction of this requirement to building permit review. In this instance, the Applicant requests, pursuant to ORS 197.522(3), that the Director impose the following condition of approval:

> "The Applicant shall provide the certification of compliance required by TCLUO 3.570(11)(a) prior to issuance of a building permit application for the approved addition."

CONCLUSION

For the above reasons, the Director can find that the all requested materials have been submitted and that the Application meets all applicable criteria and standards, as proposed or with the condition of approval recommended above.

Please contact me if you have any questions.

Best regards,

Garrett H. Stephenson

GST:jmhi
Attachments

cc: Melissa Jenk (*via e-mail mjenck@co.tillamook.or.us)*
Michael Robinson (*via e-mail mrobinson@schwabe.com*)
Katie Erickson (*via e-mail highstylevacahomes@yahoo.com*)

PDX\137715\262088\GST\31484967.1

EXISTING CONDITIONS PLAN

THIS PLAN HAS BEEN PREPARED FOR ILLUSTRATIVE PURPOSES ONLY. SITE BACKGROUND INFORMATION AND FEATURES HAVE BEEN GENERATED FROM A COMBINATION OF TOPOGRAPHIC SURVEY INFORMATION, PUBLIC GIS DATA SOURCES, AERIAL PHOTOS, TAX ASSESSOR MAPS, AND PHYSICAL SITE OBSERVATIONS. PROPOSED SITE FEATURES ARE PRELIMINARY IN NATURE AND SUBJECT TO CHANGE. NO WARRANTY OR GUARANTEE IS EXPRESSED OR IMPLIED.

FLOOD HAZARD NOTE

THE SITE IS LOCATED WITHIN ZONE X (UN-SHADED) PER FLOOD INSURANCE RATE MAP (FIRM) COMMUNITY-PANEL NUMBER 41057C1[illegible]F.

FEMA'S DEFINITION OF ZONE X (UN-SHADED) IS AN AREA OF MINIMAL FLOOD HAZARD, USUALLY DEPICTED ON FIRMS AS ABOVE THE 500-YEAR FLOOD LEVEL. ZONE X IS THE AREA DETERMINED TO BE OUTSIDE THE 500-YEAR FLOOD AND PROTECTED BY LEVEE FROM 100-YEAR FLOOD, IN COMMUNITIES THAT PARTICIPATE IN THE NFIP. FLOOD INSURANCE IS AVAILABLE TO ALL PROPERTY OWNERS AND RENTERS IN THESE ZONES.

BASIS OF BEARING

THE LINE BETWEEN FOUND MONUMENTS 202 AND 203 BEARS SOUTH 14°09'00" WEST, THE RECORD VALUE FROM MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.

MONUMENT / BOUNDARY NOTES

201 FOUND 5/8" REBAR WITH PLASTIC CAP STAMPED "LOOMIS PLS 1908" FLUSH IN GROUND, IN CALCULATED POSITION. SEE MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.

202 FOUND 1" IRON PIPE FLUSH IN GROUND, HELD FOR CONTROL AS PER MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.

203 FOUND 1" IRON PIPE 0.5' ABOVE GROUND, HELD FOR CONTROL AS PER MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.

204 FOUND 5/8" REBAR WITH PLASTIC CAP STAMPED "LOOMIS PLS 1908" 0.8' ABOVE GROUND, IN CALCULATED POSITION. SEE MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.

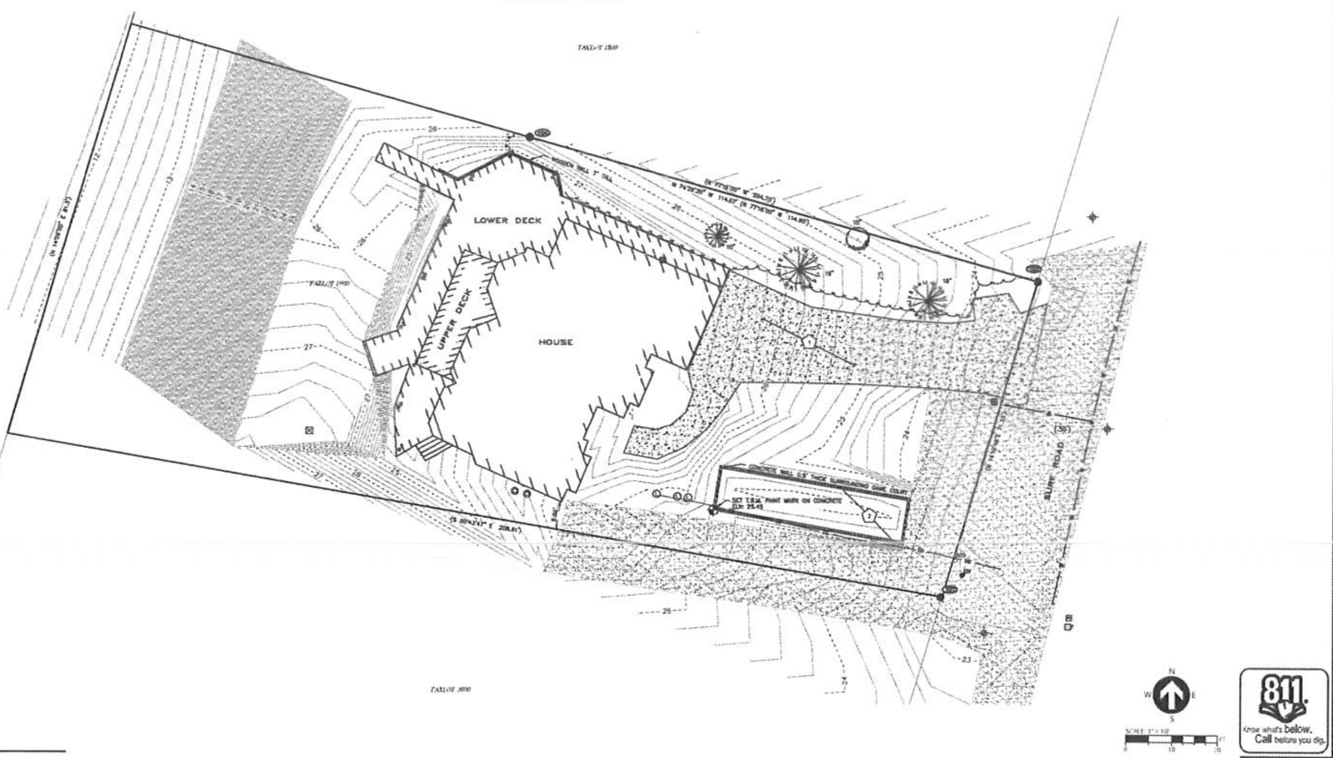
( )1 INDICATES RECORD VALUE FROM MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.
NO ( ) INDICATES MEASURED VALUE.

DEMOLITION KEY NOTES

1. REMOVE EXISTING GRAVEL DRIVEWAY TO EXTENTS OF PROPOSED SCOPE.
2. REMOVE EXISTING GAME COURT AND CONCRETE WALLS TO FULL EXTENT.

LEGEND

- PROJECT BOUNDARY
- EXISTING RIGHT OF WAY
- EXISTING EASEMENT
- EXISTING TOE OF RIP RAP
- EXISTING EDGE OF VEGETATION
- EXISTING BUILDING
- EXISTING DECK
- EXISTING CONCRETE
- EXISTING EDGE OF GRAVEL
- EXISTING SURVEY MONUMENT



Know what's below. Call before you dig.

PUBLISH DATE 07/21/2021
ISSUED FOR LAND USE
REVISIONS

EXISTING CONDITIONS & DEMOLITION PLAN
49670 SURF ROAD NESKOWIN, OREGON
TILLAMOOK COUNTY
NESKOWIN, OREGON

3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
COMMUNITY PLANNING

PROJECT INFORMATION

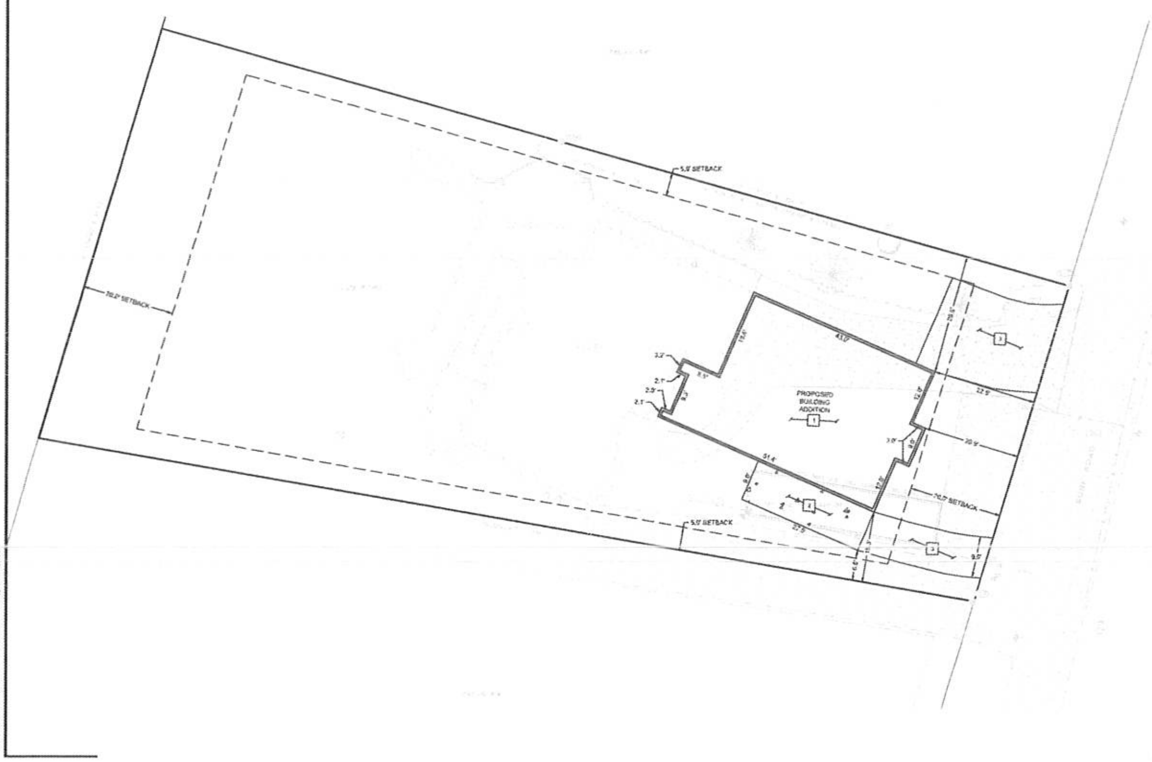
SHEET NUMBER
C100

CONSTRUCTION KEY NOTES

1. PROPOSED BUILDING ADDITION.
2. PROPOSED COVERED CONCRETE PAD.
3. PROPOSED DRIVEWAY.

LEGEND

- PROJECT BOUNDARY
- PROPOSED SETBACK LINE
- PROPOSED BUILDING
- PROJECT CONCRETE
- PROPOSED DRIVEWAY



PUBLISH DATE
07/21/2021
ISSUED FOR
LAND USE
REVISIONS

SITE PLAN
49670 SURF ROAD NESKOWIN, OREGON
TILLAMOOK COUNTY
NESKOWIN, OREGON

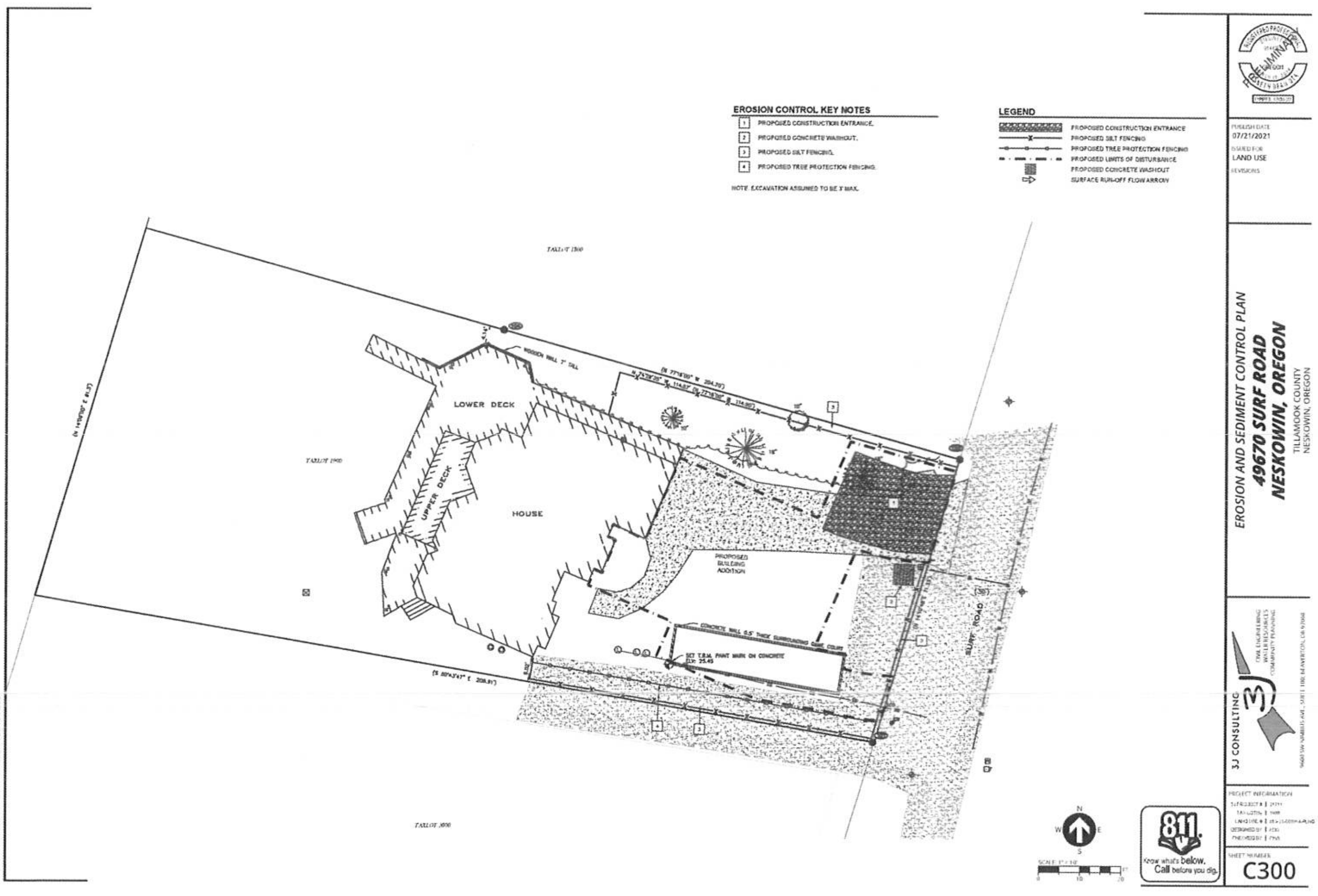
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
COMMUNITY PLANNING

PROJECT INFORMATION

Know what's below. Call before you dig.
811

SHEET NUMBER
C200

Exhibit 1
Page 2 of 3


EROSION CONTROL KEY NOTES
1 PROPOSED CONSTRUCTION ENTRANCE.
2 PROPOSED CONCRETE WASHOUT.
3 PROPOSED SILT FENCING.
4 PROPOSED TREE PROTECTION FENCING.
NOTE: EXCAVATION ASSUMED TO BE 3' MAX.
LEGEND
PROPOSED CONSTRUCTION ENTRANCE
PROPOSED SILT FENCING
PROPOSED TREE PROTECTION FENCING
PROPOSED LIMITS OF DISTURBANCE
PROPOSED CONCRETE WASHOUT
SURFACE RUN-OFF FLOW ARROW
LOWER DECK
UPPER DECK
HOUSE
PROPOSED BUILDING ADDITION
SURF ROAD
PRELIMINARY
PUBLISH DATE
07/21/2021
ISSUED FOR
LAND USE
REVISIONS
EROSION AND SEDIMENT CONTROL PLAN
49670 SURF ROAD
NESKOWIN, OREGON
TILLAMOOK COUNTY
NESKOWIN, OREGON
3J CONSULTING
CIVIL ENGINEERING
WATER RESOURCES
COMMUNITY PLANNING
PROJECT INFORMATION
SHEET NUMBER
C300
Know what's below. Call before you dig.
811

Stephenson, Garrett H.

From: Troy Farnsworth <troyfarnsworth1@gmail.com>
Sent: Tuesday, August 10, 2021 11:29 AM
To: Stephenson, Garrett H.
Subject: Re: FW: (Y214510 Erickson) Report

Garrett,
Based on my calculations, the area of the proposed addition affected by excavation equals approximately 1,927 square feet.
Considering the finish floor at the entry level the house is between 24"-30" above the adjacent exterior grade and the existing crawl space is approximately 42"-48" below the lowest structural member of the main floor one could use a conservative number of 2.5 (excavation depth) x 1,927 (total square footage of the area) = 4,817 divided by 27 (sq. yard) = 178.42 square yards of soil to be removed.

Does this help?

Thank you.
Sincerely,
Troy Farnsworth
Direct: (971) 219-1405
www.troyfarnsworth.com

On Mon, Aug 9, 2021 at 3:57 PM Stephenson, Garrett H. <GStephenson@schwabe.com> wrote:

Garrett H. Stephenson

Geologic Hazards and Geotechnical Investigation
Tax Lot 1900, Map 5S-11W-36BC
49670 Surf Road,
Neskowin, Tillamook County, Oregon

Prepared for:
Katie and Mike Erickson
P.O. Box 803
Lake Oswego, Oregon 97034

Project #Y214510

May 21, 2021

H.G. Schlicker & Associates, Inc.

H.G. Schlicker & Associates, Inc.
607 Main Street, Suite 200 · Oregon City, Oregon 97045
(503) 655-8113 · FAX (503) 655-8173

Project #Y214510

May 21, 2021

To: **Katie and Mike Erickson**
P.O. Box 803
Lake Oswego, Oregon 97034

Subject: **Geologic Hazards and Geotechnical Investigation**
Tax Lot 1900, Map 5S-11W-36BC
49670 Surf Road
Neskowin, Tillamook County, Oregon

Dear Katie and Mike Erickson:

The accompanying report presents the results of our geologic hazards and geotechnical investigation for the above subject site.

After you have reviewed our report, we would be pleased to discuss it and to answer any questions you might have.

This opportunity to be of service is sincerely appreciated. If we can be of any further assistance, please contact us.

H.G. SCHLICKER & ASSOCIATES, INC.

J. Douglas Gless, MSc, RG, CEG, LHG
President/Principal Engineering Geologist

JDG:mgb

TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

FIGURES

APPENDICES

H.G. Schlicker & Associates, Inc.
607 Main Street, Suite 200 · Oregon City, Oregon 97045
(503) 655-8113 · FAX (503) 655-8173

Project #Y214510

May 21, 2021

To: **Katie and Mike Erickson**
P.O. Box 803
Lake Oswego, Oregon 97034

Subject: **Geologic Hazards and Geotechnical Investigation**
Tax Lot 1900, Map 5S-11W-36BC
49670 Surf Road
Neskowin, Tillamook County, Oregon

Dear Katie and Mike Erickson:

1.0 Introduction

At your request and authorization, representatives of H.G. Schlicker and Associates, Inc. (HGSA) visited the subject site on April 19, 2021, to complete a geologic hazards and geotechnical investigation of Tax Lot 1900, Map 5S-11-36BC, located in Neskowin, Tillamook County, Oregon (Figures 1 and 2; Appendix A). It is our understanding that you would like to construct an addition on the eastern portion of the existing home.

This report addresses the engineering geology and geologic hazards at the site with respect to the proposed construction of an addition. The scope of our work consisted of a site visit, site observations and measurements, subsurface exploration with hand augered borings, a slope profile, limited review of the geologic literature, interpretation of topographic maps, lidar and aerial photography, and preparation of this report of our findings, conclusions and geotechnical recommendations for an addition to the east side of the existing house.

2.0 Site Description

The subject site is an oceanfront lot located on a younger stabilized dune in the community of Neskowin, Oregon (Figure 1). The property consists of Tax Lot 1900, Map 5S-11-36BC, 49670 Surf Road, a 0.38-acre lot with an existing two-story house. The lot is approximately 71 to 92 feet wide north to south and 204 to 206 feet deep east to west. An oceanfront protective structure (riprap revetment) is located on the dune slope on the western portion of the site; this revetment is contiguous with other revetments to the north and south (Figure 3; Appendix A).

The site is bounded to its north by a developed lot, to its south by an undeveloped lot, to its east by Surf Road, and to its west by the beach and the Pacific Ocean. Access to the site is via Surf Road to the east.

The site east of the riprap revetment gently slopes down to the east at approximately 2 to 5 degrees at elevations between approximately 26 to 28 feet (NAVD 88) (Figures 3 and 4). The riprap revetment slopes down to the beach at approximately 30 degrees.

At the time of our site visit, the site was vegetated with lawn grass, European beachgrass, ornamental plants, and young shore pine trees (Appendix A).

2.1 The history of the site and surrounding areas, such as previous riprap or dune grading permits, erosion events, exposed trees on the beach, or other relevant local knowledge of the site.

According to Tillamook County records, the existing two-story home at the site was built in 1991. The west side of the existing house is approximately 40 feet east of the top of the revetment. An approximately 2-foot diameter culvert daylights through the riprap revetment near the northwest corner of the site.

Based on our review of historical aerial imagery, prior to the residential development, the area of the site was occupied by a dune complex. Reportedly, the area of the site was subject to past grading and fill placement.

The site is located on loose dune sand that is easily eroded by ocean wave activity and wind when devoid of vegetation. During the winters of 1998, 1999, 2000, and 2001 severe storms resulted in substantial ocean wave erosion, which removed active dunes present west of the subject lot and eroded the western part of the dune on which the property lies. As reported by local residents, up to 10 feet of erosion has been observed during a single storm event. Ocean wave erosion has also resulted in the lowering of the beach elevation by several feet, allowing higher energy waves to impact the dune. The increase in ocean wave erosion observed along much of the Oregon Coast in the recent past is a consequence of the mid- to late 1990s El Niño/La Niña events, which altered ocean currents and transported much of the beach sand offshore. There has been some rebuilding of the beach in the last few years, but this has been a slow process. As a result, nearly all of Neskowin's oceanfront residences have had oceanfront protection installed. In the area of this site, the oceanfront has been protected with riprap revetments for hundreds of feet to the north and south.

Severe storms in the winter of 2007–2008 partly undermined many of the revetments in the Neskowin area. However, the riprap revetments significantly reduce the potential for erosion when maintained and repaired as necessary.

At the time of our site visit, numerous tree stumps were exposed on the beach (Appendix A). Locally referred to as the "Neskowin Ghost Forest," the tree stumps are the remnants of an approximately 2000-year-old Sitka Spruce forest (Hart and Peterson, 1997).

2.2 Topography, including elevations and slopes on the property itself.

The site is located on a younger stabilized dune that has been modified by past development and construction of a revetment. Elevations on the site range from approximately 6 to 28 feet (NAVD 88) along the western portion of the property to approximately 23 feet (NAVD 88) along the eastern portion of the property. The site slopes gently to the east at approximately 2 to 5 degrees (Figures 3 and 4; Appendix A).

The riprap revetment west of the site generally slopes down to the beach at approximately 30 degrees (Figures 3 and 4; Appendix A).

2.3 Vegetation cover.

At the time of our site visit, the site was vegetated with lawn grass, ornamental plants, European beachgrass, salal, ferns, and young shore pine trees (Appendix A).

2.4 Subsurface materials – the nature of the rocks and soils.

Subsurface exploration was completed by advancing four hand-augered borings to depths up to approximately 1.25 feet below the ground surface (bgs) in the area for the proposed addition. The borings generally encountered refusal on gravel fill. Subsurface materials are discussed in detail in Section 4.1.

2.5 Conditions of the seaward front of the property, particularly for sites having a sea cliff.

The seaward front of the property is located at the crest of a younger vegetated dune. The dune crest was densely vegetated with European beachgrass and beach pea, and the seaward slope is protected by a riprap revetment. The riprap revetment appeared to be in generally good condition. The quality of the single armor stone layer used for the construction of the revetment was variable and consisted of a mixture of highly fractured basalt breccia, occasional sandstone, and relatively unfractured basalt (Appendix A). Additional observations are addressed and illustrated in Section 3.0 and Appendix A.

2.6 Presence of drift logs or other flotsam on or within the property.

At the time of our site visit, we did not observe any drift logs or flotsam on or within the property or on the beach to the west of the property.

2.7 Description of streams or other drainage that might influence erosion or locally reduce the level of the beach.

Neskowin Creek discharges onto the beach approximately 1,700 feet north of the site (Figure 1). Historical satellite imagery from Google Earth indicates that although Neskowin Creek's stream channel meanders approximately 500 feet north and south on the beach, the stream generally enters the ocean near the east side of Proposal Rock and does not typically appear to influence the level of the beach fronting the site.

2.8 Proximity of nearby headlands that might block the long shore movement of beach sediments, thereby affecting the level of the beach in front of the property.

The site is located approximately 600 feet north of the Cascade Head headlands and approximately 8.4 miles south of Cape Kiwanda. Ocean current interaction with the northern extent of the Cascade Head headland generally removes sand along the beach fronting the site and reduces the level of the beach.

Proposal Rock is located approximately 1,500 feet north of the site and does not appear to affect the subject site substantially.

2.9 Description of any shore protection structures that may exist on the property or on nearby properties.

An existing riprap revetment is present on the western portion of the subject site and is connected to other oceanfront revetments, which extend for hundreds of feet to the north and south along Neskowin Beach.

2.10 Presence of pathways or stairs from the property to the beach.

An improved pathway or stairs is not present from the eastern portion of the site to the beach. However, the properties to the north and south have stairs integrated into their revetments.

2.11 Existing human impacts on the site, particularly any that might alter the resistance to wave attack.

Human impacts are not contributing to the alteration of the resistance of the riprap revetment to wave attack at this site.

3.0 Description of the Fronting Beach

Neskowin Beach fronts the site to the west. Detailed descriptions of the characteristics of the beach are provided below.

3.1 Average widths of the beach during the summer and winter.

The beach at the site has a highly variable width, which is primarily dependent upon tide levels, and it tends to be narrower in the winter than in the summer. Although the beach can be more than 300 feet wide, at high tide, there is often no walkable beach. The beach here is very dynamic and changes morphology frequently, primarily due to rip current formation.

3.2 Median grain size of beach sediment.

During our site visit, we observed fine-grained to medium-grained beach sand.

3.3 Average beach slopes during the summer and winter.

Beach slopes vary from approximately 2 to 5 degrees depending upon recent accretion or erosion. The beaches tend to be flatter in the summer.

3.4 Elevations above mean sea level of the beach at the seaward edge of the property during summer and winter.

Lidar data from 2016 shows the junction between the beach and the revetment was at an elevation of approximately 8 feet (NAVD 88) (Figures 3 and 4). Allan and Hart (2005) surveyed the elevation of the beach/dune junction in 1997, 1998, and 2002 at approximately 20 feet, 14 feet, and 16 feet, respectively. Winter elevations primarily depend on beach profiles formed by storm conditions.

3.5 Presence of rip currents and rip embayments that can locally reduce the elevation of the fronting beach.

Rip currents and rip current embayments commonly contribute to erosion along the oceanfront in Neskowin. Narrow beaches and near-shore relatively deep water conditions contribute to rip current and rip current embayment formation.

During our site visit, we did not observe any rip current embayments in the area of the site; however, rip currents and rip current embayments have developed immediately west of the site, as seen in historical satellite imagery.

3.6 Presence of rock outcrops and sea stacks, both offshore and within the beach zone.

Proposal Rock is located approximately 1,500 feet north of the site.

3.7 Information regarding the depth of beach sand down to bedrock at the seaward edge of the property.

Based on our experience with Neskowin sites in the vicinity, we estimate that bedrock lies more than 20 feet below the beach level.

4.0 Geologic Hazards Analysis

Our geologic hazards analysis is presented below.

4.1 Subsurface Materials

The site lies in an area that has been mapped as Pleistocene beach sand (Schlicker et al., 1972). Neskowin lies on a large dune complex, which is approximately 4 miles long, north to south, and extends from the coastline east to the base of the hills. This dune complex consists of numerous individual dunes, which vary in age and stability. The area of the site has been mapped as a younger stabilized dune (open dune sand conditionally stable), which is a dune that has become conditionally stable regarding wind erosion (USDA et al., 1975). The dune consists of tan, loose, fine-grained sand with a very thin, poorly developed topsoil. Based on our review of stereo pairs of aerial photographs, prior to 1953, active dunes had been present in the area of the site but have become increasingly vegetated as development in the area progressed. Schlicker et al. (1972) also mapped the area of the site as an area of high groundwater. Snavely et al. (1996) mapped the area of the site as Quaternary alluvial deposits with Quaternary beach sand west of the site.

At the time of our April 19, 2021 site visit, we completed subsurface exploration with four hand-augered borings logged by a geologist from our office who visually classified the soils encountered according to the Unified Soil Classification System (USCS) as follows:

B-1	Depth (ft.)	USCS	Description
	0 – 0.33	ML (FILL)	Sandy SILT FILL; brown, dry, loose.
	0.33 – 0.75	SP (FILL)	Silty SAND FILL; light brown, dry, loose.
	0.75 – 1.25	GP (FILL)	GRAVEL FILL; dark grey, dry, dense, compacted basalt fragments up to 2" diameter. Refusal on rock fragments at approximately 1.25 feet. Free groundwater was not encountered.

B-2	Depth (ft.)	USCS	Description
	0 – 0.33	ML (FILL)	Sandy SILT FILL; brown, dry, loose.
	0.33 – 1.0	SP (FILL)	Silty SAND FILL; light brown, dry, loose. Refusal on rock fragments at approximately 1.0 feet. Free groundwater was not encountered.

B-3	Depth (ft.)	USCS	Description
	0 – 0.33	ML (FILL)	Sandy SILT FILL; brown, dry, loose.
	0.33 – 1.0	SP (FILL)	Silty SAND FILL; light brown, dry, loose.
	1.0 – 1.33	GP (FILL)	GRAVEL FILL; dark grey, dry, dense, compacted basalt fragments up to 4" diameter. Refusal on rock fragments at approximately 1.25 feet. Free groundwater was not encountered.

B-4	Depth (ft.)	USCS	Description
	0 – 0.25	PT (FILL)	Bark Chips (Landscaping)
	0.33 – 1.0	SP (FILL)	Silty SAND FILL; light brown, dry, loose. Refusal on rock fragments at approximately 1.0 feet. Free groundwater was not encountered.

The borings generally encountered approximately 1 foot of tan, loose, fill dune sand before meeting refusal in gravel fill. During our site visit, we observed excavations in the crawlspace that exposed 4 to 5 feet of dry, loose, dune sand below the existing grade.

4.2 Structure

Structural deformation and faulting along the Oregon Coast is dominated by the Cascadia Subduction Zone (CSZ), which is a convergent plate boundary extending for approximately 680 miles from northern Vancouver Island to northern California. This convergent plate boundary is defined by the subduction of the Juan de Fuca plate beneath the North America Plate and forms an offshore north-south trench approximately 60 miles west of the Oregon coast shoreline. A resulting deformation front consisting of north-south oriented reverse faults is present along the western edge of an accretionary wedge east of the trench, and a zone of margin-oblique folding and faulting extends from the trench to the Oregon Coast (Geomatrix, 1995).

A northwest-trending strike-slip fault is mapped near the site, extending from Proposal Rock to the southeast approximately 4 miles (Snavely et al., 1996). Based on mapping, the fault appears to offset middle Tertiary geologic units.

An unnamed offshore fault is mapped approximately 10 miles west of the site (Personius et al., 2003). The fault is part of a mapped group of left- and right-lateral strike-slip, normal, and reverse faults which offset accretionary wedge sediments underlying the continental shelf and slope in the forearc of the Cascadia Subduction Zone; some of the faults in this group also offset the overlying sedimentary section and underlying oceanic basalts of the subducting Juan de Fuca Plate (Personius et al., 2003). Most of the offshore faults in this group have strikes oblique to the Cascadia deformation front, suggesting a strong lateral component of slip. No detailed information on the ages of faulted deposits has been published, but similar offshore structures offset late Pleistocene and Holocene sediments (Personius et al., 2003). An offshore thrust fault is also mapped approximately 3 miles west of the site (Personius et al., 2003).

The nearest mapped potentially active faults are located in the Tillamook Bay fault zone approximately 30 miles north of the site, which are northwest-striking faults that offset the Eocene Tillamook Volcanics on the west flank of the Coast Range. No displacements in Quaternary deposits have been documented, but the fault zone parallels the mountain front that controls the northeastern margin of Tillamook Bay and thus has geomorphic expression consistent with Quaternary displacement (Personius et al., 2003).

4.3 Slopes

Slopes are discussed in detail in Section 2.2 above.

4.4 Orientation of Bedding Planes in Relation to the Dip of the Surface Slope

The site lies in an area mapped as dune sands and Quaternary alluvium, which have beds of varying dip related to the surface slope. The underlying Basalt of Cascade Head has been mapped as dipping down to the north-northwest from 30 to 45 degrees (Snavely et al., 1996). Grades at the subject site are primarily related to past grading and fill activities rather than the orientation of underlying units.

4.5 Site Surface Water Drainage Patterns

Stormwater at the site generally infiltrates into the sandy soils and flows to the west. At the time of our site visit, we observed no streams at or in the immediate vicinity of the site. The nearest stream is a small tributary of Neskowin Creek, located approximately 700 feet east of the site. Neskowin creek discharges onto the beach approximately 1,700 feet north of the site (Figure 1).

4.6 Dune Stability and Erosion

The site is located in an area of loose dune sand, which is easily eroded by ocean wave activity, and wind when devoid of vegetation. During the winters of 1998, 1999, 2000, and 2001 severe storms resulted in substantial ocean wave erosion, which removed active dunes present west of the subject lot and eroded the western part of the dune on which the

property lies. As reported by local residents, up to 10 feet of erosion has been observed during a single storm event. Ocean wave erosion has also resulted in the lowering of the beach elevation by several feet, allowing higher energy waves to impact the western dune edge. The increase in ocean wave erosion observed along much of the Oregon Coast in the recent past is a consequence of the mid- to late 1990s El Niño/La Niña events, which altered ocean currents and transported much of the beach sand offshore. There has been some rebuilding of the beach in the last few years, but this has been a slow process. As a result, nearly all of Neskowin's oceanfront residences have had oceanfront protection installed. In the area of this site, the oceanfront has been protected with riprap revetments for hundreds of feet to the north and south.

The existing revetment located on the western portion of the subject site slopes down to the beach at approximately 30 degrees and consists of angular basalt boulders approximately 4 to 6 feet diameter on its lower portion and approximately 3 to 5 feet diameter on the upper portion (Figure 3; Appendix A). Severe storms in the winter of 2007–2008 partly undermined the revetments in areas located along Neskowin Beach. The riprap revetment greatly reduces the potential for erosion when maintained and repaired as necessary.

The eastern portion of the subject site, including the existing house and area of the proposed addition, is mapped in a zone of high coastal erosion hazard, with the beach and revetment area on the western portion of the site mapped in the very high (active) coastal erosion hazard zone (Allan and Priest, 2001). The very high (active) coastal erosion hazard zone is defined as an area that is being actively eroded by ocean waves and the mass movements directly caused by wave action. The high coastal erosion hazard zone is defined as an area having a high probability that it could be affected by active erosion in the next ~ 60 to 100 years (Allan and Priest, 2001). It should be noted that mapping done for the 2001 study was intended for regional planning use, not for site-specific hazard identification.

The site is also mapped in an area of low to high landslide hazard susceptibility based on the DOGAMI methodology (Burns, Mickelson, and Madin, 2016). Based on our field observations, the risk of landsliding at the site is low under static conditions.

4.7 Regional Seismic Hazards

Abundant evidence indicates that a series of geologically recent large earthquakes related to the Cascadia Subduction Zone have occurred along the coastline of the Pacific Northwest. Evidence suggests that more than 40 great earthquakes of magnitude 8 and larger have struck western Oregon during the last 10,000 years. The calculated odds that a Cascadia earthquake will occur in the next 50 years range from 7–15 percent for a great earthquake affecting the entire Pacific Northwest, to about a 37 percent chance that the southern end of the Cascadia Subduction Zone will produce a major earthquake in the

next 50 years (OSSPAC, 2013; OSU News and Research Communications, 2010; Goldfinger et al., 2012). Evidence suggests the last major earthquake occurred on January 26, 1700, and may have been of magnitude 8.9 to 9.0 (Clague et al., 2000).

There is now increasing recognition that great earthquakes do not necessarily result in a complete rupture along the full 1,200 km fault length of the Cascadia subduction zone. Evidence in the paleorecords indicates that partial ruptures of the plate boundary have occurred due to smaller earthquakes with moment magnitudes (Mw) < 9 (Witter et al., 2003; Kelsey et al., 2005). These partial segment ruptures appear to occur more frequently on the southern Oregon coast, as determined from paleotsunami studies. Furthermore, the records have documented that local tsunamis from Cascadia earthquakes recur in clusters (~250–400 years) followed by gaps of 700–1,300 years, with the higher tsunamis associated with earthquakes occurring at the beginning and end of a cluster (Allan et al., 2015).

These major earthquake events were accompanied by widespread subsidence of a few centimeters to 1–2 meters (Leonard et al., 2004). Tsunamis appear to have been associated with many of these earthquakes. In addition, settlement, liquefaction, and landsliding of some earth materials are believed to have been commonly associated with these seismic events.

Other earthquakes related to shallow crustal movements or earthquakes related to the Juan de Fuca plate have the potential to generate magnitude 6.0 to 7.5 earthquakes. The recurrence interval for these types of earthquakes is difficult to determine from present data, but estimates of 100 to 200 years have been given in the literature (Rogers et al., 1996).

Liquefaction and Settlement

Liquefaction occurs when saturated, cohesionless soils are subjected to ground vibrations, resulting in a decrease in the volume of the soil. If drainage is unable to occur, the tendency to decrease in volume results in an increase in pore water pressure, and if the pore water pressure builds up to the point at which it is equal to the overburden pressure, the effective stress becomes zero, and the soil loses its strength and develops a liquefied state. Liquefaction is most common in saturated, loose, granular soils, sand or silty sand materials. Cohesive soils, such as clayey silt and clay, will generally not liquefy during earthquakes. Older sediments are also more resistant to liquefaction than recently deposited sediments (Idris and Boulanger, 2008).

DOGAMI's HazVu website (https://gis.dogami.oregon.gov/maps/hazvu/) has mapped the area of the site as having a moderate susceptibility to liquefaction. DOGAMI states: "Buildings and infrastructure sitting on these [liquefiable] soils are likely to be severely damaged in an earthquake."

Settlement can be the result of liquefaction of saturated soils or simply a result of dry soil densifying under vibration (volumetric compression). Volumetric compression during an earthquake results from vibrations of the soil, which causes soil particles to settle into a denser state, decreasing the volume of the soil. The degree of settlement is primarily dependent upon the initial density of the soil and the magnitude and duration of ground vibration (shaking). The settlement caused by liquefaction is commonly differential, and the magnitude of settlement typically varies throughout a site, whereas settlement caused by volumetric compression tends to be more uniform.

4.8 Flooding Hazards

Based on the 2018 Flood Insurance Rate Map (FIRM, Panel #41057C1005F), the site east of the riprap revetment lies in an area rated as Zone X, which is defined as an area of minimal flood hazard. The riprap revetment and beach west of the site lies in an area rated as Zone VE (EL 27.3 Feet), which is defined as a coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

Although the area east of the site lies in an area rated Zone X, the top of the riprap revetment and eastern portion of the site lies at elevations of approximately 25 to 28 feet. The revetment may be subject to wave overtopping during severe storm events.

Based on the Oregon Department of Geology and Mineral Industries mapping (DOGAMI, 2012), the subject site lies within the tsunami inundation zone resulting from an approximately 8.7 and greater magnitude Cascadia Subduction Zone (CSZ) earthquake. The 2012 DOGAMI mapping is based upon five computer-modeled scenarios for shoreline tsunami inundation caused by potential CSZ earthquake events ranging in magnitude from approximately 8.7 to 9.1. The January 1700 earthquake event (discussed in Section 4.7 above) has been rated as an approximate 8.9 magnitude in DOGAMI's methodology. More distant earthquake source zones can also generate tsunamis.

4.9 Climate Change

According to most recent scientific studies, the Earth's climate is changing due to human activities, which are altering the chemical composition of the atmosphere through the buildup of greenhouse gases, primarily carbon dioxide, methane, nitrous oxide, and chlorofluorocarbons (EPA, 1998). Although there are uncertainties about exactly how the Earth's climate will respond to enhanced concentrations of greenhouse gases, scientific observations indicate that detectable changes are underway (EPA, 1998; Church and White, 2006). Global sea level rise, caused by melting polar ice caps and ocean thermal expansion, could lead to flooding of low-lying coastal property, loss of coastal wetlands, erosion of beaches and bluffs, and saltwater contamination of drinking water. Global climate change and the resultant sea level rise will likely impact the subject site through accelerated coastal erosion and more frequent and severe flooding. It

can also lead to increased rainfall, which can result in an increase in landslide occurrence in the area.

4.10 Analyses of Erosion and Flooding Potential

4.10.1 Analysis of DOGAMI beach monitoring data available for the site (if available).

DOGAMI beach monitoring data has been collected for Neskowin beach, approximately 3000 feet north of the site, regularly since 1997. Following the winter storms of 1998-99 and construction of the revetments along the beach, beach elevations have varied by several feet from minimum to maximum over the monitored period of 1997 to 2021; however, the riprap revetments have prevented any shoreline change at the 6 meter (~20 ft) elevation contour (Allan and Hart, 2005; Allan and Hart, 2007; Allan and Hart, 2008; Allan et al., 2015; NANOOS, accessed May 2021).

4.10.2 Analysis of human activities affecting shoreline erosion.

We did not observe any human activities along the dune that are affecting the shoreline erosion. See Section 2.11 above.

4.10.3 Analysis of possible mass wasting, including weathering processes, landsliding, or slumping.

The erosive processes affecting the site are discussed in detail in Section 4.6 (above).

4.10.4 Calculation of wave run-up beyond mean water elevation that might result in erosion of the sea cliff or foredune.

Coastal erosion rates and hazard zones (as referenced in Allan and Priest, 2001) were presented in Section 4.6 Dune Stability and Erosion (above). In the dune-backed shoreline recession methodology applicable to the subject site, the total water level produced by the combined effect of wave runup plus the tidal elevation must exceed some critical elevation of the fronting beach, typically the elevation of the beach-dune junction. Wave runup elevation can change with many variables such as changing beach elevations, presence of transient dunes, etc. The dune is protected by the riprap revetment at the subject site, and this shoreline recession methodology is not appropriate for the site.

4.10.5 Evaluation of frequency that erosion-inducing processes could occur, considering the most extreme potential conditions of unusually high-water levels together with severe storm wave energy.

On this stretch of dune-backed shoreline, erosion-inducing processes are daily in the form of constant wave attack. High water levels and severe storms can cause rip currents, which have the potential to undermine the revetment at the site.

4.10.6 For dune-backed shoreline, use an established geometric model to assess the potential distance of property erosion, and compare the results with direct evidence obtained during site visit, aerial photo analysis, or analysis of DOGAMI beach monitoring data.

Not applicable to the subject site or nearby area, which is a dune-backed shoreline that has been extensively riprapped; see Sections 4.10.1 and 4.10.4 (above).

4.10.7 For bluff-backed shoreline, use a combination of published reports, such as DOGAMI bluff and dune hazard risk zone studies, aerial photo analysis, and fieldwork, to assess the potential distance of property erosion.

Not applicable to the subject site, which lies in a riprap revetment protected dune-backed shoreline area.

4.10.8 Description of potential for sea level rise, estimated for local area by combining local tectonic subsidence or uplift with global rates of predicted sea level rise.

Based on data from NOAA monitoring stations at South Beach and Garibaldi collected from 1970 to 2020, this general area of Oregon's coastline has a sea level rise of approximately 2.13 mm/year, which includes the combined effects of global rates of sea level rise and landmass elevation changes (NOAA Tides & Currents Sea Level Trends http://tidesandcurrents.noaa.gov/sltrends/). Additional observations are addressed in Section 4.9 of this report.

4.11 Assessment of Potential Reactions to Erosion episodes.

4.11.1 Determination of legal restrictions of shoreline protective structures (Goal 18 prohibition, local conditional use requirements, priority for non-structural erosion control methods).

As previously noted, riprap revetments are present at the western portion of the subject site and for hundreds of feet to the north and south in this oceanfront area of

Neskowin. Lots were generally 'developed' on January 1, 1977; however, this is a legal issue that can have varying interpretations. Most lots in this area, including the subject site, generally meet Oregon's Goal 18 exception requirements to obtain protection when a structure is threatened by erosion.

According to the Ocean Shores Viewer (http://www.coastalatlas.net/oceanshores/, Accessed May 2021), the subject site appears to be Goal 18 eligible due to an exception for an oceanfront protective structure.

4.11.2 Assessment of potential reactions to erosion events, addressing the need for future erosion control measures, building relocation, or building foundation and utility repairs.

Residential development recommendations for the proposed addition, including erosion control and foundation design recommendations, are presented in Section 5. The potential to move the house and the proposed attached addition will be dependent upon design.

5.0 Development Standards and Recommendations

The main engineering geologic concerns at the site are:

1. Undocumented fill several feet thick, or more, is present throughout the site.

2. The site lies in an area mapped as dune sands, which are poorly consolidated and subject to settlement and liquefaction, and ongoing coastal erosion if the revetment is damaged. Inherent risks of seismic hazards, coastal erosion, and future sand movement, including accretion at this site, must be accepted by the owner, future owners, developers, and residents.

3. There is an inherent regional risk of earthquakes along the Oregon Coast, which could cause harm and damage structures. Ground shaking during an earthquake can cause soil consolidation resulting in settlement of the structures, and can cause soils to liquefy, resulting in the loss of bearing capacity and structural damage. The site also lies in a mapped tsunami hazard zone. A tsunami impacting the Neskowin area could cause harm, loss of life, and damage to structures. The hazards associated with tsunami flooding resulting from a significant seismic event cannot be economically mitigated. These risks must be accepted by the owner, future owners, developers, and residents of the site.

Recommendations

During construction, disturbed, dry sands may be blown by winds, resulting in the transport and deposition of sands off-site. Therefore, periodic watering or covering of exposed areas may be required to control blowing sands during windy conditions. Vegetation should be removed only as necessary, and exposed areas should be replanted following construction.

Provided the recommendations presented in this report are incorporated into the design and construction, we believe that the proposed structure will be reasonably protected from the described hazards for the life of the structure except for catastrophic hazards presented by large earthquakes and associated tsunamis.

5.1 Development Density

It is our understanding that an addition to the east side of the existing house is proposed.

5.2 Setback

Based on our site observations, with proper maintenance, the existing riprap revetment will prevent significant dune erosion at the site. However, during severe storm events, the revetment may be overtopped by severe wave swash. We recommend all foundation elements for the new addition be setback a minimum of 40 feet from the top of the revetment. It is our understanding that the addition is proposed to be approximately 85 feet from the top of the revetment, well east of this minimum setback.

5.3 Grading Practices

We recommend the following grading practices:

5.3.1 Site Preparation

All existing loose disturbed soil, fills, and debris should be stripped and removed from building, slab, and driveway areas prior to construction so that new foundations and structural fill materials can rest on dense native sand soils, recompacted fill sands, or imported granular fills. Fills need to be properly moisture conditioned when compacting.

Stripping depths may vary depending on the variable thickness of fill and loose disturbed soil at the site.

5.3.2 Cut and Fill Slopes

Temporary unsupported cut and fill slopes less than 9 feet high should be no steeper than 1.5 horizontal to 1 vertical (1.5H:1V). If temporary slopes greater than 9 feet

high are desired, or if water seepage is encountered in cuts, our firm shall be contacted to provide additional recommendations. Temporary cuts in excess of 4 feet high and steeper than 1.5H:1V will likely require appropriate shoring to provide worker safety. Temporary cuts shall be protected from inclement weather by the use of plastic sheeting to help prevent erosion and/or failure.

Permanent unsupported cut and fill slopes shall be constructed no steeper than 2 horizontal to 1 vertical (2H:1V). Cut slopes steeper than 2H:1V shall be retained with an engineered retaining wall. Fill slopes steeper than 2H:1V shall be retained or be mechanically reinforced using geogrids, or other suitable products as approved by HGSA. Areas that slope steeper than 5H:1V and are to receive fill shall be benched. Benches shall be cut into native, non-organic, dense soil. The lowest bench shall be keyed a minimum of 2 feet into native, firm soil and be a minimum of 6 feet wide.

TEMPORARY AND PERMANENT CUTS	
Temporary Cuts	1.5H:1V (maximum) [a]
Permanent Cuts	2H:1V (maximum) [a]
[a] All cuts greater than 9 feet high, or cuts where water seepage is encountered, should be approved by a representative of H.G. Schlicker & Associates, Inc.	

If the cut and fill slope recommendations provided herein cannot be achieved due to construction and/or property line constraints, temporary or permanent retention of cut slopes may be required, as determined by a representative of our firm.

5.3.3 Structural Fill

Structural fills supporting building loads should consist of granular material, free of organics and deleterious materials, and contain no particles greater than 1½ inches in diameter so that nuclear methods (ASTM D2922 &ASTM D3017) can be easily used for field density testing. All areas to receive fill should be stripped of all loose soils, organic soils, organic debris, existing fill, disturbed soils, and construction debris.

Proper test frequency and earthwork documentation usually require daily observation during stripping, rough grading, and placement of structural fill. Field density testing should generally conform to ASTM D2922 and D3017, or D1556. To minimize the number of field and laboratory tests, fill materials should be from a single source and of a consistent character. Structural fill should be approved and periodically observed by HGSA and tested by a qualified testing firm. Test results

will need to be reviewed and approved by HGSA. We recommend that one density test be performed for at least every 18 inches of fill placed and every 200 cubic yards, whichever requires more testing. Because testing is performed on an on-call basis, we recommend that the earthwork contractor schedule the testing. Relatively more testing is typically necessary on smaller projects.

STRUCTURAL FILL	
Compaction Requirements	95% ASTM D1557, compacted in 8-inch lifts maximum, at or near the optimum moisture content.
Benching Requirements [a]	Slopes steeper than 5H:1V that are to receive fill should be benched. Fills should not be placed along slopes steeper than 3H:1V, unless approved by H.G. Schlicker & Associates, Inc.
[a] Benches should be cut into native, non-organic, firm soils. Benches should be a minimum of 6 feet wide with side cuts no steeper than 1H:1V and no higher than 6 feet. The lowest bench should be keyed in a minimum of 2 feet into native, non-organic, firm soils.	

5.4 Vegetation Removal and Re-Vegetation Practices

Vegetation should be removed only as necessary, and exposed areas should be replanted following construction. Disturbed ground surfaces exposed during the wet season (November 1 through April 30) should be temporarily planted with grasses or protected with erosion control blankets or hydromulch. Existing vegetation should be left undisturbed as much as possible.

Temporary sediment fences should be installed downslope of any disturbed areas of the site until permanent vegetation cover can be established (Figure 5).

Exposed sloping areas steeper than 3 horizontal to 1 vertical (3H:1V) should be mulched, seeded, and fertilized to provide erosion protection until permanent vegetation can be established. Erosion control blankets should be installed as per the manufacturer's recommendations.

5.5 Foundation Recommendations

Building loads may be supported on individual and/or continuous spread footings bearing on undisturbed, native, non-organic, firm soils or properly designed and compacted structural fill placed on these soils. All footing areas should be stripped of all organic and loose soils, organic debris, and any existing fills. We anticipate that non-organic, native sandy soils underlying unsuitable fill will be encountered throughout the excavation.

The thickness of fill soils at the site is variable, and the depth to suitable non-organic, native sandy soils is unknown will likely require over-excavation. We recommend that foundation areas be overexcavated and replaced with free draining, ¾ inch minus crushed rock compacted in 8-inch lifts to a minimum density of 95 percent of the Modified Proctor maximum dry density (ASTM D1557), with the exception of the first lift, which can be 12 inches thick and consist of clean, free-draining, pit-run rock compacted to a dense state. Crushed rock fills underlying footings should extend to depths of 2 times the footing width below the footings or a minimum of 4 feet, whichever is greater, and have a width of 2 times the footing width (Figure 5).

Although not required, we recommend mitigation of possible liquefaction hazards during a major earthquake by tying the foundation together and reinforcing foundation elements as per OSSC 2019 1809.13 Footing Seismic Ties.

Footings bearing in undisturbed, native, non-organic, firm soils or properly compacted structural fill placed on these soils may be designed for the following:

ALLOWABLE SOIL BEARING CAPACITIES	
Allowable Dead Plus Live Load Bearing Capacity [a]	1,500 psf
Passive Resistance	150 psf/ft embedment depth
Lateral Sliding Coefficient	0.35
[a] Allowable bearing capacity may be increased by one-third for short term wind or seismic loads.	

We recommend that the house be constructed with an elevated floor and crawlspace design. Recommended foundation footing widths and embedment depths are as follows:

MINIMUM FOOTING WIDTHS & EMBEDMENT DEPTHS			
Number of Stories	One	Two	Three
Minimum Footing Width	15 inches	18 inches	20 inches
Minimum Exterior Footing Embedment Depth	18 inches	18 inches	18 inches
Minimum Interior Footing Embedment Depth [a]	6 inches	6 inches	6 inches
[a] Interior footings should be embedded a minimum of 6 inches below the lowest adjacent finished grade, or as otherwise recommended by our firm. In general, interior footings placed on sloping or benched ground should be embedded or set back in such a manner as to provide a minimum horizontal distance between the foundation component and face of the slope of one foot per every foot of elevation change.			

5.6 Retaining Wall Recommendations

For static conditions, freestanding retaining walls should be designed for a lateral active earth pressure expressed as an equivalent fluid weight (EFW) of 35 pounds per cubic foot, assuming level backfill behind the wall equal to a distance of at least half the height of the wall. An EFW of 45 pounds per cubic foot should be used, assuming sloping backfill of 2H:1V. At-rest retaining walls should be designed for a lateral at-rest pressure expressed as an EFW of 60 pounds per cubic foot, assuming level backfill behind the wall equal to a distance of at least half of the height of the wall. Walls need to be fully drained to prevent the build-up of hydrostatic pressures.

The EFWs provided herein assume static conditions and no surcharge loads from vehicles or structures. If surcharge loads will be applied to the retaining walls, forces on the walls resulting from these loads will need to be added to the pressures provided herein.

For seismic loading, a unit pseudostatic force equal to 13.5 pcf $(H)^2$, where H is the height of the wall in feet, should be added to the static lateral earth pressure. The location of the pseudostatic force can be assumed to act at a distance of 0.6H above the base of the wall.

RETAINING WALL EARTH PRESSURE PARAMETERS	
Static Case, Active Wall (level backfill/grades)	35 psf/linear foot [a]
Static Case, Active Wall (2H:1V backfill/grades)	45 psf/linear foot [a]
Static Case, At-Rest Wall (level backfill/grades)	60 psf/linear foot [a]
Seismic Loading (level backfill/grades)	13.5 pcf $(H)^2$ [b]

[a] Earth pressure expressed as an equivalent fluid weight (EFW). The location of the earth pressure can be assumed to act at a distance of 0.33H above the base of the wall.

[b] Seismic loading expressed as a pseudostatic force, where H is the height of the wall in feet. The location of the pseudostatic force can be assumed to act at a distance of 0.6H above the base of the wall.

Backfill for walls should be placed in 8-inch horizontal lifts and machine compacted to 92 percent of the maximum dry density as determined by ASTM D1557. Compaction within 2 feet of the wall should be accomplished with lightweight hand-operated compaction equipment to avoid applying additional lateral pressure on the walls. Drainage of the retaining wall should consist of slotted drains placed at the base of the wall on the backfilled side and backfilled with free-draining crushed rock (less than 5% passing the 200 mesh sieve using a washed sieve method) protected by non-woven filter fabric (Mirafi 140N or equivalent) placed between the native soil and the backfill.

Filter fabric protected free-draining crushed rock should extend to within 2 feet of the ground surface behind the wall, and the filter fabric should be overlapped at the top per the manufacturer's recommendations. All walls should be fully drained to prevent the build-up of hydrostatic pressures. All retaining walls should have a minimum of 2 feet of embedment at the toe or be designed without passive resistance.

5.7 Drainage and Storm Water Management

Surface water should be diverted from building foundations and walls to approved disposal points by grading the ground surface to slope away a minimum of 2 percent for at least 6 feet towards a suitable gravity outlet to prevent ponding near the structures. Permanent subsurface drainage of the building perimeter using footing drains is recommended.

Footing drains should be installed adjacent to the perimeter footings and sloped a minimum of 2 percent to a gravity outlet. A suitable perimeter footing drain system would consist of a 4-inch diameter, perforated PVC pipe (typical) embedded adjacent to the bottom of footings, and backfilled with approved drain rock. The type of pipe to be utilized may depend on building agency requirements and should be verified prior to construction. HGSA also recommends lining the drainage trench excavation with a non-woven geotextile filter such as Mirafi® 140N or equivalent to increase the life of the footing drain and prevent the drain from being clogged by soil. The perimeter drain excavation should be constructed in a manner that prevents undermining of foundation or slab components or any disturbance to supporting soils.

In addition to the perimeter foundation drain system, drainage of any crawlspace areas is required. Each crawlspace should be graded to a low point for installation of a crawlspace drain that is tied into the perimeter footing drain and tightlined to an approved disposal point.

All roof drains should be collected and tightlined in a separate system independent of the footing drains, or an approved backflow prevention device shall be used. All roof and footing drains should be discharged to an approved disposal point. If water will be discharged to the ground surface, we recommend that energy dissipaters, such as splash blocks or a rock apron, be utilized at all pipe outfall locations. Water collected on the site should not be concentrated and discharged to adjacent properties. We recommend that all collected water be tightlined and discharged to the local stormwater system, splash blocks, or the riprap revetment.

5.8 Erosion Control

As detailed above (Section 5.4), vegetation should be removed only as necessary, and exposed areas should be replanted following construction. Disturbed ground surfaces

exposed during the wet season (November 1 through April 30) should be temporarily planted with grasses or protected with erosion control blankets.

A temporary sediment fence should be installed downslope of any disturbed areas of the site until permanent vegetation cover can be established (Figure 6).

As recommended above, exposed sloping areas steeper than 3 horizontal to 1 vertical (3H:1V) should be protected by hydroseeding or the use of rolled erosion control products (RECP's), aka "erosion control blankets," to provide erosion protection until permanent vegetation can be established. Erosion control blankets should be installed as per the manufacturer's recommendations.

Periodic watering of exposed areas may be required during construction to control blowing sands during windy conditions and prevent transport and deposition of disturbed or dry sands off-site.

The riprap revetment should be maintained and repaired as necessary to ensure its continued performance in reducing the potential for erosion at the site.

5.9 Flooding Considerations

Provided that all drainage recommendations detailed in this report are adhered to during design and construction, we do not anticipate localized flooding hazards at the site.

5.10 Seismic Considerations

The structure and all structural elements should be designed to meet current Oregon Residential Specialty Code (ORSC) seismic requirements. Based on our knowledge of subsurface conditions at the site and our analysis using the guidelines recommended in the ORSC, the structure should be designed to meet the following seismic parameters:

SEISMIC DESIGN PARAMETERS	
Site Class	D
Seismic Design Category	D_2
Mapped Spectral Response Acceleration for Short Periods	S_S = 1.298 g
Site Coefficients	F_a = 1.200 F_v = 1.700
Design Spectral Response Acceleration at Short Periods	S_{DS} = 1.038 g

5.11 Plan Review and Construction Observations

Prior to construction, we should be provided the opportunity to review all site development, foundation, drainage, erosion control, and grading plans to assure conformance with the intent of our recommendations (Appendix B). All site plans, details, and specifications should clearly show that the above recommendations have been implemented into the design.

A representative of HGSA should observe all footing and slab excavations prior to placing structural fill, and/or forming and pouring concrete to assure that suitable bearing materials have been reached (Appendix B). Please provide us with at least 5 (five) days' notice prior to any needed site observations. There will be additional costs for these services.

5.12 Worker Safety

All construction activities should be completed in accordance with OSHA standards and all State and local laws, rules, regulations, and codes.

6.0 Summary Findings and Conclusions

HGSA certifies that all applicable content requirements of Tillamook County Land Use Ordinance Section 3.570(5) have been addressed above, and it is the undersigned engineering geologist's professional opinion that the proposed development will be within the acceptable level of risk established by the community, considering the site conditions and the above recommendations.

Our summary findings and conclusions are presented below:

6.1 Proposed Use

The proposed project consists of constructing an addition to the existing home on the eastern portion of the site. No adverse impacts are anticipated to occur on adjacent lots as a result of the development of this site, provided that the recommendations detailed in this report are adhered to. The proposed location of the addition, east of the existing house, is within the area with the least exposure to risk from coastal hazards at the site.

6.2 Hazards to Life, Property, and the Environment

Geologic hazards to life, property, and the environment associated with this proposed use include stormwater erosion, ocean wave erosion, seismic hazards, and possibly landsliding. Recommendations for mitigation of erosion and seismic hazards have been incorporated into this report. Please note that the risk of these hazards is inherent with development and construction in this part of Neskowin and must be assumed by the owner, future owners, developers, and residents.

6.3 Off-Site Protection

Adverse effects of this development on surrounding areas will be minimized when all the stormwater, foundation, vegetation, and erosion control recommendations detailed in this report are adhered to.

6.4 Stabilization Programs

Stabilization programs for this site include vegetation and erosion stabilization as addressed in Sections 5.4 and 5.8 of this report, surface water collection as addressed in Section 5.7 of this report, and maintenance of the riprap revetment as addressed in Section 5.8 of this report.

6.5 Conclusions Regarding Hazards and Adverse Environmental Effects

Adverse environmental effects will be minimized by following the recommendations detailed in this report during the design and construction of the proposed project.

6.6 Recommendations for Further Work

Assuming all the recommendations above are adhered to, no additional investigation or analysis is required by our firm other than review of site development plans, and observation of foundation excavations as detailed in Section 5.11 and Appendix B of this report.

7.0 Additional Services

Design Review

This report pertains to a specific site and development. It is not applicable to adjacent sites, nor is it valid for types of development other than that to which it refers. Any variation from the site or development plans necessitates a geotechnical review in order to determine the validity of the design concepts evolved herein.

HGSA's review of final plans and specifications is necessary to determine whether the recommendations detailed in this report for the site have been properly interpreted and incorporated in the design and construction documents. At the completion of our review, we will issue a letter of conformance to the client for the plans and specifications.

Construction Monitoring

Because of the judgmental character of geotechnics, as well as the potential for adverse circumstances arising from construction activity, observations during site preparation, excavation, and construction will need to be carried out by a representative of HGSA or our

designate. These observations may then serve as a basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein to the benefit of the project. Field observations become increasingly important should earthwork proceed during adverse weather conditions.

8.0 Limitations

The Oregon Coast is a dynamic environment with inherent unavoidable risks to development. Landsliding, erosion, tsunamis, storms, earthquakes, and other natural events can cause severe impacts to structures built within this environment and can be detrimental to the health and welfare of those who choose to place themselves within this environment. The client is warned that, although this report is intended to identify the geologic hazards causing these risks, the scientific and engineering communities' knowledge and understanding of geologic hazards processes are not complete.

Our investigation was based on engineering geological reconnaissance, limited review of published information, and our subsurface exploration and analyses. The data presented in this report are believed to be representative of the site. The conclusions herein are professional opinions derived in accordance with current standards of professional practice and budget constraints. No warranty is expressed or implied. The performance of the site during a seismic event has not been evaluated. If you would like us to do so, please contact us.

The boring logs and related information depict generalized subsurface conditions only at these specific locations, and at the particular time the subsurface exploration was completed. Soil, rock, and groundwater conditions at other locations may differ from the conditions at these boring locations. Also, the passage of time may result in a change in the soil and groundwater conditions at the site.

This report pertains to the subject site only and is not applicable to adjacent sites, nor is it valid for types of development other than that to which it refers. Geologic conditions, including materials, processes, and rates, can change with time, and therefore, a review of the site and/or this report may be necessary as time passes to assure its accuracy and adequacy. This report may only be copied in its entirety.

9.0 Disclosure

H.G. Schlicker & Associates, Inc. and the undersigned Certified Engineering Geologist have no financial interest in the subject site, the project, or the Client's organization.

10.0 References Cited

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It has been our pleasure to serve you. If you have any questions concerning this report or the site, please contact us.

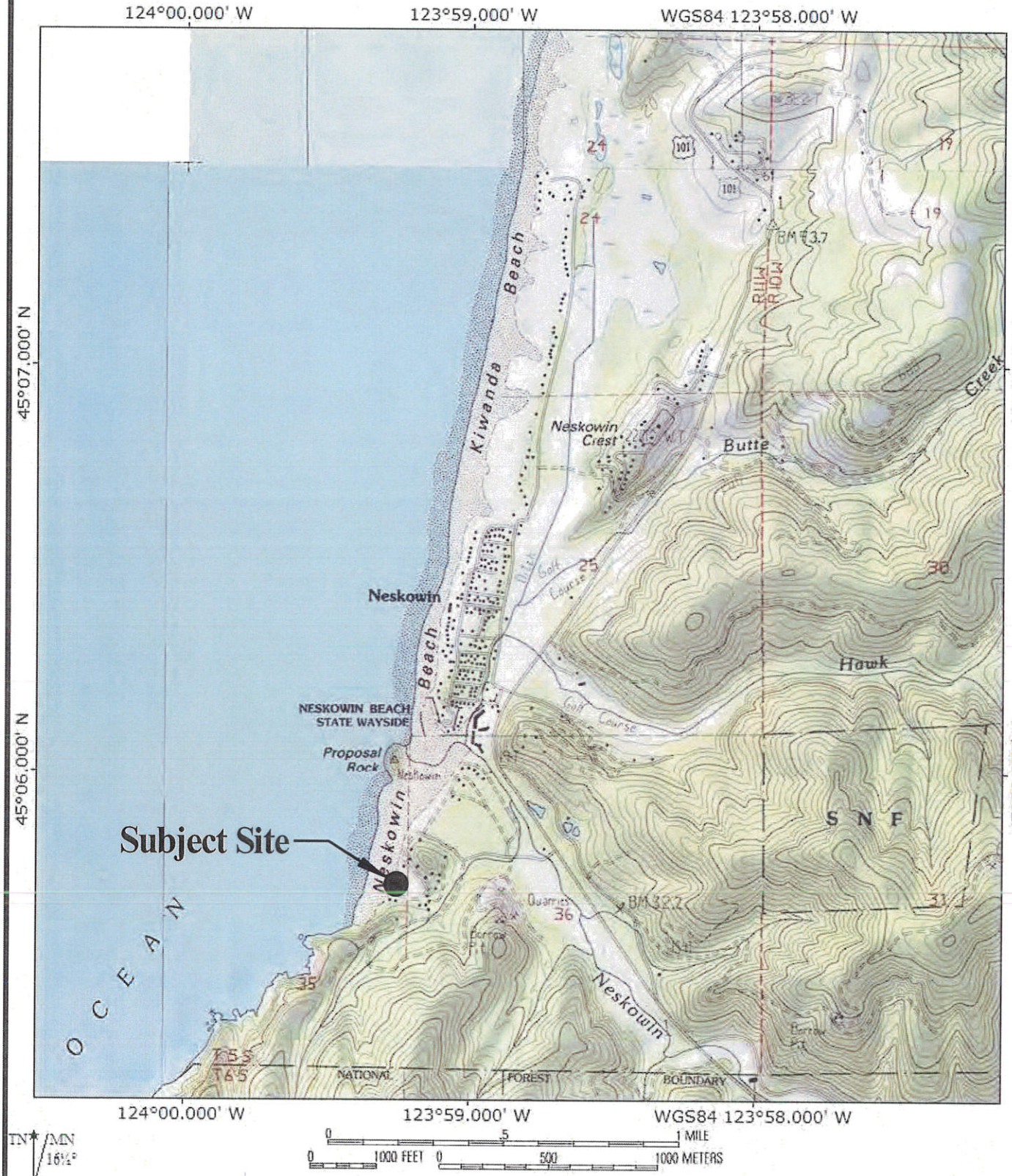
Respectfully submitted,

H.G. SCHLICKER AND ASSOCIATES, INC.

EXPIRES: 10/31/2021

J. Douglas Gless, MSc, RG, CEG, LHG
President/Principal Engineering Geologist

JDG:mgb

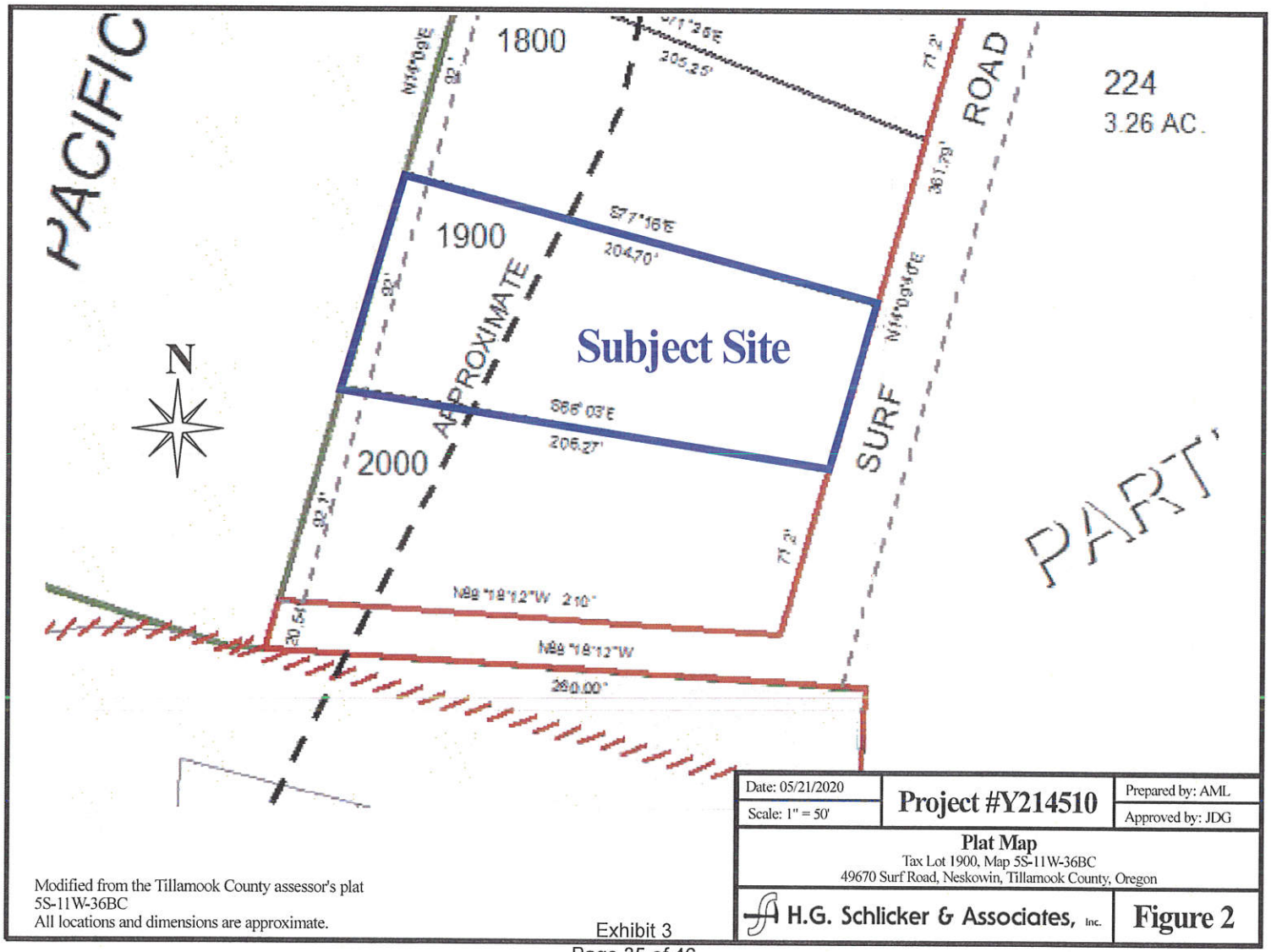


Date: 05/21/2021	**Project #Y214510**	Prepared by: AML
Scale: 1" = 2,000'		Approved by: JDG

Location Map
Tax Lot 1900, Map 5S-11W-36BC
49670 Surf Road. Neskowin, Tillamook County, Oregon

H.G. Schlicker & Associates, Inc.

Figure 1

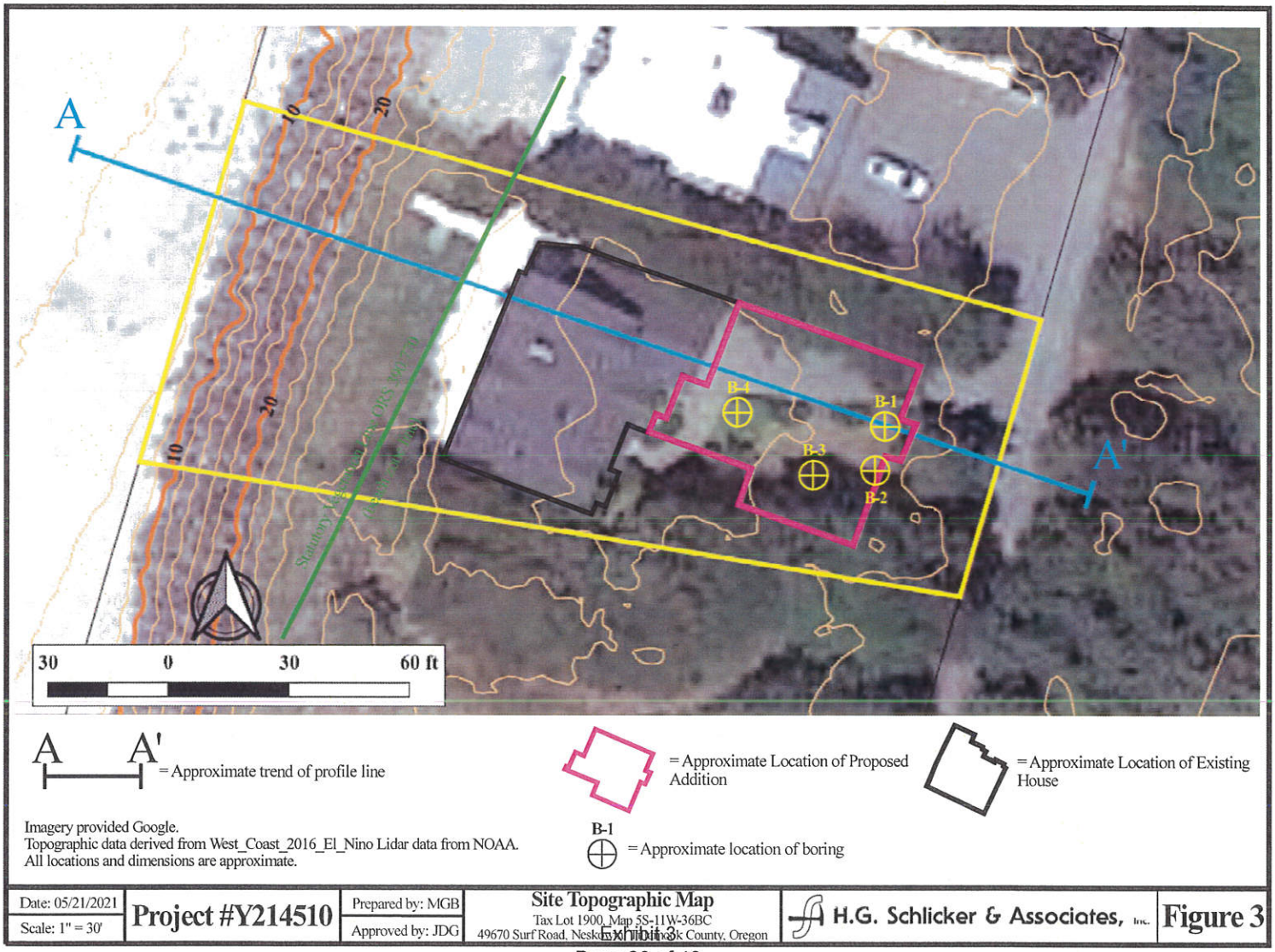


Date: 05/21/2020	**Project #Y214510**	Prepared by: AML
Scale: 1" = 50'		Approved by: JDG

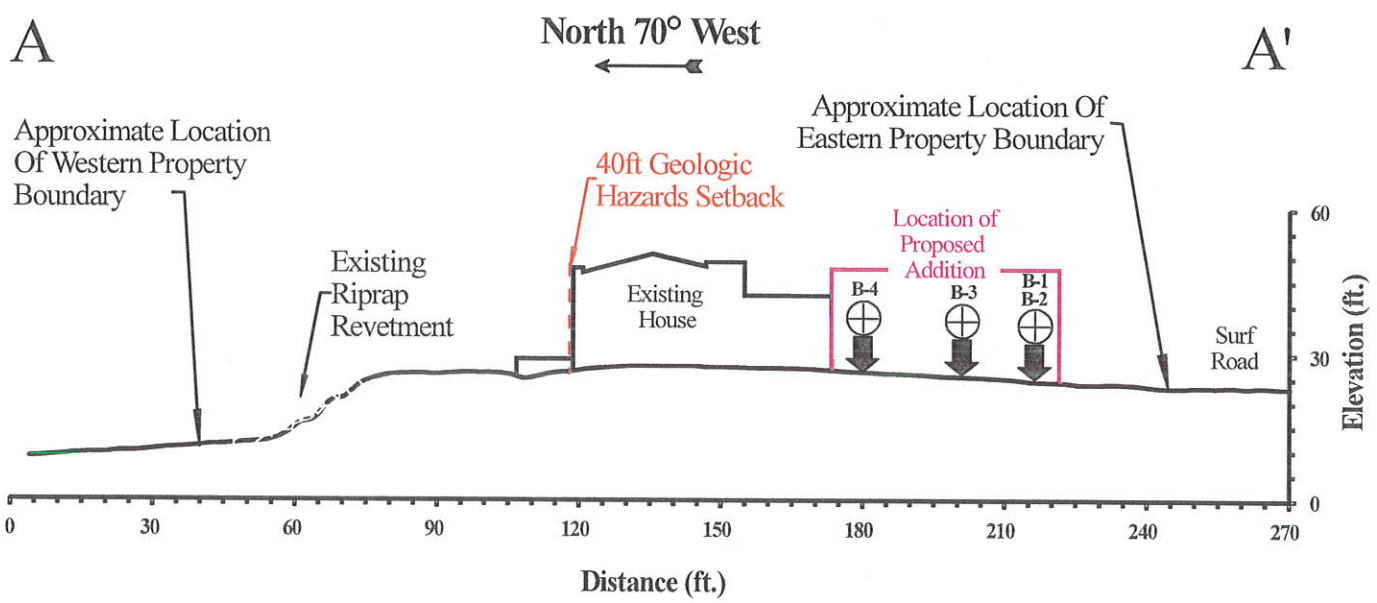
Plat Map
Tax Lot 1900, Map 5S-11W-36BC
49670 Surf Road, Neskowin, Tillamook County, Oregon

H.G. Schlicker & Associates, Inc. — **Figure 2**

Modified from the Tillamook County assessor's plat
5S-11W-36BC
All locations and dimensions are approximate.



Date: 05/21/2021 Scale: 1" = 30'	Project #Y214510	Prepared by: MGB Approved by: JDG	**Site Topographic Map** Tax Lot 1900, Map 5S-11W-36BC 49670 Surf Road, Neskowin, Tillamook County, Oregon	H.G. Schlicker & Associates, Inc.	Figure 3



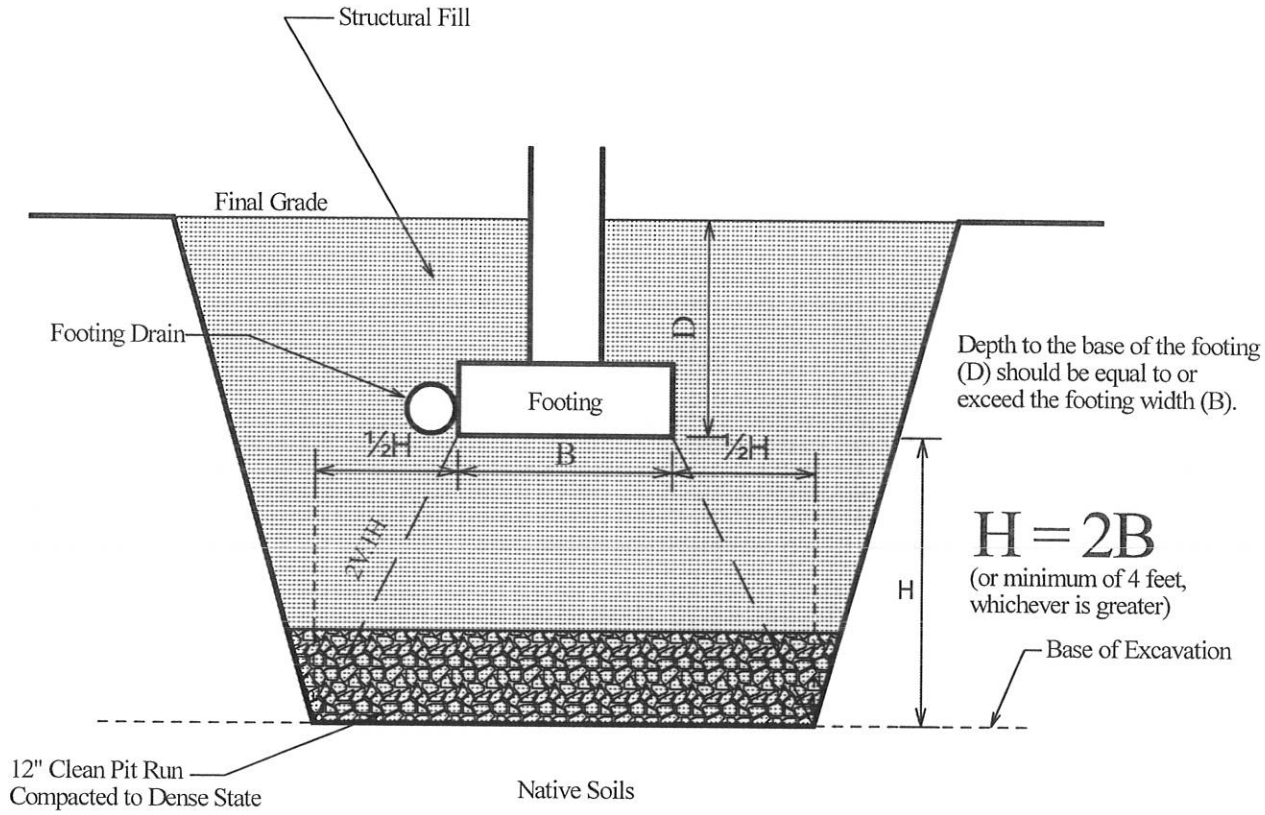
B-1 = Approximate location of boring

All dimensions, elevations and locations are approximate.
Slope profile derived from West_Coast_2016_El_Nino Lidar data from NOAA.

Date: 05/21/2021	**Project #Y214510**	Prepared by: AML
Scale: 1" = 30'		Approved by: JDG

Slope Profile, A-A'
Tax Lot 1900, Map 5S-11W-36BC
49670 Surf Road, Neskowin, Tillamook County, Oregon

H.G. Schlicker & Associates, Inc. — **Figure 4**



The base of the excavation should be constructed to a width governed by the intersection of a horizontal line and a 2V:1H line projected from the outer edges of the footing.

Date: 05/21/2021	**Project #Y214510**	Prepared by: AML
Scale: Not to Scale		Approved by: JDG
Over-Excavation and Replacement Detail Tax Lot 1900, Map 5S-11W-36BC 49670 Surf Road, Neskowin, Tillamook County, Oregon		
H.G. Schlicker & Associates, Inc.		**Figure 5**

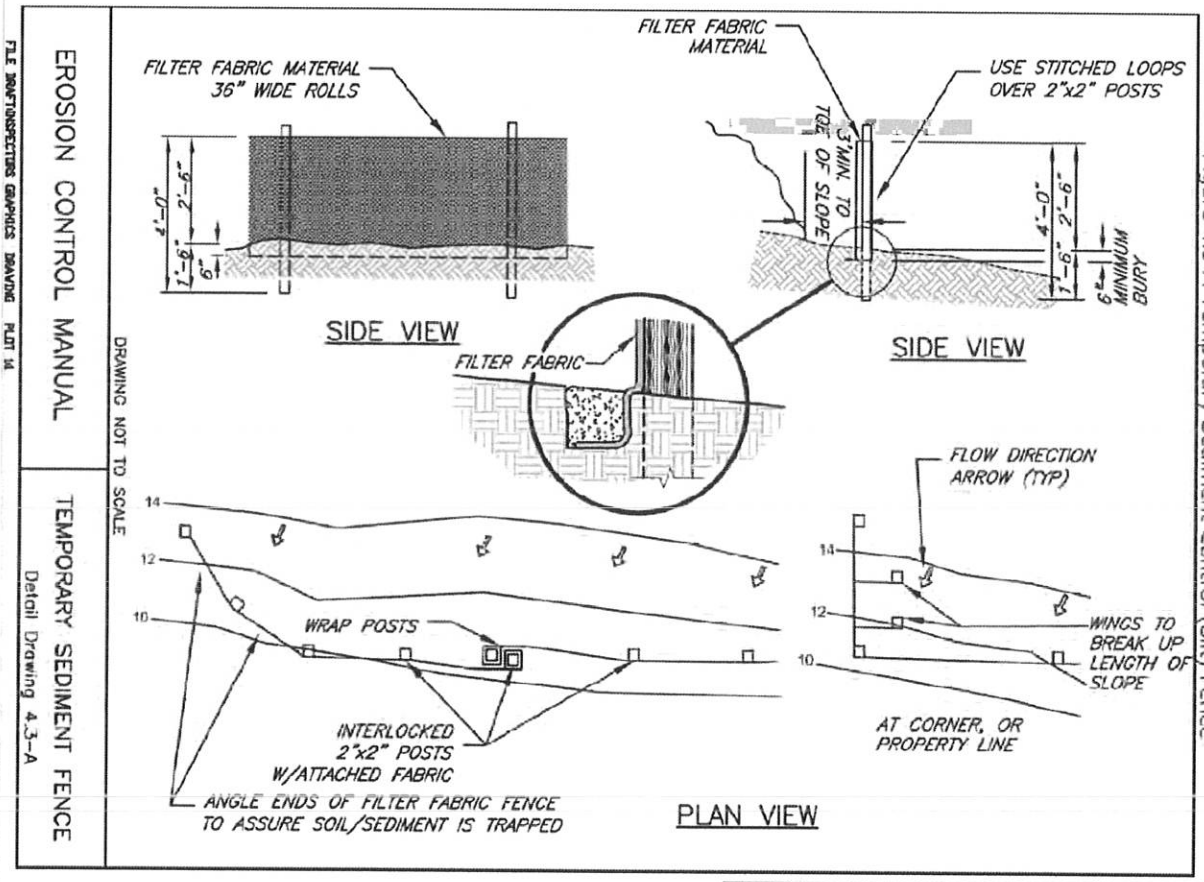


Figure 4.3-A Temporary Sediment Control (Silt) Fence

Date: 05/21/2021	**Project #Y214510**	Prepared by: AML
Scale: As Shown		Approved by: JDG

Sediment Fence Detail
Tax Lot 1900, Map 5S-11W-36BC
49670 Surf Road, Neskowin, Tillamook County, Oregon

H.G. Schlicker & Associates, Inc. **Figure 6**

Drawing modified from Erosion and Sediment Control Manual,
City of Portland Bureau of Environmental Services, 2008.

Refer to Original Source for Design Criteria/ Specifications

Appendix A
- Site Photographs –

Photo 1 – Westerly view of the eastern portion of the site from Surf Road.

Photo 2 – Northwesterly view of the area of the proposed addition.

Photo 3 – View of the western side of the existing home and deck.

Photo 4 – Easterly view of the site and existing revetment.

Photo 5 – Southerly view of the beach and exposed tree stumps near the site.

Photo 6 – View of the sandy fill soils encountered in our hand borings.

Photo 7 – View of the sand exposed in the crawlspace excavation.

Appendix B
- Checklist of Recommended Additional Work, Plan Reviews and Site Observations -

APPENDIX B

Checklist of Recommended Additional Work, Plan Reviews and Site Observations
To Be Completed by a Representative of H.G. Schlicker & Associates, Inc.

Item No.	Date Done	Procedure	Timing
1*		Review site development, foundation, drainage, grading, and erosion control plans.	Prior to permitting and construction.
2*		Observe foundation excavations and setbacks.	Following excavation of foundations, and prior to placing fill, and forming and pouring concrete.**
3*		Review Proctor (ASTM D1557) and density test results for all fills placed at the site.	Following compaction, and prior to forming and pouring.

* There will be additional charges for these services.
** Please provide us with at least 5 days' notice prior to all site observations.

R. Warren Krager, R.G., C.E.G.
Consulting Engineering Geologist
Oregon CEG #E957

February 8, 2021

Michael K. Erickson
P.O. 803
Lake Oswego, Oregon 97034

Re: Engineering Geologic and Dune/ Shoreline Hazard Review
Proposed Home Addition, 49670 Surf Road, Neskowin
Map 05S 11W 36BC, Tax Lot 01900, Tillamook County, Oregon

Dear Mr. Erickson,

As you requested, I am pleased to submit my engineering geologic hazard review and dune hazard report for the above referenced property.

Introduction

The existing home pre-dates the Tillamook County Neskowin Coastal Hazards (Nesk-CH) Overlay, Section 3.570. This geologic hazard report has been prepared in general accordance with the requirements of Tillamook County Nesk-CH Overlay for application to construction of an addition on the southeast side of the home.

It should be noted that this shoreline erosion and geologic hazard review did not include a site reconnaissance and project specific subsurface exploration, or geotechnical engineering foundation design. The engineering geologic conclusions and recommendations of this report are based on background review of available design plans, background literature review, and general familiarity with engineering geologic and residential construction conditions from prior work in the area. In preparing this report, the following geologic reports, maps, aerial photos, client provided photos and other background information were reviewed:

- Site plan for Erickson Properties LLC 5 S 11W 36 BC Tax Lot 1900 prepared by Onion Peak Design, Erick M. White, Oregon PLS#78572, dated December 28, 2020.
- Various remodel design plans prepared by Troy Farnsworth, dated December 18, 2020.
- Structural Engineering design calculations prepared by Lewis and Van Vleet, Inc. Consulting Engineers, dated December 8, 2020.
- Tillamook County Land use Ordinance TCLUO Section 3.570. and Tillamook County Assessors website.
- Environmental Geology of the Coastal Region of Tillamook and Clatsop Counties, Oregon, Oregon Department of Geology and Mineral Industries (DOGAMI), Bulletin 74, 1972.
- Geologic Map of the Tillamook Highlands, Northwest Oregon Coast Range USGS Open File Report 94-21, 1994.
- Evaluation of Coastal Erosion Hazards Zones Along the Dune and Bluff Backed Shorelines in Tillamook County, Oregon, DOGAMI Open-File Report O-01-03, by Jonathan C. Allan and George R. Priest, 2001.

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- Beaches and Dunes of the Oregon Coast, USDA Soil Conservation Service and Oregon Coastal Conservation and Development Commission, 1975.
- Google Earth aerial photographs of the Proposal Rock - Cascade Head, Oregon area, photo dates: May 5, 1994, August 15, 2000, June 15, 2003, June 9, 2005, August 1, 2011, July 6, 2012, July 30, 2014, August 23, 2016, June 22, 2017, and July 24, 2019.
- DOGAMI LIDAR Viewer, accessed online February 02, 2021.
- United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), Web Soil Survey: http://websoilsurvey.nrcs.usda.gov/ accessed online February 2, 2020.

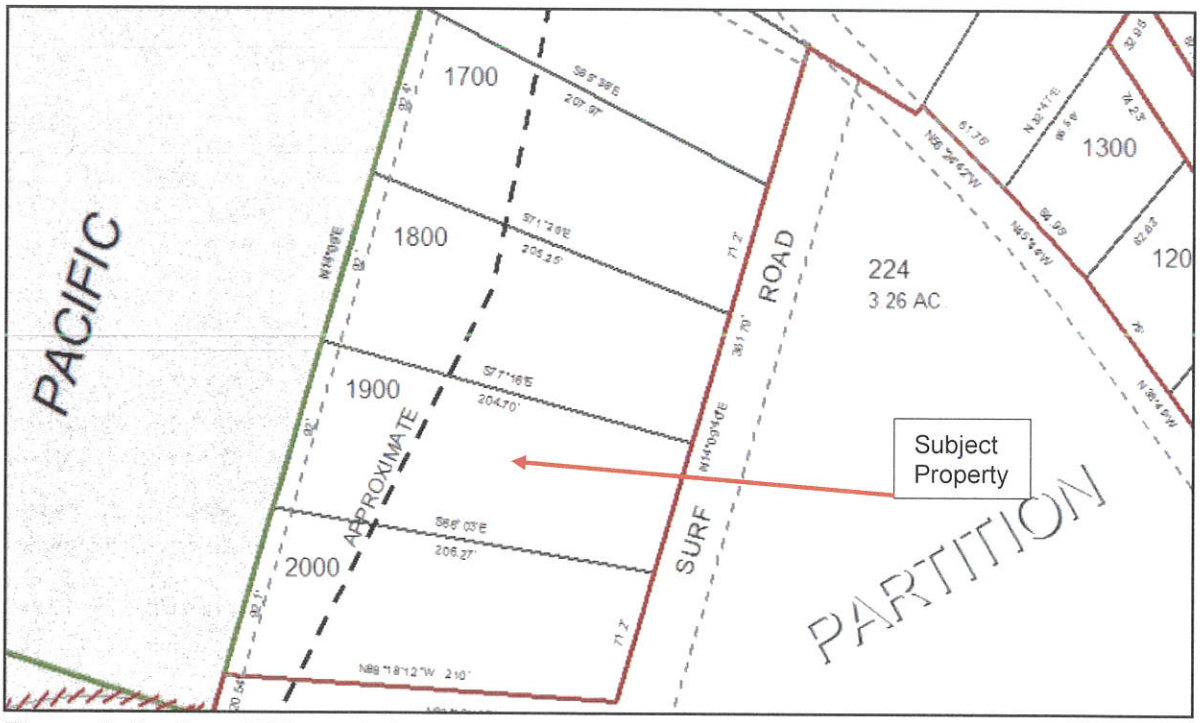


Figure 1- Portion of Tillamook County Tax Lot Map 5S11 36BC.

Site and Project Description

The subject property is identified as Tax Lot 01900, 5S1136BC in Tillamook County, Oregon. The site location is shown on Figure 1. Tax Lot 1900 is developed with an existing home and driveway, and is vegetated with low grasses, pine trees and other landscape plantings. I understand the proposed home addition will be on the east side of the existing home in a building footprint currently occupied by driveway, lawn, and a few trees. Conventional, prescriptively designed shallow spread foundation with minor backfill grading is proposed in sand soil expected in the area. No deep excavations or shoring are planned. Figure 2 shows the site plan with existing improvements and proposed building addition.

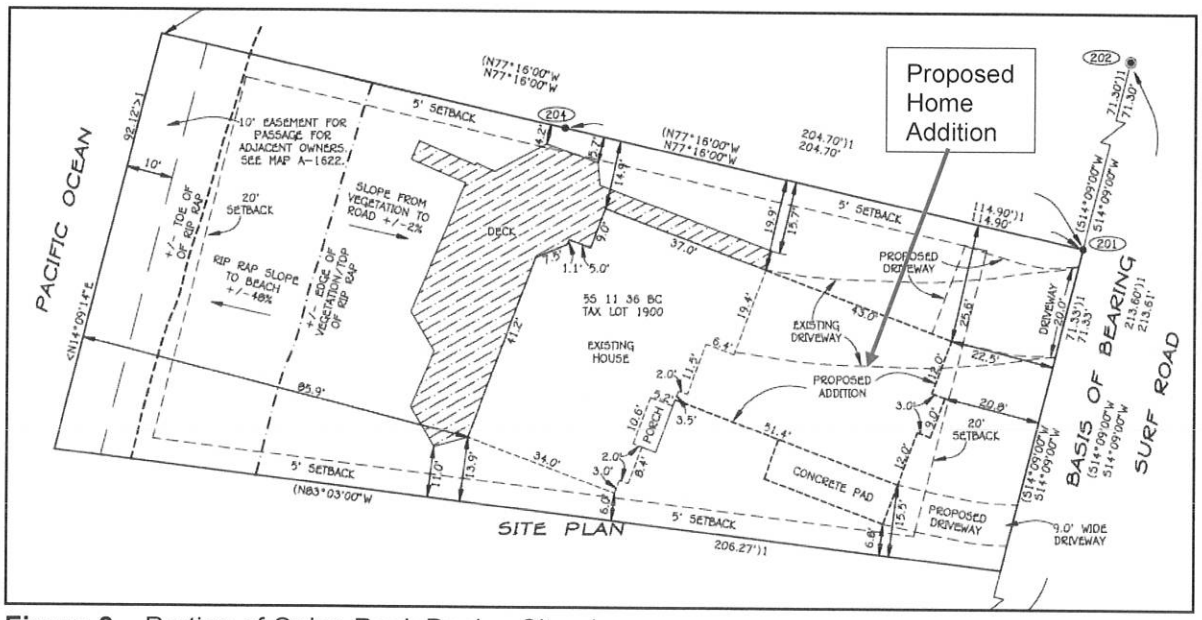


Figure 2 – Portion of Onion Peak Design Site plan.

No detailed project topography was available. Based on the Google Earth website elevation tool, the building area of Tax Lot 1900 is generally level at about 24 feet to 26 feet above mean sea level. An erosion protection revetment on the western part of the lot borders the Pacific Ocean shoreline, with its exposed toe elevation at about 17 feet above mean sea level. It is understood high tides and storm waves surge into the revetment boulders. I did not review finished floor elevations of the existing home or proposed addition.

Historical Ocean Shoreline Erosion Conditions

Aerial photos of the project area from 1953 to 1955 were used in the 1964 edition of the USDA Soil Survey of Tillamook Area, Oregon. Figure 3 shows the approximate area of Tax Lot 1900 as open sand beach embayment and active dune sand, (soil map unit **Ad**), in the mid-1950s photo. The 1982 USGS topographic map in Figure 4 shows some homes on the northern and southern upland margins of the shoreline embayment, and likely first home, on Tax Lot 1600, on the northern edge of the infilled embayment. The existing home on Tax Lot 1900 and two others to the north are visible in the May 5, 1994 Google earth aerial image. In the 1994 photo,

the area of Tax Lot 1900 is interpreted as a dune grass and shrub stabilized shoreline beach berm and foredune that had infilled across the embayment. The western edge of the vegetated foredune was then about 45 feet from the west side of the home visible in the 1994 air photo.

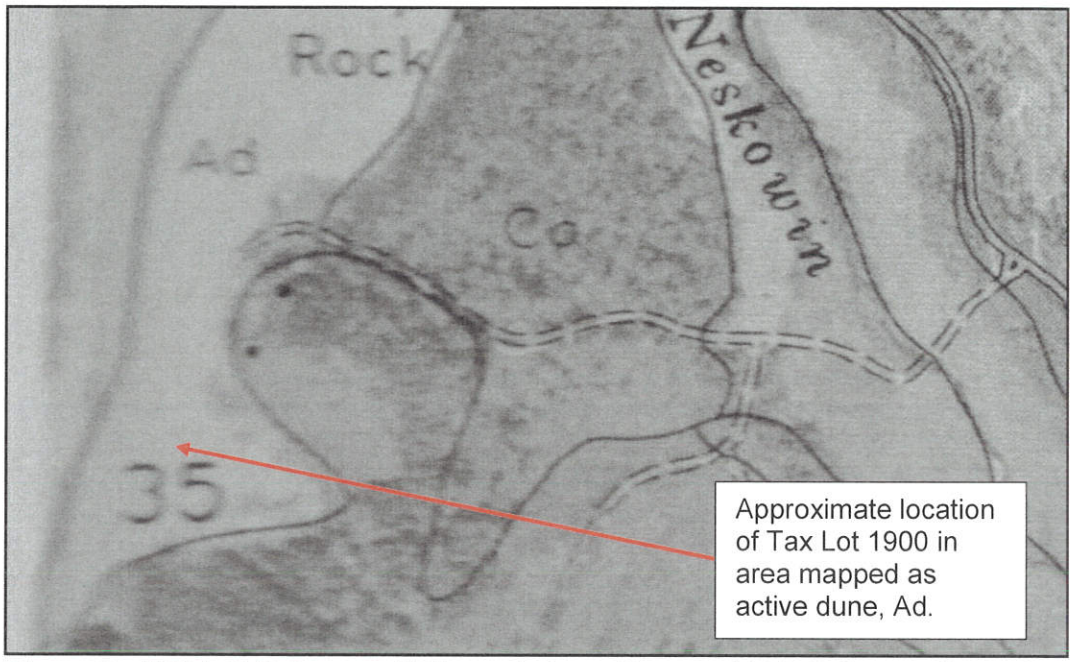


Figure 3 –USDA Soil Survey of Tillamook Area, Oregon, 1964. Soil map photo of project area from 1953, 1954, or 1955.

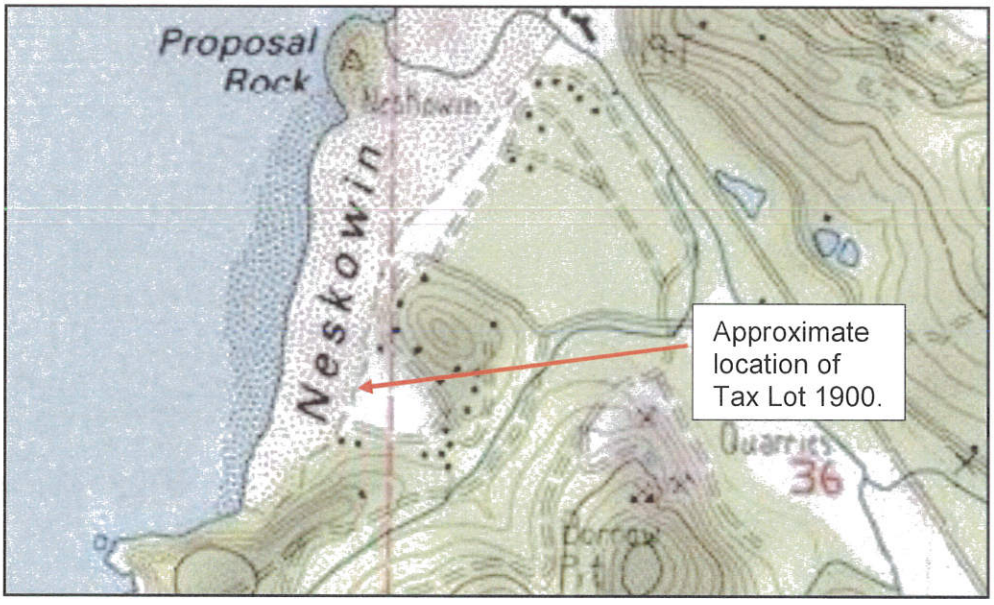


Figure 4 – Portion of USGS 7.5-Minute topographic map of Neskowin,1982

In response to shoreline erosion in the late 1990s, boulder revetment shoreline protection was reportedly permitted with Oregon State Parks and constructed along this shoreline north of

Cascade Head in the late 1990s or early 2000's, to protect homes on the west side of Surf Road and elsewhere. I have not reviewed shoreline protection permit information but would be happy to do so if provided. I understand from our discussion that you and adjacent property owners occasionally hire a specialty contractor to repair storm damage to the boulder revetment. You indicated that no significant revetment repairs have been required on Tax Lot 1900 in recent years.

The Northwest Association of Networked Ocean Observing Systems (NANOOS) and DOGAMI have developed the Oregon Beach and Shoreline Mapping and Analysis Program (OBSMAP), that documents the spatial variability of beach changes at various monitoring stations along beaches of the Oregon coast. The closest NANOOS monitoring station, Neskowin, OR - Nesk01, is 0.63 miles north of the subject property, near the west end of Yamhill Avenue, in Neskowin. Figure 5 plots the trend of shoreline-change for this monitoring station from 1997 to present. The data plot suggests rapid shoreline erosion between 1997 and about 2003.

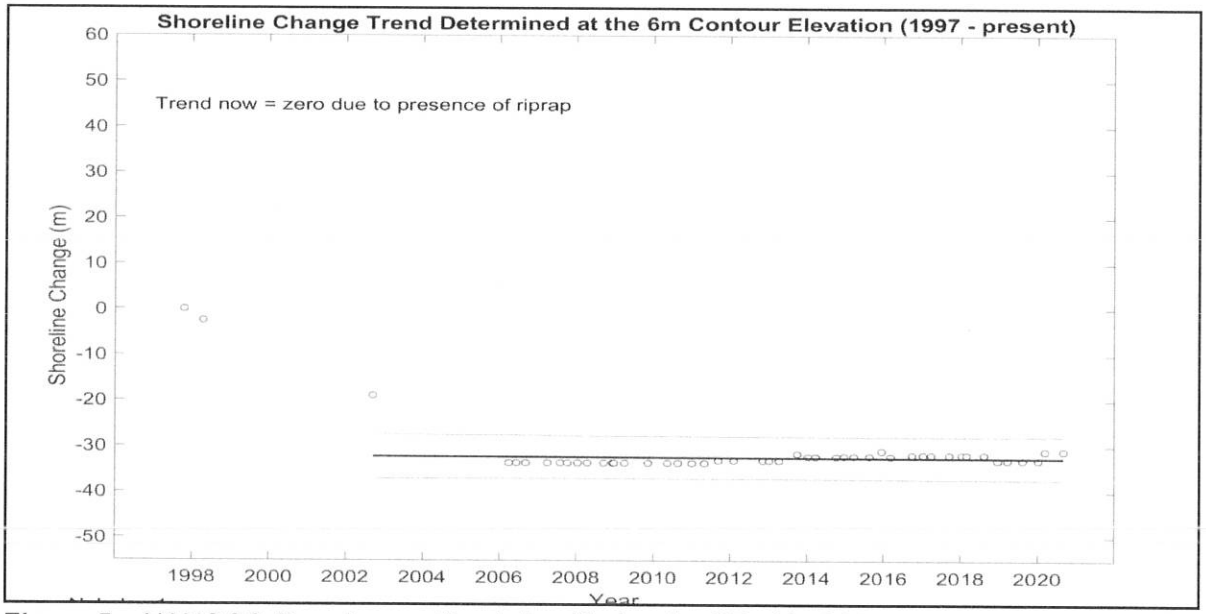


Figure 5 – NANOOS Shoreline profile station Neskowin, OR - Nesk01.

The gap in survey data from about 2003 to early 2006 suggests that construction of the shoreline protection boulder revetment may have occurred during this time. After shoreline erosion protection was completed, regular profile surveys resumed in 2006 and continue to present. The data illustrate the net erosion trend halted by installation of riprap. It should be considered that shoreline erosion conditions and timing of protective boulder revetment or riprap construction at Nesk01 survey station likely vary from the erosion protection of your beachfront property to the south. However, the observed trend of shoreline change, and result of erosion abatement following rip rap installation is expected to be similar for Tax Lot 1900. Review of Google Earth satellite images suggests initial rip rap installation on Tax Lot 1900 occurred sometime between 1994 and 2000. The eastern edge of the boulder revetment is visible in the 2003 and later Google Earth air photos about 40- to 42-feet from the existing home.

Photo 1 - Oblique east view, Google Earth aerial image dated July 24, 2019.

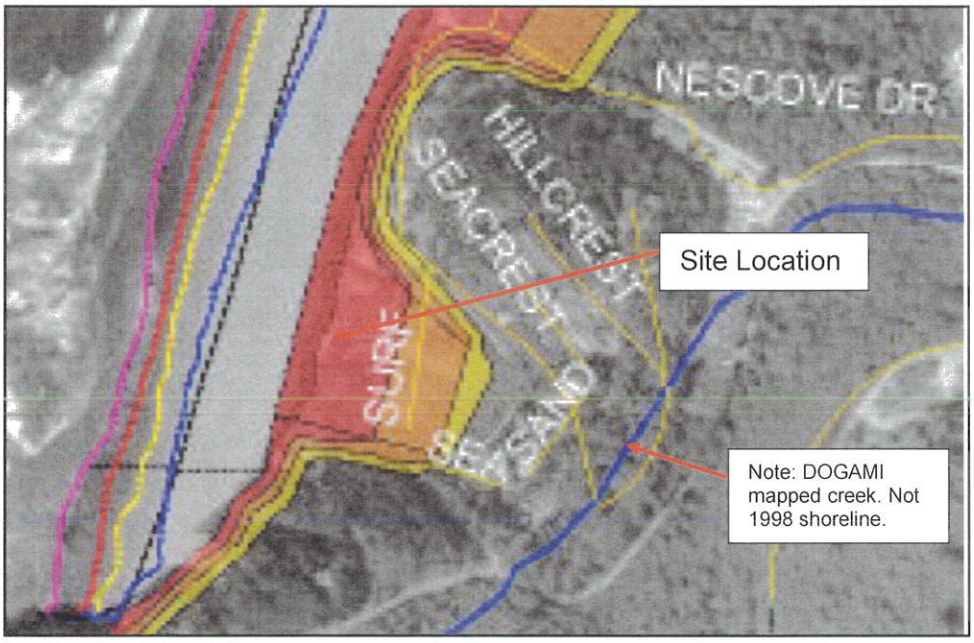


Figure 6 - Portion of DOGAMI Open-File Report O-01-03, 2001.

Tax Lot 1900 is mapped within the highest coastal erosion hazard zone as defined by DOGAMI Open-File Report O-01-03, 2001, Figure 6. Several worst-case scenario factors such as severe storms, higher than average tides, sea level rise, and other factors were considered in defining the erosion hazard zone categories. The report states that the likelihood of the occurrence of the combination of factors that define the high hazard zone is extremely low. This report was published before much of the shoreline protection revetement was constructed in the Neskowin

area. However, the protected shoreline is still considered in the highest erosion risk category, as evidenced by the continued repair and maintenance work necessary because of occasional storm damage to boulder revetment.

Offshore buoy data between the mid-1970s to 2007 suggest that average significant wave heights have been increasing during that period. Wave height increases have compounded by 1.5 to more than 6 times the average increase in height for waves recorded only during the winter months and the largest events per year. These changes in wave height increase are probably attributable in part to manmade influence on climate and sea level change. Need for repair or maintenance of boulder revetment will probably continue or increase as storm waves become more damaging in the future.

Seismic Hazard Considerations

The principal seismic geologic hazard concern for this property and throughout western Oregon is the Cascadia Subduction Zone (CSZ). This zone of tectonic plate convergence in the Pacific Ocean seafloor occurs about 50 to 60 miles off the northern Oregon coast. This compressive tectonic plate convergence zone is a global scale thrust-fault, capable of some of the strongest known earthquakes. This fault interface between the tectonic plates is held by friction and pressure wile accumulating increasing pressure and strain. CSZ earthquakes shift or release the locked fault and simultaneously release the accumulated energy. The seafloor thrust fault displaces the sea water above it causing a seismic tsunamic to the move away from the earthquake focus.

A widespread rupture of the CSZ would produce massive global scale earthquakes that will cause strong ground shaking and region wide damage. Geologic and geophysical research over the past few decades has established that the CSZ has repeatedly produced large earthquakes on an approximately 250- to 650-year recurrence interval with some lesser or greater time intervals between past earthquakes. Historic Japanese tsunami records and modern tree ring dating techniques have been used to calculate that the most recent CSZ Zone earthquake occurred off the Oregon coast in January of 1,700 AD. This last CSZ earthquake, 321 years ago, represents a greater recurrence interval than some of the geologically recorded previous earthquakes on the CSZ fault zone.

In 2008, the United States Geologic Survey (USGS) released research results estimating 10% probability that a Cascadia Subduction Zone earthquake would occur within 30 years. Scientists and engineers generally agree that the intensity of the next CSZ earthquake could potentially exceed moment magnitude 8.5 to 9.5. The duration of strong ground shaking could exceed several minutes and may be followed by days or weeks of strong aftershocks.

During a CSZ earthquake, the subject property will likely experience a few minutes of very intense ground shaking. The undersea thrust fault displacement will cause an ocean tsunami that will arrive at the Oregon coast within about 20 to 30 minutes of the onset of strong earthquake shaking. The subject lot is within the expected tsunami inundation zone. Tsunami

evacuation route planning and preparation, and practice of emergency drills should be considered for any known tsunami inundation zone.

Shoreline Erosion and Geologic Hazard Conclusions

Tax Lot 1900 is mapped within or near previously active dune, shoreline erosion and geologic hazard zones. The existing home was constructed in about 1994 within about 45 feet of the western edge of the then vegetated, stabilized foredune. The western margin of the subject property experienced beach and shoreline erosion in the late 1990's. Shoreline erosion protection revetment was installed in about 2003 or earlier and has been maintained to present.

In plan position, I estimate that the eastern edge of the existing revetment corresponds closely with the position of the western margin of the stabilized foredune in the 1994 photo. The toe of the revetment contacts the active beach sand about 70 feet from the west side of the home as measured in Figure 2. From these approximate measurements, riprap protected shoreline appears now to extend about 25 feet further west of the estimated 1994 western margin of stabilized foredune when the home was constructed.

In my opinion, the existing home is necessarily, but adequately protected from ocean shoreline erosion by the existing boulder revetment, and commitment to its future upkeep. Under these ongoing conditions, I do not foresee dune and coastal erosion to significantly impact the remaining design life of the existing home. Accordingly, I would not expect the planned addition on the east side of the home to be significantly impacted by shoreline or dune erosion.

The subject property has relatively high seismic hazard risk. Severe ground shaking, potential for seismic liquefaction, ground subsidence, and almost certain tsunami inundation are all seismic risks for this and other beach front and low-lying coastal homes in the area. These risks cannot be completely mitigated but can be managed to an acceptable level of risk by engineered foundation and home design, as allowed by building code.

The proposed home addition as shown in Figure 2 is not expected to increase coastal erosion or influence geologic hazards to Tax Lot 1900 or adjacent properties.

Limitations

The engineering geologic services performed for this project have been conducted with that level of care and skill ordinarily exercised by members of the profession currently practicing in this discipline and area under similar budget and time constraints. No warranty, expressed or implied, is made regarding the interpretations and conclusions of this report. I would be happy to discuss any of the above information or other engineering geologic services that may be desired.

This report may be used only by the client and their authorized agents for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both on- and off-site), or

other factors may change over time and could materially affect the findings. In my opinion this report should not be relied upon after 24 months from its date of issue. If the project is delayed by more than 24 months from the date of this report or other unanticipated site conditions are encountered, I would be happy to review site and design conditions and revise or update this report as appropriate.

If you have any questions regarding the information presented in this report, please do not hesitate to contact me at 360-903-4861 or warrenkrager@gmail.com.

Sincerely,

R. Warren Krager, R.G., C.E.G.
Oregon Licensed Engineering Geologist E-957

Also OSL

SECTION 3.570: NESKOWIN COASTAL HAZARDS OVERLAY ZONE (NESK-CH)

(1) PURPOSE: The purpose of the Neskowin Coastal Hazards Overlay Zone is to manage development in areas subject to chronic coastal hazards in a manner that reduces long term risks to life, property, and the community by:

(a) Identifying areas that are subject to chronic coastal natural hazards including ocean flooding, beach and dune erosion, dune accretion, bluff recession, landslides, and inlet migration;

(b) Assessing the potential risks to life and property posed by chronic coastal natural hazards; and

(c) Applying standards to the site selection and design of new development which minimize public and private risks to life and property from these chronic hazards; such measures may include hazard avoidance and other development limitations consistent with Statewide Planning Goals 7 and 18 as well as the Hazards Element and Beaches and Dunes Element of the Tillamook County Comprehensive Plan.

It is recognized that risk is ever present in identified hazard areas. The provisions and requirements of this section are intended to provide for full identification and assessment of risk from natural hazards, and to establish standards that limit overall risk to the community from identified hazards to a level acceptable to the community. It must be recognized, however, that all development in identified hazard areas is subject to increased levels of risk, and that these risks must be acknowledged and accepted by present and future property owners who proceed with development in these areas.

(2) AREAS INCLUDED: All lands within coastal erosion hazard zones as depicted on the Coastal Erosion Hazard Zone map adopted as Appendix D to the Neskowin Community Plan are subject to the provisions of this section.

(3) PERMITTED USES: Within the Neskowin Coastal Hazards Overlay Zone, all uses permitted pursuant to the provisions of the underlying zone may be permitted, subject to the additional requirements and limitations of this section.

(4) NESKOWIN COASTAL HAZARD AREA PERMIT:

(a) Except for activities identified in subsection (4)(b) as exempt, any new development, new construction or substantial improvement, as defined in Article I, in an area subject to the provisions of this section shall require a Neskowin Coastal Hazard Area Permit. The Neskowin Coastal Hazard Area Permit may be applied for prior to or in conjunction with a building permit, grading permit, or any other permit or land use approval required by Tillamook County.

(b) Except for beach or dune areas subject to the limitations of subsection (8) of this section, the following activities are exempt from the requirement for a Neskowin Coastal Hazard Area Permit:

Exceptions

(A) Maintenance, repair, or alterations to existing structures that do not alter the building footprint or foundation and do not constitute substantial improvement;

(B) An excavation which is less than two feet in depth or which involves less than twenty-five cubic yards of volume;

(C) Fill that is less than two feet in depth or that involves less than twenty-five cubic yards of volume;

D) Exploratory excavations under the direction of a certified engineering geologist or registered geotechnical engineer;

(E) Construction of structures for which a building permit is not required;

(F) Removal of trees smaller than 8 inches dbh (diameter breast height);

(G) Removal of trees larger than 8 inches dbh (diameter breast height) provided the canopy area of the trees that are removed in any one year period is less than twenty-five percent of the lot or parcel area;

(H) Yard area vegetation maintenance and other vegetation removal on slopes less than 25% slopes;

(I) Forest operations subject to regulation under ORS 527 (the Oregon Forest Practices Act);

(J) Maintenance and reconstruction of public and private roads, streets, parking lots, driveways, and utility lines, provided the work does not extend outside the previously disturbed area;

(K) Maintenance and repair of utility lines, and the installation of individual utility service connections;

(L) Emergency response activities intended to reduce or eliminate an immediate danger to life or property, or flood or fire hazard;

(M) Restoration, repair, or replacement of a lawfully established structure damaged or destroyed by fire or other casualty in accordance with subsection (12) of this section; and

(N) Construction/erection of beachfront protective structures subject to regulation by the Oregon Parks and Recreation Department under OAR 736, Division 20.

(c) Application, review, decisions, and appeals for Neskowin Coastal Hazard Area Permits shall be in accordance with the following requirements:

(d) In addition to a completed application as prescribed in subsection (c), an application for a Neskowin Coastal Hazard Area Permit shall include the following:

(A) A site plan that illustrates areas of disturbance, ground topography (contours), roads and driveways, an outline of wooded or naturally vegetated areas, watercourses, erosion control measures, and trees with a diameter of at least 8 inches dbh (diameter breast height) proposed for removal;

(B) An estimate of depths and the extent of all proposed excavation and fill work;

(C) Identification of the bluff- or dune-backed hazard zone or landslide hazard zone for the parcel or lot upon which development is to occur. In cases where properties are mapped with more than one hazard zone, an engineering geologist shall identify the hazard zone(s) within which development is proposed.

(D) A geologic report prepared by an engineering geologist that meets the content requirements of subsection (5);

(E) If engineering remediation is required to make the site suitable for the proposed development, an engineering report, prepared by a registered civil engineer, geotechnical engineer, or certified engineering geologist (with experience relating to coastal processes), which provides design and construction specifications for the required remediation; and,

(F) A Hazard Disclosure Statement, executed by the property owner, which sets forth the following:

(i) A statement that the property is subject to potential chronic natural hazards and that development thereon is subject to risk of damage from such hazards;

(ii) A statement that the property owner has commissioned a geologic report for the subject property, a copy of which is on file with Tillamook County, and that the property owner has reviewed the geologic report and has thus been informed and is aware of the type and extent of hazards present and the risks associated with development on the subject property;

(iii) A statement acknowledging that the property owner accepts and assumes all risks of damage from natural hazards associated with the development of the subject property.

(e) A decision to approve a Neskowin Coastal Hazard Area Permit shall be based upon findings of compliance with the following standards:

(b) For the purposes of Section 3.570, geologic reports should be prepared by these guidelines for engineering geologic reports. All references in Section 3.570 that refer to geologist reports assume that they are prepared with these guidelines.

(c) In addition to the requirements set forth in subsection (5)(a), geologic reports for lots or parcels abutting the ocean shore shall, to the extent practicable based on best available information, include the following information, analyses and recommendations:

(A) Site description:

(i) The history of the site and surrounding areas, such as previous riprap or dune grading permits, erosion events, exposed trees on the beach, or other relevant local knowledge of the site.

(ii) Topography, including elevations and slopes on the property itself.

(iii) Vegetation cover.

(iv) Subsurface materials – the nature of the rocks and soils.

(v) Conditions of the seaward front of the property, particularly for sites having a sea cliff.

(vi) Presence of drift logs or other flotsam on or within the property.

(vii) Description of streams or other drainage that might influence erosion or locally reduce the level of the beach.

(viii) Proximity of nearby headlands that might block the longshore movement of beach sediments, thereby affecting the level of the beach in front of the property.

(ix) Description of any shore protection structures that may exist on the property or on nearby properties.

(x) Presence of pathways or stairs from the property to the beach.

(xi) Existing human impacts on the site, particularly any that might alter the resistance to wave attack.

(B) Description of the fronting beach:

(i) Average widths of the beach during the summer and winter.

(viii) Description of potential for sea level rise, estimated for local area by combining local tectonic subsidence or uplift with global rates of predicted sea level rise.

(D) Assessment of potential reactions to erosion episodes:

(i) Determination of legal restrictions of shoreline protective structures (Goal 18 prohibition, local conditional use requirements, priority for non-structural erosion control methods).

(ii) Assessment of potential reactions to erosion events, addressing the need for future erosion control measures, building relocation, or building foundation and utility repairs.

(E) Recommendations:

(i) Use results from the above analyses to establish setbacks (beyond any minimums set by this section), building techniques, or other mitigation measures to ensure an acceptable level of safety and compliance with all local requirements.

(ii) Recommend a foundation design, or designs, that render the proposed structures readily moveable.

(iii) Recommend a plan for preservation of vegetation and existing grade within the setback area, if appropriate.

(iv) Include consideration of a local variance process to reduce the building setback on the side of the property opposite the ocean, if this reduction helps to lessen the risk of erosion, bluff failure or other hazard.

(v) Recommend methods to control and direct water drainage away from the ocean (e.g. to an approved storm water system); or, if not possible, to direct water in such a way so as to not cause erosion or visual impacts. In addition, the report shall specify erosion control measures as necessary to conform to the requirements of Section 5.100.

(d) Geologic reports required by this section shall include a statement of the engineering geologist's professional opinion as to whether the proposed development will be within the acceptable level of risk established by the community, considering site conditions and the recommended mitigation.

As used in this section, "acceptable level of risk" means the maximum risk to people and property from identified natural hazards deemed acceptable to the community in fulfilling

dwellings, the construction of additional dwelling units, including accessory dwelling units, is prohibited.

(7) MINIMUM OCEANFRONT SETBACKS: In areas subject to the provisions of this section, the building footprint of all new construction or substantial improvement subject to a Neskowin Coastal Hazard Area Permit shall be set back from the ocean shore in accordance with the following requirements:

(a) Of the following, the requirement that imposes the greatest setback shall determine the minimum oceanfront setback:

(A) A setback specified in a required geologic report;

(B) A setback that coincides with the Oceanfront Setback Line (OSL) determined pursuant to Section 3.530 (4)(A)(1)c.; or

(C) On bluff-backed shorelines, a setback from the bluff edge a distance of 50 times the annual erosion rate (as determined by an engineering geologist) plus 20 feet (or other distance determined to be an adequate buffer). The bluff edge shall be as defined in the required geologic report.

(b) On lots or parcels subject to the minimum oceanfront setback, the required yard setback opposite the oceanfront may be reduced by one foot for each one foot of oceanfront setback provided beyond the required minimum, down to a minimum of 10 feet.

(c) On lots or parcels created prior to the effective date of this section, where the application of the minimum oceanfront setback, together with any other required yards and/or setbacks, results in a building footprint area of less than 1,500 square feet, the minimum oceanfront setback may be reduced by an amount necessary to provide a building footprint of not more than 1,500 square feet.

(8) ADDITIONAL LIMITATIONS ON DEVELOPMENT ON BEACHES AND DUNES: In addition to the conditions, requirements, and limitations imposed by any required engineering geologic report, all development subject to a Neskowin Coastal Hazard Area Permit in identified beach and dune areas shall be subject to the following requirements:

(a) Foredune breaching and restoration shall be conducted in a manner consistent with sound principles of conservation. Such breaching maybe permitted only:

(A) To replenish sand supply in interdune areas;

(B) On a temporary basis in an emergency, such as for fire control, hazard removal or clean up, draining farm lands, or alleviating flood hazards; or

any geologic hazards, wind erosion, undercutting, ocean flooding and storm waves, and is designed to minimize adverse environmental effects.

(9) REQUIREMENTS FOR BEACHFRONT PROTECTIVE STRUCTURES:

(a) In reviewing a Land Use Compatibility Statement (LUCS) for an Oregon Parks and Recreation Department Ocean Shore Permit authorized by ORS 390.640, the director may determine that an application to construct a beachfront protective structure is in compliance with the local comprehensive plan and implementing regulations only if the beachfront protective structure will be placed where development existed on January 1, 1977, or where an exception to Goal 18, Implementation Requirement 2 has been adopted as set forth in Section 6.1d of the Beaches and Dunes Element of the Tillamook County Comprehensive Plan.

(b) For the purposes of this subsection, "development" means houses, commercial and industrial buildings, and vacant subdivision lots which are physically improved through construction of streets and provision of utilities to the lot.

(c) Review and decisions on Land Use Compatibility Statements for Ocean Shore Permits shall be conducted in accordance with the requirements for an administrative action in accordance with Article 10.

(10) LAND DIVISION REQUIREMENTS: All land divisions in areas subject to the provisions of this section shall be subject to the following requirements:

(a) Except as provided for in subsection (10)(b) below, all new lots and parcels shall have a building site located outside the Nesk-CH Overlay Zone. Such a building site shall consist of a minimum of 1,500 contiguous square feet of area that complies with all required lot setbacks and is located landward of the area subject to the provisions of this section.

(b) In a land division, one new lot or parcel may be exempted from the requirements of subsection (10)(a) to allow for the development or maintenance of one new single family dwelling within the Neskowin Coastal Hazards Overlay zone for properties capable of a land division. The new lot or parcel:

(A) Shall be divided from a lot or parcel that was created prior to November 5, 2014; and

(B) Is subject to an approved Coastal Hazard Area permit in accordance with subsection (4) of this section; and

(C) Shall be divided from a lot or parcel that is vacant; or

(D) Shall be divided from a lot or parcel that contains an existing dwelling located outside of the Nesk-CH Overlay Zone; or

(C) Replacement or restoration authorized by this subsection shall commence within one year of the occurrence of the fire or other casualty that necessitates such replacement or restoration.

(D) Where the cost of restoration or replacement authorized by this subsection equals or exceeds 80 percent of the RMV of the structure before the damage occurred, such restoration or replacement shall also comply with subsections (6) and (7) of this section.

(c) A building permit application for replacement, repair or restoration of a structure under the provisions of this subsection shall be accompanied by a geologic report prepared by an engineering geologist that conforms to the standards set forth in subsection (5). All recommendations contained in the report shall be complied with in accordance with subsection (11).

(d) A building permit application for replacement, repair, or restoration authorized by this subsection shall be processed and authorized as an administrative action pursuant to Article 10.

SECTION 3.575: NETARTS PLANNED RESIDENTIAL DEVELOPMENT OVERLAY ZONE (NT-PRD)

1. PURPOSE: The purpose of a Planned Residential Development is to encourage development designs that preserve the natural features and amenities of a property such as but not limited to: stream corridors, water frontage (bay, stream, wetland and shoreline), wetlands, sloping topography and natural geologic features, groves of trees and significant views. A Planned Residential Development shall conform to the general objectives as presented by the comprehensive plan for the area and it shall be compatible with the established and proposed surrounding land uses.

2. STANDARDS AND REQUIREMENTS: The following standards and requirements shall govern the application of a Planned Residential Development in an area in which it is permitted.

   a. A Planned Residential Development overlay zone is allowed in the RR, NT-R2 and NT-R3 zones.

   b. The density of a Planned Residential Development shall conform to the density and standards of the underlying zone.

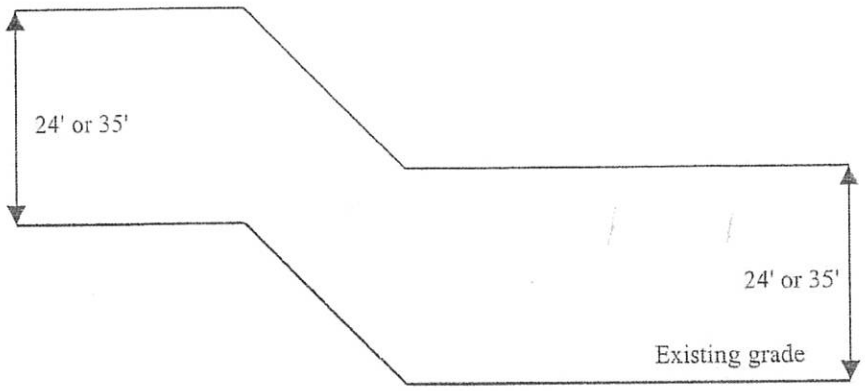
   c. Dimensional standards for lot area, depth, width, and all yard setback standards of the underlying zone shall not apply. These standards shall be established through the Planned Residential Development approval process in order to fulfill the purpose of the NT-PRD Overlay Zone. In the RR/PRD zoned areas, only those properties located within a Community Growth Boundary can utilize this item.

   d. The height limit may be increased to not more than 35 feet by the Planning Commission in approving a specific Planned Residential Development project.

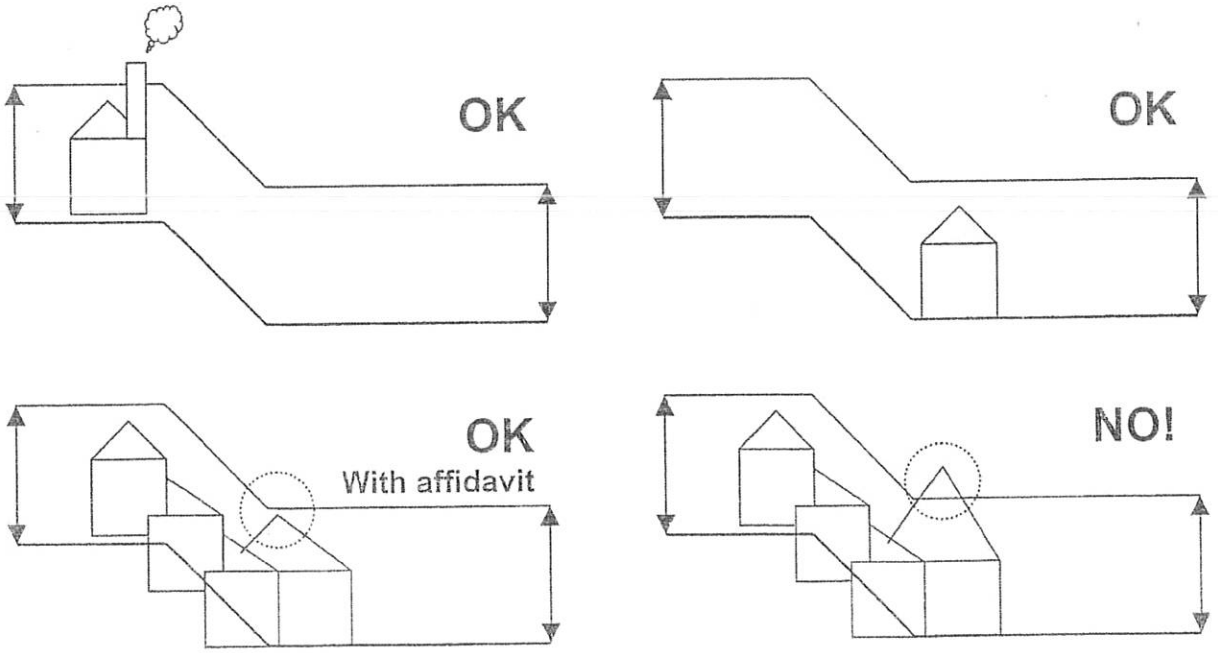
Determining Maximum Heights Within the **Neskowin** Unincorporated Community Boundary

Step 1. Determine if your parcel is an oceanfront parcel. Oceanfront parcels have a 24-foot height limit. All other parcels have a 35-foot height limit.

Step 2. Determine the building envelope. In Neskowin, a plane located exactly 24 or 35 feet above the existing grade of the parcel determines the maximum height of the structure.



Step 3. Determine if your proposed structure will pierce the plane. Some building projections such as chimneys do not count toward the height restriction. If the building is planned to be within 3 feet of the limit, a height affidavit must be signed by the property owner.



Tillamook County Department of Community Development
201 Laurel Avenue, Tillamook, OR 97401 • (503) 842-3408 • FAX (503) 842-1819

BASIS OF BEARING

THE LINE BETWEEN FOUND MONUMENTS (202) AND (203) BEARS SOUTH 14°09'00" WEST, THE RECORD VALUE FROM MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.

NOTES

THIS MAP DOES NOT CONSTITUTE A BOUNDARY SURVEY OF THE SUBJET PROPERTY. THE PURPOSE OF THIS MAP IS TO SHOW THE LOCATION OF THE EXISTING BUILDING AND PROPOSED ADDITION RELATIVE TO THE ADJACENT BOUNDARY LINES IN ACCORDANCE WITH THE TILLAMOOK COUNTY DEPARTMENT OF COMMUNITY DEVELOPMENT SITE PLAN REQUIREMENTS. THE BOUNDARIES WERE LAID OUT AT RECORD VALUES FROM MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS. THE PROPOSED ADDITION SHOWN HEREON WAS LAID OUT PER DIMENSIONS PROVIDED BY TONY FARNSWORTH ON NOVEMBER 18, 2020.

SEWER AND WATER TO EXISTING HOUSE IS CURRENTLY SERVED BY NESKOWIN REGIONAL SEWER AND WATER. ON SITE SERVICES WILL BE ADJUSTED AS NEEDED TO FIT PROPOSED ADDITION.

MONUMENT NOTES

(201) FOUND 5/8" REBAR WITH PLASTIC CAP STAMPED "LOOMIS PLS 1908" FLUSH IN GROUND, IN CALCULATED POSITION. SEE MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.

(202) FOUND 1" IRON PIPE FLUSH IN GROUND. HELD FOR CONTROL AS PER MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.

(203) FOUND 1" IRON PIPE 0.5' ABOVE GROUND. HELD FOR CONTROL AS PER MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.

(204) FOUND 5/8" REBAR WITH PLASTIC CAP STAMPED "LOOMIS PLS 1908" 0.8' ABOVE GROUND, IN CALCULATED POSITION. SEE MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.

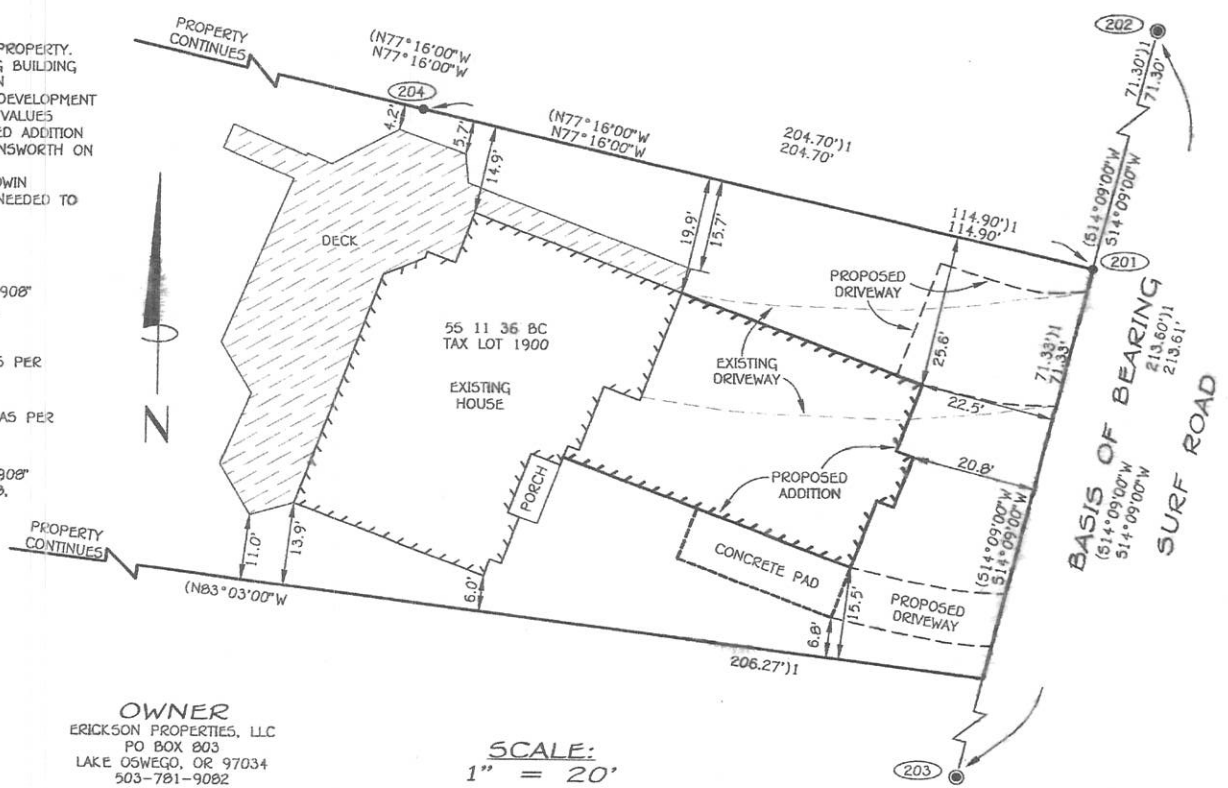
LEGEND

◉ INDICATES MONUMENT FOUND AS NOTED HEREON, HELD FOR CONTROL.

● INDICATES MONUMENT FOUND AS NOTED HEREON.

( )1 INDICATES RECORD VALUE FROM MAP B-3938, TILLAMOOK COUNTY SURVEY RECORDS.

NO ( ) INDICATES MEASURED VALUE.



SCALE:
1" = 20'

OWNER

ERICKSON PROPERTIES, LLC
PO BOX 803
LAKE OSWEGO, OR 97034
503-781-9082

SITE PLAN FOR:

ERICKSON PROPERTIES, LLC

55 11 36 BC
TAX LOT 1900

SW 1/4, NW 1/4, SECTION 36, T5S, R11W, W.M.
TILLAMOOK COUNTY
DECEMBER 28, 2020

REGISTERED
PROFESSIONAL
LAND SURVEYOR

OREGON
APRIL 28, 2014
ERICK M. WHITE
78572
RENEWS 6/30/2022

ONION PEAK DESIGN
PO BOX 326
NEHALEM, OR 97131
(503) 368-6102
FAX (503) 368-6102

"SURF" #A2020
ERICKSON2009-EX.DWG

Neskowin Coastal Hazard Zone Permit Affidavit

THIS RESTRICTIVE COVENANT, Made this 10th day of February, 2021, by and between Michael K Erickson (Erickson Properties LLC) and the County of Tillamook for property located in said County and further described as follows, to-wit:

PROPERTY LEGAL DESCRIPTION attached as Exhibit A hereto and incorporated by reference

Do hereby promise and covenant as follows:

The property herein described is located within the Neskowin Coastal Hazard Overlay (Nesk-CH) zone in Tillamook County, Oregon and is subject to potential chronic natural hazards. The owners/residents of this property understand that development thereon is subject to risk of damage from such hazards. The owners/residents of this property have obtained a geologic report for the subject property in preparation for development of said property, a copy of which is on file with Tillamook County.

I/We, being said property owner, have reviewed the geologic report and have thus been informed and are aware of the type and extent of hazards present and the risks associated with development on the subject property.

I/We do hereby accept the potential impacts and assume all risks of damage from natural hazards associated with the development of the subject property.

This affidavit shall run with the land and is intended to and hereby shall bind my/our heirs, assigns, lessees, and successors and it can not be deleted or altered without prior contact and approval by the Tillamook County Department of Community Development or its successor.

IN WITNESS WHEREOF, the said Party has executed this instrument this 10th day of February 2021,

ERICKSON PROPERTIES LLC

BY: _____
Michael K. Erikson, Member

COUNTY OF TILLAMOOK

BY: _____
Department of Community Development

STATE OF OREGON

County of Washington

February 10 2021,

Personally appeared the above named Michael K. Erickson Member of Erickson Properties, LLC.

and acknowledged the foregoing instrument to his voluntary act and deed.

Before me: Jennifer Ann Gannon

Notary Public of Oregon
(My Commission Expires) 10-16-21

OFFICIAL STAMP
JENNIFER ANN GANNON
NOTARY PUBLIC-OREGON
COMMISSION NO. 967494
MY COMMISSION EXPIRES OCTOBER 16, 2021

STATE OF OREGON

County of _____

_____, 20____,

Personally appeared the above named

_____

and acknowledged the foregoing instrument to

_____ voluntary act and deed.

Before me:

_____
Notary Public of Oregon
(My Commission Expires)

Neskowin Coastal Hazard Zone Permit Affidavit

Exhibit A

Property Address:

Erickson Properties LLC

49670 Surf Road, Neskowin, OR

Map 05S 11W 36BC, Tax Lot 01900, Tillamook County, Oregon